

TEST REPORT



DT&C Co., Ltd.

42, Yurim-ro, 154Beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea, 17042
Tel : 031-321-2664, Fax : 031-321-1664

1. Report No : DRRFCC2101-0004

2. Customer

- Name : Kyocera Corporation
- Address : Yokohama Office 2-1-1 Kagahara, Tsuzuki-ku Yokohama-shi, Kanagawa, Japan

3. Use of Report : FCC Original Grant

4. Product Name / Model Name : Mobile Phone / EB1065

FCC ID : JOYEB1065

5. FCC Regulation(s) : CFR 47 Part 2 subpart 2.1093

Test Method Used : IEEE 1528-2013, FCC SAR KDB Publications (Details in test report)

6. Date of Test : 2020.12.14 ~ 2021.01.25

7. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing

8. Testing Environment : Refer to appended test report.

9. Test Result : Refer to attached test report.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

Affirmation	Tested by	Reviewed by
	Name : BumJun Park 	Name : HakMin Kim 

2021 . 01 . 29 .

DT&C Co., Ltd.

This test report is a general report that does not use the KOLAS accreditation mark and is not related to KS Q ISO/IEC 17025 and KOLAS accreditation.

If this report is required to confirmation of authenticity, please contact to report@dtnc.net

Test Report Version

Test Report No.	Date	Description	Tested by	Reviewed by
DRRFCC2101-0004	Jan. 29, 2021	Initial issue	BumJun Park	HakMin Kim

Table of Contents

1. DESCRIPTION OF DEVICE	5
1.1 General Information	5
1.2 Power Reduction for SAR	7
1.3 Nominal and Maximum Output Power Specifications	7
1.4 DUT Antenna Locations	7
1.5 Simultaneous Transmission Capabilities	7
1.6 Miscellaneous SAR Test Considerations	7
1.7 Guidance Applied	8
1.8 Device Serial Numbers	8
1.9 FCC & ISED MRA test lab designation no. : KR0034	8
2. LTE INFORMATION	9
3. INTROCUCTION	10
4. DOSIMETRIC ASSESSMENT	11
4.1 Measurement Procedure	11
5. DEFINITION OF REFERENCE POINTS	13
5.1 Ear Reference Point	13
5.2 Handset Reference Points	13
6. TEST CONFIGURATION POSITIONS FOR HANDSETS	14
6.1 Device Holder	14
6.2 Positioning for Cheek/Touch	14
6.3 Positioning for Ear / 15 ° Tilt	14
6.4 Body-Worn Accessory Configurations	15
6.5 Extremity Exposure Configurations	15
6.6 Wireless Router Configurations	16
6.7 Phablet Configurations	16
7. RF EXPOSURE LIMITS	17
8. FCC MEASUREMENT PROCEDURES	18
8.1 Measured and Reported SAR	18
8.2 Procedures Used to Establish RF Signal for SAR	18
8.3 SAR Measurement Conditions for WCDMA (UMTS)	18
8.3.1 Output Power Verification	18
8.3.2 Head SAR Measurements for Handsets	18
8.3.3 Body SAR Measurements	19
8.3.4 Release 5 HSDPA Data Devices	19
8.3.5 Release 6 HSUPA Data Devices	19
8.4 SAR Measurement Conditions for LTE	21
8.4.1 Spectrum Plots for RB Configurations	21
8.4.2 MPR	21
8.4.3 A-MPR	21
8.4.4 Required RB Size and RB Offsets for SAR Testing	21
8.4.5 64QAM uplink	21
8.5 SAR Testing with 802.11 Transmitters	22
8.5.1 General Device Setup	22
8.5.2 U-NII and U-NII-2A	22
8.5.3 U-NII-2C and U-NII-3	22
8.5.4 Initial Test Position Procedure	23
8.5.5 2.4 GHz SAR Test Requirements	23
8.5.6 OFDM Transmission Mode and SAR Test Channel Selection	23
8.5.7 Initial Test Configuration Procedure	23
8.5.8 Subsequent Test Configuration Procedures	24
8.5.9 MIMO SAR Considerations	24
9. RF CONDUCTED POWERS	25
9.1 GSM Nominal and Maximum Output Power Spec and Conducted Powers	25
9.2 WCDMA Nominal and Maximum Output Power Spec and Conducted Powers	26
9.3 LTE Nominal and Maximum Output Power Spec and Conducted Powers	27
9.4 WLAN Nominal and Maximum Output Power Spec and Conducted Powers	29
9.5 Bluetooth Conducted Powers	31

10. SYSTEM VERIFICATION	33
10.1 Tissue Verification.....	33
10.2 Test System Verification.....	34
11. SAR TEST RESULTS	35
11.1 Standalone Head SAR Results.....	35
11.2 Standalone Body-Worn SAR Worn SAR Results	37
11.3 Standalone Hotspot SAR Results.....	39
11.4 SAR Test Notes.....	41
12. FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS.....	44
12.1 Introduction	44
12.2 Simultaneous Transmission Procedures	44
12.3 Simultaneous Transmission Capabilities	44
12.4 Head SAR Simultaneous Transmission Analysis	46
12.5 Body-Worn Simultaneous Transmission Analysis	51
12.6 Hotspot SAR Simultaneous Transmission Analysis.....	54
12.7 Phablet SAR Simultaneous Transmission Analysis.....	58
12.8 Simultaneous Transmission Conclusion.....	58
13. SAR MEASUREMENT VARIABILITY	59
13.1 Measurement Variability	59
13.2 Measurement Uncertainty	59
14. EQUIPMENT LIST	60
15. MEASUREMENT UNCERTAINTIES	61
16. CONCLUSION	68
17. REFERENCES.....	69
APPENDIX A. – Probe Calibration Data.....	71
APPENDIX B. – Dipole Calibration Data.....	117
APPENDIX C. – SAR Tissue Specifications	166
APPENDIX D. – SAR SYSTEM VALIDATION.....	169
APPENDIX E. – Description of Test Equipment.....	171

1. DESCRIPTION OF DEVICE

1.1 General Information

EUT type	Mobile Phone				
FCC ID	JOYEB1065				
Equipment model name	EB1065				
Equipment add model name	N/A				
Equipment serial no.	Identical prototype				
FCC & ISED MRA Designation No.	KR0034				
Mode(s) of Operation	GSM 850, GSM 1900, WCDMA 850, LTE Band 12, 2.4 G W-LAN (802.11b/g/n-HT20/ac-VHT20), 5 G W-LAN (802.11a/n-HT20/n-HT40/ac-VHT20/ac-VHT40/ac-VHT80), Bluetooth				
TX Frequency Range	Band	Mode	Operating Modes	Bandwidth	Frequency
	GSM 850	GSM/GPRS	Voice/Data	-	824.2 MHz ~ 848.8 MHz
	GSM 1900	GSM/GPRS	Voice/Data	-	1 850.2 MHz ~ 1 909.8 MHz
	WCDMA 850	WCDMA	Voice/Data	-	826.4 MHz ~ 846.6 MHz
	LTE Band 12	LTE	Voice/Data	1.4/3/5/10MHz	699.7 MHz ~ 715.3 MHz
	2.4 GHz W-LAN	802.11b/g/n/ac	Voice/Data	HT20/VHT20	2 412 MHz ~ 2 462 MHz
	5.2 GHz W-LAN	802.11a/n/ac	Voice/Data	HT20/VHT20	5 180 MHz ~ 5 240 MHz
		802.11n/ac	Voice/Data	HT40/VHT40	5 190 MHz ~ 5 230 MHz
		802.11ac	Voice/Data	VHT80	5 210 MHz
	5.3 GHz W-LAN	802.11a/n/ac	Voice/Data	HT20/VHT20	5 260 MHz ~ 5 320 MHz
		802.11n/ac	Voice/Data	HT40/VHT40	5 270 MHz ~ 5 310 MHz
		802.11ac	Voice/Data	VHT80	5 290 MHz
	5.6 GHz W-LAN	802.11a/n/ac	Voice/Data	HT20/VHT20	5 500 MHz ~ 5 720 MHz
		802.11n/ac	Voice/Data	HT40/VHT40	5 510 MHz ~ 5 710 MHz
		802.11ac	Voice/Data	VHT80	5 530 MHz ~ 5 690 MHz
	Bluetooth	-	Data	-	2 402 MHz ~ 2 480 MHz
RX Frequency Range	GSM 850	GSM/GPRS	Voice/Data	-	869.2 MHz ~ 893.8 MHz
	GSM 1900	GSM/GPRS	Voice/Data	-	1 930.2 MHz ~ 1 989.8 MHz
	WCDMA 850	WCDMA	Voice/Data	-	871.4 MHz ~ 891.6 MHz
	LTE Band 12	LTE	Voice/Data	1.4/3/5/10MHz	729.7 MHz ~ 745.3 MHz
	2.4 GHz W-LAN	802.11b/g/n/ac	Voice/Data	HT20/VHT20	2 412 MHz ~ 2 462 MHz
	5.2 GHz W-LAN	802.11a/n/ac	Voice/Data	HT20/VHT20	5 180 MHz ~ 5 240 MHz
		802.11n/ac	Voice/Data	HT40/VHT40	5 190 MHz ~ 5 230 MHz
		802.11ac	Voice/Data	VHT80	5 210 MHz
	5.3 GHz W-LAN	802.11a/n/ac	Voice/Data	HT20/VHT200	5 260 MHz ~ 5 320 MHz
		802.11n/ac	Voice/Data	HT40/VHT40	5 270 MHz ~ 5 310 MHz
		802.11ac	Voice/Data	VHT80	5 290 MHz
	5.6 GHz W-LAN	802.11a/n/ac	Voice/Data	HT20/VHT20	5 500 MHz ~ 5 720 MHz
		802.11n/ac	Voice/Data	HT40/VHT40	5 510 MHz ~ 5 710 MHz
		802.11ac	Voice/Data	VHT80	5 530 MHz ~ 5 690 MHz
	Bluetooth	-	Data	-	2 402 MHz ~ 2 480 MHz

SAR Summary Table

Equipment Class	Band	Reported SAR			
		1g SAR (W/kg)			10g SAR (W/kg)
		Head	Body-Worn	Hotspot	Phablet
PCE	GSM 850	0.36	0.44	-	-
PCE	GPRS 850	0.38	0.47	0.47	-
PCE	GSM 1900	0.37	0.41	-	-
PCE	GPRS 1900	0.48	0.48	0.48	-
PCE	WCDMA 850	0.36	0.59	0.59	-
PCE	LTE Band 12	0.27	0.31	0.31	-
DTS(SISO)	2.4 GHz W-LAN	0.15	< 0.1	< 0.1	-
DTS(MIMO)	2.4 GHz W-LAN	0.13	0.11	0.11	-
U-NII-1(SISO)	5.2 GHz W-LAN	-	-	-	-
U-NII-1(MIMO)	5.2 GHz W-LAN	-	-	-	-
U-NII-2A(SISO)	5.3 GHz W-LAN	0.30	0.33	0.40	-
U-NII-2A(MIMO)	5.3 GHz W-LAN	0.30	0.33	0.42	-
U-NII-2C(SISO)	5.6 GHz W-LAN	0.38	0.56	0.67	-
U-NII-2C(MIMO)	5.6 GHz W-LAN	0.37	0.41	0.73	-
DSS	Bluetooth	0.58	0.39	0.39	-
Simultaneous SAR per KDB 690783 D01v01r03		1.33	1.53	1.53	-
FCC Equipment Class	Licensed Portable Transmitter Held to Ear (PCE) Part 15 Spread Spectrum Transmitter(DSS) Digital Transmission System(DTS) Unlicensed National Information Infrastructure (UNII)				
Date(s) of Tests	2020.12.14 ~ 2021.01.25				
Antenna Type	Internal Antenna				
Functions	● GSM/GPRS (GPRS Class: 12) supported. * DTM not supported. ● No simultaneous transmission between BT & 2.4GHz WLAN ● Simultaneous transmission between [GSM, WCDMA voice & WLAN], [GPRS, WCDMA & WLAN], [LTE & WLAN]. ● VoIP is supported. ● W-LAN 2.4GHz is supported Hotspot. ● W-LAN 5 GHz is supported Hotspot.				

1.2 Power Reduction for SAR

There is no power reduction used for any band/mode implemented in this device for SAR purposes.

1.3 Nominal and Maximum Output Power Specifications

The Nominal and Maximum Output Power Specifications are in section 9 of this test report.

1.4 DUT Antenna Locations

The overall dimensions of this device are > 9 x 5 cm. A diagram showing the location of the device of the device antenna can be found in JOYEB1065_Antenna Location. Since the diagonal dimension of this device is > 160 mm and < 200 mm. it is considered a "phablet".

Mode	Device Sides for SAR Testing					
	Top	Bottom	Front	Rear	Right	Left
GSM/GPRS 850	X	O	O	O	O	X
GSM/GPRS 1900	X	O	O	O	O	X
WCDMA 850	X	O	O	O	O	X
LTE Band 12	X	O	O	O	O	X
2.4G W-LAN Ant.1	O	X	O	O	O	X
2.4G W-LAN Ant.2	O	X	O	O	X	O
2.4G W-LAN MIMO	O	X	O	O	O	O
5G W-LAN Ant.1	O	X	O	O	O	X
5G W-LAN Ant.2	O	X	O	O	X	O
5G W-LAN MIMO	O	X	O	O	O	O
Bluetooth	O	X	O	O	O	X

Note 1: Particular DUT edges were not required to be evaluated for Hotspot SAR or Phablet SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 648474 D04v01r03. The antenna document shows the distances between the transmit antennas and the edges of the device.

Note 2: O - Test / X - Not test.

1.5 Simultaneous Transmission Capabilities

The Simultaneous Transmission Capabilities are in section 12 of this test report.

1.6 Miscellaneous SAR Test Considerations

(A) WIFI

Since U-NII-1 and U-NII-2A bands have the same maximum output power and the highest reported SAR for U-NII-2A is less than 1.2 W/kg, SAR is not required for U-NII-1 band according to FCC KDB publication 248227 D01v02r02.

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is greater than 160 mm and less than 200 mm. Phablet SAR tests were not required when wireless router 1g SAR < 1.2 W/kg.

(B) Licensed Transmitter(s)

GSM/GPRS DTM is not supported for US bands. Therefore, the GSM Voice modes in this report do not transmit simultaneously with GPRS Data.

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02r04.

Per FCC KDB Publication 648474 D04 v01r03, this device is considered a "phablet" since the diagonal dimension is greater than 160 mm and less than 200 mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.

1.7 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01 (3G SAR Procedures)
- FCC KDB Publication 941225 D05v02r05 (SAR for LTE Devices)
- FCC KDB Publication 941225 D05Av01r02 (LTE Rel.10 KDB Inquiry Sheet)
- FCC KDB Publication 941225 D06v02r01(Hotspot Mode)
- FCC KDB Publication 248227 D01v02r02 (802.11 Wi-Fi SAR)
- FCC KDB Publication 447498 D01v06 (General RF Exposure Guidance)
- FCC KDB Publication 648474 D04v01r03 (Handset SAR)
- FCC KDB Publication 690783 D01v01r03 (SAR Listings on Grants)
- FCC KDB Publication 865664 D01v01r04 (SAR Measurement 100 MHz to 6 GHz)
- FCC KDB Publication 865664 D02v01r02 (RF Exposure Reporting)
- October 2013 TCB Workshop Notes (GPRS testing criteria)
- April 2015 TCB Workshop Notes (Simultaneous transmission summation clarified)
- October 2016 TCB Workshop Notes (Bluetooth Duty Factor)
- April 2019 TCB Workshop Notes (Tissue Simulating Liquids)

1.8 Device Serial Numbers

Several samples with identical hardware were used to support SAR testing. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units. The serial numbers used for each test are indicated alongside the results in Section 11.

1.9 FCC & ISED MRA test lab designation no. : KR0034

2. LTE INFORMATION

LTE Information					
FCC ID	JOYEB1065				
Form Factor	Mobile Phone				
Frequency Range of each LTE transmission Band	LTE Band 12 (699.7 ~ 715.3 MHz)				
Channel Bandwidths	LTE Band 12 : 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
Channel Number and Frequencies(MHz)	Low	Low-Mid	Mid	Mid-High	High
LTE Band 12: 1.4 MHz	699.7 (23017)	N/A	707.5 (23095)	N/A	715.3 (23173)
LTE Band 12: 3 MHz	700.5 (23025)	N/A	707.5 (23095)	N/A	714.5 (23165)
LTE Band 12: 5 MHz	701.5 (23035)	N/A	707.5 (23095)	N/A	713.5 (23155)
LTE Band 12: 10 MHz	704.0 (23060)	N/A	707.5 (23095) ^{NOTE1}	N/A	711.0 (23130)
UE Category	UE Cat 4				
Modulations Supported in UL	QPSK, 16QAM, 64QAM				
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	Yes				
A-MPR (Additional MPR) disabled for SAR Testing?	Yes				
LTE Carrier Aggregation Possible Combinations	This device does not support both UL and DL carrier aggregation.				

Note(s)

1. LTE B12 can not contain three non-overlapping channels of 10 MHz bandwidth.

Per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

3. INTROCUCTION

The FCC and Industry Canada have adopted the guidelines for evaluating the environmental effects of radio frequency (RF) radiation in ET Docket 93-62 on Aug. 6, 1996 and Health Canada Safety Code 6 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices.

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices. The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave is used for guidance in measuring SAR due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86 NCRP, 1986, Bethesda, MD 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ) It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Fig. 3.1)

$$SAR = \frac{d}{dt} \left(\frac{dU}{dm} \right) = \frac{d}{dt} \left(\frac{dU}{\rho dv} \right)$$

Fig. 3.1 SAR Mathematical Equation

SAR is expressed in units of Watts per Kilogram (W/kg).

$$SAR = \frac{\sigma \cdot E^2}{\rho}$$

where:

- σ = conductivity of the tissue-simulating material (S/m)
- ρ = mass density of the tissue-simulating material (kg/m³)
- E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.

4. DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013:

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See Table 4.1) and IEEE1528-2013.
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.
3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01r04 (See Table 4.1) and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):
 - a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 4.1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).
 - b. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.
 - c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

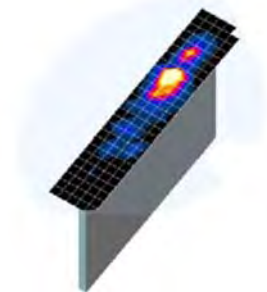


Figure 4.1
Sample SAR Area Scan

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 mm $\pm$ 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2)$ mm $\pm$ 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° $\pm$ 1°	20° $\pm$ 1°
Maximum area scan spatial resolution: Δx_{Area} , Δy_{Area}			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx_{Zoom} , Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$ mm	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.				
* When zoom scan is required and the <u>reported</u> SAR from the <u>area scan based 1-g SAR estimation</u> procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

Table 4.1 Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04*

5.1 Ear Reference Point

The diagram shows a top-down view of a head model. A dashed line represents the midline, with 'F' (Front) at the top and 'N' (Nasus) at the bottom. A solid line represents the ear plane, with 'B' (Back) on the left and 'M' (Mouth) on the right. An electrode is placed on the ear plane, labeled 'EEC'. A point on the midline is labeled 'RE ERP' (Right Ear Reference Point). A distance of '16 mm' is indicated between the 'RE ERP' and the 'EEC'.

5.2 Handset Reference Points

Figure 1 consists of two schematic diagrams, (a) and (b), illustrating the geometry of a handset. Diagram (a) is a side view showing the handset's profile. It features a vertical center line and a horizontal line. The handset is divided into three main sections: a top section labeled 'A', a middle section labeled 'B', and a bottom section labeled 'bottom of handset'. The width of the handset is indicated by $w_s/2$ on the left and $w_d/2$ on the right. The height of the handset is indicated by $w_b/2$ at the bottom and $w_g/2$ at the top. An 'acoustic output' is shown on the left side. Diagram (b) is a top view showing the handset's footprint. It features a vertical center line and a horizontal line. The handset is divided into three main sections: a top section labeled 'A', a middle section labeled 'B', and a bottom section labeled 'bottom of handset'. The width of the handset is indicated by $w_s/2$ on the left and $w_d/2$ on the right. The height of the handset is indicated by $w_b/2$ at the bottom and $w_g/2$ at the top. An 'acoustic output' is shown on the right side.

Pages: 13 /178

6. TEST CONFIGURATION POSITIONS FOR HANDSETS

6.1 Device Holder

The device holder is made out of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon = 3$ and loss tangent $\delta = 0.02$.

6.2 Positioning for Cheek/Touch

1. The test device was positioned with the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 6.1), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.



Figure 6.1 Front, Side and Top View of Cheek/Touch Position

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the ear.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the plane normal to MB-NF including the line MB (reference plane).
4. The phone was then rotated around the vertical centerline until the phone (horizontal line) was symmetrical with respect to the line NF.
5. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the phone contact with the ear, the handset was rotated about the line NF until any point on the handset made contact with a phantom point below the ear (cheek). (See Figure 6.2)

6.3 Positioning for Ear / 15 ° Tilt

With the test device aligned in the “Cheek/Touch Position”:

1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15 degree.
2. The phone was then rotated around the horizontal line by 15 degree.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the phone touches the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. The tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 6.3).

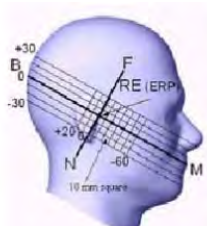


Figure 6.2 Side view w/relevant markings



Figure 6.3 Front, Side and Top View of Ear/15° Position

6.4 Body-Worn Accessory Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 6.4). Per FCC KDB Publication 648474 D04v01r03, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is $> 1.2 \text{ W/kg}$, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

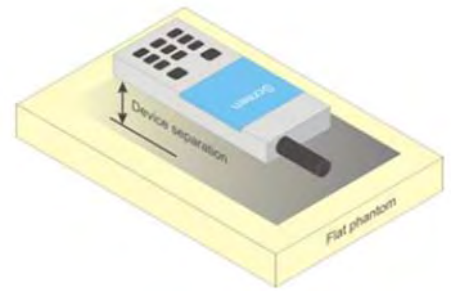


Figure 6.4 Sample Body-Worn Diagram

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented.

Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

6.5 Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1-g body and 10-g extremity SAR Exclusion Thresholds found in KDB Publication 447498 D01v06 should be applied to determine SAR test requirements.

Per KDB Publication 447498 D01v06, Cell phones (handsets) are not normally designed to be used on extremities or operated in extremity only exposure conditions. The maximum output power levels of handsets generally do not require extremity SAR testing to show compliance. Therefore, extremity SAR was not evaluated for this device.

6.6 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v02r01 where SAR test considerations for handsets ($L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$) are based on a composite test separation distance of 10 mm from the front, rear and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative test separation distance configuration may be used to support both SAR conditions.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitter often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each KDB Publication 447498 D01v06 procedures. The "Portable Hotspot" feature on the handset was not activated during SAR assessment, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

6.7 Phablet Configurations

For smart phones with a display diagonal $> 150 \text{ mm}$ or an overall diagonal dimension $> 160 \text{ mm}$ that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the phablets procedures outlined in KDB Publication 648474 D04v01r03 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worn accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna $\leq 25 \text{ mm}$ from that surface or edge, in direct contact with the phantom, for 10g SAR. The UMPC mini-tablet 1g SAR at 5 mm is not required. When hotspot mode applies, 10g SAR is required only for the surfaces and edges with hotspot mode 1g SAR $> 1.2 \text{ W/kg}$.

7. RF EXPOSURE LIMITS

Uncontrolled Environment:

UNCONTROLLED ENVIRONMENTS are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

Controlled Environment:

CONTROLLED ENVIRONMENTS are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Table 8.1.SAR Human Exposure Specified in ANSI/IEEE C95.1-1992

	HUMAN EXPOSURE LIMITS	
	General Public Exposure (W/kg) or (mW/g)	Occupational Exposure (W/kg) or (mW/g)
SPATIAL PEAK SAR * (Brain)	1.60	8.00
SPATIAL AVERAGE SAR ** (Whole Body)	0.08	0.40
SPATIAL PEAK SAR *** (Hands / Feet / Ankle / Wrist)	4.00	20.0

1. The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
2. The Spatial Average value of the SAR averaged over the whole body.
3. The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e.as a result of employment or occupation).

8. FCC MEASUREMENT PROCEDURES

Power measurements were performed using a base station simulator under digital average power.

8.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v06, When SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as reported SAR. The highest reported SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

8.2 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB Publication 941225 D01v03r01.

The device was placed into a simulated call using a base station simulator in a RF shielded chamber. Establishing connections in this manner ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. Devices under test were evaluated prior to testing, with a fully charged battery and were configured to operate at maximum output power. In order to verify that the device was tested throughout the SAR test at maximum output power, the SAR measurement system measures a “point SAR” at an arbitrary reference point at the start and end of the 1 gram SAR evaluation, to assess for any power drifts during the evaluation. If the power drift deviated by more than 5%, the SAR test and drift measurements were repeated.

8.3 SAR Measurement Conditions for WCDMA (UMTS)

8.3.1 Output Power Verification

Maximum output power is measured on the High, Middle and Low channels for each applicable transmission band according to the general descriptions in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all “1s”.

Maximum output power is verified on the High, Middle and Low channels according to the general, descriptions in section 5.2 of 3GPP TS 34.121 (release 5), using the appropriate RMC with TPC, (transmit power control) set to all “1s” or applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HS-DPCCH etc) are tabulated in this test report. All configurations that are not supported by the DUT or cannot be measured due to technical or equipment limitations are identified.

8.3.2 Head SAR Measurements for Handsets

SAR for head exposure configurations is measured using the 12.2 kbps RMC with TPC bits configured to all “1s”. SAR in AMR configurations is not required when the maximum average output of each RF channel for 12.2 kbps AMR is less than 0.25 dB higher than that measured in 12.2 kbps RMC. Otherwise, SAR is measured on the maximum output channel in 12.2 AMR with a 3.4 kbps SRB (signaling radio bearer) using the exposure configuration that resulted in the highest SAR for that RF channel in the 12.2 kbps RMC mode.

8.3.3 Body SAR Measurements

SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits all "1s".

8.3.4 Release 5 HSDPA Data Devices

The following procedures are applicable to HSDPA data devices operating under 3GPP Release 5. SAR is required for devices in body-worn accessory and other body exposure conditions, including handsets and data modems operating in various electronic devices. HSDPA operates in conjunction with WCDMA and requires an active DPCCH. The default test configuration is to measure SAR in WCDMA with HSDPA remain inactive, to establish a radio link between the test device and a communication test set using a 12.2 kbps RMC configured in Test Loop Mode 1. SAR for HSDPA is selectively measured using the highest reported SAR configuration in WCDMA, with an FRC in H-set 1 and a 12.2 kbps RMC. SAR is selectively confirmed for other physical channel configurations (DPCCH & DPDCHn) according to exposure conditions, device operating capabilities and maximum output power specified for production units, including tune-up tolerance by applying the 3G SAR test reduction procedures. Maximum output power is verified according to the applicable versions of 3GPP TS 34.121. SAR must be measured based on these maximum output conditions and requirements in KDB Publication 447498, with respect to the UE Categories, and explained in the SAR report. When Maximum Power Reduction (MPR) applies, the implementations must be clearly identified in the SAR report to support test results according to Cubic Metric (CM) and, as appropriate, Enhanced MPR (E-MPR) requirements.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	$\beta_{hs}^{(1)}$	CM (dB) ⁽²⁾
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 ⁽³⁾	15/15 ⁽³⁾	64	12/15 ⁽³⁾	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5
Note 1: $\Delta_{ACK}, \Delta_{NACK}$ and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$ Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. Note 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.						

Figure 9.1 Table 1

8.3.5 Release 6 HSUPA Data Devices

The following procedures are applicable to HSPA (HSUPA/HSDPA) data devices operating under 3GPP Release 6. SAR is required for devices in body-worn accessory and other body exposure conditions, including handsets and data modems operating in various electronic devices. HSUPA operates in conjunction with WCDMA and HSDPA. SAR is initially measured in WCDMA test configurations with HSPA remain inactive. The default test configuration is to establish a radio link between the test device and a communication test set to configure a 12.2 kbps RMC in Test Loop Mode 1. SAR for HSPA is selectively measured with HS-DPCCH, E-DPCCH and E-DPDCH, all enabled, along with a 12.2 kbps RMC using the highest reported SAR configuration in WCDMA with 12.2 kbps RMC only.

An FRC is configured according to HS-DPCCH Sub-test 1 using H-set 1 and QPSK. HSPA is configured according to E-DCH Sub-test 5 requirements. SAR for other HSPA sub-test configurations is confirmed selectively according to exposure conditions, E-DCH UE Category and maximum output power of production units, including tune-up tolerance by applying the 3G SAR test reduction procedure. Maximum output power is verified according to procedures in applicable versions of 3GPP TS 34.121. SAR must be measured based on these maximum output conditions and requirements in KDB Publication 447498, with respect to the UE Categories for HS-DPCCH and HSPA, and explained in the SAR report. When Maximum Power Reduction (MPR) applies, the implementations must be clearly identified in the SAR report to support test results according to Cubic Metric (CM) and, as appropriate, Enhanced MPR (E-MPR) requirements.

Sub-test	β_e	β_d	β_d (SF)	β_e/β_d	$\beta_{hs}^{(1)}$	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM ⁽²⁾ (dB)	MPR (dB)	AG ⁽⁴⁾ Index	E-TFCI
1	11/15 ⁽³⁾	15/15 ⁽³⁾	64	11/15 ⁽³⁾	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 ⁽⁴⁾	15/15 ⁽⁴⁾	64	15/15 ⁽⁴⁾	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_e = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_e$.

Note 2: CM = 1 for $\beta_e/\beta_d = 12/15$, $\beta_{hs}/\beta_e = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_e/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to $\beta_e = 10/15$ and $\beta_d = 15/15$.

Note 4: For subtest 5 the β_e/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to $\beta_e = 14/15$ and $\beta_d = 15/15$.

Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.

Note 6: β_{ed} cannot be set directly; it is set by Absolute Grant Value.

Figure 9.2 Table 2

8.4 SAR Measurement Conditions for LTE

LTE modes were tested according to FCC KDB 941225 D05v02r05 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR. The call simulator was used for LTE output power measurement and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

8.4.1 Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

8.4.2 MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36. 101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

8.4.3 A-MPR

A-MPR (Addition MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

8.4.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r05:

- a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
 - i. The required channel and offset combination with the highest maximum output power is required for SAR.
 - ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channel is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
 - iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.
- b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.
- c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
- d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sections 5.2.1 through 5.2.3 is less than or equal to 0.5 dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is < 1.45 W/kg.

8.4.5 64QAM uplink

(1) Per KDB 941225 D05 V02r05, we'll measure conducted powers per Section 5.1 for all uplink modulations (QPSK, 16QAM, 64QAM) and include in the test report.

(2) From these power measurements, we will apply the procedures in Section 5.2.4 ("Higher Order Modulations") to determine SAR test reduction for 16QAM and 64QAM test cases.

8.5 SAR Testing with 802.11 Transmitters

The normal network operating configurations are not suitable for measuring the SAR of 802.11 b/g/n transmitters. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227D01v02r02 for more details.

8.5.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

A periodic duty factor is required for current generation SAR systems to measure SAR. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92-96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR is scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

8.5.2 U-NII and U-NII-2A

For devices that operate in only one of the U-NII-1 and U-NII-2A bands, the normally required SAR procedures for OFDM configurations are applied. For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following, with respect to the highest reported SAR and maximum output power specified for production units. The procedures are applied independently to each exposure configuration; for example, head, body, hotspot mode etc.

- 1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, each band is tested independently for SAR.
- 2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, each band is tested independently for SAR.

8.5.3 U-NII-2C and U-NII-3

The frequency range covered by U-NII-2C and U-NII-3 is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements.

When Terminal Doppler Weather Rader (TDWR) restriction applies, the channels at 5.60 – 5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification.

Unless band gap channels are permanently disabled, SAR must be considered for these channels. When band gap channels are disabled, each band is tested independently according to the normally required OFDM SAR measurements and probe calibration frequency points requirements.

8.5.4 Initial Test Position Procedure

For exposure conditions with multiple test positions, such as handset operating next to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all position in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8 W/kg or all test position are measured.

8.5.5 2.4 GHz SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

- 1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 2) When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11 g/n OFDM are additionally evaluated for SAR if the highest reported SAR for 802.11b, adjusted by the ratio of the OFDM to DSSS specified maximum output power is > 1.2 W/kg. When SAR is required for OFDM modes in 2.4 GHz band, the Initial Test Configuration Procedures should be followed.

8.5.6 OFDM Transmission Mode and SAR Test Channel Selection

For the 2.4 GHz and 5 GHz bands, when the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations; for example, 802.11a and 802.11n or 802.11g and 802.11n with the same channel bandwidth, modulation and data rate etc., the lower order 802.11 mode i.e., 802.11a, then 802.11n or 802.11g then 802.11n is used for SAR measurement. When the maximum output power were the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

8.5.7 Initial Test Configuration Procedure

For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, and lowest data rate. The channel of the transmission mode with the highest average RF output conducted power will be the initial test configuration.

When the reported SAR is ≤ 0.8 W/kg, no additional measurements on other test channels are required.

Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is ≤ 1.2 W/kg or all channels are measured.

8.5.8 Subsequent Test Configuration Procedures

For OFDM configurations, in each frequency band and aggregated band, SAR is evaluated for initial test configuration using the fixed test position or the initial test position procedure, when applicable. When the highest reported SAR for the initial test configuration, adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power is ≤ 1.2 W/kg, no additional SAR testing for the subsequent test configurations is required.

8.5.9 MIMO SAR Considerations

Per KDB Publication 248227 D01v02r02, the simultaneous SAR provisions in KDB Publication 447498 D01v06 should be applied to determine simultaneous transmission SAR test exclusion for WIFI MIMO. If the sum of 1g single transmission chain SAR measurements is < 1.6 W/kg, no additional SAR measurements for MIMO are required. Alternatively, SAR for MIMO can be measured with all antennas transmitting simultaneously at the specified maximum output power of MIMO operation.

9. RF CONDUCTED POWERS

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v06

9.1 GSM Nominal and Maximum Output Power Spec and Conducted Powers

Band & Mode		Voice[dBm]	Burst Average GMSK [dBm]			
		1 TX Slot	1 TX Slot	2 TX Slot	3 TX Slot	4 TX Slot
GSM/GPRS 850	Maximum	34.00	34.00	31.00	29.20	28.00
	Nominal	32.50	32.50	29.50	27.70	26.50
GSM/GPRS 1900	Maximum	31.00	31.00	28.00	26.20	25.00
	Nominal	29.50	29.50	26.50	24.70	23.50

Table 9.1.1 GSM Nominal and Maximum Output Power Spec

Band	Channel	Maximum Burst-Averaged Output Power(dBm)				
		Voice	GPRS Data (GMSK)			
		GSM CS 1 Slot	GPRS 1 TX Slot	GPRS 2 TX Slot	GPRS 3 TX Slot	GPRS 4 TX Slot
GSM850	128	32.80	32.80	29.80	28.10	27.00
	190	32.90	32.90	29.70	28.00	26.90
	251	33.00	33.00	30.00	28.10	27.00
PCS 1900	512	30.60	30.60	27.50	25.70	24.60
	661	30.50	30.30	27.10	25.50	24.30
	810	30.40	30.20	27.00	25.40	24.40
Band	Channel	Calculated Maximum Frame-Averaged Output Power(dBm)				
		Voice	GPRS Data (GMSK)			
		GSM CS 1 Slot	GPRS 1 TX Slot	GPRS 2 TX Slot	GPRS 3 TX Slot	GPRS 4 TX Slot
GSM850	128	23.77	23.77	23.78	23.84	23.99
	190	23.87	23.87	23.68	23.74	23.89
	251	23.97	23.97	23.98	23.84	23.99
PCS 1900	512	21.57	21.57	21.48	21.44	21.59
	661	21.47	21.27	21.08	21.24	21.29
	810	21.37	21.17	20.98	21.14	21.39
GSM850	Frame Avg. Targets:	23.47	23.47	23.48	23.44	23.49
PCS 1900	Frame Avg. Targets:	20.47	20.47	20.48	20.44	20.49

Table 9.1.2 GSM Conducted Power

Note:

- Both burst-averaged and calculated frame-averaged powers are included. Frame-averaged power was calculated from the measured burst-averaged power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
- GPRS (GMSK) output powers were measured with coding scheme setting of 1 (CS1) on the base station simulator. CS1 was configured to measure GPRS output power measurements and SAR to ensure GMSK modulation in the signal. Our Investigation has shown that CS1 - CS4 settings do not have any impact on the output levels or modulation in the GPRS modes.

GPRS Multislot class: 12 (max 4 TX Uplink slots)
DTM Multislot Class: N/A



Figure 9.1 Power Measurement Setup

9.2 WCDMA Nominal and Maximum Output Power Spec and Conducted Powers

3GPP Release Version	Mode			Cellular Band (dBm)	3GPP MPR (dB)
99	WCDMA	Voice	Maximum	24.5	-
			Nominal	23.0	
5	HSDPA	Subtest 1	Maximum	23.5	0
			Nominal	22.0	
5		Subtest 2	Maximum	23.5	0
			Nominal	22.0	
5		Subtest 3	Maximum	23.0	0.5
			Nominal	21.5	
5		Subtest 4	Maximum	23.0	0.5
			Nominal	21.5	
6	HSPA	Subtest 1	Maximum	23.5	0
			Nominal	22.0	
6		Subtest 2	Maximum	21.5	2
			Nominal	20.0	
6		Subtest 3	Maximum	22.5	1
			Nominal	21.0	
6		Subtest 4	Maximum	21.5	2
			Nominal	20.0	
6		Subtest 5	Maximum	23.5	0
			Nominal	22.0	

Table 9.2.1 WCDMA Nominal and Maximum Output Power Spec

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band (dBm)			3GPP MPR (dB)
			4132	4183	4233	
99	WCDMA	12.2 kbps RMC	23.47	23.58	23.66	-
99		12.2 kbps AMR	23.44	23.57	23.65	-
5	HSDPA	Subtest 1	22.45	22.60	22.67	0
5		Subtest 2	22.45	22.61	22.66	0
5		Subtest 3	21.94	22.09	22.16	0.5
5		Subtest 4	21.95	22.10	22.19	0.5
6	HSPA	Subtest 1	22.44	22.60	22.66	0
6		Subtest 2	20.45	20.61	20.65	2
6		Subtest 3	21.47	21.61	21.66	1
6		Subtest 4	20.48	20.62	20.70	2
6		Subtest 5	22.45	22.61	22.65	0

Table 9.2.2 WCDMA Conducted Power

WCDMA SAR was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.

The manufacturer declares that the HSDPA and HSPA transmitter's power will not exceed the R99 maximum transmit power in devices based on Qualcomm's HSPA chipset solutions.



Figure 9.2 Power Measurement Setup

9.3 LTE Nominal and Maximum Output Power Spec and Conducted Powers

Band & Mode		Modulated Average[dBm]
LTE Band 12	Maximum	24.5
	Nominal	23.0

Table 9.3.1.1 Nominal and Maximum Output Power Spec

1) LTE Band 12

LTE Band 12 Conducted Power- 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			23095 (707.5 MHz)		
			Conducted Power (dBm)		
QPSK	1	0	23.26	≤ 1	0
	1	25	23.23		
	1	49	23.23		
	25	0	22.37		1
	25	12	22.46		
	25	25	22.41		
	50	0	22.37		1
16QAM	1	0	22.44	≤ 1	1
	1	25	22.40		
	1	49	22.42		
	25	0	21.39	≤ 2	2
	25	12	21.42		
	25	25	21.41		
	50	0	21.33		2
64QAM	1	0	21.37	≤ 2	2
	1	25	21.29		
	1	49	21.34		
	25	0	20.38	≤ 3	3
	25	12	20.47		
	25	25	20.42		
	50	0	20.44		3

Table 9.3.1.2 LTE Conducted Power

Note : LTE B12 can not contain three non-overlapping channels of 10 MHz bandwidth.

Per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

LTE Band 12 Conducted Power- 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			23035 (701.5 MHz)	23095 (707.5 MHz)	23155 (713.5 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	23.34	23.30	23.19	≤ 1	0
	1	12	23.26	23.28	23.17		
	1	24	23.29	23.29	23.18		
	12	0	22.41	22.40	22.26		1
	12	6	22.48	22.42	22.31		
	12	13	22.40	22.39	22.28		
	25	0	22.39	22.37	22.24		
16QAM	1	0	22.46	22.47	22.36	≤ 1	1
	1	12	22.42	22.42	22.25		
	1	24	22.38	22.44	22.29		
	12	0	21.45	21.40	21.28	≤ 2	2
	12	6	21.50	21.45	21.34		
	12	13	21.42	21.38	21.32		
	25	0	21.45	21.36	21.28		
64QAM	1	0	21.42	21.40	21.24	≤ 2	2
	1	12	21.32	21.32	21.21		
	1	24	21.35	21.38	21.23		
	12	0	20.46	20.45	20.31	≤ 3	3
	12	6	20.50	20.46	20.40		
	12	13	20.42	20.44	20.33		
	15	0	20.45	20.39	20.35		

Table 9.3.1.3 LTE Conducted Power

LTE Band 12 Conducted Power– 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			23025 (700.5 MHz)	23095 (707.5 MHz)	23165 (714.5 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	23.32	23.30	23.25	≤ 1	0
	1	7	23.26	23.27	23.20		
	1	14	23.30	23.26	23.10		
	8	0	22.44	22.34	22.29		1
	8	4	22.45	22.39	22.32		
	8	7	22.39	22.35	22.24		
	15	0	22.40	22.34	22.27		
16QAM	1	0	22.49	22.45	22.40	≤ 1	1
	1	7	22.38	22.43	22.25		
	1	14	22.40	22.41	22.28		
	8	0	21.48	21.42	21.36	≤ 2	2
	8	4	21.53	21.44	21.37		
	8	7	21.46	21.43	21.33		
	15	0	21.43	21.42	21.31		
64QAM	1	0	21.40	21.36	21.31	≤ 2	2
	1	7	21.30	21.33	21.19		
	1	14	21.39	21.32	21.16		
	8	0	20.48	20.43	20.36	≤ 3	3
	8	4	20.49	20.45	20.38		
	8	7	20.42	20.44	20.28		
	15	0	20.44	20.42	20.31		

Table 9.3.1.4 LTE Conducted Power

LTE Band 12 Conducted Power– 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			23017 (699.7 MHz)	23095 (707.5 MHz)	23173 (715.3 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	23.31	23.29	23.11	≤ 1	0
	1	2	23.27	23.19	23.09		
	1	5	23.19	23.16	23.07		
	3	0	23.26	23.22	23.07		0
	3	2	23.30	23.28	23.08		
	3	3	23.23	23.19	23.03		
	6	0	22.34	22.22	22.12	1	
16QAM	1	0	22.44	22.43	22.30	≤ 1	1
	1	2	22.38	22.29	22.23		
	1	5	22.32	22.33	22.20		
	3	0	22.38	22.27	22.21		1
	3	2	22.41	22.37	22.25		
	3	3	22.35	22.31	22.15		
	6	0	21.45	21.34	21.28	≤ 2	2
64QAM	1	0	21.43	21.45	21.25	≤ 2	2
	1	2	21.27	21.22	21.14		
	1	5	21.21	21.21	21.05		
	3	0	21.38	21.36	21.21		2
	3	2	21.42	21.44	21.23		
	3	3	21.36	21.34	21.22		
	6	0	20.37	20.36	20.18	≤ 3	3

Table 9.3.1.5 LTE Conducted Power

9.4 WLAN Nominal and Maximum Output Power Spec and Conducted Powers

Band (GHz)	Mode	Ch	Modulated Average[dBm]					
			Ant.1		Ant.2		MIMO	
			Maximum	Nominal	Maximum	Nominal	Maximum	Nominal
2.4	802.11b	1-11	15.0	12.0	15.0	12.0	-	-
	802.11g	1-11	14.0	11.0	14.0	11.0	-	-
	802.11n	1-11	14.0	11.0	14.0	11.0	17.0	14.0

Table 9.4.1 Nominal and Maximum Output Power Spec

Mode	Freq. (MHz)	Channel	IEEE 802.11 (2.4 GHz) Conducted Power[dBm]					
			Ant.1		Ant.2		MIMO	
802.11b	2 412	1	12.08		11.61			
	2 437	6	12.49		11.45			
	2 462	11	12.45		11.67			
802.11g	2 412	1	11.04		10.53			
	2 437	6	11.28		10.30			
	2 462	11	11.06		10.26			
802.11n (HT-20)	2 412	1	10.81		10.12		13.49	
	2 437	6	11.12		10.40		13.79	
	2 462	11	10.83		10.25		13.56	

Table 9.4.2 IEEE 802.11 Average RF Power

Band (GHz)	Mode	Ch	Modulated Average[dBm]					
			Ant.1		Ant.2		MIMO	
			Maximum	Nominal	Maximum	Nominal	Maximum	Nominal
5 (UNII)	802.11a/n/ac	36-144	13.0	10.0	13.0	10.0	16.0	13.0

Table 9.4.5 Nominal and Maximum Output Power Spec

Mode	Freq. (MHz)	Channel	IEEE 802.11a (5 GHz) Conducted Power[dBm]					
			Ant.1		Ant.2		MIMO	
802.11a	5 180	36	9.82		9.02		12.45	
	5 200	40	9.87		9.26		12.59	
	5 220	44	10.01		9.42		12.74	
	5 240	48	9.92		9.57		12.76	
	5 260	52	9.48		9.47		12.49	
	5 280	56	9.44		9.45		12.46	
	5 300	60	9.28		9.36		12.33	
	5 320	64	9.45		9.42		12.45	
	5 500	100	9.17		9.39		12.29	
	5 580	116	9.77		9.62		12.71	
	5 660	132	9.24		9.84		12.56	
	5 700	140	8.97		9.88		12.46	
	5 720	144	8.75		9.72		12.27	

Table 9.4.6 IEEE 802.11a Average RF Power

Mode	Freq. (MHz)	Channel	IEEE 802.11n HT20 (5 GHz) Conducted Power[dBm]					
			Ant.1		Ant.2		MIMO	
802.11n (HT-20)	5 180	36	9.65		8.73		12.22	
	5 200	40	9.76		8.95		12.38	
	5 220	44	9.85		9.11		12.51	
	5 240	48	9.73		9.29		12.53	
	5 260	52	9.32		9.30		12.32	
	5 280	56	9.18		9.15		12.18	
	5 300	60	9.19		9.39		12.30	
	5 320	64	9.30		9.38		12.35	
	5 500	100	8.96		9.30		12.14	
	5 580	116	9.50		9.65		12.59	
	5 660	132	9.16		9.78		12.49	
	5 700	140	8.79		9.77		12.32	
	5 720	144	8.61		9.71		12.21	

Table 9.4.7 IEEE 802.11n HT20 Average RF Power

Mode	Freq. (MHz)	Channel	IEEE 802.11ac VHT20 (5 GHz) Conducted Power[dBm]					
			Ant.1		Ant.2		MIMO	
802.11ac (VHT-20)	5 180	36	9.62		8.94		12.30	
	5 200	40	9.59		9.05		12.34	
	5 220	44	9.95		9.30		12.65	
	5 240	48	9.67		9.29		12.49	
	5 260	52	9.27		9.25		12.27	
	5 280	56	9.22		9.33		12.29	
	5 300	60	9.14		9.44		12.30	
	5 320	64	9.18		9.31		12.26	
	5 500	100	8.94		9.27		12.12	
	5 580	116	9.47		9.61		12.55	
	5 660	132	9.06		9.75		12.43	
	5 700	140	8.81		9.79		12.34	
	5 720	144	8.62		9.62		12.16	

Table 9.4.8 IEEE 802.11ac VHT20 Average RF Power

Mode	Freq. (MHz)	Channel	IEEE 802.11n HT40 (5 GHz) Conducted Power[dBm]					
			Ant.1		Ant.2		MIMO	
802.11n (HT-40)	5 190	38	9.93		9.22		12.60	
	5 230	46	10.01		9.75		12.89	
	5 270	54	9.56		9.72		12.65	
	5 310	62	9.38		9.70		12.55	
	5 510	102	9.29		9.74		12.53	
	5 590	118	9.82		9.68		12.76	
	5 670	134	9.40		10.15		12.80	
	5 710	142	8.49		10.22		12.45	

Table 9.4.9 IEEE 802.11n HT40 Average RF Power

Mode	Freq. (MHz)	Channel	IEEE 802.11ac VHT40 (5 GHz) Conducted Power[dBm]					
			Ant.1		Ant.2		MIMO	
802.11ac (VHT-40)	5 190	38	9.86		9.31		12.60	
	5 230	46	10.02		9.69		12.87	
	5 270	54	9.72		9.64		12.69	
	5 310	62	9.47		9.65		12.57	
	5 510	102	9.33		9.31		12.33	
	5 590	118	9.76		10.09		12.94	
	5 670	134	9.37		10.10		12.76	
	5 710	142	8.92		10.06		12.54	

Table 9.4.10 IEEE 802.11ac VHT40 Average RF Power

Mode	Freq. (MHz)	Channel	IEEE 802.11ac VHT80 (5 GHz) Conducted Power[dBm]					
			Ant.1		Ant.2		MIMO	
802.11ac (VHT-80)	5 210	42			9.12		12.37	
	5 290	58	9.13		9.56		12.36	
	5 530	106	9.33		9.72		12.54	
	5 610	122	9.64		9.61		12.64	
	5 690	138	8.90		9.90		12.44	

Table 9.4.11 IEEE 802.11ac VHT80 Average RF Power

Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v02r02:

- Power measurements were performed for the transmission mode configuration with the highest maximum output power specified for production units.
- For transmission modes with the same maximum output power specification, powers were measured for the largest channel bandwidth, lowest order modulation and lowest data rate.
- For transmission modes with identical maximum specified output power, channel bandwidth, modulation and data rates, power measurements were required for all identical configurations.
- For each transmission mode configuration, powers were measured for the highest and lowest channels; and at the mid-band channel(s) when there were at least 3 channels supported. For configurations with multiple mid-band channels, due to an even number of channels, both channels were measured.
- Output Power and SAR is not required for 802.11 g/n HT20/ac VHT20 channels when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjust SAR is ≤ 1.2 W/kg.
- The underlined data rate and channel above were tested for SAR.

The average output powers of this device were tested by below configuration.

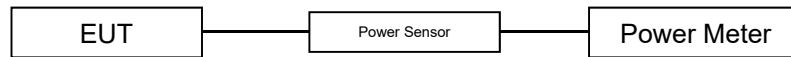


Figure 9.4 Power Measurement Setup

9.5 Bluetooth Conducted Powers

Frame Modulated Average[dBm]		
Bluetooth 1 Mbps	Maximum	18.3
	Nominal	14.6
Bluetooth 2 Mbps	Maximum	14.6
	Nominal	10.9
Bluetooth 3 Mbps	Maximum	14.6
	Nominal	10.9
Bluetooth LE	Maximum	9.6
	Nominal	6.0

Table 9.5.1 Nominal and Maximum Output Power Spec (Frame)

Channel	Frequency	Frame AVG Output Power (1Mbps)	Frame AVG Output Power (2Mbps)	Frame AVG Output Power (3Mbps)
	(MHz)	(dBm)	(dBm)	(dBm)
Low	2 402	14.64	10.37	10.37
Mid	2 441	12.42	8.22	8.21
High	2 480	13.21	9.41	9.41

Table 9.5.2 Bluetooth Frame Average RF Power

Channel	Frequency	Frame AVG Output Power(LE / 1Mbps)	Frame AVG Output Power(LE / 2Mbps)
	(MHz)	(dBm)	(dBm)
Low	2 402	5.15	5.57
Mid	2 440	4.59	4.96
High	2 480	5.37	5.81

Table 9.5.2 Bluetooth LE Frame Average RF Power

Bluetooth Conducted Powers procedures

1. Bluetooth (BDR, EDR)

- 1) Enter DUT mode in EUT and operate it.

When it operating, The EUT is transmitting at maximum power level and duty cycle fixed.

- 2) Instruments and EUT were connected like Figure 9.5.1(A).
- 3) The maximum output powers of BDR(1 Mbps), EDR(2, 3 Mbps) and each frequency were set by a Bluetooth Tester.
- 4) Power levels were measured by a Power Meter.

2. Bluetooth (LE)

- 1) Enter LE mode in EUT and operate it.

When it operating, The EUT is transmitting at maximum power level and duty cycle fixed.

- 2) Instruments and EUT were connected like Figure 9.5.1(B).
- 3) The average conducted output powers of LE and each frequency can measurement according to setting program in EUT.
- 4) Power levels were measured by a Power Meter.

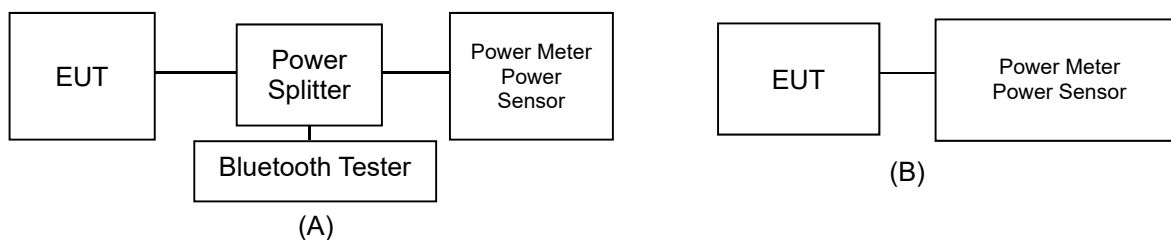


Figure 9.5.1 Average Power Measurement Setup

- Bluetooth Transmission Plot

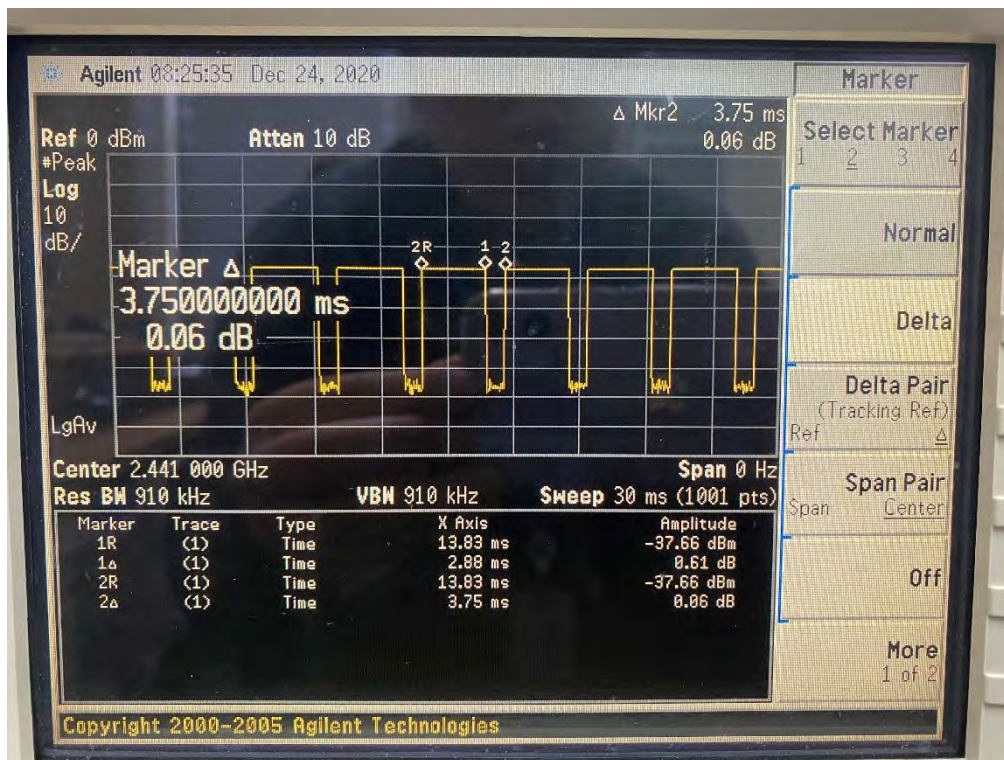


Figure 9.5.2 Bluetooth Transmission Plot

- Bluetooth Duty Cycle Calculation

$$\text{Duty Cycle} = \text{Pulse/Period} * 100\% = (2.880/3.750) * 100 = 76.8\%$$

10. SYSTEM VERIFICATION

10.1 Tissue Verification

MEASURED TISSUE PARAMETERS										
Date(s)	Tissue Type	Ambient Temp.[°C]	Liquid Temp.[°C]	Measured Frequency [MHz]	Target Dielectric Constant, ϵ_r	Target Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ_r	Measured Conductivity, σ (S/m)	Er Deviation [%]	σ Deviation [%]
Jan. 13. 2021	750 Head	21.4	21.7	707.5	42.129	0.887	42.635	0.881	1.20	-0.68
				750.0	41.900	0.890	42.050	0.919	0.36	3.26
				782.0	41.749	0.894	41.608	0.927	-0.34	3.69
Jan. 21. 2021	835 Head	20.9	20.4	821.5	41.566	0.898	42.701	0.900	2.73	0.22
				824.2	41.552	0.899	42.667	0.902	2.68	0.33
				826.4	41.542	0.899	42.634	0.905	2.63	0.67
				829.0	41.528	0.899	42.594	0.907	2.57	0.89
				831.5	41.519	0.900	42.561	0.909	2.51	1.00
				835.0	41.500	0.900	42.512	0.912	2.44	1.33
				836.5	41.500	0.901	42.484	0.913	2.37	1.33
				836.6	41.500	0.901	42.484	0.913	2.37	1.33
				841.5	41.500	0.906	42.397	0.917	2.16	1.21
				844.0	41.500	0.910	42.350	0.919	2.05	0.99
				846.6	41.500	0.912	42.302	0.921	1.93	0.99
				848.8	41.500	0.914	42.249	0.922	1.80	0.88
Jan. 25. 2021	1 900 Head	21.6	21.3	1 850.2	40.000	1.400	38.853	1.366	-2.87	-2.43
				1 852.4	40.000	1.400	38.846	1.368	-2.89	-2.29
				1 860.0	40.000	1.400	38.818	1.374	-2.96	-1.86
				1 880.0	40.000	1.400	38.723	1.391	-3.19	-0.64
				1 900.0	40.000	1.400	38.607	1.407	-3.48	0.50
				1 907.6	40.000	1.400	38.559	1.413	-3.60	0.93
				1 909.8	40.000	1.400	38.549	1.415	-3.63	1.07
				2 402.0	39.282	1.757	39.236	1.768	-0.12	0.63
Dec. 18. 2020	2 450 Head	21.6	21.8	2 412.0	39.265	1.766	39.206	1.779	-0.15	0.74
				2 437.0	39.222	1.788	39.124	1.809	-0.25	1.17
				2 441.0	39.215	1.792	39.112	1.814	-0.26	1.23
				2 450.0	39.200	1.800	39.085	1.824	-0.29	1.33
				2 462.0	39.184	1.813	39.053	1.837	-0.33	1.32
				2 467.0	39.177	1.818	39.036	1.843	-0.36	1.38
				2 472.0	39.171	1.823	39.018	1.848	-0.39	1.37
				2 480.0	39.160	1.832	38.990	1.857	-0.43	1.36
Dec. 17. 2020	2 450 Head	21.4	21.5	2 402.0	39.282	1.757	38.264	1.763	-2.59	0.34
				2 412.0	39.265	1.766	38.242	1.772	-2.61	0.34
				2 437.0	39.222	1.788	38.190	1.794	-2.63	0.34
				2 441.0	39.215	1.792	38.182	1.798	-2.63	0.33
				2 450.0	39.200	1.800	38.163	1.806	-2.65	0.33
				2 462.0	39.184	1.813	38.138	1.815	-2.67	0.11
				2 467.0	39.177	1.818	38.128	1.819	-2.68	0.06
				2 472.0	39.171	1.823	38.114	1.823	-2.70	0.00
Dec. 14. 2020	5 300 Head	20.6	21.0	2 480.0	39.160	1.832	38.092	1.830	-2.73	-0.11
				5 260.0	35.940	4.720	35.072	4.878	-2.42	3.31
				5 270.0	35.930	4.730	35.052	4.889	-2.44	3.36
				5 280.0	35.920	4.740	35.043	4.902	-2.44	3.42
				5 290.0	35.910	4.750	35.041	4.911	-2.42	3.39
				5 300.0	35.900	4.760	35.024	4.919	-2.44	3.34
				5 310.0	35.890	4.770	34.997	4.930	-2.49	3.35
				5 320.0	35.880	4.780	34.975	4.944	-2.52	3.43
Dec. 15. 2020	5 300 Head	21.1	21.7	5 260.0	35.940	4.720	37.198	4.592	3.50	-2.71
				5 270.0	35.930	4.730	37.189	4.607	3.50	-2.60
				5 280.0	35.920	4.740	37.191	4.619	3.54	-2.55
				5 290.0	35.910	4.750	37.191	4.627	3.57	-2.59
				5 300.0	35.900	4.760	37.176	4.634	3.55	-2.65
				5 310.0	35.890	4.770	37.149	4.644	3.51	-2.64
				5 320.0	35.880	4.780	37.127	4.656	3.48	-2.59
Dec. 16. 2020	5 600 Head	21.5	21.9	5 500.0	35.650	4.965	34.533	4.903	-3.13	-1.25
				5 510.0	35.635	4.976	34.508	4.913	-3.16	-1.27
				5 530.0	35.605	4.997	34.461	4.940	-3.21	-1.14
				5 550.0	35.575	5.018	34.439	4.961	-3.19	-1.14
				5 580.0	35.530	5.049	34.382	4.997	-3.23	-1.03
				5 600.0	35.500	5.070	34.359	5.019	-3.21	-1.01
				5 610.0	35.490	5.080	34.345	5.027	-3.23	-1.04
				5 660.0	35.440	5.130	34.255	5.084	-3.34	-0.90
				5 670.0	35.430	5.140	34.235	5.094	-3.37	-0.89
				5 690.0	35.410	5.160	34.199	5.121	-3.42	-0.76
				5 710.0	35.390	5.180	34.181	5.142	-3.42	-0.73
				5 720.0	35.380	5.190	34.168	5.148	-3.43	-0.81
Dec. 15. 2020	5 600 Head	22.0	21.8	5 800.0	35.300	5.270	34.022	5.241	-3.62	-0.55
				5 500.0	35.650	4.965	36.668	4.888	2.86	-1.55
				5 510.0	35.635	4.976	36.662	4.897	2.88	-1.59
				5 530.0	35.605	4.997	36.619	4.919	2.85	-1.56
				5 550.0	35.575	5.018	36.593	4.944	2.86	-1.47
				5 580.0	35.530	5.049	36.543	4.977	2.85	-1.43
				5 600.0	35.500	5.070	36.510	5.003	2.85	-1.32
				5 610.0	35.490	5.080	36.504	5.015	2.86	-1.28
				5 660.0	35.440	5.130	36.426	5.072	2.78	-1.13
				5 670.0	35.430	5.140	36.411	5.081	2.77	-1.15
				5 690.0	35.410	5.160	36.376	5.106	2.73	-1.05
				5 710.0	35.390	5.180	36.343	5.131	2.69	-0.95
				5 720.0	35.380	5.190	36.337	5.144	2.70	-0.89
				5 800.0	35.300	5.270	36.208	5.234	2.57	-0.68

The above measured tissue parameters were used in the DASY software. The DASY software was used to perform interpolation to determine the dielectric parameters at the SAR test device frequencies (per KDB 865664 and IEEE 1528-2013 6.6.1.2). The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

Measurement Procedure for Tissue verification:

- 1) The network analyzer and probe system was configured and calibrated.
- 2) The probe was immersed in the sample which was placed in a nonmetallic container. Trapped air bubbles beneath the flange were minimized by placing the probe at a slight angle.
- 3) The complex admittance with respect to the probe aperture was measured.
- 4) The complex relative permittivity, for example from the below equation (Pournaropoulos and Misra):

$$Y = \frac{j2\omega\epsilon_0\epsilon_r}{\ln(b/a)} \int_a^b \int_0^{2\pi} \cos\phi' \exp\left[-j\omega r'(\mu_0\epsilon_0')^{1/2}\right] d\phi' d\rho'$$

where Y is the admittance of the probe in contact with the sample, the primed and unprimed coordinates refer to source and observation points, respectively, $r'^2 = \rho'^2 + \rho^2 - 2\rho\rho'\cos\phi'$, ω is the angular frequency, and $j = \sqrt{-1}$.

10.2 Test System Verification

Prior to assessment, the system is verified to the $\pm 10\%$ of the specifications at using the SAR Dipole kit(s). (Graphic Plots Attached)

Table 10.2.1 System Verification Results (1g)

SYSTEM DIPOLE VERIFICATION TARGET & MEASURED												
SAR System #	Freq. [MHz]	SAR Dipole kits	Date(s)	Tissue Type	Ambient Temp. [°C]	Liquid Temp. [°C]	Probe S/N	Input Power (mW)	1W Target SAR _{1g} (W/kg)	Measured SAR _{1g} (W/kg)	1 W Normalized SAR _{1g} (W/kg)	Deviation [%]
C	750	D750V3, SN:1049	Jan. 13. 2021	Head	21.4	21.7	3933	250	8.47	2.03	8.12	-4.13
C	835	D835V2, SN:4d159	Jan. 21. 2021	Head	20.9	20.4	3933	250	9.47	2.36	9.44	-0.32
D	1 900	D1900V2, SN:5d176	Jan. 25. 2021	Head	21.6	21.3	3933	100	39.3	4.02	40.20	2.29
D	2 450	D2450V2, SN: 920	Dec. 18. 2020	Head	21.6	21.8	3866	100	52.0	5.08	50.80	-2.31
D	2 450	D2450V2, SN: 920	Dec. 17. 2020	Head	21.4	21.5	3866	100	52.0	5.37	53.70	3.27
D	5 300	D5GHZV2, SN:1212	Dec. 14. 2020	Head	20.6	21.0	3866	100	81.3	8.27	82.70	1.72
D	5 300	D5GHZV2, SN:1212	Dec. 15. 2020	Head	21.1	21.7	3866	100	81.3	8.37	83.70	2.95
D	5 600	D5GHZV2, SN:1212	Dec. 16. 2020	Head	21.5	21.9	3866	100	83.3	8.52	85.20	2.28
C	5 600	D5GHZV2, SN:1212	Dec. 15. 2020	Head	22.0	21.8	3933	100	83.3	8.46	84.60	1.56

Note1 : System Verification was measured with input 250 mW, 100 mW and normalized to 1W.

Note2 : Full system validation status and results can be found in Appendix D.

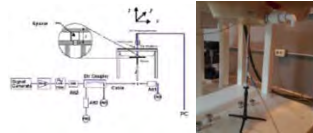


Figure 10.1 Dipole Verification Test Setup Diagram & Photo

11. SAR TEST RESULTS

11.1 Standalone Head SAR Results

Table 11.1.1 GSM/GPRS 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	# of Time Slots	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch													
836.6	190	GSM850	GSM	34.00	32.90	0.150	Left Touch	FCC #1	1	1:8.3	0.279	1.288	0.359	A1
836.6	190	GSM850	GSM	34.00	32.90	-0.010	Right Touch	FCC #1	1	1:8.3	0.237	1.288	0.305	
836.6	190	GSM850	GSM	34.00	32.90	0.190	Left Tilt	FCC #1	1	1:8.3	0.111	1.288	0.143	
836.6	190	GSM850	GSM	34.00	32.90	0.020	Right Tilt	FCC #1	1	1:8.3	0.090	1.288	0.116	
836.6	190	GSM850	GPRS	28.00	26.90	0.000	Left Touch	FCC #1	4	1:2.075	0.293	1.288	0.377	A2
836.6	190	GSM850	GPRS	28.00	26.90	0.070	Right Touch	FCC #1	4	1:2.075	0.241	1.288	0.310	
836.6	190	GSM850	GPRS	28.00	26.90	-0.140	Left Tilt	FCC #1	4	1:2.075	0.141	1.288	0.182	
836.6	190	GSM850	GPRS	28.00	26.90	-0.010	Right Tilt	FCC #1	4	1:2.075	0.144	1.288	0.185	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Head 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11.1.2 PCS/GPRS 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	# of Time Slots	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch													
1880.0	661	PCS1900	PCS	31.00	30.50	0.120	Left Touch	FCC #1	1	1:8.3	0.218	1.122	0.245	A3
1880.0	661	PCS1900	PCS	31.00	30.50	0.070	Right Touch	FCC #1	1	1:8.3	0.331	1.122	0.371	
1880.0	661	PCS1900	PCS	31.00	30.50	-0.080	Left Tilt	FCC #1	1	1:8.3	0.082	1.122	0.092	
1880.0	661	PCS1900	PCS	31.00	30.50	0.020	Right Tilt	FCC #1	1	1:8.3	0.065	1.122	0.073	
1880.0	661	PCS1900	GPRS	25.00	24.30	0.070	Left Touch	FCC #1	4	1:2.075	0.240	1.175	0.282	A4
1880.0	661	PCS1900	GPRS	25.00	24.30	0.150	Right Touch	FCC #1	4	1:2.075	0.406	1.175	0.477	
1880.0	661	PCS1900	GPRS	25.00	24.30	-0.010	Left Tilt	FCC #1	4	1:2.075	0.086	1.175	0.101	
1880.0	661	PCS1900	GPRS	25.00	24.30	-0.020	Right Tilt	FCC #1	4	1:2.075	0.086	1.175	0.101	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Head 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11.1.3 WCDMA 850 Head SAR

MEASUREMENT RESULTS													
FREQUENCY		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch												
836.6	4183	WCDMA 850	RMC	24.50	23.58	0.030	Left Touch	FCC #1	1:1	0.290	1.236	0.358	A5
836.6	4183	WCDMA 850	RMC	24.50	23.58	-0.080	Right Touch	FCC #1	1:1	0.270	1.236	0.334	
836.6	4183	WCDMA 850	RMC	24.50	23.58	0.050	Left Tilt	FCC #1	1:1	0.107	1.236	0.132	
836.6	4183	WCDMA 850	RMC	24.50	23.58	0.040	Right Tilt	FCC #1	1:1	0.098	1.236	0.121	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Head 1.6 W/kg (mW/g) averaged over 1 gram					

Table 11.1.4 LTE Band 12 Head SAR

MEASUREMENT RESULTS																	
FREQUENCY		Mode/ Band	BW [MHz]	Max Allowed Power [dBm]	Cond. PWR [dBm]	Drift Power [dB]	MPR	Position	Device Serial Number	Mod.	RB Size	RB Offs.	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch																
707.5	23095	LTE B12	10	24.50	23.26	0.010	0	Left Touch	FCC #1	QPSK	1	0	1:1	0.160	1.330	0.213	A6
707.5	23095	LTE B12	10	23.50	22.46	0.020	1	Left Touch	FCC #1	QPSK	25	12	1:1	0.130	1.271	0.165	
707.5	23095	LTE B12	10	24.50	23.26	0.100	0	Right Touch	FCC #1	QPSK	1	0	1:1	0.200	1.330	0.266	
707.5	23095	LTE B12	10	23.50	22.46	0.130	1	Right Touch	FCC #1	QPSK	25	12	1:1	0.151	1.271	0.192	
707.5	23095	LTE B12	10	24.50	23.26	0.040	0	Left Tilt	FCC #1	QPSK	1	0	1:1	0.087	1.330	0.116	
707.5	23095	LTE B12	10	23.50	22.46	0.090	1	Left Tilt	FCC #1	QPSK	25	12	1:1	0.072	1.271	0.092	
707.5	23095	LTE B12	10	24.50	23.26	0.020	0	Right Tilt	FCC #1	QPSK	1	0	1:1	0.110	1.330	0.146	
707.5	23095	LTE B12	10	23.50	22.46	0.020	1	Right Tilt	FCC #1	QPSK	25	12	1:1	0.082	1.271	0.104	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure										Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11.1.5 DTS Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode (Antenna)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
2 437.0	6	802.11b (Ant.1)	15.00	12.49	0.080	Left Touch	FCC #2	0.052	1	91.0	0.046	1.782	1.099	0.090	A7
2 437.0	6	802.11b (Ant.1)	15.00	12.49	-0.040	Right Touch	FCC #2	0.022	1	91.0	0.021	1.782	1.099	0.041	
2 437.0	6	802.11b (Ant.1)	15.00	12.49	0.050	Left Tilt	FCC #2	0.024	1	91.0	0.024	1.782	1.099	0.047	
2 437.0	6	802.11b (Ant.1)	15.00	12.49	0.000	Right Tilt	FCC #2	0.013	1	91.0	0.013	1.782	1.099	0.025	
2 462.0	11	802.11b (Ant.2)	15.00	11.67	-0.060	Left Touch	FCC #2	0.031	1	91.0	0.027	2.153	1.099	0.064	A8
2 462.0	11	802.11b (Ant.2)	15.00	11.67	-0.000	Right Touch	FCC #2	0.069	1	91.0	0.064	2.153	1.099	0.151	
2 462.0	11	802.11b (Ant.2)	15.00	11.67	-0.010	Left Tilt	FCC #2	0.017	1	91.0	0.015	2.153	1.099	0.035	
2 462.0	11	802.11b (Ant.2)	15.00	11.67	-0.010	Right Tilt	FCC #2	0.025	1	91.0	0.024	2.153	1.099	0.057	
2 437.0	6	802.11n (MIMO)	17.00	13.79	0.080	Left Touch	FCC #2	0.048	1	97.3	0.043	2.153	1.028	0.095	A9
2 437.0	6	802.11n (MIMO)	17.00	13.79	0.010	Right Touch	FCC #2	0.063	1	97.3	0.057	2.153	1.028	0.126	
2 437.0	6	802.11n (MIMO)	17.00	13.79	0.070	Left Tilt	FCC #2	0.021	1	97.3	0.022	2.153	1.028	0.049	
2 437.0	6	802.11n (MIMO)	17.00	13.79	-0.030	Right Tilt	FCC #2	0.022	1	97.3	0.018	2.153	1.028	0.040	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Head 1.6 W/kg (mW/g) averaged over 1 gram							

Adjusted SAR results for OFDM SAR													
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	1g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm]	Ratio of OFDM to DSSS	1g Adjusted SAR (W/kg)	Determine OFDM SAR	
MHz	Ch												
2 437.0	6	802.11b (Ant.1)	DSSS	15.0	0.090	2 437.0	802.11g	OFDM	14.0	0.794	0.071	X	
2 437.0	6	802.11b (Ant.1)	DSSS	15.0	0.090	2 437.0	802.11n	OFDM	14.0	0.794	0.071	X	
2 462.0	11	802.11b (Ant.2)	DSSS	15.0	0.151	2 437.0	802.11g	OFDM	14.0	0.794	0.120	X	
2 462.0	11	802.11b (Ant.2)	DSSS	15.0	0.151	2 437.0	802.11n	OFDM	14.0	0.794	0.120	X	
ANSI / IEEE C95.1-1992- SAFETY LIMIT													
Spatial Peak													
Uncontrolled Exposure/General Population Exposure													
										Head 1.6 W/kg (mW/g) averaged over 1 gram			

Note: SAR is not required for the following 2.4 GHz OFDM conditions. When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

Table 11.1.6 UNII Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode (Antenna)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5 290.0	58	802.11ac (Ant.1)	13.00	9.13	0.000	Left Touch	FCC #2	0.087	6	89.8	0.082	2.438	1.114	0.223	A10
5 290.0	58	802.11ac (Ant.1)	13.00	9.13	0.000	Right Touch	FCC #2	0.044	6	89.8	0.032	2.438	1.114	0.087	
5 290.0	58	802.11ac (Ant.1)	13.00	9.13	0.000	Left Tilt	FCC #2	0.043	6	89.8	0.038	2.438	1.114	0.103	
5 290.0	58	802.11ac (Ant.1)	13.00	9.13	0.000	Right Tilt	FCC #2	0.031	6	89.8	0.027	2.438	1.114	0.073	
5 290.0	58	802.11ac (Ant.2)	13.00	9.56	0.000	Left Touch	FCC #2	0.092	6	89.8	0.088	2.208	1.114	0.216	
5 290.0	58	802.11ac (Ant.2)	13.00	9.56	0.000	Right Touch	FCC #2	0.117	6	89.8	0.120	2.208	1.114	0.295	A11
5 290.0	58	802.11ac (Ant.2)	13.00	9.56	0.000	Left Tilt	FCC #2	0.077	6	89.8	0.078	2.208	1.114	0.192	
5 290.0	58	802.11ac (Ant.2)	13.00	9.56	0.000	Right Tilt	FCC #2	0.098	6	89.8	0.099	2.208	1.114	0.243	
5 290.0	58	802.11ac (MIMO)	16.00	12.36	0.000	Left Touch	FCC #2	0.071	6	89.8	0.058	2.438	1.114	0.157	
5 290.0	58	802.11ac (MIMO)	16.00	12.36	0.000	Right Touch	FCC #2	0.121	6	89.8	0.109	2.438	1.114	0.296	A12
5 290.0	58	802.11ac (MIMO)	16.00	12.36	0.000	Left Tilt	FCC #2	0.066	6	89.8	0.070	2.438	1.114	0.190	
5 290.0	58	802.11ac (MIMO)	16.00	12.36	0.000	Right Tilt	FCC #2	0.096	6	89.8	0.083	2.438	1.114	0.225	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure									Head 1.6 W/kg (mW/g) averaged over 1 gram						

Adjusted SAR results for UNII-1 and UNII-2A SAR												
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	1g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm]	Adjusted Factor	1g Adjusted SAR (W/kg)	SAR for the band with lower maximum output power
MHz	Ch											
5 290.0	58	802.11ac (Ant.1)	OFDM	13.00	0.223	5 210.0	802.11ac	OFDM	13.00	1.000	0.223	X
5 290.0	58	802.11ac (Ant.2)	OFDM	13.00	0.295	5 210.0	802.11ac	OFDM	13.00	1.000	0.295	X
5 290.0	58	802.11ac (MIMO)	OFDM	16.00	0.296	5 210.0	802.11ac	OFDM	16.00	1.000	0.296	X
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure						Head 1.6 W/kg (mW/g) averaged over 1 gram						

Note: U-NII-1 and U-NII-2A Bands: When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration.

Table 11.1.7 UNII Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode (Antenna)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5 610.0	122	802.11ac (Ant.1)	13.00	9.64	0.000	Left Touch	FCC #2	0.154	6	89.8	0.157	2.168	1.114	0.379	A13
5 610.0	122	802.11ac (Ant.1)	13.00	9.64	0.000	Right Touch	FCC #2	0.070	6	89.8	0.072	2.168	1.114	0.174	
5 610.0	122	802.11ac (Ant.1)	13.00	9.64	0.000	Left Tilt	FCC #2	0.092	6	89.8	0.089	2.168	1.114	0.215	
5 610.0	122	802.11ac (Ant.1)	13.00	9.64	0.000	Right Tilt	FCC #2	0.059	6	89.8	0.061	2.168	1.114	0.147	
5 690.0	138	802.11ac (Ant.2)	13.00	9.90	0.000	Left Touch	FCC #2	0.097	6	89.8	0.100	2.042	1.114	0.227	
5 690.0	138	802.11ac (Ant.2)	13.00	9.90	0.000	Right Touch	FCC #2	0.177	6	89.8	0.168	2.042	1.114	0.382	A14
5 690.0	138	802.11ac (Ant.2)	13.00	9.90	0.000	Left Tilt	FCC #2	0.107	6	89.8	0.113	2.042	1.114	0.257	
5 690.0	138	802.11ac (Ant.2)	13.00	9.90	0.000	Right Tilt	FCC #2	0.136	6	89.8	0.143	2.042	1.114	0.325	
5 610.0	122	802.11ac (MIMO)	16.00	12.64	0.000	Left Touch	FCC #2	0.161	6	89.8	0.155	2.168	1.114	0.374	A15
5 610.0	122	802.11ac (MIMO)	16.00	12.64	0.000	Right Touch	FCC #2	0.090	6	89.8	0.145	2.168	1.114	0.350	
5 610.0	122	802.11ac (MIMO)	16.00	12.64	0.000	Left Tilt	FCC #2	0.121	6	89.8	0.133	2.168	1.114	0.321	
5 610.0	122	802.11ac (MIMO)	16.00	12.64	0.000	Right Tilt	FCC #2	0.143	6	89.8	0.127	2.168	1.114	0.307	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11.1.8 Bluetooth Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Rate [Mbps]	Duty Cycle (%)	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch													
2 441.0	39	Bluetooth	18.30	12.42	0.070	Left Touch	FCC #2	1	76.8	0.114	3.873	1.302	0.575	A16
2 441.0	39	Bluetooth	18.30	12.42	0.000	Right Touch	FCC #2	1	76.8	0.042	3.873	1.302	0.212	
2 441.0	39	Bluetooth	18.30	12.42	0.000	Left Tilt	FCC #2	1	76.8	0.056	3.873	1.302	0.282	
2 441.0	39	Bluetooth	18.30	12.42	0.000	Right Tilt	FCC #2	1	76.8	0.025	3.873	1.302	0.126	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Head 1.6 W/kg (mW/g) averaged over 1 gram						

11.2 Standalone Body-Worn SAR Worn SAR Results

Table 11.2.1 GSM/PCS/GPRS/WCDMA Body-Worn SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Spacing [Side]	Device Serial Number	# of Time Slots	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch													
836.6	190	GSM850	GSM	34.00	32.90	-0.030	10 mm [Front]	FCC #1	1	1:8.3	0.290	1.288	0.374	A17
836.6	190	GSM850	GSM	34.00	32.90	0.030	10 mm [Rear]	FCC #1	1	1:8.3	0.341	1.288	0.439	
836.6	190	GSM850	GPRS	28.00	26.90	0.000	10 mm [Front]	FCC #1	4	1:2.075	0.297	1.288	0.383	
836.6	190	GSM850	GPRS	28.00	26.90	-0.080	10 mm [Rear]	FCC #1	4	1:2.075	0.361	1.288	0.465	A18
1880.0	661	PCS1900	PCS	31.00	30.50	-0.050	10 mm [Front]	FCC #1	1	1:8.3	0.261	1.122	0.293	A19
1880.0	661	PCS1900	PCS	31.00	30.50	0.030	10 mm [Rear]	FCC #1	1	1:8.3	0.363	1.122	0.407	
1880.0	661	PCS1900	GPRS	25.00	24.30	-0.000	10 mm [Front]	FCC #1	4	1:2.075	0.276	1.175	0.324	
1880.0	661	PCS1900	GPRS	25.00	24.30	-0.050	10 mm [Rear]	FCC #1	4	1:2.075	0.407	1.175	0.478	A20
836.6	4183	WCDMA 850	RMC	24.50	23.58	-0.030	10 mm [Front]	FCC #1	N/A	1:1	0.362	1.236	0.447	A21
836.6	4183	WCDMA 850	RMC	24.50	23.58	0.030	10 mm [Rear]	FCC #1	N/A	1:1	0.474	1.236	0.586	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Body 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11.2.2 LTE B12 Body-Worn SAR

MEASUREMENT RESULTS																	
FREQUENCY		Mode/ Band	BW [MHz]	Max Allowed Power [dBm]	Cond. PWR [dBm]	Drift Power [dB]	MPR	Position	Device Serial Number	Mod.	RB Size	RB Offs.	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch																
707.5	23095	LTE B12	10	24.50	23.26	-0.010	0	10 mm [Front]	FCC #1	QPSK	1	0	1:1	0.165	1.330	0.219	A22
707.5	23095	LTE B12	10	23.50	22.46	-0.010	1	10 mm [Front]	FCC #1	QPSK	25	12	1:1	0.135	1.271	0.172	
707.5	23095	LTE B12	10	24.50	23.26	0.010	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.233	1.330	0.310	
707.5	23095	LTE B12	10	23.50	22.46	-0.010	1	10 mm [Rear]	FCC #1	QPSK	25	12	1:1	0.194	1.271	0.247	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure									Body 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11.2.3 DTS Body-Worn SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	SAR (W/kg)	Plots #	
MHz	Ch															
2 437.0	6	802.11b (Ant.1)	15.00	12.49	-0.110	10 mm [Front]	FCC #2	0.016	1	91.0	0.013	1.782	1.099	0.025	A23	
2 437.0	6	802.11b (Ant.1)	15.00	12.49	0.070	10 mm [Rear]	FCC #2	0.045	1	91.0	0.042	1.782	1.099	0.082		
2 462.0	11	802.11b (Ant.2)	15.00	11.67	0.020	10 mm [Front]	FCC #2	0.015	1	91.0	0.014	2.153	1.099	0.033		
2 462.0	11	802.11b (Ant.2)	15.00	11.67	0.030	10 mm [Rear]	FCC #2	0.040	1	91.0	0.039	2.153	1.099	0.092	A24	
2 437.0	6	802.11n (MIMO)	17.00	13.79	-0.060	10 mm [Front]	FCC #2	0.016	1	97.3	0.013	2.153	1.028	0.029	A25	
2 437.0	6	802.11n (MIMO)	17.00	13.79	-0.080	10 mm [Rear]	FCC #2	0.047	1	97.3	0.049	2.153	1.028	0.108		
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure									Body 1.6 W/kg (mW/g) averaged over 1 gram							

Adjusted SAR results for OFDM SAR												
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	1g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm]	Ratio of OFDM to DSSS	1g Adjusted SAR (W/kg)	Determine OFDM SAR
MHz	Ch											
2 437.0	6	802.11b (Ant.1)	DSSS	15.0	0.082	2 437.0	802.11g	OFDM	14.0	0.794	0.065	X
2 437.0	6	802.11b (Ant.1)	DSSS	15.0	0.082	2 437.0	802.11n	OFDM	14.0	0.794	0.065	X
2 462.0	11	802.11b (Ant.2)	DSSS	15.0	0.092	2 437.0	802.11g	OFDM	14.0	0.794	0.073	X
2 462.0	11	802.11b (Ant.2)	DSSS	15.0	0.092	2 437.0	802.11n	OFDM	14.0	0.794	0.073	X
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure									Body 1.6 W/kg (mW/g) averaged over 1 gram			

Note: SAR is not required for the following 2.4 GHz OFDM conditions. When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

Table 11.2.4 UNII Body-Worn SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5 290.0	58	802.11ac (Ant.1)	13.00	9.13	-0.140	10 mm [Front]	FCC #2	0.024	6	89.8	0.019	2.438	1.114	0.052	A26
5 290.0	58	802.11ac (Ant.1)	13.00	9.13	-0.030	10 mm [Rear]	FCC #2	0.106	6	89.8	0.104	2.438	1.114	0.282	
5 290.0	58	802.11ac (Ant.2)	13.00	9.56	0.140	10 mm [Front]	FCC #2	0.060	6	89.8	0.059	2.208	1.114	0.145	
5 290.0	58	802.11ac (Ant.2)	13.00	9.56	-0.040	10 mm [Rear]	FCC #2	0.133	6	89.8	0.134	2.208	1.114	0.329	A27
5 290.0	58	802.11ac (MIMO)	16.00	12.36	-0.170	10 mm [Front]	FCC #2	0.060	6	89.8	0.056	2.438	1.114	0.152	A28
5 290.0	58	802.11ac (MIMO)	16.00	12.36	-0.010	10 mm [Rear]	FCC #2	0.123	6	89.8	0.122	2.438	1.114	0.331	
ANSI / IEEE C95.1-2005- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Body 1.6 W/kg (mW/g) averaged over 1 gram							

Adjusted SAR results for UNII-1 and UNII-2A SAR												
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	1g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm]	Adjusted Factor	1g Adjusted SAR (W/kg)	SAR for the band with lower maximum output power
MHz	Ch											
5 290.0	58	802.11ac (Ant.1)	OFDM	13.00	0.282	5 210.0	802.11ac	OFDM	13.00	1.000	0.282	X
5 290.0	58	802.11ac (Ant.2)	OFDM	13.00	0.329	5 210.0	802.11ac	OFDM	13.00	1.000	0.329	X
5 290.0	58	802.11ac (MIMO)	OFDM	16.00	0.331	5 210.0	802.11ac	OFDM	16.00	1.000	0.331	X
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure						Head 1.6 W/kg (mW/g) averaged over 1 gram						

Note: U-NII-1 and U-NII-2A Bands: When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration.

Table 11.2.5 UNII Body-Worn SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5 610.0	122	802.11ac (Ant.1)	13.00	9.64	-0.070	10 mm [Front]	FCC #2	0.072	6	89.8	0.059	2.168	1.114	0.142	A29
5 610.0	122	802.11ac (Ant.1)	13.00	9.64	0.100	10 mm [Rear]	FCC #2	0.234	6	89.8	0.232	2.168	1.114	0.560	
5 690.0	138	802.11ac (Ant.2)	13.00	9.90	0.050	10 mm [Front]	FCC #2	0.060	6	89.8	0.048	2.042	1.114	0.109	
5 690.0	138	802.11ac (Ant.2)	13.00	9.90	0.010	10 mm [Rear]	FCC #2	0.065	6	89.8	0.059	2.042	1.114	0.134	A30
5 610.0	122	802.11ac (MIMO)	16.00	12.64	-0.090	10 mm [Front]	FCC #2	0.056	6	89.8	0.044	2.168	1.114	0.106	A31
5 610.0	122	802.11ac (MIMO)	16.00	12.64	0.070	10 mm [Rear]	FCC #2	0.169	6	89.8	0.169	2.168	1.114	0.408	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11.2.6 Bluetooth Body-Worn SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Rate [Mbps]	Duty Cycle (%)	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch													
2 441.0	39	Bluetooth	18.30	12.42	-0.120	10 mm [Front]	FCC #2	1	76.8	0.030	3.873	1.302	0.151	A32
2 441.0	39	Bluetooth	18.30	12.42	-0.120	10 mm [Rear]	FCC #2	1	76.8	0.077	3.873	1.302	0.388	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Body 1.6 W/kg (mW/g) averaged over 1 gram						

11.3 Standalone Hotspot SAR Results

Table 11.3.1 GPRS/WCDMA Hotspot SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Spacing [Side]	Device Serial Number	# of Time Slots	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch													
836.6	190	GSM850	GPRS	28.00	26.90	-0.010	10 mm [Bottom]	FCC #1	4	1:2.075	0.209	1.288	0.269	A18
836.6	190	GSM850	GPRS	28.00	26.90	0.000	10 mm [Front]	FCC #1	4	1:2.075	0.297	1.288	0.383	
836.6	190	GSM850	GPRS	28.00	26.90	-0.080	10 mm [Rear]	FCC #1	4	1:2.075	0.361	1.288	0.465	
836.6	190	GSM850	GPRS	28.00	26.90	-0.100	10 mm [Right]	FCC #1	4	1:2.075	0.221	1.288	0.285	
1880.0	661	PCS1900	GPRS	25.00	24.30	-0.050	10 mm [Bottom]	FCC #1	4	1:2.075	0.333	1.175	0.391	A20
1880.0	661	PCS1900	GPRS	25.00	24.30	-0.000	10 mm [Front]	FCC #1	4	1:2.075	0.276	1.175	0.324	
1880.0	661	PCS1900	GPRS	25.00	24.30	-0.050	10 mm [Rear]	FCC #1	4	1:2.075	0.407	1.175	0.478	
1880.0	661	PCS1900	GPRS	25.00	24.30	-0.160	10 mm [Right]	FCC #1	4	1:2.075	0.277	1.175	0.325	
836.6	4183	WCDMA 850	RMC	24.50	23.58	-0.050	10 mm [Bottom]	FCC #1	N/A	1:1	0.247	1.236	0.305	A21
836.6	4183	WCDMA 850	RMC	24.50	23.58	-0.030	10 mm [Front]	FCC #1	N/A	1:1	0.362	1.236	0.447	
836.6	4183	WCDMA 850	RMC	24.50	23.58	0.030	10 mm [Rear]	FCC #1	N/A	1:1	0.474	1.236	0.586	
836.6	4183	WCDMA 850	RMC	24.50	23.58	0.120	10 mm [Right]	FCC #1	N/A	1:1	0.136	1.236	0.168	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Body 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11.3.2 LTE B12 Hotspot SAR

MEASUREMENT RESULTS																	
FREQUENCY		Mode/ Band	BW [MHz]	Max Allowed Power [dBm]	Cond. PWR [dBm]	Drift Power [dB]	MPR	Position	Device Serial Number	Mod.	RB Size	RB Offs.	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch																
707.5	23095	LTE B12	10	24.50	23.26	0.040	0	10 mm (Bottom)	FCC #1	QPSK	1	0	1:1	0.069	1.330	0.092	A22
707.5	23095	LTE B12	10	23.50	22.46	0.020	1	10 mm (Bottom)	FCC #1	QPSK	25	12	1:1	0.053	1.271	0.067	
707.5	23095	LTE B12	10	24.50	23.26	-0.010	0	10 mm (Front)	FCC #1	QPSK	1	0	1:1	0.165	1.330	0.219	
707.5	23095	LTE B12	10	23.50	22.46	-0.010	1	10 mm (Front)	FCC #1	QPSK	25	12	1:1	0.135	1.271	0.172	
707.5	23095	LTE B12	10	24.50	23.26	0.010	0	10 mm (Rear)	FCC #1	QPSK	1	0	1:1	0.233	1.330	0.310	
707.5	23095	LTE B12	10	23.50	22.46	-0.010	1	10 mm (Rear)	FCC #1	QPSK	25	12	1:1	0.194	1.271	0.247	
707.5	23095	LTE B12	10	24.50	23.26	0.020	0	10 mm (Right)	FCC #1	QPSK	1	0	1:1	0.199	1.330	0.265	
707.5	23095	LTE B12	10	23.50	22.46	-0.030	1	10 mm (Right)	FCC #1	QPSK	25	12	1:1	0.170	1.271	0.216	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure									Body 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11.3.3 DTS Hotspot SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	SAR (W/kg)	Plots #
MHz	Ch														
2 437.0	6	802.11b (Ant.1)	15.00	12.49	-0.160	10 mm [Top]	FCC #2	0.014	1	91.0	0.012	1.782	1.099	0.023	A23
2 437.0	6	802.11b (Ant.1)	15.00	12.49	-0.110	10 mm [Front]	FCC #2	0.016	1	91.0	0.013	1.782	1.099	0.025	
2 437.0	6	802.11b (Ant.1)	15.00	12.49	0.070	10 mm [Rear]	FCC #2	0.045	1	91.0	0.042	1.782	1.099	0.082	
2 437.0	6	802.11b (Ant.1)	15.00	12.49	-0.080	10 mm [Right]	FCC #2	0.041	1	91.0	0.039	1.782	1.099	0.076	
2 462.0	11	802.11b (Ant.2)	15.00	11.67	0.070	10 mm [Top]	FCC #2	0.011	1	91.0	0.008	2.153	1.099	0.019	A24
2 462.0	11	802.11b (Ant.2)	15.00	11.67	0.020	10 mm [Front]	FCC #2	0.015	1	91.0	0.014	2.153	1.099	0.033	
2 462.0	11	802.11b (Ant.2)	15.00	11.67	0.030	10 mm [Rear]	FCC #2	0.040	1	91.0	0.039	2.153	1.099	0.092	
2 462.0	11	802.11b (Ant.2)	15.00	11.67	0.130	10 mm [Left]	FCC #2	0.030	1	91.0	0.030	2.153	1.099	0.071	
2 437.0	6	802.11g (MIMO)	17.00	13.79	-0.100	10 mm [Top]	FCC #2	0.013	1	97.3	0.013	2.153	1.028	0.029	A25
2 437.0	6	802.11g (MIMO)	17.00	13.79	-0.060	10 mm [Front]	FCC #2	0.017	1	97.3	0.013	2.153	1.028	0.029	
2 437.0	6	802.11g (MIMO)	17.00	13.79	-0.080	10 mm [Rear]	FCC #2	0.048	1	97.3	0.050	2.153	1.028	0.111	
2 437.0	6	802.11g (MIMO)	17.00	13.79	-0.190	10 mm [Right]	FCC #2	0.035	1	97.3	0.046	2.153	1.028	0.102	
2 437.0	6	802.11g (MIMO)	17.00	13.79	-0.170	10 mm [Left]	FCC #2	0.033	1	97.3	0.033	2.153	1.028	0.073	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure									Body 1.6 W/kg (mW/kg) averaged over 1 gram						

Adjusted SAR results for OFDM SAR												
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	1g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm]	Ratio of OFDM to DSSS	1g Adjusted SAR (W/kg)	Determine OFDM SAR
MHz	Ch											
2437.0	6	802.11b (Ant.1)	DSSS	15.0	0.082	2437.0	802.11g	OFDM	14.0	0.794	0.065	X
2437.0	6	802.11b (Ant.1)	DSSS	15.0	0.082	2437.0	802.11n	OFDM	14.0	0.794	0.065	X
2462.0	11	802.11b (Ant.2)	DSSS	15.0	0.092	2437.0	802.11g	OFDM	14.0	0.794	0.073	X
2462.0	11	802.11b (Ant.2)	DSSS	15.0	0.092	2437.0	802.11n	OFDM	14.0	0.794	0.073	X
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure						Body 1.6 W/kg (mW/g) averaged over 1 gram						

Note: SAR is not required for the following 2.4 GHz OFDM conditions. When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

Table 11.3.4 UNII Hotspot SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5 290.0	58	802.11ac (Ant.1)	13.00	9.13	0.010	10 mm [Top]	FCC #2	0.027	1	89.8	0.021	2.438	1.114	0.057	
5 290.0	58	802.11ac (Ant.1)	13.00	9.13	-0.140	10 mm [Front]	FCC #2	0.024	1	89.8	0.019	2.438	1.114	0.052	
5 290.0	58	802.11ac (Ant.1)	13.00	9.13	-0.030	10 mm [Rear]	FCC #2	0.106	1	89.8	0.104	2.438	1.114	0.282	
5 290.0	58	802.11ac (Ant.2)	13.00	9.13	0.080	10 mm [Right]	FCC #2	0.148	1	89.8	0.148	2.438	1.114	0.402	A33
5 290.0	58	802.11ac (Ant.2)	13.00	9.56	-0.080	10 mm [Top]	FCC #2	0.032	1	89.8	0.029	2.208	1.114	0.071	
5 290.0	58	802.11ac (Ant.2)	13.00	9.56	0.140	10 mm [Front]	FCC #2	0.060	1	89.8	0.059	2.208	1.114	0.145	
5 290.0	58	802.11ac (Ant.2)	13.00	9.56	-0.040	10 mm [Rear]	FCC #2	0.133	1	89.8	0.134	2.208	1.114	0.329	A27
5 290.0	58	802.11ac (Ant.2)	13.00	9.56	-0.160	10 mm [Left]	FCC #2	0.113	1	89.8	0.114	2.208	1.114	0.280	
5 290.0	58	802.11ac (MIMO)	16.00	12.36	-0.010	10 mm [Top]	FCC #2	0.035	1	89.8	0.036	2.438	1.114	0.098	
5 290.0	58	802.11ac (MIMO)	16.00	12.36	-0.170	10 mm [Front]	FCC #2	0.060	1	89.8	0.056	2.438	1.114	0.152	
5 290.0	58	802.11ac (MIMO)	16.00	12.36	-0.010	10 mm [Rear]	FCC #2	0.123	1	89.8	0.122	2.438	1.114	0.331	
5 290.0	58	802.11ac (MIMO)	16.00	12.36	0.060	10 mm [Right]	FCC #2	0.148	1	89.8	0.151	2.438	1.114	0.410	
5 290.0	58	802.11ac (MIMO)	16.00	12.36	-0.070	10 mm [Left]	FCC #2	0.147	1	89.8	0.155	2.438	1.114	0.421	A34
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Body 1.6 W/kg (mW/g) averaged over 1 gram							

Adjusted SAR results for UNII-1 and UNII-2A SAR												
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	1g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm]	Adjusted Factor	1g Adjusted SAR (W/kg)	SAR for the band with lower maximum output power
MHz	Ch											
5 290.0	58	802.11ac (Ant.1)	OFDM	13.00	0.402	5 210.0	802.11ac	OFDM	13.00	1.000	0.402	X
5 290.0	58	802.11ac (Ant.2)	OFDM	13.00	0.329	5 210.0	802.11ac	OFDM	13.00	1.000	0.329	X
5 290.0	58	802.11ac (MIMO)	OFDM	16.00	0.421	5 210.0	802.11ac	OFDM	16.00	1.000	0.421	X
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure						Head 1.6 W/kg (mW/g) averaged over 1 gram						

Note: U-NII-1 and U-NII-2A Bands: When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration.

Table 11.3.5 UNII Hotspot SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5 610.0	122	802.11a (Ant.1)	13.00	9.64	0.050	10 mm [Top]	FCC #2	0.016	1	89.8	0.010	2.168	1.114	0.024	
5 610.0	122	802.11a (Ant.1)	13.00	9.64	-0.070	10 mm [Front]	FCC #2	0.072	1	89.8	0.059	2.168	1.114	0.142	
5 610.0	122	802.11a (Ant.1)	13.00	9.64	0.100	10 mm [Rear]	FCC #2	0.234	1	89.8	0.232	2.168	1.114	0.560	
5 610.0	122	802.11a (Ant.1)	13.00	9.64	-0.070	10 mm [Right]	FCC #2	0.267	1	89.8	0.276	2.168	1.114	0.666	A35
5 690.0	138	802.11a (Ant.2)	13.00	9.90	0.020	10 mm [Top]	FCC #2	0.022	1	89.8	0.011	2.042	1.114	0.025	
5 690.0	138	802.11a (Ant.2)	13.00	9.90	0.050	10 mm [Front]	FCC #2	0.060	1	89.8	0.048	2.042	1.114	0.109	
5 690.0	138	802.11a (Ant.2)	13.00	9.90	0.010	10 mm [Rear]	FCC #2	0.065	1	89.8	0.059	2.042	1.114	0.134	
5 690.0	138	802.11a (Ant.2)	13.00	9.90	0.020	10 mm [Left]	FCC #2	0.167	1	89.8	0.164	2.042	1.114	0.373	A36
5 610.0	122	802.11a (MIMO)	16.00	12.64	0.050	10 mm [Top]	FCC #2	0.019	1	89.8	0.010	2.168	1.114	0.024	
5 610.0	122	802.11a (MIMO)	16.00	12.64	-0.090	10 mm [Front]	FCC #2	0.056	1	89.8	0.044	2.168	1.114	0.106	
5 610.0	122	802.11a (MIMO)	16.00	12.64	0.070	10 mm [Rear]	FCC #2	0.169	1	89.8	0.169	2.168	1.114	0.408	
5 610.0	122	802.11a (MIMO)	16.00	12.64	0.120	10 mm [Right]	FCC #2	0.294	1	89.8	0.303	2.168	1.114	0.732	A37
5 610.0	122	802.11a (MIMO)	16.00	12.64	0.050	10 mm [Left]	FCC #2	0.159	1	89.8	0.154	2.168	1.114	0.372	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11.3.6 Bluetooth Hotspot SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Rate [Mbps]	Duty Cycle (%)	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch													
2 441.0	39	Bluetooth	18.30	12.42	0.160	10 mm [Top]	FCC #2	1	76.8	0.025	3.873	1.302	0.126	A32
2 441.0	39	Bluetooth	18.30	12.42	-0.120	10 mm [Front]	FCC #2	1	76.8	0.030	3.873	1.302	0.151	
2 441.0	39	Bluetooth	18.30	12.42	-0.120	10 mm [Rear]	FCC #2	1	76.8	0.077	3.873	1.302	0.388	
2 441.0	39	Bluetooth	18.30	12.42	0.150	10 mm [Right]	FCC #2	1	76.8	0.066	3.873	1.302	0.333	
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Body 1.6 W/kg (mW/g) averaged over 1 gram						

11.4 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements. A standard battery was used for all SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 10 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was not > 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were performed.
8. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v02r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated.
9. SAR measurements were performed using the DASY5 automated system. The procedure for spatial peak SAR evaluation has been implemented according to the IEEE 1528 standard. During a maximum search, global and local maxima searches are automatically performed in 2-D after each area scan measurement. The algorithm will find the global maximum and all local maxima within 2 dB of the global maxima for all SAR distributions. All local maxima within 2 dB of the global maximum were searched and passed for the Zoom Scan measurement.

GSM Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. This device supports GSM VOIP in the head and body-worn configurations; therefore GPRS was additionally evaluated for head and body-worn compliance.
3. Justification for reduced test configurations per KDB Publication 941225 D01v03r01 and October2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR.
4. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). Since the maximum output power variation across the required test channels is not $> \frac{1}{2}$ dB, the middle channel was used for testing.

WCDMA (UMTS) Notes:

1. WCDMA (UMTS) mode in was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. AMR and HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.
2. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel was used.

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r05. The general test procedures used for testing can be found in Section 8.4.4.
2. According to FCC KDB 941225 D05v02r05, when the reported SAR is ≤ 0.8 W/kg, testing of the 100% RB allocation and required test channels is not required.
Otherwise, SAR is required for the remaining required test channels using the 1 RB, 50% RB and 100% RB allocation with highest output power for that channel.
Only one channel, and as reported SAR values for 1 RB allocation and 50% RB allocation were less than 1.45 W/kg only the highest power RB offset for each allocation was required.
3. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36. 101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
4. A-MPR was disabled for all SAR tests by setting NS=1 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
5. SAR test reduction is applied using the following criteria:
Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is > 0.8 W/kg, testing for other channels is performed at the highest output power level for 1 RB, and 50% RB configuration for that channel. Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High channel when the highest reported SAR for 1 RB and 50% RB are > 0.8 W/kg, Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg. Testing for 16QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/kg and its output power is not more than 0.5 dB higher than that a QPSK. Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

WLAN Notes:

1. The initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output and the adjust SAR is ≤ 1.2 W/kg.
3. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 5 GHz WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg.
4. When the maximum reported 1g averaged SAR ≤ 0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg or all test channels were measured.
5. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor to determine compliance.
6. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D01v06 by making a SAR measurement with both antennas transmitting simultaneously.

Bluetooth Notes:

1. Bluetooth SAR was measured with the device connected to a call with hopping disabled with DH5 operation and Tx test mode type. Per October 2016 TCB Workshop Notes, the reported SAR was scaled to the 100% transmission duty factor to determine compliance. Refer to section 9.5 for the time-domain plot and calculation for the duty factor of the device.
2. Head and hotspot Bluetooth SAR were evaluated for BT tethering applications.

12. FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v06 are applicable to handsets with built-in unlicensed transmitters such as 802.11b/g/n and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

12.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v06 4.3.2 and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the sum 1-g SAR for all the simultaneous transmitting antennas in a specific physical test configuration is ≤ 1.6 W/kg. The different test position in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1-g or 10-g SAR.

12.3 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds.

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v06.

Table 12.3.1 Simultaneous SAR Cases

No.	Capable Transmit Configuration	Head SAR	Body-Worn SAR	Hotspot SAR	Phablet SAR	Note
1	GSM Voice + Wi-Fi 2.4 GHz	Yes	Yes	N/A	Yes	
2	GSM Voice + Wi-Fi 5 GHz	Yes	Yes	N/A	Yes	
3	GSM Voice + Bluetooth 2.4 GHz	Yes^	Yes	N/A	Yes	^Bluetooth Tethering is considered.
4	GSM Voice + Wi-Fi 2.4 GHz MIMO	Yes	Yes	N/A	Yes	
5	GSM Voice + Wi-Fi 5 GHz MIMO	Yes	Yes	N/A	Yes	
6	GSM Voice + Bluetooth 2.4 GHz + Wi-Fi 5 GHz	Yes^	Yes	N/A	Yes	^Bluetooth Tethering is considered.
7	GSM Voice + Bluetooth 2.4 GHz + Wi-Fi 5 GHz MIMO	Yes^	Yes	N/A	Yes	^Bluetooth Tethering is considered.
8	WCDMA + Wi-Fi 2.4 GHz	Yes	Yes	Yes	Yes	
9	WCDMA + Wi-Fi 5 GHz	Yes	Yes	Yes	Yes	^ Hotspot of UNII-1 & UNII-3 can be operated simultaneous transmission.
10	WCDMA + Bluetooth 2.4 GHz	Yes^	Yes	Yes	Yes	^Bluetooth Tethering is considered.
11	WCDMA + Wi-Fi 2.4 GHz MIMO	Yes	Yes	Yes	Yes	
12	WCDMA + Wi-Fi 5 GHz MIMO	Yes	Yes	Yes	Yes	^ Hotspot of UNII-1 & UNII-3 can be operated simultaneous transmission.
13	WCDMA + Bluetooth 2.4 GHz + Wi-Fi 5 GHz	Yes^	Yes	Yes	Yes	^Bluetooth Tethering is considered. ^ Hotspot of UNII-1 & UNII-3 can be operated simultaneous transmission.
14	WCDMA + Bluetooth 2.4 GHz + Wi-Fi 5 GHz MIMO	Yes^	Yes	Yes	Yes	^Bluetooth Tethering is considered. ^ Hotspot of UNII-1 & UNII-3 can be operated simultaneous transmission.
15	LTE + Wi-Fi 2.4 GHz	Yes	Yes	Yes	Yes	
16	LTE + Wi-Fi 5 GHz	Yes	Yes	Yes	Yes	^ Hotspot of UNII-1 & UNII-3 can be operated simultaneous transmission.
17	LTE + Bluetooth 2.4 GHz	Yes^	Yes	Yes	Yes	^Bluetooth Tethering is considered.
18	LTE + Wi-Fi 2.4 GHz MIMO	Yes	Yes	Yes	Yes	
19	LTE + Wi-Fi 5 GHz MIMO	Yes	Yes	Yes	Yes	^ Hotspot of UNII-1 & UNII-3 can be operated simultaneous transmission.
20	LTE + Bluetooth 2.4 GHz + Wi-Fi 5GHz	Yes^	Yes	Yes	Yes	^Bluetooth Tethering is considered. ^ Hotspot of UNII-1 & UNII-3 can be operated simultaneous transmission.
21	LTE + Bluetooth 2.4 GHz + Wi-Fi 5GHz MIMO	Yes^	Yes	Yes	Yes	^Bluetooth Tethering is considered. ^ Hotspot of UNII-1 & UNII-3 can be operated simultaneous transmission.
22	GPRS + Wi-Fi 2.4 GHz	Yes*	Yes*	Yes	Yes	*Pre-installed VOIP applications are considered.
23	GPRS + Wi-Fi 5 GHz	Yes*	Yes*	Yes	Yes	*Pre-installed VOIP applications are considered. ^ Hotspot of UNII-1 & UNII-3 can be operated simultaneous transmission.
24	GPRS + Bluetooth 2.4 GHz	Yes^*	Yes*	Yes	Yes	*Pre-installed VOIP applications are considered. ^Bluetooth Tethering is considered.
25	GPRS + Wi-Fi 2.4 GHz MIMO	Yes*	Yes*	Yes	Yes	*Pre-installed VOIP applications are considered.
26	GPRS + Wi-Fi 5 GHz MIMO	Yes*	Yes*	Yes	Yes	*Pre-installed VOIP applications are considered. ^ Hotspot of UNII-1 & UNII-3 can be operated simultaneous transmission.
27	GPRS + Bluetooth 2.4 GHz + Wi-Fi 5 GHz	Yes^*	Yes*	Yes	Yes	*Pre-installed VOIP applications are considered. ^Bluetooth Tethering is considered. ^ Hotspot of UNII-1 & UNII-3 can be operated simultaneous transmission.
28	GPRS + Bluetooth 2.4 GHz + Wi-Fi 5 GHz MIMO	Yes^*	Yes*	Yes	Yes	*Pre-installed VOIP applications are considered. ^Bluetooth Tethering is considered. ^ Hotspot of UNII-1 & UNII-3 can be operated simultaneous transmission.
29	Bluetooth 2.4 GHz + Wi-Fi 5 GHz	Yes^	Yes	N/A	Yes	^Bluetooth Tethering is considered.
30	Bluetooth 2.4 GHz + Wi-Fi 5 GHz MIMO	Yes^	Yes	N/A	Yes	^Bluetooth Tethering is considered.

Notes:

1. Wi-Fi 2.4GHz is supported Hotspot and Wi-Fi-Direct(GO/GC).
2. Wi-Fi 5GHz is supported Hotspot and Wi-Fi-Direct(GO/GC).
3. LTE, WCDMA, GPRS is supported Hotspot.
4. VoIP is supported in LTE, WCDMA, GSM.
5. GSM, WCDMA and LTE can not transmit simultaneously since they share the same chip.

12.4 Head SAR Simultaneous Transmission Analysis

Table 12.4.1 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.3 GHz W-LAN Ant.1 (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.3G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Head SAR	GSM 850	Left Touch	0.359	0.575	0.223	0.934	0.582	1.157
		Right Touch	0.305	0.212	0.087	0.517	0.392	0.604
		Left Tilt	0.143	0.282	0.103	0.425	0.246	0.528
		Right Tilt	0.116	0.126	0.073	0.242	0.189	0.315
	GPRS 850	Left Touch	0.377	0.575	0.223	0.952	0.600	1.175
		Right Touch	0.310	0.212	0.087	0.522	0.397	0.609
		Left Tilt	0.182	0.282	0.103	0.464	0.285	0.567
		Right Tilt	0.185	0.126	0.073	0.311	0.258	0.384
	GSM 1900	Left Touch	0.245	0.575	0.223	0.820	0.468	1.043
		Right Touch	0.371	0.212	0.087	0.583	0.458	0.670
		Left Tilt	0.092	0.282	0.103	0.374	0.195	0.477
		Right Tilt	0.073	0.126	0.073	0.199	0.146	0.272
	GPRS 1900	Left Touch	0.282	0.575	0.223	0.857	0.505	1.080
		Right Touch	0.477	0.212	0.087	0.689	0.564	0.776
		Left Tilt	0.101	0.282	0.103	0.383	0.204	0.486
		Right Tilt	0.101	0.126	0.073	0.227	0.174	0.300
	WCDMA 850	Left Touch	0.358	0.575	0.223	0.933	0.581	1.156
		Right Touch	0.334	0.212	0.087	0.546	0.421	0.633
		Left Tilt	0.132	0.282	0.103	0.414	0.235	0.517
		Right Tilt	0.121	0.126	0.073	0.247	0.194	0.320
	LTE Band 12	Left Touch	0.213	0.575	0.223	0.758	0.436	1.011
		Right Touch	0.266	0.212	0.087	0.478	0.353	0.565
		Left Tilt	0.116	0.282	0.103	0.398	0.219	0.501
		Right Tilt	0.146	0.126	0.073	0.272	0.219	0.345

Table 12.4.2 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.3 GHz W-LAN Ant.2 (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.3G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Head SAR	GSM 850	Left Touch	0.359	0.575	0.216	0.934	0.575	1.150
		Right Touch	0.305	0.212	0.295	0.517	0.600	0.812
		Left Tilt	0.143	0.282	0.192	0.425	0.335	0.617
		Right Tilt	0.116	0.126	0.243	0.242	0.359	0.485
	GPRS 850	Left Touch	0.377	0.575	0.216	0.952	0.593	1.168
		Right Touch	0.310	0.212	0.295	0.522	0.605	0.817
		Left Tilt	0.182	0.282	0.192	0.464	0.374	0.656
		Right Tilt	0.185	0.126	0.243	0.351	0.458	0.554
	GSM 1900	Left Touch	0.245	0.575	0.216	0.820	0.461	1.036
		Right Touch	0.371	0.212	0.295	0.583	0.666	0.878
		Left Tilt	0.092	0.282	0.192	0.374	0.284	0.566
		Right Tilt	0.073	0.126	0.243	0.199	0.316	0.442
	GPRS 1900	Left Touch	0.282	0.575	0.216	0.857	0.498	1.073
		Right Touch	0.477	0.212	0.295	0.689	0.772	0.984
		Left Tilt	0.101	0.282	0.192	0.383	0.293	0.575
		Right Tilt	0.101	0.126	0.243	0.227	0.344	0.470
	WCDMA 850	Left Touch	0.358	0.575	0.216	0.933	0.574	1.149
		Right Touch	0.334	0.212	0.295	0.546	0.630	0.841
		Left Tilt	0.132	0.282	0.192	0.414	0.324	0.606
		Right Tilt	0.121	0.126	0.243	0.247	0.364	0.490
	LTE Band 12	Left Touch	0.213	0.575	0.216	0.758	0.429	1.004
		Right Touch	0.266	0.212	0.295	0.478	0.561	0.773
		Left Tilt	0.116	0.282	0.192	0.398	0.308	0.590
		Right Tilt	0.146	0.126	0.243	0.272	0.389	0.515

Table 12.4.3 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.3 GHz W-LAN MIMO (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.3G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Head SAR	GSM 850	Left Touch	0.359	0.575	0.157	0.934	0.516	1.091
		Right Touch	0.305	0.212	0.296	0.517	0.601	0.813
		Left Tilt	0.143	0.282	0.190	0.425	0.333	0.615
		Right Tilt	0.116	0.126	0.225	0.242	0.341	0.467
	GPRS 850	Left Touch	0.377	0.575	0.157	0.952	0.534	1.109
		Right Touch	0.310	0.212	0.296	0.522	0.606	0.818
		Left Tilt	0.182	0.282	0.190	0.464	0.372	0.654
		Right Tilt	0.185	0.126	0.225	0.311	0.410	0.536
	GSM 1900	Left Touch	0.245	0.575	0.157	0.820	0.410	0.977
		Right Touch	0.371	0.212	0.296	0.583	0.667	0.870
		Left Tilt	0.092	0.282	0.190	0.374	0.282	0.564
		Right Tilt	0.073	0.126	0.225	0.199	0.298	0.424
	GPRS 1900	Left Touch	0.282	0.575	0.157	0.857	0.439	1.014
		Right Touch	0.477	0.212	0.296	0.689	0.773	0.985
		Left Tilt	0.101	0.282	0.190	0.383	0.291	0.573
		Right Tilt	0.101	0.126	0.225	0.227	0.326	0.452
	WCDMA 850	Left Touch	0.358	0.575	0.157	0.933	0.515	1.090
		Right Touch	0.334	0.212	0.296	0.546	0.630	0.842
		Left Tilt	0.132	0.282	0.190	0.414	0.322	0.604
		Right Tilt	0.121	0.126	0.225	0.247	0.346	0.472
	LTE Band 12	Left Touch	0.213	0.575	0.157	0.758	0.370	0.945
		Right Touch	0.266	0.212	0.296	0.478	0.562	0.774
		Left Tilt	0.116	0.282	0.190	0.398	0.306	0.588
		Right Tilt	0.146	0.126	0.225	0.272	0.371	0.497

Table 12.4.4 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.6 GHz W-LAN Ant.1 (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.6G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Head SAR	GSM 850	Left Touch	0.359	0.575	0.379	0.934	0.738	1.313
		Right Touch	0.305	0.212	0.174	0.517	0.479	0.691
		Left Tilt	0.143	0.282	0.215	0.425	0.358	0.640
		Right Tilt	0.116	0.126	0.147	0.242	0.263	0.389
	GPRS 850	Left Touch	0.377	0.575	0.379	0.952	0.756	1.331
		Right Touch	0.310	0.212	0.174	0.522	0.484	0.696
		Left Tilt	0.182	0.282	0.215	0.464	0.397	0.679
		Right Tilt	0.185	0.126	0.147	0.311	0.332	0.458
	GSM 1900	Left Touch	0.245	0.575	0.379	0.820	0.624	1.199
		Right Touch	0.371	0.212	0.174	0.583	0.545	0.757
		Left Tilt	0.092	0.282	0.215	0.374	0.307	0.589
		Right Tilt	0.073	0.126	0.147	0.199	0.220	0.346
	GPRS 1900	Left Touch	0.282	0.575	0.379	0.857	0.661	1.236
		Right Touch	0.477	0.212	0.174	0.689	0.651	0.863
		Left Tilt	0.101	0.282	0.215	0.383	0.316	0.598
		Right Tilt	0.101	0.126	0.147	0.227	0.248	0.374
	WCDMA 850	Left Touch	0.358	0.575	0.379	0.933	0.737	1.312
		Right Touch	0.334	0.212	0.174	0.546	0.508	0.720
		Left Tilt	0.132	0.282	0.215	0.414	0.347	0.629
		Right Tilt	0.121	0.126	0.147	0.247	0.268	0.394
	LTE Band 12	Left Touch	0.213	0.575	0.379	0.758	0.592	1.167
		Right Touch	0.266	0.212	0.174	0.478	0.440	0.652
		Left Tilt	0.116	0.282	0.215	0.398	0.331	0.513
		Right Tilt	0.146	0.126	0.147	0.272	0.293	0.419

Table 12.4.5 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.6 GHz W-LAN Ant.2 (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	1+2	ΣSAR (W/kg)	1+2+3
Head SAR	GSM 850	Left Touch	0.359	0.575	0.227	0.934	0.586	1.161
		Right Touch	0.305	0.212	0.382	0.517	0.687	0.999
		Left Tilt	0.143	0.282	0.257	0.425	0.400	0.682
		Right Tilt	0.116	0.126	0.325	0.242	0.441	0.567
	GPRS 850	Left Touch	0.377	0.575	0.227	0.952	0.604	1.179
		Right Touch	0.310	0.212	0.382	0.522	0.692	0.904
		Left Tilt	0.182	0.282	0.257	0.464	0.439	0.721
		Right Tilt	0.185	0.126	0.325	0.311	0.510	0.636
	GSM 1900	Left Touch	0.245	0.575	0.227	0.820	0.472	1.047
		Right Touch	0.371	0.212	0.382	0.583	0.753	0.965
		Left Tilt	0.092	0.282	0.257	0.374	0.349	0.631
		Right Tilt	0.073	0.126	0.325	0.199	0.398	0.524
	GPRS 1900	Left Touch	0.282	0.575	0.227	0.857	0.509	1.084
		Right Touch	0.477	0.212	0.382	0.689	0.859	1.071
		Left Tilt	0.101	0.282	0.257	0.383	0.358	0.640
		Right Tilt	0.101	0.126	0.325	0.227	0.426	0.552
	WCDMA 850	Left Touch	0.358	0.575	0.227	0.933	0.585	1.160
		Right Touch	0.334	0.212	0.382	0.546	0.716	0.928
		Left Tilt	0.132	0.282	0.257	0.414	0.389	0.671
		Right Tilt	0.121	0.126	0.325	0.247	0.446	0.572
	LTE Band 12	Left Touch	0.213	0.575	0.227	0.788	0.440	1.015
		Right Touch	0.266	0.212	0.382	0.478	0.648	0.860
		Left Tilt	0.116	0.282	0.257	0.398	0.373	0.655
		Right Tilt	0.146	0.126	0.325	0.272	0.471	0.597

Table 12.4.6 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.6 GHz W-LAN MIMO (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.6G W-LAN MIMO SAR (W/kg)	1+2	ΣSAR (W/kg)	1+2+3
Head SAR	GSM 850	Left Touch	0.359	0.575	0.374	0.934	0.733	1.308
		Right Touch	0.305	0.212	0.350	0.517	0.655	0.867
		Left Tilt	0.143	0.282	0.321	0.425	0.464	0.746
		Right Tilt	0.116	0.126	0.307	0.242	0.423	0.549
	GPRS 850	Left Touch	0.377	0.575	0.374	0.952	0.751	1.326
		Right Touch	0.310	0.212	0.350	0.522	0.660	0.872
		Left Tilt	0.182	0.282	0.321	0.464	0.503	0.785
		Right Tilt	0.185	0.126	0.307	0.311	0.492	0.618
	GSM 1900	Left Touch	0.245	0.575	0.374	0.820	0.619	1.194
		Right Touch	0.371	0.212	0.350	0.583	0.721	0.933
		Left Tilt	0.092	0.282	0.321	0.374	0.413	0.695
		Right Tilt	0.073	0.126	0.307	0.199	0.380	0.506
	GPRS 1900	Left Touch	0.282	0.575	0.374	0.857	0.656	1.231
		Right Touch	0.477	0.212	0.350	0.689	0.827	1.039
		Left Tilt	0.101	0.282	0.321	0.383	0.422	0.704
		Right Tilt	0.101	0.126	0.307	0.227	0.408	0.534
	WCDMA 850	Left Touch	0.358	0.575	0.374	0.933	0.732	1.307
		Right Touch	0.334	0.212	0.350	0.546	0.684	0.896
		Left Tilt	0.132	0.282	0.321	0.414	0.453	0.735
		Right Tilt	0.121	0.126	0.307	0.247	0.428	0.554
	LTE Band 12	Left Touch	0.213	0.575	0.374	0.788	0.587	1.162
		Right Touch	0.266	0.212	0.350	0.478	0.616	0.828
		Left Tilt	0.116	0.282	0.321	0.398	0.437	0.719
		Right Tilt	0.146	0.126	0.307	0.272	0.453	0.579

Table 12.4.7 Simultaneous Transmission Scenario : 2G/3G/4G + 2.4 GHz W-LAN Ant.1 (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
Head SAR	GSM 850	Left Touch	0.359	0.090	0.449
		Right Touch	0.305	0.041	0.346
		Left Tilt	0.143	0.047	0.190
		Right Tilt	0.116	0.025	0.141
	GPRS 850	Left Touch	0.377	0.090	0.467
		Right Touch	0.310	0.041	0.351
		Left Tilt	0.182	0.047	0.229
		Right Tilt	0.185	0.025	0.210
	GSM 1900	Left Touch	0.245	0.090	0.335
		Right Touch	0.371	0.041	0.412
		Left Tilt	0.092	0.047	0.139
		Right Tilt	0.073	0.025	0.098
	GPRS 1900	Left Touch	0.282	0.090	0.372
		Right Touch	0.477	0.041	0.518
		Left Tilt	0.101	0.047	0.148
		Right Tilt	0.101	0.025	0.126
	WCDMA 850	Left Touch	0.358	0.090	0.448
		Right Touch	0.334	0.041	0.375
		Left Tilt	0.132	0.047	0.179
		Right Tilt	0.121	0.025	0.146
	LTE Band 12	Left Touch	0.213	0.090	0.303
		Right Touch	0.266	0.041	0.307
		Left Tilt	0.116	0.047	0.163
		Right Tilt	0.146	0.025	0.171

Table 12.4.8 Simultaneous Transmission Scenario : 2G/3G/4G + 2.4 GHz W-LAN Ant.2 (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
Head SAR	GSM 850	Left Touch	0.359	0.064	0.423
		Right Touch	0.305	0.151	0.456
		Left Tilt	0.143	0.035	0.178
		Right Tilt	0.116	0.057	0.173
	GPRS 850	Left Touch	0.377	0.064	0.441
		Right Touch	0.310	0.151	0.461
		Left Tilt	0.182	0.035	0.217
		Right Tilt	0.185	0.057	0.242
	GSM 1900	Left Touch	0.245	0.064	0.309
		Right Touch	0.371	0.151	0.522
		Left Tilt	0.092	0.035	0.127
		Right Tilt	0.073	0.057	0.130
	GPRS 1900	Left Touch	0.282	0.064	0.346
		Right Touch	0.477	0.151	0.628
		Left Tilt	0.101	0.035	0.136
		Right Tilt	0.101	0.057	0.158
	WCDMA 850	Left Touch	0.358	0.064	0.422
		Right Touch	0.334	0.151	0.485
		Left Tilt	0.132	0.035	0.167
		Right Tilt	0.121	0.057	0.178
	LTE Band 12	Left Touch	0.213	0.064	0.277
		Right Touch	0.266	0.151	0.417
		Left Tilt	0.116	0.035	0.151
		Right Tilt	0.146	0.057	0.203

Table 12.4.9 Simultaneous Transmission Scenario : 2G/3G/4G + 2.4 GHz W-LAN MIMO (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	2.4G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
Head SAR	GSM 850	Left Touch	0.359	0.095	0.454
		Right Touch	0.305	0.126	0.431
		Left Tilt	0.143	0.049	0.192
		Right Tilt	0.116	0.040	0.156
	GPRS 850	Left Touch	0.377	0.095	0.472
		Right Touch	0.310	0.126	0.436
		Left Tilt	0.182	0.049	0.231
		Right Tilt	0.185	0.040	0.225
	GSM 1900	Left Touch	0.245	0.095	0.340
		Right Touch	0.371	0.126	0.497
		Left Tilt	0.092	0.049	0.141
		Right Tilt	0.073	0.040	0.113
	GPRS 1900	Left Touch	0.282	0.095	0.377
		Right Touch	0.477	0.126	0.603
		Left Tilt	0.101	0.049	0.150
		Right Tilt	0.101	0.040	0.141
	WCDMA 850	Left Touch	0.358	0.095	0.453
		Right Touch	0.334	0.126	0.460
		Left Tilt	0.132	0.049	0.181
		Right Tilt	0.121	0.040	0.161
	LTE Band 12	Left Touch	0.213	0.095	0.308
		Right Touch	0.266	0.126	0.392
		Left Tilt	0.116	0.049	0.165
		Right Tilt	0.146	0.040	0.186

Table 12.4.10 Simultaneous Transmission Scenario : 2G/3G/4G + 5.3 GHz W-LAN Ant.1 (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.3G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
Head SAR	GSM 850	Left Touch	0.359	0.223	0.582
		Right Touch	0.305	0.087	0.392
		Left Tilt	0.143	0.103	0.246
		Right Tilt	0.116	0.073	0.189
	GPRS 850	Left Touch	0.377	0.223	0.600
		Right Touch	0.310	0.087	0.397
		Left Tilt	0.182	0.103	0.285
		Right Tilt	0.185	0.073	0.258
	GSM 1900	Left Touch	0.245	0.223	0.468
		Right Touch	0.371	0.087	0.458
		Left Tilt	0.092	0.103	0.195
		Right Tilt	0.073	0.073	0.146
	GPRS 1900	Left Touch	0.282	0.223	0.505
		Right Touch	0.477	0.087	0.564
		Left Tilt	0.101	0.103	0.204
		Right Tilt	0.101	0.073	0.174
	WCDMA 850	Left Touch	0.358	0.223	0.581
		Right Touch	0.334	0.087	0.421
		Left Tilt	0.132	0.103	0.235
		Right Tilt	0.121	0.073	0.194
	LTE Band 12	Left Touch	0.213	0.223	0.436
		Right Touch	0.266	0.087	0.353
		Left Tilt	0.116	0.103	0.219
		Right Tilt	0.146	0.073	0.219

Table 12.4.11 Simultaneous Transmission Scenario : 2G/3G/4G + 5.3 GHz W-LAN Ant.2 (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.3G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
Head SAR	GSM 850	Left Touch	0.359	0.216	0.575
		Right Touch	0.305	0.235	0.600
		Left Tilt	0.143	0.192	0.335
		Right Tilt	0.116	0.243	0.359
	GPRS 850	Left Touch	0.377	0.216	0.593
		Right Touch	0.310	0.295	0.605
		Left Tilt	0.182	0.192	0.374
		Right Tilt	0.185	0.243	0.428
	GSM 1900	Left Touch	0.245	0.216	0.461
		Right Touch	0.371	0.295	0.666
		Left Tilt	0.092	0.192	0.284
		Right Tilt	0.073	0.243	0.316
	GPRS 1900	Left Touch	0.282	0.216	0.498
		Right Touch	0.477	0.295	0.772
		Left Tilt	0.101	0.192	0.293
		Right Tilt	0.101	0.243	0.344
	WCDMA 850	Left Touch	0.358	0.216	0.574
		Right Touch	0.334	0.295	0.629
		Left Tilt	0.132	0.192	0.324
		Right Tilt	0.121	0.243	0.364
	LTE Band 12	Left Touch	0.213	0.216	0.429
		Right Touch	0.266	0.295	0.561
		Left Tilt	0.116	0.192	0.308
		Right Tilt	0.146	0.243	0.389

Table 12.4.12 Simultaneous Transmission Scenario: 2G/3G/4G + 5.3 GHz W-LAN MIMO (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.3G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
Head SAR	GSM 850	Left Touch	0.359	0.157	0.516
		Right Touch	0.305	0.296	0.601
		Left Tilt	0.143	0.190	0.333
		Right Tilt	0.116	0.225	0.341
	GPRS 850	Left Touch	0.377	0.157	0.534
		Right Touch	0.310	0.296	0.606
		Left Tilt	0.182	0.190	0.372
		Right Tilt	0.185	0.225	0.410
	GSM 1900	Left Touch	0.245	0.157	0.402
		Right Touch	0.371	0.296	0.667
		Left Tilt	0.092	0.190	0.282
		Right Tilt	0.073	0.225	0.298
	GPRS 1900	Left Touch	0.282	0.157	0.439
		Right Touch	0.477	0.296	0.773
		Left Tilt	0.101	0.190	0.291
		Right Tilt	0.101	0.225	0.326
	WCDMA 850	Left Touch	0.358	0.157	0.515
		Right Touch	0.334	0.296	0.630
		Left Tilt	0.132	0.190	0.322
		Right Tilt	0.121	0.225	0.346
	LTE Band 12	Left Touch	0.213	0.157	0.370
		Right Touch	0.266	0.296	0.562
		Left Tilt	0.116	0.190	0.306
		Right Tilt	0.146	0.225	0.371

Table 12.4.13 Simultaneous Transmission Scenario : 2G/3G/4G + 5.6 GHz W-LAN Ant.1 (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.6G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
Head SAR	GSM 850	Left Touch	0.359	0.379	0.738
		Right Touch	0.305	0.174	0.479
		Left Tilt	0.143	0.215	0.358
		Right Tilt	0.116	0.147	0.263
	GPRS 850	Left Touch	0.377	0.379	0.756
		Right Touch	0.310	0.174	0.484
		Left Tilt	0.182	0.215	0.397
		Right Tilt	0.185	0.147	0.332
	GSM 1900	Left Touch	0.245	0.379	0.624
		Right Touch	0.371	0.174	0.545
		Left Tilt	0.092	0.215	0.307
		Right Tilt	0.073	0.147	0.220
	GPRS 1900	Left Touch	0.282	0.379	0.661
		Right Touch	0.477	0.174	0.651
		Left Tilt	0.101	0.215	0.316
		Right Tilt	0.101	0.147	0.248
	WCDMA 850	Left Touch	0.358	0.379	0.737
		Right Touch	0.334	0.174	0.508
		Left Tilt	0.132	0.215	0.347
		Right Tilt	0.121	0.147	0.268
	LTE Band 12	Left Touch	0.213	0.379	0.592
		Right Touch	0.266	0.174	0.440
		Left Tilt	0.116	0.215	0.331
		Right Tilt	0.146	0.147	0.293

Table 12.4.14 Simultaneous Transmission Scenario : 2G/3G/4G + 5.6 GHz W-LAN Ant.2 (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
Head SAR	GSM 850	Left Touch	0.359	0.227	0.586
		Right Touch	0.305	0.382	0.687
		Left Tilt	0.143	0.257	0.400
		Right Tilt	0.116	0.325	0.441
	GPRS 850	Left Touch	0.377	0.227	0.604
		Right Touch	0.310	0.382	0.692
		Left Tilt	0.182	0.257	0.439
		Right Tilt	0.185	0.325	0.510
	GSM 1900	Left Touch	0.245	0.227	0.472
		Right Touch	0.371	0.382	0.753
		Left Tilt	0.092	0.257	0.349
		Right Tilt	0.073	0.325	0.398
	GPRS 1900	Left Touch	0.282	0.227	0.509
		Right Touch	0.477	0.382	0.859
		Left Tilt	0.101	0.257	0.358
		Right Tilt	0.101	0.325	0.426
	WCDMA 850	Left Touch	0.358	0.227	0.585
		Right Touch	0.334	0.382	0.716
		Left Tilt	0.132	0.257	0.389
		Right Tilt	0.121	0.325	0.446
	LTE Band 12	Left Touch	0.213	0.227	0.440
		Right Touch	0.266	0.382	0.648
		Left Tilt	0.116	0.257	0.373
		Right Tilt	0.146	0.325	0.471

Table 12.4.15 Simultaneous Transmission Scenario : 2G/3G/4G + 5.6 GHz W-LAN MIMO (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.6G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
Head SAR	GSM 850	Left Touch	0.359	0.374	0.733
		Right Touch	0.305	0.350	0.655
		Left Tilt	0.143	0.321	0.464
		Right Tilt	0.116	0.307	0.423
	GPRS 850	Left Touch	0.377	0.374	0.751
		Right Touch	0.310	0.350	0.660
		Left Tilt	0.182	0.321	0.503
		Right Tilt	0.185	0.307	0.492
	GSM 1900	Left Touch	0.245	0.374	0.619
		Right Touch	0.371	0.350	0.721
		Left Tilt	0.092	0.321	0.413
		Right Tilt	0.073	0.307	0.380
	GPRS 1900	Left Touch	0.282	0.374	0.656
		Right Touch	0.477	0.350	0.827
		Left Tilt	0.101	0.321	0.422
		Right Tilt	0.101	0.307	0.408
	WCDMA 850	Left Touch	0.358	0.374	0.732
		Right Touch	0.334	0.350	0.684
		Left Tilt	0.132	0.321	0.453
		Right Tilt	0.121	0.307	0.428
	LTE Band 12	Left Touch	0.213	0.374	0.587
		Right Touch	0.266	0.350	0.616
		Left Tilt	0.116	0.321	0.437
		Right Tilt	0.146	0.307	0.453

Table 12.4.16 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth (Held to Ear)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	ΣSAR (W/kg)
Head SAR	GSM 850	Left Touch	0.359	0.575	0.934
		Right Touch	0.305	0.212	0.517
		Left Tilt	0.143	0.282	0.425
		Right Tilt	0.116	0.126	0.242
	GPRS 850	Left Touch	0.377	0.575	0.952
		Right Touch	0.310	0.212	0.522
		Left Tilt	0.182	0.282	0.464
		Right Tilt	0.185	0.126	0.311
	GSM 1900	Left Touch	0.245	0.575	0.820
		Right Touch	0.371	0.212	0.583
		Left Tilt	0.092	0.282	0.374
		Right Tilt	0.073	0.126	0.199
	GPRS 1900	Left Touch	0.282	0.575	0.857
		Right Touch	0.477	0.212	0.689
		Left Tilt	0.101	0.282	0.383
		Right Tilt	0.101	0.126	0.227
	WCDMA 850	Left Touch	0.358	0.575	0.933
		Right Touch	0.334	0.212	0.546
		Left Tilt	0.132	0.282	0.414
		Right Tilt	0.121	0.126	0.247
	LTE Band 12	Left Touch	0.213	0.575	0.788
		Right Touch	0.266	0.212	0.478
		Left Tilt	0.116	0.282	0.398
		Right Tilt	0.146	0.126	0.272

Table 12.4.17 Simultaneous Transmission Scenario : Bluetooth Ant.1 + 5 GHz W-LAN Ant.1 (Held to Ear)

Exposure Condition	Mode	Configuration	Bluetooth Ant.1 SAR (W/kg)	5G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Head SAR	5.3G W-LAN Ant.1	Left Touch	0.575	0.223	0.798
		Right Touch	0.212	0.087	0.299
		Left Tilt	0.282	0.103	0.385
		Right Tilt	0.126	0.073	0.199
	5.6G W-LAN Ant.1	Left Touch	0.575	0.379	0.954
		Right Touch	0.212	0.174	0.386
		Left Tilt	0.282	0.215	0.497
		Right Tilt	0.126	0.147	0.273

Table 12.4.18 Simultaneous Transmission Scenario : Bluetooth Ant.1 + 5 GHz W-LAN Ant.2 (Held to Ear)

Exposure Condition	Mode	Configuration	Bluetooth Ant.1 SAR (W/kg)	5G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Head SAR	5.3G W-LAN Ant.2	Left Touch	0.575	0.216	0.791
		Right Touch	0.212	0.295	0.507
		Left Tilt	0.282	0.192	0.474
		Right Tilt	0.126	0.243	0.369
	5.6G W-LAN Ant.2	Left Touch	0.575	0.227	0.802
		Right Touch	0.212	0.382	0.594
		Left Tilt	0.282	0.257	0.539
		Right Tilt	0.126	0.325	0.451

Table 12.4.19 Simultaneous Transmission Scenario : Bluetooth Ant.1 + 5 GHz W-LAN MIMO (Held to Ear)

Exposure Condition	Mode	Configuration	Bluetooth Ant.1 SAR (W/kg)	5G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Head SAR	5.3G W-LAN MIMO	Left Touch	0.575	0.157	0.732
		Right Touch	0.212	0.296	0.508
		Left Tilt	0.282	0.190	0.472
		Right Tilt	0.126	0.225	0.351
	5.6G W-LAN MIMO	Left Touch	0.575	0.374	0.949
		Right Touch	0.212	0.350	0.562
		Left Tilt	0.282	0.321	0.603
		Right Tilt	0.126	0.307	0.433

12.5 Body-Worn Simultaneous Transmission Analysis

Table 12.5.1 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.3 GHz W-LAN Ant.1 (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.3G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Body-Worn SAR	GSM 850	Front	0.374	0.151	0.052	0.525	0.426	0.577
		Rear	0.439	0.388	0.282	0.827	0.721	1.109
	GPRS 850	Front	0.383	0.151	0.052	0.534	0.435	0.586
		Rear	0.465	0.388	0.282	0.853	0.747	1.135
	GSM 1900	Front	0.293	0.151	0.052	0.444	0.345	0.496
		Rear	0.407	0.388	0.282	0.795	0.689	1.077
	GPRS 1900	Front	0.324	0.151	0.052	0.475	0.376	0.527
		Rear	0.478	0.388	0.282	0.866	0.760	1.148
	WCDMA 850	Front	0.447	0.151	0.052	0.598	0.499	0.650
		Rear	0.586	0.388	0.282	0.974	0.868	1.256
	LTE Band 12	Front	0.219	0.151	0.052	0.370	0.271	0.422
		Rear	0.310	0.388	0.282	0.698	0.592	0.980

Table 12.5.2 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.3 GHz W-LAN Ant.2 (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.3G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Body-Worn SAR	GSM 850	Front	0.374	0.151	0.145	0.525	0.519	0.670
		Rear	0.439	0.388	0.329	0.827	0.768	1.156
	GPRS 850	Front	0.383	0.151	0.145	0.534	0.528	0.679
		Rear	0.465	0.388	0.329	0.853	0.794	1.182
	GSM 1900	Front	0.293	0.151	0.145	0.444	0.438	0.589
		Rear	0.407	0.388	0.329	0.795	0.736	1.124
	GPRS 1900	Front	0.324	0.151	0.145	0.475	0.469	0.620
		Rear	0.478	0.388	0.329	0.866	0.807	1.195
	WCDMA 850	Front	0.447	0.151	0.145	0.598	0.592	0.743
		Rear	0.586	0.388	0.329	0.974	0.915	1.303
	LTE Band 12	Front	0.219	0.151	0.145	0.370	0.364	0.515
		Rear	0.310	0.388	0.329	0.698	0.639	1.027

Table 12.5.3 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.3 GHz W-LAN MIMO (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.3G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Body-Worn SAR	GSM 850	Front	0.374	0.151	0.152	0.525	0.526	0.677
		Rear	0.439	0.388	0.331	0.827	0.770	1.158
	GPRS 850	Front	0.383	0.151	0.152	0.534	0.535	0.686
		Rear	0.465	0.388	0.331	0.853	0.796	1.184
	GSM 1900	Front	0.293	0.151	0.152	0.444	0.445	0.596
		Rear	0.407	0.388	0.331	0.795	0.738	1.126
	GPRS 1900	Front	0.324	0.151	0.152	0.475	0.476	0.627
		Rear	0.478	0.388	0.331	0.866	0.809	1.197
	WCDMA 850	Front	0.447	0.151	0.152	0.598	0.599	0.750
		Rear	0.586	0.388	0.331	0.974	0.917	1.305
	LTE Band 12	Front	0.219	0.151	0.152	0.370	0.371	0.522
		Rear	0.310	0.388	0.331	0.698	0.641	1.029

Table 12.5.4 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.6 GHz W-LAN Ant.1 (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.6G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Body-Worn SAR	GSM 850	Front	0.374	0.151	0.142	0.525	0.516	0.667
		Rear	0.439	0.388	0.560	0.827	0.999	1.387
	GPRS 850	Front	0.383	0.151	0.142	0.534	0.525	0.676
		Rear	0.465	0.388	0.560	0.853	1.025	1.413
	GSM 1900	Front	0.293	0.151	0.142	0.444	0.435	0.586
		Rear	0.407	0.388	0.560	0.795	0.967	1.355
	GPRS 1900	Front	0.324	0.151	0.142	0.475	0.466	0.617
		Rear	0.478	0.388	0.560	0.866	1.038	1.426
	WCDMA 850	Front	0.447	0.151	0.142	0.598	0.589	0.740
		Rear	0.586	0.388	0.560	0.974	1.146	1.534
	LTE Band 12	Front	0.219	0.151	0.142	0.370	0.361	0.512
		Rear	0.310	0.388	0.560	0.698	0.870	1.258

Table 12.5.5 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.6 GHz W-LAN Ant.2 (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Body-Worn SAR	GSM 850	Front	0.374	0.151	0.109	0.525	0.483	0.634
		Rear	0.439	0.388	0.134	0.827	0.573	0.961
	GPRS 850	Front	0.383	0.151	0.109	0.534	0.492	0.643
		Rear	0.465	0.388	0.134	0.853	0.599	0.987
	GSM 1900	Front	0.293	0.151	0.109	0.444	0.402	0.553
		Rear	0.407	0.388	0.134	0.795	0.541	0.929
	GPRS 1900	Front	0.324	0.151	0.109	0.475	0.433	0.584
		Rear	0.478	0.388	0.134	0.866	0.612	1.000
	WCDMA 850	Front	0.447	0.151	0.109	0.598	0.556	0.707
		Rear	0.586	0.388	0.134	0.974	0.720	1.108
	LTE Band 12	Front	0.219	0.151	0.109	0.370	0.328	0.479
		Rear	0.310	0.388	0.134	0.698	0.444	0.832

Table 12.5.6 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.6 GHz W-LAN MIMO (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.6G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Body-Worn SAR	GSM 850	Front	0.374	0.151	0.106	0.525	0.480	0.631
		Rear	0.439	0.388	0.408	0.827	0.847	1.235
	GPRS 850	Front	0.383	0.151	0.106	0.534	0.489	0.640
		Rear	0.465	0.388	0.408	0.853	0.873	1.261
	GSM 1900	Front	0.293	0.151	0.106	0.444	0.399	0.550
		Rear	0.407	0.388	0.408	0.795	0.815	1.203
	GPRS 1900	Front	0.324	0.151	0.106	0.475	0.430	0.581
		Rear	0.478	0.388	0.408	0.866	0.886	1.274
	WCDMA 850	Front	0.447	0.151	0.106	0.598	0.553	0.704
		Rear	0.586	0.388	0.408	0.974	0.994	1.382
	LTE Band 12	Front	0.219	0.151	0.106	0.370	0.325	0.476
		Rear	0.310	0.388	0.408	0.698	0.718	1.106

Table 12.5.7 Simultaneous Transmission Scenario : 2G/3G/4G + 2.4 GHz W-LAN Ant.1 (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	GSM 850	Front	0.374	0.025	0.399
		Rear	0.439	0.082	0.521
	GPRS 850	Front	0.383	0.025	0.408
		Rear	0.465	0.082	0.547
	GSM 1900	Front	0.293	0.025	0.318
		Rear	0.407	0.082	0.489
	GPRS 1900	Front	0.324	0.025	0.349
		Rear	0.478	0.082	0.560
	WCDMA 850	Front	0.447	0.025	0.472
		Rear	0.586	0.082	0.668
	LTE Band 12	Front	0.219	0.025	0.244
		Rear	0.310	0.082	0.392

Table 12.5.8 Simultaneous Transmission Scenario : 2G/3G/4G + 2.4 GHz W-LAN Ant.2 (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	GSM 850	Front	0.374	0.033	0.407
		Rear	0.439	0.092	0.531
	GPRS 850	Front	0.383	0.033	0.416
		Rear	0.465	0.092	0.557
	GSM 1900	Front	0.293	0.033	0.326
		Rear	0.407	0.092	0.499
	GPRS 1900	Front	0.324	0.033	0.357
		Rear	0.478	0.092	0.570
	WCDMA 850	Front	0.447	0.033	0.480
		Rear	0.586	0.092	0.678
	LTE Band 12	Front	0.219	0.033	0.252
		Rear	0.310	0.092	0.402

Table 12.5.9 Simultaneous Transmission Scenario : 2G/3G/4G + 2.4 GHz W-LAN MIMO (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	2.4G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	GSM 850	Front	0.374	0.029	0.403
		Rear	0.439	0.108	0.547
	GPRS 850	Front	0.383	0.029	0.412
		Rear	0.465	0.108	0.573
	GSM 1900	Front	0.293	0.029	0.322
		Rear	0.407	0.108	0.515
	GPRS 1900	Front	0.324	0.029	0.353
		Rear	0.478	0.108	0.586
	WCDMA 850	Front	0.447	0.029	0.476
		Rear	0.586	0.108	0.694
	LTE Band 12	Front	0.219	0.029	0.248
		Rear	0.310	0.108	0.418

Table 12.5.10 Simultaneous Transmission Scenario : 2G/3G/4G + 5.3 GHz W-LAN Ant.1 (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.3G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	GSM 850	Front	0.374	0.052	0.426
		Rear	0.439	0.282	0.721
	GPRS 850	Front	0.383	0.052	0.435
		Rear	0.465	0.282	0.747
	GSM 1900	Front	0.293	0.052	0.345
		Rear	0.407	0.282	0.689
	GPRS 1900	Front	0.324	0.052	0.376
		Rear	0.478	0.282	0.760
	WCDMA 850	Front	0.447	0.052	0.499
		Rear	0.586	0.282	0.868
	LTE Band 12	Front	0.219	0.052	0.271
		Rear	0.310	0.282	0.592

Table 12.5.11 Simultaneous Transmission Scenario : 2G/3G/4G + 5.3 GHz W-LAN Ant.2 (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.3G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	GSM 850	Front	0.374	0.145	0.519
		Rear	0.439	0.329	0.768
	GPRS 850	Front	0.383	0.145	0.528
		Rear	0.465	0.329	0.794
	GSM 1900	Front	0.293	0.145	0.438
		Rear	0.407	0.329	0.736
	GPRS 1900	Front	0.324	0.145	0.469
		Rear	0.478	0.329	0.807
	WCDMA 850	Front	0.447	0.145	0.592
		Rear	0.586	0.329	0.915
	LTE Band 12	Front	0.219	0.145	0.364
		Rear	0.310	0.329	0.639

Table 12.5.12 Simultaneous Transmission Scenario : 2G/3G/4G + 5.3 GHz W-LAN MIMO (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.3G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	GSM 850	Front	0.374	0.152	0.526
		Rear	0.439	0.331	0.770
	GPRS 850	Front	0.383	0.152	0.535
		Rear	0.465	0.331	0.796
	GSM 1900	Front	0.293	0.152	0.445
		Rear	0.407	0.331	0.738
	GPRS 1900	Front	0.324	0.152	0.476
		Rear	0.478	0.331	0.809
	WCDMA 850	Front	0.447	0.152	0.599
		Rear	0.586	0.331	0.917
	LTE Band 12	Front	0.219	0.152	0.371
		Rear	0.310	0.331	0.641

Table 12.5.13 Simultaneous Transmission Scenario : 2G/3G/4G + 5.6 GHz W-LAN Ant.1 (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.6G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	GSM 850	Front	0.374	0.142	0.516
		Rear	0.439	0.560	0.999
	GPRS 850	Front	0.383	0.142	0.525
		Rear	0.465	0.560	1.025
	GSM 1900	Front	0.293	0.142	0.435
		Rear	0.407	0.560	0.967
	GPRS 1900	Front	0.324	0.142	0.466
		Rear	0.478	0.560	1.038
	WCDMA 850	Front	0.447	0.142	0.589
		Rear	0.586	0.560	1.146
	LTE Band 12	Front	0.219	0.142	0.361
		Rear	0.310	0.560	0.870

Table 12.5.14 Simultaneous Transmission Scenario : 2G/3G/4G + 5.6 GHz W-LAN Ant.2 (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	GSM 850	Front	0.374	0.109	0.483
		Rear	0.439	0.134	0.573
	GPRS 850	Front	0.383	0.109	0.492
		Rear	0.465	0.134	0.599
	GSM 1900	Front	0.293	0.109	0.402
		Rear	0.407	0.134	0.541
	GPRS 1900	Front	0.324	0.109	0.433
		Rear	0.478	0.134	0.612
	WCDMA 850	Front	0.447	0.109	0.556
		Rear	0.586	0.134	0.720
	LTE Band 12	Front	0.219	0.109	0.328
		Rear	0.310	0.134	0.444

Table 12.5.15 Simultaneous Transmission Scenario : 2G/3G/4G + 5.6 GHz W-LAN MIMO (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.6G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	GSM 850	Front	0.374	0.106	0.480
		Rear	0.439	0.408	0.847
	GPRS 850	Front	0.383	0.106	0.489
		Rear	0.465	0.408	0.873
	GSM 1900	Front	0.293	0.106	0.399
		Rear	0.407	0.408	0.815
	GPRS 1900	Front	0.324	0.106	0.430
		Rear	0.478	0.408	0.886
	WCDMA 850	Front	0.447	0.106	0.553
		Rear	0.586	0.408	0.994
	LTE Band 12	Front	0.219	0.106	0.325
		Rear	0.310	0.408	0.718

Table 12.5.16 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	GSM 850	Front	0.374	0.151	0.525
		Rear	0.439	0.388	0.827
	GPRS 850	Front	0.383	0.151	0.534
		Rear	0.465	0.388	0.853
	GSM 1900	Front	0.293	0.151	0.444
		Rear	0.407	0.388	0.795
	GPRS 1900	Front	0.324	0.151	0.475
		Rear	0.478	0.388	0.866
	WCDMA 850	Front	0.447	0.151	0.598
		Rear	0.586	0.388	0.974
	LTE Band 12	Front	0.219	0.151	0.370
		Rear	0.310	0.388	0.698

Table 12.5.17 Simultaneous Transmission Scenario : Bluetooth Ant.1 + 5 GHz W-LAN Ant.1 (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	Bluetooth Ant.1 SAR (W/kg)	5G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	5.3G W-LAN Ant.1	Front	0.151	0.052	0.203
		Rear	0.388	0.282	0.670
	5.6G W-LAN Ant.1	Front	0.151	0.142	0.293
		Rear	0.388	0.560	0.948

Table 12.5.18 Simultaneous Transmission Scenario : Bluetooth Ant.1 + 5 GHz W-LAN Ant.2 (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	Bluetooth Ant.1 SAR (W/kg)	5G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	5.3G W-LAN Ant.2	Front	0.151	0.145	0.296
		Rear	0.388	0.329	0.717
	5.6G W-LAN Ant.2	Front	0.151	0.109	0.260
		Rear	0.388	0.134	0.522

Table 12.5.19 Simultaneous Transmission Scenario : Bluetooth Ant.1 + 5 GHz W-LAN MIMO (Body-Worn at 10 mm)

Exposure Condition	Mode	Configuration	Bluetooth Ant.1 SAR (W/kg)	5G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	5.3G W-LAN MIMO	Front	0.151	0.152	0.303
		Rear	0.388	0.331	0.719
	5.6G W-LAN MIMO	Front	0.151	0.106	0.257
		Rear	0.388	0.408	0.796

12.6 Hotspot SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 941225 D06v02r01, the device edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR ("").

Table 12.6.1 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.3 GHz W-LAN Ant.1 (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.3G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	Top	-	0.126	0.057	0.126	0.057	0.183
		Bottom	0.269	-	-	0.269	0.269	0.269
		Front	0.383	0.151	0.052	0.534	0.435	0.586
		Rear	0.465	0.388	0.282	0.853	0.747	1.135
		Right	0.285	0.333	0.402	0.618	0.687	1.020
		Left	-	-	-	-	-	-
	GPRS 1900	Top	-	0.126	0.057	0.126	0.057	0.183
		Bottom	0.391	-	-	0.391	0.391	0.391
		Front	0.324	0.151	0.052	0.475	0.376	0.527
		Rear	0.478	0.388	0.282	0.866	0.760	1.148
		Right	0.325	0.333	0.402	0.658	0.727	1.060
		Left	-	-	-	-	-	-
	WCDMA 850	Top	-	0.126	0.057	0.126	0.057	0.183
		Bottom	0.305	-	-	0.305	0.305	0.305
		Front	0.447	0.151	0.052	0.598	0.499	0.650
		Rear	0.586	0.388	0.282	0.974	0.868	1.256
		Right	0.168	0.333	0.402	0.501	0.570	0.903
		Left	-	-	-	-	-	-
	LTE Band 12	Top	-	0.126	0.057	0.126	0.057	0.183
		Bottom	0.092	-	-	0.092	0.092	0.092
		Front	0.219	0.151	0.052	0.370	0.271	0.422
		Rear	0.310	0.388	0.282	0.698	0.592	0.980
		Right	0.265	0.333	0.402	0.598	0.667	1.000
		Left	-	-	-	-	-	-

Table 12.6.2 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.3 GHz W-LAN Ant.2 (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.3G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	Top	-	0.126	0.071	0.126	0.071	0.197
		Bottom	0.269	-	-	0.269	0.269	0.269
		Front	0.383	0.151	0.145	0.534	0.528	0.679
		Rear	0.465	0.388	0.329	0.853	0.794	1.182
		Right	0.285	0.333	-	0.618	0.285	0.618
		Left	-	-	0.280	-	0.280	0.280
	GPRS 1900	Top	-	0.126	0.071	0.126	0.071	0.197
		Bottom	0.391	-	-	0.391	0.391	0.391
		Front	0.324	0.151	0.145	0.475	0.469	0.620
		Rear	0.478	0.388	0.329	0.866	0.807	1.195
		Right	0.325	0.333	-	0.658	0.325	0.658
		Left	-	-	0.280	-	0.280	0.280
	WCDMA 850	Top	-	0.126	0.071	0.126	0.071	0.197
		Bottom	0.305	-	-	0.305	0.305	0.305
		Front	0.447	0.151	0.145	0.598	0.592	0.743
		Rear	0.586	0.388	0.329	0.974	0.915	1.303
		Right	0.168	0.333	-	0.501	0.168	0.501
		Left	-	-	0.280	-	0.280	0.280
	LTE Band 12	Top	-	0.126	0.071	0.126	0.071	0.197
		Bottom	0.092	-	-	0.092	0.092	0.092
		Front	0.219	0.151	0.145	0.370	0.364	0.515
		Rear	0.310	0.388	0.329	0.698	0.639	1.027
		Right	0.265	0.333	-	0.598	0.265	0.598
		Left	-	-	0.280	-	0.280	0.280

Table 12.6.3 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.3 GHz W-LAN MIMO (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.3G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	Top	-	0.126	0.098	0.126	0.098	0.224
		Bottom	0.269	-	-	0.269	0.269	0.269
		Front	0.383	0.151	0.152	0.534	0.535	0.686
		Rear	0.465	0.388	0.331	0.853	0.796	1.184
		Right	0.285	0.333	0.410	0.618	0.695	1.028
		Left	-	-	0.421	-	0.421	0.421
	GPRS 1900	Top	-	0.126	0.098	0.126	0.098	0.224
		Bottom	0.391	-	-	0.391	0.391	0.391
		Front	0.324	0.151	0.152	0.475	0.476	0.627
		Rear	0.478	0.388	0.331	0.866	0.809	1.197
		Right	0.325	0.333	0.410	0.658	0.735	1.068
		Left	-	-	0.421	-	0.421	0.421
	WCDMA 850	Top	-	0.126	0.098	0.126	0.098	0.224
		Bottom	0.305	-	-	0.305	0.305	0.305
		Front	0.447	0.151	0.152	0.598	0.599	0.750
		Rear	0.586	0.388	0.331	0.974	0.917	1.305
		Right	0.168	0.333	0.410	0.501	0.578	0.911
		Left	-	-	0.421	-	0.421	0.421
	LTE Band 12	Top	-	0.126	0.098	0.126	0.098	0.224
		Bottom	0.092	-	-	0.092	0.092	0.092
		Front	0.219	0.151	0.152	0.370	0.371	0.522
		Rear	0.310	0.388	0.331	0.698	0.641	1.029
		Right	0.265	0.333	0.410	0.598	0.675	1.008
		Left	-	-	0.421	-	0.421	0.421

Table 12.6.4 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.6 GHz W-LAN Ant.1 (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.6G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	Top	-	0.126	0.024	0.126	0.024	0.150
		Bottom	0.269	-	-	0.269	0.269	0.269
		Front	0.383	0.151	0.142	0.534	0.525	0.676
		Rear	0.465	0.388	0.560	0.853	1.025	1.413
		Right	0.285	0.333	0.666	0.618	0.951	1.284
		Left	-	-	-	-	-	-
	GPRS 1900	Top	-	0.126	0.024	0.126	0.024	0.150
		Bottom	0.391	-	-	0.391	0.391	0.391
		Front	0.324	0.151	0.142	0.475	0.466	0.617
		Rear	0.478	0.388	0.560	0.866	1.038	1.426
		Right	0.325	0.333	0.666	0.658	0.991	1.324
		Left	-	-	-	-	-	-
	WCDMA 850	Top	-	0.126	0.024	0.126	0.024	0.150
		Bottom	0.305	-	-	0.305	0.305	0.305
		Front	0.447	0.151	0.142	0.598	0.589	0.740
		Rear	0.586	0.388	0.560	0.974	1.146	1.544
		Right	0.168	0.333	0.666	0.501	0.834	1.167
		Left	-	-	-	-	-	-
	LTE Band 12	Top	-	0.126	0.024	0.126	0.024	0.150
		Bottom	0.092	-	-	0.092	0.092	0.092
		Front	0.219	0.151	0.142	0.370	0.361	0.512
		Rear	0.310	0.388	0.560	0.698	0.870	1.258
		Right	0.265	0.333	0.666	0.598	0.931	1.264
		Left	-	-	-	-	-	-

Table 12.6.5 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.6 GHz W-LAN Ant.2 (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	Top	-	0.126	0.025	0.126	0.025	0.151
		Bottom	0.269	-	-	0.269	0.269	0.269
		Front	0.383	0.151	0.109	0.534	0.492	0.643
		Rear	0.465	0.388	0.134	0.853	0.599	0.987
		Right	0.285	0.333	-	0.618	0.285	0.618
		Left	-	-	0.373	-	0.373	0.373
	GPRS 1900	Top	-	0.126	0.025	0.126	0.025	0.151
		Bottom	0.391	-	-	0.391	0.391	0.391
		Front	0.324	0.151	0.109	0.475	0.433	0.584
		Rear	0.478	0.388	0.134	0.866	0.612	1.000
		Right	0.325	0.333	-	0.658	0.325	0.658
		Left	-	-	0.373	-	0.373	0.373
	WCDMA 850	Top	-	0.126	0.025	0.126	0.025	0.151
		Bottom	0.305	-	-	0.305	0.305	0.305
		Front	0.447	0.151	0.109	0.598	0.556	0.707
		Rear	0.586	0.388	0.134	0.974	0.720	1.108
		Right	0.168	0.333	-	0.501	0.168	0.501
		Left	-	-	0.373	-	0.373	0.373
	LTE Band 12	Top	-	0.126	0.025	0.126	0.025	0.151
		Bottom	0.092	-	-	0.092	0.092	0.092
		Front	0.219	0.151	0.109	0.370	0.328	0.479
		Rear	0.310	0.388	0.134	0.698	0.444	0.832
		Right	0.265	0.333	-	0.598	0.265	0.598
		Left	-	-	0.373	-	0.373	0.373

Table 12.6.6 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth Ant.1 + 5.6 GHz W-LAN MIMO (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth Ant.1 SAR (W/kg)	5.6G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)		
			1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	Top	-	0.126	0.024	0.126	0.024	0.150
		Bottom	0.269	-	-	0.269	0.269	0.269
		Front	0.383	0.151	0.106	0.534	0.489	0.640
		Rear	0.465	0.388	0.408	0.853	0.873	1.261
		Right	0.285	0.333	0.732	0.618	1.017	1.350
		Left	-	-	0.372	-	0.372	0.372
	GPRS 1900	Top	-	0.126	0.024	0.126	0.024	0.150
		Bottom	0.391	-	-	0.391	0.391	0.391
		Front	0.324	0.151	0.106	0.475	0.430	0.581
		Rear	0.478	0.388	0.408	0.866	0.886	1.274
		Right	0.325	0.333	0.732	0.658	1.057	1.390
		Left	-	-	0.372	-	0.372	0.372
	WCDMA 850	Top	-	0.126	0.024	0.126	0.024	0.150
		Bottom	0.305	-	-	0.305	0.305	0.305
		Front	0.447	0.151	0.108	0.598	0.553	0.704
		Rear	0.586	0.388	0.408	0.974	0.994	1.382
		Right	0.168	0.333	0.732	0.501	0.900	1.233
		Left	-	-	0.372	-	0.372	0.372
	LTE Band 12	Top	-	0.126	0.024	0.126	0.024	0.150
		Bottom	0.092	-	-	0.092	0.092	0.092
		Front	0.219	0.151	0.106	0.370	0.325	0.476
		Rear	0.310	0.388	0.408	0.698	0.718	1.106
		Right	0.265	0.333	0.732	0.598	0.997	1.330
		Left	-	-	0.372	-	0.372	0.372

Table 12.6.7 Simultaneous Transmission Scenario : 2G/3G/4G + 2.4 GHz W-LAN Ant.1 (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	GPRS 850	Top	-	0.023	0.023
		Bottom	0.269	-	0.269
		Front	0.383	0.025	0.408
		Rear	0.465	0.082	0.547
		Right	0.285	0.076	0.361
		Left	-	-	-
	GPRS 1900	Top	-	0.023	0.023
		Bottom	0.391	-	0.391
		Front	0.324	0.025	0.349
		Rear	0.478	0.082	0.560
		Right	0.325	0.076	0.401
		Left	-	-	-
	WCDMA 850	Top	-	0.023	0.023
		Bottom	0.305	-	0.305
		Front	0.447	0.025	0.472
		Rear	0.586	0.082	0.668
		Right	0.168	0.076	0.244
		Left	-	-	-
	LTE Band 12	Top	-	0.023	0.023
		Bottom	0.092	-	0.092
		Front	0.219	0.025	0.244
		Rear	0.310	0.082	0.392
		Right	0.265	0.076	0.341
		Left	-	-	-

Table 12.6.8 Simultaneous Transmission Scenario : 2G/3G/4G + 2.4 GHz W-LAN Ant.2 (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	GPRS 850	Top	-	0.019	0.019
		Bottom	0.269	-	0.269
		Front	0.383	0.033	0.416
		Rear	0.465	0.092	0.557
		Right	0.285	-	0.285
		Left	-	0.071	0.071
	GPRS 1900	Top	-	0.019	0.019
		Bottom	0.391	-	0.391
		Front	0.324	0.033	0.357
		Rear	0.478	0.092	0.570
		Right	0.325	-	0.325
		Left	-	0.071	0.071
	WCDMA 850	Top	-	0.019	0.019
		Bottom	0.305	-	0.305
		Front	0.447	0.033	0.480
		Rear	0.586	0.092	0.678
		Right	0.168	-	0.168
		Left	-	0.071	0.071
	LTE Band 12	Top	-	0.019	0.019
		Bottom	0.092	-	0.092
		Front	0.219	0.033	0.252
		Rear	0.310	0.092	0.402
		Right	0.265	-	0.265
		Left	-	0.071	0.071

Table 12.6.9 Simultaneous Transmission Scenario : 2G/3G/4G + 2.4 GHz W-LAN MIMO (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	2.4G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	GPRS 850	Top	-	0.029	0.029
		Bottom	0.269	-	0.269
		Front	0.383	0.029	0.412
		Rear	0.465	0.111	0.576
		Right	0.285	0.102	0.387
		Left	-	0.073	0.073
	GPRS 1900	Top	-	0.029	0.029
		Bottom	0.391	-	0.391
		Front	0.324	0.029	0.353
		Rear	0.478	0.111	0.589
		Right	0.325	0.102	0.427
		Left	-	0.073	0.073
	WCDMA 850	Top	-	0.029	0.029
		Bottom	0.305	-	0.305
		Front	0.447	0.029	0.476
		Rear	0.586	0.111	0.697
		Right	0.168	0.102	0.270
		Left	-	0.073	0.073
	LTE Band 12	Top	-	0.029	0.029
		Bottom	0.092	-	0.092
		Front	0.219	0.029	0.248
		Rear	0.310	0.111	0.421
		Right	0.265	0.102	0.367
		Left	-	0.073	0.073

Table 12.6.10 Simultaneous Transmission Scenario : 2G/3G/4G + 5.3 GHz W-LAN Ant.1 (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.3G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	GPRS 850	Top	-	0.057	0.057
		Bottom	0.269	-	0.269
		Front	0.383	0.052	0.435
		Rear	0.465	0.282	0.747
		Right	0.285	0.402	0.687
		Left	-	-	-
	GPRS 1900	Top	-	0.057	0.057
		Bottom	0.391	-	0.391
		Front	0.324	0.052	0.376
		Rear	0.478	0.282	0.760
		Right	0.325	0.402	0.727
		Left	-	-	-
	WCDMA 850	Top	-	0.057	0.057
		Bottom	0.305	-	0.305
		Front	0.447	0.052	0.499
		Rear	0.586	0.282	0.868
		Right	0.168	0.402	0.570
		Left	-	-	-
	LTE Band 12	Top	-	0.057	0.057
		Bottom	0.092	-	0.092
		Front	0.219	0.052	0.271
		Rear	0.310	0.282	0.592
		Right	0.265	0.402	0.667
		Left	-	-	-

Table 12.6.11 Simultaneous Transmission Scenario : 2G/3G/4G + 5.3 GHz W-LAN Ant.2 (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.3G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	GPRS 850	Top	-	0.071	0.071
		Bottom	0.269	-	0.269
		Front	0.383	0.145	0.528
		Rear	0.465	0.329	0.794
		Right	0.285	-	0.285
		Left	-	0.280	0.280
	GPRS 1900	Top	-	0.071	0.071
		Bottom	0.391	-	0.391
		Front	0.324	0.145	0.469
		Rear	0.478	0.329	0.807
		Right	0.325	-	0.325
		Left	-	0.280	0.280
	WCDMA 850	Top	-	0.071	0.071
		Bottom	0.305	-	0.305
		Front	0.447	0.145	0.592
		Rear	0.586	0.329	0.915
		Right	0.168	-	0.168
		Left	-	0.280	0.280
	LTE Band 12	Top	-	0.071	0.071
		Bottom	0.092	-	0.092
		Front	0.219	0.145	0.364
		Rear	0.310	0.329	0.639
		Right	0.265	-	0.265
		Left	-	0.280	0.280

Table 12.6.12 Simultaneous Transmission Scenario : 2G/3G/4G + 5.3 GHz W-LAN MIMO (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.3G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	GPRS 850	Top	-	0.098	0.098
		Bottom	0.269	-	0.269
		Front	0.383	0.152	0.535
		Rear	0.465	0.331	0.796
		Right	0.285	0.410	0.695
		Left	-	0.421	0.421
	GPRS 1900	Top	-	0.098	0.098
		Bottom	0.391	-	0.391
		Front	0.324	0.152	0.476
		Rear	0.478	0.331	0.809
		Right	0.325	0.410	0.735
		Left	-	0.421	0.421
	WCDMA 850	Top	-	0.098	0.098
		Bottom	0.305	-	0.305
		Front	0.447	0.152	0.599
		Rear	0.586	0.331	0.917
		Right	0.168	0.410	0.578
		Left	-	0.421	0.421
	LTE Band 12	Top	-	0.098	0.098
		Bottom	0.092	-	0.092
		Front	0.219	0.152	0.371
		Rear	0.310	0.331	0.641
		Right	0.265	0.410	0.675
		Left	-	0.421	0.421

Table 12.6.13 Simultaneous Transmission Scenario : 2G/3G/4G + 5.6 GHz W-LAN Ant.1 (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.6G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	GPRS 850	Top	-	0.024	0.024
		Bottom	0.269	-	0.269
		Front	0.383	0.142	0.525
		Rear	0.465	0.560	1.025
		Right	0.285	0.666	0.951
		Left	-	-	-
	GPRS 1900	Top	-	0.024	0.024
		Bottom	0.391	-	0.391
		Front	0.324	0.142	0.466
		Rear	0.478	0.560	1.038
		Right	0.325	0.666	0.991
		Left	-	-	-
	WCDMA 850	Top	-	0.024	0.024
		Bottom	0.305	-	0.305
		Front	0.447	0.142	0.589
		Rear	0.586	0.560	1.146
		Right	0.168	0.666	0.834
		Left	-	-	-
	LTE Band 12	Top	-	0.024	0.024
		Bottom	0.092	-	0.092
		Front	0.219	0.142	0.361
		Rear	0.310	0.560	0.870
		Right	0.265	0.666	0.931
		Left	-	-	-

Table 12.6.14 Simultaneous Transmission Scenario : 2G/3G/4G + 5.6 GHz W-LAN Ant.2 (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	GPRS 850	Top	-	0.025	0.025
		Bottom	0.269	-	0.269
		Front	0.383	0.109	0.492
		Rear	0.465	0.134	0.599
		Right	0.285	-	0.285
		Left	-	0.373	0.373
	GPRS 1900	Top	-	0.025	0.025
		Bottom	0.391	-	0.391
		Front	0.324	0.109	0.433
		Rear	0.478	0.134	0.612
		Right	0.325	-	0.325
		Left	-	0.373	0.373
	WCDMA 850	Top	-	0.025	0.025
		Bottom	0.305	-	0.305
		Front	0.447	0.109	0.556
		Rear	0.586	0.134	0.720
		Right	0.168	-	0.168
		Left	-	0.373	0.373
	LTE Band 12	Top	-	0.025	0.025
		Bottom	0.092	-	0.092
		Front	0.219	0.109	0.328
		Rear	0.310	0.134	0.444
		Right	0.265	-	0.265
		Left	-	0.373	0.373

Table 12.6.15 Simultaneous Transmission Scenario : 2G/3G/4G + 5.6 GHz W-LAN MIMO (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	5.6G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	GPRS 850	Top	-	0.024	0.024
		Bottom	0.269	-	0.269
		Front	0.383	0.106	0.489
		Rear	0.465	0.408	0.873
		Right	0.285	0.732	1.017
		Left	-	0.372	0.372
	GPRS 1900	Top	-	0.024	0.024
		Bottom	0.391	-	0.391
		Front	0.324	0.106	0.430
		Rear	0.478	0.408	0.886
		Right	0.325	0.732	1.057
		Left	-	0.372	0.372
	WCDMA 850	Top	-	0.024	0.024
		Bottom	0.305	-	0.305
		Front	0.447	0.106	0.553
		Rear	0.586	0.408	0.994
		Right	0.168	0.732	0.900
		Left	-	0.372	0.372
	LTE Band 12	Top	-	0.024	0.024
		Bottom	0.092	-	0.092
		Front	0.219	0.106	0.325
		Rear	0.310	0.408	0.718
		Right	0.265	0.732	0.997
		Left	-	0.372	0.372

Table 12.6.16 Simultaneous Transmission Scenario : 2G/3G/4G + Bluetooth (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	GPRS 850	Top	-	0.126	0.126
		Bottom	0.269	-	0.269
		Front	0.383	0.151	0.534
		Rear	0.465	0.388	0.853
		Right	0.285	0.333	0.618
		Left	-	-	-
	GPRS 1900	Top	-	0.126	0.126
		Bottom	0.391	-	0.391
		Front	0.324	0.151	0.475
		Rear	0.478	0.388	0.866
		Right	0.325	0.333	0.658
		Left	-	-	-
	WCDMA 850	Top	-	0.126	0.126
		Bottom	0.305	-	0.305
		Front	0.447	0.151	0.598
		Rear	0.586	0.388	0.974
		Right	0.168	0.333	0.501
		Left	-	-	-
	LTE Band 12	Top	-	0.126	0.126
		Bottom	0.092	-	0.092
		Front	0.219	0.151	0.370
		Rear	0.310	0.388	0.698
		Right	0.265	0.333	0.598
		Left	-	-	-

Table 12.6.17 Simultaneous Transmission Scenario : Bluetooth Ant.1 + 5 GHz W-LAN Ant.1 (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	Bluetooth Ant.1 SAR (W/kg)	5G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	5.3G W-LAN Ant.1	Top	0.126	0.057	0.183
		Bottom	-	-	-
		Front	0.151	0.052	0.203
		Rear	0.388	0.282	0.670
		Right	0.333	0.402	0.735
		Left	-	-	-
	5.6G W-LAN Ant.1	Top	0.126	0.024	0.150
		Bottom	-	-	-
		Front	0.151	0.142	0.293
		Rear	0.388	0.560	0.948
		Right	0.333	0.666	0.999
		Left	-	-	-

Table 12.6.18 Simultaneous Transmission Scenario : Bluetooth Ant.1 + 5 GHz W-LAN Ant.2 (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	Bluetooth Ant.1 SAR (W/kg)	5G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	5.3G W-LAN Ant.2	Top	0.126	0.071	0.197
		Bottom	-	-	-
		Front	0.151	0.145	0.296
		Rear	0.388	0.329	0.717
		Right	0.333	-	0.333
		Left	-	0.280	0.280
	5.6G W-LAN Ant.2	Top	0.126	0.025	0.151
		Bottom	-	-	-
		Front	0.151	0.109	0.260
		Rear	0.388	0.134	0.522
		Right	0.333	-	0.333
		Left	-	0.373	0.373

Table 12.6.19 Simultaneous Transmission Scenario : Bluetooth Ant.1 + 5 GHz W-LAN MIMO (Hotspot at 10 mm)

Exposure Condition	Mode	Configuration	Bluetooth Ant.1 SAR (W/kg)	5G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	5.3G W-LAN MIMO	Top	0.126	0.098	0.224
		Bottom	-	-	-
		Front	0.151	0.152	0.303
		Rear	0.388	0.331	0.719
		Right	0.333	0.410	0.743
		Left	-	0.421	0.421
	5.6G W-LAN MIMO	Top	0.126	0.024	0.150
		Bottom	-	-	-
		Front	0.151	0.106	0.257
		Rear	0.388	0.408	0.796
		Right	0.333	0.732	1.065
		Left	-	0.372	0.372

12.7 Phablet SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 648474 D04 Handset SAR, Phablet SAR tests were not required of Hotspot 1g SAR (scaled to maximum output power, including tolerance) < 1.2 W/kg. Therefore no further analysis was required to for Phablet Simultaneous Transmission Analysis.

12.8 Simultaneous Transmission Conclusion

The above numerical summed SAR results for all the worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v06 and IEEE 1528-2013 Section 6.3.4.1.2.

13. SAR MEASUREMENT VARIABILITY

13.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

1. When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2. A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~10% from the 1-g SAR limit).
3. A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .
4. Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg
5. The same procedures should be adapted for measurements according to extremity exposure limits by applying a factor of 2.5 for extremity exposure to the corresponding SAR thresholds.

13.2 Measurement Uncertainty

The measured SAR was < 1.5 W/kg for 1g and < 3.75 W/kg for 10g for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.

14. EQUIPMENT LIST

Table 14.1.1 Test Equipment Calibration

Type	Manufacturer	Model	Cal.Date	Next.Cal.Date	S/N
☒ SEMITEC Engineering	SEMITEC	N/A	N/A	N/A	Shield Room
☒ SEMITEC Engineering	SEMITEC	N/A	N/A	N/A	Shield Room
☒ Robot	SPEAG	TX90XL	N/A	N/A	F13/5P9GA1/A/01
☒ Robot	SPEAG	TX90XL	N/A	N/A	F13/5RR2A1/A/01
☒ Robot Controller	SPEAG	CS8C	N/A	N/A	F13/5P9GA1/C/01
☒ Robot Controller	SPEAG	CS8C	N/A	N/A	F13/5RR2A1/C/01
☒ Joystick	SPEAG	N/A	N/A	N/A	S-12450905
☒ Joystick	SPEAG	N/A	N/A	N/A	S-13200990
☒ Intel Core i7-3 770 3.40 GHz Windows 7 Professional	N/A	N/A	N/A	N/A	N/A
☒ Intel Core i7-3 770 3.40 GHz Windows 7 Professional	N/A	N/A	N/A	N/A	N/A
☒ Probe Alignment Unit LB	N/A	N/A	N/A	N/A	SE UKS 030 AA
☒ Probe Alignment Unit LB	N/A	N/A	N/A	N/A	SE UKS 030 AA
☒ Device Holder	SPEAG	SD000H01HA	N/A	N/A	N/A
☒ Device Holder	SPEAG	SD000H01HA	N/A	N/A	N/A
☒ Twin SAM Phantom	SPEAG	QD000P40CD	N/A	N/A	1782
☒ Twin SAM Phantom	SPEAG	QD000P40CD	N/A	N/A	1783
☒ Twin SAM Phantom	SPEAG	QD000P40CD	N/A	N/A	1785
☒ Twin SAM Phantom	SPEAG	QD000P40CD	N/A	N/A	1786
☒ Data Acquisition Electronics	SPEAG	DAE4V1	2020-05-25	2021-05-25	1392
☒ Data Acquisition Electronics	SPEAG	DAE4V1	2020-04-22	2021-04-22	1485
☒ Data Acquisition Electronics	SPEAG	DAE4V1	2020-07-30	2021-07-30	1335
☒ Dosimetric E-Field Probe	SPEAG	EX3DV4	2020-09-23	2021-09-23	3933
☒ Dosimetric E-Field Probe	SPEAG	EX3DV4	2020-05-27	2021-05-27	3866
☒ 750MHz SAR Dipole	SPEAG	D750V3	2020-01-22	2022-01-22	1049
☒ 835MHz SAR Dipole	SPEAG	D835V2	2020-05-19	2022-05-19	4d159
☒ 1 900MHz SAR Dipole	SPEAG	D1900V2	2020-05-19	2022-05-19	5d176
☒ 2 450MHz SAR Dipole	SPEAG	D2450V2	2020-08-18	2022-08-18	920
☒ 5GHz SAR Dipole	SPEAG	D5GHZV2	2020-02-27	2022-02-27	1212
☒ Network Analyzer	Agilent	E5071C	2020-06-24	2021-06-24	MY46106970
☒ Signal Generator	Agilent	E4438C	2020-06-24	2021-06-24	US41461520
☒ Amplifier	RFBAY,Inc	MPA-40-40	2020-12-16	2021-12-16	21151801
☒ Amplifier	EMPOWER	BBS3Q7ELU	2020-06-24	2021-06-24	1020
☒ High Power RF Amplifier	EMPOWER	BBS3Q8CCJ	2020-06-24	2021-06-24	1005
☒ Power Meter	HP	EPM-442A	2020-12-16	2021-12-16	GB37170267
☒ Power Meter	HP	EPM-442A	2020-12-16	2021-12-16	GB37170413
☒ Power Sensor	HP	8481A	2020-12-16	2021-12-16	US37294267
☒ Power Sensor	HP	8481A	2020-12-16	2021-12-16	2702A61707
☒ Power Sensor	HP	8481A	2020-12-16	2021-12-16	2702A65976
☒ Dual Directional Coupler	Agilent	778D-012	2020-12-16	2021-12-16	50228
☒ Directional Coupler	HP	772D	2020-06-24	2021-06-24	2889A01064
☒ Low Pass Filter 1GHz	Wainwright Instruments	WLK6-1000-1400-9000-60SS	2020-06-24	2021-06-24	165
☒ Low Pass Filter 1.5GHz	Micro LAB	LA-15N	2020-06-24	2021-06-24	2
☒ Low Pass Filter 3.0GHz	Micro LAB	LA-30N	2020-06-24	2021-06-24	2
☒ Low Pass Filter 6.0GHz	Micro LAB	LA-60N	2020-12-16	2021-12-16	03942
☒ Attenuators(10 dB)	WEINSCHTEL	23-10-34	2020-12-16	2021-12-16	BP4387
☒ Attenuators	Cemexwave	CFADC2603U5	2020-06-24	2021-06-24	C11711
☒ Dielectric Probe kit	SPEAG	DAK 3.5	2020-11-25	2021-11-25	1092
☒ 8960 Series 10 Wireless Comms. Test Set	Agilent	E5515C	2020-06-24	2021-06-24	GB41321164
☒ Wideband Radio Communication Tester	Rohde Schwarz	CMW500	2020-12-16	2021-12-16	101414
☒ Power Splitter	Anritsu	K241B	2020-12-16	2021-12-16	1301183
☒ Bluetooth Tester	TESCOM	TC-3000C	2020-06-24	2021-06-24	3000C000563

NOTE(S):

- The E-field probe was calibrated by SPEAG, by temperature measurement procedure. Dipole Verification measurement is performed by DT&C before each test. The brain and muscle simulating material are calibrated by DT&C using the dielectric probe system and network analyzer to determine the conductivity and permittivity (dielectric constant) of the brain and muscle-equivalent material. Each equipment item was used solely within its respective calibration period.
- CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.

15. MEASUREMENT UNCERTAINTIES

750 MHz Head (SN: 3933)

Error Description	Uncertainty value ±%		Probability Distribution	Divisor	(Ci) 1 g	(Ci) 10 g	Standard 1 g (± %)	Standard 10 g (± %)	vi 2 or Veff
Measurement System									
Probe calibration	6.0		Normal	1	1	1	6.0	6.0	∞
Isotropy	1.3		Normal	1	1	1	1.3	1.3	∞
Boundary Effects	2.0		Rectangular	√3	1	1	1.2	1.2	∞
Probe Linearity	0.3		Normal	1	1	1	0.3	0.3	∞
Probe modulation response	0.0		Rectangular	√3	1	1	0.0	0.0	∞
Detection limits	0.25		Rectangular	√3	1	1	0.14	0.14	∞
Readout Electronics	0.3		Normal	1	1	1	0.3	0.3	∞
Response time	0.8		Rectangular	√3	1	1	0.46	0.46	∞
Integration time	2.6		Rectangular	√3	1	1	1.5	1.5	∞
RF Ambient Conditions – Noise	3.0		Rectangular	√3	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0		Rectangular	√3	1	1	1.7	1.7	∞
Probe Positioner	0.8		Rectangular	√3	1	1	0.46	0.46	∞
Probe Positioning	6.7		Rectangular	√3	1	1	3.9	3.9	∞
Algorithms for Max. SAR Eval.	4.0		Rectangular	√3	1	1	2.3	2.3	∞
Test Sample Related									
Device Positioning	2.9		Normal	1	1	1	2.9	2.9	145
Device Holder	3.6		Normal	1	1	1	3.6	3.6	5
Power Drift	5.0		Rectangular	√3	1	1	2.9	2.9	∞
SAR Scaling	0.0		Rectangular	√3	1	1	0.0	0.0	∞
Physical Parameters									
Phantom Shell	7.6		Rectangular	√3	1	1	4.4	4.4	∞
SAR correction	0.0		Normal	1	1	0.84	0.0	0.0	∞
Liquid conductivity (Target)	5.0		Rectangular	√3	0.64	0.43	1.8	1.2	∞
Liquid conductivity (Meas.)	4.0		Normal	1	0.78	0.71	3.1	2.8	10
Liquid permittivity (Target)	5.0		Rectangular	√3	0.60	0.49	1.7	1.4	∞
Liquid permittivity (Meas.)	3.9		Normal	1	0.23	0.26	0.9	1.0	10
Temp. unc. - Conductivity	1.9		Rectangular	√3	0.78	0.71	0.86	0.78	∞
Temp. unc. - Permittivity	1.9		Rectangular	√3	0.23	0.26	0.25	0.29	∞
Combined Standard Uncertainty							13	13	330
Expanded Uncertainty (k=2)							26	26	

$$U(1\text{ g}) = k \cdot u_c$$

$$= 2 \cdot 13\%$$

$$= 26\% \text{ (The confidence level is about } 95\% \text{ } k=2)$$

$$U(10\text{ g}) = k \cdot u_c$$

$$= 2 \cdot 13\%$$

$$= 26\% \text{ (The confidence level is about } 95\% \text{ } k=2)$$

The above measurement uncertainties are according to IEEE Std 1528

835 MHz Head (SN: 3933)

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1 g	(Ci) 10 g	Standard 1 g (± %)	Standard 10 g (± %)	vi 2 or Veff
Measurement System								
Probe calibration	6.0	Normal	1	1	1	6.0	6.0	∞
Isotropy	1.3	Normal	1	1	1	1.3	1.3	∞
Boundary Effects	2.0	Rectangular	√3	1	1	1.2	1.2	∞
Probe Linearity	0.3	Normal	1	1	1	0.3	0.3	∞
Probe modulation response	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Detection limits	0.25	Rectangular	√3	1	1	0.14	0.14	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	∞
Response time	0.8	Rectangular	√3	1	1	0.46	0.46	∞
Integration time	2.6	Rectangular	√3	1	1	1.5	1.5	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.7	1.7	∞
Probe Positioner	0.8	Rectangular	√3	1	1	0.46	0.46	∞
Probe Positioning	6.7	Rectangular	√3	1	1	3.9	3.9	∞
Algorithms for Max. SAR Eval.	4.0	Rectangular	√3	1	1	2.3	2.3	∞
Test Sample Related								
Device Positioning	2.9	Normal	1	1	1	2.9	2.9	145
Device Holder	3.6	Normal	1	1	1	3.6	3.6	5
Power Drift	5.0	Rectangular	√3	1	1	2.9	2.9	∞
SAR Scaling	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Physical Parameters								
Phantom Shell	7.6	Rectangular	√3	1	1	4.4	4.4	∞
SAR correction	0.0	Normal	1	1	0.84	0.0	0.0	∞
Liquid conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	1.8	1.2	∞
Liquid conductivity (Meas.)	4.2	Normal	1	0.78	0.71	3.3	3.0	10
Liquid permittivity (Target)	5.0	Rectangular	√3	0.60	0.49	1.7	1.4	∞
Liquid permittivity (Meas.)	4.0	Normal	1	0.23	0.26	0.92	1.0	10
Temp. unc. - Conductivity	1.9	Rectangular	√3	0.78	0.71	0.86	0.78	∞
Temp. unc. - Permittivity	2.0	Rectangular	√3	0.23	0.26	0.27	0.30	∞
Combined Standard Uncertainty						13	13	330
Expanded Uncertainty (k=2)						26	26	

$$U(1\text{ g}) = k \cdot u_c$$

$$= 2 \cdot 13\%$$

$$= 26\% \text{ (The confidence level is about 95 \% } k = 2 \text{)}$$

$$U(10\text{ g}) = k \cdot u_c$$

$$= 2 \cdot 13\%$$

$$= 26\% \text{ (The confidence level is about 95 \% } k = 2 \text{)}$$

The above measurement uncertainties are according to IEEE Std 1528

1 900 MHz Head (SN: 3933)

Error Description	Uncertainty value $\pm\%$	Probability Distribution	Divisor	(Ci) 1 g	(Ci) 10 g	Standard 1 g ($\pm\%$)	Standard 10 g ($\pm\%$)	vi 2 or Veff
Measurement System								
Probe calibration	6.0	Normal	1	1	1	6.0	6.0	∞
Axial isotropy	4.7	Rectangular	$\sqrt{3}$	1	1	2.7	2.7	∞
Hemispherical isotropy	9.6	Rectangular	$\sqrt{3}$	1	1	5.5	5.5	∞
Boundary Effects	0.8	Rectangular	$\sqrt{3}$	1	1	0.46	0.46	∞
Probe Linearity	4.7	Rectangular	$\sqrt{3}$	1	1	2.7	2.7	∞
Probe modulation response	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Detection limits	0.25	Rectangular	$\sqrt{3}$	1	1	0.14	0.14	∞
Readout Electronics	1.0	Normal	1	1	1	1.0	1.0	∞
Response time	0.8	Rectangular	$\sqrt{3}$	1	1	0.46	0.46	∞
Integration time	2.6	Rectangular	$\sqrt{3}$	1	1	1.5	1.5	∞
RF Ambient Conditions – Noise	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
Probe Positioner	0.4	Rectangular	$\sqrt{3}$	1	1	0.23	0.23	∞
Probe Positioning	2.9	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
Algorithms for Max. SAR Eval.	1.0	Rectangular	$\sqrt{3}$	1	1	0.58	0.58	∞
Test Sample Related								
Device Positioning	2.9	Normal	1	1	1	2.9	2.9	145
Device Holder	3.6	Normal	1	1	1	3.6	3.6	5
Power Drift	5.0	Rectangular	$\sqrt{3}$	1	1	2.9	2.9	∞
SAR Scaling	2.0	Rectangular	$\sqrt{3}$	1	1	1.2	1.2	∞
Physical Parameters								
Phantom Shell	7.6	Rectangular	$\sqrt{3}$	1	1	4.4	4.4	∞
Liquid conductivity (Target)	5.0	Rectangular	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
Liquid conductivity (Meas.)	4.0	Normal	1	0.78	0.71	3.1	2.8	10
Liquid permittivity (Target)	5.0	Rectangular	$\sqrt{3}$	0.60	0.49	1.7	1.4	∞
Liquid permittivity (Meas.)	4.1	Normal	1	0.23	0.26	0.94	1.1	10
Temp. unc. - Conductivity	1.9	Rectangular	$\sqrt{3}$	0.78	0.71	0.86	0.78	∞
Temp. unc. - Permittivity	1.8	Rectangular	$\sqrt{3}$	0.23	0.26	0.24	0.27	∞
Combined Standard Uncertainty						13	13	330
Expanded Uncertainty (k=2)						26	26	

$$U(1\text{ g}) = k \cdot u_c$$

$$= 2 \cdot 13\%$$

$$= 26\% \text{ (The confidence level is about } 95\% \text{ } k = 2)$$

$$U(10\text{ g}) = k \cdot u_c$$

$$= 2 \cdot 13\%$$

$$= 26\% \text{ (The confidence level is about } 95\% \text{ } k = 2)$$

2 450 MHz Head (SN: 3866)

Error Description	Uncertainty value $\pm\%$	Probability Distribution	Divisor	(Ci) 1 g	(Ci) 10 g	Standard 1 g ($\pm\%$)	Standard 10 g ($\pm\%$)	vi 2 or Veff
Measurement System								
Probe calibration	6.0	Normal	1	1	1	6.0	6.0	∞
Isotropy	1.3	Normal	1	1	1	1.3	1.3	∞
Boundary Effects	2.0	Rectangular	$\sqrt{3}$	1	1	1.2	1.2	∞
Probe Linearity	0.3	Normal	1	1	1	0.3	0.3	∞
Probe modulation response	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Detection limits	0.25	Rectangular	$\sqrt{3}$	1	1	0.14	0.14	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	∞
Response time	0.8	Rectangular	$\sqrt{3}$	1	1	0.46	0.46	∞
Integration time	2.6	Rectangular	$\sqrt{3}$	1	1	1.5	1.5	∞
RF Ambient Conditions – Noise	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
Probe Positioner	0.8	Rectangular	$\sqrt{3}$	1	1	0.46	0.46	∞
Probe Positioning	6.7	Rectangular	$\sqrt{3}$	1	1	3.9	3.9	∞
Algorithms for Max. SAR Eval.	4.0	Rectangular	$\sqrt{3}$	1	1	2.3	2.3	∞
Test Sample Related								
Device Positioning	2.9	Normal	1	1	1	2.9	2.9	145
Device Holder	3.6	Normal	1	1	1	3.6	3.6	5
Power Drift	5.0	Rectangular	$\sqrt{3}$	1	1	2.9	2.9	∞
SAR Scaling	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Physical Parameters								
Phantom Shell	7.6	Rectangular	$\sqrt{3}$	1	1	4.4	4.4	∞
SAR correction	0.0	Normal	1	1	0.84	0.0	0.0	∞
Liquid conductivity (Target)	5.0	Rectangular	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
Liquid conductivity (Meas.)	4.1	Normal	1	0.78	0.71	3.2	2.9	10
Liquid permittivity (Target)	5.0	Rectangular	$\sqrt{3}$	0.60	0.49	1.7	1.4	∞
Liquid permittivity (Meas.)	4.2	Normal	1	0.23	0.26	0.97	1.1	10
Temp. unc. - Conductivity	2.0	Rectangular	$\sqrt{3}$	0.78	0.71	0.90	0.82	∞
Temp. unc. - Permittivity	2.0	Rectangular	$\sqrt{3}$	0.23	0.26	0.27	0.30	∞
Combined Standard Uncertainty						13	13	330
Expanded Uncertainty (k=2)						26	26	

$$U(1\text{ g}) = k \cdot u_c$$

$$= 2 \cdot 13\%$$

= 26 % (The confidence level is about 95 % $k = 2$)

$$U(10\text{ g}) = k \cdot u_c$$

$$= 2 \cdot 13\%$$

= 26 % (The confidence level is about 95 % $k = 2$)

The above measurement uncertainties are according to IEEE Std 1528

5 300 MHz Head (SN: 3866)

Error Description	Uncertainty value $\pm\%$	Probability Distribution	Divisor	(Ci) 1 g	(Ci) 10 g	Standard 1 g ($\pm\%$)	Standard 10 g ($\pm\%$)	vi 2 or Veff
Measurement System								
Probe calibration	6.55	Normal	1	1	1	6.6	6.6	∞
Isotropy	1.3	Normal	1	1	1	1.3	1.3	∞
Boundary Effects	2.0	Rectangular	$\sqrt{3}$	1	1	1.2	1.2	∞
Probe Linearity	0.3	Normal	1	1	1	0.3	0.3	∞
Probe modulation response	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Detection limits	0.25	Rectangular	$\sqrt{3}$	1	1	0.14	0.14	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	∞
Response time	0.8	Rectangular	$\sqrt{3}$	1	1	0.46	0.46	∞
Integration time	2.6	Rectangular	$\sqrt{3}$	1	1	1.5	1.5	∞
RF Ambient Conditions – Noise	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
Probe Positioner	0.8	Rectangular	$\sqrt{3}$	1	1	0.46	0.46	∞
Probe Positioning	6.7	Rectangular	$\sqrt{3}$	1	1	3.9	3.9	∞
Algorithms for Max. SAR Eval.	4.0	Rectangular	$\sqrt{3}$	1	1	2.3	2.3	∞
Test Sample Related								
Device Positioning	2.9	Normal	1	1	1	2.9	2.9	145
Device Holder	3.6	Normal	1	1	1	3.6	3.6	5
Power Drift	5.0	Rectangular	$\sqrt{3}$	1	1	2.9	2.9	∞
SAR Scaling	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Physical Parameters								
Phantom Shell	7.6	Rectangular	$\sqrt{3}$	1	1	4.4	4.4	∞
SAR correction	0.0	Normal	1	1	0.84	0.0	0.0	∞
Liquid conductivity (Target)	5.0	Rectangular	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
Liquid conductivity (Meas.)	4.0	Normal	1	0.78	0.71	3.1	2.8	10
Liquid permittivity (Target)	5.0	Rectangular	$\sqrt{3}$	0.60	0.49	1.7	1.4	∞
Liquid permittivity (Meas.)	4.1	Normal	1	0.23	0.26	0.94	1.1	10
Temp. unc. - Conductivity	1.8	Rectangular	$\sqrt{3}$	0.78	0.71	0.81	0.74	∞
Temp. unc. - Permittivity	1.9	Rectangular	$\sqrt{3}$	0.23	0.26	0.25	0.29	∞
Combined Standard Uncertainty						13	13	330
Expanded Uncertainty (k=2)						26	26	

$$U(1\text{ g}) = k \cdot u_c$$

$$= 2 \cdot 13\%$$

= 26 % (The confidence level is about 95 % $k = 2$)

$$U(10\text{ g}) = k \cdot u_c$$

$$= 2 \cdot 13\%$$

= 26 % (The confidence level is about 95 % $k = 2$)

The above measurement uncertainties are according to IEEE Std 1528

5 600 MHz Head (SN: 3866)

Error Description	Uncertainty value $\pm\%$	Probability Distribution	Divisor	(Ci) 1 g	(Ci) 10 g	Standard 1 g ($\pm\%$)	Standard 10 g ($\pm\%$)	vi 2 or Veff
Measurement System								
Probe calibration	6.55	Normal	1	1	1	6.6	6.6	∞
Isotropy	1.3	Normal	1	1	1	1.3	1.3	∞
Boundary Effects	2.0	Rectangular	$\sqrt{3}$	1	1	1.2	1.2	∞
Probe Linearity	0.3	Normal	1	1	1	0.3	0.3	∞
Probe modulation response	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Detection limits	0.25	Rectangular	$\sqrt{3}$	1	1	0.14	0.14	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	∞
Response time	0.8	Rectangular	$\sqrt{3}$	1	1	0.46	0.46	∞
Integration time	2.6	Rectangular	$\sqrt{3}$	1	1	1.5	1.5	∞
RF Ambient Conditions – Noise	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
Probe Positioner	0.8	Rectangular	$\sqrt{3}$	1	1	0.46	0.46	∞
Probe Positioning	6.7	Rectangular	$\sqrt{3}$	1	1	3.9	3.9	∞
Algorithms for Max. SAR Eval.	4.0	Rectangular	$\sqrt{3}$	1	1	2.3	2.3	∞
Test Sample Related								
Device Positioning	2.9	Normal	1	1	1	2.9	2.9	145
Device Holder	3.6	Normal	1	1	1	3.6	3.6	5
Power Drift	5.0	Rectangular	$\sqrt{3}$	1	1	2.9	2.9	∞
SAR Scaling	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Physical Parameters								
Phantom Shell	7.6	Rectangular	$\sqrt{3}$	1	1	4.4	4.4	∞
SAR correction	0.0	Normal	1	1	0.84	0.0	0.0	∞
Liquid conductivity (Target)	5.0	Rectangular	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
Liquid conductivity (Meas.)	3.8	Normal	1	0.78	0.71	3.0	2.7	10
Liquid permittivity (Target)	5.0	Rectangular	$\sqrt{3}$	0.60	0.49	1.7	1.4	∞
Liquid permittivity (Meas.)	4.0	Normal	1	0.23	0.26	0.92	1.0	10
Temp. unc. - Conductivity	1.8	Rectangular	$\sqrt{3}$	0.78	0.71	0.81	0.74	∞
Temp. unc. - Permittivity	1.9	Rectangular	$\sqrt{3}$	0.23	0.26	0.25	0.29	∞
Combined Standard Uncertainty						13	13	330
Expanded Uncertainty (k=2)						26	26	

$$U(1\text{ g}) = k \cdot u_c$$

$$= 2 \cdot 13\%$$

$$= 26\% \text{ (The confidence level is about 95 \% } k = 2 \text{)}$$

$$U(10\text{ g}) = k \cdot u_c$$

$$= 2 \cdot 13\%$$

$$= 26\% \text{ (The confidence level is about 95 \% } k = 2 \text{)}$$

The above measurement uncertainties are according to IEEE Std 1528

5 600 MHz Head (SN: 3933)

Error Description	Uncertainty value $\pm\%$	Probability Distribution	Divisor	(Ci) 1 g	(Ci) 10 g	Standard 1 g ($\pm\%$)	Standard 10 g ($\pm\%$)	vi 2 or Veff
Measurement System								
Probe calibration	6.55	Normal	1	1	1	6.6	6.6	∞
Isotropy	1.3	Normal	1	1	1	1.3	1.3	∞
Boundary Effects	2.0	Rectangular	$\sqrt{3}$	1	1	1.2	1.2	∞
Probe Linearity	0.3	Normal	1	1	1	0.3	0.3	∞
Probe modulation response	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Detection limits	0.25	Rectangular	$\sqrt{3}$	1	1	0.14	0.14	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	∞
Response time	0.8	Rectangular	$\sqrt{3}$	1	1	0.46	0.46	∞
Integration time	2.6	Rectangular	$\sqrt{3}$	1	1	1.5	1.5	∞
RF Ambient Conditions – Noise	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
Probe Positioner	0.8	Rectangular	$\sqrt{3}$	1	1	0.46	0.46	∞
Probe Positioning	6.7	Rectangular	$\sqrt{3}$	1	1	3.9	3.9	∞
Algorithms for Max. SAR Eval.	4.0	Rectangular	$\sqrt{3}$	1	1	2.3	2.3	∞
Test Sample Related								
Device Positioning	2.9	Normal	1	1	1	2.9	2.9	145
Device Holder	3.6	Normal	1	1	1	3.6	3.6	5
Power Drift	5.0	Rectangular	$\sqrt{3}$	1	1	2.9	2.9	∞
SAR Scaling	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Physical Parameters								
Phantom Shell	7.6	Rectangular	$\sqrt{3}$	1	1	4.4	4.4	∞
SAR correction	0.0	Normal	1	1	0.84	0.0	0.0	∞
Liquid conductivity (Target)	5.0	Rectangular	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
Liquid conductivity (Meas.)	4.0	Normal	1	0.78	0.71	3.1	2.8	10
Liquid permittivity (Target)	5.0	Rectangular	$\sqrt{3}$	0.60	0.49	1.7	1.4	∞
Liquid permittivity (Meas.)	3.9	Normal	1	0.23	0.26	0.90	1.0	10
Temp. unc. - Conductivity	2.0	Rectangular	$\sqrt{3}$	0.78	0.71	0.90	0.82	∞
Temp. unc. - Permittivity	1.9	Rectangular	$\sqrt{3}$	0.23	0.26	0.25	0.29	∞
Combined Standard Uncertainty						13	13	330
Expanded Uncertainty (k=2)						26	26	

$$U(1\text{ g}) = k \cdot u_c$$

$$= 2 \cdot 13\%$$

$$= 26\% \text{ (The confidence level is about } 95\% \text{ } k = 2)$$

$$U(10\text{ g}) = k \cdot u_c$$

$$= 2 \cdot 13\%$$

$$= 26\% \text{ (The confidence level is about } 95\% \text{ } k = 2)$$

The above measurement uncertainties are according to IEEE Std 1528

16. CONCLUSION

Measurement Conclusion

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the FCC. These measurements are taken to simulate the RF effects exposure under the worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The tested device complies with the requirements in respect to all parameters subject to the test. The test results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are every complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role impossible biological effect are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease).

Because innumerable factors may interact to determine the specific biological outcome of an exposure to electromagnetic fields, any protection guide shall consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables.

17. REFERENCES

- [1] Federal Communications Commission, ET Docket 93-62, Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation, Aug. 1996.
- [2] ANSI/IEEE C95.1-2005, American National Standard safety levels with respect to human exposure to radiofrequency electromagnetic fields, 3kHz to 300GHz, New York: IEEE, 2006.
- [3] ANSI/IEEE C95.1-1992, American National Standard safety levels with respect to human exposure to radiofrequency electromagnetic fields, 3kHz to 300GHz, New York: IEEE, Sept. 1992.
- [4] ANSI/IEEE C95.3-2002, IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave, New York: IEEE, December 2002.
- [5] IEEE Standards Coordinating Committee 39 –Standards Coordinating Committee 34 – IEEE Std. 1528-2003, Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices.
- [6] NCRP, National Council on Radiation Protection and Measurements, Biological Effects and Exposure Criteria for Radio Frequency Electromagnetic Fields, NCRP Report No. 86, 1986. Reprinted Feb. 1995.
- [7] T. Schmid, O. Egger, N. Kuster, Automated E-field scanning system for dosimetric assessments, IEEE Transaction on Microwave Theory and Techniques, vol. 44, Jan. 1996, pp. 105-113.
- [8] K. Pokovic, T. Schmid, N. Kuster, Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequencies, ICECOM97, Oct. 1997, pp. -124.
- [9] K. Pokovic, T. Schmid, and N. Kuster, E-field Probe with improved isotropy in brain simulating liquids, Proceedings of the ELMAR, Zadar, Croatia, June 23-25, 1996, pp. 172-175.
- [10] Schmid& Partner Engineering AG, Application Note: Data Storage and Evaluation, June 1998, p2.
- [11] V. Hombach, K. Meier, M. Burkhardt, E. Kuhn, N. Kuster, The Dependence of EM Energy Absorption upon Human Modeling at 900 MHz, IEEE Transaction on Microwave Theory and Techniques, vol. 44 no. 10, Oct.1996, pp. 1865-1873.
- [12] N. Kuster and Q. Balzano, Energy absorption mechanism by biological bodies in the near field of dipole antennas above 300MHz, IEEE Transaction on Vehicular Technology, vol. 41, no. 1, Feb. 1992, pp. 17-23.
- [13] G. Hartsgrrove, A. Kraszewski, A. Surowiec, Simulated Biological Materials for Electromagnetic Radiation Absorption Studies, University of Ottawa, Bio electromagnetics, Canada: 1987, pp. 29-36.
- [14] Q. Balzano, O. Garay, T. Manning Jr., Electromagnetic Energy Exposure of Simulated Users of Portable Cellular Telephones, IEEE Transactions on Vehicular Technology, vol. 44, no.3, Aug. 1995.
- [15] W. Gander, Computer mathematick, Birkhaeuser, Basel, 1992.
- [16] W.H. Press, S.A. Teukolsky, W.T. Vetterling, and B.P. Flannery, Numerical Recipes in C, The Art of Scientific Computing, Second edition, Cambridge University Press, 1992.
- [17] N. Kuster, R. Kastle, T. Schmid, Dosimetric evaluation of mobile communications equipment with known precision, IEEE Transaction on Communications, vol. E80-B, no. 5, May 1997, pp. 645-652.
- [18] CENELEC CLC/SC111B, European Prestandard (prENV 50166-2), Human Exposure to Electromagnetic Fields High-frequency: 10kHz-300GHz, Jan. 1995.
- [19] Prof. Dr. Niels Kuster, ETH, Eidgenössische Technische Hochschule Zürich, Dosimetric Evaluation of the Cellular Phone.

- [20] IEC 62209-1, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3 GHz), Feb. 2005.
- [21] Industry Canada RSS-102 Radio Frequency Exposure Compliance of Radio communication Apparatus (All Frequency Bands) Issue 5, March 2015.
- [22] Health Canada Safety Code 6 Limits of Human Exposure to Radio Frequency Electromagnetic Fields in the Frequency Range from 3 kHz – 300 GHz, 2009
- [23] FCC SAR Test Procedures for 2G-3G Devices, Mobile Hotspot and UMPC Devices KDB Publications 941225,D01-D07
- [24] SAR Measurement procedures for IEEE 802.11a/b/g KDB Publication 248227 D01v02
- [25] FCC SAR Considerations for Handsets with Multiple Transmitters and Antennas, KDB Publications 648474D02-D04
- [26] FCC SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers, FCC KDB Publication 616217 D04
- [27] FCC SAR Measurement and Reporting Requirements for 100MHz – 6 GHz, KDB Publications 865664 D01-D02
- [28] FCC General RF Exposure Guidance and SAR Procedures for Dongles, KDB Publication 447498, D01-D02
- [29] 615223 D01 802 16e Wi-Max SAR Guidance v01, Nov. 13, 2009
- [30] Anexo à Resolução No. 533, de 10 de September de 2009.
- [31] IEC 62209-2, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body(frequency range of 30 MHz to 6 GHz), Mar. 2010.

APPENDIX A. – Probe Calibration Data

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
S Service suisse d'étalonnage
C Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Client **DT&C (Dymstec)**

Certificate No: **EX3-3866_May20**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3866**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-14.v5, QA CAL-23.v5, QA CAL-25.v7**
Calibration procedure for dosimetric E-field probes

Calibration date: **May 27, 2020**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	01-Apr-20 (No. 217-03100/03101)	Apr-21
Power sensor NRP-Z91	SN: 103244	01-Apr-20 (No. 217-03100)	Apr-21
Power sensor NRP-Z91	SN: 103245	01-Apr-20 (No. 217-03101)	Apr-21
Reference 20 dB Attenuator	SN: CC2552 (20x)	31-Mar-20 (No. 217-03106)	Apr-21
DAE4	SN: 660	27-Dec-19 (No. DAE4-660_Dec19)	Dec-20
Reference Probe ES3DV2	SN: 3013	31-Dec-19 (No. ES3-3013_Dec19)	Dec-20
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-18)	In house check: Jun-20
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-19)	In house check: Oct-20

	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	
Issued: May 30, 2020			
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization ϕ	ϕ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E^2 -field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z}** = NORM_{x,y,z} * frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A_{x,y,z}, B_{x,y,z}, C_{x,y,z}, D_{x,y,z}, VR_{x,y,z}**: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM_x (no uncertainty required).

EX3DV4 – SN:3866

May 27, 2020

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3866

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$) ^A	0.42	0.33	0.36	± 10.1 %
DCP (mV) ^B	98.5	103.7	101.3	

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB $\sqrt{\mu V}$	C	D dB	VR mV	Max dev.	Max Unc ^E (k=2)
0	CW	X	0.00	0.00	1.00	0.00	125.1	± 3.0 %	± 4.7 %
		Y	0.00	0.00	1.00		129.5		
		Z	0.00	0.00	1.00		133.6		
10352- AAA	Pulse Waveform (200Hz, 10%)	X	20.00	95.24	24.54	10.00	60.0	± 3.4 %	± 9.6 %
		Y	4.15	70.71	13.73		60.0		
		Z	20.00	90.90	20.57		60.0		
10353- AAA	Pulse Waveform (200Hz, 20%)	X	20.00	95.86	23.70	6.99	80.0	± 1.9 %	± 9.6 %
		Y	4.17	73.24	13.60		80.0		
		Z	20.00	93.13	20.51		80.0		
10354- AAA	Pulse Waveform (200Hz, 40%)	X	20.00	99.96	24.31	3.98	95.0	± 1.5 %	± 9.6 %
		Y	6.78	80.59	14.97		95.0		
		Z	20.00	99.54	22.28		95.0		
10355- AAA	Pulse Waveform (200Hz, 60%)	X	20.00	107.40	26.55	2.22	120.0	± 1.6 %	± 9.6 %
		Y	20.00	93.68	18.11		120.0		
		Z	20.00	105.04	23.76		120.0		
10387- AAA	QPSK Waveform, 1 MHz	X	2.02	66.38	15.96	1.00	150.0	± 1.4 %	± 9.6 %
		Y	1.75	65.90	15.07		150.0		
		Z	1.75	66.49	15.22		150.0		
10388- AAA	QPSK Waveform, 10 MHz	X	2.71	70.07	16.77	0.00	150.0	± 1.0 %	± 9.6 %
		Y	2.30	68.12	15.74		150.0		
		Z	2.29	68.22	15.87		150.0		
10396- AAA	64-QAM Waveform, 100 kHz	X	3.69	72.06	19.30	3.01	150.0	± 0.7 %	± 9.6 %
		Y	3.27	72.40	19.35		150.0		
		Z	2.86	70.61	18.64		150.0		
10399- AAA	64-QAM Waveform, 40 MHz	X	3.67	67.47	16.03	0.00	150.0	± 0.8 %	± 9.6 %
		Y	3.42	66.63	15.48		150.0		
		Z	3.44	66.76	15.56		150.0		
10414- AAA	WLAN CCDF, 64-QAM, 40MHz	X	5.10	65.61	15.52	0.00	150.0	± 1.0 %	± 9.6 %
		Y	4.80	65.30	15.26		150.0		
		Z	4.79	65.47	15.35		150.0		

Note: For details on UID parameters see Appendix

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A The uncertainties of Norm X,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 6).

^B Numerical linearization parameter: uncertainty not required.

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

EX3DV4- SN:3866

May 27, 2020

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3866

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $ms.V^{-2}$	T2 $ms.V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	76.4	559.06	34.40	25.15	0.69	5.10	0.74	0.53	1.01
Y	50.8	365.67	33.33	9.41	0.71	4.95	2.00	0.09	1.01
Z	43.2	310.23	33.20	11.01	0.22	5.01	1.62	0.06	1.00

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	61.8
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

EX3DV4- SN:3866

May 27, 2020

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3866

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k=2)
750	41.9	0.89	9.46	9.46	9.46	0.50	0.90	± 12.0 %
835	41.5	0.90	9.20	9.20	9.20	0.51	0.80	± 12.0 %
900	41.5	0.97	9.07	9.07	9.07	0.46	0.80	± 12.0 %
1750	40.1	1.37	8.01	8.01	8.01	0.33	0.86	± 12.0 %
1900	40.0	1.40	7.80	7.80	7.80	0.29	0.86	± 12.0 %
2300	39.5	1.67	7.54	7.54	7.54	0.37	0.90	± 12.0 %
2450	39.2	1.80	7.20	7.20	7.20	0.35	0.94	± 12.0 %
2600	39.0	1.96	7.04	7.04	7.04	0.41	0.90	± 12.0 %
5200	36.0	4.66	5.09	5.09	5.09	0.40	1.80	± 13.1 %
5300	35.9	4.76	4.89	4.89	4.89	0.40	1.80	± 13.1 %
5500	35.6	4.96	4.51	4.51	4.51	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.42	4.42	4.42	0.40	1.80	± 13.1 %
5800	35.3	5.27	4.60	4.60	4.60	0.40	1.80	± 13.1 %

^C Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

EX3DV4- SN:3866

May 27, 2020

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3866

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k=2)
750	55.5	0.96	9.36	9.36	9.36	0.39	0.80	± 12.0 %
835	55.2	0.97	9.32	9.32	9.32	0.39	0.89	± 12.0 %
900	55.0	1.05	9.21	9.21	9.21	0.46	0.80	± 12.0 %
1750	53.4	1.49	7.92	7.92	7.92	0.35	0.86	± 12.0 %
1900	53.3	1.52	7.70	7.70	7.70	0.40	0.86	± 12.0 %
2300	52.9	1.81	7.45	7.45	7.45	0.41	0.90	± 12.0 %
2450	52.7	1.95	7.36	7.36	7.36	0.30	0.94	± 12.0 %
2600	52.5	2.16	7.19	7.19	7.19	0.38	0.90	± 12.0 %
5200	49.0	5.30	4.70	4.70	4.70	0.50	1.90	± 13.1 %
5300	48.9	5.42	4.51	4.51	4.51	0.50	1.90	± 13.1 %
5500	48.6	5.65	4.03	4.03	4.03	0.50	1.90	± 13.1 %
5600	48.5	5.77	3.87	3.87	3.87	0.50	1.90	± 13.1 %
5800	48.2	6.00	4.00	4.00	4.00	0.50	1.90	± 13.1 %

^C Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

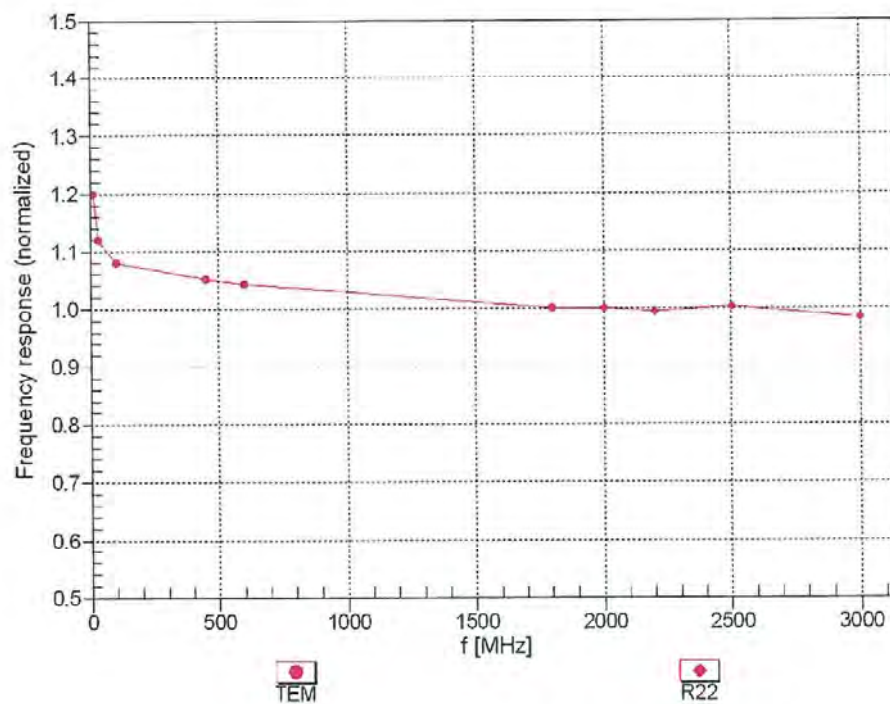
^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

EX3DV4- SN:3866

May 27, 2020

Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

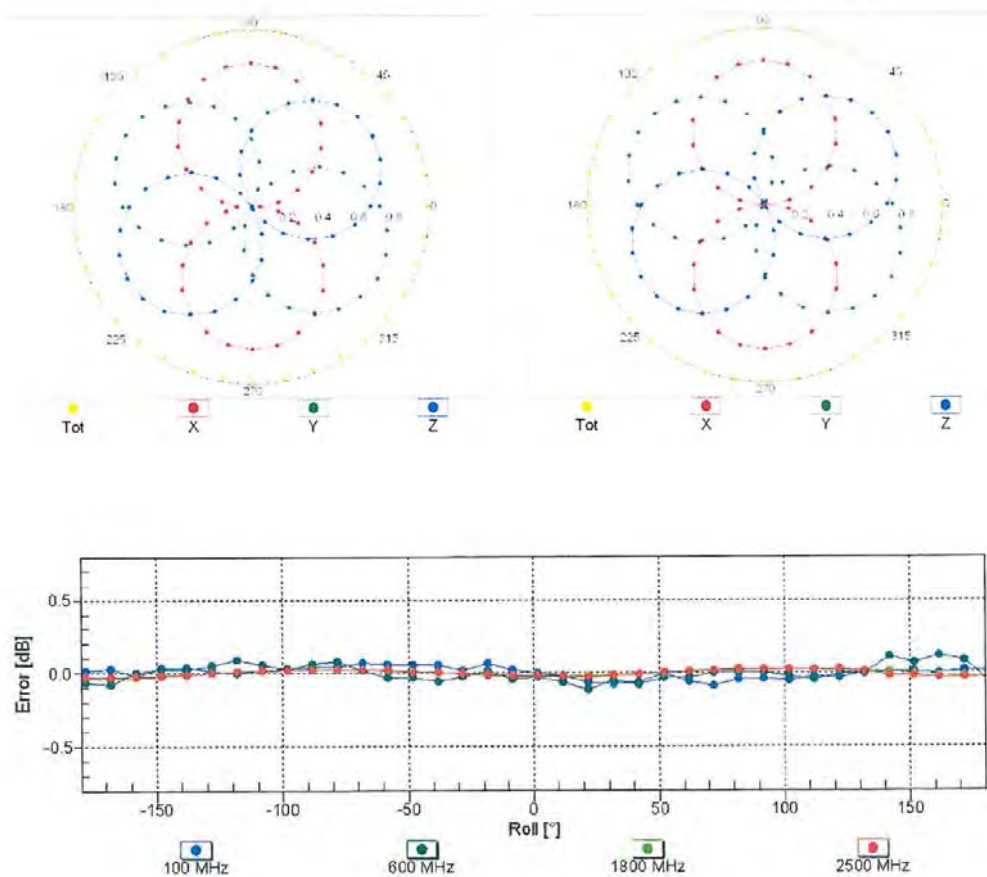
EX3DV4- SN:3866

May 27, 2020

Receiving Pattern (ϕ), $\theta = 0^\circ$

f=600 MHz,TEM

f=1800 MHz,R22

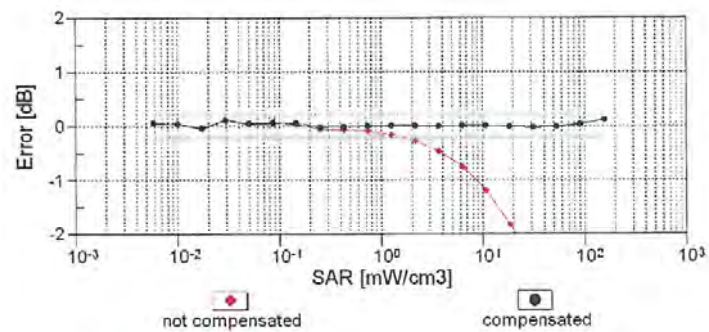
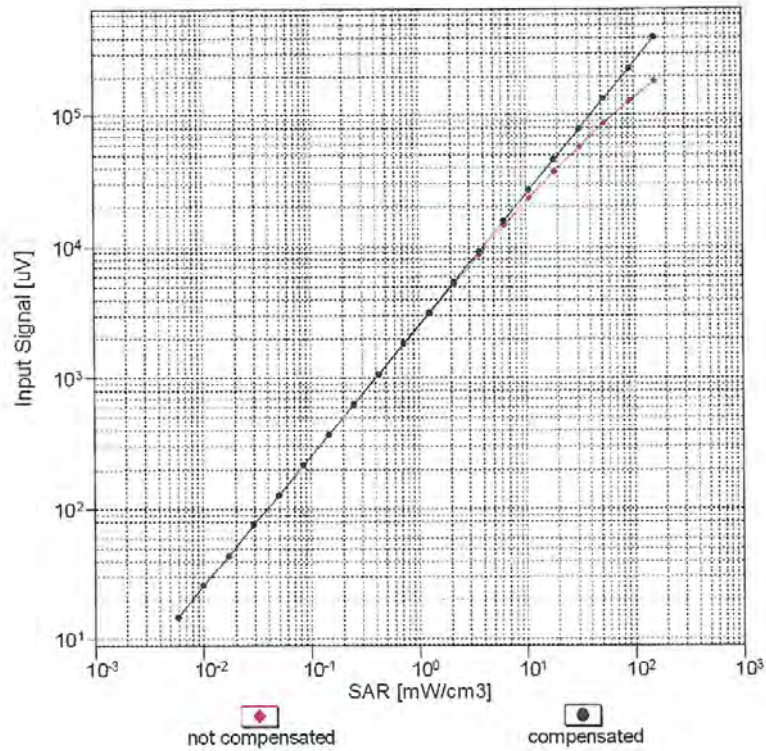


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

EX3DV4- SN:3866

May 27, 2020

Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell, $f_{\text{eval}} = 1900 \text{ MHz}$)

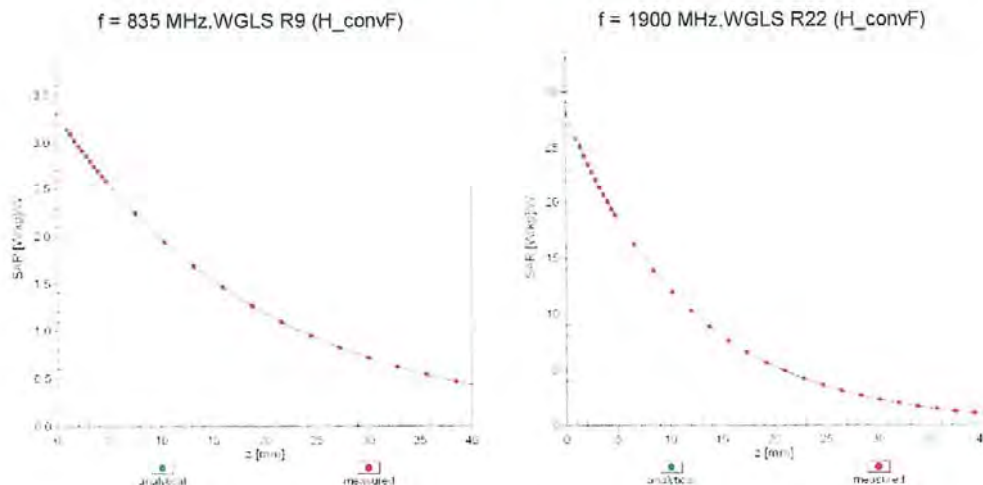


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

EX3DV4- SN:3866

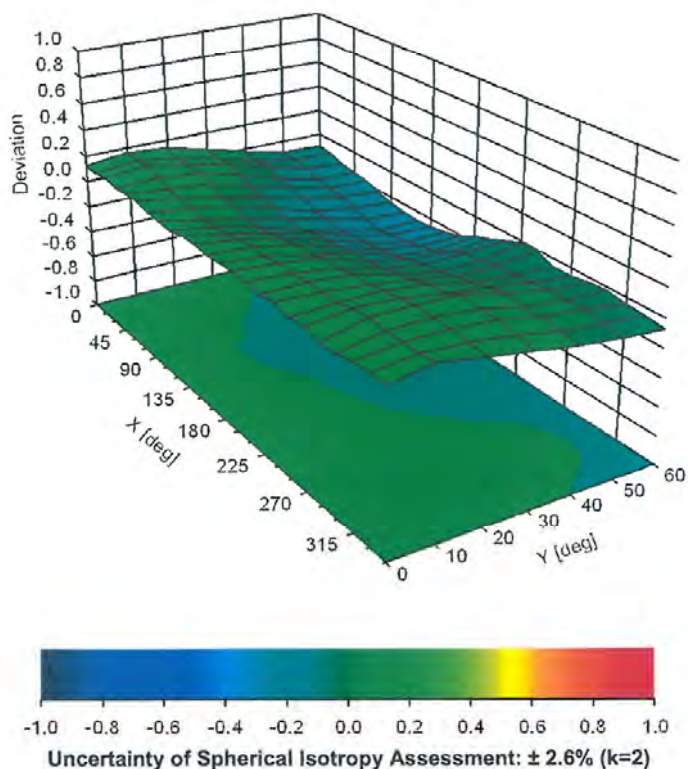
May 27, 2020

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ , θ), $f = 900 \text{ MHz}$



EX3DV4- SN:3866

May 27, 2020

Appendix: Modulation Calibration Parameters

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E (k=2)
0		CW	CW	0.00	± 4.7 %
10010	CAA	SAR Validation (Square, 100ms, 10ms)	Test	10.00	± 9.6 %
10011	CAB	UMTS-FDD (WCDMA)	WCDMA	2.91	± 9.6 %
10012	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	WLAN	1.87	± 9.6 %
10013	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	WLAN	9.46	± 9.6 %
10021	DAC	GSM-FDD (TDMA, GMSK)	GSM	9.39	± 9.6 %
10023	DAC	GPRS-FDD (TDMA, GMSK, TN 0)	GSM	9.57	± 9.6 %
10024	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	GSM	6.56	± 9.6 %
10025	DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	GSM	12.62	± 9.6 %
10026	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	GSM	9.55	± 9.6 %
10027	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	GSM	4.80	± 9.6 %
10028	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	GSM	3.55	± 9.6 %
10029	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	GSM	7.78	± 9.6 %
10030	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	Bluetooth	5.30	± 9.6 %
10031	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	Bluetooth	1.87	± 9.6 %
10032	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	Bluetooth	1.16	± 9.6 %
10033	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	Bluetooth	7.74	± 9.6 %
10034	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	Bluetooth	4.53	± 9.6 %
10035	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	Bluetooth	3.83	± 9.6 %
10036	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	Bluetooth	8.01	± 9.6 %
10037	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	Bluetooth	4.77	± 9.6 %
10038	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	Bluetooth	4.10	± 9.6 %
10039	CAB	CDMA2000 (1xRTT, RC1)	CDMA2000	4.57	± 9.6 %
10042	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	AMPS	7.78	± 9.6 %
10044	CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	AMPS	0.00	± 9.6 %
10048	CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	DECT	13.80	± 9.6 %
10049	CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	DECT	10.79	± 9.6 %
10056	CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	TD-SCDMA	11.01	± 9.6 %
10058	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	GSM	6.52	± 9.6 %
10059	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	WLAN	2.12	± 9.6 %
10060	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	WLAN	2.83	± 9.6 %
10061	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	WLAN	3.60	± 9.6 %
10062	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	WLAN	8.68	± 9.6 %
10063	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	WLAN	8.63	± 9.6 %
10064	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	WLAN	9.09	± 9.6 %
10065	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	WLAN	9.00	± 9.6 %
10066	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	WLAN	9.38	± 9.6 %
10067	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	WLAN	10.12	± 9.6 %
10068	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	WLAN	10.24	± 9.6 %
10069	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	WLAN	10.56	± 9.6 %
10071	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	WLAN	9.83	± 9.6 %
10072	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	WLAN	9.62	± 9.6 %
10073	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	WLAN	9.94	± 9.6 %
10074	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	WLAN	10.30	± 9.6 %
10075	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	WLAN	10.77	± 9.6 %
10076	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	WLAN	10.94	± 9.6 %
10077	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	WLAN	11.00	± 9.6 %
10081	CAB	CDMA2000 (1xRTT, RC3)	CDMA2000	3.97	± 9.6 %
10082	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	AMPS	4.77	± 9.6 %
10090	DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	GSM	6.56	± 9.6 %
10097	CAB	UMTS-FDD (HSDPA)	WCDMA	3.98	± 9.6 %
10098	CAB	UMTS-FDD (HSUPA, Subtest 2)	WCDMA	3.98	± 9.6 %
10099	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	GSM	9.55	± 9.6 %
10100	CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	5.67	± 9.6 %
10101	CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-FDD	6.42	± 9.6 %
10102	CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-FDD	6.60	± 9.6 %
10103	CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-TDD	9.29	± 9.6 %
10104	CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-TDD	9.97	± 9.6 %
10105	CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-TDD	10.01	± 9.6 %
10108	CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-FDD	5.80	± 9.6 %

EX3DV4- SN:3866

May 27, 2020

10109	CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-FDD	6.43	± 9.6 %
10110	CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-FDD	5.75	± 9.6 %
10111	CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	LTE-FDD	6.44	± 9.6 %
10112	CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-FDD	6.59	± 9.6 %
10113	CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-FDD	6.62	± 9.6 %
10114	CAC	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	WLAN	8.10	± 9.6 %
10115	CAC	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	WLAN	8.46	± 9.6 %
10116	CAC	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	WLAN	8.15	± 9.6 %
10117	CAC	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	WLAN	8.07	± 9.6 %
10118	CAC	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	WLAN	8.59	± 9.6 %
10119	CAC	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	WLAN	8.13	± 9.6 %
10140	CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-FDD	6.49	± 9.6 %
10141	CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-FDD	6.53	± 9.6 %
10142	CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
10143	CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-FDD	6.35	± 9.6 %
10144	CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-FDD	6.65	± 9.6 %
10145	CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-FDD	5.76	± 9.6 %
10146	CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.41	± 9.6 %
10147	CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.72	± 9.6 %
10149	CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-FDD	6.42	± 9.6 %
10150	CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-FDD	6.60	± 9.6 %
10151	CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-TDD	9.28	± 9.6 %
10152	CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-TDD	9.92	± 9.6 %
10153	CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-TDD	10.05	± 9.6 %
10154	CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-FDD	5.75	± 9.6 %
10155	CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-FDD	6.43	± 9.6 %
10156	CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-FDD	5.79	± 9.6 %
10157	CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-FDD	6.49	± 9.6 %
10158	CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-FDD	6.62	± 9.6 %
10159	CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-FDD	6.56	± 9.6 %
10160	CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-FDD	5.82	± 9.6 %
10161	CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-FDD	6.43	± 9.6 %
10162	CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-FDD	6.58	± 9.6 %
10166	CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-FDD	5.46	± 9.6 %
10167	CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.21	± 9.6 %
10168	CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.79	± 9.6 %
10169	CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
10170	CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-FDD	6.52	± 9.6 %
10171	AAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-FDD	6.49	± 9.6 %
10172	CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-TDD	9.21	± 9.6 %
10173	CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10174	CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 %
10175	CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-FDD	5.72	± 9.6 %
10176	CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-FDD	6.52	± 9.6 %
10177	CAI	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
10178	CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	LTE-FDD	6.52	± 9.6 %
10179	CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10180	CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10181	CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-FDD	5.72	± 9.6 %
10182	CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.52	± 9.6 %
10183	AAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10184	CAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
10185	CAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-FDD	6.51	± 9.6 %
10186	AAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10187	CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
10188	CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.52	± 9.6 %
10189	AAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10193	CAC	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	WLAN	8.09	± 9.6 %
10194	CAC	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	WLAN	8.12	± 9.6 %
10195	CAC	IEEE 802.11n (HT Greenfield, 85 Mbps, 64-QAM)	WLAN	8.21	± 9.6 %
10196	CAC	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	WLAN	8.10	± 9.6 %
10197	CAC	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	WLAN	8.13	± 9.6 %
10198	CAC	IEEE 802.11n (HT Mixed, 85 Mbps, 64-QAM)	WLAN	8.27	± 9.6 %
10219	CAC	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	WLAN	8.03	± 9.6 %

EX3DV4- SN:3866

May 27, 2020

10220	CAC	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	WLAN	8.13	± 9.6 %
10221	CAC	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	WLAN	8.27	± 9.6 %
10222	CAC	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	WLAN	8.06	± 9.6 %
10223	CAC	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	WLAN	8.48	± 9.6 %
10224	CAC	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	WLAN	8.08	± 9.6 %
10225	CAB	UMTS-FDD (HSPA+)	WCDMA	5.97	± 9.6 %
10226	CAB	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.49	± 9.6 %
10227	CAB	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-TDD	10.26	± 9.6 %
10228	CAB	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-TDD	9.22	± 9.6 %
10229	CAD	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10230	CAD	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 %
10231	CAD	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-TDD	9.19	± 9.6 %
10232	CAG	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10233	CAG	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 %
10234	CAG	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-TDD	9.21	± 9.6 %
10235	CAG	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10236	CAG	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 %
10237	CAG	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-TDD	9.21	± 9.6 %
10238	CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10239	CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 %
10240	CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-TDD	9.21	± 9.6 %
10241	CAB	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.82	± 9.6 %
10242	CAB	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-TDD	9.86	± 9.6 %
10243	CAB	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-TDD	9.46	± 9.6 %
10244	CAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-TDD	10.06	± 9.6 %
10245	CAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-TDD	10.06	± 9.6 %
10246	CAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-TDD	9.30	± 9.6 %
10247	CAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-TDD	9.91	± 9.6 %
10248	CAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-TDD	10.09	± 9.6 %
10249	CAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-TDD	9.29	± 9.6 %
10250	CAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-TDD	9.81	± 9.6 %
10251	CAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-TDD	10.17	± 9.6 %
10252	CAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-TDD	9.24	± 9.6 %
10253	CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-TDD	9.90	± 9.6 %
10254	CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-TDD	10.14	± 9.6 %
10255	CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-TDD	9.20	± 9.6 %
10256	CAB	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.96	± 9.6 %
10257	CAB	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-TDD	10.08	± 9.6 %
10258	CAB	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-TDD	9.34	± 9.6 %
10259	CAD	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-TDD	9.98	± 9.6 %
10260	CAD	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-TDD	9.97	± 9.6 %
10261	CAD	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-TDD	9.24	± 9.6 %
10262	CAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	LTE-TDD	9.83	± 9.6 %
10263	CAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-TDD	10.16	± 9.6 %
10264	CAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-TDD	9.23	± 9.6 %
10265	CAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-TDD	9.92	± 9.6 %
10266	CAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-TDD	10.07	± 9.6 %
10267	CAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-TDD	9.30	± 9.6 %
10268	CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-TDD	10.06	± 9.6 %
10269	CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-TDD	10.13	± 9.6 %
10270	CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-TDD	9.58	± 9.6 %
10274	CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	WCDMA	4.87	± 9.6 %
10275	CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	WCDMA	3.96	± 9.6 %
10277	CAA	PHS (QPSK)	PHS	11.81	± 9.6 %
10278	CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	PHS	11.81	± 9.6 %
10279	CAA	PHS (QPSK, BW 884MHz, Rolloff 0.38)	PHS	12.18	± 9.6 %
10290	AAB	CDMA2000, RC1, SO55, Full Rate	CDMA2000	3.91	± 9.6 %
10291	AAB	CDMA2000, RC3, SO55, Full Rate	CDMA2000	3.46	± 9.6 %
10292	AAB	CDMA2000, RC3, SO32, Full Rate	CDMA2000	3.39	± 9.6 %
10293	AAB	CDMA2000, RC3, SO3, Full Rate	CDMA2000	3.50	± 9.6 %
10295	AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	CDMA2000	12.49	± 9.6 %
10297	AAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-FDD	5.81	± 9.6 %
10298	AAD	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-FDD	5.72	± 9.6 %
10299	AAD	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-FDD	6.39	± 9.6 %

Certificate No: EX3-3866_May20

Page 13 of 22

EX3DV4- SN:3866

May 27, 2020

10300	AAD	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-FDD	6.60	± 9.6 %
10301	AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)	WiMAX	12.03	± 9.6 %
10302	AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3CTRL)	WiMAX	12.57	± 9.6 %
10303	AAA	IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	WiMAX	12.52	± 9.6 %
10304	AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	WiMAX	11.86	± 9.6 %
10305	AAA	IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC)	WiMAX	15.24	± 9.6 %
10306	AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC)	WiMAX	14.67	± 9.6 %
10307	AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC)	WiMAX	14.49	± 9.6 %
10308	AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	WiMAX	14.46	± 9.6 %
10309	AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3)	WiMAX	14.58	± 9.6 %
10310	AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3)	WiMAX	14.57	± 9.6 %
10311	AAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-FDD	6.06	± 9.6 %
10313	AAA	iDEN 1:3	iDEN	10.51	± 9.6 %
10314	AAA	iDEN 1:6	iDEN	13.48	± 9.6 %
10315	AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc dc)	WLAN	1.71	± 9.6 %
10316	AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc dc)	WLAN	8.36	± 9.6 %
10317	AAC	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc dc)	WLAN	8.36	± 9.6 %
10352	AAA	Pulse Waveform (200Hz, 10%)	Generic	10.00	± 9.6 %
10353	AAA	Pulse Waveform (200Hz, 20%)	Generic	6.99	± 9.6 %
10354	AAA	Pulse Waveform (200Hz, 40%)	Generic	3.98	± 9.6 %
10355	AAA	Pulse Waveform (200Hz, 60%)	Generic	2.22	± 9.6 %
10356	AAA	Pulse Waveform (200Hz, 80%)	Generic	0.97	± 9.6 %
10387	AAA	QPSK Waveform, 1 MHz	Generic	5.10	± 9.6 %
10388	AAA	QPSK Waveform, 10 MHz	Generic	5.22	± 9.6 %
10396	AAA	64-QAM Waveform, 100 kHz	Generic	6.27	± 9.6 %
10399	AAA	64-QAM Waveform, 40 MHz	Generic	6.27	± 9.6 %
10400	AAD	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc dc)	WLAN	8.37	± 9.6 %
10401	AAD	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc dc)	WLAN	8.60	± 9.6 %
10402	AAD	IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc dc)	WLAN	8.53	± 9.6 %
10403	AAB	CDMA2000 (1xEV-DO, Rev. 0)	CDMA2000	3.76	± 9.6 %
10404	AAB	CDMA2000 (1xEV-DO, Rev. A)	CDMA2000	3.77	± 9.6 %
10406	AAB	CDMA2000, RC3, SO32, SCH0, Full Rate	CDMA2000	5.22	± 9.6 %
10410	AAG	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Sub=2,3,4,7,8,9)	LTE-TDD	7.82	± 9.6 %
10414	AAA	WLAN CCDF, 64-QAM, 40MHz	Generic	8.54	± 9.6 %
10415	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc dc)	WLAN	1.54	± 9.6 %
10416	AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc dc)	WLAN	8.23	± 9.6 %
10417	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc dc)	WLAN	8.23	± 9.6 %
10418	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc, Long)	WLAN	8.14	± 9.6 %
10419	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc, Short)	WLAN	8.19	± 9.6 %
10422	AAB	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	WLAN	8.32	± 9.6 %
10423	AAB	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	WLAN	8.47	± 9.6 %
10424	AAB	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	WLAN	8.40	± 9.6 %
10425	AAB	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	WLAN	8.41	± 9.6 %
10426	AAB	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	WLAN	8.45	± 9.6 %
10427	AAB	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	WLAN	8.41	± 9.6 %
10430	AAD	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	LTE-FDD	8.28	± 9.6 %
10431	AAD	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	LTE-FDD	8.38	± 9.6 %
10432	AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	LTE-FDD	8.34	± 9.6 %
10433	AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	LTE-FDD	8.34	± 9.6 %
10434	AAA	W-CDMA (BS Test Model 1, 64 DPCH)	WCDMA	8.60	± 9.6 %
10435	AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Sub)	LTE-TDD	7.82	± 9.6 %
10447	AAD	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.56	± 9.6 %
10448	AAD	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.53	± 9.6 %
10449	AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.51	± 9.6 %
10450	AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.48	± 9.6 %
10451	AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	WCDMA	7.59	± 9.6 %
10453	AAD	Validation (Square, 10ms, 1ms)	Test	10.00	± 9.6 %
10456	AAB	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc dc)	WLAN	8.63	± 9.6 %
10457	AAA	UMTS-FDD (DC-HSDPA)	WCDMA	6.62	± 9.6 %
10458	AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	CDMA2000	6.55	± 9.6 %
10459	AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	CDMA2000	8.25	± 9.6 %
10460	AAA	UMTS-FDD (WCDMA, AMR)	WCDMA	2.39	± 9.6 %
10461	AAB	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Sub)	LTE-TDD	7.82	± 9.6 %
10462	AAB	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Sub)	LTE-TDD	8.30	± 9.6 %

Certificate No: EX3-3866_May20

Page 14 of 22

EX3DV4- SN:3866

May 27, 2020

10463	AAB	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Sub)	LTE-TDD	8.56	± 9.6 %
10464	AAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Sub)	LTE-TDD	7.82	± 9.6 %
10465	AAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Sub)	LTE-TDD	8.32	± 9.6 %
10466	AAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Sub)	LTE-TDD	8.57	± 9.6 %
10467	AAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Sub)	LTE-TDD	7.82	± 9.6 %
10468	AAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Sub)	LTE-TDD	8.32	± 9.6 %
10469	AAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Sub)	LTE-TDD	8.56	± 9.6 %
10470	AAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Sub)	LTE-TDD	7.82	± 9.6 %
10471	AAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Sub)	LTE-TDD	8.32	± 9.6 %
10472	AAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Sub)	LTE-TDD	8.57	± 9.6 %
10473	AAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Sub)	LTE-TDD	7.82	± 9.6 %
10474	AAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Sub)	LTE-TDD	8.32	± 9.6 %
10475	AAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Sub)	LTE-TDD	8.57	± 9.6 %
10477	AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Sub)	LTE-TDD	8.32	± 9.6 %
10478	AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Sub)	LTE-TDD	8.57	± 9.6 %
10479	AAB	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Sub)	LTE-TDD	7.74	± 9.6 %
10480	AAB	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Sub)	LTE-TDD	8.18	± 9.6 %
10481	AAB	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Sub)	LTE-TDD	8.45	± 9.6 %
10482	AAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Sub)	LTE-TDD	7.71	± 9.6 %
10483	AAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, Sub)	LTE-TDD	8.39	± 9.6 %
10484	AAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Sub)	LTE-TDD	8.47	± 9.6 %
10485	AAF	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Sub)	LTE-TDD	7.59	± 9.6 %
10486	AAF	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Sub)	LTE-TDD	8.38	± 9.6 %
10487	AAF	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Sub)	LTE-TDD	8.60	± 9.6 %
10488	AAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Sub)	LTE-TDD	7.70	± 9.6 %
10489	AAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Sub)	LTE-TDD	8.31	± 9.6 %
10490	AAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Sub)	LTE-TDD	8.54	± 9.6 %
10491	AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Sub)	LTE-TDD	7.74	± 9.6 %
10492	AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Sub)	LTE-TDD	8.41	± 9.6 %
10493	AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Sub)	LTE-TDD	8.55	± 9.6 %
10494	AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Sub)	LTE-TDD	7.74	± 9.6 %
10495	AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Sub)	LTE-TDD	8.37	± 9.6 %
10496	AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Sub)	LTE-TDD	8.54	± 9.6 %
10497	AAB	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Sub)	LTE-TDD	7.67	± 9.6 %
10498	AAB	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Sub)	LTE-TDD	8.40	± 9.6 %
10499	AAB	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Sub)	LTE-TDD	8.68	± 9.6 %
10500	AAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Sub)	LTE-TDD	7.67	± 9.6 %
10501	AAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Sub)	LTE-TDD	8.44	± 9.6 %
10502	AAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Sub)	LTE-TDD	8.52	± 9.6 %
10503	AAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Sub)	LTE-TDD	7.72	± 9.6 %
10504	AAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Sub)	LTE-TDD	8.31	± 9.6 %
10505	AAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Sub)	LTE-TDD	8.54	± 9.6 %
10506	AAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Sub)	LTE-TDD	7.74	± 9.6 %
10507	AAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Sub)	LTE-TDD	8.36	± 9.6 %
10508	AAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Sub)	LTE-TDD	8.55	± 9.6 %
10509	AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Sub)	LTE-TDD	7.99	± 9.6 %
10510	AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Sub)	LTE-TDD	8.49	± 9.6 %
10511	AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Sub)	LTE-TDD	8.51	± 9.6 %
10512	AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Sub)	LTE-TDD	7.74	± 9.6 %
10513	AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Sub)	LTE-TDD	8.42	± 9.6 %
10514	AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Sub)	LTE-TDD	8.45	± 9.6 %
10515	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc dc)	WLAN	1.58	± 9.6 %
10516	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc dc)	WLAN	1.57	± 9.6 %
10517	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc dc)	WLAN	1.58	± 9.6 %
10518	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc dc)	WLAN	8.23	± 9.6 %
10519	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc dc)	WLAN	8.39	± 9.6 %
10520	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc dc)	WLAN	8.12	± 9.6 %
10521	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc dc)	WLAN	7.97	± 9.6 %
10522	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc dc)	WLAN	8.45	± 9.6 %
10523	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc dc)	WLAN	8.08	± 9.6 %
10524	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc dc)	WLAN	8.27	± 9.6 %
10525	AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc dc)	WLAN	8.36	± 9.6 %
10526	AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc dc)	WLAN	8.42	± 9.6 %
10527	AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 99pc dc)	WLAN	8.21	± 9.6 %

EX3DV4- SN:3866

May 27, 2020

10528	AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 99pc dc)	WLAN	8.36	± 9.6 %
10529	AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 99pc dc)	WLAN	8.36	± 9.6 %
10531	AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 99pc dc)	WLAN	8.43	± 9.6 %
10532	AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 99pc dc)	WLAN	8.29	± 9.6 %
10533	AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 99pc dc)	WLAN	8.38	± 9.6 %
10534	AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 99pc dc)	WLAN	8.45	± 9.6 %
10535	AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 99pc dc)	WLAN	8.45	± 9.6 %
10536	AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 99pc dc)	WLAN	8.32	± 9.6 %
10537	AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 99pc dc)	WLAN	8.44	± 9.6 %
10538	AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 99pc dc)	WLAN	8.54	± 9.6 %
10540	AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 99pc dc)	WLAN	8.39	± 9.6 %
10541	AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 99pc dc)	WLAN	8.46	± 9.6 %
10542	AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 99pc dc)	WLAN	8.65	± 9.6 %
10543	AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 99pc dc)	WLAN	8.65	± 9.6 %
10544	AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 99pc dc)	WLAN	8.47	± 9.6 %
10545	AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc dc)	WLAN	8.55	± 9.6 %
10546	AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc dc)	WLAN	8.35	± 9.6 %
10547	AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc dc)	WLAN	8.49	± 9.6 %
10548	AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc dc)	WLAN	8.37	± 9.6 %
10550	AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc dc)	WLAN	8.38	± 9.6 %
10551	AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc dc)	WLAN	8.50	± 9.6 %
10552	AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc dc)	WLAN	8.42	± 9.6 %
10553	AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc dc)	WLAN	8.45	± 9.6 %
10554	AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 99pc dc)	WLAN	8.48	± 9.6 %
10555	AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 99pc dc)	WLAN	8.47	± 9.6 %
10556	AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 99pc dc)	WLAN	8.50	± 9.6 %
10557	AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 99pc dc)	WLAN	8.52	± 9.6 %
10558	AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 99pc dc)	WLAN	8.61	± 9.6 %
10560	AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 99pc dc)	WLAN	8.73	± 9.6 %
10561	AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 99pc dc)	WLAN	8.56	± 9.6 %
10562	AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 99pc dc)	WLAN	8.69	± 9.6 %
10563	AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 99pc dc)	WLAN	8.77	± 9.6 %
10564	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc dc)	WLAN	8.25	± 9.6 %
10565	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc dc)	WLAN	8.45	± 9.6 %
10566	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc dc)	WLAN	8.13	± 9.6 %
10567	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc dc)	WLAN	8.00	± 9.6 %
10568	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc dc)	WLAN	8.37	± 9.6 %
10569	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc dc)	WLAN	8.10	± 9.6 %
10570	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc dc)	WLAN	8.30	± 9.6 %
10571	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc dc)	WLAN	1.99	± 9.6 %
10572	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc dc)	WLAN	1.99	± 9.6 %
10573	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc dc)	WLAN	1.98	± 9.6 %
10574	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc dc)	WLAN	1.98	± 9.6 %
10575	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc dc)	WLAN	8.59	± 9.6 %
10576	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc dc)	WLAN	8.60	± 9.6 %
10577	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc dc)	WLAN	8.70	± 9.6 %
10578	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc dc)	WLAN	8.49	± 9.6 %
10579	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc dc)	WLAN	8.36	± 9.6 %
10580	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc dc)	WLAN	8.76	± 9.6 %
10581	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc dc)	WLAN	8.35	± 9.6 %
10582	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc dc)	WLAN	8.67	± 9.6 %
10583	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc dc)	WLAN	8.59	± 9.6 %
10584	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc dc)	WLAN	8.60	± 9.6 %
10585	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc dc)	WLAN	8.70	± 9.6 %
10586	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc dc)	WLAN	8.49	± 9.6 %
10587	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc dc)	WLAN	8.36	± 9.6 %
10588	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc dc)	WLAN	8.76	± 9.6 %
10589	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc dc)	WLAN	8.35	± 9.6 %
10590	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc dc)	WLAN	8.67	± 9.6 %
10591	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc dc)	WLAN	8.63	± 9.6 %
10592	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc dc)	WLAN	8.79	± 9.6 %
10593	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc dc)	WLAN	8.64	± 9.6 %
10594	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc dc)	WLAN	8.74	± 9.6 %
10595	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc dc)	WLAN	8.74	± 9.6 %

EX3DV4- SN:3866

May 27, 2020

10596	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc dc)	WLAN	8.71	± 9.6 %
10597	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc dc)	WLAN	8.72	± 9.6 %
10598	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc dc)	WLAN	8.50	± 9.6 %
10599	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc dc)	WLAN	8.79	± 9.6 %
10600	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc dc)	WLAN	8.88	± 9.6 %
10601	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc dc)	WLAN	8.82	± 9.6 %
10602	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc dc)	WLAN	8.94	± 9.6 %
10603	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc dc)	WLAN	9.03	± 9.6 %
10604	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc dc)	WLAN	8.76	± 9.6 %
10605	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc dc)	WLAN	8.97	± 9.6 %
10606	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc dc)	WLAN	8.82	± 9.6 %
10607	AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 90pc dc)	WLAN	8.64	± 9.6 %
10608	AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 90pc dc)	WLAN	8.77	± 9.6 %
10609	AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 90pc dc)	WLAN	8.57	± 9.6 %
10610	AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 90pc dc)	WLAN	8.78	± 9.6 %
10611	AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 90pc dc)	WLAN	8.70	± 9.6 %
10612	AAB	IEEE 802.11ac WiFi (20MHz, MCS5, 90pc dc)	WLAN	8.77	± 9.6 %
10613	AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc dc)	WLAN	8.94	± 9.6 %
10614	AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc dc)	WLAN	8.59	± 9.6 %
10615	AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc dc)	WLAN	8.82	± 9.6 %
10616	AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc dc)	WLAN	8.82	± 9.6 %
10617	AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc dc)	WLAN	8.81	± 9.6 %
10618	AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 90pc dc)	WLAN	8.58	± 9.6 %
10619	AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc dc)	WLAN	8.86	± 9.6 %
10620	AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc dc)	WLAN	8.87	± 9.6 %
10621	AAB	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc dc)	WLAN	8.77	± 9.6 %
10622	AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc dc)	WLAN	8.68	± 9.6 %
10623	AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 90pc dc)	WLAN	8.82	± 9.6 %
10624	AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 90pc dc)	WLAN	8.96	± 9.6 %
10625	AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 90pc dc)	WLAN	8.96	± 9.6 %
10626	AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 90pc dc)	WLAN	8.83	± 9.6 %
10627	AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 90pc dc)	WLAN	8.88	± 9.6 %
10628	AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 90pc dc)	WLAN	8.71	± 9.6 %
10629	AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 90pc dc)	WLAN	8.85	± 9.6 %
10630	AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 90pc dc)	WLAN	8.72	± 9.6 %
10631	AAB	IEEE 802.11ac WiFi (80MHz, MCS5, 90pc dc)	WLAN	8.81	± 9.6 %
10632	AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 90pc dc)	WLAN	8.74	± 9.6 %
10633	AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 90pc dc)	WLAN	8.83	± 9.6 %
10634	AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 90pc dc)	WLAN	8.80	± 9.6 %
10635	AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 90pc dc)	WLAN	8.81	± 9.6 %
10636	AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 90pc dc)	WLAN	8.83	± 9.6 %
10637	AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 90pc dc)	WLAN	8.79	± 9.6 %
10638	AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 90pc dc)	WLAN	8.86	± 9.6 %
10639	AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 90pc dc)	WLAN	8.85	± 9.6 %
10640	AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 90pc dc)	WLAN	8.98	± 9.6 %
10641	AAC	IEEE 802.11ac WiFi (160MHz, MCS5, 90pc dc)	WLAN	9.06	± 9.6 %
10642	AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 90pc dc)	WLAN	9.06	± 9.6 %
10643	AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 90pc dc)	WLAN	8.89	± 9.6 %
10644	AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 90pc dc)	WLAN	9.05	± 9.6 %
10645	AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 90pc dc)	WLAN	9.11	± 9.6 %
10646	AAG	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Sub=2,7)	LTE-TDD	11.96	± 9.6 %
10647	AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Sub=2,7)	LTE-TDD	11.96	± 9.6 %
10648	AAA	CDMA2000 (1x Advanced)	CDMA2000	3.45	± 9.6 %
10652	AAE	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	6.91	± 9.6 %
10653	AAE	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.42	± 9.6 %
10654	AAD	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	6.96	± 9.6 %
10655	AAE	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.21	± 9.6 %
10658	AAA	Pulse Waveform (200Hz, 10%)	Test	10.00	± 9.6 %
10659	AAA	Pulse Waveform (200Hz, 20%)	Test	6.99	± 9.6 %
10660	AAA	Pulse Waveform (200Hz, 40%)	Test	3.98	± 9.6 %
10661	AAA	Pulse Waveform (200Hz, 60%)	Test	2.22	± 9.6 %
10662	AAA	Pulse Waveform (200Hz, 80%)	Test	0.97	± 9.6 %
10670	AAA	Bluetooth Low Energy	Bluetooth	2.19	± 9.6 %
10671	AAA	IEEE 802.11ax (20MHz, MCS0, 90pc dc)	WLAN	9.09	± 9.6 %

Certificate No: EX3-3866_May20

Page 17 of 22

EX3DV4- SN:3866

May 27, 2020

10672	AAA	IEEE 802.11ax (20MHz, MCS1, 90pc dc)	WLAN	8.57	± 9.6 %
10673	AAA	IEEE 802.11ax (20MHz, MCS2, 90pc dc)	WLAN	8.78	± 9.6 %
10674	AAA	IEEE 802.11ax (20MHz, MCS3, 90pc dc)	WLAN	8.74	± 9.6 %
10675	AAA	IEEE 802.11ax (20MHz, MCS4, 90pc dc)	WLAN	8.90	± 9.6 %
10676	AAA	IEEE 802.11ax (20MHz, MCS5, 90pc dc)	WLAN	8.77	± 9.6 %
10677	AAA	IEEE 802.11ax (20MHz, MCS6, 90pc dc)	WLAN	8.73	± 9.6 %
10678	AAA	IEEE 802.11ax (20MHz, MCS7, 90pc dc)	WLAN	8.78	± 9.6 %
10679	AAA	IEEE 802.11ax (20MHz, MCS8, 90pc dc)	WLAN	8.89	± 9.6 %
10680	AAA	IEEE 802.11ax (20MHz, MCS9, 90pc dc)	WLAN	8.80	± 9.6 %
10681	AAA	IEEE 802.11ax (20MHz, MCS10, 90pc dc)	WLAN	8.62	± 9.6 %
10682	AAA	IEEE 802.11ax (20MHz, MCS11, 90pc dc)	WLAN	8.83	± 9.6 %
10683	AAA	IEEE 802.11ax (20MHz, MCS0, 99pc dc)	WLAN	8.42	± 9.6 %
10684	AAA	IEEE 802.11ax (20MHz, MCS1, 99pc dc)	WLAN	8.26	± 9.6 %
10685	AAA	IEEE 802.11ax (20MHz, MCS2, 99pc dc)	WLAN	8.33	± 9.6 %
10686	AAA	IEEE 802.11ax (20MHz, MCS3, 99pc dc)	WLAN	8.28	± 9.6 %
10687	AAA	IEEE 802.11ax (20MHz, MCS4, 99pc dc)	WLAN	8.45	± 9.6 %
10688	AAA	IEEE 802.11ax (20MHz, MCS5, 99pc dc)	WLAN	8.29	± 9.6 %
10689	AAA	IEEE 802.11ax (20MHz, MCS6, 99pc dc)	WLAN	8.55	± 9.6 %
10690	AAA	IEEE 802.11ax (20MHz, MCS7, 99pc dc)	WLAN	8.29	± 9.6 %
10691	AAA	IEEE 802.11ax (20MHz, MCS8, 99pc dc)	WLAN	8.25	± 9.6 %
10692	AAA	IEEE 802.11ax (20MHz, MCS9, 99pc dc)	WLAN	8.29	± 9.6 %
10693	AAA	IEEE 802.11ax (20MHz, MCS10, 99pc dc)	WLAN	8.25	± 9.6 %
10694	AAA	IEEE 802.11ax (20MHz, MCS11, 99pc dc)	WLAN	8.57	± 9.6 %
10695	AAA	IEEE 802.11ax (40MHz, MCS0, 90pc dc)	WLAN	8.78	± 9.6 %
10696	AAA	IEEE 802.11ax (40MHz, MCS1, 90pc dc)	WLAN	8.91	± 9.6 %
10697	AAA	IEEE 802.11ax (40MHz, MCS2, 90pc dc)	WLAN	8.61	± 9.6 %
10698	AAA	IEEE 802.11ax (40MHz, MCS3, 90pc dc)	WLAN	8.89	± 9.6 %
10699	AAA	IEEE 802.11ax (40MHz, MCS4, 90pc dc)	WLAN	8.82	± 9.6 %
10700	AAA	IEEE 802.11ax (40MHz, MCS5, 90pc dc)	WLAN	8.73	± 9.6 %
10701	AAA	IEEE 802.11ax (40MHz, MCS6, 90pc dc)	WLAN	8.86	± 9.6 %
10702	AAA	IEEE 802.11ax (40MHz, MCS7, 90pc dc)	WLAN	8.70	± 9.6 %
10703	AAA	IEEE 802.11ax (40MHz, MCS8, 90pc dc)	WLAN	8.82	± 9.6 %
10704	AAA	IEEE 802.11ax (40MHz, MCS9, 90pc dc)	WLAN	8.56	± 9.6 %
10705	AAA	IEEE 802.11ax (40MHz, MCS10, 90pc dc)	WLAN	8.69	± 9.6 %
10706	AAA	IEEE 802.11ax (40MHz, MCS11, 90pc dc)	WLAN	8.66	± 9.6 %
10707	AAA	IEEE 802.11ax (40MHz, MCS0, 99pc dc)	WLAN	8.32	± 9.6 %
10708	AAA	IEEE 802.11ax (40MHz, MCS1, 99pc dc)	WLAN	8.55	± 9.6 %
10709	AAA	IEEE 802.11ax (40MHz, MCS2, 99pc dc)	WLAN	8.33	± 9.6 %
10710	AAA	IEEE 802.11ax (40MHz, MCS3, 99pc dc)	WLAN	8.29	± 9.6 %
10711	AAA	IEEE 802.11ax (40MHz, MCS4, 99pc dc)	WLAN	8.39	± 9.6 %
10712	AAA	IEEE 802.11ax (40MHz, MCS5, 99pc dc)	WLAN	8.67	± 9.6 %
10713	AAA	IEEE 802.11ax (40MHz, MCS6, 99pc dc)	WLAN	8.33	± 9.6 %
10714	AAA	IEEE 802.11ax (40MHz, MCS7, 99pc dc)	WLAN	8.26	± 9.6 %
10715	AAA	IEEE 802.11ax (40MHz, MCS8, 99pc dc)	WLAN	8.45	± 9.6 %
10716	AAA	IEEE 802.11ax (40MHz, MCS9, 99pc dc)	WLAN	8.30	± 9.6 %
10717	AAA	IEEE 802.11ax (40MHz, MCS10, 99pc dc)	WLAN	8.48	± 9.6 %
10718	AAA	IEEE 802.11ax (40MHz, MCS11, 99pc dc)	WLAN	8.24	± 9.6 %
10719	AAA	IEEE 802.11ax (80MHz, MCS0, 90pc dc)	WLAN	8.81	± 9.6 %
10720	AAA	IEEE 802.11ax (80MHz, MCS1, 90pc dc)	WLAN	8.87	± 9.6 %
10721	AAA	IEEE 802.11ax (80MHz, MCS2, 90pc dc)	WLAN	8.76	± 9.6 %
10722	AAA	IEEE 802.11ax (80MHz, MCS3, 90pc dc)	WLAN	8.55	± 9.6 %
10723	AAA	IEEE 802.11ax (80MHz, MCS4, 90pc dc)	WLAN	8.70	± 9.6 %
10724	AAA	IEEE 802.11ax (80MHz, MCS5, 90pc dc)	WLAN	8.90	± 9.6 %
10725	AAA	IEEE 802.11ax (80MHz, MCS6, 90pc dc)	WLAN	8.74	± 9.6 %
10726	AAA	IEEE 802.11ax (80MHz, MCS7, 90pc dc)	WLAN	8.72	± 9.6 %
10727	AAA	IEEE 802.11ax (80MHz, MCS8, 90pc dc)	WLAN	8.66	± 9.6 %
10728	AAA	IEEE 802.11ax (80MHz, MCS9, 90pc dc)	WLAN	8.65	± 9.6 %
10729	AAA	IEEE 802.11ax (80MHz, MCS10, 90pc dc)	WLAN	8.64	± 9.6 %
10730	AAA	IEEE 802.11ax (80MHz, MCS11, 90pc dc)	WLAN	8.67	± 9.6 %
10731	AAA	IEEE 802.11ax (80MHz, MCS0, 99pc dc)	WLAN	8.42	± 9.6 %
10732	AAA	IEEE 802.11ax (80MHz, MCS1, 99pc dc)	WLAN	8.46	± 9.6 %
10733	AAA	IEEE 802.11ax (80MHz, MCS2, 99pc dc)	WLAN	8.40	± 9.6 %
10734	AAA	IEEE 802.11ax (80MHz, MCS3, 99pc dc)	WLAN	8.25	± 9.6 %
10735	AAA	IEEE 802.11ax (80MHz, MCS4, 99pc dc)	WLAN	8.33	± 9.6 %

EX3DV4- SN:3866

May 27, 2020

10736	AAA	IEEE 802.11ax (80MHz, MCS5, 99pc dc)	WLAN	8.27	± 9.6 %
10737	AAA	IEEE 802.11ax (80MHz, MCS6, 99pc dc)	WLAN	8.36	± 9.6 %
10738	AAA	IEEE 802.11ax (80MHz, MCS7, 99pc dc)	WLAN	8.42	± 9.6 %
10739	AAA	IEEE 802.11ax (80MHz, MCS8, 99pc dc)	WLAN	8.29	± 9.6 %
10740	AAA	IEEE 802.11ax (80MHz, MCS9, 99pc dc)	WLAN	8.48	± 9.6 %
10741	AAA	IEEE 802.11ax (80MHz, MCS10, 99pc dc)	WLAN	8.40	± 9.6 %
10742	AAA	IEEE 802.11ax (80MHz, MCS11, 99pc dc)	WLAN	8.43	± 9.6 %
10743	AAA	IEEE 802.11ax (160MHz, MCS0, 90pc dc)	WLAN	8.94	± 9.6 %
10744	AAA	IEEE 802.11ax (160MHz, MCS1, 90pc dc)	WLAN	9.16	± 9.6 %
10745	AAA	IEEE 802.11ax (160MHz, MCS2, 90pc dc)	WLAN	8.93	± 9.6 %
10746	AAA	IEEE 802.11ax (160MHz, MCS3, 90pc dc)	WLAN	9.11	± 9.6 %
10747	AAA	IEEE 802.11ax (160MHz, MCS4, 90pc dc)	WLAN	9.04	± 9.6 %
10748	AAA	IEEE 802.11ax (160MHz, MCS5, 90pc dc)	WLAN	8.93	± 9.6 %
10749	AAA	IEEE 802.11ax (160MHz, MCS6, 90pc dc)	WLAN	8.90	± 9.6 %
10750	AAA	IEEE 802.11ax (160MHz, MCS7, 90pc dc)	WLAN	8.79	± 9.6 %
10751	AAA	IEEE 802.11ax (160MHz, MCS8, 90pc dc)	WLAN	8.82	± 9.6 %
10752	AAA	IEEE 802.11ax (160MHz, MCS9, 90pc dc)	WLAN	8.81	± 9.6 %
10753	AAA	IEEE 802.11ax (160MHz, MCS10, 90pc dc)	WLAN	9.00	± 9.6 %
10754	AAA	IEEE 802.11ax (160MHz, MCS11, 90pc dc)	WLAN	8.94	± 9.6 %
10755	AAA	IEEE 802.11ax (160MHz, MCS0, 99pc dc)	WLAN	8.64	± 9.6 %
10756	AAA	IEEE 802.11ax (160MHz, MCS1, 99pc dc)	WLAN	8.77	± 9.6 %
10757	AAA	IEEE 802.11ax (160MHz, MCS2, 99pc dc)	WLAN	8.77	± 9.6 %
10758	AAA	IEEE 802.11ax (160MHz, MCS3, 99pc dc)	WLAN	8.69	± 9.6 %
10759	AAA	IEEE 802.11ax (160MHz, MCS4, 99pc dc)	WLAN	8.58	± 9.6 %
10760	AAA	IEEE 802.11ax (160MHz, MCS5, 99pc dc)	WLAN	8.49	± 9.6 %
10761	AAA	IEEE 802.11ax (160MHz, MCS6, 99pc dc)	WLAN	8.58	± 9.6 %
10762	AAA	IEEE 802.11ax (160MHz, MCS7, 99pc dc)	WLAN	8.49	± 9.6 %
10763	AAA	IEEE 802.11ax (160MHz, MCS8, 99pc dc)	WLAN	8.53	± 9.6 %
10764	AAA	IEEE 802.11ax (160MHz, MCS9, 99pc dc)	WLAN	8.54	± 9.6 %
10765	AAA	IEEE 802.11ax (160MHz, MCS10, 99pc dc)	WLAN	8.54	± 9.6 %
10766	AAA	IEEE 802.11ax (160MHz, MCS11, 99pc dc)	WLAN	8.51	± 9.6 %
10767	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	7.99	± 9.6 %
10768	AAC	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.01	± 9.6 %
10769	AAC	5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.01	± 9.6 %
10770	AAC	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.02	± 9.6 %
10771	AAC	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.02	± 9.6 %
10772	AAC	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.23	± 9.6 %
10773	AAC	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.03	± 9.6 %
10774	AAC	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.02	± 9.6 %
10775	AAB	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.31	± 9.6 %
10776	AAC	5G NR (CP-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.30	± 9.6 %
10777	AAB	5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.30	± 9.6 %
10778	AAC	5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.34	± 9.6 %
10779	AAB	5G NR (CP-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.42	± 9.6 %
10780	AAC	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.38	± 9.6 %
10781	AAC	5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.38	± 9.6 %
10782	AAC	5G NR (CP-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.43	± 9.6 %
10783	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.31	± 9.6 %
10784	AAC	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.29	± 9.6 %
10785	AAC	5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.40	± 9.6 %
10786	AAC	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.35	± 9.6 %
10787	AAC	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.44	± 9.6 %
10788	AAC	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.39	± 9.6 %
10789	AAC	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.37	± 9.6 %
10790	AAC	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.39	± 9.6 %
10791	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.83	± 9.6 %
10792	AAC	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.92	± 9.6 %
10793	AAC	5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.95	± 9.6 %
10794	AAC	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.82	± 9.6 %
10795	AAC	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.84	± 9.6 %
10796	AAC	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.82	± 9.6 %
10797	AAC	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.01	± 9.6 %
10798	AAC	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.89	± 9.6 %
10799	AAC	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.93	± 9.6 %

EX3DV4- SN:3866

May 27, 2020

10801	AAC	5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.89	± 9.6 %
10802	AAC	5G NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.87	± 9.6 %
10803	AAC	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.93	± 9.6 %
10805	AAC	5G NR (CP-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	± 9.6 %
10806	AAC	5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.37	± 9.6 %
10809	AAC	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	± 9.6 %
10810	AAC	5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	± 9.6 %
10812	AAC	5G NR (CP-OFDM, 50% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.35	± 9.6 %
10817	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.35	± 9.6 %
10818	AAC	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	± 9.6 %
10819	AAC	5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.33	± 9.6 %
10820	AAC	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.30	± 9.6 %
10821	AAC	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.41	± 9.6 %
10822	AAC	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.41	± 9.6 %
10823	AAC	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.36	± 9.6 %
10824	AAC	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.39	± 9.6 %
10825	AAC	5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.41	± 9.6 %
10827	AAC	5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.42	± 9.6 %
10828	AAC	5G NR (CP-OFDM, 100% RB, 90 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.43	± 9.6 %
10829	AAC	5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.40	± 9.6 %
10830	AAC	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.63	± 9.6 %
10831	AAC	5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.73	± 9.6 %
10832	AAC	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.74	± 9.6 %
10833	AAC	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.70	± 9.6 %
10834	AAC	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.75	± 9.6 %
10835	AAC	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.70	± 9.6 %
10836	AAC	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.66	± 9.6 %
10837	AAC	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.68	± 9.6 %
10839	AAC	5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.70	± 9.6 %
10840	AAC	5G NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.67	± 9.6 %
10841	AAC	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.71	± 9.6 %
10843	AAC	5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.49	± 9.6 %
10844	AAC	5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.34	± 9.6 %
10846	AAC	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	± 9.6 %
10854	AAC	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.34	± 9.6 %
10855	AAC	5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.36	± 9.6 %
10856	AAC	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.37	± 9.6 %
10857	AAC	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.35	± 9.6 %
10858	AAC	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.38	± 9.6 %
10859	AAC	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.34	± 9.6 %
10860	AAC	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	± 9.6 %
10861	AAC	5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.40	± 9.6 %
10863	AAC	5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	± 9.6 %
10864	AAC	5G NR (CP-OFDM, 100% RB, 90 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.37	± 9.6 %
10865	AAC	5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	± 9.6 %
10866	AAC	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	± 9.6 %
10868	AAC	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.89	± 9.6 %
10869	AAD	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.75	± 9.6 %
10870	AAD	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.86	± 9.6 %
10871	AAD	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.75	± 9.6 %
10872	AAD	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	6.52	± 9.6 %
10873	AAD	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.61	± 9.6 %
10874	AAD	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.65	± 9.6 %
10875	AAD	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	7.78	± 9.6 %
10876	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	8.39	± 9.6 %
10877	AAD	5G NR (CP-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	7.95	± 9.6 %
10878	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	8.41	± 9.6 %
10879	AAD	5G NR (CP-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	8.12	± 9.6 %
10880	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	8.38	± 9.6 %
10881	AAD	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.75	± 9.6 %
10882	AAD	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.96	± 9.6 %
10883	AAD	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	6.57	± 9.6 %
10884	AAD	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	6.53	± 9.6 %
10885	AAD	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.61	± 9.6 %

EX3DV4- SN:3866

May 27, 2020

10886	AAD	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.65	± 9.6 %
10887	AAD	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	7.78	± 9.6 %
10888	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	8.35	± 9.6 %
10889	AAD	5G NR (CP-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	8.02	± 9.6 %
10890	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	8.40	± 9.6 %
10891	AAD	5G NR (CP-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	8.13	± 9.6 %
10892	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	8.41	± 9.6 %
10897	AAA	5G NR (DFT-s-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.66	± 9.6 %
10898	AAA	5G NR (DFT-s-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.67	± 9.6 %
10899	AAA	5G NR (DFT-s-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.67	± 9.6 %
10900	AAA	5G NR (DFT-s-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	± 9.6 %
10901	AAA	5G NR (DFT-s-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	± 9.6 %
10902	AAA	5G NR (DFT-s-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	± 9.6 %
10903	AAA	5G NR (DFT-s-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	± 9.6 %
10904	AAA	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	± 9.6 %
10905	AAA	5G NR (DFT-s-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	± 9.6 %
10906	AAA	5G NR (DFT-s-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	± 9.6 %
10907	AAA	5G NR (DFT-s-OFDM, 50% RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.78	± 9.6 %
10908	AAA	5G NR (DFT-s-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.93	± 9.6 %
10909	AAA	5G NR (DFT-s-OFDM, 50% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.96	± 9.6 %
10910	AAA	5G NR (DFT-s-OFDM, 50% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.83	± 9.6 %
10911	AAA	5G NR (DFT-s-OFDM, 50% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.93	± 9.6 %
10912	AAA	5G NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	± 9.6 %
10913	AAA	5G NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	± 9.6 %
10914	AAA	5G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.85	± 9.6 %
10915	AAA	5G NR (DFT-s-OFDM, 50% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.83	± 9.6 %
10916	AAA	5G NR (DFT-s-OFDM, 50% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.87	± 9.6 %
10917	AAA	5G NR (DFT-s-OFDM, 50% RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.94	± 9.6 %
10918	AAA	5G NR (DFT-s-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.86	± 9.6 %
10919	AAA	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.86	± 9.6 %
10920	AAA	5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.87	± 9.6 %
10921	AAA	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	± 9.6 %
10922	AAA	5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.82	± 9.6 %
10923	AAA	5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	± 9.6 %
10924	AAA	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	± 9.6 %
10925	AAA	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.95	± 9.6 %
10926	AAA	5G NR (DFT-s-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	± 9.6 %
10927	AAA	5G NR (DFT-s-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.94	± 9.6 %
10928	AAA	5G NR (DFT-s-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	± 9.6 %
10929	AAA	5G NR (DFT-s-OFDM, 1 RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	± 9.6 %
10930	AAA	5G NR (DFT-s-OFDM, 1 RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	± 9.6 %
10931	AAA	5G NR (DFT-s-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	± 9.6 %
10932	AAA	5G NR (DFT-s-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	± 9.6 %
10933	AAA	5G NR (DFT-s-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	± 9.6 %
10934	AAA	5G NR (DFT-s-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	± 9.6 %
10935	AAA	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	± 9.6 %
10936	AAA	5G NR (DFT-s-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.90	± 9.6 %
10937	AAA	5G NR (DFT-s-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.77	± 9.6 %
10938	AAA	5G NR (DFT-s-OFDM, 50% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.90	± 9.6 %
10939	AAA	5G NR (DFT-s-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.82	± 9.6 %
10940	AAA	5G NR (DFT-s-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.89	± 9.6 %
10941	AAA	5G NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.83	± 9.6 %
10942	AAA	5G NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.85	± 9.6 %
10943	AAA	5G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.95	± 9.6 %
10944	AAA	5G NR (DFT-s-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.81	± 9.6 %
10945	AAA	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.85	± 9.6 %
10946	AAA	5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.83	± 9.6 %
10947	AAA	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.87	± 9.6 %
10948	AAA	5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.94	± 9.6 %
10949	AAA	5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.87	± 9.6 %
10950	AAA	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.94	± 9.6 %
10951	AAA	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.92	± 9.6 %
10952	AAA	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.25	± 9.6 %
10953	AAA	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.15	± 9.6 %

EX3DV4– SN:3866

May 27, 2020

10954	AAA	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.23	± 9.6 %
10955	AAA	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.42	± 9.6 %
10956	AAA	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.14	± 9.6 %
10957	AAA	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.31	± 9.6 %
10958	AAA	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.61	± 9.6 %
10959	AAA	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.33	± 9.6 %
10960	AAA	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.32	± 9.6 %
10961	AAA	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.36	± 9.6 %
10962	AAA	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.40	± 9.6 %
10963	AAA	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.55	± 9.6 %
10964	AAA	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.29	± 9.6 %
10965	AAA	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.37	± 9.6 %
10966	AAA	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.55	± 9.6 %
10967	AAA	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.42	± 9.6 %
10968	AAA	5G NR DL (CP-OFDM, TM 3.1, 100 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.49	± 9.6 %

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **DT&C (Dymstec)**

Certificate No: **EX3-3933_Sep20**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3933**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-14.v6, QA CAL-23.v5, QA CAL-25.v7**
Calibration procedure for dosimetric E-field probes

Calibration date: **September 23, 2020**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	01-Apr-20 (No. 217-03100/03101)	Apr-21
Power sensor NRP-Z91	SN: 103244	01-Apr-20 (No. 217-03100)	Apr-21
Power sensor NRP-Z91	SN: 103245	01-Apr-20 (No. 217-03101)	Apr-21
Reference 20 dB Attenuator	SN: CC2552 (20x)	31-Mar-20 (No. 217-03106)	Apr-21
DAE4	SN: 660	27-Dec-19 (No. DAE4-660_Dec19)	Dec-20
Reference Probe ES3DV2	SN: 3013	31-Dec-19 (No. ES3-3013_Dec19)	Dec-20
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-20)	In house check: Jun-22
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-19)	In house check: Oct-20

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	
Issued: September 30, 2020			

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: SCS 0108

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization ϕ	ϕ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z}** = NORM_{x,y,z} * frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; D_{x,y,z}; VR_{x,y,z}**: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM_x (no uncertainty required).