



TEST REPORT

Report No. : CHTEW19020106 Report verification: 
Project No. : SHT1812011703EW
FCC ID. : Q5ETD80
Applicant's name : Kirisun Communication Co., Ltd.
Address : 3rd Floor, Building A, Tongfang Information Harbour, No.11
Langshan Road, Nanshan District, Shenzhen 518057, P.R.China
Manufacturer : Kirisun Communication Co., Ltd.
Address : 3rd Floor, Building A, Tongfang Information Harbour, No.11
Langshan Road, Nanshan District, Shenzhen 518057, P.R.China
Test item description : Dual-Mode Smart Portable
Trade Mark : KIRISUN
Model/Type reference : TD80
Listed Model(s) : -
Standard : FCC 47 CFR Part2.1093
IEEE Std C95.1, 1999 Edition
IEEE 1528: 2013
Date of receipt of test sample : Dec. 07, 2018
Date of testing : Dec. 08, 2018- Feb. 03, 2019
Date of issue : Feb. 26, 2019
Result : PASS

Compiled by
(position+printedname+signature).... : File administrators:Xiaodong Zhao 

Supervised by
(position+printedname+signature).... : Test Engineer: Xiaodong Zhao 

Approved by
(position+printedname+signature).... : Manager: Hans Hu 

Testing Laboratory Name : Shenzhen Huatongwei International Inspection Co., Ltd
Address : 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao,
Gongming, Shenzhen, China

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The test report merely correspond to the test sample.

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1. Test Standards and Report version

1.1. Test Standards

The tests were performed according to following standards:

[FCC 47 Part 2.1093](#): Radiofrequency radiation exposure evaluation: portable devices.

[IEEE Std C95.1, 1999 Edition](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz

[IEEE Std 1528™-2013](#): IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.

FCC published RF exposure KDB procedures:

[865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04](#): SAR Measurement Requirements for 100 MHz to 6 GHz

[865664 D02 RF Exposure Reporting v01r02](#): RF Exposure Compliance Reporting and Documentation Considerations

[447498 D01 General RF Exposure Guidance v06](#): Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies

[248227 D01 802.11 Wi-Fi SAR v02r02](#): SAR Measurement Procedures for 802.11 a/b/g Transmitters

[648474 D04 Handset SAR v01r03](#): SAR Evaluation Considerations for Wireless Handsets

[941225 D01 3G SAR Procedures v03r01](#): SAR Measurement Procedures for 3G Devices

[941225 D05 SAR for LTE Devices v02r05](#): SAR Evaluation Considerations for LTE Devices

[941225 D06 Hotspot Mode v02r01](#): SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities

1.2. Report version

Revision No.	Date of issue	Description
N/A	2019-02-26	Original

2. Summary

2.1. Client Information

Applicant:	Kirisun Communication Co.,Ltd.
Address:	3rd Floor, Building A, Tongfang Information Harbour, No.11 Langshan Road, Nanshan District, Shenzhen 518057, P.R.China
Manufacturer:	Kirisun Communication Co.,Ltd.
Address:	3rd Floor, Building A, Tongfang Information Harbour, No.11 Langshan Road, Nanshan District, Shenzhen 518057, P.R.China

2.2. Product Description

Name of EUT:	Dual-Mode Smart Portable			
Trade Mark:	KIRISUN			
Model No.:	TD80			
Listed Model(s):	-			
Power supply:	DC 3.8V			
Device Category:	Portable			
Product stage:	Production unit			
RF Exposure Environment:	General Population/Uncontrolled			
IMEI:	869023035100165			
Hardware version:	V1.0			
Software version:	TD80_V2.0			
Device Dimension:	Overall (Length x Width x Thickness):145 x 75 x 28mm External Antenna(Length):102mm			
Maximum SAR Value				
Separation Distance:	Head:	0mm		
	Body-Rear (back splint):	0mm		
	Body-Front& Hotspot:	10mm		
Max Report SAR Value (1g):	Test location:	PCE	DTS	Simultaneous TX
	Head:	0.531 W/kg	0.273 W/kg	0.804 W/kg
	Body:	0.458 W/kg	0.134 W/kg	0.592 W/kg
	Hotspot:	0.458 W/kg	0.134 W/kg	0.592 W/kg
GSM				
Support Band:	GSM850,PCS1900			
Modulation Type:	GSM/GPRS:GMSK			
GPRS Multislot Class:	12			
Antenna Type:	PIFA			
WCDMA				
Operation Band:	WCDMA Band II, WCDMA Band V			
Power Class:	Class 3			
Modulation Type:	QPSK			
DC-HSUPA Release Version:	Not Supported			
Antenna Type:	PIFA			

LTE	
Operation Band:	FDD Band 2,FDD Band 4,FDD Band 5,FDD Band 7,TDD Band 38
Power Class:	Class 3
Modulation Type:	QPSK,16QAM
Antenna Type:	PIFA
WIFI 2.4G	
Supported Type:	802.11b/802.11g/802.11n(HT20)/802.11n(HT40)
Modulation Type:	DSSS for 802.11b OFDM for 802.11g/802.11n(HT20)/802.11n(HT40)
Operation Frequency:	2412MHz~2462MHz for 802.11b/802.11g/802.11n(HT20) 2422MHz~2452MHz for 802.11n(HT40)
Channel Number:	11 for 802.11b/802.11g/802.11n(HT20) 7 for 802.11n(HT40)
Channel Separation:	5MHz
Antenna Type:	PIFA
Bluetooth	
Version:	BT4.1+EDR
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Operation Frequency:	2402MHz~2480MHz
Channel Number:	79
Channel Separation:	1MHz
Antenna Type:	PIFA
Bluetooth	
Version:	BT4.1+BLE
Modulation:	GFSK
Operation Frequency:	2402MHz~2480MHz
Channel Number:	40
Channel Separation:	2MHz
Antenna Type:	PIFA
Remark: 1. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power 2. The Test EUT support two SIM card(SIM1,SIM2),so all the tests are performed at each SIM card (SIM1,SIM2) mode, the datum recorded is the worst case for all the mode at SIM1 Card mode. 3. The external antenna is UHF antenna, but the occupational push-to-talk (PTT) radios function has been removed from the host.	

3. Test Environment

3.1. Test laboratory

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

3.2. Test Facility

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 3902.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 762235

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 762235.

IC-Registration No.: 5377B-1

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377B-1.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Ambient temperature	18 °C to 25 °C
Ambient humidity	30%RH to 70%RH
Air Pressure	950-1050mbar

4. Equipments Used during the Test

Used	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YY-MM-DD)	Due date (YY-MM-DD)
●	Data Acquisition Electronics DAEx	SPEAG	DAE4	1549	2018/04/25	2019/04/24
●	E-field Probe	SPEAG	EX3DV4	7494	2018/02/26	2019/02/25
●	Universal Radio Communication Tester	R&S	CMW500	137681	2018/07/11	2019/07/10
● Tissue-equivalent liquids Validation						
●	Dielectric Assessment Kit	SPEAG	DAK-3.5	1267	2018/03/01	2019/02/28
○	Dielectric Assessment Kit	SPEAG	DAK-12	1130	2018/03/01	2019/02/28
●	Network analyzer	Keysight	E5071C	MY46733048	2018/09/19	2019/09/18
● System Validation						
○	System Validation Antenna	SPEAG	CLA-150	4024	2018/02/21	2021/02/20
○	System Validation Dipole	SPEAG	D450V3	1102	2018/02/23	2021/02/22
○	System Validation Dipole	SPEAG	D750V3	1180	2018/02/07	2021/02/06
●	System Validation Dipole	SPEAG	D835V2	4d238	2018/02/19	2021/02/18
●	System Validation Dipole	SPEAG	D1750V2	1164	2018/02/06	2021/02/05
●	System Validation Dipole	SPEAG	D1900V2	5d226	2018/02/22	2021/02/21
●	System Validation Dipole	SPEAG	D2450V2	1009	2018/02/05	2021/02/04
●	System Validation Dipole	SPEAG	D2600V2	1150	2018/02/05	2021/02/04
○	System Validation Dipole	SPEAG	D5GHzV2	1273	2018/02/21	2021/02/20
●	Signal Generator	R&S	SMB100A	114360	2018/08/21	2019/08/20
●	Power Viewer for Windows	R&S	N/A	N/A	N/A	N/A
●	Power sensor	R&S	NRP18A	101010	2018/08/21	2019/08/20
●	Power sensor	R&S	NRP18A	101011	2018/08/21	2019/08/20
●	Power Amplifier	BONN	BLWA 0160-2M	1811887	2018/11/15	2019/11/14
●	Dual Directional Coupler	Mini-Circuits	ZHDC-10-62-S+	F975001814	2018/11/15	2019/11/14
●	Attenuator	Mini-Circuits	VAT-3W2+	1819	2018/11/15	2019/11/14
●	Attenuator	Mini-Circuits	VAT-10W2+	1741	2018/11/15	2019/11/14

Note:

1. The Probe, Dipole and DAE calibration reference to the Appendix B and C.
2. Referring to KDB865664 D01, the dipole calibration interval can be extended to 3 years with justification. The dipole are also not physically damaged or repaired during the interval.

5. **Measurement Uncertainty**

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 expanded SAR measurement uncertainty must be $\leq 30\%$, for a confidence interval of $k = 2$. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

6. SAR Measurements System Configuration

6.1. SAR Measurement Set-up

The DASY5 system for performing compliance tests consists of the following items:

A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).

A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

A unit to operate the optical surface detector which is connected to the EOC.

The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.

The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003.

DASY5 software and SEMCAD data evaluation software.

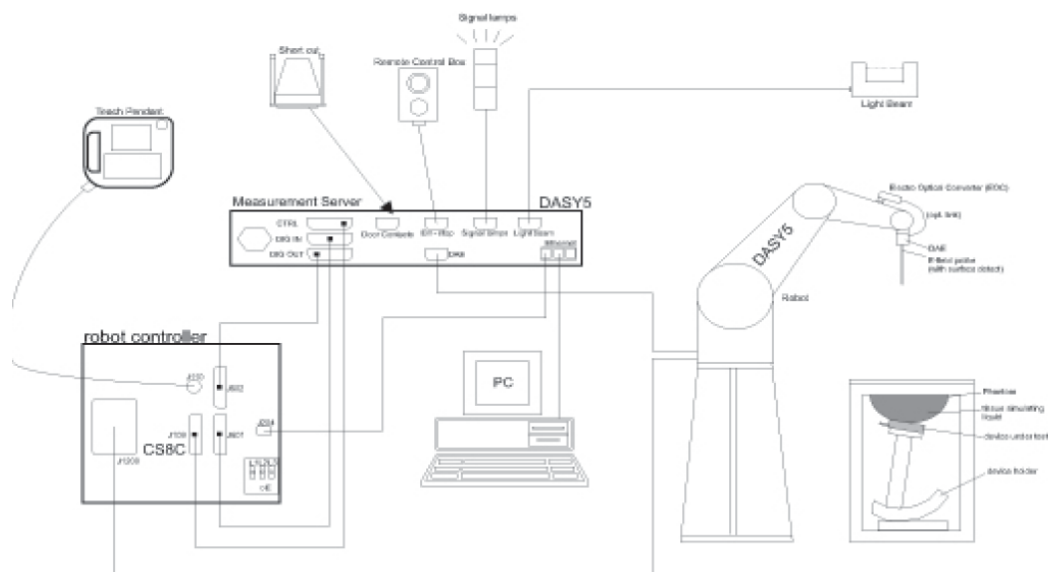
Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.

The generic twin phantom enabling the testing of left-hand and right-hand usage.

The device holder for handheld Mobile Phones.

Tissue simulating liquid mixed according to the given recipes.

System validation dipoles allowing to validate the proper functioning of the system.



6.2. DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

● Probe Specification

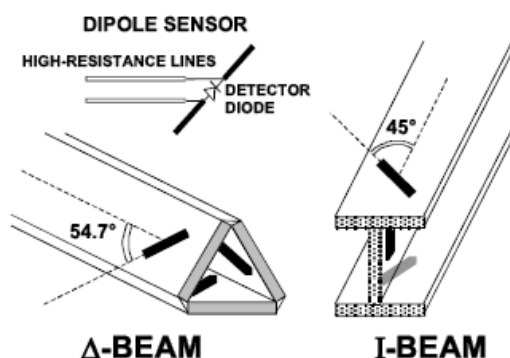
Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	4 MHz to 10 GHz; Linearity: ± 0.2 dB (30 MHz to 6 GHz)
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 W/kg; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Distance from probe tip to dipole centers: 1.0 mm
Application	General dosimetry up to 6 GHz Dosimetry in strong gradient fields Compliance tests of Mobile Phones
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI



● Isotropic E-Field Probe

The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



6.3. Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SPEAG. The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6mm).

System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

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 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.



SAM-Twin Phantom



ELI Phantom

6.4. Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the DASY system.

The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.



Device holder supplied by SPEAG

7. **SAR Test Procedure**

7.1. **Scanning Procedure**

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT's output power and should vary max. $\pm 5\%$.

The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above $\pm 0.1\text{mm}$). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe (It does not depend on the surface reflectivity or the probe angle to the surface within $\pm 30^\circ$.)

Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot. Before starting the area scan a grid spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged. After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

Zoom Scan

After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm.

Spatial Peak Detection

The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses. The DASY5 system allows evaluations that combine measured data and robot positions, such as:

- maximum search
- extrapolation
- boundary correction
- peak search for averaged SAR

During a maximum search, global and local maxima searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard's method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space.

They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard's method for extrapolation.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.

Table 1: Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v04

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

7.2. Data Storage and Evaluation

Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors),s together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension “.DA4”. The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [W/kg], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

Data Evaluation

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	Sensitivity:	Normi, ai0, ai1, ai2
	Conversion factor:	ConvFi
	Diode compression point:	Dcpi
Device parameters:	Frequency:	f
	Crest factor:	cf
Media parameters:	Conductivity:	σ
	Density:	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

Vi:	compensated signal of channel (i = x, y, z)
Ui:	input signal of channel (i = x, y, z)
cf:	crest factor of exciting field (DASY parameter)
dcp _i :	diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

$$E - \text{fieldprobes : } E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

$$H - \text{fieldprobes : } H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1}f + a_{i2}f^2}{f}$$

Vi:	compensated signal of channel (i = x, y, z)
Normi:	sensor sensitivity of channel (i = x, y, z), [mV/(V/m)²] for E-field Probes
ConvF:	sensitivity enhancement in solution
aij:	sensor sensitivity factors for H-field probes
f:	carrier frequency [GHz]
Ei:	electric field strength of channel i in V/m
Hi:	magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

SAR: local specific absorption rate in W/kg
Etot: total field strength in V/m
 σ : conductivity in [mho/m] or [Siemens/m]
 ρ : equivalent tissue density in g/cm³

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid.

8. Position of the wireless device in relation to the phantom

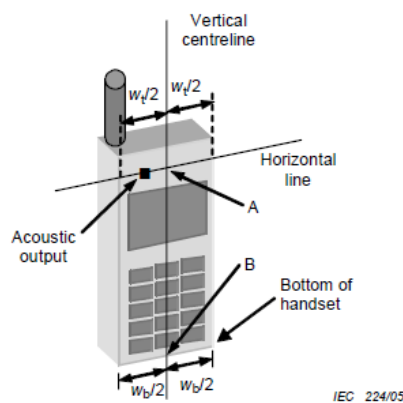
8.1. Head Position

The wireless device define two imaginary lines on the handset, the vertical centreline and the horizontal line, for the handset in vertical orientation as shown in Figures 5a and 5b.

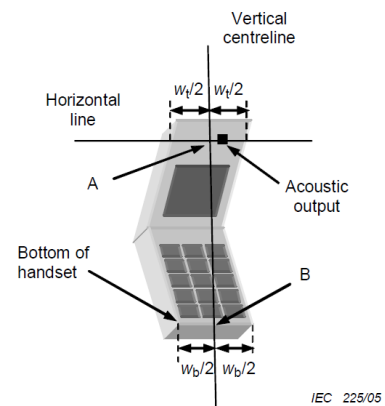
The vertical centreline passes through two points on the front side of the handset: the midpoint of the width W_t of the handset at the level of the acoustic output (point A in Figures 5a and 5b), and the midpoint of the width W_b of the bottom of the handset (point B).

The horizontal line is perpendicular to the vertical centreline and passes through the centre of the acoustic output (see Figures 5a and 5b). The two lines intersect at point A.

Note that for many handsets, point A coincides with the centre of the acoustic output. However, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centreline is not necessarily parallel to the front face of the handset (see Figure 5b), especially for clam-shell handsets, handsets with flip cover pieces, and other irregularly shaped handsets.



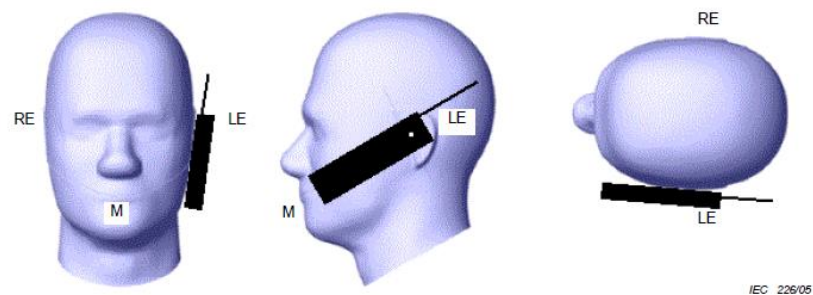
Figures 5a



Figures 5b

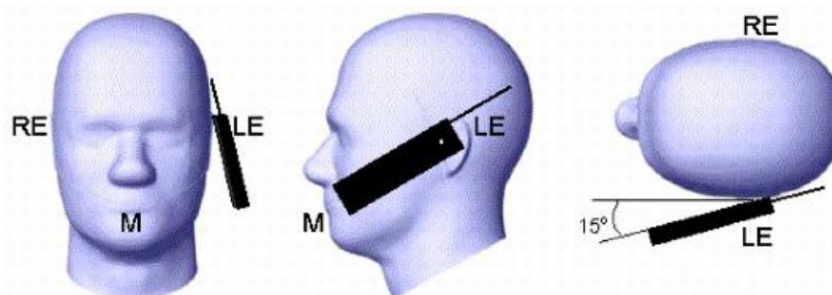
W_t	Width of the handset at the level of the acoustic
W_b	Width of the bottom of the handset
A	Midpoint of the width w_t of the handset at the level of the acoustic output
B	Midpoint of the width w_b of the bottom of the handset

Cheek position



Picture 2 Cheek position of the wireless device on the left side of SAM

Tilt position

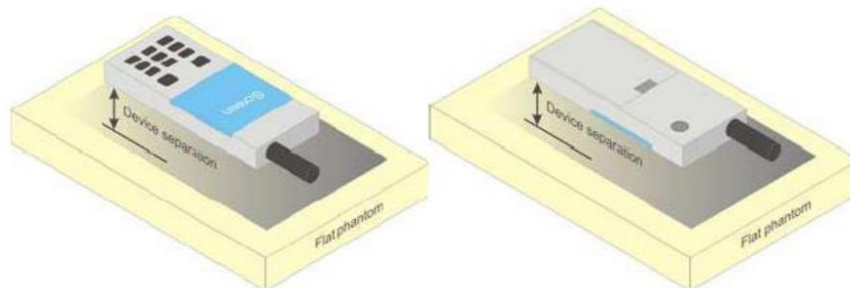


Picture 3 Tilt position of the wireless device on the left side of SAM

8.2. Body Position

Devices that support transmission while used with body-worn accessories must be tested for body-worn accessory SAR compliance, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics.

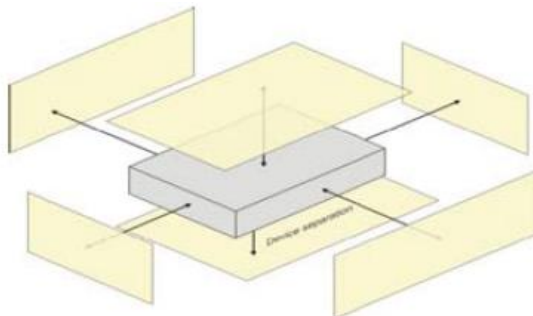
Devices that are designed to operate on the body of users using lanyards and straps or without requiring additional body-worn accessories must be tested for SAR compliance using a conservative minimum test separation distance $\leq 5\text{mm}$ to support compliance.



Picture 4 Test positions for body-worn devices

8.3. Hotspot Mode Exposure conditions

The hotspot mode and body-worn accessory SAR test configurations may overlap for handsets. When the same wireless mode transmission configurations for voice and data are required for SAR measurements, the more conservative configuration with a smaller separation distance should be tested for the overlapping SAR configurations. This typically applies to the back and front surfaces of a handset when SAR is required for both hotspot mode and body-worn accessory exposure conditions. Depending on the form factor and dimensions of a device, the test separation distance used for hotspot mode SAR measurement is either 10 mm or that used in the body-worn accessory configuration, whichever is less for devices with dimension $> 9\text{ cm} \times 5\text{ cm}$. For smaller devices with dimensions $\leq 9\text{ cm} \times 5\text{ cm}$ because of a greater potential for next to body use a test separation of $\leq 5\text{ mm}$ must be used.



Picture 5 Test positions for Hotspot Mode

9. Dielectric Property Measurements & System Check

9.1. Tissue Dielectric Parameters

The liquid has previously been proven to be suited for worst-case. It's satisfying the latest tissue dielectric parameters requirements proposed by the KDB865664.

Tissue dielectric parameters for Head and Body				
Target Frequency	Head		Body	
(MHz)	ϵ_r	σ (s/m)	ϵ_r	σ (s/m)
835	41.50	0.90	55.20	0.97
1750	40.10	1.37	53.40	1.49
1800-2000	40.00	1.40	53.30	1.52
2450	39.20	1.80	52.70	1.95
2600	39.00	1.96	52.50	2.16

Check Result:

Dielectric performance of Head tissue simulating liquid									
Frequency (MHz)	ϵ_r		σ (s/m)		Delta (ϵ_r)	Delta (σ)	Limit	Temp (°C)	Date
	Target	Measured	Target	Measured					
835	41.50	42.50	0.90	0.93	2.41%	3.56%	±5%	22	2018-12-22
1750	40.10	41.93	1.37	1.38	4.56%	0.36%	±5%	22	2018-12-25
1900	40.00	41.67	1.40	1.47	4.16%	4.71%	±5%	22	2018-12-26
2450	39.20	40.96	1.80	1.84	4.48%	2.11%	±5%	22	2018-12-28
2600	39.00	40.63	1.96	1.97	4.18%	0.51%	±5%	22	2019-01-23

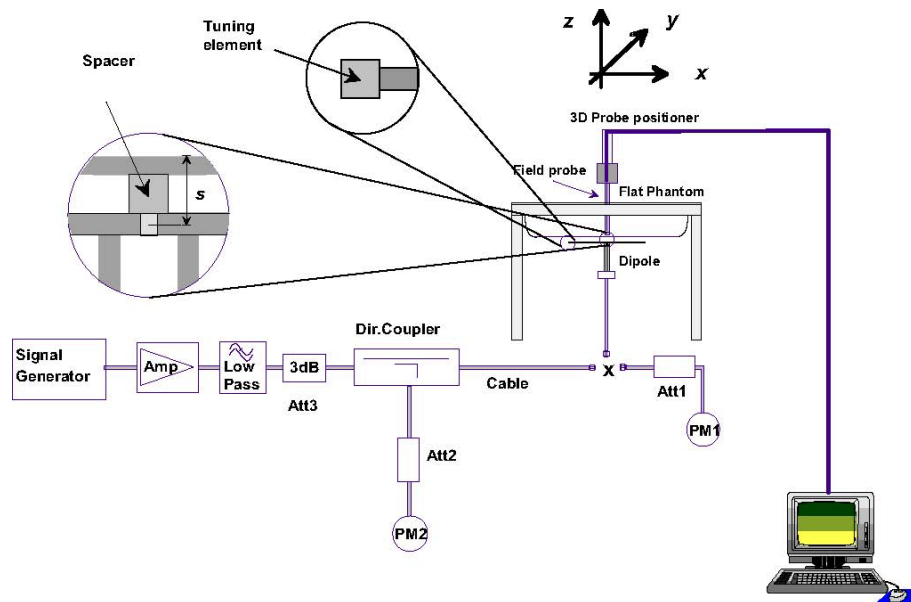
Dielectric performance of Body tissue simulating liquid									
Frequency (MHz)	ϵ_r		σ (s/m)		Delta (ϵ_r)	Delta (σ)	Limit	Temp (°C)	Date
	Target	Measured	Target	Measured					
835	55.20	55.40	0.97	0.97	0.36%	-0.41%	±5%	22	2018-12-24
1750	53.40	53.91	1.49	1.44	0.96%	-3.36%	±5%	22	2018-12-25
1900	53.30	53.72	1.52	1.55	0.79%	1.97%	±5%	22	2018-12-27
2450	52.70	53.03	1.95	2.00	0.63%	2.56%	±5%	22	2018-12-28
2600	52.50	52.78	2.16	2.15	0.53%	-0.46%	±5%	22	2019-01-24

9.2. SAR System Check

The purpose of the system check is to verify that the system operates within its specifications at the device test frequency. The system check is a simple check of repeatability to make sure that the system works correctly at the time of the compliance test;

System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system ($\pm 10\%$).

System check is performed regularly on all frequency bands where tests are performed with the DASY5 system.



System Performance Check Setup

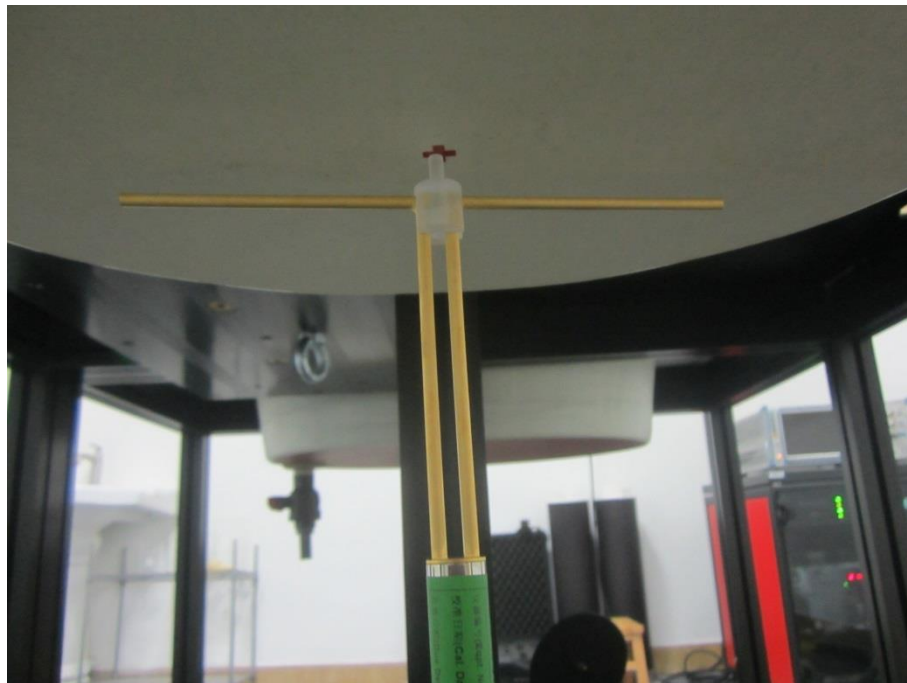


Photo of Dipole Setup

Check Result:

Head											
Frequency (MHz)	1g SAR			10g SAR			Delta (1g)	Delta (10g)	Limit	Temp (°C)	Date
	Target 1W	Normalize to 1W	Measured 250mW	Target 1W	Normalize to 1W	Measured 250mW					
835	9.51	9.92	2.48	6.15	6.52	1.63	4.31%	6.02%	±10%	22	2018-12-22
1750	36.60	36.24	9.06	19.40	19.44	4.86	-0.98%	0.21%	±10%	22	2018-12-25
1900	40.30	41.60	10.40	21.10	21.68	5.42	3.23%	2.75%	±10%	22	2018-12-26
2450	51.50	50.40	12.60	24.10	23.44	5.86	-2.14%	-2.74%	±10%	22	2018-12-28
2600	55.60	57.60	14.40	25.00	26.04	6.51	3.60%	4.16%	±10%	22	2019-01-23

Body											
Frequency (MHz)	1g SAR			10g SAR			Delta (1g)	Delta (10g)	Limit	Temp (°C)	Date
	Target 1W	Normalize to 1W	Measured 250mW	Target 1W	Normalize to 1W	Measured 250mW					
835	9.64	10.08	2.52	6.32	6.64	1.66	4.56%	5.06%	±10%	22	2018-12-24
1750	36.70	37.56	9.39	19.50	20.16	5.04	2.34%	3.38%	±10%	22	2018-12-25
1900	39.80	41.60	10.40	20.90	21.68	5.42	4.52%	3.73%	±10%	22	2018-12-27
2450	49.40	50.00	12.50	23.30	23.32	5.83	1.21%	0.09%	±10%	22	2018-12-28
2600	54.60	58.80	14.70	24.40	26.36	6.59	7.69%	8.03%	±10%	22	2019-01-24

Plots of System Performance Check

System Performance Check-Head 835MHz

DUT: D835V2; Type: D835V2; Serial: 4d238

Date: 2018-12-22

Communication System: UID 0, CW (0); Frequency: 835 MHz

Medium parameters used: $f = 835$ MHz; $\sigma = 0.932$ S/m; $\epsilon_r = 42.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7494; ConvF(10.73, 10.73, 10.73); Calibrated: 2/26/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1549; Calibrated: 4/25/2018
- Phantom: Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1947
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Head/d=15mm, Pin=250mW/Area Scan (41x101x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 3.51 W/kg

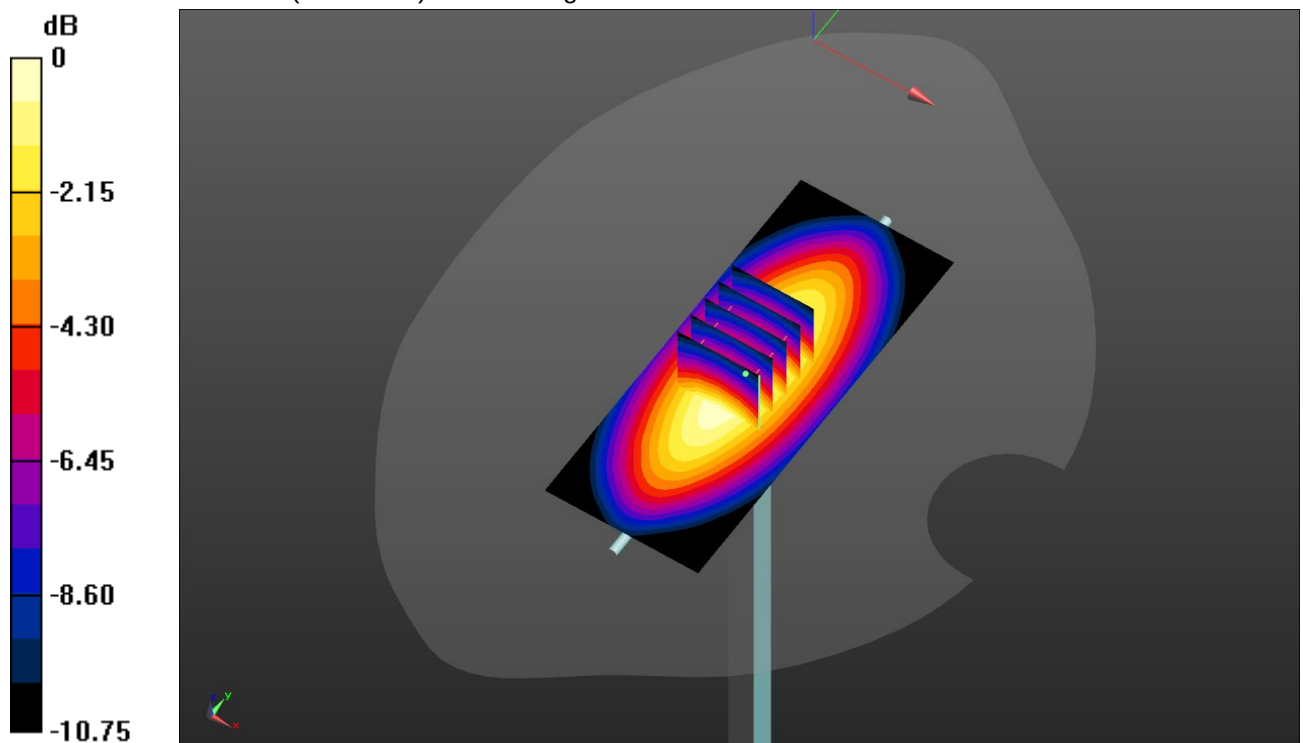
Head/d=15mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 66.38 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 3.78 W/kg

SAR(1 g) = 2.48 W/kg; SAR(10 g) = 1.63 W/kg

Maximum value of SAR (measured) = 3.34 W/kg



System Performance Check-Body 835MHz

DUT: D835V2; Type: D835V2; Serial: 4d238

Date: 2018-12-24

Communication System: UID 0, CW (0); Frequency: 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.966 \text{ S/m}$; $\epsilon_r = 55.403$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7494; ConvF(10.5, 10.5, 10.5); Calibrated: 2/26/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1549; Calibrated: 4/25/2018
- Phantom: ELI V8.0 ; Type: QD OVA 004 AA ; Serial: 2078
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Body/d=15mm,Pin=250mW/Area Scan (61x61x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 3.40 W/kg

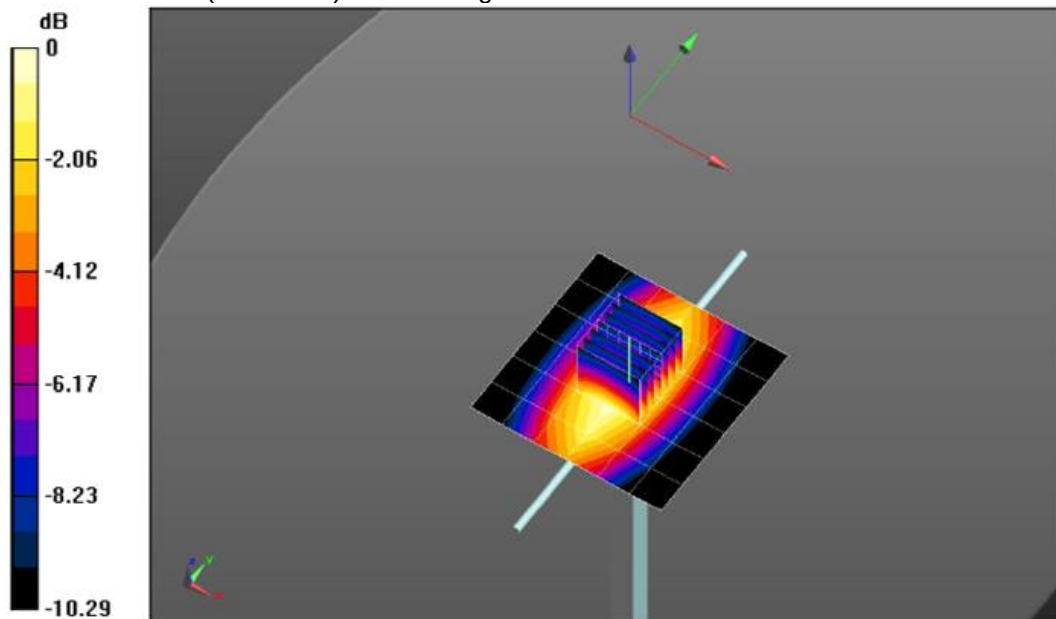
Body/d=15mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 61.67 V/m ; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 3.97 W/kg

SAR(1 g) = 2.52 W/kg ; SAR(10 g) = 1.66 W/kg

Maximum value of SAR (measured) = 3.44 W/kg



System Performance Check-Head 1750MHz

DUT: D1750V2; Type: D1750V2; Serial: 1164

Date: 2018-12-25

Communication System: UID 0, CW (0); Frequency: 1750 MHz

Medium parameters used: $f = 1750$ MHz; $\sigma = 1.375$ S/m; $\epsilon_r = 41.933$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7494; ConvF(9.23, 9.23, 9.23); Calibrated: 2/26/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1549; Calibrated: 4/25/2018
- Phantom: Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1947
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Head/d=10mm,Pin=250mW/Area Scan (41x61x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 14.1 W/kg

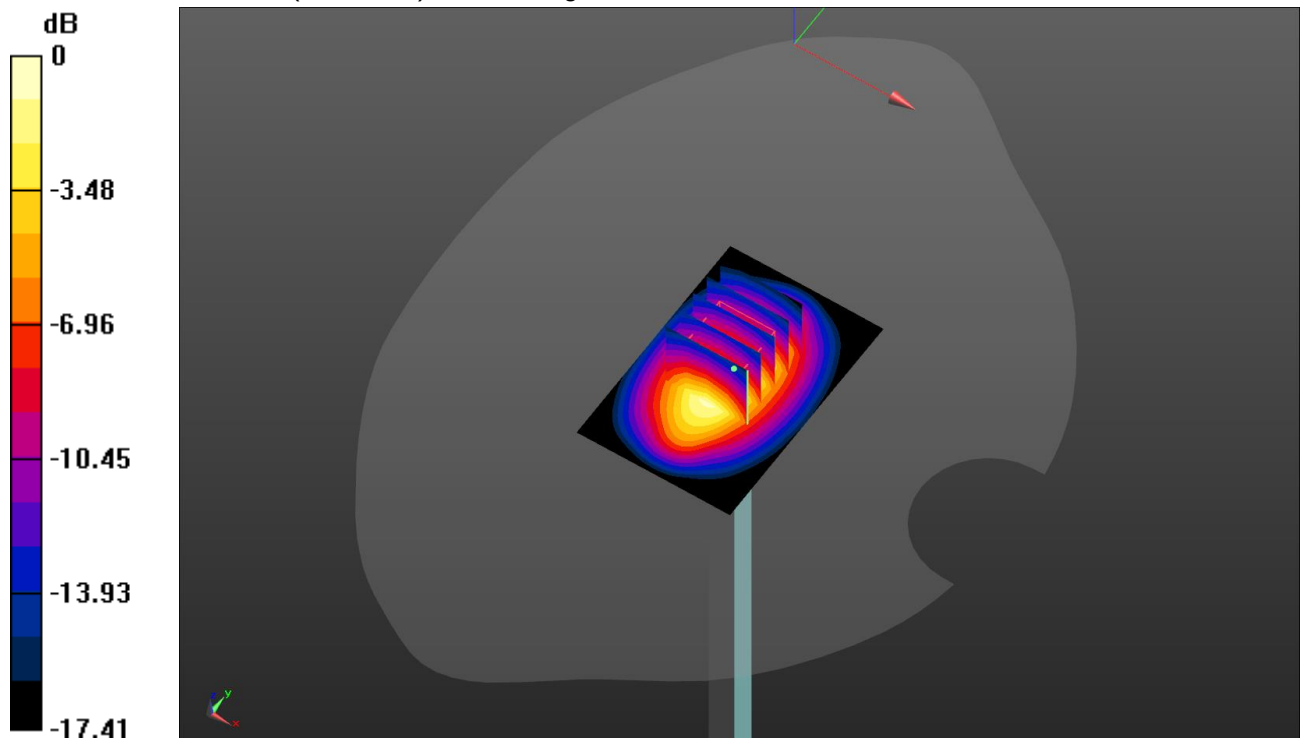
Head/d=10mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 103.5 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 16.5 W/kg

SAR(1 g) = 9.06 W/kg; SAR(10 g) = 4.86 W/kg

Maximum value of SAR (measured) = 13.8 W/kg



System Performance Check-Body 1750MHz

DUT: D1750V2; Type: D1750V2; Serial: 1164

Date: 2018-12-25

Communication System: UID 0, CW (0); Frequency: 1750 MHz

Medium parameters used: $f = 1750$ MHz; $\sigma = 1.441$ S/m; $\epsilon_r = 53.908$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7494; ConvF(8.77, 8.77, 8.77); Calibrated: 2/26/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1549; Calibrated: 4/25/2018
- Phantom: ELI V8.0 ; Type: QD OVA 004 AA ; Serial: 2078
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Body/d=10mm,Pin=250mW/Area Scan (61x61x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 14.7 W/kg

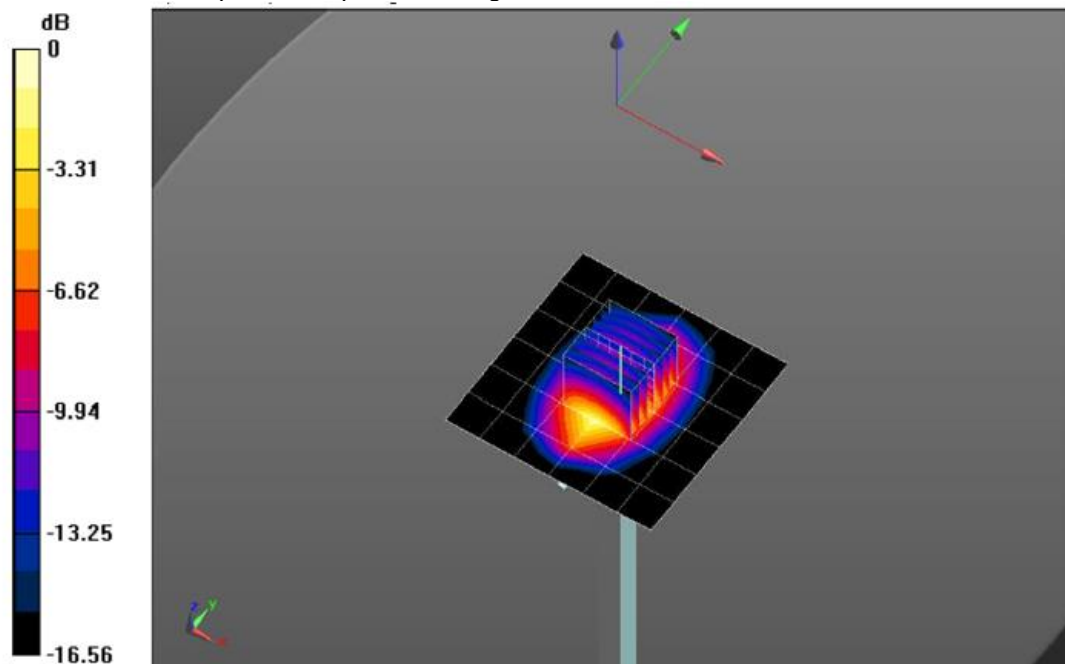
Body/d=10mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 102.2 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 16.8 W/kg

SAR(1 g) = 9.39 W/kg; SAR(10 g) = 5.04 W/kg

Maximum value of SAR (measured) = 14.1 W/kg



System Performance Check-Head 1900MHz

DUT: D1900V2; Type: D1900V2; Serial: 5d226

Date:2018-12-26

Communication System: UID 0, CW (0); Frequency: 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.466$ S/m; $\epsilon_r = 41.665$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7494; ConvF(8.83, 8.83, 8.83); Calibrated: 2/26/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1549; Calibrated: 4/25/2018
- Phantom: Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1947
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Head/d=10mm,Pin=250mW/Area Scan (41x61x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 17.1 W/kg

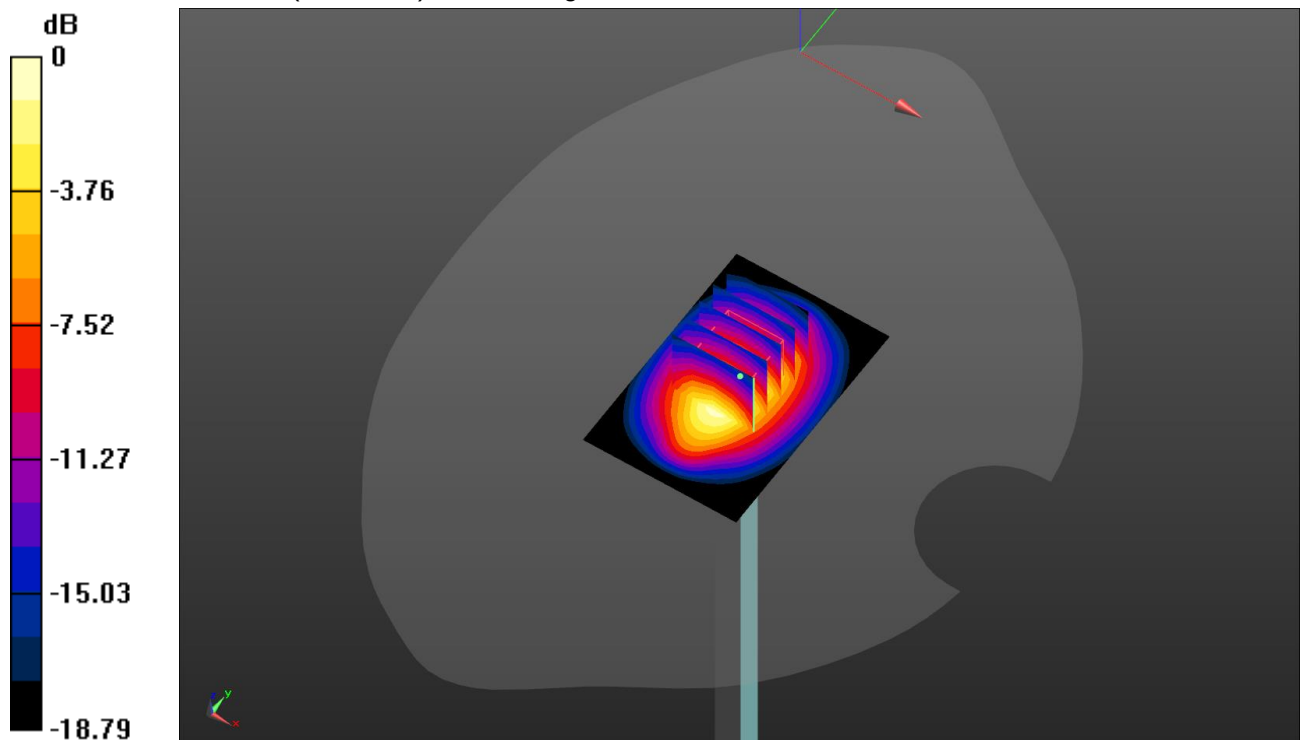
Head/d=10mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 112.4 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 19.5 W/kg

SAR(1 g) = 10.4 W/kg; SAR(10 g) = 5.42 W/kg

Maximum value of SAR (measured) = 16.1 W/kg



System Performance Check-Body 1900MHz

DUT: D1900V2; Type: D1900V2; Serial: 5d226

Date:2018-12-27

Communication System: UID 0, CW (0); Frequency: 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.553$ S/m; $\epsilon_r = 53.719$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7494; ConvF(8.42, 8.42, 8.42); Calibrated: 2/26/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1549; Calibrated: 4/25/2018
- Phantom: ELI V8.0 ; Type: QD OVA 004 AA ; Serial: 2078
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Body/d=10mm,Pin=250mW/Area Scan (61x61x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 16.4 W/kg

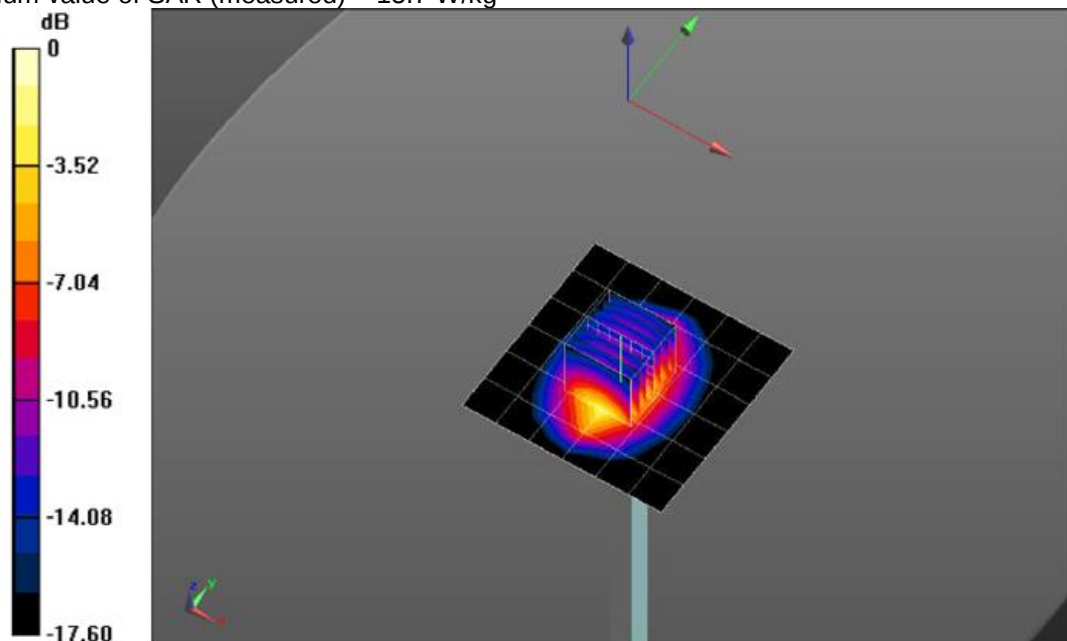
Body/d=10mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 105.9 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 18.9 W/kg

SAR(1 g) = 10.4 W/kg; SAR(10 g) = 5.42 W/kg

Maximum value of SAR (measured) = 15.7 W/kg



SystemPerformanceCheck-Head 2450MHz

DUT: D2450V2; Type: D2450V2; Serial: 1009

Date:2018-12-28

Communication System: UID 0, CW (0); Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.838$ S/m; $\epsilon_r = 40.956$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7494; ConvF(8.27, 8.27, 8.27); Calibrated: 2/26/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1549; Calibrated: 4/25/2018
- Phantom: Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1947
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Head/d=10mm,Pin=250mW/Area Scan (41x61x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 21.1 W/kg

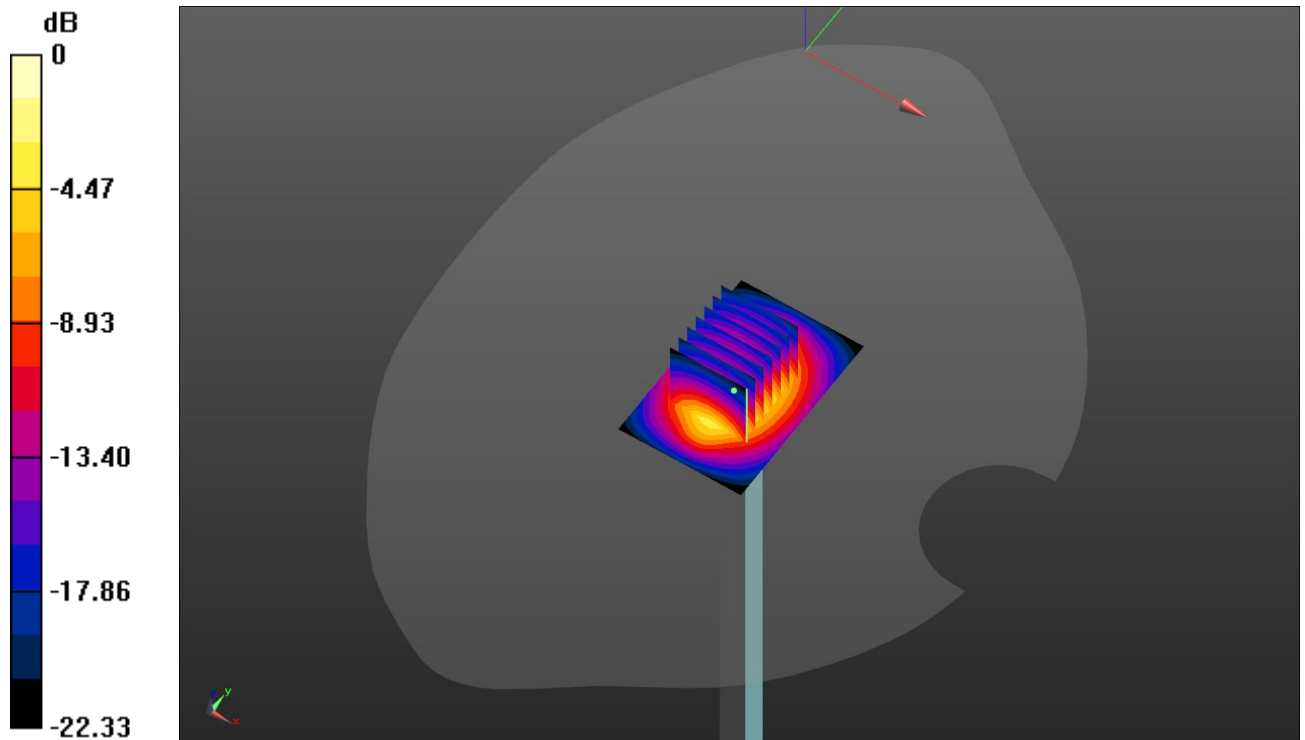
Head/d=10mm,Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 110.0 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 26.2 W/kg

SAR(1 g) = 12.6 W/kg; SAR(10 g) = 5.86 W/kg

Maximum value of SAR (measured) = 20.8 W/kg



SystemPerformanceCheck-Body 2450MHz

DUT: D2450V2; Type: D2450V2; Serial: 1009

Date:2018-12-28

Communication System: UID 0, CW (0); Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 2.001$ S/m; $\epsilon_r = 53.03$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7494; ConvF(8.08, 8.08, 8.08); Calibrated: 2/26/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1549; Calibrated: 4/25/2018
- Phantom: ELI V8.0 ; Type: QD OVA 004 AA ; Serial: 2078
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Body/d=10mm,Pin=250mW/Area Scan (71x71x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 21.1 W/kg

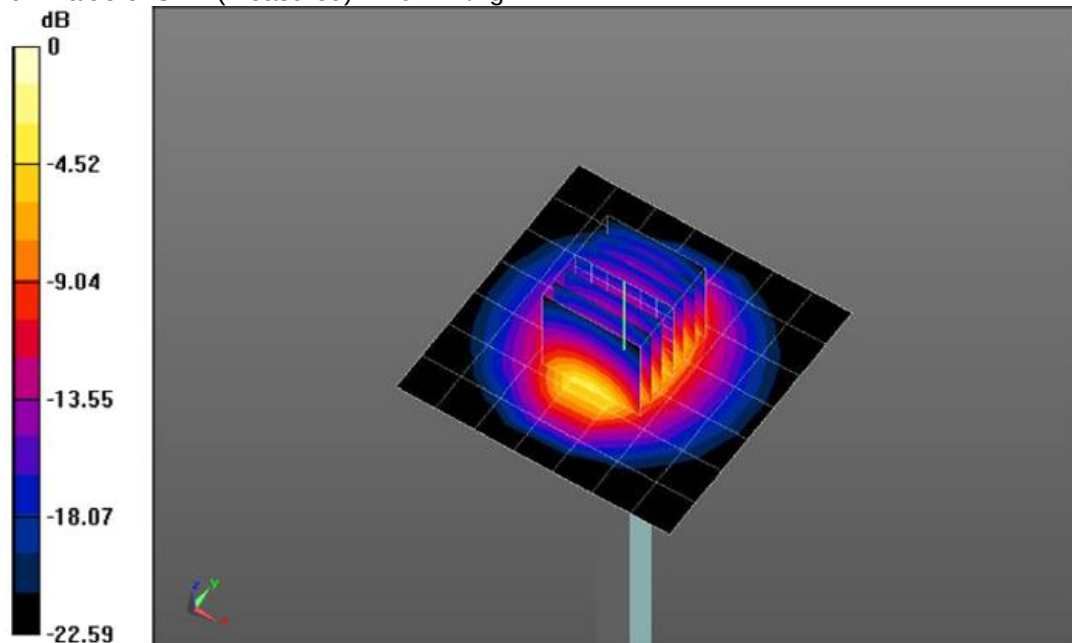
Body/d=10mm,Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 105.6 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 25.7 W/kg

SAR(1 g) = 12.5 W/kg; SAR(10 g) = 5.83 W/kg

Maximum value of SAR (measured) = 20.7 W/kg



SystemPerformanceCheck-Head 2600MHz

DUT: D2600V2; Type: D2600V2; Serial: 1150

Date:2019-01-23

Communication System: UID 0, CW (0); Frequency: 2600 MHz

Medium parameters used: $f = 2600$ MHz; $\sigma = 1.97$ S/m; $\epsilon_r = 40.632$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7494; ConvF(7.92, 7.92, 7.92); Calibrated: 2/26/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1549; Calibrated: 4/25/2018
- Phantom: Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1947
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Head/d=10mm,Pin=250mW/Area Scan (41x51x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 25.4 W/kg

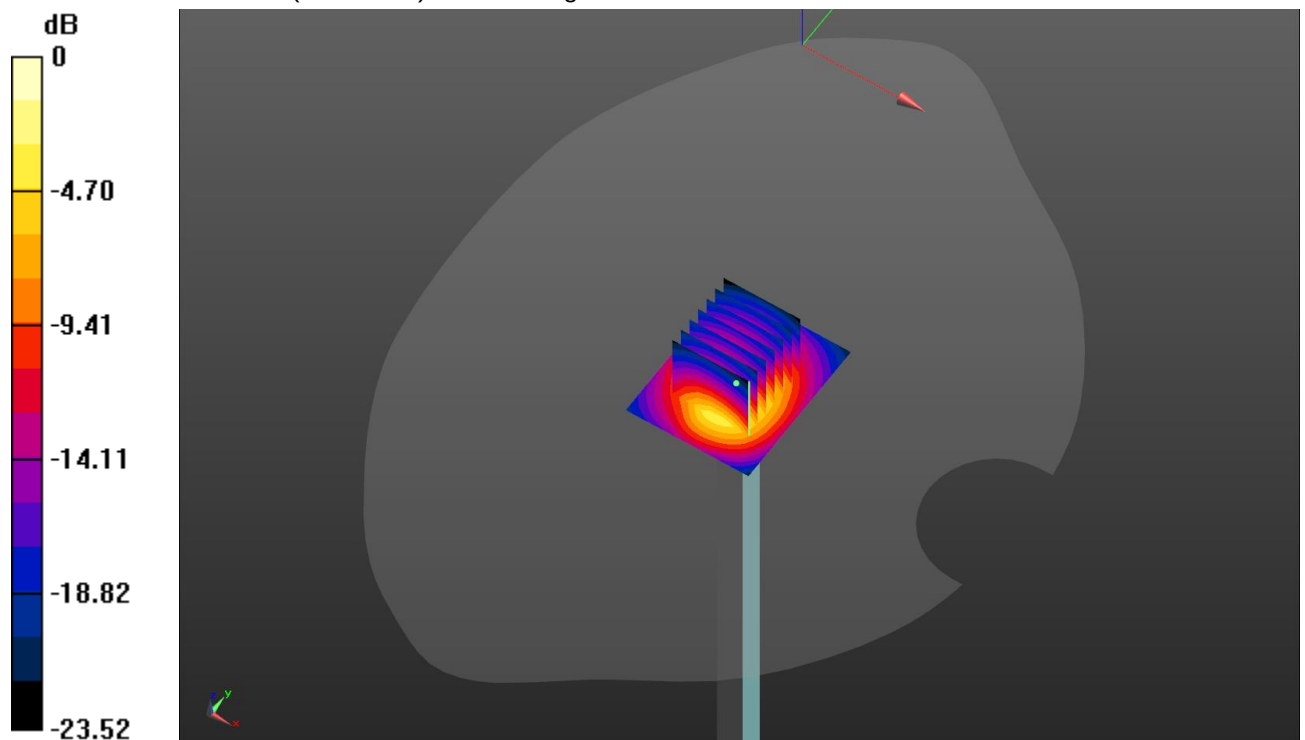
Head/d=10mm,Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 115.2 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 31.2 W/kg

SAR(1 g) = 14.4 W/kg; SAR(10 g) = 6.51 W/kg

Maximum value of SAR (measured) = 24.9 W/kg



SystemPerformanceCheck-Body 2600MHz

DUT: D2600V2; Type: D2600V2; Serial: 1150

Date:2019-01-24

Communication System: UID 0, CW (0); Frequency: 2600 MHz

Medium parameters used: $f = 2600$ MHz; $\sigma = 2.15$ S/m; $\epsilon_r = 52.78$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7494; ConvF(7.51, 7.51, 7.51); Calibrated: 2/26/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1549; Calibrated: 4/25/2018
- Phantom: ELI V8.0 ; Type: QD OVA 004 AA ; Serial: 2078
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Body/d=10mm,Pin=250mW/Area Scan (71x71x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 26.6 W/kg

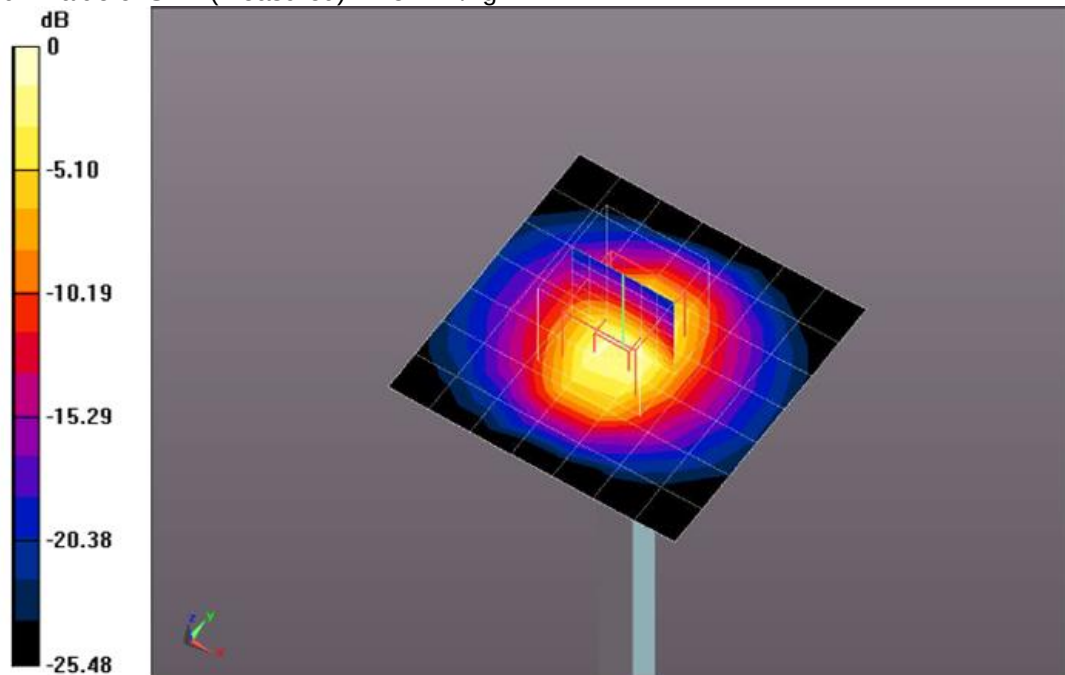
Body/d=10mm,Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 110.2 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 31.6 W/kg

SAR(1 g) = 14.7 W/kg; SAR(10 g) = 6.59 W/kg

Maximum value of SAR (measured) = 25.1 W/kg



10. SAR Exposure Limits

SAR assessments have been made in line with the requirements of FCC 47 CFR § 2.1093.

Type Exposure	Limit (W/kg)	
	General Population/ Uncontrolled Exposure Environment	Occupational/ Controlled Exposure Environment
Spatial Average SAR (whole body)	0.08	0.4
Spatial Peak SAR (1g cube tissue for head and trunk)	1.6	8.0
Spatial Peak SAR (10g for limb)	4.0	20.0

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

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

11. Conducted Power Measurement Results

GSM Conducted Power

1. Per KDB 447498 D01, the maximum output power channel is used for SAR testing and further SAR test reduction.
2. Per KDB 941225 D01, considering the possibility of e.g. 3rd party VoIP operation for Head and Body-worn SAR test reduction for GSM and GPRS modes is determined by the source-base time-averaged output power including tune-up tolerance. The 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.
3. Per KDB941225 D01, for hotspot SAR test reduction for GPRS modes is determined by the source-based time-averaged output power including tune-up tolerance, For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

Mode: GSM850		Burst Average Power (dBm)			Division Factors	Frame-Average Power (dBm)		
		CH128	CH190	CH251		CH128	CH190	CH251
		824.2MHz	836.6MHz	848.8MHz		824.2MHz	836.6MHz	848.8MHz
GSM		34.10	34.20	34.24	-9.03	25.07	25.17	25.21
GPRS (GMSK)	1TXslot	33.94	33.98	33.99	-9.03	24.91	24.95	24.96
	2TXslots	33.54	33.47	33.60	-6.02	27.52	27.45	27.58
	3TXslots	32.29	31.79	32.02	-4.26	28.03	27.53	27.76
	4TXslots	30.52	30.58	30.56	-3.01	27.51	27.57	27.55
Mode: PCS1900		Burst Average Power (dBm)			Division Factors	Frame-Average Power (dBm)		
		CH512	CH661	CH810		CH512	CH661	CH810
		1850.2MHz	1880.0MHz	1909.8MHz		1850.2MHz	1880.0MHz	1909.8MHz
GSM		29.36	30.12	30.40	-9.03	20.33	21.09	21.37
GPRS (GMSK)	1TXslot	29.30	29.96	30.26	-9.03	20.27	20.93	21.23
	2TXslots	28.44	29.16	29.77	-6.02	22.42	23.14	23.75
	3TXslots	27.05	27.80	27.86	-4.26	22.79	23.54	23.60
	4TXslots	25.12	25.95	26.35	-3.01	22.11	22.94	23.34

Note:

1) Division Factors

To Frame-Average Power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> Burst Average Power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> Burst Average Power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> Burst Average Power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> Burst Average Power divided by (8/4) => -3.01dB

WCDMA Conducted Power

1. The following tests were conducted according to the test requirements outlines in 3GPP TS34.121 specification.
2. The procedures in KDB 941225 D01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode to determine SAR test exclusion

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

- a) The EUT was connected to base station RS CMU200 referred to the setup configuration
- b) The RF path losses were compensated into the measurements
- c) A call was established between EUT and base station with following setting:
 - i. Set Gain Factors (β_c and β_d) and parameters were set according to each specific sub-test in the following table, C10.1.4, Quoted from the TS 34.121
 - ii. Set RMC 12.2Kbps + HSDPA mode
 - iii. Set Cell Power=-86dBm
 - iv. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
 - v. Select HSDPA uplink parameters
 - vi. Set Delta ACK, Delta NACK and Delta CQI=8
 - vii. Set Ack-Nack repetition Factor to 3
 - viii. Set CQI Feedback Cycle (K) to 4ms
 - ix. Set CQI repetition factor to 2
 - x. Power ctrl mode= all up bits
- d) The transmitter maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	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 $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: 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 signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.

Setup Configuration

HSUPA Setup Configuration:

- a) The EUT was connected to base station RS CMU200 referred to the setup configuration
- b) The RF path losses were compensated into the measurements
- c) A call was established between EUT and base station with following setting:
 - i. Call configs = 5.2b, 5.9b, 5.10b, and 5.13.2B with QPSK
 - ii. Set Gain Factors (β_c and β_d) and parameters (AG index) were set according to each specific sub-test in the following table, C11.1.3, Quoted from the TS 34.121
 - iii. Set Cell Power=-86dBm
 - iv. Set channel type= 12.2Kbps + HSPA mode
 - v. Set UE Target power
 - vi. Set Ctrl mode=Alternating bits
 - vii. Set and observe the E-TFCI
 - viii. Confirm that E-TFCI is equal the target E-TFCI of 75 for Sub-test 1, and other subtest's E-TFCI
- d) The transmitter maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1)	β_{EC}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	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	β_{ed1} : 47/15 β_{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 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

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 signalled 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 signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$.

Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

General Note:

- Per KDB 941225 D01, SAR for Head / Hotspot / Body-worn Exposure is measured using a 12.2Kbps RMC with TPC bit configured to all 1s
- Per KDB 941225 D01 RMC12.2Kbps setting is used to evaluate SAR. If the maximum output power and Tune-up tolerance specified for production units in HSDPA/HSUPA is $\leq 1/4$ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA to RMC 12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA.

Mode		WCDMA Band II			WCDMA Band V		
		Conducted Power (dBm)			Conducted Power (dBm)		
		CH9262	CH9400	CH9538	CH4132	CH4183	CH4233
		1852.4MHz	1880.0MHz	1907.6MHz	826.4MHz	836.6MHz	846.6MHz
AMR 12.2K		23.20	23.44	23.42	23.89	23.74	23.94
RMC 12.2K		23.23	23.47	23.43	23.92	23.77	23.95
HSDPA	Subtest-1	22.19	22.60	22.56	22.78	22.67	22.90
	Subtest-2	21.71	22.06	22.01	22.34	22.22	22.41
	Subtest-3	21.74	22.07	22.06	22.37	22.23	22.42
	Subtest-4	21.73	22.06	22.04	22.31	22.22	22.42
HSUPA	Subtest-1	20.32	20.59	20.58	20.78	20.66	20.84
	Subtest-2	20.78	20.99	20.96	21.26	21.18	21.37
	Subtest-3	21.24	21.48	21.46	21.80	21.73	21.93
	Subtest-4	20.27	20.54	20.50	20.79	20.63	20.80
	Subtest-5	22.24	22.47	22.50	22.76	22.62	22.82

LTE Conducted Power

General Note:

1. CMW500 base station simulator was used to setup the connection with EUT; the frequency band, channel, bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r03, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r03, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1 RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r03, for 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.
6. Per KDB 941225 D05v02r03, 16QAM output power for each RB allocation configuration is $> \text{not } \frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r03, smaller bandwidth output power for each RB allocation configuration is $> \text{not } \frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, smaller bandwidth SAR testing is not required.

LTE-FDD Band 2				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
1.4MHz	QPSK	1	0	23.28	23.57	23.23
			2	23.34	23.60	23.28
			5	23.22	23.59	23.22
		3	0	23.35	23.64	23.31
			1	23.35	23.50	23.41
			3	23.32	23.54	23.29
		6	0	22.32	22.44	22.34
	16QAM	1	0	22.41	22.73	22.41
			2	22.49	22.79	22.47
			5	22.37	22.74	22.41
		3	0	22.29	22.52	22.30
			1	22.30	22.46	22.26
			3	22.25	22.45	22.31
		6	0	21.33	21.45	21.32
3MHz	QPSK	1	0	23.19	23.40	23.14
			8	23.21	23.46	23.16
			14	23.10	23.41	23.17
		8	0	22.32	22.39	22.25
			4	22.32	22.41	22.31
			7	22.25	22.36	22.22
		15	0	22.27	22.47	22.24
	16QAM	1	0	22.39	22.53	22.06
			8	22.36	22.61	22.06
			14	22.25	22.49	22.17
		8	0	21.33	21.51	21.30
			4	21.32	21.53	21.12
			7	21.25	21.59	21.22
		15	0	21.25	21.47	21.20

LTE-FDD Band 2				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
5MHz	QPSK	1	0	22.44	22.31	23.12
			12	22.19	22.42	22.47
			24	22.25	22.48	22.67
		12	0	21.26	21.71	21.09
			7	21.34	21.60	21.26
			13	21.39	21.50	21.08
		25	0	21.57	22.28	21.47
	16QAM	1	0	21.39	21.77	21.42
			12	21.36	21.33	21.32
			24	21.16	21.98	21.19
		12	0	20.13	20.74	20.82
			7	20.41	20.67	20.97
			13	20.05	20.47	20.51
		25	0	21.14	21.48	21.12
10MHz	QPSK	1	0	22.55	22.33	22.18
			24	22.47	22.71	22.41
			49	22.49	22.54	22.95
		25	0	22.41	22.52	22.34
			24	22.36	22.55	22.31
			49	22.28	22.60	22.30
		50	0	22.08	22.52	22.34
	16QAM	1	0	22.21	22.60	22.16
			24	22.35	22.69	22.16
			49	22.52	22.70	22.04
		25	0	21.26	21.35	21.43
			24	21.28	21.47	21.40
			49	21.15	21.69	21.27
		50	0	21.11	21.61	21.36

LTE-FDD Band 2				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
15MHz	QPSK	1	0	22.48	22.62	22.74
			38	22.38	22.83	22.37
			74	22.50	22.97	22.41
		38	0	21.69	21.79	22.48
			18	21.52	21.96	22.38
			37	21.66	21.96	22.41
		75	0	21.51	21.69	21.59
	16QAM	1	0	21.68	21.89	21.46
			38	21.50	22.18	22.38
			74	21.61	22.31	22.41
		38	0	21.70	21.79	22.48
			18	21.51	21.97	22.39
			37	21.67	22.00	22.41
		75	0	21.29	20.70	21.57
20MHz	QPSK	1	0	23.41	23.51	23.55
			49	23.33	23.70	23.35
			99	23.49	23.68	23.33
		50	0	22.28	22.59	22.58
			25	22.28	22.59	22.58
			50	22.37	22.76	22.50
		100	0	22.32	22.66	22.53
	16QAM	1	0	22.44	22.63	22.70
			49	22.33	22.88	22.49
			99	22.49	22.87	22.53
		50	0	22.28	22.59	22.58
			25	22.28	22.59	22.59
			50	22.36	22.76	22.50
		100	0	21.25	21.72	21.57

LTE-FDD Band 4				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
1.4MHz	QPSK	1	0	24.25	24.23	23.78
			2	24.28	24.27	23.84
			5	24.23	24.23	23.78
		3	0	24.26	24.22	23.78
			1	24.27	24.22	23.78
			3	24.26	24.25	23.76
		6	0	23.31	23.33	22.91
	16QAM	1	0	23.29	23.25	22.67
			2	23.41	23.37	22.78
			5	23.30	23.29	22.67
		3	0	24.26	24.22	23.77
			1	24.26	24.22	23.78
			3	24.26	24.25	23.76
		6	0	22.34	22.16	21.79
3MHz	QPSK	1	0	24.11	24.23	23.81
			8	24.18	24.23	23.81
			14	24.16	24.18	23.75
		8	0	23.32	23.29	22.69
			4	23.35	23.28	22.71
			7	23.32	23.23	22.64
		15	0	23.29	23.26	22.87
	16QAM	1	0	23.32	23.29	22.68
			8	23.34	23.27	22.72
			14	23.32	23.23	22.64
		8	0	23.31	23.29	22.70
			4	23.35	23.27	22.71
			7	23.32	23.22	22.64
		15	0	22.35	22.17	21.71

LTE-FDD Band 4				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
5MHz	QPSK	1	0	24.33	24.33	23.98
			12	24.32	23.99	23.95
			24	24.30	24.18	23.86
		12	0	23.36	23.33	22.98
			7	23.37	23.32	22.98
			13	23.37	23.31	22.90
		25	0	23.33	23.25	22.87
	16QAM	1	0	23.31	23.42	22.98
			12	23.32	23.34	22.91
			24	23.32	23.37	22.81
		12	0	23.37	23.31	22.98
			7	23.37	23.31	22.98
			13	23.36	23.30	22.90
		25	0	22.37	22.22	21.90
10MHz	QPSK	1	0	24.17	24.23	24.05
			24	24.22	24.18	23.84
			49	24.21	24.02	23.79
		25	0	23.26	23.20	22.96
			24	23.27	23.19	22.96
			49	23.25	23.20	22.81
		50	0	23.26	23.18	22.90
	16QAM	1	0	23.38	23.29	22.94
			24	23.43	23.27	22.77
			49	23.39	23.32	22.70
		25	0	23.27	23.19	22.96
			24	23.26	23.20	22.96
			49	23.24	23.20	22.80
		50	0	22.29	22.19	21.93

LTE-FDD Band 4				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
15MHz	QPSK	1	0	24.26	24.30	24.13
			38	24.25	23.65	23.97
			74	24.32	24.01	23.81
		38	0	23.54	23.21	23.32
			18	23.51	22.75	23.15
			37	23.50	23.11	22.92
		75	0	23.36	23.33	23.10
	16QAM	1	0	23.54	23.21	23.32
			38	23.51	22.74	23.15
			74	23.49	23.10	22.92
		38	0	23.54	23.20	23.33
			18	23.51	22.73	23.15
			37	23.51	23.10	22.93
		75	0	22.36	22.32	22.04
20MHz	QPSK	1	0	24.39	24.44	23.89
			49	24.36	23.79	24.04
			99	24.26	24.27	23.84
		50	0	23.33	23.31	23.20
			25	23.33	23.31	23.20
			50	23.32	23.14	22.99
		100	0	23.32	23.30	23.10
	16QAM	1	0	23.40	23.50	23.01
			49	23.36	23.01	23.15
			99	23.36	23.43	22.86
		50	0	23.32	23.30	23.20
			25	23.32	23.31	23.19
			50	23.30	23.11	22.99
		100	0	22.31	22.28	22.14

LTE-FDD Band 5				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
1.4MHz	QPSK	1	0	23.64	23.66	23.74
			2	23.71	23.72	23.79
			5	23.66	23.67	23.71
		3	0	23.75	23.77	23.81
			1	23.75	23.77	23.80
			3	23.78	23.77	23.78
		6	0	22.73	22.74	22.73
	16QAM	1	0	22.81	22.87	22.57
			2	22.93	22.99	22.68
			5	22.83	22.88	22.55
		3	0	23.75	23.77	23.81
			1	23.75	23.77	23.80
			3	23.78	23.77	23.79
		6	0	21.81	21.70	21.76
3MHz	QPSK	1	0	23.65	23.70	23.71
			8	23.72	23.71	23.72
			14	23.68	23.64	23.63
		8	0	22.83	22.64	22.81
			4	22.89	22.68	22.82
			7	22.83	22.59	22.73
		15	0	22.78	22.74	22.72
	16QAM	1	0	22.83	22.64	22.80
			8	22.89	22.68	22.83
			14	22.83	22.60	22.73
		8	0	22.83	22.64	22.82
			4	22.90	22.68	22.82
			7	22.83	22.59	22.73
		15	0	21.76	21.77	21.73

LTE-FDD Band 5				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
5MHz	QPSK	1	0	23.74	23.79	23.93
			12	23.76	23.75	23.89
			24	23.72	23.74	23.82
		12	0	22.81	22.84	22.85
			7	22.81	22.83	22.85
			13	22.80	22.80	22.78
		25	0	22.77	22.78	22.75
	16QAM	1	0	22.78	23.06	22.84
			12	22.81	23.03	22.83
			24	22.80	22.95	22.77
		12	0	22.81	22.84	22.85
			7	22.81	22.83	22.85
			13	22.79	22.80	22.79
		25	0	21.82	21.82	21.82
10MHz	QPSK	1	0	23.63	23.71	23.75
			24	23.64	23.68	23.85
			49	23.67	23.77	23.74
		25	0	22.74	22.78	22.75
			24	22.73	22.77	22.77
			49	22.73	22.77	22.75
		50	0	22.74	22.79	22.75
	16QAM	1	0	22.88	22.95	22.63
			24	22.88	22.93	22.72
			49	22.92	22.87	22.62
		25	0	22.73	22.78	22.77
			24	22.73	22.78	22.76
			49	22.73	22.78	22.76
		50	0	21.76	21.86	21.78

LTE-FDD Band 7				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
5MHz	QPSK	1	0	21.48	21.15	21.42
			12	21.41	21.34	21.33
			24	21.38	21.48	21.52
		12	0	21.33	21.51	21.51
			7	21.23	21.34	21.54
			13	21.23	21.58	21.51
		25	0	21.15	21.18	21.26
	16QAM	1	0	20.42	20.63	20.46
			12	20.36	20.45	20.71
			24	20.38	20.37	20.46
		12	0	21.33	21.46	21.51
			7	21.50	21.37	21.56
			13	21.21	21.40	21.45
		25	0	20.91	20.30	21.30
10MHz	QPSK	1	0	21.27	21.60	21.79
			24	21.38	21.55	21.72
			49	21.13	21.55	21.72
		25	0	20.52	20.59	20.60
			24	21.11	20.65	20.70
			49	20.62	20.56	20.62
		50	0	20.74	20.58	20.58
	16QAM	1	0	20.50	20.78	20.55
			24	20.34	20.72	20.45
			49	20.33	20.71	20.50
		25	0	21.10	20.63	20.65
			24	21.12	20.65	20.67
			49	21.21	20.54	20.61
		50	0	21.08	20.82	20.74

LTE-FDD Band 7				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
15MHz	QPSK	1	0	21.71	21.62	22.07
			38	21.25	21.45	21.98
			74	21.43	21.71	21.93
		38	0	21.52	20.98	20.93
			18	21.60	20.94	20.76
			37	21.69	20.82	20.77
		75	0	21.57	20.88	20.99
	16QAM	1	0	21.52	20.84	20.91
			38	21.61	20.91	20.78
			74	21.68	20.83	20.68
		38	0	21.50	20.96	20.91
			18	21.60	20.94	20.79
			37	21.68	20.86	20.75
		75	0	20.44	20.81	20.99
20MHz	QPSK	1	0	22.59	22.78	22.76
			49	22.60	22.75	22.76
			99	22.78	22.86	22.81
		50	0	21.57	21.74	21.94
			25	21.57	21.72	21.92
			50	21.66	21.65	21.77
		100	0	21.60	21.71	21.80
	16QAM	1	0	21.55	21.93	21.88
			49	21.58	21.87	21.83
			99	21.76	21.85	21.79
		50	0	21.57	21.71	21.94
			25	21.57	21.72	21.93
			50	21.65	21.66	21.78
		100	0	20.51	20.63	20.84

LTE (TDD) Considerations

According to KDB 941225 D05 SAR for LTE Devices, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

SAR was tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7.

LTE TDD Bands support 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplinkdownlink configurations and Table 4.2-1 for Special subframe configurations.

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$(1+X) \cdot 2192 \cdot T_s$	$(1+X) \cdot 2560 \cdot T_s$	$7680 \cdot T_s$	$(1+X) \cdot 2192 \cdot T_s$	$(1+X) \cdot 2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$		
5	$6592 \cdot T_s$	$(2+X) \cdot 2192 \cdot T_s$	$(2+X) \cdot 2560 \cdot T_s$	$20480 \cdot T_s$	$(2+X) \cdot 2192 \cdot T_s$	$(2+X) \cdot 2560 \cdot T_s$
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-
10	$13168 \cdot T_s$	$13152 \cdot T_s$	$12800 \cdot T_s$	-	-	-

Table 4.2-2: Uplink-downlink configurations

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Calculated Duty Cycle = Extended cyclic prefix in uplink $\times$ (T_s) $\times$ # of S + # of U

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:

Calculated Duty Cycle = $5120 \times [1/(15000 \times 2048)] \times 2 + 6$ ms = 63.33%

where

$T_s = 1/(15000 \times 2048)$ seconds

This device supports uplink-downlink configurations 0-6. The configuration with highest duty cycle was used-configuration 0 at 63.3% duty cycle.

LTE-TDD Band 38				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
5MHz	QPSK	1	0	23.08	23.41	23.50
			12	23.16	23.48	23.48
			24	23.18	23.49	23.46
		12	0	21.99	22.53	22.42
			7	22.16	22.57	22.38
			13	22.09	22.65	22.35
		25	0	22.04	22.30	22.34
	16QAM	1	0	21.99	22.54	22.42
			12	22.17	22.60	22.41
			24	22.10	22.65	22.35
		12	0	22.00	22.52	22.41
			7	22.16	22.58	22.39
			13	22.09	22.65	22.35
		25	0	21.05	21.28	21.43
10MHz	QPSK	1	0	23.03	23.36	23.50
			24	23.15	23.44	23.49
			49	23.12	23.56	23.42
		25	0	22.00	22.26	22.38
			24	21.99	22.26	22.38
			49	22.05	22.35	22.32
		50	0	22.05	22.32	22.37
	16QAM	1	0	22.09	22.32	22.31
			24	22.25	22.43	22.30
			49	22.22	22.57	22.19
		25	0	21.99	22.26	22.38
			24	21.99	22.26	22.37
			49	22.06	22.37	22.32
		50	0	21.06	21.34	21.36

LTE-TDD Band 38				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
15MHz	QPSK	1	0	23.10	23.42	23.59
			38	23.20	23.48	23.53
			74	23.28	23.65	23.46
		38	0	22.18	22.52	22.38
			18	22.29	22.64	22.35
			37	22.35	22.72	22.22
		75	0	22.19	22.40	22.47
	16QAM	1	0	22.16	22.55	22.39
			38	22.30	22.50	22.35
			74	22.36	22.72	22.23
		38	0	22.19	22.57	22.38
			18	22.29	22.53	22.34
			37	22.36	22.72	22.22
		75	0	21.15	21.39	21.45
20MHz	QPSK	1	0	23.02	23.35	23.45
			49	23.11	23.40	23.38
			99	23.30	23.56	23.33
		50	0	21.99	22.17	22.32
			25	22.01	22.14	22.32
			50	22.09	22.36	22.28
		100	0	22.01	22.22	22.28
	16QAM	1	0	21.93	22.37	22.32
			49	22.07	22.62	22.27
			99	22.20	22.71	22.18
		50	0	21.02	21.19	21.36
			25	21.02	21.19	21.36
			50	21.08	21.38	21.30
		100	0	21.01	21.22	21.27

WLAN Conducted Power

For 2.4GHz WLAN SAR testing, highest average RF output power channel for the lowest data rate for 802.11b were for SAR evaluation. 802.11g/n were not investigated since the average putput powers over all channels and data rates were not more than 0.25dB higher than the tested channel in the lowest data rate of 802.11b mode.

The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures.

WIFI 2.4G				
Mode	Channel	Frequency (MHz)	Conducted Peak Power (dBm)	Conducted Average Power (dBm)
802.11b	1	2412	16.85	14.51
	6	2437	17.69	15.26
	11	2462	17.46	15.10
802.11g	1	2412	18.09	13.90
	6	2437	18.53	14.66
	11	2462	18.75	14.80
802.11n (HT20)	1	2412	18.06	13.97
	6	2437	18.89	14.76
	11	2462	18.68	14.81
802.11n (HT40)	3	2422	18.03	14.02
	6	2437	18.11	14.42
	9	2452	17.73	13.96

Bluetooth Conducted Power

Bluetooth			
Mode	Channel	Frequency (MHz)	Conducted Power(dBm)
GFSK	0	2402	1.51
	39	2441	3.21
	78	2480	2.32
$\pi/4$ QPSK	0	2402	0.91
	39	2441	2.63
	78	2480	1.71
8DPSK	0	2402	1.11
	39	2441	2.85
	78	2480	2.66
GFSK(BLE)	0	2402	-5.31
	19	2440	-3.86
	39	2480	-3.45

12. Maximum Tune-up Limit

GSM		
Mode	Maximum Tune-up (dBm)	
	GSM850	PCS1900
GSM (GMSK, 1Tx Slot)	34.50	30.50
GPRS (GMSK, 1Tx Slot)	34.00	30.50
GPRS (GMSK, 2Tx Slot)	34.00	30.00
GPRS (GMSK, 3Tx Slot)	32.50	28.00
GPRS (GMSK, 4Tx Slot)	31.00	26.50

WCDMA		
Mode	Maximum Tune-up (dBm)	
	WCDMA Band II	WCDMA Band V
AMR 12.2Kbps	23.50	24.00
RMC 12.2Kbps	23.50	24.00
HSDPA Subtest-1	23.00	23.00
HSDPA Subtest-2	22.50	22.50
HSDPA Subtest-3	22.50	22.50
HSDPA Subtest-4	22.50	22.50
HSUPA Subtest-1	21.00	21.00
HSUPA Subtest-2	21.00	21.50
HSUPA Subtest-3	21.50	22.00
HSUPA Subtest-4	21.00	21.00
HSUPA Subtest-5	22.50	23.00

LTE				
Fequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 2	1.4	QPSK	1	24.00
			3	24.00
			6	22.50
		16QAM	1	23.00
			3	23.00
			6	21.50
	3	QPSK	1	23.50
			8	22.50
			15	22.50
		16QAM	1	23.00
			8	22.00
			15	21.50
	5	QPSK	1	23.50
			12	22.00
			25	22.50
		16QAM	1	22.00
			12	21.00
			25	21.50
	10	QPSK	1	23.00
			25	23.00
			50	23.00
		16QAM	1	23.00
			25	22.00
			50	22.00
	15	QPSK	1	23.00
			38	22.50
			75	22.00
		16QAM	1	22.50
			38	22.50
			75	22.00
	20	QPSK	1	24.00
			50	23.00
			100	23.00
		16QAM	1	23.00
			50	23.00
			100	22.00

LTE				
Frequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 4	1.4	QPSK	1	24.50
			3	24.50
			6	23.50
		16QAM	1	23.50
			3	24.50
			6	22.50
	3	QPSK	1	24.50
			8	23.50
			15	23.50
		16QAM	1	23.50
			8	23.50
			15	22.50
	5	QPSK	1	24.50
			12	23.50
			25	23.50
		16QAM	1	23.50
			12	23.50
			25	23.50
	10	QPSK	1	24.50
			25	23.50
			50	23.50
		16QAM	1	23.50
			25	23.50
			50	22.50
	15	QPSK	1	24.50
			38	24.00
			75	23.50
		16QAM	1	24.00
			38	24.00
			75	22.50
	20	QPSK	1	24.50
			50	23.50
			100	23.50
		16QAM	1	23.50
			50	23.50
			100	22.50

LTE				
Fequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 5	1.4	QPSK	1	24.00
			3	24.00
			6	23.00
		16QAM	1	23.00
			3	24.00
			6	22.00
	3	QPSK	1	24.00
			8	23.00
			15	23.00
		16QAM	1	23.00
			8	23.00
			15	22.00
	5	QPSK	1	24.00
			12	23.00
			25	23.00
		16QAM	1	23.50
			12	23.00
			25	22.00
	10	QPSK	1	24.00
			25	23.00
			50	23.00
		16QAM	1	23.00
			25	23.00
			50	22.00

LTE				
Fequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 7	5	QPSK	1	22.00
			12	22.00
			25	21.50
		16QAM	1	21.00
			12	22.00
			25	21.50
	10	QPSK	1	22.00
			25	21.50
			50	21.00
		16QAM	1	21.00
			25	21.50
			50	21.50
	15	QPSK	1	22.50
			38	22.00
			75	22.00
		16QAM	1	22.00
			38	22.00
			75	21.00
	20	QPSK	1	23.00
			50	22.00
			100	22.00
		16QAM	1	22.00
			50	22.00
			100	21.00

LTE				
Frequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 38	5	QPSK	1	23.50
			12	23.00
			25	22.50
		16QAM	1	23.00
			12	23.00
			25	21.50
	10	QPSK	1	24.00
			25	22.50
			50	22.50
		16QAM	1	23.00
			25	22.50
			50	21.50
	15	QPSK	1	24.00
			38	23.00
			75	23.00
		16QAM	1	23.00
			38	23.00
			75	21.50
	20	QPSK	1	24.00
			50	22.50
			100	22.50
		16QAM	1	23.00
			50	21.50
			100	21.50

The allowed Maximum Power Reduction (MPR) for the maximum output power in Table 6.2.2-1 due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

WIFI 2.4G	
Mode	Maximum Tune-up (dBm) Conducted Average Power
802.11b	15.50
802.11g	15.00
802.11n(HT20)	15.00
802.11n(HT40)	14.50

Bluetooth	
Mode	Maximum Tune-up (dBm)
GFSK	3.50
$\pi/4$ QPSK	3.00
8DPSK	3.00
GFSK(BLE)	-3.00

Per KDB 447498 D01, the 1-g and 10-g SAR test exclusion thresholds for 100MHz to 6GHz at test separation distances ≤ 50 mm are determined by:

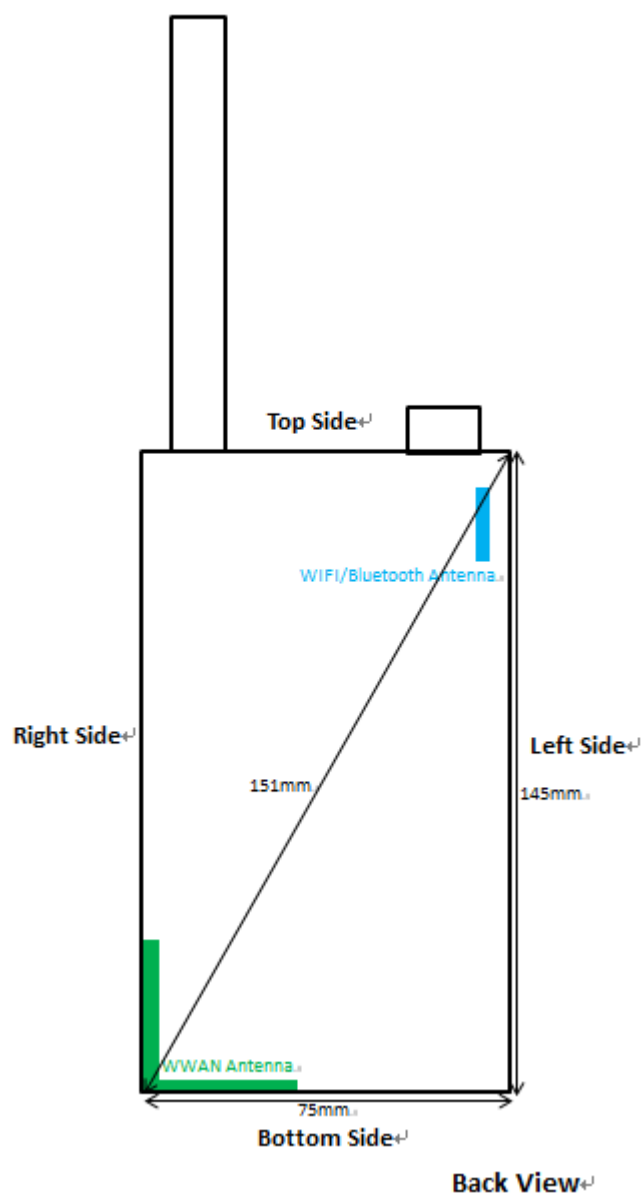
$[(\text{max. Power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] * [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR

Band/Mode	F(GHz)	Position	Separation Distance (mm)	Exclusion Thresholds	SAR test exclusion
Bluetooth	2.45	Head	0	0.7	Yes
		Body	10	0.4	Yes

Per KDB 447498 D01, when the minimum test separation distance is <5mm, a distance of 5mm is applied to determine SAR test exclusion.

The test exclusion threshold is ≤ 3 , SAR testing is not required.

13. Antenna Location



Distance of the Antenna to the EUT surface/edge(mm)						
Antenna	Rear	Front	Top side	Bottom side	Right side	Left side
WWAN	10	5	115	5	5	39
WIFI/BT	10	5	12	120	57	7

Positions for SAR tests; Hotspot mode						
Antenna	Rear	Front	Top side	Bottom side	Right side	Left side
WWAN	Yes	Yes	No	Yes	Yes	No
WIFI/BT	Yes	Yes	Yes	No	No	Yes

General note:

Referring to KDB941225 D06, when the overall device length and width are >9cm*5cm, the test distance is 10mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.

14. SAR Measurement Results

Head SAR

GSM850										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
GPRS (3Tx slots)	Left-Cheek	128	824.2	32.29	32.50	1.05	-	-	-	-
		190	836.6	31.79	32.50	1.18	0.08	0.278	0.327	-
		251	848.8	32.02	32.50	1.12	-	-	-	-
	Left-Tilt	128	824.2	32.29	32.50	1.05	-	-	-	-
		190	836.6	31.79	32.50	1.18	-0.09	0.213	0.250	-
		251	848.8	32.02	32.50	1.12	-	-	-	-
	Right-Cheek	128	824.2	32.29	32.50	1.05	-	-	-	-
		190	836.6	31.79	32.50	1.18	0.16	0.451	0.531	1
		251	848.8	32.02	32.50	1.12	-	-	-	-
	Right-Tilt	128	824.2	32.29	32.50	1.05	-	-	-	-
		190	836.6	31.79	32.50	1.18	0.05	0.341	0.402	-
		251	848.8	32.02	32.50	1.12	-	-	-	-
With external antenna(worse case)										
GPRS (3Tx slots)	Right-Cheek	190	836.6	31.79	32.50	1.18	0.09	0.446	0.525	-

PCS1900										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
GPRS (2Tx slots)	Left-Cheek	512	1850.2	28.44	30.00	1.43	-	-	-	-
		661	1880.0	29.16	30.00	1.21	-	-	-	-
		810	1909.8	29.77	30.00	1.05	-0.07	0.011	0.012	-
	Left-Tilt	512	1850.2	28.44	30.00	1.43	-	-	-	-
		661	1880.0	29.16	30.00	1.21	-	-	-	-
		810	1909.8	29.77	30.00	1.05	-0.05	0.009	0.009	-
	Right-Cheek	512	1850.2	28.44	30.00	1.43	-	-	-	-
		661	1880.0	29.16	30.00	1.21	-	-	-	-
		810	1909.8	29.77	30.00	1.05	-0.19	0.018	0.019	3
	Right-Tilt	512	1850.2	28.44	30.00	1.43	-	-	-	-
		661	1880.0	29.16	30.00	1.21	-	-	-	-
		810	1909.8	29.77	30.00	1.05	0.04	0.014	0.015	-
With external antenna(worse case)										
GPRS (2Tx slots)	Right-Cheek	661	1880.0	29.77	30.00	1.05	0.01	0.017	0.018	-

Note:

Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.

WCDMA Band II										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
RMC 12.2K bps	Left-Cheek	9262	1852.4	23.23	23.50	1.07	-	-	-	-
		9400	1880.0	23.47	23.50	1.01	0.11	0.021	0.021	-
		9538	1907.6	23.43	23.50	1.02	-	-	-	-
	Left-Tilt	9262	1852.4	23.23	23.50	1.07	-	-	-	-
		9400	1880.0	23.47	23.50	1.01	0.09	0.017	0.017	-
		9538	1907.6	23.43	23.50	1.02	-	-	-	-
	Right-Cheek	9262	1852.4	23.23	23.50	1.07	-	-	-	-
		9400	1880.0	23.47	23.50	1.01	-0.10	0.031	0.031	5
		9538	1907.6	23.43	23.50	1.02	-	-	-	-
	Right-Tilt	9262	1852.4	23.23	23.50	1.07	-	-	-	-
		9400	1880.0	23.47	23.50	1.01	-0.05	0.025	0.025	-
		9538	1907.6	23.43	23.50	1.02	-	-	-	-
With external antenna(worse case)										
RMC 12.2K bps	Right-Cheek	9400	1880.0	23.47	23.50	1.01	0.19	0.029	0.029	-

WCDMA Band V										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
RMC 12.2K bps	Left-Cheek	4132	826.4	23.92	24.00	1.02	-	-	-	-
		4183	836.6	23.77	24.00	1.05	0.01	0.121	0.127	-
		4233	846.6	23.95	24.00	1.01	-	-	-	-
	Left-Tilt	4132	826.4	23.92	24.00	1.02	-	-	-	-
		4183	836.6	23.77	24.00	1.05	0.01	0.097	0.103	-
		4233	846.6	23.95	24.00	1.01	-	-	-	-
	Right-Cheek	4132	826.4	23.92	24.00	1.02	-	-	-	-
		4183	836.6	23.77	24.00	1.05	-0.10	0.161	0.170	7
		4233	846.6	23.95	24.00	1.01	-	-	-	-
	Right-Tilt	4132	826.4	23.92	24.00	1.02	-	-	-	-
		4183	836.6	23.77	24.00	1.05	-0.01	0.127	0.133	-
		4233	846.6	23.95	24.00	1.01	-	-	-	-
With external antenna(worse case)										
RMC 12.2K bps	Right-Cheek	4183	836.6	23.77	24.00	1.05	0.05	0.157	0.165	-

Note:

Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg

LTE Band 2										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
20M_1 RB	Left-Cheek	18700	1860.0	23.49	24.00	1.12	-	-	-	-
		18900	1880.0	23.68	24.00	1.08	0.07	0.018	0.019	-
		19100	1900.0	23.33	24.00	1.17	-	-	-	-
	Left-Tilt	18700	1860.0	23.49	24.00	1.12	-	-	-	-
		18900	1880.0	23.68	24.00	1.08	0.04	0.014	0.015	-
		19100	1900.0	23.33	24.00	1.17	-	-	-	-
	Right-Cheek	18700	1860.0	23.49	24.00	1.12	-	-	-	-
		18900	1880.0	23.68	24.00	1.08	-0.14	0.034	0.037	9
		19100	1900.0	23.33	24.00	1.17	-	-	-	-
	Right-Tilt	18700	1860.0	23.49	24.00	1.12	-	-	-	-
		18900	1880.0	23.68	24.00	1.08	0.04	0.027	0.029	-
		19100	1900.0	23.33	24.00	1.17	-	-	-	-
20M_5 ORB	Left-Cheek	18700	1860.0	22.37	23.00	1.16	-	-	-	-
		18900	1880.0	22.76	23.00	1.06	0.02	0.013	0.014	-
		19100	1900.0	22.50	23.00	1.12	-	-	-	-
	Left-Tilt	18700	1860.0	22.37	23.00	1.16	-	-	-	-
		18900	1880.0	22.76	23.00	1.06	-0.01	0.011	0.012	-
		19100	1900.0	22.50	23.00	1.12	-	-	-	-
	Right-Cheek	18700	1860.0	22.37	23.00	1.16	-	-	-	-
		18900	1880.0	22.76	23.00	1.06	-0.01	0.021	0.022	-
		19100	1900.0	22.50	23.00	1.12	-	-	-	-
	Right-Tilt	18700	1860.0	22.37	23.00	1.16	-	-	-	-
		18900	1880.0	22.76	23.00	1.06	0.01	0.018	0.019	-
		19100	1900.0	22.50	23.00	1.12	-	-	-	-
With external antenna(worse case)										
20M_1 RB	Right-Cheek	18900	1880	23.68	24.00	1.08	0.06	0.032	0.034	-

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.
2. Per KDB 941225 D05v02r03, for 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.

LTE Band 4										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
20M_1 RB	Left-Cheek	20050	1720.0	24.39	24.50	1.03	-	-	-	-
		20175	1732.5	24.44	24.50	1.01	0.02	0.027	0.027	-
		20300	1745.0	23.89	24.50	1.15	-	-	-	-
	Left-Tilt	20050	1720.0	24.39	24.50	1.03	-	-	-	-
		20175	1732.5	24.44	24.50	1.01	0.01	0.021	0.021	-
		20300	1745.0	23.89	24.50	1.15	-	-	-	-
	Right-Cheek	20050	1720.0	24.39	24.50	1.03	-	-	-	-
		20175	1732.5	24.44	24.50	1.01	-0.06	0.036	0.036	11
		20300	1745.0	23.89	24.50	1.15	-	-	-	-
	Right-Tilt	20050	1720.0	24.39	24.50	1.03	-	-	-	-
		20175	1732.5	24.44	24.50	1.01	0.01	0.028	0.028	-
		20300	1745.0	23.89	24.50	1.15	-	-	-	-
20M_5 ORB	Left-Cheek	20050	1720.0	23.33	23.50	1.04	-	-	-	-
		20175	1732.5	23.31	23.50	1.04	-0.07	0.020	0.021	-
		20300	1745.0	23.20	23.50	1.07	-	-	-	-
	Left-Tilt	20050	1720.0	23.33	23.50	1.04	-	-	-	-
		20175	1732.5	23.31	23.50	1.04	0.06	0.016	0.017	-
		20300	1745.0	23.20	23.50	1.07	-	-	-	-
	Right-Cheek	20050	1720.0	23.33	23.50	1.04	-	-	-	-
		20175	1732.5	23.31	23.50	1.04	0.03	0.029	0.030	-
		20300	1745.0	23.20	23.50	1.07	-	-	-	-
	Right-Tilt	20050	1720.0	23.33	23.50	1.04	-	-	-	-
		20175	1732.5	23.31	23.50	1.04	-0.04	0.021	0.022	-
		20300	1745.0	23.20	23.50	1.07	-	-	-	-
With external antenna(worse case)										
20M_1 RB	Right-Cheek	20175	1732.5	24.44	24.50	1.01	0.17	0.034	0.034	-

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
2. Per KDB 941225 D05v02r03, for 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.

LTE Band 5										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
10M_1 RB	Left-Cheek	20450	829.0	23.63	24.00	1.09	-	-	-	-
		20525	836.5	23.71	24.00	1.07	0.09	0.101	0.108	-
		20600	844.0	23.75	24.00	1.06	-	-	-	-
	Left-Tilt	20450	829.0	23.63	24.00	1.09	-	-	-	-
		20525	836.5	23.71	24.00	1.07	0.05	0.085	0.090	-
		20600	844.0	23.75	24.00	1.06	-	-	-	-
	Right-Cheek	20450	829.0	23.63	24.00	1.09	-	-	-	-
		20525	836.5	23.71	24.00	1.07	-0.01	0.130	0.139	13
		20600	844.0	23.75	24.00	1.06	-	-	-	-
	Right-Tilt	20450	829.0	23.63	24.00	1.09	-	-	-	-
		20525	836.5	23.71	24.00	1.07	0.03	0.103	0.110	-
		20600	844.0	23.75	24.00	1.06	-	-	-	-
10M_2 5RB	Left-Cheek	20450	829.0	22.74	23.00	1.06	-	-	-	-
		20525	836.5	22.78	23.00	1.05	-0.06	0.087	0.092	-
		20600	844.0	22.75	23.00	1.06	-	-	-	-
	Left-Tilt	20450	829.0	22.74	23.00	1.06	-	-	-	-
		20525	836.5	22.78	23.00	1.05	0.04	0.067	0.071	-
		20600	844.0	22.75	23.00	1.06	-	-	-	-
	Right-Cheek	20450	829.0	22.74	23.00	1.06	-	-	-	-
		20525	836.5	22.78	23.00	1.05	-0.03	0.103	0.108	-
		20600	844.0	22.75	23.00	1.06	-	-	-	-
	Right-Tilt	20450	829.0	22.74	23.00	1.06	-	-	-	-
		20525	836.5	22.78	23.00	1.05	-0.03	0.084	0.088	-
		20600	844.0	22.75	23.00	1.06	-	-	-	-
With external antenna(worse case)										
10M_1 RB	Right-Cheek	20525	836.5	23.71	24.00	1.07	-0.01	0.126	0.135	-

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
2. Per KDB 941225 D05v02r03, for 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.

LTE Band 7										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
20M_1 RB	Left-Cheek	20850	2510	22.59	23.00	1.10	-	-	-	-
		21100	2535	22.78	23.00	1.05	0.06	0.177	0.186	-
		21350	2560	22.76	23.00	1.06	-	-	-	-
	Left-Tilt	20850	2510	22.59	23.00	1.10	-	-	-	-
		21100	2535	22.78	23.00	1.05	0.03	0.148	0.156	-
		21350	2560	22.76	23.00	1.06	-	-	-	-
	Right-Cheek	20850	2510	22.59	23.00	1.10	-	-	-	-
		21100	2535	22.78	23.00	1.05	-0.14	0.277	0.291	15
		21350	2560	22.76	23.00	1.06	-	-	-	-
	Right-Tilt	20850	2510	22.59	23.00	1.10	-	-	-	-
		21100	2535	22.78	23.00	1.05	0.02	0.220	0.231	-
		21350	2560	22.76	23.00	1.06	-	-	-	-
20M_5 ORB	Left-Cheek	20850	2510	21.57	22.00	1.10	-	-	-	-
		21100	2535	21.74	22.00	1.06	-0.02	0.122	0.130	-
		21350	2560	21.94	22.00	1.01	-	-	-	-
	Left-Tilt	20850	2510	21.57	22.00	1.10	-	-	-	-
		21100	2535	21.74	22.00	1.06	0.01	0.095	0.100	-
		21350	2560	21.94	22.00	1.01	-	-	-	-
	Right-Cheek	20850	2510	21.57	22.00	1.10	-	-	-	-
		21100	2535	21.74	22.00	1.06	-0.01	0.212	0.225	-
		21350	2560	21.94	22.00	1.01	-	-	-	-
	Right-Tilt	20850	2510	21.57	22.00	1.10	-	-	-	-
		21100	2535	21.74	22.00	1.06	-0.01	0.173	0.184	-
		21350	2560	21.94	22.00	1.01	-	-	-	-
With external antenna(worse case)										
20M_1 RB	Right-Cheek	21100	2535	22.78	23.00	1.05	-0.14	0.274	0.288	-

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
2. Per KDB 941225 D05v02r03, for 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.

LTE Band 38											
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Duty Cycle Scaling Factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz								
20M_1 RB	Left-Cheek	37850	2580	23.02	24.00	1.25	1.006	-	-	-	-
		38000	2595	23.35	24.00	1.16	1.006	0.11	0.098	0.115	-
		38150	2610	23.45	24.00	1.14	1.006	-	-	-	-
	Left-Tilt	37850	2580	23.02	24.00	1.25	1.006	-	-	-	-
		38000	2595	23.35	24.00	1.16	1.006	0.06	0.082	0.096	-
		38150	2610	23.45	24.00	1.14	1.006	-	-	-	-
	Right-Cheek	37850	2580	23.02	24.00	1.25	1.006	-	-	-	-
		38000	2595	23.35	24.00	1.16	1.006	0.14	0.171	0.200	17
		38150	2610	23.45	24.00	1.14	1.006	-	-	-	-
	Right-Tilt	37850	2580	23.02	24.00	1.25	1.006	-	-	-	-
		38000	2595	23.35	24.00	1.16	1.006	0.04	0.136	0.158	-
		38150	2610	23.45	24.00	1.14	1.006	-	-	-	-
20M_5 ORB	Left-Cheek	37850	2580	21.99	22.50	1.12	1.006	-	-	-	-
		38000	2595	22.17	22.50	1.08	1.006	0.06	0.081	0.088	-
		38150	2610	22.32	22.50	1.04	1.006	-	-	-	-
	Left-Tilt	37850	2580	21.99	22.50	1.12	1.006	-	-	-	-
		38000	2595	22.17	22.50	1.08	1.006	-0.04	0.063	0.068	-
		38150	2610	22.32	22.50	1.04	1.006	-	-	-	-
	Right-Cheek	37850	2580	21.99	22.50	1.12	1.006	-	-	-	-
		38000	2595	22.17	22.50	1.08	1.006	0.03	0.112	0.122	-
		38150	2610	22.32	22.50	1.04	1.006	-	-	-	-
	Right-Tilt	37850	2580	21.99	22.50	1.12	1.006	-	-	-	-
		38000	2595	22.17	22.50	1.08	1.006	0.03	0.091	0.099	-
		38150	2610	22.32	22.50	1.04	1.006	-	-	-	-
With external antenna(worse case)											
20M_1 RB	Right-Cheek	38000	2595	23.35	24.00	1.16	1.006	0.02	0.167	0.195	-

Note:

- Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
- Per KDB 941225 D05v02r03, for 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.
- For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9%) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.

WIFI 2.4G										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
802.11 b 1Mbps	Left-Cheek	01	2412	14.51	15.50	1.26	-	-	-	-
		06	2437	15.26	15.50	1.06	0.11	0.198	0.209	-
		11	2462	15.10	15.50	1.10	-	-	-	-
	Left-Tilt	01	2412	14.51	15.50	1.26	-	-	-	-
		06	2437	15.26	15.50	1.06	-0.15	0.168	0.177	-
		11	2462	15.10	15.50	1.10	-	-	-	-
	Right-Cheek	01	2412	14.51	15.50	1.26	-	-	-	-
		06	2437	15.26	15.50	1.06	-0.14	0.258	0.273	19
		11	2462	15.10	15.50	1.10	-	-	-	-
	Right-Tilt	01	2412	14.51	15.50	1.26	-	-	-	-
		06	2437	15.26	15.50	1.06	0.08	0.217	0.229	-
		11	2462	15.10	15.50	1.10	-	-	-	-
With external antenna(worse case)										
802.11 b 1Mbps	Right-Cheek	6	2437	15.26	15.50	1.06	0.05	0.253	0.267	-

Note:

- According to the above table, the initial test position for head is "Left Cheek", and its reported SAR is $\leq 0.4\text{W/kg}$. Thus further SAR measurement is not required for the other (remaining) test positions. Because the reported SAR of the highest measured maximum output power channel for the exposure configuration is $\leq 0.8\text{W/kg}$, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied. SAR is not required for the following 2.4 GHz OFDM conditions.
 - When KDB Publication 447498 D01 SAR test exclusion applies to the OFDM configuration.
 - When the highest *reported* SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is $\leq 1.2\text{ W/kg}$, the 802.11g/n is not required.

WIFI 2.4G- Scaled Reported SAR							
Mode	Test Position	Frequency		Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
		CH	MHz				
802.11b 1Mbps	Left-Cheek	6	2437	100%	100%	0.209	0.209
	Left-Tilt	6	2437	100%	100%	0.177	0.177
	Right-Cheek	6	2437	100%	100%	0.273	0.273
	Right-Tilt	6	2437	100%	100%	0.229	0.229

Note:

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit. A maximum transmission duty factor of 100% is achievable for WLAN in this project.

Body SAR

GSM850										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
GPRS (3Tx slots)	Front	128	824.2	32.29	32.50	1.05	-	-	-	-
		190	836.6	31.79	32.50	1.18	0.03	0.335	0.394	2
		251	848.8	32.02	32.50	1.12	-	-	-	-
	Rear (back splint)	128	824.2	32.29	32.50	1.05	-	-	-	-
		190	836.6	31.79	32.50	1.18	0.02	0.116	0.137	-
		251	848.8	32.02	32.50	1.12	-	-	-	-
With external antenna(worse case)										
GPRS (3Tx slots)	Front	190	836.6	31.79	32.50	1.18	0.17	0.328	0.386	-

PCS1900										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
GPRS (2Tx slots)	Front	512	1850.2	28.44	30.00	1.43	-	-	-	-
		661	1880.0	29.16	30.00	1.21	-	-	-	-
		810	1909.8	29.77	30.00	1.05	-0.10	0.031	0.033	4
	Rear (back splint)	512	1850.2	28.44	30.00	1.43	-	-	-	-
		661	1880.0	29.16	30.00	1.21	-	-	-	-
		810	1909.8	29.77	30.00	1.05	-0.10	0.012	0.013	-
With external antenna(worse case)										
GPRS (2Tx slots)	Front	810	1909.8	29.77	30.00	1.05	0.09	0.029	0.031	-

Note:

Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg

WCDMA Band II										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
RMC 12.2Kbps	Front	9262	1852.4	23.23	23.50	1.07	-	-	-	-
		9400	1880.0	23.47	23.50	1.01	-0.03	0.038	0.038	6
		9538	1907.6	23.43	23.50	1.02	-	-	-	-
	Rear (back splint)	9262	1852.4	23.23	23.50	1.07	-	-	-	-
		9400	1880.0	23.47	23.50	1.01	-0.04	0.008	0.008	-
		9538	1907.6	23.43	23.50	1.02	-	-	-	-
With external antenna(worse case)										
RMC 12.2Kbps	Front	9400	1880.0	23.47	23.50	1.01	0.14	0.035	0.035	-

WCDMA Band V										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
RMC 12.2Kbps	Front	4132	826.4	23.92	24.00	1.02	-	-	-	-
		4183	836.6	23.77	24.00	1.05	-0.01	0.120	0.126	8
		4233	846.6	23.95	24.00	1.01	-	-	-	-
	Rear (back splint)	4132	826.4	23.92	24.00	1.02	-	-	-	-
		4183	836.6	23.77	24.00	1.05	0.13	0.035	0.037	-
		4233	846.6	23.95	24.00	1.01	-	-	-	-
With external antenna(worse case)										
RMC 12.2Kbps	Front	4183	836.6	23.77	24.00	1.05	0.06	0.116	0.122	-

Note:

Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg

LTE Band 2										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
20M_1RB	Front	18700	1860.0	23.49	24.00	1.12	-	-	-	-
		18900	1880.0	23.68	24.00	1.08	-0.13	0.043	0.047	10
		19100	1900.0	23.33	24.00	1.17	-	-	-	-
	Rear (back splint)	18700	1860.0	23.49	24.00	1.12	-	-	-	-
		18900	1880.0	23.68	24.00	1.08	0.08	0.015	0.016	-
		19100	1900.0	23.33	24.00	1.17	-	-	-	-
20M_50RB	Front	18700	1860.0	22.37	23.00	1.16	-	-	-	-
		18900	1880.0	22.76	23.00	1.06	-0.01	0.033	0.035	-
		19100	1900.0	22.50	23.00	1.12	-	-	-	-
	Rear (back splint)	18700	1860.0	22.37	23.00	1.16	-	-	-	-
		18900	1880.0	22.76	23.00	1.06	0.06	0.011	0.012	-
		19100	1900.0	22.50	23.00	1.12	-	-	-	-
With external antenna(worse case)										
20M_1RB	Front	18900	1880	23.68	24.00	1.08	0.09	0.040	0.043	-

LTE Band 4										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
20M_1RB	Front	20050	1720.0	24.39	24.50	1.03	-	-	-	-
		20175	1732.5	24.44	24.50	1.01	-0.15	0.061	0.062	12
		20300	1745.0	23.89	24.50	1.15	-	-	-	-
	Rear (back splint)	20050	1720.0	24.39	24.50	1.03	-	-	-	-
		20175	1732.5	24.44	24.50	1.01	-0.10	0.019	0.019	-
		20300	1745.0	23.89	24.50	1.15	-	-	-	-
20M_50RB	Front	20050	1720.0	23.33	23.50	1.04	-	-	-	-
		20175	1732.5	23.31	23.50	1.04	0.06	0.053	0.055	-
		20300	1745.0	23.20	23.50	1.07	-	-	-	-
	Rear (back splint)	20050	1720.0	23.33	23.50	1.04	-	-	-	-
		20175	1732.5	23.31	23.50	1.04	0.08	0.010	0.010	-
		20300	1745.0	23.20	23.50	1.07	-	-	-	-
With external antenna(worse case)										
20M_1RB	Front	20175	1732.5	24.44	24.50	1.01	0.18	0.057	0.058	-

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
2. Per KDB 941225 D05v02r03, for 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.

LTE Band 5										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
10M_1RB	Front	20450	829.0	23.63	24.00	1.09	-	-	-	-
		20525	836.5	23.71	24.00	1.07	0.01	0.126	0.135	14
		20600	844.0	23.75	24.00	1.06	-	-	-	-
	Rear (back splint)	20450	829.0	23.63	24.00	1.09	-	-	-	-
		20525	836.5	23.71	24.00	1.07	-0.01	0.039	0.042	-
		20600	844.0	23.75	24.00	1.06	-	-	-	-
10M_25RB	Front	20450	829.0	22.74	23.00	1.06	-	-	-	-
		20525	836.5	22.78	23.00	1.05	-0.14	0.098	0.103	-
		20600	844.0	22.75	23.00	1.06	-	-	-	-
	Rear (back splint)	20450	829.0	22.74	23.00	1.06	-	-	-	-
		20525	836.5	22.78	23.00	1.05	0.01	0.028	0.029	-
		20600	844.0	22.75	23.00	1.06	-	-	-	-
With external antenna(worse case)										
10M_1RB	Front	20525	836.5	23.71	24.00	1.07	-0.17	0.122	0.130	-

LTE Band 7										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
20M_1RB	Front	20850	2510	22.59	23.00	1.10	-	-	-	-
		21100	2535	22.78	23.00	1.05	0.13	0.435	0.458	16
		21350	2560	22.76	23.00	1.06	-	-	-	-
	Rear (back splint)	20850	2510	22.59	23.00	1.10	-	-	-	-
		21100	2535	22.78	23.00	1.05	0.09	0.176	0.185	-
		21350	2560	22.76	23.00	1.06	-	-	-	-
20M_50RB	Front	20850	2510	21.57	22.00	1.10	-	-	-	-
		21100	2535	21.74	22.00	1.06	-0.18	0.377	0.400	-
		21350	2560	21.94	22.00	1.01	-	-	-	-
	Rear (back splint)	20850	2510	21.57	22.00	1.10	-	-	-	-
		21100	2535	21.74	22.00	1.06	0.02	0.097	0.103	-
		21350	2560	21.94	22.00	1.01	-	-	-	-
With external antenna(worse case)										
20M_1RB	Front	21100	2535	22.78	23.00	1.05	-0.14	0.425	0.447	-

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
2. Per KDB 941225 D05v02r03, for 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.

LTE Band 38											
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Duty Cycle Scaling Factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz								
20M_1 RB	Front	37850	2580	23.02	24.00	1.25	1.006	-	-	-	-
		38000	2595	23.35	24.00	1.16	1.006	0.07	0.237	0.277	18
		38150	2610	23.45	24.00	1.14	1.006	-	-	-	-
	Rear (back splint)	37850	2580	23.02	24.00	1.25	1.006	-	-	-	-
		38000	2595	23.35	24.00	1.16	1.006	-0.06	0.082	0.096	-
		38150	2610	23.45	24.00	1.14	1.006	-	-	-	-
20M_5 ORB	Front	37850	2580	21.99	22.50	1.12	1.006	-	-	-	-
		38000	2595	22.17	22.50	1.08	1.006	0.12	0.176	0.191	-
		38150	2610	22.32	22.50	1.04	1.006	-	-	-	-
	Rear (back splint)	37850	2580	21.99	22.50	1.12	1.006	-	-	-	-
		38000	2595	22.17	22.50	1.08	1.006	0.14	0.059	0.064	-
		38150	2610	22.32	22.50	1.04	1.006	-	-	-	-
With external antenna(worse case)											
20M_1 RB	Front	38000	2595	23.35	24.00	1.16	1.006	-0.14	0.230	0.269	-

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
2. Per KDB 941225 D05v02r03, for 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.
3. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9%) was used to perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.

WIFI 2.4G										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
802.11b 1Mbps	Front	1	2412	14.51	15.50	1.26	-	-	-	-
		6	2437	15.26	15.50	1.06	-0.16	0.127	0.134	20
		11	2462	15.10	15.50	1.10	-	-	-	-
	Rear (back splint)	1	2412	14.51	15.50	1.26	-	-	-	-
		6	2437	15.26	15.50	1.06	-0.07	0.063	0.067	-
		11	2462	15.10	15.50	1.10	-	-	-	-
With external antenna(worse case)										
802.11b 1Mbps	Front	6	2437	15.26	15.50	1.06	-0.08	0.121	0.128	-

Note:

- According to the above table, the initial test position for body is "Rear", and its reported SAR is $\leq 0.4\text{W/kg}$. Thus further SAR measurement is not required for the other (remaining) test positions. Because the reported SAR of the highest measured maximum output power channel for the exposure configuration is $\leq 0.8\text{W/kg}$, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied. SAR is not required for the following 2.4 GHz OFDM conditions.
 - When KDB Publication 447498 D01 SAR test exclusion applies to the OFDM configuration.
 - When the highest *reported* SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is $\leq 1.2\text{ W/kg}$, the 802.11g/n is not required.

WIFI 2.4G- Scaled Reported SAR							
Mode	Test Position	Frequency		Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
		CH	MHz				
802.11b 1Mbps	Front	6	2437	100%	100%	0.134	0.134
	Rear	6	2437	100%	100%	0.067	0.067

Note:

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit. A maximum transmission duty factor of 100% is achievable for WLAN in this project.

Hotspot SAR

Positions for SAR tests; Hotspot mode						
Antenna	Rear	Front	Top side	Bottom side	Right side	Left side
WWAN	Yes	Yes	No	Yes	Yes	No
WIFI/BT	Yes	Yes	Yes	No	No	Yes

General note:

Referring to KDB941225 D06, when the overall device length and width are >9cm*5cm, the test distance is 10mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.

GSM850										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
GPRS (3Tx slots)	Front	128	824.2	32.29	32.50	1.05	-	-	-	-
		190	836.6	31.79	32.50	1.18	0.03	0.335	0.394	2
		251	848.8	32.02	32.50	1.12	-	-	-	-
	Rear	128	824.2	32.29	32.50	1.05	-	-	-	-
		190	836.6	31.79	32.50	1.18	-0.04	0.136	0.160	-
		251	848.8	32.02	32.50	1.12	-	-	-	-
	Left	190	836.6	31.79	32.50	1.18	-	-	-	-
	Right	190	836.6	31.79	32.50	1.18	-0.01	0.073	0.086	-
	Top	190	836.6	31.79	32.50	1.18	-	-	-	-
	Bottom	190	836.6	31.79	32.50	1.18	-0.01	0.060	0.071	-

PCS1900										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
GPRS (2Tx slots)	Front	512	1850.2	28.44	30.00	1.43	-	-	-	-
		661	1880.0	29.16	30.00	1.21	-	-	-	-
		810	1909.8	29.77	30.00	1.05	-0.10	0.031	0.033	4
	Rear	512	1850.2	28.44	30.00	1.43	-	-	-	-
		661	1880.0	29.16	30.00	1.21	-	-	-	-
		810	1909.8	29.77	30.00	1.05	-0.10	0.018	0.019	-
	Left	810	1909.8	29.77	30.00	1.05	-	-	-	-
	Right	810	1909.8	29.77	30.00	1.05	0.03	0.024	0.026	-
	Top	810	1909.8	29.77	30.00	1.05	-	-	-	-
	Bottom	810	1909.8	29.77	30.00	1.05	-0.10	0.019	0.021	-

Note:

Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg

WCDMA Band II										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
RMC 12.2Kbps	Front	9262	1852.4	23.23	23.50	1.07	-	-	-	-
		9400	1880.0	23.47	23.50	1.01	-0.03	0.038	0.038	6
		9538	1907.6	23.43	23.50	1.02	-	-	-	-
	Rear	9262	1852.4	23.23	23.50	1.07	-	-	-	-
		9400	1880.0	23.47	23.50	1.01	-0.10	0.012	0.012	-
		9538	1907.6	23.43	23.50	1.02	-	-	-	-
	Left	9400	1880.0	23.47	23.50	1.01	-	-	-	-
	Right	9400	1880.0	23.47	23.50	1.01	0.11	0.022	0.022	-
	Top	9400	1880.0	23.47	23.50	1.01	-	-	-	-
	Bottom	9400	1880.0	23.47	23.50	1.01	0.03	0.025	0.025	-

WCDMA Band V										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
RMC 12.2Kbps	Front	4132	826.4	23.92	24.00	1.02	-	-	-	-
		4183	836.6	23.77	24.00	1.05	-0.01	0.120	0.126	8
		4233	846.6	23.95	24.00	1.01	-	-	-	-
	Rear	4132	826.4	23.92	24.00	1.02	-	-	-	-
		4183	836.6	23.77	24.00	1.05	0.02	0.070	0.074	-
		4233	846.6	23.95	24.00	1.01	-	-	-	-
	Left	4183	836.6	23.77	24.00	1.05	-	-	-	-
	Right	4183	836.6	23.77	24.00	1.05	0.03	0.033	0.035	-
	Top	4183	836.6	23.77	24.00	1.05	-	-	-	-
	Bottom	4183	836.6	23.77	24.00	1.05	0.01	0.025	0.026	-

Note:

Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg

LTE Band 2										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
20M_1RB	Front	18700	1860.0	23.49	24.00	1.12	-	-	-	-
		18900	1880.0	23.68	24.00	1.08	-0.13	0.043	0.047	10
		19100	1900.0	23.33	24.00	1.17	-	-	-	-
	Rear	18700	1860.0	23.49	24.00	1.12	-	-	-	-
		18900	1880.0	23.68	24.00	1.08	0.08	0.024	0.026	-
		19100	1900.0	23.33	24.00	1.17	-	-	-	-
	Left	18900	1880.0	23.68	24.00	1.08	-	-	-	-
	Right	18900	1880.0	23.68	24.00	1.08	0.03	0.032	0.034	-
	Top	18900	1880.0	23.68	24.00	1.08	-	-	-	-
	Bottom	18900	1880.0	23.68	24.00	1.08	0.08	0.031	0.034	-
20M_50RB	Front	18700	1860.0	22.37	23.00	1.16	-	-	-	-
		18900	1880.0	22.76	23.00	1.06	-0.01	0.033	0.035	-
		19100	1900.0	22.50	23.00	1.12	-	-	-	-
	Rear	18700	1860.0	22.37	23.00	1.16	-	-	-	-
		18900	1880.0	22.76	23.00	1.06	0.06	0.018	0.019	-
		19100	1900.0	22.50	23.00	1.12	-	-	-	-
	Left	18900	1880.0	22.76	23.00	1.06	-	-	-	-
	Right	18900	1880.0	22.76	23.00	1.06	-0.01	0.024	0.026	-
	Top	18900	1880.0	22.76	23.00	1.06	-	-	-	-
	Bottom	18900	1880.0	22.76	23.00	1.06	0.06	0.025	0.026	-

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
2. Per KDB 941225 D05v02r03, for 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.

LTE Band 4										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
20M_1RB	Front	20050	1720.0	24.39	24.50	1.03	-	-	-	-
		20175	1732.5	24.44	24.50	1.01	-0.15	0.061	0.062	12
		20300	1745.0	23.89	24.50	1.15	-	-	-	-
	Rear	20050	1720.0	24.39	24.50	1.03	-	-	-	-
		20175	1732.5	24.44	24.50	1.01	-0.10	0.026	0.026	-
		20300	1745.0	23.89	24.50	1.15	-	-	-	-
	Left	20175	1732.5	24.44	24.50	1.01	-	-	-	-
	Right	20175	1732.5	24.44	24.50	1.01	-0.01	0.044	0.045	-
	Top	20175	1732.5	24.44	24.50	1.01	-	-	-	-
	Bottom	20175	1732.5	24.44	24.50	1.01	-0.04	0.046	0.047	-
20M_50RB	Front	20050	1720.0	23.33	23.50	1.04	-	-	-	-
		20175	1732.5	23.31	23.50	1.04	0.06	0.053	0.055	-
		20300	1745.0	23.20	23.50	1.07	-	-	-	-
	Rear	20050	1720.0	23.33	23.50	1.04	-	-	-	-
		20175	1732.5	23.31	23.50	1.04	0.08	0.016	0.017	-
		20300	1745.0	23.20	23.50	1.07	-	-	-	-
	Left	20175	1732.5	23.31	23.50	1.04	-	-	-	-
	Right	20175	1732.5	23.31	23.50	1.04	0.01	0.039	0.041	-
	Top	20175	1732.5	23.31	23.50	1.04	-	-	-	-
	Bottom	20175	1732.5	23.31	23.50	1.04	0.02	0.040	0.042	-

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.
2. Per KDB 941225 D05v02r03, for 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.

LTE Band 5										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
10M_1RB	Front	20450	829.0	23.63	24.00	1.09	-	-	-	-
		20525	836.5	23.71	24.00	1.07	0.01	0.126	0.135	14
		20600	844.0	23.75	24.00	1.06	-	-	-	-
	Rear	20450	829.0	23.63	24.00	1.09	-	-	-	-
		20525	836.5	23.71	24.00	1.07	-0.01	0.048	0.051	-
		20600	844.0	23.75	24.00	1.06	-	-	-	-
	Left	20525	836.5	23.71	24.00	1.07	-	-	-	-
	Right	20525	836.5	23.71	24.00	1.07	0.00	0.029	0.032	-
	Top	20525	836.5	23.71	24.00	1.07	-	-	-	-
	Bottom	20525	836.5	23.71	24.00	1.07	-0.01	0.026	0.027	-
10M_25RB	Front	20450	829.0	22.74	23.00	1.06	-	-	-	-
		20525	836.5	22.78	23.00	1.05	-0.14	0.098	0.103	-
		20600	844.0	22.75	23.00	1.06	-	-	-	-
	Rear	20450	829.0	22.74	23.00	1.06	-	-	-	-
		20525	836.5	22.78	23.00	1.05	0.01	0.037	0.039	-
		20600	844.0	22.75	23.00	1.06	-	-	-	-
	Left	20525	836.5	22.78	23.00	1.05	-	-	-	-
	Right	20525	836.5	22.78	23.00	1.05	0.00	0.028	0.030	-
	Top	20525	836.5	22.78	23.00	1.05	-	-	-	-
	Bottom	20525	836.5	22.78	23.00	1.05	0.00	0.020	0.021	-

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
2. Per KDB 941225 D05v02r03, for 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.

LTE Band 7										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
20M_1RB	Front	20850	2510	22.59	23.00	1.10	-	-	-	-
		21100	2535	22.78	23.00	1.05	0.13	0.435	0.458	16
		21350	2560	22.76	23.00	1.06	-	-	-	-
	Rear	20850	2510	22.59	23.00	1.10	-	-	-	-
		21100	2535	22.78	23.00	1.05	-0.11	0.219	0.230	-
		21350	2560	22.76	23.00	1.06	-	-	-	-
	Left	21100	2535	22.78	23.00	1.05	-	-	-	-
	Right	21100	2535	22.78	23.00	1.05	-0.04	0.319	0.336	-
	Top	21100	2535	22.78	23.00	1.05	-	-	-	-
	Bottom	21100	2535	22.78	23.00	1.05	-0.07	0.331	0.348	-
20M_50RB	Front	20850	2510	21.57	22.00	1.10	-	-	-	-
		21100	2535	21.74	22.00	1.06	0.18	0.377	0.400	-
		21350	2560	21.94	22.00	1.01	-	-	-	-
	Rear	20850	2510	21.57	22.00	1.10	-	-	-	-
		21100	2535	21.74	22.00	1.06	-0.05	0.146	0.155	-
		21350	2560	21.94	22.00	1.01	-	-	-	-
	Left	21100	2535	21.74	22.00	1.06	-	-	-	-
	Right	21100	2535	21.74	22.00	1.06	-0.02	0.276	0.293	-
	Top	21100	2535	21.74	22.00	1.06	-	-	-	-
	Bottom	21100	2535	21.74	22.00	1.06	-0.01	0.283	0.300	-

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
2. Per KDB 941225 D05v02r03, for 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.

LTE Band 38											
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Duty Cycle Scaling Factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz								
20M_1 RB	Front	37850	2580	23.02	24.00	1.25	1.006	-	-	-	-
		38000	2595	23.35	24.00	1.16	1.006	0.07	0.237	0.277	18
		38150	2610	23.45	24.00	1.14	1.006	-	-	-	-
	Rear	37850	2580	23.02	24.00	1.25	1.006	-	-	-	-
		38000	2595	23.35	24.00	1.16	1.006	-0.14	0.106	0.124	-
		38150	2610	23.45	24.00	1.14	1.006	-	-	-	-
	Left	38000	2595	23.35	24.00	1.16	1.006	-	-	-	-
	Right	38000	2595	23.35	24.00	1.16	1.006	-0.05	0.173	0.203	-
	Top	38000	2595	23.35	24.00	1.16	1.006	-	-	-	-
	Bottom	38000	2595	23.35	24.00	1.16	1.006	-0.09	0.178	0.209	-
20M_5 ORB	Front	37850	2580	21.99	22.50	1.12	1.006	-	-	-	-
		38000	2595	22.17	22.50	1.08	1.006	0.12	0.176	0.191	-
		38150	2610	22.32	22.50	1.04	1.006	-	-	-	-
	Rear	37850	2580	21.99	22.50	1.12	1.006	-	-	-	-
		38000	2595	22.17	22.50	1.08	1.006	0.06	0.086	0.093	-
		38150	2610	22.32	22.50	1.04	1.006	-	-	-	-
	Left	38000	2595	22.17	22.50	1.08	1.006	-	-	-	-
	Right	38000	2595	22.17	22.50	1.08	1.006	0.02	0.129	0.140	-
	Top	38000	2595	22.17	22.50	1.08	1.006	-	-	-	-
	Bottom	38000	2595	22.17	22.50	1.08	1.006	0.01	0.132	0.143	-

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
2. Per KDB 941225 D05v02r03, for 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.
3. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9%) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.

WIFI 2.4G										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Plot No.
		CH	MHz							
802.11b 1Mbps	Front	1	2412	14.51	15.50	1.26	-	-	-	-
		6	2437	15.26	15.50	1.06	-0.16	0.127	0.134	20
		11	2462	15.10	15.50	1.10	-	-	-	-
	Rear	1	2412	14.51	15.50	1.26	-	-	-	-
		6	2437	15.26	15.50	1.06	0.02	0.077	0.081	-
		11	2462	15.10	15.50	1.10	-	-	-	-
	Left	6	2437	15.26	15.50	1.06	0.12	0.093	0.099	-
	Right	6	2437	15.26	15.50	1.06	-	-	-	-
	Top	6	2437	15.26	15.50	1.06	-0.01	0.084	0.088	-
	Bottom	6	2437	15.26	15.50	1.06	-	-	-	-

Note:

- According to the above table, the initial test position for body is "Rear", and its reported SAR is $\leq 0.4\text{W/kg}$. Thus further SAR measurement is not required for the other (remaining) test positions. Because the reported SAR of the highest measured maximum output power channel for the exposure configuration is $\leq 0.8\text{W/kg}$, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied. SAR is not required for the following 2.4 GHz OFDM conditions.
 - When KDB Publication 447498 D01 SAR test exclusion applies to the OFDM configuration.
 - When the highest *reported* SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is $\leq 1.2\text{ W/kg}$, the 802.11g/n is not required

WIFI 2.4G- Scaled Reported SAR							
Mode	Test Position	Frequency		Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
		CH	MHz				
802.11b 1Mbps	Front	6	2437	100%	100%	0.134	0.134
	Rear	6	2437	100%	100%	0.081	0.081
	Left	6	2437	100%	100%	0.099	0.099
	Top	6	2437	100%	100%	0.088	0.088

Note:

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit. A maximum transmission duty factor of 100% is achievable for WLAN in this project.

SAR Test Data Plots to the Appendix A.

15. Simultaneous Transmission analysis

No.	Simultaneous Transmission Configurations	Head	Body-worn	Hotspot	Note
1	GSM(voice) + Bluetooth (data)	Yes	Yes		
2	GSM(voice) + WIFI (data)	Yes	Yes		
3	WCDMA(voice) + Bluetooth (data)	Yes	Yes		
4	WCDMA(voice) + WIFI (data)	Yes	Yes		
5	GPRS (data) + Bluetooth (data)	Yes	Yes	NA	
6	GPRS (data) + WIFI (data)	Yes	Yes	Yes	
7	WCDMA (data) + Bluetooth (data)	Yes	Yes	NA	
8	WCDMA (data) + WIFI (data)	Yes	Yes	Yes	
9	LTE + Bluetooth (data)	Yes	Yes	NA	
10	LTE + WIFI (data)	Yes	Yes	Yes	

General note:

1. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
2. EUT will choose either GSM or WCDMA LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
3. The reported SAR summation is calculated based on the same configuration and test position
4. For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01 based on the formula below
 - a) $[(\text{max. Power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] * [\sqrt{f(\text{GHz})}/x] \text{W/kg}$ for test separation distances $\leq 50\text{mm}$; when $x=7.5$ for 1-g SAR, and $x=18.75$ for 10-g SAR.
 - b) When the minimum separation distance is $<5\text{mm}$, the distance is used 5mm to determine SAR test exclusion
 - c) 0.4 W/kg for 1-g SAR and 1.0W/kg for 10-g SAR, when the test separation distances is $>50\text{mm}$.

Bluetooth Max power	Exposure position	Head	Body-worn
	Test separation	0mm	10mm
3.50 dBm	Estimated SAR (W/kg)	0.093	0.047

Maximum reported SAR value for Head

WWAN PCE + WLAN DTS					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR (W/kg)
			WWAN PCE	WLAN DTS	
GSM	GSM850	Left Cheek	0.327	0.209	0.536
		Left Tilted	0.250	0.177	0.427
		Right Cheek	0.531	0.273	0.804
		Right Tilted	0.402	0.229	0.631
	PCS1900	Left Cheek	0.012	0.209	0.221
		Left Tilted	0.009	0.177	0.186
		Right Cheek	0.019	0.273	0.292
		Right Tilted	0.015	0.229	0.244
WCDMA	Band II	Left Cheek	0.021	0.209	0.230
		Left Tilted	0.017	0.177	0.194
		Right Cheek	0.031	0.273	0.304
		Right Tilted	0.025	0.229	0.254
	Band V	Left Cheek	0.127	0.209	0.336
		Left Tilted	0.103	0.177	0.280
		Right Cheek	0.170	0.273	0.443
		Right Tilted	0.133	0.229	0.362
LTE	B2 1RB	Left Cheek	0.019	0.209	0.228
		Left Tilted	0.015	0.177	0.192
		Right Cheek	0.037	0.273	0.310
		Right Tilted	0.029	0.229	0.258
	B2 50RB	Left Cheek	0.014	0.209	0.223
		Left Tilted	0.012	0.177	0.189
		Right Cheek	0.022	0.273	0.295
		Right Tilted	0.019	0.229	0.248
	B4 1RB	Left Cheek	0.027	0.209	0.236
		Left Tilted	0.021	0.177	0.198
		Right Cheek	0.036	0.273	0.309
		Right Tilted	0.028	0.229	0.257
	B4 50RB	Left Cheek	0.021	0.209	0.230
		Left Tilted	0.017	0.177	0.194
		Right Cheek	0.030	0.273	0.303
		Right Tilted	0.022	0.229	0.251

LTE	B5 1RB	Left Cheek	0.108	0.209	0.317
		Left Tilted	0.090	0.177	0.267
		Right Cheek	0.139	0.273	0.412
		Right Tilted	0.110	0.229	0.339
	B5 25RB	Left Cheek	0.092	0.209	0.301
		Left Tilted	0.071	0.177	0.248
		Right Cheek	0.108	0.273	0.381
		Right Tilted	0.088	0.229	0.317
	B7 1RB	Left Cheek	0.186	0.209	0.395
		Left Tilted	0.156	0.177	0.333
		Right Cheek	0.291	0.273	0.564
		Right Tilted	0.231	0.229	0.460
	B7 50RB	Left Cheek	0.130	0.209	0.339
		Left Tilted	0.100	0.177	0.277
		Right Cheek	0.225	0.273	0.498
		Right Tilted	0.184	0.229	0.413
	B38 1RB	Left Cheek	0.115	0.209	0.324
		Left Tilted	0.096	0.177	0.273
		Right Cheek	0.200	0.273	0.473
		Right Tilted	0.158	0.229	0.387
	B38 50RB	Left Cheek	0.088	0.209	0.297
		Left Tilted	0.068	0.177	0.245
		Right Cheek	0.122	0.273	0.395
		Right Tilted	0.099	0.229	0.328

WWAN PCE + Bluetooth					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR (W/kg)
			WWAN PCE	Bluetooth	
GSM	GSM850	Left Cheek	0.327	0.093	0.420
		Left Tilted	0.250	0.093	0.343
		Right Cheek	0.531	0.093	0.624
		Right Tilted	0.402	0.093	0.495
	PCS1900	Left Cheek	0.012	0.093	0.105
		Left Tilted	0.009	0.093	0.102
		Right Cheek	0.019	0.093	0.112
		Right Tilted	0.015	0.093	0.108
WCDMA	Band II	Left Cheek	0.021	0.093	0.114
		Left Tilted	0.017	0.093	0.110
		Right Cheek	0.031	0.093	0.124
		Right Tilted	0.025	0.093	0.118
	Band V	Left Cheek	0.127	0.093	0.220
		Left Tilted	0.103	0.093	0.196
		Right Cheek	0.170	0.093	0.263
		Right Tilted	0.133	0.093	0.226
LTE	B2 1RB	Left Cheek	0.019	0.093	0.112
		Left Tilted	0.015	0.093	0.108
		Right Cheek	0.037	0.093	0.130
		Right Tilted	0.029	0.093	0.122
	B2 50RB	Left Cheek	0.014	0.093	0.107
		Left Tilted	0.012	0.093	0.105
		Right Cheek	0.022	0.093	0.115
		Right Tilted	0.019	0.093	0.112
	B4 1RB	Left Cheek	0.027	0.093	0.120
		Left Tilted	0.021	0.093	0.114
		Right Cheek	0.036	0.093	0.129
		Right Tilted	0.028	0.093	0.121
	B4 50RB	Left Cheek	0.021	0.093	0.114
		Left Tilted	0.017	0.093	0.110
		Right Cheek	0.030	0.093	0.123
		Right Tilted	0.022	0.093	0.115

LTE	B5 1RB	Left Cheek	0.108	0.093	0.201
		Left Tilted	0.090	0.093	0.183
		Right Cheek	0.139	0.093	0.232
		Right Tilted	0.110	0.093	0.203
	B5 25RB	Left Cheek	0.092	0.093	0.185
		Left Tilted	0.071	0.093	0.164
		Right Cheek	0.108	0.093	0.201
		Right Tilted	0.088	0.093	0.181
	B7 1RB	Left Cheek	0.186	0.093	0.279
		Left Tilted	0.156	0.093	0.249
		Right Cheek	0.291	0.093	0.384
		Right Tilted	0.231	0.093	0.324
	B7 50RB	Left Cheek	0.130	0.093	0.223
		Left Tilted	0.100	0.093	0.193
		Right Cheek	0.225	0.093	0.318
		Right Tilted	0.184	0.093	0.277
	B38 1RB	Left Cheek	0.115	0.093	0.208
		Left Tilted	0.096	0.093	0.189
		Right Cheek	0.200	0.093	0.293
		Right Tilted	0.158	0.093	0.251
	B38 50RB	Left Cheek	0.088	0.093	0.181
		Left Tilted	0.068	0.093	0.161
		Right Cheek	0.122	0.093	0.215
		Right Tilted	0.099	0.093	0.192

Maximum reported SAR value for Body

WWAN PCE + WLAN DTS					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR
			WWAN PCE	WLAN DTS	(W/kg)
GSM	GSM850	Front	0.394	0.134	0.528
		Rear (back splint)	0.137	0.067	0.204
	PCS1900	Front	0.033	0.134	0.167
		Rear (back splint)	0.019	0.067	0.086
WCDMA	Band II	Front	0.038	0.134	0.172
		Rear (back splint)	0.008	0.067	0.075
	Band V	Front	0.126	0.134	0.260
		Rear (back splint)	0.037	0.067	0.104
LTE	B2 1RB	Front	0.047	0.134	0.181
		Rear (back splint)	0.016	0.067	0.083
	B2 50RB	Front	0.035	0.134	0.169
		Rear (back splint)	0.012	0.067	0.079
	B4 1RB	Front	0.062	0.134	0.196
		Rear	0.019	0.067	0.086
	B4 50RB	Front	0.055	0.134	0.189
		Rear (back splint)	0.010	0.067	0.077
	B5 1RB	Front	0.135	0.134	0.269
		Rear (back splint)	0.042	0.067	0.109
	B5 25RB	Front	0.103	0.134	0.237
		Rear (back splint)	0.029	0.067	0.096
	B7 1RB	Front	0.458	0.134	0.592
		Rear (back splint)	0.185	0.067	0.252
	B7 50RB	Front	0.400	0.134	0.534
		Rear (back splint)	0.103	0.067	0.170

LTE	B38 1RB	Front	0.277	0.134	0.411
		Rear (back splint)	0.096	0.067	0.163
	B38 50RB	Front	0.191	0.134	0.325
		Rear (back splint)	0.064	0.067	0.131

WWAN PCE + Bluetooth					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR
			WWAN PCE	Bluetooth	(W/kg)
GSM	GSM850	Front	0.394	0.047	0.441
		Rear (back splint)	0.137	0.047	0.184
	PCS1900	Front	0.033	0.047	0.080
		Rear (back splint)	0.019	0.047	0.066
WCDMA	Band II	Front	0.038	0.047	0.085
		Rear (back splint)	0.008	0.047	0.055
	Band V	Front	0.126	0.047	0.173
		Rear (back splint)	0.037	0.047	0.084
LTE	B2 1RB	Front	0.047	0.047	0.094
		Rear (back splint)	0.016	0.047	0.063
	B2 50RB	Front	0.035	0.047	0.082
		Rear (back splint)	0.012	0.047	0.059
	B4 1RB	Front	0.062	0.047	0.109
		Rear	0.019	0.047	0.066
	B4 50RB	Front	0.055	0.047	0.102
		Rear (back splint)	0.010	0.047	0.057
	B5 1RB	Front	0.135	0.047	0.182
		Rear (back splint)	0.042	0.047	0.089
	B5 25RB	Front	0.103	0.047	0.150
		Rear (back splint)	0.029	0.047	0.076
	B7 1RB	Front	0.458	0.047	0.505
		Rear (back splint)	0.185	0.047	0.232
	B7 50RB	Front	0.400	0.047	0.447
		Rear (back splint)	0.103	0.047	0.150

LTE	B38 1RB	Front	0.277	0.047	0.324
		Rear (back splint)	0.096	0.047	0.143
	B38 50RB	Front	0.191	0.047	0.238
		Rear (back splint)	0.064	0.047	0.111

Maximum reported SAR value for Hotspot mode

WWAN PCE + WLAN DTS					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR
			WWAN PCE	WLAN DTS	(W/kg)
GSM	GSM850	Front	0.394	0.134	0.528
		Rear	0.160	0.081	0.241
		Left side	-	0.099	0.099
		Right side	0.086	-	0.086
		Top side	-	0.088	0.088
		Bottom side	0.071	-	0.071
	PCS1900	Front	0.033	0.134	0.167
		Rear	0.019	0.081	0.100
		Left side	-	0.099	0.099
		Right side	0.026	-	0.026
		Top side	-	0.088	0.088
		Bottom side	0.021	-	0.021
WCDMA	Band II	Front	0.038	0.134	0.172
		Rear	0.012	0.081	0.093
		Left side	-	0.099	0.099
		Right side	0.022	-	0.022
		Top side	-	0.088	0.088
		Bottom side	0.025	-	0.025
	Band V	Front	0.126	0.134	0.260
		Rear	0.074	0.081	0.155
		Left side	-	0.099	0.099
		Right side	0.035	-	0.035
		Top side	-	0.088	0.088
		Bottom side	0.026	-	0.026

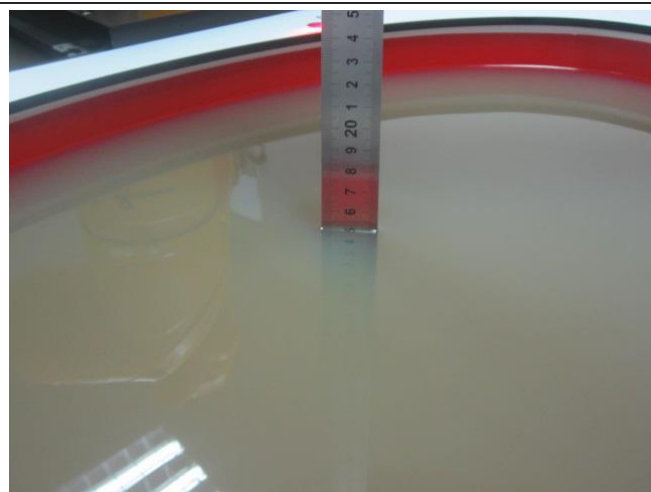
LTE	B2 1RB	Front	0.047	0.134	0.181
		Rear	0.026	0.081	0.107
		Left side	-	0.099	0.099
		Right side	0.034	-	0.034
		Top side	-	0.088	0.088
		Bottom side	0.034	-	0.034
	B2 50RB	Front	0.035	0.134	0.169
		Rear	0.019	0.081	0.100
		Left side	-	0.099	0.099
		Right side	0.026	-	0.026
		Top side	-	0.088	0.088
		Bottom side	0.026	-	0.026
	B4 1RB	Front	0.062	0.134	0.196
		Rear	0.026	0.081	0.107
		Left side	-	0.099	0.099
		Right side	0.045	-	0.045
		Top side	-	0.088	0.088
		Bottom side	0.047	-	0.047
	B4 50RB	Front	0.055	0.134	0.189
		Rear	0.017	0.081	0.098
		Left side	-	0.099	0.099
		Right side	0.041	-	0.041
		Top side	-	0.088	0.088
		Bottom side	0.042	-	0.042
	B5 1RB	Front	0.135	0.134	0.269
		Rear	0.051	0.081	0.132
		Left side	-	0.099	0.099
		Right side	0.032	-	0.032
		Top side	-	0.088	0.088
		Bottom side	0.027	-	0.027
	B5 25RB	Front	0.103	0.134	0.237
		Rear	0.039	0.081	0.120
		Left side	-	0.099	0.099
		Right side	0.030	-	0.030
		Top side	-	0.088	0.088
		Bottom side	0.021	-	0.021

LTE	B7 1RB	Front	0.458	0.134	0.592
		Rear	0.230	0.081	0.311
		Left side	-	0.099	0.099
		Right side	0.336	-	0.336
		Top side	-	0.088	0.088
		Bottom side	0.348	-	0.348
	B7 50RB	Front	0.400	0.134	0.534
		Rear	0.155	0.081	0.236
		Left side	-	0.099	0.099
		Right side	0.293	-	0.293
		Top side	-	0.088	0.088
		Bottom side	0.300	-	0.300
	B38 1RB	Front	0.277	0.134	0.411
		Rear	0.124	0.081	0.205
		Left side	-	0.099	0.099
		Right side	0.203	-	0.203
		Top side	-	0.088	0.088
		Bottom side	0.209	-	0.209
	B38 50RB	Front	0.191	0.134	0.325
		Rear	0.093	0.081	0.174
		Left side	-	0.099	0.099
		Right side	0.140	-	0.140
		Top side	-	0.088	0.088
		Bottom side	0.143	-	0.143

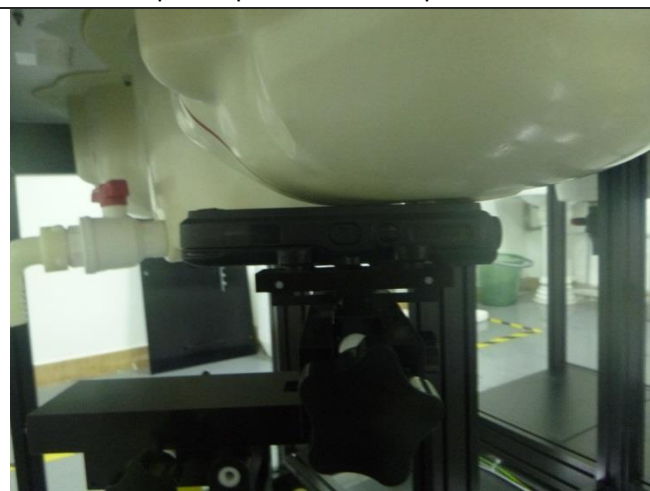
16. TestSetup Photos



Liquid depth in the Head phantom



Liquid depth in the Body phantom



Left Head Touch



Right Head Touch



Left Head Tilt (15°)



Right Head Tilt (15°)



Right Head Touch-With external antenna



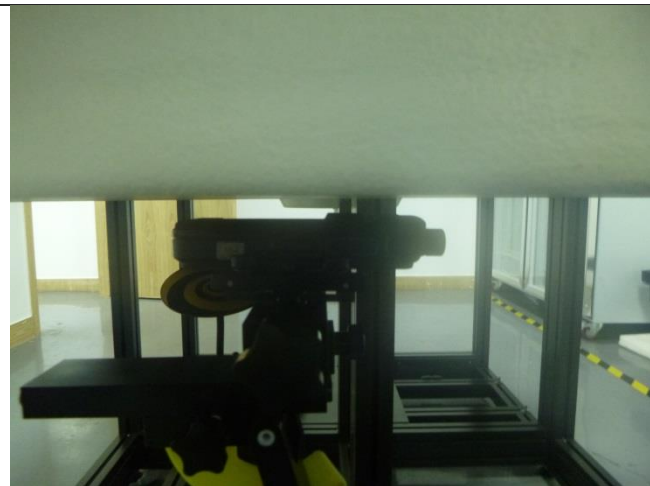
Body-worn Front (10mm)



Body-worn Rear(0mm)



Front (10mm)-No external antenna



Rear (10mm)



Left Side (10mm)



17. External and Internal Photos of the EUT

Please reference to the report No.: CHTEW19010099

-----End of Report-----