

FCC SAR TEST REPORT

Product Name: NuStar 65 Portable Data Collector

Trade Mark: 

Model No.: Nustar65

Report Number: 24081713266SAR-1

Test Standards: FCC 47 CFR Part 2 §2.1093
ANSI/IEEE C95.1-1992
IEEE Std 1528-2013

FCC ID: 2ATAN-NUSTAR65

Test Result: PASS

Date of Issue: October 23, 2024

Prepared for:

3nStar, Inc.

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October 23, 2024

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UTTR-SAR-IEEE Std 1528-2013-V1.1

Version

Version No.	Date	Description
V1.0	October 23, 2024	Original Report



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CONTENTS

1. GENERAL INFORMATION	5
1.1. STATEMENT OF COMPLIANCE	5
1.2. CLIENT INFORMATION	6
1.3. EUT INFORMATION	6
1.3.1. GENERAL DESCRIPTION OF EUT	6
1.3.2. DESCRIPTION OF ACCESSORIES	7
1.3.3. EUT Tx FREQUENCY BANDS	8
1.3.4. WIRELESS TECHNOLOGIES	9
1.4. MAXIMUM CONDUCTED POWER	10
1.5. OTHER INFORMATION	11
1.6. TEST LOCATION	11
1.7. TEST FACILITY	11
1.8. GUIDANCE STANDARD	12
2. SPECIFIC ABSORPTION RATE (SAR)	13
2.1. INTRODUCTION	13
2.2. SAR DEFINITION	13
2.3. SAR LIMITS	13
3. SAR MEASUREMENT SYSTEM	14
3.1. SPEAG DASY SYSTEM	14
3.1.1. ROBOT	14
3.1.2. PROBE	15
3.1.3. DATA ACQUISITION ELECTRONICS (DAE)	15
3.1.4. PHANTOM	16
3.1.5. DEVICE HOLDER	17
3.1.6. SYSTEM VALIDATION DIPOLES	17
3.2. SAR SCAN PROCEDURE	18
3.2.1. SAR REFERENCE MEASUREMENT (DRIFT)	18
3.2.2. AREA SCAN	18
3.2.3. ZOOM SCAN	19
3.2.4. SAR DRIFT MEASUREMENT	19
3.3. EQUIPMENT LIST	20
3.4. MEASUREMENT UNCERTAINTY	21
3.5. TISSUE DIELECTRIC PARAMETER MEASUREMENT & SYSTEM VERIFICATION	23
3.5.1. TISSUE SIMULATING LIQUIDS	23
3.5.2. SYSTEM CHECK DESCRIPTION	25
3.5.3. TISSUE VERIFICATION	26
3.5.4. SYSTEM VERIFICATION	26
4. SAR MEASUREMENT EVALUATION	27
4.1. EUT CONFIGURATION AND SETTING	27
4.1.1. GSM CONFIGURATION AND TESTING	27
4.1.2. WCDMA CONFIGURATION AND TESTING	27
4.1.3. LTE CONFIGURATION AND TESTING	29
4.1.4. WLAN CONFIGURATION AND TESTING	30
4.2. EUT TESTING POSITION	32
4.2.1. HEAD EXPOSURE CONDITIONS	32
4.2.2. BODY-WORN ACCESSORY EXPOSURE CONDITIONS	34
4.2.3. HOTSPOT ACCESSORY EXPOSURE CONDITIONS	35
4.3. MEASURED CONDUCTED POWER RESULT	35
4.3.1. CONDUCTED POWER OF GSM BANDS	35
4.3.2. CONDUCTED POWER OF WCDMA BANDS	36
4.3.3. CONDUCTED POWER OF LTE BANDS	37
4.3.4. CONDUCTED POWER OF WLAN	44

4.3.5. CONDUCTED POWER OF BT	46
4.4. SAR TEST EXCLUSION EVALUATIONS	47
4.4.1. STANDALONE SAR TEST EXCLUSION CONSIDERATIONS	47
4.4.2. ESTIMATED SAR CALCULATION	49
4.5. SAR TESTING RESULTS	50
4.5.1. SAR TEST REDUCTION CONSIDERATIONS	50
4.5.2. SAR RESULTS FOR HEAD EXPOSURE CONDITION	52
4.5.3. SAR RESULTS FOR BODY-WORN EXPOSURE CONDITION (SEPARATION DISTANCE IS 1.0 CM)	55
4.5.4. SAR RESULTS FOR HOTSPOT EXPOSURE CONDITION (SEPARATION DISTANCE IS 1.0 CM)	57
4.5.5. SAR RESULTS FOR EXTREMITY EXPOSURE CONDITION (SEPARATION DISTANCE IS 0 CM)	60
4.6. SAR MEASUREMENT VARIABILITY	61
4.6.1. REPEATED MEASUREMENT	61
4.7. SIMULTANEOUS MULTI-BAND TRANSMISSION EVALUATION	62
4.7.1. SIMULTANEOUS TRANSMISSION SAR TEST EXCLUSION CONSIDERATIONS	62
4.7.2. SIMULTANEOUS TRANSMISSION POSSIBILITIES	63
4.7.3. MAX. STANDALONE SAR	64
4.7.4. SUM OF SAR	64

Appendix A. SAR Plots of System Verification

Appendix B. SAR Plots of SAR Measurement

Appendix C. Calibration Certificate for Probe and Dipole

Appendix D. Photographs of EUT and Setup

1. GENERAL INFORMATION

1.1. STATEMENT OF COMPLIANCE

The maximum results of Specific Absorption Rate (SAR) found during testing for the EUT are as follows:

Equipment Class	Mode	Highest Reported Head SAR _{1g} (W/kg)	Highest Reported Body-worn SAR _{1g} (1.0 cm Gap) (W/kg)	Highest Reported Hotspot SAR _{1g} (1.0 cm Gap) (W/kg)	Highest Reported Extremity SAR _{10g} (0 cm Gap) (W/kg)
Limits		1.6 W/kg	1.6 W/kg	1.6 W/kg	4 W/kg
PCB	GSM 850	0.346	0.683	0.683	N/A
	PCS 1900	0.170	0.683	1.152	N/A
	WCDMA Band II	0.199	0.748	1.165	N/A
	WCDMA Band V	0.206	0.424	0.424	N/A
	LTE Band 2	0.223	0.584	0.866	N/A
	LTE Band 4	0.085	0.371	0.452	N/A
	LTE Band 7	0.188	0.467	0.467	N/A
	LTE Band 26(5)	0.179	0.383	0.383	N/A
	LTE Band 41(38)	0.108	0.403	0.403	N/A
DTS	2.4G WLAN	0.149	0.168	0.168	N/A
NII-1	5G WLAN	0.231	0.204	0.204	N/A
NII-2A	5G WLAN	0.252	0.151	N/A	0.236
NII-2C	5G WLAN	0.196	0.101	N/A	0.252
NII-3	5G WLAN	0.254	0.157	0.160	N/A
DSS	Bluetooth	0.025	0.033	0.033	N/A
DXX	NFC	N/A	N/A	N/A	N/A
Max. SAR		0.346	0.748	1.165	0.252
Highest Simultaneous Transmission SAR		Head (W/kg)	Body-worn (W/kg)	Hotspot (W/kg)	Extremity (W/kg)
PCB + DSS		0.358	0.781	1.172	N/A
PCB + DTS		0.477	0.916	1.217	N/A
PCB + NII		0.607	0.985	1.206	N/A

1.2. CLIENT INFORMATION

Applicant:	3nStar, Inc.
Address of Applicant:	10813 NW 30th, Street, STE#110, Doral FL, 33172, USA
Manufacturer:	3nStar, Inc.
Address of Manufacturer:	10813 NW 30th, Street, STE#110, Doral FL, 33172, USA

1.3. EUT INFORMATION

1.3.1. General Description of EUT

Product Name:	NuStar 65 Portable Data Collector
Trade Mark:	
Model No.:	Nustar65
FCC ID:	YHLBLU64W
DUT Stage:	Identical Prototype
Software Version:	S651-G1-SC6101-NU419-V3.01.240830 (Provided by the customer)
Hardware Version:	S651_MA_B08D_V1.0 (Provided by the customer)
Sample No.:	1. S202408164150-ZJA01/7; 2. S202408164150-ZJA03/7
Sample Received Date:	August 16, 2024
Sample Tested Date:	August 27, 2024 to September 23, 2024

1.3.2. Description of Accessories

Adapter	
Model No.:	BI12T-050200-BdVU
Input:	100-240 V~50/60 Hz 0.5A
Output:	5.0 V $\equiv$ 2.0A

Battery	
Model No.:	BAT-655001
Battery Type:	Rechargeable Li-ion Battery
Rated Voltage:	3.87 Vdc
Limited Charge Voltage:	4.45 Vdc
Rated Capacity:	5050 mAh

Cable	
Description:	USB Type-C to USB 3.0 Type A Cable
Connector:	USB Type-C / USB 3.0 Type A
Cable Type:	Shielded without ferrite
Length:	1 Meter

Adapter (Desktop Cradle)	
Model No.:	BI24G-120200-AdU
Input:	100-240 V~50/60 Hz 0.8A
Output:	12 V $\equiv$ 2.0A

Desktop Cradle	
Model No.:	S65-HB
Input:	Input: 12.0 V $\equiv$ 2.0A
Output:	Output: 5.0 V $\equiv$ 3.0A and 4.4 V $\equiv$ 1.7A

1.3.3. EUT Tx Frequency Bands

RF Type	Band(s)	Tx Frequency Range (Unit: MHz)
GSM	GSM 850:	824.2 - 848.8
	PCS 1900:	1850.2 - 1909.8
WCDMA	WCDMA Band II:	1852.4 - 1907.6
	WCDMA Band V:	826.4 - 846.6
LTE	LTE Band 2:	1850.7 - 1909.3 (1.4M), 1851.5 - 1908.5 (3M), 1852.5 - 1907.5 (5M), 1855 - 1905 (10M), 1857.5 - 1902.5 (15M), 1860 - 1900 (20M)
	LTE Band 4:	1710.7 - 1754.3 (1.4M), 1711.5 - 1753.5 (3M), 1712.5 - 1752.5 (5M), 1715 - 1750 (10M), 1717.5 - 1747.5 (15M), 1720 - 1745 (20M)
	LTE Band 5:	824.7 - 848.3 (1.4M), 825.5 - 847.5 (3M), 826.5 - 846.5 (5M), 829 - 844 (10M)
	LTE Band 7:	2502.5 - 2567.5 (5M), 2505 - 2565 (10M), 2507.5 - 2562.5 (15M), 2510 - 2560 (20M)
	LTE Band 26:	814.7 - 848.3 (1.4M), 815.5 - 847.5 (3M), 816.5 - 846.5 (5M), 819 - 844 (10M), 821.5 - 841.5 (15M)
	LTE Band 38:	2572.5 - 2617.5 (5M), 2575 - 2615 (10M), 2577.5 - 2612.5 (15M), 2580 - 2610 (20M)
	LTE Band 41:	2557.5 - 2562.5 (5M), 2560 - 2650 (10M), 2562.5 - 2647.5 (15M), 2565 - 2645 (20M)
WLAN	2.4 GHz:	2412 - 2472
	U-NII-1:	5180 - 5240
	U-NII-2A:	5260 - 5320
	U-NII-2C:	5500 - 5720
	U-NII-3:	5745 - 5825
Bluetooth	2.4 GHz:	2402 - 2480
NFC	13.553-13.567 MHz	13.56
Note 1: According to 201504 FCC TCB workshop RF exposure slides, for overlapping bands, only larger band was tested.		
1. The maximum output power, including tolerance, for the smaller band is = the larger band to qualify for the SAR test exclusion.		
2. The channel bandwidth and other operating parameters for the smaller band is fully supported by the larger band.		
➤ Band 41 (2555 - 2655 MHz) SAR can support band 38 (2570 - 2620 MHz).		
➤ Band 26 (814 - 849 MHz) SAR can support band 5 (824 - 849 MHz).		

1.3.4. Wireless Technologies

GSM	Voice GPRS (Multi-Slot Class: 12-4UP) EDGE (Multi-Slot Class: 12-4UP)
WCDMA	RMC HSDPA HSUPA HSPA+
LTE	QPSK 16QAM 64QAM VoLTE
2.4G WLAN	802.11b 802.11g 802.11n (HT20/HT40)
5G WLAN	802.11a 802.11n (HT20/HT40) 802.11ac (VHT20/VHT40/VHT80)
Bluetooth	BR+EDR LE/2LE/LE Code
Others	GNSS Rx, NFC
Device Class (GSM)	B
Antenna Type	NFC: FPCB Antenna WWAN/WLAN/BT/GNSS: LDS Antenna
Power Reduction	Not Support
Dynamic Antenna	Not Support
Wireless Router (Hotspot)	2.4G WLAN: Support 5.2G WLAN: Support 5.3G WLAN: Not Support 5.6G WLAN: Not Support 5.8G WLAN: Support
VOIP	Not Support
Dual SIM	SIM 1: GSM + WCDMA + CDMA + LTE SIM 2: GSM + WCDMA + CDMA + LTE Note : This device support dual SIM but they share the same antenna. Since these two SIM are used for subscriber identification only and it is not related to RF identity, only SIM1 was used for SAR testing.

1.4. MAXIMUM CONDUCTED POWER

The maximum conducted average power including tune-up tolerance is shown as below.

➤ GSM

Mode	Maximum conducted average power (dBm)	
	GSM 850	DCS 1900
GSM (GMSK, 1Tx-slot)	32.5	31.5
GPRS (GMSK, 1Tx-slot)	32.5	31.5
GPRS (GMSK, 2Tx-slot)	32.0	30.5
GPRS (GMSK, 3Tx-slot)	30.5	29.0
GPRS (GMSK, 4Tx-slot)	30.0	28.25
EDGE (8PSK, 1Tx-slot)	28.5	27.5
EDGE (8PSK, 2Tx-slot)	27.0	26.5
EDGE (8PSK, 3Tx-slot)	24.5	24.5
EDGE (8PSK, 4Tx-slot)	23.5	23.5

➤ WCDMA

Mode	Maximum conducted average power (dBm)	
	WCDMA Band II	WCDMA Band V
RMC 12.2K	24.75	24.0
HSDPA Subtest-1	24.0	23.0
HSDPA Subtest-2	23.5	22.5
HSDPA Subtest-3	23.5	22.5
HSDPA Subtest-4	23.5	22.5
HSUPA Subtest-1	22.0	21.0
HSUPA Subtest-2	21.0	21.0
HSUPA Subtest-3	23.0	22.0
HSUPA Subtest-4	21.5	20.5
HSUPA Subtest-5	23.0	22.0

➤ LTE

Band	Mode	Maximum conducted average power (dBm)
LTE Band 2	QPSK/16QAM/64QAM	25.0
LTE Band 4	QPSK/16QAM/64QAM	25.0
LTE Band 5	QPSK/16QAM/64QAM	24.0
LTE Band 7	QPSK/16QAM/64QAM	22.5
LTE Band 26	QPSK/16QAM/64QAM	24.5
LTE Band 38	QPSK/16QAM/64QAM	22.0
LTE Band 41	QPSK/16QAM/64QAM	22.0

➤ 2.4GHz WLAN

Mode	Maximum conducted average power (dBm)
802.11b	17.0
802.11g	13.5
802.11n-HT20	13.5
802.11n-HT40	15.0

➤ **5GHz WLAN**

Mode	Maximum conducted average power (dBm)			
	U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
802.11a	14.5	14.5	14.5	14.5
802.11n-HT20	14.0	14.0	14.0	14.0
802.11n-HT40	14.0	14.0	9.0	14.0
802.11ac-VHT20	14.0	14.0	14.0	14.0
802.11ac-VHT40	14.0	14.0	9.0	14.0
802.11ac-VHT80	14.0	14.0	11.5	14.0

➤ **Bluetooth**

Mode	Modulation	Maximum conducted average power (dBm)
BR + EDR	GFSK	8.0
	$\pi/4$ -DQPSK	5.0
	8-DPSK	5.0
LE	GFSK	5.0
2LE	GFSK	3.5
LE Code (S=2)	GFSK	5.5
LE Code (S=8)	GFSK	6.0

1.5. OTHER INFORMATION

None.

1.6. TEST LOCATION

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1.7. TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

Shenzhen UnionTrust Quality and Technology Co., Ltd.

CNAS-Lab Code: L9069

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

A2LA-Lab Certificate No.: 4312.01

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED Wireless Device Testing Laboratories

CAB identifier: CN0032

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FCC Accredited Lab.

Designation Number: CN1194

Test Firm Registration Number: 259480

1.8. GUIDANCE STANDARD

The tests documented in this report were performed in accordance with FCC 47 CFR Part 2 §2.1093, IEEE Std 1528-2013, ANSI/IEEE C95.1-1992, the following FCC Published RF exposure KDB procedures:

KDB 865664 D01 v01r04

KDB 865664 D02 v01r02

KDB 248227 D01 v02r02

KDB 447498 D04 v01

KDB 648474 D04 v01r03

KDB 941225 D01 v03r01

KDB 941225 D05 v02r05

KDB 941225 D05A v01r02

KDB 941225 D06 v02r01

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2. SPECIFIC ABSORPTION RATE (SAR)

2.1. INTRODUCTION

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling, by appropriate techniques, to produce specific absorption rates (SARs) as averaged over the whole-body, any 1 g or any 10 g of tissue (defined as a tissue volume in the shape of a cube). All SAR values are to be averaged over any six-minute period. When portable device was used within 20 cm of the user's body, SAR evaluation of the device will be required. The SAR limit in chapter 2.3.

2.2. SAR DEFINITION

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

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

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

SAR measurement can be related to the electrical field in the tissue by

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

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

2.3. SAR LIMITS

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

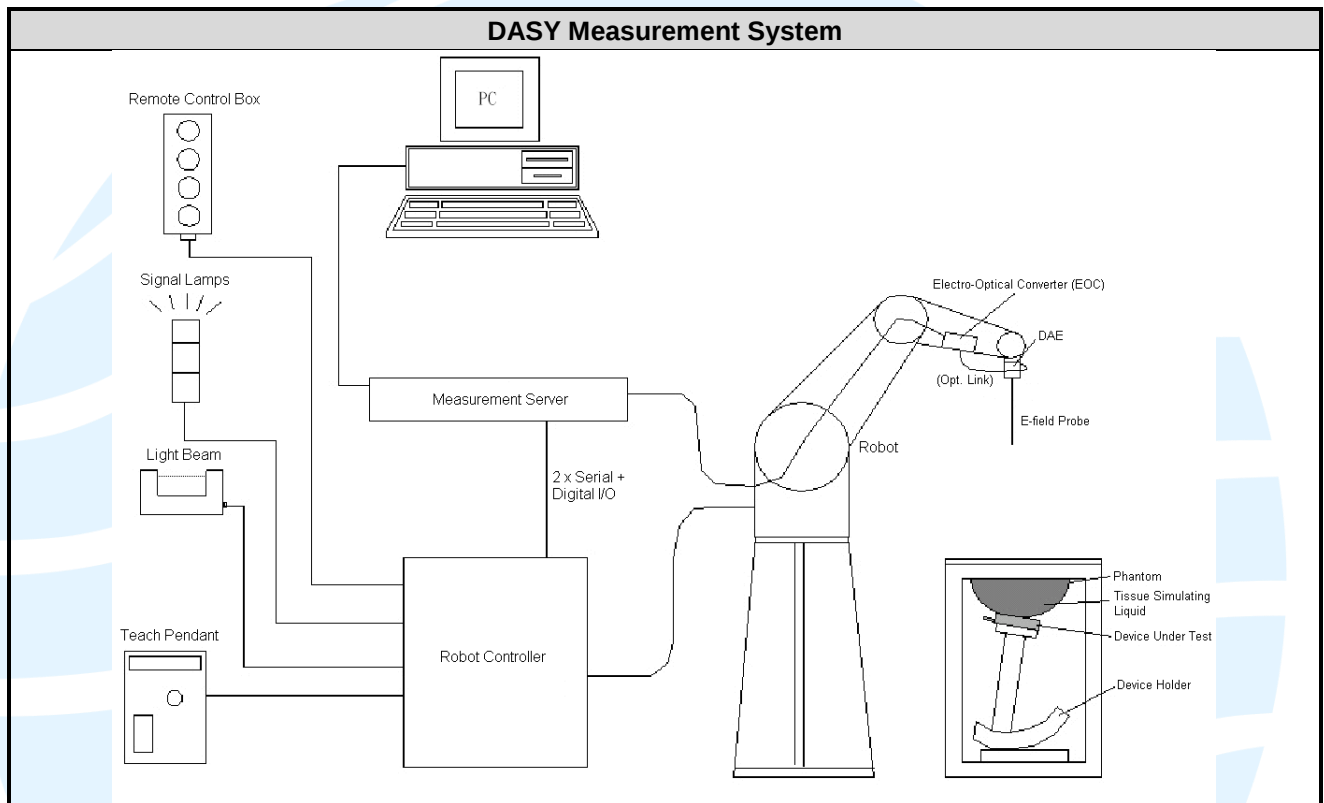
Note:

- 1) Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.
- 2) At frequencies above 6.0 GHz, SAR limits are not applicable and MPE limits for power density should be applied at 5 cm or more from the transmitting device.
- 3) The SAR limit is specified in FCC 47 CFR Part 2 §2.1093, ANSI/IEEE C95.1-1992.

3. SAR MEASUREMENT SYSTEM

3.1. SPEAG DASY SYSTEM

DASY system consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY5 software defined. The DASY software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC.



3.1.1. Robot

The DASY system uses the high precision robots from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY4: CS7MB) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ± 0.02 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

3.1.2. Probe

The SAR measurement is conducted with the dosimetric probe. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.

Model	EX3DV4	
Construction	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).	
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 μ W/g to 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)	
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

Model	ES3DV3	
Construction	Symmetrical design with triangular core. Interleaved sensors. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).	
Frequency	10 MHz to 4 GHz Linearity: ± 0.2 dB	
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	5 μ W/g to 100 mW/g Linearity: ± 0.2 dB	
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm	

3.1.3. Data Acquisition Electronics (DAE)

Model	DAE3, DAE4	
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY embedded system (fully remote controlled). Two step probe touch detectors for mechanical surface detection and emergency robot stop.	
Measurement Range	-100 to +300 mV (16-bit resolution and two range settings: 4mV, 400mV)	
Input Voltage Offset	< 5 μ V (with auto zero)	
Input Bias Current	< 50 fA	
Dimensions	60 x 60 x 68 mm	

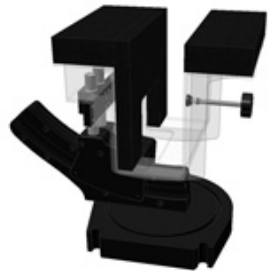
3.1.4. Phantom

Model	Twin SAM	
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)	
Dimensions	Length: 1000 mm Width: 500 mm Height: adjustable feet	
Filling Volume	approx. 25 liters	

Model	ELI	
Construction	Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	

3.1.5. Device Holder

Model	Mounting Device	
Construction	In combination with the Twin SAM Phantom or ELI4, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Rotation point is the ear opening point. Transmitter devices can be easily and accurately positioned according to IEC, IEEE, FCC or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).	
Material	POM	

Model	Laptop Extensions Kit	
Construction	Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.). It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner.	
Material	POM, Acrylic glass, Foam	

3.1.6. System Validation Dipoles

Model	D-Serial	
Construction	Symmetrical dipole with 1/4 balun. Enables measurement of feed point impedance with NWA. Matched for use near flat phantoms filled with tissue simulating solutions.	
Frequency	750 MHz to 5800 MHz	
Return Loss	> 20 dB	
Power Capability	> 100 W (f < 1GHz), > 40 W (f > 1GHz)	

3.2. SAR SCAN PROCEDURE

3.2.1. SAR Reference Measurement (drift)

Prior to the SAR test, local SAR shall be measured at a stationary reference point where the SAR exceeds the lower detection limit of the measurement system.

3.2.2. Area Scan

Measurement procedures for evaluating the SAR of wireless device start with a coarse measurement grid to determine the approximate location of the local peak SAR values. This is known as the area-scan procedure. All antennas and radiating structures that may contribute to the measured SAR or influence the SAR distribution must be included in the area scan. The area scan measurement resolution must enable the extrapolation algorithms of the SAR system to correctly identify the peak SAR location(s) for subsequent zoom scan measurements to correctly determine the 1-g SAR. Area scans are performed at a constant distance from the phantom surface, determined by the measurement frequencies. When a measured peak is closer than ½ the zoom scan volume dimension (x, y) from the edge of the area scan region, unless the entire peak and gram-averaging volume are both captured within the zoom scan volume, the area scan must be repeated by shifting and expanding the area scan region to ensure all peaks are away from the area scan boundary. The area scan resolutions specified in the table below must be applied to the SAR measurements.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 mm ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2)$ mm ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scans 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 ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

3.2.3. Zoom Scan

To evaluate the peak spatial-average SAR values with respect to 1 g or 10 g cubes, fine resolution volume scans, called zoom scans, are performed at the peak SAR locations identified during the area scan. If the cube volume within the zoom scan chosen to calculate the peak spatial-average SAR touches any boundary of the zoom-scan volume, the zoom scan shall be repeated with the center of the zoom-scan volume shifted to the new maximum SAR location. For any secondary peaks found in the area scan that are within 2 dB of the maximum peak and are not within this zoom scan, the zoom scan shall be performed for such peaks, unless the peak spatial-average SAR at the location of the maximum peak is more than 2 dB below the applicable SAR limit (i.e., 1 W/kg for a 1.6 W/kg 1 g limit, or 1.26 W/kg for a 2 W/kg 10 g limit). The zoom scan resolutions specified in the table below must be applied to the SAR measurements.

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: $\Delta x_{Zoom}, \Delta y_{Zoom}$			≤ 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	≤ 1.5· $\Delta Z_{Zoom}(n-1)$ 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 reported SAR from the area scan based 1-g SAR estimation 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.				

3.2.4. SAR Drift Measurement

The local SAR (or conducted power) shall be measured at exactly the same location as in 3.2.1 section. The absolute value of the measurement drift (the difference between the SAR measured in 3.2.1 and 3.2.4 section) shall be recorded. The SAR drift shall be kept within ± 5%.

3.3. EQUIPMENT LIST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval
System Validation Dipole	SPEAG	D835V2	4d005	Mar. 15, 2024	3 Year
System Validation Dipole	SPEAG	D1750V2	1086	Mar. 14, 2024	3 Year
System Validation Dipole	SPEAG	D1900V2	509	Mar. 14, 2024	3 Year
System Validation Dipole	SPEAG	D2450V2	883	Jan. 02, 2024	3 Year
System Validation Dipole	SPEAG	D2600V2	1082	Jan. 03, 2024	3 Year
System Validation Dipole	SPEAG	D5GHzV2	1115	Jan. 02, 2024	3 Year
Dosimetric E-Field Probe	SPEAG	ES3DV3	3090	Mar. 26, 2024	1 Year
Data Acquisition Electronics	SPEAG	DAE4	662	Mar. 18, 2024	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	7738	Dec. 13, 2023	1 Year
Data Acquisition Electronics	SPEAG	DAE4	1725	Oct. 26, 2023	1 Year
Wideband Radio Communication Tester	R&S	CMW500	120932	Mar. 29, 2024	1 Year
ENA Series Network Analyzer	Agilent	8753ES	US39170317	Oct. 31, 2023	1 Year
Twin Phantom	SPEAG	SAM	TP-1376	N/A	N/A
Twin Phantom	SPEAG	SAM	TP-1378	N/A	N/A
Robot controller	STAUBLI	CS7MB	F05/511KA1/A/01	N/A	N/A
Robot	STAUBLI	RX90BL	F05/511KA1/A/01	N/A	N/A
Dielectric Assessment Kit	SPEAG	DAK-3.5	1056	N/A	N/A
USB/GPIB Interface	Agilent	82357B	N10149	N/A	N/A
Signal Generator	R&S	SMB100A	103718	Mar. 29, 2024	1 Year
POWER METER	R&S	NRP	101293	Oct. 27, 2023	1 Year
Thermometer	Shanghai Gao Zhi Precision Instrument Co., Ltd.	HB6801	18022507	Oct. 29, 2023	1 Year
Dual Directional Coupler	Agilent	778D	MY52180234	Oct. 27, 2023	1 Year
Amplifier	Mini-Circuit	ZHL42	QA1252001	Mar. 29, 2024	1 Year
DC Source	Agilent	66319B	MY43000795	Oct. 31, 2023	1 Year

3.4. MEASUREMENT UNCERTAINTY

TABLE 1 EXPOSURE ASSESSMENT UNCERTAINTY FOR HANDSET SAR

Source of Uncertainty	Tolerance (± %)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g) (± %)	Standard Uncertainty (10g) (± %)	Vi Veff
Measurement System								
Probe Calibration (< 3 GHz)	7.5	N (k=2)	2	1	1	3.75	3.75	∞
Probe Calibration (> 3 GHz)	6.3	N (k=2)	2	1	1	3.15	3.15	∞
Axial Isotropy	1.2	N (k=2)	2	0.7	0.7	0.42	0.42	∞
Hemispherical Isotropy	3.2	N (k=2)	2	0.7	0.7	1.12	1.12	∞
Boundary Effects	2	Rectangular	√3	1	1	1.15	1.15	∞
Linearity	0.9	N (k=2)	2	1	1	0.45	0.45	∞
Detection Limits	0.25	Rectangular	√3	1	1	0.14	0.14	∞
Modulation Response	2.4	Rectangular	√3	1	1	1.39	1.39	∞
Readout Electronics	0.3	Normal	1	1	1	0.30	0.30	∞
Response Time	0	Rectangular	√3	1	1	0.00	0.00	∞
Integration Time	1.7	Rectangular	√3	1	1	0.98	0.98	∞
RF Ambient – Noise	3	Rectangular	√3	1	1	1.73	1.73	∞
RF Ambient – Reflections	3	Rectangular	√3	1	1	1.73	1.73	∞
Probe Positioner	0.4	Rectangular	√3	1	1	0.23	0.23	∞
Probe Positioning	6.7	Rectangular	√3	1	1	3.87	3.87	∞
Max. SAR Evaluation	4	Rectangular	√3	1	1	2.31	2.31	∞
Test Sample Related								
Device Positioning	2.3 / 2.4	Normal	1	1	1	2.30	2.40	30
Device Holder	2.8 / 2.8	Normal	1	1	1	2.80	2.80	30
Power Drift	5	Rectangular	√3	1	1	2.89	2.89	∞
Power Scaling	0	Rectangular	√3	1	1	0.00	0.00	∞
Phantom and Setup								
Phantom Uncertainty	7.9	Rectangular	√3	1	1	4.56	4.56	∞
SAR correction	1.2 / 0.97	Rectangular	√3	1	0.84	0.69	0.47	∞
Liquid Conductivity (Meas.)	2.5	Rectangular	√3	0.78	0.71	1.13	1.02	∞
Liquid Permittivity (Meas.)	2.5	Rectangular	√3	0.26	0.26	0.38	0.38	∞
Temp. unc. - Conductivity	3.4	Rectangular	√3	0.78	0.71	1.53	1.39	∞
Temp. unc. - Permittivity	0.4	Rectangular	√3	0.23	0.26	0.05	0.06	∞
Combined Standard Uncertainty (k = 1) (≤ 3 GHz)						9.64	9.62	
Combined Standard Uncertainty (k = 1) (> 3 GHz)						9.42	9.40	
Max. Expanded Uncertainty (k = 2)						19.27	19.23	

TABLE 2 SYSTEM VALIDATION Measurement uncertainty

Source of Uncertainty	Tolerance (± %)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g) (± %)	Standard Uncertainty (10g) (± %)	Vi Veff
Measurement System								
Probe Calibration (< 3 GHz)	7.5	N (k=2)	2	1	1	3.75	3.75	∞
Probe Calibration (> 3 GHz)	6.3	N (k=2)	2	1	1	3.15	3.15	∞
Axial Isotropy	1.2	N (k=2)	2	0.7	0.7	0.42	0.42	∞
Hemispherical Isotropy	3.2	N (k=2)	2	0.7	0.7	1.12	1.12	∞
Boundary Effects	2	Rectangular	√3	1	1	1.15	1.15	∞
Linearity	0.9	N (k=2)	2	1	1	0.45	0.45	∞
Detection Limits	0.25	Rectangular	√3	1	1	0.14	0.14	∞
Modulation Response	2.4	Rectangular	√3	1	1	1.39	1.39	∞
Readout Electronics	0.3	Normal	1	1	1	0.30	0.30	∞
Response Time	0	Rectangular	√3	1	1	0.00	0.00	∞
Integration Time	1.7	Rectangular	√3	1	1	0.98	0.98	∞
RF Ambient – Noise	3	Rectangular	√3	1	1	1.73	1.73	∞
RF Ambient – Reflections	3	Rectangular	√3	1	1	1.73	1.73	∞
Probe Positioner	0.4	Rectangular	√3	1	1	0.23	0.23	∞
Probe Positioning	6.7	Rectangular	√3	1	1	3.87	3.87	∞
Max. SAR Evaluation	4	Rectangular	√3	1	1	2.31	2.31	∞
Test Sample Related								
Device Positioning	2.3 / 2.4	Normal	1	1	1	2.30	2.40	30
Device Holder	2.8 / 2.8	Normal	1	1	1	2.80	2.80	30
Power Drift	5	Rectangular	√3	1	1	2.89	2.89	∞
Power Scaling	0	Rectangular	√3	1	1	0.00	0.00	∞
Phantom and Setup								
Phantom Uncertainty	7.9	Rectangular	√3	1	1	4.56	4.56	∞
SAR correction	1.2 / 0.97	Rectangular	√3	1	0.84	0.69	0.47	∞
Liquid Conductivity (Meas.)	2.5	Rectangular	√3	0.78	0.71	1.13	1.02	∞
Liquid Permittivity (Meas.)	2.5	Rectangular	√3	0.26	0.26	0.38	0.38	∞
Temp. unc. - Conductivity	3.4	Rectangular	√3	0.78	0.71	1.53	1.39	∞
Temp. unc. - Permittivity	0.4	Rectangular	√3	0.23	0.26	0.05	0.06	∞
Combined Standard Uncertainty (k = 1) (≤ 3 GHz)						9.64	9.62	
Combined Standard Uncertainty (k = 1) (> 3 GHz)						9.42	9.40	
Max. Expanded Uncertainty (k = 2)						19.27	19.23	

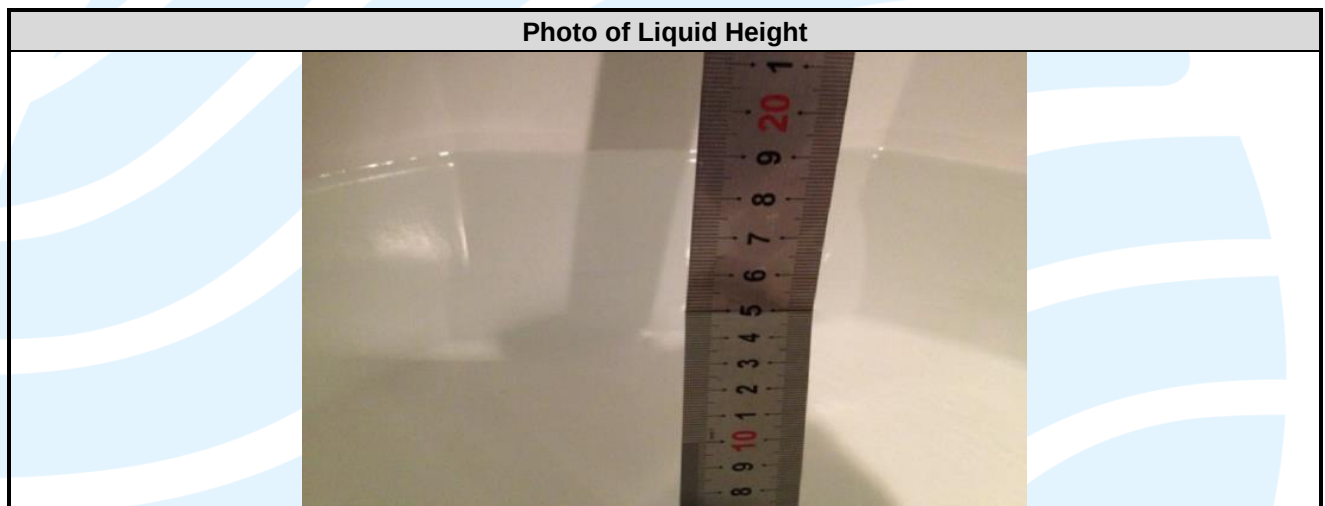
3.5. TISSUE DIELECTRIC PARAMETER MEASUREMENT & SYSTEM VERIFICATION

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

3.5.1. Tissue Simulating Liquids

The temperature of the tissue-equivalent medium used during measurement must also be within 18 °C to 25 °C and within ± 2 °C of the temperature when the tissue parameters are characterized. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 - 4 days of use; or earlier if the dielectric parameters can become out of tolerance.

The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm with $\leq \pm 0.5$ cm variation for SAR measurements ≤ 3 GHz and ≥ 10.0 cm with $\leq \pm 0.5$ cm variation for measurements > 3 GHz. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in Table-3.1.



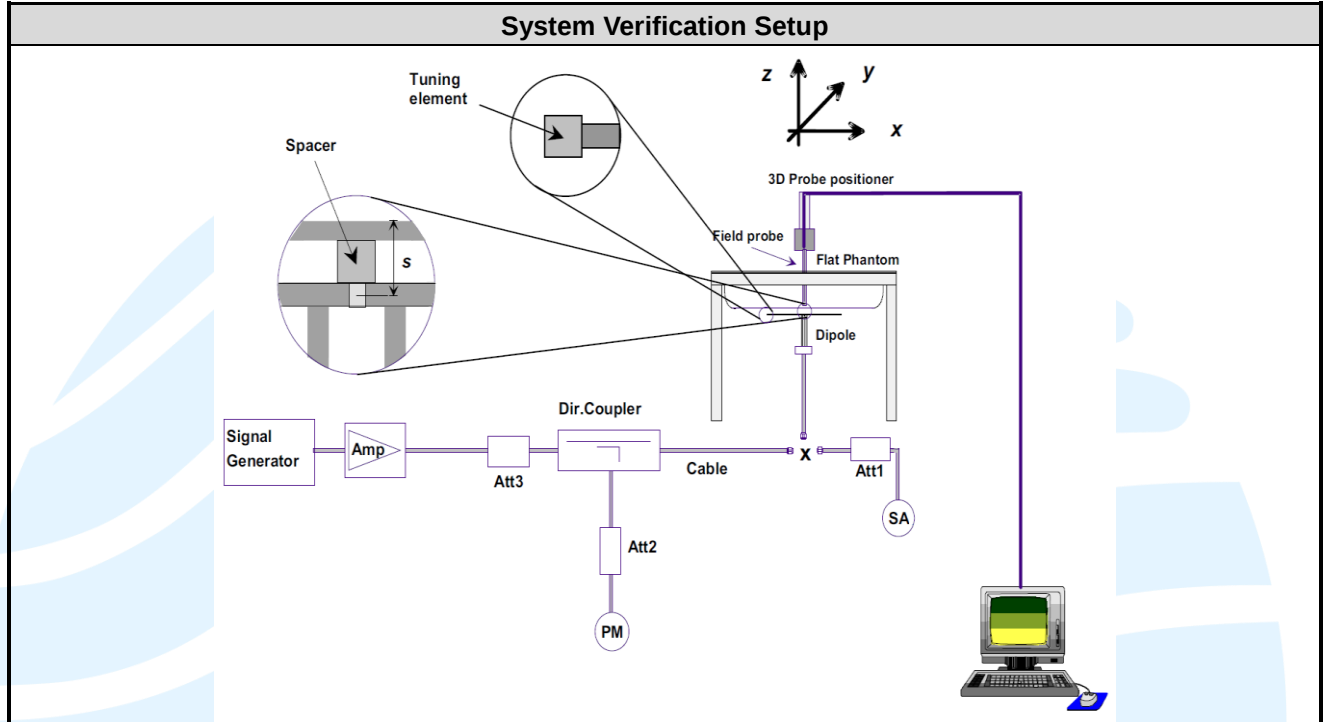
Tissue Dielectric Parameters for Head and Body				
Target Frequency	Head		Body	
(MHz)	ϵ_r	σ (S/m)	ϵ_r	σ (S/m)
750	41.9	0.89	55.5	0.96
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
1450	40.5	1.20	54.0	1.30
1640	40.3	1.29	53.8	1.40
1750	40.1	1.37	53.4	1.49
1800	40.0	1.40	53.3	1.52
1900	40.0	1.40	53.3	1.52
2000	40.0	1.40	53.3	1.52
2300	39.5	1.67	52.9	1.81
2450	39.2	1.80	52.7	1.95
2600	39.0	1.96	52.5	2.16
3500	37.9	2.91	51.3	3.31
5200	36.0	4.66	49.0	5.30
5300	35.9	4.76	48.9	5.42
5500	35.6	4.96	48.6	5.65
5600	35.5	5.07	48.5	5.77
5800	35.3	5.27	48.2	6.00
(ϵ_r = relative permittivity, σ = conductivity and $\rho = 1000$ kg/m ³)				

The following table gives the recipes for tissue simulating liquids.

Recipes of Tissue Simulating Liquid								
Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
H750	0.2	-	0.2	1.4	57.0	-	41.1	-
H835	0.1	-	1.0	1.4	57.0	-	40.5	-
H900	0.1	-	1.0	1.5	56.5	-	40.9	-
H1450	-	45.5	-	0.7	-	-	53.8	-
H1640	-	45.8	-	0.5	-	-	53.7	-
H1750	-	44.5	-	0.3	-	-	55.2	-
H1800	-	44.9	-	0.2	-	-	54.9	-
H1900	-	44.9	-	0.2	-	-	54.9	-
H2000	-	50	-	-	-	-	50	-
H2300	-	44.9	-	0.1	-	-	55.0	-
H2450	-	45.0	-	0.1	-	-	54.9	-
H2600	-	45.1	-	0.1	-	-	54.8	-
H3500	-	8.0	-	0.2	-	20.0	71.8	-
H5G	-	-	-	-	-	17.2	65.52	17.3
B750	0.2	-	0.2	0.8	48.8	-	50.0	-
B835	0.2	-	0.2	0.9	48.5	-	50.2	-
B900	0.2	-	0.2	0.9	48.2	-	50.5	-
B1450	-	34.0	-	0.3	-	-	65.7	-
B1640	-	32.5	-	0.3	-	-	67.2	-
B1750	-	29.4	-	0.4	-	-	70.2	-
B1800	-	29.5	-	0.4	-	-	70.1	-
B1900	-	29.5	-	0.3	-	-	70.2	-
B2000	-	30.0	-	0.2	-	-	69.8	-
B2300	-	31.0	-	0.1	-	-	68.9	-
B2450	-	31.4	-	0.1	-	-	68.5	-
B2600	-	31.8	-	0.1	-	-	68.1	-
B3500	-	28.8	-	0.1	-	-	71.1	-
B5G	-	-	-	-	-	10.7	78.6	10.7

3.5.2. System Check Description

The system check procedure provides a simple, fast, and reliable test method that can be performed daily or before every SAR measurement. The objective here is to ascertain that the measurement system has acceptable accuracy and repeatability. This test requires a flat phantom and a radiating source. The system verification setup is shown as below.



3.5.3. Tissue Verification

The measuring results for tissue simulating liquid are shown as below.

Test Date	Tissue Type	Frequency (MHz)	Liquid Temp. (°C)	Measured Conductivity (σ)	Measured Permittivity (ϵ_r)	Target Conductivity (σ)	Target Permittivity (ϵ_r)	Conductivity Deviation (%)	Permittivity Deviation (%)
Sep. 10, 2024	Head	835	22.8	0.887	41.197	0.90	41.50	-1.43	-0.73
Sep. 11, 2024	Head	835	21.5	0.890	41.443	0.90	41.50	-1.07	-0.14
Sep. 06, 2024	Head	1750	22.5	1.364	40.313	1.37	40.10	-0.44	0.53
Sep. 07, 2024	Head	1900	22.6	1.437	39.739	1.40	40.00	2.64	-0.65
Sep. 08, 2024	Head	1900	22.3	1.413	41.330	1.40	40.00	0.93	3.33
Sep. 23, 2024	Head	1900	22.5	1.388	39.821	1.40	40.00	-0.86	-0.45
Sep. 05, 2024	Head	2450	21.3	1.783	40.180	1.80	39.20	-0.94	2.50
Sep. 21, 2024	Head	2600	21.7	2.053	38.335	1.96	39.00	4.74	-1.71
Aug. 27, 2024	Head	5250	21.8	4.561	37.438	4.71	35.90	-3.16	4.28
Aug. 27, 2024	Head	5600	21.8	4.938	36.734	5.07	35.50	-2.60	3.48
Aug. 28, 2024	Head	5800	21.6	5.145	36.469	5.27	35.30	-2.37	3.31

Note:

The dielectric properties of the tissue simulating liquid must be measured within 24 hours before the SAR testing and within $\pm 5\%$ of the target values. The variation of the liquid temperature must be within $\pm 2^\circ\text{C}$ during the test.

3.5.4. System Verification

The measuring result for system verification is tabulated as below.

Test Date	Tissue Type	Freq. (MHz)	1W Target SAR-1g (W/kg)	1W Target SAR-10g (W/kg)	Measured SAR-1g (W/kg)	Measured SAR-10g (W/kg)	Normalized to 1W SAR-1g (W/kg)	Normalized to 1W SAR-10g (W/kg)	Deviation 1g(%)	Deviation 10g(%)	Dipole S/N	Probe S/N	DAE S/N
Sep. 10, 2024	Head	835	9.61	6.23	2.420	1.580	9.68	6.32	0.73	1.44	4d005	3090	662
Sep. 11, 2024	Head	835	9.61	6.23	2.500	1.630	10.00	6.52	4.06	4.65	4d005	3090	662
Sep. 06, 2024	Head	1750	36.80	19.50	9.380	5.130	37.52	20.52	1.96	5.23	1086	3090	662
Sep. 07, 2024	Head	1900	40.00	20.90	10.100	5.300	40.40	21.20	1.00	1.44	509	3090	662
Sep. 08, 2024	Head	1900	40.00	20.90	9.340	4.910	37.36	19.64	-6.60	-6.03	509	3090	662
Sep. 23, 2024	Head	1900	40.00	20.90	9.340	4.990	37.36	19.96	-6.60	-4.50	509	3090	662
Sep. 05, 2024	Head	2450	53.70	24.80	14.200	6.570	56.80	26.28	5.77	5.97	883	3090	662
Sep. 21, 2024	Head	2600	56.10	24.80	14.600	6.510	58.40	26.04	4.10	5.00	1082	3090	662
Aug. 27, 2024	Head	5250	78.60	22.30	7.95	2.26	79.50	22.60	1.15	1.35	1115	7738	1725
Aug. 27, 2024	Head	5600	81.90	23.10	8.40	2.36	84.00	23.60	2.56	2.16	1115	7738	1725
Aug. 28, 2024	Head	5800	78.60	22.00	8.30	2.31	83.00	23.10	5.60	5.00	1115	7738	1725

Note:

Comparing to the reference SAR value, the validation data should be within its specification of 10%. The result indicates the system check can meet the variation criterion and the plots can be referred to Appendix A of this report.

4. SAR MEASUREMENT EVALUATION

4.1. EUT CONFIGURATION AND SETTING

Connections between EUT and System Simulator

For WWAN SAR testing, the EUT was linked and controlled by base station emulator. Communication between the EUT and the emulator was established by air link. The distance between the EUT and the communicating antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of EUT. The EUT was set from the emulator to radiate maximum output power during SAR testing.

4.1.1. GSM Configuration and Testing

GSM (GMSK: CS1) voice mode transmits with 1 time slot. GPRS (GMSK: CS1) and EDGE (GMSK: MCS1, 8PSK: MCS9) may transmit up to 4 time slots in the 8 time-slot frame according to the multislot class implemented in a device.

4.1.2. WCDMA Configuration and Testing

WCDMA Handsets Head SAR

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode.

WCDMA Handsets Body-worn SAR

SAR for body-worn configurations is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by the handset with 12.2 kbps RMC as the primary mode.

Handsets with Release 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body-worn configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSDPA using the HSDPA body SAR procedures in the "Release 5 HSDPA Data Devices", for the highest reported SAR body-worn exposure configuration in 12.2 kbps RMC. Handsets with both HSDPA and HSUPA are tested according to Release 6 HSPA test procedures.

Handsets with Release 6 HSUPA

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body-worn configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures in the "Release 6 HSPA Data Devices", for the highest reported body-worn exposure SAR configuration in 12.2 kbps RMC. When VOIP is applicable for next to the ear head exposure in HSPA, the 3G SAR test reduction procedure is applied to HSPA with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body-worn measurements is tested for next to the ear head exposure.

Release 5 HSDPA Data Devices

The 3G SAR test reduction procedure is applied to body SAR with 12.2 kbps RMC as the primary mode. Otherwise, body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, for the highest reported SAR configuration in 12.2 kbps RMC without HSDPA. HSDPA is configured according to the applicable UE category of a test device. The number of HS-DSCH / HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms and a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors (β_c , β_d), and HS-DPCCH power offset parameters (Δ_{ACK} , Δ_{NACK} , Δ_{CQI}) are set according to values indicated in below. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

Sub-test	β_c	β_d	β_d (SF)	β_c / β_d	$\beta_{hs}^{(1)}$	CM (dB) ⁽²⁾	MPR
1	2 / 15	15 / 15	64	2 / 15	4 / 15	0.0	0

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2	12 / 15 ⁽³⁾	15 / 15 ⁽³⁾	64	12 / 15 ⁽³⁾	24 / 15	1.0	0
3	15 / 15	8 / 15	64	15 / 8	30 / 15	1.5	0.5
4	15 / 15	4 / 15	64	15 / 4	30 / 15	1.5	0.5

Note 1: Δ_{ACK} , Δ_{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 $\beta_d = 15 / 15$.

Release 6 HSPA Data Devices

The 3G SAR test reduction procedure is applied to body SAR with 12.2 kbps RMC as the primary mode. Otherwise, body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 and power control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode. Otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing. Due to inner loop power control requirements in HSPA, a communication test set is required for output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA are configured according to the β values indicated in below.

Sub-test	β_c	β_d	β_d (SF)	β_c / β_d	β_{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 $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs} / \beta_c = 30 / 15 \Leftrightarrow \beta_{hs} = 30 / 15 * \beta_c$.

Note 2: CM = 1 for $\beta_c / \beta_d = 12 / 15$, $\beta_{hs} / \beta_c = 24 / 15$. 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_c / 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 $\beta_c = 10 / 15$ and $\beta_d = 15 / 15$.

Note 4: For subtest 5 the β_c / 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 $\beta_c = 14 / 15$ 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.

HSPA+ SAR Guidance

The 3G SAR test reduction procedure is applied to HSPA+ (uplink) with 12.2 kbps RMC as the primary mode. Otherwise, when SAR is required for Rel. 6 HSPA, SAR is required for Rel. 7 HSPA+. Power is measured for HSPA+ that supports uplink 16QAM according to configurations in Table C.11.1.4 of 3GPP TS 34.121-1 to determine SAR test reduction.

DC-HSDPA SAR Guidance

The 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Otherwise, when SAR is required for Rel. 5 HSDPA, SAR is required for Rel. 8 DC-HSDPA. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

Uplink-Downlink Configurations and duty cycle												
Uplink-Downlink Configuration	Downlink-to-Uplink Switch-Point Periodicity	Subframe Number										Duty-Cycle
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33%
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33%
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33%
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67%
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67%
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67%
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33%

Considering the highest transmission duty cycle, TDD-LTE was tested using Uplink-Downlink Configuration 0 with 6 uplink subframe and 2 special subframe. The special subframe was set to special subframe configuration 7 using extended cyclic prefix uplink. Therefore, SAR testing for TDD-LTE was performed at the maximum output power with highest transmission duty cycle of 63.33%.

4.1.4. WLAN Configuration and Testing

In general, various vendor specific external test software and chipset based internal test modes are typically used for SAR measurement. These chipset-based test mode utilities are generally hardware and manufacturer dependent, and often include substantial flexibility to reconfigure or reprogram a device. A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement. The test frequencies established using test mode must correspond to the actual channel frequencies. 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. In addition, a periodic transmission duty factor is required for current generation SAR systems to measure SAR correctly. The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

According to KDB 248227 D01, this device has installed WLAN engineering testing software which can provide continuous transmitting RF signal. During WLAN SAR testing, this device was operated to transmit continuously at the maximum transmission duty with specified transmission mode, operating frequency, lowest data rate, and maximum output power.

Initial Test Configuration

An initial test configuration is determined for OFDM transmission modes in 2.4 GHz and 5 GHz bands according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.

Subsequent Test Configuration

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. Additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. When the highest reported SAR for the initial test configuration according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.

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SAR Test Configuration and Channel Selection

When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the initial test configuration is using largest channel bandwidth, lowest order modulation, lowest data rate, and lowest order 802.11 mode (i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n). After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following.

- 1) The channel closest to mid-band frequency is selected for SAR measurement.
- 2) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

Test Reduction for U-NII-1 (5.2 GHz) and U-NII-2A (5.3 GHz) Bands

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.

- 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).
- 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.

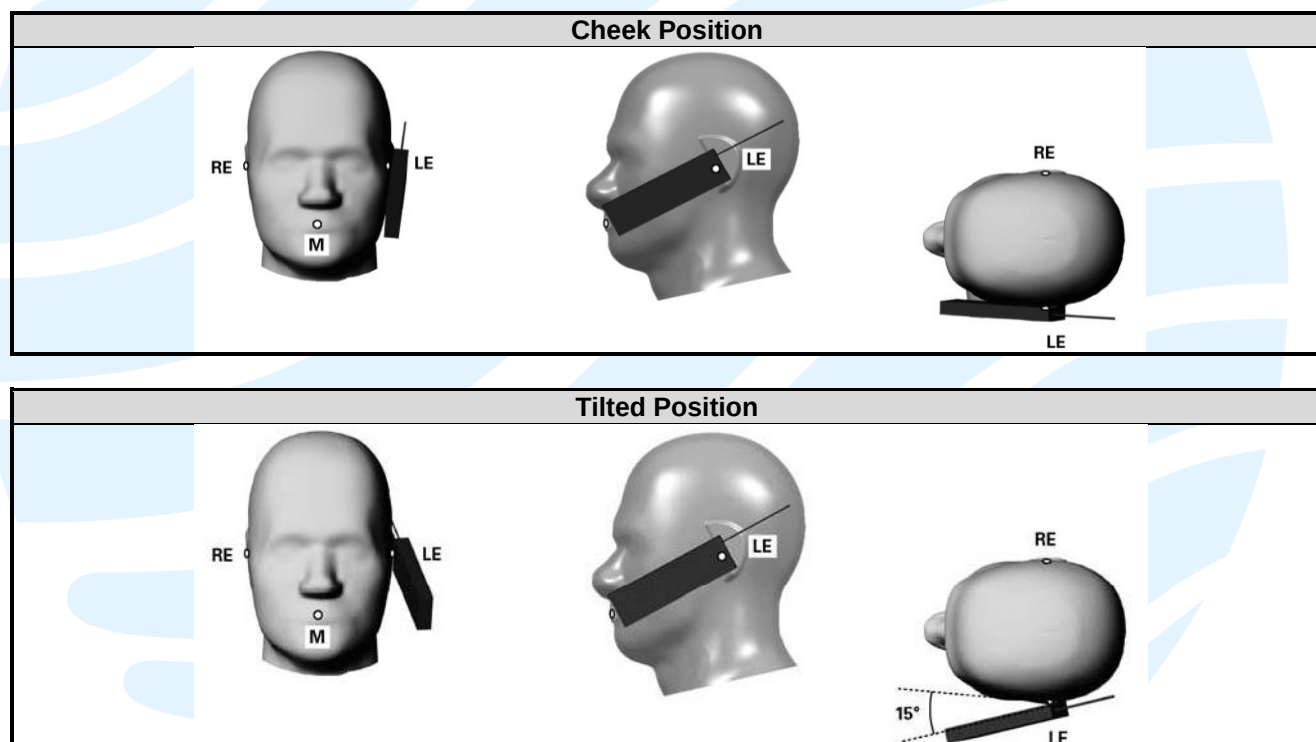
4.2. EUT TESTING POSITION

4.2.1. Head Exposure Conditions

RF Exposure Conditions	Test Position	Separation Distance	SAR test exclusion
Head	Right Cheek	0 cm	N/A
	Right Tilted		
	Left Cheek		
	Left Tilted		

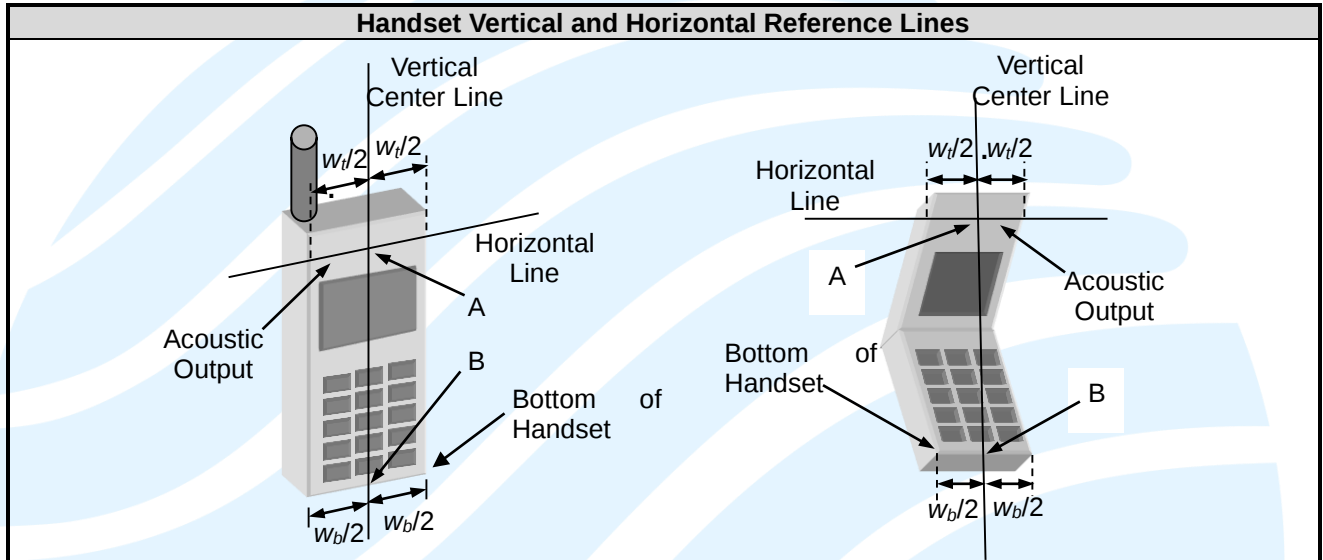
Note:

- 1) Head exposure for voice mode of handset is limited to next to the ear exposure conditions.
- 2) Devices that are designed to transmit next to the ear must be tested using the SAM phantom.
- 3) Other head exposure conditions, for example, in-front-of the face, should be tested using a flat phantom according to the required published RF exposure KDB procedures.
- 4) When data mode operates in next to the ear configurations, either data alone or in conjunction with voice transmissions, SAR evaluation is required for such use conditions.
- 5) When device supports VoIP, SAR evaluation for head Exposure Conditions using the most appropriate wireless data mode configurations is required.



Define two imaginary lines on the handset

- 1) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.
- 2) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.
- 3) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

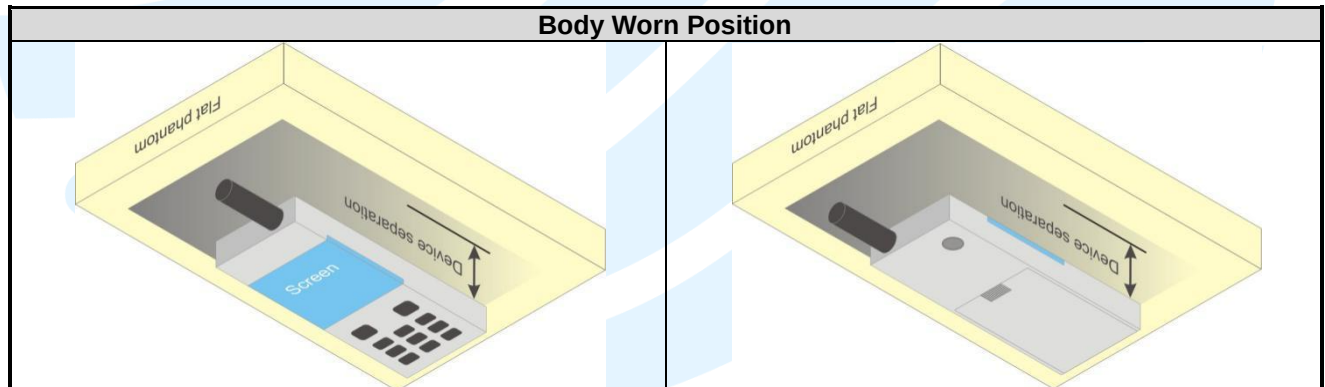


4.2.2. Body-worn Accessory Exposure Conditions

RF Exposure Conditions	Test Position	Separation Distance	SAR test exclusion
Body-worn	Front Face	0 ~ 2.5 cm	N/A
	Rear Face		

Note:

- 1) Body-worn accessories that do not contain metallic or conductive components may be tested according to worst-case exposure configurations, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics. All body-worn accessories containing metallic components are tested in conjunction with the host device.
- 2) Body-worn accessory SAR compliance is based on a single minimum test separation distance for all wireless and operating modes applicable to each body-worn accessory used by the host, and according to the relevant voice and/or data mode transmissions and operations. If a body-worn accessory supports voice only operations in its normal and expected use conditions, testing of data mode for body-worn compliance is not required.
- 3) A conservative minimum test separation distance for supporting off-the-shelf body-worn accessories that may be acquired by users of consumer handsets should be used to test for body-worn accessory SAR compliance. This distance is determined by the handset manufacturer according to the typical body-worn accessories users may acquire at the time of equipment certification, but not more than 2.5 cm, to enable users to purchase aftermarket body-worn accessories with the required minimum separation.
- 4) Devices that are designed to operate on the body of users using lanyards and straps or without requiring additional body-worn accessories must be tested for SAR compliance using a conservative minimum test separation distance ≤ 5 mm to support compliance.
- 5) When device supports VoIP, SAR evaluation for body-worn accessory Exposure Conditions using the most appropriate wireless data mode configurations is required.
- 6) Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories.
- 7) When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.

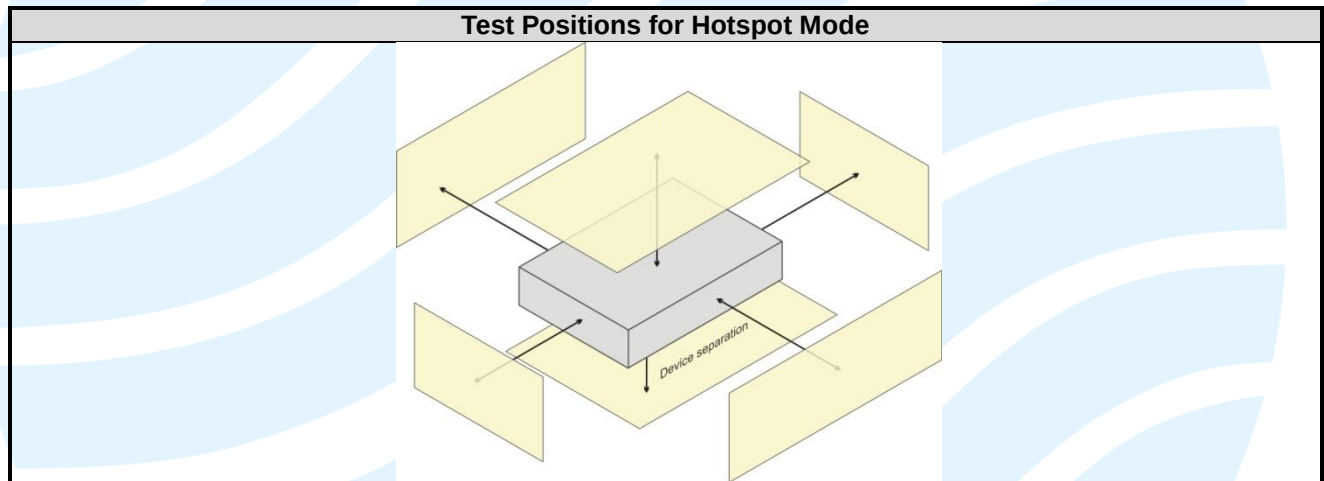


4.2.3. Hotspot Accessory Exposure Conditions

RF Exposure Conditions	Test Position	Separation Distance	SAR test exclusion
Hotspot	Front Face	1 cm	Note 2/3
	Rear Face		
	Left Side		
	Right Side		
	Top Side		
	Bottom Side		

Note:

- 1) The SAR test separation distance for hotspot mode is determined according to device form factor. When the overall length and width of a device is > 9 cm x 5 cm (~3.5" x 2"), a test separation distance of 10 mm is required for hotspot mode SAR measurements. A test separation distance of 5 mm or less is required for smaller devices. The SAR test separation distance for hotspot mode is determined according to device form factor.
- 2) Hotspot mode SAR is measured for all edges and surfaces of the device with a transmitting antenna located within 25 mm from that surface or edge.
- 3) Based on the antenna location shown on appendix D of this report, the SAR testing required for hotspot mode is listed on section 4.5.1.



4.3. MEASURED CONDUCTED POWER RESULT

4.3.1. Conducted Power of GSM Bands

The measuring conducted average power (Unit: dBm) is shown as below.

Band	GSM 850			PCS 1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.2	836.6	848.8	1850.2	1880.0	1909.8
Maximum Burst-Averaged Output Power						
GSM (GMSK, 1Tx-slot)	32.06	31.90	31.81	30.65	30.85	30.83
GPRS (GMSK, 1Tx-slot)	32.07	31.84	31.75	30.63	30.77	30.74
GPRS (GMSK, 2Tx-slot)	31.36	31.17	31.07	29.69	29.86	29.84
GPRS (GMSK, 3Tx-slot)	30.15	29.97	29.86	28.22	28.40	28.38
GPRS (GMSK, 4Tx-slot)	29.61	29.43	29.32	27.68	27.86	27.84
EDGE (8PSK, 1Tx-slot)	27.90	27.44	27.14	27.07	26.87	26.97
EDGE (8PSK, 2Tx-slot)	26.54	26.27	25.99	25.93	25.90	25.94
EDGE (8PSK, 3Tx-slot)	24.15	23.91	23.62	23.95	23.93	24.04
EDGE (8PSK, 4Tx-slot)	22.83	22.59	22.22	22.74	22.87	22.86
Maximum Frame-Averaged Output Power						
GSM (GMSK, 1Tx-slot)	23.06	22.90	22.81	21.65	21.85	21.83
GPRS (GMSK, 1Tx-slot)	23.07	22.84	22.75	21.63	21.77	21.74
GPRS (GMSK, 2Tx-slot)	25.36	25.17	25.07	23.69	23.86	23.84

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GPRS (GMSK, 3Tx-slot)	25.89	25.71	25.60	23.96	24.14	24.12
GPRS (GMSK, 4Tx-slot)	26.61	26.43	26.32	24.68	24.86	24.84
EDGE (8PSK, 1Tx-slot)	18.90	18.44	18.14	18.07	17.87	17.97
EDGE (8PSK, 2Tx-slot)	20.54	20.27	19.99	19.93	19.90	19.94
EDGE (8PSK, 3Tx-slot)	19.89	19.65	19.36	19.69	19.67	19.78
EDGE (8PSK, 4Tx-slot)	19.83	19.59	19.22	19.74	19.87	19.86

Note:

- 1) SAR testing was performed on the maximum frame-averaged power mode.
- 2) The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum burst-averaged power based on time slots. The calculated method is shown as below:
- 3) Frame-averaged power = 10 x log (Burst-averaged power mW x Slot used / 8)

4.3.2. Conducted Power of WCDMA Bands

The measuring conducted average power (Unit: dBm) is shown as below.

Band	WCDMA Band II			WCDMA Band V		
Channel	9262	9400	9538	4132	4182	4233
Frequency (MHz)	1852.4	1880.0	1907.6	826.4	836.4	846.6
RMC 12.2K	24.46	24.28	24.25	23.63	23.31	23.22
HSDPA Subtest-1	23.47	23.33	23.23	22.65	22.36	22.24
HSDPA Subtest-2	23.06	22.70	22.79	22.16	21.79	21.75
HSDPA Subtest-3	23.05	22.73	22.85	22.12	21.78	21.70
HSDPA Subtest-4	22.99	22.81	22.75	22.11	21.88	21.78
HSUPA Subtest-1	21.46	21.28	21.27	20.67	20.38	20.26
HSUPA Subtest-2	20.51	20.30	20.25	20.70	20.38	20.26
HSUPA Subtest-3	22.48	22.27	22.26	21.64	20.37	21.25
HSUPA Subtest-4	21.01	20.82	20.81	20.21	19.90	19.78
HSUPA Subtest-5	22.48	22.28	22.29	21.59	21.39	21.27

4.3.3. Conducted Power of LTE Bands

➤ LTE Band 2

Conducted Power (dBm)											
Modulation											
Band	Bandwidth (MHz)	RB	QPSK			16QAM			64QAM		
			18607 1850.7 MHz	18900 1880 MHz	19193 1909.3 MHz	18607 1850.7 MHz	18900 1880 MHz	19193 1909.3 MHz	18607 1850.7 MHz	18900 1880 MHz	19193 1909.3 MHz
2	1.4	1RB#0	24.01	23.38	23.28	23.00	22.22	22.07	22.35	21.51	20.96
		1RB#2	24.12	23.55	23.43	23.18	22.39	22.24	22.50	21.67	21.18
		1RB#5	23.54	23.34	23.31	22.97	22.17	22.02	22.32	21.53	20.94
		3RB#0	23.01	23.41	23.29	23.00	22.18	22.11	22.16	21.32	21.10
		3RB#1	23.04	23.43	23.27	23.00	22.18	22.11	22.17	21.32	21.10
		3RB#3	22.98	23.37	23.26	22.98	22.13	22.11	22.17	21.29	21.09
		6RB#0	23.04	22.48	22.37	22.26	21.42	21.17	21.08	20.23	20.16
Band	Bandwidth (MHz)	RB	18615 1851.5 MHz	18900 1880 MHz	19185 1908.5 MHz	18615 1851.5 MHz	18900 1880 MHz	19185 1908.5 MHz	18615 1851.5 MHz	18900 1880 MHz	19185 1908.5 MHz
			18615 1851.5 MHz	18900 1880 MHz	19185 1908.5 MHz	18615 1851.5 MHz	18900 1880 MHz	19185 1908.5 MHz	18615 1851.5 MHz	18900 1880 MHz	19185 1908.5 MHz
2	3	1RB#0	24.26	23.52	23.21	23.21	22.24	22.01	22.03	21.18	21.33
		1RB#8	24.14	23.48	23.22	23.11	22.20	21.99	22.01	21.14	21.35
		1RB#14	24.15	23.40	23.22	23.12	22.12	22.07	21.98	21.11	21.33
		8RB#0	23.28	22.48	22.31	22.26	21.37	21.24	21.19	20.40	20.21
		8RB#4	23.29	22.50	22.31	22.23	21.39	21.23	21.19	20.40	20.22
		8RB#7	23.23	22.34	22.28	22.20	21.28	21.21	21.10	20.29	20.16
		15RB#0	23.20	22.36	22.24	22.17	21.26	21.13	21.21	20.31	20.13
Band	Bandwidth (MHz)	RB	18625 1852.5 MHz	18900 1880 MHz	19175 1907.5 MHz	18625 1852.5 MHz	18900 1880 MHz	19175 1907.5 MHz	18625 1852.5 MHz	18900 1880 MHz	19175 1907.5 MHz
			18625 1852.5 MHz	18900 1880 MHz	19175 1907.5 MHz	18625 1852.5 MHz	18900 1880 MHz	19175 1907.5 MHz	18625 1852.5 MHz	18900 1880 MHz	19175 1907.5 MHz
2	5	1RB#0	24.24	23.38	23.16	23.11	22.37	22.04	21.97	21.67	21.22
		1RB#12	24.24	23.44	23.27	23.13	22.44	22.15	22.03	21.83	21.32
		1RB#24	24.09	23.27	23.20	22.97	22.31	22.09	21.94	21.57	21.22
		12RB#0	23.21	22.43	22.28	22.13	21.44	21.25	21.17	20.40	20.27
		12RB#6	23.18	22.44	22.28	22.15	21.45	21.26	21.17	20.36	20.28
		12RB#13	23.21	22.32	22.21	22.14	21.32	21.17	21.17	20.21	20.22
		25RB#0	23.18	22.38	22.25	22.20	21.34	21.26	21.19	20.30	20.26
Band	Bandwidth (MHz)	RB	18650 1855 MHz	18900 1880 MHz	19150 1905 MHz	18650 1855 MHz	18900 1880 MHz	19150 1905 MHz	18650 1855 MHz	18900 1880 MHz	19150 1905 MHz
			18650 1855 MHz	18900 1880 MHz	19150 1905 MHz	18650 1855 MHz	18900 1880 MHz	19150 1905 MHz	18650 1855 MHz	18900 1880 MHz	19150 1905 MHz
2	10	1RB#0	24.20	23.57	23.16	23.17	22.24	21.86	22.08	21.17	21.18
		1RB#24	24.27	23.52	23.29	23.27	22.25	22.03	22.07	21.19	21.41
		1RB#49	24.01	23.30	23.23	23.02	22.11	21.99	21.87	21.05	21.32
		25RB#0	23.24	22.55	22.36	22.17	21.52	21.31	21.23	20.47	20.27
		25RB#12	23.16	22.53	22.35	22.17	21.51	21.31	21.26	20.50	20.23
		25RB#25	23.21	22.34	22.19	22.15	21.28	21.16	21.18	20.18	20.08
		50RB#0	23.16	22.41	22.26	22.16	21.38	21.20	21.12	20.31	20.14
Band	Bandwidth (MHz)	RB	18675 1857.5 MHz	18900 1880 MHz	19125 1902.5 MHz	18675 1857.5 MHz	18900 1880 MHz	19125 1902.5 MHz	18675 1857.5 MHz	18900 1880 MHz	19125 1902.5 MHz
			18675 1857.5 MHz	18900 1880 MHz	19125 1902.5 MHz	18675 1857.5 MHz	18900 1880 MHz	19125 1902.5 MHz	18675 1857.5 MHz	18900 1880 MHz	19125 1902.5 MHz
2	15	1RB#0	24.15	23.44	23.05	23.08	22.52	21.77	21.96	21.52	21.07
		1RB#38	24.09	23.34	23.21	23.05	22.43	21.92	21.94	21.47	21.29
		1RB#74	23.75	23.06	23.15	22.81	22.21	21.96	21.59	21.20	21.27
		38RB#0	23.20	22.54	22.31	23.23	22.53	22.29	23.23	22.54	22.25
		38RB#18	23.23	22.56	22.28	23.22	22.52	22.29	23.21	22.57	22.28
		38RB#37	23.24	22.52	22.29	23.24	22.51	22.29	23.22	22.52	22.29
		75RB#0	23.23	22.54	22.25	22.13	21.45	21.21	21.13	20.39	20.13
Band	Bandwidth (MHz)	RB	18700 1860 MHz	18900 1880 MHz	19100 1900 MHz	18700 1860 MHz	18900 1880 MHz	19100 1900 MHz	18700 1860 MHz	18900 1880 MHz	19100 1900 MHz
			18700 1860 MHz	18900 1880 MHz	19100 1900 MHz	18700 1860 MHz	18900 1880 MHz	19100 1900 MHz	18700 1860 MHz	18900 1880 MHz	19100 1900 MHz
2	20	1RB#0	24.26	23.48	22.89	22.86	22.51	21.73	22.12	21.53	20.67
		1RB#49	24.45	23.62	23.26	22.91	22.63	22.08	22.32	21.73	20.93
		1RB#99	24.21	22.95	23.02	22.36	22.04	21.85	21.50	21.16	20.80
		50RB#0	24.25	22.54	21.99	21.98	21.53	20.99	21.01	20.55	20.00
		50RB#25	24.27	22.58	21.99	21.95	21.51	21.01	21.02	20.59	20.04
		50RB#50	24.28	22.20	21.93	21.95	21.18	20.93	21.01	20.17	19.86
		100RB#0	23.33	22.37	21.96	21.97	21.32	20.94	20.96	20.37	19.96

➤ LTE Band 4

Conducted Power(dBm)											
Modulation			QPSK			16QAM			64QAM		
Band	Bandwidth	RB	19957	20175	20393	19957	20175	20393	19957	20175	20393
	(MHz)		1710.7 MHz	1732.5 MHz	1754.3 MHz	1710.7 MHz	1732.5 MHz	1754.3 MHz	1710.7 MHz	1732.5 MHz	1754.3 MHz
4	1.4	1RB#0	24.16	24.18	24.09	22.94	22.89	22.93	21.86	22.26	22.26
		1RB#2	24.26	24.30	24.30	23.09	23.08	23.14	22.00	22.38	22.45
		1RB#5	24.21	24.19	24.10	22.91	22.94	22.91	21.86	22.24	22.27
		3RB#0	24.18	24.25	24.17	22.97	22.97	22.92	21.99	22.25	22.05
		3RB#1	24.19	24.25	24.18	22.99	23.00	22.89	22.02	22.25	22.07
		3RB#3	24.21	24.29	24.12	22.97	22.96	22.89	21.98	22.24	22.11
		6RB#0	23.25	23.29	23.21	22.05	22.19	22.11	21.03	21.14	21.00
Band	Bandwidth	RB	19965	20175	20385	19965	20175	20385	19965	20175	20385
	(MHz)		1711.5 MHz	1732.5 MHz	1753.5 MHz	1711.5 MHz	1732.5 MHz	1753.5 MHz	1711.5 MHz	1732.5 MHz	1753.5 MHz
4	3	1RB#0	24.15	24.25	24.07	23.16	23.04	22.81	21.93	21.97	22.14
		1RB#8	24.07	24.24	24.09	23.12	23.02	22.84	21.93	21.86	22.17
		1RB#14	24.12	24.22	24.10	23.15	23.03	22.88	21.97	21.94	22.22
		8RB#0	23.17	23.20	23.16	22.19	22.17	22.10	21.17	21.20	21.12
		8RB#4	23.17	23.18	23.17	22.16	22.16	22.12	21.16	21.23	21.11
		8RB#7	23.17	23.18	23.20	22.17	22.14	22.06	21.15	21.18	21.11
		15RB#0	23.10	23.15	23.09	22.11	22.03	21.95	21.21	21.11	21.02
Band	Bandwidth	RB	19975	20175	20375	19975	20175	20375	19975	20175	20375
	(MHz)		1712.5 MHz	1732.5 MHz	1752.5 MHz	1712.5 MHz	1732.5 MHz	1752.5 MHz	1712.5 MHz	1732.5 MHz	1752.5 MHz
4	5	1RB#0	24.09	24.17	24.07	22.99	23.11	22.90	21.87	22.50	22.10
		1RB#12	24.23	24.26	24.20	23.12	23.26	23.05	22.00	22.64	22.24
		1RB#24	24.15	24.12	24.09	23.10	23.10	22.96	21.91	22.43	22.09
		12RB#0	23.16	23.11	23.09	22.10	22.10	22.00	21.17	21.17	21.13
		12RB#6	23.17	23.09	23.07	22.06	22.13	22.08	21.15	21.13	21.10
		12RB#13	23.08	23.17	23.07	21.97	22.15	21.97	21.07	21.14	21.10
		25RB#0	23.09	23.17	23.10	22.07	22.10	22.11	21.17	21.15	21.12
Band	Bandwidth	RB	20000	20175	20350	20000	20175	20350	20000	20175	20350
	(MHz)		1715 MHz	1732.5 MHz	1750 MHz	1715 MHz	1732.5 MHz	1750 MHz	1715 MHz	1732.5 MHz	1750 MHz
4	10	1RB#0	24.05	24.24	24.02	23.11	23.02	22.82	21.89	21.96	22.15
		1RB#24	24.23	24.36	24.22	23.25	23.11	22.85	22.08	22.12	22.33
		1RB#49	24.24	24.13	24.12	23.17	23.00	22.82	21.96	21.89	22.19
		25RB#0	23.21	23.12	23.16	22.13	22.16	22.14	21.23	21.16	21.14
		25RB#12	23.17	23.13	23.13	22.13	22.11	22.11	21.23	21.18	21.14
		25RB#25	23.18	23.20	23.03	22.11	22.21	22.01	21.17	21.15	21.06
		50RB#0	23.11	23.15	23.01	22.08	22.14	22.03	21.14	21.22	21.02
Band	Bandwidth	RB	20025	20175	20325	20025	20175	20325	20025	20175	20325
	(MHz)		1717.5 MHz	1732.5 MHz	1747.5 MHz	1717.5 MHz	1732.5 MHz	1747.5 MHz	1717.5 MHz	1732.5 MHz	1747.5 MHz
4	15	1RB#0	24.06	24.12	24.06	23.05	23.22	22.79	21.89	22.19	22.15
		1RB#38	24.21	24.19	24.12	23.18	23.25	22.90	22.01	22.22	22.25
		1RB#74	24.18	24.05	24.06	23.15	23.14	22.88	21.99	22.12	22.14
		38RB#0	23.26	23.23	23.18	23.25	23.22	23.16	23.24	23.20	23.16
		38RB#18	23.23	23.23	23.18	23.24	23.21	23.18	23.27	23.24	23.17
		38RB#37	23.26	23.22	23.16	23.24	23.20	23.17	23.24	23.22	23.17
		75RB#0	23.24	23.20	23.17	22.21	22.20	22.11	21.27	21.27	21.17
Band	Bandwidth	RB	20050	20175	20300	20050	20175	20300	20050	20175	20300
	(MHz)		1720 MHz	1732.5 MHz	1745 MHz	1720 MHz	1732.5 MHz	1745 MHz	1720 MHz	1732.5 MHz	1745 MHz
4	20	1RB#0	23.99	24.08	23.95	22.85	23.17	22.75	22.06	22.20	21.67
		1RB#49	24.40	24.35	24.20	23.25	23.44	22.99	22.42	22.41	21.98
		1RB#99	24.10	24.01	23.90	22.97	23.09	22.70	22.20	22.11	21.67
		50RB#0	23.15	23.10	23.04	22.18	22.12	22.09	21.21	21.17	21.08
		50RB#25	23.21	23.11	23.05	22.16	22.11	22.13	21.29	21.17	21.06
		50RB#50	23.24	23.17	22.96	22.24	22.20	22.04	21.32	21.27	21.03
		100RB#0	23.26	23.12	23.06	22.23	22.13	21.98	21.24	21.21	21.07

➤ LTE Band 5

Conducted Power(dBm)											
Modulation			QPSK			16QAM			64QAM		
Band	Bandwidth	RB	20407	20525	20643	20407	20525	20643	20407	20525	20643
	(MHz)		824.7 MHz	836.5 MHz	848.3 MHz	824.7 MHz	836.5 MHz	848.3 MHz	824.7 MHz	836.5 MHz	848.3 MHz
5	1.4	1RB#0	23.32	22.95	22.90	22.06	21.70	21.75	21.00	21.06	21.12
		1RB#2	23.42	23.05	23.07	22.29	21.90	22.03	21.01	21.14	21.23
		1RB#5	23.23	22.91	22.92	22.03	21.67	21.75	20.91	20.99	21.04
		3RB#0	23.34	23.02	23.00	22.11	21.78	21.78	21.12	20.99	20.92
		3RB#1	23.32	23.05	22.99	22.11	21.78	21.77	21.12	20.94	20.93
		3RB#3	23.31	23.05	23.01	22.06	21.77	21.71	21.07	20.99	20.93
		6RB#0	22.31	21.99	21.95	21.12	20.95	20.98	20.14	19.94	19.86
Band	Bandwidth	RB	20415	20525	20635	20415	20525	20635	20415	20525	20635
	(MHz)		825.5 MHz	836.5 MHz	847.5 MHz	825.5 MHz	836.5 MHz	847.5 MHz	825.5 MHz	836.5 MHz	847.5 MHz
5	3	1RB#0	23.27	23.01	22.95	22.24	21.88	21.70	21.04	20.76	21.02
		1RB#8	23.19	23.01	22.96	22.18	21.79	21.74	21.02	20.75	21.04
		1RB#14	23.16	23.00	22.95	22.12	21.76	21.69	21.01	20.76	21.03
		8RB#0	22.28	21.97	21.94	21.25	20.94	20.96	20.30	19.98	19.95
		8RB#4	22.24	21.99	21.94	21.23	20.97	20.96	20.29	19.99	19.97
		8RB#7	22.19	21.95	22.01	21.20	20.90	20.97	20.18	19.96	19.93
		15RB#0	22.22	21.97	21.93	21.21	20.88	20.85	20.27	19.97	19.94
Band	Bandwidth	RB	20425	20525	20625	20425	20525	20625	20425	20525	20625
	(MHz)		826.5 MHz	836.5 MHz	846.5 MHz	826.5 MHz	836.5 MHz	846.5 MHz	826.5 MHz	836.5 MHz	846.5 MHz
5	5	1RB#0	23.24	22.91	22.89	22.11	21.99	21.76	21.01	21.33	21.01
		1RB#12	23.27	22.97	23.04	22.14	22.03	21.98	21.00	21.38	21.11
		1RB#24	23.14	22.86	22.92	22.00	21.94	21.70	20.87	21.26	20.92
		12RB#0	22.24	21.99	21.91	21.17	20.96	20.86	20.31	19.99	19.96
		12RB#6	22.21	21.95	21.92	21.16	20.95	20.83	20.31	20.01	19.98
		12RB#13	22.12	21.97	21.94	21.08	20.94	20.94	20.24	19.98	20.02
		25RB#0	22.16	21.96	21.91	21.15	20.93	20.93	20.20	20.00	19.98
Band	Bandwidth	RB	20450	20525	20600	20450	20525	20600	20450	20525	20600
	(MHz)		829 MHz	836.5 MHz	844 MHz	829 MHz	836.5 MHz	844 MHz	829 MHz	836.5 MHz	844 MHz
5	10	1RB#0	23.22	23.02	22.83	22.23	21.91	21.65	21.10	20.82	20.98
		1RB#24	23.49	23.11	22.97	22.18	21.94	21.82	21.02	20.80	21.15
		1RB#49	23.02	22.92	22.91	22.01	21.77	21.73	20.81	20.68	21.05
		25RB#0	22.23	22.01	22.08	21.20	21.01	21.06	20.25	19.97	20.14
		25RB#12	22.23	22.00	22.06	21.17	21.00	21.10	20.32	20.00	20.11
		25RB#25	22.11	21.87	22.01	21.11	20.88	21.07	20.15	19.89	20.04
		50RB#0	22.17	21.90	22.06	21.10	20.93	21.05	20.20	19.95	20.07

➤ LTE Band 7

Conducted Power(dBm)											
Modulation			QPSK			16QAM			64QAM		
Band	Bandwidth	RB	20775	21100	21425	20775	21100	21425	20775	21100	21425
	(MHz)		2502.5 MHz	2535 MHz	2567.5 MHz	2502.5 MHz	2535 MHz	2567.5 MHz	2502.5 MHz	2535 MHz	2567.5 MHz
7	5	1RB#0	21.06	21.43	20.76	20.51	19.97	19.59	19.35	19.30	18.77
		1RB#12	21.40	21.06	20.83	20.61	20.13	19.67	19.47	19.44	18.92
		1RB#24	20.96	20.90	20.71	20.47	19.98	19.54	19.32	19.27	18.73
		12RB#0	20.62	20.02	19.76	19.56	18.97	18.74	18.60	17.98	17.83
		12RB#6	20.59	20.01	19.77	19.59	19.03	18.76	18.61	17.99	17.82
		12RB#13	20.66	20.00	19.69	19.62	19.07	18.68	18.68	18.04	17.72
		25RB#0	20.65	20.06	19.75	19.66	19.02	18.77	18.69	18.01	17.76
Band	Bandwidth	RB	20800	21100	21400	20800	21100	21400	20800	21100	21400
	(MHz)		2505 MHz	2535 MHz	2565 MHz	2505 MHz	2535 MHz	2565 MHz	2505 MHz	2535 MHz	2565 MHz
7	10	1RB#0	21.13	21.07	20.79	20.11	19.84	19.59	18.96	18.77	18.92
		1RB#24	21.24	21.07	20.88	20.19	19.96	19.71	19.01	18.78	19.04
		1RB#49	21.13	21.07	20.72	20.05	19.85	19.52	19.03	18.80	18.84
		25RB#0	20.10	19.99	19.92	19.05	19.08	18.93	18.59	18.02	17.94
		25RB#12	20.20	20.07	19.95	19.16	19.10	18.92	18.55	18.05	17.89
		25RB#25	20.48	20.06	19.68	19.69	19.09	18.71	18.70	18.09	17.72
		50RB#0	20.47	20.07	19.79	19.58	19.06	18.77	18.56	18.07	17.80
Band	Bandwidth	RB	20825	21100	21375	20825	21100	21375	20825	21100	21375
	(MHz)		2507.5 MHz	2535 MHz	2562.5 MHz	2507.5 MHz	2535 MHz	2562.5 MHz	2507.5 MHz	2535 MHz	2562.5 MHz
7	15	1RB#0	21.10	20.87	20.82	20.06	20.06	19.53	18.90	19.02	18.86
		1RB#38	21.18	20.97	20.87	20.08	20.09	19.60	18.92	19.14	18.98
		1RB#74	21.00	20.91	20.63	19.94	19.87	19.42	18.89	18.96	18.76
		38RB#0	20.27	20.11	19.93	20.26	20.14	19.96	20.25	20.14	19.97
		38RB#18	20.25	20.15	19.96	20.25	20.14	19.93	20.24	20.12	19.93
		38RB#37	20.24	20.11	19.94	20.24	20.13	19.93	20.27	20.10	19.93
		75RB#0	20.27	20.14	19.93	19.17	19.13	18.84	18.48	18.08	17.88
Band	Bandwidth	RB	20850	21100	21350	20850	21100	21350	20850	21100	21350
	(MHz)		2510 MHz	2535 MHz	2560 MHz	2510 MHz	2535 MHz	2560 MHz	2510 MHz	2535 MHz	2560 MHz
7	20	1RB#0	21.61	21.09	20.94	19.88	20.00	19.48	19.11	19.06	18.44
		1RB#49	21.82	21.56	21.40	20.22	20.19	19.74	19.39	19.30	18.69
		1RB#99	21.63	21.03	20.73	19.80	19.88	19.35	18.97	18.94	18.31
		50RB#0	19.99	19.98	19.80	18.99	19.00	18.85	18.03	18.07	17.82
		50RB#25	19.96	20.02	19.80	19.01	19.04	18.84	17.98	18.07	17.86
		50RB#50	20.13	20.09	19.61	19.04	19.11	18.64	18.03	18.13	17.69
		100RB#0	19.99	20.02	19.68	19.00	19.07	18.70	18.05	18.08	17.77

➤ LTE Band 26

Conducted Power(dBm)											
Modulation			QPSK			16QAM			64QAM		
Band	Bandwidth	RB	26697	26915	27033	26697	26915	27033	26697	26915	27033
	(MHz)		814.7 MHz	836.5 MHz	848.3 MHz	814.7 MHz	836.5 MHz	848.3 MHz	814.7 MHz	836.5 MHz	848.3 MHz
26	1.4	1RB#0	23.73	23.19	23.24	22.69	22.07	21.99	22.01	21.42	21.01
		1RB#2	23.71	23.31	23.44	22.86	22.28	22.09	22.13	21.51	21.13
		1RB#5	23.42	23.17	23.37	22.68	22.05	21.95	22.02	21.40	20.95
		3RB#0	22.80	23.27	23.26	22.64	22.07	22.11	21.77	21.19	21.12
		3RB#1	22.82	23.29	23.26	22.62	22.05	22.06	21.76	21.18	21.08
		3RB#3	22.66	23.26	23.26	22.60	22.07	22.04	21.74	21.21	21.11
		6RB#0	22.73	22.25	22.33	21.82	21.26	21.12	20.64	20.09	20.10
Band	Bandwidth	RB	26705	26915	27025	26705	26915	27025	26705	26915	27025
	(MHz)		815.5 MHz	836.5 MHz	847.5 MHz	815.5 MHz	836.5 MHz	847.5 MHz	815.5 MHz	836.5 MHz	847.5 MHz
26	3	1RB#0	23.83	23.31	23.24	22.89	22.18	22.02	21.68	21.13	21.35
		1RB#8	23.75	23.33	23.25	22.78	22.13	22.06	21.68	21.10	21.41
		1RB#14	23.74	23.32	23.32	22.74	22.02	22.03	21.63	21.03	21.38
		8RB#0	22.82	22.27	22.31	21.84	21.25	21.24	20.81	20.32	20.24
		8RB#4	22.84	22.34	22.25	21.87	21.28	21.28	20.77	20.30	20.27
		8RB#7	22.80	22.27	22.30	21.80	21.17	21.27	20.75	20.28	20.22
		15RB#0	22.83	22.21	22.25	21.86	21.15	21.19	20.85	20.30	20.22
Band	Bandwidth	RB	26715	26915	27015	26715	26915	27015	26715	26915	27015
	(MHz)		816.5 MHz	836.5 MHz	846.5 MHz	816.5 MHz	836.5 MHz	846.5 MHz	816.5 MHz	836.5 MHz	846.5 MHz
26	5	1RB#0	23.77	23.25	23.12	22.71	22.31	22.04	21.59	21.58	21.26
		1RB#12	23.86	23.33	23.30	22.76	22.34	22.20	21.66	21.72	21.44
		1RB#24	23.66	23.14	23.26	22.54	22.15	22.05	21.43	21.54	21.24
		12RB#0	22.73	22.32	22.21	21.74	21.38	21.23	20.81	20.36	20.33
		12RB#6	22.81	22.29	22.20	21.75	21.32	21.24	20.78	20.36	20.31
		12RB#13	22.80	22.19	22.26	21.74	21.21	21.26	20.82	20.25	20.39
		25RB#0	22.78	22.25	22.27	21.82	21.25	21.33	20.79	20.31	20.32
Band	Bandwidth	RB	26740	26915	26990	26740	26915	26990	26740	26915	26990
	(MHz)		819 MHz	836.5 MHz	844 MHz	819 MHz	836.5 MHz	844 MHz	819 MHz	836.5 MHz	844 MHz
26	10	1RB#0	23.79	23.40	23.20	22.82	22.29	21.94	21.71	21.11	21.33
		1RB#24	23.77	23.40	23.26	22.80	22.28	22.15	21.55	21.23	21.48
		1RB#49	23.62	23.25	23.28	22.55	22.07	22.02	21.39	21.06	21.40
		25RB#0	22.78	22.34	22.47	21.75	21.34	21.52	20.77	20.38	20.45
		25RB#12	22.74	22.36	22.47	21.72	21.39	21.52	20.77	20.39	20.47
		25RB#25	22.63	22.15	22.39	21.57	21.21	21.40	20.67	20.20	20.36
		50RB#0	22.69	22.20	22.39	21.64	21.29	21.38	20.68	20.30	20.40
Band	Bandwidth	RB	26765	26865	26965	26765	26865	26965	26765	26865	26965
	(MHz)		821.5 MHz	831.5 MHz	841.5 MHz	821.5 MHz	831.5 MHz	841.5 MHz	821.5 MHz	831.5 MHz	841.5 MHz
26	15	1RB#0	23.74	23.49	23.29	22.83	22.45	22.08	21.97	21.28	21.40
		1RB#38	23.99	23.42	23.29	22.86	22.44	22.05	21.89	21.28	21.44
		1RB#74	23.74	23.18	23.24	22.71	22.18	22.00	21.69	21.02	21.34
		36RB#0	23.84	22.54	22.46	21.66	22.51	22.45	20.65	22.54	22.43
		36RB#18	23.84	22.54	22.44	21.66	22.52	22.38	20.65	22.54	22.45
		36RB#37	23.83	22.52	22.42	21.55	22.51	22.37	20.49	22.51	22.42
		75RB#0	22.73	22.54	22.43	21.60	21.40	21.35	20.57	20.52	20.31

➤ LTE Band 38

Conducted Power(dBm)											
Modulation			QPSK			16QAM			64QAM		
Band	Bandwidth	RB	37775	38000	38225	37775	38000	38225	37775	38000	38225
	(MHz)		2572.5 MHz	2595 MHz	2617.5 MHz	2572.5 MHz	2595 MHz	2617.5 MHz	2572.5 MHz	2595 MHz	2617.5 MHz
38	5	1RB#0	21.05	20.85	20.57	20.00	19.96	19.69	18.96	18.91	18.97
		1RB#12	21.15	20.97	20.68	20.12	20.13	19.82	19.05	19.03	19.08
		1RB#24	21.01	20.76	20.56	20.02	19.80	19.69	18.76	18.89	18.97
		12RB#0	20.05	19.84	19.68	18.96	18.70	18.72	18.02	17.76	17.78
		12RB#6	20.09	19.82	19.76	18.99	18.71	18.73	17.91	17.76	17.81
		12RB#13	20.09	19.78	19.69	19.00	18.76	18.73	17.99	17.76	17.75
		25RB#0	19.98	19.82	19.76	18.87	18.79	18.74	18.07	17.79	17.68
Band	Bandwidth	RB	37800	38000	38200	37800	38000	38200	37800	38000	38200
	(MHz)		2575 MHz	2595 MHz	2615 MHz	2575 MHz	2595 MHz	2615 MHz	2575 MHz	2595 MHz	2615 MHz
38	10	1RB#0	21.08	20.98	20.76	20.28	19.53	19.67	19.34	18.44	19.05
		1RB#24	21.30	21.20	20.99	20.42	19.72	19.87	19.56	18.75	19.24
		1RB#49	21.04	20.89	20.70	20.14	19.44	19.63	19.15	18.47	19.02
		25RB#0	20.07	19.83	19.78	19.18	18.77	18.78	18.02	17.73	17.81
		25RB#12	20.09	19.83	19.78	19.19	18.78	18.80	18.03	17.72	17.80
		25RB#25	20.11	19.80	19.72	19.09	18.77	18.72	18.06	17.71	17.73
		50RB#0	20.07	19.78	19.78	19.00	18.77	18.74	18.11	17.76	17.71
Band	Bandwidth	RB	37825	38000	38175	37825	38000	38175	37825	38000	38175
	(MHz)		2577.5 MHz	2595 MHz	2612.5 MHz	2577.5 MHz	2595 MHz	2612.5 MHz	2577.5 MHz	2595 MHz	2612.5 MHz
38	15	1RB#0	21.00	21.00	20.71	20.18	19.61	19.60	19.23	18.88	18.94
		1RB#38	21.06	21.07	20.73	20.16	19.68	19.60	19.28	18.90	19.06
		1RB#74	20.93	20.88	20.67	19.98	19.53	19.55	19.08	18.76	18.94
		38RB#0	20.09	19.98	19.90	20.08	19.97	19.92	20.11	19.97	19.92
		38RB#18	20.09	19.97	19.94	20.10	19.96	19.92	20.10	19.96	19.91
		38RB#37	20.11	19.96	19.95	20.08	19.96	19.93	20.06	19.96	19.93
		75RB#0	20.10	19.96	19.88	19.05	18.84	18.81	18.07	17.84	17.82
Band	Bandwidth	RB	37850	38000	38150	37850	38000	38150	37850	38000	38150
	(MHz)		2580 MHz	2595 MHz	2610 MHz	2580 MHz	2595 MHz	2610 MHz	2580 MHz	2595 MHz	2610 MHz
38	20	1RB#0	20.89	20.67	20.74	19.90	19.20	19.24	18.80	18.71	18.60
		1RB#49	21.31	20.98	21.05	20.15	19.47	19.56	19.04	18.96	18.92
		1RB#99	20.77	20.61	20.58	19.64	19.11	19.22	18.57	18.58	18.62
		50RB#0	19.94	19.78	19.76	18.96	18.77	18.73	17.90	17.88	17.79
		50RB#25	19.96	19.75	19.77	18.94	18.74	18.72	17.91	17.86	17.80
		50RB#50	20.00	19.78	19.69	18.94	18.77	18.60	17.97	17.86	17.66
		100RB#0	19.95	19.74	19.70	18.95	18.74	18.69	17.99	17.82	17.71

➤ LTE Band 41

Conducted Power(dBm)											
Modulation			QPSK			16QAM			64QAM		
Band	Bandwidth	RB	40265	40690	41215	40265	40690	41215	40265	40690	41215
	(MHz)		2557.5 MHz	2600 MHz	2652.5 MHz	2557.5 MHz	2600 MHz	2652.5 MHz	2557.5 MHz	2600 MHz	2652.5 MHz
41	5	1RB#0	21.40	20.85	20.93	20.78	20.04	19.94	19.63	19.29	18.84
		1RB#12	21.50	21.00	21.06	20.89	20.17	20.04	19.71	19.46	19.01
		1RB#24	21.31	20.84	20.90	20.68	20.02	19.86	19.56	19.29	18.77
		12RB#0	20.43	20.03	19.96	19.40	19.04	18.89	18.45	18.11	17.81
		12RB#6	20.40	19.99	19.91	19.42	19.01	18.84	18.45	18.07	17.83
		12RB#13	20.37	20.01	19.95	19.34	19.05	18.86	18.38	18.06	17.87
		25RB#0	20.47	20.01	19.97	19.48	19.04	18.90	18.50	18.02	17.89
Band	Bandwidth	RB	40290	40690	41190	40290	40690	41190	40290	40690	41190
	(MHz)		2560 MHz	2600 MHz	2650 MHz	2560 MHz	2600 MHz	2650 MHz	2560 MHz	2600 MHz	2650 MHz
41	10	1RB#0	21.55	21.13	21.02	20.77	19.74	20.05	19.79	18.75	19.35
		1RB#24	21.53	21.31	21.21	20.88	19.98	20.19	19.94	19.00	19.58
		1RB#49	21.39	21.05	20.99	20.60	19.71	19.90	19.65	18.72	19.30
		25RB#0	20.44	20.09	19.98	19.56	19.04	18.99	18.47	18.01	17.97
		25RB#12	20.55	20.07	19.98	19.55	19.08	18.96	18.50	17.97	17.98
		25RB#25	20.45	20.01	20.02	19.53	19.00	18.99	18.45	17.96	18.03
		50RB#0	20.46	20.05	19.99	19.45	19.07	18.95	18.46	18.08	17.94
Band	Bandwidth	RB	40315	40690	41165	40315	40690	41165	40315	40690	41165
	(MHz)		2562.5 MHz	2600 MHz	2647.5 MHz	2562.5 MHz	2600 MHz	2647.5 MHz	2562.5 MHz	2600 MHz	2647.5 MHz
41	15	1RB#0	21.44	21.12	20.93	20.64	19.85	19.92	19.73	19.20	19.29
		1RB#38	21.45	21.18	21.00	20.65	19.93	19.98	19.71	19.26	19.40
		1RB#74	21.31	21.05	20.89	20.53	19.82	19.80	19.57	19.11	19.24
		38RB#0	20.46	20.07	20.03	20.46	20.06	20.04	20.47	20.04	20.05
		38RB#18	20.48	20.07	20.05	20.47	20.08	20.06	20.45	20.07	20.05
		38RB#37	20.43	20.09	20.04	20.46	20.08	20.02	20.44	20.06	20.05
		75RB#0	20.44	20.07	20.03	19.46	19.07	19.02	18.46	18.03	18.05
Band	Bandwidth	RB	40340	40690	41140	40340	40690	41140	40340	40690	41140
	(MHz)		2565 MHz	2600 MHz	2645 MHz	2565 MHz	2600 MHz	2645 MHz	2565 MHz	2600 MHz	2645 MHz
41	20	1RB#0	21.30	20.92	20.83	20.37	19.53	19.46	19.25	18.97	18.86
		1RB#49	21.57	21.20	21.23	20.64	19.78	19.87	19.50	19.27	19.26
		1RB#99	21.14	20.71	20.85	20.15	19.35	19.45	19.00	18.86	18.86
		50RB#0	20.39	20.10	19.96	19.41	19.11	18.90	18.41	18.15	17.95
		50RB#25	20.36	20.09	19.96	19.40	19.15	18.92	18.38	18.18	17.92
		50RB#50	20.41	20.01	20.07	19.44	19.04	19.01	18.47	18.11	18.08
		100RB#0	20.37	20.08	20.04	19.41	19.05	19.04	18.49	18.11	17.98

4.3.4. Conducted Power of WLAN

The measuring conducted average power is shown as below.

Band	Mode	Channel	Frequency (MHz)	Average Power (dBm)
2.4GHz	802.11b	1	2412	15.79
		6	2437	16.47
		11	2462	16.05
	802.11g	1	2412	12.05
		6	2437	12.80
		11	2462	12.37
	802.11n-HT20	1	2412	11.91
		6	2437	12.84
		11	2462	12.37
	802.11n-HT40	3	2422	13.71
		6	2437	14.09
		9	2452	14.51

Mode	Band	Channel	Freq. (MHz)	Average Power (dBm)
IEEE 802.11a	U-NII-1	36	5180	13.83
		44	5220	13.99
		48	5240	13.78
	U-NII-2A	52	5260	13.95
		60	5300	13.80
		64	5320	13.93
	U-NII-2C	100	5500	13.82
		116	5580	13.73
		120	5600	13.78
		140	5700	13.71
	U-NII-3	144	5720	13.65
		149	5745	13.93
		157	5785	13.72
		165	5825	13.72
IEEE 802.11n-HT20	U-NII-1	36	5180	13.64
		44	5220	13.62
		48	5240	13.59
	U-NII-2A	52	5260	13.70
		60	5300	13.61
		64	5320	13.76
	U-NII-2C	100	5500	13.57
		116	5580	13.38
		120	5600	13.54
		140	5700	13.43
	U-NII-3	144	5720	13.69
		149	5745	13.56
		157	5785	13.48
		165	5825	13.61
IEEE 802.11n-HT40	U-NII-1	38	5190	13.74
		46	5230	13.70
	U-NII-2A	54	5270	13.61
		62	5310	13.62
	U-NII-2C	102	5510	8.70
		110	5550	8.60
		118	5590	8.45
		134	5670	8.50

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UTTR-SAR-IEEE Std 1528-2013-V1.1

	U-NII-3	142	5710	8.40
		151	5755	13.48
		159	5795	13.57
IEEE 802.11ac-VHT20	U-NII-1	36	5180	13.69
		44	5220	13.77
		48	5240	13.59
	U-NII-2A	52	5260	13.71
		60	5300	13.81
		64	5320	13.84
	U-NII-2C	100	5500	13.49
		116	5580	13.37
		120	5600	13.57
		140	5700	13.52
		144	5720	13.46
	U-NII-3	149	5745	13.56
		157	5785	13.48
		165	5825	13.46
IEEE 802.11ac-VHT40	U-NII-1	38	5190	13.82
		46	5230	13.64
	U-NII-2A	54	5270	13.53
		62	5310	13.81
	U-NII-2C	102	5510	8.41
		110	5550	8.34
		118	5590	8.70
		134	5670	8.51
		142	5710	8.35
	U-NII-3	151	5755	13.40
		159	5795	13.50
IEEE 802.11ac-VHT80	U-NII-1	42	5210	13.52
	U-NII-2A	58	5290	13.54
	U-NII-2C	106	5530	10.52
		122	5610	10.65
		138	5690	10.82
	U-NII-3	155	5775	13.39

4.3.5. Conducted Power of BT

Mode	Modulation	Channel	Frequency (MHz)	Average Power (dBm)
BR + EDR	GFSK	0	2402	6.85
		39	2441	7.75
		78	2480	6.25
	$\pi/4$ -DQPSK	0	2402	3.74
		39	2441	4.71
		78	2480	3.09
	8-DPSK	0	2402	3.73
		39	2441	4.68
		78	2480	3.08

Mode	Modulation	Channel	Frequency (MHz)	Average Power (dBm)
LE	GFSK	0	2402	3.10
		19	2440	4.73
		39	2480	3.58
2LE	GFSK	0	2402	1.77
		19	2440	3.03
		39	2480	2.43
LE Code (S=2)	GFSK	0	2402	3.41
		19	2440	5.02
		39	2480	3.87
LE Code (S=8)	GFSK	0	2402	3.67
		19	2440	5.30
		39	2480	4.15

4.4. SAR TEST EXCLUSION EVALUATIONS

4.4.1. Standalone SAR Test Exclusion Considerations

According to KDB 447498 D04, SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time-averaged power or maximum time-averaged ERP, whichever is greater.

The separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. In the case of mobile or portable devices, the separation distance is from the outer housing of the device where it is closest to the antenna.

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula (B.2).

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B.2})$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1).

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)									
	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

Mode	Max. time-averaged Power (dBm)	Gain (dBi)	ERP (dBm)	P _{ant} (mW)	Left Side			Right Side			Top Side			Bottom Side		
					Ant. to Surface (cm)	P _{th} (mW)	Require SAR Testing ?	Ant. to Surface (cm)	P _{th} (mW)	Require SAR Testing ?	Ant. to Surface (cm)	P _{th} (mW)	Require SAR Testing ?	Ant. to Surface (cm)	P _{th} (mW)	Require SAR Testing ?
GSM 850 (GPRS (GMSK, 4Tx-slot))	27.0	-1.71	23.14	501.19	0.6	11.72	Yes	4	174.83	Yes	16	1260.00	No	0.5	9.04	Yes
PCS 1900 (GPRS (GMSK, 4Tx-slot))	25.5	1.58	27.08	510.50	0.6	4.69	Yes	4	156.31	Yes	16	2025.94	No	0.5	3.35	Yes
WCDMA Band II	25.0	1.58	26.58	454.99	0.6	4.70	Yes	4	156.37	Yes	16	2026.05	No	0.5	3.35	Yes
WCDMA Band V	24.0	-1.71	20.14	251.19	0.6	11.76	Yes	4	174.85	Yes	16	1257.20	No	0.5	9.07	Yes
LTE Band 2	25.0	1.58	26.58	454.99	0.6	4.69	Yes	4	156.32	Yes	16	2025.96	No	0.5	3.35	Yes
LTE Band 4	25.0	1.44	26.44	440.55	0.6	5.01	Yes	4	161.02	Yes	16	2034.29	No	0.5	3.59	Yes
LTE Band 5	24.0	-1.71	20.14	251.19	0.6	11.73	Yes	4	174.84	Yes	16	1259.36	No	0.5	9.04	Yes
LTE Band 7	22.5	1.44	23.94	247.74	0.6	3.75	Yes	4	140.95	Yes	16	1997.09	No	0.5	2.64	Yes
LTE Band 26	24.5	-1.71	20.64	281.84	0.6	11.73	Yes	4	174.84	Yes	16	1259.36	No	0.5	9.04	Yes
LTE Band 38	22.0	1.44	23.44	220.80	0.6	3.69	Yes	4	140.00	Yes	16	1995.23	No	0.5	2.60	Yes
LTE Band 41	22.0	1.44	23.44	220.80	0.6	3.62	Yes	4	138.72	Yes	16	1992.68	No	0.5	2.55	Yes
2.4G WLAN	17.0	1.01	18.01	63.24	5.4	252.92	No	0.5	2.72	Yes	0.5	2.72	Yes	15.8	1953.41	No
5.2G WLAN	14.5	1.54	16.04	40.18	5.4	204.28	No	0.5	1.49	Yes	0.5	1.49	Yes	15.8	1879.72	No
5.3G WLAN	14.5	1.54	16.04	40.18	5.4	203.40	No	0.5	1.47	Yes	0.5	1.47	Yes	15.8	1878.26	No
5.6G WLAN	14.5	1.54	16.04	40.18	5.4	199.25	No	0.5	1.39	Yes	0.5	1.39	Yes	15.8	1871.30	No
5.8G WLAN	14.5	1.54	16.04	40.18	5.4	198.22	No	0.5	1.37	Yes	0.5	1.37	Yes	15.8	1869.56	No
Bluetooth	8.0	1.01	9.01	7.96	5.4	252.69	No	0.5	2.72	Yes	0.5	2.72	Yes	15.8	1953.09	No

Note:

- 1) Based on the antenna location shown on appendix D of this report for SAR test exclusion.
- 2) The 1 mW Blanket Exemption applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power of no more than 1 mW, regardless of separation distance.

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4.4.2. Estimated SAR Calculation

According to KDB 447498 D04, when an antenna qualifies for test exemption in single transmitter/antenna mode, its actual SAR value may not be available, because it was not required to be measured. In this case, the SAR contribution of that antenna to simultaneous transmission must be estimated relative to the SAR or MPE based exemption criteria for the applicable terms in the equation of § 1.1307(b)(3)(ii)(B) (see also Appendix C), by multiplying the corresponding ratio by the SAR limit of 1.6 W/kg for 1-g SAR. This is referred to as estimated SAR.

For instance, a given antenna may qualify for a SAR-based exemption according to Section B.4, with $P_{ant} < P_{th}$, where P_{ant} is maximum time-averaged power or effective radiated power (ERP), whichever is greater, and P_{th} is defined in Formula (B.2). Then, per the preceding paragraph, the estimated SAR is computed as $SAR_{est} = 1.6 * P_{ant} / P_{th}$ [W/kg].

Mode / Band	Frequency (GHz)	P_{ant} (mW)	Ant. to Surface (cm)	P_{th} (mW)	Test Position	Estimated 1g SAR (W/kg)
GSM 850	848.8	501.19	16	1260.00	Top Side	0.636
PCS 1900	1909.8	510.50	16	2025.94	Top Side	0.403
WCDMA Band II	1907.6	454.99	16	2026.05	Top Side	0.359
WCDMA Band V	846.6	251.19	16	1257.20	Top Side	0.320
LTE Band 2	1909.3	454.99	16	2025.96	Top Side	0.359
LTE Band 4	1754.3	440.55	16	2034.29	Top Side	0.346
LTE Band 5	848.3	251.19	16	1259.36	Top Side	0.319
LTE Band 7	2567.5	247.74	16	1997.09	Top Side	0.198
LTE Band 26	848.3	281.84	16	1259.36	Top Side	0.358
LTE Band 38	2617.5	220.80	16	1995.23	Top Side	0.177
LTE Band 41	2687.5	220.80	16	1992.68	Top Side	0.177
2.4G WLAN	2472	63.24	5.4	252.92	Left Side	0.400
5.2G WLAN	5240	40.18	5.4	204.28	Left Side	0.315
5.3G WLAN	5320	40.18	5.4	203.40	Left Side	0.316
5.6G WLAN	5720	40.18	5.4	199.25	Left Side	0.323
5.8G WLAN	5825	40.18	5.4	198.22	Left Side	0.324
Bluetooth	2480	7.96	5.4	252.69	Left Side	0.050
2.4G WLAN	2472	63.24	15.8	1953.41	Bottom Side	0.052
5.2G WLAN	5240	40.18	15.8	1879.72	Bottom Side	0.034
5.3G WLAN	5320	40.18	15.8	1878.26	Bottom Side	0.034
5.6G WLAN	5720	40.18	15.8	1871.30	Bottom Side	0.034
5.8G WLAN	5825	40.18	15.8	1869.56	Bottom Side	0.034
Bluetooth	2480	7.96	15.8	1953.09	Bottom Side	0.007

4.5. SAR TESTING RESULTS

4.5.1. SAR Test Reduction Considerations

KDB 447498 D01 General RF Exposure Guidance

Testing of other required channels within the operating mode of a frequency band is not required when the reported SAR for the mid-band or highest output power channel is:

- a) ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
- b) ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
- c) ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

KDB 941225 D01 3G SAR Procedures

a) GSM SAR Test Reduction

SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. The GMSK EDGE configurations are grouped with GPRS and considered with respect to time-averaged maximum output power to determine compliance. The 3G SAR test reduction procedure is applied to 8-PSK EDGE with GMSK GPRS/EDGE as the primary mode.

b) 3G SAR Test Reduction Procedure

The mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq 1/4$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

KDB 941225 D05 SAR for LTE Devices

a) QPSK with 1 RB and 50% RB allocation

Start with the largest channel bandwidth and measure SAR, 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 of the remaining RB offset configurations and required test channels is not required; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

b) QPSK with 100% RB allocation

SAR is not required when the highest maximum output power for 100% RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 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.

c) Higher order modulations

SAR is required only when the highest maximum output power for the configuration in the higher order modulation is $> 1/2$ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

d) Others channel bandwidth

SAR is required when the highest maximum output power of the smaller channel bandwidth is $> 1/2$ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

KDB 941225 D06 Hot Spot SAR

Hotspot mode SAR is measured for all edges and surfaces of the device with a transmitting antenna located within 25 mm from that surface or edge.

Antenna	Front Face	Rear Face	Left Side	Right	Top Side	Bottom Side
WWAN Main ANT	Yes	Yes	Yes	Yes	N/A	Yes
WLAN / BT	Yes	Yes	N/A	Yes	Yes	N/A

KDB 248227 D01 Wi-Fi SAR

- For handsets operating next to ear, hotspot mode or mini-tablet configurations, 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 the reported SAR of initial test position is ≤ 0.4 W/kg, SAR testing for remaining test positions is not 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.
- For WLAN 2.4 GHz, the highest measured maximum output power channel for DSSS was selected for SAR measurement. When the reported SAR is ≤ 0.8 W/kg, no further SAR testing is required. Otherwise, SAR is evaluated at the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel. For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and it is ≤ 1.2 W/kg.
- For WLAN 5 GHz, the initial test configuration was selected according to the transmission mode with the highest maximum output power. When the reported SAR of initial test configuration is > 0.8 W/kg, SAR is required for the subsequent highest measured output power channel until the reported SAR result is ≤ 1.2 W/kg or all required channels are measured. For other transmission modes, SAR is not required when the highest reported SAR for initial test configuration is adjusted by the ratio of subsequent test configuration to initial test configuration specified maximum output power and it is ≤ 1.2 W/kg.
- For WLAN MIMO mode, the power-based standalone SAR test exclusion or the sum of SAR provision in KDB 447498 to determine simultaneous transmission SAR test exclusion should be applied. Otherwise, SAR for MIMO mode will be measured with all applicable antennas transmitting simultaneously at the specified maximum output power of MIMO operation.

4.5.2. SAR Results for Head Exposure Condition

Plot No.	Band	Mode	Test Position	Channel	RB#	RB Offset	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Measured SAR-10g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
1	GSM 850	GPRS12	Right Cheek	128	--	--	--	30.0	29.61	0.03	0.316	0.243	1.09	0.346
	GSM 850	GPRS12	Right Tilted	128	--	--	--	30.0	29.61	0.07	0.165	0.129	1.09	0.181
	GSM 850	GPRS12	Left Cheek	128	--	--	--	30.0	29.61	-0.02	0.3	0.234	1.09	0.328
	GSM 850	GPRS12	Left Tilted	128	--	--	--	30.0	29.61	-0.11	0.171	0.135	1.09	0.187
2	PCS 1900	GPRS12	Right Cheek	661	--	--	--	28.25	27.86	0.18	0.155	0.103	1.09	0.170
	PCS 1900	GPRS12	Right Tilted	661	--	--	--	28.25	27.86	0.01	0.0793	0.0487	1.09	0.087
	PCS 1900	GPRS12	Left Cheek	661	--	--	--	28.25	27.86	0.06	0.134	0.0847	1.09	0.147
	PCS 1900	GPRS12	Left Tilted	661	--	--	--	28.25	27.86	-0.02	0.0861	0.0556	1.09	0.094
3	WCDMA Band II	RMC12.2K	Right Cheek	9262	--	--	--	24.75	24.46	-0.01	0.186	0.121	1.07	0.199
	WCDMA Band II	RMC12.2K	Right Tilted	9262	--	--	--	24.75	24.46	-0.01	0.0956	0.0589	1.07	0.102
	WCDMA Band II	RMC12.2K	Left Cheek	9262	--	--	--	24.75	24.46	0.04	0.171	0.106	1.07	0.183
	WCDMA Band II	RMC12.2K	Left Tilted	9262	--	--	--	24.75	24.46	-0.03	0.113	0.0724	1.07	0.121
4	WCDMA Band V	RMC12.2K	Right Cheek	4132	--	--	--	24.0	23.63	0.03	0.189	0.144	1.09	0.206
	WCDMA Band V	RMC12.2K	Right Tilted	4132	--	--	--	24.0	23.63	0.06	0.0901	0.0709	1.09	0.098
	WCDMA Band V	RMC12.2K	Left Cheek	4132	--	--	--	24.0	23.63	0.05	0.167	0.131	1.09	0.182
	WCDMA Band V	RMC12.2K	Left Tilted	4132	--	--	--	24.0	23.63	0.05	0.0979	0.0769	1.09	0.107
5	LTE Band 2	QPSK20M	Right Cheek	18700	1	49	--	25.0	24.51	0.10	0.199	0.129	1.12	0.223
	LTE Band 2	QPSK20M	Right Tilted	18700	1	49	--	25.0	24.51	0.03	0.102	0.0626	1.12	0.114
	LTE Band 2	QPSK20M	Left Cheek	18700	1	49	--	25.0	24.51	0.04	0.177	0.112	1.12	0.198
	LTE Band 2	QPSK20M	Left Tilted	18700	1	49	--	25.0	24.51	0.05	0.121	0.0782	1.12	0.135
	LTE Band 2	QPSK20M	Right Cheek	18700	50	50	--	25.0	24.34	0.05	0.145	0.0945	1.16	0.169
	LTE Band 2	QPSK20M	Right Tilted	18700	50	50	--	25.0	24.34	0.07	0.0748	0.0459	1.16	0.087
	LTE Band 2	QPSK20M	Left Cheek	18700	50	50	--	25.0	24.34	0.06	0.131	0.0825	1.16	0.153
	LTE Band 2	QPSK20M	Left Tilted	18700	50	50	--	25.0	24.34	0.05	0.0882	0.0569	1.16	0.103
6	LTE Band 4	QPSK20M	Right Cheek	20050	1	49	--	25.0	24.40	0.06	0.0743	0.0496	1.15	0.085
	LTE Band 4	QPSK20M	Right Tilted	20050	1	49	--	25.0	24.40	0.05	0.0469	0.0309	1.15	0.054
	LTE Band 4	QPSK20M	Left Cheek	20050	1	49	--	25.0	24.40	0.09	0.074	0.049	1.15	0.085
	LTE Band 4	QPSK20M	Left Tilted	20050	1	49	--	25.0	24.40	0.03	0.0517	0.035	1.15	0.059
	LTE Band 4	QPSK20M	Right Cheek	20050	50	50	--	24.0	23.40	0.06	0.0567	0.0378	1.15	0.065
	LTE Band 4	QPSK20M	Right Tilted	20050	50	50	--	24.0	23.40	0.04	0.0362	0.0237	1.15	0.042
	LTE Band 4	QPSK20M	Left Cheek	20050	50	50	--	24.0	23.40	0.03	0.0563	0.0372	1.15	0.065
	LTE Band 4	QPSK20M	Left Tilted	20050	50	50	--	24.0	23.40	0.03	0.0399	0.0269	1.15	0.046
	LTE Band 7	QPSK20M	Right Cheek	20850	1	49	--	22.5	21.82	0.09	0.12	0.0668	1.17	0.140
	LTE Band 7	QPSK20M	Right Tilted	20850	1	49	--	22.5	21.82	0.09	0.0868	0.0462	1.17	0.102

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Plot No.	Band	Mode	Test Position	Channel	RB#	RB Offset	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Measured SAR-10g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
7	LTE Band 7	QPSK20M	Left Cheek	20850	1	49	--	22.5	21.82	0.05	0.161	0.0851	1.17	0.188
	LTE Band 7	QPSK20M	Left Tilted	20850	1	49	--	22.5	21.82	0.08	0.0727	0.0392	1.17	0.085
	LTE Band 7	QPSK20M	Right Cheek	20850	50	50	--	20.5	20.13	0.05	0.0859	0.0473	1.09	0.094
	LTE Band 7	QPSK20M	Right Tilted	20850	50	50	--	20.5	20.13	0.12	0.0644	0.0341	1.09	0.070
	LTE Band 7	QPSK20M	Left Cheek	20850	50	50	--	20.5	20.13	0.05	0.117	0.061	1.09	0.127
	LTE Band 7	QPSK20M	Left Tilted	20850	50	50	--	20.5	20.13	0.13	0.0521	0.0281	1.09	0.057
8	LTE Band 26(5)	QPSK15M	Right Cheek	26765	1	38	--	24.5	23.99	0.02	0.159	0.122	1.12	0.179
	LTE Band 26(5)	QPSK15M	Right Tilted	26765	1	38	--	24.5	23.99	0.14	0.0816	0.0641	1.12	0.092
	LTE Band 26(5)	QPSK15M	Left Cheek	26765	1	38	--	24.5	23.99	0.04	0.148	0.116	1.12	0.166
	LTE Band 26(5)	QPSK15M	Left Tilted	26765	1	38	--	24.5	23.99	0.05	0.0915	0.0716	1.12	0.103
	LTE Band 26(5)	QPSK15M	Right Cheek	26765	38	0	--	24.5	23.84	0.02	0.116	0.09	1.16	0.135
	LTE Band 26(5)	QPSK15M	Right Tilted	26765	38	0	--	24.5	23.84	0.14	0.0597	0.0468	1.16	0.069
	LTE Band 26(5)	QPSK15M	Left Cheek	26765	38	0	--	24.5	23.84	0.17	0.111	0.0869	1.16	0.129
	LTE Band 26(5)	QPSK15M	Left Tilted	26765	38	0	--	24.5	23.84	0.15	0.0683	0.0535	1.16	0.080
	LTE Band 41(38)	QPSK20M	Right Cheek	40340	1	49	--	22.0	21.57	0.09	0.0664	0.0355	1.10	0.073
	LTE Band 41(38)	QPSK20M	Right Tilted	40340	1	49	--	22.0	21.57	0.08	0.0563	0.0288	1.10	0.062
9	LTE Band 41(38)	QPSK20M	Left Cheek	40340	1	49	--	22.0	21.57	0.11	0.0974	0.0501	1.10	0.108
	LTE Band 41(38)	QPSK20M	Left Tilted	40340	1	49	--	22.0	21.57	0.17	0.0388	0.0207	1.10	0.043
	LTE Band 41(38)	QPSK20M	Right Cheek	40340	50	50	--	21.0	20.41	0.18	0.0538	0.0282	1.15	0.062
	LTE Band 41(38)	QPSK20M	Right Tilted	40340	50	50	--	21.0	20.41	0.02	0.0448	0.0228	1.15	0.051
	LTE Band 41(38)	QPSK20M	Left Cheek	40340	50	50	--	21.0	20.41	0.12	0.0779	0.0398	1.15	0.089
	LTE Band 41(38)	QPSK20M	Left Tilted	40340	50	50	--	21.0	20.41	0.03	0.03	0.0161	1.15	0.034
	2.4GHz	IEEE 802.11b	Right Cheek	6	--	--	99.05%	17.0	16.47	0.03	0.0696	0.0426	1.13	0.079
	2.4GHz	IEEE 802.11b	Right Tilted	6	--	--	99.05%	17.0	16.47	0.01	0.0763	0.0401	1.13	0.087
10	2.4GHz	IEEE 802.11b	Left Cheek	6	--	--	99.05%	17.0	16.47	0.02	0.131	0.0723	1.13	0.149
	2.4GHz	IEEE 802.11b	Left Tilted	6	--	--	99.05%	17.0	16.47	0.10	0.101	0.0513	1.13	0.115
	2.4GHz	Bluetooth DH5	Right Cheek	39	--	--	76.80%	8.0	7.75	0.09	0.00843	0.00507	1.06	0.012
	2.4GHz	Bluetooth DH5	Right Tilted	39	--	--	76.80%	8.0	7.75	0.04	0.0102	0.00565	1.06	0.014
11	2.4GHz	Bluetooth DH5	Left Cheek	39	--	--	76.80%	8.0	7.75	0.00	0.0182	0.00984	1.06	0.025
	2.4GHz	Bluetooth DH5	Left Tilted	39	--	--	76.80%	8.0	7.75	0.08	0.00611	0.00294	1.06	0.008
	U-NII-1	IEEE 802.11a	Right Cheek	44	--	--	96.86%	14.5	13.85	-0.05	0.14	0.049	1.16	0.168
	U-NII-1	IEEE 802.11a	Right Tilted	44	--	--	96.86%	14.5	13.85	-0.02	0.149	0.052	1.16	0.179
12	U-NII-1	IEEE 802.11a	Left Cheek	44	--	--	96.86%	14.5	13.85	-0.06	0.193	0.066	1.16	0.231
	U-NII-1	IEEE 802.11a	Left Tilted	44	--	--	96.86%	14.5	13.85	-0.01	0.157	0.054	1.16	0.188
	U-NII-2A	IEEE 802.11a	Right Cheek	52	--	--	96.86%	14.5	13.81	-0.17	0.135	0.049	1.17	0.163
	U-NII-2A	IEEE 802.11a	Right Tilted	52	--	--	96.86%	14.5	13.81	-0.08	0.149	0.053	1.17	0.180

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Plot No.	Band	Mode	Test Position	Channel	RB#	RB Offset	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Measured SAR-10g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
13	U-NII-2A	IEEE 802.11a	Left Cheek	52	--	--	96.86%	14.5	13.81	-0.09	0.208	0.065	1.17	0.252
	U-NII-2A	IEEE 802.11a	Left Tilted	52	--	--	96.86%	14.5	13.81	-0.06	0.163	0.057	1.17	0.197
	U-NII-2C	IEEE 802.11a	Right Cheek	100	--	--	96.86%	14.0	13.68	-0.03	0.133	0.049	1.08	0.148
	U-NII-2C	IEEE 802.11a	Right Tilted	100	--	--	96.86%	14.0	13.68	-0.05	0.138	0.049	1.08	0.153
14	U-NII-2C	IEEE 802.11a	Left Cheek	100	--	--	96.86%	14.0	13.68	-0.05	0.176	0.056	1.08	0.196
	U-NII-2C	IEEE 802.11a	Left Tilted	100	--	--	96.86%	14.0	13.68	-0.14	0.142	0.048	1.08	0.158
	U-NII-3	IEEE 802.11a	Right Cheek	149	--	--	96.86%	14.0	13.79	-0.06	0.128	0.044	1.05	0.139
	U-NII-3	IEEE 802.11a	Right Tilted	149	--	--	96.86%	14.0	13.79	0.03	0.137	0.05	1.05	0.148
15	U-NII-3	IEEE 802.11a	Left Cheek	149	--	--	96.86%	14.0	13.79	-0.09	0.234	0.071	1.05	0.254
	U-NII-3	IEEE 802.11a	Left Tilted	149	--	--	96.86%	14.0	13.79	-0.02	0.159	0.057	1.05	0.172

Note: Scaled SAR-1g (W/kg) = (Measured SAR-1g (W/kg) x Scaling Factor) / Duty Cycle.

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4.5.3. SAR Results for Body-Worn Exposure Condition (Separation Distance is 1.0 cm)

Plot No.	Band	Mode	Test Position	Channel	RB#	RB Offset	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Measured SAR-10g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
16	GSM 850	GPRS12	Front Face	128	--	--	--	30.0	29.61	-0.02	0.561	0.352	1.09	0.614
	GSM 850	GPRS12	Rear Face	128	--	--	--	30.0	29.61	0.04	0.624	0.413	1.09	0.683
17	PCS 1900	GPRS12	Front Face	661	--	--	--	28.25	27.86	-0.02	0.382	0.216	1.09	0.418
	PCS 1900	GPRS12	Rear Face	661	--	--	--	28.25	27.86	-0.04	0.624	0.374	1.09	0.683
18	WCDMA Band II	RMC12.2K	Front Face	9262	--	--	--	24.75	24.46	0.03	0.499	0.278	1.07	0.533
	WCDMA Band II	RMC12.2K	Rear Face	9262	--	--	--	24.75	24.46	-0.06	0.700	0.421	1.07	0.748
19	WCDMA Band V	RMC12.2K	Front Face	4132	--	--	--	24.0	23.63	-0.06	0.313	0.197	1.09	0.341
	WCDMA Band V	RMC12.2K	Rear Face	4132	--	--	--	24.0	23.63	-0.11	0.389	0.258	1.09	0.424
20	LTE Band 2	QPSK20M	Front Face	18700	1	49	--	25.0	24.51	-0.03	0.494	0.28	1.12	0.553
	LTE Band 2	QPSK20M	Rear Face	18700	1	49	--	25.0	24.51	-0.05	0.522	0.317	1.12	0.584
	LTE Band 2	QPSK20M	Front Face	18700	50	50	--	25.0	24.34	0.03	0.363	0.205	1.16	0.423
	LTE Band 2	QPSK20M	Rear Face	18700	50	50	--	25.0	24.34	-0.05	0.389	0.236	1.16	0.453
21	LTE Band 4	QPSK20M	Front Face	20050	1	49	--	25.0	24.40	0.03	0.187	0.109	1.15	0.215
	LTE Band 4	QPSK20M	Rear Face	20050	1	49	--	25.0	24.40	-0.04	0.323	0.2	1.15	0.371
	LTE Band 4	QPSK20M	Front Face	20050	50	50	--	24.0	23.40	0.09	0.147	0.0858	1.15	0.169
	LTE Band 4	QPSK20M	Rear Face	20050	50	50	--	24.0	23.40	-0.06	0.257	0.158	1.15	0.295
22	LTE Band 7	QPSK20M	Front Face	20850	1	49	--	22.5	21.82	0.02	0.177	0.0923	1.17	0.207
	LTE Band 7	QPSK20M	Rear Face	20850	1	49	--	22.5	21.82	-0.12	0.399	0.208	1.17	0.467
	LTE Band 7	QPSK20M	Front Face	20850	50	50	--	20.5	20.13	-0.01	0.129	0.0676	1.09	0.140
	LTE Band 7	QPSK20M	Rear Face	20850	50	50	--	20.5	20.13	-0.11	0.295	0.154	1.09	0.321
23	LTE Band 26(5)	QPSK15M	Front Face	26765	1	38	--	24.5	23.99	-0.02	0.286	0.18	1.12	0.322
	LTE Band 26(5)	QPSK15M	Rear Face	26765	1	38	--	24.5	23.99	0.01	0.341	0.227	1.12	0.383
	LTE Band 26(5)	QPSK15M	Front Face	26765	36	0	--	24.5	23.84	-0.05	0.208	0.13	1.16	0.242
	LTE Band 26(5)	QPSK15M	Rear Face	26765	36	0	--	24.5	23.84	0.08	0.253	0.169	1.16	0.295
24	LTE Band 41(38)	QPSK20M	Front Face	40340	1	49	--	22.0	21.57	-0.15	0.111	0.0579	1.10	0.123
	LTE Band 41(38)	QPSK20M	Rear Face	40340	1	49	--	22.0	21.57	-0.07	0.365	0.179	1.10	0.403
	LTE Band 41(38)	QPSK20M	Front Face	40340	50	50	--	21.0	20.41	0.12	0.0876	0.0455	1.15	0.100
	LTE Band 41(38)	QPSK20M	Rear Face	40340	50	50	--	21.0	20.41	-0.06	0.295	0.144	1.15	0.338
25	2.4GHz	IEEE 802.11b	Front Face	6	--	--	99.05%	17.0	16.47	-0.14	0.0349	0.0199	1.13	0.040
	2.4GHz	IEEE 802.11b	Rear Face	6	--	--	99.05%	17.0	16.47	0.12	0.147	0.0736	1.13	0.168
26	2.4GHz	Bluetooth DH5	Front Face	39	--	--	76.80%	8.0	7.75	0.04	0.00485	0.00268	1.06	0.007
	2.4GHz	Bluetooth DH5	Rear Face	39	--	--	76.80%	8.0	7.75	0.09	0.0241	0.0114	1.06	0.033
27	U-NII-1	IEEE 802.11a	Front Face	44	--	--	96.86%	14.5	13.85	-0.01	0.057	0.023	1.16	0.068
	U-NII-1	IEEE 802.11a	Rear Face	44	--	--	96.86%	14.5	13.85	-0.02	0.170	0.066	1.16	0.204

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Plot No.	Band	Mode	Test Position	Channel	RB#	RB Offset	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Measured SAR-10g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
	U-NII-2A	IEEE 802.11a	Front Face	52	--	--	96.86%	14.5	13.81	-0.02	0.05	0.021	1.17	0.061
28	U-NII-2A	IEEE 802.11a	Rear Face	52	--	--	96.86%	14.5	13.81	-0.06	0.125	0.049	1.17	0.151
	U-NII-2C	IEEE 802.11a	Front Face	100	--	--	96.86%	14.0	13.68	-0.06	0.044	0.018	1.08	0.049
29	U-NII-2C	IEEE 802.11a	Rear Face	100	--	--	96.86%	14.0	13.68	-0.05	0.091	0.031	1.08	0.101
	U-NII-3	IEEE 802.11a	Front Face	149	--	--	96.86%	14.0	13.79	-0.08	0.067	0.026	1.05	0.073
30	U-NII-3	IEEE 802.11a	Rear Face	149	--	--	96.86%	14.0	13.79	-0.09	0.145	0.043	1.05	0.157

Note: Scaled SAR-1g (W/kg) = (Measured SAR-1g (W/kg) x Scaling Factor) / Duty Cycle.

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4.5.4. SAR Results for Hotspot Exposure Condition (Separation Distance is 1.0 cm)

Plot No.	Band	Mode	Test Position	Channel	RB#	RB Offset	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Measured SAR-10g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
16	GSM 850	GPRS12	Front Face	128	--	--	--	30.0	29.61	-0.02	0.561	0.352	1.09	0.614
	GSM 850	GPRS12	Rear Face	128	--	--	--	30.0	29.61	0.04	0.624	0.413	1.09	0.683
	GSM 850	GPRS12	Left Side	128	--	--	--	30.0	29.61	-0.14	0.226	0.156	1.09	0.247
	GSM 850	GPRS12	Right Side	128	--	--	--	30.0	29.61	-0.03	0.25	0.173	1.09	0.273
	GSM 850	GPRS12	Bottom Side	128	--	--	--	30.0	29.61	0.00	0.367	0.239	1.09	0.401
	PCS 1900	GPRS12	Front Face	661	--	--	--	28.25	27.86	-0.02	0.382	0.216	1.09	0.418
	PCS 1900	GPRS12	Rear Face	661	--	--	--	28.25	27.86	-0.04	0.624	0.374	1.09	0.683
	PCS 1900	GPRS12	Left Side	661	--	--	--	28.25	27.86	0.00	0.208	0.127	1.09	0.228
	PCS 1900	GPRS12	Right Side	661	--	--	--	28.25	27.86	0.03	0.113	0.0727	1.09	0.124
	PCS 1900	GPRS12	Bottom Side	661	--	--	--	28.25	27.86	0.14	0.846	0.455	1.09	0.925
31	PCS 1900	GPRS12	Bottom Side	512	--	--	--	28.25	27.68	0.01	1.01	0.544	1.14	1.152
*	PCS 1900	GPRS12	Bottom Side	512	--	--	--	28.25	27.68	0.07	1.01	0.543	1.14	1.152
	PCS 1900	GPRS12	Bottom Side	810	--	--	--	28.25	27.84	0.06	0.839	0.447	1.10	0.922
	WCDMA Band II	RMC12.2K	Front Face	9262	--	--	--	24.75	24.46	0.03	0.499	0.278	1.07	0.533
	WCDMA Band II	RMC12.2K	Rear Face	9262	--	--	--	24.75	24.46	-0.06	0.7	0.421	1.07	0.748
	WCDMA Band II	RMC12.2K	Left Side	9262	--	--	--	24.75	24.46	0.03	0.279	0.172	1.07	0.298
	WCDMA Band II	RMC12.2K	Right Side	9262	--	--	--	24.75	24.46	0.06	0.152	0.0983	1.07	0.162
	WCDMA Band II	RMC12.2K	Bottom Side	9262	--	--	--	24.75	24.46	0.04	1.09	0.583	1.07	1.165
32	WCDMA Band II	RMC12.2K	Bottom Side	9262	--	--	--	24.75	24.46	0.00	1.04	0.558	1.07	1.112
*	WCDMA Band II	RMC12.2K	Bottom Side	9262	--	--	--	24.75	24.46	0.00	1.04	0.558	1.07	1.112
	WCDMA Band II	RMC12.2K	Bottom Side	9400	--	--	--	24.75	24.28	0.19	0.931	0.497	1.11	1.037
	WCDMA Band II	RMC12.2K	Bottom Side	9538	--	--	--	24.75	24.25	0.10	0.681	0.364	1.12	0.764
19	WCDMA Band V	RMC12.2K	Front Face	4132	--	--	--	24.0	23.63	-0.06	0.313	0.197	1.09	0.341
	WCDMA Band V	RMC12.2K	Rear Face	4132	--	--	--	24.0	23.63	-0.11	0.389	0.258	1.09	0.424
	WCDMA Band V	RMC12.2K	Left Side	4132	--	--	--	24.0	23.63	0.09	0.113	0.0788	1.09	0.123
	WCDMA Band V	RMC12.2K	Right Side	4132	--	--	--	24.0	23.63	-0.04	0.144	0.0992	1.09	0.157
	WCDMA Band V	RMC12.2K	Bottom Side	4132	--	--	--	24.0	23.63	0.07	0.216	0.14	1.09	0.235
	LTE Band 2	QPSK20M	Front Face	18700	1	49	--	25.0	24.51	-0.03	0.494	0.28	1.12	0.553
	LTE Band 2	QPSK20M	Rear Face	18700	1	49	--	25.0	24.51	-0.05	0.522	0.317	1.12	0.584
	LTE Band 2	QPSK20M	Left Side	18700	1	49	--	25.0	24.51	0.02	0.294	0.183	1.12	0.329
	LTE Band 2	QPSK20M	Right Side	18700	1	49	--	25.0	24.51	0.15	0.151	0.0976	1.12	0.169
	LTE Band 2	QPSK20M	Bottom Side	18700	1	49	--	25.0	24.51	0.17	0.774	0.423	1.12	0.866
33	LTE Band 2	QPSK20M	Front Face	18700	50	50	--	25.0	24.34	0.03	0.363	0.205	1.16	0.423
	LTE Band 2	QPSK20M	Rear Face	18700	50	50	--	25.0	24.34	-0.05	0.389	0.236	1.16	0.453
	LTE Band 2	QPSK20M	Left Side	18700	50	50	--	25.0	24.34	0.00	0.216	0.134	1.16	0.251

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Plot No.	Band	Mode	Test Position	Channel	RB#	RB Offset	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Measured SAR-10g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
	LTE Band 2	QPSK20M	Right Side	18700	50	50	--	25.0	24.34	0.13	0.11	0.0715	1.16	0.128
	LTE Band 2	QPSK20M	Bottom Side	18700	50	50	--	25.0	24.34	0.20	0.578	0.316	1.16	0.673
	LTE Band 2	QPSK20M	Bottom Side	18900	1	49	--	25.0	23.68	0.13	0.615	0.335	1.36	0.833
	LTE Band 2	QPSK20M	Bottom Side	19100	1	49	--	25.0	23.32	0.17	0.484	0.263	1.47	0.713
	LTE Band 4	QPSK20M	Front Face	20050	1	49	--	25.0	24.40	0.03	0.187	0.109	1.15	0.215
	LTE Band 4	QPSK20M	Rear Face	20050	1	49	--	25.0	24.40	-0.04	0.323	0.2	1.15	0.371
	LTE Band 4	QPSK20M	Left Side	20050	1	49	--	25.0	24.40	-0.02	0.115	0.0716	1.15	0.132
	LTE Band 4	QPSK20M	Right Side	20050	1	49	--	25.0	24.40	0.02	0.0653	0.0418	1.15	0.075
34	LTE Band 4	QPSK20M	Bottom Side	20050	1	49	--	25.0	24.40	0.15	0.394	0.214	1.15	0.452
	LTE Band 4	QPSK20M	Front Face	20050	50	50	--	24.0	23.40	0.09	0.147	0.0858	1.15	0.169
	LTE Band 4	QPSK20M	Rear Face	20050	50	50	--	24.0	23.40	-0.06	0.257	0.158	1.15	0.295
	LTE Band 4	QPSK20M	Left Side	20050	50	50	--	24.0	23.40	-0.04	0.0902	0.0566	1.15	0.104
	LTE Band 4	QPSK20M	Right Side	20050	50	50	--	24.0	23.40	0.04	0.0515	0.033	1.15	0.059
	LTE Band 4	QPSK20M	Bottom Side	20050	50	50	--	24.0	23.40	0.14	0.305	0.165	1.15	0.350
	LTE Band 7	QPSK20M	Front Face	20850	1	49	--	22.5	21.82	0.02	0.177	0.0923	1.17	0.207
22	LTE Band 7	QPSK20M	Rear Face	20850	1	49	--	22.5	21.82	-0.12	0.399	0.208	1.17	0.467
	LTE Band 7	QPSK20M	Left Side	20850	1	49	--	22.5	21.82	0.13	0.3	0.161	1.17	0.351
	LTE Band 7	QPSK20M	Right Side	20850	1	49	--	22.5	21.82	0.04	0.0482	0.0276	1.17	0.056
	LTE Band 7	QPSK20M	Bottom Side	20850	1	49	--	22.5	21.82	0.16	0.212	0.107	1.17	0.248
	LTE Band 7	QPSK20M	Front Face	20850	50	50	--	20.5	20.13	-0.01	0.129	0.0676	1.09	0.140
	LTE Band 7	QPSK20M	Rear Face	20850	50	50	--	20.5	20.13	-0.11	0.295	0.154	1.09	0.321
	LTE Band 7	QPSK20M	Left Side	20850	50	50	--	20.5	20.13	0.19	0.217	0.117	1.09	0.236
	LTE Band 7	QPSK20M	Right Side	20850	50	50	--	20.5	20.13	0.10	0.0355	0.0202	1.09	0.039
	LTE Band 7	QPSK20M	Bottom Side	20850	50	50	--	20.5	20.13	0.10	0.156	0.0786	1.09	0.170
	LTE Band 26(5)	QPSK15M	Front Face	26765	1	38	--	24.5	23.99	-0.02	0.286	0.18	1.12	0.322
23	LTE Band 26(5)	QPSK15M	Rear Face	26765	1	38	--	24.5	23.99	0.01	0.341	0.227	1.12	0.383
	LTE Band 26(5)	QPSK15M	Left Side	26765	1	38	--	24.5	23.99	0.06	0.118	0.0815	1.12	0.133
	LTE Band 26(5)	QPSK15M	Right Side	26765	1	38	--	24.5	23.99	-0.03	0.126	0.0869	1.12	0.142
	LTE Band 26(5)	QPSK15M	Bottom Side	26765	1	38	--	24.5	23.99	-0.07	0.197	0.127	1.12	0.222
	LTE Band 26(5)	QPSK15M	Front Face	26765	36	0	--	24.5	23.84	-0.05	0.208	0.13	1.16	0.242
	LTE Band 26(5)	QPSK15M	Rear Face	26765	36	0	--	24.5	23.84	0.08	0.253	0.169	1.16	0.295
	LTE Band 26(5)	QPSK15M	Left Side	26765	36	0	--	24.5	23.84	-0.01	0.0874	0.0607	1.16	0.102
	LTE Band 26(5)	QPSK15M	Right Side	26765	36	0	--	24.5	23.84	-0.04	0.0931	0.0644	1.16	0.108
	LTE Band 26(5)	QPSK15M	Bottom Side	26765	36	0	--	24.5	23.84	-0.02	0.144	0.093	1.16	0.168
	LTE Band 41(38)	QPSK20M	Front Face	40340	1	49	--	22.0	21.57	-0.15	0.111	0.0579	1.10	0.123
24	LTE Band 41(38)	QPSK20M	Rear Face	40340	1	49	--	22.0	21.57	-0.07	0.365	0.179	1.10	0.403

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Plot No.	Band	Mode	Test Position	Channel	RB#	RB Offset	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Measured SAR-10g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
	LTE Band 41(38)	QPSK20M	Left Side	40340	1	49	--	22.0	21.57	0.02	0.192	0.103	1.10	0.212
	LTE Band 41(38)	QPSK20M	Right Side	40340	1	49	--	22.0	21.57	0.08	0.0185	0.0105	1.10	0.020
	LTE Band 41(38)	QPSK20M	Bottom Side	40340	1	49	--	22.0	21.57	0.02	0.248	0.119	1.10	0.274
	LTE Band 41(38)	QPSK20M	Front Face	40340	50	50	--	21.0	20.41	0.12	0.0876	0.0455	1.15	0.100
	LTE Band 41(38)	QPSK20M	Rear Face	40340	50	50	--	21.0	20.41	-0.06	0.295	0.144	1.15	0.338
	LTE Band 41(38)	QPSK20M	Left Side	40340	50	50	--	21.0	20.41	0.04	0.151	0.0812	1.15	0.173
	LTE Band 41(38)	QPSK20M	Right Side	40340	50	50	--	21.0	20.41	0.11	0.014	0.00783	1.15	0.016
	2.4GHz	IEEE 802.11b	Front Face	6	--	--	99.05%	17.0	16.47	-0.14	0.0349	0.0199	1.13	0.040
25	2.4GHz	IEEE 802.11b	Rear Face	6	--	--	99.05%	17.0	16.47	0.12	0.147	0.0736	1.13	0.168
	2.4GHz	IEEE 802.11b	Left Side	6	--	--	99.05%	17.0	16.47	0.05	0.00837	0.00425	1.13	0.010
	2.4GHz	IEEE 802.11b	Right Side	6	--	--	99.05%	17.0	16.47	-0.02	0.0689	0.037	1.13	0.079
	2.4GHz	IEEE 802.11b	Top Side	6	--	--	99.05%	17.0	16.47	-0.06	0.0751	0.0396	1.13	0.086
	2.4GHz	Bluetooth DH5	Front Face	39	--	--	76.80%	8.0	7.75	0.04	0.00485	0.00268	1.06	0.007
26	2.4GHz	Bluetooth DH5	Rear Face	39	--	--	76.80%	8.0	7.75	0.09	0.0241	0.0114	1.06	0.033
	2.4GHz	Bluetooth DH5	Left Side	39	--	--	76.80%	8.0	7.75	0.04	0.00279	0.000388	1.06	0.004
	2.4GHz	Bluetooth DH5	Right Side	39	--	--	76.80%	8.0	7.75	0.03	0.00785	0.00319	1.06	0.011
	2.4GHz	Bluetooth DH5	Top Side	39	--	--	76.80%	8.0	7.75	0.11	0.0105	0.00545	1.06	0.014
	U-NII-1	IEEE 802.11a	Front Face	44	--	--	96.86%	14.5	13.85	-0.01	0.057	0.023	1.16	0.068
27	U-NII-1	IEEE 802.11a	Rear Face	44	--	--	96.86%	14.5	13.85	-0.02	0.17	0.066	1.16	0.204
	U-NII-1	IEEE 802.11a	Right Side	44	--	--	96.86%	14.5	13.85	-0.05	0.07	0.029	1.16	0.084
	U-NII-1	IEEE 802.11a	Top Side	44	--	--	96.86%	14.5	13.85	-0.06	0.091	0.038	1.16	0.109
	U-NII-3	IEEE 802.11a	Front Face	149	--	--	96.86%	14.0	13.79	-0.08	0.067	0.026	1.05	0.073
	U-NII-3	IEEE 802.11a	Rear Face	149	--	--	96.86%	14.0	13.79	-0.09	0.145	0.043	1.05	0.157
	U-NII-3	IEEE 802.11a	Right Side	149	--	--	96.86%	14.0	13.79	-0.09	0.112	0.048	1.05	0.121
35	U-NII-3	IEEE 802.11a	Top Side	149	--	--	96.86%	14.0	13.79	-0.07	0.148	0.059	1.05	0.160

Note:

- 1) Scaled SAR-1g (W/kg) = (Measured SAR-1g (W/kg) x Scaling Factor) / Duty Cycle.
- 2) "*" indicates that the data is repeated Measurement.

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4.5.5. SAR Results for Extremity Exposure Condition (Separation Distance is 0 cm)

Plot No.	Band	Mode	Test Position	Channel	RB#	RB Offset	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Measured SAR-10g (W/kg)	Scaling Factor	Scaled SAR-10g (W/kg)
	U-NII-2A	IEEE 802.11a	Front Face	52	--	--	96.86%	14.5	13.81	-0.02	0.34	0.098	1.17	0.119
36	U-NII-2A	IEEE 802.11a	Rear Face	52	--	--	96.86%	14.5	13.81	-0.09	0.669	0.195	1.17	0.236
	U-NII-2A	IEEE 802.11a	Right Side	52	--	--	96.86%	14.5	13.81	-0.08	0.38	0.13	1.17	0.157
	U-NII-2A	IEEE 802.11a	Top Side	52	--	--	96.86%	14.5	13.81	-0.03	0.609	0.189	1.17	0.229
	U-NII-2C	IEEE 802.11a	Front Face	100	--	--	96.86%	14.0	13.68	0.00	0.383	0.135	1.08	0.150
37	U-NII-2C	IEEE 802.11a	Rear Face	100	--	--	96.86%	14.0	13.68	-0.01	0.851	0.227	1.08	0.252
	U-NII-2C	IEEE 802.11a	Right Side	100	--	--	96.86%	14.0	13.68	-0.03	0.426	0.138	1.08	0.153
	U-NII-2C	IEEE 802.11a	Top Side	100	--	--	96.86%	14.0	13.68	-0.02	0.602	0.186	1.08	0.207

Note: Scaled SAR-1g (W/kg) = (Measured SAR-1g (W/kg) x Scaling Factor) / Duty Cycle.

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UTTR-SAR-IEEE Std 1528-2013-V1.1

4.6. SAR MEASUREMENT VARIABILITY

4.6.1. Repeated Measurement

According to KDB 865664 D01, SAR measurement variability was assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. Alternatively, if the highest measured SAR for both head and body tissue-equivalent media are ≤ 1.45 W/kg and the ratio of these highest SAR values, i.e., largest divided by smallest value, is ≤ 1.10 , the highest SAR configuration for either head or body tissue-equivalent medium may be used to perform the repeated measurement. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR repeated measurement procedure:

- 1) When the highest measured SAR is < 0.80 W/kg, repeated measurement is not required.
- 2) When the highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
- 3) If the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 , or when the original or repeated measurement is ≥ 1.45 W/kg, perform a second repeated measurement.
- 4) If the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 , and the original, first or second repeated measurement is ≥ 1.5 W/kg, perform a third repeated measurement.

Band	Mode	Test Position	Separation Distance (cm)	Channel	Original Measured SAR-1g (W/kg)	1st Repeated SAR-1g (W/kg)	L/S Ratio	2nd Repeated SAR-1g (W/kg)	L/S Ratio	3rd Repeated SAR-1g (W/kg)	L/S Ratio
Body Exposure Condition											
PCS 1900	GPRS12	Bottom Side	10	512	1.01	1.01	1.000	N/A	N/A	N/A	N/A
WCDMA Band II	RMC12.2K	Bottom Side	10	9262	1.09	1.04	1.048	N/A	N/A	N/A	N/A

4.7. SIMULTANEOUS MULTI-BAND TRANSMISSION EVALUATION

4.7.1. Simultaneous Transmission SAR Test Exclusion Considerations

a) Sum of SAR

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of SAR_{1g} of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR_{1g} 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR_{1g} is greater than the SAR limit (SAR_{1g} 1.6 W/kg), SAR test exclusion is determined by the SPLSR.

b) SAR to Peak Location Separation Ratio

The simultaneous transmitting antennas in each operating mode and exposure condition combination are considered one pair at a time to determine the SPLSR.

$$SPLSR = (SAR_1 + SAR_2)^{1.5} / R_i$$

The ratio is rounded to two decimal digits, and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion. When 10-g SAR applies, the ratio must be ≤ 0.10 .

SAR_1 and SAR_2 are the highest reported or estimated SAR values for each antenna in the pair, and R_i is the separation distance in mm between the peak SAR locations for the antenna pair

$$\text{peak location separation distance} = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2}$$

Where (x_1, y_1, z_1) and (x_2, y_2, z_2) are the coordinates of the extrapolated peak SAR locations in the area or zoom scans.

When standalone test exclusion applies, SAR is estimated; the peak location is assumed to be at the feed-point or geometric center of the antenna. Due to curvatures on the SAM phantom, when SAR is estimated for one of the antennas in an antenna pair, the measured peak SAR location will be translated onto the test device to determine the peak location separation for the antenna pair.

When SAR is estimated for both antennas, the peak location separation should be determined by the closest physical separation of the antennas, according to the feed-point or geometric center of the antennas.

c) Volume Scan

When the SPLSR is ≤ 0.04 for 1-g SAR and ≤ 0.10 for 10-g SAR, the simultaneous transmission SAR is not required. Otherwise, the enlarged zoom scan and volume scan post-processing procedures will be performed.

4.7.2. Simultaneous Transmission Possibilities

The simultaneous transmission possibilities for this device are listed as below.

Simultaneous Transmission Configurations	Head Exposure Condition	Body-worn Exposure Condition	Hotspot Exposure Condition	Extremity Exposure Condition
GSM (Voice / Data) + WLAN (Data)	Yes	Yes	Yes	No
WCDMA (Voice / Data) + WLAN (Data)	Yes	Yes	Yes	No
LTE (Data) + WLAN (Data)	Yes	Yes	Yes	No
GSM (Voice / Data) + BT (Data)	Yes	Yes	Yes	No
WCDMA (Voice / Data) + BT (Data)	Yes	Yes	Yes	No
LTE (Data) + BT (Data)	Yes	Yes	Yes	No
GSM (Voice / Data) + WLAN (Data) + BT (Data)	No	No	No	No
WCDMA (Voice / Data) + WLAN (Data) + BT (Data)	No	No	No	No
LTE (Data) + WLAN (Data) + BT (Data)	No	No	No	No

Note:

- 1) The 2.4G WLAN and 5G WLAN cannot transmit simultaneously.
- 2) The WLAN and Bluetooth cannot transmit simultaneously, so there is no co-location test requirement for WLAN and Bluetooth.
- 3) Both GSM/WCDMA and LTE can transmit through either WWAN MAIN Ant or WWAN DIV ANT. However, only one technology (GSM or WCDMA or LTE) can transmit from an antenna at a time, and the other technology transmits through the other antenna.

4.7.3. Max. Standalone SAR

Position		GSM Band		WCDMA Band		LTE Band					2.4G		5G
		850	1900	II	V	2	4	7	26(5)	41(38)	BT	Wi-Fi	Wi-Fi
Head	Right Cheek	0.346	0.170	0.199	0.206	0.223	0.085	0.140	0.179	0.073	0.012	0.079	0.168
	Right Tilted	0.181	0.087	0.102	0.098	0.114	0.054	0.102	0.092	0.062	0.014	0.087	0.180
	Left Cheek	0.328	0.147	0.183	0.182	0.198	0.085	0.188	0.166	0.108	0.025	0.149	0.254
	Left Tilted	0.187	0.094	0.121	0.107	0.135	0.059	0.085	0.103	0.043	0.008	0.115	0.197
Body-Worn	Front Face	0.614	0.418	0.533	0.341	0.553	0.215	0.207	0.322	0.123	0.007	0.040	0.073
	Rear Face	0.683	0.683	0.748	0.424	0.584	0.371	0.467	0.383	0.403	0.033	0.168	0.204
Hotspot	Front Face	0.614	0.418	0.533	0.341	0.553	0.215	0.207	0.322	0.123	0.007	0.040	0.073
	Rear Face	0.683	0.683	0.748	0.424	0.584	0.371	0.467	0.383	0.403	0.033	0.168	0.204
	Left Side	0.247	0.228	0.298	0.123	0.329	0.132	0.351	0.133	0.212	0.004	0.010	0.324
	Right Side	0.273	0.124	0.162	0.157	0.169	0.075	0.056	0.142	0.020	0.011	0.079	0.121
	Top Side	0.636	0.403	0.359	0.32	0.359	0.346	0.198	0.358	0.177	0.014	0.086	0.160
	Bottom Side	0.401	1.152	1.165	0.235	0.866	0.452	0.248	0.222	0.274	0.007	0.052	0.034

4.7.4. Sum of SAR

WWAN + BT (DSS)

Position		Highest Simultaneous Transmission SAR (W/kg)	GSM Band		WCDMA Band		LTE Band				
			850	1900	II	V	2	4	7	26(5)	41(38)
Head	Right Cheek	0.358	0.358	0.182	0.211	0.218	0.235	0.097	0.152	0.191	0.085
	Right Tilted		0.195	0.101	0.116	0.112	0.128	0.068	0.116	0.106	0.076
	Left Cheek		0.353	0.172	0.208	0.207	0.223	0.110	0.213	0.191	0.133
	Left Tilted		0.195	0.102	0.129	0.115	0.143	0.067	0.093	0.111	0.051
Body-Worn	Front Face	0.781	0.621	0.425	0.540	0.348	0.560	0.222	0.214	0.329	0.130
	Rear Face		0.716	0.716	0.781	0.457	0.617	0.404	0.500	0.416	0.436
Hotspot	Front Face	1.172	0.621	0.425	0.540	0.348	0.560	0.222	0.214	0.329	0.130
	Rear Face		0.716	0.716	0.781	0.457	0.617	0.404	0.500	0.416	0.436
	Left Side		0.251	0.232	0.302	0.127	0.333	0.136	0.355	0.137	0.216
	Right Side		0.284	0.135	0.173	0.168	0.180	0.086	0.067	0.153	0.031
	Top Side		0.650	0.417	0.373	0.334	0.373	0.360	0.212	0.372	0.191
	Bottom Side		0.408	1.159	1.172	0.242	0.873	0.459	0.255	0.229	0.281

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WWAN + WLAN (DTS)

Position		Highest Simultaneous Transmission SAR (W/kg)	GSM Band		WCDMA Band		LTE Band				
			850	1900	II	V	2	4	7	26(5)	41(38)
Head	Right Cheek	0.477	0.425	0.249	0.278	0.285	0.302	0.164	0.219	0.258	0.152
	Right Tilted		0.268	0.174	0.189	0.185	0.201	0.141	0.189	0.179	0.149
	Left Cheek		0.477	0.296	0.332	0.331	0.347	0.234	0.337	0.315	0.257
	Left Tilted		0.302	0.209	0.236	0.222	0.250	0.174	0.200	0.218	0.158
Body-Worn	Front Face	0.916	0.654	0.458	0.573	0.381	0.593	0.255	0.247	0.362	0.163
	Rear Face		0.851	0.851	0.916	0.592	0.752	0.539	0.635	0.551	0.571
Hotspot	Front Face	1.217	0.654	0.458	0.573	0.381	0.593	0.255	0.247	0.362	0.163
	Rear Face		0.851	0.851	0.916	0.592	0.752	0.539	0.635	0.551	0.571
	Left Side		0.257	0.238	0.308	0.133	0.339	0.142	0.361	0.143	0.222
	Right Side		0.352	0.203	0.241	0.236	0.248	0.154	0.135	0.221	0.099
	Top Side		0.722	0.489	0.445	0.406	0.445	0.432	0.284	0.444	0.263
	Bottom Side		0.453	1.204	1.217	0.287	0.918	0.504	0.300	0.274	0.326

WWAN + WLAN (NII)

Position		Highest Simultaneous Transmission SAR (W/kg)	GSM Band		WCDMA Band		LTE Band				
			850	1900	II	V	2	4	7	26(5)	41(38)
Head	Right Cheek	0.607	0.526	0.350	0.379	0.386	0.403	0.265	0.320	0.359	0.253
	Right Tilted		0.375	0.281	0.296	0.292	0.308	0.248	0.296	0.286	0.256
	Left Cheek		0.607	0.426	0.462	0.461	0.477	0.364	0.467	0.445	0.387
	Left Tilted		0.392	0.299	0.326	0.312	0.340	0.264	0.290	0.308	0.248
Body-Worn	Front Face	0.985	0.694	0.498	0.613	0.421	0.633	0.295	0.287	0.402	0.203
	Rear Face		0.920	0.920	0.985	0.661	0.821	0.608	0.704	0.620	0.640
Hotspot	Front Face	1.206	0.694	0.498	0.613	0.421	0.633	0.295	0.287	0.402	0.203
	Rear Face		0.920	0.920	0.985	0.661	0.821	0.608	0.704	0.620	0.640
	Left Side		0.575	0.556	0.626	0.451	0.657	0.460	0.679	0.461	0.540
	Right Side		0.405	0.256	0.294	0.289	0.301	0.207	0.188	0.274	0.152
	Top Side		0.810	0.577	0.533	0.494	0.533	0.520	0.372	0.532	0.351
	Bottom Side		0.442	1.193	1.206	0.276	0.907	0.493	0.289	0.263	0.315

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*** End of Report ***

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APPENDIX A. SAR PLOTS OF SYSTEM VERIFICATION

The plots for system verification with largest deviation for each SAR system combination are shown as follows.



APPENDIX B. SAR PLOTS OF SAR MEASUREMENT

The SAR plots for highest measured SAR in each exposure configuration, wireless mode and frequency band combination, and measured SAR > 1.5 W/kg are shown as follows.



APPENDIX C. CALIBRATION CERTIFICATE FOR PROBE AND DIPOLE

The calibration certificates are shown as follows.



APPENDIX D. PHOTOGRAPHS OF EUT AND SETUP

The photographs of EUT and setup are shown as follows.

