FCC SAR TEST REPORT

FCC ID	:	**B32V400M2**
Equipment	:	**Point of Sale Terminal**
Brand Name	:	**Verifone**
Model Name	:	**V400m-2**
Applicant	:	**Verifone, Inc. 1400 West Stanford Ranch Road Suite 150 Rocklin CA 95765 USA**
Manufacturer	:	**Verifone, Inc.**
Standard	:	**FCC 47 CFR Part 2 (2.1093)**

The product was received on Jul. 25, 2023 and testing was started from Aug. 07, 2023 and completed on Aug. 22, 2023. 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. 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
FA372517	01	Initial issue of report	Sep. 20, 2023

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) for Verifone, Inc., Point of Sale Terminal, V400m-2, are as follows.

Equipment Class	Frequency Band		Highest SAR Summary Extremity (Separation 0mm) 10g SAR (W/kg)	Highest Simultaneous Transmission 10g SAR (W/kg)
Licensed	GSM	GSM850	1.05	3.44
		GSM1900	2.87	
	WCDMA	WCDMA II	3.15	
		WCDMA IV	2.61	
		WCDMA V	1.02	
	LTE	LTE Band 2	3.39	
		LTE Band 5	0.82	
		LTE Band 7	1.69	
		LTE Band 12	0.82	
		LTE Band 13	1.02	
		LTE Band 26	0.91	
		LTE Band 4 / 66	2.32	
		LTE Band 38 / 41	1.54	
DTS	WLAN	2.4GHz WLAN	0.66	3.44
NII		5GHz WLAN	0.73	3.44
DSS	2.4GHz Band	Bluetooth	0.07	3.44
DXX	NFC	NFC	0.12	3.44
Date of Testing:			2023/8/7 ~ 2023/8/22	

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation 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 (4.0 W/kg for Extremity 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: Carlie Tsai

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	Point of Sale Terminal
Brand Name	Verifone
Model Name	V400m-2
FCC ID	B32V400M2
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 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 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 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 WLAN 5.6 GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8 GHz Band: 5725 MHz ~ 5850 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC: 13.56 MHz
Mode	GSM/GPRS/EGPRS RMC 12.2Kbps HSDPA HSUPA LTE: QPSK, 16QAM WLAN: 802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC: ASK
HW Version	DVT
EUT Stage	Production Unit

Remark:
1. The WLAN and Bluetooth will not transmit simultaneous at the same time for this device.
2. The device is designed for ordering and electronic payment, intended for use in hand; therefore, performed extremity SAR to show compliance

3.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	B32V400M2
Equipment Name	Point of Sale 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 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 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 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 26: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
uplink modulations used	QPSK / 16QAM
LTE Voice / Data requirements	Data only
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 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 12								
	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	23017	699.7	23025	700.5	23035	701.5	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

LTE Band 13				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	23205	779.5	23230	782
M	23230	782		
H	23255	784.5		

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

LTE Band 38								
	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	37775	2572.5	37800	2575	37825	2577.5	37850	2580
M	38000	2595	38000	2595	38000	2595	38000	2595
H	38225	2617.5	38200	2615	38175	2612.5	38150	2610

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	39675	2498.5	39700	2501	39725	2503.5	39750	2506
LM	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5
M	40620	2593	40620	2593	40620	2593	40620	2593
HM	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5
H	41565	2687.5	41540	2685	41515	2682.5	41490	2680

LTE Band 66												
	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	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745
H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770

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:

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

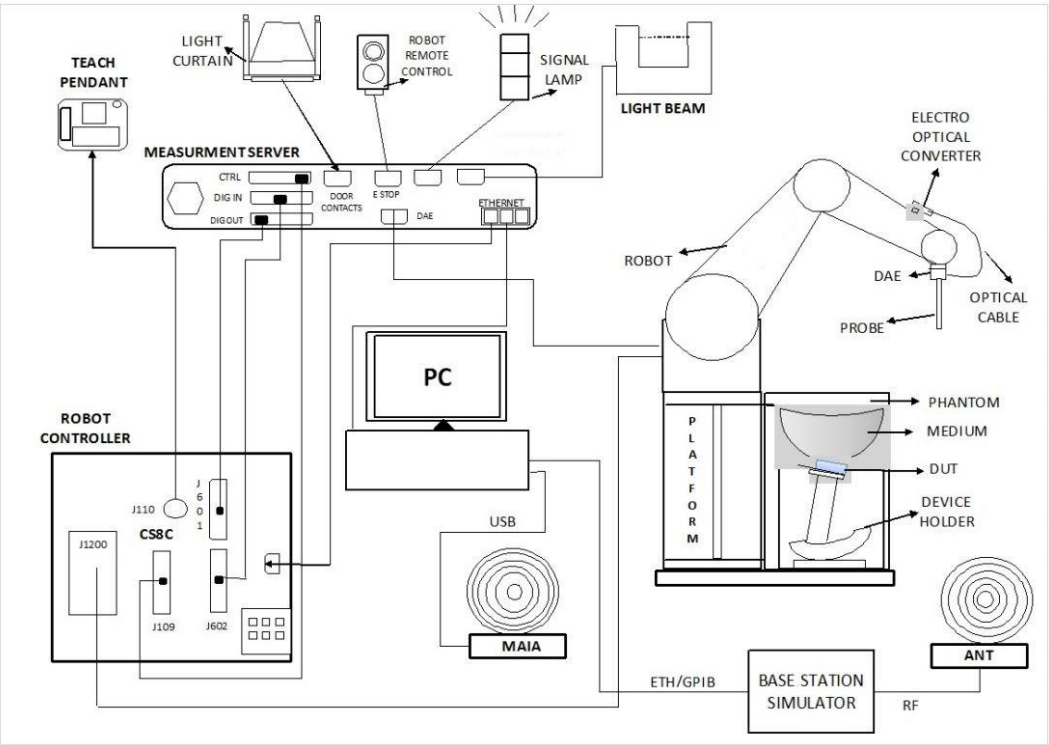
SAR is expressed in units of Watts per kilogram (W/kg)

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

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:



- The DASY system in SAR Configuration is shown above
- 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 windows software and the DASY 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	SAR16-HY
	SAR06-HY	SAR10-HY	SAR13-HY	SAR14-HY	SAR17-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)

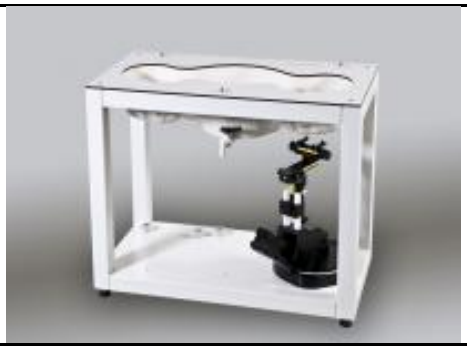
The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an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

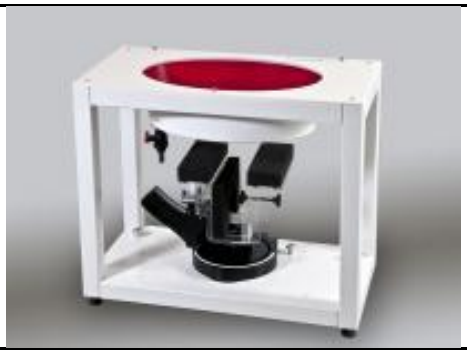
6.4 Phantom

<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:

(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	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
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	750MHz System Validation Kit(2)	D750V3	1012	Aug. 18, 2021	Aug. 15, 2024
SPEAG	835MHz System Validation Kit(2)	D835V2	4d060	Mar. 24, 2022	Mar. 22, 2024
SPEAG	1750MHz System Validation Kit	D1750V2	1068	Nov. 21, 2022	Nov. 20, 2023
SPEAG	1900MHz System Validation Kit(2)	D1900V2	5d093	Mar. 25, 2022	Mar. 23, 2024
SPEAG	2450MHz System Validation Kit(2)	D2450V2	806	Mar. 24, 2022	Mar. 22, 2024
SPEAG	2600MHz System Validation Kit(2)	D2600V2	1008	Aug. 17, 2021	Aug. 14, 2024
SPEAG	5GHz System Validation Kit(2)	D5GHzV2	1006	May. 25, 2023	May. 23, 2025
SPEAG	13MHz System Validation Kit	CLA13	1011	Jul. 10, 2023	Jul. 09, 2024
SPEAG	Data Acquisition Electronics	DAE4	853	Jul. 14, 2023	Jul. 13, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7306	Jul. 18, 2023	Jul. 17, 2024
RCPTWN	Thermometer	HTC-1	TM685-1	Mar. 21, 2023	Mar. 20, 2024
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Oct. 31, 2022	Oct. 30, 2023
R&S	BT Base Station	CBT32	101136	Oct. 25, 2022	Oct. 24, 2023
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Oct. 12, 2022	Oct. 11, 2023
Keysight	ENA Network Analyzer	E5071C	MY46104758	Sep. 22, 2022	Sep. 21, 2023
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 28, 2022	Sep. 27, 2023
SPEAG	Dielectric Probe Kit	DAK-12	1156	Jul. 17, 2023	Jul. 16, 2024
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3796	Jan. 13, 2023	Jan. 12, 2024
Anritsu	Power Meter	ML2495A	1804003	Oct. 17, 2022	Oct. 16, 2023
Anritsu	Power Sensor	MA2411B	1726150	Oct. 17, 2022	Oct. 16, 2023
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jul. 10, 2023	Jul. 09, 2024
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 14, 2022	Oct. 13, 2023
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
13	22.5	0.757	53.400	0.75	55.00	0.93	-2.91	±5	2023/8/11
750	22.6	0.884	42.015	0.89	41.90	-0.67	0.27	±5	2023/8/8
835	22.6	0.918	41.719	0.90	41.50	2.00	0.53	±5	2023/8/8
1750	22.6	1.373	40.837	1.37	40.10	0.22	1.84	±5	2023/8/7
1900	22.6	1.389	40.584	1.40	40.00	-0.79	1.46	±5	2023/8/7
1900	22.1	1.385	40.351	1.40	40.00	-1.07	0.88	±5	2023/8/16
2450	22.4	1.753	38.648	1.80	39.20	-2.61	-1.41	±5	2023/8/22
2600	22.2	1.947	37.974	1.96	39.00	-0.66	-2.63	±5	2023/8/9
5250	22.4	4.834	36.040	4.71	35.95	2.63	0.25	±5	2023/8/22
5600	22.4	5.097	35.435	5.07	35.50	0.53	-0.18	±5	2023/8/22
5750	22.4	5.321	35.117	5.22	35.35	1.93	-0.66	±5	2023/8/22

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 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
SAR05	2023/8/11	13	250	CLA13-1011	EX3DV4 - SN7306	DAE4 Sn853	0.083	0.340	0.332	-2.35
SAR05	2023/8/8	750	50	D750V3-1012	EX3DV4 - SN7306	DAE4 Sn853	0.273	5.560	5.46	-1.80
SAR05	2023/8/8	835	50	D835V2-4d060	EX3DV4 - SN7306	DAE4 Sn853	0.324	6.390	6.48	1.41
SAR05	2023/8/7	1750	50	D1750V2-1068	EX3DV4 - SN7306	DAE4 Sn853	0.958	19.300	19.16	-0.73
SAR05	2023/8/7	1900	50	D1900V2-5d093	EX3DV4 - SN7306	DAE4 Sn853	1.000	20.700	20	-3.38
SAR05	2023/8/16	1900	50	D1900V2-5d093	EX3DV4 - SN7306	DAE4 Sn853	1.000	20.700	20	-3.38
SAR05	2023/8/22	2450	50	D2450V2-806	EX3DV4 - SN7306	DAE4 Sn853	1.210	24.400	24.2	-0.82
SAR05	2023/8/9	2600	50	D2600V2-1008	EX3DV4 - SN7306	DAE4 Sn853	1.200	25.800	24	-6.98
SAR05	2023/8/22	5250	50	D5GHzV2-1006	EX3DV4 - SN7306	DAE4 Sn853	1.140	23.200	22.8	-1.72
SAR05	2023/8/22	5600	50	D5GHzV2-1006	EX3DV4 - SN7306	DAE4 Sn853	1.270	24.200	25.4	4.96
SAR05	2023/8/22	5750	50	D5GHzV2-1006	EX3DV4 - SN7306	DAE4 Sn853	1.120	22.900	22.4	-2.18

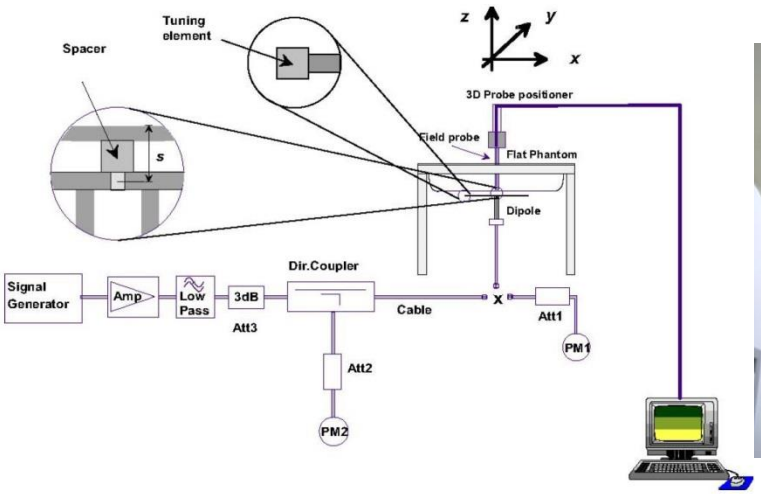


Fig 8.3.1 System Performance Check Setup

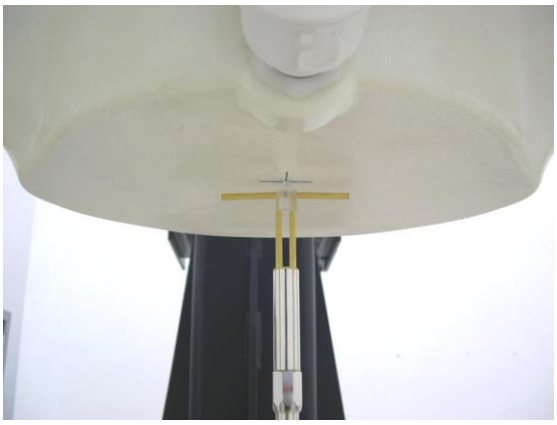


Fig 8.3.2 Setup Photo

10. GSM/UMTS/LTE Output Power (Unit: dBm)

<GSM Conducted Power>

1. Per KDB 447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03r01, for SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance, for modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested, therefore, the GPRS 2Tx slots modes was selected when EUT operating without power back-off, the GPRS 2Tx slots modes was selected when EUT operating with power back-off, according to the highest source-based time-averaged output power.

<GSM>

GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	128	189	251		128	189	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GSM 1 Tx slot	32.81	32.65	32.75	33.50	23.81	23.65	23.75	24.50
GPRS 1 Tx slot	32.92	32.70	32.89	33.50	23.92	23.70	23.89	24.50
GPRS 2 Tx slots	30.10	29.59	29.42	31.00	24.10	23.59	23.42	25.00
GPRS 3 Tx slots	27.94	27.03	27.21	29.00	23.68	22.77	22.95	24.74
GPRS 4 Tx slots	26.35	25.64	25.77	27.50	23.35	22.64	22.77	24.50
EDGE 1 Tx slot	25.73	25.58	25.87	27.50	16.73	16.58	16.87	18.50
EDGE 2 Tx slots	23.10	23.02	23.01	25.00	17.10	17.02	17.01	19.00
EDGE 3 Tx slots	21.02	21.15	21.08	23.00	16.76	16.89	16.82	18.74
EDGE 4 Tx slots	19.63	19.77	19.70	21.50	16.63	16.77	16.70	18.50

GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	30.97	30.97	30.62	31.00	21.98	21.98	21.62	22.00
GPRS 1 Tx slot	30.73	30.97	30.60	31.00	21.73	21.99	21.60	22.00
GPRS 2 Tx slots	27.94	27.98	27.96	28.00	21.94	21.98	21.96	22.00
GPRS 3 Tx slots	26.37	26.50	26.19	26.50	22.11	22.24	21.93	22.24
GPRS 4 Tx slots	25.00	24.98	24.75	25.00	22.00	21.98	21.75	22.00
EDGE 1 Tx slot	26.15	26.25	25.78	26.50	17.15	17.25	16.78	17.50
EDGE 2 Tx slots	23.40	23.34	22.82	23.50	17.40	17.34	16.82	17.50
EDGE 3 Tx slots	20.99	20.70	20.31	22.00	16.73	16.44	16.05	17.74
EDGE 4 Tx slots	19.99	19.60	19.08	21.00	16.99	16.60	16.08	18.00

<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.

<WCDMA>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	RMC 12.2Kbps	22.36	22.45	21.96	23.00	23.01	23.40	23.48	23.50	23.45	23.42	23.49	23.50
3GPP Rel 6	HSDPA Subtest-1	21.54	21.50	21.01	23.00	22.11	22.28	22.44	23.50	22.68	22.63	22.66	23.50
3GPP Rel 6	HSDPA Subtest-2	21.43	21.51	21.04	23.00	22.10	22.25	22.46	23.50	22.77	22.77	22.81	23.50
3GPP Rel 6	HSDPA Subtest-3	21.03	21.09	20.51	22.50	21.59	21.76	21.94	23.00	22.28	22.27	22.30	23.00
3GPP Rel 6	HSDPA Subtest-4	21.02	21.08	20.63	22.50	21.58	21.76	21.93	23.00	22.29	22.28	22.32	23.00
3GPP Rel 6	HSUPA Subtest-1	21.19	21.31	21.03	23.00	22.12	21.58	21.53	23.50	21.99	22.05	22.48	23.50
3GPP Rel 6	HSUPA Subtest-2	20.49	20.44	19.99	21.00	21.39	21.42	21.25	21.50	21.49	21.41	21.10	21.50
3GPP Rel 6	HSUPA Subtest-3	20.28	20.38	20.10	22.00	20.70	20.90	20.93	22.50	21.16	21.09	21.20	22.50
3GPP Rel 6	HSUPA Subtest-4	20.49	20.49	20.19	21.00	20.39	20.63	21.00	21.50	21.34	21.38	21.37	21.50
3GPP Rel 6	HSUPA Subtest-5	21.40	21.50	21.10	23.00	21.57	21.52	21.59	23.50	22.50	22.50	22.70	23.50

<LTE Conducted Power>

General Note:

1. 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/B12/B26/B38 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 4/38 SAR test was covered by Band 66/41; 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

<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)
Channel				18700	18900	19100	
Frequency (MHz)				1860	1880	1900	
20	QPSK	1	0	22.69	22.70	22.43	23
20	QPSK	1	49	22.83	22.96	22.83	
20	QPSK	1	99	22.50	22.50	22.60	
20	QPSK	50	0	21.87	21.97	21.67	22.5
20	QPSK	50	24	21.76	21.90	21.58	
20	QPSK	50	50	21.82	21.89	21.67	
20	QPSK	100	0	21.73	21.84	21.61	
20	16QAM	1	0	21.80	21.96	21.54	22.5
20	16QAM	1	13	21.93	21.94	22.01	
20	16QAM	1	26	22.11	22.15	22.31	
20	16QAM	12	0	22.36	22.20	22.35	22.5
20	16QAM	12	7	22.37	22.33	22.22	
20	16QAM	12	15	22.39	22.27	22.40	
20	16QAM	27	0	21.21	21.22	21.21	21.5
Channel				18675	18900	19125	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	QPSK	1	0	22.81	22.77	22.68	23
15	QPSK	1	37	22.68	22.95	22.91	
15	QPSK	1	74	22.65	22.79	22.61	
15	QPSK	36	0	21.86	21.89	21.57	22.5
15	QPSK	36	20	21.80	21.95	21.64	
15	QPSK	36	39	21.85	21.88	21.59	
15	QPSK	75	0	21.88	21.83	21.49	
15	16QAM	1	0	21.99	22.00	21.53	22.5
15	16QAM	1	13	21.74	21.77	21.88	
15	16QAM	1	26	22.31	22.09	22.13	
15	16QAM	12	0	22.45	22.19	22.53	22.5
15	16QAM	12	7	22.48	22.24	22.34	
15	16QAM	12	15	22.49	22.36	22.27	
15	16QAM	27	0	21.02	21.32	21.04	21.5
Channel				18650	18900	19150	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	QPSK	1	0	22.56	22.70	22.60	23
10	QPSK	1	25	22.52	22.72	22.61	
10	QPSK	1	49	22.42	22.60	22.48	
10	QPSK	25	0	21.39	21.54	21.42	22.5
10	QPSK	25	12	21.40	21.57	21.47	
10	QPSK	25	25	21.38	21.55	21.43	
10	QPSK	50	0	21.40	21.50	21.38	
10	16QAM	1	0	21.78	21.94	21.44	22.5
10	16QAM	1	13	21.87	21.84	21.97	
10	16QAM	1	26	22.09	22.09	22.23	
10	16QAM	12	0	22.35	22.19	22.25	22.5
10	16QAM	12	7	22.34	22.24	22.17	
10	16QAM	12	15	22.32	22.21	22.32	
10	16QAM	27	0	21.16	21.18	21.17	21.5
Channel				18625	18900	19175	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	QPSK	1	0	22.85	22.70	22.70	23
5	QPSK	1	12	22.83	22.91	22.61	
5	QPSK	1	24	22.42	22.63	22.29	
5	QPSK	12	0	21.85	21.76	21.44	22.5
5	QPSK	12	7	21.75	21.79	21.51	
5	QPSK	12	13	21.66	21.75	21.41	
5	QPSK	25	0	21.70	21.75	21.50	
5	16QAM	1	0	21.70	21.95	21.46	22.5

5	16QAM	1	12	21.91	21.88	22.00	
5	16QAM	1	24	22.11	22.10	22.24	
5	16QAM	12	0	22.31	22.15	22.29	21.5
5	16QAM	12	7	22.33	22.30	22.16	
5	16QAM	12	13	22.35	22.18	22.30	
5	16QAM	25	0	21.19	21.18	21.11	
Channel				18615	18900	19185	Tune-up limit (dBm)
Frequency (MHz)				1851.5	1880	1908.5	
3	QPSK	1	0	22.91	22.85	22.47	23
3	QPSK	1	8	22.59	22.68	22.24	
3	QPSK	1	14	22.60	22.64	22.36	
3	QPSK	8	0	21.84	21.89	21.57	22.5
3	QPSK	8	4	21.76	21.90	21.51	
3	QPSK	8	7	21.74	21.98	21.56	
3	QPSK	15	0	21.82	21.83	21.53	
3	16QAM	1	0	21.75	21.95	21.49	22.5
3	16QAM	1	8	21.85	21.87	21.96	
3	16QAM	1	14	22.06	22.07	22.25	
3	16QAM	8	0	22.35	22.16	22.34	21.5
3	16QAM	8	4	22.35	22.32	22.14	
3	16QAM	8	7	22.32	22.19	22.36	
3	16QAM	15	0	21.14	21.17	21.16	
Channel				18607	18900	19193	Tune-up limit (dBm)
Frequency (MHz)				1850.7	1880	1909.3	
1.4	QPSK	1	0	22.76	22.86	22.54	23
1.4	QPSK	1	3	22.81	22.90	22.64	
1.4	QPSK	1	5	22.68	22.70	22.41	
1.4	QPSK	3	0	22.90	22.79	22.62	
1.4	QPSK	3	1	22.91	22.87	22.67	
1.4	QPSK	3	3	22.71	22.89	22.63	
1.4	QPSK	6	0	21.85	21.92	21.55	22.5
1.4	16QAM	1	0	21.78	21.93	21.50	22.5
1.4	16QAM	1	3	21.91	21.93	21.98	
1.4	16QAM	1	5	22.10	22.07	22.26	
1.4	16QAM	3	0	22.35	22.10	22.35	
1.4	16QAM	3	1	22.37	22.24	22.14	
1.4	16QAM	3	3	22.29	22.23	22.38	
1.4	16QAM	6	0	21.18	21.16	21.19	21.5

<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)
Channel				20050	20175	20300	
Frequency (MHz)				1720	1732.5	1745	
20	QPSK	1	0	23.04	23.45	23.37	24
20	QPSK	1	49	22.98	23.44	23.36	
20	QPSK	1	99	22.76	23.11	23.36	
20	QPSK	50	0	22.11	22.44	22.40	23
20	QPSK	50	24	22.02	22.10	22.31	
20	QPSK	50	50	22.07	22.18	22.39	
20	QPSK	100	0	22.07	22.48	22.42	
20	16QAM	1	0	22.03	22.01	22.38	22.5
20	16QAM	1	13	21.46	21.50	21.41	
20	16QAM	1	26	21.50	21.56	21.46	
20	16QAM	12	0	21.23	21.27	21.18	22.5
20	16QAM	12	7	21.61	21.66	21.56	
20	16QAM	12	15	21.66	21.73	21.67	
20	16QAM	27	0	20.53	20.52	20.54	22.5
Channel				20025	20175	20325	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1732.5	1747.5	

15	QPSK	1	0	22.74	23.01	23.42	24
15	QPSK	1	37	22.84	23.25	23.36	
15	QPSK	1	74	22.94	23.10	23.40	
15	QPSK	36	0	21.77	22.03	22.36	23
15	QPSK	36	20	21.79	22.09	22.47	
15	QPSK	36	39	21.87	22.15	22.53	
15	QPSK	75	0	21.77	22.06	22.24	
15	16QAM	1	0	21.95	21.98	22.36	22.5
15	16QAM	1	13	21.36	21.40	21.40	
15	16QAM	1	26	21.47	21.47	21.36	
15	16QAM	12	0	21.21	21.27	21.12	22.5
15	16QAM	12	7	21.60	21.59	21.46	
15	16QAM	12	15	21.61	21.67	21.64	
15	16QAM	27	0	20.55	20.51	20.58	22.5
Channel				20000	20175	20350	Tune-up limit (dBm)
Frequency (MHz)				1715	1732.5	1750	
10	QPSK	1	0	23.07	22.78	23.29	24
10	QPSK	1	25	22.87	23.10	23.28	
10	QPSK	1	49	22.57	22.85	23.24	
10	QPSK	25	0	21.68	22.01	22.40	23
10	QPSK	25	12	21.75	21.93	22.41	
10	QPSK	25	25	21.67	22.07	22.36	
10	QPSK	50	0	21.75	22.07	22.40	
10	16QAM	1	0	22.01	21.99	22.35	22.5
10	16QAM	1	13	21.41	21.49	21.41	
10	16QAM	1	26	21.47	21.52	21.42	
10	16QAM	12	0	21.14	21.19	21.16	22.5
10	16QAM	12	7	21.51	21.64	21.53	
10	16QAM	12	15	21.63	21.67	21.62	
10	16QAM	27	0	20.50	20.52	20.54	22.5
Channel				19975	20175	20375	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1732.5	1752.5	
5	QPSK	1	0	22.55	22.75	23.24	24
5	QPSK	1	12	22.71	22.99	23.36	
5	QPSK	1	24	22.61	22.67	23.26	
5	QPSK	12	0	21.53	21.73	22.34	23
5	QPSK	12	7	21.54	21.93	22.29	
5	QPSK	12	13	21.55	21.85	22.28	
5	QPSK	25	0	21.50	21.83	22.34	
5	16QAM	1	0	21.93	21.94	22.30	22.5
5	16QAM	1	12	21.38	21.44	21.37	
5	16QAM	1	24	21.49	21.49	21.44	
5	16QAM	12	0	21.23	21.25	21.17	22.5
5	16QAM	12	7	21.59	21.58	21.54	
5	16QAM	12	13	21.64	21.67	21.60	
5	16QAM	25	0	20.56	20.53	20.50	
Channel				19965	20175	20385	Tune-up limit (dBm)
Frequency (MHz)				1711.5	1732.5	1753.5	
3	QPSK	1	0	23.03	23.37	23.26	24
3	QPSK	1	8	22.89	23.20	23.39	
3	QPSK	1	14	22.99	23.00	23.22	
3	QPSK	8	0	21.87	22.23	22.38	23
3	QPSK	8	4	21.77	22.30	22.38	
3	QPSK	8	7	21.72	22.25	22.40	
3	QPSK	15	0	21.73	22.27	22.30	
3	16QAM	1	0	21.97	21.99	22.35	22.5
3	16QAM	1	8	21.39	21.48	21.34	
3	16QAM	1	14	21.41	21.52	21.39	
3	16QAM	8	0	21.21	21.22	21.15	22.5
3	16QAM	8	4	21.58	21.59	21.47	
3	16QAM	8	7	21.59	21.72	21.62	
3	16QAM	15	0	20.51	20.55	20.53	
Channel				19957	20175	20393	Tune-up limit

Frequency (MHz)				1710.7	1732.5	1754.3	(dBm)
1.4	QPSK	1	0	22.51	22.89	23.15	24
1.4	QPSK	1	3	22.59	23.01	23.06	
1.4	QPSK	1	5	22.53	22.94	23.03	
1.4	QPSK	3	0	22.52	23.03	23.21	
1.4	QPSK	3	1	22.61	23.12	23.27	
1.4	QPSK	3	3	22.61	23.09	23.28	
1.4	QPSK	6	0	21.67	22.08	22.08	23
1.4	16QAM	1	0	21.98	21.92	22.33	22.5
1.4	16QAM	1	3	21.44	21.45	21.38	
1.4	16QAM	1	5	21.45	21.47	21.36	
1.4	16QAM	3	0	21.19	21.20	21.18	
1.4	16QAM	3	1	21.58	21.58	21.49	
1.4	16QAM	3	3	21.57	21.68	21.60	
1.4	16QAM	6	0	20.53	20.53	20.54	22.5

<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	22.44	22.97	22.81	23
10	QPSK	1	25	22.87	22.87	22.88	
10	QPSK	1	49	22.61	22.48	22.56	
10	QPSK	25	0	21.90	21.95	21.86	22
10	QPSK	25	12	21.86	21.91	21.83	
10	QPSK	25	25	21.89	21.83	21.85	
10	QPSK	50	0	21.79	21.85	21.72	
10	16QAM	1	0	21.52	21.65	21.45	22
10	16QAM	1	13	21.60	21.80	21.65	
10	16QAM	1	26	21.47	21.67	21.49	
10	16QAM	12	0	21.57	21.69	21.55	22
10	16QAM	12	7	21.71	21.91	21.71	
10	16QAM	12	15	21.75	21.92	21.78	
10	16QAM	27	0	20.88	21.07	20.92	21
Channel				20425	20525	20625	Tune-up limit (dBm)
Frequency (MHz)				826.5	836.5	846.5	
5	QPSK	1	0	22.13	22.54	22.38	23
5	QPSK	1	12	22.51	22.69	22.73	
5	QPSK	1	24	22.44	22.48	22.09	
5	QPSK	12	0	21.30	21.53	21.52	22
5	QPSK	12	7	21.45	21.42	21.54	
5	QPSK	12	13	21.44	21.42	21.45	
5	QPSK	25	0	21.33	21.49	21.49	
5	16QAM	1	0	21.42	21.53	21.37	22
5	16QAM	1	12	21.17	21.37	21.21	
5	16QAM	1	24	21.16	21.35	21.24	
5	16QAM	12	0	20.67	20.82	20.68	21
5	16QAM	12	7	20.78	20.90	20.70	
5	16QAM	12	13	20.61	20.79	20.68	
5	16QAM	25	0	20.56	20.73	20.55	
Channel				20415	20525	20635	Tune-up limit (dBm)
Frequency (MHz)				825.5	836.5	847.5	
3	QPSK	1	0	22.91	22.89	22.84	23
3	QPSK	1	8	22.93	22.86	22.82	
3	QPSK	1	14	22.90	22.85	22.67	
3	QPSK	8	0	21.96	21.95	21.95	22
3	QPSK	8	4	21.96	21.94	21.96	
3	QPSK	8	7	21.99	22.00	21.93	
3	QPSK	15	0	21.94	21.99	21.88	

3	16QAM	1	0	21.78	21.94	21.81	22
3	16QAM	1	8	21.59	21.75	21.60	
3	16QAM	1	14	21.68	21.88	21.76	
3	16QAM	8	0	20.89	21.07	20.94	21
3	16QAM	8	4	21.04	21.14	21.02	
3	16QAM	8	7	20.86	20.99	20.80	
3	16QAM	15	0	20.57	20.74	20.58	
Channel				20407	20525	20643	Tune-up limit (dBm)
Frequency (MHz)				824.7	836.5	848.3	
1.4	QPSK	1	0	22.28	22.53	22.44	23
1.4	QPSK	1	3	22.34	22.47	22.34	
1.4	QPSK	1	5	22.15	22.38	22.44	
1.4	QPSK	3	0	22.33	22.51	22.65	
1.4	QPSK	3	1	22.37	22.56	22.55	
1.4	QPSK	3	3	22.31	22.52	22.53	
1.4	QPSK	6	0	21.47	21.57	21.56	22
1.4	16QAM	1	0	21.75	21.92	21.75	22
1.4	16QAM	1	3	21.83	21.95	21.83	
1.4	16QAM	1	5	21.70	21.81	21.65	
1.4	16QAM	3	0	21.66	21.85	21.66	
1.4	16QAM	3	1	21.86	21.99	21.86	
1.4	16QAM	3	3	21.65	21.85	21.65	
1.4	16QAM	6	0	20.77	20.95	20.77	21

<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)
Channel				20850	21100	21350	
Frequency (MHz)				2510	2535	2560	
20	QPSK	1	0	23.56	23.62	23.69	24.5
20	QPSK	1	49	23.94	24.10	24.35	
20	QPSK	1	99	23.62	23.66	23.97	
20	QPSK	50	0	22.81	23.07	23.12	23.5
20	QPSK	50	24	22.78	23.04	23.11	
20	QPSK	50	50	22.79	23.06	23.06	
20	QPSK	100	0	22.95	23.10	23.16	
20	16QAM	1	0	22.13	22.13	22.30	23.5
20	16QAM	1	13	22.52	22.52	22.67	
20	16QAM	1	26	22.54	22.51	22.70	
20	16QAM	12	0	22.45	22.41	22.57	23.5
20	16QAM	12	7	22.62	22.66	22.82	
20	16QAM	12	15	22.69	22.69	22.83	
20	16QAM	27	0	21.57	21.58	21.61	22.5
Channel				20825	21100	21375	Tune-up limit (dBm)
Frequency (MHz)				2507.5	2535	2562.5	
15	QPSK	1	0	23.85	23.89	23.82	24.5
15	QPSK	1	37	24.09	23.95	23.96	
15	QPSK	1	74	23.84	23.96	23.75	
15	QPSK	36	0	22.82	22.99	22.87	23.5
15	QPSK	36	20	22.90	23.07	22.93	
15	QPSK	36	39	22.92	23.06	22.92	
15	QPSK	75	0	22.80	23.04	22.93	
15	16QAM	1	0	21.97	21.99	22.11	23.5
15	16QAM	1	13	22.32	22.38	22.55	
15	16QAM	1	26	22.37	22.41	22.60	
15	16QAM	12	0	22.31	22.30	22.46	23.5
15	16QAM	12	7	22.42	22.50	22.70	
15	16QAM	12	15	22.50	22.53	22.64	
15	16QAM	27	0	21.61	21.64	21.58	22.5
Channel				20800	21100	21400	Tune-up limit

Frequency (MHz)				2505	2535	2565	(dBm)
10	QPSK	1	0	23.45	23.67	23.58	24.5
10	QPSK	1	25	23.95	24.06	23.99	
10	QPSK	1	49	23.56	23.61	23.63	
10	QPSK	25	0	22.65	22.97	22.97	23.5
10	QPSK	25	12	22.70	23.01	22.94	
10	QPSK	25	25	22.80	22.88	22.87	
10	QPSK	50	0	22.72	22.92	22.92	
10	16QAM	1	0	21.95	21.94	22.13	23.5
10	16QAM	1	13	22.38	22.38	22.50	
10	16QAM	1	26	22.42	22.34	22.57	
10	16QAM	12	0	22.28	22.24	22.41	23.5
10	16QAM	12	7	22.48	22.51	22.62	
10	16QAM	12	15	22.54	22.55	22.66	
10	16QAM	27	0	21.57	21.54	21.53	22.5
Channel				20775	21100	21425	Tune-up limit (dBm)
Frequency (MHz)				2502.5	2535	2567.5	
5	QPSK	1	0	23.31	23.60	23.40	24.5
5	QPSK	1	12	23.47	23.78	23.64	
5	QPSK	1	24	23.42	23.56	23.27	
5	QPSK	12	0	22.57	22.72	22.62	23.5
5	QPSK	12	7	22.62	22.71	22.67	
5	QPSK	12	13	22.53	22.66	22.52	
5	QPSK	25	0	22.49	22.69	22.54	
5	16QAM	1	0	22.02	21.98	22.19	23.5
5	16QAM	1	12	22.32	22.40	22.49	
5	16QAM	1	24	22.34	22.38	22.57	
5	16QAM	12	0	22.33	22.23	22.47	22.5
5	16QAM	12	7	22.45	22.52	22.62	
5	16QAM	12	13	22.55	22.58	22.68	
5	16QAM	25	0	21.59	21.62	21.56	

<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				23060	23095	23130	
Frequency (MHz)				704	707.5	711	
10	QPSK	1	0	23.34	23.02	23.14	24
10	QPSK	1	25	23.45	23.51	23.20	
10	QPSK	1	49	23.39	23.07	23.16	
10	QPSK	25	0	22.30	22.41	22.46	23
10	QPSK	25	12	22.38	22.51	22.47	
10	QPSK	25	25	22.57	22.49	22.44	
10	QPSK	50	0	22.43	22.48	22.47	
10	16QAM	1	0	22.01	22.08	21.95	23
10	16QAM	1	13	21.96	22.16	21.93	
10	16QAM	1	26	21.72	21.83	21.92	
10	16QAM	12	0	21.88	21.97	21.77	23
10	16QAM	12	7	21.76	21.98	21.81	
10	16QAM	12	15	21.57	21.63	21.81	
10	16QAM	27	0	21.10	21.29	21.09	22
Channel				23035	23095	23155	Tune-up limit (dBm)
Frequency (MHz)				701.5	707.5	713.5	
5	QPSK	1	0	23.21	23.09	23.10	24
5	QPSK	1	12	23.27	23.26	23.21	
5	QPSK	1	24	22.99	23.30	23.16	
5	QPSK	12	0	22.17	22.24	22.20	23
5	QPSK	12	7	22.11	22.32	22.23	
5	QPSK	12	13	22.00	22.35	22.22	
5	QPSK	25	0	22.14	22.32	22.16	

5	16QAM	1	0	22.13	22.24	22.10	23
5	16QAM	1	12	22.15	22.28	22.13	
5	16QAM	1	24	21.48	21.65	21.45	
5	16QAM	12	0	21.23	21.38	21.23	22
5	16QAM	12	7	21.20	21.37	21.21	
5	16QAM	12	13	21.20	21.39	21.26	
5	16QAM	25	0	21.26	21.37	21.25	
Channel				23025	23095	23165	Tune-up limit (dBm)
Frequency (MHz)				700.5	707.5	714.5	
3	QPSK	1	0	23.29	23.41	23.33	24
3	QPSK	1	8	23.05	23.42	23.47	
3	QPSK	1	14	23.06	23.43	23.50	
3	QPSK	8	0	22.37	22.42	22.48	23
3	QPSK	8	4	22.35	22.45	22.53	
3	QPSK	8	7	22.33	22.46	22.49	
3	QPSK	15	0	22.35	22.48	22.54	
3	16QAM	1	0	21.98	22.11	21.93	23
3	16QAM	1	8	22.03	22.09	21.96	
3	16QAM	1	14	21.36	21.55	21.29	
3	16QAM	8	0	21.04	21.24	21.04	22
3	16QAM	8	4	21.04	21.17	21.07	
3	16QAM	8	7	21.00	21.23	21.11	
3	16QAM	15	0	21.15	21.23	21.13	
Channel				23017	23095	23173	Tune-up limit (dBm)
Frequency (MHz)				699.7	707.5	715.3	
1.4	QPSK	1	0	23.28	23.32	23.08	24
1.4	QPSK	1	3	23.36	23.40	23.35	
1.4	QPSK	1	5	23.24	23.34	23.35	
1.4	QPSK	3	0	23.27	23.26	23.20	
1.4	QPSK	3	1	23.24	23.26	23.34	
1.4	QPSK	3	3	23.23	23.30	23.37	
1.4	QPSK	6	0	22.26	22.34	22.39	23
1.4	16QAM	1	0	21.90	21.96	21.79	23
1.4	16QAM	1	3	21.76	22.01	21.82	
1.4	16QAM	1	5	21.72	21.77	21.75	
1.4	16QAM	3	0	21.84	21.88	21.83	
1.4	16QAM	3	1	21.81	21.98	21.74	
1.4	16QAM	3	3	21.68	21.63	21.69	
1.4	16QAM	6	0	20.93	20.95	20.88	22

<LTE Band 13>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				23230			
Frequency (MHz)				782			
10	QPSK	1	0		23.60		24
10	QPSK	1	25		23.38		
10	QPSK	1	49		23.39		
10	QPSK	25	0		22.52		23
10	QPSK	25	12		22.52		
10	QPSK	25	25		22.54		
10	QPSK	50	0		22.45		
10	16QAM	1	0		22.06		23
10	16QAM	1	13		22.36		
10	16QAM	1	26		22.35		
10	16QAM	12	0		22.05		23
10	16QAM	12	7		22.35		
10	16QAM	12	15		22.48		
10	16QAM	27	0		21.33		22
Channel				23205	23230	23255	Tune-up limit

Frequency (MHz)				779.5	782	784.5	(dBm)
5	QPSK	1	0	23.48	23.40	23.21	24
5	QPSK	1	12	23.52	23.43	23.27	
5	QPSK	1	24	23.19	23.41	23.44	
5	QPSK	12	0	22.32	22.27	22.34	23
5	QPSK	12	7	22.47	22.40	22.48	
5	QPSK	12	13	22.38	22.48	22.43	
5	QPSK	25	0	22.44	22.35	22.37	
5	16QAM	1	0	21.96	22.15	21.95	23
5	16QAM	1	12	22.12	22.30	22.15	
5	16QAM	1	24	21.94	22.10	21.90	
5	16QAM	12	0	21.25	21.39	21.25	22
5	16QAM	12	7	21.20	21.40	21.26	
5	16QAM	12	13	21.09	21.24	21.14	
5	16QAM	25	0	21.26	21.32	21.30	

<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	23.37	23.55	23.41	24
15	QPSK	1	37	23.53	23.54	23.28	
15	QPSK	1	74	23.53	23.44	23.35	
15	QPSK	36	0	22.61	22.38	22.43	23
15	QPSK	36	20	22.46	22.45	22.41	
15	QPSK	36	39	22.50	22.58	22.43	
15	QPSK	75	0	22.12	22.32	22.06	
15	16QAM	1	0	21.61	21.72	21.62	23
15	16QAM	1	13	21.41	21.55	21.40	
15	16QAM	1	26	21.50	21.61	21.49	
15	16QAM	12	0	21.16	21.15	21.20	23
15	16QAM	12	7	21.50	21.69	21.59	
15	16QAM	12	15	21.71	21.90	21.73	
15	16QAM	27	0	20.41	20.58	20.44	22
Channel				26740	26865	26990	Tune-up limit (dBm)
Frequency (MHz)				819	831.5	844	
10	QPSK	1	0	22.73	22.37	22.78	24
10	QPSK	1	25	22.97	22.97	22.82	
10	QPSK	1	49	22.39	22.97	22.44	
10	QPSK	25	0	21.82	21.67	21.73	23
10	QPSK	25	12	21.82	21.73	21.75	
10	QPSK	25	25	21.86	21.87	21.81	
10	QPSK	50	0	21.85	21.79	21.70	
10	16QAM	1	0	21.20	21.32	21.14	23
10	16QAM	1	13	21.20	21.31	21.17	
10	16QAM	1	26	21.42	21.59	21.47	
10	16QAM	12	0	21.25	21.40	21.25	23
10	16QAM	12	7	21.43	21.60	21.49	
10	16QAM	12	15	21.60	21.71	21.56	
10	16QAM	27	0	20.46	20.62	20.43	22
Channel				26715	26865	27015	Tune-up limit (dBm)
Frequency (MHz)				816.5	831.5	846.5	
5	QPSK	1	0	22.15	22.32	22.24	24
5	QPSK	1	12	22.82	22.79	22.86	
5	QPSK	1	24	22.60	22.50	22.05	
5	QPSK	12	0	21.62	21.41	21.54	23
5	QPSK	12	7	21.63	21.56	21.66	
5	QPSK	12	13	21.62	21.53	21.50	
5	QPSK	25	0	21.59	21.61	21.55	

5	16QAM	1	0	21.56	21.75	21.59	23
5	16QAM	1	12	21.89	22.05	21.94	
5	16QAM	1	24	21.99	22.10	21.90	
5	16QAM	12	0	20.71	20.89	20.72	22
5	16QAM	12	7	20.78	20.89	20.77	
5	16QAM	12	13	20.58	20.78	20.68	
5	16QAM	25	0	20.47	20.57	20.38	
Channel				26705	26865	27025	Tune-up limit (dBm)
Frequency (MHz)				815.5	831.5	847.5	
3	QPSK	1	0	22.98	22.77	23.10	24
3	QPSK	1	8	22.86	22.85	22.87	
3	QPSK	1	14	23.07	22.93	22.59	
3	QPSK	8	0	21.98	21.89	22.04	23
3	QPSK	8	4	22.15	21.94	21.89	
3	QPSK	8	7	22.03	21.94	21.90	
3	QPSK	15	0	22.15	21.88	21.92	
3	16QAM	1	0	21.41	21.55	21.48	23
3	16QAM	1	8	21.71	21.90	21.79	
3	16QAM	1	14	21.84	21.97	21.70	
3	16QAM	8	0	20.42	20.56	20.36	22
3	16QAM	8	4	20.38	20.55	20.42	
3	16QAM	8	7	20.54	20.65	20.47	
3	16QAM	15	0	20.61	20.72	20.60	
Channel				26697	26865	27033	Tune-up limit (dBm)
Frequency (MHz)				814.7	831.5	848.3	
1.4	QPSK	1	0	22.51	22.38	22.49	24
1.4	QPSK	1	3	22.68	22.69	22.30	
1.4	QPSK	1	5	22.54	22.71	22.33	
1.4	QPSK	3	0	22.52	22.44	22.53	
1.4	QPSK	3	1	22.60	22.42	22.43	
1.4	QPSK	3	3	22.61	22.48	22.42	
1.4	QPSK	6	0	21.48	21.53	21.50	23
1.4	16QAM	1	0	21.43	21.60	21.46	23
1.4	16QAM	1	3	21.77	21.91	21.83	
1.4	16QAM	1	5	21.79	21.93	21.72	
1.4	16QAM	3	0	21.39	21.63	21.45	
1.4	16QAM	3	1	21.73	21.92	21.80	
1.4	16QAM	3	3	21.80	21.96	21.73	
1.4	16QAM	6	0	20.63	20.73	20.65	22

<LTE Band 66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				132072	132322	132572	
Frequency (MHz)				1720	1745	1770	
20	QPSK	1	0	23.15	23.55	23.51	24
20	QPSK	1	49	23.01	23.51	23.43	
20	QPSK	1	99	23.14	23.37	23.13	
20	QPSK	50	0	22.26	22.60	22.59	23
20	QPSK	50	24	22.12	22.56	22.51	
20	QPSK	50	50	22.19	22.59	22.55	
20	QPSK	100	0	21.82	22.28	22.22	
20	16QAM	1	0	21.16	21.32	21.24	23
20	16QAM	1	13	21.18	21.30	21.20	
20	16QAM	1	26	21.16	21.28	21.12	
20	16QAM	12	0	21.40	21.52	21.36	23
20	16QAM	12	7	21.47	21.61	21.41	
20	16QAM	12	15	21.41	21.55	21.39	
20	16QAM	27	0	20.26	20.55	20.93	22
Channel				132047	132322	132597	Tune-up limit

Frequency (MHz)				1717.5	1745	1772.5	(dBm)
15	QPSK	1	0	22.87	23.48	23.52	24
15	QPSK	1	37	23.19	23.50	23.43	
15	QPSK	1	74	23.13	23.50	23.45	
15	QPSK	36	0	21.90	22.61	22.62	23
15	QPSK	36	20	22.06	22.51	22.48	
15	QPSK	36	39	22.04	22.60	22.52	
15	QPSK	75	0	21.68	22.21	22.32	
15	16QAM	1	0	21.04	21.22	21.14	23
15	16QAM	1	13	21.12	21.13	21.05	
15	16QAM	1	26	21.02	21.08	21.00	
15	16QAM	12	0	21.26	21.33	21.22	23
15	16QAM	12	7	21.31	21.41	21.25	
15	16QAM	12	15	21.31	21.41	21.20	
15	16QAM	27	0	20.07	20.40	20.83	22
Channel				132022	132322	132622	Tune-up limit (dBm)
Frequency (MHz)				1715	1745	1775	
10	QPSK	1	0	22.49	23.11	23.36	24
10	QPSK	1	25	23.03	23.39	23.03	
10	QPSK	1	49	22.86	23.16	22.83	
10	QPSK	25	0	21.68	22.23	22.27	23
10	QPSK	25	12	21.79	22.23	22.10	
10	QPSK	25	25	21.79	22.13	22.06	
10	QPSK	50	0	21.74	22.17	22.11	
10	16QAM	1	0	21.11	21.15	21.07	23
10	16QAM	1	13	21.08	21.12	21.02	
10	16QAM	1	26	21.06	21.11	21.10	
10	16QAM	12	0	21.25	21.40	21.22	23
10	16QAM	12	7	21.27	21.43	21.30	
10	16QAM	12	15	21.27	21.36	21.20	
10	16QAM	27	0	20.10	20.39	20.73	22
Channel				131997	132322	132647	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1745	1777.5	
5	QPSK	1	0	22.54	23.02	22.79	24
5	QPSK	1	12	22.51	23.15	23.00	
5	QPSK	1	24	22.64	23.02	22.63	
5	QPSK	12	0	21.46	22.04	21.96	23
5	QPSK	12	7	21.51	22.07	21.91	
5	QPSK	12	13	21.44	22.04	21.97	
5	QPSK	25	0	21.39	22.04	21.99	
5	16QAM	1	0	21.11	21.21	21.13	23
5	16QAM	1	12	21.08	21.15	21.03	
5	16QAM	1	24	21.13	21.16	21.02	
5	16QAM	12	0	21.27	21.42	21.19	22
5	16QAM	12	7	21.34	21.41	21.24	
5	16QAM	12	13	21.30	21.36	21.21	
5	16QAM	25	0	21.20	21.10	21.18	
Channel				131987	132322	132657	Tune-up limit (dBm)
Frequency (MHz)				1711.5	1745	1778.5	
3	QPSK	1	0	22.73	23.46	23.40	24
3	QPSK	1	8	22.75	23.47	23.32	
3	QPSK	1	14	22.79	23.47	23.29	
3	QPSK	8	0	21.71	22.19	22.27	23
3	QPSK	8	4	21.72	22.24	22.19	
3	QPSK	8	7	21.78	22.25	22.16	
3	QPSK	15	0	21.69	22.31	22.17	
3	16QAM	1	0	21.16	21.20	21.09	23
3	16QAM	1	8	21.08	21.13	21.01	
3	16QAM	1	14	21.12	21.09	21.10	
3	16QAM	8	0	21.22	21.36	21.17	22
3	16QAM	8	4	21.27	21.49	21.21	
3	16QAM	8	7	21.31	21.35	21.27	
3	16QAM	15	0	21.26	21.18	21.13	

Channel				131979	132322	132665	Tune-up limit (dBm)
Frequency (MHz)				1710.7	1745	1779.3	
1.4	QPSK	1	0	22.58	22.88	23.17	24
1.4	QPSK	1	3	22.57	23.06	23.23	
1.4	QPSK	1	5	22.54	23.05	23.11	
1.4	QPSK	3	0	22.55	23.04	23.11	
1.4	QPSK	3	1	22.81	23.33	23.31	
1.4	QPSK	3	3	22.64	23.07	23.26	
1.4	QPSK	6	0	21.58	22.06	22.08	23
1.4	16QAM	1	0	21.05	21.15	21.14	23
1.4	16QAM	1	3	21.02	21.19	21.07	
1.4	16QAM	1	5	21.02	21.08	21.00	
1.4	16QAM	3	0	21.29	21.34	21.21	
1.4	16QAM	3	1	21.33	21.41	21.22	
1.4	16QAM	3	3	21.22	21.36	21.27	
1.4	16QAM	6	0	20.06	20.41	20.75	22

<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.

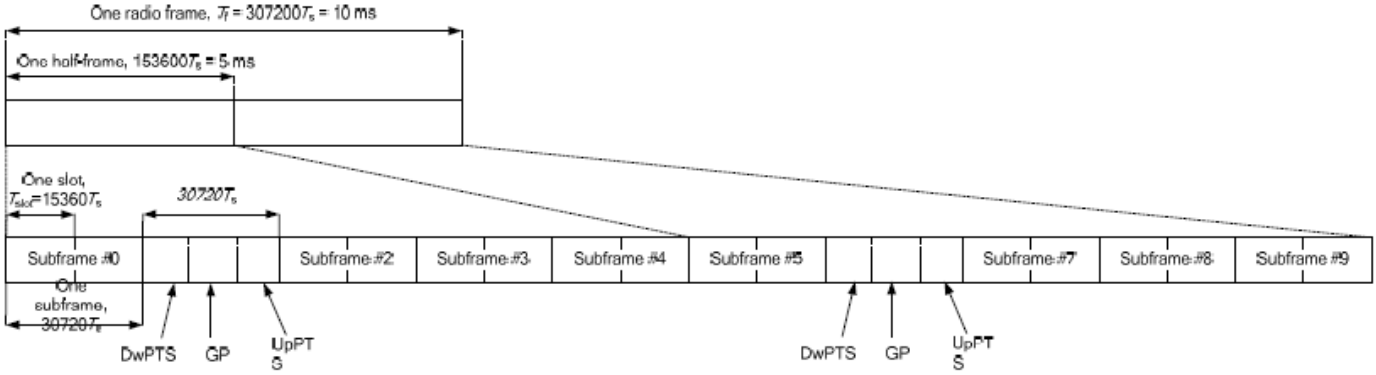


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

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 38>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				37850	38000	38150	
Frequency (MHz)				2580	2595	2610	
20	QPSK	1	0	24.40	24.43	24.38	25
20	QPSK	1	49	24.55	24.40	24.73	
20	QPSK	1	99	24.39	24.53	24.61	
20	QPSK	50	0	23.57	23.70	23.70	24
20	QPSK	50	24	23.49	23.65	23.68	
20	QPSK	50	50	23.42	23.55	23.58	
20	QPSK	100	0	23.45	23.47	23.49	
20	16QAM	1	0	22.82	23.00	22.80	23
20	16QAM	1	13	22.71	22.84	22.64	
20	16QAM	1	26	22.79	22.99	22.81	
20	16QAM	12	0	22.80	22.96	22.78	23
20	16QAM	12	7	22.67	22.86	22.67	
20	16QAM	12	15	22.76	22.87	22.70	
20	16QAM	27	0	21.71	21.89	21.78	22
Channel				37825	38000	38175	Tune-up limit (dBm)
Frequency (MHz)				2577.5	2595	2612.5	
15	QPSK	1	0	24.58	24.61	24.56	25
15	QPSK	1	37	24.65	24.51	24.56	
15	QPSK	1	74	24.63	24.56	24.70	
15	QPSK	36	0	23.58	23.68	23.74	24
15	QPSK	36	20	23.49	23.56	23.68	
15	QPSK	36	39	23.48	23.62	23.74	
15	QPSK	75	0	23.50	23.43	23.66	
15	16QAM	1	0	22.62	22.80	22.60	23
15	16QAM	1	13	22.59	22.67	22.44	
15	16QAM	1	26	22.69	22.79	22.68	
15	16QAM	12	0	22.62	22.78	22.59	23
15	16QAM	12	7	22.55	22.72	22.56	
15	16QAM	12	15	22.63	22.71	22.55	
15	16QAM	27	0	21.56	21.71	21.60	22
Channel				37800	38000	38200	Tune-up limit (dBm)
Frequency (MHz)				2575	2595	2615	
10	QPSK	1	0	24.47	24.68	24.60	25
10	QPSK	1	25	24.71	24.68	24.70	
10	QPSK	1	49	24.46	24.47	24.51	
10	QPSK	25	0	23.62	23.79	23.58	24
10	QPSK	25	12	23.54	23.71	23.60	
10	QPSK	25	25	23.56	23.72	23.74	
10	QPSK	50	0	23.45	23.81	23.64	
10	16QAM	1	0	22.66	22.90	22.62	23
10	16QAM	1	13	22.58	22.72	22.49	
10	16QAM	1	26	22.59	22.89	22.62	
10	16QAM	12	0	22.64	22.82	22.63	23
10	16QAM	12	7	22.49	22.70	22.47	
10	16QAM	12	15	22.65	22.74	22.53	
10	16QAM	27	0	21.58	21.69	21.63	22
Channel				37775	38000	38225	Tune-up limit (dBm)
Frequency (MHz)				2572.5	2595	2617.5	
5	QPSK	1	0	24.46	24.53	24.42	25
5	QPSK	1	12	24.60	24.67	24.53	
5	QPSK	1	24	24.49	24.41	24.48	
5	QPSK	12	0	23.45	23.49	23.54	24
5	QPSK	12	7	23.45	23.42	23.59	
5	QPSK	12	13	23.50	23.60	23.71	
5	QPSK	25	0	23.58	23.54	23.74	

5	16QAM	1	0	22.25	22.45	22.32	23
5	16QAM	1	12	22.45	22.60	22.48	
5	16QAM	1	24	22.59	22.76	22.62	
5	16QAM	12	0	22.31	22.10	22.41	23
5	16QAM	12	7	22.30	22.38	22.40	
5	16QAM	12	13	22.46	22.37	22.42	
5	16QAM	25	0	22.69	22.38	22.68	

<LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				39750	40185	40620	41055	41490	
Frequency (MHz)				2506	2549.5	2593	2636.5	2680	
20	QPSK	1	0	23.97	23.90	23.86	23.74	23.63	25
20	QPSK	1	49	24.03	24.30	23.91	23.96	23.70	
20	QPSK	1	99	23.93	23.94	23.76	23.73	23.53	
20	QPSK	50	0	22.94	22.73	22.89	22.75	22.73	24
20	QPSK	50	24	23.04	23.07	22.98	22.82	22.76	
20	QPSK	50	50	22.92	22.98	22.89	22.77	22.72	
20	QPSK	100	0	22.82	22.93	22.86	22.85	22.59	
20	16QAM	1	0	22.70	22.80	22.62	22.67	22.60	23
20	16QAM	1	13	22.32	22.52	22.42	22.37	22.41	
20	16QAM	1	26	22.39	22.58	22.45	22.39	22.40	
20	16QAM	12	0	22.76	22.89	22.76	22.72	22.79	23
20	16QAM	12	7	22.59	22.78	22.66	22.64	22.61	
20	16QAM	12	15	22.65	22.85	22.71	22.67	22.73	
20	16QAM	27	0	21.74	21.87	21.77	21.71	21.68	22
Channel				39725	40173	40620	41068	41515	Tune-up limit (dBm)
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5	
15	QPSK	1	0	24.04	23.98	24.11	24.12	23.62	25.00
15	QPSK	1	37	24.24	24.28	24.00	24.18	24.08	
15	QPSK	1	74	24.18	24.26	23.99	24.09	23.78	
15	QPSK	36	0	23.05	23.02	23.09	23.07	23.02	24
15	QPSK	36	20	23.04	23.07	23.07	22.95	22.89	
15	QPSK	36	39	23.04	23.22	23.03	23.04	22.82	
15	QPSK	75	0	22.80	22.77	22.88	22.73	22.65	
15	16QAM	1	0	22.52	22.64	22.43	22.56	22.48	23
15	16QAM	1	13	22.21	22.39	22.25	22.23	22.31	
15	16QAM	1	26	22.22	22.44	22.27	22.21	22.21	
15	16QAM	12	0	22.64	22.78	22.64	22.56	22.67	23
15	16QAM	12	7	22.39	22.67	22.49	22.52	22.42	
15	16QAM	12	15	22.55	22.74	22.56	22.47	22.63	
15	16QAM	27	0	21.58	21.70	21.63	21.55	21.58	22
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)
Frequency (MHz)				2501	2547	2593	2639	2685	
10	QPSK	1	0	24.09	23.93	23.98	23.86	23.75	25.00
10	QPSK	1	25	24.10	24.11	24.05	23.90	23.74	
10	QPSK	1	49	24.19	23.95	23.88	23.80	23.70	
10	QPSK	25	0	22.99	22.90	23.02	22.78	22.77	24
10	QPSK	25	12	22.96	22.90	23.04	22.81	22.69	
10	QPSK	25	25	22.96	23.01	23.06	22.82	22.63	
10	QPSK	50	0	23.05	22.92	23.15	22.76	22.76	
10	16QAM	1	0	22.54	22.66	22.45	22.50	22.50	23
10	16QAM	1	13	22.16	22.36	22.32	22.23	22.31	
10	16QAM	1	26	22.21	22.40	22.34	22.25	22.26	
10	16QAM	12	0	22.64	22.72	22.56	22.52	22.65	23
10	16QAM	12	7	22.46	22.61	22.51	22.49	22.47	
10	16QAM	12	15	22.54	22.68	22.53	22.48	22.56	
10	16QAM	27	0	21.56	21.74	21.58	21.51	21.52	22

Channel				39675	40148	40620	41093	41565	Tune-up limit (dBm)
Frequency (MHz)				2498.5	2545.8	2593	2640.30	2687.5	
5	QPSK	1	0	23.79	23.67	23.63	23.72	23.35	25.00
5	QPSK	1	12	24.08	23.55	23.83	23.75	23.51	
5	QPSK	1	24	23.72	23.62	23.55	23.60	23.13	
5	QPSK	12	0	22.65	22.53	22.71	22.62	22.56	24
5	QPSK	12	7	22.74	22.76	22.73	22.64	22.64	
5	QPSK	12	13	22.83	22.73	22.73	22.60	22.39	
5	QPSK	25	0	22.73	22.77	22.76	22.51	22.42	
5	16QAM	1	0	22.56	22.15	22.30	22.65	22.18	23
5	16QAM	1	12	22.39	22.51	22.48	22.37	22.58	
5	16QAM	1	24	22.34	22.36	22.27	22.08	22.07	
5	16QAM	12	0	21.59	21.59	21.69	21.60	21.44	23
5	16QAM	12	7	21.50	21.72	21.79	21.49	21.58	
5	16QAM	12	13	21.71	21.68	21.80	21.67	21.57	
5	16QAM	25	0	21.90	21.90	21.98	21.74	21.76	

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

General Note:

1. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures. For “Not required”, SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, additional output power measurements were not necessary.
2. 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.
3. 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).
4. 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.
5. 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.

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	15.60	16.00	99.80
		6	2437	15.80	16.00	
		11	2462	15.50	16.00	
		12	2467	15.50	16.00	
		13	2472	16.00	16.00	
	802.11g 6Mbps	1	2412	Not Required	14.50	Not Required
		6	2437		14.50	
		11	2462		14.50	
		12	2467		14.50	
		13	2472		14.50	
	802.11n-HT20 MCS0	1	2412		13.00	
		6	2437		13.00	
		11	2462		13.00	
		12	2467		13.00	
		13	2472		13.00	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	12.50	13.00	89.40
		40	5200	12.90	13.00	
		44	5220	12.40	13.00	
		48	5240	12.70	13.00	
	802.11n-HT20 MCS0	36	5180	Not Required	12.50	Not Required
		40	5200		12.50	
		44	5220		12.50	
		48	5240		12.50	
	802.11n-HT40 MCS0	38	5190		12.00	
		46	5230		12.00	
	802.11ac-VHT20 MCS0	36	5180		12.50	
		40	5200		12.50	
		44	5220		12.50	
		48	5240		12.50	
	802.11ac-VHT40 MCS0	38	5190		12.00	
		46	5230		12.00	
	802.11ac-VHT80 MCS0	42	5210		9.50	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	Not Required	12.00	Not Required
		56	5280		12.00	
		60	5300		12.00	
		64	5320		12.00	
	802.11n-HT20 MCS0	52	5260		12.00	
		56	5280		12.00	
		60	5300		12.00	
		64	5320		12.00	
	802.11n-HT40 MCS0	54	5270		11.50	
		62	5310		11.50	
	802.11ac-VHT20 MCS0	52	5260		11.00	
		56	5280		11.00	
		60	5300		11.50	
		64	5320		11.50	
	802.11ac-VHT40 MCS0	54	5270		11.00	
		62	5310		11.00	
	802.11ac-VHT80 MCS0	58	5290		8.00	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	Not Required	11.50	Not Required
		116	5580		11.50	
		124	5620		11.50	
		132	5660		11.50	
		144	5720		11.50	
	802.11n-HT20 MCS0	100	5500		11.50	
		116	5580		11.50	
		124	5620		11.50	
		132	5660		11.50	
		144	5720		11.50	
	802.11n-HT40 MCS0	102	5510	11.80	12.00	97.10
		110	5550	12.00	12.00	
		126	5630	12.00	12.00	
		134	5670	11.50	12.00	
		142	5710	11.50	12.00	
	802.11ac-VHT20 MCS0	100	5500	Not Required	11.50	Not Required
		116	5580		11.50	
		124	5620		11.50	
		132	5660		11.50	
		144	5720		11.50	
	802.11ac-VHT40 MCS0	102	5510		12.00	
		110	5550		12.00	
		126	5630		12.00	
		134	5670		12.00	
		142	5710		12.00	
	802.11ac-VHT80 MCS0	106	5530		8.00	
		122	5610		8.00	
		138	5690		8.00	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	11.90	12.50	93.64
		157	5785	11.80	12.50	
		165	5825	11.70	12.50	
	802.11n-HT20 MCS0	149	5745	Not Required	12.00	Not Required
		157	5785		12.00	
		165	5825		12.00	
	802.11n-HT40 MCS0	151	5755		12.00	
		159	5795		12.00	
	802.11ac-VHT20 MCS0	149	5745		12.00	
		157	5785		12.00	
		165	5825		12.00	
	802.11ac-VHT40 MCS0	151	5755		12.00	
		159	5795		12.00	
	802.11ac-VHT80 MCS0	155	5775		9.50	

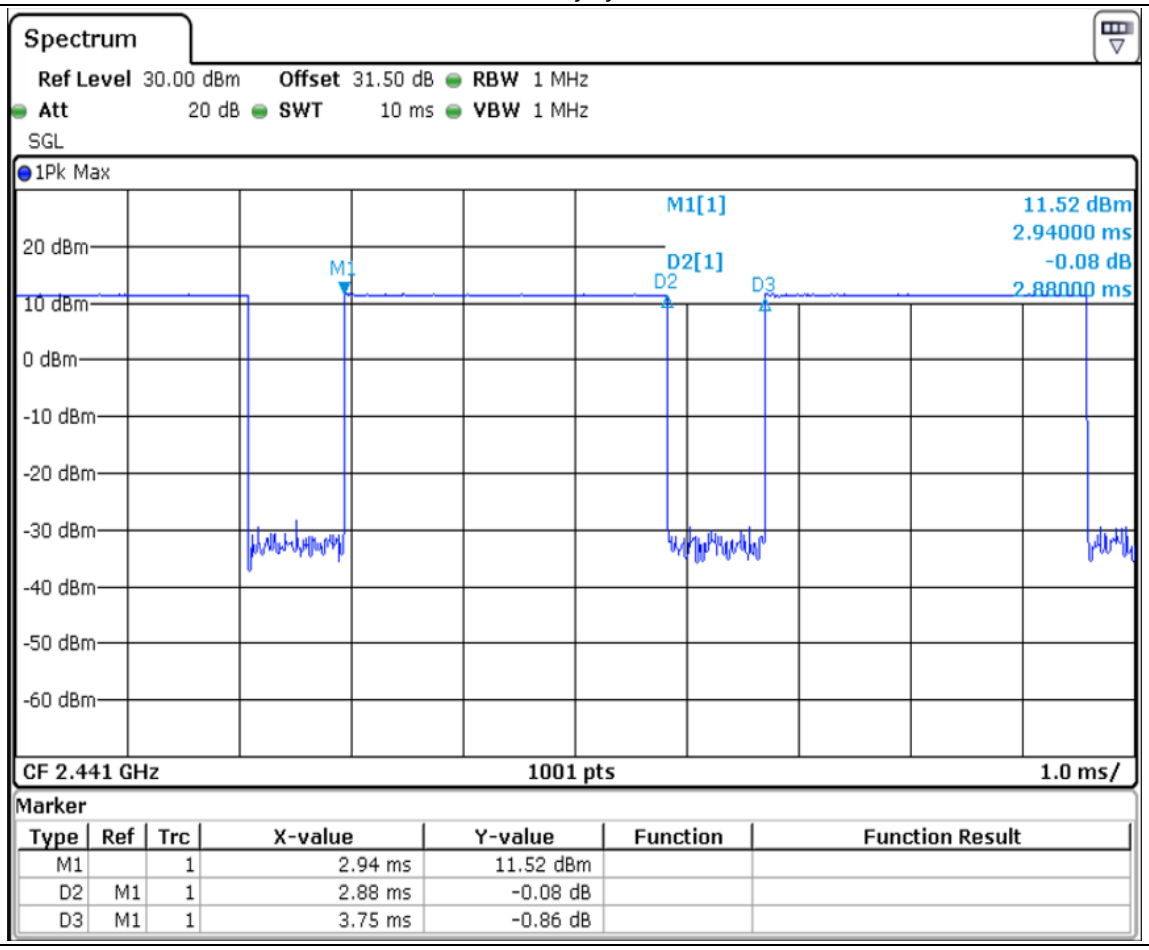
<2.4GHz Bluetooth>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
Bluetooth	BR / EDR 1Mbps	0	2402	7.50	8.50	76.80
		39	2441	7.50	8.50	
		78	2480	3.40	4.00	
	BR / EDR 2Mbps	0	2402	Not Required	4.00	Not Required
		39	2441		4.00	
		78	2480		2.00	
	BR / EDR 3Mbps	0	2402		4.00	
		39	2441		4.00	
		78	2480		2.00	
	LE 1Mbps	0	2402		4.00	
		19	2440		4.00	
		39	2480		4.00	

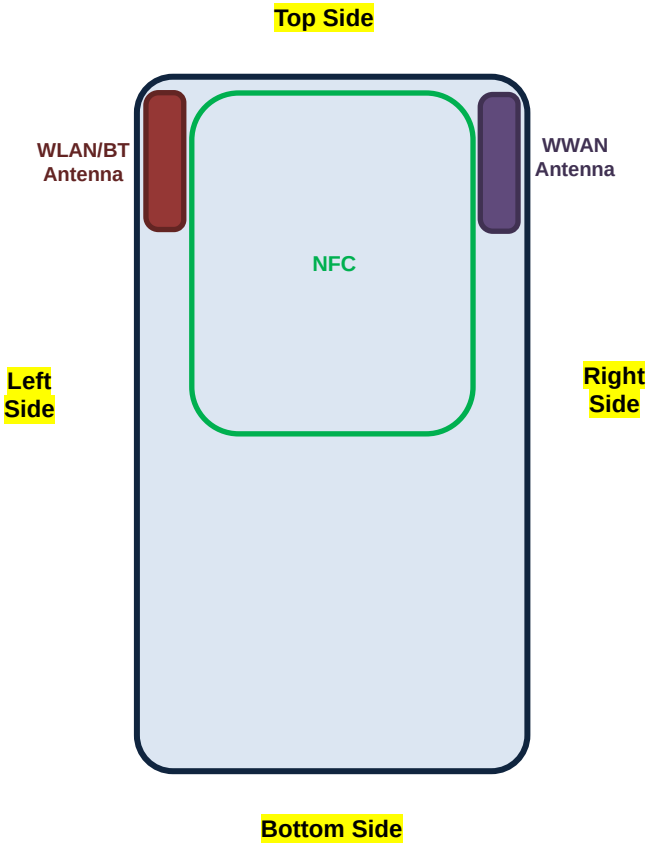
General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps due to its highest average power and duty cycle is 76.8% considered in SAR testing, and the duty cycle would be scaled to theoretical 83.3% in reported SAR calculation.

BT Duty cycle



12. Antenna Location



Front View

<SAR test exclusion table>

General Note:

1. The below table, when the distance is < 50 mm exclusion threshold is "Ratio", when the distance is > 50 mm exclusion threshold is "mW"
2. Maximum power is the source-based time-average power and represents the maximum RF output power among production units
3. Per KDB 447498 D01v06, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
4. Per KDB 447498 D01v06, standalone SAR test exclusion threshold is applied; If the test separation distance is < 5mm, 5mm is used to determine SAR exclusion threshold.
5. Per KDB 447498 D01v06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
   [(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
   - f(GHz) is the RF channel transmit frequency in GHz
   - Power and distance are rounded to the nearest mW and mm before calculation
   - The result is rounded to one decimal place for comparison
6. Per KDB 447498 D01v06, at 100 MHz to 6 GHz and for *test separation distances* > 50 mm, the SAR test exclusion threshold is determined according to the following
   a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz
   b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

	Wireless Interface	GPRS 850	GPRS 1900	WCDMA Band V	WCDMA Band IV	WCDMA Band II	LTE Band 12	LTE Band 13	LTE Band 5	LTE Band 26	LTE Band 4	LTE Band 66	LTE Band 2	LTE Band 7	LTE Band 38	LTE Band 41	BT & 2.4GHz WLAN	5GHz WLAN
Exposure Position	Calculated Frequency (MHz)	824.2	1880	846.6	1752.6	1880	707.5	782	836.5	831.5	1732.5	1745	1880	2560	2610	2687.5	2472	5825
	Maximum power (dBm)	25.00	22.24	23.50	23.50	23.00	24.00	24.00	23.00	24.00	24.00	24.50	23.00	24.50	25.00	25.00	16.00	13.00
	Maximum rated power(mW)	316.23	167.49	223.87	223.87	199.53	251.19	251.19	199.53	251.19	251.19	281.84	199.53	281.84	316.23	316.23	39.81	19.95
Front	Separation distance(mm)	22.0															22.0	22.0
	exclusion threshold	13.1	10.4	9.4	13.5	12.4	9.6	10.1	8.3	10.4	15.0	16.9	12.4	20.5	23.2	23.6	2.9	2.2
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Back	Separation distance(mm)	20.0															20.0	20.0
	exclusion threshold	14.4	11.5	10.3	14.8	13.7	10.6	11.1	9.1	11.5	16.5	18.6	13.7	22.6	25.5	25.9	3.1	2.4
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Left Side	Separation distance(mm)	65.0															5.0	5.0
	exclusion threshold	248.0	259.0	248.0	263.0	259.0	249.0	248.0	248.0	248.0	264.0	264.0	259.0	244.0	243.0	241.0	12.5	9.6
	Testing required?	Yes	No	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Right Side	Separation distance(mm)	5.0															65.0	65.0
	exclusion threshold	57.4	45.9	41.2	59.3	54.7	42.3	44.4	36.5	45.8	66.1	74.5	54.7	90.2	102.2	103.7	245.0	212.0
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Top Side	Separation distance(mm)	23.0															23.0	23.0
	exclusion threshold	12.5	10.0	9.0	12.9	11.9	9.2	9.7	7.9	10.0	14.4	16.2	11.9	19.6	22.2	22.5	2.7	2.1
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Bottom Side	Separation distance(mm)	115.0															115.0	115.0
	exclusion threshold	522.0	759.0	530.0	763.0	759.0	485.0	508.0	526.0	525.0	764.0	764.0	759.0	744.0	743.0	741.0	745.0	712.0
	Testing required?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

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
   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.
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. A factor of 2.5 is applied for 10g Extremity SAR consideration

GSM Note:

1. Per KDB 941225 D01v03r01, for SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance, for modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested, therefore, the GPRS 2Tx slots modes was selected when EUT operating without power back-off, the GPRS 2Tx slots modes was selected when EUT operating with power back-off, according to the highest source-based time-averaged output power.

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) 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/B12/B26/B38 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 4/38 SAR test was covered by Band 66/41; 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. 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.

NFC Note:

1. NFC mainly operate in hand-held extremity exposure conditions and NFC sensing distance with other device or reading tag is about 20cm, therefore Standalone 10-g extremity SAR testing for NFC will be performed with active mode and max power mode, with 100% duty cycle at 0mm separation distance.
2. NFC 13.56MHz antenna port is not available on the device to support conducted power measurement, therefore the measured results are referred to as reported SAR.
3. NFC SAR test tissue-simulating liquid parameter: refer to IEC/IEEE 62209-1528 2020.

13.1 Extremity SAR

<GSM 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 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	GSM850	GPRS (2 Tx slots)	Front	0mm	128	824.2	30.10	31.00	1.230	0.08	0.311	0.383
	GSM850	GPRS (2 Tx slots)	Back	0mm	128	824.2	30.10	31.00	1.230	0.01	0.501	0.616
01	GSM850	GPRS (2 Tx slots)	Right Side	0mm	128	824.2	30.10	31.00	1.230	-0.03	0.851	1.047
	GSM850	GPRS (2 Tx slots)	Left Side	0mm	128	824.2	30.10	31.00	1.230	-0.06	0.106	0.130
	GSM850	GPRS (2 Tx slots)	Top Side	0mm	128	824.2	30.10	31.00	1.230	0.03	0.336	0.413
	GSM1900	GPRS (3 Tx slots)	Front	0mm	661	1880	26.50	26.50	1.000	-0.08	0.072	0.072
	GSM1900	GPRS (3 Tx slots)	Back	0mm	661	1880	26.50	26.50	1.000	0.1	0.365	0.365
	GSM1900	GPRS (3 Tx slots)	Right Side	0mm	661	1880	26.50	26.50	1.000	-0.18	2.300	2.300
	GSM1900	GPRS (3 Tx slots)	Right Side	0mm	512	1850.2	26.37	26.50	1.030	0.1	1.700	1.752
02	GSM1900	GPRS (3 Tx slots)	Right Side	0mm	810	1909.8	26.19	26.50	1.074	-0.03	2.670	2.868
	GSM1900	GPRS (3 Tx slots)	Top Side	0mm	661	1880	26.50	26.50	1.000	0.12	0.102	0.102

<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 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	0mm	9400	1880	22.45	23.00	1.135	0.08	0.084	0.095
	WCDMA II	RMC 12.2Kbps	Back	0mm	9400	1880	22.45	23.00	1.135	0.01	0.454	0.515
	WCDMA II	RMC 12.2Kbps	Right Side	0mm	9400	1880	22.45	23.00	1.135	0.03	2.310	2.622
	WCDMA II	RMC 12.2Kbps	Right Side	0mm	9262	1852.4	22.36	23.00	1.159	-0.08	2.080	2.410
03	WCDMA II	RMC 12.2Kbps	Right Side	0mm	9538	1907.6	21.96	23.00	1.271	-0.01	2.480	3.151
	WCDMA II	RMC 12.2Kbps	Top Side	0mm	9400	1880	22.45	23.00	1.135	-0.08	0.113	0.128
	WCDMA IV	RMC 12.2Kbps	Front	0mm	1513	1752.6	23.48	23.50	1.005	-0.17	0.061	0.061
	WCDMA IV	RMC 12.2Kbps	Back	0mm	1513	1752.6	23.48	23.50	1.005	0.17	0.895	0.899
04	WCDMA IV	RMC 12.2Kbps	Right Side	0mm	1513	1752.6	23.48	23.50	1.005	-0.08	2.600	2.612
	WCDMA IV	RMC 12.2Kbps	Right Side	0mm	1312	1712.4	23.01	23.50	1.119	-0.05	2.180	2.440
	WCDMA IV	RMC 12.2Kbps	Right Side	0mm	1413	1732.6	23.40	23.50	1.023	0.01	2.450	2.507
	WCDMA IV	RMC 12.2Kbps	Top Side	0mm	1513	1752.6	23.48	23.50	1.005	0.1	0.161	0.162
	WCDMA V	RMC 12.2Kbps	Front	0mm	4233	846.6	23.49	23.50	1.002	-0.03	0.178	0.178
	WCDMA V	RMC 12.2Kbps	Back	0mm	4233	846.6	23.49	23.50	1.002	0.08	0.521	0.522
05	WCDMA V	RMC 12.2Kbps	Right Side	0mm	4233	846.6	23.49	23.50	1.002	-0.11	1.020	1.022
	WCDMA V	RMC 12.2Kbps	Top Side	0mm	4233	846.6	23.49	23.50	1.002	0.02	0.225	0.226

<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 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	49	Front	0mm	18900	1880	22.96	23.00	1.009	0.18	0.093	0.094
	LTE Band 2	20M	QPSK	50	0	Front	0mm	18900	1880	21.97	22.50	1.130	0.14	0.076	0.086
	LTE Band 2	20M	QPSK	1	49	Back	0mm	18900	1880	22.96	23.00	1.009	-0.17	0.590	0.595
	LTE Band 2	20M	QPSK	50	0	Back	0mm	18900	1880	21.97	22.50	1.130	0.17	0.481	0.543
	LTE Band 2	20M	QPSK	1	49	Right Side	0mm	18900	1880	22.96	23.00	1.009	-0.05	2.860	2.886
	LTE Band 2	20M	QPSK	1	49	Right Side	0mm	18700	1860	22.83	23.00	1.040	0.01	2.790	2.901
06	LTE Band 2	20M	QPSK	1	49	Right Side	0mm	19100	1900	22.83	23.00	1.040	0.03	3.260	3.390
	LTE Band 2	20M	QPSK	50	0	Right Side	0mm	18900	1880	21.97	22.50	1.130	0.1	2.190	2.474
	LTE Band 2	20M	QPSK	50	0	Right Side	0mm	18700	1860	21.87	22.50	1.156	0.06	2.230	2.578
	LTE Band 2	20M	QPSK	50	0	Right Side	0mm	19100	1900	21.67	22.50	1.211	-0.08	2.370	2.869
	LTE Band 2	20M	QPSK	100	0	Right Side	0mm	18900	1880	21.84	22.50	1.164	-0.17	2.260	2.631
	LTE Band 2	20M	QPSK	1	49	Top Side	0mm	18900	1880	22.96	23.00	1.009	0.04	0.140	0.141
	LTE Band 2	20M	QPSK	50	0	Top Side	0mm	18900	1880	21.97	22.50	1.130	-0.01	0.110	0.124
	LTE Band 5	10M	QPSK	1	0	Front	0mm	20525	836.5	22.97	23.00	1.007	-0.08	0.157	0.158
	LTE Band 5	10M	QPSK	25	0	Front	0mm	20525	836.5	21.95	22.00	1.012	0.05	0.107	0.108
	LTE Band 5	10M	QPSK	1	0	Back	0mm	20525	836.5	22.97	23.00	1.007	0.06	0.433	0.436
	LTE Band 5	10M	QPSK	25	0	Back	0mm	20525	836.5	21.95	22.00	1.012	-0.09	0.303	0.307
07	LTE Band 5	10M	QPSK	1	0	Right Side	0mm	20525	836.5	22.97	23.00	1.007	-0.03	0.812	0.818
	LTE Band 5	10M	QPSK	25	0	Right Side	0mm	20525	836.5	21.95	22.00	1.012	-0.08	0.592	0.599
	LTE Band 5	10M	QPSK	1	0	Top Side	0mm	20525	836.5	22.97	23.00	1.007	0.13	0.189	0.190
	LTE Band 5	10M	QPSK	25	0	Top Side	0mm	20525	836.5	21.95	22.00	1.012	0.12	0.167	0.169
	LTE Band 7	20M	QPSK	1	49	Front	0mm	21350	2560	24.35	24.50	1.035	0.08	0.047	0.049
	LTE Band 7	20M	QPSK	50	0	Front	0mm	21350	2560	23.12	23.50	1.091	0.01	0.036	0.039
	LTE Band 7	20M	QPSK	1	49	Back	0mm	21350	2560	24.35	24.50	1.035	0.03	0.479	0.496
	LTE Band 7	20M	QPSK	50	0	Back	0mm	21350	2560	23.12	23.50	1.091	-0.08	0.362	0.395
	LTE Band 7	20M	QPSK	1	49	Left Side	0mm	21350	2560	24.35	24.50	1.035	-0.09	0.001	0.001
	LTE Band 7	20M	QPSK	50	0	Left Side	0mm	21350	2560	23.12	23.50	1.091	0.06	0.001	0.001
08	LTE Band 7	20M	QPSK	1	49	Right Side	0mm	21350	2560	24.35	24.50	1.035	0.07	1.630	1.687
	LTE Band 7	20M	QPSK	50	0	Right Side	0mm	21350	2560	23.12	23.50	1.091	0.1	1.310	1.430
	LTE Band 7	20M	QPSK	1	49	Top Side	0mm	21350	2560	24.35	24.50	1.035	-0.18	0.073	0.076
	LTE Band 7	20M	QPSK	50	0	Top Side	0mm	21350	2560	23.12	23.50	1.091	0.1	0.053	0.058
	LTE Band 12	10M	QPSK	1	25	Front	0mm	23095	707.5	23.51	24.00	1.119	0.08	0.058	0.065
	LTE Band 12	10M	QPSK	25	12	Front	0mm	23095	707.5	22.51	23.00	1.119	0.01	0.047	0.053
	LTE Band 12	10M	QPSK	1	25	Back	0mm	23095	707.5	23.51	24.00	1.119	0.03	0.229	0.256
	LTE Band 12	10M	QPSK	25	12	Back	0mm	23095	707.5	22.51	23.00	1.119	-0.08	0.180	0.201
	LTE Band 12	10M	QPSK	1	25	Left Side	0mm	23095	707.5	23.51	24.00	1.119	0.03	0.008	0.009
	LTE Band 12	10M	QPSK	25	12	Left Side	0mm	23095	707.5	22.51	23.00	1.119	0.13	0.003	0.003
09	LTE Band 12	10M	QPSK	1	25	Right Side	0mm	23095	707.5	23.51	24.00	1.119	-0.04	0.733	0.821
	LTE Band 12	10M	QPSK	25	12	Right Side	0mm	23095	707.5	22.51	23.00	1.119	-0.08	0.566	0.634
	LTE Band 12	10M	QPSK	1	25	Top Side	0mm	23095	707.5	23.51	24.00	1.119	0.1	0.054	0.060
	LTE Band 12	10M	QPSK	25	12	Top Side	0mm	23095	707.5	22.51	23.00	1.119	-0.18	0.043	0.048

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 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 13	10M	QPSK	1	0	Front	0mm	23230	782	23.60	24.00	1.096	0.12	0.117	0.128
	LTE Band 13	10M	QPSK	25	25	Front	0mm	23230	782	22.54	23.00	1.112	0.08	0.090	0.100
	LTE Band 13	10M	QPSK	1	0	Back	0mm	23230	782	23.60	24.00	1.096	-0.17	0.387	0.424
	LTE Band 13	10M	QPSK	25	25	Back	0mm	23230	782	22.54	23.00	1.112	-0.03	0.297	0.330
	LTE Band 13	10M	QPSK	1	0	Left Side	0mm	23230	782	23.60	24.00	1.096	0.01	0.029	0.032
	LTE Band 13	10M	QPSK	25	25	Left Side	0mm	23230	782	22.54	23.00	1.112	0.02	0.021	0.023
10	LTE Band 13	10M	QPSK	1	0	Right Side	0mm	23230	782	23.60	24.00	1.096	-0.05	0.929	1.019
	LTE Band 13	10M	QPSK	25	25	Right Side	0mm	23230	782	22.54	23.00	1.112	0.14	0.593	0.659
	LTE Band 13	10M	QPSK	1	0	Top Side	0mm	23230	782	23.60	24.00	1.096	0.11	0.163	0.179
	LTE Band 13	10M	QPSK	25	25	Top Side	0mm	23230	782	22.54	23.00	1.112	-0.05	0.141	0.157
	LTE Band 26	15M	QPSK	1	0	Front	0mm	26865	831.5	23.55	24.00	1.109	-0.08	0.157	0.174
	LTE Band 26	15M	QPSK	36	39	Front	0mm	26865	831.5	22.58	23.00	1.102	0.05	0.107	0.118
	LTE Band 26	15M	QPSK	1	0	Back	0mm	26865	831.5	23.55	24.00	1.109	0.06	0.433	0.480
	LTE Band 26	15M	QPSK	36	39	Back	0mm	26865	831.5	22.58	23.00	1.102	-0.09	0.303	0.334
	LTE Band 26	15M	QPSK	1	0	Left Side	0mm	26865	831.5	23.55	24.00	1.109	0.02	0.367	0.407
	LTE Band 26	15M	QPSK	36	39	Left Side	0mm	26865	831.5	22.58	23.00	1.102	0.01	0.295	0.325
11	LTE Band 26	15M	QPSK	1	0	Right Side	0mm	26865	831.5	23.55	24.00	1.109	0.07	0.816	0.905
	LTE Band 26	15M	QPSK	36	39	Right Side	0mm	26865	831.5	22.58	23.00	1.102	-0.08	0.592	0.652
	LTE Band 26	15M	QPSK	1	0	Top Side	0mm	26865	831.5	23.55	24.00	1.109	0.13	0.189	0.210
	LTE Band 26	15M	QPSK	36	39	Top Side	0mm	26865	831.5	22.58	23.00	1.102	0.12	0.167	0.184
	LTE Band 66	20M	QPSK	1	0	Front	0mm	132322	1745	23.55	24.00	1.109	-0.15	0.053	0.059
	LTE Band 66	20M	QPSK	50	0	Front	0mm	132322	1745	22.60	23.00	1.096	0.19	0.039	0.043
	LTE Band 66	20M	QPSK	1	0	Back	0mm	132322	1745	23.55	24.00	1.109	0.07	0.740	0.821
	LTE Band 66	20M	QPSK	50	0	Back	0mm	132322	1745	22.60	23.00	1.096	-0.18	0.555	0.609
	LTE Band 66	20M	QPSK	1	0	Left Side	0mm	132322	1745	23.55	24.00	1.109	0.07	0.231	0.256
	LTE Band 66	20M	QPSK	50	0	Left Side	0mm	132322	1745	22.60	23.00	1.096	-0.13	0.208	0.228
12	LTE Band 66	20M	QPSK	1	0	Right Side	0mm	132322	1745	23.55	24.00	1.109	-0.07	2.090	2.318
	LTE Band 66	20M	QPSK	1	0	Right Side	0mm	132072	1720	23.15	24.00	1.216	-0.15	1.840	2.238
	LTE Band 66	20M	QPSK	1	0	Right Side	0mm	132572	1770	23.51	24.00	1.119	-0.15	1.960	2.194
	LTE Band 66	20M	QPSK	50	0	Right Side	0mm	132322	1745	22.60	23.00	1.096	0.11	1.640	1.798
	LTE Band 66	20M	QPSK	100	0	Right Side	0mm	132322	1745	22.28	23.00	1.180	-0.08	1.550	1.829
	LTE Band 66	20M	QPSK	1	0	Top Side	0mm	132322	1745	23.55	24.00	1.109	-0.04	0.123	0.136
	LTE Band 66	20M	QPSK	50	0	Top Side	0mm	132322	1745	22.60	23.00	1.096	-0.08	0.103	0.113

<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 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 41	20M	QPSK	1	49	Front	0mm	40185	2549.5	24.30	25.00	1.175	62.9	1.006	0.08	0.031	0.037
	LTE Band 41	20M	QPSK	50	24	Front	0mm	40185	2549.5	23.07	24.00	1.239	62.9	1.006	0.08	0.026	0.032
	LTE Band 41	20M	QPSK	1	49	Back	0mm	40185	2549.5	24.30	25.00	1.175	62.9	1.006	-0.04	0.356	0.421
	LTE Band 41	20M	QPSK	50	24	Back	0mm	40185	2549.5	23.07	24.00	1.239	62.9	1.006	-0.07	0.264	0.329
	LTE Band 41	20M	QPSK	1	49	Left Side	0mm	40185	2549.5	24.30	25.00	1.175	62.9	1.006	0.08	0.012	0.014
	LTE Band 41	20M	QPSK	50	24	Left Side	0mm	40185	2549.5	23.07	24.00	1.239	62.9	1.006	-0.13	0.005	0.006
13	LTE Band 41	20M	QPSK	1	49	Right Side	0mm	40185	2549.5	24.30	25.00	1.175	62.9	1.006	0.01	1.300	1.537
	LTE Band 41	20M	QPSK	1	49	Right Side	0mm	39750	2506	24.03	25.00	1.250	62.9	1.006	0.18	1.080	1.358
	LTE Band 41	20M	QPSK	1	49	Right Side	0mm	40620	2593	23.91	25.00	1.285	62.9	1.006	0.1	0.982	1.270
	LTE Band 41	20M	QPSK	1	49	Right Side	0mm	41055	2636.5	23.96	25.00	1.271	62.9	1.006	0.04	0.993	1.269
	LTE Band 41	20M	QPSK	1	49	Right Side	0mm	41490	2680	23.70	25.00	1.349	62.9	1.006	-0.15	0.962	1.305
	LTE Band 41	20M	QPSK	50	24	Right Side	0mm	40185	2549.5	23.07	24.00	1.239	62.9	1.006	-0.16	0.958	1.194
	LTE Band 41	20M	QPSK	1	49	Top Side	0mm	40185	2549.5	24.30	25.00	1.175	62.9	1.006	0.1	0.041	0.048
	LTE Band 41	20M	QPSK	50	24	Top Side	0mm	40185	2549.5	23.07	24.00	1.239	62.9	1.006	0.04	0.032	0.040

<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 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	13	2472	16.00	16.00	1.000	99.8	1.002	-0.05	0.050	0.050
14	WLAN2.4GHz	802.11b 1Mbps	Left Side	0mm	13	2472	16.00	16.00	1.000	99.8	1.002	-0.05	0.654	0.655
15	WLAN5GHz	802.11a 6Mbps	Left Side	0mm	40	5200	12.90	13.00	1.023	89.4	1.119	-0.03	0.641	0.734
16	WLAN5GHz	802.11n-HT40 MCS0	Left Side	0mm	126	5630	12.00	12.00	1.000	97.1	1.030	-0.07	0.427	0.440
17	WLAN5GHz	802.11a 6Mbps	Left Side	0mm	149	5745	11.90	12.50	1.148	93.64	1.068	-0.03	0.496	0.608

<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 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	Bluetooth	1Mbps	Back	0mm	39	2441	7.50	8.50	1.259	76.8	1.085	-0.02	0.001	0.001
18	Bluetooth	1Mbps	Left Side	0mm	39	2441	7.50	8.50	1.259	76.8	1.085	0.05	0.052	0.071

<NFC SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Freq. (MHz)	Power Drift (dB)	Measured 10g SAR (W/kg)
19	NFC	ASK	Front	0mm	13.56	0.09	0.124
	NFC	ASK	Back	0mm	13.56	-0.01	0.004
	NFC	ASK	Left Side	0mm	13.56	-0.02	0.066
	NFC	ASK	Right Side	0mm	13.56	-0.06	0.053
	NFC	ASK	Top Side	0mm	13.56	0.03	0.011

13.2 Repeated SAR Measurement

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 10g SAR (W/kg)	Ratio	Reported 10g SAR (W/kg)
1st	WCDMA IV	RMC 12.2Kbps	Right Side	0mm	1513	1752.6	23.48	23.50	1.005	-0.08	2.600	-	2.612
2nd	WCDMA IV	RMC 12.2Kbps	Right Side	0mm	1513	1752.6	23.48	23.50	1.005	0.01	2.470	1.05	2.481
1st	LTE Band 2	20M_QPSK_1_49	Right Side	0mm	19100	1900	22.83	23.00	1.040	0.03	3.260	-	3.390
2nd	LTE Band 2	20M_QPSK_1_49	Right Side	0mm	19100	1900	22.83	23.00	1.040	0.08	3.120	1.04	3.245

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. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. The ratio is the difference in percentage between original and repeated *measured SAR*.
5. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

14. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Extremity
1.	WWAN + WLAN2.4GHz + NFC	Yes
2.	WWAN + WLAN5GHz + NFC	Yes
3.	WWAN + Bluetooth + NFC	Yes

General Note:

1. 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.
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 Extremity Exposure Conditions

Exposure Position	1	2	3	4	5	1+2+5 Summed 10g SAR (W/kg)	1+3+5 Summed 10g SAR (W/kg)	1+4+5 Summed 10g SAR (W/kg)
	Maximum WWAN	WLAN2.4GHz	WLAN5GHz	Bluetooth	NFC			
	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)			
Front	0.383				0.124	**0.507**	**0.507**	**0.507**
Back	0.899	0.050		0.001	0.004	**0.953**	**0.903**	**0.904**
Left side	0.407	0.655	0.734	0.071	0.066	**1.128**	**1.207**	**0.544**
Right side	3.390				0.053	**3.443**	**3.443**	**3.443**
Top side	0.413				0.011	**0.424**	**0.424**	**0.424**

Test Engineer： Bevis Chang and Kells Chen

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 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.