FCC SAR TEST REPORT

FCC ID : RF41539C

Equipment : Handheld Terminal

Brand Name : KEYENCE

Model Name : DX-A400

Applicant : KEYENCE CORPORATION
1-3-14 HIGASHI-NAKAJIMA,
HIGASHI-YODOGAWA-KU, OSAKA, JAPAN

Manufacturer : KEYENCE CORPORATION
1-3-14 HIGASHI-NAKAJIMA,
HIGASHI-YODOGAWA-KU, OSAKA, JAPAN

Standard : FCC 47 CFR Part 2 (2.1093)

The product was received on Aug. 16, 2021 and testing was started from Aug. 16, 2021 and completed on Sep. 15, 2021. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample provide by manufacturer and the test data has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been pass the FCC requirement.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Cona Huang

Approved by: Cona Huang / Deputy Manager

Testing Laboratory
1190

Sporton International Inc. EMC & Wireless Communications Laboratory

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History of this test report

Report No.	Version	Description	Issued Date
FA181627	01	Initial issue of report	Nov. 16, 2021

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for KEYENCE CORPORATION, Handheld Terminal, DX-A400, are as follows.

Equipment Class	Frequency Band		Highest SAR Summary			Highest Simultaneous Transmission 1g SAR (W/kg)
			Head (Separation 0mm)	Body-worn (Separation 10mm)	Hotspot (Separation 10mm)	
			1g SAR (W/kg)			
Licensed	WCDMA	WCDMA II	0.47	1.03	1.07	1.44
		WCDMA V	0.50	0.55	0.55	
	LTE	LTE Band 2	0.60	1.11	1.19	
		LTE Band 4	0.46	0.88	0.88	
		LTE Band 5	0.34	0.43	0.43	
		LTE Band 41	0.09	0.94	1.19	
DTS	WLAN	2.4GHz WLAN	0.38	0.06	0.06	1.19
NII		5GHz WLAN	0.93	0.15		1.44
DSS	2.4GHz Band	Bluetooth	0.05	0.01	0.01	1.19
Date of Testing:			2021/8/16 ~ 2021/9/15			

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No.TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

Reviewed by: Jason Wang
Report Producer: Paula Chen

2. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards, the below KDB standard may not including in the TAF code without accreditation.

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r03
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01

3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	Handheld Terminal
Brand Name	KEYENCE
Model Name	DX-A400
FCC ID	RF41539C
Wireless Technology and Frequency Range	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 41: 2555 MHz ~ 2655 MHz WLAN 2.4 GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2 GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3 GHz Band: 5250 MHz ~ 5350 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz
Mode	RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+ (16QAM uplink) LTE: QPSK, 16QAM WLAN: 802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC: ASK
HW Version	R003
SW Version	V10.01.00.G
EUT Stage	Identical Prototype
Remark: 1. This device WLAN 2.4GHz supports Hotspot operation and Bluetooth support tethering applications.	

3.2 General LTE SAR Test and Reporting Considerations

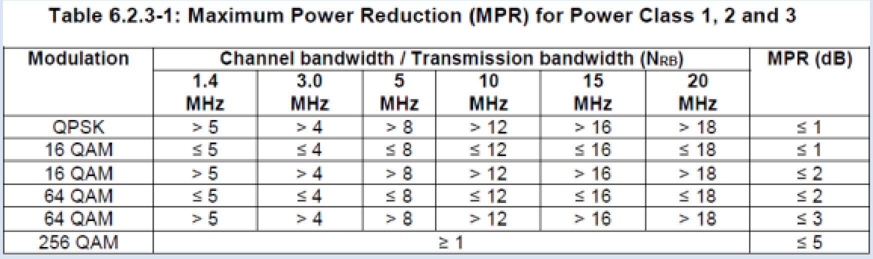
Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	RF41539C
Equipment Name	Handheld Terminal
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 41: 2555 MHz ~ 2655 MHz
Channel Bandwidth	LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz
uplink modulations used	QPSK / 16QAM
LTE Voice / Data requirements	Voice and Data
LTE MPR permanently built-in by design	

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

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

LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.

Transmission (H, M, L) channel numbers and frequencies in each LTE band

LTE Band 2

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900

LTE Band 4

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745

LTE Band 5

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844

LTE Band 41

	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	40265	2557.5	40290	2560	40315	2562.5	40340	2565
M	40740	2605	40740	2605	40740	2605	40740	2605
H	41215	2652.5	41190	2650	41165	2647.5	41140	2645

4. RF Exposure Limits

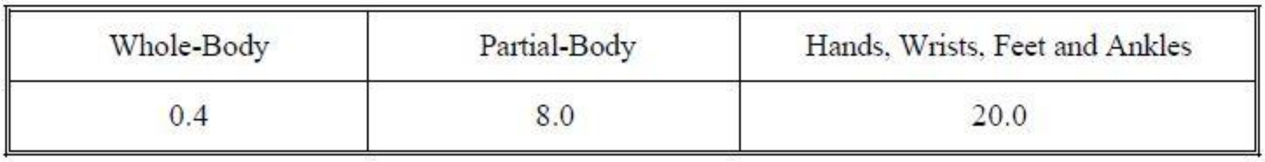
4.1 Uncontrolled Environment

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

4.2 Controlled Environment

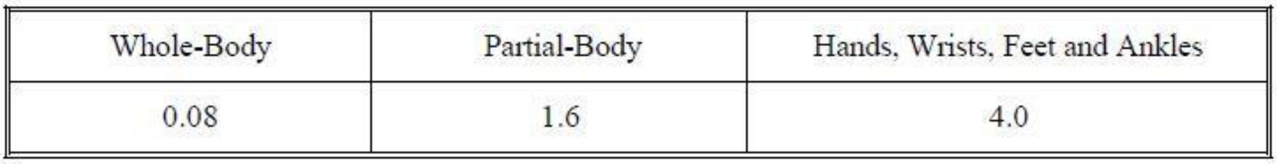
Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed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

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

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram 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.

5. Specific Absorption Rate (SAR)

5.1 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. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

5.2 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:

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

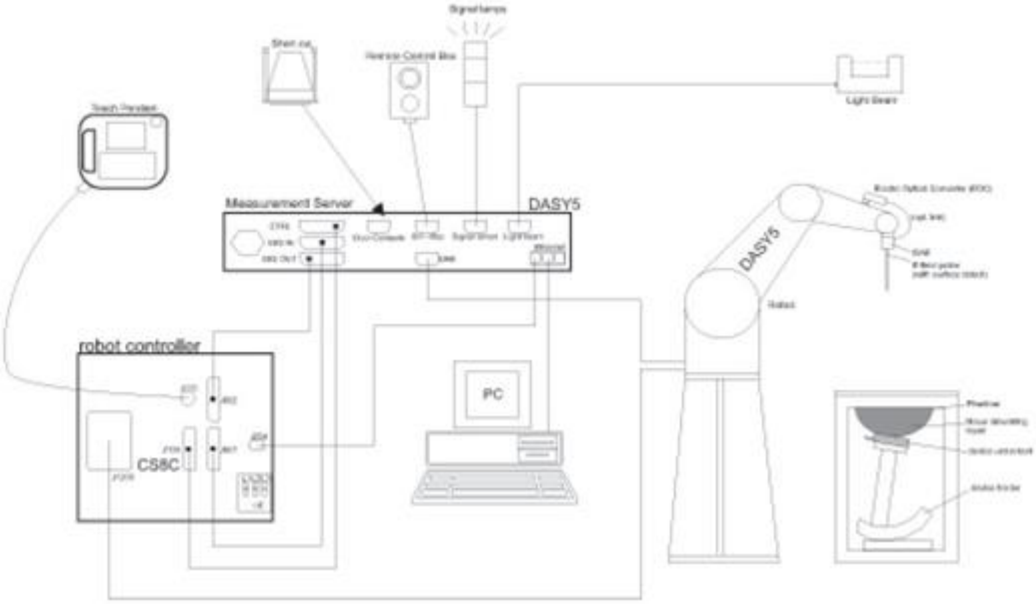
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

6. System Description and Setup

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



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

6.1 Test Site Location

The SAR measurement facilities used to collect data are within both Sporton Lab list below test site location are accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190 and 3786) and the FCC designation No.TW1190 and TW3786 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test.

Test Site	EMC & Wireless Communications Laboratory		Wensan Laboratory		
Test Site Location	TW1190 No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan		TW3786 No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan		
Test Site No.	SAR01-HY	SAR03-HY	SAR08-HY	SAR09-HY	SAR15-HY
	SAR04-HY	SAR05-HY	SAR11-HY	SAR12-HY	
	SAR06-HY	SAR10-HY	SAR13-HY	SAR14-HY	

6.2 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG).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. This probe has a built in optical surface detection system to prevent from collision with phantom.

<ES3DV3 Probe>

Construction	Symmetric 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 – 4 GHz; Linearity: ±0.2 dB (30 MHz – 4 GHz)	
Directivity	±0.2 dB in TSL (rotation around probe axis) ±0.3 dB in TSL (rotation normal to probe axis)	
Dynamic Range	5 µW/g – >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: 3.0 mm	

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – >6 GHz Linearity: ±0.2 dB (30 MHz – 6 GHz)	
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 µW/g – >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	

6.3 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

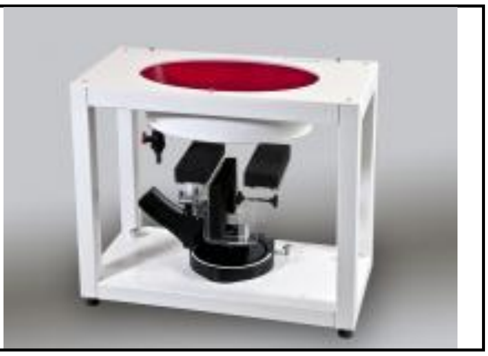
6.4 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	
Filling Volume	Approx. 25 liters	
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
Measurement Areas	Left Hand, Right Hand, Flat Phantom	

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)	
Filling Volume	Approx. 30 liters	
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm	

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

6.5 Device Holder

<Mounting Device for Hand-Held Transmitter>

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.

Mounting Device for Hand-Held Transmitters

Mounting Device Adaptor for Wide-Phones

<Mounting Device for Laptops and other Body-Worn Transmitters>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

Mounting Device for Laptops

7. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

(a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
(b) Read the WWAN RF power level from the base station simulator.
(c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
(d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

<SAR measurement>

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix D demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

7.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

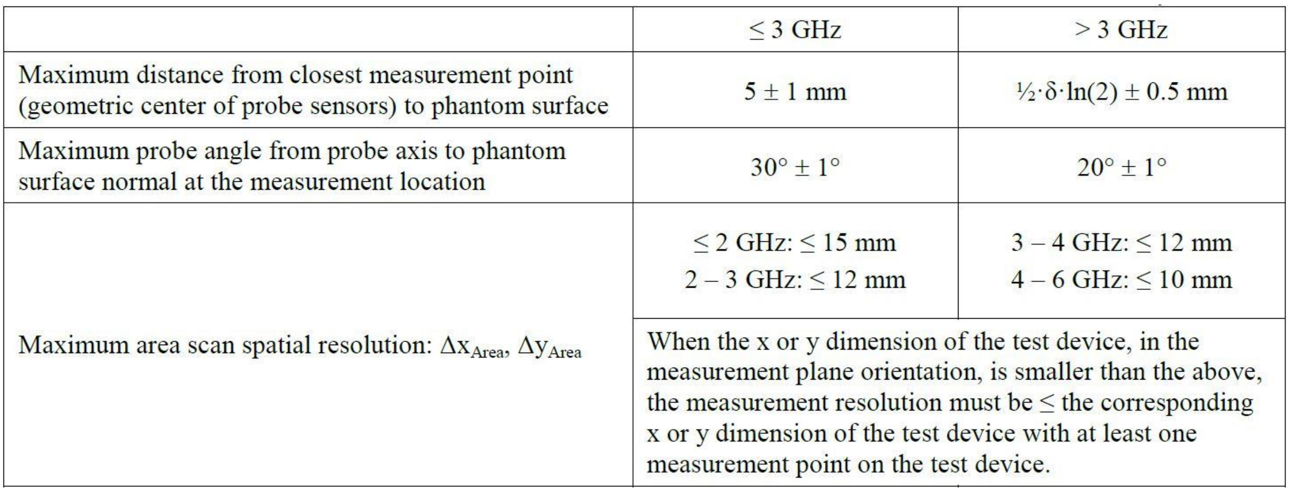
7.2 Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

7.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0 is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

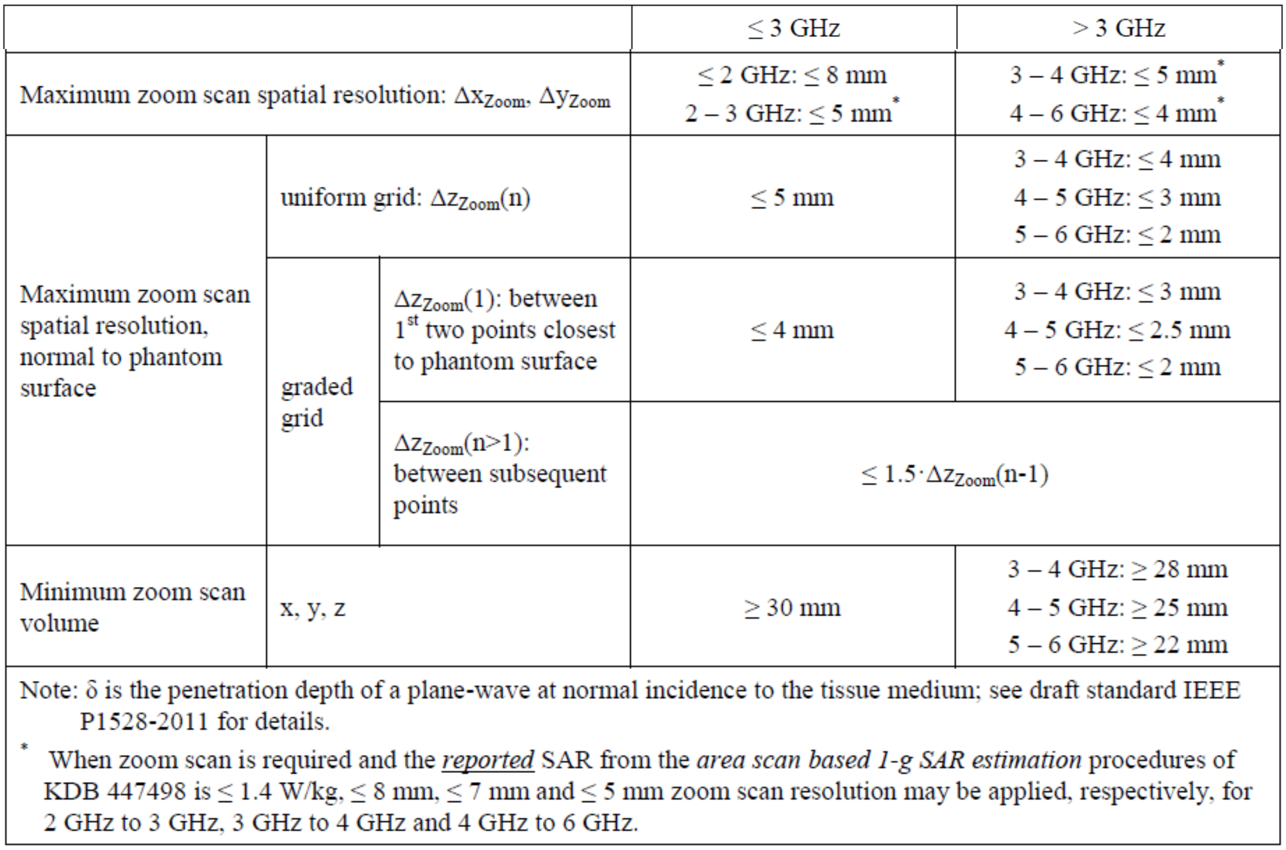


	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area},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

7.4 Zoom Scan

Zoom scans are used assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube shoes base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.



			$\leq$ 3 GHz	$>$ 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			$\leq$ 2 GHz: $\leq$ 8 mm 2 – 3 GHz: $\leq$ 5 mm*	3 – 4 GHz: $\leq$ 5 mm* 4 – 6 GHz: $\leq$ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		$\leq$ 5 mm	3 – 4 GHz: $\leq$ 4 mm 4 – 5 GHz: $\leq$ 3 mm 5 – 6 GHz: $\leq$ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	$\leq$ 4 mm	3 – 4 GHz: $\leq$ 3 mm 4 – 5 GHz: $\leq$ 2.5 mm 5 – 6 GHz: $\leq$ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		$\geq$ 30 mm	3 – 4 GHz: $\geq$ 28 mm 4 – 5 GHz: $\geq$ 25 mm 5 – 6 GHz: $\geq$ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

7.5 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

7.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

8. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	835MHz System Validation Kit(2)	D835V2	4d167	Nov. 25, 2019	Nov. 23, 2021
SPEAG	1750MHz System Validation Kit(2)	D1750V2	1112	Mar. 07, 2019	Mar. 04, 2022
SPEAG	1900MHz System Validation Kit(2)	D1900V2	5d041	Sep. 11, 2018	Sep. 08, 2021
SPEAG	1900MHz System Validation Kit(2)	D1900V2	5d185	Mar. 07, 2019	Mar. 04, 2022
SPEAG	2450MHz System Validation Kit(2)	D2450V2	736	Aug. 31, 2018	Aug. 28, 2021
SPEAG	2450MHz System Validation Kit(2)	D2450V2	929	Nov. 21, 2019	Nov. 19, 2021
SPEAG	2600MHz System Validation Kit(2)	D2600V2	1078	Mar. 06, 2019	Mar. 03, 2022
SPEAG	5GHz System Validation Kit(2)	D5GHzV2	1128	Dec. 16, 2019	Dec. 14, 2021
SPEAG	Data Acquisition Electronics	DAE3	577	Sep. 16, 2020	Sep. 15, 2021
SPEAG	Data Acquisition Electronics	DAE4	778	May. 21, 2021	May. 20, 2022
SPEAG	Data Acquisition Electronics	DAE4	1399	Feb. 16, 2021	Feb. 15, 2022
SPEAG	Data Acquisition Electronics	DAE4	1424	Jan. 19, 2021	Jan. 18, 2022
SPEAG	Data Acquisition Electronics	DAE4	1647	Jan. 07, 2021	Jan. 06, 2022
SPEAG	Dosimetric E-Field Probe	ES3DV3	3169	May. 28, 2021	May. 27, 2022
SPEAG	Dosimetric E-Field Probe	EX3DV4	3728	Feb. 23, 2021	Feb. 22, 2022
SPEAG	Dosimetric E-Field Probe	EX3DV4	3931	Oct. 22, 2020	Oct. 21, 2021
SPEAG	Dosimetric E-Field Probe	EX3DV4	7439	Feb. 23, 2021	Feb. 22, 2022
SPEAG	Dosimetric E-Field Probe	EX3DV4	7590	Mar. 25, 2021	Mar. 24, 2022
RCPTWN	Thermometer	HTC-1	TM685-1	Nov. 10, 2020	Nov. 09, 2021
RCPTWN	Thermometer	HTC-1	TM560-2	Nov. 10, 2020	Nov. 09, 2021
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Nov. 10, 2020	Nov. 09, 2021
Keysight	Wireless Communication Test Set	E5515C	MY50267236	Mar. 21, 2021	Mar. 20, 2022
R&S	BT Base Station	CBT	100815	Feb. 19, 2021	Feb. 18, 2022
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Nov. 11, 2020	Nov. 10, 2021
Keysight	ENA Network Analyzer	E5071C	MY46316648	Jul. 22, 2021	Jul. 21, 2022
SPEAG	Dielectric Probe Kit	DAK-12	1156	Jul. 16, 2021	Jul. 15, 2022
LINE SEIKI	Digital Thermometer	DTM3000-spezial	2942	Nov. 06, 2020	Nov. 05, 2021
Anritsu	Power Meter	ML2495A	2119003	Jun. 09, 2021	Jun. 08, 2022
Anritsu	Power Sensor	MA2411B	1911334	Jun. 01, 2021	May. 31, 2022
Anritsu	Power Meter	ML2495A	1804003	Oct. 21, 2020	Oct. 20, 2021
Anritsu	Power Sensor	MA2411B	1726150	Oct. 21, 2020	Oct. 20, 2021
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jul. 16, 2021	Jul. 15, 2022
Anritsu	Spectrum Analyzer	N9010A	MY53470118	Jan. 15, 2021	Jan. 14, 2022
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 21, 2020	Oct. 20, 2021
Mini-Circuits	Power Amplifier	ZHL-42W+	715701915	May. 11, 2021	May. 10, 2022
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

General Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.
2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.

9. System Verification

9.1 Tissue Verification

The tissue dielectric parameters of tissue-equivalent media used for SAR measurements must be characterized within a temperature range of 18℃ to 25℃, measured with calibrated instruments and apparatuses, such as network analyzers and temperature probes. The temperature of the tissue-equivalent medium during SAR measurement must also be within 18℃ to 25℃ and within ± 2℃ of the temperature when the tissue parameters are characterized. The tissue dielectric measurement system must be calibrated before use. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements.
The liquid tissue depth was at least 15cm in the phantom for all SAR testing

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
835	22.4	0.883	42.628	0.90	41.50	-1.89	2.72	±5	2021/8/17
835	22.4	0.907	42.521	0.90	41.50	0.78	2.46	±5	2021/9/10
835	22.6	0.906	42.510	0.90	41.50	0.67	2.43	±5	2021/9/11
835	22.7	0.885	41.552	0.90	41.50	-1.67	0.13	±5	2021/9/13
1750	22.5	1.342	41.108	1.37	40.10	-2.04	2.51	±5	2021/9/9
1750	22.6	1.341	41.097	1.37	40.10	-2.12	2.49	±5	2021/9/11
1900	22.4	1.433	38.773	1.40	40.00	2.36	-3.07	±5	2021/8/17
1900	22.5	1.426	39.550	1.40	40.00	1.86	-1.13	±5	2021/8/25
1900	22.5	1.392	40.477	1.40	40.00	-0.57	1.19	±5	2021/9/9
1900	22.4	1.448	39.579	1.40	40.00	3.43	-1.05	±5	2021/9/10
1900	22.6	1.437	39.733	1.40	40.00	2.64	-0.67	±5	2021/9/15
2450	22.6	1.746	38.818	1.80	39.20	-3.00	-0.97	±5	2021/8/16
2450	22.6	1.766	39.623	1.80	39.20	-1.89	1.08	±5	2021/8/23
2450	22.7	1.810	38.941	1.80	39.20	0.56	-0.66	±5	2021/9/13
2600	22.6	2.008	37.107	1.96	39.00	2.45	-4.85	±5	2021/9/7
5250	22.6	4.723	36.384	4.71	35.95	0.28	1.21	±5	2021/8/23
5250	22.7	4.718	37.392	4.71	35.95	0.17	4.01	±5	2021/9/13

9.2 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Test Site	Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
SAR01	2021/8/17	835	250	D835V2-4d167	ES3DV3 - SN3169	DAE3 Sn577	2.53	9.55	10.12	5.97
SAR05	2021/9/10	835	250	D835V2-4d167	EX3DV4 - SN7590	DAE4 Sn1424	2.41	9.55	9.64	0.94
SAR06	2021/9/11	835	50	D835V2-4d167	EX3DV4 - SN7439	DAE4 Sn1647	0.447	9.55	8.94	-6.39
SAR04	2021/9/13	835	50	D835V2-4d167	EX3DV4 - SN3931	DAE4 Sn1399	0.467	9.55	9.34	-2.20
SAR10	2021/9/9	1750	50	D1750V2-1112	EX3DV4 - SN3728	DAE4 Sn778	1.72	36.70	34.4	-6.27
SAR06	2021/9/11	1750	250	D1750V2-1112	EX3DV4 - SN7439	DAE4 Sn1647	8.38	36.70	33.52	-8.66
SAR01	2021/8/17	1900	250	D1900V2-5d041	ES3DV3 - SN3169	DAE3 Sn577	10.20	40.20	40.8	1.49
SAR05	2021/8/25	1900	250	D1900V2-5d041	EX3DV4 - SN7590	DAE4 Sn1424	9.83	40.20	39.32	-2.19
SAR10	2021/9/9	1900	50	D1900V2-5d185	EX3DV4 - SN3728	DAE4 Sn778	1.94	39.40	38.8	-1.52
SAR05	2021/9/10	1900	250	D1900V2-5d185	EX3DV4 - SN7590	DAE4 Sn1424	9.26	39.40	37.04	-5.99
SAR04	2021/9/15	1900	50	D1900V2-5d185	EX3DV4 - SN3931	DAE4 Sn1399	2.06	39.40	41.2	4.57
SAR01	2021/8/16	2450	250	D2450V2-736	ES3DV3 - SN3169	DAE3 Sn577	13.80	52.70	55.2	4.74
SAR05	2021/8/23	2450	250	D2450V2-736	EX3DV4 - SN7590	DAE4 Sn1424	13.00	52.70	52	-1.33
SAR04	2021/9/13	2450	50	D2450V2-929	EX3DV4 - SN3931	DAE4 Sn1399	2.58	53.10	51.6	-2.82
SAR10	2021/9/7	2600	50	D2600V2-1078	EX3DV4 - SN3728	DAE4 Sn778	2.79	57.60	55.8	-3.13
SAR05	2021/8/23	5250	100	D5GHzV2-1128-5250	EX3DV4 - SN7590	DAE4 Sn1424	7.32	80.00	73.2	-8.50
SAR04	2021/9/13	5250	100	D5GHzV2-1128-5250	EX3DV4 - SN3931	DAE4 Sn1399	7.96	80.00	79.6	-0.50

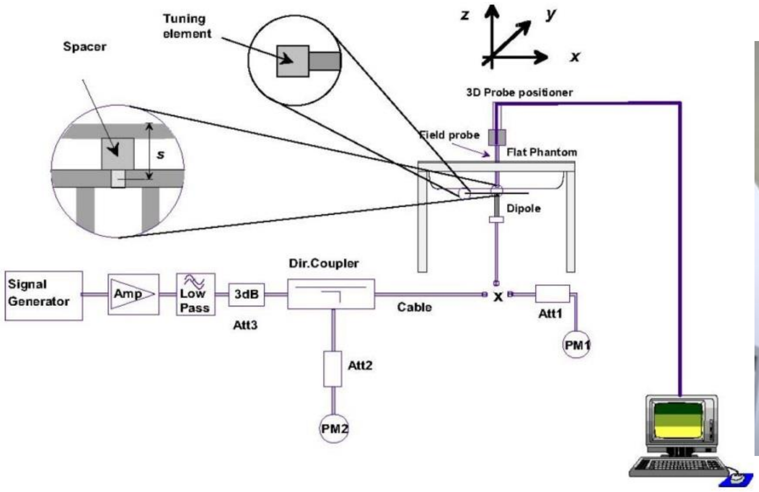


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

10. RF Exposure Positions

10.1 Ear and handset reference point

Figure 9.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled “M,” the left ear reference point (ERP) is marked “LE,” and the right ERP is marked “RE.” Each ERP is 15 mm along the B-M (back-mouth) line behind the entrance-to-ear-canal (EEC) point, as shown in Figure 9.1.2 The Reference Plane is defined as passing through the two ear reference points and point M. The line N-F (neck-front), also called the reference pivoting line, is normal to the Reference Plane and perpendicular to both a line passing through RE and LE and the B-M line (see Figure 9.1.3). Both N-F and B-M lines should be marked on the exterior of the phantom shell to facilitate handset positioning. Posterior to the N-F line the ear shape is a flat surface with 6 mm thickness at each ERP, and forward of the N-F line the ear is truncated, as illustrated in Figure 9.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

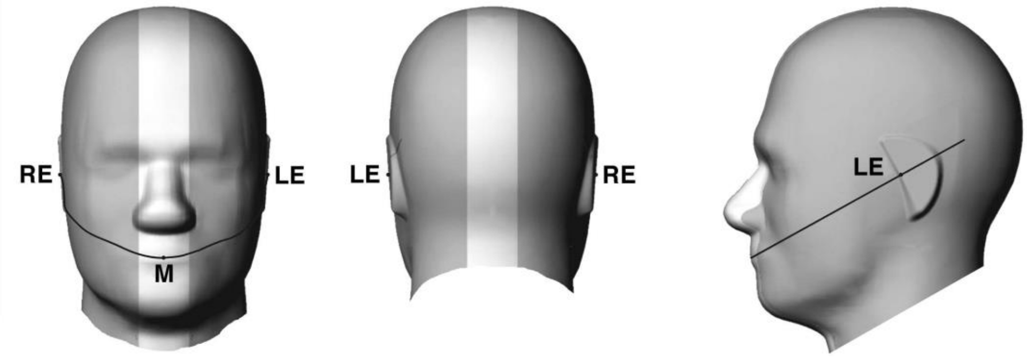


Fig 9.1.1 Front, back, and side views of SAM twin phantom

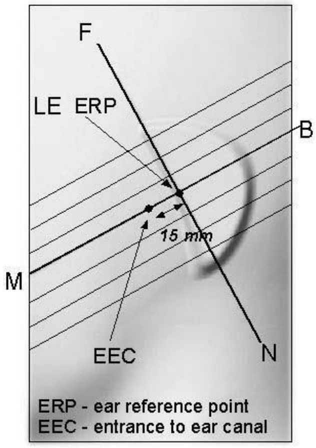


Fig 9.1.2 Close-up side view of phantom showing the ear region.

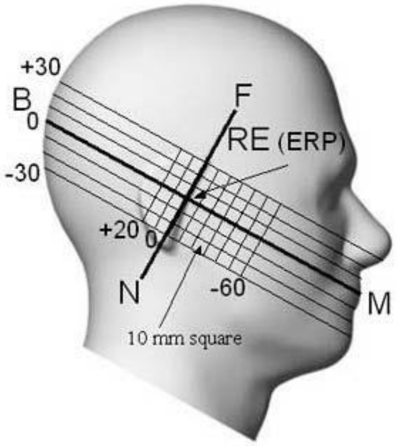


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

10.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. 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 (point A in Figure 9.2.1 and Figure 9.2.2), and the midpoint of the width wb of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 9.2.1). 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 (see Figure 9.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
3. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 9.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
4. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP.
5. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
6. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.
7. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 9.2.3. The actual rotation angles should be documented in the test report.

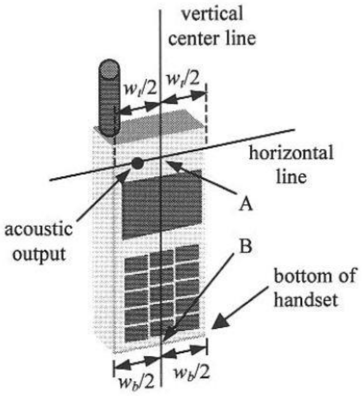


Fig 9.2.1 Handset vertical and horizontal reference lines—"fixed case

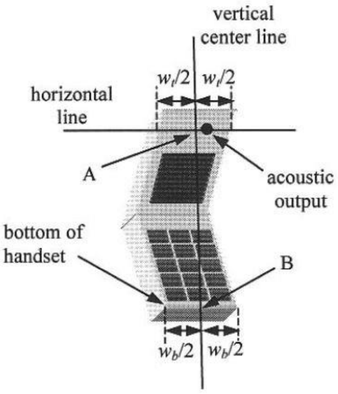


Fig 9.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

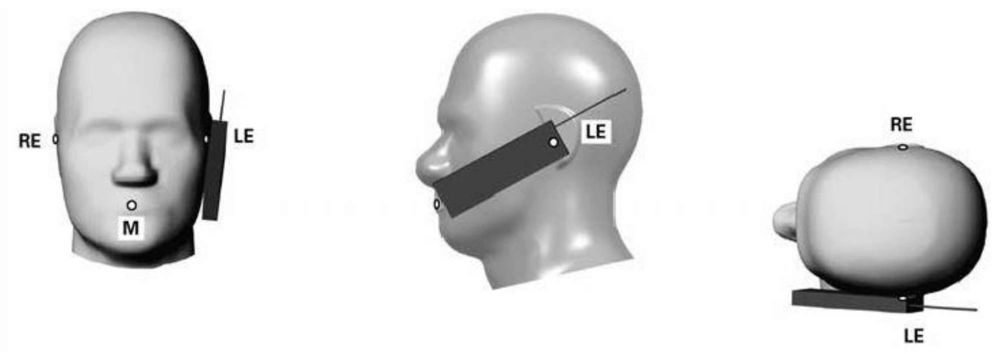


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

10.3 Definition of the tilt position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. While maintaining the orientation of the handset, move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15°.
3. Rotate the handset around the horizontal line by 15°.
4. While maintaining the orientation of the handset, move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact point is on the pinna. See Figure 9.3.1. If contact occurs at any location other than the pinna, e.g., the antenna at the back of the phantom head, the angle of the handset should be reduced. In this case, the tilt position is obtained if any point on the handset is in contact with the pinna and a second point

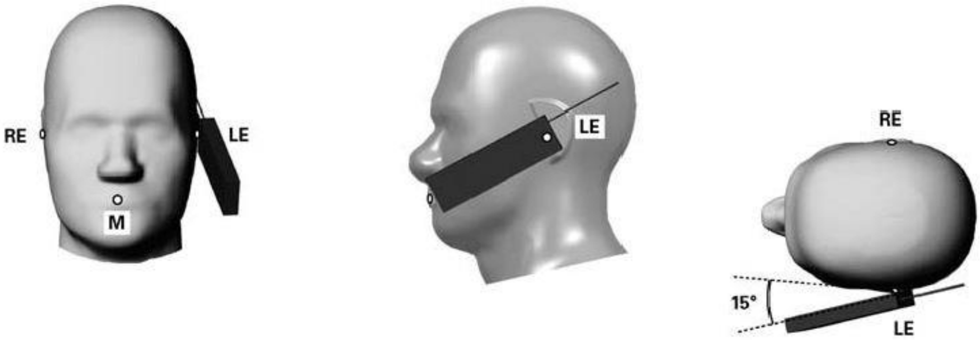


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

10.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 9.4). Per KDB648474 D04v01r03, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for 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 that body-worn accessory with a handset attached to the handset.

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

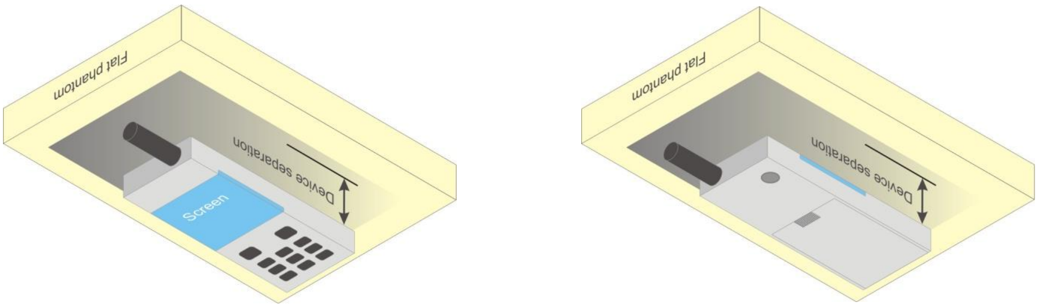


Fig 9.4 Body Worn Position

10.5 Wireless Router

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v02r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined form general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

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

11. UMTS/LTE Output Power (Unit: dBm)

<WCDMA Conducted Power>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For HSPA+ devices supporting 16 QAM in the uplink, power measurements procedure is according to the configurations in Table C.11.1.4 of 3GPP TS 34.121-1.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
    i. Set Gain Factors (β_c and β_d) and parameters were set according to each
    ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
    iii. Set RMC 12.2Kbps + HSDPA mode.
    iv. Set Cell Power = -86 dBm
    v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
    vi. Select HSDPA Uplink Parameters
    vii. Set Delta ACK, Delta NACK and Delta CQI = 8
    viii. Set Ack-Nack Repetition Factor to 3
    ix. Set CQI Feedback Cycle (k) to 4 ms
    x. Set CQI Repetition Factor to 2
    xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

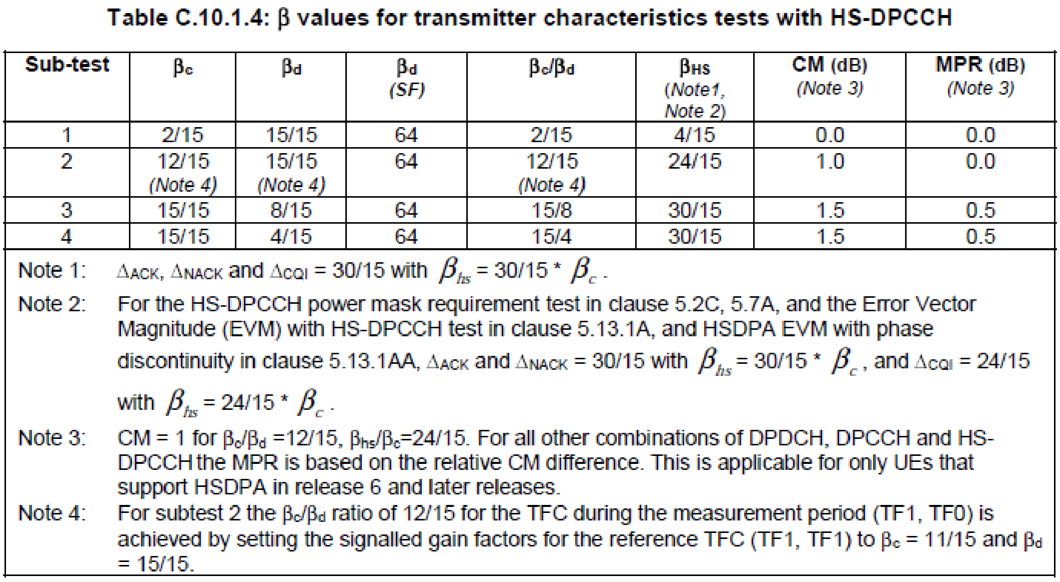


Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

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

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

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

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSUPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
    i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
    ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
    iii. Set Cell Power = -86 dBm
    iv. Set Channel Type = 12.2k + HSPA
    v. Set UE Target Power
    vi. Power Ctrl Mode= Alternating bits
    vii. Set and observe the E-TFCI
    viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

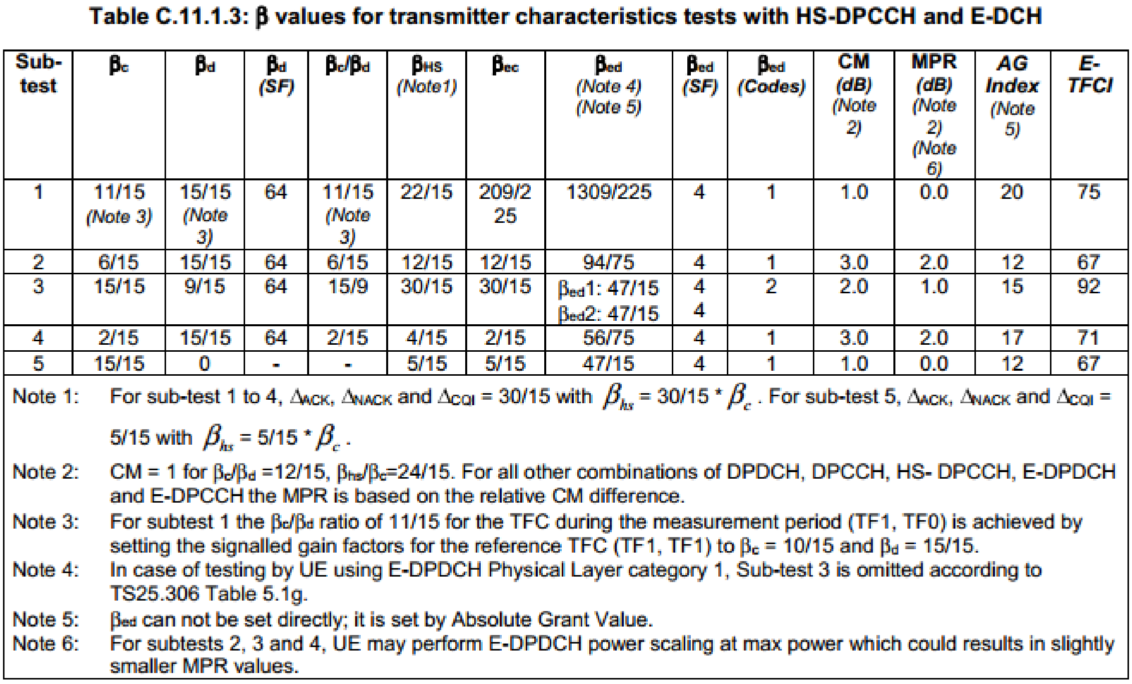


Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	**β_c**	**β_d**	**β_d** *(SF)*	**β_c/β_d**	**β_{HS}** *(Note1)*	**β_{ec}**	**β_{ed}** *(Note 4) (Note 5)*	**β_{ed}** *(SF)*	**β_{ed}** *(Codes)*	**CM** *(dB) (Note 2)*	**MPR** *(dB) (Note 2) (Note 6)*	***AG Index*** *(Note 5)*	***E-TFCI***
1	11/15 *(Note 3)*	15/15 *(Note 3)*	64	11/15 *(Note 3)*	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 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	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{WCK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with $\beta_{hs} = 5/15 * \beta_c$.

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 signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

Setup Configuration

HSPA+ 3GPP release 7 (uplink category 7) 16QAM, Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
    i. Call Configs = 5.2E:HSPA+:UL with 16QAM
    ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.4, quoted from the TS 34.121-1 s5.2E
    iii. Set Channel Parms
    iv. Set Cell Power = -86 dBm
    v. Set Channel Type = HSPA
    vi. Set UE Target Power =21 dBm
    vii. Power Ctrl Mode= All Up Bits
    viii. Set Manual Uplink DPCH Bc/Bd = Manual
    ix. Set Manual Uplink DPCH Bc and Bd=15,15(for 34.121-1 v8.10.0 table C11.1.4 sub-test 1)
    x. Set HSPA Conn DL Channel Levels
    xi. Set HS-SCCH Configs
    xii. Set RB Test Mode Setup
    xiii. Set Common HSUPA Parameters
    xiv. Set Serving Grant
    xv. Confirm that E-TFCI is equal to the target E-TFCI of 105 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

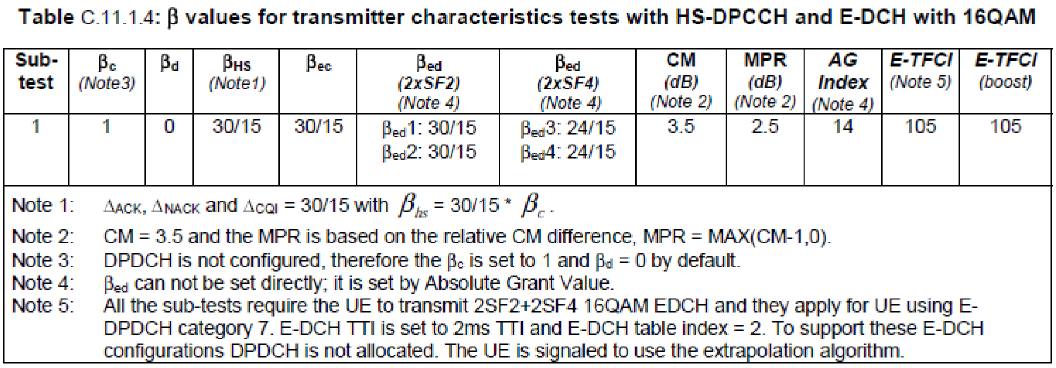


Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signaled to use the extrapolation algorithm.

Setup Configuration

<WCDMA Conducted Power>

General Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”.
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA , and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA.

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		4132	4182	4233	
Rx Channel		9662	9800	9938		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	21.75	21.71	21.80	22.00	23.47	23.54	23.55	24.00
3GPP Rel 99	RMC 12.2Kbps	21.78	21.76	21.84	22.00	23.48	23.56	23.57	24.00
3GPP Rel 6	HSDPA Subtest-1	20.76	20.75	20.83	21.00	22.38	22.45	22.47	23.00
3GPP Rel 6	HSDPA Subtest-2	20.71	20.70	20.76	21.00	22.36	22.41	22.44	23.00
3GPP Rel 6	HSDPA Subtest-3	20.23	20.24	20.30	20.50	22.31	22.35	22.42	22.50
3GPP Rel 6	HSDPA Subtest-4	20.18	20.22	20.29	20.50	22.32	22.38	22.41	22.50
3GPP Rel 6	HSUPA Subtest-1	18.85	18.75	18.83	20.00	22.36	22.37	22.35	23.00
3GPP Rel 6	HSUPA Subtest-2	18.78	18.75	18.82	19.00	22.35	22.38	22.42	23.00
3GPP Rel 6	HSUPA Subtest-3	19.77	19.71	19.82	20.00	21.36	21.33	21.43	22.00
3GPP Rel 6	HSUPA Subtest-4	18.30	18.29	18.27	19.00	22.28	22.33	22.38	23.00
3GPP Rel 6	HSUPA Subtest-5	19.60	19.70	19.80	20.00	21.37	21.38	21.41	23.00
3GPP Rel 7	HSPA+ (16QAM) Subtest-1	19.75	19.67	19.73	20.00	22.01	22.12	22.08	22.50

<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4/B5 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	20.99	21.08	21.01	22	0
20	QPSK	1	49	21.51	21.50	21.48		
20	QPSK	1	99	20.93	20.92	20.98		
20	QPSK	50	0	20.48	20.23	20.66	21	1
20	QPSK	50	24	20.38	20.38	20.41		
20	QPSK	50	50	20.34	20.29	20.51		
20	QPSK	100	0	20.43	20.28	20.57		
20	16QAM	1	0	20.32	20.60	20.35	21	1
20	16QAM	1	49	20.82	20.79	20.86		
20	16QAM	1	99	20.50	20.26	20.44		
20	16QAM	50	0	19.52	19.30	19.69	20	2
20	16QAM	50	24	19.44	19.40	19.52		
20	16QAM	50	50	19.43	19.29	19.61		
20	16QAM	100	0	19.48	19.30	19.64		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	21.20	21.26	21.26	22	0
15	QPSK	1	37	21.39	21.38	21.40		
15	QPSK	1	74	21.18	21.13	21.21		
15	QPSK	36	0	20.45	20.36	20.52	21	1
15	QPSK	36	20	20.43	20.42	20.50		
15	QPSK	36	39	20.40	20.36	20.56		
15	QPSK	75	0	20.44	20.34	20.54		
15	16QAM	1	0	20.48	20.76	20.65	21	1
15	16QAM	1	37	20.84	20.84	20.91		
15	16QAM	1	74	20.68	20.43	20.59		
15	16QAM	36	0	19.43	19.40	19.59	20	2
15	16QAM	36	20	19.43	19.41	19.59		
15	16QAM	36	39	19.44	19.32	19.62		
15	16QAM	75	0	19.46	19.35	19.63		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	21.26	21.33	21.33	22	0
10	QPSK	1	25	21.39	21.39	21.40		
10	QPSK	1	49	21.26	21.26	21.32		
10	QPSK	25	0	20.49	20.33	20.46	21	1
10	QPSK	25	12	20.42	20.43	20.49		
10	QPSK	25	25	20.36	20.39	20.57		
10	QPSK	50	0	20.47	20.37	20.55		
10	16QAM	1	0	20.53	20.80	20.80	21	1
10	16QAM	1	25	20.76	20.82	20.95		
10	16QAM	1	49	20.69	20.56	20.66		
10	16QAM	25	0	19.49	19.37	19.61	20	2
10	16QAM	25	12	19.45	19.44	19.62		
10	16QAM	25	25	19.41	19.40	19.68		
10	16QAM	50	0	19.49	19.39	19.65		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	21.02	21.09	21.14	22	0
5	QPSK	1	12	21.29	21.33	21.39		
5	QPSK	1	24	21.02	21.06	21.12		

5	QPSK	12	0	20.22	20.21	20.26	21	1
5	QPSK	12	7	20.24	20.29	20.36		
5	QPSK	12	13	20.18	20.23	20.32		
5	QPSK	25	0	20.18	20.22	20.30		
5	16QAM	1	0	20.31	20.52	20.64	21	1
5	16QAM	1	12	20.57	20.74	20.80		
5	16QAM	1	24	20.37	20.41	20.45		
5	16QAM	12	0	19.20	19.22	19.36	20	2
5	16QAM	12	7	19.22	19.30	19.46		
5	16QAM	12	13	19.17	19.22	19.40		
5	16QAM	25	0	19.18	19.24	19.38		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	21.24	21.32	21.37	22	0
3	QPSK	1	8	21.25	21.31	21.34		
3	QPSK	1	14	21.26	21.28	21.34		
3	QPSK	8	0	20.33	20.37	20.42	21	1
3	QPSK	8	4	20.35	20.41	20.46		
3	QPSK	8	7	20.30	20.39	20.42		
3	QPSK	15	0	20.33	20.36	20.43		
3	16QAM	1	0	20.51	20.73	20.81	21	1
3	16QAM	1	8	20.53	20.71	20.72		
3	16QAM	1	14	20.56	20.66	20.66		
3	16QAM	8	0	19.37	19.48	19.58	20	2
3	16QAM	8	4	19.39	19.52	19.61		
3	16QAM	8	7	19.36	19.47	19.55		
3	16QAM	15	0	19.32	19.40	19.51		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	21.15	21.23	21.24	22	0
1.4	QPSK	1	3	21.29	21.37	21.39		
1.4	QPSK	1	5	21.15	21.21	21.25		
1.4	QPSK	3	0	21.26	21.34	21.36		
1.4	QPSK	3	1	21.32	21.37	21.43		
1.4	QPSK	3	3	21.26	21.34	21.37		
1.4	QPSK	6	0	20.33	20.36	20.42	21	1
1.4	16QAM	1	0	20.42	20.61	20.61	21	1
1.4	16QAM	1	3	20.56	20.77	20.70		
1.4	16QAM	1	5	20.45	20.62	20.59		
1.4	16QAM	3	0	20.26	20.43	20.44		
1.4	16QAM	3	1	20.32	20.48	20.50		
1.4	16QAM	3	3	20.27	20.41	20.42		
1.4	16QAM	6	0	19.37	19.48	19.56	20	2

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	22.75	22.74	22.71	23.5	0
20	QPSK	1	49	23.12	23.13	23.10		
20	QPSK	1	99	22.70	22.70	22.66		
20	QPSK	50	0	22.15	22.14	22.00	22.5	1
20	QPSK	50	24	22.14	22.12	22.09		
20	QPSK	50	50	21.94	22.05	21.94		
20	QPSK	100	0	22.03	22.09	21.94		
20	16QAM	1	0	21.96	21.93	21.96	22.5	1
20	16QAM	1	49	22.31	22.33	22.36		
20	16QAM	1	99	21.92	21.95	21.85		
20	16QAM	50	0	21.09	21.10	20.97	21.5	2
20	16QAM	50	24	21.08	21.08	21.05		
20	16QAM	50	50	20.90	21.04	20.93		
20	16QAM	100	0	20.98	21.04	20.94		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.91	22.89	22.90	23.5	0
15	QPSK	1	37	23.17	23.16	23.15		
15	QPSK	1	74	22.89	22.89	22.83		
15	QPSK	36	0	22.11	22.09	22.04	22.5	1
15	QPSK	36	20	22.10	22.09	22.05		
15	QPSK	36	39	22.01	22.07	21.98		
15	QPSK	75	0	22.05	22.07	21.99		
15	16QAM	1	0	22.13	22.11	22.16	22.5	1
15	16QAM	1	37	22.33	22.39	22.36		
15	16QAM	1	74	22.11	22.15	22.01		
15	16QAM	36	0	21.03	21.05	21.00	21.5	2
15	16QAM	36	20	21.04	21.05	21.02		
15	16QAM	36	39	20.97	21.03	20.95		
15	16QAM	75	0	21.02	21.04	21.00		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	23.03	23.00	22.99	23.5	0
10	QPSK	1	25	23.11	23.12	23.05		
10	QPSK	1	49	23.00	22.99	22.93		
10	QPSK	25	0	22.15	22.15	22.11	22.5	1
10	QPSK	25	12	22.11	22.11	22.08		
10	QPSK	25	25	22.08	22.11	21.98		
10	QPSK	50	0	22.11	22.15	22.05		
10	16QAM	1	0	22.23	22.21	22.21	22.5	1
10	16QAM	1	25	22.31	22.33	22.29		
10	16QAM	1	49	22.19	22.22	22.09		
10	16QAM	25	0	21.11	21.12	21.07	21.5	2
10	16QAM	25	12	21.07	21.10	21.04		
10	16QAM	25	25	21.04	21.10	20.95		
10	16QAM	50	0	21.07	21.09	21.02		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	22.94	22.93	22.88	23.5	0
5	QPSK	1	12	23.23	23.15	23.16		
5	QPSK	1	24	22.92	22.92	22.86		

5	QPSK	12	0	22.07	22.07	22.05	22.5	1
5	QPSK	12	7	22.11	22.09	22.06		
5	QPSK	12	13	22.08	22.07	21.97		
5	QPSK	25	0	22.08	22.09	22.04		
5	16QAM	1	0	22.15	22.14	22.10	22.5	1
5	16QAM	1	12	22.39	22.43	22.31		
5	16QAM	1	24	22.12	22.11	22.01		
5	16QAM	12	0	21.00	21.04	21.01	21.5	2
5	16QAM	12	7	21.07	21.09	21.02		
5	16QAM	12	13	21.02	21.03	20.90		
5	16QAM	25	0	21.06	21.07	21.00		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	23.03	23.03	22.97	23.5	0
3	QPSK	1	8	23.05	23.06	22.98		
3	QPSK	1	14	23.04	23.00	22.94		
3	QPSK	8	0	22.07	22.05	22.02	22.5	1
3	QPSK	8	4	22.10	22.09	22.03		
3	QPSK	8	7	22.06	22.05	21.99		
3	QPSK	15	0	22.08	22.08	22.04		
3	16QAM	1	0	22.24	22.23	22.15	22.5	1
3	16QAM	1	8	22.25	22.25	22.14		
3	16QAM	1	14	22.23	22.23	22.11		
3	16QAM	8	0	21.09	21.10	21.06	21.5	2
3	16QAM	8	4	21.12	21.12	21.08		
3	16QAM	8	7	21.09	21.09	20.99		
3	16QAM	15	0	21.05	21.06	20.98		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	22.99	22.96	22.92	23.5	0
1.4	QPSK	1	3	23.16	23.15	23.12		
1.4	QPSK	1	5	22.99	22.96	22.90		
1.4	QPSK	3	0	23.08	23.07	23.02		
1.4	QPSK	3	1	23.15	23.13	23.09		
1.4	QPSK	3	3	23.07	23.07	23.01		
1.4	QPSK	6	0	22.11	22.09	22.06	22.5	1
1.4	16QAM	1	0	22.21	22.20	22.09	22.5	1
1.4	16QAM	1	3	22.36	22.30	22.20		
1.4	16QAM	1	5	22.20	22.20	22.07		
1.4	16QAM	3	0	22.05	22.01	21.93		
1.4	16QAM	3	1	22.11	22.06	21.99		
1.4	16QAM	3	3	22.04	22.03	21.92		
1.4	16QAM	6	0	21.17	21.16	21.11	21.5	2

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	23.06	23.00	23.04	23.5	0
10	QPSK	1	25	23.19	23.20	23.19		
10	QPSK	1	49	22.99	23.08	23.00		
10	QPSK	25	0	22.01	22.23	22.10	23	0.5
10	QPSK	25	12	22.10	22.16	22.16		
10	QPSK	25	25	22.15	22.06	22.06		
10	QPSK	50	0	22.07	22.18	22.06		
10	16QAM	1	0	22.41	22.27	22.41	23	0.5
10	16QAM	1	25	22.49	22.49	22.51		
10	16QAM	1	49	22.24	22.43	22.21		
10	16QAM	25	0	21.04	21.23	21.15	22	1.5
10	16QAM	25	12	21.13	21.17	21.19		
10	16QAM	25	25	21.17	21.09	21.08		
10	16QAM	50	0	21.07	21.17	21.10		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.98	22.97	22.98	23.5	0
5	QPSK	1	12	23.24	23.20	23.22		
5	QPSK	1	24	22.99	22.98	22.93		
5	QPSK	12	0	22.05	22.18	22.13	23	0.5
5	QPSK	12	7	22.14	22.17	22.17		
5	QPSK	12	13	22.16	22.06	22.02		
5	QPSK	25	0	22.08	22.12	22.07		
5	16QAM	1	0	22.35	22.22	22.28	23	0.5
5	16QAM	1	12	22.61	22.51	22.46		
5	16QAM	1	24	22.29	22.32	22.17		
5	16QAM	12	0	21.08	21.15	21.12	22	1.5
5	16QAM	12	7	21.18	21.16	21.15		
5	16QAM	12	13	21.18	21.08	20.99		
5	16QAM	25	0	21.13	21.14	21.06		
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	23.08	23.06	23.05	23.5	0
3	QPSK	1	8	23.13	23.07	23.08		
3	QPSK	1	14	23.08	23.05	23.04		
3	QPSK	8	0	22.09	22.13	22.13	23	0.5
3	QPSK	8	4	22.16	22.13	22.13		
3	QPSK	8	7	22.11	22.10	22.09		
3	QPSK	15	0	22.07	22.11	22.15		
3	16QAM	1	0	22.44	22.32	22.29	23	0.5
3	16QAM	1	8	22.48	22.36	22.26		
3	16QAM	1	14	22.41	22.38	22.26		
3	16QAM	8	0	21.22	21.18	21.18	22	1.5
3	16QAM	8	4	21.28	21.21	21.19		
3	16QAM	8	7	21.21	21.19	21.12		
3	16QAM	15	0	21.13	21.13	21.13		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	23.00	23.03	23.02	23.5	0
1.4	QPSK	1	3	23.18	23.17	23.18		
1.4	QPSK	1	5	23.07	23.03	22.98		

1.4	QPSK	3	0	23.10	23.12	23.09		
1.4	QPSK	3	1	23.17	23.16	23.16		
1.4	QPSK	3	3	23.09	23.12	23.13		
1.4	QPSK	6	0	22.13	22.14	22.15	23	0.5
1.4	16QAM	1	0	22.39	22.30	22.21	23	0.5
1.4	16QAM	1	3	22.51	22.46	22.32		
1.4	16QAM	1	5	22.43	22.33	22.23		
1.4	16QAM	3	0	22.17	22.13	22.04		
1.4	16QAM	3	1	22.22	22.19	22.12		
1.4	16QAM	3	3	22.16	22.12	22.07		
1.4	16QAM	6	0	21.27	21.24	21.23	22	1.5

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

SAR was tested with a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by 3GPP.

a. 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations

b. “special subframe S” contains both uplink and downlink transmissions, it has been taken into consideration to determine the transmission duty factor according to the worst case uplink and downlink cyclic prefix requirements for UpPTS

c. Establishing connections with base station simulators ensure a consistent means for testing SAR and recommended for evaluating SAR. The Anritsu MT8820C (firmware: #22.52#004) was used for LTE output power measurements and SAR testing.

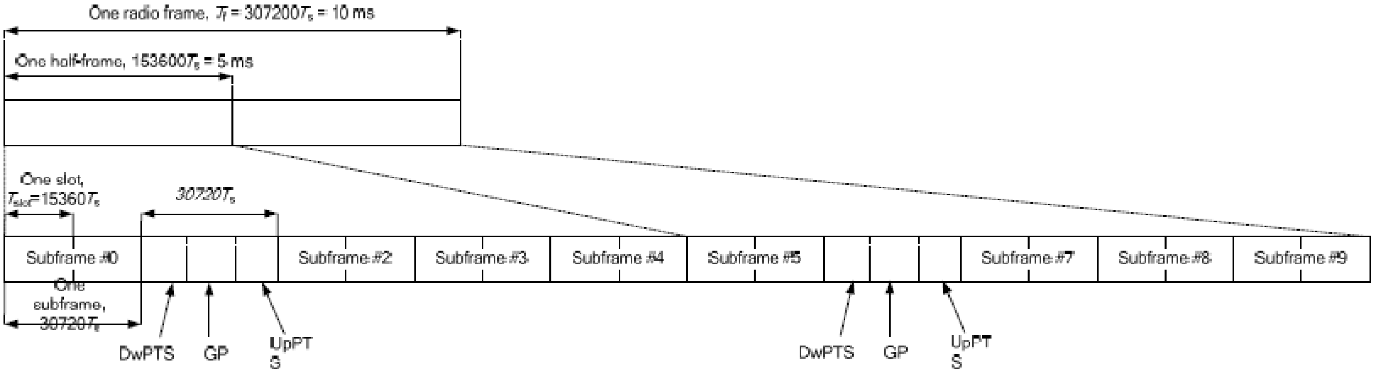


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

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

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

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Special subframe (30720·T_S): Normal cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	**Normal cyclic prefix in uplink**	**Extended cyclic prefix in uplink**
Uplink duty factor in one special subframe	**0~4**	7.13%	8.33%
	5~9	14.3%	16.7%

Special subframe(30720·T_S): Extended cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	**Normal cyclic prefix in uplink**	**Extended cyclic prefix in uplink**
Uplink duty factor in one special subframe	**0~3**	7.13%	8.33%
	4~7	14.3%	16.7%

The highest duty factor is resulted from:

i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subfames, uplink operation is in 3 uplink subframes and 1 special subframe.

ii. special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink

iii. for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is: (3+0.167)/5 = 63.3%

iv. for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is: (3+0.143)/5 = 62.9%

v. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.

<LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				40340	40740	41140		
Frequency (MHz)				2565	2605	2645		
20	QPSK	1	0	20.14	20.27	20.25	21	0
20	QPSK	1	49	20.77	20.85	20.71		
20	QPSK	1	99	20.23	20.26	20.11		
20	QPSK	50	0	19.52	19.67	19.73	20	1
20	QPSK	50	24	19.62	19.76	19.75		
20	QPSK	50	50	19.68	19.70	19.66		
20	QPSK	100	0	19.56	19.64	19.63		
20	16QAM	1	0	19.29	19.45	19.48	20	1
20	16QAM	1	49	19.81	19.94	19.92		
20	16QAM	1	99	19.35	19.44	19.34		
20	16QAM	50	0	18.52	18.69	18.89	19	2
20	16QAM	50	24	18.65	18.75	18.94		
20	16QAM	50	50	18.66	18.68	18.86		
20	16QAM	100	0	18.55	18.69	18.80		
Channel				40315	40740	41165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2562.5	2605	2647.5		
15	QPSK	1	0	20.38	20.48	20.44	21	0
15	QPSK	1	37	20.62	20.80	20.64		
15	QPSK	1	74	20.35	20.50	20.29		
15	QPSK	36	0	19.53	19.66	19.59	20	1
15	QPSK	36	20	19.58	19.67	19.63		
15	QPSK	36	39	19.56	19.70	19.61		
15	QPSK	75	0	19.53	19.71	19.75		
15	16QAM	1	0	19.51	19.67	19.66	20	1
15	16QAM	1	37	19.76	19.95	19.82		
15	16QAM	1	74	19.52	19.61	19.49		
15	16QAM	36	0	18.43	18.60	18.63	19	2
15	16QAM	36	20	18.52	18.64	18.67		
15	16QAM	36	39	18.49	18.64	18.61		
15	16QAM	75	0	18.59	18.68	18.87		
Channel				40290	40740	41190	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2560	2605	2650		
10	QPSK	1	0	20.46	20.65	20.51	21	0
10	QPSK	1	25	20.44	20.60	20.42		
10	QPSK	1	49	20.48	20.60	20.45		
10	QPSK	25	0	19.52	19.78	19.56	20	1
10	QPSK	25	12	19.59	19.72	19.59		
10	QPSK	25	25	19.57	19.77	19.57		
10	QPSK	50	0	19.56	19.82	19.72		
10	16QAM	1	0	19.58	19.80	19.75	20	1
10	16QAM	1	25	19.59	19.76	19.67		
10	16QAM	1	49	19.62	19.75	19.66		
10	16QAM	25	0	18.58	18.73	18.63	19	2
10	16QAM	25	12	18.58	18.74	18.71		
10	16QAM	25	25	18.59	18.70	18.70		
10	16QAM	50	0	18.58	18.78	18.90		
Channel				40265	40740	41215	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2557.5	2605	2652.5		
5	QPSK	1	0	20.31	20.51	20.36	21	0
5	QPSK	1	12	20.61	20.78	20.54		
5	QPSK	1	24	20.37	20.48	20.33		

5	QPSK	12	0	19.49	19.67	19.53	20	1
5	QPSK	12	7	19.53	19.67	19.61		
5	QPSK	12	13	19.46	19.69	19.58		
5	QPSK	25	0	19.52	19.69	19.54		
5	16QAM	1	0	19.46	19.68	19.60	20	1
5	16QAM	1	12	19.73	19.93	19.79		
5	16QAM	1	24	19.51	19.67	19.55		
5	16QAM	12	0	18.43	18.61	18.57	19	2
5	16QAM	12	7	18.49	18.66	18.61		
5	16QAM	12	13	18.43	18.58	18.58		
5	16QAM	25	0	18.53	18.72	18.64		

12. WiFi/Bluetooth Output Power (Unit: dBm)

General Note:

1. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
2. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
3. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, 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 for each frequency band.
4. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
    a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
    b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
    c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

<u><2.4GHz WLAN></u>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	13.68	14.00	99.88
		6	2437	13.84	14.00	
		11	2462	13.81	14.00	
	802.11g 6Mbps	1	2412	14.26	14.50	97.46
		6	2437	14.32	14.50	
		11	2462	14.28	14.50	
	802.11n-HT20 MCS0	1	2412	14.04	14.50	97.31
		6	2437	14.31	14.50	
		11	2462	14.35	14.50	
	802.11n-HT40 MCS0	3	2422	14.27	14.50	94.56
		6	2437	14.28	14.50	
		9	2452	14.29	14.50	

<5GHz WLAN>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	14.47	14.50	97.99
		40	5200	14.43	14.50	
		44	5220	14.35	14.50	
		48	5240	14.37	14.50	
	802.11n-HT20 MCS0	36	5180	14.25	14.50	97.86
		40	5200	14.20	14.50	
		44	5220	14.18	14.50	
		48	5240	14.16	14.50	
	802.11n-HT40 MCS0	38	5190	14.22	14.50	94.55
		46	5230	14.20	14.50	
	802.11ac-VHT20 MCS0	36	5180	14.27	14.50	97.86
		40	5200	14.22	14.50	
		44	5220	14.21	14.50	
		48	5240	14.20	14.50	
	802.11ac-VHT40 MCS0	38	5190	14.25	14.50	95.03
		46	5230	14.22	14.50	
	802.11ac-VHT80 MCS0	42	5210	13.30	13.50	89.06

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	14.39	14.50	97.99
		56	5280	14.41	14.50	
		60	5300	14.46	14.50	
		64	5320	14.43	14.50	
	802.11n-HT20 MCS0	52	5260	14.28	14.50	97.86
		56	5280	14.26	14.50	
		60	5300	14.27	14.50	
		64	5320	14.31	14.50	
	802.11n-HT40 MCS0	54	5270	14.18	14.50	94.55
		62	5310	14.51	15.00	
	802.11ac-VHT20 MCS0	52	5260	14.32	14.50	97.86
		56	5280	14.28	14.50	
		60	5300	14.33	14.50	
		64	5320	14.35	14.50	
	802.11ac-VHT40 MCS0	54	5270	14.21	14.50	95.03
		62	5310	14.55	15.00	
	802.11ac-VHT80 MCS0	58	5290	12.77	14.50	89.06

<2.4GHz Bluetooth>

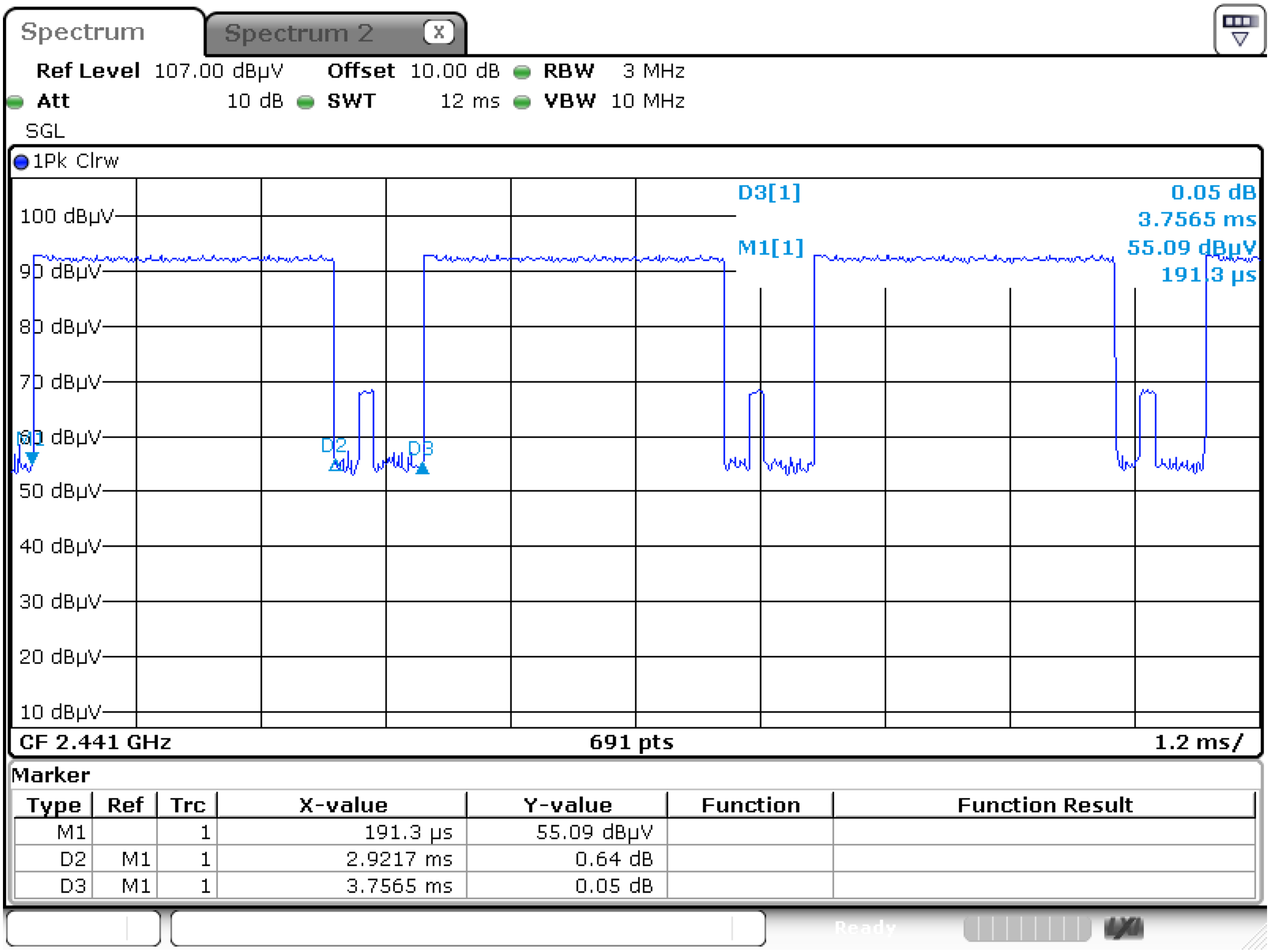
Mode	Channel	Frequency (MHz)	Average power (dBm)			Tune-up Limit		
			1Mbps	2Mbps	3Mbps	1Mbps	2Mbps	3Mbps
BR / EDR	CH 00	2402	8.84	5.86	5.87	9.00	6.00	6.00
	CH 39	2441	9.23	6.42	6.42	9.50	6.50	6.50
	CH 78	2480	9.29	6.18	6.18	9.50	6.50	6.50

Mode	Channel	Frequency (MHz)	Average power (dBm)		Tune-up Limit	
			1Mbps	2Mbps	1Mbps	2Mbps
LE	CH 00	2402	-3.91	-3.91	-3.50	-3.50
	CH 19	2440	-2.51	-2.52	-2.50	-2.50
	CH 39	2480	-3.21	-3.21	-3.00	-3.00

General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps due to its highest average power and duty cycle is 77.78% considered in SAR testing, and the duty cycle would be scaled to theoretical 83.3% in reported SAR calculation.

BT Duty cycle



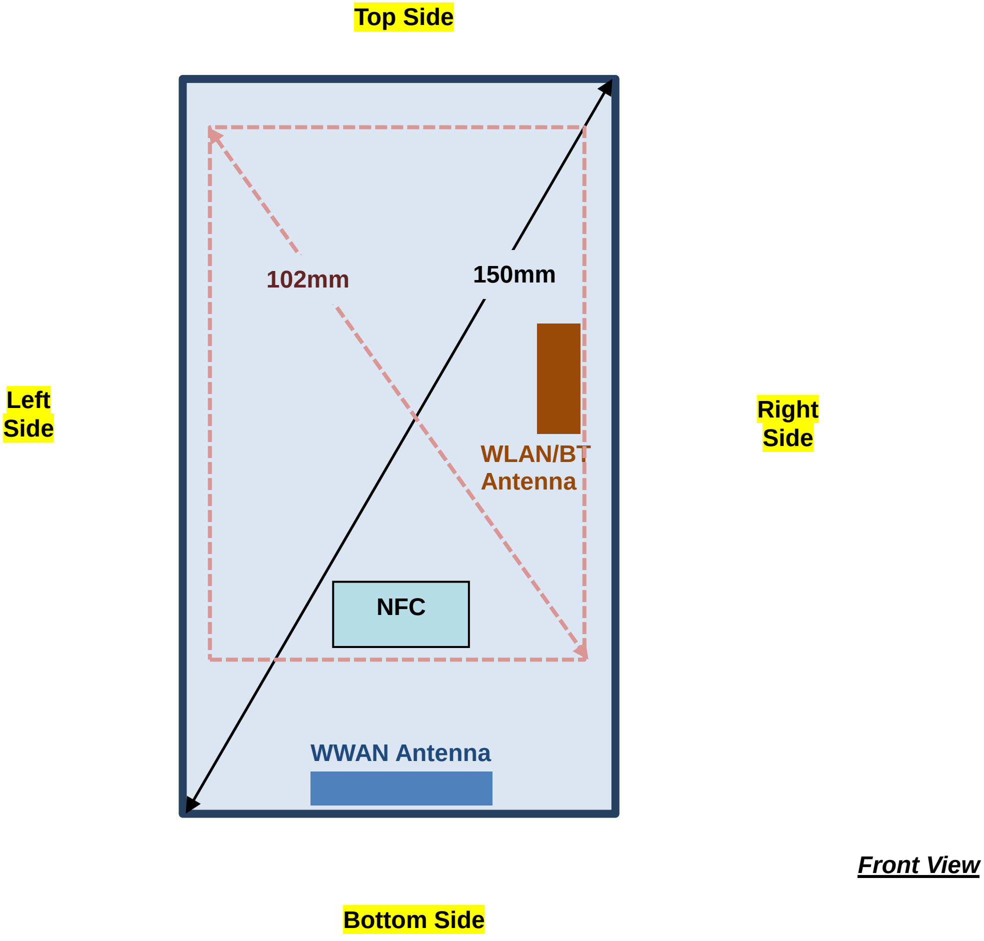
Ref Level 107.00 dBµV **Offset** 10.00 dB **RBW** 3 MHz
Att 10 dB **SWT** 12 ms **VBW** 10 MHz
SGL

CF 2.441 GHz 691 pts 1.2 ms/

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	191.3 µs	55.09 dBµV		
D2	M1	1	2.9217 ms	0.64 dB		
D3	M1	1	3.7565 ms	0.05 dB		

13. Antenna Location



Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm	≤ 25mm
BT&WLAN	≤ 25mm	≤ 25mm	>25mm	>25mm	≤ 25mm	>25mm

Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main	Yes	Yes	No	Yes	Yes	Yes
BT&WLAN	Yes	Yes	No	No	Yes	No

General Note:

1. Referring to KDB 941225 D06 v02r01, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.

14. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   e. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.=>有 TDD LTE 使用
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 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
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
4. Per KDB 648474 D04v01r03, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.

UMTS Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”.
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA , and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA .

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4/B5 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

WLAN Note:

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. Per KDB 248227 D01v02r02, WLAN5.2GHz SAR testing is not required when the WLAN5.3GHz band highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for WLAN5.2GHz band.
3. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
4. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
5. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

14.1 Head SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Right Cheek	0mm	9538	1907.6	21.84	22.00	1.038	-0.09	0.187	0.194
	WCDMA II	RMC 12.2Kbps	Right Tilted	0mm	9538	1907.6	21.84	22.00	1.038	-0.08	0.073	0.076
	WCDMA II	RMC 12.2Kbps	Left Cheek	0mm	9538	1907.6	21.84	22.00	1.038	-0.18	0.416	0.432
	WCDMA II	RMC 12.2Kbps	Left Cheek	0mm	9262	1852.4	21.78	22.00	1.052	-0.06	0.438	0.461
01	WCDMA II	RMC 12.2Kbps	Left Cheek	0mm	9400	1880	21.76	22.00	1.057	-0.05	0.442	0.467
	WCDMA II	RMC 12.2Kbps	Left Tilted	0mm	9538	1907.6	21.84	22.00	1.038	-0.12	0.070	0.073
02	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	4233	846.6	23.57	24.00	1.104	0.08	0.455	0.502
	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	4132	826.4	23.48	24.00	1.127	-0.01	0.368	0.415
	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	4182	836.4	23.56	24.00	1.107	-0.01	0.429	0.475
	WCDMA V	RMC 12.2Kbps	Right Tilted	0mm	4233	846.6	23.57	24.00	1.104	-0.14	0.232	0.256
	WCDMA V	RMC 12.2Kbps	Left Cheek	0mm	4233	846.6	23.57	24.00	1.104	-0.02	0.352	0.389
	WCDMA V	RMC 12.2Kbps	Left Tilted	0mm	4233	846.6	23.57	24.00	1.104	-0.09	0.215	0.237

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	49	Right Cheek	0mm	18700	1860	21.51	22.00	1.119	-0.09	0.243	0.272
	LTE Band 2	20M	QPSK	50	0	Right Cheek	0mm	19100	1900	20.66	21.00	1.081	-0.03	0.209	0.226
	LTE Band 2	20M	QPSK	1	49	Right Tilted	0mm	18700	1860	21.51	22.00	1.119	-0.07	0.092	0.103
	LTE Band 2	20M	QPSK	50	0	Right Tilted	0mm	19100	1900	20.66	21.00	1.081	-0.05	0.064	0.069
	LTE Band 2	20M	QPSK	1	49	Left Cheek	0mm	18700	1860	21.51	22.00	1.119	-0.1	0.456	0.510
03	LTE Band 2	20M	QPSK	1	49	Left Cheek	0mm	18900	1880	21.50	22.00	1.122	-0.07	0.537	0.603
	LTE Band 2	20M	QPSK	1	49	Left Cheek	0mm	19100	1900	21.48	22.00	1.127	-0.14	0.493	0.556
	LTE Band 2	20M	QPSK	50	0	Left Cheek	0mm	19100	1900	20.66	21.00	1.081	-0.09	0.437	0.473
	LTE Band 2	20M	QPSK	1	49	Left Tilted	0mm	18700	1860	21.51	22.00	1.119	-0.11	0.155	0.174
	LTE Band 2	20M	QPSK	50	0	Left Tilted	0mm	19100	1900	20.66	21.00	1.081	0.07	0.167	0.181
	LTE Band 4	20M	QPSK	1	49	Right Cheek	0mm	20175	1732.5	23.13	23.50	1.089	-0.02	0.263	0.286
	LTE Band 4	20M	QPSK	50	0	Right Cheek	0mm	20175	1732.5	22.14	22.50	1.086	-0.13	0.230	0.250
	LTE Band 4	20M	QPSK	1	49	Right Tilted	0mm	20175	1732.5	23.13	23.50	1.089	-0.03	0.048	0.052
	LTE Band 4	20M	QPSK	50	0	Right Tilted	0mm	20175	1732.5	22.14	22.50	1.086	-0.1	0.044	0.048
04	LTE Band 4	20M	QPSK	1	49	Left Cheek	0mm	20175	1732.5	23.13	23.50	1.089	-0.04	0.423	0.461
	LTE Band 4	20M	QPSK	50	0	Left Cheek	0mm	20175	1732.5	22.14	22.50	1.086	-0.15	0.237	0.257
	LTE Band 4	20M	QPSK	1	49	Left Tilted	0mm	20175	1732.5	23.13	23.50	1.089	-0.02	0.074	0.081
	LTE Band 4	20M	QPSK	50	0	Left Tilted	0mm	20175	1732.5	22.14	22.50	1.086	-0.01	0.063	0.068
	LTE Band 5	10M	QPSK	1	25	Right Cheek	0mm	20525	836.5	23.20	23.50	1.072	-0.15	0.307	0.329
	LTE Band 5	10M	QPSK	25	0	Right Cheek	0mm	20525	836.5	22.23	23.00	1.194	-0.06	0.281	0.336
	LTE Band 5	10M	QPSK	1	25	Right Tilted	0mm	20525	836.5	23.20	23.50	1.072	-0.17	0.199	0.213
	LTE Band 5	10M	QPSK	25	0	Right Tilted	0mm	20525	836.5	22.23	23.00	1.194	-0.02	0.159	0.190
05	LTE Band 5	10M	QPSK	1	25	Left Cheek	0mm	20525	836.5	23.20	23.50	1.072	-0.07	0.320	0.343
	LTE Band 5	10M	QPSK	25	0	Left Cheek	0mm	20525	836.5	22.23	23.00	1.194	-0.13	0.247	0.295
	LTE Band 5	10M	QPSK	1	25	Left Tilted	0mm	20525	836.5	23.20	23.50	1.072	-0.01	0.175	0.188
	LTE Band 5	10M	QPSK	25	0	Left Tilted	0mm	20525	836.5	22.23	23.00	1.194	-0.07	0.142	0.170

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 41	20M	QPSK	1	49	Right Cheek	0mm	40740	2605	20.85	21.00	1.035	62.9	1.006	-0.01	0.024	0.025
	LTE Band 41	20M	QPSK	50	24	Right Cheek	0mm	40740	2605	19.76	20.00	1.057	62.9	1.006	0.02	0.011	0.012
	LTE Band 41	20M	QPSK	1	49	Right Tilted	0mm	40740	2605	20.85	21.00	1.035	62.9	1.006	0.06	0.030	0.031
	LTE Band 41	20M	QPSK	50	24	Right Tilted	0mm	40740	2605	19.76	20.00	1.057	62.9	1.006	0.14	0.026	0.028
	LTE Band 41	20M	QPSK	1	49	Left Cheek	0mm	40740	2605	20.85	21.00	1.035	62.9	1.006	-0.08	0.050	0.052
06	LTE Band 41	20M	QPSK	1	49	Left Cheek	0mm	40340	2565	20.77	21.00	1.054	62.9	1.006	-0.19	0.086	0.091
	LTE Band 41	20M	QPSK	1	49	Left Cheek	0mm	41140	2645	20.71	21.00	1.069	62.9	1.006	0.07	0.067	0.072
	LTE Band 41	20M	QPSK	50	24	Left Cheek	0mm	40740	2605	19.76	20.00	1.057	62.9	1.006	0.01	0.061	0.065
	LTE Band 41	20M	QPSK	1	49	Left Tilted	0mm	41140	2645	20.71	21.00	1.069	62.9	1.006	-0.14	0.021	0.023
	LTE Band 41	20M	QPSK	50	24	Left Tilted	0mm	41140	2645	19.75	20.00	1.059	62.9	1.006	0.18	0.016	0.017

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
07	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	6	2437	13.84	14.00	1.038	99.88	1.001	-0.04	0.366	0.380
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	1	2412	13.68	14.00	1.076	99.88	1.001	-0.01	0.321	0.346
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	11	2462	13.81	14.00	1.045	99.88	1.001	-0.14	0.300	0.314
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	6	2437	13.84	14.00	1.038	99.88	1.001	-0.03	0.024	0.025
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	6	2437	13.84	14.00	1.038	99.88	1.001	-0.06	0.090	0.093
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	6	2437	13.84	14.00	1.038	99.88	1.001	-0.09	0.037	0.038
08	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	62	5310	14.51	15.00	1.119	94.55	1.058	-0.01	0.789	0.934
	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	54	5270	14.18	14.50	1.076	94.55	1.058	-0.15	0.772	0.879
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	58	5290	12.77	14.50	1.489	89.06	1.123	0.13	0.522	0.873
	WLAN5GHz	802.11n-HT40 MCS0	Right Tilted	0mm	62	5310	14.51	15.00	1.119	94.55	1.058	-0.04	0.053	0.063
	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	62	5310	14.51	15.00	1.119	94.55	1.058	-0.01	0.286	0.339
	WLAN5GHz	802.11n-HT40 MCS0	Left Tilted	0mm	62	5310	14.51	15.00	1.119	94.55	1.058	-0.15	0.145	0.172

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
09	Bluetooth	1Mbps	Right Cheek	0mm	78	2480	9.29	9.50	1.050	77.78	1.071	-0.03	0.043	0.048
	Bluetooth	1Mbps	Right Cheek	0mm	0	2402	8.84	9.00	1.038	77.78	1.071	-0.1	0.040	0.044
	Bluetooth	1Mbps	Right Cheek	0mm	39	2441	9.23	9.50	1.064	77.78	1.071	-0.08	0.041	0.047
	Bluetooth	1Mbps	Right Tilted	0mm	78	2480	9.29	9.50	1.050	77.78	1.071	0.06	0.001	0.001
	Bluetooth	1Mbps	Left Cheek	0mm	78	2480	9.29	9.50	1.050	77.78	1.071	0.01	0.001	0.001
	Bluetooth	1Mbps	Left Tilted	0mm	78	2480	9.29	9.50	1.050	77.78	1.071	0.11	0.001	0.001

14.2 Hotspot SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	10mm	9538	1907.6	21.84	22.00	1.038	-0.11	0.995	1.032
	WCDMA II	RMC 12.2Kbps	Front	10mm	9262	1852.4	21.78	22.00	1.052	-0.11	0.882	0.928
	WCDMA II	RMC 12.2Kbps	Front	10mm	9400	1880	21.76	22.00	1.057	-0.11	0.896	0.947
	WCDMA II	RMC 12.2Kbps	Back	10mm	9538	1907.6	21.84	22.00	1.038	-0.17	0.304	0.315
	WCDMA II	RMC 12.2Kbps	Left Side	10mm	9538	1907.6	21.84	22.00	1.038	-0.16	0.265	0.275
	WCDMA II	RMC 12.2Kbps	Right Side	10mm	9538	1907.6	21.84	22.00	1.038	-0.17	0.088	0.091
10	WCDMA II	RMC 12.2Kbps	Bottom Side	10mm	9538	1907.6	21.84	22.00	1.038	0.11	1.030	1.069
	WCDMA II	RMC 12.2Kbps	Bottom Side	10mm	9262	1852.4	21.78	22.00	1.052	0.14	0.846	0.890
	WCDMA II	RMC 12.2Kbps	Bottom Side	10mm	9400	1880	21.76	22.00	1.057	0.17	0.897	0.948
	WCDMA V	RMC 12.2Kbps	Front	10mm	4233	846.6	23.57	24.00	1.104	-0.17	0.482	0.532
11	WCDMA V	RMC 12.2Kbps	Front	10mm	4132	826.4	23.48	24.00	1.127	0.06	0.484	0.546
	WCDMA V	RMC 12.2Kbps	Front	10mm	4182	836.4	23.56	24.00	1.107	-0.17	0.455	0.504
	WCDMA V	RMC 12.2Kbps	Back	10mm	4233	846.6	23.57	24.00	1.104	-0.11	0.311	0.343
	WCDMA V	RMC 12.2Kbps	Left Side	10mm	4233	846.6	23.57	24.00	1.104	-0.08	0.246	0.272
	WCDMA V	RMC 12.2Kbps	Right Side	10mm	4233	846.6	23.57	24.00	1.104	-0.11	0.343	0.379
	WCDMA V	RMC 12.2Kbps	Bottom Side	10mm	4233	846.6	23.57	24.00	1.104	-0.13	0.151	0.167

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	49	Front	10mm	18700	1860	21.51	22.00	1.119	-0.12	0.852	0.954
	LTE Band 2	20M	QPSK	1	49	Front	10mm	18900	1880	21.50	22.00	1.122	0.01	0.872	0.978
	LTE Band 2	20M	QPSK	1	49	Front	10mm	19100	1900	21.48	22.00	1.127	0.14	0.981	1.106
	LTE Band 2	20M	QPSK	50	0	Front	10mm	19100	1900	20.66	21.00	1.081	-0.11	0.930	1.006
	LTE Band 2	20M	QPSK	50	0	Front	10mm	18700	1860	20.48	21.00	1.127	-0.16	0.815	0.919
	LTE Band 2	20M	QPSK	50	24	Front	10mm	18900	1880	20.38	21.00	1.153	-0.14	0.816	0.941
	LTE Band 2	20M	QPSK	100	0	Front	10mm	19100	1900	20.57	21.00	1.104	-0.1	0.867	0.957
	LTE Band 2	20M	QPSK	1	49	Back	10mm	18700	1860	21.51	22.00	1.119	-0.12	0.332	0.372
	LTE Band 2	20M	QPSK	50	0	Back	10mm	19100	1900	20.66	21.00	1.081	-0.17	0.299	0.323
	LTE Band 2	20M	QPSK	1	49	Left Side	10mm	18700	1860	21.51	22.00	1.119	-0.16	0.357	0.400
	LTE Band 2	20M	QPSK	50	0	Left Side	10mm	19100	1900	20.66	21.00	1.081	-0.16	0.289	0.313
	LTE Band 2	20M	QPSK	1	49	Right Side	10mm	18700	1860	21.51	22.00	1.119	-0.15	0.106	0.119
	LTE Band 2	20M	QPSK	50	0	Right Side	10mm	19100	1900	20.66	21.00	1.081	0.17	0.088	0.095
	LTE Band 2	20M	QPSK	1	49	Bottom Side	10mm	18700	1860	21.51	22.00	1.119	0.01	1.020	1.142
12	LTE Band 2	20M	QPSK	1	49	Bottom Side	10mm	18900	1880	21.50	22.00	1.122	0.02	1.060	1.189
	LTE Band 2	20M	QPSK	1	49	Bottom Side	10mm	19100	1900	21.48	22.00	1.127	0.05	1.050	1.184
	LTE Band 2	20M	QPSK	50	0	Bottom Side	10mm	19100	1900	20.66	21.00	1.081	0.13	1.040	1.125
	LTE Band 2	20M	QPSK	50	0	Bottom Side	10mm	18700	1860	20.48	21.00	1.127	0.1	0.872	0.983
	LTE Band 2	20M	QPSK	50	24	Bottom Side	10mm	18900	1880	20.38	21.00	1.153	0.12	0.924	1.066
	LTE Band 2	20M	QPSK	100	0	Bottom Side	10mm	19100	1900	20.57	21.00	1.104	0.12	1.050	1.159

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
13	LTE Band 4	20M	QPSK	1	49	Front	10mm	20175	1732.5	23.13	23.50	1.089	-0.17	0.806	0.878
	LTE Band 4	20M	QPSK	50	0	Front	10mm	20175	1732.5	22.14	22.50	1.086	-0.11	0.668	0.726
	LTE Band 4	20M	QPSK	100	0	Front	10mm	20175	1732.5	22.09	22.50	1.099	-0.19	0.671	0.737
	LTE Band 4	20M	QPSK	1	49	Back	10mm	20175	1732.5	23.13	23.50	1.089	-0.19	0.288	0.314
	LTE Band 4	20M	QPSK	50	0	Back	10mm	20175	1732.5	22.14	22.50	1.086	-0.19	0.212	0.230
	LTE Band 4	20M	QPSK	1	49	Left Side	10mm	20175	1732.5	23.13	23.50	1.089	-0.06	0.210	0.229
	LTE Band 4	20M	QPSK	50	0	Left Side	10mm	20175	1732.5	22.14	22.50	1.086	-0.17	0.185	0.201
	LTE Band 4	20M	QPSK	1	49	Right Side	10mm	20175	1732.5	23.13	23.50	1.089	-0.13	0.104	0.113
	LTE Band 4	20M	QPSK	50	0	Right Side	10mm	20175	1732.5	22.14	22.50	1.086	-0.15	0.094	0.102
	LTE Band 4	20M	QPSK	1	49	Bottom Side	10mm	20175	1732.5	23.13	23.50	1.089	0.14	0.734	0.799
	LTE Band 4	20M	QPSK	50	0	Bottom Side	10mm	20175	1732.5	22.14	22.50	1.086	0.15	0.671	0.729
14	LTE Band 5	10M	QPSK	1	25	Front	10mm	20525	836.5	23.20	23.50	1.072	0.19	0.398	0.426
	LTE Band 5	10M	QPSK	25	0	Front	10mm	20525	836.5	22.23	23.00	1.194	-0.09	0.327	0.390
	LTE Band 5	10M	QPSK	1	25	Back	10mm	20525	836.5	23.20	23.50	1.072	-0.05	0.273	0.293
	LTE Band 5	10M	QPSK	25	0	Back	10mm	20525	836.5	22.23	23.00	1.194	0.18	0.226	0.270
	LTE Band 5	10M	QPSK	1	25	Left Side	10mm	20525	836.5	23.20	23.50	1.072	-0.01	0.234	0.251
	LTE Band 5	10M	QPSK	25	0	Left Side	10mm	20525	836.5	22.23	23.00	1.194	-0.01	0.192	0.229
	LTE Band 5	10M	QPSK	1	25	Right Side	10mm	20525	836.5	23.20	23.50	1.072	0.08	0.295	0.316
	LTE Band 5	10M	QPSK	25	0	Right Side	10mm	20525	836.5	22.23	23.00	1.194	0.02	0.244	0.291
	LTE Band 5	10M	QPSK	1	25	Bottom Side	10mm	20525	836.5	23.20	23.50	1.072	-0.03	0.106	0.114
	LTE Band 5	10M	QPSK	25	0	Bottom Side	10mm	20525	836.5	22.23	23.00	1.194	-0.02	0.084	0.100

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 41	20M	QPSK	1	49	Front	10mm	40740	2605	20.85	21.00	1.035	62.9	1.006	0.1	0.865	0.901
	LTE Band 41	20M	QPSK	1	49	Front	10mm	40340	2565	20.77	21.00	1.054	62.9	1.006	-0.05	0.882	0.936
	LTE Band 41	20M	QPSK	1	49	Front	10mm	41140	2645	20.71	21.00	1.069	62.9	1.006	0.05	0.837	0.900
	LTE Band 41	20M	QPSK	50	24	Front	10mm	40740	2605	19.76	20.00	1.057	62.9	1.006	0.16	0.691	0.735
	LTE Band 41	20M	QPSK	100	0	Front	10mm	40740	2605	19.64	20.00	1.086	62.9	1.006	-0.05	0.692	0.756
	LTE Band 41	20M	QPSK	1	49	Back	10mm	40740	2605	20.85	21.00	1.035	62.9	1.006	-0.14	0.203	0.211
	LTE Band 41	20M	QPSK	50	24	Back	10mm	40740	2605	19.76	20.00	1.057	62.9	1.006	0.02	0.160	0.170
	LTE Band 41	20M	QPSK	1	49	Left Side	10mm	40740	2605	20.85	21.00	1.035	62.9	1.006	-0.02	0.044	0.046
	LTE Band 41	20M	QPSK	50	24	Left Side	10mm	40740	2605	19.76	20.00	1.057	62.9	1.006	0.1	0.035	0.037
	LTE Band 41	20M	QPSK	1	49	Right Side	10mm	40740	2605	20.85	21.00	1.035	62.9	1.006	0.11	0.047	0.049
	LTE Band 41	20M	QPSK	50	24	Right Side	10mm	40740	2605	19.76	20.00	1.057	62.9	1.006	0.11	0.036	0.038
	LTE Band 41	20M	QPSK	1	49	Bottom Side	10mm	40740	2605	20.85	21.00	1.035	62.9	1.006	-0.02	1.130	1.177
15	LTE Band 41	20M	QPSK	1	49	Bottom Side	10mm	40340	2565	20.77	21.00	1.054	62.9	1.006	-0.13	1.120	1.188
	LTE Band 41	20M	QPSK	1	49	Bottom Side	10mm	41140	2645	20.71	21.00	1.069	62.9	1.006	-0.13	1.070	1.151
	LTE Band 41	20M	QPSK	50	24	Bottom Side	10mm	40740	2605	19.76	20.00	1.057	62.9	1.006	-0.16	0.912	0.970
	LTE Band 41	20M	QPSK	50	50	Bottom Side	10mm	40340	2565	19.68	20.00	1.076	62.9	1.006	-0.09	0.983	1.065
	LTE Band 41	20M	QPSK	50	24	Bottom Side	10mm	41140	2645	19.75	20.00	1.059	62.9	1.006	-0.04	0.952	1.014
	LTE Band 41	20M	QPSK	100	0	Bottom Side	10mm	40740	2605	19.64	20.00	1.086	62.9	1.006	-0.02	0.878	0.960

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	6	2437	13.84	14.00	1.038	99.88	1.001	0.18	0.039	0.040
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	1	2412	13.68	14.00	1.076	99.88	1.001	-0.06	0.023	0.025
16	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	11	2462	13.81	14.00	1.045	99.88	1.001	0.17	0.053	0.055
	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	6	2437	13.84	14.00	1.038	99.88	1.001	0.17	0.006	0.006
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	6	2437	13.84	14.00	1.038	99.88	1.001	0.08	0.034	0.035

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	1Mbps	Front	10mm	78	2480	9.29	9.50	1.050	77.78	1.071	-0.1	0.006	0.007
	Bluetooth	1Mbps	Back	10mm	78	2480	9.29	9.50	1.050	77.78	1.071	0.07	0.005	0.006
17	Bluetooth	1Mbps	Right Side	10mm	78	2480	9.29	9.50	1.050	77.78	1.071	-0.07	0.010	0.011
	Bluetooth	1Mbps	Right Side	10mm	0	2402	8.84	9.00	1.038	77.78	1.071	-0.18	0.008	0.009
	Bluetooth	1Mbps	Right Side	10mm	39	2441	9.23	9.50	1.064	77.78	1.071	0.06	0.009	0.010

14.3 Body-Worn Accessory SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
18	WCDMA II	RMC 12.2Kbps	Front	10mm	9538	1907.6	21.84	22.00	1.038	-0.11	0.995	1.032
	WCDMA II	RMC 12.2Kbps	Front	10mm	9262	1852.4	21.78	22.00	1.052	-0.11	0.882	0.928
	WCDMA II	RMC 12.2Kbps	Front	10mm	9400	1880	21.76	22.00	1.057	-0.11	0.896	0.947
	WCDMA II	RMC 12.2Kbps	Back	10mm	9538	1907.6	21.84	22.00	1.038	-0.17	0.304	0.315
	WCDMA V	RMC 12.2Kbps	Front	10mm	4233	846.6	23.57	24.00	1.104	-0.17	0.482	0.532
19	WCDMA V	RMC 12.2Kbps	Front	10mm	4132	826.4	23.48	24.00	1.127	0.06	0.484	0.546
	WCDMA V	RMC 12.2Kbps	Front	10mm	4182	836.4	23.56	24.00	1.107	-0.17	0.455	0.504
	WCDMA V	RMC 12.2Kbps	Back	10mm	4233	846.6	23.57	24.00	1.104	-0.11	0.311	0.343

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	49	Front	10mm	18700	1860	21.51	22.00	1.119	-0.12	0.852	0.954
	LTE Band 2	20M	QPSK	1	49	Front	10mm	18900	1880	21.50	22.00	1.122	0.01	0.872	0.978
20	LTE Band 2	20M	QPSK	1	49	Front	10mm	19100	1900	21.48	22.00	1.127	0.14	0.981	1.106
	LTE Band 2	20M	QPSK	50	0	Front	10mm	19100	1900	20.66	21.00	1.081	-0.11	0.930	1.006
	LTE Band 2	20M	QPSK	50	0	Front	10mm	18700	1860	20.48	21.00	1.127	-0.16	0.815	0.919
	LTE Band 2	20M	QPSK	50	24	Front	10mm	18900	1880	20.38	21.00	1.153	-0.14	0.816	0.941
	LTE Band 2	20M	QPSK	100	0	Front	10mm	19100	1900	20.57	21.00	1.104	-0.1	0.867	0.957
	LTE Band 2	20M	QPSK	1	49	Back	10mm	18700	1860	21.51	22.00	1.119	-0.12	0.332	0.372
	LTE Band 2	20M	QPSK	50	0	Back	10mm	19100	1900	20.66	21.00	1.081	-0.17	0.299	0.323
21	LTE Band 4	20M	QPSK	1	49	Front	10mm	20175	1732.5	23.13	23.50	1.089	-0.17	0.806	0.878
	LTE Band 4	20M	QPSK	50	0	Front	10mm	20175	1732.5	22.14	22.50	1.086	-0.11	0.668	0.726
	LTE Band 4	20M	QPSK	100	0	Front	10mm	20175	1732.5	22.09	22.50	1.099	-0.19	0.671	0.737
	LTE Band 4	20M	QPSK	1	49	Back	10mm	20175	1732.5	23.13	23.50	1.089	-0.19	0.288	0.314
	LTE Band 4	20M	QPSK	50	0	Back	10mm	20175	1732.5	22.14	22.50	1.086	-0.19	0.212	0.230
22	LTE Band 5	10M	QPSK	1	25	Front	10mm	20525	836.5	23.20	23.50	1.072	0.19	0.398	0.426
	LTE Band 5	10M	QPSK	25	0	Front	10mm	20525	836.5	22.23	23.00	1.194	-0.09	0.327	0.390
	LTE Band 5	10M	QPSK	1	25	Back	10mm	20525	836.5	23.20	23.50	1.072	-0.05	0.273	0.293
	LTE Band 5	10M	QPSK	25	0	Back	10mm	20525	836.5	22.23	23.00	1.194	0.18	0.226	0.270

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 41	20M	QPSK	1	49	Front	10mm	40740	2605	20.85	21.00	1.035	62.9	1.006	0.1	0.865	0.901
23	LTE Band 41	20M	QPSK	1	49	Front	10mm	40340	2565	20.77	21.00	1.054	62.9	1.006	-0.05	0.882	0.936
	LTE Band 41	20M	QPSK	1	49	Front	10mm	41140	2645	20.71	21.00	1.069	62.9	1.006	0.05	0.837	0.900
	LTE Band 41	20M	QPSK	50	24	Front	10mm	40740	2605	19.76	20.00	1.057	62.9	1.006	0.16	0.691	0.735
	LTE Band 41	20M	QPSK	100	0	Front	10mm	40740	2605	19.64	20.00	1.086	62.9	1.006	-0.05	0.692	0.756
	LTE Band 41	20M	QPSK	1	49	Back	10mm	40740	2605	20.85	21.00	1.035	62.9	1.006	-0.14	0.203	0.211
	LTE Band 41	20M	QPSK	50	24	Back	10mm	40740	2605	19.76	20.00	1.057	62.9	1.006	0.02	0.160	0.170

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	6	2437	13.84	14.00	1.038	99.88	1.001	0.18	0.039	0.040
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	1	2412	13.68	14.00	1.076	99.88	1.001	-0.06	0.023	0.025
24	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	11	2462	13.81	14.00	1.045	99.88	1.001	0.17	0.053	0.055
	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	6	2437	13.84	14.00	1.038	99.88	1.001	0.17	0.006	0.006
25	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	62	5310	14.51	15.00	1.119	94.55	1.058	-0.07	0.130	0.154
	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	54	5270	14.18	14.50	1.076	94.55	1.058	-0.08	0.099	0.113
	WLAN5GHz	802.11n-HT40 MCS0	Back	10mm	62	5310	14.51	15.00	1.119	94.55	1.058	0.19	0.063	0.075

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
26	Bluetooth	1Mbps	Front	10mm	78	2480	9.29	9.50	1.050	77.78	1.071	-0.1	0.006	0.007
	Bluetooth	1Mbps	Front	10mm	0	2402	8.84	9.00	1.038	77.78	1.071	-0.18	0.004	0.004
	Bluetooth	1Mbps	Front	10mm	39	2441	9.23	9.50	1.064	77.78	1.071	0.03	0.004	0.005
	Bluetooth	1Mbps	Back	10mm	78	2480	9.29	9.50	1.050	77.78	1.071	0.07	0.005	0.006

14.4 Repeated SAR Measurement

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 2	20M	QPSK	1	49	Bottom Side	10mm	18900	1880	21.50	22.00	1.122			0.02	1.060	-	1.189
2nd	LTE Band 2	20M	QPSK	1	49	Bottom Side	10mm	18900	1880	21.50	22.00	1.122			-0.16	1.030	1.029	1.156
1st	LTE Band 4	20M	QPSK	1	49	Front	10mm	20175	1732.5	23.13	23.50	1.089			-0.17	0.806	-	0.878
2nd	LTE Band 4	20M	QPSK	1	49	Front	10mm	20175	1732.5	23.13	23.50	1.089			-0.14	0.746	1.08	0.812
1st	LTE Band 41	20M	QPSK	1	49	Bottom Side	10mm	40740	2605	20.85	21.00	1.035	62.9	1.006	-0.02	1.130	-	1.177
2nd	LTE Band 41	20M	QPSK	1	49	Bottom Side	10mm	40740	2605	20.85	21.00	1.035	62.9	1.006	-0.05	1.120	1.009	1.166

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

15. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Portable Handset		
		Head	Body-worn	Hotspot
1.	WWAN + WLAN2.4GHz	Yes	Yes	Yes
2.	WWAN + WLAN5GHz	Yes	Yes	No
3.	WWAN + Bluetooth	Yes	Yes	Yes

General Note:

1. This device WLAN 2.4GHz supports Hotspot operation and Bluetooth support tethering applications.
2. The worst case WLAN reported SAR for each configuration was used for SAR summation. Therefore, the following summations represent the absolute worst cases for simultaneous transmission with WLAN.
3. The Scaled SAR summation is calculated based on the same configuration and test position.
4. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.

15.1 Head Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)
		WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth			
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)			
WCDMA II	Right Cheek	0.194	0.380	0.934	0.048	**0.574**	**1.128**	**0.242**
	Right Tilted	0.076	0.025	0.063	0.001	**0.101**	**0.139**	**0.077**
	Left Cheek	0.467	0.093	0.339	0.001	**0.560**	**0.806**	**0.468**
	Left Tilted	0.073	0.038	0.172	0.001	**0.111**	**0.245**	**0.074**
WCDMA V	Right Cheek	0.502	0.380	0.934	0.048	**0.882**	**1.436**	**0.550**
	Right Tilted	0.256	0.025	0.063	0.001	**0.281**	**0.319**	**0.257**
	Left Cheek	0.389	0.093	0.339	0.001	**0.482**	**0.728**	**0.390**
	Left Tilted	0.237	0.038	0.172	0.001	**0.275**	**0.409**	**0.238**
LTE Band 2	Right Cheek	0.272	0.380	0.934	0.048	**0.652**	**1.206**	**0.320**
	Right Tilted	0.103	0.025	0.063	0.001	**0.128**	**0.166**	**0.104**
	Left Cheek	0.603	0.093	0.339	0.001	**0.696**	**0.942**	**0.604**
	Left Tilted	0.181	0.038	0.172	0.001	**0.219**	**0.353**	**0.182**
LTE Band 4	Right Cheek	0.286	0.380	0.934	0.048	**0.666**	**1.220**	**0.334**
	Right Tilted	0.052	0.025	0.063	0.001	**0.077**	**0.115**	**0.053**
	Left Cheek	0.461	0.093	0.339	0.001	**0.554**	**0.800**	**0.462**
	Left Tilted	0.081	0.038	0.172	0.001	**0.119**	**0.253**	**0.082**
LTE Band 5	Right Cheek	0.336	0.380	0.934	0.048	**0.716**	**1.270**	**0.384**
	Right Tilted	0.213	0.025	0.063	0.001	**0.238**	**0.276**	**0.214**
	Left Cheek	0.343	0.093	0.339	0.001	**0.436**	**0.682**	**0.344**
	Left Tilted	0.188	0.038	0.172	0.001	**0.226**	**0.360**	**0.189**
LTE Band 41	Right Cheek	0.025	0.380	0.934	0.048	**0.405**	**0.959**	**0.073**
	Right Tilted	0.031	0.025	0.063	0.001	**0.056**	**0.094**	**0.032**
	Left Cheek	0.091	0.093	0.339	0.001	**0.184**	**0.430**	**0.092**
	Left Tilted	0.023	0.038	0.172	0.001	**0.061**	**0.195**	**0.024**

15.2 Hotspot Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)
		WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth			
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)			
WCDMA II	Front	1.032	0.055		0.007	**1.087**		**1.039**
	Back	0.315	0.006		0.006	**0.321**		**0.321**
	Left side	0.275				**0.275**		**0.275**
	Right side	0.091	0.035		0.011	**0.126**		**0.102**
	Top side					**0.000**		**0.000**
	Bottom side	1.069				**1.069**		**1.069**
WCDMA V	Front	0.546	0.055		0.007	**0.601**		**0.553**
	Back	0.343	0.006		0.006	**0.349**		**0.349**
	Left side	0.272				**0.272**		**0.272**
	Right side	0.379	0.035		0.011	**0.414**		**0.390**
	Top side					**0.000**		**0.000**
	Bottom side	0.167				**0.167**		**0.167**
LTE Band 2	Front	1.106	0.055		0.007	**1.161**		**1.113**
	Back	0.372	0.006		0.006	**0.378**		**0.378**
	Left side	0.400				**0.400**		**0.400**
	Right side	0.119	0.035		0.011	**0.154**		**0.130**
	Top side					**0.000**		**0.000**
	Bottom side	1.189				**1.189**		**1.189**
LTE Band 4	Front	0.878	0.055		0.007	**0.933**		**0.885**
	Back	0.314	0.006		0.006	**0.320**		**0.320**
	Left side	0.229				**0.229**		**0.229**
	Right side	0.113	0.035		0.011	**0.148**		**0.124**
	Top side					**0.000**		**0.000**
	Bottom side	0.799				**0.799**		**0.799**
LTE Band 5	Front	0.426	0.055		0.007	**0.481**		**0.433**
	Back	0.293	0.006		0.006	**0.299**		**0.299**
	Left side	0.251				**0.251**		**0.251**
	Right side	0.316	0.035		0.011	**0.351**		**0.327**
	Top side					**0.000**		**0.000**
	Bottom side	0.114				**0.114**		**0.114**
LTE Band 41	Front	0.936	0.055		0.007	**0.991**		**0.943**
	Back	0.211	0.006		0.006	**0.217**		**0.217**
	Left side	0.046				**0.046**		**0.046**
	Right side	0.049	0.035		0.011	**0.084**		**0.060**
	Top side					**0.000**		**0.000**
	Bottom side	1.188				**1.188**		**1.188**

15.3 Body-Worn Accessory Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)
		WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth			
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)			
WCDMA II	Front	1.032	0.055	0.154	0.007	**1.087**	**1.186**	**1.039**
	Back	0.315	0.006	0.075	0.006	**0.321**	**0.390**	**0.321**
WCDMA V	Front	0.546	0.055	0.154	0.007	**0.601**	**0.700**	**0.553**
	Back	0.343	0.006	0.075	0.006	**0.349**	**0.418**	**0.349**
LTE Band 2	Front	1.106	0.055	0.154	0.007	**1.161**	**1.260**	**1.113**
	Back	0.372	0.006	0.075	0.006	**0.378**	**0.447**	**0.378**
LTE Band 4	Front	0.878	0.055	0.154	0.007	**0.933**	**1.032**	**0.885**
	Back	0.314	0.006	0.075	0.006	**0.320**	**0.389**	**0.320**
LTE Band 5	Front	0.426	0.055	0.154	0.007	**0.481**	**0.580**	**0.433**
	Back	0.293	0.006	0.075	0.006	**0.299**	**0.368**	**0.299**
LTE Band 41	Front	0.936	0.055	0.154	0.007	**0.991**	**1.090**	**0.943**
	Back	0.211	0.006	0.075	0.006	**0.217**	**0.286**	**0.217**

Test Engineer： Jordar Jhuang, Wilson Lin, Charles Shen, Jerry Hsu and White Huang

16. Uncertainty Assessment

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg. Therefore, the measurement uncertainty table is not required in this report.

Declaration of Conformity:

The test results with all measurement uncertainty excluded is presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

17. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

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

[4] SPEAG DASY System Handbook

[5] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.

[6] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[7] FCC KDB 648474 D04 v01r03, “SAR Evaluation Considerations for Wireless Handsets”, Oct 2015.

[8] FCC KDB 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, Oct 2015

[9] FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015

[10] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.

[11] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[12] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.