FCC SAR TEST REPORT

FCC ID	:	**GKRGBZ4S**
Equipment	:	**Wireless Device**
Model Name	:	**GBZ4S**
Applicant	:	**Compal Electronics, Inc No. 581-1 & 581, Ruiguang Rd., Nei-hu District, Taipei City 114, TAIWAN (R.O.C.).**
Standard	:	**FCC 47 CFR Part 2 (2.1093)**

The product was received on May. 03, 2021 and testing was started from Jun. 02, 2021 and completed on Nov. 03, 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.

Approved by: Cona Huang / Deputy Manager

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History of this test report

Report No.	Version	Description	Issued Date
FA0D2204-01	01	Initial issue of report	Nov. 03, 2021

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Compal Electronics, Inc, Wireless Device, GBZ4S, are as follows.

Equipment Class	Frequency Band	Highest SAR Summary		Highest Simultaneous Transmission 1g SAR (W/kg)	Highest Simultaneous Transmission 10g SAR (W/kg)
		Head SAR (Separation 10mm)	Hand SAR (Separation 0mm)		
		1g SAR (W/kg)	10g SAR (W/kg)		
Licensed	WCDMA V	0.08	0.27	0.35	0.34
	LTE Band 7	0.27	0.16		
	LTE Band 5/26	0.08	0.19		
DTS	2.4GHz WLAN	0.08	0.07	0.35	0.34
DSS	Bluetooth	0.05	0.02	0.32	0.29
Date of Testing:		2021/6/2 ~ 2021/11/3			

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 Head 1g SAR, 4.0 W/kg for Hand 10g 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 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

3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	Wireless Device
Model Name	GBZ4S
FCC ID	GKRGBZ4S
Wireless Technology and Frequency Range	WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 26: 814 MHz ~ 849 MHz WLAN 2.4 GHz Band: 2400 MHz ~ 2483.5 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz Rx only WPT: 165KHz ~ 205KHz Rx only
Mode	RMC/AMR 12.2Kbps HSDPA HSUPA LTE: QPSK, 16QAM WLAN: 802.11b/g/n HT20 Bluetooth BR/EDR/LE NFC: ASK WPT: ASK

3.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	GKRGBZ4S
Equipment Name	WIRELESS Device
Operating Frequency Range of each LTE transmission band	LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 26: 814 MHz ~ 849 MHz
Channel Bandwidth	LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 26:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz
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 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 7

	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	20775	2502.5	20800	2505	20825	2507.5	20850	2510
M	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560

LTE Band 26

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5

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:

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

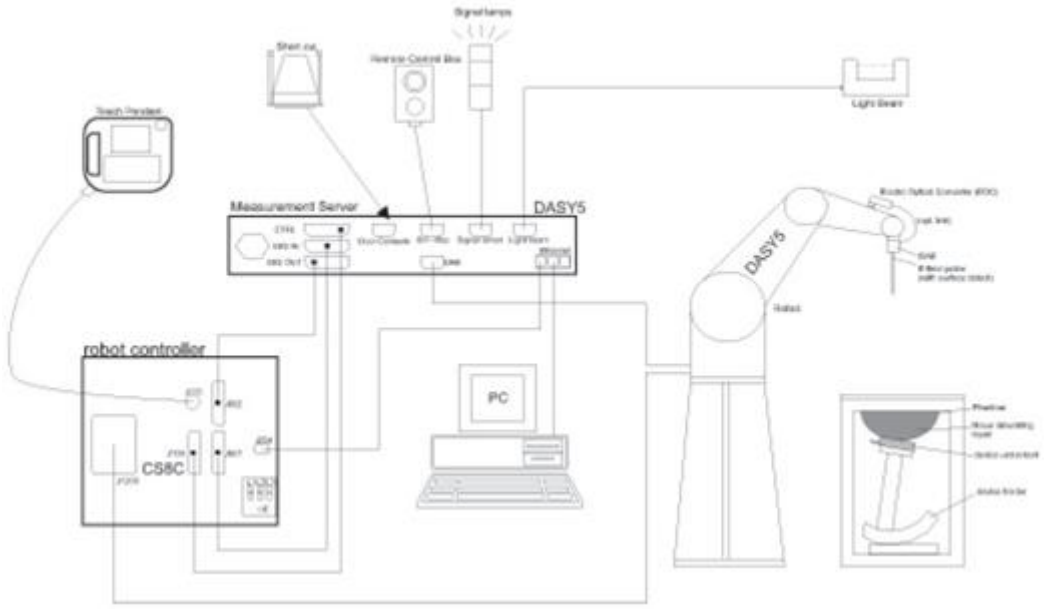
SAR is expressed in units of Watts per kilogram (W/kg)

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

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. In system validation list test site number, if the test site number is include in the Wensan Laboratory, that's mean the test data are subcontracted to Sporton International Inc. Wensan Laboratory.

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.

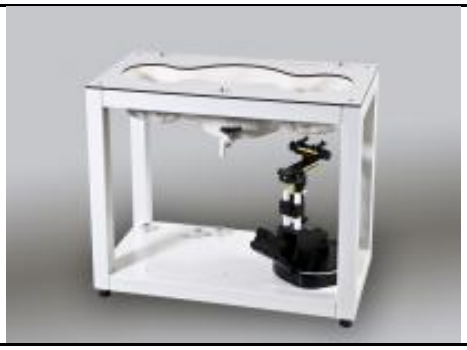
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

6.4 Phantom

<SAM Twin Phantom>

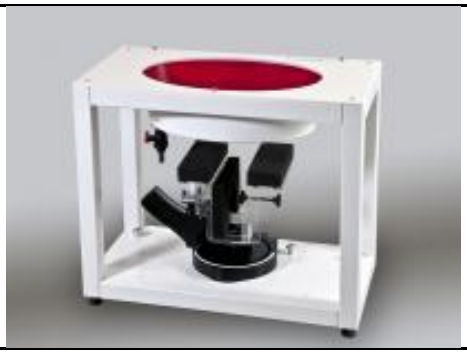
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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.

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

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see 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	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	1008	Aug. 31, 2018	Aug. 28, 2021
SPEAG	2600MHz System Validation Kit(2)	D2600V2	1078	Mar. 06, 2019	Mar. 03, 2022
SPEAG	Data Acquisition Electronics	DAE4	376	Nov. 23, 2020	Nov. 22, 2021
SPEAG	Data Acquisition Electronics	DAE4	1424	Jan. 19, 2021	Jan. 18, 2022
SPEAG	Data Acquisition Electronics	DAE4	1512	Feb. 11, 2021	Feb. 10, 2022
SPEAG	Data Acquisition Electronics	DAE4	1647	Jan. 07, 2021	Jan. 06, 2022
SPEAG	Dosimetric E-Field Probe	ES3DV3	3184	Sep. 23, 2020	Sep. 22, 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
SPEAG	Dosimetric E-Field Probe	EX3DV4	7625	Jan. 19, 2021	Jan. 18, 2022
Testo	Hygro meter	608-H1	45196600	Nov. 10, 2020	Nov. 09, 2021
Testo	Hygro meter	608-H1	45207528	Nov. 10, 2020	Nov. 09, 2021
RCPTWN	Thermometer	HTC-1	TM685-1	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	MY46104758	Sep. 03, 2020	Sep. 02, 2021
Keysight	ENA Network Analyzer	E5071C	MY46316648	Jul. 22, 2021	Jul. 21, 2022
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 16, 2020	Sep. 15, 2021
SPEAG	Dielectric Probe Kit	DAK-3.5	1146	Jul. 14, 2021	Jul. 13, 2022
LINE SEIKI	Digital Thermometer	DTM3000-spezial	2942	Nov. 06, 2020	Nov. 05, 2021
Anritsu	Power Meter	ML2495A	1419002	Aug. 19, 2020	Aug. 18, 2021
Anritsu	Power Meter	ML2495A	1804003	Oct. 21, 2020	Oct. 20, 2021
Anritsu	Power Meter	ML2496A	2119003	Jun. 09, 2021	Jun. 08, 2022
Anritsu	Power Meter	ML2495A	1419002	Aug. 18, 2021	Aug. 17, 2022
Anritsu	Power Sensor	MA2411B	1911176	Aug. 18, 2020	Aug. 17, 2021
Anritsu	Power Sensor	MA2411B	1726150	Oct. 21, 2020	Oct. 20, 2021
Anritsu	Power Sensor	MA2411B	1911334	Jun. 01, 2021	May. 31, 2022
Anritsu	Power Sensor	MA2411B	1911176	Aug. 18, 2021	Aug. 17, 2022
Agilent	Spectrum Analyzer	E4408B	MY44211028	Aug. 27, 2020	Aug. 26, 2021
Anritsu	Spectrum Analyzer	N9010A	MY53470118	Jan. 15, 2021	Jan. 14, 2022
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jul. 16, 2021	Jul. 15, 2022
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 21, 2020	Oct. 20, 2021
Mini-Circuits	Power Amplifier	ZVE-8G+	479102029	Aug. 26, 2020	Aug. 25, 2021
Mini-Circuits	Power Amplifier	ZHL-42W+	715701915	May. 11, 2021	May. 10, 2022
Mini-Circuits	Power Amplifier	ZHL-42W+	321501827	Sep. 06, 2021	Sep. 05, 2022
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Warison	Directional Coupler	WCOU-10-50S-10	WR889BMC4B1	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	0.890	41.265	0.90	41.50	-1.11	-0.57	±5	2021/7/28
835	22.4	0.888	42.488	0.90	41.50	-1.33	2.38	±5	2021/8/2
835	22.5	0.877	41.112	0.90	41.50	-2.56	-0.93	±5	2021/8/3
835	22.3	0.905	42.409	0.90	41.50	0.56	2.19	±5	2021/8/3
835	22.1	0.902	43.157	0.90	41.50	0.22	3.99	±5	2021/8/10
835	22.4	0.887	40.821	0.90	41.50	-1.44	-1.64	±5	2021/8/11
835	22.6	0.926	42.620	0.90	41.50	2.89	2.70	±5	2021/11/3
2450	22.2	1.823	39.268	1.80	39.20	1.28	0.17	±5	2021/6/2
2450	22.4	1.777	40.162	1.80	39.20	-1.28	2.45	±5	2021/8/11
2600	22.2	1.992	38.660	1.96	39.00	1.63	-0.87	±5	2021/6/2
2600	22.5	1.979	38.553	1.96	39.00	0.97	-1.15	±5	2021/6/11
2600	22.4	1.932	39.551	1.96	39.00	-1.43	1.41	±5	2021/8/11

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 (%)	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
SAR09	2021/7/28	835	250	D835V2-4d167	ES3DV3 - SN3184	DAE4 Sn1647	2.42	9.55	9.68	1.36	1.63	6.21	6.52	4.99
SAR05	2021/8/2	835	250	D835V2-4d167	EX3DV4 - SN7590	DAE4 Sn1424	2.36	9.55	9.44	-1.15	1.53	6.21	6.12	-1.45
SAR09	2021/8/3	835	250	D835V2-4d167	ES3DV3 - SN3184	DAE4 Sn1647	2.15	9.55	8.6	-9.95	1.45	6.21	5.8	-6.60
SAR05	2021/8/3	835	250	D835V2-4d167	EX3DV4 - SN7590	DAE4 Sn1424	2.40	9.55	9.6	0.52	1.55	6.21	6.2	-0.16
SAR05	2021/8/10	835	250	D835V2-4d167	EX3DV4 - SN7590	DAE4 Sn1424	2.38	9.55	9.52	-0.31	1.53	6.21	6.12	-1.45
SAR05	2021/8/11	835	250	D835V2-4d167	EX3DV4 - SN7590	DAE4 Sn1424	2.38	9.55	9.52	-0.31	1.55	6.21	6.2	-0.16
SAR15	2021/11/3	835	250	D835V2-4d167	EX3DV4 - SN7625	DAE4 Sn1512	2.43	9.55	9.72	1.78	1.57	6.21	6.28	1.13
SAR06	2021/6/2	2450	50	D2450V2-736	EX3DV4 - SN7439	DAE4 Sn376	2.60	52.70	52	-1.33	1.21	24.60	24.2	-1.63
SAR05	2021/8/11	2450	250	D2450V2-929	EX3DV4 - SN7590	DAE4 Sn1424	13.10	53.10	52.4	-1.32	6.16	24.70	24.64	-0.24
SAR06	2021/6/2	2600	50	D2600V2-1008	EX3DV4 - SN7439	DAE4 Sn376	2.98	56.40	59.6	5.67	1.37	25.30	27.4	8.30
SAR06	2021/6/11	2600	50	D2600V2-1008	EX3DV4 - SN7439	DAE4 Sn376	2.96	56.40	59.2	4.96	1.36	25.30	27.2	7.51
SAR05	2021/8/11	2600	250	D2600V2-1078	EX3DV4 - SN7590	DAE4 Sn1424	13.80	57.60	55.2	-4.17	6.30	25.50	25.2	-1.18

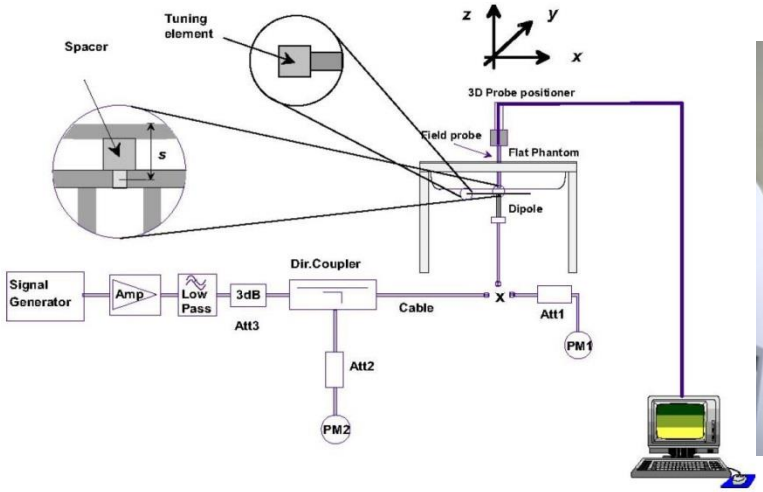


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

10. RF Exposure Positions

10.1 Hand Exposure

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, According to KDB648474 D04v01r03, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.

2. The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions.6 The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

11. UMTS/CDMA/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.

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 β_{hs} = 30/15 * β_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 β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_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	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 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_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c.

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

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the 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

<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.

Ant. Top

Band		WCDMA V			Tune-up Limit (dBm)
TX Channel		4132	4182	4233	
Rx Channel		4357	4407	4458	
Frequency (MHz)		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	23.91	23.84	23.76	25.00
3GPP Rel 99	RMC 12.2Kbps	24.01	23.92	23.80	25.00
3GPP Rel 6	HSDPA Subtest-1	22.08	21.99	21.86	23.00
3GPP Rel 6	HSDPA Subtest-2	22.06	22.02	21.83	23.00
3GPP Rel 6	HSDPA Subtest-3	21.15	21.10	20.98	22.00
3GPP Rel 6	HSDPA Subtest-4	20.10	19.98	19.84	21.00
3GPP Rel 6	HSUPA Subtest-1	20.62	20.55	20.40	21.00
3GPP Rel 6	HSUPA Subtest-2	18.07	18.10	17.86	19.00
3GPP Rel 6	HSUPA Subtest-3	20.10	19.99	19.91	21.00
3GPP Rel 6	HSUPA Subtest-4	18.12	17.97	17.87	19.00
3GPP Rel 6	HSUPA Subtest-5	21.90	21.70	21.70	22.50

Ant. Bottom

Band		WCDMA V			Tune-up Limit (dBm)
TX Channel		4132	4182	4233	
Rx Channel		4357	4407	4458	
Frequency (MHz)		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	24.60	24.40	24.34	25.00
3GPP Rel 99	RMC 12.2Kbps	24.61	24.50	24.42	25.00
3GPP Rel 6	HSDPA Subtest-1	22.68	22.55	22.46	23.30
3GPP Rel 6	HSDPA Subtest-2	22.68	22.59	22.51	23.30
3GPP Rel 6	HSDPA Subtest-3	21.78	21.68	21.57	22.30
3GPP Rel 6	HSDPA Subtest-4	20.69	20.62	20.45	21.30
3GPP Rel 6	HSUPA Subtest-1	21.27	21.14	21.05	21.30
3GPP Rel 6	HSUPA Subtest-2	18.71	18.61	18.39	19.30
3GPP Rel 6	HSUPA Subtest-3	20.69	20.62	20.48	21.30
3GPP Rel 6	HSUPA Subtest-4	18.65	18.64	18.50	19.30
3GPP Rel 6	HSUPA Subtest-5	21.60	21.52	21.97	22.80

<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 B5/B26 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.
9. LTE band 5 SAR test was covered by Band 26; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
    a. the maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion
    b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

Ant. Top

<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	23.12	23.28	23.17	24.5	0
10	QPSK	1	25	23.11	23.15	23.14		
10	QPSK	1	49	23.08	23.12	23.05		
10	QPSK	25	0	22.16	22.22	22.22	23.5	1
10	QPSK	25	12	22.16	22.21	22.20		
10	QPSK	25	25	22.15	22.21	22.18		
10	QPSK	50	0	22.17	22.20	22.23		
10	16QAM	1	0	22.00	21.96	22.05	23.5	1
10	16QAM	1	25	21.91	21.94	22.00		
10	16QAM	1	49	21.90	21.71	21.88		
10	16QAM	25	0	21.09	21.09	21.16	22.5	2
10	16QAM	25	12	21.04	21.09	21.16		
10	16QAM	25	25	21.04	21.09	21.12		
10	16QAM	50	0	21.12	21.14	21.18		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	23.21	23.19	23.08	24.5	0
5	QPSK	1	12	23.19	23.19	23.01		
5	QPSK	1	24	23.19	23.18	22.98		
5	QPSK	12	0	22.21	22.20	22.07	23.5	1
5	QPSK	12	7	22.19	22.22	22.05		
5	QPSK	12	13	22.21	22.21	22.06		
5	QPSK	25	0	22.23	22.22	22.10		
5	16QAM	1	0	21.92	22.11	21.95	23.5	1
5	16QAM	1	12	22.00	22.01	21.91		
5	16QAM	1	24	21.96	21.82	21.89		
5	16QAM	12	0	21.13	21.14	21.03	22.5	2
5	16QAM	12	7	21.16	21.15	21.03		
5	16QAM	12	13	21.14	21.14	21.00		
5	16QAM	25	0	21.13	21.14	21.00		
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	23.24	23.12	23.02	24.5	0
3	QPSK	1	8	23.22	23.13	22.99		
3	QPSK	1	14	23.22	23.12	22.98		
3	QPSK	8	0	22.26	22.20	22.07	23.5	1
3	QPSK	8	4	22.25	22.21	22.02		
3	QPSK	8	7	22.26	22.20	22.02		
3	QPSK	15	0	22.27	22.22	22.07		
3	16QAM	1	0	22.05	22.00	21.97	23.5	1
3	16QAM	1	8	22.05	21.89	21.91		
3	16QAM	1	14	22.04	21.87	21.89		
3	16QAM	8	0	21.22	21.11	20.96	22.5	2
3	16QAM	8	4	21.22	21.09	20.92		
3	16QAM	8	7	21.21	21.08	20.90		
3	16QAM	15	0	21.16	21.10	20.93		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	23.26	23.18	22.98	24.5	0
1.4	QPSK	1	3	23.26	23.18	22.98		
1.4	QPSK	1	5	23.27	23.16	22.99		
1.4	QPSK	3	0	23.26	23.21	23.05		
1.4	QPSK	3	1	23.26	23.20	23.06		
1.4	QPSK	3	3	23.25	23.21	23.04		

1.4	QPSK	6	0	22.25	22.18	22.02	23.5	1
1.4	16QAM	1	0	22.11	22.23	22.03	23.5	1
1.4	16QAM	1	3	22.13	22.20	21.94		
1.4	16QAM	1	5	22.18	22.08	21.95		
1.4	16QAM	3	0	22.10	21.94	21.96		
1.4	16QAM	3	1	22.12	21.97	21.90		
1.4	16QAM	3	3	22.05	21.96	21.86		
1.4	16QAM	6	0	21.17	21.08	20.92	22.5	2

<LTE Band 7>

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				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	23.30	23.64	23.52	24.5	0
20	QPSK	1	49	23.62	23.62	23.50		
20	QPSK	1	99	23.58	23.56	23.51		
20	QPSK	50	0	22.56	22.64	22.55	23.5	1
20	QPSK	50	24	22.73	22.74	22.59		
20	QPSK	50	50	22.88	22.83	22.64		
20	QPSK	100	0	22.74	22.72	22.58		
20	16QAM	1	0	22.13	22.37	22.32	23.5	1
20	16QAM	1	49	22.51	22.56	22.38		
20	16QAM	1	99	22.75	22.75	22.37		
20	16QAM	50	0	21.50	21.58	21.55	22.5	2
20	16QAM	50	24	21.66	21.70	21.59		
20	16QAM	50	50	21.83	21.77	21.64		
20	16QAM	100	0	21.64	21.67	21.59		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	23.24	23.61	23.42	24.5	0
15	QPSK	1	37	23.56	23.60	23.48		
15	QPSK	1	74	23.59	23.58	23.55		
15	QPSK	36	0	22.49	22.65	22.51	23.5	1
15	QPSK	36	20	22.64	22.73	22.54		
15	QPSK	36	39	22.79	22.82	22.54		
15	QPSK	75	0	22.65	22.75	22.53		
15	16QAM	1	0	22.27	22.42	22.36	23.5	1
15	16QAM	1	37	22.51	22.65	22.37		
15	16QAM	1	74	22.79	22.76	22.46		
15	16QAM	36	0	21.35	21.59	21.46	22.5	2
15	16QAM	36	20	21.54	21.68	21.50		
15	16QAM	36	39	21.66	21.74	21.54		
15	16QAM	75	0	21.55	21.72	21.54		
Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	23.28	23.52	23.49	24.5	0
10	QPSK	1	25	23.62	23.61	23.51		
10	QPSK	1	49	23.62	23.63	23.58		
10	QPSK	25	0	22.60	22.68	22.56	23.5	1
10	QPSK	25	12	22.71	22.73	22.60		
10	QPSK	25	25	22.82	22.76	22.61		
10	QPSK	50	0	22.71	22.73	22.60		
10	16QAM	1	0	22.36	22.46	22.34	23.5	1
10	16QAM	1	25	22.61	22.63	22.29		
10	16QAM	1	49	22.76	22.71	22.25		
10	16QAM	25	0	21.52	21.64	21.54	22.5	2
10	16QAM	25	12	21.62	21.68	21.56		
10	16QAM	25	25	21.71	21.72	21.56		
10	16QAM	50	0	21.66	21.72	21.60		

Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	23.59	23.63	23.53	24.5	0
5	QPSK	1	12	23.62	23.62	23.55		
5	QPSK	1	24	23.61	23.64	23.59		
5	QPSK	12	0	22.74	22.69	22.57	23.5	1
5	QPSK	12	7	22.81	22.72	22.59		
5	QPSK	12	13	22.85	22.74	22.60		
5	QPSK	25	0	22.80	22.72	22.59		
5	16QAM	1	0	22.62	22.41	22.48	23.5	1
5	16QAM	1	12	22.73	22.40	22.47		
5	16QAM	1	24	22.78	22.51	22.29		
5	16QAM	12	0	21.70	21.65	21.50	22.5	2
5	16QAM	12	7	21.77	21.68	21.54		
5	16QAM	12	13	21.81	21.71	21.55		
5	16QAM	25	0	21.74	21.68	21.57		

<LTE Band 26>

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				26765	26865	26965		
Frequency (MHz)				821.5	831.5	841.5		
15	QPSK	1	0	23.38	23.30	23.34	24.5	0
15	QPSK	1	37	23.29	23.30	23.24		
15	QPSK	1	74	23.29	23.25	23.17		
15	QPSK	36	0	22.42	22.39	22.37	23.5	1
15	QPSK	36	20	22.38	22.36	22.34		
15	QPSK	36	39	22.37	22.37	22.31		
15	QPSK	75	0	22.39	22.38	22.35		
15	16QAM	1	0	22.32	22.19	22.14	23.5	1
15	16QAM	1	37	22.22	22.22	22.13		
15	16QAM	1	74	22.12	22.17	22.07		
15	16QAM	36	0	21.35	21.31	21.28	22.5	2
15	16QAM	36	20	21.32	21.30	21.28		
15	16QAM	36	39	21.30	21.29	21.23		
15	16QAM	75	0	21.35	21.33	21.28		
Channel				26740	26865	26990	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	23.35	23.32	23.26	24.5	0
10	QPSK	1	25	23.33	23.32	23.21		
10	QPSK	1	49	23.33	23.32	23.13		
10	QPSK	25	0	22.46	22.41	22.33	23.5	1
10	QPSK	25	12	22.44	22.41	22.32		
10	QPSK	25	25	22.41	22.39	22.28		
10	QPSK	50	0	22.44	22.43	22.34		
10	16QAM	1	0	22.32	22.21	22.13	23.5	1
10	16QAM	1	25	22.23	22.15	22.05		
10	16QAM	1	49	22.17	22.09	21.97		
10	16QAM	25	0	21.38	21.33	21.26	22.5	2
10	16QAM	25	12	21.38	21.31	21.24		
10	16QAM	25	25	21.35	21.33	21.19		
10	16QAM	50	0	21.42	21.38	21.28		
Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	23.34	23.35	23.29	24.5	0
5	QPSK	1	12	23.30	23.34	23.25		
5	QPSK	1	24	23.28	23.32	23.20		
5	QPSK	12	0	22.36	22.40	22.30	23.5	1
5	QPSK	12	7	22.35	22.39	22.27		
5	QPSK	12	13	22.35	22.38	22.26		

5	QPSK	25	0	22.38	22.40	22.30		
5	16QAM	1	0	22.28	22.22	22.05	23.5	1
5	16QAM	1	12	22.19	22.20	22.16		
5	16QAM	1	24	22.17	22.19	22.07		
5	16QAM	12	0	21.30	21.32	21.24	22.5	2
5	16QAM	12	7	21.31	21.34	21.20		
5	16QAM	12	13	21.30	21.33	21.19		
5	16QAM	25	0	21.31	21.34	21.23		
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	23.37	23.32	23.31	24.5	0
3	QPSK	1	8	23.36	23.36	23.25		
3	QPSK	1	14	23.37	23.35	23.26		
3	QPSK	8	0	22.39	22.38	22.30	23.5	1
3	QPSK	8	4	22.37	22.37	22.30		
3	QPSK	8	7	22.36	22.34	22.28		
3	QPSK	15	0	22.38	22.38	22.30		
3	16QAM	1	0	22.32	22.27	22.32	23.5	1
3	16QAM	1	8	22.31	22.22	22.25		
3	16QAM	1	14	22.31	22.30	22.20		
3	16QAM	8	0	21.33	21.34	21.24	22.5	2
3	16QAM	8	4	21.32	21.36	21.25		
3	16QAM	8	7	21.36	21.36	21.20		
3	16QAM	15	0	21.31	21.31	21.22		
Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	23.35	23.26	23.18	24.5	0
1.4	QPSK	1	3	23.37	23.27	23.21		
1.4	QPSK	1	5	23.33	23.27	23.17		
1.4	QPSK	3	0	23.34	23.34	23.26		
1.4	QPSK	3	1	23.36	23.36	23.26		
1.4	QPSK	3	3	23.34	23.34	23.26		
1.4	QPSK	6	0	22.33	22.32	22.24	23.5	1
1.4	16QAM	1	0	22.40	22.24	22.15	23.5	1
1.4	16QAM	1	3	22.40	22.27	22.17		
1.4	16QAM	1	5	22.38	22.27	22.18		
1.4	16QAM	3	0	22.27	22.19	22.13		
1.4	16QAM	3	1	22.22	22.15	22.15		
1.4	16QAM	3	3	22.17	22.17	22.11		
1.4	16QAM	6	0	21.33	21.27	21.18	22.5	2

Ant. Bottom

<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)
Channel				20450	20525	20600	
Frequency (MHz)				829	836.5	844	
10	QPSK	1	0	23.57	23.26	23.44	25
10	QPSK	1	25	23.72	23.17	23.59	
10	QPSK	1	49	23.17	23.70	23.19	
10	QPSK	25	0	22.97	22.53	22.78	24
10	QPSK	25	12	22.94	22.41	22.75	
10	QPSK	25	25	22.75	22.24	22.34	
10	QPSK	50	0	22.86	22.39	22.53	
10	16QAM	1	0	22.88	22.59	22.65	24
10	16QAM	1	25	22.74	22.55	22.80	
10	16QAM	1	49	22.49	22.18	22.59	
10	16QAM	25	0	21.89	21.59	21.63	23
10	16QAM	25	12	21.87	21.48	21.62	
10	16QAM	25	25	21.87	21.31	21.24	
10	16QAM	50	0	21.91	21.48	21.44	
Channel				20425	20525	20625	Tune-up limit (dBm)
Frequency (MHz)				826.5	836.5	846.5	
5	QPSK	1	0	23.45	23.03	23.46	25
5	QPSK	1	12	23.45	23.69	23.67	
5	QPSK	1	24	23.44	23.67	23.36	
5	QPSK	12	0	22.72	22.14	22.45	24
5	QPSK	12	7	22.69	22.90	22.09	
5	QPSK	12	13	22.73	22.89	22.78	
5	QPSK	25	0	22.71	22.05	22.02	
5	16QAM	1	0	22.90	22.43	22.70	24
5	16QAM	1	12	22.87	22.31	22.22	
5	16QAM	1	24	22.82	22.29	22.67	
5	16QAM	12	0	21.77	21.28	21.34	23
5	16QAM	12	7	21.74	21.16	21.06	
5	16QAM	12	13	21.81	21.15	21.81	
5	16QAM	25	0	21.79	21.21	21.05	
Channel				20415	20525	20635	Tune-up limit (dBm)
Frequency (MHz)				825.5	836.5	847.5	
3	QPSK	1	0	23.49	23.05	23.14	25
3	QPSK	1	8	23.44	23.70	23.71	
3	QPSK	1	14	23.51	23.53	23.51	
3	QPSK	8	0	22.64	22.06	22.11	24
3	QPSK	8	4	22.63	22.92	22.78	
3	QPSK	8	7	22.69	22.90	22.76	
3	QPSK	15	0	22.67	22.91	22.79	
3	16QAM	1	0	22.91	22.32	22.43	24
3	16QAM	1	8	22.90	22.16	22.73	
3	16QAM	1	14	22.97	22.17	22.65	
3	16QAM	8	0	21.81	21.14	21.09	23
3	16QAM	8	4	21.79	21.03	21.76	
3	16QAM	8	7	21.86	21.05	21.73	
3	16QAM	15	0	21.80	21.08	21.76	
Channel				20407	20525	20643	Tune-up limit (dBm)
Frequency (MHz)				824.7	836.5	848.3	
1.4	QPSK	1	0	23.71	23.11	23.65	25
1.4	QPSK	1	3	23.70	23.69	23.64	
1.4	QPSK	1	5	23.71	23.58	23.38	
1.4	QPSK	3	0	23.67	23.70	23.70	
1.4	QPSK	3	1	23.66	23.68	23.62	
1.4	QPSK	3	3	23.66	23.70	23.38	

1.4	QPSK	6	0	22.82	22.09	22.76	24
1.4	16QAM	1	0	23.02	22.44	22.03	24
1.4	16QAM	1	3	23.07	22.35	22.70	
1.4	16QAM	1	5	23.12	22.38	22.64	
1.4	16QAM	3	0	22.89	22.22	22.62	
1.4	16QAM	3	1	22.90	22.20	22.60	
1.4	16QAM	3	3	22.89	22.17	22.57	
1.4	16QAM	6	0	21.92	21.27	21.74	23

<LTE Band 26>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				26765	26865	26965	
Frequency (MHz)				821.5	831.5	841.5	
15	QPSK	1	0	24.08	24.00	23.66	25
15	QPSK	1	37	24.03	23.94	23.65	
15	QPSK	1	74	23.98	23.46	23.53	
15	QPSK	36	0	23.11	23.04	22.62	24
15	QPSK	36	20	23.09	23.03	22.57	
15	QPSK	36	39	23.06	22.80	22.26	
15	QPSK	75	0	23.07	23.00	22.35	
15	16QAM	1	0	23.02	22.93	22.70	24
15	16QAM	1	37	23.12	22.87	22.76	
15	16QAM	1	74	23.09	22.60	22.62	
15	16QAM	36	0	22.06	21.96	21.51	23
15	16QAM	36	20	22.04	21.95	21.50	
15	16QAM	36	39	22.02	21.79	21.26	
15	16QAM	75	0	22.05	21.98	21.40	
Channel				26740	26865	26990	Tune-up limit (dBm)
Frequency (MHz)				819	831.5	844	
10	QPSK	1	0	23.91	23.26	23.11	25
10	QPSK	1	25	23.08	23.26	23.33	
10	QPSK	1	49	23.09	23.79	23.26	
10	QPSK	25	0	22.08	22.44	22.30	24
10	QPSK	25	12	22.21	22.36	22.32	
10	QPSK	25	25	22.28	22.11	22.84	
10	QPSK	50	0	22.21	22.30	22.07	
10	16QAM	1	0	22.08	22.51	22.27	24
10	16QAM	1	25	22.40	22.50	22.55	
10	16QAM	1	49	22.40	22.71	22.68	
10	16QAM	25	0	21.25	21.59	21.32	23
10	16QAM	25	12	21.36	21.55	21.35	
10	16QAM	25	25	21.43	21.32	21.80	
10	16QAM	50	0	21.35	21.50	21.14	
Channel				26715	26865	27015	Tune-up limit (dBm)
Frequency (MHz)				816.5	831.5	846.5	
5	QPSK	1	0	23.88	23.14	23.26	25
5	QPSK	1	12	23.86	23.01	23.75	
5	QPSK	1	24	23.83	23.86	23.26	
5	QPSK	12	0	22.04	22.29	22.16	24
5	QPSK	12	7	22.07	22.25	22.82	
5	QPSK	12	13	22.06	22.17	22.79	
5	QPSK	25	0	22.05	22.27	22.83	
5	16QAM	1	0	22.19	22.64	22.43	24
5	16QAM	1	12	22.35	22.48	22.06	
5	16QAM	1	24	22.29	22.21	22.50	
5	16QAM	12	0	21.21	21.45	21.15	23
5	16QAM	12	7	21.27	21.41	21.76	
5	16QAM	12	13	21.26	21.34	21.74	
5	16QAM	25	0	21.28	21.47	21.81	

Channel				26705	26865	27025	Tune-up limit (dBm)
Frequency (MHz)				815.5	831.5	847.5	
3	QPSK	1	0	23.90	23.19	23.11	25
3	QPSK	1	8	23.89	23.12	23.72	
3	QPSK	1	14	23.90	23.94	23.00	
3	QPSK	8	0	22.14	22.29	22.01	24
3	QPSK	8	4	22.18	22.27	22.87	
3	QPSK	8	7	22.17	22.23	22.74	
3	QPSK	15	0	22.17	22.29	22.89	
3	16QAM	1	0	22.29	22.55	22.30	24
3	16QAM	1	8	22.39	22.50	22.81	
3	16QAM	1	14	22.35	22.35	22.49	
3	16QAM	8	0	21.37	21.55	21.08	23
3	16QAM	8	4	21.43	21.55	21.80	
3	16QAM	8	7	21.47	21.52	21.78	
3	16QAM	15	0	21.44	21.56	21.80	
Channel				26697	26865	27033	Tune-up limit (dBm)
Frequency (MHz)				814.7	831.5	848.3	
1.4	QPSK	1	0	23.11	23.09	23.85	25
1.4	QPSK	1	3	23.16	23.07	23.83	
1.4	QPSK	1	5	23.17	23.02	23.71	
1.4	QPSK	3	0	23.15	23.05	23.84	
1.4	QPSK	3	1	23.20	23.06	23.85	
1.4	QPSK	3	3	23.20	23.02	23.67	
1.4	QPSK	6	0	22.37	22.22	22.89	24
1.4	16QAM	1	0	22.56	22.45	22.82	24
1.4	16QAM	1	3	22.59	22.42	22.84	
1.4	16QAM	1	5	22.57	22.38	22.83	
1.4	16QAM	3	0	22.39	22.30	22.75	
1.4	16QAM	3	1	22.41	22.30	22.73	
1.4	16QAM	3	3	22.39	22.21	22.70	
1.4	16QAM	6	0	21.53	21.39	20.25	23

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.

<2.4GHz WLAN>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	18.00	18.50	98.90
		6	2437	18.30	18.50	
		11	2462	18.50	18.50	
	802.11g 6Mbps	1	2412	18.40	18.50	93.10
		6	2437	18.40	18.50	
		11	2462	17.90	18.50	
	802.11n-HT20 MCS0	1	2412	17.00	17.50	92.70
		6	2437	17.10	17.50	
		11	2462	16.70	17.00	

<2.4GHz Bluetooth>

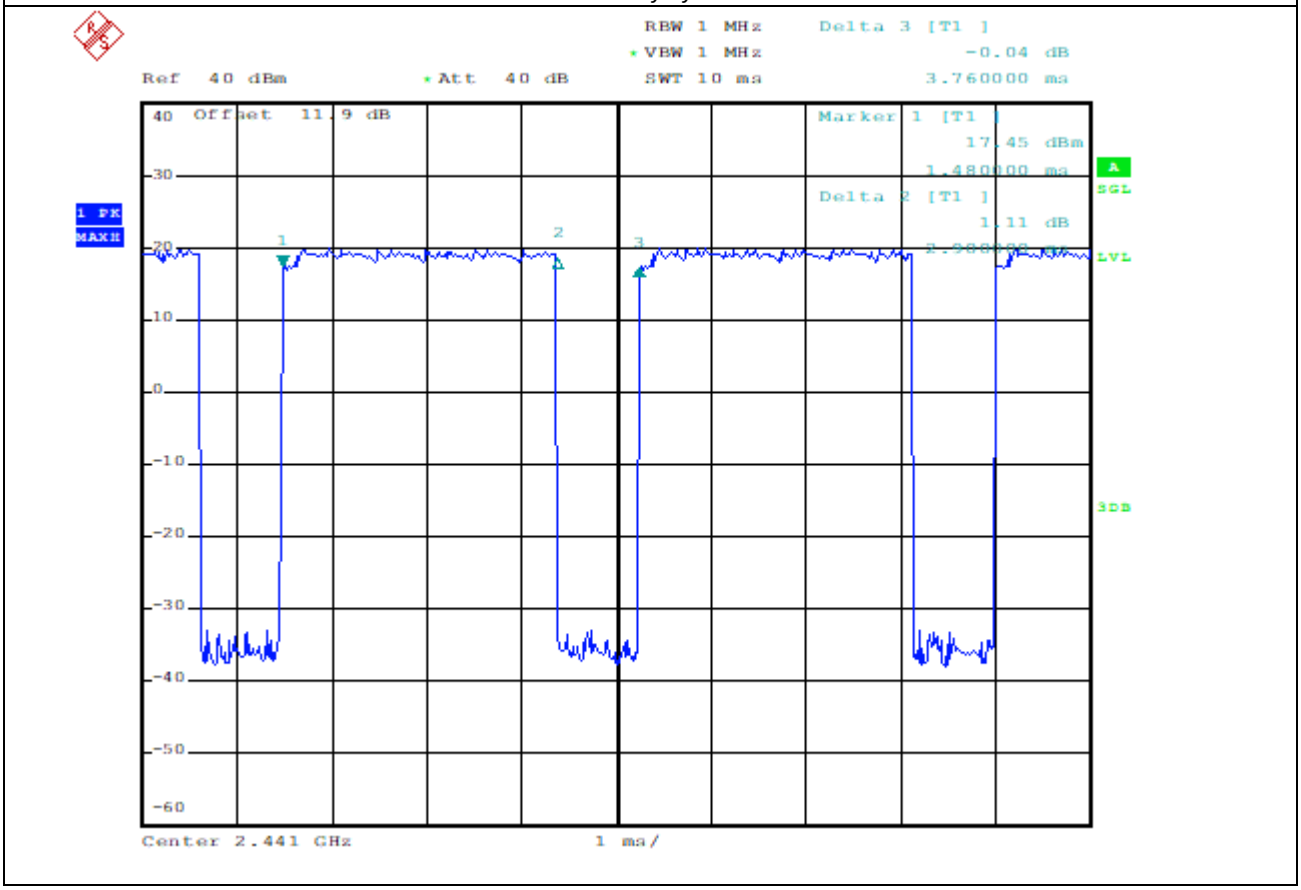
Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
BR / EDR	CH 00	2402	20.46	16.98	16.96
	CH 39	2441	20.39	16.97	16.79
	CH 78	2480	20.03	16.96	16.43
Tune-up Limit			20.5	17	17

Mode	Channel	Frequency (MHz)	Average power (dBm)	
			1Mbps	2Mbps
LE	CH 00	2402	20.50	20.20
	CH 19	2440	20.50	20.10
	CH 39	2480	20.10	20.10
Tune-up Limit			20.5	20.5

General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps due to its highest average power and duty cycle is 77.13% considered in SAR testing, and the duty cycle would be scaled to theoretical 83.3% in reported SAR calculation.

BT Duty cycle



13. 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
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.

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 B5/B26 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.
7. LTE band 5 SAR test was covered by Band 26; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. The maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion.
   b. The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

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. 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.
3. 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.
4. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

13.1 Head SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Strap	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 V_ Top	RMC 12.2Kbps	Front	10mm	Strap 2	4132	826.4	24.01	25.00	1.256	-0.04	0.057	0.072
	WCDMA V_ Top	RMC 12.2Kbps	Front	10mm	Strap 2	4182	836.4	23.92	25.00	1.282	0	0.058	0.074
01	WCDMA V_ Top	RMC 12.2Kbps	Front	10mm	Strap 2	4233	846.6	23.80	25.00	1.318	-0.1	0.063	0.083
	WCDMA V_ Top	RMC 12.2Kbps	Front	10mm	Strap 1	4132	826.4	24.01	25.00	1.256	0.13	0.044	0.055
	WCDMA V_ Top	RMC 12.2Kbps	Front	10mm	Strap 1	4182	836.4	23.92	25.00	1.282	0.08	0.051	0.065
	WCDMA V_ Top	RMC 12.2Kbps	Front	10mm	Strap 1	4233	846.6	23.80	25.00	1.318	-0.05	0.051	0.067
	WCDMA V_ Top	RMC 12.2Kbps	Front	10mm	Strap 3	4132	826.4	24.01	25.00	1.256	0.02	0.050	0.063
	WCDMA V_ Top	RMC 12.2Kbps	Front	10mm	Strap 3	4182	836.4	23.92	25.00	1.282	-0.16	0.051	0.065
	WCDMA V_ Top	RMC 12.2Kbps	Front	10mm	Strap 3	4233	846.6	23.80	25.00	1.318	-0.19	0.053	0.070
	WCDMA V_ Bottom	RMC 12.2Kbps	Front	10mm	Strap 2	4182	836.4	24.50	25.00	1.122	-0.11	0.001	0.001
	WCDMA V_ Bottom	RMC 12.2Kbps	Front	10mm	Strap 2	4132	826.4	24.61	25.00	1.094	-0.13	0.001	0.001
	WCDMA V_ Bottom	RMC 12.2Kbps	Front	10mm	Strap 2	4233	846.6	24.42	25.00	1.143	0.15	0.001	0.001
	WCDMA V_ Bottom	RMC 12.2Kbps	Front	10mm	Strap 1	4182	836.4	24.50	25.00	1.122	-0.13	0.001	0.001
	WCDMA V_ Bottom	RMC 12.2Kbps	Front	10mm	Strap 1	4132	826.4	24.61	25.00	1.094	0.19	0.001	0.001
	WCDMA V_ Bottom	RMC 12.2Kbps	Front	10mm	Strap 1	4233	846.6	24.42	25.00	1.143	-0.19	0.001	0.001
	WCDMA V_ Bottom	RMC 12.2Kbps	Front	10mm	Strap 3	4182	836.4	24.50	25.00	1.122	-0.05	0.001	0.001
	WCDMA V_ Bottom	RMC 12.2Kbps	Front	10mm	Strap 3	4132	826.4	24.61	25.00	1.094	0	0.001	0.001
	WCDMA V_ Bottom	RMC 12.2Kbps	Front	10mm	Strap 3	4233	846.6	24.42	25.00	1.143	0.12	0.001	0.001

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Strap	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 7_ Top	20M	QPSK	1	0	Front	10mm	Strap 2	21100	2535	23.64	24.50	1.219	0	0.157	0.192
	LTE Band 7_ Top	20M	QPSK	1	49	Front	10mm	Strap 2	20850	2510	23.62	24.50	1.225	-0.1	0.165	0.202
	LTE Band 7_ Top	20M	QPSK	1	0	Front	10mm	Strap 2	21350	2560	23.52	24.50	1.253	0.16	0.147	0.184
	LTE Band 7_ Top	20M	QPSK	50	50	Front	10mm	Strap 2	20850	2510	22.88	23.50	1.153	0.12	0.126	0.146
	LTE Band 7_ Top	20M	QPSK	1	0	Front	10mm	Strap 1	21100	2535	23.64	24.50	1.219	0.05	0.200	0.244
	LTE Band 7_ Top	20M	QPSK	1	49	Front	10mm	Strap 1	20850	2510	23.62	24.50	1.225	0.11	0.209	0.256
	LTE Band 7_ Top	20M	QPSK	1	0	Front	10mm	Strap 1	21350	2560	23.52	24.50	1.253	0.18	0.192	0.241
	LTE Band 7_ Top	20M	QPSK	50	50	Front	10mm	Strap 1	20850	2510	22.88	23.50	1.153	0.04	0.139	0.160
	LTE Band 7_ Top	20M	QPSK	1	0	Front	10mm	Strap 3	21100	2535	23.64	24.50	1.219	-0.07	0.215	0.262
02	LTE Band 7_ Top	20M	QPSK	1	49	Front	10mm	Strap 3	20850	2510	23.62	24.50	1.225	0	0.219	0.268
	LTE Band 7_ Top	20M	QPSK	1	0	Front	10mm	Strap 3	21350	2560	23.52	23.50	0.995	0.02	0.220	0.219
	LTE Band 7_ Top	20M	QPSK	50	50	Front	10mm	Strap 3	20850	2510	22.88	23.50	1.153	0.15	0.185	0.214
	LTE Band 26_ Top	15M	QPSK	1	0	Front	10mm	Strap 2	26865	831.5	23.30	24.50	1.318	-0.07	0.049	0.065
	LTE Band 26_ Top	15M	QPSK	36	0	Front	10mm	Strap 2	26865	831.5	22.39	23.50	1.291	0.01	0.042	0.054
03	LTE Band 26_ Top	15M	QPSK	1	0	Front	10mm	Strap 1	26865	831.5	23.30	24.50	1.318	-0.01	0.062	0.082
	LTE Band 26_ Top	15M	QPSK	36	0	Front	10mm	Strap 1	26865	831.5	22.39	23.50	1.291	-0.12	0.059	0.076
	LTE Band 26_ Top	15M	QPSK	1	0	Front	10mm	Strap 3	26865	831.5	23.30	24.50	1.318	-0.03	0.047	0.062
	LTE Band 26_ Top	15M	QPSK	36	0	Front	10mm	Strap 3	26865	831.5	22.39	23.50	1.291	0.09	0.042	0.054
	LTE Band 26_Bottom	15M	QPSK	1	0	Front	10mm	Strap 2	26865	831.5	24.00	25.00	1.259	-0.13	0.001	0.001
	LTE Band 26_Bottom	15M	QPSK	36	0	Front	10mm	Strap 2	26865	831.5	23.04	24.00	1.247	-0.07	0.001	0.001
	LTE Band 26_Bottom	15M	QPSK	1	0	Front	10mm	Strap 1	26865	831.5	24.00	25.00	1.259	0.19	0.001	0.001
	LTE Band 26_Bottom	15M	QPSK	36	0	Front	10mm	Strap 1	26865	831.5	23.04	24.00	1.247	-0.09	0.001	0.001
	LTE Band 26_Bottom	15M	QPSK	1	0	Front	10mm	Strap 3	26865	831.5	24.00	25.00	1.259	-0.19	0.001	0.001
	LTE Band 26_Bottom	15M	QPSK	36	0	Front	10mm	Strap 3	26865	831.5	23.04	24.00	1.247	0	0.001	0.001

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Strap	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	Strap 2	11	2462	18.50	18.50	1.000	98.9	1.011	0.06	0.053	0.054
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Strap 2	1	2412	18.00	18.50	1.122	98.9	1.011	0.12	0.035	0.040
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Strap 2	6	2437	18.30	18.50	1.047	98.9	1.011	0.05	0.040	0.043
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Strap 1	11	2462	18.50	18.50	1.000	98.9	1.011	0.19	0.047	0.047
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Strap 1	1	2412	18.00	18.50	1.122	98.9	1.011	0.07	0.031	0.035
04	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Strap 1	6	2437	18.30	18.50	1.047	98.9	1.011	-0.1	0.073	0.077
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Strap 3	11	2462	18.50	18.50	1.000	98.9	1.011	0.06	0.034	0.034
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Strap 3	1	2412	18.00	18.50	1.122	98.9	1.011	-0.12	0.020	0.022
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Strap 3	6	2437	18.30	18.50	1.047	98.9	1.011	0.05	0.029	0.031

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Strap	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	Strap 2	0	2402	20.46	20.50	1.009	77.13	1.080	0.19	0.030	0.033
	Bluetooth	1Mbps	Front	10mm	Strap 2	39	2441	20.39	20.50	1.026	77.13	1.080	0.18	0.029	0.032
	Bluetooth	1Mbps	Front	10mm	Strap 2	78	2480	20.03	20.50	1.114	77.13	1.080	-0.13	0.034	0.041
	Bluetooth	1Mbps	Front	10mm	Strap 1	0	2402	20.46	20.50	1.009	77.13	1.080	0.17	0.028	0.031
	Bluetooth	1Mbps	Front	10mm	Strap 1	39	2441	20.39	20.50	1.026	77.13	1.080	0.19	0.031	0.034
05	Bluetooth	1Mbps	Front	10mm	Strap 1	78	2480	20.03	20.50	1.114	77.13	1.080	-0.13	0.044	0.053
	Bluetooth	1Mbps	Front	10mm	Strap 3	0	2402	20.46	20.50	1.009	77.13	1.080	0.18	0.030	0.033
	Bluetooth	1Mbps	Front	10mm	Strap 3	39	2441	20.39	20.50	1.026	77.13	1.080	0.14	0.031	0.034
	Bluetooth	1Mbps	Front	10mm	Strap 3	78	2480	20.03	20.50	1.114	77.13	1.080	-0.17	0.040	0.048

13.2 Hand SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Strap	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WCDMA V_ Top	RMC 12.2Kbps	Back	0mm	Strap 2	4132	826.4	24.01	25.00	1.256	-0.18	0.020	0.025
	WCDMA V_ Top	RMC 12.2Kbps	Back	0mm	Strap 2	4182	836.4	23.92	25.00	1.282	-0.15	0.021	0.027
	WCDMA V_ Top	RMC 12.2Kbps	Back	0mm	Strap 2	4233	846.6	23.80	25.00	1.318	-0.07	0.021	0.028
	WCDMA V_ Top	RMC 12.2Kbps	Back	0mm	Strap 1	4132	826.4	24.01	25.00	1.256	0.02	0.098	0.123
	WCDMA V_ Top	RMC 12.2Kbps	Back	0mm	Strap 1	4182	836.4	23.92	25.00	1.282	-0.11	0.099	0.127
	WCDMA V_ Top	RMC 12.2Kbps	Back	0mm	Strap 1	4233	846.6	23.80	25.00	1.318	-0.14	0.097	0.128
	WCDMA V_ Top	RMC 12.2Kbps	Back	0mm	Strap 3	4132	826.4	24.01	25.00	1.256	0.13	0.020	0.025
	WCDMA V_ Top	RMC 12.2Kbps	Back	0mm	Strap 3	4182	836.4	23.92	25.00	1.282	0.13	0.019	0.024
	WCDMA V_ Top	RMC 12.2Kbps	Back	0mm	Strap 3	4233	846.6	23.80	25.00	1.318	-0.04	0.022	0.029
	WCDMA V_ Bottom	RMC 12.2Kbps	Back	0mm	Strap 2	4182	836.4	24.50	25.00	1.122	0.07	0.144	0.162
	WCDMA V_ Bottom	RMC 12.2Kbps	Back	0mm	Strap 2	4132	826.4	24.61	25.00	1.094	-0.14	0.125	0.137
	WCDMA V_ Bottom	RMC 12.2Kbps	Back	0mm	Strap 2	4233	846.6	24.42	25.00	1.143	-0.14	0.115	0.131
06	WCDMA V_ Bottom	RMC 12.2Kbps	Back	0mm	Strap 1	4182	836.4	24.50	25.00	1.122	-0.03	0.239	0.268
	WCDMA V_ Bottom	RMC 12.2Kbps	Back	0mm	Strap 1	4132	826.4	24.61	25.00	1.094	0.13	0.205	0.224
	WCDMA V_ Bottom	RMC 12.2Kbps	Back	0mm	Strap 1	4233	846.6	24.42	25.00	1.143	0.02	0.226	0.258
	WCDMA V_ Bottom	RMC 12.2Kbps	Back	0mm	Strap 3	4182	836.4	24.50	25.00	1.122	0.07	0.083	0.093
	WCDMA V_ Bottom	RMC 12.2Kbps	Back	0mm	Strap 3	4132	826.4	24.61	25.00	1.094	-0.05	0.073	0.080
	WCDMA V_ Bottom	RMC 12.2Kbps	Back	0mm	Strap 3	4233	846.6	24.42	25.00	1.143	-0.16	0.087	0.099

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Strap	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 7_ Top	20M	QPSK	1	0	Back	0mm	Strap 2	21100	2535	23.64	24.50	1.219	-0.19	0.035	0.043
	LTE Band 7_ Top	20M	QPSK	1	49	Back	0mm	Strap 2	20850	2510	23.62	24.50	1.225	-0.11	0.037	0.045
	LTE Band 7_ Top	20M	QPSK	1	0	Back	0mm	Strap 2	21350	2560	23.52	24.50	1.253	-0.15	0.032	0.040
	LTE Band 7_ Top	20M	QPSK	50	50	Back	0mm	Strap 2	20850	2510	22.88	23.50	1.153	-0.03	0.032	0.037
	LTE Band 7_ Top	20M	QPSK	1	0	Back	0mm	Strap 1	21100	2535	23.64	24.50	1.219	0	0.022	0.027
	LTE Band 7_ Top	20M	QPSK	1	49	Back	0mm	Strap 1	20850	2510	23.62	24.50	1.225	0.01	0.022	0.027
	LTE Band 7_ Top	20M	QPSK	1	0	Back	0mm	Strap 1	21350	2560	23.52	24.50	1.253	0.06	0.019	0.024
	LTE Band 7_ Top	20M	QPSK	50	50	Back	0mm	Strap 1	20850	2510	22.88	23.50	1.153	0.13	0.020	0.023
	LTE Band 7_ Top	20M	QPSK	1	0	Back	0mm	Strap 3	21100	2535	23.64	24.50	1.219	-0.15	0.122	0.149
07	LTE Band 7_ Top	20M	QPSK	1	49	Back	0mm	Strap 3	20850	2510	23.62	24.50	1.225	-0.1	0.134	0.164
	LTE Band 7_ Top	20M	QPSK	1	0	Back	0mm	Strap 3	21350	2560	23.52	24.50	1.253	-0.07	0.110	0.138
	LTE Band 7_ Top	20M	QPSK	50	50	Back	0mm	Strap 3	20850	2510	22.88	23.50	1.153	-0.03	0.107	0.123
	LTE Band 26_ Top	15M	QPSK	1	0	Back	0mm	Strap 2	26865	831.5	23.30	24.50	1.318	-0.18	0.015	0.020
	LTE Band 26_ Top	15M	QPSK	36	0	Back	0mm	Strap 2	26865	831.5	22.39	23.50	1.291	0.01	0.015	0.019
	LTE Band 26_ Top	15M	QPSK	1	0	Back	0mm	Strap 1	26865	831.5	23.30	24.50	1.318	-0.11	0.015	0.020
	LTE Band 26_ Top	15M	QPSK	36	0	Back	0mm	Strap 1	26865	831.5	22.39	23.50	1.291	0.12	0.012	0.015
	LTE Band 26_ Top	15M	QPSK	1	0	Back	0mm	Strap 3	26865	831.5	23.30	24.50	1.318	-0.09	0.016	0.021
	LTE Band 26_ Top	15M	QPSK	36	0	Back	0mm	Strap 3	26865	831.5	22.39	23.50	1.291	-0.01	0.011	0.014
	LTE Band 26_ Bottom	15M	QPSK	1	0	Back	0mm	Strap 2	26865	831.5	24.00	25.00	1.259	-0.03	0.085	0.107
	LTE Band 26_ Bottom	15M	QPSK	36	0	Back	0mm	Strap 2	26865	831.5	23.04	24.00	1.247	0.16	0.072	0.090
08	LTE Band 26_ Bottom	15M	QPSK	1	0	Back	0mm	Strap 1	26865	831.5	24.00	25.00	1.259	-0.14	0.150	0.189
	LTE Band 26_ Bottom	15M	QPSK	36	0	Back	0mm	Strap 1	26865	831.5	23.04	24.00	1.247	0.19	0.119	0.148
	LTE Band 26_ Bottom	15M	QPSK	1	0	Back	0mm	Strap 3	26865	831.5	24.00	25.00	1.259	-0.09	0.091	0.115
	LTE Band 26_ Bottom	15M	QPSK	36	0	Back	0mm	Strap 3	26865	831.5	23.04	24.00	1.247	-0.19	0.068	0.085

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Strap	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Strap 2	11	2462	18.50	18.50	1.000	98.9	1.011	0.01	0.018	0.018
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Strap 2	1	2412	18.00	18.50	1.122	98.9	1.011	-0.05	0.020	0.023
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Strap 2	6	2437	18.30	18.50	1.047	98.9	1.011	-0.15	0.027	0.029
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Strap 1	11	2462	18.50	18.50	1.000	98.9	1.011	0.13	0.021	0.021
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Strap 1	1	2412	18.00	18.50	1.122	98.9	1.011	-0.01	0.011	0.012
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Strap 1	6	2437	18.30	18.50	1.047	98.9	1.011	0.02	0.021	0.022
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Strap 3	11	2462	18.50	18.50	1.000	98.9	1.011	0.12	0.047	0.048
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Strap 3	1	2412	18.00	18.50	1.122	98.9	1.011	0.16	0.033	0.037
09	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Strap 3	6	2437	18.30	18.50	1.047	98.9	1.011	0.11	0.066	0.070

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Strap	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	Bluetooth	1Mbps	Back	0mm	Strap 2	0	2402	20.46	20.50	1.009	77.13	1.080	-0.04	0.021	0.023
	Bluetooth	1Mbps	Back	0mm	Strap 2	39	2441	20.39	20.50	1.026	77.13	1.080	0	0.019	0.021
	Bluetooth	1Mbps	Back	0mm	Strap 2	78	2480	20.03	20.50	1.114	77.13	1.080	0.08	0.020	0.024
	Bluetooth	1Mbps	Back	0mm	Strap 1	0	2402	20.46	20.50	1.009	77.13	1.080	0.01	0.011	0.012
	Bluetooth	1Mbps	Back	0mm	Strap 1	39	2441	20.39	20.50	1.026	77.13	1.080	-0.19	0.013	0.014
	Bluetooth	1Mbps	Back	0mm	Strap 1	78	2480	20.03	20.50	1.114	77.13	1.080	-0.02	0.012	0.014
10	Bluetooth	1Mbps	Back	0mm	Strap 3	0	2402	20.46	20.50	1.009	77.13	1.080	-0.18	0.022	0.024
	Bluetooth	1Mbps	Back	0mm	Strap 3	39	2441	20.39	20.50	1.026	77.13	1.080	0.11	0.020	0.022
	Bluetooth	1Mbps	Back	0mm	Strap 3	78	2480	20.03	20.50	1.114	77.13	1.080	-0.13	0.018	0.022

14. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Head	Hand
1.	WWAN + WLAN2.4GHz	Yes	Yes
2.	WWAN + Bluetooth	Yes	Yes

General Note:

1. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
2. The Scaled SAR summation is calculated based on the same configuration and test position.
3. 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.

14.1 Head Exposure Conditions

Exposure Position	1	2	3	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)
	Maximum WWAN	2.4GHz WLAN	Bluetooth		
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
Front	0.268	0.077	0.053	**0.345**	**0.321**

14.2 Hand Exposure Conditions

Exposure Position	1	2	3	1+2 Summed 10g SAR (W/kg)	1+3 Summed 10g SAR (W/kg)
	Maximum WWAN	2.4GHz WLAN	Bluetooth		
	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)		
Back	0.268	0.070	0.024	**0.338**	**0.292**

Test Engineer：Kells Chen, Kevin Guo and Shane Song

15. 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 and highest measured 10-g SAR is less 3.75W/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.

16. 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 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, Oct 2015

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

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

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