FCC SAR Test Report

FCC ID: M82-AIM10W

Project No.	:	1710083
Equipment	:	Computer
Model Name	:	AIM-10W, AIM-10WXXXXXXXXXXXXXXXX
Applicant	:	Advantech Co., Ltd.
Address	:	No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 11491, Taiwan, R.O.C.

Date of Receipt	:	Nov. 10, 2017
Date of Test	:	Nov. 27, 2017 ~ Jan.10, 2018
Issued Date	:	Jan. 29, 2018
Tested by	:	BTL Inc.

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Testing Laboratory
0659

Declaration

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REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCC-SAR-1-1710083	Original Issue	Jan. 29, 2018

1.. GENERAL SUMMARY

Equipment	Advantech Co., Ltd.
Brand Name	Advantech
Model Name	AIM-10W, AIM-10WXXXXXXXXXXXXXXXX
Model difference	For Different Market
Manufacturer	Advantech Co., Ltd.
Address	No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 11491, Taiwan, R.O.C.
Standard(s)	**ANSI Std C95.1-1992** Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.(IEEE Std C95.1-1991) **IEEE Std 1528-2013** Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques **KDB616217 D04** SAR for laptop and tablets v01r02 **KDB941225 D01** 3G SAR Procedures v03r01 **KDB941225 D05** SAR for LTE Devices v02r05 **KDB447498 D01** General RF Exposure Guidance v06 **KDB648474 D04** Handset SAR v01r03 **KDB248227 D01** 802. 11 Wi-Fi SAR v02r02 **KDB865664 D01** SAR measurement 100 MHz to 6 GHz v01r04 **KDB865664 D02** SAR Reporting v01r02 **KDB690783 D01** SAR Listings on Grants v01r03

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCC-SAR-1-1710083) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2.. RF EMISSIONS MEASUREMENT

2.1. TEST FACILITY

The test facilities used to collect the test data in this report is **SAR room** at the location of No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan.

2.2. MEASUREMENT UNCERTAINTY

Note:Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz,when the highest measured1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

3.. GENERAL INFORMATION

3.1.STATEMENT OF COMPLIANCE

Equipment Class	Band	Sensor Off Highest Body SAR-1g (W/kg)	Sensor On Highest Body SAR-1g (W/kg)
PCE	UMTS II	0.45	0.75
	UMTS IV	0.35	0.94
	UMTS V	0.15	0.16
	LTE 4	0.86	0.65
	LTE 5	0.11	0.16
	LTE 7	0.77	1.00
	LTE 12	0.15	0.35
	LTE 13	0.09	0.19
	LTE 25	0.41	0.73
	LTE 30	0.31	0.42
	LTE 41	0.38	0.29
DSS	Bluetooth	0.01	
DTS	2.4G WLAN	0.54	
U-NII	5.8G WLAN	0.77	
	5.2G WLAN	0.59	
	5.3G WLAN	0.58	
	5.6G WLAN	0.62	

Note:

1) * For body-worn operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal and that positions the handset a minimum of 0mm from the body. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

2) The device is in compliance with Specific Absorption Rate(SAR)for general population uncontrolled exposure limits according to the FCC rule §2.1093, the ANSI C95.1:1992/IEEE C95.1:1991, the NCRP Report Number 86 for uncontrolled environment, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013 .

3) According to TCB workshop October, 2014 RF Exposure Procedures Update (Overlapping LTE Bands): SAR for LTE Band 2 (Frequency range: 1850 - 1910 MHz) is covered by LTE Band 25 (Frequency range: 1850 - 1915 MHz) due to similar frequency range, the same maximum tune up limit and same channel bandwidth.

3.2. GENERAL DESCRIPTION OF EUT

Equipment	Computer		
Model Name	AIM-10W, AIM-10WXXXXXXXXXXXXXXXX		
IMEI Code	359073060203886		
SN	2017SEP10US011		
Modulation	GSM(GMSK/8PSK),UMTS(QPSK),LTE(QPSK/16QAM),WiFi(DSSS/OFDM),BT(GFSK/π/4-DQPSK/8-DPSK)		
Operation Frequency Range(s)	Band	TX (MHz)	RX (MHz)
	UMTS Band 2	1850~1910	1930~1990
	UMTS Band 4	1710~1755	2110~2155
	UMTS Band 5	824~849	869~894
	LTE Band 2	1850~1910	1930~1990
	LTE Band 4	1710~1755	2110~2155
	LTE Band 5	824~849	869~894
	LTE Band 7	2500~2570	2620~2690
	LTE Band 12	699~716	729~746
	LTE Band 13	777~787	746~756
	LTE Band 25	1850~1915	1930~1995
	LTE Band 30	2305~2315	2350~2360
	LTE Band 41	2496~2690	2496~2690
	Bluetooth	2402-2480	
	2.4G WIFI	2412-2462	
	5G WIFI Band I	5150-5250	
	5G WIFI Band II	5250-5350	
	5G WIFI Band III	5470-5725	
	5G WIFI Band IV	5725-5850	
HSDPA UE Category	14		
HSUPA UE Category	6		
Power Class	3, tested with power control “all 1”(UMTS Band 2/4/5)		
	3, tested with power control “all Max” (LTE Band 2/4/5/7/12/17/25/26/41)		

	Band	Channel
Test Channels (low-mid-high):	UMTS Band 2	9262-9400-9538
	UMTS Band 4	1312-1413-1513
	UMTS Band 5	4132-4182-4233
	LTE Band 2 BW=20MHz	18700-18900-19100
	LTE Band 4 BW=20MHz	20050-20175-20300
	LTE Band 5 BW=10MHz	20450-20525-20600
	LTE Band 7 BW=20MHz	20850-21100-21350
	LTE Band 12 BW=10MHz	23060-23095-23130
	LTE Band 13 BW=10MHz	23230
	LTE Band 25 BW=20MHz	26140-26365-26590
	LTE Band 30 BW=10MHz	27710
	LTE Band 41 BW=20MHz	39750-40185-40620-41055-41490
	2.4G WIFI	1-6-11
	5G WiFi Band I	36-40-44-48
	5G WiFi Band II	52-56-60-64
	5G WiFi Band III	100-104-108-112-116-132-136-140
	5G WiFi Band IV	149-153-157-161-165
	BT	0-39-78
Antenna Gain	Band	Ant Gain
	UMTS Band 2 / LTE Band 2 / LTE Band 25	-7.51 dBi
	UMTS Band 4 / LTE Band 4	-2.29 dBi
	UMTS Band 5 / LTE Band 5	-5.77 dBi
	LTE Band 7	-6.37 dBi
	LTE Band 12	-3.7 dBi
	LTE Band 13	-5.44 dBi
	LTE Band 30	-5.27 dBi
	LTE Band 41	-5.57 dBi
	2.4G WIFI / BT	1.32 dBi
	5.2G	0.32 dBi
	5.5G	-0.16 dBi
	5.8G	0.2 dBi
Other Information		
Battery	Model	F16
	Capacitance	10.8 Vdc
	Rated Voltage	2400mAh
	Manufacturer	Advantech Co., Ltd.

3.3.LABORATORY ENVIRONMENT

Temperature	Min. = 18ºC, Max. = 25ºC
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

3.4. MAIN TEST INSTRUMENTS

Item	Equipment	Manufacturer	Model	Serial No.	Cal. Date	Cal. Interval
1	E-field Probe	Speag	EX3DV4	7369	Aug. 24, 2017	1 Year
2	Data Acquisition Electronics	Speag	DAE4	1486	Aug. 17, 2017	1 Year
3	System Validation Dipole	Speag	D750V3	1145	Aug. 24, 2015	3 Year
4	System Validation Dipole	Speag	D835V2	4d199	Aug. 12, 2015	3 Year
5	System Validation Dipole	Speag	D1800V2	2d210	Aug. 13, 2015	3 Year
6	System Validation Dipole	Speag	D1900V2	5d208	Aug. 13, 2015	3 Year
7	System Validation Dipole	Speag	D2300V2	1054	Aug. 14, 2015	3 Year
8	System Validation Dipole	Speag	D2450V2	973	Aug. 14, 2015	3 Year
9	System Validation Dipole	Speag	D2600V2	1111	Aug. 14, 2015	3 Year
10	System Validation Dipole	Speag	D5GHzV2	1221	Aug. 11, 2015	3 Year
11	Oval Flat Phantom	Speag	Oval Flat Phantom ELI 5.0	1240	N/A	N/A
12	8960 Series 10 Wireless Co m Test set	Agilent	E5515E	MY53211053	Mar. 26, 2017	1 Year
13	Radio Com Analyzer	Anritsu	MT8820C	6201525878	Nov. 05, 2017	1 Year
14	ENA Network Analyzer	Agilent	E5071C	MY46102965	Mar. 26, 2017	1 Year
15	Signal Generator	R&S	SMB100A	113244	Jul. 18. 2017	1 Year
16	Spectyrm Analyzer	R&S	FSV 7 GHz	103031	Jun. 06. 2017	1 Year
17	Power Meter	Anritsu	ML2495A	1128008	Oct, 02. 2017	1 Year
18	Power Sensor	Anritsu	MA2411B	1126001	Oct. 02. 2017	1 Year
19	Power Meter	Anritsu	ML2487A	6K00004714	Sep. 11. 2017	1 Year
20	Power Sensor	Anritsu	MA2411A	34138	Sep, 11. 2017	1 Year
21	Dielectric Assessment Kit	Speag	DAK-3.5	1226	Nov. 09. 2015	N/A
22	Dielectric Probe Kit	Agilent	85070E	2593	N/A	N/A
23	Low pass filter	Mini-Circuits	SLP-2950+	M108294	N/A	N/A
24	Power Amplifier	Mini-Circuits	ZVE-2W-272+	N650001538	N/A	Note 1
25	Power Amplifier	Mini-Circuits	ZVE-8G+	N628801631	N/A	Note 1
26	Attenuator	Worken	WFA0602-10	SA10-01	N/A	N/A
27	Attenuator	Worken	WFA0602-10	SA10-02	N/A	N/A
28	Attenuator	Worken	WFA0602-3	SA3-01	N/A	N/A
29	Dual directional coupler	Woken	0110A05601O-10	DOM5CIW3E2	N/A	Note 1

Note:
1.” N/A” denotes no model name,serial No. orcalibration specified.
2.
1) Per KDB865664 D01 requirements for dipole calibration, the test laboratory has adopted three-year extended calibration interval. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.
a) There is no physical damage on the dipole;
b) System check with specific dipole is within 10% of calibrated value;
c) The most recent return-loss result , measured at least annually, deviates by no more than 20% from the previous measurement;
d) The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 5Ω from the previous measurement.

2) Network analyzer probe calibration against air, distilled water and a short block performed before measuring liquid parameters.

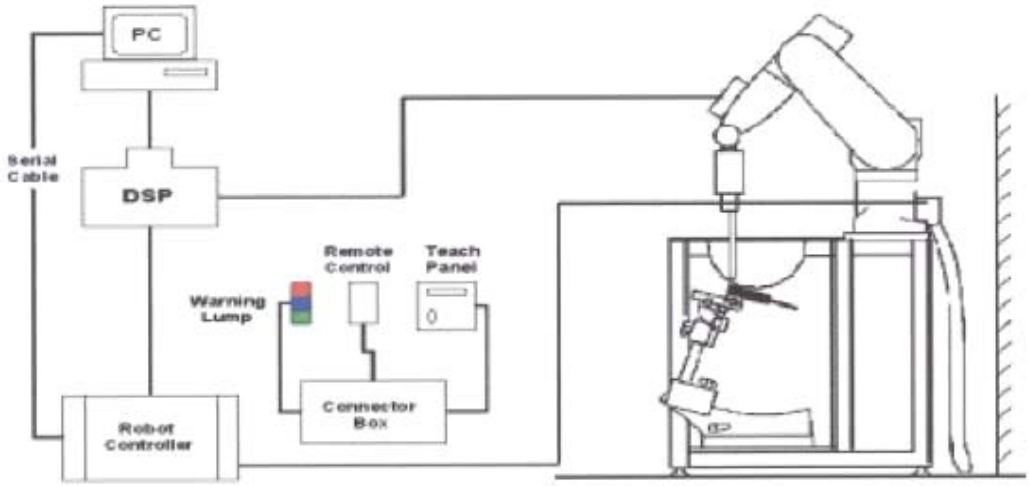
4..SAR MEASUREMENTS SYSTEM CONFIGURATION

4.1.SAR MEASUREMENT SET-UP

The DASY5 system for performing compliance tests consists of the following items:

1. A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. A dissymmetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
3. A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
4. A unit to operate the optical surface detector which is connected to the EOC.
5. The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.
6. TheDASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 7
7. DASY5 software and SEMCAD data evaluation software.
8. Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
9. The generic twin phantom enabling the testing of left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. System validation dipoles allowing to validate the proper functioning of the system.

4.1.1.Test Setup Layout



4.2.DASY5E-FIELDPROBESYSTEM

The SAR measurements were conducted with the dosimetric probe EX3DV4(manufactured by SPEAG),designed in the classical triangular configuration and optimized for dosimetric evaluation.

4.2.1.EX3DV4 PROBE SPECIFICATION

Construction	Symmetrical design with triangular core Inter leaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 μW/g to > 100 mW/g Linearity:± 0.2dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Distance from probe tip to dipole centers: 1.0 mm

EX3DV4 E-field Probe

4.2.2.E-FIELD PROBE CALIBRATION

Eachprobeiscalibratedaccordingtoadosimetricassessmentprocedurewithaccuracybetterthan±10 %.The spherical isotropy was evaluatedandfoundtobebetterthan±0.25dB.The sensitivity parameters (NormX,NormY,NormZ),the diode compression parameter (DCP) and the conversion factor(ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$\mathbf{SAR} = \mathbf{C}\frac{\Delta T}{\Delta t}$$

Where: Δt=Exposure time(30 seconds),

C =Heat capacity of tissue (brain or muscle),

ΔT=Temperature increase due to RF exposure.

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

Where:σ=Simulated tissue conductivity,

ρ=Tissue density (kg/m3).

4.2.3.OTHER TEST EQUIPMENT

4.2.3.1. Device Holder for Transmitters

Construction: Simple but effect tiveandeasy-to-use extension for Mounting Device that facilitates the testing of larger devices(e.g.,laptops,cameras,etc.)It is light weight and fit sassily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the TwinSAM, ELI4and SAM v6.0Phantoms.
Material: POM, Acrylic glass,Foam

4.2.3.2 Phantom

Model	ELI4 Phantom	
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.	
Shell Thickness	2±0.1 mm	
Filling Volume	Approx. 30 liters	
Dimensions	Length: 600 mm ; Width: 190mm Height: adjustable feet	
Available	Special	

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.	
Shell Thickness	2 ± 0.2 mm	
Filling Volume	Approx. 25 liters	
Dimensions	Length:1000mm; Width: 500mm Height: adjustable feet	
Available	Special	

4.2.4.SCANNING PROCEDURE

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT’s output power and should vary max. ± 5 %.

The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparingthe results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in theliquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). Top revent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is spec if idwith each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

- Area Scan

The “area scan” measures the SAR above the DUT or verification dipole on a parallel plane to the surface. It is used to locate the approximate location of the peak SAR with 2D spline interpolation. The robot performs a stepped movement along one grid axis while the local electrical field strength is measured by the probe. The probe is touching the surface of the SAM during acquisition of measurement values. The standard scan uses large grid spacing for faster measurement.

Standard grid spacing for head measurements is 15 mm in x- and y- dimension(⩽2GHz) , 12 mm inx- and y- dimension(2-4 GHz) and 10mm in x- and y- dimension(4-6GHz). If a finer resolution is needed, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result. For special applications where the standard scan method does not find the peak SAR within the grid, e.g. mobile phones with flip cover, the grid can be adapted in orientation.

- Zoom Scan

A “zoom scan” measures the field in a volume around the 2D peak SAR value acquired in the previous “coarse” scan. This is a fine grid with maximum scan spatial resolution: Δx_{zoom}, Δy_{zoom}⩽ 2GHz -⩽8mm, 2-4GHz -⩽5 mm and 4-6 GHz-⩽4mm; Δz_{zoom}⩽3GHz -⩽5 mm, 3-4 GHz-⩽4mm and 4-6GHz-⩽2mm where the robot additionally moves the probe along the z-axis away from thebottom of the Phantom. DASY is also able to perform repeated zoom scans if more than 1 peak is found during area scan. In this document, the evaluated peak 1g and 10g averaged SAR values are shown in the 2D-graphics in Appendix B. Test results relevant for the specified standard (see chapter 1.4.)are shown in table form form in chapter 7.2.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube scan. The probe is moved away in z-direction from the bottom of the SAMphantom in 2 mm steps. This measurement shows the continuity of the liquid and can - depending inthe field strength – also show the liquid depth.

The following table summarizes the area scan and zoom scan resolutions per FCC KDB 865664D01:

Frequency	Maximun Area Scan resolution (Δx_{area}, Δy_{area})	Maximun Zoom Scan spatial resolution (Δx_{Zoom}, Δy_{Zoom})	Maximun Zoom Scan spatial resolution			Minimum zoom scan volume (x,y,z)
			Uniform Grid	Graded Grad		
			$\Delta z_{Zoom}(n)$	$\Delta z_{Zoom}(1)$*	$\Delta z_{Zoom}(n>1)$*	
≤2GHz	≤15mm	≤8mm	≤5mm	≤4mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥30mm
2-3GHz	≤12mm	≤5mm	≤5mm	≤4mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥30mm
3-4GHz	≤12mm	≤5mm	≤4mm	≤3mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥28mm
4-5GHz	≤10mm	≤4mm	≤3mm	≤2.5mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥25mm
5-6GHz	≤10mm	≤4mm	≤2mm	≤2mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥22mm

4.2.5.SPATIAL PEAK SAR EVALUATION

The spatial peak SAR - value for 1 and 10 g is evaluated after the Cube measurements have been done.The basis of the evaluation are the SAR values measured at the points of the fine cube grid consisting of 5 x 5 x 7 points(with 8mm horizontal resolution) or 7 x 7 x 7 points(with 5mm horizontal resolution) or 8 x 8 x 7 points(with 4mm horizontal resolution). The algorithm that finds the maximal averaged volume is separated into three different stages.

- The data between the dipole center of the probe and the surface of the phantom are extrapolated. This data cannot be measured since the center of the dipole is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is about 1 mm (see probe calibration sheet). The extrapolated data from a cube measurement can be visualized by selecting “Graph Evaluated”.
- The maximum interpolated value is searched with a straight-forward algorithm. Around this maximum the SAR - values averaged over the spatial volumes (1g or 10 g) are computed using the 3d-spline interpolation algorithm. If the volume cannot be evaluated (i.e., if a part of the grid was cut off by the boundary of the measurement area) the evaluation will be started on the corners of the bottom plane of the cube.
- All neighboring volumes are evaluated until no neighboring volume with a higher average value is found.

Extrapolation

The extrapolation is based on a least square algorithm [W. Gander, Computermathematik,p.168-180]. Through the points in the first 3 cm along the z-axis, polynomials of order four are calculated. These polynomials are then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1 mm from each other.

Interpolation

The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a knot"-condition [W. Gander, Computermathematik, p.141-150] (x, y and z -direction) [Numerical Recipes in C, Second Edition, p.123ff].

Volume Averaging

At First the size of the cube is calculated. Then the volume is integrated with the trapezoidal algorithm. 8000 points (20x20x20) are interpolated to calculate the average.

Advanced Extrapolation

DASY5 uses the advanced extrapolation option which is able to compansate boundary effects on E-field probes.

4.2.6.DATA STORAGE AND EVALUATION

4.2.5.1Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension “.DAE4”. The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

4.2.7.Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	Sensitivity	Normi, a_{i0}, a_{i1},a_{i2}
	Conversionfactor	$ConvF_i$
	Diode compression point	Dcp_i
Device parameters:	Frequency	f
	Crestfactor	cf
Media parameters:	Conductivity	·
	Density	·

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf / dcp_i$$

With	V_i= compensated signal of channeli	(i = x,y,z)
	U_i= input signal of channel i	(i = x, y,z)
	cf=crestfactorofexciting field	(DASY parameter)
	dcp_i=diode compressionpoint	(DASYparameter)

Fromthe compensated input signals the primary field data for each channel can be evaluated:

E-field probes: $E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$

H-field probes: $H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1} f + a_{i2} f^2) / f$

With V_i= compensated signal of channeli (i = x,y,z)

$Norm_i$= sensor sensitivityof channel i (i = x, y,z)
[mV/(V/m)^2]for E-field Probes

ConvF = sensitivity enhancement in solution

aij=sensorsensitivityfactorsfor H-field probes

f=carrier frequency [GHz]

E_i=electric fieldstrength of channel i in V/m

H_i= magnetic field strength ofchannel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = (E_X^2 + E_Y^2 + E_Z^2)^{1/2}$$

The primary field data are used to calculate the derived field units.

$$SAR = (E_{tot})^2 \cdot \sigma / (\rho \cdot 1000)$$

With SAR=local specific absorption rateinmW/g

E_{tot}=total field strength in V/m
=conductivity in[mho/m]or[Siemens/m]
=equivalent tissue densityin g/cm^3

Note that the density is normally set to 1(or1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}^2 / 3770 \text{ or } P_{pwe} = H_{tot}^2 \cdot 37.7$$

With P_{pwe}= equivalent power density of a plane wave in mW/cm^2

E_{tot}=total field strength in V/m

H_{tot}=total magnetic field strength in A/m

5.. SYSTEM VERIFICATION PROCEDURE

5.1. TISSUE VERIFICATION

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectic parameter are within the tolerances of the specified target values. The measured conductivity and relative permittivity should be within ± 5% of the target values.

The following materials are used for producing the tissue-equivalent materials.

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
Body 750	0.2	-	0.2	0.8	48.8	-	50.0	-
Body 835	0.2	-	0.2	0.9	48.5	-	50.2	-
Body 1750	-	31.0	-	0.2	-	-	68.8	-
Body 1900	-	29.5	-	0.3	-	-	70.2	-
Body 2000	-	30.0	-	0.2	-	-	69.8	-
Body 2450	-	31.4	-	0.1	-	-	68.5	-
Body 2600	-	31.8	-	0.1	-	-	68.1	-
Body 5G	-	-	-	-	-	10.7	78.6	10.7

Salt: 99+% Pure Sodium Chloride; Sugar: 98+% Pure Sucrose; Water: De-ionized, 16M + resistivity
HEC: Hydroxyethyl Cellulose; DGBE: 99+% Di(ethylene glycol) butyl ether,[2-(2-butoxyethoxy)ethanol]
Triton X-100(ultra pure): Polyethylene glycol mono [4-(1,1,3,3-tetramethylbutyl)phenyl]ether

Tissue Verification									
Tissue Type	Frequency (MHz)	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (εr)	Targeted Conductivity (σ)	Targeted Permittivity (εr)	Deviation Conductivity (σ) (%)	Deviation Permittivity (εr) (%)	Date
Body	750	21.9	0.974	55.909	0.96	55.5	1.46	0.74	Nov. 28, 2017
Body	750	22.1	0.966	55.257	0.96	55.5	0.63	-0.44	Dec. 01, 2017
Body	835	22.5	0.976	55.240	0.97	55.2	0.62	0.07	Nov. 28, 2017
Body	835	22.2	0.994	56.023	0.97	55.2	2.47	1.49	Dec. 01, 2017
Body	835	21.8	0.984	54.419	0.97	55.2	1.44	-1.41	Jan. 02, 2018
Body	1800	22.1	1.577	52.296	1.52	53.3	3.75	-1.88	Nov. 27, 2017
Body	1800	22.0	1.532	52.220	1.52	53.3	0.79	-2.03	Nov. 30, 2017
Body	1900	21.8	1.554	51.802	1.52	53.3	2.24	-2.81	Nov. 27, 2017
Body	1900	21.6	1.550	52.041	1.52	53.3	1.97	-2.36	Nov. 30, 2017
Body	2300	22.2	1.769	52.629	1.81	52.9	-2.27	-0.51	Nov. 24, 2017
Body	2300	21.9	1.854	51.810	1.81	52.9	2.43	-2.06	Dec. 04, 2017
Body	2450	22.1	1.990	51.538	1.95	52.7	2.05	-2.20	Dec. 13, 2017
Body	2450	22.0	1.950	50.730	1.95	52.7	0.00	-3.74	Jan. 10, 2018
Body	2600	22.5	2.207	52.283	2.16	52.5	2.18	-0.41	Nov. 24, 2017
Body	2600	22.0	2.210	52.420	2.16	52.5	2.31	-0.15	Dec. 04, 2017
Body	5200	21.9	5.118	50.009	5.30	49.0	-3.43	2.06	Jan. 09, 2018
Body	5300	21.9	5.262	49.770	5.42	48.9	-2.92	1.78	Jan. 09, 2018
Body	5600	22.0	5.695	48.766	5.77	48.5	-1.30	0.55	Jan. 10, 2018
Body	5800	22.0	5.990	48.355	6.00	48.2	-0.17	0.32	Jan. 10, 2018

Note:
1)The dielectric parameters of the tissue-equivalent liquid should be measured under similar ambient conditions and within 2 °C of the conditions expected during the SAR evaluation to satisfy protocol requirements.
2)KDB 865664 was ensured to be applied for probe calibration frequencies greater than or equal to 50MHz of the EUT frequencies.
3)The above measured tissue parameters were used in the DASY software to perform interpolation via the DASY software to determine actual dielectric parameters at the test frequencies. The SAR test plots may slightly differ from the table above since the DASY rounds to three significant digits.

5.2. SYSTEM CHECK

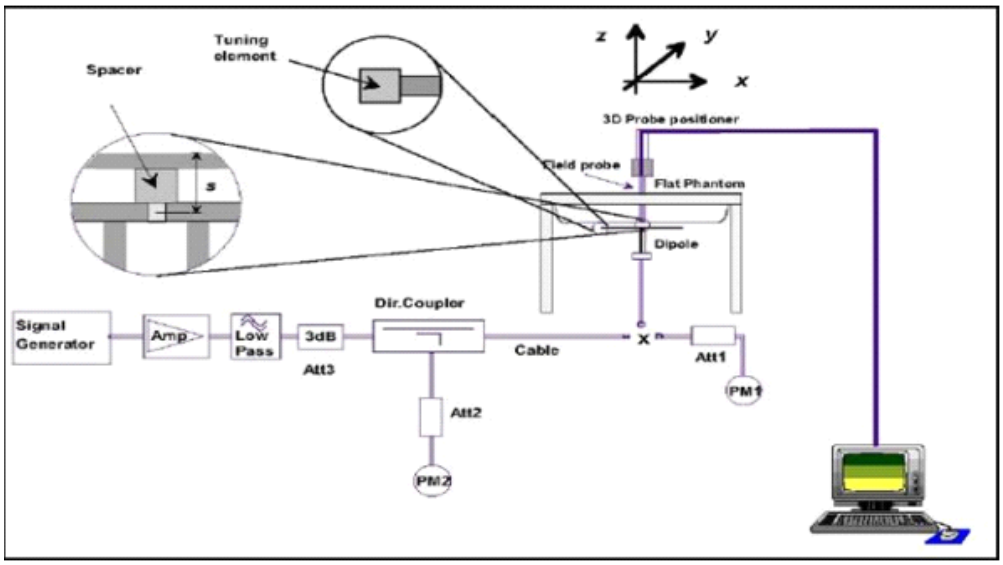
The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE P1528 (described above). The following table shows system check results for all frequency bands and tissue liquids used during the tests.

System Check	Frequency (MHz)	Date	Targeted SAR-1g (W/kg)	Measured SAR-1g (W/kg)	normalized SAR-1g (W/kg)	Deviation (%)	Dipole S/N
Body	750	Nov. 28, 2017	8.60	2.24	8.96	4.19	1145
Body	750	Dec. 01, 2017	8.60	2.22	8.88	3.26	1145
Body	835	Nov. 28, 2017	9.43	2.25	9.00	-4.56	4d199
Body	835	Dec. 01, 2017	9.43	2.29	9.16	-2.86	4d199
Body	835	Jan. 02, 2018	9.43	2.27	9.08	-3.71	4d199
Body	1800	Nov. 27, 2017	37.20	9.77	39.08	5.05	2d210
Body	1800	Nov. 30, 2017	37.20	9.50	38.00	2.15	2d210
Body	1900	Nov. 27, 2017	40.40	10.40	41.60	2.97	5d208
Body	1900	Nov. 30, 2017	40.40	10.70	42.80	5.94	5d208
Body	2300	Nov. 24, 2017	48.50	12.80	51.20	5.57	1054
Body	2300	Dec. 04, 2017	48.50	12.60	50.40	3.92	1054
Body	2450	Dec. 13, 2017	51.70	13.10	52.40	1.35	973
Body	2450	Jan. 10, 2018	51.70	12.40	49.60	-4.06	973
Body	2600	Nov. 24, 2017	57.20	13.40	53.60	-6.29	1111
Body	2600	Dec. 04, 2017	57.20	13.60	54.40	-4.90	1111
Body	5200	Jan. 09, 2018	74.70	7.44	74.40	-0.40	1160
Body	5300	Jan. 09, 2018	75.80	7.51	75.10	-0.92	1160
Body	5600	Jan. 10, 2018	80.60	7.92	79.20	-1.74	1160
Body	5800	Jan. 10, 2018	77.70	7.79	77.90	0.26	1160

5.3. SYSTEM CHECK PROCEDURE

The system check is performed by using a system check dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a plexiglass spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 250 mW(below 5GHz) or 100mW(above 5GHz). To adjust this power a power meter is used. The power sensor is connected to the cable before the system check to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the system check to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test.

System check results have to be equal or near the values determined during dipole calibration (target SAR in table above) with the relevant liquids and test system(±10 %).



6..SAR MEASUREMENT VARIABILITY AND UNCERTAINTY

6.1.SAR MEASUREMENT VARIABILITY

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. The 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.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
2) When the original highest measured SAR is ⩾ 0.80 W/kg, repeat that measurement once.
3) Perform a second repeated measurement only 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 (~ 10% from the 1-g SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ⩾1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeatedmeasurements is > 1.20.

The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

The detailed repeated measurement results are shown in Section 8.2.

7..OPERATIONAL CONDITIONS DURING TEST

7.1.SAR TEST CONFIGURATION

7.1.1.UMTS TEST CONFIGURATION

1. Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the procedures description in section 5.2 of 3GPP TS 34.121,using the appropriate RMC or AMR with TPC(transmit power control) set to all “1s” for WCDMA/HSDPA or applying the required inner loop power control procedure to maintain maximum output power while HSUPA is active. Result for all applicable physical channel configurations(DPCCH,DPDCHn and spreading codes, HSDPA, HSPA)
Should be tabulated in the SAR report .All configuration that are not supported by the DUT or cannot be measured due to technical or equipment limitation should be clearly identified.

2. WCDMA

(1).Head SAR Measurements
SAR for Head exposure configurations in voice mode is measured using a 12.2 kbps RMC with TPC bits configured to all “1s”. SAR in AMR configurations is not required when the maximum average output of each RF channel for 12.2 kbps AMR is less than ¼ dB higher than that measured in 12.2 kbps RMC.Otherwise SAR is measured on the maximum output channel in 12.2 kbps AMR with 3.4kbps SRB(signalling radio bearer) using the exposure configuration that results in the highest SAR in12.2kbps RMC for that RF channel.

(2).Body SAR Measurements
SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits configured to all “1s”. SAR for other spreading codes and multiple DPDCHn, when supported by the EUT, are not required when the maximum average outputs of each RF channel, for each spreading code and DPDCHn configuration, are less than ¼ dB higher than those measured in 12.2 kbps RMC.

3. HSDPA

SAR for body exposure configurations is measured according to the “Body SAR Measurements"" procedures of 3G device. In addition, body SAR is also measured for HSDPA when the maximum average outputs of each RF channel with HSDPA active is at ¼ dB higher than that measured without HSDPA using 12.2kbps RMC or the maximum SAR 12.2kbps RMC is above 75% of the SAR limit. Body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2 kbps RMC without HSDPA.
HSDPA should be configured according to UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HAPRQ 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 condition, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. The β_c and β_d gain factors for DPCCH and DPDCH were set according to the values in the below table, β_{hs} for HS-DPCCH is set automatically to the correct value when △ACK, △NACK, △CQI = 8. The variation of the β_c /β_d ratio causes a power reduction at sub-tests 2 - 4.

Sub-test	β_c	β_d	β_d (SF)	β_c /β_d	β_{hs} (1)	CM(dB)(2)	MPR (dB)
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: △ACK, △NACK and △CQI = 8 $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$
Note 2 : CM=1 for β_c/β_d= 12/15, β_{hs}/β_c = 24/15. For all other combinations of DPDCH,DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.
Note 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 signalled gain factors for the reference TFC (TF1,TF1) to β_c = 11/15 and β_d = 15/15

The measurements were performed with a Fixed Reference Channel (FRC) and H-Set 1 QPSK.

Settings of required H-Set 1 QPSK acc. to 3GPP 34.121

Parameter	Value
Nominal average inf. bit rate	534 kbit/s
Inter-TTI Distance	3 TTI"s
Number of HARQ Processes	2 Processes
Information Bit Payload	3202 Bits
MAC-d PDU size	336 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	4800 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	9600 SMLs
Coding Rate	0.67
Number of Physical Channel Codes	5

HSDPA UE category

HS-DSCH Category	Maximum HS-DSCH Codes Received	Minimum Inter-TTI Interval	Maximum HS-DSCH Transport Block Bits/HS-DSCH TTI	Total Soft Channel Bits
1	5	3	7298	19200
2	5	3	7298	28800
3	5	2	7298	28800
4	5	2	7298	38400
5	5	1	7298	57600
6	5	1	7298	67200
7	10	1	14411	115200
8	10	1	14411	134400
9	15	1	25251	172800
10	15	1	27952	172800
11	5	2	3630	14400
12	5	1	3630	28800
13	15	1	34800	259200
14	15	1	42196	259200
15	15	1	23370	345600
16	15	1	27952	345600

4. HSUPA

SAR for Body exposure configurations is measured according to the “Body SAR Measurements” procedures of 3G device. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤¼ 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 primary mode and the adjusted SAR is ≤ 1.2W/kg, SAR measurement is not required for the secondary mode.

Per KDB941225 D01, the 3G SAR test reduction procedures is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures for the highest reported body exposure SAR configuration in 12.2 kbps RMC.

Due to inner loop power control requirements in HSUPA, a commercial communication test set should be used for the output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSDPA should be configured according to the values indicated below as well as other applicable procedures described in the “WCDMA Handset“ and „Release 5 HSDPA Data Device”sections of 3G device.

Subtests for WCDMA Release 6 HSUPA

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

Note 1: Δ ACK, Δ NACK and Δ CQI = 8 $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$

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 signalled 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 signalled 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} can not be set directly; it is set by Absolute Grant Value.

HSUPA UE category

UE E-DCH Category	Maximum E-DCH Codes Transmitted	Number of HARQ Processes	E-DCH TTI(ms)	Minimum Speading Factor	Maximum E-DCH Transport Block Bits	Max Rate (Mbps)
1	1	4	10	4	7110	0.7296
2	2	8	2	4	2798	1.4592
	2	4	10	4	14484	
3	2	4	10	4	14484	1.4592
4	2	8	2	2	5772	2.9185
	2	4	10	2	20000	2.00
5	2	4	10	2	20000	2.00
6 (No DPDCH)	4	8	10	2SF2&2SF4	11484	5.76
	4	4	2		20000	2.00
7 (No DPDCH)	4	8	2	2SF2&2SF4	22996	?
	4	4	10		20000	?

NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4.UE categories 1 to 6 support QPSK only. UE category 7 supports QPSK and 16QAM.(TS25.306-7.3.0).

7.1.2. LTE TEST CONFIGURATION

SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices. The CMW500 WideBand Radio Communication Tester was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing.SAR test were performed with the same number of RB and RB offsets transmitting on all TTI frames(Maximum TTI)

1. Spectrum Plots for RB configurations

A properly configured base station simulator was used for LTE output power measurements and SAR testing.Therefore, spectrum plots for RB configurations were not required to be included in this report.

2. MPR

When MPR is implemented permanently within the UE, regardless of network requirements, only those RB configurations allowed by 3GPP for the channel bandwidth and modulation combinations may be tested with MPR active. Configurations with RB allocations less than the RB thresholds required by 3GPP must be tested without MPR.
The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101:

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

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

3. A-MPR

A-MPR(Additional MPR) has been disabled for all SAR tests by using Network Signalling Value of “NS_01”on the base station simulator.

4. LTE procedures for SAR testing

A) Largest channel bandwidth standalone SAR test requirements

i) QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; 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.

ii) QPSK with 50% RB allocation

The procedures required for 1 RB allocation in i) are applied to measure the SAR for QPSK with 50% RB allocation

iii) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in i) and ii) 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.

iv) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

B) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ 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.

LTE (TDD) Test Configuration

TDD LTE Band 41supports 3GPP TS 36for Time-Division Duplex (TDD) systems, SAR must be tested using a fixedperiodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDDconfigurations.
TDD LTE Band 41supports 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations andTable 4.2-1 for Special subframe configurations.

Figure 4.2-1: Frame structure type 2

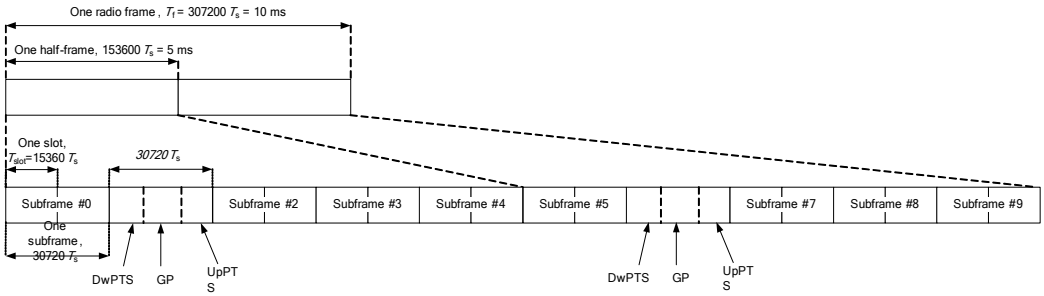


Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

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

Table 4.2-2: Uplink-downlink configurations

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

According to Figure 4.2-1, one radio frame is configured by 10 subframes, which consist of Uplink-subframe, Downlink-subframe and Special subframe. For TDD-LTE, the Duty Cycle should be calculated on Uplink-subframes and Special subframes, due to Special subframecontaining both Uplink transmissions. So for one radio frame, Duty Cycle can be calculated with formula as below. The count of Uplink subframes are according to Table 4.2-2:

Dutycycle =(30720Ts*Ups+Uplink Component*Specials)/(307200Ts)

About the uplink component of Special subframes, we can figure out by Table 4.2-1:

Uplink Component=UpPTS

In conclusion, for the TDD LTE Band 41, Duty Cycle can be calculated with formula as below .all these sets are ok when we test, or we can set as below.

Dutycycle =[(30720Ts*Ups)+UpPTS *Specials]/(307200Ts)

And we can get different Duty cycles under different configurations:

Uplink-downlink configuratin	Subframe number			Configuration of special subframe							
				Normal cyclic prefix in downlink				Extended cyclic prefix in downlink			
				Normal cyclic prefix in uplink		Extended cyclic prefix in uplink		Normal cyclic prefix in uplink		Extended cyclic prefix in uplink	
	D	S	U	configuration 0-4	configuration 5-9	configuration 0-4	configuration 5-9	configuration 0-3	configuration 4-7	configuration 0-3	configuration
0	2	2	6	61.43%	62.85%	61.67%	63.33%	61.43%	62.85%	61.67%	63.33%
1	4	2	4	41.43%	42.85%	41.67%	43.33%	41.43%	42.85%	41.67%	43.33%
2	6	2	2	21.43%	22.85%	21.67%	23.33%	21.43%	22.85%	21.67%	23.33%
3	6	1	3	30.71%	31.43%	30.83%	31.67%	30.71%	31.43%	30.83%	31.67%
4	7	1	2	20.71%	21.43%	20.83%	21.67%	20.71%	21.43%	20.83%	21.67%
5	8	1	1	10.71%	11.43%	10.83%	11.67%	10.71%	11.43%	10.83%	11.67%
6	3	2	5	51.43%	52.85%	51.67%	53.33%	51.43%	52.85%	51.67%	53.33%

For TDD LTE, SAR should be tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7 for Frame structure type 2.

7.1.3.WIFI TEST CONFIGURATION

For WLAN SAR testing, WLAN engineering testing software installed on the DUT can providecontinuous transmitting RF signal.

2.4G

Mode	802.11b	802.11g	802.11n HT20
Duty cycle	100%		
Crest factor	1		

5G

Mode	802.11a	802.11n HT20	802.11ac VHT80
Duty cycle	100%		
Crest factor	1		

For WiFi SAR testing, a communication link is set up with the test mode software for WiFi mode test. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. The RF signal utilized in SAR measurement has 100% duty cycle and its crest factor is 1. The test procedures in KDB 248227 D01 are applied.

7.1.4.1 2.4G SAR Test Requirements

802.11b DSSS SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
2) When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied. SAR is not required for the following 2.4 GHz OFDM conditions.

1) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
2) 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.

SAR Test Requirements for OFDM configurations

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, each standalone And frequency aggregated band is considered separately for SAR test reduction. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

7.1.4.2 5G SAR Test Requirements

✧ **U-NII-1 and U-NII-2A Band**

For devices that operate in both U-NII-1 and U-NII-2A bands, 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); otherwise, both bands are tested independently for SAR. 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; otherwise, both bands are tested independently for SAR.

✧ **U-NII-2C, U-NII-3 Bands**

The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, the channels at 5.60 – 5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification.

Unless band gap channels are permanently disabled, they must be considered for SAR testing. To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz may be grouped with the 5.8 GHz channels in U-NII-3 or §15.247 band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels.11 When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

7.1.4.3 OFDM transmission mode and SAR test channel selection

For the 2.4GHz and 5GHz bands, when the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations(for example 802.11a,802.11n and 802.11ac,or 802.11g and 802.11n,with the same channel bandwidth, modulation, and data rate, etc.),the lower order 802.11 mode(i.e.802.11a then 802.11n and 802.11ac,or 802.11g then 802.11n) is used for SAR measurement. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

7.1.4.4 Initial test configuration procedure

For OFDM, in both 2.4G and 5GHz bands, an initial test configuration is determined for each frequency band and aggregated band,according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, and lowest data rate. If the average RF output powers of the highest identical transmission modes are within 0.25 dB of each other, mid channel of the transmission mode with highest average RF output powers is the initial test channel. Otherwise, the channel of the transmission mode with the highest average RF output power will be the initial test configuration.

When the reported SAR is≤ 0.8 W/kg, no additional measurements on other test channels are required. Otherwise, SARis evaluated using the subsequent highest average RF output channel until the reported SAR result is ≤1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurement.

7.2.SAR SENSOR WORKING

When the sensor is active，the active distance as below：

ANT	Test Position	Active distance（mm）
PCB	Rear Face	10
	Right Side	10

The SAR power reduce as below：

Band	Sensor Off _ High Power		Sensor on _ Low Power		Reduce power（dBm）
	Target Power (dBm)	Tolerance (dBm)	Target Power (dBm)	Tolerance (dBm)	
UMTS Band 2	22.0	±2	17.5	±2	4.5
UMTS Band 4	22.0	±2	17.5	±2	4.5
UMTS Band 5	22.0	±2	18.0	±2	4
LTE Band 2	22.0	±2	17.5	±2	4.5
LTE Band 4	22.0	±2	18.0	±2	4
LTE Band 5	22.0	±2	18.0	±2	4
LTE Band 7	21.0	±2	16.5	±2	4.5
LTE Band 12	22.0	±2	18.0	±2	4
LTE Band 13	22.0	±2	17.5	±2	4.5
LTE Band 25	22.0	±2	17.5	±2	4.5
LTE Band 30	21.0	±2	17.0	±2	4
LTE Band 41	21.0	±2	17.0	±2	4

Note:
1. The UMTS reduce power refers to the power of RMC12.2K.
2. The LTE reduce power refers to the power of QPSK/1RB
3. The sensor can only be triggered at the rear face and top side.

7.3.POWER REDUCTION BY PROXIMITY SENSOR

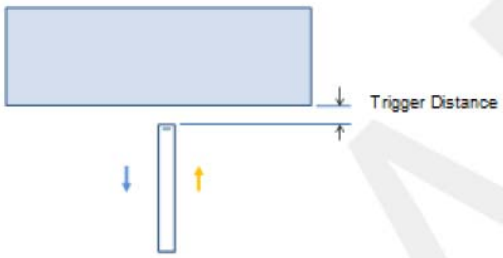
7.3.1 Proximity Sensor Triggering Distance

The bottom of the DUT was placed directly below the flat phantom. The DUT was moved toward the phantom in accordance with the steps outlined in KDB 616217 §6.2 to determine the trigger distance for enabling power reduction. The DUT was moved away from the phantom to determine the trigger distance for resuming full power.

The measurement was then repeated for the Rear surface.

The DUT featured a sound indicator on its player that showed the status of the proximity sensor (Triggered or not triggered). This was used to determine the status of the sensor during the proximity sensor assessment as monitoring the output power directly was not practical without affecting the measurement.

It was confirmed separately that the output power was altered according to the proximity sensor status indication. This was achieved by observing the proximity sensor status at the same time as monitoring the conducted power. Section 9 contains both the full and reduced conducted power measurements.



Proximity Sensor Trigger Distance Assessment
KDB 616219 §6.2, Edge 1

Proximity Sensor Trigger Distance Assessment
KDB 616219 §6.2, Rear

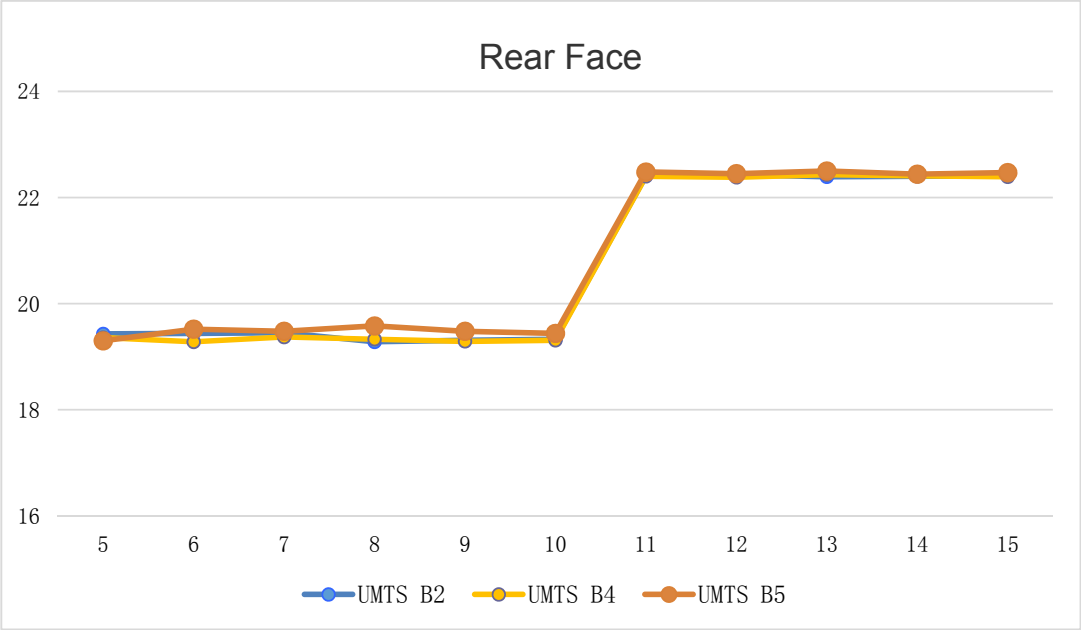
LEGEND

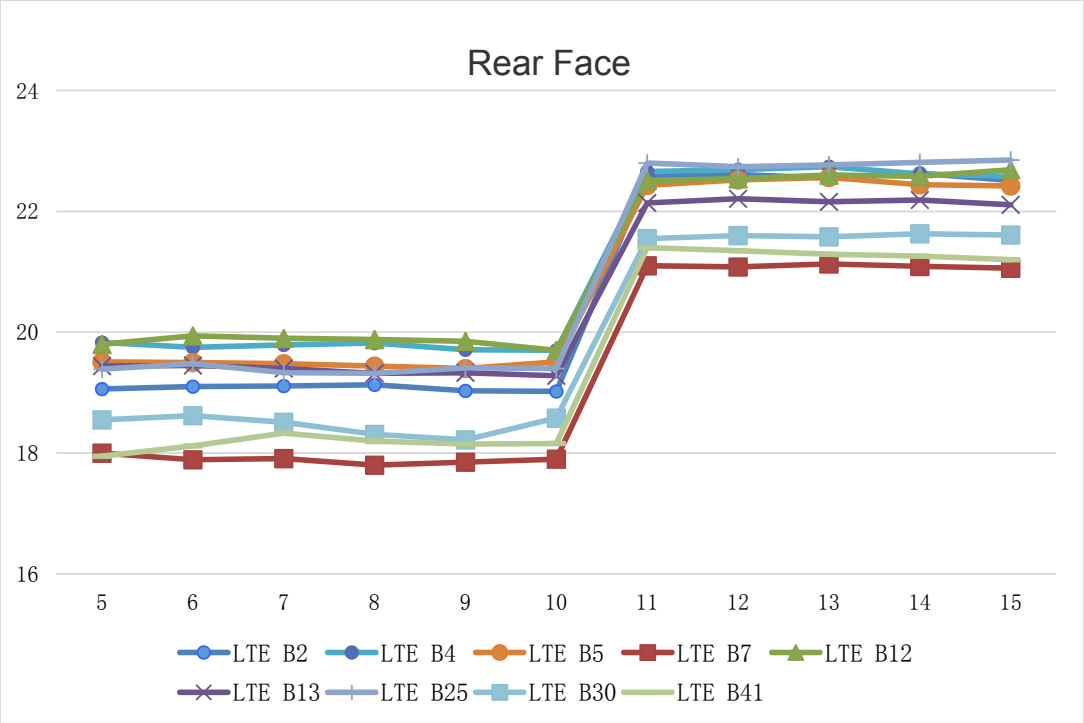
→ Direction of DUT travel for determination of power reduction triggering point

→ Direction of DUT travel for determination of full power resumption triggering point

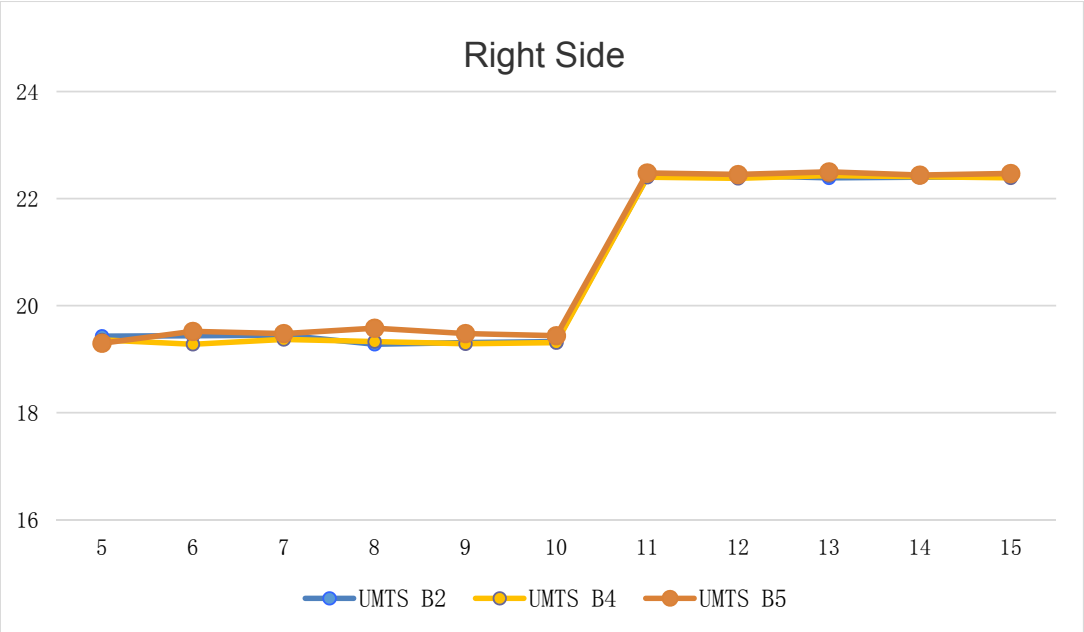
Proximity Sensor Triggering Distance Measurement Results

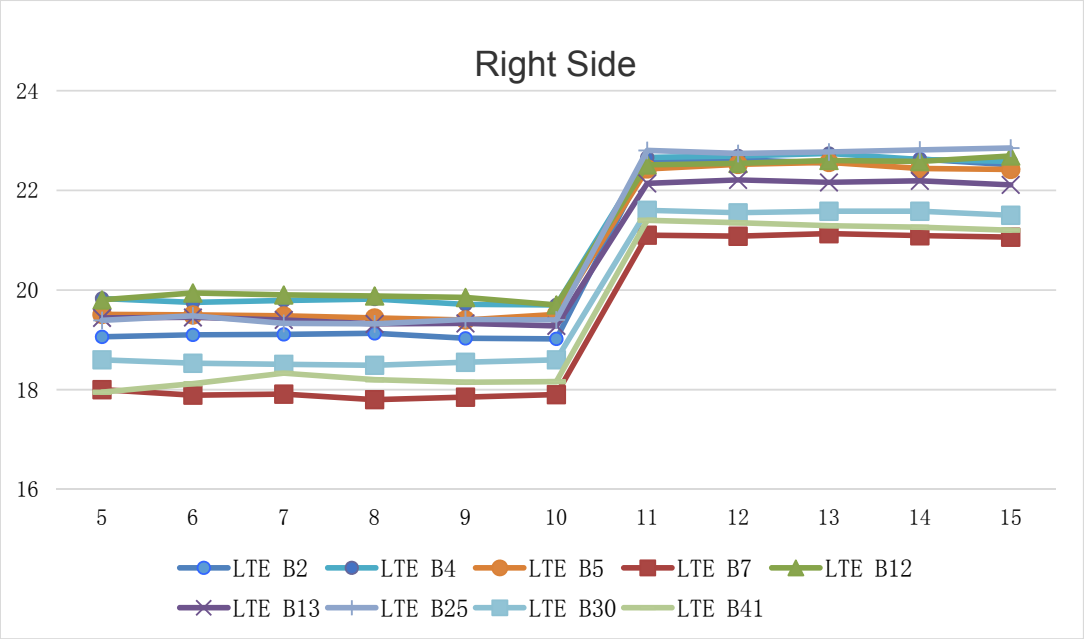
mode		distance(mm)										
		Rear Face										
		Sensor on						Sensor off				
		5	6	7	8	9	10	11	12	13	14	15
WCDMA	UMTS B2	19.43	19.44	19.45	19.28	19.31	19.33	22.41	22.43	22.39	22.4	22.41
	UMTS B4	19.36	19.28	19.37	19.33	19.29	19.31	22.4	22.38	22.43	22.41	22.39
	UMTS B5	19.3	19.52	19.48	19.58	19.48	19.44	22.48	22.45	22.5	22.44	22.47
LTE	LTE B2	19.06	19.1	19.11	19.13	19.03	19.02	22.58	22.61	22.55	22.63	22.51
	LTE B4	19.83	19.75	19.79	19.82	19.71	19.7	22.66	22.69	22.74	22.62	22.58
	LTE B5	19.51	19.5	19.48	19.44	19.4	19.51	22.43	22.52	22.56	22.44	22.42
	LTE B7	18	17.89	17.91	17.8	17.85	17.9	21.1	21.08	21.13	21.09	21.06
	LTE B12	19.8	19.94	19.9	19.88	19.85	19.7	22.51	22.54	22.6	22.58	22.69
	LTE B13	19.44	19.45	19.4	19.32	19.33	19.28	22.14	22.21	22.16	22.19	22.11
	LTE B25	19.39	19.48	19.33	19.32	19.41	19.4	22.8	22.74	22.77	22.81	22.85
	LTE B30	18.55	18.62	18.51	18.31	18.22	18.58	21.55	21.6	21.58	21.63	21.61
	LTE B41	17.95	18.12	18.33	18.2	18.15	18.16	21.4	21.35	21.29	21.26	21.2


Rear Face
24
22
20
18
16
5
6
7
8
9
10
11
12
13
14
15
UMTS B2
UMTS B4
UMTS B5


Rear Face
24
22
20
18
16
5
6
7
8
9
10
11
12
13
14
15
LTE B2
LTE B4
LTE B5
LTE B7
LTE B12
LTE B13
LTE B25
LTE B30
LTE B41

mode		distance(mm)										
		Right Side										
		Sensor on						Sensor off				
		5	6	7	8	9	10	11	12	13	14	15
WCDMA	UMTS B2	19.4	19.33	19.44	19.3	19.29	19.26	22.43	22.39	22.3	22.36	22.4
	UMTS B4	19.39	19.4	19.38	19.3	19.34	19.28	22.46	22.4	22.33	22.31	22.44
	UMTS B5	19.41	19.47	19.42	19.23	19.4	19.35	22.37	22.41	22.46	22.34	22.38
LTE	LTE B2	19.2	19.18	19.08	19.16	19.18	19.09	22.44	22.55	22.6	22.54	22.58
	LTE B4	19.85	19.81	19.77	19.7	19.79	19.82	22.58	22.53	22.44	22.52	22.56
	LTE B5	19.55	19.44	19.4	19.51	19.4	19.39	22.4	22.41	22.35	22.54	22.43
	LTE B7	17.99	17.87	18.01	17.96	17.88	17.9	21.03	21.1	21.11	21.05	21.07
	LTE B12	19.94	19.84	19.91	19.8	19.86	19.83	22.56	22.6	22.63	22.51	22.57
	LTE B13	19.3	19.27	19.4	19.38	19.23	19.42	22.19	22.21	22.3	22.24	22.08
	LTE B25	19.41	19.45	19.36	19.31	19.31	19.29	22.85	22.81	22.76	22.77	22.7
	LTE B30	18.6	18.53	18.51	18.49	18.55	18.6	21.6	21.55	21.58	21.58	21.5
	LTE B41	18	17.93	17.84	18.21	18.31	18.22	21.2	21.24	21.2	21.3	21.41


Right Side
24
22
20
18
16
5
6
7
8
9
10
11
12
13
14
15
UMTS B2
UMTS B4
UMTS B5


Right Side
24
22
20
18
16
5
6
7
8
9
10
11
12
13
14
15
LTE B2
LTE B4
LTE B5
LTE B7
LTE B12
LTE B13
LTE B25
LTE B30
LTE B41

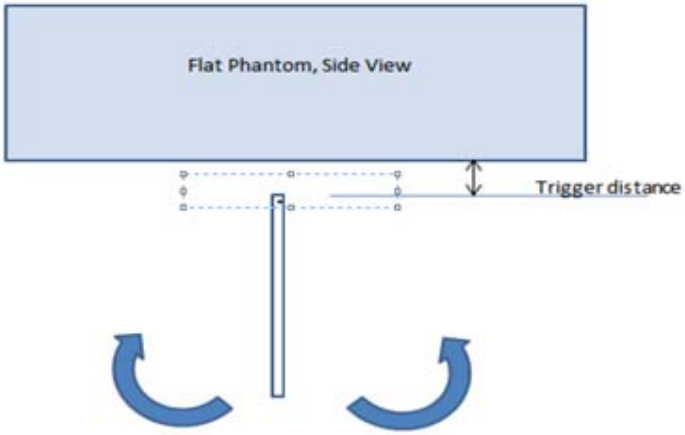
7.3.2. Proximity Sensor Coverage (KDB 616217 §6.3)

As there is no spatial offset between the antenna and the proximity sensor element, proximity sensor coverage did not need to be assessed.

7.3.3. Proximity Sensor Tilt Angle Assessment (KDB 616217 §6.4)

The DUT was positioned directly below the flat phantom at the minimum measured trigger distance with Bottom parallel to the base of the flat phantom for each band.

The EUT was rotated about Edge 1 for angles up to +/- 45°. If the output power increased during the rotation the DUT was moved 1mm toward the phantom and the rotation repeated. This procedure was repeated until the power remained reduced for all angles up to +/- 45°.



Proximity sensor tilt angle assessment (bottom)

Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering for Bottom

Band (MHz)	Minimum trigger distance measured according to KDB 616217 §6.2		Minimum distance at which power reduction was maintained over +/-45°		-45°	-40°	-30°	-20°	-10°	0°	10°	20°	30°	40°	45°
	Rear Face	Risgt Side	Rear Face	Risgt Side											
UMTS B2	10mm	10mm	10mm	10mm	on	on	on	on	on	on	on	on	on	on	on
UMTS B4	10mm	10mm	10mm	10mm	on	on	on	on	on	on	on	on	on	on	on
UMTS B5	10mm	10mm	10mm	10mm	on	on	on	on	on	on	on	on	on	on	on
LTE B2	10mm	10mm	10mm	10mm	on	on	on	on	on	on	on	on	on	on	on
LTE B4	10mm	10mm	10mm	10mm	on	on	on	on	on	on	on	on	on	on	on
LTE B5	10mm	10mm	10mm	10mm	on	on	on	on	on	on	on	on	on	on	on
LTE B7	10mm	10mm	10mm	10mm	on	on	on	on	on	on	on	on	on	on	on
LTE B12	10mm	10mm	10mm	10mm	on	on	on	on	on	on	on	on	on	on	on
LTE B13	10mm	10mm	10mm	10mm	on	on	on	on	on	on	on	on	on	on	on
LTE B25	10mm	10mm	10mm	10mm	on	on	on	on	on	on	on	on	on	on	on
LTE B30	10mm	10mm	10mm	10mm	on	on	on	on	on	on	on	on	on	on	on
LTE B41	10mm	10mm	10mm	10mm	on	on	on	on	on	on	on	on	on	on	on

7.4. LTE CARRIER AGGREGATION POWER

LTE Rel.10 Carrier Aggregation

When downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than 1/4dB higher than the maximum output power measured when downlink carrier aggregation is inactive, the CA test is not required.

Table 1-1：LTE CA Inter-band Bandwidth Support

E-UTRA CA configuration	E-UTRA bands	1.4 [MHz]	3 [MHz]	5 [MHz]	10 [MHz]	15 [MHz]	20 [MHz]	Maximum aggregated bandwidth [MHz]	Bandwidth combination set
CA_2A-5A	2			Y	Y	Y	Y	30	0
	5			Y	Y				
CA_2A-12A	2			Y	Y	Y	Y	30	0
	12			Y	Y				
	2			Y	Y	Y	Y	30	1
	12		Y	Y	Y				
CA_2A-13A	2			Y	Y	Y	Y	30	0
	13				Y				
	2			Y	Y			20	1
	13				Y				
CA_4A-5A	4			Y	Y			20	0
	5			Y	Y				
	4			Y	Y	Y	Y	30	1
	5			Y	Y				
CA_4A-12A	4	Y	Y	Y	Y			20	0
	12			Y	Y				
	4	Y	Y	Y	Y	Y	Y	30	1
	12			Y	Y				
	4			Y	Y	Y	Y	30	2
	12		Y	Y	Y				
	4			Y	Y			20	3
	12			Y	Y				
	4			Y	Y	Y	Y	30	4
	12			Y	Y				
CA_4A-13A	4			Y	Y	Y	Y	30	0
	13				Y				
	4			Y	Y			20	1
	13				Y				
CA_12A-30A	12			Y	Y			20	1
	30			Y	Y				

Note:

1）For the inter-band CA combinations, all the listed bands above can be used as PCC or SCC.

2) The channel spacing and aggregated channel bandwidth for CA are identical to the associated specification in 3GPP TS 36.101 V13.2.0.

3) The reference test frequencies for CA refers to3GPP TS 36.508 V13.1.0

Table 1-2：LTE CA Intra-band (Contiguous) Bandwidth Support

E-UTRA CA configuration	Component carriers in order of increasing carrier frequency		Maximum aggregated bandwidth [MHz]	Bandwidth combination set
	Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]		
CA_7C	15	15	40	0
	20	20		
	10	20	40	1
	15	15,20		
	20	10, 15,20		
CA_41C	10	20	40	0
	15	15,20		
	20	10,15,20		
	5,10	20	40	1
	15	15,20		
	20	5,10,15,20		

Note:
1) The channel spacing and aggregated channel bandwidth for CA are identical to the associated specification in 3GPP TS 36.101 V13.2.0.
2) The reference test frequencies for CA refers to3GPP TS 36.508 V13.1.0

1) Carrier Aggregation power test results (Main full Power)

E-UTRA CA configuration	CC-Combo	PCC									SCC				Power	
		Band	BW [MHZ]	Modulation	RB	Offset	Channel (UL)	Frequency [MHZ]	Channel (DL)	Frequency [MHZ]	Band	BW [MHZ]	Channel (DL)	Frequency [MHZ]	TX power with DL CA	TX Power Single Carrier
CA_2A-5A	5M+5M	LTE B2	5	QPSK	1	12	18900	1880	900	1960	LTE B5	5	2525	881.5	22.31	22.43
	5M+10M	LTE B2	5	QPSK	1	12	18900	1880	900	1960	LTE B5	10	2525	881.5	22.34	22.43
	10M+5M	LTE B2	10	QPSK	1	24	18900	1880	900	1960	LTE B5	5	2525	881.5	22.35	22.44
	10M+10M	LTE B2	10	QPSK	1	24	18900	1880	900	1960	LTE B5	10	2525	881.5	22.37	22.44
	15M+5M	LTE B2	15	QPSK	1	37	18900	1880	900	1960	LTE B5	5	2525	881.5	22.44	22.59
	15M+10M	LTE B2	15	QPSK	1	37	18900	1880	900	1960	LTE B5	10	2525	881.5	22.46	22.59
	20M+5M	LTE B2	20	QPSK	1	50	18900	1880	900	1960	LTE B5	5	2525	881.5	22.54	22.61
	20M+10M	LTE B2	20	QPSK	1	50	18900	1880	900	1960	LTE B5	10	2525	881.5	22.52	22.61
CA_2A-12A	5M+5M	LTE B2	5	QPSK	1	12	18900	1880	900	1960	LTE B12	5	5095	737.5	22.24	22.43
	5M+10M	LTE B2	5	QPSK	1	12	18900	1880	900	1960	LTE B12	10	5095	737.5	22.28	22.43
	10M+5M	LTE B2	10	QPSK	1	24	18900	1880	900	1960	LTE B12	5	5095	737.5	22.3	22.44
	10M+10M	LTE B2	10	QPSK	1	24	18900	1880	900	1960	LTE B12	10	5095	737.5	22.27	22.44
	15M+5M	LTE B2	15	QPSK	1	37	18900	1880	900	1960	LTE B12	5	5095	737.5	22.45	22.59
	15M+10M	LTE B2	15	QPSK	1	37	18900	1880	900	1960	LTE B12	10	5095	737.5	22.41	22.59
	20M+5M	LTE B2	20	QPSK	1	50	18900	1880	900	1960	LTE B12	5	5095	737.5	22.53	22.61
	20M+10M	LTE B2	20	QPSK	1	50	18900	1880	900	1960	LTE B12	10	5095	737.5	22.51	22.61
CA_2A-13A	5M+10M	LTE B2	5	QPSK	1	12	18900	1880	900	1960	LTE B13	10	5230	751	22.21	22.43
	10M+10M	LTE B2	10	QPSK	1	24	18900	1880	900	1960	LTE B13	10	5230	751	22.24	22.44
	15M+10M	LTE B2	15	QPSK	1	37	18900	1880	900	1960	LTE B13	10	5230	751	22.43	22.59
	20M+10M	LTE B2	20	QPSK	1	50	18900	1880	900	1960	LTE B13	10	5230	751	22.55	22.61
CA_4A-5A	5M+5M	LTE B4	5	QPSK	1	12	20175	1732.5	2175	2132.5	LTE B5	5	2525	881.5	22.33	22.49
	5M+10M	LTE B4	5	QPSK	1	12	20175	1732.5	2175	2132.5	LTE B5	10	2525	881.5	22.36	22.49
	10M+5M	LTE B4	10	QPSK	1	24	20175	1732.5	2175	2132.5	LTE B5	5	2525	881.5	22.51	22.56
	10M+10M	LTE B4	10	QPSK	1	24	20175	1732.5	2175	2132.5	LTE B5	10	2525	881.5	22.48	22.56
	15M+5M	LTE B4	15	QPSK	1	37	20175	1732.5	2175	2132.5	LTE B5	5	2525	881.5	22.54	22.58
	15M+10M	LTE B4	15	QPSK	1	37	20175	1732.5	2175	2132.5	LTE B5	10	2525	881.5	22.52	22.58
	20M+5M	LTE B4	20	QPSK	1	50	20175	1732.5	2175	2132.5	LTE B5	5	2525	881.5	22.50	22.61
	20M+10M	LTE B4	20	QPSK	1	50	20175	1732.5	2175	2132.5	LTE B5	10	2525	881.5	22.46	22.61

E-UTRA CA configuration	CC-Combo	PCC									SCC				Power	
		Band	BW [MHZ]	Modulation	RB	Offset	Channel (UL)	Frequency [MHZ]	Channel (DL)	Frequency [MHZ]	Band	BW [MHZ]	Channel (DL)	Frequency [MHZ]	TX power with DL CA	TX Power Single Carrier
CA_4A-12A	5M+5M	LTE B4	5	QPSK	1	12	20175	1732.5	2175	2132.5	LTE B12	5	5095	737.5	22.25	22.49
	5M+10M	LTE B4	5	QPSK	1	12	20175	1732.5	2175	2132.5	LTE B12	10	5095	737.5	22.29	22.49
	10M+5M	LTE B4	10	QPSK	1	24	20175	1732.5	2175	2132.5	LTE B12	5	5095	737.5	22.41	22.56
	10M+10M	LTE B4	10	QPSK	1	24	20175	1732.5	2175	2132.5	LTE B12	10	5095	737.5	22.38	22.56
	15M+5M	LTE B4	15	QPSK	1	37	20175	1732.5	2175	2132.5	LTE B12	5	5095	737.5	22.47	22.58
	15M+10M	LTE B4	15	QPSK	1	37	20175	1732.5	2175	2132.5	LTE B12	10	5095	737.5	22.41	22.58
	20M+5M	LTE B4	20	QPSK	1	50	20175	1732.5	2175	2132.5	LTE B12	5	5095	737.5	22.45	22.61
	20M+10M	LTE B4	20	QPSK	1	50	20175	1732.5	2175	2132.5	LTE B12	10	5095	737.5	22.43	22.61
CA_4A-13A	5M+10M	LTE B4	5	QPSK	1	12	20175	1732.5	2175	2132.5	LTE B13	10	5230	751	22.34	22.49
	10M+10M	LTE B4	10	QPSK	1	24	20175	1732.5	2175	2132.5	LTE B13	10	5230	751	22.41	22.56
	15M+10M	LTE B4	15	QPSK	1	37	20175	1732.5	2175	2132.5	LTE B13	10	5230	751	22.43	22.58
	20M+10M	LTE B4	20	QPSK	1	50	20175	1732.5	2175	2132.5	LTE B13	10	5230	751	22.54	22.61
CA_12A-30A	5M+5M	LTE B12	5	QPSK	1	12	23095	707.5	5095	737.5	LTE B30	5	9820	2355	22.31	22.38
	5M+10M	LTE B12	5	QPSK	1	12	23095	707.5	5095	737.5	LTE B30	10	9820	2355	22.28	22.38
	10M+5M	LTE B12	10	QPSK	1	50	23095	707.5	5095	737.5	LTE B30	5	9820	2355	22.41	22.50
	10M+10M	LTE B12	10	QPSK	1	50	23095	707.5	5095	737.5	LTE B30	10	9820	2355	22.43	22.50

E-UTRA CA configuration	CC-Combo	PCC									SCC				Power	
		Band	BW [MHZ]	Modulation	RB	Off set	Channel (UL)	Frequency [MHZ]	Channel (DL)	Frequency [MHZ]	Band	BW [MHZ]	Channel (DL)	Frequency [MHZ]	TX power with DL CA	TX Power Single Carrier
CA_7C	10M+20M	LTE B7	10	QPSK	1	0	21006	2525.6	3006	2645.6	LTE B7	20	3150	2660	21.08	21.11
	15M+15M	LTE B7	15	QPSK	1	0	21225	2547.5	3225	2667.5	LTE B7	15	3375	2682.5	21.15	21.23
	15M+20M	LTE B7	15	QPSK	1	0	21003	2525.3	3003	2645.3	LTE B7	20	3174	2662.4	21.09	21.23
	20M+10M	LTE B7	20	QPSK	1	0	21051	2530.1	3051	2650.1	LTE B7	10	3195	2664.5	21.22	21.34
	20M+15M	LTE B7	20	QPSK	1	0	21026	2527.6	3026	2647.6	LTE B7	15	3197	2664.7	21.29	21.34
	20M+20M	LTE B7	20	QPSK	1	0	21001	2525.1	3001	2645.1	LTE B7	20	3199	2664.9	20.21	20.32
CA_41C	10M+20M	LTE B41	10	QPSK	1	24	40596	2590.6	40596	2590.6	LTE B41	20	40740	2565	20.31	20.49
	15M+15M	LTE B41	15	QPSK	1	37	40615	2592.5	40615	2592.5	LTE B41	15	40765	2607.5	20.48	20.61
	15M+20M	LTE B41	15	QPSK	1	37	40593	2590.3	40593	2590.3	LTE B41	20	40764	2607.4	20.53	20.61
	20M+10M	LTE B41	20	QPSK	1	50	40641	2595.1	40641	2595.1	LTE B41	10	40785	2609.5	20.65	20.73
	20M+15M	LTE B41	20	QPSK	1	50	40616	2592.6	40616	2592.6	LTE B41	15	40787	2609.7	20.60	20.73
	20M+20M	LTE B41	20	QPSK	1	50	40591	2590.1	40591	2590.1	LTE B41	20	40789	2609.9	20.54	20.73

2) Carrier Aggregation power test results (Main Power sensor)

E-UTRA CA configuration	CC-Combo	PCC									SCC				Power	
		Band	BW [MHZ]	Modulation	RB	Off set	Channel (UL)	Frequency [MHZ]	Channel (DL)	Frequency [MHZ]	Band	BW [MHZ]	Channel (DL)	Frequency [MHZ]	TX power with DL CA	TX Power Single Carrier
CA_2A-5A	5M+5M	LTE B2	5	QPSK	1	12	18900	1880	900	1960	LTE B5	5	2525	881.5	18.52	18.79
	5M+10M	LTE B2	5	QPSK	1	12	18900	1880	900	1960	LTE B5	10	2525	881.5	18.45	18.79
	10M+5M	LTE B2	10	QPSK	1	24	18900	1880	900	1960	LTE B5	5	2525	881.5	18.71	18.90
	10M+10M	LTE B2	10	QPSK	1	24	18900	1880	900	1960	LTE B5	10	2525	881.5	18.77	18.90
	15M+5M	LTE B2	15	QPSK	1	37	18900	1880	900	1960	LTE B5	5	2525	881.5	18.89	19.03
	15M+10M	LTE B2	15	QPSK	1	37	18900	1880	900	1960	LTE B5	10	2525	881.5	18.97	19.03
	20M+5M	LTE B2	20	QPSK	1	50	18900	1880	900	1960	LTE B5	5	2525	881.5	19.01	19.16
	20M+10M	LTE B2	20	QPSK	1	50	18900	1880	900	1960	LTE B5	10	2525	881.5	19.09	19.16
CA_2A-12A	5M+5M	LTE B2	5	QPSK	1	12	18900	1880	900	1960	LTE B12	5	5095	737.5	18.56	18.79
	5M+10M	LTE B2	5	QPSK	1	12	18900	1880	900	1960	LTE B12	10	5095	737.5	18.51	18.79
	10M+5M	LTE B2	10	QPSK	1	24	18900	1880	900	1960	LTE B12	5	5095	737.5	18.67	18.90
	10M+10M	LTE B2	10	QPSK	1	24	18900	1880	900	1960	LTE B12	10	5095	737.5	18.62	18.90
	15M+5M	LTE B2	15	QPSK	1	37	18900	1880	900	1960	LTE B12	5	5095	737.5	18.8	19.03
	15M+10M	LTE B2	15	QPSK	1	37	18900	1880	900	1960	LTE B12	10	5095	737.5	18.83	19.03
	20M+5M	LTE B2	20	QPSK	1	50	18900	1880	900	1960	LTE B12	5	5095	737.5	18.95	19.16
	20M+10M	LTE B2	20	QPSK	1	50	18900	1880	900	1960	LTE B12	10	5095	737.5	19.03	19.16
CA_2A-13A	5M+10M	LTE B2	5	QPSK	1	12	18900	1880	900	1960	LTE B13	10	5230	751	18.64	18.79
	10M+10M	LTE B2	10	QPSK	1	24	18900	1880	900	1960	LTE B13	10	5230	751	18.79	18.90
	15M+10M	LTE B2	15	QPSK	1	37	18900	1880	900	1960	LTE B13	10	5230	751	18.96	19.03
	20M+10M	LTE B2	20	QPSK	1	50	18900	1880	900	1960	LTE B13	10	5230	751	19.05	19.16
CA_4A-5A	5M+5M	LTE B4	5	QPSK	1	12	20175	1732.5	2175	2132.5	LTE B5	5	2525	881.5	19.02	19.07
	5M+10M	LTE B4	5	QPSK	1	12	20175	1732.5	2175	2132.5	LTE B5	10	2525	881.5	18.95	19.07
	10M+5M	LTE B4	10	QPSK	1	24	20175	1732.5	2175	2132.5	LTE B5	5	2525	881.5	19.09	19.21
	10M+10M	LTE B4	10	QPSK	1	24	20175	1732.5	2175	2132.5	LTE B5	10	2525	881.5	19.15	19.21
	15M+5M	LTE B4	15	QPSK	1	37	20175	1732.5	2175	2132.5	LTE B5	5	2525	881.5	19.19	19.32
	15M+10M	LTE B4	15	QPSK	1	37	20175	1732.5	2175	2132.5	LTE B5	10	2525	881.5	19.22	19.32
	20M+5M	LTE B4	20	QPSK	1	50	20175	1732.5	2175	2132.5	LTE B5	5	2525	881.5	19.31	19.44
	20M+10M	LTE B4	20	QPSK	1	50	20175	1732.5	2175	2132.5	LTE B5	10	2525	881.5	19.24	19.44

E-UTRA CA configuration	CC-Combo	PCC									SCC				Power	
		Band	BW [MHZ]	Modulation	RB	Offset	Channel (UL)	Frequency [MHZ]	Channel (DL)	Frequency [MHZ]	Band	BW [MHZ]	Channel (DL)	Frequency [MHZ]	TX power with DL CA	TX Power Single Carrier
CA_4A-12A	5M+5M	LTE B4	5	QPSK	1	12	20175	1732.5	2175	2132.5	LTE B12	5	5095	737.5	18.96	19.07
	5M+10M	LTE B4	5	QPSK	1	12	20175	1732.5	2175	2132.5	LTE B12	10	5095	737.5	18.99	19.07
	10M+5M	LTE B4	10	QPSK	1	24	20175	1732.5	2175	2132.5	LTE B12	5	5095	737.5	19.16	19.21
	10M+10M	LTE B4	10	QPSK	1	24	20175	1732.5	2175	2132.5	LTE B12	10	5095	737.5	19.1	19.21
	15M+5M	LTE B4	15	QPSK	1	37	20175	1732.5	2175	2132.5	LTE B12	5	5095	737.5	19.25	19.32
	15M+10M	LTE B4	15	QPSK	1	37	20175	1732.5	2175	2132.5	LTE B12	10	5095	737.5	19.21	19.32
	20M+5M	LTE B4	20	QPSK	1	50	20175	1732.5	2175	2132.5	LTE B12	5	5095	737.5	19.35	19.44
	20M+10M	LTE B4	20	QPSK	1	50	20175	1732.5	2175	2132.5	LTE B12	10	5095	737.5	19.29	19.44
CA_4A-13A	5M+10M	LTE B4	5	QPSK	1	12	20175	1732.5	2175	2132.5	LTE B13	10	5230	751	19.01	19.07
	10M+10M	LTE B4	10	QPSK	1	24	20175	1732.5	2175	2132.5	LTE B13	10	5230	751	19.15	19.21
	15M+10M	LTE B4	15	QPSK	1	37	20175	1732.5	2175	2132.5	LTE B13	10	5230	751	19.23	19.32
	20M+10M	LTE B4	20	QPSK	1	50	20175	1732.5	2175	2132.5	LTE B13	10	5230	751	19.3	19.44
CA_12A-30A	5M+5M	LTE B12	5	QPSK	1	12	23095	707.5	5095	737.5	LTE B30	5	9820	2355	19.31	19.48
	5M+10M	LTE B12	5	QPSK	1	12	23095	707.5	5095	737.5	LTE B30	10	9820	2355	19.39	19.48
	10M+5M	LTE B12	10	QPSK	1	50	23095	707.5	5095	737.5	LTE B30	5	9820	2355	19.5	19.60
	10M+10M	LTE B12	10	QPSK	1	50	23095	707.5	5095	737.5	LTE B30	10	9820	2355	19.56	19.60

E-UTRA CA configuration	CC-Combo	PCC									SCC				Power	
		Band	BW [MHZ]	Modulation	RB	Off set	Channel (UL)	Frequency [MHZ]	Channel (DL)	Frequency [MHZ]	Band	BW [MHZ]	Channel (DL)	Frequency [MHZ]	TX power with DL CA	TX Power Single Carrier
CA_7C	10M+20M	LTE B7	10	QPSK	1	0	21006	2525.6	3006	2645.6	LTE B7	20	3150	2660	18.1	18.20
	15M+15M	LTE B7	15	QPSK	1	0	21225	2547.5	3225	2667.5	LTE B7	15	3375	2682.5	18.18	18.33
	15M+20M	LTE B7	15	QPSK	1	0	21003	2525.3	3003	2645.3	LTE B7	20	3174	2662.4	18.23	18.33
	20M+10M	LTE B7	20	QPSK	1	0	21051	2530.1	3051	2650.1	LTE B7	10	3195	2664.5	18.35	18.49
	20M+15M	LTE B7	20	QPSK	1	0	21026	2527.6	3026	2647.6	LTE B7	15	3197	2664.7	18.3	18.49
	20M+20M	LTE B7	20	QPSK	1	0	21001	2525.1	3001	2645.1	LTE B7	20	3199	2664.9	18.11	18.18
CA_41C	10M+20M	LTE B41	10	QPSK	1	24	40596	2590.6	40596	2590.6	LTE B41	20	40740	2565	18.2	18.34
	15M+15M	LTE B41	15	QPSK	1	37	40615	2592.5	40615	2592.5	LTE B41	15	40765	2607.5	18.32	18.45
	15M+20M	LTE B41	15	QPSK	1	37	40593	2590.3	40593	2590.3	LTE B41	20	40764	2607.4	18.29	18.45
	20M+10M	LTE B41	20	QPSK	1	50	40641	2595.1	40641	2595.1	LTE B41	10	40785	2609.5	18.41	18.59
	20M+15M	LTE B41	20	QPSK	1	50	40616	2592.6	40616	2592.6	LTE B41	15	40787	2609.7	18.46	18.59
	20M+20M	LTE B41	20	QPSK	1	50	40591	2590.1	40591	2590.1	LTE B41	20	40789	2609.9	18.39	18.59

7.5. TEST POSITION

- **7.5.1 Body test configuration**

The overall diagonal dimension of the display section of a tablet is 27.2cm>20cm,Per FCC KDB 616217,the back surface and edges of the tablet should be tested for SAR compliance with the Tablet touching the phantom.SAR evaluation for the front surface of tablet display screens are generally not necessary.
The SAR Exclusion Threshold in KDB 447498 D01can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned adjacent the phantom and the edge containing the antenna positioned perpendicular to the phantom.

SAR test reduction and exclusion guidance

(1)The SAR exclusion threshold for distances<50mm is defined by the following equation:

$$\frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}}\sqrt{\text{Frequency (GHz)}} \leq 3.0$$

The test exclusions are applicable only when the minimum test separation distance is ≤50mm and for transmission frequencies between 100MHz and 6GHz. When the minimum test separation distance is<5mm, a distance of 5mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

(2)The SAR exclusion threshold for distances>50mm is defined by the following equation, as illustrated in KDB 447498 D01 Appendix B:

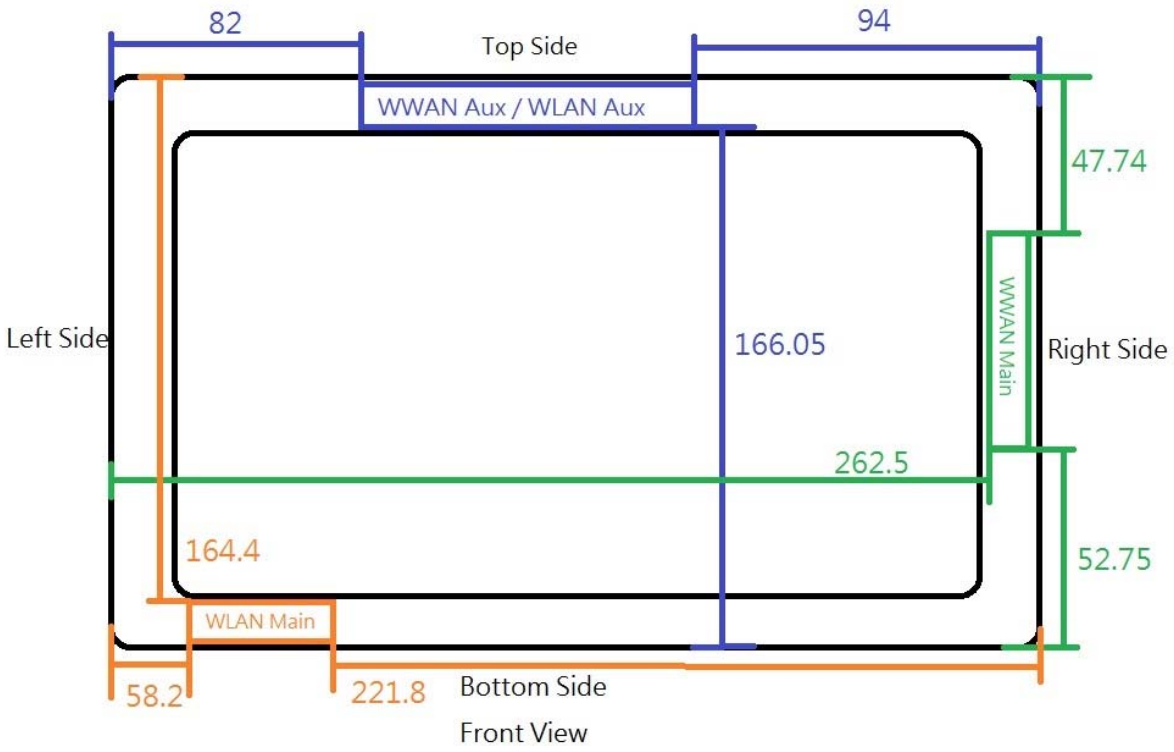
a) at 100 MHz to1500 MHz

$$\text{[Power allowed at numeric Threshold at 50 mm in step 1) + (test separation distance - 50 mm)} \cdot (f_{(MHz)}/150)\text{] mW}$$

b) at >1500MHz and ≤6GHz

$$\text{[Power allowed at numeric Threshold at 50 mm in step 1) + (test separation distance - 50 mm)} \cdot 10\text{] mW}$$

The location of the antenna inside EUT is as below:



Antenna	Front Face	Rear Face	Right Side	Left Side	Top Side	Bottom Side
WWAN Main	<5mm	<5mm	8.4 mm	262.5 mm	47.74 mm	52.75 mm
WLAN Main	<5mm	<5mm	221.8 mm	58.2 mm	164.4 mm	7.9 mm
WLANAux/BT	<5mm	<5mm	94 mm	82 mm	8.35 mm	166.05 mm

Note:
1) Diversity antenna is used to improve the acceptance of performance of the main antenna, it does not have a transmitter function.

The distance <50mm

WWAN Ant

Antennas ≦ 50mm to edges (100M~6G)											
Radio	Frq. (MHz)	Tune-up Power		Separation distances (mm)				Calculated Threshold			
		dBm	mW	Rear	Front	Right	Top	Rear	Front	Right	Top
WCDMA II	1907.6	24.00	251.19	5.00	10.90	8.40	47.74	11	24	18	104
Test Requirement(Yes/No)								Yes	Yes	Yes	Yes
WCDMA IV	1712.4	24.00	251.19	5.00	10.90	8.40	47.74	11	25	19	109
Test Requirement(Yes/No)								Yes	Yes	Yes	Yes
WCDMA V	846.6	24.00	251.19	5.00	10.90	8.40	47.74	16	36	27	156
Test Requirement(Yes/No)								Yes	Yes	Yes	Yes
LTE 2	1880	24.00	251.19	5.00	10.90	8.40	47.74	11	24	18	104
Test Requirement(Yes/No)								Yes	Yes	Yes	Yes
LTE 4	1720.0	24.00	251.19	5.00	10.90	8.40	47.74	11	25	19	109
Test Requirement(Yes/No)								Yes	Yes	Yes	Yes
LTE 5	836.5	24.00	251.19	5.00	10.90	8.40	47.74	16	36	28	157
Test Requirement(Yes/No)								Yes	Yes	Yes	Yes
LTE 7	2535	23.00	199.53	5.00	10.90	8.40	47.74	9	21	16	90
Test Requirement(Yes/No)								Yes	Yes	Yes	Yes
LTE 12	704	24.00	251.19	5.00	10.90	8.40	47.74	18	39	30	171
Test Requirement(Yes/No)								Yes	Yes	Yes	Yes
LTE 13	782	24.00	251.19	5.00	10.90	8.40	47.74	17	37	28	162
Test Requirement(Yes/No)								Yes	Yes	Yes	Yes
LTE 25	1860	24.00	251.19	5.00	10.90	8.40	47.74	11	24	18	105
Test Requirement(Yes/No)								Yes	Yes	Yes	Yes
LTE 30	2310.0	23.00	199.53	5.00	10.90	8.40	47.74	10	22	17	94
Test Requirement(Yes/No)								Yes	Yes	Yes	Yes
LTE 41	2506.0	23.00	199.53	5.00	10.90	8.40	47.74	9	21	16	90
Test Requirement(Yes/No)								Yes	Yes	Yes	Yes

The distance >50mm

WWAN Ant

Antennas > 50mm edges (100M-1500M)							
Radio	Frq. (MHz)	Tune-up Power		Separation distances (mm)		Calculated Threshold	
		dBm	mW	Left	Bottom	Left	Bottom
WCDMA V	846.6	24.00	251.19	262.50	52.75	1362	179
Test Requirement(Yes/No)						**NO**	**Yes**
LTE 5	836.5	24.00	251.19	262.50	52.75	1349	179
Test Requirement(Yes/No)						**NO**	**Yes**
LTE 12	704	24.00	251.19	262.50	52.75	1176	192
Test Requirement(Yes/No)						**NO**	**Yes**
LTE 13	782	24.00	251.19	262.50	52.75	1277	184
Test Requirement(Yes/No)						**NO**	**Yes**

Antennas > 50mm edges (1500~6G)							
Radio	Frq. (MHz)	Tune-up Power		Separation distances (mm)		Calculated Threshold	
		dBm	mW	Left	Bottom	Left	Bottom
WCDMA II	1907.6	24.00	251.19	262.50	52.75	2234	136
Test Requirement(Yes/No)						**NO**	**Yes**
WCDMA IV	1712.4	24.00	251.19	262.50	52.75	2240	142
Test Requirement(Yes/No)						**NO**	**Yes**
LTE 2	1880	24.00	251.19	262.50	52.75	2234	137
Test Requirement(Yes/No)						**NO**	**Yes**
LTE 4	1720	24.00	251.19	262.50	52.75	2239	142
Test Requirement(Yes/No)						**NO**	**Yes**
LTE 7	2535	23.00	199.53	262.50	52.75	2219	122
Test Requirement(Yes/No)						**NO**	**Yes**
LTE 25	1860	24.00	251.19	262.50	52.75	2235	137
Test Requirement(Yes/No)						**NO**	**Yes**
LTE 30	2310	23.00	199.53	262.50	52.75	2224	126
Test Requirement(Yes/No)						**NO**	**Yes**
LTE 41	2506.0	23.00	199.53	262.50	52.75	2220	122
Test Requirement(Yes/No)						**NO**	**Yes**

The distance <50mm

WLAN Main_Ant

Antennas ≦ 50mm to edges (100M~6G)							
Radio	Frq. (MHz)	Tune-up Power		Separation distances (mm)		Calculated Threshold	
		dBm	mW	Rear	Bottom	Rear	Bottom
802.11b	2437	19.00	79.43	5.00	7.90	10	15
Test Requirement(Yes/No)						**Yes**	**Yes**
802.11a	5240	15.50	35.48	5.00	7.90	7	10
Test Requirement(Yes/No)						**Yes**	**Yes**
802.11a	5300	15.50	35.48	5.00	7.90	7	10
Test Requirement(Yes/No)						**Yes**	**Yes**
802.11a	5520	15.50	35.48	5.00	7.90	6	10
Test Requirement(Yes/No)						**Yes**	**Yes**
802.11a	5745	15.50	35.48	5.00	7.90	6	15
Test Requirement(Yes/No)						**Yes**	**Yes**

The distance >50mm

Antennas > 50mm edges (1500~6G)									
Radio	Frq. (MHz)	Tune-up Power		Separation distances (mm)			Calculated Threshold		
		dBm	mW	Left	Right	Top	Left	Right	Top
802.11b	2437	19.00	79.43	58.20	221.80	164.40	178	1814	1240
Test Requirement(Yes/No)							**No**	**No**	**No**
802.11a	5240	15.50	35.48	58.20	221.80	164.40	148	1784	1210
Test Requirement(Yes/No)							**No**	**No**	**No**
802.11a	5300	15.50	35.48	58.20	221.80	164.40	147	1783	1209
Test Requirement(Yes/No)							**No**	**No**	**No**
802.11a	5520	15.50	35.48	58.20	221.80	164.40	146	1782	1208
Test Requirement(Yes/No)							**No**	**No**	**No**
802.11a	5745	15.50	35.48	58.20	221.80	164.40	145	1781	1207
Test Requirement(Yes/No)							**No**	**No**	**No**

The distance <50mm

WLAN Aux_Ant

Antennas ≦ 50mm to edges (100M~6G)							
Radio	Frq. (MHz)	Tune-up Power		Separation distances (mm)		Calculated Threshold	
		dBm	mW	Rear	Top	Rear	Top
Bluetooth	2480	10.50	11.22	5.00	8.35	10	16
Test Requirement(Yes/No)						**Yes**	**NO**
802.11b	2437	19.00	79.43	5.00	8.35	10	16
Test Requirement(Yes/No)						**Yes**	**Yes**
802.11a	5240	15.50	35.48	5.00	8.35	7	11
Test Requirement(Yes/No)						**Yes**	**Yes**
802.11a	5300	15.50	35.48	5.00	8.35	7	11
Test Requirement(Yes/No)						**Yes**	**Yes**
802.11a	5520	15.50	35.48	5.00	8.35	6	11
Test Requirement(Yes/No)						**Yes**	**Yes**
802.11a	5745	15.50	35.48	5.00	8.35	6	10
Test Requirement(Yes/No)						**Yes**	**Yes**

The distance <50mm

Antennas ≦ 50mm to edges (100M~6G)									
Radio	Frq. (MHz)	Tune-up Power		Separation distances (mm)			Calculated Threshold		
		dBm	mW	Left	Right	Bottom	Left	Right	Bottom
Bluetooth	2480	10.50	11.22	82.00	94.00	166.05	415	534	1256
Test Requirement(Yes/No)							**No**	**No**	**No**
802.11b	2437	19.00	79.43	82.00	94.00	166.05	416	536	1257
Test Requirement(Yes/No)							**No**	**No**	**No**
802.11a	5240	15.50	35.48	82.00	94.00	166.05	386	506	1226
Test Requirement(Yes/No)							**No**	**No**	**No**
802.11a	5300	15.50	35.48	82.00	94.00	166.05	385	505	1226
Test Requirement(Yes/No)							**No**	**No**	**No**
802.11a	5520	15.50	35.48	82.00	94.00	166.05	384	504	1224
Test Requirement(Yes/No)							**No**	**No**	**No**
802.11a	5745	15.50	35.48	82.00	94.00	166.05	383	503	1223
Test Requirement(Yes/No)							**No**	**No**	**No**

8..TEST RESULT

8.1.CONDUCTED POWER RESULTS

8.1.1.CONDUCTED POWER MEASUREMENTS OF UMTS BAND

1) Conducted power measurement results of Sensor off

Band	UMTS II				UMTS V				UMTS IV			
Tx Channel	Max. Tune-up Power	9262	9400	9538	Max. Tune-up Power	4132	4182	4233	Max. Tune-up Power	1312	1413	1513
Rx Channel		9662	9800	9938		4357	4407	4458		1537	1638	1738
Frequency		1852.4	1880	1907.6		826.4	836.4	846.6		1712.4	1732.6	1752.6
RMC 12.2K	24	22.41	22.43	22.44	24	22.38	22,30	22.43	24	22.48	22.42	22.50
HSDPA Subtest-1	22	21.14	21.29	21.35	22	21.21	21.13	21.26	22	21.27	21.26	21.31
HSDPA Subtest-2	22	21.34	21.42	21.43	22	21,30	21.15	21.29	22	21.31	21.28	21.35
HSDPA Subtest-3	22	20.92	20.91	20.94	22	20.80	20.66	20.80	22	20.82	20.80	20.77
HSDPA Subtest-4	22	20.90	20.93	20.91	22	20.78	20.66	20.80	22	20.81	20.74	20.76
HSUPA Subtest-1	22	21.23	21.20	21.28	22	21.07	21.01	21.13	22	21.22	21.14	21.27
HSUPA Subtest-2	22	20.55	20.52	20.60	22	20.08	20,02	20.14	22	20.23	20.15	20.28
HSUPA Subtest-3	21	20.51	20.48	20.56	21	20.29	20.23	20.35	21	20.45	20.37	20.50
HSUPA Subtest-4	22	20.98	20.95	21.03	22	20.36	20.30	20.42	22	20.52	20.44	20.57
HSUPA Subtest-5	22	21.57	21.54	21.62	22	21.28	21.22	21.34	22	21.53	21.45	21.58

Note:
1) The conducted power of UMTS Band is measured with RMS detector.
2)Note: Per KDB941225 D01, When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤¼ 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.

2) Conducted power measurement results of Sensor on

Band	UMTS II				UMTS V				UMTS IV			
Tx Channel	Max. Tune-up Power	9262	9400	9538	Max. Tune-up Power	4132	4182	4233	Max. Tune-up Power	1312	1413	1513
Rx Channel		9662	9800	9938		4357	4407	4458		1537	1638	1738
Frequency		1852.4	1880	1907.6		826.4	836.4	846.6		1712.4	1732.6	1752.6
RMC 12.2K	19.5	19.48	19.42	19.28	19.50	19.37	19.28	19.36	20.0	19.58	19.30	19.53
HSDPA Subtest-1	19.0	18.32	18.26	18.18	18.50	18.18	18.09	18.17	18.5	18.43	18.15	18.38
HSDPA Subtest-2	18.5	18.34	18.28	18.20	18.50	18.23	18.14	18.22	18.5	18.45	18.17	18.40
HSDPA Subtest-3	18.0	17.83	17.77	17.69	18.00	17.74	17.65	17.73	18.0	17.94	17.66	17.89
HSDPA Subtest-4	18.0	17.82	17.76	17.68	18.00	17.73	17.64	17.72	18.0	17.91	17.63	17.86
HSUPA Subtest-1	17.0	16.46	16.40	16.32	17.00	16.32	16.23	16.31	17.0	16.51	16.23	16.46
HSUPA Subtest-2	17.0	16.65	16.59	16.51	17.00	16.75	16.66	16.74	17.5	17.26	16.98	17.21
HSUPA Subtest-3	17.5	17.01	16.95	16.87	17.00	16.95	16.86	16.94	17.5	17.05	16.77	17.00
HSUPA Subtest-4	17.0	16.67	16.61	16.53	16.50	16.48	16.39	16.47	17.5	17.18	16.90	17.13
HSUPA Subtest-5	18.0	17.99	17.93	17.85	18.00	17.96	17.87	17.95	18.5	18.18	17.90	18.13

Note:

1) The conducted power of UMTS Band is measured with RMS detector.

2)Note: Per KDB941225 D01, When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤¼ 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.

8.1.2.CONDUCTED POWER MEASUREMENTS OF LTE

1）Conducted power measurement results of LTE Band 2_ Sensor Off_ Full Power Mode

Band / BW	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 18607 1850.7 MHz	Mid CH 18900 1880 MHz	High CH 19193 1909.3 MHz	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 18607 1850.7 MHz	Mid CH 18900 1880 MHz	High CH 19193 1909.3 MHz
2 / 1.4M	QPSK	1	0	24	22.52	22.50	22.46	16QAM	1	0	23	21.72	21.70	21.66
		1	2	24	22.50	22.48	22.44		1	2	23	21.69	21.67	21.63
		1	5	24	22.53	22.51	22.47		1	5	23	21.70	21.68	21.64
		3	0	24	22.41	22.39	22.35		3	0	23	21.42	21.40	21.36
		3	1	24	22.34	22.32	22.28		3	1	23	21.38	21.36	21.32
		3	3	24	22.27	22.25	22.21		3	3	23	21.39	21.37	21.33
		6	0	23	21.30	21.28	21.24		6	0	22	20.31	20.29	20.25
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**18615 1851.5 MHz**	**18900 1880 MHz**	**19185 1908.5 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**18615 1851.5 MHz**	**18900 1880 MHz**	**19185 1908.5 MHz**
2 / 3M	QPSK	1	0	24	22.46	22.34	22.28	16QAM	1	0	23.0	21.73	21.61	21.55
		1	7	24	22.44	22.32	22.26		1	7	23.0	21.71	21.59	21.53
		1	14	24	22.02	21.90	21.84		1	14	23.0	21.24	21.12	21.06
		8	0	23	21.39	21.27	21.21		8	0	23.0	20.39	20.27	20.21
		8	3	23	21.37	21.25	21.19		8	3	22.0	20.35	20.23	20.17
		8	7	23	21.31	21.19	21.13		8	7	22.0	20.33	20.21	20.15
		15	0	22	21.32	21.20	21.14		15	0	22.0	20.29	20.17	20.11
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**18625 1852.5 MHz**	**18900 1880 MHz**	**19175 1907.5 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**18625 1852.5 MHz**	**18900 1880 MHz**	**19175 1907.5 MHz**
2 / 5M	QPSK	1	0	24	22.50	22.45	22.56	16QAM	1	0	23	21.77	21.72	21.83
		1	12	24	22.48	22.43	22.54		1	12	23	21.75	21.70	21.81
		1	24	24	22.06	22.01	22.12		1	24	23	21.28	21.23	21.34
		12	0	23	21.43	21.38	21.49		12	0	23	20.43	20.38	20.49
		12	6	23	21.41	21.36	21.47		12	6	22	20.39	20.34	20.45
		12	13	23	21.35	21.30	21.41		12	13	22	20.37	20.32	20.43
		25	0	23	21.36	21.31	21.42		25	0	22	20.33	20.28	20.39

Band / BW	Modulation	RB Size	RB Offset	Tune-up	18650	18900	19150	Modulation	RB Size	RB Offset	Tune-up	18650	18900	19150
					1855 MHz	1880 MHz	1905 MHz					1855 MHz	1880 MHz	1905 MHz
2 / 10M	QPSK	1	0	24	22.58	22.46	22.60	16QAM	1	0	23	21.85	21.73	21.87
		1	24	24	22.56	22.44	22.58		1	24	23	21.83	21.71	21.85
		1	49	24	22.14	22.02	22.16		1	49	23	21.36	21.24	21.38
		25	0	23	21.51	21.39	21.53		25	0	23	20.51	20.39	20.53
		25	12	23	21.49	21.37	21.51		25	12	22	20.47	20.35	20.49
		25	25	23	21.43	21.31	21.45		25	25	22	20.45	20.33	20.47
		50	0	23	21.44	21.32	21.46		50	0	22	20.41	20.29	20.43
Band / BW	Modulation	RB Size	RB Offset	Tune-up	18675	18900	19125	Modulation	RB Size	RB Offset	Tune-up	18675	18900	19125
					1857.5 MHz	1880 MHz	1902.5 MHz					1857.5 MHz	1880 MHz	1902.5 MHz
2 / 15M	QPSK	1	0	24	22.43	22.61	22.45	16QAM	1	0	23	21.70	21.88	21.72
		1	37	24	22.41	22.59	22.43		1	37	23	21.68	21.86	21.70
		1	74	24	21.99	22.17	22.01		1	74	23	21.21	21.39	21.23
		36	0	23	21.36	21.54	21.38		36	0	23	20.36	20.54	20.38
		36	19	23	21.34	21.52	21.36		36	19	22	20.32	20.50	20.34
		36	39	23	21.28	21.46	21.30		36	39	22	20.30	20.48	20.32
		75	0	23	21.29	21.47	21.31		75	0	22	20.26	20.44	20.28
Band / BW	Modulation	RB Size	RB Offset	Tune-up	18700	18900	19100	Modulation	RB Size	RB Offset	Tune-up	18700	18900	19100
					1860 MHz	1880 MHz	1900 MHz					1860 MHz	1880 MHz	1900 MHz
2 / 20M	QPSK	1	0	24	22.45	22.63	22.50	16QAM	1	0	23	21.72	21.90	21.77
		1	50	24	22.43	22.61	22.48		1	50	23	21.70	21.88	21.75
		1	99	24	22.01	22.19	22.06		1	99	23	21.23	21.41	21.28
		50	0	23	21.38	21.56	21.43		50	0	23	20.38	20.56	20.43
		50	25	23	21.36	21.54	21.41		50	25	22	20.34	20.52	20.39
		50	50	23	21.30	21.48	21.35		50	50	22	20.32	20.50	20.37
		100	0	23	21.31	21.49	21.36		100	0	22	20.28	20.46	20.33

2）Conducted power measurement results of LTE Band 2_ Sensor On_ Low Power Mode

Band / BW	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 18607 1850.7 MHz	Mid CH 18900 1880 MHz	High CH 19193 1909.3 MHz	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 18607 1850.7 MHz	Mid CH 18900 1880 MHz	High CH 19193 1909.3 MHz
2 / 1.4M	QPSK	1	0	19.5	18.52	18.60	18.24	16QAM	1	0	19.5	18.41	18.56	18.13
		1	2	19.5	18.40	18.55	18.12		1	2	19.5	18.32	18.47	18.04
		1	5	19.5	18.03	18.18	17.75		1	5	19.5	18.22	18.37	17.94
		3	0	19.5	18.39	18.54	18.11		3	0	19.5	18.40	18.55	18.12
		3	1	19.5	18.41	18.56	18.13		3	1	19.5	18.47	18.62	18.19
		3	3	19.5	18.37	18.52	18.09		3	3	19.5	18.40	18.55	18.12
		6	0	19.5	18.33	18.48	18.05		6	0	19.5	18.37	18.52	18.09
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**18615 1851.5 MHz**	**18900 1880 MHz**	**19185 1908.5 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**18615 1851.5 MHz**	**18900 1880 MHz**	**19185 1908.5 MHz**
2 / 3M	QPSK	1	0	19.5	18.64	18.79	18.36	16QAM	1	0	19.5	18.53	18.68	18.25
		1	7	19.5	18.52	18.67	18.24		1	7	19.5	18.44	18.59	18.16
		1	14	19.5	18.15	18.30	17.87		1	14	19.5	18.34	18.49	18.06
		8	0	19.5	18.51	18.66	18.23		8	0	19.5	18.52	18.67	18.24
		8	3	19.5	18.53	18.68	18.25		8	3	19.5	18.59	18.74	18.31
		8	7	19.5	18.49	18.64	18.21		8	7	19.5	18.52	18.67	18.24
		15	0	19.5	18.45	18.60	18.17		15	0	19.5	18.49	18.64	18.21
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**18625 1852.5 MHz**	**18900 1880 MHz**	**19175 1907.5 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**18625 1852.5 MHz**	**18900 1880 MHz**	**19175 1907.5 MHz**
2 / 5M	QPSK	1	0	19.5	18.76	18.91	18.48	16QAM	1	0	19.5	18.65	18.80	18.37
		1	12	19.5	18.64	18.79	18.36		1	12	19.5	18.56	18.71	18.28
		1	24	19.5	18.27	18.42	17.99		1	24	19.5	18.46	18.61	18.18
		12	0	19.5	18.63	18.78	18.35		12	0	19.5	18.64	18.79	18.36
		12	6	19.5	18.65	18.80	18.37		12	6	19.5	18.71	18.86	18.43
		12	13	19.5	18.61	18.76	18.33		12	13	19.5	18.64	18.79	18.36
		25	0	19.5	18.57	18.72	18.29		25	0	19.5	18.61	18.76	18.33

Band / BW	Modulation	RB Size	RB Offset	Tune-up	18650	18900	19150	Modulation	RB Size	RB Offset	Tune-up	18650	18900	19150
					1855 MHz	1880 MHz	1905 MHz					1855 MHz	1880 MHz	1905 MHz
2 / 10M	QPSK	1	0	19.5	18.87	18.95	18.59	16QAM	1	0	19.5	18.76	18.91	18.48
		1	24	19.5	18.75	18.90	18.47		1	24	19.5	18.67	18.82	18.39
		1	49	19.5	18.38	18.53	18.10		1	49	19.5	18.57	18.72	18.29
		25	0	19.5	18.74	18.89	18.46		25	0	19.5	18.75	18.90	18.47
		25	12	19.5	18.76	18.91	18.48		25	12	19.5	18.82	18.97	18.54
		25	25	19.5	18.72	18.87	18.44		25	25	19.5	18.75	18.90	18.47
		50	0	19.5	18.68	18.83	18.40		50	0	19.5	18.72	18.87	18.44
Band / BW	Modulation	RB Size	RB Offset	Tune-up	18675	18900	19125	Modulation	RB Size	RB Offset	Tune-up	18675	18900	19125
					1857.5 MHz	1880 MHz	1902.5 MHz					1857.5 MHz	1880 MHz	1902.5 MHz
2 / 15M	QPSK	1	0	19.5	19.00	19.07	18.72	16QAM	1	0	19.5	18.89	19.04	18.61
		1	37	19.5	18.88	19.03	18.60		1	37	19.5	18.80	18.95	18.52
		1	74	19.5	18.51	18.66	18.23		1	74	19.5	18.70	18.85	18.42
		36	0	19.5	18.87	19.02	18.59		36	0	19.5	18.88	19.03	18.60
		36	19	19.5	18.89	19.04	18.61		36	19	19.5	18.95	19.10	18.67
		36	39	19.5	18.85	19.00	18.57		36	39	19.5	18.88	19.03	18.60
		75	0	19.5	18.81	18.96	18.53		75	0	19.5	18.85	19.00	18.57
Band / BW	Modulation	RB Size	RB Offset	Tune-up	18700	18900	19100	Modulation	RB Size	RB Offset	Tune-up	18700	18900	19100
					1860 MHz	1880 MHz	1900 MHz					1860 MHz	1880 MHz	1900 MHz
2 / 20M	QPSK	1	0	19.5	19.13	19.28	18.85	16QAM	1	0	19.5	19.02	19.17	18.74
		1	50	19.5	19.01	19.16	18.73		1	50	19.5	18.93	19.08	18.65
		1	99	19.5	18.64	18.79	18.36		1	99	19.5	18.83	18.98	18.55
		50	0	19.5	19.00	19.15	18.72		50	0	19.5	19.01	19.16	18.73
		50	25	19.5	19.02	19.17	18.74		50	25	19.5	19.08	19.23	18.80
		50	50	19.5	18.98	19.13	18.70		50	50	19.5	19.01	19.16	18.73
		100	0	19.5	18.94	19.09	18.66		100	0	19.5	18.98	19.13	18.70

3）Conducted power measurement results of LTE Band 4_ Sensor Off_ Full Power Mode

Band / BW	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 19957 1710.7 MHz	Mid CH 20175 1732.5 MHz	High CH 20393 1754.3 MHz	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 19957 1710.7 MHz	Mid CH 20175 1732.5 MHz	High CH 20393 1754.3 MHz
4 / 1.4M	QPSK	1	0	24	22.70	22.60	22.61	16QAM	1	0	23	21.91	21.81	21.82
		1	2	24	22.67	22.57	22.58		1	2	23	21.89	21.79	21.80
		1	5	24	22.61	22.51	22.52		1	5	23	21.87	21.77	21.78
		3	0	24	22.61	22.51	22.52		3	0	23	21.69	21.59	21.60
		3	1	24	22.58	22.48	22.49		3	1	23	21.62	21.52	21.53
		3	3	24	22.53	22.43	22.44		3	3	23	21.55	21.45	21.46
		6	0	23	21.47	21.37	21.38		6	0	22	20.50	20.40	20.41
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**19965 1711.5 MHz**	**20175 1732.5 MHz**	**20385 1753.5 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**19965 1711.5 MHz**	**20175 1732.5 MHz**	**20385 1753.5 MHz**
4 / 3M	QPSK	1	0	24	22.62	22.50	22.39	16QAM	1	0	23	21.82	21.70	21.59
		1	7	24	22.58	22.46	22.35		1	7	23	21.77	21.65	21.54
		1	14	24	22.50	22.38	22.27		1	14	23	21.40	21.28	21.17
		8	0	23	21.64	21.52	21.41		8	0	23	20.52	20.40	20.29
		8	3	23	21.62	21.50	21.39		8	3	22	20.48	20.36	20.25
		8	7	23	21.51	21.39	21.28		8	7	22	20.37	20.25	20.14
		15	0	23	21.48	21.36	21.25		15	0	22	20.48	20.36	20.25
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**19975 1712.5 MHz**	**20175 1732.5 MHz**	**20375 1752.5 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**19975 1712.5 MHz**	**20175 1732.5 MHz**	**20375 1752.5 MHz**
4 / 5M	QPSK	1	0	24	22.65	22.53	22.54	16QAM	1	0	23	21.85	21.73	21.74
		1	12	24	22.61	22.49	22.5		1	12	23	21.8	21.68	21.69
		1	24	24	22.53	22.41	22.42		1	24	23	21.43	21.31	21.32
		12	0	23	21.67	21.55	21.56		12	0	23	20.55	20.43	20.44
		12	6	23	21.65	21.53	21.54		12	6	22	20.51	20.39	20.4
		12	13	23	21.54	21.42	21.43		12	13	22	20.4	20.28	20.29
		25	0	23	21.51	21.39	21.4		25	0	22	20.51	20.39	20.4

Band / BW	Modulation	RB Size	RB Offset	Tune-up	20000	20175	20350	Modulation	RB Size	RB Offset	Tune-up	20000	20175	20350
					1715 MHz	1732.5 MHz	1750 MHz					1715 MHz	1732.5 MHz	1750 MHz
4 / 10M	QPSK	1	0	24	22.67	22.6	22.57	16QAM	1	0	23	21.87	21.8	21.77
		1	24	24	22.63	22.56	22.53		1	24	23	21.82	21.75	21.72
		1	49	24	22.55	22.48	22.45		1	49	23	21.45	21.38	21.35
		25	0	23	21.69	21.62	21.59		25	0	23	20.57	20.5	20.47
		25	12	23	21.67	21.6	21.57		25	12	22	20.53	20.46	20.43
		25	25	23	21.56	21.49	21.46		25	25	22	20.42	20.35	20.32
		50	0	23	21.53	21.46	21.43		50	0	22	20.53	20.46	20.43
Band / BW	Modulation	RB Size	RB Offset	Tune-up	20025	20175	20325	Modulation	RB Size	RB Offset	Tune-up	20025	20175	20325
					1717.5 MHz	1732.5 MHz	1747.5 MHz					1717.5 MHz	1732.5 MHz	1747.5 MHz
4 / 15M	QPSK	1	0	24	22.70	22.62	22.60	16QAM	1	0	23	21.90	21.82	21.80
		1	37	24	22.66	22.58	22.56		1	37	23	21.85	21.77	21.75
		1	74	24	22.58	22.50	22.48		1	74	23	21.48	21.40	21.38
		36	0	23	21.72	21.64	21.62		36	0	23	20.60	20.52	20.50
		36	19	23	21.70	21.62	21.60		36	19	22	20.56	20.48	20.46
		36	39	23	21.59	21.51	21.49		36	39	22	20.45	20.37	20.35
		75	0	23	21.56	21.48	21.46		75	0	22	20.56	20.48	20.46
Band / BW	Modulation	RB Size	RB Offset	Tune-up	20050	20175	20300	Modulation	RB Size	RB Offset	Tune-up	20050	20175	20300
					1720 MHz	1732.5 MHz	1745 MHz					1720 MHz	1732.5 MHz	1745 MHz
4 / 20M	QPSK	1	0	24	22.74	22.65	22.62	16QAM	1	0	23	21.94	21.85	21.82
		1	50	24	22.70	22.61	22.58		1	50	23	21.89	21.80	21.77
		1	99	24	22.62	22.53	22.50		1	99	23	21.52	21.43	21.40
		50	0	23	21.76	21.67	21.64		50	0	23	20.64	20.55	20.52
		50	25	23	21.74	21.65	21.62		50	25	22	20.60	20.51	20.48
		50	50	23	21.63	21.54	21.51		50	50	22	20.49	20.40	20.37
		100	0	23	21.60	21.51	21.48		100	0	22	20.60	20.51	20.48

4）Conducted power measurement results of LTE Band 4_ Sensor On_ Low Power Mode

Band / BW	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 19957 1710.7 MHz	Mid CH 20175 1732.5 MHz	High CH 20393 1754.3 MHz	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 19957 1710.7 MHz	Mid CH 20175 1732.5 MHz	High CH 20393 1754.3 MHz
4 / 1.4M	QPSK	1	0	20	19.27	18.93	18.85	16QAM	1	0	20	19.26	18.92	19.18
		1	2	20	19.18	18.84	19.10		1	2	20	19.11	19.19	19.15
		1	5	20	18.87	18.53	18.79		1	5	20	19.12	18.78	19.04
		3	0	20	19.25	18.91	19.17		3	0	20	19.25	18.91	19.17
		3	1	20	19.26	18.92	19.18		3	1	20	19.17	18.83	19.09
		3	3	20	19.13	18.79	19.05		3	3	20	19.15	18.81	19.07
		6	0	20	19.24	18.90	19.16		6	0	20	19.21	18.87	19.13
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**19965 1711.5 MHz**	**20175 1732.5 MHz**	**20385 1753.5 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**19965 1711.5 MHz**	**20175 1732.5 MHz**	**20385 1753.5 MHz**
4 / 3M	QPSK	1	0	20	19.38	19.04	18.96	16QAM	1	0	20	19.37	19.03	19.29
		1	7	20	19.29	18.95	19.21		1	7	20	19.22	19.30	19.26
		1	14	20	18.98	18.64	18.90		1	14	20	19.23	18.89	19.15
		8	0	20	19.36	19.02	19.28		8	0	20	19.36	19.02	19.28
		8	3	20	19.37	19.03	19.29		8	3	20	19.28	18.94	19.20
		8	7	20	19.24	18.90	19.16		8	7	20	19.26	18.92	19.18
		15	0	20	19.35	19.01	19.27		15	0	20	19.32	18.98	19.24
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**19975 1712.5 MHz**	**20175 1732.5 MHz**	**20375 1752.5 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**19975 1712.5 MHz**	**20175 1732.5 MHz**	**20375 1752.5 MHz**
4 / 5M	QPSK	1	0	20	19.50	19.16	19.08	16QAM	1	0	20	19.49	19.15	19.41
		1	12	20	19.41	19.07	19.33		1	12	20	19.34	19.42	19.38
		1	24	20	19.10	18.76	19.02		1	24	20	19.35	19.01	19.27
		12	0	20	19.48	19.14	19.40		12	0	20	19.48	19.14	19.40
		12	6	20	19.49	19.15	19.41		12	6	20	19.40	19.06	19.32
		12	13	20	19.36	19.02	19.28		12	13	20	19.38	19.04	19.30
		25	0	20	19.47	19.13	19.39		25	0	20	19.44	19.10	19.36

Band / BW	Modulation	RB Size	RB Offset	Tune-up	20000	20175	20350	Modulation	RB Size	RB Offset	Tune-up	20000	20175	20350
					1715 MHz	1732.5 MHz	1750 MHz					1715 MHz	1732.5 MHz	1750 MHz
4 / 10M	QPSK	1	0	20	19.64	19.30	19.22	16QAM	1	0	20	19.63	19.29	19.55
		1	24	20	19.55	19.21	19.47		1	24	20	19.48	19.56	19.52
		1	49	20	19.24	18.90	19.16		1	49	20	19.49	19.15	19.41
		25	0	20	19.62	19.28	19.54		25	0	20	19.62	19.28	19.54
		25	12	20	19.63	19.29	19.55		25	12	20	19.54	19.20	19.46
		25	25	20	19.50	19.16	19.42		25	25	20	19.52	19.18	19.44
		50	0	20	19.61	19.27	19.53		50	0	20	19.58	19.24	19.50
Band / BW	Modulation	RB Size	RB Offset	Tune-up	20025	20175	20325	Modulation	RB Size	RB Offset	Tune-up	20025	20175	20325
					1717.5 MHz	1732.5 MHz	1747.5 MHz					1717.5 MHz	1732.5 MHz	1747.5 MHz
4 / 15M	QPSK	1	0	20	19.75	19.41	19.33	16QAM	1	0	20	19.74	19.40	19.66
		1	37	20	19.66	19.32	19.58		1	37	20	19.59	19.67	19.63
		1	74	20	19.35	19.01	19.27		1	74	20	19.60	19.26	19.52
		36	0	20	19.73	19.39	19.65		36	0	20	19.73	19.39	19.65
		36	19	20	19.74	19.40	19.66		36	19	20	19.65	19.31	19.57
		36	39	20	19.61	19.27	19.53		36	39	20	19.63	19.29	19.55
		75	0	20	19.72	19.38	19.64		75	0	20	19.69	19.35	19.61
Band / BW	Modulation	RB Size	RB Offset	Tune-up	20050	20175	20300	Modulation	RB Size	RB Offset	Tune-up	20050	20175	20300
					1720 MHz	1732.5 MHz	1745 MHz					1720 MHz	1732.5 MHz	1745 MHz
4 / 20M	QPSK	1	0	20	19.87	19.53	19.45	16QAM	1	0	20	19.86	19.52	19.78
		1	50	20	19.78	19.44	19.70		1	50	20	19.71	19.79	19.75
		1	99	20	19.47	19.13	19.39		1	99	20	19.72	19.38	19.64
		50	0	20	19.85	19.51	19.77		50	0	20	19.85	19.51	19.77
		50	25	20	19.86	19.52	19.78		50	25	20	19.77	19.43	19.69
		50	50	20	19.73	19.39	19.65		50	50	20	19.75	19.41	19.67
		100	0	20	19.84	19.50	19.76		100	0	20	19.81	19.47	19.73

5）Conducted power measurement results of LTE Band 5_ Sensor Off_ Full Power Mode

Band / BW	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 20407 824.7 MHz	Mid CH 20525 836.5 MHz	High CH 20643 848.3 MHz	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 20407 824.7 MHz	Mid CH 20525 836.5 MHz	High CH 20643 848.3 MHz
5 / 1.4M	QPSK	1	0	24	22.12	22.20	21.99	16QAM	1	0	23	21.40	21.35	21.27
		1	2	24	22.04	22.07	21.91		1	2	23	21.28	21.23	21.15
		1	5	24	21.96	21.99	21.83		1	5	23	21.25	21.20	21.12
		3	0	24	21.79	21.82	21.66		3	0	23	21.32	21.27	21.19
		3	1	24	21.87	21.90	21.74		3	1	23	21.20	21.15	21.07
		3	3	24	21.80	21.83	21.67		3	3	23	21.17	21.12	21.04
		6	0	23	21.33	21.42	21.48		6	0	22	20.16	20.11	20.03
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**20415 825.5 MHz**	**20525 836.5 MHz**	**20635 847.5 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**20415 825.5 MHz**	**20525 836.5 MHz**	**20635 847.5 MHz**
5 / 3M	QPSK	1	0	24	22.23	22.31	22.10	16QAM	1	0	23	21.51	21.46	21.38
		1	7	24	22.15	22.18	22.02		1	7	23	21.39	21.34	21.26
		1	14	24	22.07	22.10	21.94		1	14	23	21.36	21.31	21.23
		8	0	23	21.02	21.05	20.89		8	0	23	20.14	20.09	20.01
		8	3	23	21.10	21.13	20.97		8	3	22	20.13	20.08	20.00
		8	7	23	21.03	21.06	20.90		8	7	22	20.10	20.05	19.97
		15	0	23	20.96	20.99	20.83		15	0	22	20.04	19.99	19.91

Band / BW	Modulation	RB Size	RB Offset	Tune-up	20425	20525	20625	Modulation	RB Size	RB Offset	Tune-up	20425	20525	20625
					826.5 MHz	836.5 MHz	846.5 MHz					826.5 MHz	836.5 MHz	846.5 MHz
5 / 5M	QPSK	1	0	24	22.36	22.44	22.23	16QAM	1	0	23	21.64	21.59	21.51
		1	12	24	22.28	22.31	22.15		1	12	23	21.52	21.47	21.39
		1	24	24	22.20	22.23	22.07		1	24	23	21.49	21.44	21.36
		12	0	23	21.15	21.18	21.02		12	0	23	20.27	20.22	20.14
		12	6	23	21.23	21.26	21.10		12	6	22	20.26	20.21	20.13
		12	13	23	21.16	21.19	21.03		12	13	22	20.23	20.18	20.10
		25	0	23	21.09	21.12	20.96		25	0	22	20.17	20.12	20.04
Band / BW	Modulation	RB Size	RB Offset	Tune-up	20450	20525	20600	Modulation	RB Size	RB Offset	Tune-up	20450	20525	20600
					829 MHz	836.5 MHz	844 MHz					829 MHz	836.5 MHz	844 MHz
5 / 10M	QPSK	1	0	24	22.48	22.56	22.35	16QAM	1	0	23	21.76	21.71	21.63
		1	24	24	22.40	22.43	22.27		1	24	23	21.64	21.59	21.51
		1	49	24	22.32	22.35	22.19		1	49	23	21.61	21.56	21.48
		25	0	23	21.27	21.30	21.14		25	0	23	20.39	20.34	20.26
		25	12	23	21.35	21.38	21.22		25	12	22	20.38	20.33	20.25
		25	25	23	21.28	21.31	21.15		25	25	22	20.35	20.30	20.22
		50	0	23	21.21	21.24	21.08		50	0	22	20.29	20.24	20.16

6）Conducted power measurement results of LTE Band 5_ Sensor On_ Low Power Mode

Band / BW	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 20407 824.7 MHz	Mid CH 20525 836.5 MHz	High CH 20643 848.3 MHz	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 20407 824.7 MHz	Mid CH 20525 836.5 MHz	High CH 20643 848.3 MHz
5 / 1.4M	QPSK	1	0	20	19.20	18.86	18.80	16QAM	1	0	20	19.07	18.88	19.01
		1	2	20	18.95	18.76	18.89		1	2	20	19.12	18.93	19.06
		1	5	20	18.90	18.71	18.84		1	5	20	18.87	19.01	19.14
		3	0	20	18.87	18.68	18.81		3	0	20	18.87	18.68	18.81
		3	1	20	18.92	18.73	18.86		3	1	20	18.91	18.72	18.85
		3	3	20	18.89	18.70	18.83		3	3	20	18.88	18.69	18.82
		6	0	20	18.92	18.73	18.86		6	0	20	18.93	18.74	18.87
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**20415 825.5 MHz**	**20525 836.5 MHz**	**20635 847.5 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**20415 825.5 MHz**	**20525 836.5 MHz**	**20635 847.5 MHz**
5 / 3M	QPSK	1	0	20	19.33	18.99	18.93	16QAM	1	0	20	19.20	19.01	19.14
		1	7	20	19.08	18.89	19.02		1	7	20	19.25	19.06	19.19
		1	14	20	19.03	18.84	18.97		1	14	20	19.00	19.14	19.27
		8	0	20	19.00	18.81	18.94		8	0	20	19.00	18.81	18.94
		8	3	20	19.05	18.86	18.99		8	3	20	19.04	18.85	18.98
		8	7	20	19.02	18.83	18.96		8	7	20	19.01	18.82	18.95
		15	0	20	19.05	18.86	18.99		15	0	20	19.06	18.87	19.00

Band / BW	Modulation	RB Size	RB Offset	Tune-up	20425	20525	20625	Modulation	RB Size	RB Offset	Tune-up	20425	20525	20625
					826.5 MHz	836.5 MHz	846.5 MHz					826.5 MHz	836.5 MHz	846.5 MHz
5 / 5M	QPSK	1	0	20	19.44	19.10	19.04	16QAM	1	0	20	19.31	19.12	19.25
		1	12	20	19.19	19.00	19.13		1	12	20	19.36	19.17	19.30
		1	24	20	19.14	18.95	19.08		1	24	20	19.11	19.25	19.38
		12	0	20	19.11	18.92	19.05		12	0	20	19.11	18.92	19.05
		12	6	20	19.16	18.97	19.10		12	6	20	19.15	18.96	19.09
		12	13	20	19.13	18.94	19.07		12	13	20	19.12	18.93	19.06
		25	0	20	19.16	18.97	19.10		25	0	20	19.17	18.98	19.11
Band / BW	Modulation	RB Size	RB Offset	Tune-up	20450	20525	20600	Modulation	RB Size	RB Offset	Tune-up	20450	20525	20600
					829 MHz	836.5 MHz	844 MHz					829 MHz	836.5 MHz	844 MHz
5 / 10M	QPSK	1	0	20	19.58	19.24	19.18	16QAM	1	0	20	19.45	19.26	19.39
		1	24	20	19.33	19.14	19.27		1	24	20	19.50	19.31	19.44
		1	49	20	19.28	19.09	19.22		1	49	20	19.25	19.39	19.52
		25	0	20	19.25	19.06	19.19		25	0	20	19.25	19.06	19.19
		25	12	20	19.30	19.11	19.24		25	12	20	19.29	19.10	19.23
		25	25	20	19.27	19.08	19.21		25	25	20	19.26	19.07	19.20
		50	0	20	19.30	19.11	19.24		50	0	20	19.31	19.12	19.25

7）Conducted power measurement results of LTE Band 7_ Sensor Off_ Full Power Mode

Band / BW	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 20775 2502.5 MHz	Mid CH 21100 2535 MHz	High CH 21425 2567.5 MHz	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 20775 2502.5 MHz	Mid CH 21100 2535 MHz	High CH 21425 2567.5 MHz
7 / 5M	QPSK	1	0	23	20.70	20.76	20.64	16QAM	1	0	22	20.09	20.14	19.99
		1	12	23	20.81	20.97	20.66		1	12	22	20.12	20.31	19.97
		1	24	23	20.79	20.64	20.62		1	24	22	20.13	19.99	19.96
		12	0	22	19.90	19.92	19.70		12	0	21	18.91	19.02	18.75
		12	6	22	19.84	19.99	19.75		12	6	21	18.92	19.09	18.84
		12	13	22	19.87	19.86	19.76		12	13	21	18.82	18.88	18.74
		25	0	23	19.91	19.95	19.77		25	0	20	18.93	18.88	18.85
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**20800 2505 MHz**	**21100 2535 MHz**	**21400 2565 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**20800 2505 MHz**	**21100 2535 MHz**	**21400 2565 MHz**
7 / 10M	QPSK	1	0	23	20.84	20.90	20.78	16QAM	1	0	22	20.23	20.28	20.13
		1	24	23	20.95	21.11	20.80		1	24	22	20.26	20.45	20.11
		1	49	23	20.93	20.78	20.76		1	49	22	20.27	20.13	20.10
		25	0	22	20.04	20.06	19.84		25	0	21	19.05	19.16	18.89
		25	12	22	19.98	20.13	19.89		25	12	21	19.06	19.23	18.98
		25	25	22	20.01	20.00	19.90		25	25	21	18.96	19.02	18.88
		50	0	22	20.05	20.09	19.91		50	0	20	19.07	19.02	18.99

Band / BW	Modulation	RB Size	RB Offset	Tune-up	20825	21100	21375	Modulation	RB Size	RB Offset	Tune-up	20825	21100	21375
					2507.5 MHz	2535 MHz	2562.5 MHz					2507.5 MHz	2535 MHz	2562.5 MHz
7 / 15M	QPSK	1	0	23	20.96	21.02	20.90	16QAM	1	0	22	20.35	20.40	20.25
		1	37	23	21.07	21.23	20.92		1	37	22	20.38	20.57	20.23
		1	74	23	21.05	20.90	20.88		1	74	22	20.39	20.25	20.22
		36	0	22	20.16	20.18	19.96		36	0	21	19.17	19.28	19.01
		36	19	22	20.10	20.25	20.01		36	19	21	19.18	19.35	19.10
		36	39	22	20.13	20.12	20.02		36	39	21	19.08	19.14	19.00
		75	0	22	20.17	20.21	20.03		75	0	20	19.19	19.14	19.11
Band / BW	Modulation	RB Size	RB Offset	Tune-up	20850	21100	21350	Modulation	RB Size	RB Offset	Tune-up	20850	21100	21350
					2510 MHz	2535 MHz	2560 MHz					2510 MHz	2535 MHz	2560 MHz
7 / 20M	QPSK	1	0	23	21.07	21.13	21.01	16QAM	1	0	22	20.46	20.51	20.36
		1	50	23	21.18	21.34	21.03		1	50	22	20.49	20.68	20.34
		1	99	23	21.16	21.01	20.99		1	99	22	20.50	20.36	20.33
		50	0	22	20.27	20.29	20.07		50	0	21	19.28	19.39	19.12
		50	25	22	20.21	20.36	20.12		50	25	21	19.29	19.46	19.21
		50	50	22	20.24	20.23	20.13		50	50	21	19.19	19.25	19.11
		100	0	22	20.28	20.32	20.14		100	0	20	19.30	19.25	19.22

8）Conducted power measurement results of LTE Band 7_ Sensor On_ Low Power Mode

Band / BW	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 20775 2502.5 MHz	Mid CH 21100 2535 MHz	High CH 21425 2567.5 MHz	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 20775 2502.5 MHz	Mid CH 21100 2535 MHz	High CH 21425 2567.5 MHz
7 / 5M	QPSK	1	0	18.5	17.43	17.55	17.37	16QAM	1	0	18.5	17.82	17.94	17.76
		1	12	18.5	17.96	18.08	17.90		1	12	18.5	17.76	17.88	17.70
		1	24	18.5	17.32	17.44	17.26		1	24	18.5	17.62	17.74	17.56
		12	0	18.5	17.63	17.75	17.57		12	0	18.5	17.66	17.78	17.60
		12	6	18.5	17.68	17.80	17.62		12	6	18.5	17.61	17.73	17.55
		12	13	18.5	17.53	17.65	17.47		12	13	18.5	17.55	17.67	17.49
		25	0	18.5	17.58	17.70	17.52		25	0	18.5	17.57	17.69	17.51
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**20800 2505 MHz**	**21100 2535 MHz**	**21400 2565 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**20800 2505 MHz**	**21100 2535 MHz**	**21400 2565 MHz**
7 / 10M	QPSK	1	0	18.5	17.55	17.67	17.49	16QAM	1	0	18.5	17.94	18.06	17.88
		1	24	18.5	18.08	18.20	18.02		1	24	18.5	17.88	18.00	17.82
		1	49	18.5	17.44	17.56	17.38		1	49	18.5	17.74	17.86	17.68
		25	0	18.5	17.75	17.87	17.69		25	0	18.5	17.78	17.90	17.72
		25	12	18.5	17.80	17.92	17.74		25	12	18.5	17.73	17.85	17.67
		25	25	18.5	17.65	17.77	17.59		25	25	18.5	17.67	17.79	17.61
		50	0	18.5	17.70	17.82	17.64		50	0	18.5	17.69	17.81	17.63

Band / BW	Modulation	RB Size	RB Offset	Tune-up	20825	21100	21375	Modulation	RB Size	RB Offset	Tune-up	20825	21100	21375
					2507.5 MHz	2535 MHz	2562.5 MHz					2507.5 MHz	2535 MHz	2562.5 MHz
7 / 15M	QPSK	1	0	18.5	17.68	17.80	17.62	16QAM	1	0	18.5	18.07	18.19	18.01
		1	37	18.5	18.21	18.33	18.15		1	37	18.5	18.01	18.13	17.95
		1	74	18.5	17.57	17.69	17.51		1	74	18.5	17.87	17.99	17.81
		36	0	18.5	17.88	18.00	17.82		36	0	18.5	17.91	18.03	17.85
		36	19	18.5	17.93	18.05	17.87		36	19	18.5	17.86	17.98	17.80
		36	39	18.5	17.78	17.90	17.72		36	39	18.5	17.80	17.92	17.74
		75	0	18.5	17.83	17.95	17.77		75	0	18.5	17.82	17.94	17.76
Band / BW	Modulation	RB Size	RB Offset	Tune-up	20850	21100	21350	Modulation	RB Size	RB Offset	Tune-up	20850	21100	21350
					2510 MHz	2535 MHz	2560 MHz					2510 MHz	2535 MHz	2560 MHz
7 / 20M	QPSK	1	0	18.5	17.91	18.03	17.85	16QAM	1	0	18.5	18.30	18.42	18.24
		1	50	18.5	18.44	18.49	18.38		1	50	18.5	18.24	18.36	18.18
		1	99	18.5	17.80	17.92	17.74		1	99	18.5	18.10	18.22	18.04
		50	0	18.5	18.11	18.23	18.05		50	0	18.5	18.14	18.26	18.08
		50	25	18.5	18.16	18.28	18.10		50	25	18.5	18.09	18.21	18.03
		50	50	18.5	18.01	18.13	17.95		50	50	18.5	18.03	18.15	17.97
		100	0	18.5	18.06	18.18	18.00		100	0	18.5	18.05	18.17	17.99

9）Conducted power measurement results of LTE Band 12_ Sensor Off_ Full Power Mode

Band / BW	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 23017 699.7 MHz	Mid CH 23095 707.5 MHz	High CH 23173 715.3 MHz	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 23017 699.7 MHz	Mid CH 23095 707.5 MHz	High CH 23173 715.3 MHz
12 / 1.4M	QPSK	1	0	24	22.32	22.25	22.20	16QAM	1	0	23	22.30	22.23	22.18
		1	2	24	22.20	22.13	22.08		1	2	23	22.18	22.11	22.06
		1	5	24	22.18	22.11	22.06		1	5	23	22.16	22.09	22.04
		3	0	24	22.04	21.97	21.92		3	0	23	22.02	21.95	21.90
		3	1	24	21.99	21.92	21.87		3	1	23	21.97	21.90	21.85
		3	3	24	22.04	21.97	21.92		3	3	23	22.02	21.95	21.90
		6	0	23	21.20	21.13	21.08		6	0	22	21.16	21.09	21.04
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**23025 700.5 MHz**	**23095 707.5 MHz**	**23165 714.5 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**23025 700.5 MHz**	**23095 707.5 MHz**	**23165 714.5 MHz**
12 / 3M	QPSK	1	0	24	22.44	22.37	22.32	16QAM	1	0	23	22.31	22.28	22.22
		1	7	24	22.32	22.25	22.20		1	7	23	22.16	22.13	22.07
		1	14	24	22.30	22.23	22.18		1	14	23	22.17	22.14	22.08
		8	0	23	21.24	21.17	21.12		8	0	23	21.18	21.11	21.06
		8	3	23	21.19	21.12	21.07		8	3	22	21.13	21.06	21.01
		8	7	23	21.24	21.17	21.12		8	7	22	21.18	21.11	21.06
		15	0	22	21.23	21.16	21.11		15	0	22	21.17	21.10	21.05

Band / BW	Modulation	RB Size	RB Offset	Tune-up	23035	23095	23155	Modulation	RB Size	RB Offset	Tune-up	23035	23095	23155
					701.5 MHz	707.5 MHz	713.5 MHz					701.5 MHz	707.5 MHz	713.5 MHz
12 / 5M	QPSK	1	0	24	22.57	22.50	22.45	16QAM	1	0	23	21.74	21.71	21.65
		1	12	24	22.45	22.38	22.33		1	12	23	21.59	21.56	21.50
		1	24	24	22.43	22.36	22.31		1	24	23	21.60	21.57	21.51
		12	0	23	21.37	21.30	21.25		12	0	23	20.29	20.26	20.20
		12	6	23	21.32	21.25	21.20		12	6	22	20.22	20.19	20.13
		12	13	23	21.37	21.30	21.25		12	13	22	20.28	20.25	20.19
		25	0	23	21.36	21.29	21.24		25	0	22	20.23	20.20	20.14
Band / BW	Modulation	RB Size	RB Offset	Tune-up	23060	23095	23130	Modulation	RB Size	RB Offset	Tune-up	23060	23095	23130
					704 MHz	707.5 MHz	711 MHz					704 MHz	707.5 MHz	711 MHz
12 / 10M	QPSK	1	0	24	22.69	22.62	22.57	16QAM	1	0	23	21.86	21.83	21.77
		1	24	24	22.57	22.50	22.45		1	24	23	21.71	21.68	21.62
		1	49	24	22.55	22.48	22.43		1	49	23	21.72	21.69	21.63
		25	0	23	21.49	21.42	21.37		25	0	23	20.41	20.38	20.32
		25	12	23	21.44	21.37	21.32		25	12	22	20.34	20.31	20.25
		25	25	23	21.45	21.42	21.37		25	25	22	20.40	20.37	20.31
		50	0	23	21.48	21.41	21.36		50	0	22	20.35	20.32	20.26

10）Conducted power measurement results of LTE Band 12_ Sensor On_ Low Power Mode

Band / BW	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 23017 699.7 MHz	Mid CH 23095 707.5 MHz	High CH 23173 715.3 MHz	Modulation	RB Sizet	RB Offset	Max. Tune-up Power	Low CH 23017 699.7 MHz	Mid CH 23095 707.5 MHz	High CH 23173 715.3 MHz
12 / 1.4M	QPSK	1	0	20	19.55	19.63	19.47	16QAM	1	0	20	19.54	19.62	19.38
		1	2	20	19.16	19.24	19.00		1	2	20	19.48	19.56	19.32
		1	5	20	19.15	19.23	18.99		1	5	20	19.47	19.55	19.31
		3	0	20	19.13	19.21	18.97		3	0	20	19.19	19.27	19.03
		3	1	20	19.12	19.20	18.96		3	1	20	19.21	19.29	19.05
		3	3	20	19.15	19.23	18.99		3	3	20	19.12	19.20	18.96
		6	0	20	19.17	19.25	19.01		6	0	20	19.22	19.30	19.06
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**23025 700.5 MHz**	**23095 707.5 MHz**	**23165 714.5 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**23025 700.5 MHz**	**23095 707.5 MHz**	**23165 714.5 MHz**
12 / 3M	QPSK	1	0	20	19.67	19.75	19.59	16QAM	1	0	20	19.66	19.74	19.50
		1	7	20	19.28	19.36	19.12		1	7	20	19.60	19.68	19.44
		1	14	20	19.27	19.35	19.11		1	14	20	19.59	19.67	19.43
		8	0	20	19.25	19.33	19.09		8	0	20	19.31	19.39	19.15
		8	3	20	19.24	19.32	19.08		8	3	20	19.33	19.41	19.17
		8	7	20	19.27	19.35	19.11		8	7	20	19.24	19.32	19.08
		15	0	20	19.29	19.37	19.13		15	0	20	19.34	19.42	19.18

Band / BW	Modulation	RB Size	RB Offset	Tune-up	23035	23095	23155	Modulation	RB Size	RB Offset	Tune-up	23035	23095	23155
					701.5 MHz	707.5 MHz	713.5 MHz					701.5 MHz	707.5 MHz	713.5 MHz
12 / 5M	QPSK	1	0	20	19.79	19.87	19.71	16QAM	1	0	20	19.78	19.86	19.62
		1	12	20	19.40	19.48	19.24		1	12	20	19.72	19.80	19.56
		1	24	20	19.39	19.47	19.23		1	24	20	19.71	19.79	19.55
		12	0	20	19.37	19.45	19.21		12	0	20	19.43	19.51	19.27
		12	6	20	19.36	19.44	19.20		12	6	20	19.45	19.53	19.29
		12	13	20	19.39	19.47	19.23		12	13	20	19.36	19.44	19.20
		25	0	20	19.41	19.49	19.25		25	0	20	19.46	19.54	19.30
Band / BW	Modulation	RB Size	RB Offset	Tune-up	23060	23095	23130	Modulation	RB Size	RB Offset	Tune-up	23060	23095	23130
					704 MHz	707.5 MHz	711 MHz					704 MHz	707.5 MHz	711 MHz
12 / 10M	QPSK	1	0	20	19.91	19.99	19.83	16QAM	1	0	20	19.90	19.98	19.74
		1	24	20	19.52	19.60	19.36		1	24	20	19.84	19.92	19.68
		1	49	20	19.51	19.59	19.35		1	49	20	19.83	19.91	19.67
		25	0	20	19.49	19.57	19.33		25	0	20	19.55	19.63	19.39
		25	12	20	19.48	19.56	19.32		25	12	20	19.57	19.65	19.41
		25	25	20	19.51	19.59	19.35		25	25	20	19.48	19.56	19.32
		50	0	20	19.53	19.58	19.37		50	0	20	19.58	19.56	19.42

11）Conducted power measurement results of LTE Band 13_ Sensor Off_ Full Power Mode

Band / BW	Modulation	RB Size	RB Offset	Max. Tune-up Power	Low CH 23205 779.5 MHz	Mid CH 23230 782 MHz	High CH 23255 784.5 MHz	Modulation	RB Size	RB Offset	Max. Tune-up Power	Low CH 23205 779.5 MHz	Mid CH 23230 782 MHz	High CH 23255 784.5 MHz
13 / 5M	QPSK	1	0	24	22.23	22.08	22.06	16QAM	1	0	23	21.33	21.18	21.16
		1	12	24	22.16	22.01	21.99		1	12	23	21.17	21.02	21.00
		1	24	24	22.15	22.00	21.98		1	24	23	21.05	20.90	20.88
		12	0	23	21.17	21.02	21.00		12	0	23	19.84	19.69	19.67
		12	6	23	21.12	20.97	20.95		12	6	22	19.83	19.68	19.66
		12	13	23	21.15	21.00	20.98		12	13	22	19.80	19.65	19.63
		25	0	23	21.14	20.99	20.97		25	0	22	19.82	19.67	19.65

Band / BW	Modulation	RB Size	RB Offset	Max. Tune-up Power	Mid CH 23230 782 MHz	Modulation	RB Size	RB Offset	Max. Tune-up Power	Mid CH 23230 782 MHz
13 / 10M	QPSK	1	0	24	22.30	16QAM	1	0	23	21.59
		1	24	24	22.13		1	24	23	21.43
		1	49	24	22.12		1	49	23	21.31
		25	0	23	21.14		25	0	23	20.10
		25	12	23	21.09		25	12	22	20.09
		25	25	23	21.12		25	25	22	20.06
		50	0	23	21.11		50	0	22	20.08

12）Conducted power measurement results of LTE Band 13_ Sensor On_ Low Power Mode

Band / BW	Modulation	RB Size	RB Offset	Max. Tune-up Power	Low CH 23205 779.5 MHz	Mid CH 23230 782 MHz	High CH 23255 784.5 MHz	Modulation	RB Size	RB Offset	Max. Tune-up Power	Low CH 23205 779.5 MHz	Mid CH 23230 782 MHz	High CH 23255 784.5 MHz
13 / 5M	QPSK	1	0	19.5	19.45	19.26	19.38	16QAM	1	0	19.5	19.46	19.37	19.47
		1	12	19.5	19.28	19.19	19.31		1	12	19.5	19.41	19.43	19.55
		1	24	19.5	19.43	19.34	19.46		1	24	19.5	19.40	19.31	19.43
		12	0	19.5	19.25	19.16	19.28		12	0	19.5	19.30	19.21	19.33
		12	6	19.5	19.35	19.26	19.38		12	6	19.5	19.36	19.27	19.39
		12	13	19.5	19.34	19.25	19.37		12	13	19.5	19.32	19.23	19.35
		25	0	19.5	19.30	19.21	19.33		25	0	19.5	19.40	19.31	19.43
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Max. Tune-up Power**	**Mid CH 23230 782 MHz**			**Modulation**	**RB Size**	**RB Offset**	**Max. Tune-up Power**	**Mid CH 23230 782 MHz**		
13 / 10M	QPSK	1	0	19.5	19.49			16QAM	1	0	19.5	19.22		
		1	24	19.5	19.31				1	24	19.5	19.51		
		1	49	19.5	19.25				1	49	19.5	19.53		
		25	0	19.5	19.35				25	0	19.5	19.26		
		25	12	19.5	19.25				25	12	19.5	19.29		
		25	25	19.5	19.22				25	25	19.5	19.24		
		50	0	19.5	19.33				50	0	19.5	19.31		

13）Conducted power measurement results of LTE Band 25_ Sensor Off_ Full Power Mode

Band / BW	Modulation	RB Size	RB Offset	Max. Tune-up Power	Low CH 26047 1850.7 MHz	Mid CH 26365 1882.5 MHz	High CH 26683 1914.3 MHz	Modulation	RB Offset	Max. Tune-up Power	Low CH 26047 1850.7 MHz	Mid CH 26365 1882.5 MHz	High CH 26683 1914.3
25 / 1.4M	QPSK	1	0	24	22.21	22.17	22.15	16QAM	0	23	21.54	21.53	21.40
		1	2	24	22.28	22.11	22.19		2	23	21.68	21.56	21.66
		1	5	24	21.92	21.81	21.79		5	23	21.23	21.14	21.11
		3	0	24	21.32	21.18	21.19		0	23	20.29	20.20	20.18
		3	1	24	21.29	21.21	21.19		1	23	20.27	20.28	20.22
		3	3	24	21.12	21.11	21.06		3	23	20.07	20.11	20.09
		6	0	23	21.13	21.13	21.15		0	22	20.16	20.14	20.08
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**26055 1851.5 MHz**	**26365 1882.5 MHz**	**26675 1913.5 MHz**	**Modulation**	**RB Offset**	**Tune-up**	**26055 1851.5 MHz**	**26365 1882.5 MHz**	**26675 1913.5 MHz**
25 / 3M	QPSK	1	0	24	22.33	22.29	22.27	16QAM	0	23	21.66	21.65	21.52
		1	7	24	22.40	22.23	22.31		7	23	21.80	21.68	21.78
		1	14	24	22.04	21.93	21.91		14	23	21.35	21.26	21.23
		8	0	23	21.44	21.30	21.31		0	23	20.41	20.32	20.30
		8	3	23	21.41	21.33	21.31		3	22	20.39	20.40	20.34
		8	7	23	21.24	21.23	21.18		7	22	20.19	20.23	20.21
		15	0	23	21.25	21.25	21.27		0	22	20.28	20.26	20.20
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**26065 1852.5 MHz**	**26365 1882.5 MHz**	**26665 1912.5 MHz**	**Modulation**	**RB Offset**	**Tune-up**	**26065 1852.5 MHz**	**26365 1882.5 MHz**	**26665 1912.5 MHz**
25 / 5M	QPSK	1	0	24	22.46	22.42	22.40	16QAM	0	23	21.79	21.78	21.65
		1	12	24	22.53	22.36	22.44		12	23	21.93	21.81	21.91
		1	24	24	22.17	22.06	22.04		24	23	21.48	21.39	21.36
		12	0	23	21.57	21.43	21.44		0	23	20.54	20.45	20.43
		12	6	23	21.54	21.46	21.44		6	22	20.52	20.53	20.47
		12	13	23	21.37	21.36	21.31		13	22	20.32	20.36	20.34
		25	0	23	21.38	21.38	21.40		0	22	20.41	20.39	20.33

Band / BW	Modulation	RB Size	RB Offset	Tune-up	26090	26365	26640	Modulation	RB Offset	Tune-up	26090	26365	26640
					1855 MHz	1882.5 MHz	1910 MHz				1855 MHz	1882.5 MHz	1910 MHz
25 / 10M	QPSK	1	0	24	22.59	22.55	22.53	16QAM	0	23	21.92	21.91	21.78
		1	24	24	22.66	22.49	22.57		24	23	22.06	21.94	22.04
		1	49	24	22.30	22.19	22.17		49	23	21.61	21.52	21.49
		25	0	23	21.70	21.56	21.57		0	23	20.67	20.58	20.56
		25	12	23	21.67	21.59	21.57		12	22	20.65	20.66	20.6
		25	25	23	21.50	21.49	21.44		25	22	20.45	20.49	20.47
		50	0	23	21.51	21.51	21.53		0	22	20.54	20.52	20.46
Band / BW	Modulation	RB Size	RB Offset	Tune-up	26115	26365	26615	Modulation	RB Offset	Tune-up	26115	26365	26615
					1857.5 MHz	1882.5 MHz	1907.5 MHz				1857.5 MHz	1882.5 MHz	1907.5 MHz
25 / 15M	QPSK	1	0	24	22.67	22.63	22.61	16QAM	0	23	22.00	21.99	21.86
		1	37	24	22.74	22.57	22.65		37	23	22.14	22.02	22.12
		1	74	24	22.38	22.27	22.25		74	23	21.69	21.60	21.57
		36	0	23	21.78	21.64	21.65		0	23	20.75	20.66	20.64
		36	19	23	21.75	21.67	21.65		19	22	20.73	20.74	20.68
		36	39	23	21.58	21.57	21.52		39	22	20.53	20.57	20.55
		75	0	23	21.59	21.59	21.61		0	22	20.62	20.60	20.54
Band / BW	Modulation	RB Size	RB Offset	Tune-up	26140	26365	26590	Modulation	RB Offset	Tune-up	26140	26365	26590
					1860 MHz	1882.5 MHz	1905 MHz				1860 MHz	1882.5 MHz	1905 MHz
25 / 20M	QPSK	1	0	24	22.85	22.81	22.79	16QAM	0	23	22.18	22.17	22.04
		1	50	24	22.92	22.75	22.83		50	23	22.32	22.20	22.30
		1	99	24	22.56	22.45	22.43		99	23	21.87	21.78	21.75
		50	0	23	21.96	21.82	21.83		0	23	20.93	20.84	20.82
		50	25	23	21.93	21.85	21.83		25	22	20.91	20.92	20.86
		50	50	23	21.76	21.75	21.70		50	22	20.71	20.75	20.73
		100	0	23	21.77	21.77	21.79		0	22	20.80	20.78	20.72

14）Conducted power measurement results of LTE Band 25_ Sensor On_ Low Power Mode

Band / BW	Modulation	RB Size	RB Offset	Max. Tune-up Power	Low CH 26047 1850.7 MHz	Mid CH 26365 1882.5 MHz	High CH 26683 1914.3 MHz	Modulation	RB Size	RB Offset	Max. Tune-up Power	Low CH 26047 1850.7 MHz	Mid CH 26365 1882.5 MHz	High CH 26683 1914.3
25 / 1.4M	QPSK	1	0	19.5	18.92	18.76	18.71	16QAM	1	0	19.5	18.82	18.78	18.73
		1	2	19.5	18.74	18.70	18.65		1	2	19.5	18.62	18.58	18.53
		1	5	19.5	18.39	18.35	18.30		1	5	19.5	18.80	18.76	18.71
		3	0	19.5	18.78	18.74	18.69		3	0	19.5	18.75	18.71	18.66
		3	1	19.5	18.75	18.71	18.66		3	1	19.5	18.65	18.61	18.56
		3	3	19.5	18.73	18.69	18.64		3	3	19.5	18.64	18.60	18.55
		6	0	19.5	18.68	18.64	18.59		6	0	19.5	18.74	18.70	18.65
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**26055 1851.5 MHz**	**26365 1882.5 MHz**	**26675 1913.5 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**26055 1851.5 MHz**	**26365 1882.5 MHz**	**26675 1913.5 MHz**
25 / 3M	QPSK	1	0	19.5	18.96	18.90	18.85	16QAM	1	0	19.5	18.96	18.92	18.87
		1	7	19.5	18.88	18.84	18.79		1	7	19.5	18.76	18.72	18.67
		1	14	19.5	18.53	18.49	18.44		1	14	19.5	18.94	18.90	18.85
		8	0	19.5	18.92	18.88	18.83		8	0	19.5	18.89	18.85	18.80
		8	3	19.5	18.89	18.85	18.80		8	3	19.5	18.79	18.75	18.70
		8	7	19.5	18.87	18.83	18.78		8	7	19.5	18.78	18.74	18.69
		15	0	19.5	18.82	18.78	18.73		15	0	19.5	18.88	18.84	18.79
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**26065 1852.5 MHz**	**26365 1882.5 MHz**	**26665 1912.5 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**26065 1852.5 MHz**	**26365 1882.5 MHz**	**26665 1912.5 MHz**
25 / 5M	QPSK	1	0	19.5	19.18	19.02	18.97	16QAM	1	0	19.5	19.08	19.04	18.99
		1	12	19.5	19.00	18.96	18.91		1	12	19.5	18.88	18.84	18.79
		1	24	19.5	18.65	18.61	18.56		1	24	19.5	19.06	19.02	18.97
		12	0	19.5	19.04	19.00	18.95		12	0	19.5	19.01	18.97	18.92
		12	6	19.5	19.01	18.97	18.92		12	6	19.5	18.91	18.87	18.82
		12	13	19.5	18.99	18.95	18.90		12	13	19.5	18.90	18.86	18.81
		25	0	19.5	18.94	18.90	18.85		25	0	19.5	19.00	18.96	18.91

Band / BW	Modulation	RB Size	RB Offset	Tune-up	26090	26365	26640	Modulation	RB Size	RB Offset	Tune-up	26090	26365	26640
					1855 MHz	1882.5 MHz	1910 MHz					1855 MHz	1882.5 MHz	1910 MHz
25 / 10M	QPSK	1	0	19.5	19.30	19.14	19.09	16QAM	1	0	19.5	19.20	19.16	19.11
		1	24	19.5	19.12	19.08	19.03		1	24	19.5	19.00	18.96	18.91
		1	49	19.5	18.77	18.73	18.68		1	49	19.5	19.18	19.14	19.09
		25	0	19.5	19.16	19.12	19.07		25	0	19.5	19.13	19.09	19.04
		25	12	19.5	19.13	19.09	19.04		25	12	19.5	19.03	18.99	18.94
		25	25	19.5	19.11	19.07	19.02		25	25	19.5	19.02	18.98	18.93
		50	0	19.5	19.06	19.02	18.97		50	0	19.5	19.12	19.08	19.03
Band / BW	Modulation	RB Size	RB Offset	Tune-up	26115	26365	26615	Modulation	RB Size	RB Offset	Tune-up	26115	26365	26615
					1857.5 MHz	1882.5 MHz	1907.5 MHz					1857.5 MHz	1882.5 MHz	1907.5 MHz
25 / 15M	QPSK	1	0	19.5	19.43	19.27	19.22	16QAM	1	0	19.5	19.33	19.29	19.24
		1	37	19.5	19.25	19.21	19.16		1	37	19.5	19.13	19.09	19.04
		1	74	19.5	18.90	18.86	18.81		1	74	19.5	19.31	19.27	19.22
		36	0	19.5	19.29	19.25	19.20		36	0	19.5	19.26	19.22	19.17
		36	19	19.5	19.26	19.22	19.17		36	19	19.5	19.16	19.12	19.07
		36	39	19.5	19.24	19.20	19.15		36	39	19.5	19.15	19.11	19.06
		75	0	19.5	19.19	19.15	19.10		75	0	19.5	19.25	19.21	19.16
Band / BW	Modulation	RB Size	RB Offset	Tune-up	26140	26365	26590	Modulation	RB Size	RB Offset	Tune-up	26140	26365	26590
					1860 MHz	1882.5 MHz	1905 MHz					1860 MHz	1882.5 MHz	1905 MHz
25 / 20M	QPSK	1	0	19.5	19.48	19.39	19.34	16QAM	1	0	19.5	19.45	19.41	19.36
		1	50	19.5	19.37	19.33	19.28		1	50	19.5	19.25	19.21	19.16
		1	99	19.5	19.02	18.98	18.93		1	99	19.5	19.43	19.39	19.34
		50	0	19.5	19.41	19.37	19.32		50	0	19.5	19.38	19.34	19.29
		50	25	19.5	19.38	19.34	19.29		50	25	19.5	19.28	19.24	19.19
		50	50	19.5	19.36	19.32	19.27		50	50	19.5	19.27	19.23	19.18
		100	0	19.5	19.31	19.27	19.22		100	0	19.5	19.37	19.33	19.28

15）Conducted power measurement results of LTE Band 30_ Sensor Off_ Full Power Mode

Band / BW	Modulation	RB Size	RB Offset	Max. Tune-up Power	L-CH 27685 2307.5 MHz	M-CH 27710 2310 MHz	M-CH 27735 2312.5 MHz	Modulation	RB Offset	Max. Tune-up Power	L-CH 27685 2307.5 MHz	M-CH 27710 2310 MHz	M-CH 27735 2312.5 MHz
30 / 5M	QPSK	1	0	23	21.52	21.47	21.5	16QAM	0	22	20.83	20.87	20.81
		1	12	23	21.42	21.46	21.4		12	22	20.86	20.9	20.84
		1	24	23	21.29	21.33	21.27		24	22	20.65	20.69	20.63
		12	0	22	20.43	20.47	20.41		0	21	19.45	19.49	19.43
		12	6	22	20.42	20.46	20.4		6	21	19.42	19.46	19.4
		12	13	22	20.23	20.27	20.21		13	21	19.24	19.28	19.22
		25	0	22	20.34	20.38	20.32		0	20	19.35	19.39	19.33
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**27710 2310 MHz**			**Modulation**	**RB Offset**	**Tune-up**	**27710 2310 MHz**		
30 / 10M	QPSK	1	0	23	21.63			16QAM	0	22	20.94		
		1	24	23	21.53				24	22	20.97		
		1	49	23	21.4				49	22	20.76		
		25	0	22	20.54				0	21	19.56		
		25	12	22	20.53				12	21	19.53		
		25	25	22	20.34				25	21	19.35		
		50	0	22	20.45				0	20	19.46		

16）Conducted power measurement results of LTE Band 30_ Sensor On_ Low Power Mode

Band / BW	Modulation	RB Size	RB Offset	Max. Tune-up Power	L-CH 27685 2307.5 MHz	M-CH 27710 2310 MHz	M-CH 27735 2312.5 MHz	Modulation	RB Size	RB Offset	Max. Tune-up Power	L-CH 27685 2307.5 MHz	M-CH 27710 2310 MHz	M-CH 27735 2312.5 MHz
30 / 5M	QPSK	1	0	19	18.31	18.52	18.25	16QAM	1	0	19	18.00	18.21	17.94
		1	12	19	18.00	18.21	17.94		1	12	19	18.13	18.34	18.07
		1	24	19	17.93	18.14	17.87		1	24	19	18.24	18.45	18.18
		12	0	19	18.05	18.26	17.99		12	0	19	18.07	18.28	18.01
		12	6	19	18.04	18.25	17.98		12	6	19	18.02	18.23	17.96
		12	13	19	17.80	18.01	17.74		12	13	19	17.86	18.07	17.80
		25	0	19	17.97	18.18	17.91		25	0	19	17.99	18.20	17.93

Band / BW	Modulation	RB Size	RB Offset	Tune-up	27710 2310 MHz	Modulation	RB Size	RB Offset	Tune-up	27710 2310 MHz
30 / 10M	QPSK	1	0	19	18.62	16QAM	1	0	19	18.33
		1	24	19	18.33		1	24	19	18.46
		1	49	19	18.26		1	49	19	18.57
		25	0	19	18.38		25	0	19	18.40
		25	12	19	18.37		25	12	19	18.35
		25	25	19	18.13		25	25	19	18.19
		50	0	19	18.30		50	0	19	18.32

17）Conducted power measurement results of LTE Band 41_ Sensor Off_ Full Power Mode

Band / BW	Modulation	RB Size	RB Offset	Max. Tune-up Power	L-CH 39675 2498.5 MHz	M-CH 40148 2545.8 MHz	M-CH 40620 2593 MHz	M-CH 41093 2640.3 MHz	H-CH 41565 2687.5 MHz	Modulation	RB Size	RB Offset	Max. Tune-up Power	L-CH 39675 2498.5 MHz	M-CH 40148 2545.8 MHz	M-CH 40620 2593 MHz	M-CH 41093 2640.3 MHz	H-CH 41565 2687.5 MHz
41 / 5M	QPSK	1	0	23	20.88	20.88	21.09	20.80	20.87	16QAM	1	0	22	20.22	20.21	20.21	20.18	20.40
		1	12	23	21.12	20.85	21.01	20.91	20.81		1	12	22	20.37	20.18	20.38	20.31	20.29
		1	24	23	20.91	20.54	20.80	20.79	20.70		1	24	22	20.10	19.94	20.21	20.16	20.23
		12	0	22	20.02	19.80	20.08	19.92	20.08		12	0	21	19.04	18.84	19.11	18.96	19.12
		12	6	22	19.97	19.82	20.12	20.03	20.02		12	6	21	19.07	18.88	19.17	19.11	19.04
		12	13	22	19.89	19.80	20.04	19.96	19.93		12	13	21	18.95	18.79	19.10	19.06	18.93
		25	0	22	19.93	19.76	20.10	19.89	19.94		25	0	20	19.01	18.82	19.11	18.96	19.02
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**39700 2501 MHz**	**40160 2547 MHz**	**40620 2593 MHz**	**41080 2639 MHz**	**41540 2685 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**39700 2501 MHz**	**40160 2547 MHz**	**40620 2593 MHz**	**41080 2639 MHz**	**41540 2685 MHz**
41 / 10M	QPSK	1	0	23	20.99	20.89	21.20	20.91	20.98	16QAM	1	0	22	20.33	20.32	20.32	20.29	20.51
		1	24	23	21.23	20.96	21.12	21.02	20.92		1	24	22	20.48	20.29	20.49	20.42	20.40
		1	49	23	21.02	20.65	20.91	20.90	20.81		1	49	22	20.21	20.05	20.32	20.27	20.34
		25	0	22	20.13	19.91	20.19	20.03	20.19		25	0	21	19.15	18.95	19.22	19.07	19.23
		25	12	22	20.08	19.93	20.23	20.14	20.13		25	12	21	19.18	18.99	19.28	19.22	19.15
		25	25	22	20.00	19.91	20.15	20.07	20.04		25	25	21	19.06	18.90	19.21	19.17	19.04
		50	0	22	20.04	19.87	20.21	20.00	20.05		50	0	20	19.12	18.93	19.22	19.07	19.13

Band / BW	Modulation	RB Size	RB Offset	Tune-up	39725 2503.5 MHz	40173 2548.3 MHz	40620 2593 MHz	41068 2637.8 MHz	41515 2682.5 MHz	Modulation	RB Size	RB Offset	Tune-up	39725 2503.5 MHz	40173 2548.3 MHz	40620 2593 MHz	41068 2637.8 MHz	41515 2682.5 MHz
41 / 15M	QPSK	1	0	23	21.11	21.11	21.32	21.03	21.10	16QAM	1	0	22	20.45	20.44	20.44	20.41	20.63
		1	37	23	21.35	21.08	21.24	21.14	21.04		1	37	22	20.60	20.41	20.61	20.54	20.52
		1	74	23	21.14	20.77	21.03	21.02	20.93		1	74	22	20.33	20.17	20.44	20.39	20.46
		36	0	22	20.25	20.03	20.31	20.15	20.31		36	0	21	19.27	19.07	19.34	19.19	19.35
		36	19	22	20.20	20.05	20.35	20.26	20.25		36	19	21	19.30	19.11	19.40	19.34	19.27
		36	39	22	20.12	20.03	20.27	20.19	20.16		36	39	21	19.18	19.02	19.33	19.29	19.16
		75	0	22	20.16	19.99	20.33	20.12	20.17		75	0	20	19.24	19.05	19.34	19.19	19.25
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**39750 2506 MHz**	**40185 2549.5 MHz**	**40620 2593 MHz**	**41055 2636.5 MHz**	**41490 2680 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**39750 2506 MHz**	**40185 2549.5 MHz**	**40620 2593 MHz**	**41055 2636.5 MHz**	**41490 2680 MHz**
41 / 20M	QPSK	1	0	23	21.23	21.23	21.44	21.15	21.22	16QAM	1	0	22	20.57	20.56	20.56	20.53	20.75
		1	50	23	21.47	21.20	21.36	21.26	21.16		1	50	22	20.72	20.53	20.73	20.66	20.64
		1	99	23	21.26	20.89	21.15	21.14	21.05		1	99	22	20.45	20.29	20.56	20.51	20.58
		50	0	22	20.37	20.15	20.43	20.27	20.43		50	0	21	19.39	19.19	19.46	19.31	19.47
		50	25	22	20.32	20.17	20.47	20.38	20.37		50	25	21	19.42	19.23	19.52	19.46	19.39
		50	50	22	20.24	20.15	20.39	20.31	20.28		50	50	21	19.30	19.14	19.45	19.41	19.28
		100	0	22	20.28	20.11	20.45	20.24	20.29		100	0	20	19.36	19.17	19.46	19.31	19.37

18）Conducted power measurement results of LTE Band 41_ Sensor On_ Low Power Mode

Band / BW	Modulation	RB Size	RB Offset	Max. Tune-up Power	L-CH 39675 2498.5 MHz	M-CH 40148 2545.8 MHz	M-CH 40620 2593 MHz	M-CH 41093 2640.3 MHz	H-CH 41565 2687.5 MHz	Modulation	RB Size	RB Offset	Max. Tune-up Power	L-CH 39675 2498.5 MHz	M-CH 40148 2545.8 MHz	M-CH 40620 2593 MHz	M-CH 41093 2640.3 MHz	H-CH 41565 2687.5 MHz
41 / 5M	QPSK	1	0	19	17.61	17.72	18.02	17.98	17.70	16QAM	1	0	19	17.84	17.92	18.10	18.18	17.93
		1	12	19	17.96	17.74	18.22	18.00	18.05		1	12	19	17.75	17.86	18.01	18.12	17.84
		1	24	19	17.48	17.45	18.07	17.71	17.57		1	24	19	17.77	17.84	18.03	18.10	17.86
		12	0	19	17.76	17.68	18.02	17.94	17.85		12	0	19	17.78	17.94	18.04	18.20	17.87
		12	6	19	17.82	17.67	18.08	17.93	17.91		12	6	19	17.85	17.88	18.11	18.14	17.94
		12	13	19	17.75	17.66	18.01	17.92	17.84		12	13	19	17.72	17.94	17.98	18.20	17.81
		25	0	19	17.78	17.60	18.04	17.86	17.87		25	0	19	17.86	17.90	18.12	18.16	17.95
Band / BW	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**39700 2501 MHz**	**40160 2547 MHz**	**40620 2593 MHz**	**41080 2639 MHz**	**41540 2685 MHz**	**Modulation**	**RB Size**	**RB Offset**	**Tune-up**	**39700 2501 MHz**	**40160 2547 MHz**	**40620 2593 MHz**	**41080 2639 MHz**	**41540 2685 MHz**
41 / 10M	QPSK	1	0	19	17.73	17.84	17.99	18.10	17.82	16QAM	1	0	19	17.96	18.04	18.22	18.30	18.05
		1	24	19	18.08	17.86	18.34	18.12	18.17		1	24	19	17.87	17.98	18.13	18.24	17.96
		1	49	19	17.60	17.57	17.86	17.83	17.69		1	49	19	17.89	17.96	18.15	18.22	17.98
		25	0	19	17.88	17.80	18.14	18.06	17.97		25	0	19	17.90	18.06	18.16	18.32	17.99
		25	12	19	17.94	17.79	18.20	18.05	18.03		25	12	19	17.97	18.00	18.23	18.26	18.06
		25	25	19	17.87	17.78	18.13	18.04	17.96		25	25	19	17.84	18.06	18.10	18.32	17.93
		50	0	19	17.90	17.72	18.16	17.98	17.99		50	0	19	17.98	18.02	18.24	18.28	18.07

Band / BW	Modulation	RB Size	RB Offset	Tune-up	39725 2503.5 MHz	40173 2548.3 MHz	40620 2593 MHz	41068 2637.8 MHz	41515 2682.5 MHz	Modulation	RB Size	RB Offset	Tune-up	39725 2503.5 MHz	40173 2548.3 MHz	40620 2593 MHz	41068 2637.8 MHz	41515 2682.5 MHz
41 / 15M	QPSK	1	0	19	17.84	17.95	18.10	18.21	17.93	16QAM	1	0	19	18.07	18.15	18.33	18.41	18.16
		1	37	19	18.19	17.97	18.45	18.23	18.28		1	37	19	17.98	18.09	18.24	18.35	18.07
		1	74	19	17.71	17.68	17.97	17.94	17.80		1	74	19	18.00	18.07	18.26	18.33	18.09
		36	0	19	17.99	17.91	18.25	18.17	18.08		36	0	19	18.01	18.17	18.27	18.43	18.10
		36	19	19	18.05	17.90	18.31	18.16	18.14		36	19	19	18.08	18.11	18.34	18.37	18.17
		36	39	19	17.98	17.89	18.24	18.15	18.07		36	39	19	17.95	18.17	18.21	18.43	18.04
		75	0	19	18.01	17.83	18.27	18.09	18.10		75	0	19	18.09	18.13	18.35	18.39	18.18
Band / BW	Modulation	RB Size	RB Offset	Tune-up	39750 2506 MHz	40185 2549.5 MHz	40620 2593 MHz	41055 2636.5 MHz	41490 2680 MHz	Modulation	RB Size	RB Offset	Tune-up	39750 2506 MHz	40185 2549.5 MHz	40620 2593 MHz	41055 2636.5 MHz	41490 2680 MHz
41 / 20M	QPSK	1	0	19	17.98	18.09	18.24	18.35	18.07	16QAM	1	0	19	18.21	18.29	18.47	18.55	18.30
		1	50	19	18.33	18.11	18.59	18.37	18.42		1	50	19	18.12	18.23	18.38	18.49	18.21
		1	99	19	17.85	17.82	18.11	18.08	17.94		1	99	19	18.14	18.21	18.40	18.47	18.23
		50	0	19	18.13	18.05	18.39	18.31	18.22		50	0	19	18.15	18.31	18.41	18.57	18.24
		50	25	19	18.19	18.04	18.45	18.30	18.28		50	25	19	18.22	18.25	18.48	18.51	18.31
		50	50	19	18.12	18.03	18.38	18.29	18.21		50	50	19	18.09	18.31	18.35	18.57	18.18
		100	0	19	18.15	17.97	18.41	18.23	18.24		100	0	19	18.23	18.27	18.49	18.53	18.32

19）Conducted power measurement results of BT_ Mode

BT	CH	Tune Up	Average Conducted Power (dBm)	SAR Test (Yes/No)
1M_DH5	CH0_2402MHz	7.5	7.34	No
1M_DH5	CH39_2441 MHz	9.5	9.19	No
1M_DH5	CH78_2480 MHz	10.5	10.34	YES
3M_DH5	CH0_2402MHz	5	4.59	No
3M_DH5	CH39_2441 MHz	6	5.99	No
3M_DH5	CH78_2480 MHz	7	6.95	No

BT	CH	Tune Up	Average Conducted Power (dBm)	SAR Test (Yes/No)
BLE	CH0_2402 MHz	0.5	0.09	No
BLE	CH19_2440 MHz	1.5	1.14	No
BLE	CH39_2480 MHz	1.5	1.33	No

20）Conducted power measurement results of WLAN_ Mode

Antenna 0+1 for WLAN2.4G

Mode	Channel	Frequency(MHz)	Data Rate (Mbps)	Ant 0	Ant 1	Tune up	Average Power	SAR Test
				Avg Power	Avg Power		(dBm)	(Yes/No)
802.11b	1	2412	1M	15.52	14.64	19	18.11	Yes
	6	2437		15.61	15.48	19	18.56	
	11	2462		15.68	15.64	19	18.67	
802.11g	1	2412	6M	14.79	14.05	18	17.45	No
	6	2437		14.93	14.31	18	17.64	
	11	2462		14.94	14.44	18	17.71	
802.11n HT20	1	2412	MCS0	13.48	12.95	17	16.23	No
	6	2437		13.77	13.23	17	16.52	
	11	2462		13.88	13.44	17	16.68	

Antenna 0+1 for WLAN5.2G

Mode	Channel	Frequency(MHz)	Data Rate (Mbps)	Ant 0	Ant 1	Tune-up	Average Power	SAR Test
				Avg Power	Avg Power		(dBm)	(Yes/No)
802.11a	36	5180	6.5	12.69	10.92	15.5	14.90	Yes
	40	5200		12.71	10.87	15.5	14.90	
	44	5220		12.88	11.41	15.5	15.22	
	48	5240		12.96	11.61	15.5	15.35	
802.11n HT20	36	5180	6.5	11.67	9.9	14.5	13.88	No
	40	5200		11.94	10.14	14.5	14.14	
	44	5220		11.88	10.25	14.5	14.15	
	48	5240		11.91	10.71	14.5	14.36	
802.11ac VHT80	42	5210	29.3	9.46	8.51	12.5	12.02	No

Antenna 0+1 for WLAN5.3G

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Ant 0 Avg Power	Ant 1 Avg Power	Tune-up	Average Power (dBm)	SAR Test(Yes/No)
802.11a	52	5260	6	12.37	11.29	15.5	14.87	Yes
	56	5280		12.34	11.49	15.5	14.95	
	60	5300		12.58	11.5	15.5	15.08	
	64	5320		12.48	11.6	15.5	15.07	
802.11n HT20	52	5260	6.5	11.23	10.49	14.5	13.89	No
	56	5280		11.39	10.93	14.5	14.18	
	60	5300		11.37	10.81	14.5	14.11	
	64	5320		11.51	10.89	14.5	14.22	
802.11ac VHT80	58	5290	29.3	9.96	9.48	13	12.74	No

Antenna 0+1 for WLAN5.6G

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Ant 0 Avg Power	Ant 1 Avg Power	Tune-up	Average Power (dBm)	SAR Test(Yes/No)
802.11a	100	5500	6	12.79	11.91	15.5	15.38	Yes
	104	5520		12.86	11.85	15.5	15.39	
	108	5540		12.78	11.53	15.5	15.21	
	112	5560		12.77	11.33	15.5	15.12	
	116	5580		12.68	11.57	15.5	15.17	
	132	5660		12.26	10	15.5	14.29	
	136	5680		12.14	10.05	15.5	14.23	
	140	5700		12.13	10.02	15.5	14.21	
802.11n HT20	100	5500	6.5	11.91	11.05	15	14.51	No
	104	5520		11.97	10.72	15	14.40	
	108	5540		11.84	10.45	15	14.21	
	112	5560		11.69	10.71	15	14.24	
	116	5580		11.83	10.6	15	14.27	
	132	5660		11.12	9.02	15	13.21	
	136	5680		11.87	10.03	15	14.06	
	140	5700		11.93	9.84	15	14.02	
802.11ac VHT80	106	5530	29.3	9.93	8.82	12.5	12.42	No
	122	5610		9.69	8.49	12.5	12.14	
	138	5690		9.95	7.78	12.5	12.01	

Antenna 0+1 for WLAN5.8G

Mode	Channel	Frequency	Data Rate	Ant 0	Ant 1	Tune-up	Total Avg Power	SAR Test
		(MHz)	(Mbps)	Avg Power	Avg Power		(dBm)	(Yes/No)
802.11a	149	5745	6	12.98	10.74	15.5	15.01	Yes
	153	5765		12.88	10.25	15.5	14.77	
	157	5785		12.51	10.33	15.5	14.57	
	161	5805		12.6	10.4	15.5	14.65	
	165	5825		12.16	9.97	15.5	14.21	
802.11n HT20	149	5745	6.5	11.63	9.46	14.5	13.69	No
	153	5765		11.49	8.91	14.5	13.40	
	157	5785		11.35	9.34	14.5	13.47	
	161	5805		11.37	9.24	14.5	13.44	
	165	5825		11.95	9.86	14.5	14.04	
802.11ac VHT80	155	5775	29.3	9.28	7.61	12	11.54	No

8.2.SAR TEST RESULTS

General Notes:

1) Per KDB447498 D01, all measurement SAR results are scaled to the maximum tune-up tolerance limit to demonstrate compliant.
2) Per KDB447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:≤0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is≤100 MHz. When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.
3) Per KDB865664 D01,for each frequency band,repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg; if the deviation among the repeated measurement is ≤ 20%,and the measured SAR <1.45W/kg,only one repeated measurement is required.
4) Per KDB941225 D06, the DUT Dimension is bigger than 9 cm x 5 cm, so 10mm is chosen as the test separation distance for Hotspot mode. When the antenna-to-edge distance is greater than 2.5cm,such position does not need to be tested.
5) Per KDB648474 D04, SAR is evaluated without a headset connected to the device.When the standalone reported body-worn SAR is ≤1.2 W/kg, no additional SAR evaluations using a headset are required.
6) Per KDB865664 D02, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is > 1.5 W/kg, or > 7.0 W/kg for occupational exposure. The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-processing.

UMTS Notes:

Per KDB941225 D01, When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤¼ 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.

LTE notes:

1) The LTE test configurations are determined according to KDB941225 D05 SAR for LTE Devices.The general test procedures used for SAR testing can be found in Section 7.1.3.
2) A-MPR was disabled for all SAR test by setting NS_01 on the base station simulator.SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames(maximum TTI)

WLAN Notes:

1. For exposure conditions with multiple test positions, such as handset operating next to the ear, devices with hotspot mode, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all positions in an exposure condition. The test position with the highest extrapolated(peak)SAR is used as the initial test position. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 for 2.4GHZ WIFI single transmission chain operations, the highest measured maximum output powerChannel for DSSS was selected for SAR measurement.SAR for OFDM modes(2.4GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR.See Section7.1.4 for more information.
3. Justification for test configurations for WLAN per KDB Publication 248227 for 5GHZ WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed power. Other transmission mode were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than1.2W/kg. See Section 7.1.4 for more information.

8.2.1.SAR MEASUREMENT RESULT

1. SAR test results of UMTS_ Sensor Off , SAR test distance at 0.9cm.

Test No.	Band	Mode	CH	Test Position	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR Value (W/kg)1-g	Reported SAR
1	WCDMA II	RMC12.2K	9538	Rear Face	24	22.44	0.1	0.26	0.37
2	WCDMA II	RMC12.2K	9538	Right Side	24	22.44	0.05	0.316	**0.45**
3	WCDMA II	RMC12.2K	9538	Top Side	24	22.44	-0.07	0.029	0.04
4	WCDMA II	RMC12.2K	9538	Bottom Side	24	22.44	-0.11	0.014	0.02
10	WCDMA IV	RMC12.2K	1513	Rear Face	24	22.50	0.14	0.192	0.27
11	WCDMA IV	RMC12.2K	1513	Right Side	24	22.50	0.06	0.247	**0.35**
12	WCDMA IV	RMC12.2K	1513	Top Side	24	22.50	-0.04	0.01	0.01
13	WCDMA IV	RMC12.2K	1513	Bottom Side	24	22.50	-0.09	0.011	0.02
19	WCDMA V	RMC12.2K	4233	Rear Face	24	22.43	0.09	0.105	**0.15**
20	WCDMA V	RMC12.2K	4233	Right Side	24	22.43	0.13	0.0271	0.04
21	WCDMA V	RMC12.2K	4233	Top Side	24	22.43	0	0.00486	0.01
22	WCDMA V	RMC12.2K	4233	Bottom Side	24	22.43	0.13	0.0107	0.02

2. SAR test results of LTE_ Sensor Off , SAR test distance at 0.9cm.

Test No.	Band	Mode	CH	RB	offset	Test Position	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR Value (W/kg)1-g	Reported SAR
200	LTE 4	QPSK _20M	20050	1	0	Rear Face	24	22.74	0.02	0.646	**0.86**
201	LTE 4	QPSK _20M	20050	1	0	Right Side	24	22.74	0.11	0.396	0.53
202	LTE 4	QPSK _20M	20050	1	0	Top Side	24	22.74	0.14	0.011	0.01
203	LTE 4	QPSK _20M	20050	1	0	Bottom Side	24	22.74	0.04	0.015	0.02
349	LTE 4	QPSK _20M	20175	1	0	Rear Face	24	22.65	0.08	0.342	0.47
350	LTE 4	QPSK _20M	20300	1	0	Rear Face	24	22.62	-0.04	0.18	0.25
351 _Repeat	LTE 4	QPSK _20M	20050	1	0	Rear Face	24	22.74	0.05	0.6	0.80
204	LTE 4	QPSK _20M	20050	50	0	Rear Face	23	21.76	-0.04	0.45	0.60
205	LTE 4	QPSK _20M	20050	50	0	Right Side	23	21.76	0.17	0.206	0.27
206	LTE 4	QPSK _20M	20050	50	0	Top Side	23	21.76	0.01	0.00905	0.01
207	LTE 4	QPSK _20M	20050	50	0	Bottom Side	23	21.76	0.06	0.015	0.02
352	LTE 5	QPSK _10M	20525	1	0	Rear Face	24	22.48	0.11	0.08	**0.11**
353	LTE 5	QPSK _10M	20525	1	0	Right Side	24	22.48	-0.06	0.027	0.04
354	LTE 5	QPSK _10M	20525	1	0	Top Side	24	22.48	0.05	0.00648	0.01
355	LTE 5	QPSK _10M	20525	1	0	Bottom Side	24	22.48	0.09	0.0056	0.01
356	LTE 5	QPSK _10M	20525	50	12	Rear Face	23	21.76	0.04	0.067	0.09
357	LTE 5	QPSK _10M	20525	50	12	Right Side	23	21.76	0.01	0.02	0.03
358	LTE 5	QPSK _10M	20525	50	12	Top Side	23	21.76	-0.05	0.00487	0.01
359	LTE 5	QPSK _10M	20525	50	12	Bottom Side	23	21.76	0.04	0.00462	0.01

Test No.	Band	Mode	CH	RB	offset	Test Position	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR Value (W/kg)1-g	Reported SAR
216	LTE 7	QPSK _20M	21100	1	50	Rear Face	23	21.34	0.07	0.524	**0.77**
217	LTE 7	QPSK _20M	21100	1	50	Right Side	23	21.34	0.08	0.246	0.36
218	LTE 7	QPSK _20M	21100	1	50	Top Side	23	21.34	0.03	0.069	0.10
219	LTE 7	QPSK _20M	21100	1	50	Bottom Side	23	21.34	0	0	0.00
224	LTE 7	QPSK _20M	21100	50	25	Rear Face	22	20.36	0.06	0.471	0.69
225	LTE 7	QPSK _20M	21100	50	25	Right Side	22	20.36	-0.11	0.192	0.28
226	LTE 7	QPSK _20M	21100	50	25	Top Side	22	20.36	0.02	0.0547	0.08
227	LTE 7	QPSK _20M	21100	50	25	Bottom Side	22	20.36	0.09	0.000588	0.001
232	LTE 12	QPSK _10M	23060	1	0	Rear Face	24	22.69	0.07	0.111	**0.15**
233	LTE 12	QPSK _10M	23060	1	0	Right Side	24	22.69	-0.13	0.076	0.10
234	LTE 12	QPSK _10M	23060	1	0	Top Side	24	22.69	0.07	0.00965	0.01
235	LTE 12	QPSK _10M	23060	1	0	Bottom Side	24	22.69	0.03	0.00515	0.01
240	LTE 12	QPSK _10M	23060	25	0	Rear Face	23	21.49	0.11	0.1	0.14
241	LTE 12	QPSK _10M	23060	25	0	Right Side	23	21.49	-0.03	0.061	0.09
242	LTE 12	QPSK _10M	23060	25	0	Top Side	23	21.49	0.18	0.00912	0.01
243	LTE 12	QPSK _10M	23060	25	0	Bottom Side	23	21.49	0.14	0.00473	0.01

Test No.	Band	Mode	CH	RB	offset	Test Position	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR Value (W/kg)1-g	Reported SAR
254	LTE 13	QPSK _10M	23230	1	0	Rear Face	24	22.30	0.06	0.059	**0.09**
255	LTE 13	QPSK _10M	23230	1	0	Right Side	24	22.30	0.07	0.041	0.06
256	LTE 13	QPSK _10M	23230	1	0	Top Side	24	22.30	0.12	0.0078	0.01
257	LTE 13	QPSK _10M	23230	1	0	Bottom Side	24	22.30	0.17	0.0061	0.01
262	LTE 13	QPSK _10M	23230	25	0	Rear Face	23	21.14	0.19	0.045	0.07
263	LTE 13	QPSK _10M	23230	25	0	Right Side	23	21.14	-0.16	0.019	0.03
264	LTE 13	QPSK _10M	23230	25	0	Top Side	23	21.14	0.11	0.00528	0.01
265	LTE 13	QPSK _10M	23230	25	0	Bottom Side	23	21.14	0.05	0.00393	0.01
262	LTE 13	QPSK _10M	23230	25	0	Rear Face	23	21.14	0.19	0.045	0.07
297	LTE 25	QPSK _20M	26140	1	50	Rear Face	24	22.92	0.15	0.219	0.28
298	LTE 25	QPSK _20M	26140	1	50	Right Side	24	22.92	0.09	0.32	**0.41**
299	LTE 25	QPSK _20M	26140	1	50	Top Side	24	22.92	0.04	0.034	0.04
300	LTE 25	QPSK _20M	26140	1	50	Bottom Side	24	22.92	0.02	0.00546	0.01
305	LTE 25	QPSK _20M	26140	50	0	Rear Face	23	21.96	0.04	0.276	0.35
306	LTE 25	QPSK _20M	26140	50	0	Right Side	23	21.96	0.03	0.284	0.36
307	LTE 25	QPSK _20M	26140	50	0	Top Side	23	21.96	0.06	0.022	0.03
308	LTE 25	QPSK _20M	26140	50	0	Bottom Side	23	21.96	-0.07	0.00506	0.01

Test No.	Band	Mode	CH	RB	offset	Test Position	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR Value (W/kg)1-g	Reported SAR
341	LTE 30	QPSK _10M	27710	1	0	Rear Face	23	21.63	-0.02	0.161	0.22
342	LTE 30	QPSK _10M	27710	1	0	Right Side	23	21.63	0.05	0.224	**0.31**
343	LTE 30	QPSK _10M	27710	1	0	Top Side	23	21.63	0.05	0.0156	0.02
344	LTE 30	QPSK _10M	27710	1	0	Bottom Side	23	21.63	0	0.00738	0.01
345	LTE 30	QPSK _10M	27710	25	0	Rear Face	22	20.54	-0.06	0.15	0.21
346	LTE 30	QPSK _10M	27710	25	0	Right Side	22	20.54	0.05	0.112	0.16
347	LTE 30	QPSK _10M	27710	25	0	Top Side	22	20.54	0.02	0.0159	0.02
348	LTE 30	QPSK _10M	27710	25	0	Bottom Side	22	20.54	0	0.00593	0.01
329	LTE 41	QPSK _20M	39750	1	50	Rear Face	23	21.47	-0.03	0.269	**0.38**
330	LTE 41	QPSK _20M	39750	1	50	Right Side	23	21.47	0.07	0.102	0.15
331	LTE 41	QPSK _20M	39750	1	50	Top Side	23	21.47	-0.05	0.026	0.04
332	LTE 41	QPSK _20M	39750	1	50	Bottom Side	23	21.47	0.08	0.00146	0.002
400	LTE 41	QPSK _20M	40185	1	50	Rear Face	23	21.2	-0.09	0.211	0.32
401	LTE 41	QPSK _20M	40620	1	50	Rear Face	23	21.36	0.11	0.226	0.33
402	LTE 41	QPSK _20M	41055	1	50	Rear Face	23	21.26	-0.04	0.219	0.33
403	LTE 41	QPSK _20M	41490	1	50	Rear Face	23	21.16	0.05	0.195	0.30
337	LTE 41	QPSK _20M	40620	50	25	Rear Face	22	20.47	-0.02	0.187	0.27
338	LTE 41	QPSK _20M	40620	50	25	Right Side	22	20.47	0.05	0.223	0.32
339	LTE 41	QPSK _20M	40620	50	25	Top Side	22	20.47	0.07	0.032	0.05
340	LTE 41	QPSK _20M	40620	50	25	Bottom Side	22	20.47	0.16	0.000691	0.001
404	LTE 41	QPSK _20M	39750	50	25	Right Side	22	20.32	-0.13	0.207	0.30
405	LTE 41	QPSK _20M	40185	50	25	Right Side	22	20.15	0.05	0.19	0.29
406	LTE 41	QPSK _20M	41055	50	25	Right Side	22	20.38	-0.01	0.216	0.31
407	LTE 41	QPSK _20M	41490	50	25	Right Side	22	20.37	0.06	0.207	0.30

Note: The test data of LTE B41 duty cycle is 63.3%.

3. SAR test results of UMTS_ Sensor On , SAR test distance at 0cm.

Test No.	Band	Mode	CH	Test Position	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR Value (W/kg)1-g	Reported SAR
60	WCDMA II	RMC12.2K	9262	Rear Face	19.5	19.48	0.13	0.533	0.54
61	WCDMA II	RMC12.2K	9262	Right Side	19.5	19.48	0.14	0.748	**0.75**
62	WCDMA II	RMC12.2K	9262	Top Side	19.5	19.48	0.18	0.05	0.05
63	WCDMA II	RMC12.2K	9262	Bottom Side	19.5	19.48	0.06	0.01	0.01
70	WCDMA IV	RMC12.2K	1312	Rear Face	20	19.58	0.11	0.5	0.55
71	WCDMA IV	RMC12.2K	1312	Right Side	20	19.58	0.06	0.851	**0.94**
72	WCDMA IV	RMC12.2K	1312	Top Side	20	19.58	0.08	0.023	0.03
73	WCDMA IV	RMC12.2K	1312	Bottom Side	20	19.58	0.14	0.023	0.03
76	WCDMA IV	RMC12.2K	1413	Right Side	20	19.30	-0.04	0.366	0.43
77	WCDMA IV	RMC12.2K	1513	Right Side	20	19.53	0.06	0.399	0.44
78_ Repeat	WCDMA IV	RMC12.2K	1312	Right Side	20	19.58	0.01	0.837	0.92
80	WCDMA V	RMC12.2K	4132	Rear Face	19.5	19.37	0.1	0.157	**0.16**
81	WCDMA V	RMC12.2K	4132	Right Side	19.5	19.37	-0.05	0.099	0.10
82	WCDMA V	RMC12.2K	4132	Top Side	19.5	19.37	-0.14	0.00397	0.004
83	WCDMA V	RMC12.2K	4132	Bottom Side	19.5	19.37	0.17	0.00282	0.003

4. SAR test results of LTE_ Sensor On , SAR test distance at 0cm.

Test No.	Band	Mode	CH	RB	offset	Test Position	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR Value (W/kg)1-g	Reported SAR
500	LTE 4	QPSK _20M	20050	1	0	Rear Face	20	19.87	0.03	0.522	0.54
501	LTE 4	QPSK _20M	20050	1	0	Right Side	20	19.87	-0.1	0.635	**0.65**
502	LTE 4	QPSK _20M	20050	1	0	Top Side	20	19.87	0.14	0.016	0.02
503	LTE 4	QPSK _20M	20050	1	0	Bottom Side	20	19.87	0.1	0.022	0.023
509	LTE 4	QPSK _20M	20050	50	25	Rear Face	20	19.86	0.01	0.364	0.38
510	LTE 4	QPSK _20M	20050	50	25	Right Side	20	19.86	-0.06	0.474	0.49
511	LTE 4	QPSK _20M	20050	50	25	Top Side	20	19.86	0.12	0.025	0.03
512	LTE 4	QPSK _20M	20050	50	25	Bottom Side	20	19.86	0.08	0.022	0.023
653	LTE 5	QPSK _10M	20450	1	0	Rear Face	20	19.58	0.03	0.137	0.15
654	LTE 5	QPSK _10M	20450	1	0	Right Side	20	19.58	0.05	0.092	0.10
655	LTE 5	QPSK _10M	20450	1	0	Top Side	20	19.58	-0.09	0.00511	0.01
656	LTE 5	QPSK _10M	20450	1	0	Bottom Side	20	19.58	-0.06	0.0042	0.005
657	LTE 5	QPSK _10M	20450	25	12	Rear Face	20	19.30	0.07	0.136	**0.16**
658	LTE 5	QPSK _10M	20450	25	12	Right Side	20	19.30	0.09	0.087	0.10
659	LTE 5	QPSK _10M	20450	25	12	Top Side	20	19.30	-0.04	0.00454	0.01
660	LTE 5	QPSK _10M	20450	25	12	Bottom Side	20	19.30	-0.14	0.00414	0.005

Test No.	Band	Mode	CH	RB	offset	Test Position	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR Value (W/kg)1-g	Reported SAR
521	LTE 7	QPSK _20M	21100	1	50	Rear Face	18.5	18.49	0.14	0.896	0.90
522	LTE 7	QPSK _20M	21100	1	50	Right Side	18.5	18.49	0.15	0.394	0.39
523	LTE 7	QPSK _20M	21100	1	50	Top Side	18.5	18.49	0.01	0.031	0.031
524	LTE 7	QPSK _20M	21100	1	50	Bottom Side	18.5	18.49	0.07	0.00135	0.001
525	LTE 7	QPSK _20M	20850	1	50	Rear Face	18.5	18.44	0.05	0.937	0.95
526	LTE 7	QPSK _20M	21350	1	50	Rear Face	18.5	18.38	0.12	0.809	0.83
651_ Repeat	LTE 7	QPSK _20M	20850	1	50	Rear Face	18.5	18.44	0.01	0.934	0.95
529	LTE 7	QPSK _20M	21100	50	25	Rear Face	18.5	18.28	-0.12	0.902	0.95
530	LTE 7	QPSK _20M	21100	50	25	Right Side	18.5	18.28	0.01	0.398	0.42
531	LTE 7	QPSK _20M	21100	50	25	Top Side	18.5	18.28	0.02	0.031	0.033
532	LTE 7	QPSK _20M	21100	50	25	Bottom Side	18.5	18.28	0.04	0.000851	0.001
533	LTE 7	QPSK _20M	20850	50	25	Rear Face	18.5	18.26	0.06	0.949	**1.00**
534	LTE 7	QPSK _20M	21350	50	25	Rear Face	18.5	18.10	0.09	0.792	0.87
535_ Repeat	LTE 7	QPSK _20M	20850	50	25	Rear Face	18.5	18.26	0.03	0.924	0.98
537	LTE 12	QPSK _10M	23095	1	0	Rear Face	21	19.99	0.13	0.28	**0.35**
538	LTE 12	QPSK _10M	23095	1	0	Right Side	21	19.99	0.12	0.183	0.23
539	LTE 12	QPSK _10M	23095	1	0	Top Side	21	19.99	0.19	0.022	0.028
540	LTE 12	QPSK _10M	23095	1	0	Bottom Side	21	19.99	-0.15	0.015	0.02
546	LTE 12	QPSK _10M	23095	25	25	Rear Face	21	19.59	0.17	0.241	0.33
547	LTE 12	QPSK _10M	23095	25	25	Right Side	21	19.59	0.03	0.156	0.22
548	LTE 12	QPSK _10M	23095	25	25	Top Side	21	19.59	0.1	0.02	0.03
549	LTE 12	QPSK _10M	23095	25	25	Bottom Side	21	19.59	0.13	0.014	0.02

Test No.	Band	Mode	CH	RB	offset	Test Position	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR Value (W/kg)1-g	Reported SAR
554	LTE 13	QPSK _10M	23230	1	0	Rear Face	21	19.49	0.02	0.132	**0.19**
555	LTE 13	QPSK _10M	23230	1	0	Right Side	21	19.49	0.14	0.097	0.14
556	LTE 13	QPSK _10M	23230	1	0	Top Side	21	19.49	0.14	0.00601	0.01
557	LTE 13	QPSK _10M	23230	1	0	Bottom Side	21	19.49	0.08	0.00359	0.005
563	LTE 13	QPSK _10M	23230	25	0	Rear Face	21	19.35	-0.11	0.126	0.18
564	LTE 13	QPSK _10M	23230	25	0	Right Side	21	19.35	0.03	0.093	0.14
565	LTE 13	QPSK _10M	23230	25	0	Top Side	21	19.35	0.18	0.00434	0.0063
566	LTE 13	QPSK _10M	23230	25	0	Bottom Side	21	19.35	0.05	0.00313	0.0046
588	LTE 25	QPSK _20M	26140	1	0	Rear Face	19.5	19.48	0.12	0.511	0.51
589	LTE 25	QPSK _20M	26140	1	0	Right Side	19.5	19.48	0.03	0.707	0.71
590	LTE 25	QPSK _20M	26140	1	0	Top Side	19.5	19.48	0.09	0.04	0.04
591	LTE 25	QPSK _20M	26140	1	0	Bottom Side	19.5	19.48	0.05	0.012	0.01
596	LTE 25	QPSK _20M	26140	50	0	Rear Face	19.5	19.41	0.18	0.529	0.54
597	LTE 25	QPSK _20M	26140	50	0	Right Side	19.5	19.41	0.08	0.718	**0.73**
598	LTE 25	QPSK _20M	26140	50	0	Top Side	19.5	19.41	0.14	0.04	0.04
599	LTE 25	QPSK _20M	26140	50	0	Bottom Side	19.5	19.41	-0.03	0.012	0.01

Test No.	Band	Mode	CH	RB	offset	Test Position	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR Value (W/kg)1-g	Reported SAR
640	LTE 30	QPSK _10M	27710	1	0	Rear Face	19	18.62	0.15	0.366	0.40
641	LTE 30	QPSK _10M	27710	1	0	Right Side	19	18.62	-0.05	0.242	0.26
642	LTE 30	QPSK _10M	27710	1	0	Top Side	19	18.62	0.16	0.023	0.03
643	LTE 30	QPSK _10M	27710	1	0	Bottom Side	19	18.62	0.17	0.024	0.03
647	LTE 30	QPSK _10M	27710	25	0	Rear Face	19	18.38	0.06	0.363	**0.42**
648	LTE 30	QPSK _10M	27710	25	0	Right Side	19	18.38	-0.07	0.237	0.27
649	LTE 30	QPSK _10M	27710	25	0	Top Side	19	18.38	0.17	0.024	0.03
650	LTE 30	QPSK _10M	27710	25	0	Bottom Side	19	18.38	0.15	0.011	0.01
620	LTE 41	QPSK _20M	40620	1	50	Rear Face	19	18.59	0.01	0.251	0.28
621	LTE 41	QPSK _20M	40620	1	50	Right Side	19	18.59	0.05	0.226	0.25
622	LTE 41	QPSK _20M	40620	1	50	Top Side	19	18.59	-0.14	0.022	0.02
623	LTE 41	QPSK _20M	40620	1	50	Bottom Side	19	18.59	0.16	0.00158	0.002
700	LTE 41	QPSK _20M	39750	1	50	Rear Face	19	18.33	0.05	0.202	0.24
701	LTE 41	QPSK _20M	40185	1	50	Rear Face	19	18.11	0.09	0.192	0.24
702	LTE 41	QPSK _20M	41055	1	50	Rear Face	19	18.37	0.12	0.226	0.26
703	LTE 41	QPSK _20M	41490	1	50	Rear Face	19	18.42	0.14	0.235	0.27
628	LTE 41	QPSK _20M	40620	50	25	Rear Face	19	18.45	0.1	0.253	**0.29**
629	LTE 41	QPSK _20M	40620	50	25	Right Side	19	18.45	-0.08	0.23	0.26
630	LTE 41	QPSK _20M	40620	50	25	Top Side	19	18.45	0	0.021	0.024
631	LTE 41	QPSK _20M	40620	50	25	Bottom Side	19	18.45	0.19	0.00133	0.002
704	LTE 41	QPSK _20M	39750	50	25	Rear Face	19	18.19	-0.07	0.196	0.24
705	LTE 41	QPSK _20M	40185	50	25	Rear Face	19	18.04	0.12	0.185	0.23
706	LTE 41	QPSK _20M	41055	50	25	Rear Face	19	18.3	-0.09	0.214	0.25
707	LTE 41	QPSK _20M	41490	50	25	Rear Face	19	18.28	0.14	0.207	0.24

Note: The test data of LTE B41 duty cycle is 63.3%.

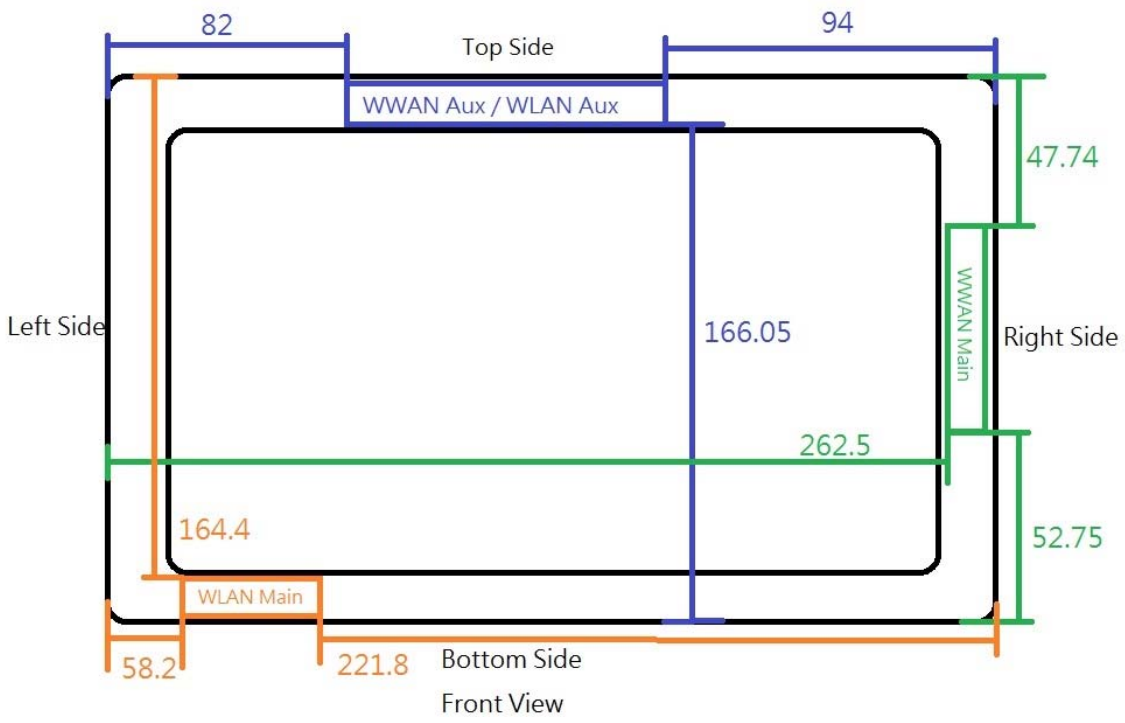
5. SAR test results of WIFI/BT ,SAR test distance at 0cm.

Test No.	Band	Mode	CH	Test Position	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR Value (W/kg)1-g	Reported SAR
835	Bluetooth	1M-DH5	78	Rear Face	10.5	10.34	0	0.00563	**0.01**
800	802.11b	-	11	Rear Face	19	18.67	-0.07	0.497	**0.54**
801	802.11b	-	11	Left Side	19	18.67	0.1	0.035	0.04
802	802.11b	-	11	Top Side	19	18.67	0.12	0.22	0.24
803	802.11b	-	11	Bottom Side	19	18.67	0.05	0.35	0.38
807	802.11a	-	48	Rear Face	15.5	15.35	0.02	0.461	0.48
808	802.11a	-	48	Left Side	15.5	15.35	0.06	0.017	0.02
809	802.11a	-	48	Top Side	15.5	15.35	-0.03	0.574	**0.59**
810	802.11a	-	48	Bottom Side	15.5	15.35	0.12	0.189	0.20
814	802.11a	-	60	Rear Face	15.5	15.08	-0.08	0.405	0.45
815	802.11a	-	60	Left Side	15.5	15.08	0.01	0.016	0.02
816	802.11a	-	60	Top Side	15.5	15.08	0.09	0.529	**0.58**
817	802.11a	-	60	Bottom Side	15.5	15.08	-0.05	0.153	0.17
821	802.11a	-	104	Rear Face	15.5	15.38	0.02	0.605	**0.62**
822	802.11a	-	104	Left Side	15.5	15.38	-0.15	0.03	0.03
823	802.11a	-	104	Top Side	15.5	15.38	-0.05	0.589	0.61
824	802.11a	-	104	Bottom Side	15.5	15.38	-0.03	0.345	0.35
828	802.11a	-	149	Rear Face	15.5	15.01	0.09	0.612	0.69
829	802.11a	-	149	Left Side	15.5	15.01	0.05	0.014	0.02
830	802.11a	-	149	Top Side	15.5	15.01	0	0.688	**0.77**
831	802.11a	-	149	Bottom Side	15.5	15.01	0.16	0.485	0.54

8.3. MULTIPLE TRANSMITTER EVALUATION

The following tables list information which is relevant for the decision if a simultaneous transmit evaluation is necessary according to FCC KDB 447498D01 General RF Exposure Guidance v06.

The location of the antennas inside the pad is shown as below picture:



8.3.1.STAND-ALONE SAR TEST EXCLUSION

Per FCC KDB 447498D01, SAR compliance for simultaneous transmission must be considered when the maximum duration of overlapping transmissions, including network hand-offs, is greater than 30 seconds.This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis.

The Simultaneous Transmission Possibilities of this device are as below:

No.	Configuration	Body-worn
1	UMTS (DATA)+WiFi	Yes
2	UMTS (DATA)+BT	Yes
3	LTE(DATA)+WiFi	Yes
4	LTE(DATA)+BT	Yes

Note:
i) Wi-Fi and Bluetooth share the same antenna and can’t transmit simultaneously.
ii)3G&4G share the same antenna and can’t transmit simultaneously.
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8.3.2.SAR SUMMATION SCENARIO

1) About BT/WiFi and UMTS/LTE Main antenna (sensor off)

Test Position / SAR1g(W/kg)	Rear Face	Top Side	Right Side	Bottom Side
UMTS Band 2	0.45	0.04	0.45	0.02
UMTS Band 4	0.27	0.01	0.35	0.02
UMTS Band 5	0.15	0.01	0.04	0.02
LTE Band 4	0.86	0.01	0.53	0.02
LTE Band 5	0.11	0.01	0.04	0.01
LTE Band 7	0.77	0.10	0.36	0.001
LTE Band 12	0.15	0.01	0.10	0.01
LTE Band 13	0.09	0.01	0.06	0.01
LTE Band 25	0.35	0.04	0.41	0.01
LTE Band 30	0.22	0.02	0.31	0.01
LTE Band 41	0.38	0.05	0.32	0.002
2.4GWiFi	0.54	0.24	-	0.38
5.2G WiFi	0.48	0.59	-	0.20
5.3G WiFi	0.45	0.58	-	0.17
5.6G WiFi	0.62	0.61	-	0.35
5.8G WiFi	0.69	0.77	-	0.54
BT	0.01	-	-	-
MAX$\sum SAR_{1g}$	1.55	0.87	-	0.56

2) About BT/WiFi and UMTS/LTE Main antenna (sensor on)

Test Position / SAR1g(W/kg)	Rear Face	Top Side	Right Side	Bottom Side
UMTS Band 2	0.54	0.05	0.75	0.01
UMTS Band 4	0.55	0.03	0.94	0.03
UMTS Band 5	0.16	0.004	0.10	0.003
LTE Band 4	0.54	0.03	0.65	0.023
LTE Band 5	0.16	0.01	0.10	0.005
LTE Band 7	1.00	0.033	0.42	0.001
LTE Band 12	0.35	0.03	0.23	0.02
LTE Band 13	0.19	0.01	0.14	0.005
LTE Band 25	0.54	0.04	0.73	0.01
LTE Band 30	0.42	0.03	0.27	0.03
LTE Band 41	0.29	0.024	0.26	0.002
2.4GWiFi	0.54	0.24	-	0.38
5.2G WiFi	0.48	0.59	-	0.20
5.3G WiFi	0.45	0.58	-	0.17
5.6G WiFi	0.62	0.61	-	0.35
5.8G WiFi	0.69	0.77	-	0.54
BT	0.01	-	-	-
$MAX\sum SAR_{1g}$	1.69	0.82	0.94	0.57

8.3.3.SIMULTANEOUS TRANSMISSION CONLCUSION

According to KDB447498 D01, When the sum of SAR is larger than limit, SAR test exclusion isdetermined by the SAR to peak location separation ratio(SPLSR).When the SAR to peak location ratio for each pair of antennas is 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion. When 10-g SAR applies, the ratio must be ≤ 0.10.

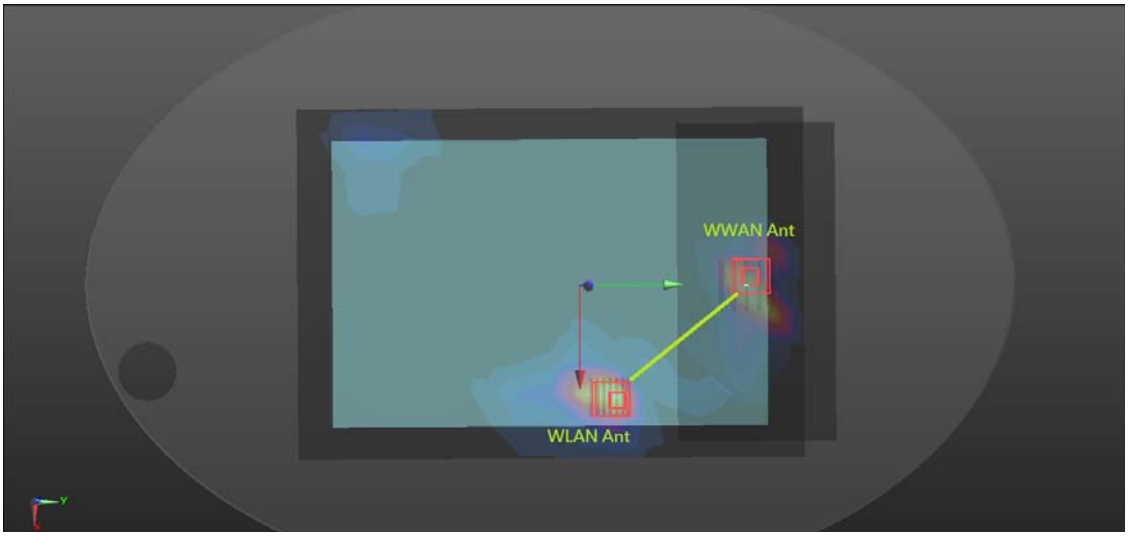
When SAR is measured for both antennas in the pair the peak location separation distance is computed by the followingformula:

$$\text{Distance}_{Tx1\text{-}Tx2} = R_i = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2}$$

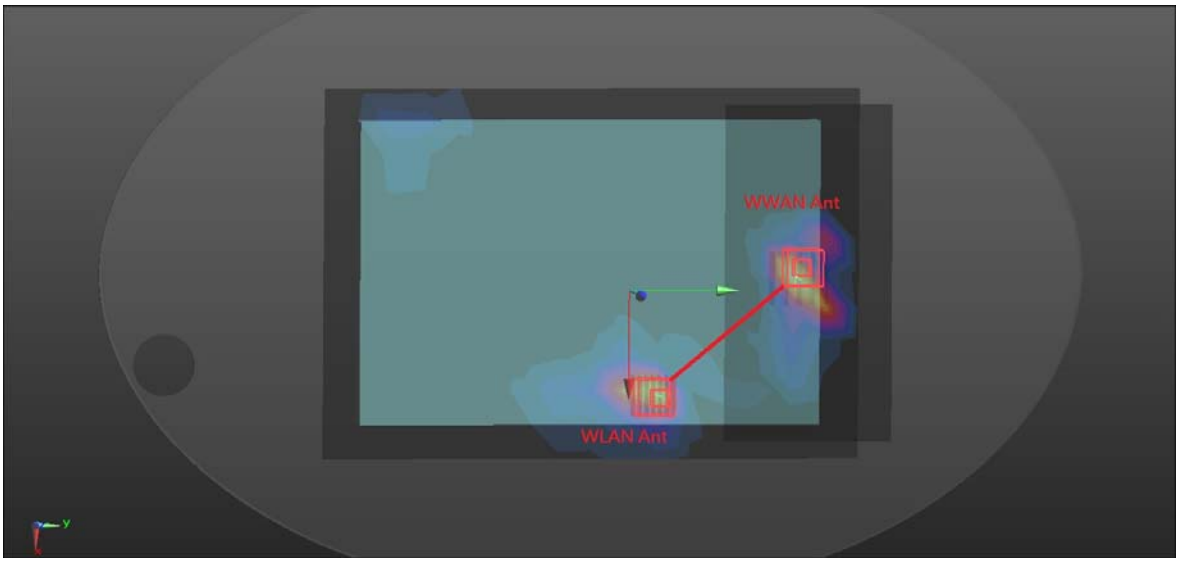
$$\text{SPLS Ratio} = (SAR_1 + SAR_2)^{1.5}/R_i$$

When standalone test exclusion applies, SAR is estimated; the peak location is assumed to be at the feed-point or geometric center of the antenna. Due to curvatures on the SAM phantom, when SAR is estimated for one of the antennas in an antenna pair, the measured peak SAR location should be translated onto the test device to determine the peak location separation for the antenna pair. The ERP location on the phantom is aligned with the ERP location on the handset, with 6mm separation in the z coordinate due to the ear spacer. A measured peak location can be translated onto the handset, with respect to the ERP location, by ignoring the 6 mm offset in the z coordinate. The assumed peak location of the antenna with estimated SAR can also be determined with respect to the ERP location on the handset. The peak location separation distance is estimated by the x and y coordinated of the peaks, referenced to the ERP location. While flat phantoms are not expected to have these issues, the same peak translation approach should be applied to determine peak location separation.

1） The sum of aggregate 1g SAR was above 1.6 W/kg for RearFace configuration with LTE Band7 and WiFi5.6G.
The Peak SAR location is as below:

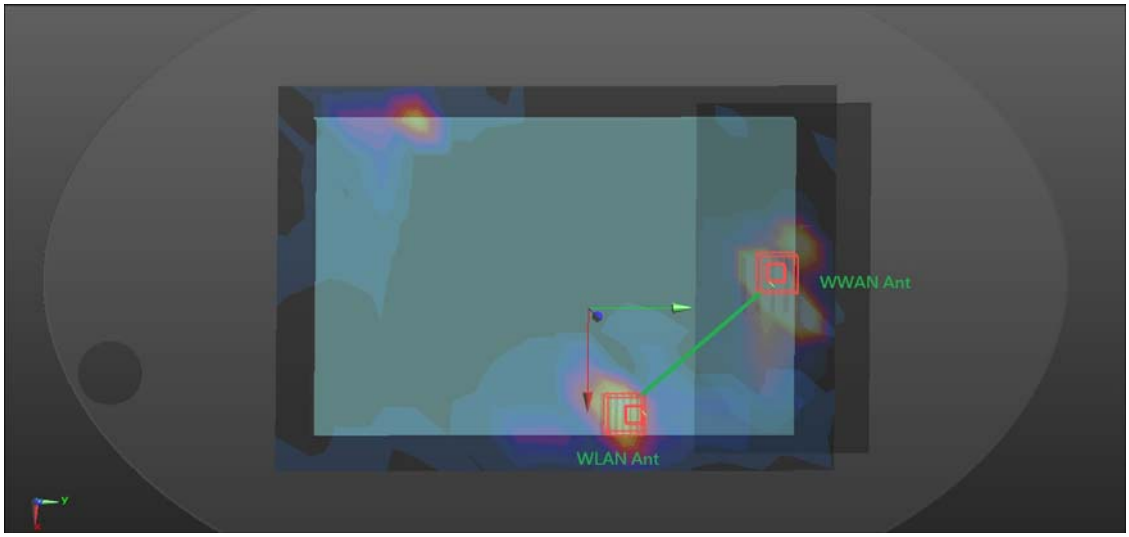


Mode	Reported SAR_{1g}	Peak SAR_{1g}	X	Y	Z	D(mm)	SPLSR	Ratio Limit	Simultaneous SAR
	mW/g	mW/g	m	m	m				
LTE B7	0.95	1.383	-2.8	125.2	5.41	1123.9	0.002	0.04	No
WiFi 5.6G	0.62	1.101	72	41.4	1.57				

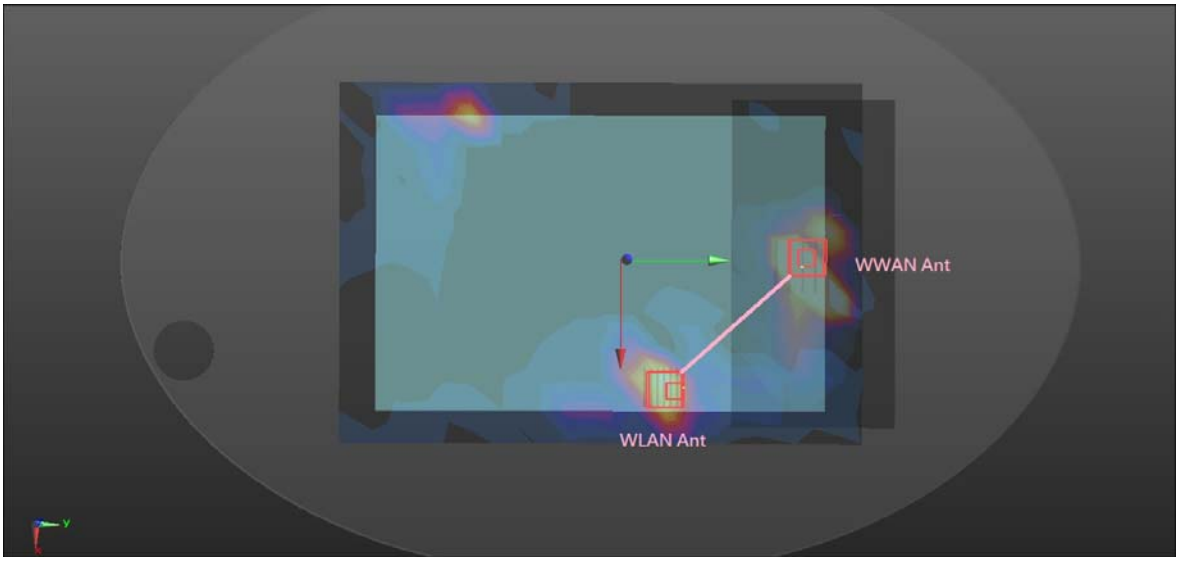


Mode	Reported SAR_{1g}	Peak SAR_{1g}	X	Y	Z	D(mm)	SPLSR	Ratio Limit	Simultaneous SAR
	mW/g	mW/g	m	m	m				
LTE B7	1	1.386	-2.8	125.2	5.25	1123.9	0.002	0.04	No
WiFi 5.6G	0.62	1.101	72	41.4	1.57				

2） The sum of aggregate 1g SAR was above 1.6 W/kg for RearFace configuration with LTE Band7 and WiFi5.8G.
The Peak SAR location is as below:



Mode	Reported SAR_{1g}	Peak SAR_{1g}	X	Y	Z	D(mm)	SPLSR	Ratio Limit	Simultaneous SAR
	mW/g	mW/g	m	m	m				
LTE B7	0.95	1.383	-2.8	125.2	5.41	1101.2	0.002	0.04	No
WiFi 5.6G	0.69	1.263	76.8	49.2	1.58				



Mode	Reported SAR_{1g}	Peak SAR_{1g}	X	Y	Z	D(mm)	SPLSR	Ratio Limit	Simultaneous SAR
	mW/g	mW/g	m	m	m				
LTE B7	0.95	1.386	-2.8	125.2	5.25	1101.2	0.002	0.04	No
WiFi 5.6G	0.69	1.263	76.8	49.2	1.58				

APPENDIX

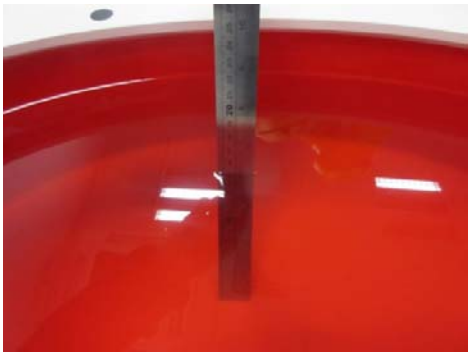
1. Test Layout

Specific Absorption Rate Test Layout

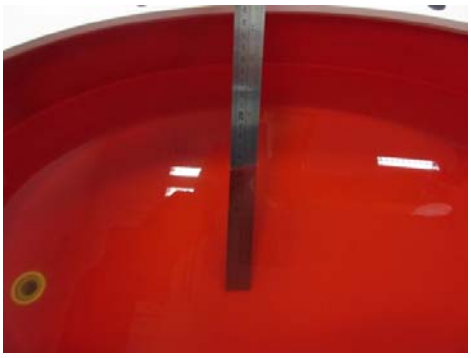
Liquid depth in the flat Phantom (≥15cm depth)

Body(750MHz)_15.6cm

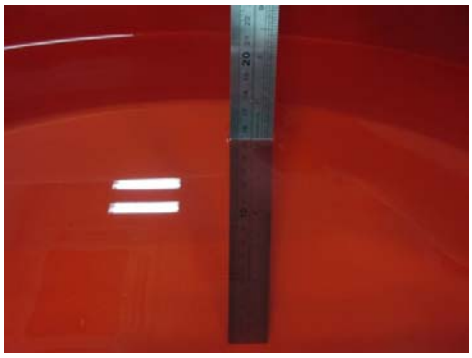
Body(835MHz)_15.7cm



Body(1750MHz)_15.6cm



Body(1900~3800MHz)_15.6cm



Body (5G)_15.8cm

Appendix A. SAR Plots of System Verification

(Pls See Appendix A.)

Appendix B. SAR Plots of SAR Measurement

(Pls See Appendix B. SAR Plots of SAR Measurement_Sensor Off / SAR Plots of SAR Measurement_Sensor on / SAR Plots of SAR Measurement_WLAN+BT)

Appendix C. Calibration Certificate for Probe and Dipole

(Pls See Appendix C.)

Appendix D. Photographs of the Test Set-Up

(Pls See Appendix D.)

End