FCC SAR TEST REPORT

Product Name:	Smart Phone
Trade Mark:	or RHINO
Model No.:	PACE A1
Add. Model No.:	N/A
Report Number:	220514004SAR-1
Test Standards:	FCC 47 CFR Part 2 §2.1093 ANSI/IEEE C95.1-1992 IEEE Std 1528-2013
FCC ID:	2AUOUPA1NA
Test Result:	PASS
Date of Issue:	July 25, 2022

Prepared for:

Rhino Mobility LLC
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Prepared by:

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Date: July 25, 2022

Version

Version No.	Date	Description
V1.0	July 25, 2022	Original Report

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1. GENERAL INFORMATION

1.1. STATEMENT OF COMPLIANCE

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

Equipment Class	Mode	Highest Reported Head SAR_{1g} (W/kg)	Highest Reported Body-worn SAR_{1g} (1.0 cm Gap) (W/kg)	Highest Reported Hotspot SAR_{1g} (1.0 cm Gap) (W/kg)
PCE	WCDMA Band II	0.199	0.684	0.917
	WCDMA Band IV	0.343	0.834	1.072
	WCDMA Band V	0.320	0.422	0.422
	LTE Band 12	0.179	0.356	0.356
	LTE Band 13	0.198	0.298	0.298
	LTE Band 25 (2)	0.184	0.599	0.895
	LTE Band 26 (5)	0.200	0.321	0.321
	LTE Band 41	0.098	0.547	0.612
	LTE Band 66 (4)	0.277	0.857	1.083
	LTE Band 71	0.176	0.376	0.376
DTS	2.4GHz WLAN	0.070	0.040	0.040
NII	5.2GHz WLAN	0.490	0.410	0.670
	5.3GHz WLAN	0.558	0.427	0.453
	5.6GHz WLAN	0.408	0.345	0.391
	5.8GHz WLAN	0.438	0.367	0.431
DSS	Bluetooth	N/A	N/A	N/A
Max SAR		**0.558**	**0.857**	**1.083**
Highest Simultaneous Transmission SAR		**Head (W/kg)**	**Body-worn (W/kg)**	**Hotspot (W/kg)**
PCE + DTS		**0.753**	**1.110**	**1.110**
PCE + NII		**0.878**	**1.268**	**1.268**
PCE + DSS		**0.413**	**0.897**	**1.083**

1.2. CLIENT INFORMATION

Applicant:	Rhino Mobility LLC
Address of Applicant:	8 The Green, Suite A, Dover, Delaware,19901, USA
Manufacturer:	Rhino Mobility LLC
Address of Manufacturer:	8 The Green, Suite A, Dover, Delaware,19901, USA

1.3. EUT INFORMATION

1.3.1. General Description of EUT

Product Name:	Smart Phone
Trade Mark:	 or RHINO
Model No.:	PACE A1
Add. Model No.:	N/A
FCC ID:	2AUOUPA1NA
DUT Stage:	Identical Prototype
IMEI Code:	351528101297260
Software Version:	PACE_A1(005)_20220531 (Provided by the customer)
Hardware Version:	H318_MB_V2 (Provided by the customer)
Sample Received Date:	May 18, 2022
Sample Tested Date:	June 10, 2022 to June 21, 2022
Note: The PACE A1 have two LCD Module from different vendors. This report has evaluated and pre-testing of two batches of LCD Module, with only the worst data recorded in the report.	

1.3.2. Description of Accessories

Adapter	
Model No.:	MST-0501000
Input:	100-240 V~50/60 Hz 0.15 A Max
Output:	5.0 V ⎓ 1000mA
AC Cable:	N/A
DC Cable:	N/A

Battery	
Model No.:	BPA1
Battery Type:	Lithium-ion Rechargeable Battery
Rated Voltage:	3.8 Vdc
Limited Charge Voltage:	4.35 Vdc
Rated Capacity:	2400 mAh

Cable	
Description:	USB Type-C Plug Cable
Cable Type:	Shielded without ferrite
Length:	1 Meter

1.3.3. EUT Tx Frequency Bands

RF Type	Band(s)	Tx Frequency Range (Unit: MHz)
WCDMA	WCDMA Band II:	1852.4 - 1907.6
	WCDMA Band IV:	1712.4 - 1752.6
	WCDMA Band V:	826.4 - 846.6
LTE	LTE Band 2:	1850.7 - 1909.3 (1.4M), 1851.5 - 1908.5 (3M), 1852.5 - 1907.5 (5M), 1855 - 1905 (10M), 1857.5 - 1902.5 (15M), 1860 - 1900 (20M)
	LTE Band 4:	1710.7 - 1754.3 (1.4M), 1711.5 - 1753.5 (3M), 1712.5 - 1752.5 (5M), 1715 - 1750 (10M), 1717.5 - 1747.5 (15M), 1720 - 1745 (20M)
	LTE Band 5:	824.7 - 848.3 (1.4M), 825.5 - 847.5 (3M), 826.5 - 846.5 (5M), 829 - 844 (10M)
	LTE Band 12:	699.7 - 715.3 (1.4M), 700.5 - 714.5 (3M), 701.5 - 713.5 (5M), 704 - 711 (10M)
	LTE Band 13:	779.5 - 784.5 (5M), 782 (10M)
	LTE Band 25:	1850.7 - 1914.3 (1.4M), 1851.5 - 1913.5 (3M), 1852.5 - 1912.5 (5M), 1855 - 1910 (10M), 1857.5 - 1907.5 (15M), 1860 - 1905 (20M)
	LTE Band 26:	814.7 - 848.3 (1.4M), 815.5 - 847.5 (3M), 816.5 - 846.5 (5M), 819 - 844 (10M), 821.5 - 841.5 (15M)
	LTE Band 41:	2498.5 - 2687.5 (5M), 2501 - 2685 (10M), 2503.5 - 2682.5 (15M) 2506 - 2680 (20M)
	LTE Band 66:	1710.7 - 1779.3 (1.4M), 1711.5 - 1778.5 (3M), 1712.5 - 1777.5 (5M), 1715 - 1775 (10M), 1717.5 - 1772.5 (15M), 1720 - 1770 (20M)
	LTE Band 71:	665.5 - 695.5 (5M), 668 – 693 (10M), 670.5 - 690.5 (15M), 673 – 688 (20M)
WLAN	2.4 GHz:	2412 - 2462
	U-NII-1:	5180 - 5240
	U-NII-2A:	5260 - 5320
	U-NII-2C:	5500 - 5700
	U-NII-3:	5745 - 5825
Bluetooth	2.4 GHz:	2402 - 2480

Note 1:
According to 201504 FCC TCB workshop RF exposure slides, for overlapping bands, only larger band was tested.

1. The maximum output power, including tolerance, for the smaller band is = the larger band to qualify for the SAR test exclusion.
2. The channel bandwidth and other operating parameters for the smaller band is fully supported by the larger band.
   - Band 25 (1850 - 1915 MHz) SAR can support band 2 (1850 - 1910 MHz)
   - Band 66 (1710 - 1780 MHz) SAR can support band 4 (1710 - 1755 MHz)
   - Band 26 (814 - 849 MHz) SAR can support band 5 (824 – 849 MHz)

1.3.4. Wireless Technologies

WCDMA	RMC HSDPA HSUPA DC-HSDPA HSPA+
LTE	QPSK 16QAM 64QAM VoLTE
2.4G WLAN	802.11b 802.11g 802.11n (HT20/HT40)
5G WLAN	802.11a 802.11n (HT20/HT40)
Bluetooth	BR+EDR LE
Antenna Type	LDS Antenna
Power Reduction	Not Support
Dynamic Antenna	Not Support
Wireless Router (Hotspot)	2.4G WLAN: Support 5.2G WLAN: Support 5.3G WLAN: Not Support 5.3G WLAN: Not Support 5.8G WLAN: Support
VOIP	Not Support

1.4. MAXIMUM CONDUCTED POWER

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

➢ **WCDMA**

Mode	Maximum conducted average power (dBm)		
	WCDMA Band II	WCDMA Band V	WCDMA Band IV
RMC 12.2K	22.5	22.5	22.0
HSDPA	21.5	21.5	21.5
DC-HSDPA	21.5	21.5	21.0
HSUPA	21.5	21.5	21.5
HSPA+	21.0	21.0	20.5

➢ **LTE**

Band	Mode	Maximum Conducted Power (dBm)
LTE Band 2	QPSK / 16QAM / 64QAM	23.0
LTE Band 4	QPSK / 16QAM / 64QAM	22.5
LTE Band 5	QPSK / 16QAM / 64QAM	23.0
LTE Band 12	QPSK / 16QAM / 64QAM	23.0
LTE Band 13	QPSK / 16QAM / 64QAM	22.5
LTE Band 25	QPSK / 16QAM / 64QAM	23.5
LTE Band 26	QPSK / 16QAM / 64QAM	23.0
LTE Band 41	QPSK / 16QAM / 64QAM	23.0
LTE Band 66	QPSK / 16QAM / 64QAM	22.5
LTE Band 71	QPSK / 16QAM / 64QAM	23.0

➢ **2.4GHz WLAN**

Mode	Maximum Conducted Power (dBm)				
	Ch. 1	Ch. 6	Ch. 11	Ch. 12	Ch. 13
802.11b	14.0	15.0	15.0	15.0	14.0
802.11g	9.5	13.0	13.0	13.0	9.5
802.11n-HT20	9.5	13.0	13.0	13.0	9.5
Mode	**Maximum Conducted Power (dBm)**				
	Ch. 3	**Ch. 6**	**Ch. 9**	**Ch. 10**	**Ch. 11**
802.11n-HT40	12.5	15.0	15.0	15.0	11.5

➢ **5GHz WLAN**

Mode	Maximum Conducted Power (dBm)			
	U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
802.11a	10.0	10.0	8.5	9.5
802.11n-HT20	10.0	10.0	8.5	9.5
802.11n-HT40	9.0	9.0	7.5	8.5

➢ **Bluetooth**

Mode	Modulation	Maximum Conducted Power (dBm)
BR + EDR	GFSK	2.5
	π/4-DQPSK	0.0
	8-DPSK	0.0
LE	GFSK	2.5

1.5. OTHER INFORMATION

None.

1.6. TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: Unit D/E of 9/F and 16/F, Block A, Building 6, Baoneng science and technology park, Longhua district, Shenzhen, China
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1.7. TEST FACILITY

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

Shenzhen UnionTrust Quality and Technology Co., Ltd.

CNAS-Lab Code: L9069
The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

A2LA-Lab Certificate No.: 4312.01
Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED Wireless Device Testing Laboratories
CAB identifier: CN0032

FCC Accredited Lab.
Designation Number: CN1194
Test Firm Registration Number: 259480

1.8. GUIDANCE STANDARD

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

KDB 865664 D01 v01r04
KDB 865664 D02 v01r02
KDB 248227 D01 v02r02
KDB 447498 D01 v06
KDB 648474 D04 v01r03
KDB 941225 D01 v03r01
KDB 941225 D05 v02r05
KDB 941225 D05A v01r02
KDB 941225 D06 v02r01
KDB 941225 D07 v01r02

2. SPECIFIC ABSORPTION RATE (SAR)

2.1. INTRODUCTION

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

2.2. SAR DEFINITION

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

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

SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be related to the electrical field in the tissue by

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

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

2.3. SAR LIMITS

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

Note:

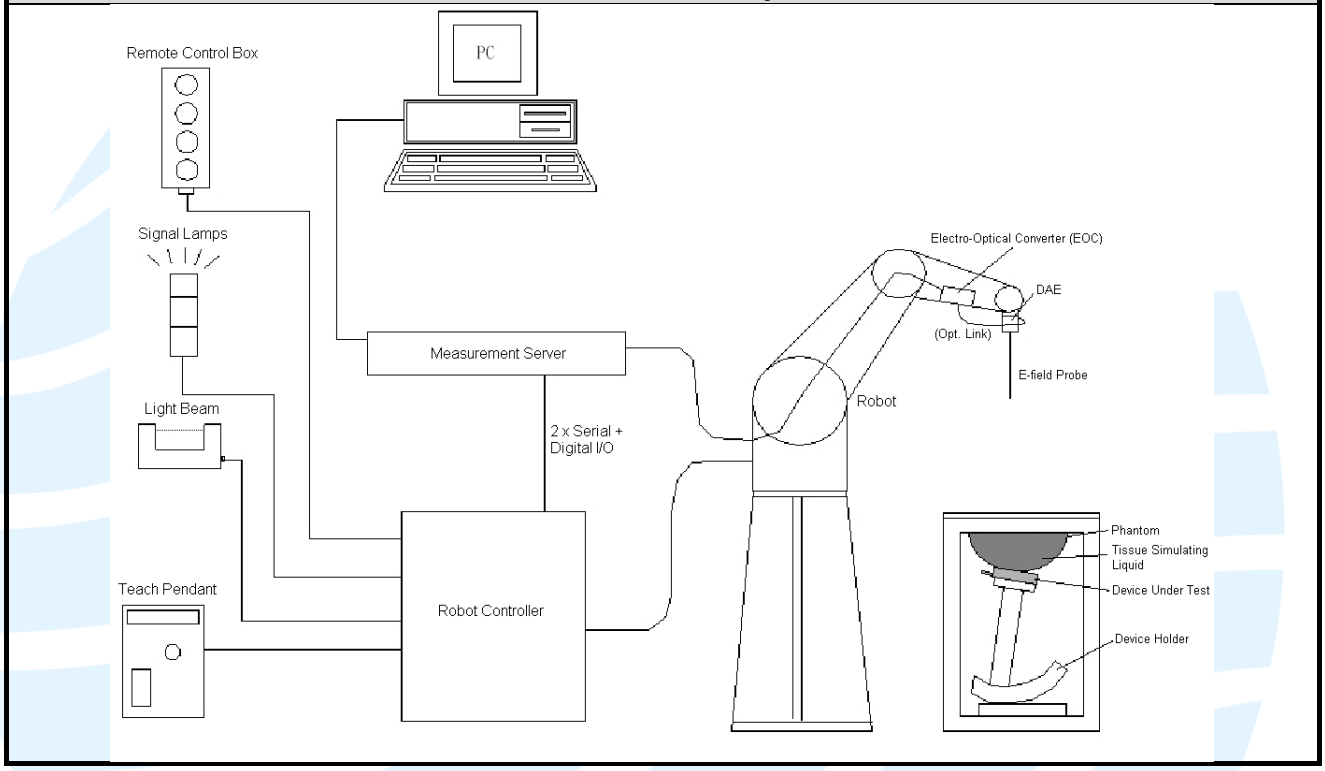
1) Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.
2) At frequencies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

3. SAR MEASUREMENT SYSTEM

3.1. SPEAG DASY SYSTEM

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

DASY Measurement System



3.1.1. Robot

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

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

3.1.2. Probe

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

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

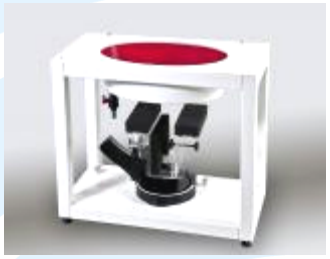
Model	ES3DV3	
Construction	Symmetrical design with triangular core. Interleaved sensors. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).	
Frequency	10 MHz to 4 GHz Linearity: ± 0.2 dB	
Directivity	± 0.2 dB in HSL (rotation around probe axis)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

3.1.3. Data Acquisition Electronics (DAE)

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

3.1.4. Phantom

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

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

3.1.5. Device Holder

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

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

3.1.6. System Validation Dipoles

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

3.2. SAR SCAN PROCEDURE

3.2.1. SAR Reference Measurement (drift)

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

3.2.2. Area Scan

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

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 mm ± 1 mm	½·δ·ln(2) mm ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scans spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

3.2.3. Zoom Scan

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

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom Scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: ΔZ_{Zoom}(n)</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>ΔZ_{Zoom}(1): between 1^{ST} two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>ΔZ_{Zoom}(n>1): between subsequent points</td><td colspan="2">≤ 1.5·ΔZ_{Zoom}(n-1) mm</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.
* When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

3.2.4. SAR Drift Measurement

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

3.3. EQUIPMENT LIST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval
System Validation Dipole	SPEAG	D750V3	1180	Jan. 22, 2021	3 Year
System Validation Dipole	SPEAG	D835V2	4D238	Jan. 22, 2021	3 Year
System Validation Dipole	SPEAG	D1750V2	1164	Jan. 22, 2021	3 Year
System Validation Dipole	SPEAG	D1900V2	5D226	Jan. 22, 2021	3 Year
System Validation Dipole	SPEAG	D2450V2	1009	Jan. 28, 2021	3 Year
System Validation Dipole	SPEAG	D2600V2	1150	Jan. 25, 2021	3 Year
System Validation Dipole	SPEAG	D5GHzV2	1273	Jan. 28, 2021	3 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	7494	May 16, 2022	1 Year
Data Acquisition Electronics	SPEAG	DAE4	1549	Apr. 12, 2022	1 Year
Wideband Radio Communication Tester	R&S	CMW500	120932	Apr. 15, 2022	1 Year
ENA Series Network Analyzer	Agilent	8753ES	US39170317	Nov. 05, 2021	1 Year
Dielectric Assessment Kit	SPEAG	DAK-3.5	1056	N/A	N/A
USB/GPIB Interface	Agilent	82357B	N10149	N/A	N/A
Signal Generator	R&S	SMB100A	103718	Apr. 15, 2022	1 Year
POWER METER	R&S	NRP	101293	Nov. 05, 2021	1 Year
Thermometer	Shanghai Gao Zhi Precision Instrument Co., Ltd.	HB6801	18022507	Nov. 10, 2021	1 Year
Dual Directional Coupler	Agilent	778D	MY52180234	Nov. 05, 2021	1 Year
Amplifier	Mini-Circuit	ZHL42	QA1252001	Apr. 15, 2022	1 Year
DC Source	Agilent	66319B	MY43000795	Nov. 05, 2021	1 Year

3.4. 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 extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

TABLE 1 EXPOSURE ASSESSMENT UNCERTAINTY FOR HANDSET SAR

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

TABLE 2SYSTEM VALIDATION Measurement uncertainty

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

3.5. TISSUE DIELECTRIC PARAMETER MEASUREMENT & SYSTEM VERIFICATION

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

3.5.1. Tissue Simulating Liquids

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

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

Photo of Liquid Height

Tissue Dielectric Parameters for Head and Body

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

(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)

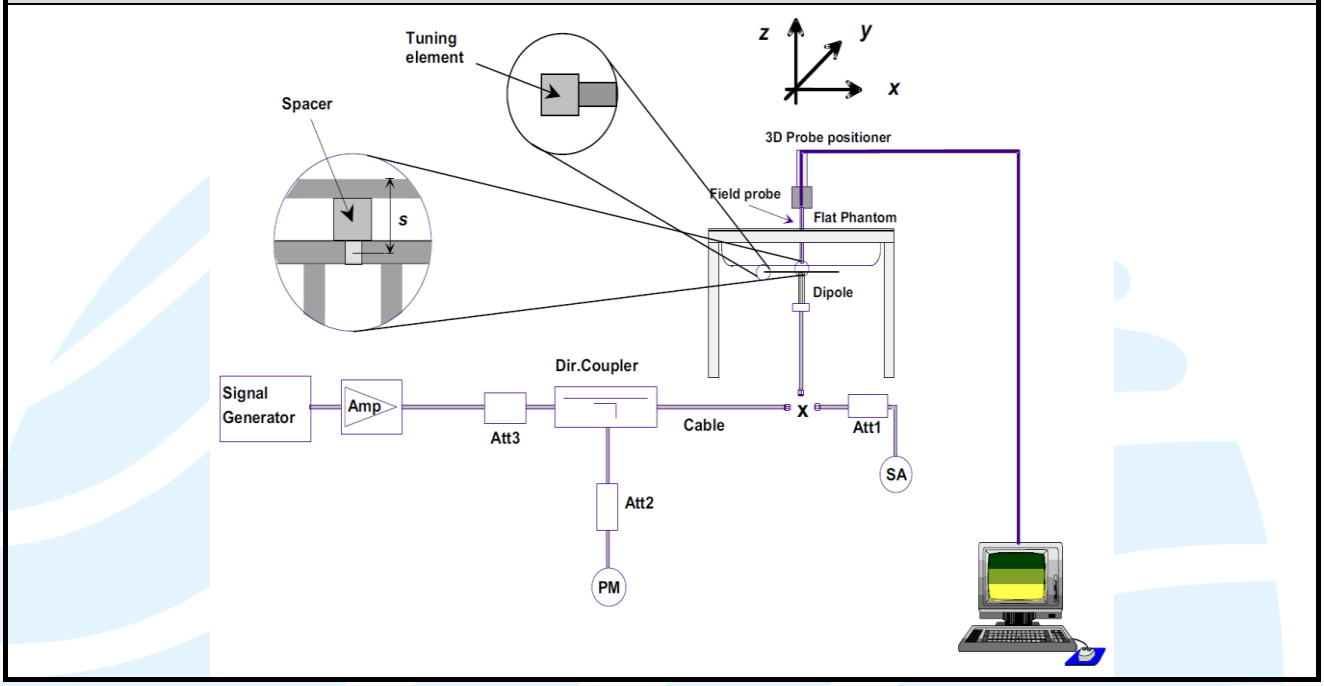
The following table gives the recipes for tissue simulating liquids.

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

3.5.2. System Check Description

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

System Verification Setup



3.5.3. Tissue Verification

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

Test Date	Tissue Type	Frequency (MHz)	Liquid Temp. (℃)	Measured Conductivity (σ)	Measured Permittivity (ε_r)	Target Conductivity (σ)	Target Permittivity (ε_r)	Conductivity Deviation (%)	Permittivity Deviation (%)
2022/6/13	Head	750	22.6	0.920	40.73	0.890	41.90	3.37%	-2.79%
2022/6/17	Head	750	22.5	0.933	40.92	0.890	41.90	4.83%	-2.34%
2022/6/14	Head	835	22.3	0.904	40.55	0.900	41.50	0.44%	-2.29%
2022/6/15	Head	1750	22.4	1.395	39.41	1.370	40.10	1.82%	-1.72%
2022/6/16	Head	1900	22.4	1.404	39.21	1.400	40.00	0.29%	-1.97%
2022/6/10	Head	2450	22.5	1.798	39.72	1.800	39.20	-0.11%	1.33%
2022/6/10	Head	2600	22.5	1.905	39.46	1.960	39.00	-2.81%	1.18%
2022/6/20	Head	5250	22.3	4.630	35.45	4.706	35.93	-1.61%	-1.34%
2022/6/20	Head	5600	22.3	4.976	35.00	5.065	35.53	-1.76%	-1.49%
2022/6/20	Head	5750	22.3	5.121	35.82	5.219	35.36	-1.88%	1.30%

Note:

The dielectric properties of the tissue simulating liquid must be measured within 24 hours before the SAR testing and within ± 5% of the target values. The variation of the liquid temperature must be within ± 2 °C during the test.

3.5.4. System Verification

The measuring result for system verification is tabulated as below.

Test Date	Tissue Type	Frequency (MHz)	1W Target SAR-1g (W/kg)	Measured SAR-1g (W/kg)	Normalized to 1W SAR-1g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
2022/6/13	Head	750	8.43	2.25	9.00	6.76%	1180	7494	1549
2022/6/17	Head	750	8.43	2.27	9.08	7.71%	1180	7494	1549
2022/6/14	Head	835	9.39	2.51	10.04	6.92%	4D238	7494	1549
2022/6/15	Head	1750	36.40	9.62	38.48	5.71%	1164	7494	1549
2022/6/16	Head	1900	39.80	10.50	42.00	5.53%	5D226	7494	1549
2022/6/10	Head	2450	52.00	11.80	47.20	-9.23%	1009	7494	1549
2022/6/10	Head	2600	56.50	14.20	56.80	0.53%	1150	7494	1549
2022/6/20	Head	5250	78.20	8.26	82.60	5.63%	1273	7494	1549
2022/6/20	Head	5600	81.60	8.36	83.60	2.45%	1273	7494	1549
2022/6/20	Head	5750	79.30	7.65	76.50	-3.53%	1273	7494	1549

Note:

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

4. SAR MEASUREMENT EVALUATION

4.1. EUT CONFIGURATION AND SETTING

Connections between EUT and System Simulator

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

4.1.1. WCDMA Configuration and Testing

WCDMA Handsets Head SAR

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

WCDMA Handsets Body-worn SAR

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

Handsets with Release 5 HSDPA

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

Handsets with Release 6 HSUPA

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

Release 5 HSDPA Data Devices

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

Sub-test	β_c	β_d	β_d (SF)	β_c / β_d	β_{hs} (1)	CM (dB)(2)	MPR
1	2 / 15	15 / 15	64	2 / 15	4 / 15	0.0	0
2	12 / 15 (3)	15 / 15 (3)	64	12 / 15 (3)	24 / 15	1.0	0
3	15 / 15	8 / 15	64	15 / 8	30 / 15	1.5	0.5
4	15 / 15	4 / 15	64	15 / 4	30 / 15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 8 ⇔ A_{hs} = β_{hs} / β_c = 30 / 15 ⇔ β_{hs} = 30 / 15 * β_c.

Note 2: CM = 1 for β_c / β_d = 12 / 15, β_{hs} / β_c = 24 / 15.

Note 3: For subtest 2 the β_c / β_d ratio of 12 / 15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 11 / 15 and β_d = 15 / 15.

Release 6 HSUPA Data Devices

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

Sub-test	β_c	β_d	β_d (SF)	β_c / β_d	β_{hs} (1)	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM (2) (dB)	MPR (dB)	AG (4) Index	E-TFCI
1	11 / 15 (3)	15 / 15 (3)	64	11 / 15 (3)	22 / 15	209 / 225	1039 / 225	4	1	1.0	0.0	20	75
2	6 / 15	15 / 15	64	6 / 15	12 / 15	12 / 15	94 / 75	4	1	3.0	2.0	12	67
3	15 / 15	9 / 15	64	15 / 9	30 / 15	30 / 15	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 (4)	15 / 15 (4)	64	15 / 15 (4)	30 / 15	24 / 15	134 / 15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 8 ⇔ A_{hs} = β_{hs} / β_c = 30 / 15 ⇔ β_{hs} = 30 / 15 * β_c.
Note 2: CM = 1 for β_c / β_d = 12 / 15, β_{hs} / β_c = 24 / 15. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c / β_d ratio of 11 / 15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 10 / 15 and β_d = 15 / 15.
Note 4: For subtest 5 the β_c / β_d ratio of 15 / 15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 14 / 15 and β_d = 15 / 15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
Note 6: β_{ed} cannot be set directly; it is set by Absolute Grant Value.

HSPA+ SAR Guidance

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

DC-HSDPA SAR Guidance

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

4.1.2. LTE Configuration and Testing

UE power class is category 3. The LTE maximum power reduction (MPR) in accordance with 3GPP TS 36.101 is active all times during LTE operation. The allowed MPR for the maximum output power please refer to the tune up procedure.

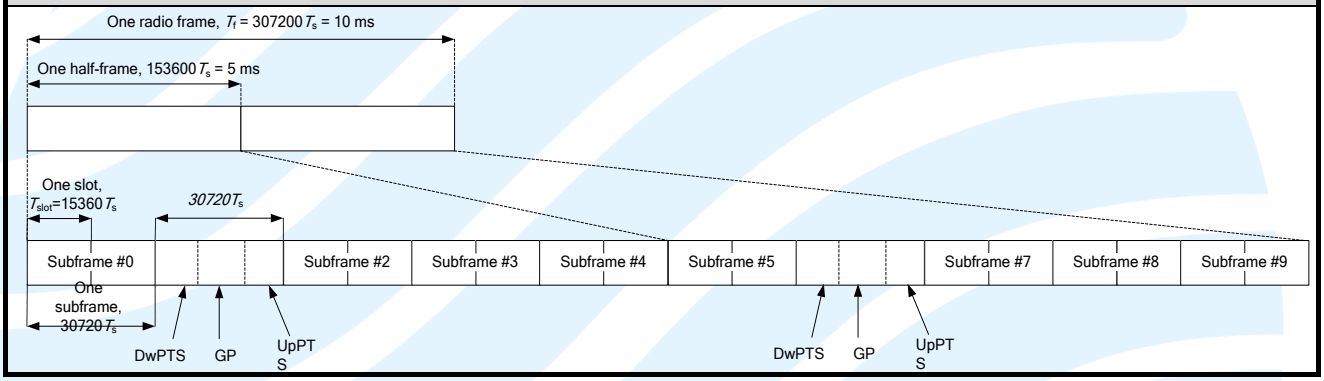
In addition, the device is compliant with additional maximum power reduction (A-MPR) requirements defined in 3GPP TS 36.101 section 6.2.4 that was disabled for all FCC compliance testing.

A properly configured base station simulator is used for the SAR and power measurements, so spectrum plots for each RB allocation and offset configuration are not included in the SAR report to demonstrate that the tested RB allocations have been correctly established at the maximum output power conditions.

TDD-LTE Setup Configurations

According to KDB 941225 D05, SAR testing for TDD-LTE device 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 TDD-LTE configurations. The TDD-LTE of this device supports frame structure type 2 defined in 3GPP TS 36.211 section 4.2, and the frame structure configuration can be referred to below.

3GPP TS 36.211 Figure 4.2-1: Frame Structure Type 2



3GPP TS 36.211 Table 4.2-1: Configuration of Special Subframe

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·Ts	2192·Ts	2560·Ts	7680·Ts	2192·Ts	2560·Ts
1	19760·Ts			20480·Ts		
2	21952·Ts			23040·Ts		
3	24144·Ts			25600·Ts		
4	26336·Ts			7680·Ts	4384·Ts	5120·Ts
5	6592·Ts	4384·Ts	5120·Ts	20480·Ts		
6	19760·Ts			23040·Ts		
7	21952·Ts			12800·Ts		
8	24144·Ts			-	-	-
9	13168·Ts			-	-	-

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

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

LTE DL CA

This device supports DL CA, E-UTRA CA configurations and bandwidth combination sets defined for inter-band CA as bellow table.

Table 5.6A.1-2: E-UTRA CA configurations and bandwidth combination sets defined for inter-band CA										
E-UTRA CA configuration / Bandwidth combination set										
E-UTRA CA Configuration	CA configurations	EUTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum aggregated bandwidth [MHz]	Bandwidth combination set
CA_2A-5A	CA_2A-5A	2			Yes	Yes	Yes	Yes	30	0
		5			Yes	Yes				
		2			Yes	Yes			20	1
		5			Yes	Yes				
CA_4A-5A	CA_4A-5A	4			Yes	Yes			20	0
		5			Yes	Yes				
		4			Yes	Yes	Yes	Yes	30	1
		5			Yes	Yes				
CA_25A-26A	CA_25A-26A	25		Yes	Yes	Yes	Yes	Yes	35	0
		26	Yes	Yes	Yes	Yes	Yes			
		25		Yes	Yes	Yes			20	1
		26		Yes	Yes	Yes				
		25			Yes	Yes			20	2
		26			Yes	Yes				
CA_5A-30A	CA_5A-30A	5			Yes	Yes			20	0
		30			Yes	Yes				
CA_5A-66A	CA_5A-66A	5			Yes	Yes			30	0
		66			Yes	Yes	Yes	Yes		

4.1.3. WLAN Configuration and Testing

In general, various vendor specific external test software and chipset based internal test modes are typically used for SAR measurement. These chipset-based test mode utilities are generally hardware and manufacturer dependent, and often include substantial flexibility to reconfigure or reprogram a device. A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement. The test frequencies established using test mode must correspond to the actual channel frequencies. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. In addition, a periodic transmission duty factor is required for current generation SAR systems to measure SAR correctly. The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

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

Initial Test Configuration

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

Subsequent Test Configuration

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

SAR Test Configuration and Channel Selection

When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the initial test configuration is using largest channel bandwidth, lowest order modulation, lowest data rate, and lowest order 802.11 mode (i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n). After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following.
1) The channel closest to mid-band frequency is selected for SAR measurement.
2) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

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

For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following.

1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition).

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

4.2. EUT TESTING POSITION

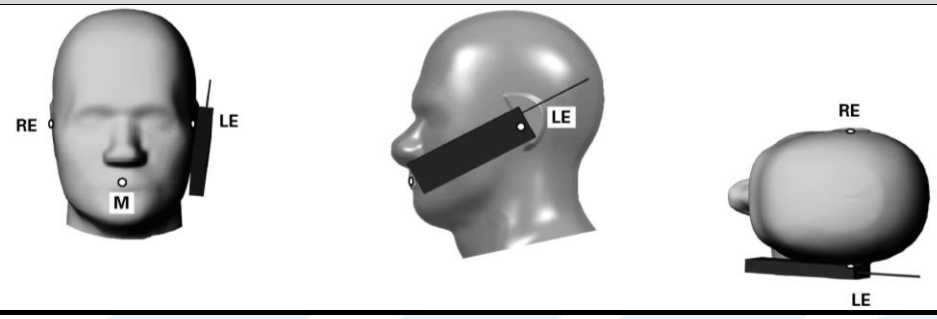
4.2.1. Head Exposure Conditions

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

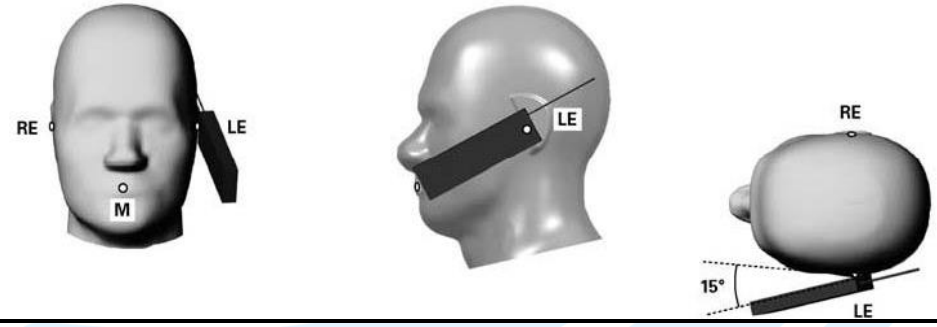
Note:

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

Cheek Position



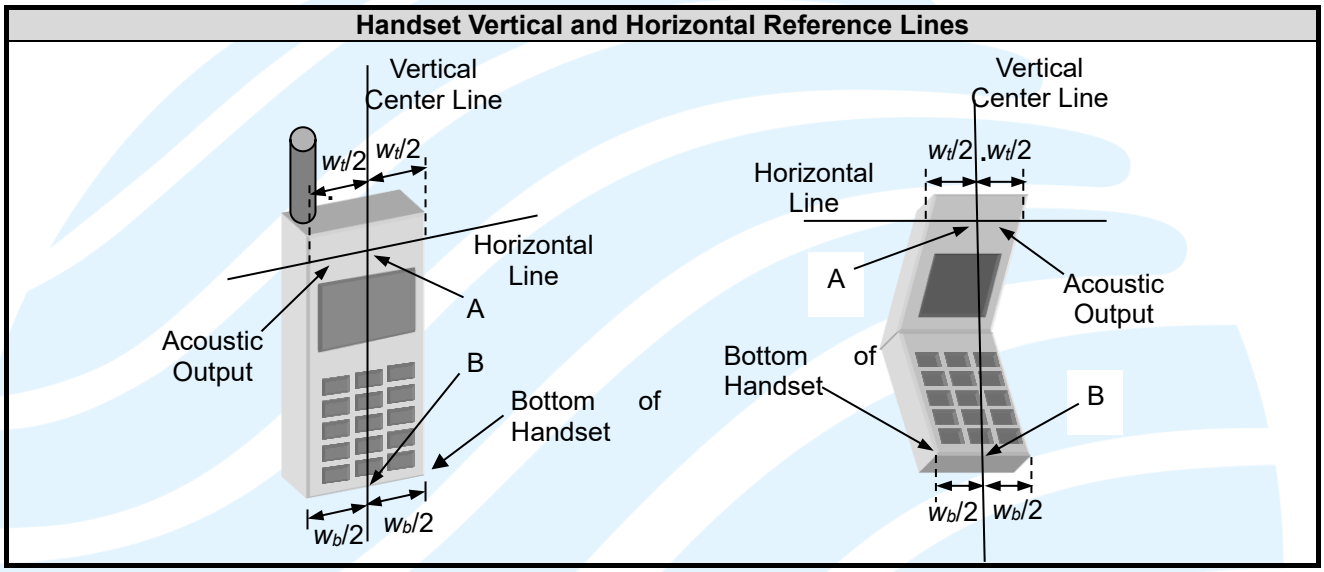
Tilted Position



Define two imaginary lines on the handset

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

Handset Vertical and Horizontal Reference Lines

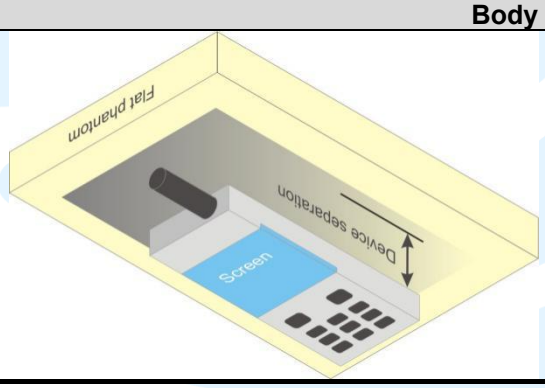
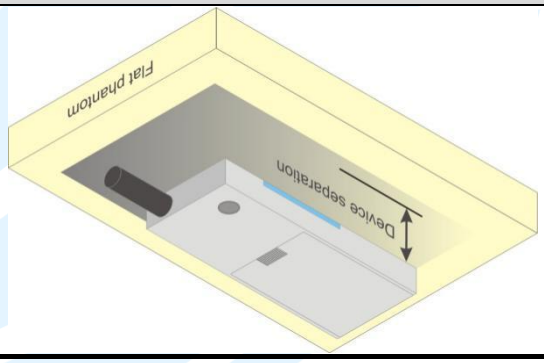


4.2.2. Body-worn Accessory Exposure Conditions

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

Note:

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

Body Worn Position	
	

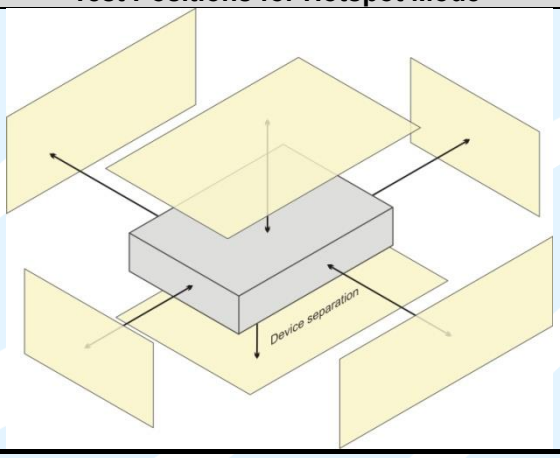
4.2.3. Hotspot Accessory Exposure Conditions

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

Note:

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

Test Positions for Hotspot Mode



4.3. MEASURED CONDUCTED POWER RESULT

4.3.1. Conducted Power of WCDMA Bands

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

Band	WCDMA Band II			WCDMA Band V			WCDMA Band IV			3GPP MPR (dB)
Channel	9262	9400	9538	1312	1413	1513	4132	4182	4233	
Frequency (MHz)	1852.4	1880.0	1907.6	1712.4	1732.6	1752.6	826.4	836.4	846.6	
RMC 12.2K	21.89	21.93	22.00	22.17	22.05	22.06	21.74	21.67	21.63	-
HSDPA Subtest-1	20.92	20.95	20.99	21.15	21.06	21.12	20.71	20.73	20.68	0
HSDPA Subtest-2	20.91	20.95	21.03	21.16	21.12	21.08	20.78	20.71	20.73	0
HSDPA Subtest-3	20.47	20.54	20.60	20.71	20.68	20.65	20.29	20.23	20.24	0.5
HSDPA Subtest-4	20.45	20.45	20.57	20.73	20.67	20.63	20.26	20.21	20.25	0.5
DC-HSDPA Subtest-1	20.91	20.92	20.99	21.11	21.05	21.02	20.61	20.62	20.62	0
DC-HSDPA Subtest-2	20.84	20.84	20.95	21.15	21.01	21.00	20.71	20.57	20.69	0
DC-HSDPA Subtest-3	20.44	20.43	20.57	20.65	20.63	20.58	20.21	20.13	20.14	0.5
DC-HSDPA Subtest-4	20.38	20.38	20.55	20.63	20.63	20.57	20.18	20.20	20.21	0.5
HSUPA Subtest-1	20.89	20.95	21.02	21.16	21.06	21.08	20.73	20.70	20.72	0
HSUPA Subtest-2	20.92	20.97	21.03	21.18	21.11	21.12	20.76	20.73	20.75	2
HSUPA Subtest-3	20.45	20.48	20.58	20.75	20.64	20.66	20.31	20.28	20.24	1
HSUPA Subtest-4	20.92	20.95	21.05	21.21	21.12	21.14	20.81	20.75	20.77	2
HSUPA Subtest-5	20.40	20.44	20.52	20.65	20.62	20.63	20.26	20.21	20.24	0
HSPA+ Subtest-1	20.32	20.39	20.45	20.52	20.50	20.50	20.21	20.07	20.10	2.5

4.3.2. Conducted Power of LTE Bands

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

➢ **LTE Band 2**

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 18607	Mid CH 18900	High CH 19193		Low CH 18607	Mid CH 18900	High CH 19193		Low CH 18607	Mid CH 18900	High CH 19193	
			1850.7 MHz	1880.0 MHz	1909.3 MHz		1850.7 MHz	1880.0 MHz	1909.3 MHz		1850.7 MHz	1880.0 MHz	1909.3 MHz	
2 / 1.4M	1	0	22.33	22.39	22.32	0	21.28	21.25	21.19	1	20.35	20.34	20.24	2
	1	2	22.39	22.59	22.52	0	21.44	21.43	21.37	1	20.57	20.57	20.54	2
	1	5	22.34	22.33	22.29	0	21.36	21.28	21.23	1	20.39	20.37	20.37	2
	3	0	21.29	21.32	21.35	1	20.31	20.46	20.48	2	19.45	19.66	19.66	3
	3	1	21.37	21.39	21.37	1	20.51	20.46	20.46	2	19.55	19.46	19.49	3
	3	3	21.31	21.35	21.42	1	20.43	20.49	20.45	2	19.50	19.63	19.59	3
	6	0	21.32	21.29	21.26	1	20.42	20.40	20.33	2	19.52	19.54	19.40	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 18615	Mid CH 18900	High CH 19185		Low CH 18615	Mid CH 18900	High CH 19185		Low CH 18615	Mid CH 18900	High CH 19185	
			1851.5 MHz	1880.0 MHz	1908.5 MHz		1851.5 MHz	1880.0 MHz	1908.5 MHz		1851.5 MHz	1880.0 MHz	1908.5 MHz	
2 / 3M	1	0	22.37	22.40	22.29	0	21.44	21.54	21.32	1	20.48	20.68	20.43	2
	1	7	22.40	22.30	22.31	0	21.37	21.52	21.27	1	20.41	20.65	20.42	2
	1	14	22.46	22.34	22.35	0	21.40	21.60	21.24	1	20.50	20.64	20.37	2
	8	0	21.37	21.44	21.38	1	20.34	20.49	20.35	2	19.50	19.55	19.51	3
	8	3	21.29	21.46	21.23	1	20.44	20.59	20.35	2	19.50	19.77	19.45	3
	8	7	21.26	21.38	21.25	1	20.26	20.58	20.24	2	19.40	19.61	19.34	3
	15	0	21.29	21.41	21.27	1	20.50	20.46	20.20	2	19.64	19.47	19.20	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 18625	Mid CH 18900	High CH 19175		Low CH 18625	Mid CH 18900	High CH 19175		Low CH 18625	Mid CH 18900	High CH 19175	
			1852.5 MHz	1880.0 MHz	1907.5 MHz		1852.5 MHz	1880.0 MHz	1907.5 MHz		1852.5 MHz	1880.0 MHz	1907.5 MHz	
2 / 5M	1	0	22.20	22.28	22.14	0	21.20	21.33	21.12	1	20.29	20.52	20.16	2
	1	12	22.33	22.43	22.33	0	21.31	21.38	21.11	1	20.32	20.55	20.12	2
	1	24	22.18	22.34	22.17	0	21.21	21.28	21.04	1	20.27	20.44	20.05	2
	12	0	21.30	21.37	21.34	1	20.26	20.58	20.18	2	19.32	19.65	19.33	3
	12	6	21.33	21.46	21.30	1	20.50	20.63	20.41	2	19.68	19.67	19.51	3
	12	13	21.21	21.41	21.21	1	20.33	20.52	20.27	2	19.46	19.61	19.34	3
	25	0	21.31	21.49	21.34	1	20.38	20.56	20.38	2	19.47	19.75	19.40	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 18650	Mid CH 18900	High CH 19150		Low CH 18650	Mid CH 18900	High CH 19150		Low CH 18650	Mid CH 18900	High CH 19150	
			1855.0 MHz	1880.0 MHz	1905.0 MHz		1855.0 MHz	1880.0 MHz	1905.0 MHz		1855.0 MHz	1880.0 MHz	1905.0 MHz	
2 / 10M	1	0	22.05	22.27	22.00	0	21.12	21.25	21.50	1	20.16	20.30	20.57	2
	1	24	22.49	22.47	22.37	0	21.43	21.68	21.88	1	20.59	20.76	20.94	2
	1	49	21.97	22.05	21.94	0	20.98	21.19	21.48	1	20.17	20.28	20.66	2
	25	0	21.45	21.33	21.23	1	20.43	20.35	20.26	2	19.62	19.46	19.40	3
	25	12	21.36	21.38	21.38	1	20.38	20.47	20.30	2	19.55	19.58	19.39	3
	25	25	21.40	21.18	21.29	1	20.38	20.21	20.23	2	19.46	19.24	19.26	3
	50	0	21.34	21.27	21.23	1	20.39	20.31	20.31	2	19.45	19.44	19.38	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 18675	Mid CH 18900	High CH 19125		Low CH 18675	Mid CH 18900	High CH 19125		Low CH 18675	Mid CH 18900	High CH 19125	
			1857.5 MHz	1880.0 MHz	1902.5 MHz		1857.5 MHz	1880.0 MHz	1902.5 MHz		1857.5 MHz	1880.0 MHz	1902.5 MHz	
2 / 15M	1	0	22.25	22.25	22.13	0	21.99	21.33	21.60	1	21.10	20.42	20.70	2
	1	37	22.21	22.46	22.25	0	22.04	21.38	21.70	1	21.06	20.53	20.74	2
	1	74	22.10	22.31	22.12	0	21.85	21.19	21.54	1	20.93	20.32	20.55	2
	36	0	21.37	21.49	21.27	1	20.44	20.49	20.24	2	19.59	19.67	19.27	3
	36	19	21.31	21.38	21.27	1	20.44	20.56	20.29	2	19.53	19.68	19.35	3
	36	39	21.27	21.44	21.35	1	20.32	20.31	20.35	2	19.39	19.36	19.52	3
	75	0	21.37	21.41	21.29	1	20.38	20.41	20.20	2	19.41	19.52	19.33	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 18700	Mid CH 18900	High CH 19100		Low CH 18700	Mid CH 18900	High CH 19100		Low CH 18700	Mid CH 18900	High CH 19100	
			1860.0 MHz	1880.0 MHz	1900.0 MHz		1860.0 MHz	1880.0 MHz	1900.0 MHz		1860.0 MHz	1880.0 MHz	1900.0 MHz	
2 / 20M	1	0	22.43	22.50	22.28	0	21.28	21.54	21.90	1	20.30	20.56	21.08	2
	1	50	22.69	22.59	22.52	0	21.38	21.56	22.13	1	20.55	20.73	21.21	2
	1	99	22.36	22.41	22.30	0	21.26	21.33	21.99	1	20.26	20.41	21.11	2
	50	0	21.48	21.58	21.34	1	20.47	20.76	20.44	2	19.65	19.89	19.62	3
	50	25	21.43	21.52	21.27	1	20.56	20.61	20.33	2	19.71	19.81	19.41	3
	50	50	21.36	21.42	21.36	1	20.44	20.50	20.46	2	19.45	19.62	19.65	3
	100	0	21.40	21.64	21.45	1	20.44	20.66	20.32	2	19.45	19.70	19.47	3

➢ **LTE Band 4**

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 19957 1710.7 MHz	Mid CH 20175 1732.5 MHz	High CH 20393 1754.3 MHz		Low CH 19957 1710.7 MHz	Mid CH 20175 1732.5 MHz	High CH 20393 1754.3 MHz		Low CH 19957 1710.7 MHz	Mid CH 20175 1732.5 MHz	High CH 20393 1754.3 MHz	
4 / 1.4M	1	0	21.72	21.72	21.73	0	20.83	20.85	20.90	1	19.92	19.90	20.02	2
	1	2	21.67	21.50	21.67	0	20.68	20.55	20.86	1	19.80	19.72	19.93	2
	1	5	21.83	21.68	22.00	0	20.95	20.81	21.03	1	20.08	20.00	20.15	2
	3	0	20.76	20.58	20.66	1	19.81	19.64	19.79	2	18.90	18.73	18.95	2
	3	1	20.82	21.06	20.49	1	19.84	20.11	19.68	2	18.85	19.16	18.80	2
	3	3	20.71	20.65	21.00	1	19.72	19.83	20.19	2	18.72	18.85	19.29	2
	6	0	20.84	21.07	20.58	1	19.91	20.14	19.67	2	18.92	19.15	18.71	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 19965 1711.5 MHz	Mid CH 20175 1732.5 MHz	High CH 20385 1753.5 MHz		Low CH 19965 1711.5 MHz	Mid CH 20175 1732.5 MHz	High CH 20385 1753.5 MHz		Low CH 19965 1711.5 MHz	Mid CH 20175 1732.5 MHz	High CH 20385 1753.5 MHz	
4 / 3M	1	0	21.69	21.76	21.79	0	20.87	20.88	20.95	1	20.01	20.05	20.03	2
	1	7	21.81	21.83	21.74	0	20.98	20.98	20.78	1	20.05	20.06	19.89	2
	1	14	21.89	21.89	21.76	0	20.95	21.03	20.80	1	19.97	20.19	19.84	2
	8	0	20.84	21.28	20.75	1	19.86	20.39	19.82	2	18.95	19.55	18.97	3
	8	3	19.65	20.00	19.77	1	18.75	19.05	18.94	2	17.77	18.10	17.95	3
	8	7	20.01	19.92	19.81	1	19.20	18.94	19.01	2	18.30	18.11	18.01	3
	15	0	19.64	20.00	19.76	1	18.73	19.03	18.81	2	17.91	18.21	17.82	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 19975 1712.5 MHz	Mid CH 20175 1732.5 MHz	High CH 20375 1752.5 MHz		Low CH 19975 1712.5 MHz	Mid CH 20175 1732.5 MHz	High CH 20375 1752.5 MHz		Low CH 19975 1712.5 MHz	Mid CH 20175 1732.5 MHz	High CH 20375 1752.5 MHz	
4 / 5M	1	0	21.67	21.66	21.77	0	20.83	20.70	20.90	1	19.97	19.85	19.95	2
	1	12	21.45	21.55	21.58	0	20.58	20.56	20.74	1	19.76	19.71	19.80	2
	1	24	21.53	21.77	21.80	0	20.67	20.92	20.87	1	19.68	20.03	19.94	2
	12	0	20.29	20.62	20.69	1	19.49	19.74	19.83	2	18.63	18.84	18.91	3
	12	6	19.71	19.67	19.78	1	18.80	18.69	18.88	2	17.83	17.87	18.01	3
	12	13	19.82	19.87	19.99	1	18.93	19.01	19.05	2	18.05	18.11	18.17	3
	25	0	19.67	19.68	19.74	1	18.79	18.83	18.76	2	17.87	17.99	17.79	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 20000 1715.0 MHz	Mid CH 20175 1732.5 MHz	High CH 20350 1750.0 MHz		Low CH 20000 1715.0 MHz	Mid CH 20175 1732.5 MHz	High CH 20350 1750.0 MHz		Low CH 20000 1715.0 MHz	Mid CH 20175 1732.5 MHz	High CH 20350 1750.0 MHz	
4 / 10M	1	0	21.70	21.54	21.54	0	20.78	21.04	20.59	1	19.97	20.06	19.63	2
	1	24	21.93	21.93	22.05	0	21.07	21.23	21.08	1	20.11	20.32	20.26	2
	1	49	21.62	21.45	21.52	0	20.69	21.00	20.53	1	19.83	20.13	19.66	2
	25	0	20.72	20.86	20.78	1	19.70	19.99	19.88	2	18.84	19.11	19.02	3
	25	12	20.72	20.76	20.81	1	19.87	19.85	19.83	2	18.89	18.87	18.90	3
	25	25	20.74	20.66	20.86	1	19.76	19.79	19.66	2	18.89	18.80	18.82	3
	50	0	20.73	20.82	20.87	1	19.76	19.85	19.81	2	18.78	18.91	18.92	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 20025	Mid CH 20175	High CH 20325		Low CH 20025	Mid CH 20175	High CH 20325		Low CH 20025	Mid CH 20175	High CH 20325	
			1717.5 MHz	1732.5 MHz	1747.5 MHz		1717.5 MHz	1732.5 MHz	1747.5 MHz		1717.5 MHz	1732.5 MHz	1747.5 MHz	
4 / 15M	1	0	21.74	21.62	21.77	0	21.16	21.36	20.81	1	20.17	20.50	19.87	2
	1	37	21.66	21.74	21.79	0	21.23	21.37	20.84	1	20.28	20.38	20.04	2
	1	74	21.78	21.54	21.67	0	21.19	21.26	20.65	1	20.34	20.46	19.73	2
	36	0	20.76	20.84	20.84	1	19.73	19.88	19.76	2	18.91	18.97	18.78	3
	36	19	20.75	20.80	20.75	1	19.77	19.78	19.85	2	18.92	18.86	18.85	3
	36	39	20.64	20.75	20.77	1	19.77	19.78	19.78	2	18.90	18.95	18.79	3
	75	0	20.73	20.74	20.77	1	19.78	19.84	19.74	2	18.84	19.02	18.77	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 20050	Mid CH 20175	High CH 20300		Low CH 20050	Mid CH 20175	High CH 20300		Low CH 20050	Mid CH 20175	High CH 20300	
			1720.0 MHz	1732.5 MHz	1745.0 MHz		1720.0 MHz	1732.5 MHz	1745.0 MHz		1720.0 MHz	1732.5 MHz	1745.0 MHz	
4 / 20M	1	0	21.92	21.67	21.82	0	21.01	20.71	20.84	1	20.15	19.87	19.91	2
	1	50	22.08	21.88	21.77	0	21.24	21.01	20.78	1	20.34	20.05	19.89	2
	1	99	22.07	21.77	21.73	0	21.18	20.85	20.93	1	20.38	19.88	19.98	2
	50	0	20.81	20.82	21.06	1	19.88	19.97	20.20	2	18.96	19.10	19.39	3
	50	25	20.76	21.41	20.73	1	19.93	20.45	19.86	2	18.95	19.54	19.05	3
	50	50	20.68	21.63	19.69	1	19.71	20.65	18.77	2	18.84	19.69	17.91	3
	100	0	20.85	21.39	19.86	1	19.98	20.46	19.03	2	19.03	19.53	18.07	3

➢ **LTE Band 5**

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 20407	Mid CH 20525	High CH 20643		Low CH 20407	Mid CH 20525	High CH 20643		Low CH 20407	Mid CH 20525	High CH 20643	
			824.7 MHz	836.5 MHz	848.3 MHz		824.7 MHz	836.5 MHz	848.3 MHz		824.7 MHz	836.5 MHz	848.3 MHz	
5 / 1.4M	1	0	22.51	21.93	21.90	0	21.64	21.08	20.98	1	20.83	20.23	20.17	2
	1	2	22.57	22.07	22.19	0	21.73	21.12	21.35	1	20.76	20.29	20.43	2
	1	5	22.42	21.96	21.91	0	21.46	21.04	21.07	1	20.66	20.16	20.18	2
	3	0	21.44	21.04	21.09	1	20.51	20.23	20.24	2	19.55	19.41	19.31	2
	3	1	21.40	20.96	21.01	1	20.43	20.15	20.15	2	19.63	19.25	19.26	2
	3	3	21.38	20.78	20.86	1	20.42	19.84	19.95	2	19.50	19.03	18.96	2
	6	0	21.42	21.10	21.02	1	20.61	20.15	20.12	2	19.70	19.17	19.20	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 20415	Mid CH 20525	High CH 20635		Low CH 20415	Mid CH 20525	High CH 20635		Low CH 20415	Mid CH 20525	High CH 20635	
			825.5 MHz	836.5 MHz	847.5 MHz		825.5 MHz	836.5 MHz	847.5 MHz		825.5 MHz	836.5 MHz	847.5 MHz	
5 / 3M	1	0	22.44	21.98	21.91	0	21.50	21.04	21.09	1	20.58	20.19	20.12	2
	1	7	22.46	22.08	21.99	0	21.60	21.11	21.19	1	20.79	20.16	20.26	2
	1	14	22.51	22.04	21.96	0	21.66	21.04	21.09	1	20.70	20.07	20.15	2
	8	0	21.39	20.97	20.99	1	20.48	20.08	20.19	2	19.57	19.25	19.31	3
	8	3	21.51	21.04	21.04	1	20.61	20.20	20.21	2	19.64	19.28	19.24	3
	8	7	21.45	20.89	20.94	1	20.64	20.02	19.97	2	19.67	19.17	19.04	3
	15	0	21.43	21.00	20.97	1	20.46	20.15	20.08	2	19.63	19.30	19.13	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 20425	Mid CH 20525	High CH 20625		Low CH 20425	Mid CH 20525	High CH 20625		Low CH 20425	Mid CH 20525	High CH 20625	
			826.5 MHz	836.5 MHz	846.5 MHz		826.5 MHz	836.5 MHz	846.5 MHz		826.5 MHz	836.5 MHz	846.5 MHz	
5 / 5M	1	0	22.44	21.87	21.94	0	21.32	20.74	20.74	1	20.38	19.90	19.81	2
	1	12	22.42	21.97	21.97	0	21.44	20.80	20.99	1	20.61	19.84	19.99	2
	1	24	22.36	21.76	21.93	0	21.35	20.67	20.82	1	20.46	19.77	20.00	2
	12	0	21.38	20.91	20.99	1	20.43	19.78	19.92	2	19.62	18.90	19.08	3
	12	6	21.47	21.02	21.03	1	20.59	20.11	19.99	2	19.79	19.13	19.13	3
	12	13	21.53	21.00	20.91	1	20.54	19.87	19.90	2	19.68	18.95	18.95	3
	25	0	21.44	21.02	20.88	1	20.49	19.91	19.96	2	19.67	19.07	18.98	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 20450	Mid CH 20525	High CH 20600		Low CH 20450	Mid CH 20525	High CH 20600		Low CH 20450	Mid CH 20525	High CH 20600	
			829.0 MHz	836.5 MHz	844.0 MHz		829.0 MHz	836.5 MHz	844.0 MHz		829.0 MHz	836.5 MHz	844.0 MHz	
5 / 10M	1	0	22.47	22.55	21.98	0	21.54	21.72	21.14	1	20.74	20.72	20.31	2
	1	24	22.53	22.59	22.28	0	21.61	21.69	21.34	1	20.68	20.70	20.34	2
	1	49	22.43	22.51	22.06	0	21.61	21.66	21.08	1	20.80	20.69	20.14	2
	25	0	21.39	21.63	21.08	1	20.59	20.66	20.23	2	19.70	19.76	19.41	3
	25	12	21.56	21.57	20.98	1	20.70	20.62	20.11	2	19.78	19.72	19.12	3
	25	25	21.50	21.59	20.97	1	20.53	20.68	20.08	2	19.67	19.86	19.25	3
	50	0	21.40	21.62	21.12	1	20.59	20.66	20.27	2	19.76	19.85	19.31	3

➢ **LTE Band 12**

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 23017	Mid CH 23095	High CH 23173		Low CH 23017	Mid CH 23095	High CH 23173		Low CH 23017	Mid CH 23095	High CH 23173	
			699.7 MHz	707.5 MHz	715.3 MHz		699.7 MHz	707.5 MHz	715.3 MHz		699.7 MHz	707.5 MHz	715.3 MHz	
12 / 1.4M	1	0	21.89	21.87	21.87	0	21.01	20.77	20.86	1	20.18	19.86	20.04	2
	1	2	22.13	22.25	22.02	0	21.22	20.98	20.93	1	20.24	20.14	20.02	2
	1	5	21.89	21.96	21.82	0	21.01	20.86	20.91	1	20.17	19.87	20.06	2
	3	0	20.86	20.87	21.00	1	20.13	20.38	19.86	2	19.29	19.43	19.03	2
	3	1	21.00	21.08	20.98	1	20.10	20.02	20.24	2	19.16	19.19	19.27	2
	3	3	21.03	20.86	21.00	1	19.90	20.23	19.97	2	19.08	19.43	19.14	2
	6	0	20.88	21.01	20.98	1	19.74	19.97	19.93	2	18.86	19.05	19.07	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 23025	Mid CH 23095	High CH 23165		Low CH 23025	Mid CH 23095	High CH 23165		Low CH 23025	Mid CH 23095	High CH 23165	
			700.5 MHz	707.5 MHz	714.5 MHz		700.5 MHz	707.5 MHz	714.5 MHz		700.5 MHz	707.5 MHz	714.5 MHz	
12 / 3M	1	0	21.96	22.01	21.95	0	20.97	20.96	21.54	1	20.03	20.04	20.64	2
	1	7	21.82	21.99	21.80	0	20.90	20.97	21.59	1	19.95	20.16	20.78	2
	1	14	21.87	22.08	21.86	0	20.85	21.08	21.59	1	20.03	20.20	20.69	2
	8	0	20.88	20.98	20.91	1	20.02	19.92	20.21	2	19.22	19.10	19.30	3
	8	3	20.92	21.03	20.99	1	20.06	20.09	20.08	2	19.08	19.22	19.12	3
	8	7	20.87	20.90	20.88	1	19.88	19.85	20.17	2	18.92	19.01	19.23	3
	15	0	20.98	21.04	20.95	1	19.91	20.15	20.14	2	19.00	19.25	19.21	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 23035	Mid CH 23095	High CH 23155		Low CH 23035	Mid CH 23095	High CH 23155		Low CH 23035	Mid CH 23095	High CH 23155	
			701.5 MHz	707.5 MHz	713.5 MHz		701.5 MHz	707.5 MHz	713.5 MHz		701.5 MHz	707.5 MHz	713.5 MHz	
12 / 5M	1	0	21.86	21.96	21.86	0	20.91	20.98	21.58	1	20.08	20.16	20.64	2
	1	12	21.88	22.13	21.96	0	21.15	21.26	21.67	1	20.22	20.43	20.87	2
	1	24	21.96	22.03	21.79	0	20.89	21.03	21.47	1	20.09	20.23	20.50	2
	12	0	20.84	20.89	21.12	1	19.92	20.05	20.22	2	19.03	19.08	19.28	3
	12	6	21.01	20.92	20.97	1	20.09	20.14	20.00	2	19.23	19.33	19.15	3
	12	13	20.81	20.96	21.07	1	19.84	20.03	20.15	2	18.97	19.06	19.34	3
	25	0	20.91	21.06	21.16	1	19.90	20.07	20.15	2	18.93	19.13	19.32	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 23060	Mid CH 23095	High CH 23130		Low CH 23060	Mid CH 23095	High CH 23130		Low CH 23060	Mid CH 23095	High CH 23130	
			704.0 MHz	707.5 MHz	711.0 MHz		704.0 MHz	707.5 MHz	711.0 MHz		704.0 MHz	707.5 MHz	711.0 MHz	
12 / 10M	1	0	22.04	22.08	22.04	0	20.88	20.70	20.86	1	20.01	19.88	20.02	2
	1	24	22.15	22.28	22.18	0	20.91	20.86	21.00	1	19.95	19.90	20.13	2
	1	49	22.02	22.11	22.09	0	20.76	20.67	20.85	1	19.84	19.80	19.91	2
	25	0	20.77	21.13	21.01	1	20.00	20.02	20.02	2	19.08	19.18	19.14	3
	25	12	20.90	21.02	20.94	1	20.09	20.17	20.08	2	19.24	19.32	19.15	3
	25	25	21.05	20.98	20.88	1	20.04	19.88	19.88	2	19.16	18.93	18.95	3
	50	0	21.54	21.06	21.00	1	19.88	20.08	20.13	2	18.90	19.17	19.22	3

➢ **LTE Band 13**

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 23205	Mid CH 23230	High CH 23255		Low CH 23205	Mid CH 23230	High CH 23255		Low CH 23205	Mid CH 23230	High CH 23255	
			779.5 MHz	782.0 MHz	784.5 MHz		779.5 MHz	782.0 MHz	784.5 MHz		779.5 MHz	782.0 MHz	784.5 MHz	
13 / 5M	1	0	21.93	21.97	21.79	0	20.80	20.89	20.88	1	20.00	19.95	20.08	2
	1	12	22.03	22.05	22.07	0	20.93	20.94	21.04	1	19.94	20.07	20.15	2
	1	24	21.86	21.92	21.93	0	20.77	20.79	20.90	1	19.96	19.80	19.94	2
	12	0	20.96	20.85	20.98	1	19.95	19.77	20.26	2	18.99	18.89	19.45	3
	12	6	20.98	20.93	20.98	1	20.23	20.03	20.21	2	19.39	19.15	19.40	3
	12	13	21.16	20.92	20.97	1	20.11	20.01	20.09	2	19.29	19.12	19.26	3
	25	0	21.07	20.88	21.02	1	20.13	19.93	20.09	2	19.19	19.07	19.25	3

LTE Band / BW	RB Size	RB Offset	QPSK	3GPP MPR (dB)	16QAM	3GPP MPR (dB)	64QAM	3GPP MPR (dB)
			Mid CH 23230		Mid CH 23230		Mid CH 23230	
			782.0 MHz		782.0 MHz		782.0 MHz	
13 / 10M	1	0	22.00	0	21.00	1	20.07	2
	1	24	22.18	0	21.16	1	20.26	2
	1	49	21.89	0	20.86	1	19.89	2
	25	0	21.09	1	20.15	2	19.21	3
	25	12	21.00	1	20.13	2	19.25	3
	25	25	21.18	1	20.15	2	19.31	3
	50	0	21.17	1	20.17	2	19.17	3

➢ **LTE Band 25**

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 26047 1850.7 MHz	Mid CH 26365 1882.5 MHz	High CH 26683 1914.3 MHz		Low CH 26047 1850.7 MHz	Mid CH 26365 1882.5 MHz	High CH 26683 1914.3 MHz		Low CH 26047 1850.7 MHz	Mid CH 26365 1882.5 MHz	High CH 26683 1914.3 MHz	
25 / 1.4M	1	0	22.62	22.55	22.42	0	21.32	21.46	21.39	1	20.41	20.52	20.46	2
	1	2	22.68	22.83	22.79	0	21.63	21.57	21.63	1	20.72	20.61	20.79	2
	1	5	22.57	22.59	22.33	0	21.37	21.44	21.47	1	20.44	20.53	20.61	2
	3	0	21.62	21.61	21.40	1	20.74	20.39	20.54	2	19.81	19.39	19.73	2
	3	1	21.69	21.58	21.57	1	20.52	20.63	20.58	2	19.68	19.72	19.61	2
	3	3	21.55	21.54	21.54	1	20.71	20.45	20.50	2	19.78	19.53	19.61	2
	6	0	21.43	21.53	21.38	1	20.51	20.67	20.12	2	19.71	19.80	19.14	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 26055 1851.5 MHz	Mid CH 26365 1882.5 MHz	High CH 26675 1913.5 MHz		Low CH 26055 1851.5 MHz	Mid CH 26365 1882.5 MHz	High CH 26675 1913.5 MHz		Low CH 26055 1851.5 MHz	Mid CH 26365 1882.5 MHz	High CH 26675 1913.5 MHz	
25 / 3M	1	0	22.50	22.60	22.42	0	21.58	21.55	21.43	1	20.73	20.69	20.57	2
	1	7	22.42	22.62	22.54	0	21.57	21.44	21.56	1	20.66	20.59	20.61	2
	1	14	22.48	22.56	22.57	0	21.57	21.53	21.49	1	20.74	20.64	20.65	2
	8	0	21.46	21.59	21.41	1	20.71	20.54	20.32	2	19.81	19.69	19.42	3
	8	3	21.47	21.47	21.48	1	20.59	20.54	20.47	2	19.72	19.68	19.63	3
	8	7	21.48	21.55	21.33	1	20.71	20.53	20.31	2	19.77	19.70	19.44	3
	15	0	21.57	21.51	21.52	1	20.60	20.57	20.50	2	19.72	19.65	19.61	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 26065 1852.5 MHz	Mid CH 26365 1882.5 MHz	High CH 26665 1912.5 MHz		Low CH 26065 1852.5 MHz	Mid CH 26365 1882.5 MHz	High CH 26665 1912.5 MHz		Low CH 26065 1852.5 MHz	Mid CH 26365 1882.5 MHz	High CH 26665 1912.5 MHz	
25 / 5M	1	0	22.90	22.46	22.35	0	21.20	21.38	21.29	1	20.28	20.47	20.41	2
	1	12	22.55	22.53	22.43	0	21.33	21.42	21.53	1	20.52	20.52	20.56	2
	1	24	22.44	22.33	22.30	0	21.23	21.33	21.31	1	20.35	20.43	20.41	2
	12	0	21.46	21.57	21.44	1	20.42	20.45	20.61	2	19.45	19.50	19.78	3
	12	6	21.59	21.60	21.48	1	20.70	20.72	20.67	2	19.90	19.72	19.77	3
	12	13	21.53	21.52	21.47	1	20.39	20.33	20.61	2	19.45	19.40	19.75	3
	25	0	21.56	21.63	21.40	1	20.54	20.60	20.45	2	19.59	19.68	19.63	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 26090 1855.0 MHz	Mid CH 26365 1882.5 MHz	High CH 26640 1910.0 MHz		Low CH 26090 1855.0 MHz	Mid CH 26365 1882.5 MHz	High CH 26640 1910.0 MHz		Low CH 26090 1855.0 MHz	Mid CH 26365 1882.5 MHz	High CH 26640 1910.0 MHz	
25 / 10M	1	0	22.64	22.48	22.45	0	21.56	22.22	21.48	1	20.66	21.37	20.49	2
	1	24	22.91	22.83	22.45	0	21.79	22.18	21.49	1	20.94	21.26	20.49	2
	1	49	22.47	22.45	22.46	0	21.52	21.88	21.41	1	20.68	21.02	20.55	2
	25	0	21.52	21.58	21.48	1	20.71	20.67	20.43	2	19.87	19.68	19.43	3
	25	12	21.58	21.62	21.52	1	20.66	20.67	20.51	2	19.74	19.68	19.54	3
	25	25	21.62	21.58	21.64	1	20.69	20.59	20.50	2	19.77	19.67	19.61	3
	50	0	21.60	21.56	21.53	1	20.61	20.55	20.54	2	19.62	19.72	19.58	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 26115 1857.5 MHz	Mid CH 26365 1882.5 MHz	High CH 26615 1907.5 MHz		Low CH 26115 1857.5 MHz	Mid CH 26365 1882.5 MHz	High CH 26615 1907.5 MHz		Low CH 26115 1857.5 MHz	Mid CH 26365 1882.5 MHz	High CH 26615 1907.5 MHz	

25 / 15M	1	0	22.48	22.33	22.40	0	21.48	21.84	21.97	1	20.63	20.92	20.99	2
	1	37	22.60	22.52	22.44	0	21.54	22.04	22.09	1	20.69	21.19	21.21	2
	1	74	22.35	22.24	22.27	0	21.45	21.62	21.90	1	20.46	20.62	20.95	2
	36	0	21.63	21.61	21.38	1	20.62	20.63	20.38	2	19.73	19.82	19.38	3
	36	19	21.62	21.57	21.41	1	20.67	20.59	20.56	2	19.71	19.73	19.57	3
	36	39	21.54	21.59	21.46	1	20.51	20.55	20.39	2	19.52	19.67	19.49	3
	75	0	21.61	21.67	21.49	1	20.58	20.60	20.55	2	19.71	19.78	19.70	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 26140	Mid CH 26365	High CH 26590		Low CH 26140	Mid CH 26365	High CH 26590		Low CH 26140	Mid CH 26365	High CH 26590	
			1860.0 MHz	1882.5 MHz	1905.0 MHz		1860.0 MHz	1882.5 MHz	1905.0 MHz		1860.0 MHz	1882.5 MHz	1905.0 MHz	
25 / 20M	1	0	22.39	22.40	22.38	0	21.81	21.33	21.28	1	20.90	20.37	20.34	2
	1	50	22.76	22.74	22.92	0	22.20	21.78	21.63	1	21.21	20.83	20.67	2
	1	99	22.32	22.30	22.40	0	21.61	21.18	21.27	1	20.72	20.28	20.37	2
	50	0	21.80	21.88	21.52	1	20.55	20.65	20.29	2	19.62	19.71	19.34	3
	50	25	21.65	21.75	21.55	1	20.63	20.71	20.49	2	19.65	19.80	19.54	3
	50	50	21.61	21.68	21.55	1	20.49	20.53	20.33	2	19.60	19.53	19.34	3
	100	0	21.76	21.79	21.54	1	20.54	20.66	20.37	2	19.68	19.76	19.46	3

➢ **LTE Band 26**

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 26697	Mid CH 26865	High CH 27033		Low CH 26697	Mid CH 26865	High CH 27033		Low CH 26697	Mid CH 26865	High CH 27033	
			814.7 MHz	831.5 MHz	848.3 MHz		814.7 MHz	831.5 MHz	848.3 MHz		814.7 MHz	831.5 MHz	848.3 MHz	
26 / 1.4M	1	0	22.56	21.97	21.96	0	21.60	20.80	20.98	1	20.72	19.97	20.17	2
	1	2	22.53	22.07	22.25	0	21.60	20.95	21.09	1	20.60	20.05	20.25	2
	1	5	22.51	21.99	21.89	0	21.56	20.88	21.00	1	20.64	20.05	20.13	2
	3	0	21.64	21.55	21.50	1	20.51	20.79	20.92	2	19.53	19.97	20.09	2
	3	1	21.54	21.56	21.41	1	20.62	21.04	20.97	2	19.62	20.21	20.13	2
	3	3	21.62	21.38	21.46	1	20.53	20.68	21.09	2	19.60	19.73	20.09	2
	6	0	21.55	21.06	21.05	1	20.70	19.93	19.78	2	19.89	19.04	18.96	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 26705	Mid CH 26865	High CH 27025		Low CH 26705	Mid CH 26865	High CH 27025		Low CH 26705	Mid CH 26865	High CH 27025	
			815.5 MHz	831.5 MHz	847.5 MHz		815.5 MHz	831.5 MHz	847.5 MHz		815.5 MHz	831.5 MHz	847.5 MHz	
26 / 3M	1	0	22.59	21.99	22.09	0	21.60	20.96	21.05	1	20.76	20.05	20.25	2
	1	7	22.44	21.98	22.12	0	21.50	20.96	21.06	1	20.63	20.04	20.09	2
	1	14	22.55	21.91	22.01	0	21.54	20.88	20.98	1	20.59	19.91	20.01	2
	8	0	21.63	20.88	21.00	1	20.59	19.89	19.94	2	19.68	19.03	19.01	3
	8	3	21.51	21.08	20.92	1	20.57	19.98	20.03	2	19.73	19.10	19.19	3
	8	7	21.49	20.91	20.88	1	20.63	19.85	19.82	2	19.73	18.97	18.99	3
	15	0	21.50	20.93	20.90	1	20.63	19.78	20.01	2	19.79	18.87	19.05	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 26715	Mid CH 26865	High CH 27015		Low CH 26715	Mid CH 26865	High CH 27015		Low CH 26715	Mid CH 26865	High CH 27015	
			816.5 MHz	831.5 MHz	846.5 MHz		816.5 MHz	831.5 MHz	846.5 MHz		816.5 MHz	831.5 MHz	846.5 MHz	
`	1	0	22.56	21.90	21.96	0	21.49	20.89	20.74	1	20.64	19.96	19.80	2
	1	12	22.61	21.86	21.93	0	21.59	20.87	20.86	1	20.60	19.98	20.06	2
	1	24	22.59	21.86	21.91	0	21.49	20.77	20.76	1	20.60	19.78	19.89	2
	12	0	21.58	20.93	20.91	1	20.53	19.95	19.93	2	19.70	19.11	19.03	3
	12	6	21.61	20.86	21.07	1	20.47	20.19	20.08	2	19.57	19.32	19.23	3
	12	13	21.56	20.91	20.97	1	20.56	19.99	19.88	2	19.58	19.02	18.92	3

	25	0	21.60	20.92	20.95	1	20.56	19.97	20.07	2	19.64	18.97	19.24	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 26740 819.0 MHz	Mid CH 26865 831.5 MHz	High CH 26990 844.0 MHz		Low CH 26740 819.0 MHz	Mid CH 26865 831.5 MHz	High CH 26990 844.0 MHz		Low CH 26740 819.0 MHz	Mid CH 26865 831.5 MHz	High CH 26990 844.0 MHz	
26 / 10M	1	0	22.54	22.05	22.04	0	21.49	20.98	21.04	1	20.64	20.18	20.12	2
	1	24	22.61	22.18	22.35	0	21.61	21.09	21.14	1	20.65	20.17	20.16	2
	1	49	22.47	21.93	22.06	0	21.38	20.84	20.99	1	20.50	19.88	20.05	2
	25	0	21.57	21.17	21.04	1	20.60	20.08	20.18	2	19.76	19.23	19.37	3
	25	12	21.58	21.06	21.05	1	20.65	20.04	20.05	2	19.71	19.20	19.23	3
	25	25	21.59	20.99	21.08	1	20.63	19.97	20.11	2	19.82	19.10	19.24	3
	50	0	21.55	21.10	21.09	1	20.55	20.11	20.19	2	19.66	19.25	19.20	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 26765 821.5 MHz	Mid CH 26865 831.5 MHz	High CH 26965 841.5 MHz		Low CH 26765 821.5 MHz	Mid CH 26865 831.5 MHz	High CH 26965 841.5 MHz		Low CH 26765 821.5 MHz	Mid CH 26865 831.5 MHz	High CH 26965 841.5 MHz	
26 / 15M	1	0	22.68	22.48	22.52	0	21.95	21.86	22.05	1	20.99	20.89	21.12	2
	1	37	22.48	22.51	22.52	0	22.07	21.88	22.22	1	21.11	21.03	21.37	2
	1	74	22.41	22.34	22.34	0	21.93	21.69	21.95	1	20.96	20.78	21.08	2
	36	0	21.65	21.50	21.71	1	20.56	20.46	20.63	2	19.69	19.52	19.80	3
	36	19	21.61	21.52	21.69	1	20.57	20.54	20.68	2	19.66	19.56	19.80	3
	36	39	21.59	21.55	21.66	1	20.57	20.46	20.63	2	19.64	19.64	19.68	3
	75	0	21.58	21.50	21.69	1	20.58	20.45	20.62	2	19.59	19.61	19.70	3

➢ **LTE Band 41**

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 39675 2498.5 MHz	Mid CH 40620 2593.0 MHz	High CH 41565 2687.5 MHz		Low CH 39675 2498.5 MHz	Mid CH 40620 2593.0 MHz	High CH 41565 2687.5 MHz		Low CH 39675 2498.5 MHz	Mid CH 40620 2593.0 MHz	High CH 41565 2687.5 MHz	
41 / 5M	1	0	22.25	22.35	21.84	0	21.32	21.30	20.38	1	20.50	20.35	19.53	2
	1	12	22.34	22.52	21.98	0	21.47	21.39	21.11	1	20.58	20.54	20.14	2
	1	24	22.17	22.37	21.84	0	21.37	20.79	20.35	1	20.54	19.96	19.47	2
	12	0	21.32	21.50	20.90	1	20.43	19.92	20.53	2	19.44	19.01	19.68	3
	12	6	21.39	21.52	21.50	1	20.47	20.06	20.52	2	19.56	19.10	19.66	3
	12	13	21.30	21.58	20.93	1	20.36	19.86	19.94	2	19.42	19.00	19.05	3
	25	0	21.28	21.52	21.48	1	20.36	19.89	20.56	2	19.39	18.92	19.69	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 39700 2501.0 MHz	Mid CH 40620 2593.0 MHz	High CH 41540 2685.0 MHz		Low CH 39700 2501.0 MHz	Mid CH 40620 2593.0 MHz	High CH 41540 2685.0 MHz		Low CH 39700 2501.0 MHz	Mid CH 40620 2593.0 MHz	High CH 41540 2685.0 MHz	
41 / 10M	1	0	22.39	22.40	22.01	0	21.51	20.61	21.22	1	20.58	19.80	20.27	2
	1	24	22.67	22.66	22.43	0	21.68	20.83	21.15	1	20.72	19.86	20.22	2
	1	49	22.45	22.39	22.04	0	21.35	20.51	21.28	1	20.45	19.55	20.47	2
	25	0	21.38	21.63	21.03	1	20.39	20.54	20.54	2	19.49	19.72	19.71	3
	25	12	21.40	21.60	20.97	1	20.50	20.01	20.53	2	19.61	19.16	19.53	3
	25	25	21.32	21.63	21.67	1	20.33	20.08	20.61	2	19.49	19.11	19.77	3
	50	0	21.51	21.52	21.49	1	20.44	20.03	20.52	2	19.51	19.12	19.64	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 39725	Mid CH 40620	High CH 41515		Low CH 39725	Mid CH 40620	High CH 41515		Low CH 39725	Mid CH 40620	High CH 41515	
			2503.5 MHz	2593.0 MHz	2682.5 MHz		2503.5 MHz	2593.0 MHz	2682.5 MHz		2503.5 MHz	2593.0 MHz	2682.5 MHz	
41 / 15M	1	0	22.16	22.35	21.93	0	21.41	20.52	21.21	1	20.61	19.57	20.36	2
	1	37	22.23	22.42	22.06	0	21.44	21.12	21.43	1	20.59	20.23	20.49	2
	1	74	22.09	22.31	22.41	0	21.34	20.91	21.11	1	20.35	19.94	20.22	2
	36	0	21.37	21.63	21.05	1	20.38	20.04	20.44	2	19.50	19.22	19.44	3
	36	19	21.51	21.58	21.47	1	20.36	19.86	20.47	2	19.48	18.93	19.64	3
	36	39	21.42	21.51	21.41	1	20.38	20.48	20.37	2	19.44	19.59	19.55	3
	75	0	21.47	21.59	21.48	1	20.32	19.86	20.57	2	19.49	19.04	19.57	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			Low CH 39750	Mid CH 40620	High CH 41490		Low CH 39750	Mid CH 40620	High CH 41490		Low CH 39750	Mid CH 40620	High CH 41490	
			2506.0 MHz	2593.0 MHz	2680.0 MHz		2506.0 MHz	2593.0 MHz	2680.0 MHz		2506.0 MHz	2593.0 MHz	2680.0 MHz	
41 / 20M	1	0	22.29	22.28	22.14	0	20.95	21.18	20.84	1	20.04	20.38	19.95	2
	1	50	22.40	22.64	22.69	0	21.43	21.66	21.19	1	20.53	20.84	20.23	2
	1	99	22.19	22.19	22.16	0	20.89	21.13	20.70	1	20.02	20.22	19.78	2
	50	0	21.31	21.39	21.32	1	20.38	20.34	20.44	2	19.51	19.36	19.51	3
	50	25	21.40	21.40	21.40	1	20.34	20.50	20.47	2	19.38	19.69	19.56	3
	50	50	21.25	21.39	21.41	1	20.36	20.32	20.50	2	19.54	19.44	19.56	3
	100	0	21.39	21.46	21.56	1	20.35	20.39	20.38	2	19.38	19.49	19.48	3

➢ **LTE Band 66**

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			CH 131979	CH 132322	CH 132665		CH 131979	CH 132322	CH 132665		CH 131979	CH 132322	CH 132665	
			1710.7 MHz	1745 MHz	1779.3 MHz		1710.7 MHz	1745 MHz	1779.3 MHz		1710.7 MHz	1745 MHz	1779.3 MHz	
66 / 1.4M	1	0	21.83	21.78	21.77	0	21.01	20.95	20.96	1	20.20	20.02	20.03	2
	1	2	21.76	21.62	21.74	0	20.82	20.73	20.90	1	19.84	19.81	20.02	2
	1	5	21.91	21.68	21.92	0	21.02	20.80	21.10	1	20.17	20.00	20.18	2
	3	0	20.69	20.72	20.76	1	19.73	19.78	19.85	2	18.81	18.89	18.99	2
	3	1	20.74	21.03	20.62	1	19.88	20.14	19.71	2	19.07	19.19	18.86	2
	3	3	20.82	20.75	21.05	1	19.99	19.80	20.12	2	18.99	18.99	19.30	2
	6	0	20.80	20.96	20.71	1	19.85	20.03	19.82	2	19.05	19.06	18.90	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			CH 131987	CH 132322	CH 132657		CH 131987	CH 132322	CH 132657		CH 131987	CH 132322	CH 132657	
			1711.5 MHz	1745 MHz	1778.5 MHz		1711.5 MHz	1745 MHz	1778.5 MHz		1711.5 MHz	1745 MHz	1778.5 MHz	
66 / 3M	1	0	21.81	21.73	21.79	0	20.87	20.75	20.94	1	19.92	19.75	20.06	2
	1	7	21.93	21.44	21.74	0	20.94	20.60	20.88	1	20.14	19.75	20.00	2
	1	14	21.80	21.36	21.77	0	20.96	20.54	20.82	1	20.15	19.57	19.83	2
	8	0	20.80	20.32	20.80	1	19.94	19.44	19.93	2	18.96	18.44	19.09	3
	8	3	20.74	20.88	20.74	1	19.94	20.04	19.94	2	19.05	19.10	18.99	3
	8	7	20.92	20.82	20.77	1	20.02	20.00	19.88	2	19.07	19.18	19.03	3
	15	0	20.81	20.88	20.68	1	19.82	19.96	19.83	2	18.91	19.06	18.90	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			CH 131997 1712.5 MHz	CH 132322 1745 MHz	CH 132647 1777.5 MHz		CH 131997 1712.5 MHz	CH 132322 1745 MHz	CH 132647 1777.5 MHz		CH 131997 1712.5 MHz	CH 132322 1745 MHz	CH 132647 1777.5 MHz	
66 / 5M	1	0	21.73	21.92	21.75	0	20.77	21.08	20.81	1	19.87	20.19	19.87	2
	1	12	21.56	21.66	21.60	0	20.66	20.79	20.62	1	19.85	19.86	19.72	2
	1	24	21.57	21.78	21.88	0	20.71	20.81	20.94	1	19.80	19.97	19.95	2
	12	0	20.75	20.61	20.65	1	19.91	19.75	19.69	2	18.95	18.88	18.78	3
	12	6	20.63	20.60	20.89	1	19.78	19.60	20.09	2	18.98	18.77	19.25	3
	12	13	20.91	20.83	21.01	1	20.08	19.89	20.11	2	19.17	18.90	19.12	3
	25	0	20.67	20.62	20.75	1	19.71	19.65	19.80	2	18.86	18.69	18.92	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			CH 132022 1715 MHz	CH 132322 1745 MHz	CH 132622 1775 MHz		CH 132022 1715 MHz	CH 132322 1745 MHz	CH 132622 1775 MHz		CH 132022 1715 MHz	CH 132322 1745 MHz	CH 132622 1775 MHz	
66 / 10M	1	0	21.79	21.66	21.79	0	20.80	20.71	20.98	1	19.81	19.87	20.08	2
	1	24	22.01	21.88	21.82	0	21.02	20.96	20.98	1	20.04	19.98	20.16	2
	1	49	21.98	21.89	21.75	0	21.00	21.00	20.90	1	20.05	20.09	19.96	2
	25	0	20.71	20.89	21.01	1	19.72	20.06	20.18	2	18.86	19.16	19.20	3
	25	12	20.85	20.31	20.71	1	19.86	19.35	19.76	2	19.01	18.43	18.85	3
	25	25	20.74	20.60	20.77	1	19.83	19.75	19.78	2	19.02	18.80	18.95	3
	50	0	20.79	20.26	20.88	1	19.91	19.30	20.06	2	19.07	18.43	19.19	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			CH 132047 1717.5 MHz	CH 132322 1745 MHz	CH 132597 1772.5 MHz		CH 132047 1717.5 MHz	CH 132322 1745 MHz	CH 132597 1772.5 MHz		CH 132047 1717.5 MHz	CH 132322 1745 MHz	CH 132597 1772.5 MHz	
66 / 15M	1	0	21.62	21.65	21.67	0	20.70	20.71	20.86	1	19.88	19.84	19.92	2
	1	37	21.75	21.80	21.74	0	20.80	20.95	20.87	1	19.83	19.95	20.06	2
	1	74	21.66	21.53	21.63	0	20.81	20.63	20.81	1	19.89	19.64	19.86	2
	36	0	20.79	20.69	20.83	1	19.83	19.82	19.85	2	18.98	18.95	18.88	3
	36	19	20.67	20.72	20.79	1	19.78	19.77	19.83	2	18.88	18.83	18.83	3
	36	39	20.75	20.86	20.75	1	19.89	20.06	19.88	2	18.97	19.15	18.95	3
	75	0	20.62	21.02	20.73	1	19.74	20.08	19.75	2	18.79	19.23	18.94	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			CH 132072 1720 MHz	CH 132322 1745 MHz	CH 132572 1770 MHz		CH 132072 1720 MHz	CH 132322 1745 MHz	CH 132572 1770 MHz		CH 132072 1720 MHz	CH 132322 1745 MHz	CH 132572 1770 MHz	
66 / 20M	1	0	21.56	21.53	21.51	0	20.72	20.62	20.59	1	19.87	19.68	19.74	2
	1	50	22.04	22.11	21.84	0	21.10	21.11	20.87	1	20.15	20.13	19.97	2
	1	99	21.58	21.41	21.37	0	20.78	20.48	20.51	1	19.85	19.63	19.59	2
	50	0	20.84	20.83	20.75	1	20.02	19.93	19.91	2	19.17	19.07	19.06	3
	50	25	20.69	20.77	20.82	1	19.78	19.82	19.89	2	18.80	18.82	18.99	3
	50	50	20.53	20.69	20.61	1	19.70	19.88	19.80	2	18.77	19.01	18.86	3
	100	0	20.71	20.79	20.72	1	19.88	19.97	19.76	2	18.89	19.15	18.94	3

➢ **LTE Band 71**

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			CH 133147 665.5 MHz	CH 133297 680.5 MHz	CH 133447 695.5 MHz		CH 133147 665.5 MHz	CH 133297 680.5 MHz	CH 133447 695.5 MHz		CH 133147 665.5 MHz	CH 133297 680.5 MHz	CH 133447 695.5 MHz	
71 / 5M	1	0	22.18	22.14	22.11	0	21.28	21.26	21.03	1	20.35	20.45	20.05	2
	1	12	22.23	22.16	22.12	0	21.35	21.38	21.16	1	20.37	20.41	20.32	2
	1	24	22.17	22.12	22.09	0	21.13	21.15	21.03	1	20.23	20.31	20.20	2
	12	0	21.16	21.32	21.26	1	20.25	20.40	20.09	2	19.37	19.58	19.13	3
	12	6	21.29	21.21	21.42	1	20.46	20.60	20.33	2	19.51	19.72	19.39	3
	12	13	21.26	21.36	21.32	1	20.28	20.51	20.14	2	19.43	19.59	19.20	3
	25	0	21.35	21.29	21.21	1	20.45	20.42	20.31	2	19.47	19.43	19.32	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			CH 133172 668 MHz	CH 133297 680.5 MHz	CH 133422 693 MHz		CH 133172 668 MHz	CH 133297 680.5 MHz	CH 133422 693 MHz		CH 133172 668 MHz	CH 133297 680.5 MHz	CH 133422 693 MHz	
71 / 10M	1	0	22.18	22.27	22.25	0	21.37	21.42	21.84	1	20.57	20.50	20.99	2
	1	24	22.42	22.56	22.28	0	21.51	21.47	22.11	1	20.59	20.54	21.19	2
	1	49	22.30	22.36	22.10	0	21.25	21.37	21.99	1	20.43	20.51	21.18	2
	25	0	21.48	21.39	21.39	1	20.49	20.51	20.46	2	19.55	19.62	19.50	3
	25	12	21.34	21.34	21.29	1	20.47	20.48	20.48	2	19.66	19.64	19.67	3
	25	25	21.32	21.40	21.43	1	20.42	20.55	20.50	2	19.49	19.62	19.50	3
	50	0	21.51	21.43	21.47	1	20.50	20.47	20.48	2	19.70	19.54	19.58	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			CH 133197 670.5 MHz	CH 133297 680.5 MHz	CH 133397 690.5 MHz		CH 133197 670.5 MHz	CH 133297 680.5 MHz	CH 133397 690.5 MHz		CH 133197 670.5 MHz	CH 133297 680.5 MHz	CH 133397 690.5 MHz	
71 / 15M	1	0	22.08	22.18	22.14	0	21.90	21.24	21.69	1	21.07	20.38	20.88	2
	1	37	22.15	22.31	22.14	0	22.01	21.35	21.82	1	21.04	20.38	20.85	2
	1	74	22.13	22.13	22.12	0	21.95	21.25	21.60	1	21.05	20.37	20.70	2
	36	0	21.33	21.37	21.32	1	20.30	20.45	20.31	2	19.41	19.48	19.38	3
	36	19	21.31	21.31	21.41	1	20.47	20.50	20.29	2	19.63	19.68	19.48	3
	36	39	21.36	21.41	21.43	1	20.46	20.40	20.44	2	19.64	19.54	19.59	3
	75	0	21.23	21.41	21.51	1	20.36	20.46	20.32	2	19.44	19.59	19.42	3

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)	64QAM			3GPP MPR (dB)
			CH 133222 673 MHz	CH 133322 683 MHz	CH 133372 688 MHz		CH 133222 673 MHz	CH 133322 683 MHz	CH 133372 688 MHz		CH 133222 673 MHz	CH 133322 683 MHz	CH 133372 688 MHz	
71 / 20M	1	0	22.17	22.20	22.14	0	21.14	21.24	21.50	1	20.26	20.29	20.57	2
	1	50	22.45	22.57	22.46	0	21.32	21.64	21.88	1	20.41	20.80	20.91	2
	1	99	22.23	22.25	22.22	0	21.15	21.30	21.60	1	20.30	20.39	20.74	2
	50	0	21.52	21.57	21.38	1	20.58	20.55	20.54	2	19.58	19.73	19.70	3
	50	25	21.54	21.50	21.40	1	20.62	20.68	20.38	2	19.68	19.81	19.41	3
	50	50	21.50	21.54	21.38	1	20.49	20.45	20.43	2	19.65	19.58	19.49	3
	100	0	21.44	21.49	21.42	1	20.58	20.52	20.44	2	19.65	19.62	19.46	3

4.3.3. Conducted Power of WLAN

The measuring conducted average power is shown as below.

Band	Mode	Channel	Frequency (MHz)	Average Power (dBm)
2.4GHz	802.11b	1	2412	13.56
		6	2437	13.65
		11	2462	13.87
		12	2467	13.85
		13	2472	13.69
	802.11g	1	2412	9.22
		6	2437	12.06
		11	2462	12.35
		12	2467	12.41
		13	2472	9.14
	802.11n-HT20	1	2412	9.08
		6	2437	12.24
		11	2462	12.41
		12	2467	12.51
		13	2472	8.25
	802.11n-HT40	3	2422	11.81
		6	2437	14.34
		9	2452	14.45
		10	2457	14.48
		11	2462	11.18

Mode	Band	Channel	Frequency (MHz)	Average Power (dBm)
802.11a	U-NII-1	36	5180	9.46
		44	5220	9.12
		48	5240	9.15
	U-NII-2A	52	5260	9.58
		60	5300	9.33
		64	5320	9.24
	U-NII-2C	100	5500	8.10
		120	5600	8.16
		140	5700	8.11
	U-NII-3	149	5745	8.68
		157	5785	8.88
		165	5825	9.05

Mode	Band	Channel	Frequency (MHz)	Average Power (dBm)
802.11n-HT20	U-NII-1	36	5180	9.40
		44	5220	9.11
		48	5240	9.00
	U-NII-2A	52	5260	9.54
		60	5300	9.25
		64	5320	9.30
	U-NII-2C	100	5500	8.12
		120	5600	8.00
		140	5700	8.02
	U-NII-3	149	5745	8.99
		157	5785	8.83
		165	5825	9.15

Mode	Band	Channel	Frequency (MHz)	Average Power (dBm)
802.11n-HT40	U-NII-1	38	5190	8.50
		46	5230	8.24
	U-NII-2A	54	5270	8.45
		62	5310	8.22
	U-NII-2C	102	5510	7.09
		118	5590	6.95
		134	5670	7.04
	U-NII-3	151	5755	7.93
		159	5795	8.23

4.3.4. Conducted Power of BT

Mode	Modulation	Channel	Frequency (MHz)	Average Power (dBm)
BR + EDR	GFSK	0	2402	2.14
		39	2441	1.82
		78	2480	1.92
	π/4-DQPSK	0	2402	-0.47
		39	2441	-0.53
		78	2480	-0.68
	8-DPSK	0	2402	-0.51
		39	2441	-0.72
		78	2480	-0.87

Mode	Modulation	Channel	Frequency (MHz)	Average Power (dBm)
LE	GFSK	0	2402	2.18
		19	2440	0.60
		39	2480	-0.37

4.4. SAR TEST EXCLUSION EVALUATIONS

4.4.1. Standalone SAR Test Exclusion Considerations

According to KDB 447498 D01, the SAR test exclusion condition is based on source-based time-averaged maximum conducted output power, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The 1-g and 10-g SAR test exclusion thresholds are determined by the following:

1) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm:

$$\frac{Max.Tune\ up\ Power_{(mW)}}{Min.Test\ Separation\ Distance_{(mm)}} \times \sqrt{f_{(GHz)}} \leq 3.0 \text{ for SAR-1g, } \leq 7.5 \text{ for SAR-10g}$$

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

2) For 100 MHz to 1500 MHz and test separation distances > 50 mm:

{[Threshold for 50 mm in step a)] + [(test separation distance – 50 mm) · ($f_{(MHz)}$/150)]} mW

3) For > 1500 MHz and ≤ 6 GHz and test separation distances > 50 mm:

{[Threshold for 50 mm in step a)] + [(test separation distance – 50 mm) ·10]} mW

When the calculated result in step a) is <= 3.0 for SAR-1g exposure condition, or <= 7.5 for SAR-10g exposure condition, the SAR testing exclusion is applied.

When the device output power is less than the calculated result (power threshold, mW) shown in in step b) and c), the SAR testing exclusion is applied.

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	Head			Body-Worn		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?
BT	2.5	1.78	5	0.6	No	10	0.3	No

4.4.2. Estimated SAR Calculation

According to KDB 447498 D01, when an antenna qualifies for the standalone SAR test exclusion and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to the following to determine the simultaneous transmission SAR test exclusion criteria:

a) For test separation distances ≤ 50 mm:

$$Estimated\ SAR = \frac{Max.Tune\ up\ Power_{(mW)}}{Min.Test\ Separation\ Distance_{(mm)}} \times \frac{\sqrt{\mathrm{f(GHz)}}}{x}$$

Where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR.

b) For test separation distances > 50 mm, 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR.

Mode / Band	Frequency (GHz)	Max. Tune-up Power (dBm)	Test Position	Separation Distance (mm)	Estimated SAR (W/kg)
BT	2.48	2.5	Head	5	0.07
BT	2.48	2.5	Body	10	0.04

4.5. SAR TESTING RESULTS

4.5.1. SAR Test Reduction Considerations

KDB 447498 D01 General RF Exposure Guidance

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

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

KDB 941225 D01 3G SAR Procedures

a) GSM SAR Test Reduction

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

b) 3G SAR Test Reduction Procedure

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

KDB 941225 D05 SAR for LTE Devices

a) QPSK with 1 RB and 50% RB allocation

Start with the largest channel bandwidth and measure SAR, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

b) QPSK with 100% RB allocation

SAR is not required when the highest maximum output power for 100% RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

c) Higher order modulations

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

d) Others channel bandwidth

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

KDB 941225 D06 Hot Spot SAR

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

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

KDB 248227 D01 Wi-Fi SAR

a) For handsets operating next to ear, hotspot mode or mini-tablet configurations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When the reported SAR of initial test position is <= 0.4 W/kg, SAR testing for remaining test positions is not required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is <= 0.8 W/kg or all test positions are measured.

b) For WLAN 2.4 GHz, the highest measured maximum output power channel for DSSS was selected for SAR measurement. When the reported SAR is <= 0.8 W/kg, no further SAR testing is required. Otherwise, SAR is evaluated at the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel. For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and it is <= 1.2 W/kg.

c) For WLAN 5 GHz, the initial test configuration was selected according to the transmission mode with the highest maximum output power. When the reported SAR of initial test configuration is > 0.8 W/kg, SAR is required for the subsequent highest measured output power channel until the reported SAR result is <= 1.2 W/kg or all required channels are measured. For other transmission modes, SAR is not required when the highest reported SAR for initial test configuration is adjusted by the ratio of subsequent test configuration to initial test configuration specified maximum output power and it is <= 1.2 W/kg.

d) For WLAN MIMO mode, the power-based standalone SAR test exclusion or the sum of SAR provision in KDB 447498 to determine simultaneous transmission SAR test exclusion should be applied. Otherwise, SAR for MIMO mode will be measured with all applicable antennas transmitting simultaneously at the specified maximum output power of MIMO operation.

4.5.2. SAR Results for Head Exposure Condition

Plot No.	Band	Mode	Test Position	Channel	RB#	RB Offset	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)	Note
1	WCDMA Band II	RMC12.2K	Right Cheek	9538	-	-	22.5	22.00	-0.07	0.177	1.12	0.199	--
	WCDMA Band II	RMC12.2K	Right Tilted	9538	-	-	22.5	22.00	-0.01	0.142	1.12	0.159	--
	WCDMA Band II	RMC12.2K	Left Cheek	9538	-	-	22.5	22.00	0.03	0.133	1.12	0.149	--
	WCDMA Band II	RMC12.2K	Left Tilted	9538	-	-	22.5	22.00	0.03	0.109	1.12	0.122	--
2	WCDMA Band IV	RMC12.2K	Right Cheek	1312	-	-	22.0	21.74	-0.14	0.323	1.06	0.343	--
	WCDMA Band IV	RMC12.2K	Right Tilted	1312	-	-	22.0	21.74	0.06	0.259	1.06	0.275	--
	WCDMA Band IV	RMC12.2K	Left Cheek	1312	-	-	22.0	21.74	-0.02	0.168	1.06	0.178	--
	WCDMA Band IV	RMC12.2K	Left Tilted	1312	-	-	22.0	21.74	-0.02	0.138	1.06	0.147	--
3	WCDMA Band V	RMC12.2K	Right Cheek	4132	-	-	22.5	22.17	0.04	0.297	1.08	0.320	--
	WCDMA Band V	RMC12.2K	Right Tilted	4132	-	-	22.5	22.17	0.03	0.238	1.08	0.257	--
	WCDMA Band V	RMC12.2K	Left Cheek	4132	-	-	22.5	22.17	-0.08	0.21	1.08	0.227	--
	WCDMA Band V	RMC12.2K	Left Tilted	4132	-	-	22.5	22.17	-0.07	0.173	1.08	0.187	--
4	LTE Band 12	QPSK10M	Right Cheek	23095	1	25	23.0	22.28	-0.11	0.152	1.18	0.179	--
	LTE Band 12	QPSK10M	Right Tilted	23095	1	25	23.0	22.28	-0.04	0.118	1.18	0.139	--
	LTE Band 12	QPSK10M	Left Cheek	23095	1	25	23.0	22.28	0.08	0.126	1.18	0.149	--
	LTE Band 12	QPSK10M	Left Tilted	23095	1	25	23.0	22.28	0.04	0.087	1.18	0.103	--
	LTE Band 12	QPSK10M	Right Cheek	23095	25	0	21.5	21.13	-0.10	0.133	1.09	0.145	--
	LTE Band 12	QPSK10M	Right Tilted	23095	25	0	21.5	21.13	-0.04	0.105	1.09	0.114	--
	LTE Band 12	QPSK10M	Left Cheek	23095	25	0	21.5	21.13	0.07	0.12	1.09	0.131	--
	LTE Band 12	QPSK10M	Left Tilted	23095	25	0	21.5	21.13	0.04	0.072	1.09	0.078	
5	LTE Band 13	QPSK10M	Right Cheek	23230	1	49	22.5	22.18	-0.10	0.184	1.08	0.198	--
	LTE Band 13	QPSK10M	Right Tilted	23230	1	49	22.5	22.18	-0.06	0.143	1.08	0.154	--
	LTE Band 13	QPSK10M	Left Cheek	23230	1	49	22.5	22.18	-0.05	0.164	1.08	0.177	--
	LTE Band 13	QPSK10M	Left Tilted	23230	1	49	22.5	22.18	0.03	0.117	1.08	0.126	--
	LTE Band 13	QPSK10M	Right Cheek	23230	25	25	21.5	21.18	-0.05	0.162	1.08	0.174	--
	LTE Band 13	QPSK10M	Right Tilted	23230	25	25	21.5	21.18	-0.01	0.12	1.08	0.129	--
	LTE Band 13	QPSK10M	Left Cheek	23230	25	25	21.5	21.18	-0.02	0.144	1.08	0.155	--

	LTE Band 13	QPSK10M	Left Tilted	23230	25	25	21.5	21.18	0.01	0.091	1.08	0.098	--
6	LTE Band 25	QPSK20M	Right Cheek	26590	1	49	23.5	22.92	-0.13	0.161	1.14	**0.184**	--
	LTE Band 25	QPSK20M	Right Tilted	26590	1	49	23.5	22.92	0.06	0.129	1.14	0.147	--
	LTE Band 25	QPSK20M	Left Cheek	26590	1	49	23.5	22.92	-0.18	0.148	1.14	0.169	--
	LTE Band 25	QPSK20M	Left Tilted	26590	1	49	23.5	22.92	-0.15	0.113	1.14	0.129	--
	LTE Band 25	QPSK20M	Right Cheek	26365	50	0	22.5	21.88	-0.08	0.138	1.15	0.159	--
	LTE Band 25	QPSK20M	Right Tilted	26365	50	0	22.5	21.88	0.03	0.09	1.15	0.104	--
	LTE Band 25	QPSK20M	Left Cheek	26365	50	0	22.5	21.88	-0.11	0.122	1.15	0.141	--
	LTE Band 25	QPSK20M	Left Tilted	26365	50	0	22.5	21.88	-0.09	0.086	1.15	0.099	--
7	LTE Band 26	QPSK15M	Right Cheek	26765	1	37	23.0	22.60	0.07	0.182	1.10	**0.200**	--
	LTE Band 26	QPSK15M	Right Tilted	26765	1	37	23.0	22.60	0.02	0.144	1.10	0.158	--
	LTE Band 26	QPSK15M	Left Cheek	26765	1	37	23.0	22.60	-0.05	0.17	1.10	0.186	--
	LTE Band 26	QPSK15M	Left Tilted	26765	1	37	23.0	22.60	-0.03	0.126	1.10	0.138	--
	LTE Band 26	QPSK15M	Right Cheek	26965	36	0	22.0	21.71	-0.04	0.164	1.07	0.175	--
	LTE Band 26	QPSK15M	Right Tilted	26965	36	0	22.0	21.71	-0.01	0.128	1.07	0.137	--
	LTE Band 26	QPSK15M	Left Cheek	26965	36	0	22.0	21.71	0.03	0.158	1.07	0.169	--
	LTE Band 26	QPSK15M	Left Tilted	26965	36	0	22.0	21.71	0.02	0.104	1.07	0.111	--
8	LTE Band 41	QPSK20M	Right Cheek	41490	1	50	23.0	22.69	-0.13	0.091	1.07	**0.098**	--
	LTE Band 41	QPSK20M	Right Tilted	41490	1	50	23.0	22.69	0.06	0.073	1.07	0.078	--
	LTE Band 41	QPSK20M	Left Cheek	41490	1	50	23.0	22.69	-0.18	0.084	1.07	0.090	--
	LTE Band 41	QPSK20M	Left Tilted	41490	1	50	23.0	22.69	-0.15	0.057	1.07	0.061	--
	LTE Band 41	QPSK20M	Right Cheek	41490	50	50	22.0	21.41	-0.05	0.075	1.15	0.086	--
	LTE Band 41	QPSK20M	Right Tilted	41490	50	50	22.0	21.41	0.02	0.06	1.15	0.069	--
	LTE Band 41	QPSK20M	Left Cheek	41490	50	50	22.0	21.41	-0.07	0.066	1.15	0.076	--
	LTE Band 41	QPSK20M	Left Tilted	41490	50	50	22.0	21.41	-0.06	0.038	1.15	0.044	--
9	LTE Band 66	QPSK20M	Right Cheek	132322	1	50	22.5	22.11	-0.08	0.253	1.09	**0.277**	--
	LTE Band 66	QPSK20M	Right Tilted	132322	1	50	22.5	22.11	-0.03	0.164	1.09	0.179	--
	LTE Band 66	QPSK20M	Left Cheek	132322	1	50	22.5	22.11	0.06	0.228	1.09	0.249	--
	LTE Band 66	QPSK20M	Left Tilted	132322	1	50	22.5	22.11	0.03	0.127	1.09	0.139	--
	LTE Band 66	QPSK20M	Right Cheek	132072	50	0	21.5	20.84	-0.07	0.2	1.16	0.233	--
	LTE Band 66	QPSK20M	Right Tilted	132072	50	0	21.5	20.84	-0.02	0.11	1.16	0.128	--
	LTE Band 66	QPSK20M	Left Cheek	132072	50	0	21.5	20.84	0.05	0.164	1.16	0.191	--

	LTE Band 66	QPSK20M	Left Tilted	132072	50	0	21.5	20.84	0.03	0.083	1.16	0.097	--
10	LTE Band 71	QPSK20M	Right Cheek	133322	1	49	23.0	22.57	-0.18	0.159	1.10	**0.176**	--
	LTE Band 71	QPSK20M	Right Tilted	133322	1	49	23.0	22.57	0.08	0.117	1.10	0.129	--
	LTE Band 71	QPSK20M	Left Cheek	133322	1	49	23.0	22.57	-0.06	0.126	1.10	0.139	--
	LTE Band 71	QPSK20M	Left Tilted	133322	1	49	23.0	22.57	0.11	0.083	1.10	0.092	--
	LTE Band 71	QPSK20M	Right Cheek	133322	50	0	22.0	21.57	-0.04	0.151	1.10	0.167	--
	LTE Band 71	QPSK20M	Right Tilted	133322	50	0	22.0	21.57	-0.01	0.102	1.10	0.113	--
	LTE Band 71	QPSK20M	Left Cheek	133322	50	0	22.0	21.57	0.19	0.12	1.10	0.132	--
	LTE Band 71	QPSK20M	Left Tilted	133322	50	0	22.0	21.57	0.15	0.076	1.10	0.084	--
11	2.4GHz_Wi-Fi	IEEE 802.11b	Right Cheek	11	-	-	15.0	13.87	-0.07	0.316	1.30	**0.410**	--
	2.4GHz_Wi-Fi	IEEE 802.11b	Right Tilted	11	-	-	15.0	13.87	0.02	0.253	1.30	0.328	--
	2.4GHz_Wi-Fi	IEEE 802.11b	Left Cheek	11	-	-	15.0	13.87	-0.04	0.245	1.30	0.318	--
	2.4GHz_Wi-Fi	IEEE 802.11b	Left Tilted	11	-	-	15.0	13.87	-0.03	0.202	1.30	0.262	--
	5.2GHz_Wi-Fi	IEEE 802.11a	Right Cheek	36	-	-	10.0	9.46	0.02	0.42	1.13	0.476	--
	5.2GHz_Wi-Fi	IEEE 802.11a	Right Tilted	36	-	-	10.0	9.46	-0.03	0.352	1.13	0.399	--
12	5.2GHz_Wi-Fi	IEEE 802.11a	Left Cheek	36	-	-	10.0	9.46	-0.04	0.433	1.13	**0.490**	--
	5.2GHz_Wi-Fi	IEEE 802.11a	Left Tilted	36	-	-	10.0	9.46	0.05	0.387	1.13	0.438	--
	5.3GHz_Wi-Fi	IEEE 802.11a	Right Cheek	52	-	-	10.0	9.58	0.05	0.486	1.10	0.535	--
	5.3GHz_Wi-Fi	IEEE 802.11a	Right Tilted	52	-	-	10.0	9.58	-0.07	0.395	1.10	0.435	--
13	5.3GHz_Wi-Fi	IEEE 802.11a	Left Cheek	52	-	-	10.0	9.58	-0.10	0.507	1.10	**0.558**	--
	5.3GHz_Wi-Fi	IEEE 802.11a	Left Tilted	52	-	-	10.0	9.58	0.14	0.418	1.10	0.460	--
	5.6GHz_Wi-Fi	IEEE 802.11a	Right Cheek	120	-	-	8.5	8.16	0.04	0.354	1.08	0.383	--
	5.6GHz_Wi-Fi	IEEE 802.11a	Right Tilted	120	-	-	8.5	8.16	-0.06	0.215	1.08	0.233	--
14	5.6GHz_Wi-Fi	IEEE 802.11a	Left Cheek	120	-	-	8.5	8.16	-0.08	0.377	1.08	**0.408**	--
	5.6GHz_Wi-Fi	IEEE 802.11a	Left Tilted	120	-	-	8.5	8.16	0.11	0.231	1.08	0.250	--
	5.8GHz_Wi-Fi	IEEE 802.11a	Right Cheek	165	-	-	9.5	9.05	0.02	0.369	1.11	0.409	--
	5.8GHz_Wi-Fi	IEEE 802.11a	Right Tilted	165	-	-	9.5	9.05	-0.03	0.288	1.11	0.319	--
15	5.8GHz_Wi-Fi	IEEE 802.11a	Left Cheek	165	-	-	9.5	9.05	-0.04	0.395	1.11	**0.438**	--
	5.8GHz_Wi-Fi	IEEE 802.11a	Left Tilted	165	-	-	9.5	9.05	0.05	0.317	1.11	0.352	--

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

Plot No.	Band	Mode	Test Position	Channel	RB#	RB Offset	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)	Note
16	WCDMA Band II	RMC12.2K	Front Face	9538	-	-	22.5	22.00	-0.17	0.61	1.12	**0.684**	--
	WCDMA Band II	RMC12.2K	Rear Face	9538	-	-	22.5	22.00	-0.08	0.593	1.12	0.665	--
17	WCDMA Band IV	RMC12.2K	Front Face	1312	-	-	22.0	21.74	-0.09	0.786	1.06	**0.834**	--
	WCDMA Band IV	RMC12.2K	Rear Face	1312	-	-	22.0	21.74	0.03	0.559	1.06	0.593	--
	WCDMA Band IV	RMC12.2K	Front Face	1413	-	-	22.0	21.67	0.13	0.748	1.08	0.807	--
	WCDMA Band IV	RMC12.2K	Front Face	1513	-	-	22.0	21.63	-0.02	0.726	1.09	0.791	--
	WCDMA Band V	RMC12.2K	Front Face	4132	-	-	22.5	22.17	0.02	0.258	1.08	0.278	--
18	WCDMA Band V	RMC12.2K	Rear Face	4132	-	-	22.5	22.17	-0.04	0.391	1.08	**0.422**	--
	LTE Band 12	QPSK10M	Front Face	23095	1	25	23.0	22.28	0.03	0.215	1.18	0.254	--
19	LTE Band 12	QPSK10M	Rear Face	23095	1	25	23.0	22.28	-0.08	0.302	1.18	**0.356**	--
	LTE Band 12	QPSK10M	Front Face	23095	25	0	21.5	21.13	0.04	0.181	1.09	0.197	--
	LTE Band 12	QPSK10M	Rear Face	23095	25	0	21.5	21.13	-0.10	0.255	1.09	0.278	--
	LTE Band 13	QPSK10M	Front Face	23230	1	49	22.5	22.18	0.02	0.197	1.08	0.212	--
20	LTE Band 13	QPSK10M	Rear Face	23230	1	49	22.5	22.18	-0.04	0.277	1.08	**0.298**	--
	LTE Band 13	QPSK10M	Front Face	23230	25	25	21.5	21.20	0.02	0.152	1.07	0.163	--
	LTE Band 13	QPSK10M	Rear Face	23230	25	25	21.5	21.20	-0.06	0.213	1.07	0.228	--
21	LTE Band 25	QPSK20M	Front Face	26590	1	49	23.5	22.92	-0.07	0.524	1.14	**0.599**	--
	LTE Band 25	QPSK20M	Rear Face	26590	1	49	23.5	22.92	0.03	0.373	1.14	0.426	--
	LTE Band 25	QPSK20M	Front Face	26365	50	0	22.5	21.88	-0.04	0.488	1.15	0.563	--
	LTE Band 25	QPSK20M	Rear Face	26365	50	0	22.5	21.88	0.02	0.347	1.15	0.400	--
	LTE Band 26	QPSK15M	Front Face	26765	1	37	23.0	22.60	-0.03	0.209	1.10	0.229	--
22	LTE Band 26	QPSK15M	Rear Face	26765	1	37	23.0	22.60	0.09	0.293	1.10	**0.321**	--
	LTE Band 26	QPSK15M	Front Face	26965	36	0	22.0	21.71	-0.01	0.172	1.07	0.184	--
	LTE Band 26	QPSK15M	Rear Face	26965	36	0	22.0	21.71	0.03	0.241	1.07	0.258	--
	LTE Band 41	QPSK20M	Front Face	41490	1	50	23.0	22.69	0.03	0.446	1.07	0.479	--

23	LTE Band 41	QPSK20M	Rear Face	41490	1	50	23.0	22.69	-0.07	0.509	1.07	**0.547**	--
	LTE Band 41	QPSK20M	Front Face	41490	50	50	22.0	21.41	0.04	0.374	1.15	0.428	--
	LTE Band 41	QPSK20M	Rear Face	41490	50	50	22.0	21.41	-0.10	0.455	1.15	0.521	--
	LTE Band 66	QPSK20M	Front Face	132072	1	50	22.5	22.04	-0.03	0.766	1.11	0.852	--
24	LTE Band 66	QPSK20M	Front Face	132322	1	50	22.5	22.11	-0.15	0.783	1.09	**0.857**	--
	LTE Band 66	QPSK20M	Front Face	132572	1	50	22.5	21.84	0.14	0.729	1.16	0.849	--
	LTE Band 66	QPSK20M	Rear Face	132072	1	50	22.5	22.04	-0.05	0.75	1.11	0.834	--
	LTE Band 66	QPSK20M	Rear Face	132322	1	50	22.5	22.11	0.06	0.769	1.09	0.841	--
	LTE Band 66	QPSK20M	Rear Face	132572	1	50	22.5	21.84	0.11	0.713	1.16	0.830	--
	LTE Band 66	QPSK20M	Front Face	132072	50	0	21.5	20.84	-0.10	0.705	1.16	0.821	--
	LTE Band 66	QPSK20M	Rear Face	132072	50	0	21.5	20.84	0.04	0.662	1.16	0.771	--
	LTE Band 71	QPSK20M	Front Face	133322	1	49	23.0	22.57	0.04	0.189	1.10	0.209	--
25	LTE Band 71	QPSK20M	Rear Face	133322	1	49	23.0	22.57	0.12	0.341	1.10	**0.376**	--
	LTE Band 71	QPSK20M	Front Face	133322	50	0	22.0	21.57	-0.13	0.155	1.10	0.171	--
	LTE Band 71	QPSK20M	Rear Face	133322	50	0	22.0	21.57	0.05	0.323	1.10	0.357	--
	2.4GHz_Wi-Fi	IEEE 802.11b	Front Face	11	-	-	15.0	13.87	-0.10	0.177	1.30	0.230	--
26	2.4GHz_Wi-Fi	IEEE 802.11b	Rear Face	11	-	-	15.0	13.87	-0.14	0.207	1.30	**0.269**	--
	5.2GHz_Wi-Fi	IEEE 802.11a	Front Face	36	-	-	10.0	9.46	-0.02	0.324	1.13	0.367	--
27	5.2GHz_Wi-Fi	IEEE 802.11a	Rear Face	36	-	-	10.0	9.46	-0.07	0.362	1.13	**0.410**	--
	5.3GHz_Wi-Fi	IEEE 802.11a	Front Face	52	-	-	10.0	9.58	-0.09	0.312	1.10	0.344	--
28	5.3GHz_Wi-Fi	IEEE 802.11a	Rear Face	52	-	-	10.0	9.58	-0.05	0.388	1.10	**0.427**	--
	5.6GHz_Wi-Fi	IEEE 802.11a	Front Face	120	-	-	8.5	8.16	-0.13	0.255	1.08	0.276	--
29	5.6GHz_Wi-Fi	IEEE 802.11a	Rear Face	120	-	-	8.5	8.16	-0.07	0.319	1.08	**0.345**	--
	5.8GHz_Wi-Fi	IEEE 802.11a	Front Face	165	-	-	9.5	9.05	-0.06	0.284	1.11	0.315	--
30	5.8GHz_Wi-Fi	IEEE 802.11a	Rear Face	165	-	-	9.5	9.05	-0.11	0.331	1.11	**0.367**	--

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

Plot No.	Band	Mode	Test Position	Channel	RB#	RB Offset	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)	Note
	WCDMA Band II	RMC12.2K	Front Face	9538	-	-	22.5	22.00	-0.17	0.61	1.12	0.684	--
	WCDMA Band II	RMC12.2K	Rear Face	9538	-	-	22.5	22.00	-0.08	0.593	1.12	0.665	--
	WCDMA Band II	RMC12.2K	Left Side	9538	-	-	22.5	22.00	0.05	0.529	1.12	0.594	--
	WCDMA Band II	RMC12.2K	Bottom Side	9262	-	-	22.5	21.89	-0.07	0.778	1.15	0.895	--
	WCDMA Band II	RMC12.2K	Bottom Side	9400	-	-	22.5	21.93	0.05	0.793	1.14	0.904	--
31	WCDMA Band II	RMC12.2K	Bottom Side	9538	-	-	22.5	22.00	0.01	0.817	1.12	**0.917**	--
	WCDMA Band IV	RMC12.2K	Front Face	1312	-	-	22.0	21.74	-0.09	0.786	1.06	0.834	--
	WCDMA Band IV	RMC12.2K	Front Face	1413	-	-	22.0	21.67	0.13	0.748	1.08	0.807	--
	WCDMA Band IV	RMC12.2K	Front Face	1513	-	-	22.0	21.63	-0.02	0.726	1.09	0.791	--
	WCDMA Band IV	RMC12.2K	Rear Face	1312	-	-	22.0	21.74	0.03	0.559	1.06	0.593	--
	WCDMA Band IV	RMC12.2K	Left Side	1312	-	-	22.0	21.74	0.05	0.484	1.06	0.514	--
32	WCDMA Band IV	RMC12.2K	Bottom Side	1312	-	-	22.0	21.74	-0.03	1.01	1.06	**1.072**	--
	WCDMA Band IV	RMC12.2K	Bottom Side	1413	-	-	22.0	21.67	0.11	0.983	1.08	1.061	--
	WCDMA Band IV	RMC12.2K	Bottom Side	1513	-	-	22.0	21.63	0.09	0.969	1.09	1.055	--
	WCDMA Band V	RMC12.2K	Front Face		-	-	22.5	22.17	0.02	0.258	1.08	0.278	--
33	WCDMA Band V	RMC12.2K	Rear Face		-	-	22.5	22.17	-0.04	0.391	1.08	**0.422**	--
	WCDMA Band V	RMC12.2K	Left Side		-	-	22.5	22.06	0.02	0.219	1.11	0.242	--
	WCDMA Band V	RMC12.2K	Bottom Side		-	-	22.5	22.06	-0.05	0.221	1.11	0.245	--
	LTE Band 12	QPSK10M	Front Face	23095	1	25	23.0	22.28	0.03	0.215	1.18	0.254	--
34	LTE Band 12	QPSK10M	Rear Face	23095	1	25	23.0	22.28	-0.08	0.302	1.18	**0.356**	--
	LTE Band 12	QPSK10M	Left Side	23095	1	25	23.0	22.28	0.05	0.162	1.18	0.191	--
	LTE Band 12	QPSK10M	Bottom Side	23095	1	25	23.0	22.28	-0.06	0.186	1.18	0.220	--
	LTE Band 12	QPSK10M	Front Face	23095	25	0	21.5	21.13	0.04	0.181	1.09	0.197	--
	LTE Band 12	QPSK10M	Rear Face	23095	25	0	21.5	21.13	-0.10	0.255	1.09	0.278	--
	LTE Band 12	QPSK10M	Left Side	23095	25	0	21.5	21.13	0.06	0.154	1.09	0.168	--
	LTE Band 12	QPSK10M	Bottom Side	23095	25	0	21.5	21.13	-0.04	0.174	1.09	0.189	--
	LTE Band 13	QPSK10M	Front Face	23230	1	49	22.5	22.18	0.02	0.197	1.08	0.212	--
35	LTE Band 13	QPSK10M	Rear Face	23230	1	49	22.5	22.18	-0.04	0.277	1.08	**0.298**	--

	LTE Band 13	QPSK10M	Left Side	23230	1	49	22.5	22.18	-0.01	0.144	1.08	0.155	--
	LTE Band 13	QPSK10M	Bottom Side	23230	1	49	22.5	22.18	-0.10	0.163	1.08	0.175	--
	LTE Band 13	QPSK10M	Front Face	23230	25	25	21.5	21.18	0.02	0.152	1.08	0.164	--
	LTE Band 13	QPSK10M	Rear Face	23230	25	25	21.5	21.18	-0.06	0.213	1.08	0.229	--
	LTE Band 13	QPSK10M	Left Side	23230	25	25	21.5	21.18	-0.01	0.117	1.08	0.126	--
	LTE Band 13	QPSK10M	Bottom Side	23230	25	25	21.5	21.18	0.01	0.141	1.08	0.152	--
	LTE Band 25	QPSK20M	Front Face	26590	1	49	23.5	22.92	-0.07	0.524	1.14	0.599	--
	LTE Band 25	QPSK20M	Rear Face	26590	1	49	23.5	22.92	0.03	0.373	1.14	0.426	--
	LTE Band 25	QPSK20M	Left Side	26590	1	49	23.5	22.92	-0.02	0.23	1.14	0.263	--
36	LTE Band 25	QPSK20M	Bottom Side	26590	1	49	23.5	22.92	0.13	0.783	1.14	**0.895**	--
	LTE Band 25	QPSK20M	Front Face	26365	50	0	22.5	21.88	-0.04	0.488	1.15	0.563	--
	LTE Band 25	QPSK20M	Rear Face	26365	50	0	22.5	21.88	0.02	0.347	1.15	0.400	--
	LTE Band 25	QPSK20M	Left Side	26365	50	0	22.5	21.88	-0.01	0.214	1.15	0.247	--
	LTE Band 25	QPSK20M	Bottom Side	26365	50	0	22.5	21.88	0.01	0.738	1.15	0.851	--
	LTE Band 26	QPSK15M	Front Face	26765	1	37	23.0	22.60	-0.03	0.209	1.10	0.229	--
37	LTE Band 26	QPSK15M	Rear Face	26765	1	37	23.0	22.60	0.09	0.293	1.10	**0.321**	--
	LTE Band 26	QPSK15M	Left Side	26765	1	37	23.0	22.60	-0.05	0.154	1.10	0.169	--
	LTE Band 26	QPSK15M	Bottom Side	26765	1	37	23.0	22.60	0.09	0.176	1.10	0.193	--
	LTE Band 26	QPSK15M	Front Face	26965	36	0	22.0	21.71	-0.01	0.172	1.07	0.184	--
	LTE Band 26	QPSK15M	Rear Face	26965	36	0	22.0	21.71	0.03	0.241	1.07	0.258	--
	LTE Band 26	QPSK15M	Left Side	26965	36	0	22.0	21.71	0.01	0.126	1.07	0.135	--
	LTE Band 26	QPSK15M	Bottom Side	26965	36	0	22.0	21.71	0.07	0.159	1.07	0.170	--
	LTE Band 41	QPSK20M	Front Face	41490	1	50	23.0	22.69	0.03	0.446	1.07	0.479	--
	LTE Band 41	QPSK20M	Rear Face	41490	1	50	23.0	22.69	-0.07	0.509	1.07	0.547	--
	LTE Band 41	QPSK20M	Left Side	41490	1	50	23.0	22.69	0.04	0.274	1.07	0.294	--
38	LTE Band 41	QPSK20M	Bottom Side	41490	1	50	23.0	22.69	-0.12	0.57	1.07	**0.612**	--
	LTE Band 41	QPSK20M	Front Face	41490	50	50	22.0	21.41	0.04	0.374	1.15	0.428	--
	LTE Band 41	QPSK20M	Rear Face	41490	50	50	22.0	21.41	-0.10	0.455	1.15	0.521	--
	LTE Band 41	QPSK20M	Left Side	41490	50	50	22.0	21.41	0.06	0.248	1.15	0.284	--
	LTE Band 41	QPSK20M	Bottom Side	41490	50	50	22.0	21.41	-0.04	0.523	1.15	0.599	--
	LTE Band 66	QPSK20M	Front Face	132072	1	50	22.5	22.04	-0.03	0.766	1.11	0.852	--
	LTE Band 66	QPSK20M	Front Face	132322	1	50	22.5	22.11	-0.15	0.783	1.09	0.857	--

	LTE Band 66	QPSK20M	Front Face	132572	1	50	22.5	21.84	0.14	0.729	1.16	0.849	--
	LTE Band 66	QPSK20M	Rear Face	132072	1	50	22.5	22.04	-0.05	0.75	1.11	0.834	--
	LTE Band 66	QPSK20M	Rear Face	132322	1	50	22.5	22.11	0.06	0.769	1.09	0.841	--
	LTE Band 66	QPSK20M	Rear Face	132572	1	50	22.5	21.84	0.11	0.713	1.16	0.830	--
	LTE Band 66	QPSK20M	Left Side	132322	1	50	22.5	22.11	-0.03	0.413	1.09	0.452	--
	LTE Band 66	QPSK20M	Bottom Side	132072	1	50	22.5	22.04	0.13	0.924	1.11	1.027	--
	LTE Band 66	QPSK20M	Bottom Side	132322	1	50	22.5	22.11	-0.08	0.951	1.09	1.040	--
	LTE Band 66	QPSK20M	Bottom Side	132572	1	50	22.5	21.84	-0.05	0.886	1.16	1.031	--
	LTE Band 66	QPSK20M	Front Face	132072	50	0	21.5	20.84	-0.10	0.705	1.16	0.821	--
	LTE Band 66	QPSK20M	Rear Face	132072	50	0	21.5	20.84	0.04	0.662	1.16	0.771	--
	LTE Band 66	QPSK20M	Left Side	132072	50	0	21.5	20.84	-0.02	0.386	1.16	0.449	--
39	LTE Band 66	QPSK20M	Bottom Side	132072	50	0	21.5	20.84	0.01	0.93	1.16	**1.083**	--
	LTE Band 66	QPSK20M	Bottom Side	132322	50	0	21.5	20.83	0.17	0.907	1.17	1.058	--
	LTE Band 66	QPSK20M	Bottom Side	132572	50	0	21.5	20.75	0.06	0.896	1.19	1.065	--
	LTE Band 66	QPSK20M	Bottom Side	132072	100	0	21.5	20.71	-0.08	0.882	1.20	1.058	--
	LTE Band 66	QPSK20M	Bottom Side	132322	100	0	21.5	20.79	0.01	0.918	1.18	1.081	--
	LTE Band 66	QPSK20M	Bottom Side	132572	100	0	21.5	20.72	0.11	0.857	1.20	1.026	--
	LTE Band 71	QPSK20M	Front Face	133322	1	49	23.0	22.57	0.04	0.189	1.10	0.209	--
40	LTE Band 71	QPSK20M	Rear Face	133322	1	49	23.0	22.57	0.12	0.341	1.10	**0.376**	--
	LTE Band 71	QPSK20M	Left Side	133322	1	49	23.0	22.57	0.18	0.074	1.10	0.082	--
	LTE Band 71	QPSK20M	Bottom Side	133322	1	49	23.0	22.57	-0.12	0.081	1.10	0.089	--
	LTE Band 71	QPSK20M	Front Face	133322	50	0	22.0	21.57	-0.13	0.155	1.10	0.171	--
	LTE Band 71	QPSK20M	Rear Face	133322	50	0	22.0	21.57	0.05	0.323	1.10	0.357	--
	LTE Band 71	QPSK20M	Left Side	133322	50	0	22.0	21.57	-0.11	0.068	1.10	0.075	--
	LTE Band 71	QPSK20M	Bottom Side	133322	50	0	22.0	21.57	-0.03	0.077	1.10	0.085	--
	2.4GHz_Wi-Fi	IEEE 802.11b	Front Face	11	-	-	15.0	13.87	-0.10	0.177	1.30	0.230	--
	2.4GHz_Wi-Fi	IEEE 802.11b	Rear Face	11	-	-	15.0	13.87	-0.14	0.207	1.30	0.269	--
	2.4GHz_Wi-Fi	IEEE 802.11b	Right Side	11	-	-	15.0	13.87	0.08	0.127	1.30	0.165	--
41	2.4GHz_Wi-Fi	IEEE 802.11b	Top Side	11	-	-	15.0	13.87	0.07	0.287	1.30	**0.372**	--
	5.2GHz_Wi-Fi	IEEE 802.11a	Front Face	36	-	-	10.0	9.46	-0.02	0.324	1.13	0.367	--
	5.2GHz_Wi-Fi	IEEE 802.11a	Rear Face	36	-	-	10.0	9.46	-0.07	0.362	1.13	0.410	--
	5.2GHz_Wi-Fi	IEEE 802.11a	Right Side	36	-	-	10.0	9.46	0.04	0.223	1.13	0.253	--
42	5.2GHz_Wi-Fi	IEEE 802.11a	Top Side	36	-	-	10.0	9.46	-0.14	0.592	1.13	**0.670**	--

	5.3GHz_Wi-Fi	IEEE 802.11a	Front Face	52	-	-	10.0	9.58	-0.09	0.312	1.10	0.344	--
	5.3GHz_Wi-Fi	IEEE 802.11a	Rear Face	52	-	-	10.0	9.58	-0.05	0.388	1.10	0.427	--
	5.3GHz_Wi-Fi	IEEE 802.11a	Right Side	52	-	-	10.0	9.58	0.03	0.239	1.10	0.263	--
43	5.3GHz_Wi-Fi	IEEE 802.11a	Top Side	52	-	-	10.0	9.58	-0.06	0.411	1.10	**0.453**	--
	5.6GHz_Wi-Fi	IEEE 802.11a	Front Face	120	-	-	8.5	8.16	-0.13	0.255	1.08	0.276	--
	5.6GHz_Wi-Fi	IEEE 802.11a	Rear Face	120	-	-	8.5	8.16	-0.07	0.319	1.08	0.345	--
	5.6GHz_Wi-Fi	IEEE 802.11a	Right Side	120	-	-	8.5	8.16	0.04	0.196	1.08	0.212	--
44	5.6GHz_Wi-Fi	IEEE 802.11a	Top Side	120	-	-	8.5	8.16	-0.09	0.362	1.08	**0.391**	--
	5.8GHz_Wi-Fi	IEEE 802.11a	Front Face	165	-	-	9.5	9.05	-0.06	0.284	1.11	0.315	--
	5.8GHz_Wi-Fi	IEEE 802.11a	Rear Face	165	-	-	9.5	9.05	-0.11	0.331	1.11	0.367	--
	5.8GHz_Wi-Fi	IEEE 802.11a	Right Side	165	-	-	9.5	9.05	0.06	0.204	1.11	0.226	--
45	5.8GHz_Wi-Fi	IEEE 802.11a	Top Side	165	-	-	9.5	9.05	-0.12	0.389	1.11	**0.431**	--

4.6. SAR MEASUREMENT VARIABILITY

4.6.1. Repeated Measurement

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

SAR repeated measurement procedure:

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

Band	Mode	Test Position	Channel	Original Measured SAR-1g (W/kg)	1st Repeated SAR-1g (W/kg)	L/S Ratio	2nd Repeated SAR-1g (W/kg)	L/S Ratio	3rd Repeated SAR-1g (W/kg)	L/S Ratio
Head Exposure Condition										
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Body-worn Exposure Condition										
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hotspot Exposure Condition										
WCDMA Band II	RMC12.2K	Bottom Side	9538	0.871	0.803	1.017	N/A	N/A	N/A	N/A
WCDMA Band IV	RMC12.2K	Bottom Side	1312	1.010	0.979	1.031	N/A	N/A	N/A	N/A
LTE Band 66	QPSK20M	Bottom Side	132322	0.951	0.926	1.027	N/A	N/A	N/A	N/A

4.6.2. DUT Holder Perturbations

Depending on antenna locations, buttons locations on phones or device, form factor (e.g. dongles etc.), the measured SAR could be influenced by the relative positions of the test device and its holder.

When the highest reported SAR of an antenna is > 1.2 W/kg, holder perturbation verification is required, using the highest SAR configuration among all applicable frequency bands with and without the device holder.

All the measured SAR are less than 1.2 W/kg, so the holder perturbation verification is not required.

4.7. SIMULTANEOUS MULTI-BAND TRANSMISSION EVALUATION

4.7.1. Simultaneous Transmission SAR Test Exclusion Considerations

a) Sum of SAR

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of SAR1g of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR1g 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR1g is greater than the SAR limit (SAR1g 1.6 W/kg), SAR test exclusion is determined by the SPLSR.

b) SAR to Peak Location Separation Ratio

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

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

The ratio is rounded to two decimal digits, and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion. When 10-g SAR applies, the ratio must be ≤ 0.10.
SAR_1 and SAR_2 are the highest reported or estimated SAR values for each antenna in the pair, and R_i is the separation distance in mm between the peak SAR locations for the antenna pair

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

Where $(x_1,\ y_1,\ z_1)$ and $(x_2,\ y_2,\ z_2)$ are the coordinates of the extrapolated peak SAR locations in the area or zoom scans.
When standalone test exclusion applies, SAR is estimated; the peak location is assumed to be at the feed-point or geometric center of the antenna. Due to curvatures on the SAM phantom, when SAR is estimated for one of the antennas in an antenna pair, the measured peak SAR location will be translated onto the test device to determine the peak location separation for the antenna pair.
When SAR is estimated for both antennas, the peak location separation should be determined by the closest physical separation of the antennas, according to the feed-point or geometric center of the antennas.

c) Volume Scan

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

4.7.2. Simultaneous Transmission Possibilities

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

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

Note:

1) The 2.4G WLAN and 5G WLAN cannot transmit simultaneously.
2) The WLAN and Bluetooth cannot transmit simultaneously, so there is no co-location test requirement for WLAN and Bluetooth.

4.7.3. Max. Standalone SAR

Position		LTE Band SAR-1g(W/kg)							WCDMA SAR-1g(W/kg)		
		25(2)	26(5)	12	13	41	66(4)	71	II	IV	V
Head	Right Cheek	0.184	0.2	0.179	0.198	0.098	0.277	0.176	0.199	0.343	0.32
	Right Tilted	0.147	0.158	0.139	0.154	0.078	0.179	0.129	0.159	0.275	0.257
	Left Cheek	0.169	0.186	0.149	0.177	0.09	0.249	0.139	0.149	0.178	0.227
	Left Tilted	0.129	0.138	0.103	0.126	0.061	0.139	0.092	0.122	0.147	0.187
Body-worn	Front Face	0.599	0.229	0.254	0.212	0.479	0.857	0.209	0.684	0.834	0.278
	Rear Face	0.426	0.321	0.356	0.298	0.547	0.841	0.376	0.665	0.593	0.422
Hotspot	Front Face	0.599	0.229	0.254	0.212	0.479	0.857	0.209	0.684	0.834	0.278
	Rear Face	0.426	0.321	0.356	0.298	0.547	0.841	0.376	0.665	0.593	0.422
	Left Side	0.263	0.169	0.191	0.155	0.294	0.452	0.082	0.594	0.514	0.242
	Right Side	--	--	--	--	--	--	--	--	--	--
	Top Side	--	--	--	--	--	--	--	--	--	--
	Bottom Side	0.895	0.193	0.22	0.175	0.612	1.083	0.089	0.917	1.072	0.245

Position		WLAN SAR-1g(W/kg)					BT SAR-1g(W/kg)
		2.4GHz	5.2GHz	5.3GHz	5.6GHz	5.8GHz	2.4GHz
Head	Right Cheek	0.410	0.476	0.535	0.383	0.409	0.07
	Right Tilted	0.328	0.399	0.435	0.233	0.319	0.07
	Left Cheek	0.318	0.490	0.558	0.408	0.438	0.07
	Left Tilted	0.262	0.438	0.460	0.250	0.352	0.07
Body-worn	Front Face	0.230	0.367	0.344	0.276	0.315	0.04
	Rear Face	0.269	0.410	0.427	0.345	0.367	0.04
Hotspot	Front Face	0.230	0.367	0.344	0.276	0.315	0.04
	Rear Face	0.269	0.410	0.427	0.345	0.367	0.04
	Left Side	--	--	--	--	--	--
	Right Side	0.165	0.253	0.263	0.212	0.226	0.04
	Top Side	0.372	0.670	0.453	0.391	0.431	0.04
	Bottom Side	--	--	--	--	--	--

4.7.4. Sum of SAR

WWAN + WLAN (DTS)

Position		Highest Simultaneous Transmission SAR-1g (W/kg)	LTE Band SAR-1g(W/kg)							WCDMA SAR-1g(W/kg)		
			25(2)	26(5)	12	13	41	66(4)	71	II	IV	V
Head	Right Cheek	0.753	0.594	0.61	0.589	0.608	0.508	0.687	0.586	0.609	0.753	0.73
	Right Tilted		0.475	0.486	0.467	0.482	0.406	0.507	0.457	0.487	0.603	0.585
	Left Cheek		0.487	0.504	0.467	0.495	0.408	0.567	0.457	0.467	0.496	0.545
	Left Tilted		0.391	0.4	0.365	0.388	0.323	0.401	0.354	0.384	0.409	0.449
Body-worn	Front Face	1.110	0.829	0.459	0.484	0.442	0.709	1.087	0.439	0.914	1.064	0.508
	Rear Face		0.695	0.59	0.625	0.567	0.816	1.11	0.645	0.934	0.862	0.691
Hotspot	Front Face	1.110	0.829	0.459	0.484	0.442	0.709	1.087	0.439	0.914	1.064	0.508
	Rear Face		0.695	0.59	0.625	0.567	0.816	1.11	0.645	0.934	0.862	0.691
	Left Side		0.263	0.169	0.191	0.155	0.294	0.452	0.082	0.594	0.514	0.242
	Right Side		0.165	0.165	0.165	0.165	0.165	0.165	0.165	0.165	0.165	0.165
	Top Side		0.372	0.372	0.372	0.372	0.372	0.372	0.372	0.372	0.372	0.372
	Bottom Side		0.895	0.193	0.22	0.175	0.612	1.083	0.089	0.917	1.072	0.245

WWAN + WLAN(NII)

Position		Highest Simultaneous Transmission SAR-1g (W/kg)	LTE Band SAR-1g(W/kg)							WCDMA SAR-1g(W/kg)		
			25(2)	26(5)	12	13	41	66(4)	71	II	IV	V
Head	Right Cheek	0.878	0.719	0.735	0.714	0.733	0.633	0.812	0.711	0.734	0.878	0.855
	Right Tilted		0.582	0.593	0.574	0.589	0.513	0.614	0.564	0.594	0.71	0.692
	Left Cheek		0.727	0.744	0.707	0.735	0.648	0.807	0.697	0.707	0.736	0.785
	Left Tilted		0.589	0.598	0.563	0.586	0.521	0.599	0.552	0.582	0.607	0.647
Body-worn	Front Face	1.268	0.966	0.596	0.621	0.579	0.846	1.224	0.576	1.051	1.201	0.645
	Rear Face		0.853	0.748	0.783	0.725	0.974	1.268	0.803	1.092	1.02	0.849
Hotspot	Front Face	1.268	0.966	0.596	0.621	0.579	0.846	1.224	0.576	1.051	1.201	0.645
	Rear Face		0.853	0.748	0.783	0.725	0.974	1.268	0.803	1.092	1.02	0.849
	Left Side		0.263	0.169	0.191	0.155	0.294	0.452	0.082	0.594	0.514	0.242
	Right Side		0.263	0.263	0.263	0.263	0.263	0.263	0.263	0.263	0.263	0.263
	Top Side		0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
	Bottom Side		0.895	0.193	0.22	0.175	0.612	1.083	0.089	0.917	1.072	0.245

WWAN + BT(DSS)

Position		Highest Simultaneous Transmission SAR-1g (W/kg)	LTE Band SAR-1g(W/kg)							WCDMA SAR-1g(W/kg)		
			25(2)	26(5)	12	13	41	66(4)	71	II	IV	V
Head	Right Cheek	0.413	0.254	0.27	0.249	0.268	0.168	0.347	0.246	0.269	0.413	0.39
	Right Tilted		0.217	0.228	0.209	0.224	0.148	0.249	0.199	0.229	0.345	0.327
	Left Cheek		0.239	0.256	0.219	0.247	0.16	0.319	0.209	0.219	0.248	0.297
	Left Tilted		0.199	0.208	0.173	0.196	0.131	0.209	0.162	0.192	0.217	0.257
Body-worn	Front Face	0.897	0.639	0.269	0.294	0.252	0.519	0.897	0.249	0.724	0.874	0.318
	Rear Face		0.466	0.361	0.396	0.338	0.587	0.881	0.416	0.705	0.633	0.462
Hotspot	Front Face	1.083	0.639	0.269	0.294	0.252	0.519	0.897	0.249	0.724	0.874	0.318
	Rear Face		0.466	0.361	0.396	0.338	0.587	0.881	0.416	0.705	0.633	0.462
	Left Side		0.263	0.169	0.191	0.155	0.294	0.452	0.082	0.594	0.514	0.242
	Right Side		0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
	Top Side		0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
	Bottom Side		0.895	0.193	0.22	0.175	0.612	1.083	0.089	0.917	1.072	0.245

*** End of Report ***

APPENDIX A. SAR PLOTS OF SYSTEM VERIFICATION

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

APPENDIX B. SAR PLOTS OF SAR MEASUREMENT

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

APPENDIX C. CALIBRATION CERTIFICATE FOR PROBE AND DIPOLE

The calibration certificates are shown as follows.

APPENDIX D. PHOTOGRAPHS OF EUT AND SETUP

The photographs of EUT and setup are shown as follows.