

FCC SAR Test Report

Report No. : ENS2111040057W00209R
Applicant : Micro-Star Int'l Co.,Ltd.
Address : No., 69, Lide St., Zhonghe Dist., New Taipei City, Taiwan
Product : Tablet
FCC ID : I4L-MSND52GEN2
Trade Mark : MSI
Model No. : MS-ND52-Gen2
Standards : FCC 47 CFR Part 2 (2.1093) / IEEE C95.1:1992 / IEEE 1528:2013
KDB 865664 D01 v01r04 / KDB 865664 D02 v01r02
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KDB 941225 D01 v03r01/ KDB 941225 D05 v02r05
Sample Received Date : Nov. 21, 2021
Date of Testing : Nov. 29, 2021 ~ Dec. 08, 2021

CERTIFICATION:The above equipment have been tested by**EMTEK (SHENZHEN) CO., LTD.**Bldg 69, Majialong Industry Zone,Nanshan District, Shenzhen, Guangdong, China,and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's SAR characteristics under the conditions specified in this report.It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by A2LA or any government agencies.

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1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest Reported Body SAR _{1g} (W/kg)
PCB	WCDMA II	0.64
	WCDMA IV	0.73
	WCDMA V	0.47
	LTE 7	0.86
	LTE 12	0.15
	LTE 13	0.26
	LTE 25	0.53
	LTE 26	0.41
	LTE 30	0.78
	LTE 41	0.99
	LTE 66	0.50
DTS	2.4G WLAN	0.39
NII	5.2G WLAN	0.20
	5.6G WLAN	0.33
	5.8G WLAN	0.35
DSS	Bluetooth	N/A
DXX	NFC	N/A
Highest Simultaneous Transmission SAR		Body (W/kg)
PCB +WLAN(DTS)		1.38
PCB +WLAN(NII)		1.34
PCB +BT		1.10

Note:

- The SAR limit (**Head & Body: SAR_{1g} 1.6 W/kg, Extremity: SAR_{10g} 4.0 W/kg**) for general population/uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992.

2. Description of Equipment Under Test

EUT Type	Tablet
FCC ID	I4L-MSND52GEN2
Trade Mark	MSI
Model Name	MS-ND52-Gen2
Tx Frequency Bands (Unit: MHz)	WCDMA Band II : 1852.4 ~ 1907.6 WCDMA Band IV : 1712.4 ~ 1752.6 WCDMA Band V : 826.4 ~ 846.6 LTE Band 2 : 1850 ~ 1910 LTE Band 4 : 1710 ~ 1755 LTE Band 5 : 824 ~ 849 LTE Band 7 : 2500 ~ 2570 LTE Band 12 : 699 ~ 716 LTE Band 13 : 777 ~ 787 LTE Band 25 : 1850 ~ 1915 LTE Band 26 : 814 ~ 849 LTE Band 30 : 2305 ~ 2315 LTE Band 41 : 2496 ~ 2690 LTE Band 66 : 1710 ~ 1780 WLAN(2.4G) : 2412 ~ 2462 WLAN(5G) : 5180 ~ 5240, 5260 ~ 5320, 5500 ~ 5700, 5745 ~ 5825 Bluetooth : 2402 ~ 2480 NFC : 13.56
Uplink Modulations	WCDMA : QPSK LTE : QPSK, 16QAM, 64QAM 802.11b : DSSS 802.11a/g/n/ac : OFDM Bluetooth : GFSK, $\pi/4$ -DQPSK, 8-DPSK, BLE NFC : ASK
Maximum Tune-up Conducted Power (Unit: dBm)	WCDMA Band II : 22.0 WCDMA Band IV : 22.0 WCDMA Band V : 22.5 LTE Band 2 : 22.0 LTE Band 4 : 21.5 LTE Band 5 : 22.5 LTE Band 7 : 22.0 LTE Band 12 : 22.5 LTE Band 13 : 22.5 LTE Band 25 : 22.0 LTE Band 26 : 22.5 LTE Band 30 : 21.0 LTE Band 41 : 23.0 LTE Band 66 : 22.0 WLAN 2.4G : 21.0 WLAN 5.2G : 15.0 WLAN 5.3G : 15.0 WLAN 5.6G : 16.0 WLAN 5.8G : 15.0 Bluetooth : 4.0
Antenna Type	Fixed Internal Antenna
EUT Stage	Identical Prototype

Feature of Equipment under Test

	DC 3.7V internal rechargeable lithium battery DC 19V from Adapter
Power supply:	Adapter: Model: ADP-65JH HB INPUT: 100-240V~ 1.5A 50-60Hz OUTPUT: DC 19V, 3.42A
Battery information:	Rating: DC 3.7V, 10800mAh, 39.96Wh

Note:

1. The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

3. SAR Measurement System

3.1 Definition of Specific Absorption Rate (SAR)

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.

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:

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

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

SAR measurement can be related to the electrical field in the tissue by

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

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

3.2 SPEAG DASY System

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

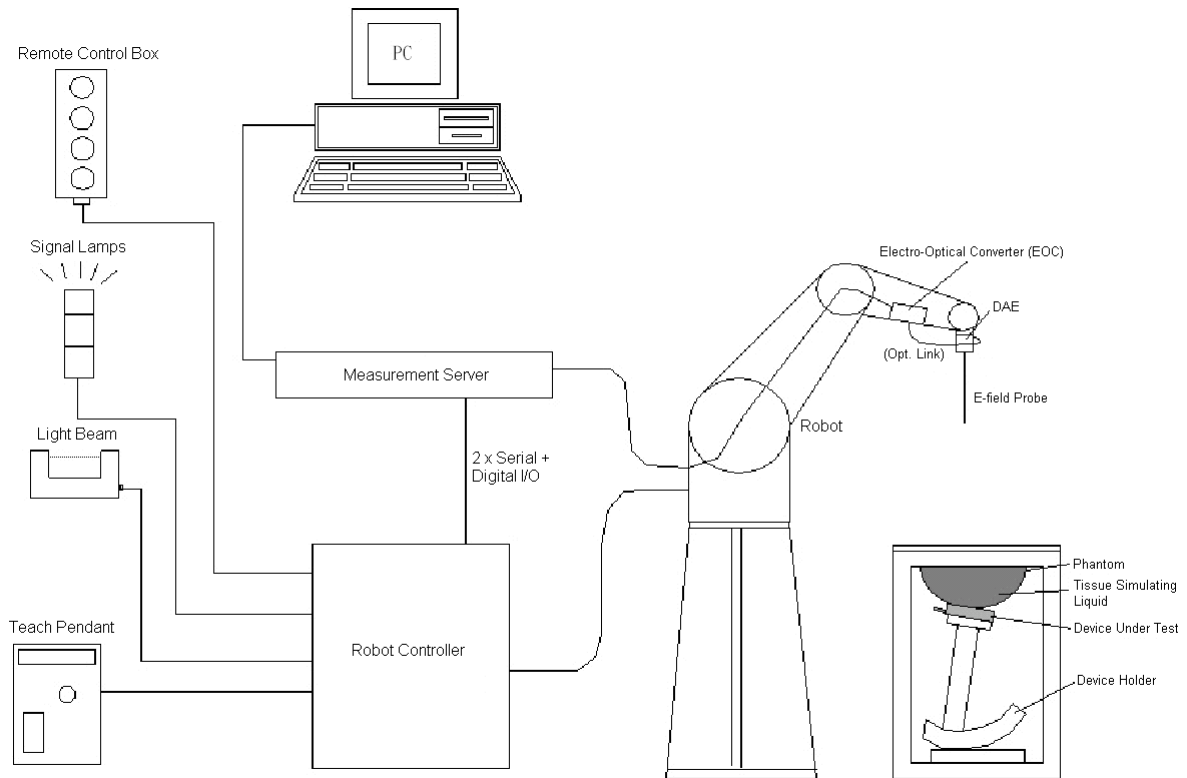


Fig-3.1 DASY System Setup

3.2.1 Robot

The DASYsystem uses the high precision robots from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY5: CS8c) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ± 0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

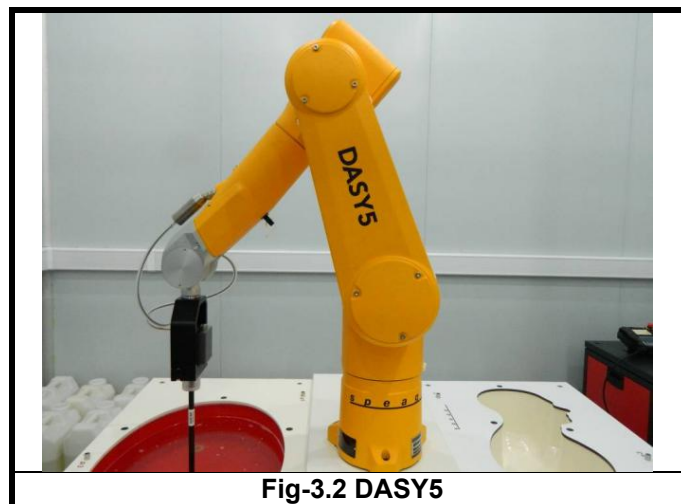




Fig-3.2 DASY5

3.2.2 Probes


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


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


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

3.2.3 Data Acquisition Electronics (DAE)


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

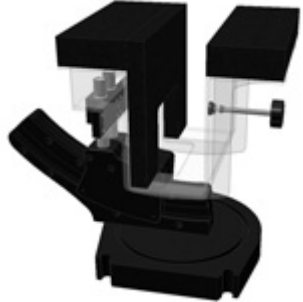
3.2.4 Phantoms

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


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

3.2.5 Device Holder

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

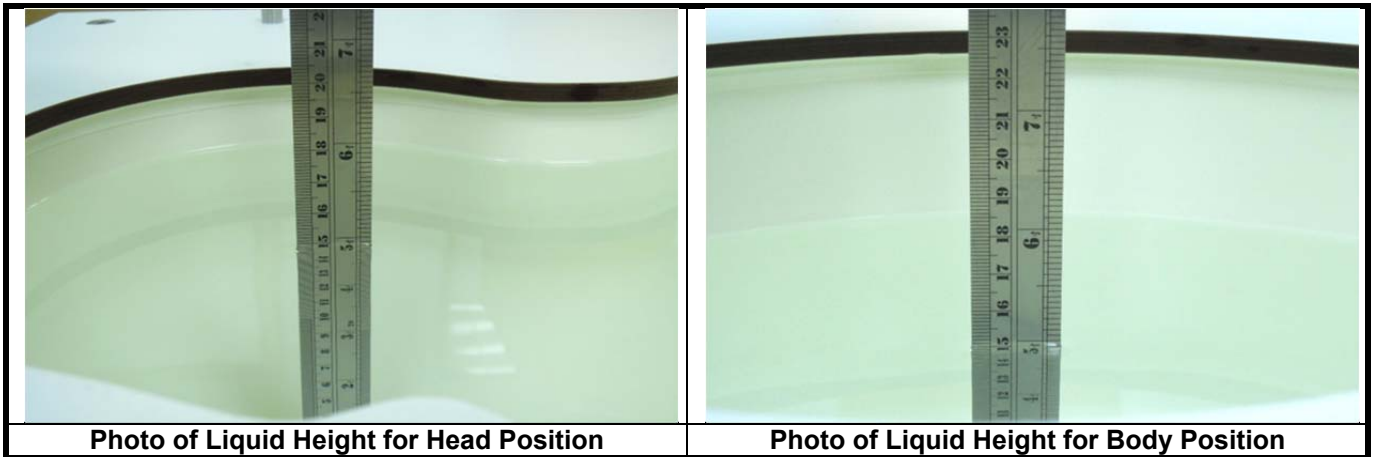
Model	Laptop Extensions Kit	
Construction	Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.). It is lightweight and fits easily on the upper part of the Mounting Device in place of the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

3.2.6 System Validation Dipoles

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

3.2.7 Tissue Simulating Liquids

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in Table-3.1.



The dielectric properties of the head tissue simulating liquids are defined in IEEE1528, and KDB 865664 D01 Appendix A. For the body tissue simulating liquids, the dielectric properties are defined in KDB 865664 D01 Appendix A. The dielectric properties of the tissue simulating liquids were verified prior to the SAR evaluation using a dielectric assessment kit and a network analyzer.

Table-3.1 Targets of Tissue Simulating Liquid

Frequency (MHz)	Target Permittivity	Range of $\pm 5\%$	Target Conductivity	Range of $\pm 5\%$
For Head				
750	41.9	39.8 ~ 44.0	0.89	0.85 ~ 0.93
835	41.5	39.4 ~ 43.6	0.90	0.86 ~ 0.95
900	41.5	39.4 ~ 43.6	0.97	0.92 ~ 1.02
1450	40.5	38.5 ~ 42.5	1.20	1.14 ~ 1.26
1640	40.3	38.3 ~ 42.3	1.29	1.23 ~ 1.35
1750	40.1	38.1 ~ 42.1	1.37	1.30 ~ 1.44
1800	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
1900	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2000	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2300	39.5	37.5 ~ 41.5	1.67	1.59 ~ 1.75
2450	39.2	37.2 ~ 41.2	1.80	1.71 ~ 1.89
2600	39.0	37.1 ~ 41.0	1.96	1.86 ~ 2.06
3500	37.9	36.0 ~ 39.8	2.91	2.76 ~ 3.06
5200	36.0	34.2 ~ 37.8	4.66	4.43 ~ 4.89
5300	35.9	34.1 ~ 37.7	4.76	4.52 ~ 5.00
5500	35.6	33.8 ~ 37.4	4.96	4.71 ~ 5.21
5600	35.5	33.7 ~ 37.3	5.07	4.82 ~ 5.32
5800	35.3	33.5 ~ 37.1	5.27	5.01 ~ 5.53
For Body				
750	55.5	52.7 ~ 58.3	0.96	0.91 ~ 1.01
835	55.2	52.4 ~ 58.0	0.97	0.92 ~ 1.02
900	55.0	52.3 ~ 57.8	1.05	1.00 ~ 1.10
1450	54.0	51.3 ~ 56.7	1.30	1.24 ~ 1.37
1640	53.8	51.1 ~ 56.5	1.40	1.33 ~ 1.47
1750	53.4	50.7 ~ 56.1	1.49	1.42 ~ 1.56
1800	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
1900	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
2000	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
2300	52.9	50.3 ~ 55.5	1.81	1.72 ~ 1.90
2450	52.7	50.1 ~ 55.3	1.95	1.85 ~ 2.05
2600	52.5	49.9 ~ 55.1	2.16	2.05 ~ 2.27
3500	51.3	48.7 ~ 53.9	3.31	3.14 ~ 3.48
5200	49.0	46.6 ~ 51.5	5.30	5.04 ~ 5.57
5300	48.9	46.5 ~ 51.3	5.42	5.15 ~ 5.69
5500	48.6	46.2 ~ 51.0	5.65	5.37 ~ 5.93
5600	48.5	46.1 ~ 50.9	5.77	5.48 ~ 6.06
5800	48.2	45.8 ~ 50.6	6.00	5.70 ~ 6.30

The following table gives the recipes for tissue simulating liquids.

Table-3.2 Recipes of Tissue Simulating Liquid

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
H750	0.2	-	0.2	1.5	56.0	-	42.1	-
H835	0.2	-	0.2	1.5	57.0	-	41.1	-
H900	0.2	-	0.2	1.4	58.0	-	40.2	-
H1450	-	43.3	-	0.6	-	-	56.1	-
H1640	-	45.8	-	0.5	-	-	53.7	-
H1750	-	47.0	-	0.4	-	-	52.6	-
H1800	-	44.5	-	0.3	-	-	55.2	-
H1900	-	44.5	-	0.2	-	-	55.3	-
H2000	-	44.5	-	0.1	-	-	55.4	-
H2300	-	44.9	-	0.1	-	-	55.0	-
H2450	-	45.0	-	0.1	-	-	54.9	-
H2600	-	45.1	-	0.1	-	-	54.8	-
H3500	-	8.0	-	0.2	-	20.0	71.8	-
H5G	-	-	-	-	-	17.2	65.5	17.3
B750	0.2	-	0.2	0.8	48.8	-	50.0	-
B835	0.2	-	0.2	0.9	48.5	-	50.2	-
B900	0.2	-	0.2	0.9	48.2	-	50.5	-
B1450	-	34.0	-	0.3	-	-	65.7	-
B1640	-	32.5	-	0.3	-	-	67.2	-
B1750	-	31.0	-	0.2	-	-	68.8	-
B1800	-	29.5	-	0.4	-	-	70.1	-
B1900	-	29.5	-	0.3	-	-	70.2	-
B2000	-	30.0	-	0.2	-	-	69.8	-
B2300	-	31.0	-	0.1	-	-	68.9	-
B2450	-	31.4	-	0.1	-	-	68.5	-
B2600	-	31.8	-	0.1	-	-	68.1	-
B3500	-	28.8	-	0.1	-	-	71.1	-
B5G	-	-	-	-	-	10.7	78.6	10.7

3.3 SAR System Verification

The system check verifies that the system operates within its specifications. It is performed daily or before every SAR measurement. The system check uses normal SAR measurements in the flat section of the phantom with a matched dipole at a specified distance. The system verification setup is shown as below.

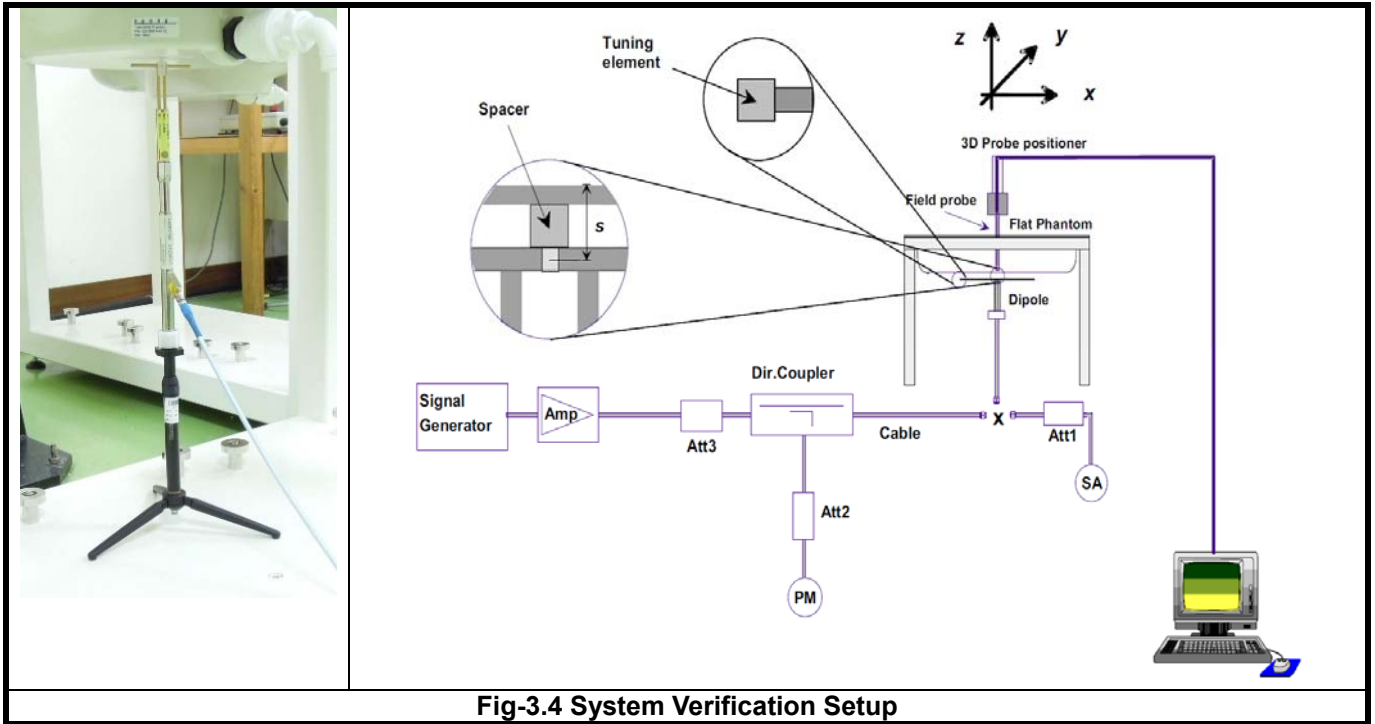


Fig-3.4 System Verification Setup

The validation dipole is placed beneath the flat phantom with the specific spacer in place. The distance spacer is touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The spectrum analyzer measures the forward power at the location of the system check dipole connector. The signal generator is adjusted for the desired forward power (250 mW is used for 700 MHz to 3 GHz, 100 mW is used for 3.5 GHz to 6 GHz) at the dipole connector and the power meter is read at that level. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter.

After system check testing, the SAR result will be normalized to 1W forward input power and compared with the reference SAR value derived from validation dipole certificate report. The deviation of system check should be within 10 %.

3.4 SAR Measurement Procedure

According to the SAR 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

The SAR measurement procedures for each of test conditions are as follows:

- (a) Make EUT to transmit maximum output power
- (b) Measure conducted output power through RF cable
- (c) Place the EUT in the specific position of phantom
- (d) Perform SAR testing steps on the DASY system
- (e) Record the SAR value

3.4.1 Area & Zoom Scan Procedure

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. According to KDB 865664D01, the resolution for Area and Zoom scan is specified in the table below.

Items	≤ 2 GHz	2-3 GHz	3-4 GHz	4-5 GHz	5-6 GHz
Area Scan (Δx, Δy)	≤ 15 mm	≤ 12 mm	≤ 12 mm	≤ 10 mm	≤ 10 mm
Zoom Scan (Δx, Δy)	≤ 8 mm	≤ 5 mm	≤ 5 mm	≤ 4 mm	≤ 4 mm
Zoom Scan (Δz)	≤ 5 mm	≤ 5 mm	≤ 4 mm	≤ 3 mm	≤ 2 mm
Zoom Scan Volume	≥ 30 mm	≥ 30 mm	≥ 28 mm	≥ 25 mm	≥ 22 mm

Note:

When zoom scan is required and report SAR is ≤1.4 W/kg, the zoom scan resolution of Δx / Δy (2-3GHz: ≤ 8 mm, 3-4GHz: ≤ 7 mm, 4-6GHz: ≤ 5 mm) may be applied.

3.4.2 VolumeScan Procedure

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.

3.4.3 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 drift more than 5%, the SAR will be retested.

3.4.4 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 from 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

3.4.5 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

SAR Measurement Evaluation

4.1 EUT Configuration and Setting

<Considerations Related to Proximity Sensor>

The device supports WWAN, WLAN, and Bluetooth capabilities. It is designed with a proximity sensor which can trigger/not trigger power reduction for WCDMA and LTE on Rear Face and Left Side of EUT for SAR compliance. Others RF capability (WLAN and Bluetooth) have no power reduction. The power levels for all wireless technologies and the power reduction please refer to section 4.6 of this report.

Proximity Sensor Triggering Distances (KDB 616217 D04 §6.2)

The proximity sensor triggering distance was determined per KDB 616217 for rear face and applicable edge. Summary for power verification per distance was tabulated in the below table.

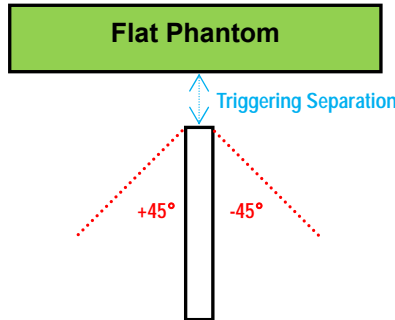
Output Power Verification in dBm for EUT Rear Face											
Distance (mm)	6	7	8	9	10	11	12	13	14	15	16
WCDMA II	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
WCDMA IV	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
WCDMA V	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
LTE 2	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
LTE 4	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
LTE 5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
LTE 7	19.5	19.5	19.5	19.5	19.5	19.5	22.0	22.0	22.0	22.0	22.0
LTE 12	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
LTE 13	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
LTE 25	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
LTE 26	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
LTE 30	19.5	19.5	19.5	19.5	19.5	19.5	21.0	21.0	21.0	21.0	21.0
LTE 41	21.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
LTE 66	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0

Proximity Sensor Coverage (KDB 616217 D04 §6.3)

Since the proximity sensor is collocated with antenna in one component, the procedure for proximity sensor coverage is not required.

Proximity Sensor Tilt Angle Influences (KDB 616217 D04 §6.4)

The proximity sensor tilt angle influence was determined per KDB 616217 for applicable edge. Summary for proximity sensor tilt angle influence is shown in below.



Orientation	Separation Distance (mm)	Tilt Angle										
		-45°	-40°	-30°	-20°	-10°	0°	10°	20°	30°	40°	45°
Left Side	11	On	On	On	On	On	On	On	On	On	On	On

Summary for Proximity Sensor Triggering Test

According to the procedures noticed in KDB 616217 D04, the proximity sensor triggering distance is 16 mm for EUT Rear Face, and 11 mm for Left Side. The separation distance of 11 mm determined by the smallest triggering distance on Left Side is used to access the tilt angle influence and the sensor does not release during ±45 degree. Therefore, the smallest separation distance for tilt angle influence is 11 mm for the Left Side. The conservation triggering distances based on the separation distance for the sensor trigger / not triggered as EUT with power reduction at 0 mm, and EUT without power reduction at 15 mm for EUT Rear Face, and 10 mm for Left Side were used to test SAR.

The power reduction is depends on the proximity sensor input. For a steady SAR test, the power reduction was enabled or disabled manually by engineering software during SAR testing.

<Connections between EUT and System Simulator>

For WWAN SAR testing, the EUT was linked and controlled by base station emulator (**R&S CMW500**). Communication between the EUT and the emulator was established by air link. The distance between the EUT and the communicating antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of EUT. The EUT was set from the emulator to radiate maximum output power during SAR testing.

<Considerations Related to WCDMA for Setup and Testing>

WCDMA Handsets Head SAR

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

WCDMA Handsets Body-worn SAR

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

Handsets with Release 5 HSDPA

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

Handsets with Release 6 HSUPA

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

Release 5 HSDPA Data Devices

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

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

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs} / \beta_c = 30 / 15 \Leftrightarrow \beta_{hs} = 30 / 15 * \beta_c$.
 Note 2: CM = 1 for $\beta_c / \beta_d = 12 / 15$, $\beta_{hs} / \beta_c = 24 / 15$.
 Note 3: For subtest 2 the β_c / β_d ratio of 12 / 15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11 / 15$ and $\beta_d = 15 / 15$.

Release 6 HSUPA Data Devices

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	$\beta_{hs}^{(1)}$	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM ⁽²⁾ (dB)	MPR (dB)	AG ⁽⁴⁾ Index	E-TFCI
1	11/15 ⁽³⁾	15/15 ⁽³⁾	64	11/15 ⁽³⁾	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1} : 47/15 β_{ed2} : 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 ⁽⁴⁾	15/15 ⁽⁴⁾	64	15/15 ⁽⁴⁾	30/15	24/15	134/15	4	1	1.0	0.0	21	81

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

<Considerations Related to LTE for Setup and Testing>

This device contains LTE transmitter which follows 3GPP standards, is category 3, supports both QPSK and 16QAM modulations, and supported LTE band and channel bandwidth is listed in below. The output power was tested per 3GPP TS 36.521-1 maximum transmit procedures for both QPSK and 16QAM modulation. The results please refer to section 4.6 of this report.

EUT Supported LTE Band and Channel Bandwidth						
LTE Band	BW 1.4 MHz	BW 3 MHz	BW 5 MHz	BW 10 MHz	BW 15 MHz	BW 20 MHz
2	√	√	√	√	√	√
4	√	√	√	√	√	√
5	√	√	√	√		
7			√	√	√	√
12	√	√	√	√		
13			√	√		
25	√	√	√	√	√	√
26	√	√	√	√	√	
30			√	√		
41			√	√	√	√
66	√	√	√	√	√	√

The LTE maximum power reduction (MPR) in accordance with 3GPP TS 36.101 is active all times during LTE operation. The allowed MPR for the maximum output power is specified in below.

Modulation	Channel Bandwidth / RB Configurations						LTE MPR Setting (dB)
	BW 1.4 MHz	BW 3 MHz	BW 5 MHz	BW 10 MHz	BW 15 MHz	BW 20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	1
16QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	1
16QAM	> 5	> 4	> 8	> 12	> 16	> 18	2

Note: MPR is according to the standard and implemented in the circuit (mandatory).

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

During LTE SAR testing, the related parameters of operating band, channel bandwidth, uplink channel number, modulation type, and RB was set in base station simulator. When the EUT has registered and communicated to base station simulator, the simulator set to make EUT transmitting the maximum radiated power.

For LTE B4 / B5 / B12 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

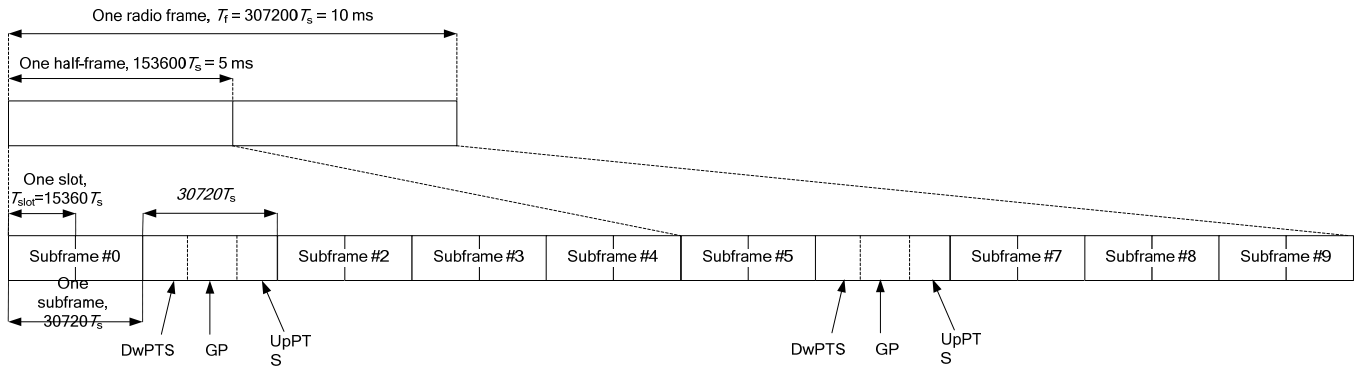
LTE band 2 SAR test was covered by Band 25; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if

- 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

FCC SAR Test Report

TDD-LTE Setup Configurations

According to KDB 941225 D05, SAR testing for TDD-LTE device must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP TDD-LTE configurations. The TDD-LTE of this device supports frame structure type 2 defined in 3GPP TS 36.211 section 4.2, and the frame structure configuration can be referred to below.



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

Special Subframe Configuration	Normal Cyclic Prefix in Downlink			Extended Cyclic Prefix in Downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal Cyclic Prefix in Uplink	Extended Cyclic Prefix in Uplink		Normal Cyclic Prefix in Uplink	Extended Cyclic Prefix in Uplink
0	6592 · Ts	2192 · Ts	2560 · Ts	7680 · Ts	2192 · Ts	2560 · Ts
1	19760 · Ts			20480 · Ts		
2	21952 · Ts			23040 · Ts		
3	24144 · Ts			25600 · Ts		
4	26336 · Ts	4384 · Ts	5120 · Ts	7680 · Ts	4384 · Ts	5120 · Ts
5	6592 · Ts			20480 · Ts		
6	19760 · Ts			23040 · Ts		
7	21952 · Ts			12800 · Ts		
8	24144 · Ts	-	-	-	-	-
9	13168 · Ts	-	-	-	-	-

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

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	

3GPP TS 36.211 Table 4.2-2: Uplink-Downlink Configurations

The variety of different TD-LTE uplink-downlink configurations allows a network operator to allocate the network's capacity between uplink and downlink traffic to meet the needs of the network. The uplink duty cycle of these seven configurations can readily be computed and shown in below.

UL-DL Configuration	0	1	2	3	4	5	6
Highest Duty-Cycle	63.33%	43.33%	23.33%	31.67%	21.67%	11.67%	53.33%

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

<Considerations Related to WLAN for Setup and Testing>

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

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

Initial Test Configuration

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

Subsequent Test Configuration

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

SAR Test Configuration and Channel Selection

When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the initial test configuration is using largest channel bandwidth, lowest order modulation, lowest data rate, and lowest order 802.11 mode (i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over

802.11n). After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following.

- 1) The channel closest to mid-band frequency is selected for SAR measurement.
- 2) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

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

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

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

4.2 EUT Testing Position

4.2.1 Body Exposure Conditions

For full-size tablet, according to KDB 616217 D04, SAR evaluation is required for back surface and edges of the devices. The back surface and edges of the tablet are tested with the tablet touching the phantom. Exposures from antennas through the front surface of the display section of a tablet are generally limited to the user’s hands. Exposures to hands for typical consumer transmitters used in tablets are not expected to exceed the extremity SAR limit; therefore, SAR evaluation for the front surface of tablet display screens are generally not necessary. When voice mode is supported on a tablet and it is limited to speaker mode or headset operations only, additional SAR testing for this type of voice use is not required.

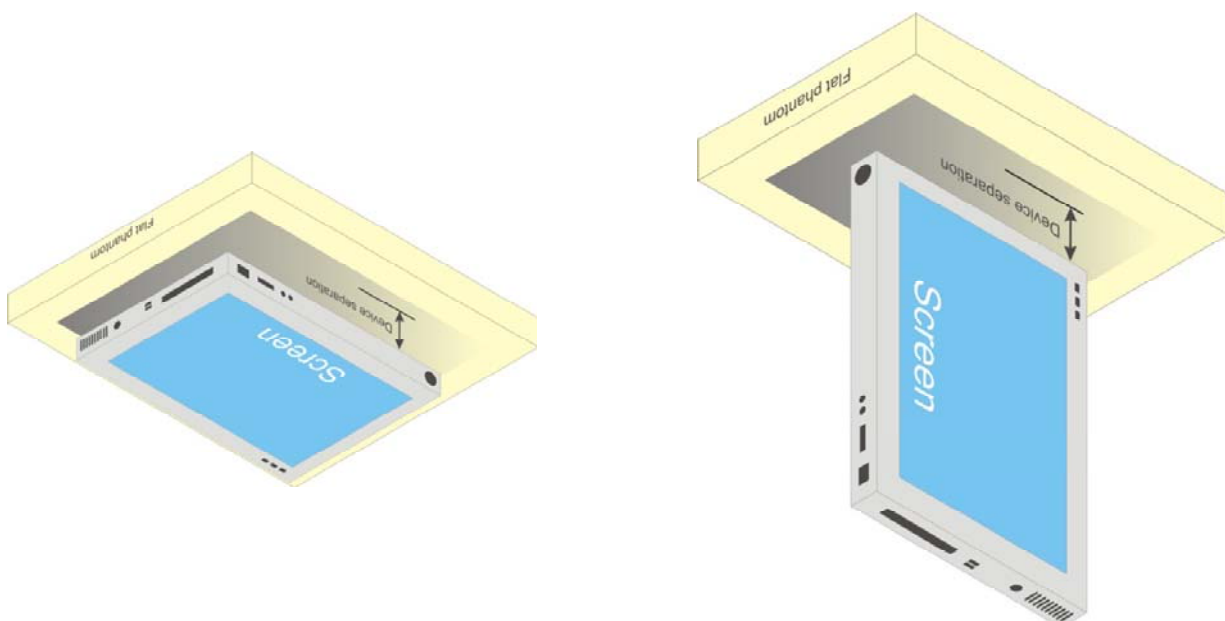


Fig-4.1 Illustration for Tablet Setup

4.2.2 SAR Test Exclusion Evaluations

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

1. For the test separation distance ≤ 50 mm

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

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

2. For the test separation distance > 50 mm, and the frequency at 100 MHz to 1500 MHz

$$\left[(\text{Threshold at 50 mm in Step 1}) + (\text{Test Separation Distance} - 50 \text{ mm}) \times \left(\frac{f_{(MHz)}}{150} \right) \right]_{(mW)}$$

3. For the test separation distance > 50 mm, and the frequency at > 1500 MHz to 6 GHz

$$[(\text{Threshold at 50 mm in Step 1}) + (\text{Test Separation Distance} - 50 \text{ mm}) \times 10]_{(mW)}$$

<For Antenna for WWAN>

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	RearFace			LeftSide			RightSide			TopSide			BottomSide		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?
WCDM A II	22.0	158.49	5	43.8	Yes	5	43.8	Yes	260	2209 mW	No	70	309 mW	No	70	309 mW	No
WCDM A IV	22.5	177.83	5	47.1	Yes	5	47.1	Yes	260	2213 mW	No	70	313 mW	No	70	313 mW	No
WCDM A V	22.0	158.49	5	29.2	Yes	5	29.2	Yes	260	1349 mW	No	70	276 mW	No	70	276 mW	No
LTE 2	22.0	158.49	5	43.8	Yes	5	43.8	Yes	260	2209 mW	No	70	309 mW	No	70	309 mW	No
LTE 4	21.5	141.25	5	37.4	Yes	5	37.4	Yes	260	2213 mW	No	70	313 mW	No	70	313 mW	No
LTE 5	22.5	177.83	5	32.7	Yes	5	32.7	Yes	260	1349 mW	No	70	276 mW	No	70	276 mW	No
LTE 7	22.0	158.49	5	50.7	Yes	5	50.7	Yes	260	2194 mW	No	70	294 mW	No	70	294 mW	No
LTE 12	22.5	177.83	5	30.1	Yes	5	30.1	Yes	260	1177 mW	No	70	273 mW	No	70	273 mW	No
LTE 13	22.5	177.83	5	31.5	Yes	5	31.5	Yes	260	1268 mW	No	70	274 mW	No	70	274 mW	No
LTE 25	22.0	158.49	5	43.8	Yes	5	43.8	Yes	260	2208 mW	No	70	308 mW	No	70	308 mW	No
LTE 26	22.5	177.83	5	32.8	Yes	5	32.8	Yes	260	1351 mW	No	70	276 mW	No	70	276 mW	No
LTE 30	21.0	125.89	5	38.3	Yes	5	38.3	Yes	260	2199 mW	No	70	299 mW	No	70	299 mW	No
LTE41	23.0	199.53	5	65.4	Yes	5	65.4	Yes	260	2191 mW	No	70	291 mW	No	70	291 mW	No
LTE 66	22	158.49	5	41.9	Yes	5	41.9	Yes	260	2212 mW	No	70	312 mW	No	70	312 mW	No

<For Antenna for WLAN-0 & BT>

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	RearFace			LeftSide			RightSide			TopSide			BottomSide		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?
WLAN 2.4G	19.0	39.81	5	24.9	Yes	5	24.9	Yes	260	2196 mW	No	135	946 mW	No	25	5.0	Yes
WLAN 5.2G	12.5	22.39	5	8.1	Yes	5	8.1	Yes	260	2166 mW	No	135	916 mW	No	25	1.6	No
WLAN 5.6G	12.5	22.39	5	8.2	Yes	5	8.2	Yes	260	2165 mW	No	135	915 mW	No	25	1.6	No
WLAN 5.8G	12.0	17.78	5	7.6	Yes	5	7.6	Yes	260	2163 mW	No	135	913 mW	No	25	1.5	No
BT	11.5	2.51	5	6.8	No	5	6.8	No	260	2162 mW	No	135	912 mW	No	25	1.4	No

<For Antenna for WLAN-1>

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	RearFace			LeftSide			RightSide			TopSide			BottomSide		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?
WLAN 2.4G	19.0	39.81	5	24.9	Yes	165	1246 mW	No	90	496 mW	No	170	1296 mW	No	5	24.9	Yes
WLAN 5.2G	11.5	19.95	5	6.5	Yes	165	1216 mW	No	90	466 mW	No	170	1266 mW	No	5	6.5	Yes
WLAN 5.6G	13.0	14.13	5	9.2	Yes	165	1215 mW	No	90	465 mW	No	170	1265 mW	No	5	9.2	Yes
WLAN 5.8G	13.5	17.78	5	10.7	Yes	165	1213 mW	No	90	463 mW	No	170	1263 mW	No	5	10.7	Yes

<For WLAN Ant-0 + Ant-1>

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	RearFace			LeftSide			RightSide			TopSide			BottomSide		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing ?
WLAN 2.4G	21.0	100.00	5	39.5	Yes	5	39.5	Yes	90	496 mW	No	135	946 mW	No	5	39.5	Yes
WLAN 5.2G	15.0	31.62	5	14.5	Yes	5	14.5	Yes	90	466 mW	No	135	916 mW	No	5	14.5	Yes
WLAN 5.6G	15.0	28.18	5	14.6	Yes	5	14.6	Yes	90	465 mW	No	135	915 mW	No	5	14.6	Yes
WLAN 5.8G	15.0	28.18	5	19.0	Yes	5	19.0	Yes	90	463 mW	No	135	913 mW	No	5	19.0	Yes

Note:

1. When separation distance ≤ 50 mm and the calculated result shown in above table is ≤ 3.0 for SAR-1g exposure condition, or ≤ 7.5 for SAR-10g exposure condition, the SAR testing exclusion is applied.
2. When separation distance > 50 mm and the device output power is less than the calculated result (power threshold, mW) shown in above table, the SAR testing exclusion is applied.

4.2.3 Simultaneous Transmission Possibilities

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

Simultaneous TX Combination	Capable Transmit Configurations	Body Exposure Condition
1	WCDMA II (Data) + WLAN (Data)	Yes
2	WCDMA IV (Data) + WLAN (Data)	Yes
3	WCDMA V (Data) + WLAN (Data)	Yes
4	LTE 2 (Data) + WLAN (Data)	Yes
5	LTE 4 (Data) + WLAN (Data)	Yes
6	LTE 5 (Data) + WLAN (Data)	Yes
7	LTE 7 (Data) + WLAN (Data)	Yes
8	LTE 12 (Data) + WLAN (Data)	Yes
9	LTE 13 (Data) + WLAN (Data)	Yes
10	LTE 25 (Data) + WLAN (Data)	Yes
11	LTE 26 (Data) + WLAN (Data)	Yes
12	LTE 30 (Data) + WLAN (Data)	Yes
13	LTE 41 (Data) + WLAN (Data)	Yes
14	LTE 66 (Data) + WLAN (Data)	Yes
15	WCDMA II (Voice / Data) + BT (Data)	Yes
16	WCDMA IV (Voice / Data) + BT (Data)	Yes
17	WCDMA V (Voice / Data) + BT (Data)	Yes
18	LTE 2 (Data) + BT (Data)	Yes
19	LTE 4 (Data) + BT (Data)	Yes
20	LTE 5 (Data) + BT (Data)	Yes
21	LTE 7 (Data) + BT (Data)	Yes
22	LTE 12 (Data) + BT (Data)	Yes
23	LTE 13 (Data) + BT (Data)	Yes
24	LTE 25 (Data) + BT (Data)	Yes
25	LTE 26 (Data) + BT (Data)	Yes
26	LTE 30 (Data) + BT (Data)	Yes
27	LTE 41 (Data) + BT (Data)	Yes
28	LTE 66 (Data) + BT (Data)	Yes

Note :

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

4.3 Tissue Verification

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

Test Date	Tissue Type	Frequency (MHz)	Liquid Temp. (°C)	Measured Conductivity (σ)	Measured Permittivity (ε _r)	Target Conductivity (σ)	Target Permittivity (ε _r)	Conductivity Deviation (%)	Permittivity Deviation (%)
Nov. 29, 2021	Head	750	21.6	0.904	41.128	0.89	41.90	1.57	-1.84
Nov. 30, 2021	Head	835	21.6	0.918	42.883	0.90	41.50	2.00	3.33
Dec. 01, 2021	Head	1750	21.6	1.335	41.503	1.37	40.10	-2.55	3.50
Dec. 02, 2021	Head	1900	21.6	1.463	39.642	1.40	40.00	4.50	-0.89
Dec. 03, 2021	Head	2300	21.6	1.689	38.8	1.67	39.50	1.14	-1.77
Dec. 04, 2021	Head	2450	21.6	1.786	40.406	1.80	39.20	-0.78	3.08
Dec. 05, 2021	Head	2600	21.6	2.054	38.328	1.96	39.00	4.80	-1.72
Dec. 06, 2021	Head	5200	21.6	4.829	36.892	4.76	35.90	1.45	2.76
Dec. 07, 2021	Head	5600	21.6	5.211	36.228	5.07	35.50	2.78	2.05
Dec. 08, 2021	Head	5800	21.6	5.444	35.777	5.27	35.30	3.30	1.35

Note:

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

4.4 System Validation

The SAR measurement system was validated according to procedures in KDB 865664 D01. The validation status in tabulated summary is as below.

Calibration Date	Probe S/N	Calibration Point		Measured Conductivity (σ)	Measured Permittivity (ε _r)	Validation for CW			Validation for Modulation		
						Sensitivity Range	Probe Linearity	Probe Isotropy	Modulation Type	Duty Factor	PAR
Nov. 29, 2021	3970	Head	750	0.904	41.128	Pass	Pass	Pass	OFDM	N/A	Pass
Nov. 30, 2021	3970	Head	835	0.918	42.883	Pass	Pass	Pass	OFDM	N/A	Pass
Dec. 01, 2021	3970	Head	1750	1.335	41.503	Pass	Pass	Pass	OFDM	N/A	Pass
Dec. 02, 2021	3970	Head	1900	1.463	39.642	Pass	Pass	Pass	OFDM	N/A	Pass
Dec. 03, 2021	3970	Head	2300	1.689	38.8	Pass	Pass	Pass	OFDM	N/A	Pass
Dec. 04, 2021	3970	Head	2450	1.786	40.406	Pass	Pass	Pass	OFDM	N/A	Pass
Dec. 05, 2021	3970	Head	2600	2.054	38.328	Pass	Pass	Pass	OFDM	N/A	Pass
Dec. 06, 2021	3970	Head	5300	4.829	36.892	Pass	Pass	Pass	OFDM	N/A	Pass
Dec. 07, 2021	3970	Head	5600	5.211	36.228	Pass	Pass	Pass	OFDM	N/A	Pass
Dec. 08, 2021	3970	Head	5800	5.444	35.777	Pass	Pass	Pass	OFDM	N/A	Pass

4.5 System Verification

The measuring result for system verification is tabulated as below.

Test Date	Mode	Frequency (MHz)	1W Target SAR-1g (W/kg)	Measured SAR-1g (W/kg)	Normalized to 1W SAR-1g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
Nov. 29, 2021	Head	750	8.25	2.09	8.44	2.30	1078	3970	1418
Nov. 30, 2021	Head	835	9.40	2.42	9.92	5.53	4d092	3970	1418
Dec. 01, 2021	Head	1750	36.30	9.10	37.60	3.58	1023	3970	1418
Dec. 02, 2021	Head	1900	39.50	9.64	38.32	-2.99	5d142	3970	1418
Dec. 03, 2021	Head	2300	49.50	12.60	52.40	5.86	1004	3970	1418
Dec. 04, 2021	Head	2450	51.50	13.20	53.20	3.30	835	3970	1418
Dec. 05, 2021	Head	2600	55.80	14.30	58.40	4.66	1058	3970	1418
Dec. 06, 2021	Head	5300	82.20	8.22	81.80	-0.49	1040	3970	1418
Dec. 07, 2021	Head	5600	85.30	8.54	86.40	1.29	1040	3970	1418
Dec. 08, 2021	Head	5800	80.60	8.07	81.80	1.49	1040	3970	1418

Note:

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

4.6 Maximum Output Power

4.6.1 Maximum Conducted Power

The maximum conducted average power (Unit: dBm) including tune-up tolerance is shown as below.

Mode	WCDMA Band II (without Power Reduction)
RMC 12.2K	22.0

Mode	WCDMA Band IV (without Power Reduction)
RMC 12.2K	22.0

Mode	WCDMA Band V (without Power Reduction)
RMC 12.2K	22.5

Mode	LTE 2 (without Power Reduction)
QPSK / 16QAM	22.0

Mode	LTE 4 (without Power Reduction)
QPSK / 16QAM	21.5

Mode	LTE 5 (without Power Reduction)
QPSK / 16QAM	22.5

Mode	LTE 7 (without Power Reduction)	LTE 7 (with Power Reduction)	Power Reduction (dB)
QPSK / 16QAM	22.0	18.0	±2

Mode	LTE 12 (without Power Reduction)
QPSK / 16QAM	22.5

Mode	LTE 13 (without Power Reduction)
QPSK / 16QAM	22.5

Mode	LTE 25 (without Power Reduction)
QPSK / 16QAM	22.0

Mode	LTE 26 (without Power Reduction)
QPSK / 16QAM	22.5

Mode	LTE 30 (without Power Reduction)	LTE 30 (with Power Reduction)	Power Reduction (dB)
QPSK / 16QAM	21.0	17.0	±2

Mode	LTE 41 (without Power Reduction)
QPSK / 16QAM	23.0

Mode	LTE 66 (without Power Reduction)
QPSK / 16QAM	22.0

Mode	2.4G WLAN	5.2G WLAN	5.3G WLAN	5.6G WLAN	5.8G WLAN
802.11b	19.0	N/A	N/A	N/A	N/A
802.11g	19.0	N/A	N/A	N/A	N/A
802.11a	N/A	12.5	12.5	12.5	12.0
802.11n HT20	21.0	15.0	14.5	16.0	14.0
802.11n HT40	21.0	15.0	15.0	14.5	15.0
802.11ac VHT80	N/A	14.0	13.5	14.0	13.5

Mode	2.4G Bluetooth
GFSK	2.5
$\pi/4$ -DQPSK	4.0
8-DPSK	4.0
LE	2.0

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4.6.2 Measured Conducted Power Result

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

Band	WCDMA Band II			WCDMA Band IV			3GPP MPR (dB)
Channel	9262	9400	9538	1312	1413	1513	
Frequency (MHz)	1852.4	1880.0	1907.6	1712.4	1732.6	1752.6	
EUT without Power Reduction (P-Sensor NOT Triggered)							
RMC 12.2K	21.68	21.96	21.83	21.69	21.73	21.63	-
HSDPA Subtest-1	20.47	20.75	20.62	20.48	20.52	20.42	0
HSDPA Subtest-2	20.46	20.74	20.61	20.47	20.51	20.41	0
HSDPA Subtest-3	19.98	20.26	20.13	19.99	20.03	19.93	0.5
HSDPA Subtest-4	19.96	20.24	20.11	19.97	20.01	19.91	0.5
HSUPA Subtest-1	20.55	20.83	20.70	20.56	20.60	20.49	0
HSUPA Subtest-2	18.57	18.85	18.72	18.58	18.62	18.51	2
HSUPA Subtest-3	19.52	19.80	19.67	19.53	19.57	19.46	1
HSUPA Subtest-4	18.41	18.69	18.56	18.42	18.46	18.35	2
HSUPA Subtest-5	20.73	20.93	20.88	20.74	20.78	20.68	0

Band	WCDMA Band V			3GPP MPR (dB)
Channel	4132	4182	4233	
Frequency (MHz)	826.4	836.4	846.6	
EUT without Power Reduction (P-Sensor NOT Triggered)				
RMC 12.2K	22.39	22.41	22.24	-
HSDPA Subtest-1	21.18	21.20	21.03	0
HSDPA Subtest-2	21.17	21.19	21.02	0
HSDPA Subtest-3	20.69	20.71	20.54	0.5
HSDPA Subtest-4	20.67	20.69	20.52	0.5
HSUPA Subtest-1	21.26	21.28	21.11	0
HSUPA Subtest-2	19.28	19.30	19.13	2
HSUPA Subtest-3	20.23	20.25	20.08	1
HSUPA Subtest-4	19.12	19.14	18.97	2
HSUPA Subtest-5	21.44	21.46	21.29	0

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 18607	Mid CH 18900	High CH 19193		Low CH 18607	Mid CH 18900	High CH 19193	
			1850.7 MHz	1880.0 MHz	1909.3 MHz		1850.7 MHz	1880.0 MHz	1909.3 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
2 / 1.4M	1	0	21.46	21.50	21.37	0	20.47	20.51	20.38	1
	1	2	21.45	21.49	21.36	0	20.44	20.47	20.35	1
	1	5	21.42	21.46	21.33	0	20.43	20.46	20.34	1
	3	0	21.45	21.49	21.36	0	20.45	20.49	20.36	1
	3	1	21.44	21.48	21.35	0	20.42	20.45	20.34	1
	3	3	21.41	21.45	21.32	0	20.40	20.43	20.32	1
	6	0	20.52	20.56	20.43	1	19.44	19.60	19.36	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 18615	Mid CH 18900	High CH 19185		Low CH 18615	Mid CH 18900	High CH 19185	
			1851.5 MHz	1880.0 MHz	1908.5 MHz		1851.5 MHz	1880.0 MHz	1908.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
2 / 3M	1	0	21.49	21.53	21.40	0	20.50	20.54	20.41	1
	1	7	21.48	21.52	21.39	0	20.47	20.50	20.38	1
	1	14	21.45	21.49	21.36	0	20.46	20.49	20.37	1
	8	0	20.54	20.58	20.45	1	19.58	19.73	19.48	2
	8	3	20.52	20.56	20.43	1	19.57	19.72	19.48	2
	8	7	20.47	20.51	20.38	1	19.50	19.66	19.42	2
	15	0	20.55	20.59	20.46	1	19.47	19.62	19.38	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 18625	Mid CH 18900	High CH 19175		Low CH 18625	Mid CH 18900	High CH 19175	
			1852.5 MHz	1880.0 MHz	1907.5 MHz		1852.5 MHz	1880.0 MHz	1907.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
2 / 5M	1	0	21.52	21.56	21.43	0	20.53	20.57	20.44	1
	1	12	21.51	21.55	21.42	0	20.50	20.53	20.41	1
	1	24	21.48	21.52	21.39	0	20.49	20.52	20.40	1
	12	0	20.57	20.61	20.48	1	19.61	19.76	19.51	2
	12	6	20.55	20.59	20.46	1	19.60	19.75	19.51	2
	12	13	20.50	20.54	20.41	1	19.53	19.69	19.45	2
	25	0	20.58	20.62	20.49	1	19.50	19.65	19.41	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 18650	Mid CH 18900	High CH 19150		Low CH 18650	Mid CH 18900	High CH 19150	
			1855.0 MHz	1880.0 MHz	1905.0 MHz		1855.0 MHz	1880.0 MHz	1905.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
2 / 10M	1	0	21.54	21.58	21.45	0	20.55	20.59	20.46	1
	1	24	21.53	21.57	21.44	0	20.52	20.55	20.43	1
	1	49	21.50	21.54	21.41	0	20.51	20.54	20.42	1
	25	0	20.59	20.63	20.50	1	19.63	19.78	19.54	2
	25	12	20.57	20.61	20.48	1	19.62	19.77	19.53	2
	25	25	20.52	20.56	20.43	1	19.56	19.73	19.48	2
	50	0	20.60	20.64	20.51	1	19.54	19.68	19.44	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 18675	Mid CH 18900	High CH 19125		Low CH 18675	Mid CH 18900	High CH 19125	
			1857.5 MHz	1880.0 MHz	1902.5 MHz		1857.5 MHz	1880.0 MHz	1902.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
2 / 15M	1	0	21.57	21.61	21.48	0	20.58	20.62	20.49	1
	1	37	21.56	21.60	21.47	0	20.55	20.58	20.46	1
	1	74	21.53	21.57	21.44	0	20.54	20.57	20.45	1
	36	0	20.62	20.66	20.53	1	19.66	19.81	19.57	2
	36	19	20.60	20.64	20.51	1	19.65	19.80	19.56	2
	36	39	20.55	20.59	20.46	1	19.59	19.76	19.51	2
	75	0	20.63	20.67	20.54	1	19.57	19.71	19.47	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 18700	Mid CH 18900	High CH 19100		Low CH 18700	Mid CH 18900	High CH 19100	
			1860.0 MHz	1880.0 MHz	1900.0 MHz		1860.0 MHz	1880.0 MHz	1900.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
2 / 20M	1	0	21.62	21.66	21.53	0	20.63	20.67	20.54	1
	1	50	21.61	21.65	21.52	0	20.60	20.63	20.51	1
	1	99	21.58	21.62	21.49	0	20.59	20.62	20.50	1
	50	0	20.67	20.71	20.58	1	19.71	19.86	19.62	2
	50	25	20.65	20.69	20.56	1	19.70	19.85	19.61	2
	50	50	20.60	20.64	20.51	1	19.64	19.81	19.56	2
	100	0	20.68	20.72	20.59	1	19.62	19.76	19.52	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 19957	Mid CH 20175	High CH 20393		Low CH 19957	Mid CH 20175	High CH 20393	
			1710.7 MHz	1732.5 MHz	1754.3 MHz		1710.7 MHz	1732.5 MHz	1754.3 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
4 / 1.4M	1	0	21.04	21.08	20.85	0	20.05	20.09	19.87	1
	1	2	21.03	21.07	20.84	0	20.02	20.06	19.84	1
	1	5	21.00	21.04	20.81	0	20.01	20.05	19.83	1
	3	0	21.02	21.06	20.83	0	20.04	20.08	19.86	1
	3	1	21.01	21.05	20.82	0	20.01	20.05	19.83	1
	3	3	20.98	21.02	20.79	0	20.00	20.04	19.82	1
	6	0	20.10	20.14	19.92	1	19.11	19.06	18.84	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 19965	Mid CH 20175	High CH 20385		Low CH 19965	Mid CH 20175	High CH 20385	
			1711.5 MHz	1732.5 MHz	1753.5 MHz		1711.5 MHz	1732.5 MHz	1753.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
4 / 3M	1	0	21.05	21.09	20.86	0	20.06	20.10	19.88	1
	1	7	21.04	21.08	20.85	0	20.03	20.07	19.85	1
	1	14	21.01	21.05	20.82	0	20.02	20.06	19.84	1
	8	0	20.10	20.14	19.91	1	19.21	19.19	18.96	2
	8	3	20.08	20.12	19.89	1	19.18	19.17	18.95	2
	8	7	20.03	20.07	19.84	1	19.15	19.12	18.88	2
	15	0	20.11	20.15	19.93	1	19.12	19.07	18.85	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 19975	Mid CH 20175	High CH 20375		Low CH 19975	Mid CH 20175	High CH 20375	
			1712.5 MHz	1732.5 MHz	1752.5 MHz		1712.5 MHz	1732.5 MHz	1752.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
4 / 5M	1	0	21.08	21.12	20.89	0	20.09	20.13	19.91	1
	1	12	21.07	21.11	20.88	0	20.06	20.10	19.88	1
	1	24	21.04	21.08	20.85	0	20.05	20.09	19.87	1
	12	0	20.13	20.17	19.94	1	19.24	19.21	18.99	2
	12	6	20.11	20.15	19.92	1	19.23	19.20	18.98	2
	12	13	20.06	20.10	19.87	1	19.18	19.15	18.91	2
	25	0	20.14	20.18	19.96	1	19.14	19.13	18.90	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20000	Mid CH 20175	High CH 20350		Low CH 20000	Mid CH 20175	High CH 20350	
			1715.0 MHz	1732.5 MHz	1750.0 MHz		1715.0 MHz	1732.5 MHz	1750.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
4 / 10M	1	0	21.12	21.16	20.93	0	20.13	20.17	19.95	1
	1	24	21.11	21.15	20.92	0	20.10	20.14	19.92	1
	1	49	21.08	21.12	20.89	0	20.09	20.13	19.91	1
	25	0	20.17	20.21	19.98	1	19.28	19.25	19.03	2
	25	12	20.15	20.19	19.96	1	19.27	19.24	19.02	2
	25	25	20.10	20.14	19.91	1	19.22	19.19	18.95	2
	50	0	20.18	20.22	20.00	1	19.18	19.17	18.94	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20025	Mid CH 20175	High CH 20325		Low CH 20025	Mid CH 20175	High CH 20325	
			1717.5 MHz	1732.5 MHz	1747.5 MHz		1717.5 MHz	1732.5 MHz	1747.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
4 / 15M	1	0	21.18	21.22	20.99	0	20.19	20.23	20.01	1
	1	37	21.17	21.21	20.98	0	20.16	20.20	19.98	1
	1	74	21.14	21.18	20.95	0	20.15	20.19	19.97	1
	36	0	20.23	20.27	20.04	1	19.34	19.31	19.09	2
	36	19	20.21	20.25	20.02	1	19.33	19.30	19.08	2
	36	39	20.16	20.20	19.97	1	19.28	19.25	19.01	2
	75	0	20.24	20.28	20.06	1	19.24	19.23	19.00	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20050	Mid CH 20175	High CH 20300		Low CH 20050	Mid CH 20175	High CH 20300	
			1720.0 MHz	1732.5 MHz	1745.0 MHz		1720.0 MHz	1732.5 MHz	1745.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
4 / 20M	1	0	21.21	21.25	21.02	0	20.22	20.26	20.04	1
	1	50	21.20	21.24	21.01	0	20.19	20.23	20.01	1
	1	99	21.17	21.21	20.98	0	20.18	20.22	20.00	1
	50	0	20.26	20.30	20.07	1	19.37	19.34	19.12	2
	50	25	20.24	20.28	20.05	1	19.36	19.33	19.11	2
	50	50	20.19	20.23	20.00	1	19.31	19.28	19.04	2
	100	0	20.27	20.31	20.09	1	19.27	19.26	19.03	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20407	Mid CH 20525	High CH 20643		Low CH 20407	Mid CH 20525	High CH 20643	
			824.7 MHz	836.5 MHz	848.3 MHz		824.7 MHz	836.5 MHz	848.3 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
5 / 1.4M	1	0	22.18	22.25	22.03	0	21.19	21.26	21.04	1
	1	2	22.17	22.24	22.02	0	21.16	21.23	21.01	1
	1	5	22.14	22.21	21.99	0	21.15	21.22	21.00	1
	3	0	22.16	22.23	22.01	0	21.18	21.25	21.03	1
	3	1	22.15	22.22	22.00	0	21.15	21.22	21.00	1
	3	3	22.12	22.19	21.97	0	21.14	21.20	20.99	1
	6	0	21.24	21.31	21.09	1	20.15	20.22	20.03	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20415	Mid CH 20525	High CH 20635		Low CH 20415	Mid CH 20525	High CH 20635	
			825.5 MHz	836.5 MHz	847.5 MHz		825.5 MHz	836.5 MHz	847.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
5 / 3M	1	0	22.22	22.29	22.07	0	21.23	21.30	21.08	1
	1	7	22.21	22.28	22.06	0	21.20	21.27	21.05	1
	1	14	22.18	22.25	22.03	0	21.19	21.26	21.04	1
	8	0	21.27	21.34	21.12	1	20.31	20.38	20.16	2
	8	3	21.25	21.32	21.10	1	20.28	20.37	20.15	2
	8	7	21.20	21.27	21.05	1	20.24	20.30	20.09	2
	15	0	21.28	21.35	21.13	1	20.19	20.26	20.06	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20425	Mid CH 20525	High CH 20625		Low CH 20425	Mid CH 20525	High CH 20625	
			826.5 MHz	836.5 MHz	846.5 MHz		826.5 MHz	836.5 MHz	846.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
5 / 5M	1	0	22.28	22.35	22.13	0	21.29	21.36	21.14	1
	1	12	22.27	22.34	22.12	0	21.26	21.33	21.11	1
	1	24	22.24	22.31	22.09	0	21.25	21.32	21.10	1
	12	0	21.33	21.40	21.18	1	20.37	20.44	20.22	2
	12	6	21.31	21.38	21.16	1	20.35	20.43	20.21	2
	12	13	21.26	21.33	21.11	1	20.30	20.36	20.16	2
	25	0	21.34	21.41	21.19	1	20.28	20.32	20.12	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20450	Mid CH 20525	High CH 20600		Low CH 20450	Mid CH 20525	High CH 20600	
			829.0 MHz	836.5 MHz	844.0 MHz		829.0 MHz	836.5 MHz	844.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
5 / 10M	1	0	22.31	22.38	22.16	0	21.32	21.39	21.17	1
	1	24	22.30	22.37	22.15	0	21.29	21.36	21.14	1
	1	49	22.27	22.34	22.12	0	21.28	21.35	21.13	1
	25	0	21.36	21.43	21.21	1	20.40	20.47	20.25	2
	25	12	21.34	21.41	21.19	1	20.38	20.46	20.24	2
	25	25	21.29	21.36	21.14	1	20.33	20.39	20.19	2
	50	0	21.37	21.44	21.22	1	20.31	20.35	20.15	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20775	Mid CH 21100	High CH 21425		Low CH 20775	Mid CH 21100	High CH 21425	
			2502.5 MHz	2535.0 MHz	2567.5 MHz		2502.5 MHz	2535.0 MHz	2567.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
7 / 5M	1	0	21.55	21.84	21.72	0	20.56	20.85	20.73	1
	1	12	21.54	21.83	21.71	0	20.53	20.82	20.70	1
	1	24	21.51	21.80	21.68	0	20.52	20.81	20.69	1
	12	0	20.60	20.89	20.77	1	19.64	19.93	19.81	2
	12	6	20.58	20.87	20.75	1	19.64	19.92	19.80	2
	12	13	20.53	20.82	20.70	1	19.57	19.87	19.74	2
	25	0	20.61	20.90	20.78	1	19.54	19.85	19.71	2
EUT with Power Reduction (P-Sensor Triggered)										
7 / 5M	1	0	17.39	17.52	17.35	0	16.40	16.53	16.36	1
	1	12	17.38	17.51	17.34	0	16.37	16.50	16.33	1
	1	24	17.35	17.48	17.31	0	16.36	16.49	16.32	1
	12	0	16.44	16.57	16.40	1	15.48	15.61	15.44	2
	12	6	16.42	16.55	16.38	1	15.48	15.60	15.43	2
	12	13	16.37	16.50	16.33	1	15.41	15.55	15.37	2
	25	0	16.45	16.58	16.41	1	15.38	15.53	15.34	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20800	Mid CH 21100	High CH 21400		Low CH 20800	Mid CH 21100	High CH 21400	
			2505.0 MHz	2535.0 MHz	2565.0 MHz		2505.0 MHz	2535.0 MHz	2565.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
7 / 10M	1	0	21.59	21.88	21.76	0	20.60	20.89	20.77	1
	1	24	21.58	21.87	21.75	0	20.57	20.86	20.74	1
	1	49	21.55	21.84	21.72	0	20.56	20.85	20.73	1
	25	0	20.64	20.93	20.81	1	19.68	19.97	19.85	2
	25	12	20.62	20.91	20.79	1	19.67	19.96	19.84	2
	25	25	20.57	20.86	20.74	1	19.61	19.91	19.78	2
	50	0	20.65	20.94	20.82	1	19.60	19.89	19.77	2
EUT with Power Reduction (P-Sensor Triggered)										
7 / 10M	1	0	17.43	17.56	17.39	0	16.44	16.57	16.40	1
	1	24	17.42	17.55	17.38	0	16.41	16.54	16.37	1
	1	49	17.39	17.52	17.35	0	16.40	16.53	16.36	1
	25	0	16.48	16.61	16.44	1	15.52	15.65	15.48	2
	25	12	16.46	16.59	16.42	1	15.51	15.64	15.47	2
	25	25	16.41	16.54	16.37	1	15.45	15.59	15.41	2
	50	0	16.49	16.62	16.45	1	15.44	15.57	15.40	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20825	Mid CH 21100	High CH 21375		Low CH 20825	Mid CH 21100	High CH 21375	
			2507.5 MHz	2535.0 MHz	2562.5 MHz		2507.5 MHz	2535.0 MHz	2562.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
7 / 15M	1	0	21.65	21.94	21.82	0	20.66	20.95	20.83	1
	1	37	21.64	21.93	21.81	0	20.63	20.92	20.80	1
	1	74	21.61	21.90	21.78	0	20.62	20.91	20.79	1
	36	0	20.70	20.99	20.87	1	19.74	20.03	19.91	2
	36	19	20.68	20.97	20.85	1	19.73	20.02	19.90	2
	36	39	20.63	20.92	20.80	1	19.68	19.97	19.85	2
	75	0	20.71	21.00	20.88	1	19.66	19.95	19.83	2
EUT with Power Reduction (P-Sensor Triggered)										
7 / 15M	1	0	17.49	17.62	17.45	0	16.50	16.63	16.46	1
	1	37	17.48	17.61	17.44	0	16.47	16.60	16.43	1
	1	74	17.45	17.58	17.41	0	16.46	16.59	16.42	1
	36	0	16.54	16.67	16.50	1	15.58	15.71	15.54	2
	36	19	16.52	16.65	16.48	1	15.57	15.70	15.53	2
	36	39	16.47	16.60	16.43	1	15.52	15.65	15.48	2
	75	0	16.55	16.68	16.51	1	15.50	15.63	15.46	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20850	Mid CH 21100	High CH 21350		Low CH 20850	Mid CH 21100	High CH 21350	
			2510.0 MHz	2535.0 MHz	2560.0 MHz		2510.0 MHz	2535.0 MHz	2560.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
7 / 20M	1	0	21.68	21.97	21.85	0	20.69	20.98	20.86	1
	1	50	21.67	21.96	21.84	0	20.66	20.95	20.83	1
	1	99	21.64	21.93	21.81	0	20.65	20.94	20.82	1
	50	0	20.73	21.02	20.90	1	19.77	20.06	19.94	2
	50	25	20.71	21.00	20.88	1	19.76	20.05	19.93	2
	50	50	20.66	20.95	20.83	1	19.71	20.00	19.88	2
	100	0	20.74	21.03	20.91	1	19.69	19.98	19.86	2
EUT with Power Reduction (P-Sensor Triggered)										
7 / 20M	1	0	17.52	17.65	17.48	0	16.53	16.66	16.49	1
	1	50	17.51	17.64	17.47	0	16.50	16.63	16.46	1
	1	99	17.48	17.61	17.44	0	16.49	16.62	16.45	1
	50	0	16.57	16.70	16.53	1	15.61	15.74	15.57	2
	50	25	16.55	16.68	16.51	1	15.60	15.73	15.56	2
	50	50	16.50	16.63	16.46	1	15.55	15.68	15.51	2
	100	0	16.58	16.71	16.54	1	15.53	15.66	15.49	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 23017	Mid CH 23095	High CH 23173		Low CH 23017	Mid CH 23095	High CH 23173	
			699.7 MHz	707.5 MHz	715.3 MHz		699.7 MHz	707.5 MHz	715.3 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
12 / 1.4M	1	0	22.09	22.25	22.00	0	21.05	21.22	20.96	1
	1	2	22.08	22.24	21.99	0	21.02	21.19	20.93	1
	1	5	22.05	22.21	21.96	0	21.01	21.18	20.92	1
	3	0	22.07	22.23	21.98	0	21.04	21.20	20.95	1
	3	1	22.06	22.22	21.97	0	21.01	21.18	20.92	1
	3	3	22.03	22.19	21.94	0	21.00	21.17	20.91	1
	6	0	21.10	21.27	21.01	1	20.05	20.24	19.96	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 23025	Mid CH 23095	High CH 23165		Low CH 23025	Mid CH 23095	High CH 23165	
			700.5 MHz	707.5 MHz	714.5 MHz		700.5 MHz	707.5 MHz	714.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
12 / 3M	1	0	22.13	22.29	22.04	0	21.09	21.26	21.00	1
	1	7	22.12	22.28	22.03	0	21.06	21.23	20.97	1
	1	14	22.09	22.25	22.00	0	21.05	21.22	20.96	1
	8	0	21.13	21.30	21.04	1	20.17	20.34	20.11	2
	8	3	21.11	21.28	21.02	1	20.16	20.33	20.07	2
	8	7	21.06	21.23	20.97	1	20.10	20.31	20.03	2
	15	0	21.14	21.31	21.05	1	20.08	20.26	20.00	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 23035	Mid CH 23095	High CH 23155		Low CH 23035	Mid CH 23095	High CH 23155	
			701.5 MHz	707.5 MHz	713.5 MHz		701.5 MHz	707.5 MHz	713.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
12 / 5M	1	0	22.19	22.35	22.10	0	21.15	21.32	21.06	1
	1	12	22.18	22.34	22.09	0	21.12	21.29	21.03	1
	1	24	22.15	22.31	22.06	0	21.11	21.28	21.02	1
	12	0	21.19	21.36	21.10	1	20.23	20.40	20.14	2
	12	6	21.17	21.34	21.08	1	20.22	20.39	20.13	2
	12	13	21.12	21.29	21.03	1	20.16	20.34	20.09	2
	25	0	21.20	21.37	21.11	1	20.14	20.32	20.07	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 23060	Mid CH 23095	High CH 23130		Low CH 23060	Mid CH 23095	High CH 23130	
			704.0 MHz	707.5 MHz	711.0 MHz		704.0 MHz	707.5 MHz	711.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
12 / 10M	1	0	22.22	22.38	22.13	0	21.18	21.35	21.09	1
	1	24	22.21	22.37	22.12	0	21.15	21.32	21.06	1
	1	49	22.18	22.34	22.09	0	21.14	21.31	21.05	1
	25	0	21.22	21.39	21.13	1	20.26	20.43	20.17	2
	25	12	21.20	21.37	21.11	1	20.25	20.42	20.16	2
	25	25	21.15	21.32	21.06	1	20.19	20.37	20.12	2
	50	0	21.23	21.40	21.14	1	20.17	20.35	20.10	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 23205	Mid CH 23230	High CH 23255		Low CH 23205	Mid CH 23230	High CH 23255	
			779.5 MHz	782.0 MHz	784.5 MHz		779.5 MHz	782.0 MHz	784.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
13 / 5M	1	0	22.30	22.40	22.07	0	21.26	21.37	21.03	1
	1	12	22.29	22.39	22.06	0	21.23	21.34	21.00	1
	1	24	22.26	22.36	22.03	0	21.22	21.33	20.99	1
	12	0	21.30	21.41	21.07	1	20.34	20.45	20.11	2
	12	6	21.28	21.39	21.05	1	20.33	20.44	20.10	2
	12	13	21.23	21.34	21.00	1	20.28	20.39	20.05	2
	25	0	21.31	21.42	21.08	1	20.26	20.37	20.03	2

Band / BW	RB Size	RB Offset	QPSK		3GPP MPR (dB)	16QAM		3GPP MPR (dB)
			Mid CH 23230	782.0 MHz		Mid CH 23230	782.0 MHz	
			EUT without Power Reduction (P-Sensor NOT Triggered)					
13 / 10M	1	0	22.33		0	21.29		1
	1	24	22.32		0	21.26		1
	1	49	22.29		0	21.25		1
	25	0	21.33		1	20.37		2
	25	12	21.31		1	20.36		2
	25	25	21.26		1	20.31		2
	50	0	21.34		1	20.29		2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 26047	Mid CH 26365	High CH 26683		Low CH 26047	Mid CH 26365	High CH 26683	
			1850.7 MHz	1882.5 MHz	1914.3 MHz		1850.7 MHz	1882.5 MHz	1914.3 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
25 / 1.4M	1	0	21.56	21.68	21.45	0	20.57	20.64	20.46	1
	1	2	21.55	21.62	21.44	0	20.54	20.61	20.43	1
	1	5	21.52	21.59	21.41	0	20.53	20.60	20.42	1
	3	0	21.54	21.66	21.43	0	20.56	20.63	20.45	1
	3	1	21.53	21.60	21.42	0	20.53	20.60	20.42	1
	3	3	21.50	21.57	21.39	0	20.52	20.58	20.41	1
	6	0	20.62	20.69	20.51	1	19.48	19.62	19.45	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 26055	Mid CH 26365	High CH 26675		Low CH 26055	Mid CH 26365	High CH 26675	
			1851.5 MHz	1882.5 MHz	1913.5 MHz		1851.5 MHz	1882.5 MHz	1913.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
25 / 3M	1	0	21.57	21.69	21.46	0	20.58	20.65	20.47	1
	1	7	21.56	21.63	21.45	0	20.55	20.62	20.44	1
	1	14	21.53	21.60	21.42	0	20.54	20.61	20.43	1
	8	0	20.62	20.69	20.51	1	19.66	19.73	19.55	2
	8	3	20.60	20.67	20.49	1	19.62	19.72	19.54	2
	8	7	20.55	20.62	20.44	1	19.58	19.67	19.49	2
	15	0	20.63	20.70	20.52	1	19.51	19.63	19.46	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 26065	Mid CH 26365	High CH 26665		Low CH 26065	Mid CH 26365	High CH 26665	
			1852.5 MHz	1882.5 MHz	1912.5 MHz		1852.5 MHz	1882.5 MHz	1912.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
25 / 5M	1	0	21.59	21.71	21.48	0	20.60	20.67	20.49	1
	1	12	21.58	21.65	21.47	0	20.57	20.64	20.46	1
	1	24	21.55	21.62	21.44	0	20.56	20.63	20.45	1
	12	0	20.64	20.71	20.53	1	19.68	19.75	19.57	2
	12	6	20.62	20.69	20.51	1	19.64	19.74	19.56	2
	12	13	20.57	20.64	20.46	1	19.60	19.69	19.51	2
	25	0	20.65	20.72	20.54	1	19.53	19.65	19.48	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 26090	Mid CH 26365	High CH 26640		Low CH 26090	Mid CH 26365	High CH 26640	
			1855.0 MHz	1882.5 MHz	1910.0 MHz		1855.0 MHz	1882.5 MHz	1910.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
25 / 10M	1	0	21.61	21.73	21.50	0	20.62	20.69	20.51	1
	1	24	21.60	21.67	21.49	0	20.59	20.66	20.48	1
	1	49	21.57	21.64	21.46	0	20.58	20.65	20.47	1
	25	0	20.66	20.73	20.55	1	19.70	19.77	19.59	2
	25	12	20.64	20.71	20.53	1	19.69	19.76	19.58	2
	25	25	20.59	20.66	20.48	1	19.64	19.71	19.53	2
	50	0	20.67	20.74	20.56	1	19.56	19.69	19.50	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 26115	Mid CH 26365	High CH 26615		Low CH 26115	Mid CH 26365	High CH 26615	
			1857.5 MHz	1882.5 MHz	1907.5 MHz		1857.5 MHz	1882.5 MHz	1907.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
25 / 15M	1	0	21.63	21.70	21.52	0	20.64	20.71	20.53	1
	1	37	21.62	21.69	21.51	0	20.61	20.68	20.50	1
	1	74	21.59	21.66	21.48	0	20.60	20.67	20.49	1
	36	0	20.68	20.75	20.57	1	19.72	19.79	19.61	2
	36	19	20.66	20.73	20.55	1	19.71	19.78	19.60	2
	36	39	20.61	20.68	20.50	1	19.66	19.73	19.55	2
	75	0	20.69	20.76	20.58	1	19.58	19.71	19.52	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 26140	Mid CH 26365	High CH 26590		Low CH 26140	Mid CH 26365	High CH 26590	
			1860.0 MHz	1882.5 MHz	1905.0 MHz		1860.0 MHz	1882.5 MHz	1905.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
25 / 20M	1	0	21.66	21.73	21.55	0	20.67	20.74	20.56	1
	1	50	21.65	21.72	21.54	0	20.64	20.71	20.53	1
	1	99	21.62	21.69	21.51	0	20.63	20.70	20.52	1
	50	0	20.71	20.78	20.60	1	19.75	19.82	19.64	2
	50	25	20.69	20.76	20.58	1	19.74	19.81	19.63	2
	50	50	20.64	20.71	20.53	1	19.69	19.76	19.58	2
	100	0	20.72	20.79	20.61	1	19.63	19.73	19.57	2

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Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 26797	Mid CH 26915	High CH 27033		Low CH 26797	Mid CH 26915	High CH 27033	
			824.7 MHz	836.5 MHz	848.3 MHz		824.7 MHz	836.5 MHz	848.3 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
26 / 1.4M	1	0	22.12	22.32	22.24	0	21.13	21.33	21.25	1
	1	2	22.11	22.31	22.23	0	21.10	21.30	21.22	1
	1	5	22.08	22.28	22.20	0	21.09	21.29	21.21	1
	3	0	22.10	22.30	22.22	0	21.12	21.32	21.24	1
	3	1	22.09	22.29	22.21	0	21.09	21.29	21.21	1
	3	3	22.06	22.26	22.18	0	21.08	21.26	21.20	1
	6	0	21.18	21.38	21.30	1	20.09	20.33	20.19	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 26805	Mid CH 26915	High CH 27025		Low CH 26805	Mid CH 26865	High CH 27025	
			825.5 MHz	836.5 MHz	847.5 MHz		825.5 MHz	831.0 MHz	847.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
26 / 3M	1	0	22.13	22.33	22.25	0	21.14	21.34	21.26	1
	1	7	22.12	22.32	22.24	0	21.11	21.31	21.23	1
	1	14	22.09	22.29	22.21	0	21.10	21.30	21.22	1
	8	0	21.18	21.38	21.30	1	20.22	20.42	20.34	2
	8	3	21.16	21.36	21.28	1	20.21	20.41	20.33	2
	8	7	21.11	21.31	21.23	1	20.16	20.36	20.28	2
	15	0	21.19	21.39	21.31	1	20.10	20.34	20.20	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 26815	Mid CH 26915	High CH 27015		Low CH 26815	Mid CH 26915	High CH 27015	
			826.5 MHz	836.5 MHz	846.5 MHz		826.5 MHz	836.5 MHz	846.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
26 / 5M	1	0	22.15	22.35	22.27	0	21.16	21.36	21.28	1
	1	12	22.14	22.34	22.26	0	21.13	21.33	21.25	1
	1	24	22.11	22.31	22.23	0	21.12	21.32	21.24	1
	12	0	21.20	21.40	21.32	1	20.24	20.44	20.36	2
	12	6	21.18	21.38	21.30	1	20.23	20.43	20.35	2
	12	13	21.13	21.33	21.25	1	20.18	20.38	20.30	2
	25	0	21.21	21.41	21.33	1	20.12	20.36	20.24	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 26840	Mid CH 26915	High CH 26990		Low CH 26840	Mid CH 26915	High CH 26990	
			829.0 MHz	836.5 MHz	844.0 MHz		829.0 MHz	836.5 MHz	844.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
26 / 10M	1	0	22.17	22.37	22.29	0	21.18	21.38	21.30	1
	1	24	22.16	22.36	22.28	0	21.15	21.35	21.27	1
	1	49	22.13	22.33	22.25	0	21.14	21.34	21.26	1
	25	0	21.22	21.42	21.34	1	20.26	20.46	20.38	2
	25	12	21.20	21.40	21.32	1	20.25	20.45	20.37	2
	25	25	21.15	21.35	21.27	1	20.20	20.40	20.32	2
	50	0	21.23	21.43	21.35	1	20.17	20.38	20.27	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 26865	Mid CH 26915	High CH 26965		Low CH 26865	Mid CH 26915	High CH 26965	
			831.5 MHz	836.5 MHz	841.5 MHz		831.5 MHz	836.5 MHz	841.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
26 / 15M	1	0	22.19	22.39	22.31	0	21.20	21.40	21.32	0
	1	37	22.18	22.38	22.30	0	21.17	21.37	21.29	0
	1	74	22.15	22.35	22.27	0	21.16	21.36	21.28	0
	36	0	21.24	21.44	21.36	1	20.28	20.48	20.40	1
	36	19	21.22	21.42	21.34	1	20.27	20.47	20.39	1
	36	39	21.17	21.37	21.29	1	20.22	20.42	20.34	1
	75	0	21.25	21.45	21.37	1	20.19	20.40	20.29	1

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 27685	Mid CH 27710	High CH 27735		Low CH 27685	Mid CH 27710	High CH 27735	
			2307.5 MHz	2310.0 MHz	2312.5 MHz		2307.5 MHz	2310.0 MHz	2312.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
30 / 5M	1	0	20.83	20.81	20.90	0	19.84	19.82	19.91	1
	1	12	20.82	20.80	20.89	0	19.81	19.79	19.88	1
	1	24	20.79	20.77	20.86	0	19.80	19.78	19.87	1
	12	0	19.88	19.86	19.95	1	18.92	18.90	18.99	2
	12	6	19.86	19.84	19.93	1	18.91	18.89	18.98	2
	12	13	19.81	19.79	19.88	1	18.86	18.84	18.93	2
	25	0	19.89	19.87	19.96	1	18.84	18.83	18.90	2
EUT with Power Reduction (P-Sensor Triggered)										
30 / 5M	1	0	16.50	16.58	16.44	0	15.51	15.59	15.45	1
	1	12	16.49	16.57	16.43	0	15.48	15.56	15.42	1
	1	24	16.46	16.54	16.40	0	15.47	15.55	15.41	1
	12	0	15.55	15.63	15.49	1	14.59	14.67	14.53	2
	12	6	15.53	15.61	15.47	1	14.58	14.66	14.52	2
	12	13	15.48	15.56	15.42	1	14.53	14.61	14.47	2
	25	0	15.56	15.64	15.50	1	14.51	14.60	14.44	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Mid CH 27710				Mid CH 27710			
			2310.0 MHz				2310.0 MHz			
EUT without Power Reduction (P-Sensor NOT Triggered)										
30 / 10M	1	0	20.96			0	19.92			1
	1	24	20.95			0	19.89			1
	1	49	20.92			0	19.88			1
	25	0	19.96			1	19.00			2
	25	12	19.94			1	18.99			2
	25	25	19.89			1	18.94			2
	50	0	19.97			1	18.92			2
EUT with Power Reduction (P-Sensor Triggered)										
30 / 10M	1	0	16.60			0	15.56			1
	1	24	16.59			0	15.53			1
	1	49	16.56			0	15.52			1
	25	0	15.60			1	14.64			2
	25	12	15.58			1	14.63			2
	25	25	15.53			1	14.58			2
	50	0	15.61			1	14.56			2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			L-CH 39675	M-CH 40620	H-CH 41565		L-CH 39675	M-CH 40620	H-CH 41565	
			2498.5 MHz	2593.0 MHz	2687.5 MHz		2498.5 MHz	2593.0 MHz	2687.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
41 / 5M	1	0	22.49	22.78	22.56	0	21.50	21.79	21.57	1
	1	12	22.48	22.77	22.55	0	21.47	21.76	21.54	1
	1	24	22.45	22.74	22.52	0	21.46	21.75	21.53	1
	12	0	21.54	21.83	21.61	1	20.58	20.87	20.65	2
	12	6	21.52	21.81	21.59	1	20.57	20.86	20.64	2
	12	13	21.47	21.76	21.54	1	20.53	20.81	20.61	2
	25	0	21.55	21.84	21.62	1	20.49	20.79	20.59	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			L-CH 39700	M-CH 40620	H-CH 41540		L-CH 39700	M-CH 40620	H-CH 41540	
			2501.0 MHz	2593.0 MHz	2685.0 MHz		2501.0 MHz	2593.0 MHz	2685.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
41 / 10M	1	0	22.52	22.81	22.59	0	21.53	21.82	21.60	1
	1	24	22.51	22.80	22.58	0	21.50	21.79	21.57	1
	1	49	22.48	22.77	22.55	0	21.49	21.78	21.56	1
	25	0	21.57	21.86	21.64	1	20.61	20.90	20.68	2
	25	12	21.55	21.84	21.62	1	20.60	20.89	20.67	2
	25	25	21.50	21.79	21.57	1	20.56	20.84	20.65	2
	50	0	21.58	21.87	21.65	1	20.54	20.82	20.62	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			L-CH 39725	M-CH 40620	H-CH 41515		L-CH 39725	M-CH 40620	H-CH 41515	
			2503.5 MHz	2593.0 MHz	2682.5 MHz		2503.5 MHz	2593.0 MHz	2682.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
41 / 15M	1	0	22.56	22.85	22.63	0	21.57	21.86	21.64	1
	1	37	22.55	22.84	22.62	0	21.54	21.83	21.61	1
	1	74	22.52	22.81	22.59	0	21.53	21.82	21.60	1
	36	0	21.61	21.90	21.68	1	20.65	20.94	20.72	2
	36	19	21.59	21.88	21.66	1	20.64	20.93	20.71	2
	36	39	21.54	21.83	21.61	1	20.60	20.88	20.69	2
	75	0	21.62	21.91	21.69	1	20.58	20.86	20.66	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			L-CH 39750	M-CH 40620	H-CH 41490		L-CH 39750	M-CH 40620	H-CH 41490	
			2506.0 MHz	2593.0 MHz	2680.0 MHz		2506.0 MHz	2593.0 MHz	2680.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
41 / 20M	1	0	22.62	22.91	22.69	0	21.63	21.92	21.70	1
	1	50	22.61	22.90	22.68	0	21.60	21.89	21.67	1
	1	99	22.58	22.87	22.65	0	21.59	21.88	21.66	1
	50	0	21.67	21.96	21.74	1	20.71	21.00	20.78	2
	50	25	21.65	21.94	21.72	1	20.70	20.99	20.77	2
	50	50	21.60	21.89	21.67	1	20.66	20.94	20.75	2
	100	0	21.68	21.97	21.75	1	20.64	20.92	20.72	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH (131979)	Mid CH (132322)	High CH (132665)		Low CH (131979)	Mid CH (132322)	High CH (132665)	
			Frequency (1710.7) MHz	Frequency (1745)MHz	Frequency (1779.3) MHz		Frequency (1710.7) MHz	Frequency (1745)MHz	Frequency (1779.3) MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
66 / 1.4M	1	0	21.30	21.41	21.39	0	20.31	20.42	20.40	1
	1	12	21.29	21.40	21.38	0	20.28	20.39	20.37	1
	1	24	21.26	21.37	21.35	0	20.27	20.38	20.36	1
	12	0	20.35	20.46	20.44	1	19.39	19.50	19.48	2
	12	6	20.33	20.44	20.42	1	19.38	19.49	19.47	2
	12	13	20.28	20.39	20.37	1	19.33	19.44	19.42	2
	25	0	20.36	20.47	20.45	1	19.29	19.42	19.40	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH (131987)	Mid CH (132422)	High CH (132657)		Low CH (131987)	Mid CH (132422)	High CH (132657)	
			Frequency (1711.5) MHz	Frequency (1745)MHz	Frequency (1778.5) MHz		Frequency (1711.5) MHz	Frequency (1745)MHz	Frequency (1778.5) MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
66 / 3M	1	0	21.33	21.44	21.42	0	20.34	20.45	20.43	1
	1	12	21.32	21.43	21.41	0	20.31	20.42	20.40	1
	1	24	21.29	21.40	21.38	0	20.30	20.41	20.39	1
	12	0	20.38	20.49	20.47	1	19.42	19.53	19.51	2
	12	6	20.36	20.47	20.45	1	19.41	19.52	19.50	2
	12	13	20.31	20.42	20.40	1	19.36	19.47	19.46	2
	25	0	20.39	20.50	20.48	1	19.34	19.45	19.43	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 131997	Mid CH 132422	High CH 132647		Low CH 131997	Mid CH 132422	High CH 132647	
			1712.5 MHz	1745.0 MHz	1777.5 MHz		1712.5 MHz	1745.0 MHz	1777.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
66 / 5M	1	0	21.59	21.61	21.42	0	21.62	21.64	21.45	1
	1	12	21.58	21.60	21.41	0	21.61	21.63	21.44	1
	1	24	21.55	21.57	21.38	0	21.58	21.60	21.41	1
	12	0	20.64	20.66	20.47	1	20.67	20.69	20.50	2
	12	6	20.62	20.64	20.45	1	20.65	20.67	20.48	2
	12	13	20.57	20.59	20.40	1	20.60	20.62	20.43	2
	25	0	20.65	20.67	20.48	1	20.68	20.70	20.51	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 131997	Mid CH 132422	High CH 132647		Low CH 131997	Mid CH 132422	High CH 132647	
			1715.0 MHz	1745.0 MHz	1775.0 MHz		1715.0 MHz	1745.0 MHz	1775.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
66 / 10M	1	0	21.62	21.64	21.45	0	20.63	20.65	20.46	1
	1	24	21.61	21.63	21.44	0	20.60	20.62	20.43	1
	1	49	21.58	21.60	21.41	0	20.59	20.61	20.42	1
	25	0	20.67	20.69	20.50	1	19.71	19.73	19.54	2
	25	12	20.65	20.67	20.48	1	19.70	19.72	19.53	2
	25	25	20.60	20.62	20.43	1	19.65	19.67	19.49	2
	50	0	20.68	20.70	20.51	1	19.63	19.65	19.46	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 132047	Mid CH 132422	High CH 132665		Low CH 132047	Mid CH 132422	High CH 132665	
			1717.5 MHz	1745.0 MHz	1772.5 MHz		1717.5 MHz	1745.0 MHz	1772.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
66 / 15M	1	0	21.66	21.68	21.49	0	20.67	20.69	20.50	1
	1	37	21.65	21.67	21.48	0	20.64	20.66	20.47	1
	1	74	21.62	21.64	21.45	0	20.63	20.65	20.46	1
	36	0	20.71	20.73	20.54	1	19.75	19.77	19.58	2
	36	19	20.69	20.71	20.52	1	19.74	19.76	19.57	2
	36	39	20.64	20.66	20.47	1	19.69	19.71	19.53	2
	75	0	20.72	20.74	20.55	1	19.67	19.67	19.50	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 132072	Mid CH 132422	High CH 132572		Low CH 132072	Mid CH 132422	High CH 132572	
			1720.0 MHz	1745.0 MHz	1770.0 MHz		1720.0 MHz	1745.0 MHz	1770.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
66 / 20M	1	0	21.72	21.74	21.55	0	20.73	20.75	20.56	1
	1	50	21.71	21.73	21.54	0	20.70	20.72	20.53	1
	1	99	21.68	21.70	21.51	0	20.69	20.71	20.52	1
	50	0	20.77	20.79	20.60	1	19.81	19.83	19.64	2
	50	25	20.75	20.77	20.58	1	19.80	19.82	19.63	2
	50	50	20.70	20.72	20.53	1	19.75	19.77	19.59	2
	100	0	20.78	20.80	20.61	1	19.73	19.73	19.56	2

Note:

When The device can trigger proximity sensors when used near a human body, the EUT with Power reduction for LTE Band 7(4dB),LTE Band 30(4dB)

<WLAN 2.4G>

Mode	802.11b		
Channel / Frequency (MHz)	1 (2412)	6 (2437)	11 (2462)
Average Power (Ant-0)	16.42	17.76	18.69
Average Power (Ant-1)	17.98	17.60	16.81
Mode	802.11g		
Channel / Frequency (MHz)	1 (2412)	6 (2437)	11 (2462)
Average Power (Ant-0)	18.41	18.74	18.27
Average Power (Ant-1)	18.36	18.62	18.29
Mode	802.11n (HT20)		
Channel / Frequency (MHz)	1 (2412)	6 (2437)	11 (2462)
Average Power (Ant-0)	17.63	17.54	17.37
Average Power (Ant-1)	17.58	17.88	17.57
Average Power (Ant-0 + Ant-1)	20.62	20.72	20.48
Mode	802.11n (HT40)		
Channel / Frequency (MHz)	3 (2422)	6 (2437)	9 (2452)
Average Power (Ant-0)	17.48	18.00	17.65
Average Power (Ant-1)	17.42	17.80	17.63
Average Power (Ant-0 + Ant-1)	20.46	20.91	20.65

<WLAN 5.2G>

Mode	802.11a		
Channel / Frequency (MHz)	36 (5180)	40 (5200)	48 (5240)
Average Power (Ant-0)	12.19	12.25	12.22
Average Power (Ant-1)	10.41	10.48	10.46
Mode	802.11n (HT20)		
Channel / Frequency (MHz)	36 (5180)	40 (5200)	48 (5240)
Average Power (Ant-0)	12.60	12.25	11.75
Average Power (Ant-1)	10.56	10.45	10.49
Average Power (Ant-0 + Ant-1)	14.71	14.45	14.18
Mode	802.11n (HT40)		
Channel / Frequency (MHz)	38 (5190)	46 (5230)	
Average Power (Ant-0)	12.37	11.81	
Average Power (Ant-1)	10.62	10.65	
Average Power (Ant-0 + Ant-1)	14.59	14.87	
Mode	802.11ac (VHT80)		
Channel / Frequency (MHz)	42 (5210)		
Average Power (Ant-0)	10.83		
Average Power (Ant-1)	11.13		
Average Power (Ant-0 + Ant-1)	13.99		

<WLAN 5.3G>

Mode	802.11a		
Channel / Frequency (MHz)	52 (5260)	56 (5280)	64 (5320)
Average Power (Ant-0)	12.43	12.48	12.33
Average Power (Ant-1)	10.52	10.51	10.42
Mode	802.11n (HT20)		
Channel / Frequency (MHz)	52 (5260)	56 (5280)	64 (5320)
Average Power (Ant-0)	12.07	12.04	11.75
Average Power (Ant-1)	10.47	10.49	10.39
Average Power (Ant-0 + Ant-1)	14.35	14.34	14.13
Mode	802.11n (HT40)		
Channel / Frequency (MHz)	54 (5270)	62 (5310)	
Average Power (Ant-0)	10.96	10.46	
Average Power (Ant-1)	10.50	12.67	
Average Power (Ant-0 + Ant-1)	13.75	14.71	
Mode	802.11ac (VHT80)		
Channel / Frequency (MHz)	58 (5290)		
Average Power (Ant-0)	9.23		
Average Power (Ant-1)	10.98		
Average Power (Ant-0 + Ant-1)	13.20		

<WLAN 5.6G>

Mode	802.11a		
Channel / Frequency (MHz)	100(5500)	116 (5580)	140 (5700)
Average Power (Ant-0)	11.83	11.72	11.00
Average Power (Ant-1)	11.29	12.13	10.78
Mode	802.11n (HT20)		
Channel / Frequency (MHz)	100(5500)	116 (5580)	140 (5700)
Average Power (Ant-0)	12.07	11.79	10.16
Average Power (Ant-1)	13.18	10.12	9.71
Average Power (Ant-0 + Ant-1)	15.67	14.05	12.95
Mode	802.11n (HT40)		
Channel / Frequency (MHz)	102 (5510)	134 (5670)	
Average Power (Ant-0)	11.02	10.31	
Average Power (Ant-1)	11.24	10.29	
Average Power (Ant-0 + Ant-1)	14.14	13.31	
Mode	802.11ac (VHT80)		
Channel / Frequency (MHz)	106 (5530)		
Average Power (Ant-0)	9.76		
Average Power (Ant-1)	11.71		
Average Power (Ant-0 + Ant-1)	13.85		

<WLAN 5.8G>

Mode	802.11a		
Channel / Frequency (MHz)	149 (5745)	157 (5785)	165 (5825)
Average Power (Ant-0)	10.86	10.80	10.35
Average Power (Ant-1)	10.97	11.25	11.77
Mode	802.11n (HT20)		
Channel / Frequency (MHz)	149 (5745)	157 (5785)	165 (5825)
Average Power (Ant-0)	10.86	10.98	9.60
Average Power (Ant-1)	11.00	10.57	11.01
Average Power (Ant-0 + Ant-1)	13.94	13.79	13.37
Mode	802.11n (HT40)		
Channel / Frequency (MHz)	151 (5755)	159 (5795)	
Average Power (Ant-0)	11.33	11.02	
Average Power (Ant-1)	11.30	12.02	
Average Power (Ant-0 + Ant-1)	14.33	14.56	
Mode	802.11ac (VHT80)		
Channel / Frequency (MHz)	155 (5775)		
Average Power (Ant-0)	10.49		
Average Power (Ant-1)	10.04		
Average Power (Ant-0 + Ant-1)	13.28		

<Bluetooth>

Mode	Bluetooth GFSK		
Channel / Frequency (MHz)	0 (2402)	39 (2441)	78 (2480)
Average Power	2.244	1.500	-0.384
Mode	Bluetoothπ/4-DQPSK		
Channel / Frequency (MHz)	0 (2402)	39 (2441)	78 (2480)
Average Power	3.557	2.869	0.721
Mode	Bluetooth 8-DPSK		
Channel / Frequency (MHz)	0 (2402)	39 (2441)	78 (2480)
Average Power	3.681	2.990	1.040
Mode	Bluetooth BLE		
Channel / Frequency (MHz)	0 (2402)	19 (2440)	39 (2480)
Average Power	1.948	1.169	-0.863

4.7 SAR Testing Results

4.7.1 SAR Test Reduction Considerations

<KDB 447498 D01, General RF Exposure Guidance>

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

- (1) ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
- (2) ≤ 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
- (3) ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

<KDB 941225 D01, 3G SAR Measurement Procedures>

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

<KDB 941225 D05, SAR Evaluation Considerations for LTE Devices>

- (1) QPSK with 1 RB and 50% RB allocation

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

- (2) QPSK with 100% RB allocation

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

- (3) Higher order modulations

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

- (4) Other channel bandwidth

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

<KDB 248227 D01, SAR Guidance for Wi-Fi Transmitters>

- (1) For handsets operating next to ear, hotspot mode or mini-tablet configurations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When the reported SAR of initial test position is ≤ 0.4 W/kg, SAR testing for remaining test positions is not required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
- (2) For WLAN 2.4 GHz, the highest measured maximum output power channel for DSSS was selected for SAR measurement. When the reported SAR is ≤ 0.8 W/kg, no further SAR testing is required. Otherwise, SAR is evaluated at the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel. For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and it is ≤ 1.2 W/kg.
- (3) For WLAN 5GHz, the initial test configuration was selected according to the transmission mode with the highest maximum output power. When the reported SAR of initial test configuration is > 0.8 W/kg, SAR is required for the subsequent highest measured output power channel until the reported SAR result is ≤ 1.2 W/kg or all required channels are measured. For other transmission modes, SAR is not required when the highest reported SAR for initial test configuration is adjusted by the ratio of subsequent test configuration to initial test configuration specified maximum output power and it is ≤ 1.2 W/kg.
- (4) For WLAN MIMO mode, the power-based standalone SAR test exclusion or the sum of SAR provision in KDB 447498 to determine simultaneous transmission SAR test exclusion should be applied. Otherwise, SAR for MIMO mode will be measured with all applicable antennas transmitting simultaneously at the specified maximum output power of MIMO operation.

4.7.2 SAR Results for Body Exposure Condition

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Fr.(MHz)	Power Sensor	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
1	WCDMA II	RMC12.2K	Rear Face	0	1880	-	22.0	21.96	-0.09	0.631	1.01	0.64
	WCDMA II	RMC12.2K	Bottom Side	0	1880	-	22.0	21.96	0.03	0.124	1.01	0.13
	WCDMA II	RMC12.2K	Left Side	0	1880	-	22.0	21.96	0.02	0.342	1.01	0.35
	WCDMA II	RMC12.2K	Rear Face	0	1852.4	-	22.0	21.68	-0.01	0.548	1.08	0.59
	WCDMA II	RMC12.2K	Rear Face	0	1907	-	22.0	21.83	0.05	0.601	1.04	0.62
2	WCDMA IV	RMC12.2K	Rear Face	0	1732.6	-	22.0	21.73	-0.19	0.690	1.06	0.73
	WCDMA IV	RMC12.2K	Bottom Side	0	1732.6	-	22.0	21.73	-0.14	0.153	1.06	0.16
	WCDMA IV	RMC12.2K	Left Side	0	1732.6	-	22.0	21.73	-0.11	0.311	1.06	0.33
	WCDMA IV	RMC12.2K	Rear Face	0	1712.4	-	22.0	21.69	0.03	0.603	1.07	0.65
	WCDMA IV	RMC12.2K	Rear Face	0	1752.6	-	22.0	21.63	0.01	0.626	1.09	0.68
3	WCDMA V	RMC12.2K	Rear Face	0	836.4	-	22.5	22.41	0.05	0.459	1.02	0.47
	WCDMA V	RMC12.2K	Bottom Side	0	836.4	-	22.5	22.41	0.08	0.231	1.02	0.24
	WCDMA V	RMC12.2K	Left Side	0	836.4	-	22.5	22.41	0.03	0.101	1.02	0.10
	WCDMA V	RMC12.2K	Rear Face	0	826.4	-	22.5	22.39	-0.02	0.411	1.03	0.42
	WCDMA V	RMC12.2K	Rear Face	0	846.6	-	22.5	22.24	0.04	0.423	1.06	0.45

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Fr.(MHz)	Power Sensor	RB#	RB Offset	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
5	LTE 7	QPSK20M	Rear Face	0	2535	OFF	1	0	22.0	21.97	-0.08	1.88	1.01	1.89
	LTE 7	QPSK20M	Bottom Side	0	2535	OFF	1	0	22.0	21.97	-0.01	0.953	1.01	0.36
	LTE 7	QPSK20M	Left Side	0	2535	OFF	1	0	22.0	21.97	-0.05	0.935	1.01	0.94
	LTE 7	QPSK20M	Rear Face	0	2535	ON	1	0	18.0	17.65	0.01	0.792	1.08	0.86
	LTE 7	QPSK20M	Rear Face	0	2535	ON	50	0	18.0	16.70	0.02	0.612	1.35	0.83
	LTE 7	QPSK20M	Rear Face	0	2510	ON	1	0	17.0	17.52	0.06	0.704	0.89	0.62
	LTE 7	QPSK20M	Rear Face	0	2560	ON	1	0	18.0	17.48	0.11	0.726	1.13	0.82
6	LTE 12	QPSK10M	Rear Face	0	707.5	-	1	0	22.5	22.38	-0.11	0.149	1.03	0.15
	LTE 12	QPSK10M	Bottom Side	0	707.5	-	1	0	22.5	22.38	0.02	0.082	1.03	0.08
	LTE 12	QPSK10M	Left Side	0	707.5	-	1	0	22.5	22.38	0.05	0.101	1.03	0.10
	LTE 12	QPSK10M	Rear Face	0	707.5	-	25	0	21.5	21.39	-0.09	0.114	1.03	0.12
7	LTE 13	QPSK10M	Rear Face	0	782	-	1	0	22.5	22.33	-0.05	0.253	1.04	0.26
	LTE 13	QPSK10M	Bottom Side	0	782	-	1	0	22.5	22.33	-0.11	0.142	1.04	0.15
	LTE 13	QPSK10M	Left Side	0	782	-	1	0	22.5	22.33	-0.12	0.189	1.04	0.20
	LTE 13	QPSK10M	Rear Face	0	782	-	25	0	21.5	21.33	-0.03	0.202	1.31	0.21
7	LTE 25	QPSK20M	Rear Face	0	1882.5	-	1	0	22.0	21.73	-0.18	0.495	1.06	0.53
	LTE 25	QPSK20M	Bottom Side	0	1882.5	-	1	0	22.0	21.73	-0.01	0.147	1.06	0.16
	LTE 25	QPSK20M	Left Side	0	1882.5	-	1	0	22.0	21.73	-0.15	0.258	1.06	0.27
	LTE 25	QPSK20M	Rear Face	0	1882.5	-	50	0	21.0	20.78	0.03	0.374	1.05	0.39
	LTE 25	QPSK20M	Rear Face	0	1860	-	1	0	22.0	21.66	0.06	0.403	1.08	0.44
	LTE 25	QPSK20M	Rear Face	0	1905	-	1	0	22.0	21.55	0.08	0.422	1.11	0.47
7	LTE 26	QPSK15M	Rear Face	0	836.5	-	1	0	22.5	22.39	0.02	0.351	1.03	0.36
	LTE 26	QPSK15M	Bottom Side	0	836.5	-	1	0	22.5	22.39	0.01	0.125	1.03	0.13
	LTE 26	QPSK15M	Left Side	0	836.5	-	1	0	22.5	22.39	0.06	0.193	1.03	0.20
	LTE 26	QPSK15M	Rear Face	0	836.5	-	36	0	21.5	21.44	0.17	0.257	1.01	0.26
	LTE 26	QPSK15M	Rear Face	0	831.5	-	1	0	22.5	22.19	-0.09	0.382	1.07	0.41
	LTE 26	QPSK15M	Rear Face	0	841.5	-	1	0	22.5	22.31	-0.03	0.366	1.04	0.38
8	LTE 30	QPSK15M	Rear Face	0	2310	OFF	1	0	21.0	20.96	-0.02	1.88	1.01	1.90
	LTE 30	QPSK15M	Bottom Side	0	2310	OFF	1	0	21.0	20.96	-0.01	0.511	1.01	0.52
	LTE 30	QPSK15M	Left Side	0	2310	OFF	1	0	21.0	20.96	-0.06	0.763	1.01	0.77
	LTE 30	QPSK15M	Rear Face	0	2310	ON	1	0	17.0	16.60	-0.03	0.707	1.10	0.78
	LTE 30	QPSK15M	Rear Face	0	2310	ON	25	0	16.0	15.60	-0.05	0.582	1.10	0.64
	LTE 30	QPSK15M	Rear Face	0	2310	ON	50	0	16.0	15.60	-0.05	0.582	1.10	0.64
9	LTE 41	QPSK20M	Rear Face	0	2593	-	1	0	23.0	22.91	-0.02	0.965	1.02	0.99
	LTE 41	QPSK20M	Bottom Side	0	2593	-	1	0	23.0	22.91	-0.05	0.284	1.02	0.29
	LTE 41	QPSK20M	Left Side	0	2593	-	1	0	23.0	22.91	0.01	0.538	1.02	0.55
	LTE 41	QPSK20M	Rear Face	0	2593	-	50	0	22.0	21.96	0.08	0.625	1.01	0.63
	LTE 41	QPSK20M	Rear Face	0	2506	-	1	0	23.0	22.62	0.09	0.843	1.09	0.92
	LTE 41	QPSK20M	Rear Face	0	2680	-	1	0	23.0	22.69	0.06	0.908	1.07	0.98
10	LTE 66	QPSK20M	Rear Face	0	1745	-	1	0	22.0	21.74	-0.13	0.474	1.06	0.50
	LTE 66	QPSK20M	Bottom Side	0	1745	-	1	0	22.0	21.74	-0.05	0.185	1.06	0.20
	LTE 66	QPSK20M	Left Side	0	1745	-	1	0	22.0	21.74	-0.06	0.297	1.06	0.32
	LTE 66	QPSK20M	Rear Face	0	1745	-	50	0	21.0	20.79	-0.03	0.318	1.05	0.33
	LTE 66	QPSK20M	Rear Face	0	1720	-	1	0	22.0	21.72	0.11	0.438	1.07	0.47
	LTE 66	QPSK20M	Rear Face	0	1770	-	1	0	22.0	21.55	0.15	0.429	1.11	0.48

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Ch.	Antenna	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
11	802.11b	-	Rear Face	0	11	0	19.0	18.69	-0.13	0.366	1.07	0.39
	802.11b	-	Left Side	0	11	0	19.0	18.69	-0.05	0.132	1.07	0.14
	802.11b	-	Bottom Side	0	11	0	19.0	18.69	-0.06	0.263	1.07	0.28
	802.11b	-	Rear Face	0	1	1	18.0	17.98	-0.01	0.118	1.00	0.12
	802.11b	-	Bottom Side	0	1	1	18.0	17.98	0.11	0.096	1.00	0.10
	802.11n	HT40	Rear Face	0	6	0+1	21.0	20.91	0.14	0.101	1.02	0.10
	802.11n	HT40	Left Side	0	6	0+1	21.0	20.91	0.10	0.021	1.02	0.02
802.11n	HT40	Bottom Side	0	6	0+1	21.0	20.91	0.03	0.083	1.02	0.08	
12	802.11a	-	Rear Face	0	56	0	12.5	12.48	-0.10	0.198	1.00	0.20
	802.11a	-	Left Side	0	56	0	12.5	12.48	-0.02	0.098	1.00	0.10
	802.11a	-	Bottom Side	0	56	1	11.0	10.51	-0.05	0.113	1.12	0.13
	802.11a	-	Rear Face	0	56	1	11.0	10.51	-0.07	0.138	1.12	0.15
	802.11a	-	Bottom Side	0	56	1	11.0	10.51	-0.14	0.103	1.12	0.12
	802.11n	HT40	Rear Face	0	62	0+1	15.0	14.71	-0.18	0.127	1.07	0.14
	802.11n	HT40	Left Side	0	62	0+1	15.0	14.71	-0.13	0.067	1.07	0.07
802.11n	HT40	Bottom Side	0	62	0+1	15.0	14.71	0.02	0.084	1.07	0.09	
13	802.11a	-	Rear Face	0	100	0	12.0	11.83	-0.03	0.322	1.04	0.33
	802.11a	-	Left Side	0	100	0	12.0	11.83	-0.08	0.118	1.04	0.12
	802.11a	-	Bottom Side	0	100	1	12.5	12.13	0.01	0.192	1.09	0.21
	802.11a	-	Rear Face	0	100	1	12.5	12.13	0.15	0.215	1.09	0.23
	802.11a	-	Bottom Side	0	100	1	12.5	12.13	0.11	0.155	1.09	0.17
	802.11n	HT20	Rear Face	0	100	0+1	16.0	15.67	0.14	0.203	1.08	0.22
	802.11n	HT20	Left Side	0	100	0+1	16.0	15.67	0.17	0.108	1.08	0.12
802.11n	HT20	Bottom Side	0	100	0+1	16.0	15.67	0.14	0.134	1.08	0.14	
14	802.11a	-	Rear Face	0	149	0	11.0	10.86	0.01	0.342	1.03	0.35
	802.11a	-	Left Side	0	149	0	11.0	10.86	0.07	0.109	1.03	0.11
	802.11a	-	Bottom Side	0	149	0	11.0	10.86	0.05	0.231	1.03	0.24
	802.11a	-	Rear Face	0	149	1	12.0	11.77	0.11	0.301	1.05	0.32
	802.11a	-	Bottom Side	0	149	1	12.0	11.77	-0.14	0.218	1.05	0.23
	802.11n	HT40	Rear Face	0	159	0+1	15.0	14.56	0.09	0.284	1.11	0.31
	802.11n	HT40	Left Side	0	159	0+1	15.0	14.56	0.04	0.092	1.11	0.10
802.11n	HT40	Bottom Side	0	159	0+1	15.0	14.56	-0.03	0.199	1.11	0.22	

Note:

- SAR for LTE Band 2 (Frequency range: 1850 - 1910 MHz) is covered by LTE Band 25 (Frequency range: 1850 - 1915 MHz) due to overlapping frequency range, same maximum tune-up limit and similar channel bandwidth.
- SAR for LTE Band 4 (Frequency range: 1710 - 1755 MHz) is covered by LTE Band 66 (Frequency range: 1710 - 1780 MHz) due to overlapping frequency range, same maximum tune-up limit and similar channel bandwidth.
- SAR for LTE Band 5 (Frequency range: 824 - 849 MHz) is covered by LTE Band 26 (Frequency range: 814 - 849 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel.

4.7.3 2.4GHz 802.11g/n OFDM SAR Test Exclusion Consideration:

Modulation Mode	P _{avg} (dBm)	P _{avg} (mW)	Reported SAR (W/Kg)	Adjusted SAR (W/kg)	Limit (W/Kg)	SAR Test Exclusion
802.11b(DSSS)	18.69	73.96	0.39	/	/	/
802.11g(OFDM)	18.74	74.82	/	0.39	1.2	Yes
802.11n(OFDM)	18.0	63.10	/	0.33	1.2	Yes

Note:

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.

4.7.4 SAR Measurement Variability

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

SAR repeated measurement procedure:

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

Band	Test Position	Fr.	Original Measured SAR-1g (W/kg)	1st Repeated SAR-1g (W/kg)	L/S Ratio	2nd Repeated SAR-1g (W/kg)	L/S Ratio	3rd Repeated SAR-1g (W/kg)	L/S Ratio
LTE Band 41	Rear Face	2593	0.965	0.947	1.00	N/A	N/A	N/A	N/A

4.7.5 Simultaneous Multi-band Transmission Evaluation

<Estimated SAR Calculation>

According to KDB 447498 D01, when standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR was estimated according to following formula to result in substantially conservative SAR values of ≤ 0.4 W/kg to determine simultaneous transmission SAR test exclusion.

$$\text{Estimated SAR} = \frac{\text{Max. Tune up Power}_{(mW)}}{\text{Min. Test Separation Distance}_{(mm)}} \times \frac{\sqrt{f_{(GHz)}}}{7.5}$$

If the minimum test separation distance is < 5 mm, a distance of 5 mm is used for estimated SAR calculation. When the test separation distance is > 50 mm, the 0.4 W/kg is used for SAR-1g.

Mode / Band	Frequency (GHz)	Max. Tune-up Power (dBm)	Test Position	Separation Distance (mm)	Estimated SAR (W/kg)
BT (DSS)	2.48	4.0	Body	5	0.11

Note:

1. The separation distance is determined from the outer housing of the EUT to the user.
2. When standalone SAR testing is not required, an estimated SAR can be applied to determine simultaneous transmission SAR test exclusion.

<SAR Summation Analysis>

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of SAR_{1g} of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR_{1g} 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR_{1g} is greater than the SAR limit (SAR_{1g} 1.6 W/kg), SAR test exclusion is determined by the SPLSR.

No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
1	LTE B41 + WLAN(DTS)	Body	Rear Side	0.99	0.39	1.38	ΣSAR < 1.6, Not required
2	LTE B41 + WLAN(NII)	Body	Rear Side	0.99	0.35	1.34	ΣSAR < 1.6, Not required
3	LTE B41 + BT	Body	Rear Side	0.99	0.11	1.10	ΣSAR < 1.6, Not required

4. Calibration of Test Equipment

Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
System Validation Dipole	SPEAG	D750V3	1078	Jun. 18, 2021	1 Year
System Validation Dipole	SPEAG	D835V2	4d092	Jun. 18, 2021	1 Year
System Validation Dipole	SPEAG	D1750V2	1023	Jun. 11, 2021	1 Year
System Validation Dipole	SPEAG	D1900V2	5d142	Jun. 12, 2021	1 Year
System Validation Dipole	SPEAG	D2300V2	1004	Jan. 17, 2021	1 Year
System Validation Dipole	SPEAG	D2450V2	835	Jun. 19, 2021	1 Year
System Validation Dipole	SPEAG	D2600V2	1058	Jun. 18, 2021	1 Year
System Validation Dipole	SPEAG	D5GHzV2	1040	Jun. 10, 2021	1 Year
System Validation Dipole	SPEAG	EX3DV4	3970	Mar. 30, 2021	1 Year
Dosimetric E-Field Probe	SPEAG	DAE4	1418	Mar. 11, 2021	1 Year
Data Acquisition Electronics	Agilent	E5071B	MY42404246	May. 16, 2021	1 Year
Wideband Radio Communication Tester	Agilent	N9010A	My53470879	May. 16, 2021	1Year
ENA Series Network Analyzer	Agilent	N5181A	MY50145187	May. 17, 2021	1 Year
Signal Analyzer	Agilent	N1918A	MY54180006	May. 17, 2021	1 Year
Signal Generator	Agilent	E9304A H18	MY52050011	May. 16, 2021	1 Year
Power Meter	BOONTON	4232A	10539	May. 17, 2021	1 Year
Power Sensor	BOONTON	51011EMC	34236/34238	May. 16, 2021	1 Year
Temp. &Humi. Recorder	CLOCK	HTC-1	EE-334	May. 16, 2021	1 Year
Electronic Thermometer	FeiHong	HY	TP101	May. 17, 2021	1 Year
Coupler	Woken	0110A056020	COM27RW1A3	May. 17, 2021	1 Year

5. Measurement Uncertainty

Source of Uncertainty	Tolerance (± %)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (± %, 1g)	Standard Uncertainty (± %, 10g)	Vi
Measurement System								
Probe Calibration	6.0	Normal	1	1	1	6.05	6.05	∞
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	1.9	1.9	∞
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	3.9	3.9	∞
Linearity	4.7	Rectangular	√3	1	1	2.7	2.7	∞
Probe Modulation Response	2.4	Rectangular	√3	1	1	1.4	1.4	∞
Detection Limits	0.25	Rectangular	√3	1	1	0.14	0.14	∞
Boundary Effect	1.0	Rectangular	√3	1	1	0.6	0.6	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	∞
Response Time	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Integration Time	1.7	Rectangular	√3	1	1	1.0	1.0	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.7	1.7	∞
Probe Positioner Mech. Restrictions	0.4	Rectangular	√3	1	1	0.2	0.2	∞
Probe Positioning with Respect to Phantom Shell	2.9	Rectangular	√3	1	1	1.7	1.7	∞
Post-processing	2.0	Rectangular	√3	1	1	1.2	1.2	∞
Test Sample Related								
Device Holder Uncertainty	4.2 / 1.8	Normal	1	1	1	4.2	1.8	32
Test Sample Positioning	1.5 / 0.7	Normal	1	1	1	1.5	0.7	32
Power Scaling	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Power Drift of Measured SAR	5.0	Rectangular	√3	1	1	2.9	2.9	∞
Phantom and Setup								
Phantom Uncertainty (Shape and Thickness Tolerances)	7.2	Rectangular	√3	1	1	4.2	4.2	∞
Algorithm for Correcting SAR for Deviations in Permittivity and Conductivity	1.2 / 0.97	Normal	1	1	0.84	1.2	0.8	∞
Liquid Conductivity (Meas.)	1.0	Normal	1	0.78	0.71	0.8	0.7	25

Liquid Permittivity (Meas.)	0.5	Normal	1	0.23	0.26	0.1	0.1	25
Liquid Conductivity– Temperature Uncertainty	2.2	Rectangular	$\sqrt{3}$	0.78	0.71	1.0	0.9	∞
Liquid Permittivity– Temperature Uncertainty	1.9	Rectangular	$\sqrt{3}$	0.23	0.26	0.3	0.3	∞
Combined Standard Uncertainty						±12.1%	± 11.4 %	
Expanded Uncertainty (K=2)						±24.2%	±22.8%	

Uncertainty budget for frequency range 300 MHz to 3 GHz

Source of Uncertainty	Tolerance (± %)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (± %, 1g)	Standard Uncertainty (± %, 10g)	Vi
Measurement System								
Probe Calibration	6.55	Normal	1	1	1	6.65	6.65	∞
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	1.9	1.9	∞
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	3.9	3.9	∞
Linearity	4.7	Rectangular	√3	1	1	2.7	2.7	∞
Probe Modulation Response	2.4	Rectangular	√3	1	1	1.4	1.4	∞
Detection Limits	0.25	Rectangular	√3	1	1	0.14	0.14	∞
Boundary Effect	2.0	Rectangular	√3	1	1	1.2	1.2	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	∞
Response Time	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Integration Time	1.7	Rectangular	√3	1	1	1.0	1.0	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.7	1.7	∞
Probe Positioner Mech. Restrictions	0.4	Rectangular	√3	1	1	0.2	0.2	∞
Probe Positioning with Respect to Phantom Shell	6.7	Rectangular	√3	1	1	3.9	3.9	∞
Post-processing	4.0	Rectangular	√3	1	1	2.3	2.3	∞
Test Sample Related								
Device Holder Uncertainty	4.2 / 1.8	Normal	1	1	1	4.2	1.8	32
Test Sample Positioning	1.5 / 0.7	Normal	1	1	1	1.5	0.7	32
Power Scaling	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Power Drift of Measured SAR	5.0	Rectangular	√3	1	1	2.9	2.9	∞
Phantom and Setup								
Phantom Uncertainty (Shape and Thickness Tolerances)	7.6	Rectangular	√3	1	1	4.4	4.4	∞
Algorithm for Correcting SAR for Deviations in Permittivity and Conductivity	1.2 / 0.97	Normal	1	1	0.84	1.2	0.8	∞
Liquid Conductivity (Meas.)	1.0	Normal	1	0.78	0.71	0.8	0.7	25
Liquid Permittivity (Meas.)	0.5	Normal	1	0.23	0.26	0.1	0.1	25
Liquid Conductivity– Temperature	2.2	Rectangular	√3	0.78	0.71	1.0	0.9	∞

Uncertainty		ar						
Liquid Permittivity– Temperature Uncertainty	1.9	Rectangular	$\sqrt{3}$	0.23	0.26	0.3	0.3	∞
Combined Standard Uncertainty						±13.2%	±12.5	
Expanded Uncertainty (K=2)						±26.4%	±25.0%	

Uncertainty budget for frequency range 3 GHz to 6 GHz

6. Information on the Testing Laboratories

We, EMTEK (SHENZHEN) CO., LTD., were founded in 2000 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Site Description

EMC Lab. : **Accredited by CNAS**
The Certificate Registration Number is L2291.
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01 (identical to ISO/IEC 17025:2017)

Accredited by FCC
Designation Number: CN1204
Test Firm Registration Number: 882943

Accredited by A2LA
The Certificate Number is 4321.01.

Accredited by Industry Canada
The Conformity Assessment Body Identifier is CN0008

Name of Firm : EMTEK(SHENZHEN) CO., LTD.
Site Location : Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

If you have any comments, please feel free to contact us at the following:

Add: Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

TEL: 86-755-26954280

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Email: csg@emtek.com.cn

Web Site: www.emtek.com.cn

The road map of all our labs can be found in our web site also.

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Appendix A. SAR Plots of System Verification

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

Appendix B. SAR Plots of SAR Measurement

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

Appendix C. Calibration Certificate for Probe and Dipole

The calibration certificates are shown as follows.

Appendix D. Photographs of EUT and Setup