FCC SAR Compliance Test Report

Product Name:	HUAWEI MediaPad T1 10
Model:	T1-A22L
Report No.:	SYBH(Z-SAR)017092015-2
FCC ID:	QIST1-A22L

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DATE	2015-11-10	2015-11-10

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※ ※ Modified History ※ ※

REV.	DESCRIPTION	ISSUED DATE	REMARK
Rev.1.0	Initial Test Report Release	2015-11-10	Li Wei

1 General Information

1.1 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for T1-A22L is as below Table 1.

Band	Position	Max Reported 1-g SAR SAR(W/kg)
GSM850	Top side(0mm)	1.11
GSM1900	Back side(0mm)	1.10
UMTS Band II	Back side(0mm)	1.32
UMTS Band IV	Back side(0mm)	1.23
UMTS Band V	Top side(0mm)	0.69
LTE Band II	Back side(16mm)	1.27
LTE Band IV	Back side(0mm)	1.36
LTE Band V	Top side(0mm)	1.14
LTE Band VII	Back side(0mm)	1.01
LTE Band XVII	Back side(0mm)	**1.42**
LTE Band XXVI	Top side(0mm)	1.19
WiFi 2.4G	Back side(0mm)	1.20
WiFi 5G	Back side(0mm)	1.20
The highest simultaneous SAR value is 1.59 W/kg per KDB690783 D01		

Table 1:Summary of test result

Note:

The device is in compliance with Specific Absorption Rate(SAR)for general population/uncontraolled exposure limits according to the FCC rule §2.1093, the ANSI/IEEE C95.1:1992, the NCRP Report Number 86 for uncontrolled environment, according to the Industry Canada Radio Standards Specification RSS-102 for General Population/Uncontrolled exposure, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013

1.2 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain/Body/Arms/Legs)	**1.60 W/kg**	8.00 W/kg
Spatial Average SAR** (Whole Body)	0.08 W/kg	0.40 W/kg
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	4.00 W/kg	20.00 W/kg

Table 2: RF exposure limits

The limit applied in this test report is shown in **bold** letters

Notes:

* The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

** The Spatial Average value of the SAR averaged over the whole body.

*** The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation.

1.3 EUT Description

Device Information：			
Product Name:	HUAWEI MediaPad T1 10		
Model:	T1-A22L		
FCC ID :	QIST1-A22L		
IMEI:	868492020004073		
Device Type :	Portable device		
Device Phase:	Identical Prototype		
Exposure Category:	Uncontrolled environment / general population		
Hardware Version :	SH1T1A21LM		
Software Version :	T1-A22LV100R001C001		
Antenna Type :	Internal antenna		
Device Operating Configurations:			
Supporting Mode(s)	GSM850/1900, UMTS Band II/IV/V, LTE Band II/IV/V/VII/XVII/ XXVI, WiFi 2.4G/5G(Tested); BT(Untested)		
Test Modulation	GSM(GMSK/8PSK),UMTS(QPSK),CDMA(QPSK),LTE(QPSK/16QAM), WiFi(DSSS/OFDM),BT(GFSK)		
Device Class	B		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM850	824-849	869-894
	GSM1900	1850-1910	1930-1990
	UMTS Band II	1850-1910	1930-1990
	UMTS Band IV	1710-1755	2110-2155
	UMTS Band V	824-849	869-894
	LTE Band II	1850 -1910	1930 -1990
	LTE Band IV	1710 -1755	2110 -2155
	LTE Band V	824-849	869-894
	LTE Band VII	2500-2570	2620-2690
	LTE Band XVII	704-716	734-746
	LTE Band XXVI	814-849	859-894
	BT	2402-2480	
	WiFi 2.4G	2412-2462	
	WiFi 5G	5150-5250 5250-5350 5470-5725 5725-5850	
GPRS Multislot Class(12)	Max Number of Timeslots in Uplink:		4
	Max Number of Timeslots in Downlink:		4
	Max Total Timeslot:		5
EGPRS Multislot Class(12)	Max Number of Timeslots in Uplink:		4
	Max Number of Timeslots in Downlink:		4
	Max Total Timeslot:		5
HSDPA UE Category	14		
HSUPA UE Category	6		
DC-HSDPA UE Category	24		

Power Class:	4,tested with power level 5(GSM850)
	1,tested with power level 0(GSM1900)
	3, tested with power control “all 1”(UMTS Band II)
	3, tested with power control “all 1”(UMTS Band IV)
	3, tested with power control “all 1”(UMTS Band V)
	3, tested with power control all Max.(LTE Band II)
	3, tested with power control all Max.(LTE Band IV)
	3, tested with power control all Max.(LTE Band V)
	3, tested with power control all Max.(LTE Band VII)
	3, tested with power control all Max.(LTE Band XVII)
	3, tested with power control all Max.(LTE Band XXVI)
Test Channels (low-mid-high):	128-190-251(GSM850)
	512-661-810(GSM1900)
	9262-9400-9538(UMTS Band II)
	1312-1413-1513(UMTS Band IV)
	4132-4182-4233(UMTS Band V)
	18607-18900-19193(LTE Band II BW=1.4MHz)
	18615-18900-19185(LTE Band II BW=3MHz)
	18625-18900-19175(LTE Band II BW=5MHz)
	18650-18900-19150(LTE Band II BW=10MHz)
	18675-18900-19125(LTE Band II BW=15MHz)
	18700-18900-19100(LTE Band II BW=20MHz)
	19957-20175-20393(LTE Band IV BW=1.4MHz)
	19965-20175-20385(LTE Band IV BW=3MHz)
	19975-20175-20375(LTE Band IV BW=5MHz)
	20000-20175-20350(LTE Band IV BW=10MHz)
	20025-20175-20325(LTE Band IV BW=15MHz)
	20050-20175-20300(LTE Band IV BW=20MHz)
	20407-20525-20643(LTE Band V BW=1.4MHz)
	20415-20525-20635(LTE Band V BW=3MHz)
	20425-20525-20625(LTE Band V BW=5MHz)
	20450-20525-20600(LTE Band V BW=10MHz)
	20775-21100-21425(LTE Band VII BW=5MHz)
	20800-21100-21400(LTE Band VII BW=10MHz)
	20825-21100-21375(LTE Band VII BW=15MHz)
	20850-21100-21350(LTE Band VII BW=20MHz)
	23755-23790-23825(LTE Band XVII BW=5MHz)
	23780-23790-23800(LTE Band XVII BW=10MHz)
	26697-26865-27033(LTE Band XXVI BW=1.4MHz)
	26705-26865-27025(LTE Band XXVI BW=3MHz)
	26715-26865-27015(LTE Band XXVI BW=5MHz)
	26750-26865-26990(LTE Band XXVI BW=10MHz)
	26775-26865-26965(LTE Band XXVI BW=15MHz)
	802.11b/g/n 20M:1-6-11 (WiFi 2.4G)
	802.11a/n 20M: 36-40-44-48-52-56-60-64-100-104-108-112-116-120-124-128-132-136-140-149-153-157-161(WiFi 5G) 802.11 n 40M: 38-46-54-62-102-110-118-126-134-151-159(WiFi 5G)

Table 3:Device information and operating configuration

1.3.1 General Description

HUAWEI MediaPad T1 10 (MediaPad T1 10 for short) is a 9.6-inch tablet that incorporates a Qualcomm MSM8916 chip, and a 28 nm A53 quad-core at 1.2 GHz. With support for 4G and Wi-Fi data connections, MediaPad T1 10 provides users with unprecedented access to high-speed Internet services.
With a light metal unibody and ultra-thin 8.3 mm design, MediaPad T1 10 weights about 433g grams.

Battery information:

Name	Manufacture	Serials number	Description
Rechargeable Li-ion	Huawei Technologies Co., Ltd.	NA	Battery Model: HB3080G1EBW Rated capacity: 4800mAh Nominal Voltage: ⎓ +3.8V Charging Voltage: ⎓ +4.35V

1.3.2 Power reduction specification

This device uses a proximity sensor that share the same metallic electrode as the transmitting antenna to facilitate triggering in typical user interactivity with the device.
Due to the operating configurations and exposure conditions required by the device, the proximity sensor is used to indicate when the tablet is held close to a user's body exposure condition. It utilizes the proximity sensor to reduce the output power in specific wireless and operating modes of main antenna to ensure SAR compliance. The procedures in KDB 616217D04 are applied (Refer to Section 6.1 for details).

The following tables summerize the key power reduction information:

Band	Sensor Trigger Distance	Full Power Level (dBm)	Reduced power Level (dBm)	Power reduction (dB)
GSM 850	Back side: 17mm Top side: 20mm	33.0	30.5	2.5
GSM 1900	Back side: 17mm Top side: 20mm	30.5	21.5	9.0
UMTS B2	Back side: 17mm Top side: 20mm	23.5	14.0	9.5
UMTS B4	Back side: 17mm Top side: 20mm	23.5	14.0	9.5
UMTS B5	Back side: 17mm Top side: 20mm	24.0	21.0	3.0
LTE B2	Back side: 17mm Top side: 20mm	23.0	14.0	9.0
LTE B4	Back side: 17mm Top side: 20mm	23.0	14.5	8.5
LTE B5	b Back side: 17mm Top side: 20mm	23.5	22.5	1.0
LTE B7	Back side: 17mm Top side: 20mm	23.0	14.5	8.5
LTE B17	Back side: 17mm Top side: 20mm	24.0	23.0	1.0

Note:
1) Since the capacitive proximity sensor triggering distance for the back side is 17mm , a conservative distance of 16mm was tested for SAR at maximum power level per KDB616217§6.2.
2) Since the capacitive proximity sensor triggering distance for the Top side is 20mm , a conservative distance of 19mm was tested for SAR at maximum power level per KDB616217§6.2.
The detailed full power and reduced tune-up specifications and conducted power measurement results are provided in Section 7 of this report.
3) The capacitive proximity sensor does not trigger power reduction for the other edges or frequency bands of the device.

1.4 Test specification(s)

ANSI 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
RSS-102	Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands (Issue 5 of March 2015)
KDB941225 D01	3G SAR Procedures v03r01
KDB941225 D05	SAR for LTE Devices v02r04
KDB447498 D01	General RF Exposure Guidance v06
KDB616217 D04	SAR for laptop and tablets v01r02
KDB248227 D01	SAR Guidance for IEEE 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

1.5 Testing laboratory

Test Site	The Reliability Laboratory of Huawei Technologies Co., Ltd.
Test Location	Zone G1,Huawei Industrial Base, Bantian Industry Area, Longgang District, Shenzhen, Guangdong, China
Telephone	+86 755 28780808
Fax	+86 755 89652518
State of accreditation	The Test laboratory (area of testing) is accredited according to ISO/IEC 17025. CNAS Registration number: L0310 A2LA TESTING CERT #2174.01

1.6 Applicant and Manufacturer

Company Name	HUAWEI TECHNOLOGIES CO., LTD
Address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

1.7 Application details

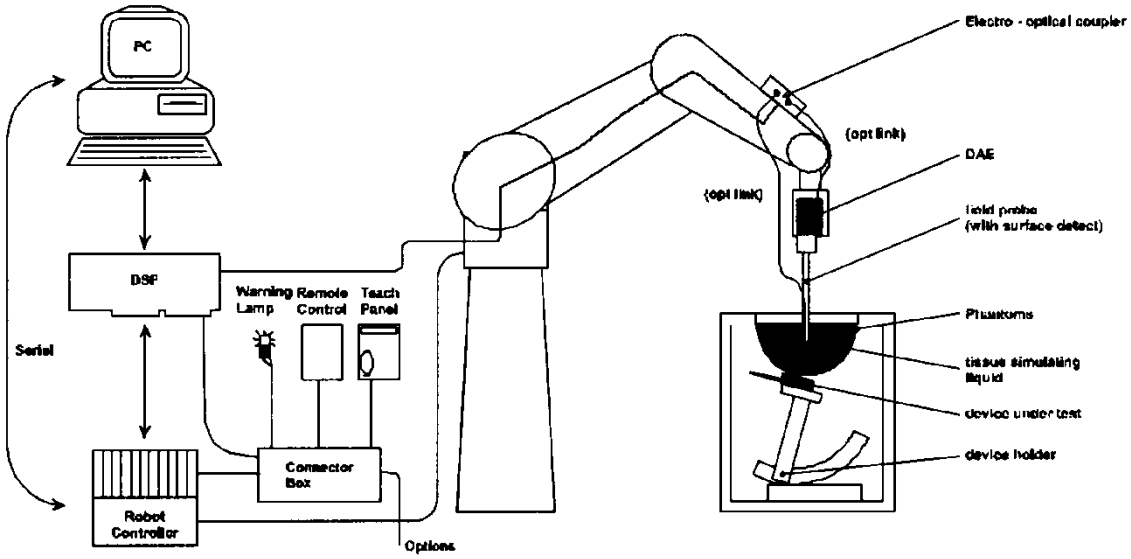
Start Date of test	2015-09-16
End Date of test	2015-10-22

1.8 Ambient Condition

Ambient temperature	20°C – 24°C
Relative Humidity	30% – 70%

2 SAR Measurement System

2.1 SAR Measurement Set-up



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

- A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).

- A dosimetric 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.

- 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.
- A unit to operate the optical surface detector which is connected to the EOC.
- 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.
- The DASY5 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.
- DASY5 software and SEMCAD data evaluation software.
- Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
- The generic twin phantom enabling the testing of left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- System check dipoles allowing to validate the proper functioning of the system.

2.2 Test environment

The DASY5 measurement system is placed at the head end of a room with dimensions:
5 x 2.5 x 3 m³, the SAM phantom is placed in a distance of 75 cm from the side walls and 1.1m from the rear wall. Above the test system a 1.5 x 1.5 m² array of pyramid absorbers is installed to reduce reflections from the ceiling.
Picture 1 of the photo documentation shows a complete view of the test environment.
The system allows the measurement of SAR values larger than 0.005 mW/g.

2.3 Data Acquisition Electronics description

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

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

DAE4

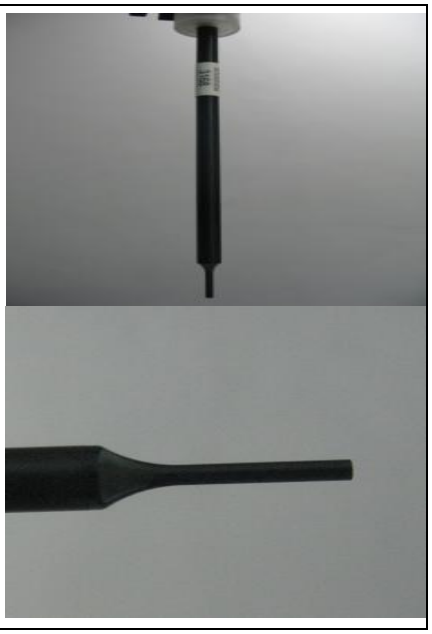
Input Impedance	200MOhm	
The Inputs	symmetrical and floating	
Common mode rejection	above 80 dB	

2.4 Probe description

These probes are specially designed and calibrated for use in liquids with high permittivities. They should not be used in air, since the spherical isotropy in air is poor (±2 dB). The dosimetric probes have special calibrations in various liquids at different frequencies.

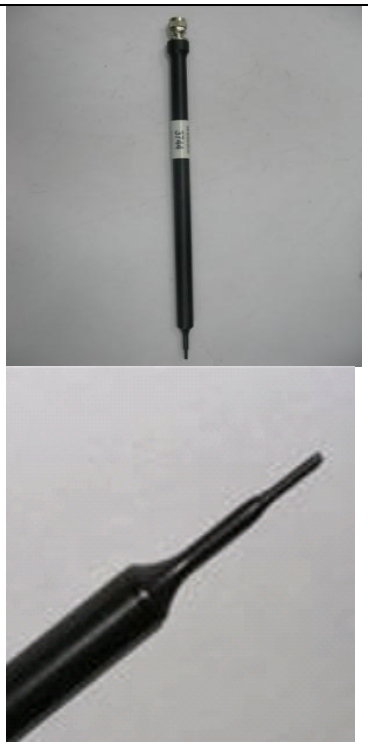
Isotropic E-Field Probe ES3DV3 for Dosimetric Measurements

Construction	Symmetrical design with triangular core Interleaved 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 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic range	5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones



Isotropic E-Field Probe EX3DV4 for Dosimetric Measurements

Construction	Symmetrical design with triangular core 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: ± 0.2 dB(noise:typically<1µW/g)
Dimensions	Overall length: 337 mm (Tip:20 mm) Tip diameter:2.5 mm (Body:12 mm) Typical distance from probe tip to dipole centers: 1mm
Application	High precision dosimetric measurements in any exposure scenario(e.g.,very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%

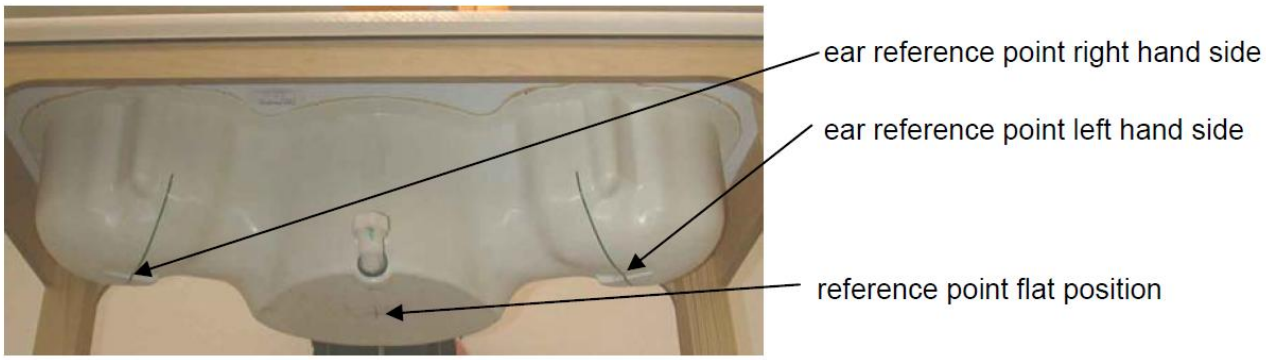


2.5 Phantom description

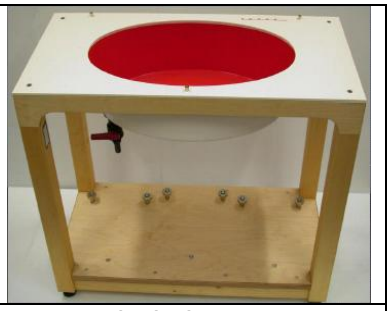
SAM Twin Phantom

Shell Thickness	2mm±0.2mm;The ear region:6.0±0.2mm	
Filling Volume	Approximately 25 liters	
Dimensions	Length:1000mm; Width:500mm; Height: adjustable feet	
Measurement Areas	Left hand Right hand Flat phantom	
The bottom plate contains three pairs of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to cover the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. Free space scans of devices on top of this phantom cover are possible. Three reference marks are provided on the phantom counter. These reference marks are used to teach the absolute phantom position relative to the robot.		

The following figure shows the definition of reference point:



ELI4 Phantom

Shell Thickness	2mm±0.2mm	
Filling Volume	Approximately 30 liters	
Dimensions	Major axis:600mm; Minor axis:400mm;	
Measurement Areas	Flat phantom	
The ELI4 phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30MHz to 6GHz. ELI4 is fully compatible with the latest draft of the standard IEC 62209-2 and all known tissue simulating liquids.		

The phantom shell material is resistant to all ingredients used in the tissue-equivalent liquid recipes. The shell of the phantom including ear spacers is constructed from low permittivity and low loss material, with a relative permittivity $2 \leq \varepsilon r \leq 5$ at ≤3 GHz, $3 \leq \varepsilon r \leq 4$ at >3 GHz and and a loss tangent ⩽0.05.

2.6 Device holder description

The DASY5 device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65°. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. This device holder is used for standard mobile phones or PDA's only. If necessary an additional support of polystyrene material is used.

The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity ε =3 and loss tangent σ =0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.
The device holder permits the device to be positioned with a tolerance of ±1° in the tilt angle.

Larger DUT's (e.g. notebooks) cannot be tested using this device holder. Instead a support of bigger polystyrene cubes and thin polystyrene plates is used to position the DUT in all relevant positions to find and measure spots with maximum SAR values.
Therefore those devices are normally only tested at the flat part of the SAM.

2.7 Test Equipment List

This table gives a complete overview of the SAR measurement equipment.
Devices used during the test described are marked ☒

	Manufacturer	Device	Type	Serial number	Date of last calibration	Valid period
☒	SPEAG	Dosimetric E-Field Probe	EX3DV4	3744	2015-07-24	One year
☒	SPEAG	Dosimetric E-Field Probe	EX3DV4	7350	2015-01-08	One year
☒	SPEAG	750MHz Dipole	D750V3	1044	2015-09-14	Three years
☒	SPEAG	835MHz Dipole	D835V2	4d059	2013-05-02	Three years
☒	SPEAG	1750MHz Dipole	D1750V2	1123	2014-07-08	Three years
☒	SPEAG	1900MHz Dipole	D1900V2	5d143	2014-09-23	Three years
☐	SPEAG	2300MHz Dipole	D2300V2	1016	2014-11-19	Three years
☒	SPEAG	2450MHz Dipole	D2450V2	860	2014-11-19	Three years
☒	SPEAG	2600MHz Dipole	D2600V2	1021	2015-07-24	Three years
☒	SPEAG	5GHz Dipole	D5GHzV2	1155	2015-04-27	Three years
☒	SPEAG	Data acquisition electronics	DAE4	1236	2014-11-13	One year
☐	SPEAG	Data acquisition electronics	DAE4	852	2015-04-27	One year
☒	SPEAG	Software	DASY 5	N/A	NCR	NCR
☐	SPEAG	Twin Phantom	SAM1	TP-1475	NCR	NCR
☐	SPEAG	Twin Phantom	SAM2	TP-1474	NCR	NCR
☐	SPEAG	Twin Phantom	SAM3	TP-1597	NCR	NCR
☐	SPEAG	Twin Phantom	SAM4	TP-1620	NCR	NCR
☐	SPEAG	Flat Phantom	ELI 4.0	TP-1038	NCR	NCR
☒	SPEAG	Flat Phantom	ELI 4.0	TP-1111	NCR	NCR
☒	R & S	Universal Radio Communication Tester	CMU 200	113989	2015-05-18	One year
☒	R & S	Universal Radio Communication Tester	CMW 500	126855	2015-07-02	One year
☒	Agilent	Network Analyser	E5071C	MY46213349	2015-02-13	One year
☒	Agilent	Dielectric Probe Kit	85070E	2484	NCR	NCR
☒	Agilent	Signal Generator	N5181A	MY47420989	2015-01-07	One year
☒	MINI-CIRCUITS	Amplifier	ZHL-42W	QA1402001	NCR	NCR
☒	MINI-CIRCUITS	Amplifier	ZVE-8G+	N523101139	NCR	NCR
☒	AR	Directional Coupler	DC7144M1	0423264	2015-03-31	One year
☒	Agilent	Dual Directional Coupler	772D	MY52180173	2015-01-08	One year
☒	R & S	Power Meter	NRP	100740	2015-07-02	One year
☒	R & S	Power Meter Sensor	NRP-Z11	106288	2015-07-02	One year
☒	Agilent	Power Meter	E4417A	MY45101339	2015-01-07	One year
☒	Agilent	Power Meter Sensor	E9321A	MY44420359	2015-01-07	One year

Note:
1) Per KDB865664D01 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 shorting block performed before measuring liquid parameters.

3 SAR Measurement Procedure

3.1 Scanning procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and system check. 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 comparing the 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 the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent 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 specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

- 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 in x- 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.
  Results of this coarse scan are shown in Appendix B.

- 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 the bottom 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 SAM phantom in 2 mm steps. This measurement shows the continuity of the liquid and can - depending in the field strength – also show the liquid depth. A z-axis scan of the measurement with maximum SAR value is shown in Appendix B.

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

3.2 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.

3.3 Data Storage and Evaluation

Data 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.

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	$Norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion factor	$ConvF_i$
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- Density	ρ

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 channel i (i = x, y, z)
U_i = input signal of channel i (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcp_i = diode compression point (DASY parameter)

From the 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 channel i (i = x, y, z)

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

ConvF = sensitivity enhancement in solution

a_{ij} = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

E_i = electric field strength of channel i in V/m

H_i = magnetic field strength of channel 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 rate in mW/g

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

σ = conductivity in [mho/m] or [Siemens/m]

ρ = equivalent tissue density in g/cm^3

Note that the density is normally set to 1 (or 1.06), 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.

$P_{pwe} = E_{tot}^2 / 3770$ 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 electric field strength in V/m

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

4 System Verification Procedure

4.1 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.

Ingredients (% of weight)	**Head Tissue**						
Frequency Band (MHz)	750	835	1750	1900	2300	2450	2600
Water	39.2	41.45	52.64	55.242	62.82	62.7	55.242
Salt (NaCl)	2.7	1.45	0.36	0.306	0.51	0.5	0.306
Sugar	57.0	56.0	0.0	0.0	0.0	0.0	0.0
HEC	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Bactericide	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	47.0	44.542	36.67	36.8	44.452
Ingredients (% of weight)	**Body Tissue**						
Frequency Band (MHz)	**750**	**835**	**1750**	**1900**	2300	**2450**	**2600**
Water	50.3	52.4	69.91	69.91	73.32	73.2	64.493
Salt (NaCl)	1.60	1.40	0.13	0.13	0.06	0.04	0.024
Sugar	47.0	45.0	0.0	0.0	0.0	0.0	0.0
HEC	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Bactericide	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	29.96	29.96	26.62	26.7	32.252

Table 4: Tissue Dielectric Properties

Salt: 99+% Pure Sodium Chloride; Sugar: 98+% Pure Sucrose; Water: De-ionized, 16MΩ+ 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

☐**Simulating Head Liquid for 5G(HBBL3500-5800MHz), Manufactured by SPEAG:**

Ingredients	(% by weight)
Water	50-65%
Mineral oil	10-30%
Emulsifiers	8-25%
Sodium salt	0-1.5%

☒**Simulating Body Liquid for 5G(MBBL3500-5800MHz),Manufactured by SPEAG:**

Ingredients	(% by weight)
Water	60-80%
Esters,Emulsifiers,Inhibitors	20-40%
Sodium salt	0-1.5%

Tissue Type	Measured Frequency （MHz）	Target Tissue		Measured Tissue		Liquid Temp.	Test Date
		εr (+/-5%)	σ (S/m) (+/-5%)	εr	σ (S/m)		
750B	705	55.70 (52.92~58.48)	0.96 (0.92~1.008)	55.80	0.93	21.4°C	2015-09-24
	710	55.70 (52.92~58.48)	0.96 (0.92~1.008)	55.67	0.93		
	750	55.50 (52.73~58.27)	0.96 (0.92~1.008)	55.42	0.97		
835B	825	55.20 (52.44~57.96)	0.97 (0.92~1.02)	54.65	0.97	21.5°C	2015-09-18
	835	55.20 (52.44~57.96)	0.97 (0.92~1.02)	54.59	0.98		
	850	55.20 (52.44~57.96)	0.99 (0.94~1.04)	54.47	1.00		
835B	825	55.20 (52.44~57.96)	0.97 (0.92~1.02)	53.06	0.98	21.5°C	2015-10-09
	835	55.20 (52.44~57.96)	0.97 (0.92~1.02)	52.87	0.99		
	850	55.20 (52.44~57.96)	0.99 (0.94~1.04)	52.79	1.01		
1750B	1710	53.5 (50.83~56.18)	1.46 (1.39~1.53)	52.26	1.39	21.8°C	2015-10-10
	1730	53.5 (50.83~56.18)	1.48 (1.41~1.55)	52.19	1.41		
	1750	53.4 (50.73~56.07)	1.49 (1.42~1.56)	52.14	1.43		
	1800	53.3 (50.64~55.97)	1.52 (1.44~1.60)	52.00	1.48		
1750B	1710	53.5 (50.83~56.18)	1.46 (1.39~1.53)	51.54	1.40	21.8°C	2015-10-16
	1730	53.5 (50.83~56.18)	1.48 (1.41~1.55)	51.47	1.42		
	1750	53.4 (50.73~56.07)	1.49 (1.42~1.56)	51.40	1.44		
	1800	53.3 (50.64~55.97)	1.52 (1.44~1.60)	51.23	1.49		
1900B	1850	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.62	1.51	21.0°C	2015-09-21
	1880	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.52	1.55		
	1900	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.43	1.57		
	1910	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.39	1.58		
1900B	1850	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.05	1.52	21.0°C	2015-10-13
	1880	53.30 (50.64~55.97)	1.52 (1.44~1.60)	51.95	1.55		
	1900	53.30 (50.64~55.97)	1.52 (1.44~1.60)	51.90	1.57		
	1910	53.30 (50.64~55.97)	1.52 (1.44~1.60)	51.87	1.59		

2450B	2410	52.80 (50.16~55.44)	1.91 (1.81~2.00)	52.06	1.93	21.0°C	2015-10-17
	2435	52.70 (50.07~55.34)	1.94 (1.84~2.04)	51.97	1.96		
	2450	52.70 (50.07~55.34)	1.95 (1.85~2.05)	51.92	1.98		
	2460	52.70 (50.07~55.34)	1.96 (1.86~2.06)	51.87	1.99		
2600B	2510	52.62 (49.99~55.25)	2.03 (1.93~2.13)	51.41	2.09	21.5°C	2015-10-19
	2535	52.59 (49.96~55.22)	2.07 (1.97~2.17)	51.32	2.13		
	2560	52.57 (49.94~55.20)	2.09 (1.99~2.19)	51.21	2.16		
	2600	52.5 (49.88~55.13)	2.16 (2.05~2.27)	51.07	2.21		
5G B	5200	49.0 (46.55~51.45)	5.30 (5.03~5.56)	49.98	5.22	21.3°C	2015-10-22
	5600	48.50 (46.08~50.92)	5.77 (5.48~6.05)	47.79	5.92		
	5800	48.20 (45.79~50.61)	6.00 (5.70~6.30)	47.63	6.21		
ε_r= Relative permittivity, σ= Conductivity							

Table 5:Measured Tissue Parameter

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.

4.2 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(Graphic Plot(s) see Appendix A).

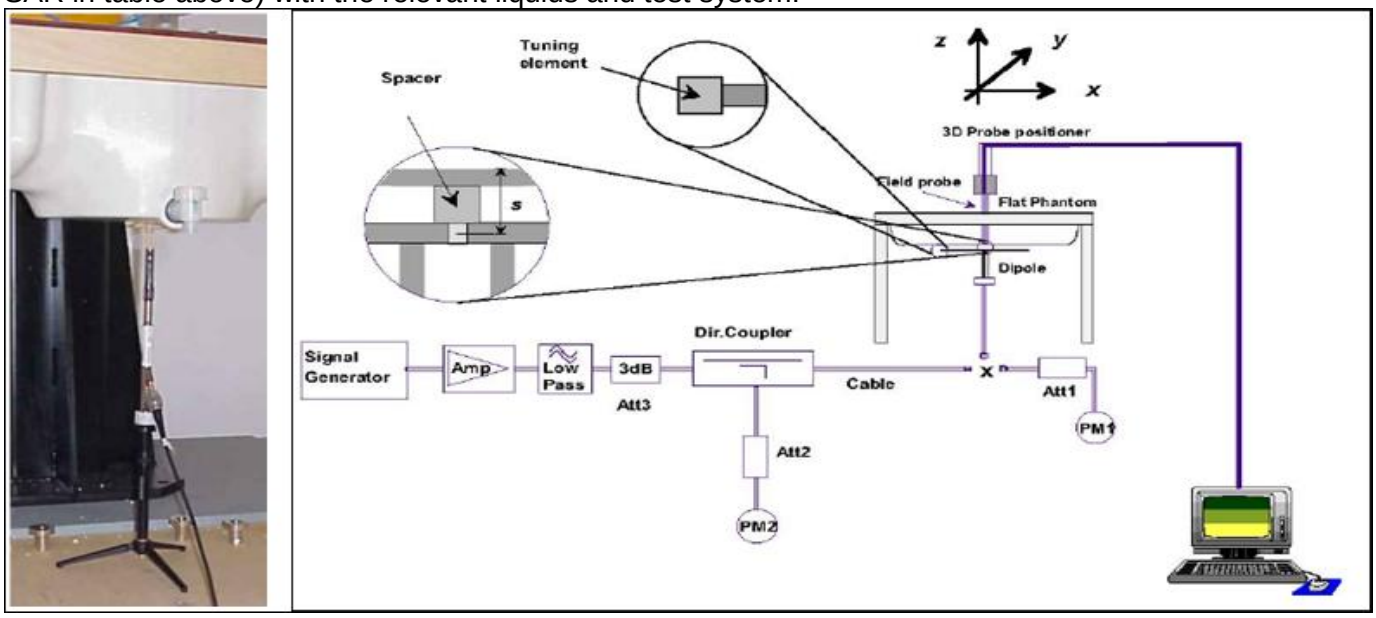
System Check	Target SAR (1W) (+/-10%)		Measured SAR (Normalized to 1W)		Liquid Temp.	Test Date
	1-g (mW/g)	10-g (mW/g)	1-g (mW/g)	10-g (mW/g)		
750MHz Body	8.76 (7.88~9.63)	5.78 (5.20~6.35)	8.96	6.04	21.4°C	2015-09-24
835MHz Body	9.42 (8.48~10.36)	6.19 (5.57~6.80)	9.56	6.28	21.5°C	2015-09-18
835MHz Body	9.42 (8.48~10.36)	6.19 (5.57~6.80)	9.72	6.40	21.5°C	2015-10-09
1750MHz Body	36.3 (32.67~39.93)	19.5 (17.55~21.45)	38.08	20.40	21.8°C	2015-10-10
1750MHz Body	36.3 (32.67~39.93)	19.5 (17.55~21.45)	38.28	20.52	21.8°C	2015-10-16
1900MHz Body	40.20 (36.18~44.22)	21.30 (19.17~23.43)	41.20	21.56	21.0°C	2015-09-21
1900MHz Body	40.20 (36.18~44.22)	21.30 (19.17~23.43)	41.20	21.44	21.0°C	2015-10-13
2450MHz Body	51.4 (46.26~56.54)	23.9 (21.51~26.29)	54.40	25.32	21.0°C	2015-10-17
2600MHz Body	57.5 (51.75~63.25)	25.9 (23.31~28.49)	59.20	25.96	21.5°C	2015-10-19
5200MHz Body	74.7 (67.23~82.17)	20.9 (18.81~22.99)	73.20	22.00	21.3°C	2015-10-22
5600MHz Body	77.8 (70.02~85.58)	21.6 (19.44~23.76)	76.70	22.60	21.3°C	2015-10-22
5800MHz Body	76.2 (68.58~83.82)	21.0 (18.9~23.10)	75.90	22.40	21.3°C	2015-10-22

Table 6:System Check Results

4.3 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 (result on plot).

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.



5 SAR measurement variability and uncertainty

5.1 SAR measurement variability

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04, 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 repeated measurements 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 7.2.

5.2 SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04,when the highest measured 1-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.

6 SAR Test Configuration

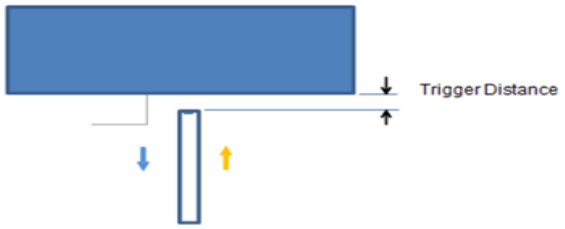
6.1 Test Positions Configuration

6.1.1 Body Exposure Condition

The overall diagonal dimension of the tablet is > 20 cm. Per FCC KDB616217D04, the back side and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR Exclusion Threshold in FCC KDB 447498D01 can 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 against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

6.1.2 Proximity sensor triggering distances Assessment

The device uses a capacitance proximity sensor to reduce the maximum output power in selected wireless modes and operating configurations to ensure SAR compliance.
FCC KDB616217D04 section 6 was used as a test guideline for selecting SAR test distances for this device at these additional exposure conditions.
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 7 contains both the full and reduced conducted power measurements.



Proximity Sensor Trigger Distance Assessment
Top Side

Proximity Sensor Trigger Distance Assessment
Back Side

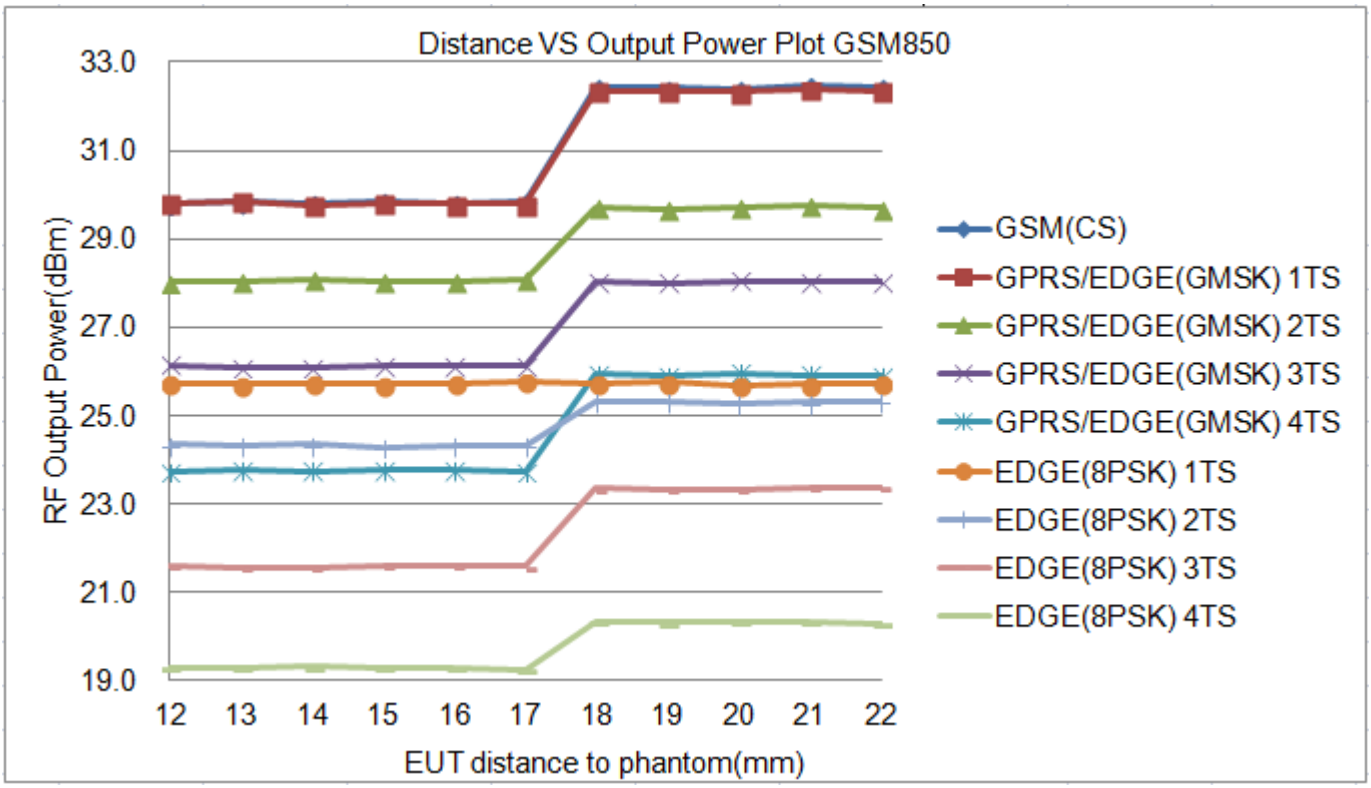
Table: Summary of Trigger Distances

Band(MHz)	Trigger distance-Back Side		Trigger distance-Top Side	
	Moving toward phantom	Moving away from phantom	Moving toward phantom	Moving away from phantom
GSM850	17mm	17mm	20mm	20mm
GSM1900	17mm	17mm	20mm	20mm
UMTS B2	17mm	17mm	20mm	20mm
UMTS B4	17mm	17mm	20mm	20mm
UMTS B5	17mm	17mm	20mm	20mm
LTE B2	17mm	17mm	20mm	20mm
LTE B4	17mm	17mm	20mm	20mm
LTE B5	17mm	17mm	20mm	20mm
LTE B7	17mm	17mm	20mm	20mm
LTE B17	17mm	17mm	20mm	20mm

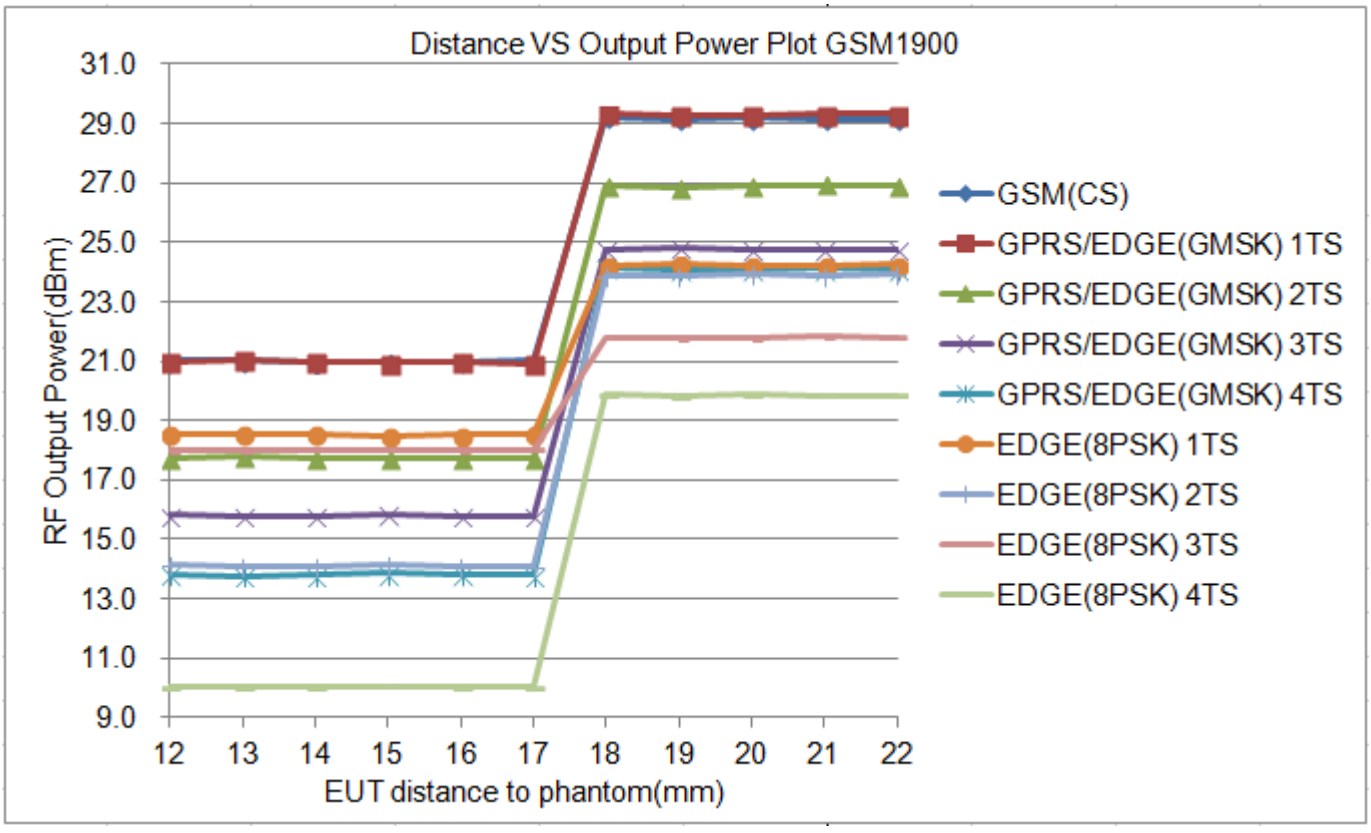
1) Since the capacitive proximity sensor triggering distance for the back side is 17mm , a conservative distance of 16mm was tested for SAR at maximum power level.

2) Since the capacitive proximity sensor triggering distance for the Top side is 20mm , a conservative distance of 19mm was tested for SAR at maximum power level.

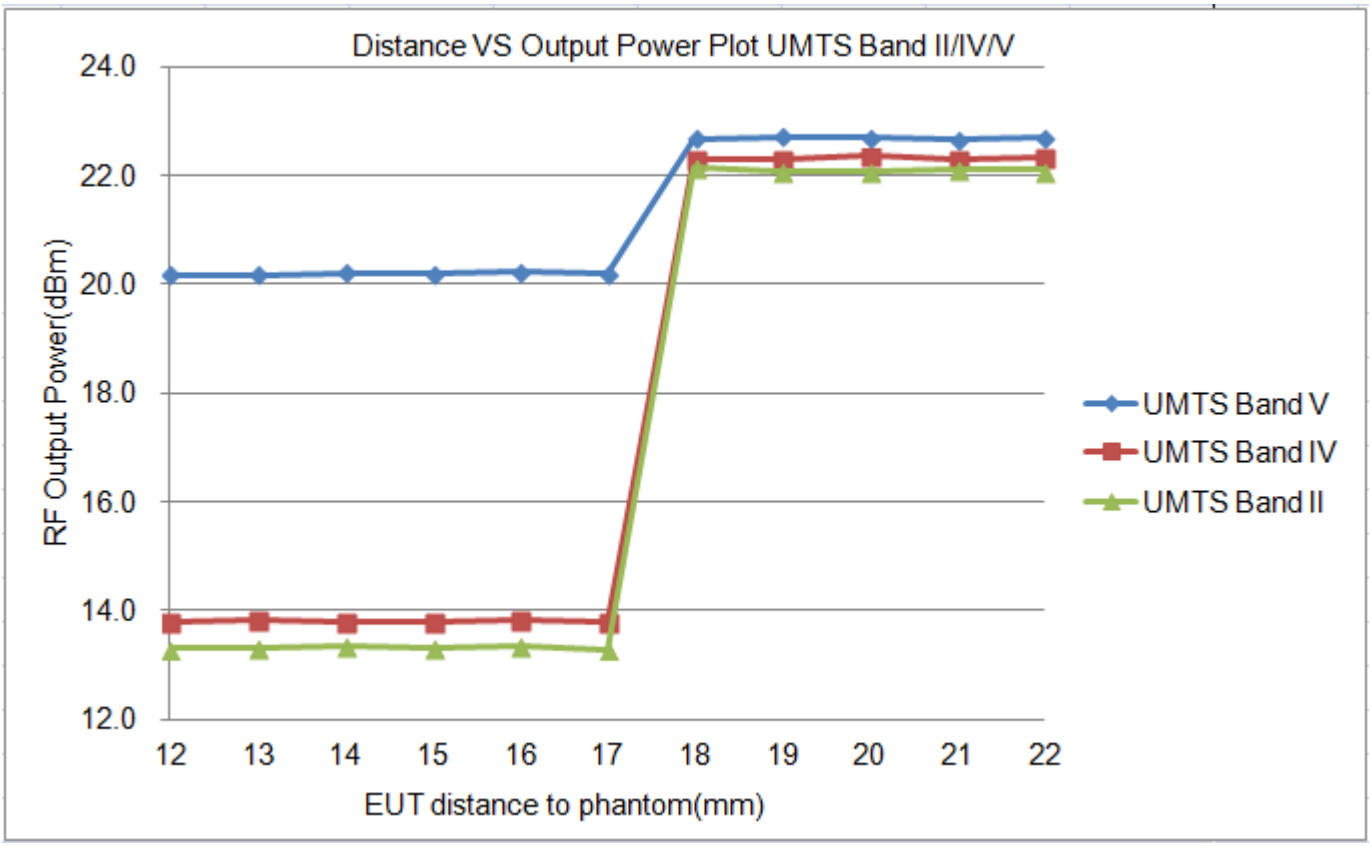
The detailed conducted power measurement data to determine the triggering distances is as below:
1) DUT is moved towards and away from the flat phantom-Back Side:
GSM850:



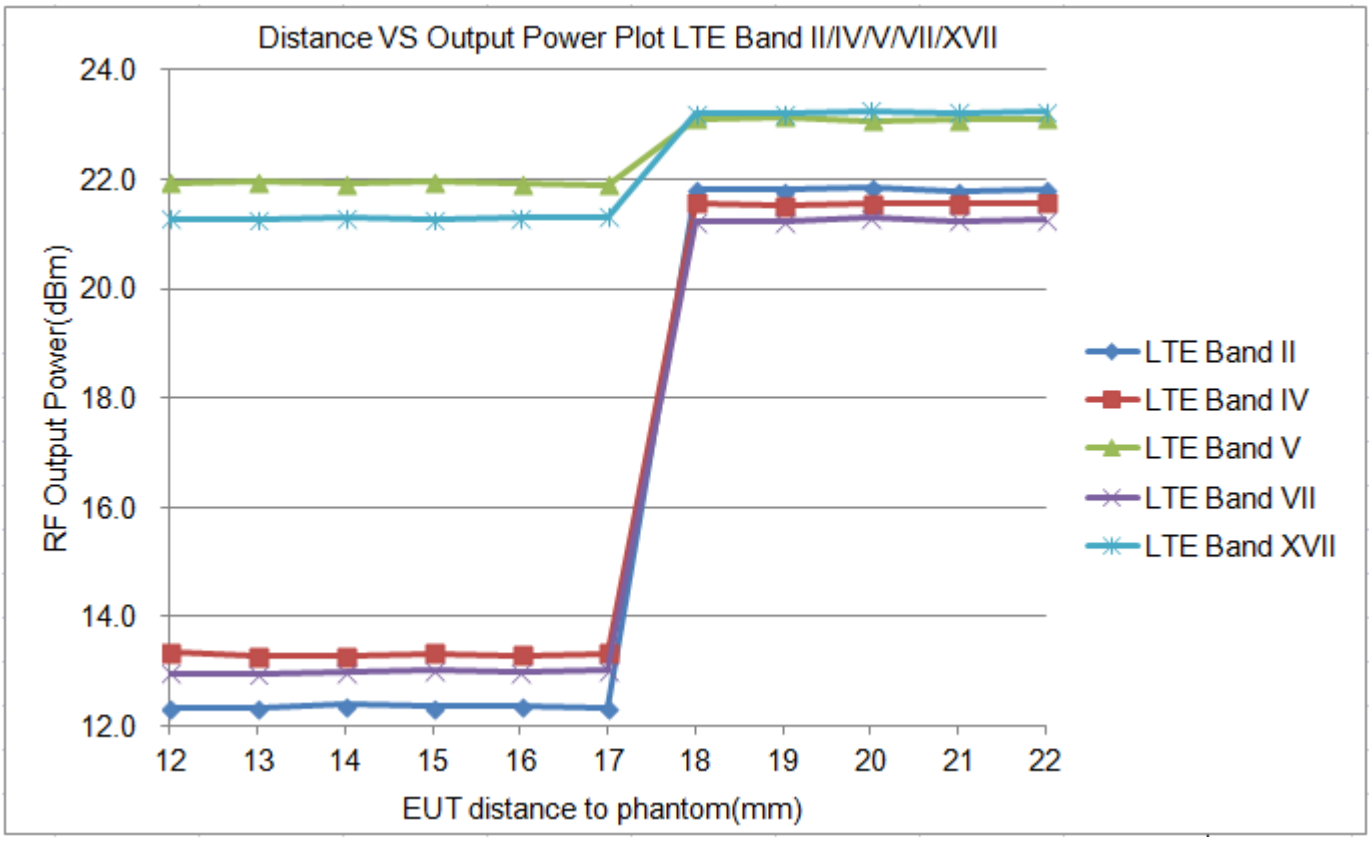
GSM1900:



UMTS Band II/IV/V:

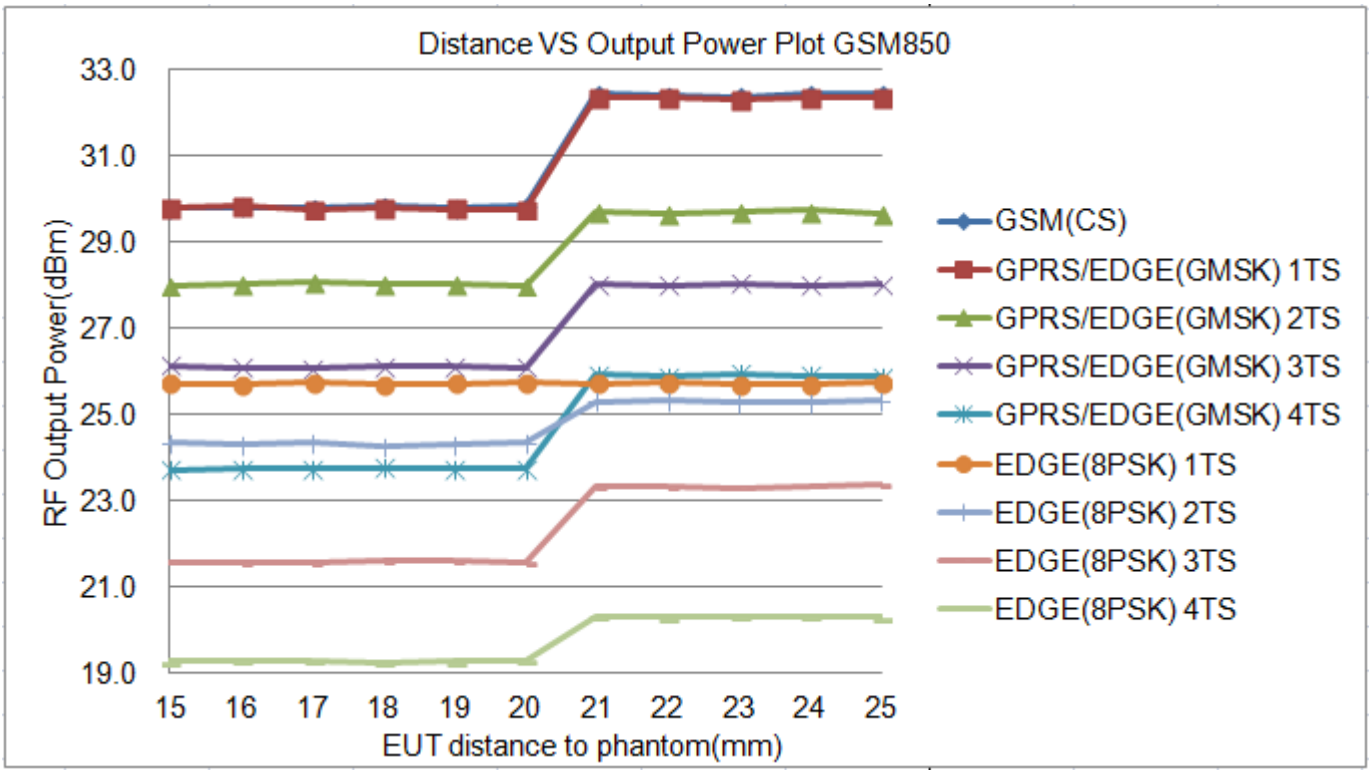


LTE Band II/IV/V/VII/XVII:

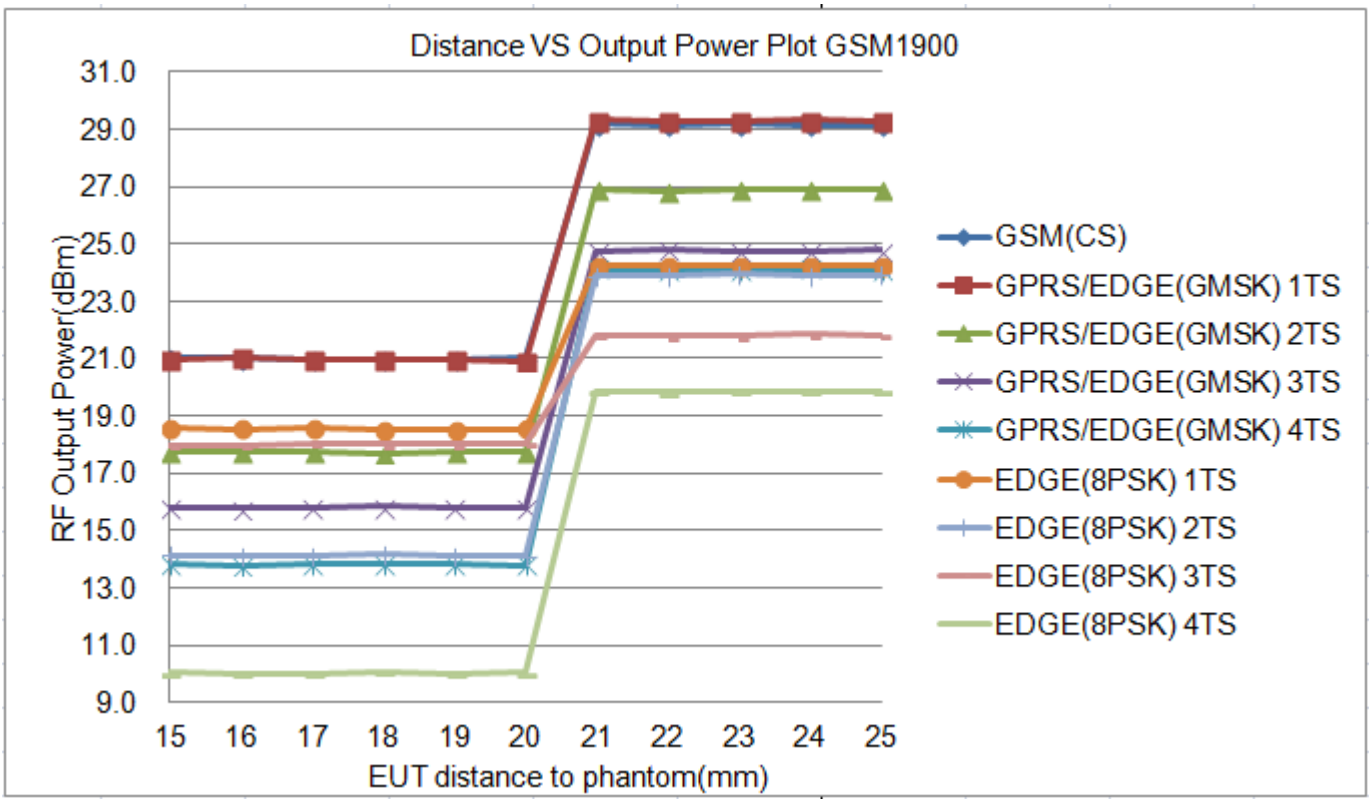


2) DUT is moved towards and away from the flat phantom-Top Side

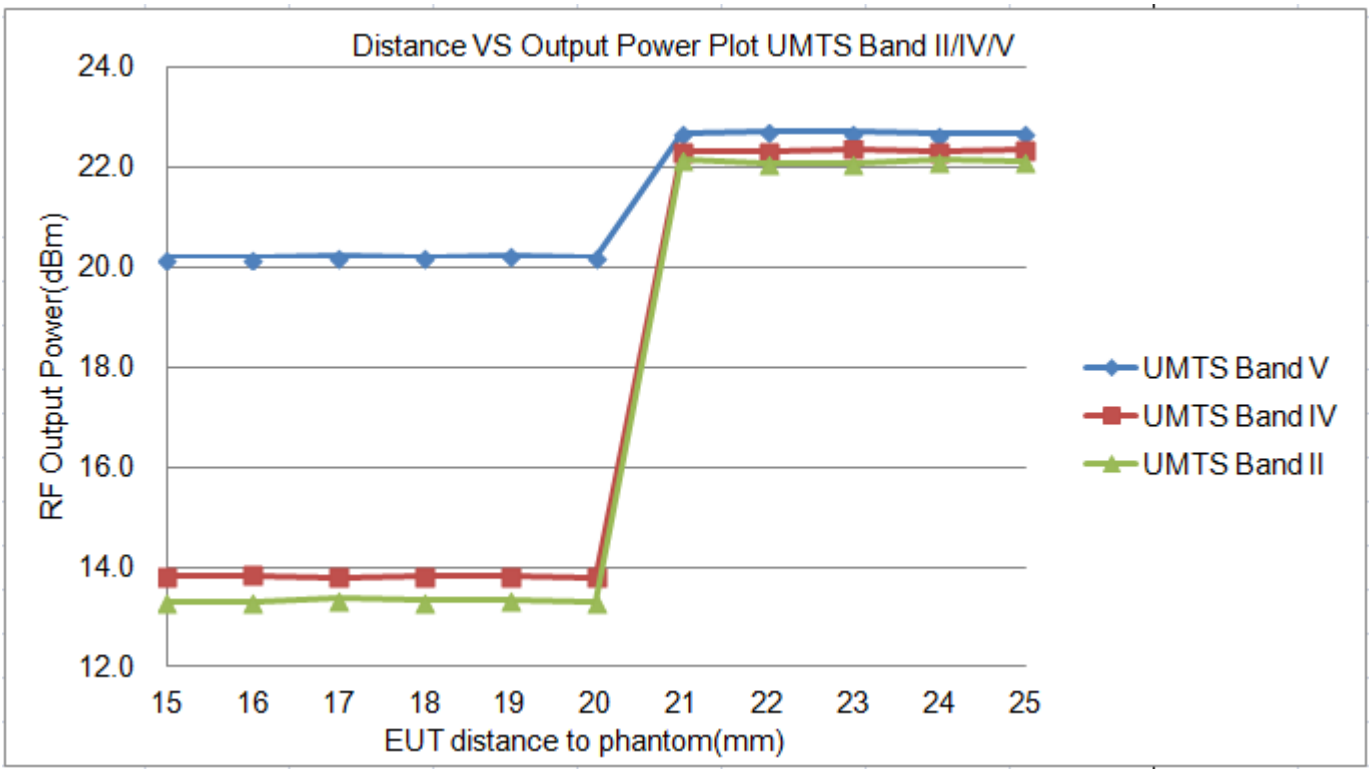
GSM850:



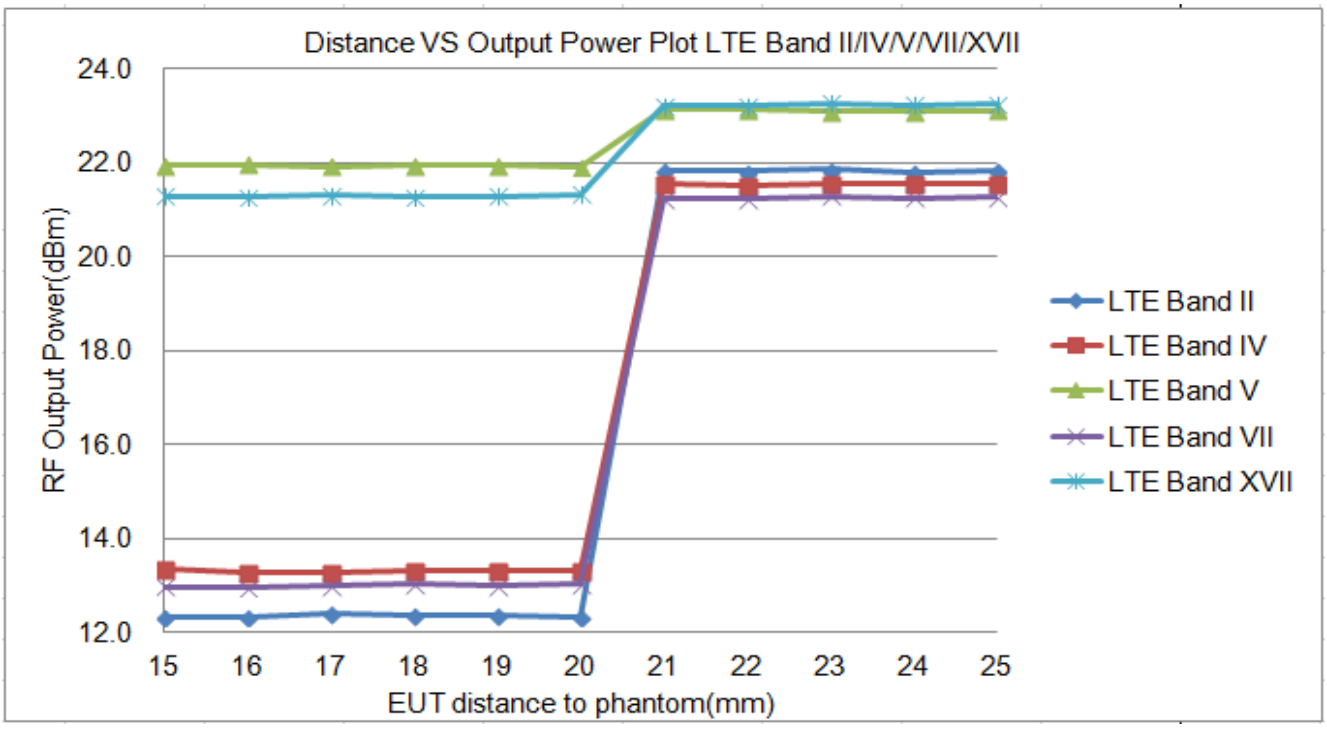
GSM1900:



UMTS Band II/IV/V:



LTE Band II/IV/V/VII/XVII:

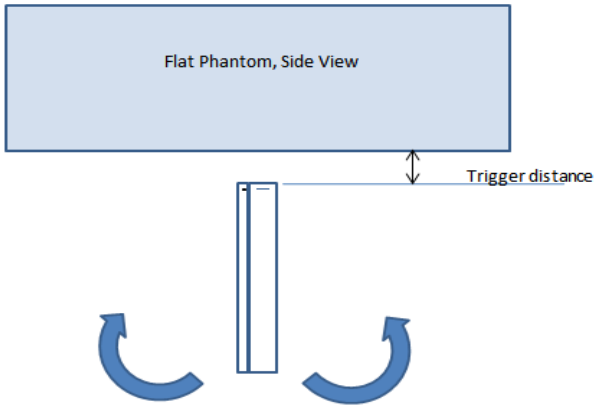


6.1.3 Proximity Sensor Coverage Assessment

As there is no spatial offset between the main antenna and the proximity sensor element(Refer to the antenna picture in Section 7.3), proximity sensor coverage per KDB 616217 §6.3 did not need to be assessed for this device.

6.1.4 Proximity Sensor Tilt Angle Assessment

Per KDB 616217 §6.4, the DUT was positioned directly below the flat phantom at the minimum measured trigger distance with Top side parallel to the base of the flat phantom for each band.
The EUT was rotated about Top side 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°.



Picture: Proximity sensor tilt angle assessment (Top side)

Table: Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering(Top side)

Band (MHz)	Minimum trigger distance Per KDB61621§6.2	Minimum trigger distance at which power reduction was maintained over ±45°	Power Reduction Status										
			-45°	-35°	-25°	-15°	-5°	0°	5°	15°	25°	35°	45°
GSM850	20mm	20mm	On	On	On	On	On	On	On	On	On	On	On
GSM1900	20mm	20mm	On	On	On	On	On	On	On	On	On	On	On
UMTS B2	20mm	20mm	On	On	On	On	On	On	On	On	On	On	On
UMTS B4	20mm	20mm	On	On	On	On	On	On	On	On	On	On	On
UMTS B5	20mm	20mm	On	On	On	On	On	On	On	On	On	On	On
LTE B2	20mm	20mm	On	On	On	On	On	On	On	On	On	On	On
LTE B4	20mm	20mm	On	On	On	On	On	On	On	On	On	On	On
LTE B5	20mm	20mm	On	On	On	On	On	On	On	On	On	On	On
LTE B7	20mm	20mm	On	On	On	On	On	On	On	On	On	On	On
LTE B17	20mm	20mm	On	On	On	On	On	On	On	On	On	On	On

6.2 3G SAR Test Reduction Procedure

Per KDB941225 D01v03r01, in the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ 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. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

6.3 GSM Test Configuration

SAR tests for GSM850 and GSM1900, a communication link is set up with a base station by air link. Using CMU200 the power lever is set to “5”and “0” in SAR of GSM850 and GSM1900. The tests in the band of GSM850 and GSM1900 are performed in the mode of GPRS/EGPRS function. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslot is 5. The EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink, and at most 4 timeslots in downlink, the maximum total timeslot is 5.

When SAR tests for EGPRS mode is necessary, GMSK modulation should be used to minimize SAR measurement error due to higher peak-to-average power (PAR) ratios inherent in 8-PSK.

6.4 UMTS Test Configuration

1) Output Power Verification

Maximum output power is verified on the high, middle and low channels according to procedures described in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all “1’s” for WCDMA/HSDPA or by applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HSDPA, HSPA) are requied in the SAR report. All configurations that are not supported by the handset or cannot be measured due to technical or equipment limitations must be clearly identified.

2) WCDMA

a. Body SAR Measurements

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

3) HSDPA

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 adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

Per KDB941225 D01v03, the 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSDPA using the HSDPA body SAR procedures for the highest reported SAR body exposure configuration in 12.2 kbps RMC.

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 ΔACK, ΔNACK, ΔCQI = 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

Table 7: Sub-tests for UMTS Release 5 HSDPA

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

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

Table 8:settings of required H-Set 1 QPSK acc. to 3GPP 34.121

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

Table 9:HSDPA UE category

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 adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

Per KDB941225 D01v03, the 3G SAR test reduction procedure 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 HSDPA, 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.

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.

Table 10:Subtests for UMTS Release 6 HSUPA

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).						

Table 11:HSUPA UE category

5) DC-HSDPA

SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a Second serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS 34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH _Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13
The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

The measurements were performed with a Fixed Reference Channel (FRC) H-Set 12 with QPSK

Parameter	Value
Nominal average inf. bit rate	60 kbit/s
Inter-TTI Distance	1 TTI's
Number of HARQ Processes	6 Processes
Information Bit Payload	120 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	960 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	3200 SMLs
Coding Rate	0.15
Number of Physical Channel Codes	1

Table 12:settings of required H-Set 12 QPSK acc. to 3GPP 34.121

Note:

1.The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table above.

2.Maximum number of transmission is limited to 1,i.e.,retransmission is not allowed. The redundancy and constellation version 0 shall be used.

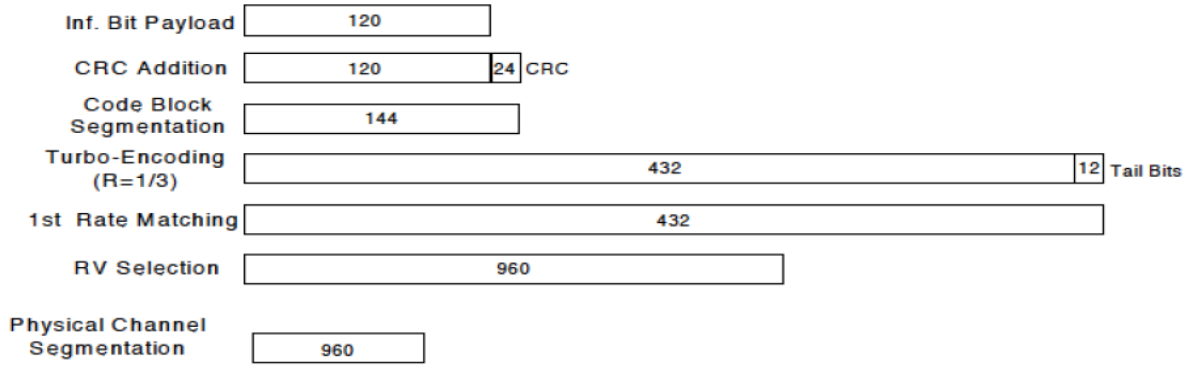


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 5 procedures. A summary of subtest settings are illustrated below:

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: 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 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 $\beta_c = 11/15$ and $\beta_d = 15/15$

Up commands are set continuously to set the UE to Max power.

Note:

1.The Dual Carriers transmission only applies to HSDPA physical channels

2.The Dual Carriers belong to the same Node and are on adjacent carriers.

3.The Dual Carriers do not support MIMO to serve UEs configured for dual cell operation

4.The Dual Carriers operate in the same frequency band .

5.The device doesn't support the modulation of 16QAM in uplink but 64QAM in downlink for DC-HSDPA mode.

6.The device doesn't support carrier aggregation for it just can operate in Release 8.

6.5 LTE Test Configuration

SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices v02r04. 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 (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.

6.6 WiFi Test Configuration

For WiFi SAR testing, a communication link is set up with the testing 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 248227D01v02r02 are applied.

6.6.1 Initial Test Position Procedure

For exposure condition with multiple test position, such as handsets operating next to the ear, devices with hotspot mode or UMPC mini-tablet , 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 position in an exposure condition. The test position with the highest extrapolated(peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4W/kg, no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8W/kg or all test position are measured. For all positions/configurations tested using the initial test position and subsequent test positions, when the *reported* SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the *reported* SAR is ≤ 1.2 W/kg or all required channels are tested.

6.6.2 Initial Test Configuration Procedure

An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. For configurations with the same specified or measured maximum output power, additional transmission mode and test channel selection procedures are required (see section 5.3.2 of KDB 248227D01v02). SAR test reduction of subsequent highest output test channels is based on the *reported* SAR of the initial test configuration.

For next to the ear, hotspot mode and UMC mini-tablet exposure configurations where multiple test positions are required, the initial test position procedure is applied to minimize the number of test positions required for SAR measurement using the initial test configuration transmission mode. For fixed exposure conditions that do not have multiple SAR test positions, SAR is measured in the transmission mode determined by the initial test configuration.

When the *reported* SAR of the initial test configuration is > 0.8 W/kg, SAR measurement is required for the subsequent next highest measured output power channel(s) in the initial test configuration until the *reported* SAR is ≤ 1.2 W/kg or all required channels are tested.

6.6.3 Sub Test Configuration Procedure

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units.

When the highest reported SAR for the initial test configuration, according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.

6.6.4 WiFi 2.4G SAR Test Procedures

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions.

A) 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 (section 3.1 of of KDB 248227D01v02) 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.

B) 2.4GHz 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 (section 5.3 of of KDB 248227D01v02r02). 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.

C) SAR Test Requirements for OFDM configurations

When SAR measurement is required for 802.11 g/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.

6.6.5 WiFi 5G SAR Test Procedures

A) U-NII-1 and U-NII-2A Bands

For devices that operate in only one of the U-NII-1 and U-NII-2A bands, the normally required SAR procedures for OFDM configurations are applied. For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following：

1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest *reported* SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, both bands are tested independently for SAR.

2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest *reported* SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, both bands are tested independently for SAR.

3) The two U-NII bands may be aggregated to support a 160 MHz channel on channel number 50. Without additional testing, the maximum output power for this is limited to the lower of the maximum output power certified for the two bands. When SAR measurement is required for at least one of the bands and the highest *reported* SAR adjusted by the ratio of specified maximum output power of aggregated to standalone band is > 1.2 W/kg, SAR is required for the 160 MHz channel. This procedure does not apply to an aggregated band with maximum output higher than the standalone band(s); the aggregated band must be tested independently for SAR. SAR is not required when the 160 MHz channel is operating at a reduced maximum power and also qualifies for SAR test exclusion.

B) U-NII-2C and 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, all channels that operate at 5.60 – 5.65 GHz must be included to apply the SAR test reduction and measurement procedures.

When the same transmitter and antenna(s) are used for U-NII-2C band and U-NII-3 band or 5.8 GHz band of §15.247, the bands may be aggregated to enable additional channels with 20, 40 or 80 MHz bandwidth to span across the band gap, as illustrated in Appendix B. The maximum output power for the additional band gap channels is limited to the lower of those certified for the bands. Unless band gap channels are permanently disabled, they must be considered for SAR testing. 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. 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. 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.

C) OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements

The initial test configuration for 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the highest maximum output power channel determined by the default power measurement procedures. When multiple configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined according to the following steps applied sequentially.

1) The largest channel bandwidth configuration is selected among the multiple configurations with the same specified maximum output power.

2) If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.

3) If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected.

4) When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n.

After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.

1) The channel closest to mid-band frequency is selected for SAR measurement.

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

D) SAR Test Requirements for OFDM configurations

When SAR measurement is required for 802.11 a/n/ac OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. When the same transmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction applies. When band gap channels between U-NII-2C band and 5.8 GHz U-NII-3 or §15.247 band are supported, the highest maximum output power transmission mode configuration and maximum output power channel across the bands must be used to determine SAR test reduction, according to the initial test configuration and subsequent test configuration requirements. 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 SAR Measurement Results

7.1 Conducted power measurements

For the measurements a Rohde & Schwarz Radio Communication Tester CMU 200&CMW500 was used.
SAR drift measured at the same position in liquid before and after each SAR test as below 7.2 chapter.
Note: CMU200 measures GSM peak and average output power for active timeslots.For SAR the timebased average power is relevant. The difference in between depends on the duty cycle of the TDMA signal :

No. of timeslots	1	2	3	4
Duty Cycle	1:8.3	1:4.1	1:2.77	1:2.08
timebased avg. power compared to slotted avg. power	-9.19dB	-6.13dB	-4.42dB	-3.18dB

The signalling modes differ as follows:

mode	coding scheme	modulation
GPRS	CS1 to CS4	GMSK
EDGE	MCS1 to MCS4	GMSK
EDGE	MCS5 to MCS9	8PSK

Apart from modulation change (GMSK/8PSK) coding schemes differ in code rate without influence on the RF signal. Therefore one coding scheme per mode was selected for conducted power measurements.

7.1.1 Conducted power measurements of GSM850

GSM850		Burst-Averaged output Power (dBm)				Division Factors	Frame-Averaged output Power (dBm)			
		Tune-up	128CH	190CH	251CH		Tune-up	128CH	190CH	251CH
GSM (CS)		33.00	32.37	32.44	32.41	-9.19	23.81	23.18	23.25	23.22
GPRS/ EDGE (GMSK)	1 Tx Slot	33.00	32.21	32.30	32.36	-9.19	23.81	23.02	23.11	23.17
	2 Tx Slots	**31.00**	**29.48**	**29.70**	**29.78**	**-6.13**	**24.87**	**23.35**	**23.57**	**23.65**
	3 Tx Slots	29.00	27.72	28.02	28.11	-4.42	24.58	23.30	23.60	23.69
	4 Tx Slots	27.00	25.68	25.94	25.91	-3.18	23.82	22.50	22.76	22.73
EDGE (8PSK)	1 Tx Slot	26.50	25.53	25.74	25.69	-9.19	17.31	16.34	16.55	16.50
	2 Tx Slots	26.00	25.11	25.31	25.37	-6.13	19.87	18.98	19.18	19.24
	3 Tx Slots	24.00	23.13	23.34	23.35	-4.42	19.58	18.71	18.92	18.93
	4 Tx Slots	21.50	20.01	20.33	20.40	-3.18	18.32	16.83	17.15	17.22

Table 13:Conducted power measurement results of GSM850 with Proximity sensor deactivated

GSM850		Burst-Averaged output Power (dBm)				Division Factors	Frame-Averaged output Power (dBm)			
		Tune-up	128CH	190CH	251CH		Tune-up	128CH	190CH	251CH
GSM (CS)		30.50	29.63	29.81	29.87	-9.19	21.31	20.44	20.62	20.68
GPRS/ EDGE (GMSK)	1 Tx Slot	30.50	29.62	29.78	29.83	-9.19	21.31	20.43	20.59	20.64
	2 Tx Slots	**28.50**	**27.74**	**28.05**	**28.12**	**-6.13**	**22.37**	**21.61**	**21.92**	**21.99**
	3 Tx Slots	26.50	25.78	26.11	26.02	-4.42	22.08	21.36	21.69	21.60
	4 Tx Slots	24.50	23.54	23.75	23.89	-3.18	21.32	20.36	20.57	20.71
EDGE (8PSK)	1 Tx Slot	26.50	25.49	25.72	25.74	-9.19	17.31	16.30	16.53	16.55
	2 Tx Slots	25.00	24.16	24.32	24.33	-6.13	18.87	18.03	18.19	18.20
	3 Tx Slots	23.00	21.30	21.59	21.62	-4.42	18.58	16.88	17.17	17.20
	4 Tx Slots	20.50	19.03	19.27	19.28	-3.18	17.32	15.85	16.09	16.10

Table 14:Conducted power measurement results of GSM850 with Proximity sensor activated

Note:

1) The conducted power of GSM850 is measured with RMS detector.

2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timesolts.

3) Per KDB941225 D01v03, SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

7.1.2 Conducted power measurements of GSM1900

GSM1900		Burst-Averaged output Power (dBm)				Division Factors	Frame-Averaged output Power (dBm)			
		Tune-up	512CH	661CH	810CH		Tune-up	512CH	661CH	810CH
GSM (CS)		30.50	29.18	29.17	29.31	-9.19	21.31	19.99	19.98	20.12
GPRS/ EDGE (GMSK)	1 Tx Slot	30.50	29.32	29.31	29.46	-9.19	21.31	20.13	20.12	20.27
	2 Tx Slots	**28.00**	**26.99**	**26.90**	**27.14**	**-6.13**	**21.87**	**20.86**	**20.77**	**21.01**
	3 Tx Slots	25.50	24.87	24.78	25.28	-4.42	21.08	20.45	20.36	20.86
	4 Tx Slots	25.00	24.08	24.01	24.40	-3.18	21.82	20.90	20.83	21.22
EDGE (8PSK)	1 Tx Slot	25.50	24.42	24.25	24.57	-9.19	16.31	15.23	15.06	15.38
	2 Tx Slots	25.00	24.06	23.92	24.28	-6.13	18.87	17.93	17.79	18.15
	3 Tx Slots	23.00	21.92	21.80	22.10	-4.42	18.58	17.50	17.38	17.68
	4 Tx Slots	21.00	19.92	19.85	20.04	-3.18	17.82	16.74	16.67	16.86

Table 15: Conducted power measurement results of GSM1900 with Proximity sensor deactivated

GSM1900		Burst-Averaged output Power (dBm)				Division Factors	Frame-Averaged output Power (dBm)			
		Tune-up	512CH	661CH	810CH		Tune-up	512CH	661CH	810CH
GSM (CS)		21.50	21.15	20.99	21.28	-9.19	12.31	11.96	11.80	12.09
GPRS/ EDGE (GMSK)	1 Tx Slot	21.50	21.02	20.97	21.21	-9.19	12.31	11.83	11.78	12.02
	2 Tx Slots	**19.50**	**17.87**	**17.72**	**18.12**	**-6.13**	**13.37**	**11.74**	**11.59**	**11.99**
	3 Tx Slots	16.50	15.79	15.80	15.92	-4.42	12.08	11.37	11.38	11.50
	4 Tx Slots	14.50	13.90	13.83	14.02	-3.18	11.32	10.72	10.65	10.84
EDGE (8PSK)	1 Tx Slot	19.50	18.70	18.53	18.82	-9.19	10.31	9.51	9.34	9.63
	2 Tx Slots	15.00	14.26	14.10	14.57	-6.13	8.87	8.13	7.97	8.44
	3 Tx Slots	13.00	12.22	12.18	12.49	-4.42	8.58	7.80	7.76	8.07
	4 Tx Slots	11.00	10.20	10.02	10.52	-3.18	7.82	7.02	6.84	7.34

Table 16: Conducted power measurement results of GSM1900 with Proximity sensor activated

Note:

1) The conducted power of GSM850 is measured with RMS detector.

2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timesolts.

3) Per KDB941225 D01v03, SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

7.1.3 Conducted power measurements of UMTS Band V

UMTS Band V		Tune-up	Conducted Power (dBm)		
			4132CH	4182CH	4233CH
WCDMA	12.2kbps RMC	24.0	**22.87**	**22.69**	**22.67**
	64kbps RMC	24.0	22.86	22.68	22.64
	144kbps RMC	24.0	22.85	22.70	22.65
	384kbps RMC	24.0	22.84	22.68	22.66
HSDPA	Subtest 1	23.0	21.78	21.68	21.79
	Subtest 2	23.0	21.72	21.44	21.53
	Subtest 3	22.5	21.14	20.85	20.87
	Subtest 4	22.5	21.03	20.89	20.91
HSUPA	Subtest 1	22.0	21.44	21.18	21.61
	Subtest 2	21.5	20.37	20.16	20.49
	Subtest 3	21.5	20.54	20.19	20.26
	Subtest 4	22.0	20.53	20.42	20.76
	Subtest 5	22.0	21.24	20.99	21.31
DC-HSDPA	Subtest 1	23.0	21.74	21.72	21.70
	Subtest 2	23.0	21.70	21.49	21.50
	Subtest 3	22.5	21.21	20.98	20.84
	Subtest 4	22.5	21.09	20.94	20.90

Table 17: Conducted power measurement results of UMTS Band V with Proximity sensor deactivated

UMTS Band V		Tune-up	Conducted Power (dBm)		
			4132CH	4182CH	4233CH
WCDMA	12.2kbps RMC	21.0	**20.43**	**20.23**	**20.24**
	64kbps RMC	21.0	20.46	20.24	20.25
	144kbps RMC	21.0	20.42	20.22	20.23
	384kbps RMC	21.0	20.44	20.23	20.21
HSDPA	Subtest 1	20.0	19.42	19.31	19.44
	Subtest 2	20.0	19.02	19.07	19.27
	Subtest 3	19.5	18.62	18.52	18.60
	Subtest 4	19.5	18.53	18.43	18.62
HSUPA	Subtest 1	19.0	18.35	18.44	18.52
	Subtest 2	18.5	18.15	18.20	18.48
	Subtest 3	18.5	18.21	17.91	18.23
	Subtest 4	19.0	18.93	18.96	18.98
	Subtest 5	19.0	18.79	18.55	18.44
DC-HSDPA	Subtest 1	20.0	19.40	19.38	19.40
	Subtest 2	20.0	19.07	19.11	19.29
	Subtest 3	19.5	18.69	18.55	18.66
	Subtest 4	19.5	18.53	18.46	18.60

Table 18: Conducted power measurement results of UMTS Band V with Proximity sensor activated

Note:

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

2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).

3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second 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 Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

7.1.4 Conducted power measurements of UMTS Band IV

UMTS Band IV		Tune-up	Conducted Power (dBm)		
			1312CH	1413CH	1513CH
WCDMA	12.2kbps RMC	23.5	**22.44**	**22.34**	**22.37**
	64kbps RMC	23.5	22.42	22.40	22.36
	144kbps RMC	23.5	22.41	22.41	22.35
	384kbps RMC	23.5	22.43	22.38	22.37
HSDPA	Subtest 1	22.5	21.47	21.35	21.38
	Subtest 2	22.0	21.21	21.10	20.94
	Subtest 3	22.0	20.72	20.58	20.45
	Subtest 4	22.5	20.68	20.56	20.52
HSUPA	Subtest 1	22.0	20.81	20.74	20.97
	Subtest 2	21.0	19.66	20.23	19.92
	Subtest 3	20.5	20.08	20.21	19.84
	Subtest 4	21.5	20.68	20.46	20.18
	Subtest 5	22.0	20.66	20.55	20.25
DC-HSDPA	Subtest 1	22.5	21.48	21.34	21.37
	Subtest 2	22.0	21.25	21.11	21.03
	Subtest 3	22.0	20.70	20.59	20.49
	Subtest 4	22.5	20.66	20.54	20.58

Table 19: Conducted power measurement results of UMTS Band IV with Proximity sensor deactivated

UMTS Band IV		Tune-up	Conducted Power (dBm)		
			1312CH	1413CH	1513CH
WCDMA	12.2kbps RMC	14.0	**13.90**	**13.82**	**13.93**
	64kbps RMC	14.0	13.89	13.84	13.91
	144kbps RMC	14.0	13.90	13.81	13.90
	384kbps RMC	14.0	13.91	13.82	13.92
HSDPA	Subtest 1	13.0	11.92	11.93	11.65
	Subtest 2	12.5	11.75	11.73	11.45
	Subtest 3	12.5	11.19	11.21	11.04
	Subtest 4	13.0	11.20	11.12	11.05
HSUPA	Subtest 1	12.5	11.81	11.94	11.93
	Subtest 2	11.5	10.01	10.25	10.05
	Subtest 3	11.0	9.51	9.61	9.55
	Subtest 4	12.0	11.66	11.93	11.84
	Subtest 5	12.5	11.49	11.60	11.31
DC-HSDPA	Subtest 1	13.0	11.90	11.91	11.69
	Subtest 2	12.5	11.72	11.70	11.52
	Subtest 3	12.5	11.25	11.28	11.01
	Subtest 4	13.0	11.28	11.21	11.04

Table 20: Conducted power measurement results of UMTS Band IV with Proximity sensor activated

Note:

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

2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).

3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second 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 Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

7.1.5 Conducted power measurements of UMTS Band II

UMTS Band II		Tune-up	Conducted Power (dBm)		
			9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	23.5	**22.07**	**22.10**	**21.97**
	64kbps RMC	23.5	22.05	22.06	21.98
	144kbps RMC	23.5	22.04	22.07	22.00
	384kbps RMC	23.5	22.05	22.08	21.98
HSDPA	Subtest 1	22.5	21.55	21.58	21.69
	Subtest 2	22.5	21.43	21.38	21.52
	Subtest 3	22.0	20.96	20.84	20.91
	Subtest 4	22.0	20.89	20.91	20.83
HSUPA	Subtest 1	22.0	21.40	21.41	21.44
	Subtest 2	21.0	20.32	20.62	20.61
	Subtest 3	21.0	20.57	20.48	20.45
	Subtest 4	21.5	20.43	20.46	20.41
	Subtest 5	22.0	21.16	21.39	21.26
DC-HSDPA	Subtest 1	22.5	21.59	21.61	21.65
	Subtest 2	22.5	21.49	21.34	21.50
	Subtest 3	22.0	21.04	20.88	20.90
	Subtest 4	22.0	20.95	20.92	20.88

Table 21: Conducted power measurement results of UMTS Band II with Proximity sensor deactivated

UMTS Band II		Tune-up	Conducted Power (dBm)		
			9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	14.0	**13.40**	**13.35**	**13.31**
	64kbps RMC	14.0	13.54	13.35	13.33
	144kbps RMC	14.0	13.44	13.36	13.35
	384kbps RMC	14.0	13.42	13.32	13.34
HSDPA	Subtest 1	13.0	12.98	12.92	12.87
	Subtest 2	13.0	12.94	12.64	12.57
	Subtest 3	12.5	12.44	12.24	12.17
	Subtest 4	12.5	12.46	12.21	12.19
HSUPA	Subtest 1	14.0	13.12	13.10	13.35
	Subtest 2	12.0	11.15	11.33	11.34
	Subtest 3	12.0	10.66	11.45	10.81
	Subtest 4	14.0	13.12	13.11	13.08
	Subtest 5	13.0	12.32	12.43	12.46
DC-HSDPA	Subtest 1	13.0	12.90	12.90	12.83
	Subtest 2	13.0	12.91	12.66	12.51
	Subtest 3	12.5	12.41	12.28	12.24
	Subtest 4	12.5	12.38	12.21	12.21

Table 22: Conducted power measurement results of UMTS Band II with Proximity sensor activated

Note:

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

2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).

3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second 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 Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

7.1.6 Conducted power measurements of LTE Band II

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18607CH	18900CH	19193CH
1.4MHz	QPSK	1	0	23	21.42	21.52	21.57
		1	3	23	21.29	21.41	21.42
		1	5	23	21.29	21.46	21.35
		3	0	23	21.37	21.47	21.47
		3	2	23	21.46	21.52	21.50
		3	3	23	21.44	21.49	21.42
		6	0	22	20.33	20.39	20.33
	16QAM	1	0	22	20.89	20.31	20.94
		1	3	22	20.96	20.11	20.12
		1	5	22	20.97	20.08	20.06
		3	0	22	20.23	20.05	20.11
		3	2	22	20.21	20.11	20.03
		3	3	22	20.22	20.08	20.07
		6	0	21	19.58	19.21	19.16
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18615CH	18900CH	19185CH
3MHz	QPSK	1	0	23	21.46	21.65	21.58
		1	7	23	21.57	21.97	21.55
		1	14	23	21.58	21.65	21.58
		8	0	22	20.34	20.45	20.37
		8	4	22	20.30	20.40	20.37
		8	7	22	20.33	20.37	20.49
		15	0	22	20.28	20.47	20.40
	16QAM	1	0	22	21.26	20.31	21.03
		1	7	22	21.32	20.43	20.80
		1	14	22	21.21	20.39	20.85
		8	0	21	19.55	19.43	19.54
		8	4	21	19.62	19.55	19.37
		8	7	21	19.65	19.45	19.07
		15	0	21	19.31	19.29	19.55

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18625CH	18900CH	19175CH
5MHz	QPSK	1	0	23	21.09	21.52	21.55
		1	13	23	21.13	21.51	21.58
		1	24	23	21.18	21.50	21.59
		12	0	22	20.20	20.38	20.39
		12	6	22	20.25	20.40	20.37
		12	13	22	20.23	20.42	20.42
		25	0	22	20.29	20.40	20.40
	16QAM	1	0	22	20.14	20.02	20.69
		1	13	22	20.12	20.06	20.58
		1	24	22	20.01	20.03	20.66
		12	0	21	19.43	19.34	19.16
		12	6	21	19.42	19.49	19.14
		12	13	21	19.29	19.48	19.20
		25	0	21	19.54	19.40	19.60
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18650CH	18900CH	19150CH
10MHz	QPSK	1	0	23	21.57	21.74	21.77
		1	25	23	21.83	21.74	21.67
		1	49	23	21.64	21.67	21.70
		25	0	22	20.33	20.42	20.40
		25	13	22	20.35	20.51	20.43
		25	25	22	20.29	20.52	20.38
		50	0	22	20.28	20.53	20.49
	16QAM	1	0	22	21.12	20.70	20.62
		1	25	22	20.94	20.79	20.76
		1	49	22	21.13	20.51	20.52
		25	0	21	19.48	19.49	19.38
		25	13	21	19.44	19.41	19.43
		25	25	21	19.45	19.53	19.39
		50	0	21	19.35	19.42	19.29

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18675CH	18900CH	19125CH
15MHz	QPSK	1	0	23	21.65	21.78	21.91
		1	38	23	21.54	21.61	21.46
		1	74	23	21.57	21.61	21.75
		36	0	22	20.30	20.44	20.48
		36	18	22	20.31	20.42	20.38
		36	39	22	20.20	20.37	20.33
		75	0	22	20.31	20.44	20.34
	16QAM	1	0	22	21.18	20.29	20.42
		1	38	22	20.89	20.24	20.49
		1	74	22	20.97	20.22	20.73
		36	0	21	19.45	19.30	19.30
		36	18	21	19.38	19.30	19.21
		36	39	21	19.11	19.23	19.25
		75	0	21	19.59	19.63	19.36
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18700CH	18900CH	19100CH
20MHz	QPSK	1	0	23	21.52	**21.82**	21.56
		1	50	23	**21.53**	21.74	**21.61**
		1	99	23	21.27	21.58	21.42
		50	0	22	**20.46**	20.49	**20.43**
		50	25	22	20.26	**20.51**	20.32
		50	50	22	20.30	20.42	20.29
		100	0	22	20.39	**20.48**	20.39
	16QAM	1	0	22	20.28	20.31	20.43
		1	50	22	20.10	20.61	20.22
		1	99	22	20.11	20.18	20.24
		50	0	21	19.50	19.63	19.51
		50	25	21	19.32	19.63	19.47
		50	50	21	19.46	19.56	19.43
		100	0	21	19.38	19.40	19.54

Table 23: Conducted power measurement results of LTE Band II with Proximity sensor deactivated

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18607CH	18900CH	19193CH
1.4MHz	QPSK	1	0	14	12.55	12.52	12.54
		1	3	14	12.54	12.62	12.61
		1	5	14	12.67	12.5	12.63
		3	0	14	12.50	12.53	12.44
		3	2	14	12.48	12.63	12.46
		3	3	14	12.55	12.49	12.58
		6	0	13	11.79	11.97	11.84
	16QAM	1	0	13	11.80	12.09	12.06
		1	3	13	12.02	12.28	12.11
		1	5	13	11.95	12.14	11.89
		3	0	13	11.73	11.61	11.81
		3	2	13	11.84	11.68	11.49
		3	3	13	11.53	11.66	11.53
		6	0	12	11.58	11.67	11.68
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18615CH	18900CH	19185CH
3MHz	QPSK	1	0	14	12.47	12.16	12.11
		1	7	14	12.56	12.55	12.55
		1	14	14	12.19	12.28	11.98
		8	0	13	11.89	12.04	12.04
		8	4	13	11.88	11.98	11.94
		8	7	13	11.91	11.98	11.96
		15	0	13	11.87	12.07	11.93
	16QAM	1	0	13	12.06	12.36	12.21
		1	7	13	12.12	12.17	12.01
		1	14	13	12.34	12.42	12.02
		8	0	12	11.79	11.99	11.90
		8	4	12	11.78	11.98	11.89
		8	7	12	11.85	11.94	11.83
		15	0	12	11.52	11.98	11.99

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18625CH	18900CH	19175CH
5MHz	QPSK	1	0	14	12.13	12.43	12.41
		1	13	14	12.04	12.06	12.02
		1	24	14	12.32	12.52	12.28
		12	0	13	11.83	12.03	11.87
		12	6	13	11.78	11.98	11.93
		12	13	13	11.83	11.98	11.85
		25	0	13	11.89	11.97	11.93
	16QAM	1	0	13	12.17	12.47	12.48
		1	13	13	12.01	12.05	12.01
		1	24	13	12.41	12.60	12.41
		12	0	12	11.86	11.91	11.81
		12	6	12	11.88	11.89	11.89
		12	13	12	11.87	11.98	11.85
		25	0	12	11.85	11.95	11.94
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18650CH	18900CH	19150CH
10MHz	QPSK	1	0	14	12.37	12.55	12.29
		1	25	14	12.41	12.34	12.46
		1	49	14	12.51	12.70	12.51
		25	0	13	11.97	12.04	11.94
		25	13	13	11.88	12.02	11.92
		25	25	13	11.92	11.96	11.98
		50	0	13	11.93	11.94	11.89
	16QAM	1	0	13	12.25	12.32	12.29
		1	25	13	11.62	11.55	11.49
		1	49	13	12.37	12.50	12.44
		25	0	12	11.84	11.90	11.96
		25	13	12	11.97	11.99	11.94
		25	25	12	11.98	11.96	11.72
		50	0	12	11.88	11.86	11.81

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18675CH	18900CH	19125CH
15MHz	QPSK	1	0	14	12.48	12.60	12.58
		1	38	14	12.11	12.45	12.71
		1	74	14	12.41	12.95	12.58
		36	0	13	11.88	12.07	12.05
		36	18	13	11.86	11.97	11.92
		36	39	13	11.81	11.89	11.98
		75	0	13	11.87	12.00	11.91
	16QAM	1	0	13	12.28	12.42	12.51
		1	38	13	11.50	11.67	11.38
		1	74	13	12.15	12.90	12.53
		36	0	12	11.93	11.98	11.97
		36	18	12	11.86	11.82	11.82
		36	39	12	11.84	11.77	11.72
		75	0	12	11.81	11.97	11.91
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18700CH	18900CH	19100CH
20MHz	QPSK	1	0	14	**12.35**	12.37	**12.72**
		1	50	14	12.34	12.73	12.11
		1	99	14	12.34	**12.90**	12.68
		50	0	13	**12.04**	**12.03**	**12.02**
		50	25	13	11.88	12.02	12.01
		50	50	13	11.90	11.95	11.89
		100	0	13	11.93	12.03	**12.04**
	16QAM	1	0	13	12.78	12.76	12.75
		1	50	13	12.44	12.41	12.50
		1	99	13	12.72	12.89	12.65
		50	0	12	11.87	11.98	11.97
		50	25	12	11.70	11.98	11.96
		50	50	12	11.70	11.97	11.94
		100	0	12	11.98	11.95	11.89

Table 24: Conducted power measurement results of LTE Band II with Proximity sensor activated

7.1.7 Conducted power measurements of LTE Band IV

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					19957CH	20175CH	20393CH
1.4MHz	QPSK	1	0	23	21.56	21.60	21.77
		1	3	23	21.63	22.28	22.32
		1	5	23	21.59	21.64	21.84
		3	0	23	21.65	21.50	21.55
		3	2	23	21.69	21.53	21.57
		3	3	23	21.67	21.51	21.54
		6	0	22	20.59	20.48	20.51
	16QAM	1	0	22	20.09	20.02	21.25
		1	3	22	20.21	20.25	21.17
		1	5	22	20.86	20.10	20.26
		3	0	22	20.39	20.14	20.29
		3	2	22	20.39	20.18	20.31
		3	3	22	20.39	20.15	20.28
		6	0	21	19.47	19.25	19.88
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					19965CH	20175CH	20385CH
3MHz	QPSK	1	0	23	21.77	21.77	21.66
		1	7	23	21.88	21.74	21.82
		1	14	23	21.90	21.82	21.88
		8	0	22	20.53	20.46	20.34
		8	4	22	20.63	20.44	20.45
		8	7	22	20.61	20.43	20.49
		15	0	22	20.61	20.51	20.43
	16QAM	1	0	22	21.60	21.49	21.47
		1	7	22	21.62	21.67	21.66
		1	14	22	21.59	21.42	21.48
		8	0	21	19.94	19.61	19.59
		8	4	21	20.02	19.20	19.66
		8	7	21	19.93	19.22	19.64
		15	0	21	19.72	19.70	19.66

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					19975CH	20175CH	20375CH
5MHz	QPSK	1	0	23	21.70	21.67	21.68
		1	13	23	21.84	21.65	21.65
		1	24	23	21.74	21.63	21.73
		12	0	22	20.57	20.48	20.34
		12	6	22	20.56	20.46	20.41
		12	13	22	20.56	20.52	20.48
		25	0	22	20.55	20.55	20.51
	16QAM	1	0	22	20.06	20.39	20.08
		1	13	22	20.40	20.02	20.67
		1	24	22	21.08	20.04	20.60
		12	0	21	19.76	19.43	19.32
		12	6	21	19.72	19.50	19.36
		12	13	21	19.62	19.49	19.58
		25	0	21	19.79	19.56	19.62
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20000CH	20175CH	20350CH
10MHz	QPSK	1	0	23	21.93	21.84	21.81
		1	25	23	22.00	21.51	21.55
		1	49	23	21.85	21.66	21.67
		25	0	22	20.64	20.47	20.48
		25	13	22	20.62	20.37	20.49
		25	25	22	20.58	20.39	20.54
		50	0	22	20.60	20.44	20.46
	16QAM	1	0	22	21.55	20.69	21.29
		1	25	22	21.12	20.35	21.10
		1	49	22	21.29	20.22	20.62
		25	0	21	19.63	19.60	19.49
		25	13	21	19.51	19.48	19.58
		25	25	21	19.67	19.40	19.63
		50	0	21	19.66	19.52	19.54

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20025CH	20175CH	20325CH
15MHz	QPSK	1	0	23	21.95	22.13	21.93
		1	38	23	21.84	21.69	21.60
		1	74	23	21.83	21.76	21.62
		36	0	22	20.64	20.50	20.53
		36	18	22	20.67	20.46	20.46
		36	39	22	20.48	20.39	20.45
		75	0	22	20.49	20.43	20.47
	16QAM	1	0	22	21.11	20.52	20.58
		1	38	22	20.93	20.24	20.35
		1	74	22	20.95	21.05	20.74
		36	0	21	19.62	19.58	19.64
		36	18	21	19.50	19.40	19.56
		36	39	21	19.42	19.54	19.56
		75	0	21	19.76	19.52	19.55
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20050CH	20175CH	20300CH
20MHz	QPSK	1	0	23	**21.92**	**21.57**	21.73
		1	50	23	21.66	21.56	**21.93**
		1	99	23	21.58	21.35	21.40
		50	0	22	20.58	**20.59**	20.52
		50	25	22	20.48	20.40	20.39
		50	50	22	20.41	20.44	20.39
		100	0	22	20.43	20.46	**20.48**
	16QAM	1	0	22	20.50	20.52	20.62
		1	50	22	20.21	20.32	20.39
		1	99	22	20.07	20.33	20.49
		50	0	21	19.69	19.70	19.68
		50	25	21	19.53	19.55	19.56
		50	50	21	19.48	19.59	19.66
		100	0	21	19.57	19.65	19.61

Table 25: Conducted power measurement results of LTE Band IV with Proximity sensor deactivated

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					19957CH	20175CH	20393CH
1.4MHz	QPSK	1	0	14.5	13.25	13.02	13.06
		1	3	14.5	13.14	13.12	13.16
		1	5	14.5	13.20	13.12	13.27
		3	0	14.5	13.25	13.05	13.09
		3	2	14.5	13.29	13.08	13.13
		3	3	14.5	13.27	13.15	13.19
		6	0	13.5	13.25	13.04	13.15
	16QAM	1	0	14.5	13.89	12.63	13.96
		1	3	14.5	13.91	12.75	12.89
		1	5	14.5	13.85	12.72	13.45
		3	0	13.5	13.23	12.64	13.49
		3	2	13.5	13.27	12.66	13.20
		3	3	13.5	13.24	12.55	13.38
		6	0	13.5	12.98	12.84	12.99
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					19965CH	20175CH	20385CH
3MHz	QPSK	1	0	14.5	13.42	13.19	13.22
		1	7	14.5	13.43	13.27	13.33
		1	14	14.5	13.43	13.26	13.30
		8	0	13.5	13.15	13.14	13.05
		8	4	13.5	13.24	13.12	13.14
		8	7	13.5	13.24	13.10	13.13
		15	0	13.5	13.25	13.14	13.15
	16QAM	1	0	14.5	12.25	13.24	12.03
		1	7	14.5	13.52	12.39	12.34
		1	14	14.5	13.96	12.12	12.16
		8	0	13.5	12.99	12.83	12.98
		8	4	13.5	12.67	12.85	12.99
		8	7	13.5	12.98	12.75	12.98
		15	0	13.5	12.93	12.95	12.99

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					19975CH	20175CH	20375CH
5MHz	QPSK	1	0	14.5	13.35	13.01	13.21
		1	13	14.5	13.28	13.02	13.09
		1	24	14.5	13.04	13.07	13.22
		12	0	13.5	13.15	13.14	12.94
		12	6	13.5	13.17	13.10	12.93
		12	13	13.5	13.19	13.07	13.10
		25	0	13.5	13.15	13.11	13.12
	16QAM	1	0	14.5	12.63	12.99	13.82
		1	13	14.5	12.76	12.40	12.52
		1	24	14.5	12.66	12.40	12.75
		12	0	13.5	12.94	12.99	12.91
		12	6	13.5	12.79	12.92	12.78
		12	13	13.5	12.87	12.90	12.98
		25	0	13.5	12.97	12.99	12.98
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20000CH	20175CH	20350CH
10MHz	QPSK	1	0	14.5	13.45	13.43	13.52
		1	25	14.5	13.51	13.52	13.51
		1	49	14.5	13.53	13.32	13.44
		25	0	13.5	13.29	13.16	13.12
		25	13	13.5	13.15	13.10	13.12
		25	25	13.5	13.20	13.14	13.20
		50	0	13.5	13.24	13.19	13.21
	16QAM	1	0	14.5	13.00	13.35	13.82
		1	25	14.5	12.90	13.45	13.82
		1	49	14.5	13.00	13.20	13.90
		25	0	13.5	12.99	12.99	12.98
		25	13	13.5	12.98	12.95	12.99
		25	25	13.5	12.98	12.92	12.94
		50	0	13.5	12.98	12.98	12.99

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20025CH	20175CH	20325CH
15MHz	QPSK	1	0	14.5	13.64	13.56	13.47
		1	38	14.5	13.47	13.15	13.19
		1	74	14.5	13.43	13.28	13.27
		36	0	13.5	13.24	13.18	13.19
		36	18	13.5	13.27	13.12	13.09
		36	39	13.5	13.16	13.15	13.20
		75	0	13.5	13.11	13.10	13.13
	16QAM	1	0	14.5	13.80	13.13	13.15
		1	38	14.5	13.58	12.81	12.87
		1	74	14.5	13.62	12.97	12.95
		36	0	13.5	12.99	12.93	12.92
		36	18	13.5	12.93	12.87	12.94
		36	39	13.5	12.94	12.90	12.95
		75	0	13.5	12.84	12.95	12.98
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20050CH	20175CH	20300CH
20MHz	QPSK	1	0	14.5	**13.61**	**13.30**	**13.54**
		1	50	14.5	13.50	13.06	13.43
		1	99	14.5	13.20	13.14	13.23
		50	0	13.5	**13.35**	**13.22**	**13.19**
		50	25	13.5	13.20	13.06	13.12
		50	50	13.5	13.07	13.04	13.16
		100	0	13.5	13.12	13.14	**13.19**
	16QAM	1	0	14.5	13.44	13.23	13.11
		1	50	14.5	13.13	13.03	12.88
		1	99	14.5	13.10	13.02	12.91
		50	0	13.5	12.98	12.88	12.84
		50	25	13.5	12.93	12.81	12.92
		50	50	13.5	12.83	12.83	12.92
		100	0	13.5	12.93	12.90	12.86

Table 26: Conducted power measurement results of LTE Band IV with Proximity sensor activated

7.1.8 Conducted power measurements of LTE Band V

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20407CH	20525CH	20643CH
1.4MHz	QPSK	1	0	23.5	22.93	22.79	22.89
		1	3	23.5	22.78	22.82	22.91
		1	5	23.5	22.83	22.73	22.76
		3	0	23.5	22.88	22.63	22.96
		3	2	23.5	22.77	22.70	22.88
		3	3	23.5	22.88	22.61	22.92
		6	0	22.5	21.89	21.79	21.81
	16QAM	1	0	22.5	22.23	21.34	21.50
		1	3	22.5	22.23	21.46	21.58
		1	5	22.5	22.19	21.39	21.49
		3	0	22.5	21.74	21.66	21.66
		3	2	22.5	22.09	21.85	21.58
		3	3	22.5	22.13	21.78	21.53
		6	0	21.5	21.08	20.58	20.58
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20415CH	20525CH	20635CH
3MHz	QPSK	1	0	23.5	23.02	22.99	22.99
		1	7	23.5	23.15	22.82	23.02
		1	14	23.5	22.95	22.90	23.05
		8	0	22.5	21.79	21.80	21.84
		8	4	22.5	21.73	21.75	21.88
		8	7	22.5	21.75	21.63	21.89
		15	0	22.5	21.88	21.76	21.96
	16QAM	1	0	22.5	21.87	20.71	21.74
		1	7	22.5	22.08	21.00	21.44
		1	14	22.5	22.14	21.64	22.09
		8	0	21.5	20.78	20.51	20.71
		8	4	21.5	20.76	20.84	20.81
		8	7	21.5	20.67	20.66	20.76
		15	0	21.5	20.52	20.72	20.93

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20425CH	20525CH	20625CH
5MHz	QPSK	1	0	23.5	22.95	22.74	22.82
		1	13	23.5	22.96	22.77	22.82
		1	24	23.5	22.36	22.64	22.87
		12	0	22.5	21.79	21.81	21.79
		12	6	22.5	21.85	21.70	21.70
		12	13	22.5	21.78	21.69	21.85
		25	0	22.5	21.91	21.79	21.81
	16QAM	1	0	22.5	22.5	21.70	21.17
		1	13	22.5	22.49	21.68	21.22
		1	24	22.5	21.40	21.61	21.46
		12	0	21.5	20.86	20.65	20.70
		12	6	21.5	20.71	20.62	20.58
		12	13	21.5	20.81	20.59	20.59
		25	0	21.5	20.74	20.72	20.88
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20450CH	20525CH	20600CH
10MHz	QPSK	1	0	23.5	23.09	23.11	22.99
		1	25	23.5	23.12	22.82	**23.13**
		1	49	23.5	22.94	22.81	23.02
		25	0	22.5	21.80	21.84	21.76
		25	13	22.5	21.70	21.80	21.82
		25	25	22.5	21.76	**21.85**	21.81
		50	0	22.5	21.80	21.73	21.84
	16QAM	1	0	22.5	22.06	22.42	22.00
		1	25	22.5	22.08	22.29	22.48
		1	49	22.5	21.81	22.22	22.00
		25	0	21.5	20.67	20.87	20.77
		25	13	21.5	20.76	20.81	20.72
		25	25	21.5	20.77	20.49	20.83
		50	0	21.5	20.64	20.64	20.68

Table 27: Conducted power measurement results of LTE Band V with Proximity sensor deactivated

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20407CH	20525CH	20643CH
1.4MHz	QPSK	1	0	22.5	21.18	21.19	21.41
		1	3	22.5	21.23	21.78	21.43
		1	5	22.5	21.19	21.09	21.22
		3	0	22.5	21.26	21.16	21.43
		3	2	22.5	21.50	21.10	21.32
		3	3	22.5	21.35	21.02	21.36
		6	0	21.5	21.29	21.09	21.32
	16QAM	1	0	21.5	20.76	20.81	20.72
		1	3	21.5	21.02	20.81	20.57
		1	5	21.5	20.78	20.83	20.70
		3	0	21.5	21.25	20.98	21.25
		3	2	21.5	21.49	21.04	21.48
		3	3	21.5	21.47	21.31	21.19
		6	0	20.5	20.45	20.46	20.49
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20415CH	20525CH	20635CH
3MHz	QPSK	1	0	22.5	21.26	21.44	21.22
		1	7	22.5	21.22	21.36	21.44
		1	14	22.5	21.23	21.35	21.47
		8	0	21.5	21.30	21.21	21.15
		8	4	21.5	21.25	21.11	21.26
		8	7	21.5	21.11	21.04	21.26
		15	0	21.5	21.31	21.15	21.30
	16QAM	1	0	21.5	21.33	20.13	21.35
		1	7	21.5	21.26	20.38	21.25
		1	14	21.5	21.02	20.18	20.31
		8	0	20.5	20.32	20.43	20.48
		8	4	20.5	20.49	20.49	20.49
		8	7	20.5	20.36	20.35	20.45
		15	0	20.5	20.44	20.49	20.49

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20425CH	20525CH	20625CH
5MHz	QPSK	1	0	22.5	20.94	21.15	21.04
		1	13	22.5	20.81	21.11	21.11
		1	24	22.5	20.78	21.07	21.17
		12	0	21.5	21.22	21.28	21.26
		12	6	21.5	21.18	21.06	21.22
		12	13	21.5	21.19	21.12	21.28
		25	0	21.5	21.26	21.19	21.20
	16QAM	1	0	21.5	21.18	20.65	20.98
		1	13	21.5	21.06	20.48	21.04
		1	24	21.5	20.98	20.49	20.60
		12	0	20.5	20.48	20.47	20.49
		12	6	20.5	20.49	20.49	20.43
		12	13	20.5	20.49	20.42	20.49
		25	0	20.5	20.49	20.48	20.47
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20450CH	20525CH	20600CH
10MHz	QPSK	1	0	22.5	**21.50**	**21.93**	21.41
		1	25	22.5	21.20	21.45	**21.45**
		1	49	22.5	21.30	21.34	21.44
		25	0	21.5	21.22	**21.25**	21.07
		25	13	21.5	21.17	21.08	21.14
		25	25	21.5	**21.23**	21.00	**21.27**
		50	0	21.5	21.22	21.11	**21.23**
	16QAM	1	0	21.5	21.22	21.44	21.31
		1	25	21.5	21.01	21.35	21.41
		1	49	21.5	21.30	21.02	21.36
		25	0	20.5	20.45	20.49	20.49
		25	13	20.5	20.50	20.42	20.49
		25	25	20.5	20.48	20.49	20.47
		50	0	20.5	20.49	20.42	20.48

Table 28: Conducted power measurement results of LTE Band V with Proximity sensor activated

7.1.9 Conducted power measurements of LTE Band VII

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20775CH	21100CH	21425CH
5MHz	QPSK	1	0	23	21.11	21.30	21.44
		1	13	23	21.18	21.42	21.41
		1	24	23	21.09	21.24	21.29
		12	0	22	20.07	20.10	20.20
		12	6	22	20.09	20.12	20.16
		12	13	22	20.09	20.10	20.15
		25	0	22	20.08	20.09	20.14
	16QAM	1	0	22	20.12	20.77	20.52
		1	13	22	20.05	20.87	20.35
		1	24	22	20.28	20.91	20.26
		12	0	21	19.04	19.23	19.10
		12	6	21	19.07	20.25	19.15
		12	13	21	19.09	20.24	19.27
		25	0	21	19.03	19.32	19.41
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20800CH	21100CH	21400CH
10MHz	QPSK	1	0	23	21.42	21.75	21.39
		1	25	23	21.41	21.32	21.31
		1	49	23	21.36	21.42	21.28
		25	0	22	20.23	20.22	20.18
		25	13	22	20.16	20.10	20.20
		25	25	22	20.21	20.12	20.14
		50	0	22	20.11	20.18	20.21
	16QAM	1	0	22	20.33	20.90	20.33
		1	25	22	20.94	20.80	20.45
		1	49	22	20.25	20.15	20.02
		25	0	21	19.10	19.15	19.21
		25	13	21	19.04	19.11	19.28
		25	25	21	19.25	19.03	19.22
		50	0	21	19.03	19.16	19.19

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20825CH	21100CH	21375CH
15MHz	QPSK	1	0	23	21.44	21.46	21.41
		1	38	23	21.25	21.28	21.23
		1	74	23	21.27	21.27	21.22
		36	0	22	20.19	20.17	20.20
		36	18	22	20.20	20.12	20.11
		36	39	22	20.15	20.07	20.13
		75	0	22	20.18	20.15	20.15
	16QAM	1	0	22	20.96	20.33	20.09
		1	38	22	20.73	20.05	20.03
		1	74	22	20.67	20.11	20.05
		36	0	21	19.12	19.26	19.07
		36	18	21	19.10	19.10	19.40
		36	39	21	19.41	19.05	19.03
		75	0	21	19.06	19.14	19.37
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20850CH	21100CH	21350CH
20MHz	QPSK	1	0	23	21.15	21.26	21.27
		1	50	23	21.16	**21.28**	21.26
		1	99	23	21.14	21.25	21.05
		50	0	22	20.23	**20.24**	20.18
		50	25	22	20.16	20.13	20.10
		50	50	22	20.11	20.06	20.18
		100	0	22	20.22	20.11	20.23
	16QAM	1	0	22	20.22	20.13	20.15
		1	50	22	20.09	20.05	20.36
		1	99	22	20.66	20.60	20.30
		50	0	21	19.21	19.26	19.34
		50	25	21	19.24	19.09	19.26
		50	50	21	19.12	19.09	19.27
		100	0	21	19.19	19.15	19.11

Table 29: Conducted power measurement results of LTE Band VII with Proximity sensor deactivated

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20775CH	21100CH	21425CH
5MHz	QPSK	1	0	14.5	12.75	12.65	12.66
		1	13	14.5	12.68	12.60	12.68
		1	24	14.5	12.62	12.69	12.70
		12	0	13.5	12.16	12.10	12.14
		12	6	13.5	12.15	12.12	12.19
		12	13	13.5	12.05	12.14	12.13
		25	0	13.5	12.16	12.13	12.19
	16QAM	1	0	13.5	12.59	12.86	12.76
		1	13	13.5	11.99	12.01	11.96
		1	24	13.5	12.48	12.61	12.54
		12	0	12.5	12.02	11.98	12.14
		12	6	12.5	12.07	11.92	12.08
		12	13	12.5	12.11	11.97	12.11
		25	0	12.5	12.24	12.26	12.21
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20800CH	21100CH	21400CH
10MHz	QPSK	1	0	14.5	12.73	12.96	12.96
		1	25	14.5	12.72	12.55	12.58
		1	49	14.5	12.83	12.65	12.54
		25	0	13.5	12.15	12.23	12.15
		25	13	13.5	12.09	12.15	12.17
		25	25	13.5	12.18	12.10	12.14
		50	0	13.5	12.15	12.15	12.19
	16QAM	1	0	13.5	12.50	12.83	12.84
		1	25	13.5	11.61	11.55	11.58
		1	49	13.5	12.70	12.46	12.37
		25	0	12.5	12.24	12.11	12.20
		25	13	12.5	12.14	12.07	12.22
		25	25	12.5	12.13	12.10	12.08
		50	0	12.5	12.10	12.04	12.11

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20825CH	21100CH	21375CH
15MHz	QPSK	1	0	14.5	12.71	13.05	12.95
		1	38	14.5	12.72	12.55	12.52
		1	74	14.5	12.68	12.64	12.57
		36	0	13.5	12.20	12.22	12.08
		36	18	13.5	12.18	12.12	12.08
		36	39	13.5	12.12	12.10	12.12
		75	0	13.5	12.16	12.09	12.13
	16QAM	1	0	13.5	12.51	12.83	12.72
		1	38	13.5	11.68	11.52	11.51
		1	74	13.5	12.79	12.51	12.23
		36	0	12.5	12.17	12.13	12.01
		36	18	12.5	12.25	11.97	11.94
		36	39	12.5	12.16	11.92	11.95
		75	0	12.5	12.09	12.11	12.27
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20850CH	21100CH	21350CH
20MHz	QPSK	1	0	14.5	**12.94**	**12.99**	**12.86**
		1	50	14.5	12.90	12.69	12.77
		1	99	14.5	12.76	12.53	12.76
		50	0	13.5	**12.14**	**12.23**	**12.18**
		50	25	13.5	12.13	12.06	12.05
		50	50	13.5	11.98	12.11	12.13
		100	0	13.5	**12.21**	12.17	12.11
	16QAM	1	0	13.5	12.98	13.42	13.39
		1	50	13.5	12.63	12.45	12.48
		1	99	13.5	13.16	13.07	12.75
		50	0	12.5	12.13	12.32	11.97
		50	25	12.5	12.09	12.14	11.94
		50	50	12.5	12.07	12.15	11.98
		100	0	12.5	12.15	12.13	12.18

Table 30: Conducted power measurement results of LTE Band VII with Proximity sensor activated

7.1.10 Conducted power measurements of LTE Band XVII

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23755CH	23790CH	23825CH
5MHz	QPSK	1	0	24	22.73	22.76	22.62
		1	13	24	22.46	22.63	22.72
		1	24	24	22.50	22.33	22.48
		12	0	23	21.55	21.50	21.37
		12	6	23	21.57	21.45	21.37
		12	13	23	21.52	21.57	21.48
		25	0	23	21.57	21.56	21.54
	16QAM	1	0	23	21.32	21.02	21.17
		1	13	23	21.21	21.21	21.13
		1	24	23	21.17	21.01	21.02
		12	0	22	20.56	20.45	20.28
		12	6	22	20.61	20.41	20.37
		12	13	22	20.34	20.35	20.32
		25	0	22	20.65	20.47	20.33
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23780CH	23790CH	23800CH
10MHz	QPSK	1	0	24	22.79	**23.24**	22.78
		1	25	24	22.60	23.09	22.81
		1	49	24	22.71	23.11	22.63
		25	0	23	**21.73**	21.61	21.61
		25	13	23	21.49	21.43	21.62
		25	25	23	21.52	21.57	21.47
		50	0	23	21.62	21.54	21.54
	16QAM	1	0	23	22.35	21.42	22.33
		1	25	23	21.93	21.39	22.01
		1	49	23	22.19	21.15	22.18
		25	0	22	20.71	20.41	20.69
		25	13	22	20.59	20.63	20.62
		25	25	22	20.65	20.47	20.47
		50	0	22	20.53	20.51	20.54

Table 31: Conducted power measurement results of LTE Band XVII with Proximity sensor deactivated

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23755CH	23790CH	23825CH
5MHz	QPSK	1	0	23	21.01	21.20	21.02
		1	13	23	21.02	21.15	21.05
		1	24	23	21.07	21.01	21.06
		12	0	22	20.90	20.98	20.79
		12	6	22	20.96	20.86	20.90
		12	13	22	20.96	20.96	20.96
		25	0	22	20.98	20.97	20.80
	16QAM	1	0	22	20.37	20.51	20.38
		1	13	22	20.39	20.29	20.21
		1	24	22	20.46	20.20	20.14
		12	0	22	20.52	20.45	20.25
		12	6	22	20.45	20.38	20.37
		12	13	22	20.49	20.41	20.40
		25	0	22	20.59	20.47	20.37
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23780CH	23790CH	23800CH
10MHz	QPSK	1	0	23	**21.20**	**21.29**	**21.36**
		1	25	23	21.05	21.13	21.26
		1	49	23	21.18	21.09	21.21
		25	0	22	**20.99**	**20.98**	**20.99**
		25	13	22	20.96	20.91	20.88
		25	25	22	20.94	20.95	20.96
		50	0	22	**20.98**	20.97	20.95
	16QAM	1	0	22	20.99	20.98	20.99
		1	25	22	20.98	20.83	20.94
		1	49	22	20.67	20.72	20.95
		25	0	22	20.68	20.39	20.41
		25	13	22	20.50	20.41	20.41
		25	25	22	20.52	20.44	20.38
		50	0	22	20.45	20.51	20.53

Table 32: Conducted power measurement results of LTE Band XVII with Proximity sensor activated

7.1.11 Conducted power measurements of LTE Band XXVI

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26697CH	26865CH	27033CH
1.4MHz	QPSK	1	0	23.5	22.23	22.29	22.41
		1	3	23.5	22.42	22.97	22.93
		1	5	23.5	22.35	22.30	22.31
		3	0	23.5	22.17	22.05	22.19
		3	2	23.5	22.21	22.14	22.11
		3	3	23.5	22.21	22.18	22.08
		6	0	22.5	21.10	21.06	21.23
	16QAM	1	0	22.5	21.88	20.81	20.97
		1	3	22.5	21.33	20.92	21.13
		1	5	22.5	21.43	20.83	21.43
		3	0	22.5	21.42	20.92	21.48
		3	2	22.5	21.06	20.93	21.36
		3	3	22.5	21.01	21.00	21.37
		6	0	21.5	20.02	20.06	20.68
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26705CH	26865CH	27025CH
3MHz	QPSK	1	0	23.5	22.38	22.40	22.51
		1	7	23.5	22.35	22.32	22.50
		1	14	23.5	22.44	22.39	22.36
		8	0	22.5	21.18	21.16	21.30
		8	4	22.5	21.10	21.05	21.19
		8	7	22.5	21.21	21.05	21.23
		15	0	22.5	21.30	21.08	21.28
	16QAM	1	0	22.5	21.56	21.11	21.29
		1	7	22.5	21.59	21.55	22.04
		1	14	22.5	21.11	21.79	21.62
		8	0	21.5	19.96	20.18	20.57
		8	4	21.5	19.91	20.43	20.50
		8	7	21.5	19.96	20.27	20.27
		15	0	21.5	20.16	20.29	20.07

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26715CH	26865CH	27015CH
5MHz	QPSK	1	0	23.5	21.95	22.31	22.29
		1	13	23.5	22.25	22.39	22.41
		1	24	23.5	22.40	21.84	22.21
		12	0	22.5	21.15	21.12	21.25
		12	6	22.5	21.18	21.04	21.34
		12	13	22.5	21.33	21.26	21.20
		25	0	22.5	21.21	21.20	21.26
	16QAM	1	0	22.5	20.86	20.61	20.72
		1	13	22.5	21.10	20.71	22.07
		1	24	22.5	20.98	20.76	20.71
		12	0	21.5	20.30	20.15	20.52
		12	6	21.5	20.21	20.10	20.40
		12	13	21.5	20.29	20.12	20.32
		25	0	21.5	20.37	20.19	20.37
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26750CH	26865CH	26990CH
10MHz	QPSK	1	0	23.5	22.53	22.49	22.46
		1	25	23.5	22.67	22.51	22.35
		1	49	23.5	22.66	22.34	22.38
		25	0	22.5	21.26	21.16	21.24
		25	13	22.5	21.37	21.18	21.27
		25	25	22.5	21.38	21.27	21.42
		50	0	22.5	21.30	21.26	21.35
	16QAM	1	0	22.5	20.94	21.95	21.02
		1	25	22.5	20.96	21.88	21.81
		1	49	22.5	21.15	21.92	21.96
		25	0	21.5	20.43	20.26	20.20
		25	13	21.5	20.29	20.15	20.25
		25	25	21.5	20.29	20.18	20.32
		50	0	21.5	20.37	20.27	20.25

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel 26775CH	Channel 26865CH	Channel 26965CH
15MHz	QPSK	1	0	23.5	**23.09**	**22.59**	22.36
		1	38	23.5	23.07	22.35	22.22
		1	74	23.5	22.96	22.58	**22.40**
		36	0	22.5	**21.43**	**21.15**	21.30
		36	18	22.5	21.32	21.05	21.18
		36	39	22.5	21.30	21.14	**21.37**
		75	0	22.5	21.25	21.12	**21.27**
	16QAM	1	0	22.5	21.31	21.30	21.02
		1	38	22.5	21.39	21.09	21.04
		1	74	22.5	21.24	22.05	21.25
		36	0	21.5	20.50	20.33	20.35
		36	18	21.5	20.32	20.30	20.35
		36	39	21.5	20.39	20.16	20.37
		75	0	21.5	20.38	20.17	20.29

Table 33: Conducted power measurement results of LTE Band XXVI

7.1.12 Conducted power measurements of WiFi 2.4G

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11b	1	2412	1	12.00	10.79	Yes
	6	2437		12.00	11.02	Yes
	11	2462		12.00	10.91	Yes
802.11g	1	2412	6	12.00	Not Required	No
	6	2437		12.00	Not Required	No
	11	2462		12.00	Not Required	No
802.11n-20M	1	2412	6.5	11.50	Not Required	No
	6	2437		11.50	Not Required	No
	11	2462		11.50	Not Required	No

Table 34: Conducted power measurement results of WiFi 2.4G

Note: 1) The Average conducted power of WiFi is measured with RMS detector.

7.1.13 Conducted power measurements of WiFi 5G

Band (GHz)	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
5.2	802.11a	CH 36	5180	6M	10.5	Not Required	NO
		CH 40	5200		10.5	Not Required	NO
		CH 44	5220		10.5	Not Required	NO
		CH 48	5240		10.5	Not Required	NO
	802.11n 20M	CH 36	5180	6.5M	10.5	Not Required	NO
		CH 40	5200		10.5	Not Required	NO
		CH 44	5220		10.5	Not Required	NO
		CH 48	5240		10.5	Not Required	NO
	802.11n 40M	CH 38	5190	13.5M	10.5	9.17	Yes
		CH 46	5230		10.5	8.85	Yes
Band (GHz)	**Mode**	**Channel**	**Frequency (MHz)**	**Data Rate (Mbps)**	**Tune-up**	**Average Power (dBm)**	**SAR Test (Yes/No)**
5.3	802.11a	CH 52	5260	6M	10.0	Not Required	NO
		CH 56	5280		10.0	Not Required	NO
		CH 60	5300		10.0	Not Required	NO
		CH 64	5320		10.0	Not Required	NO
	802.11n 20M	CH 52	5260	6.5M	10.0	Not Required	NO
		CH 56	5280		10.0	Not Required	NO
		CH 60	5300		10.0	Not Required	NO
		CH 64	5320		10.0	Not Required	NO
	802.11n 40M	CH 54	5270	13.5M	10.0	Not Required	NO
		CH 62	5310		10.0	Not Required	NO
Band (GHz)	**Mode**	**Channel**	**Frequency (MHz)**	**Data Rate (Mbps)**	**Tune-up**	**Average Power (dBm)**	**SAR Test (Yes/No)**
5.5	802.11a	CH 100	5500	6M	10.5	Not Required	No
		CH 104	5520		10.5	Not Required	No
		CH 108	5540		10.5	Not Required	No
		CH 112	5560		10.5	Not Required	No
		CH 116	5580		10.5	Not Required	No
		CH 120	5600		10.5	Not Required	No
		CH 124	5620		10.5	Not Required	No
		CH 128	5640		10.5	Not Required	No
		CH 132	5660		10.5	Not Required	No
		CH 136	5680		10.5	Not Required	No
		CH 140	5700		10.5	Not Required	No

Band (GHz)	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
5.5	802.11n 20M	CH 100	5500	6.5M	10.5	Not Required	No
		CH 104	5520		10.5	Not Required	No
		CH 108	5540		10.5	Not Required	No
		CH 112	5560		10.5	Not Required	No
		CH 116	5580		10.5	Not Required	No
		CH 120	5600		10.5	Not Required	No
		CH 124	5620		10.5	Not Required	No
		CH 128	5640		10.5	Not Required	No
		CH 132	5660		10.5	Not Required	No
		CH 136	5680		10.5	Not Required	No
		CH 140	5700		10.5	Not Required	No
	802.11n 40M	CH 102	5510	13.5M	10.5	9.02	Yes
		CH 110	5550		10.5	9.03	Yes
		CH 118	5590		10.5	8.81	Yes
		CH 126	5630		10.5	8.74	Yes
		CH 134	5670		10.5	8.52	Yes
Band (GHz)	**Mode**	**Channel**	**Frequency (MHz)**	**Data Rate (Mbps)**	**Tune-up**	**Average Power (dBm)**	**SAR Test (Yes/No)**
5.8	802.11a	CH 149	5745	6M	10.5	Not Required	No
		CH 153	5765		10.5	Not Required	No
		CH 157	5785		10.5	Not Required	No
		CH 161	5805		10.5	Not Required	No
	802.11n 20M	CH 149	5745	6.5M	10.5	Not Required	No
		CH 153	5765		10.5	Not Required	No
		CH 157	5785		10.5	Not Required	No
		CH 161	5805		10.5	Not Required	No
	802.11n 40M	CH 151	5755	13.5M	10.5	8.98	Yes
		CH 159	5795		10.5	9.27	Yes

Table 35: Conducted power measurement results of WiFi 5G.

Note: 1) The Average conducted power of WiFi is measured with RMS detector.

7.1.14 Conducted power measurements of BT

The output power of BT antenna is as following:

BT 2450	Tune-up	Average Conducted Power (dBm)		
		0CH	39CH	78CH
DH5	5.0	2.70	2.40	3.35
2DH5	5.0	0.97	0.51	1.41
3DH5	5.0	1.01	0.52	0.68

BT 2450	Tune-up	Average Conducted Power (dBm)		
		0CH	19CH	39CH
BT 4.0	0.0	-3.24	-1.83	-3.90

Table 36: Conducted power measurement results of BT.

Note: The conducted power of BT is measured with RMS detector.

7.2 SAR measurement Results

General Notes:

1) Per KDB447498 D01v06, all SAR measurement results are scaled to the maximum tune-up tolerance limit to demonstrate SAR compliance.

2) Per KDB447498 D01v06, 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:

● ≤ 0.8W/kg for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is ≤ 100MHz.

● ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.

● ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz.

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 D01v01r04,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 KDB865664 D02v01r01, 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(Refer to the blue SAR test results in the tables of Section 7.3 and appendix B for detailed SAR plots).

GSM Notes:

1) Per KDB941225 D01v03, SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

2) Per KDB648474 D04v01r03, the device does not support DTM function. Body-worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.

UMTS Notes:

1) Per KDB941225 D01v03r01, When the maximum output power and tune-up tolerance specified for production units in a Second 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 Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

LTE Notes:

1) The LTE test configurations are determined according to KDB941225 D05 SAR for LTE Devices v02r04.The general test procedures used for SAR testing can be found in Section 6.5.

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)

WiFi Notes:

Per KDB248227D01v02r02:

1) When reported SAR for the initial test position is ≤ 0.4W/kg, no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8W/kg or all test position are measured. For all positions/configurations tested using the initial test position and subsequent test positions, when the *reported* SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the *reported* SAR is ≤ 1.2 W/kg or all required channels are tested.

2) The highest SAR measured for the initial test position or initial test configuration should be used to determine SAR test exclusion according to the sum of 1-g SAR and SAR peak to location ratio provisions in KDB 447498D01. In addition, a test lab may also choose to perform standalone SAR measurements for test positions and 802.11 configurations that are not required by the initial test position or initial test configuration procedures and apply the results to determine simultaneous transmission SAR test exclusion, according to sum of 1-g and SAR peak to location ratio requirements to reduce the number of simultaneous transmission SAR measurements.

3) For WiFi 2.4G , SAR is measured for 2.4 GHz 802.11b DSSS using the initial test position procedure. SAR is not required for the 2.4 GHz 802.11g/n OFDM conditions when KDB Publication 447498 SAR test exclusion applies to the OFDM configuration or when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

4) For WiFi 5G U-NII-1 and U-NII-2A bands, as the 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.

5) For WiFi 5G, SAR is measured for 5 GHz 802.11n 40M OFDM using the initial test position and initial test configuration procedures. SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band.

7.2.1 SAR measurement Result of GSM850

Test Position of Body	Test channel /Freq.(MHz)	Test Mode	Test Dist. (mm)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)
				1-g	10-g				
Proximity sensor is activated									
Back Side	190/836.6	GPRS 2TS	0	0.660	0.354	0.180	28.05	28.50	0.732
Top Side	190/836.6	GPRS 2TS	0	0.877	0.465	0.180	28.05	28.50	0.973
Top Side	251/848.8	GPRS 2TS	0	1.010	0.529	-0.030	28.12	28.50	1.102
Top Side-Repeated	251/848.8	GPRS 2TS	0	1.020	0.535	0.020	28.12	28.50	**1.113**
Top Side	128/824.2	GPRS 2TS	0	0.756	0.404	0.080	27.74	28.50	0.901
Back Side with Headset	251/848.8	GSM	0	0.537	0.289	0.160	29.87	30.50	0.621
Proximity sensor is deactivated									
Left Side	190/836.6	GPRS 2TS	0	0.122	0.072	0.190	29.70	31.00	0.165
Back Side	190/836.6	GPRS 2TS	16	0.193	0.127	-0.050	29.70	31.00	0.260
Top Side	190/836.6	GPRS 2TS	19	0.214	0.143	0.030	29.70	31.00	**0.289**
Back Side with Headset	190/836.6	GSM	16	0.195	0.129	-0.050	32.44	33.00	0.222

Table 37: Body SAR test results of GSM850

7.2.2 SAR measurement Result of GSM1900

Test Position of Body	Test channel /Freq.(MHz)	Test Mode	Test Dist. (mm)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)
				1-g	10-g				
Proximity sensor is activated									
Back Side	661/1880	GPRS 2TS	0	0.727	0.309	-0.040	17.72	19.50	**1.095**
Back Side	512/1850.2	GPRS 2TS	0	0.726	0.309	-0.070	17.87	19.50	1.057
Back Side	810/1909.8	GPRS 2TS	0	0.752	0.316	0.000	18.12	19.50	1.033
Back Side with Headset	810/1909.8	GSM	0	0.823	0.349	0.000	21.28	21.50	0.866
Back Side with Headset-Repeated	810/1909.8	GSM	0	0.804	0.337	0.110	21.28	21.50	0.846
Top Side	661/1880	GPRS 2TS	0	0.446	0.204	0.000	17.72	19.50	0.672
Proximity sensor is deactivated									
Left Side	661/1880	GPRS 2TS	0	0.117	0.059	0.130	26.90	28.00	0.151
Back Side	661/1880	GPRS 2TS	16	0.575	0.290	-0.190	26.90	28.00	0.741
Back Side with Headset	661/1880	GSM	16	0.648	0.331	-0.070	29.17	30.50	0.880
Back Side with Headset	512/1850.2	GSM	16	0.628	0.321	-0.030	29.17	30.50	0.853
Back Side with Headset	810/1909.8	GSM	16	0.666	0.340	-0.070	29.17	30.50	**0.905**
Top Side	661/1880	GPRS 2TS	19	0.246	0.144	0.180	26.90	28.00	0.317

Table 38: Body SAR test results of GSM1900

7.2.3 SAR measurement Result of UMTS Band II

Test Position of Body	Test channel /Freq.(MHz)	Test Mode	Test Dist. (mm)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)
				1-g	10-g				
Proximity sensor is activated									
Back Side	9400/1880	RMC	0	1.140	0.473	0.000	13.35	14.00	**1.324**
Back Side-Repeated	9400/1880	RMC	0	1.040	0.434	0.130	13.35	14.00	1.208
Back Side	9262/1852.4	RMC	0	1.010	0.421	0.000	13.40	14.00	1.160
Back Side	9538/1907.6	RMC	0	1.040	0.429	0.000	13.31	14.00	1.219
Back Side with Headset	9400/1880	RMC	0	1.130	0.460	0.000	13.35	14.00	1.312
Top Side	9400/1880	RMC	0	0.617	0.281	0.180	13.35	14.00	0.717
Proximity sensor is deactivated									
Left Side	9400/1880	RMC	0	0.302	0.149	0.080	22.10	23.50	0.417
Back Side	9400/1880	RMC	16	0.755	0.407	0.020	22.10	23.50	1.042
Back Side	9262/1852.4	RMC	16	0.783	0.423	0.160	22.07	23.50	**1.088**
Back Side	9538/1907.6	RMC	16	0.713	0.384	0.110	21.97	23.50	1.014
Back Side with Headset	9262/1852.4	RMC	16	0.722	0.392	0.040	22.07	23.50	1.004
Top Side	9400/1880	RMC	19	0.514	0.292	0.170	22.10	23.50	0.710

Table 39: Body SAR test results of UMTS Band II

7.2.4 SAR measurement Result of UMTS Band IV

Test Position of Body	Test channel /Freq.(MHz)	Test Mode	Test Dist. (mm)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)
				1-g	10-g				
Proximity sensor is activated									
Back Side	1413/1732.6	RMC	0	1.170	0.517	0.000	13.82	14.00	1.220
Back Side	1312/1712.4	RMC	0	1.130	0.499	0.000	13.90	14.00	1.156
Back Side	1513/1752.6	RMC	0	1.140	0.500	0.000	13.93	14.00	1.159
Back Side with Headset	1413/1732.6	RMC	0	1.180	0.519	-0.150	13.82	14.00	**1.230**
Back Side-Repeated	1413/1732.6	RMC	0	1.180	0.518	0.190	13.82	14.00	1.230
Top Side	1413/1732.6	RMC	0	0.513	0.253	0.120	13.82	14.00	0.535
Proximity sensor is deactivated									
Left Side	1413/1732.6	RMC	0	0.337	0.178	0.180	22.34	23.50	0.440
Back Side	1413/1732.6	RMC	16	0.660	0.358	0.080	22.34	23.50	0.862
Back Side	1312/1712.4	RMC	16	0.572	0.311	0.040	22.44	23.50	0.730
Back Side	1513/1752.6	RMC	16	0.711	0.384	-0.020	22.37	23.50	0.922
Back Side with Headset	1513/1752.6	RMC	16	0.730	0.396	0.130	22.37	23.50	**0.947**
Top Side	1413/1732.6	RMC	19	0.586	0.356	0.160	22.34	23.50	0.765

Table 40: Body SAR test results of UMTS Band IV

7.2.5 SAR measurement Result of UMTS Band V

Test Position of Body	Test channel /Freq.(MHz)	Test Mode	Test Dist. (mm)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)
				1-g	10-g				
Proximity sensor is activated									
Back Side	4182/836.4	RMC	0	0.352	0.189	0.020	20.23	21.00	0.420
Top Side	4182/836.4	RMC	0	0.580	0.310	0.080	20.23	21.00	**0.693**
Back Side with Headset	4182/836.4	RMC	0	0.338	0.205	0.030	20.23	21.00	0.404
Proximity sensor is deactivated									
Left Side	4182/836.4	RMC	0	0.090	0.055	0.060	22.69	24.00	0.121
Back Side	4182/836.4	RMC	16	0.103	0.069	-0.120	22.69	24.00	0.139
Top Side	4182/836.4	RMC	19	0.096	0.066	-0.040	22.69	24.00	0.130
Back Side with Headset	4182/836.4	RMC	16	0.113	0.076	-0.080	22.69	24.00	**0.153**

Table 41: Body SAR test results of UMTS Band V

7.2.6 SAR measurement Result of LTE Band II

Test Position of Body	Test channel /Freq.(MHz)	Test Mode	Test Dist. (mm)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)
				1-g	10-g				
Proximity sensor is activated									
1RB									
Back Side	18900/1880	20M QPSK 1RB#99	0	0.764	0.318	0.000	12.90	14.00	0.984
Back Side	18700/1860	20M QPSK 1RB#0	0	0.851	0.357	0.000	12.35	14.00	**1.244**
Back Side	19100/1900	20M QPSK 1RB#0	0	0.865	0.361	0.000	12.72	14.00	1.161
Back Side-Repeated	19100/1900	20M QPSK 1RB#0	0	0.869	0.356	0.000	12.72	14.00	1.167
Top Side	18900/1880	20M QPSK 1RB#99	0	0.518	0.236	0.180	12.90	14.00	0.667
50%RB									
Back Side	18700/1860	20M QPSK 50%RB#0	0	0.848	0.356	0.000	12.04	13.00	1.058
Back Side	18900/1880	20M QPSK 50%RB#0	0	0.779	0.325	0.000	12.03	13.00	0.974
Back Side	19100/1900	20M QPSK 50%RB#0	0	0.808	0.337	0.000	12.02	13.00	1.013
Top Side	18700/1860	20M QPSK 50%RB#0	0	0.571	0.263	0.140	12.04	13.00	0.712
100%RB									
Back Side	18700/1860	20M QPSK 100%RB#0	0	0.814	0.347	0.000	12.04	13.00	1.015
Proximity sensor is deactivated									
1RB									
Left Side	18900/1880	20M QPSK 1RB#0	0	0.189	0.103	0.040	21.82	23.00	0.248
Back Side	18900/1880	20M QPSK 1RB#0	16	0.966	0.496	-0.050	21.82	23.00	**1.268**
Back Side-Repeated	18900/1880	20M QPSK 1RB#0	16	0.865	0.459	-0.010	21.82	23.00	1.135
Back Side	18700/1860	20M QPSK 1RB#50	16	0.807	0.427	-0.110	21.53	23.00	1.132
Back Side	19100/1900	20M QPSK 1RB#50	16	0.761	0.395	-0.140	21.61	23.00	1.048
Top Side	18900/1880	20M QPSK 1RB#0	19	0.442	0.248	0.140	21.82	23.00	0.580
50%RB									
Left Side	18900/1880	20M QPSK 50%RB#25	0	0.136	0.073	0.160	20.51	22.00	0.192
Back Side	18900/1880	20M QPSK 50%RB#25	16	0.631	0.327	-0.160	20.51	22.00	0.889
Back Side	18700/1860	20M QPSK 50%RB#0	16	0.669	0.346	-0.140	20.46	22.00	0.954
Back Side	19100/1900	20M QPSK 50%RB#0	16	0.623	0.322	0.190	20.43	22.00	0.894
Top Side	18900/1880	20M QPSK 50%RB#25	19	0.325	0.182	0.050	20.51	22.00	0.458

100%RB									
Back Side	18900/1880	20M QPSK 100%RB#0	16	0.683	0.354	-0.140	20.48	22.00	0.969

Table 42: Body SAR test results of LTE Band II

7.2.7 SAR measurement Result of LTE Band IV

Test Position of Body	Test channel /Freq.(MHz)	Test Mode	Test Dist. (mm)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)
				1-g	10-g				
Proximity sensor is activated									
1RB									
Back Side	20050/1720	20M QPSK 1RB#0	0	1.050	0.460	0.180	13.61	14.50	1.289
Back Side	20175/1732.5	20M QPSK 1RB#0	0	1.030	0.443	0.000	13.30	14.50	**1.358**
Back Side	20300/1745	20M QPSK 1RB#0	0	1.030	0.451	0.000	13.54	14.50	1.285
Top Side	20050/1720	20M QPSK 1RB#0	0	0.324	0.156	0.090	13.61	14.50	0.398
50%RB									
Back Side	20050/1720	20M QPSK 50%RB#0	0	1.030	0.461	0.060	13.35	13.50	1.066
Back Side	20175/1732.5	20M QPSK 50%RB#0	0	1.060	0.460	0.140	13.22	13.50	1.131
Back Side	20300/1745	20M QPSK 50%RB#0	0	1.090	0.472	-0.030	13.19	13.50	1.171
Back Side-Repeated	20300/1745	20M QPSK 50%RB#0	0	1.020	0.445	0.170	13.19	13.50	1.095
Top Side	20050/1720	20M QPSK 50%RB#0	0	0.284	0.139	0.150	13.35	13.50	0.294
100%RB									
Back Side	20300/1745	20M QPSK 100%RB#0	0	1.040	0.448	0.000	13.19	13.50	1.117
Proximity sensor is deactivated									
1RB									
Left Side	20300/1745	20M QPSK 1RB#50	0	0.309	0.172	0.050	21.93	23.00	0.395
Back Side	20300/1745	20M QPSK 1RB#50	16	0.751	0.407	0.060	21.93	23.00	**0.961**
Back Side	20050/1720	20M QPSK 1RB#0	16	0.582	0.326	0.160	21.92	23.00	0.746
Back Side	20175/1732.5	20M QPSK 1RB#0	16	0.677	0.369	0.150	21.57	23.00	0.941
Top Side	20300/1745	20M QPSK 1RB#50	19	0.429	0.251	0.170	21.93	23.00	0.549
50%RB									
Left Side	20175/1732.5	20M QPSK 50%RB#0	0	0.254	0.141	0.070	20.59	22.00	0.351
Back Side	20175/1732.5	20M QPSK 50%RB#0	16	0.522	0.282	0.150	20.59	22.00	0.722
Top Side	20175/1732.5	20M QPSK 50%RB#0	19	0.306	0.179	0.100	20.59	22.00	0.423
100%RB									
Back Side	20300/1745	20M QPSK 100%RB#0	16	0.559	0.303	0.180	20.48	22.00	0.793

Table 43: Body SAR test results of LTE Band IV

7.2.8 SAR measurement Result of LTE Band V

Test Position of Body	Test channel /Freq.(MHz)	Test Mode	Test Dist. (mm)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)
				1-g	10-g				
Proximity sensor is activated									
1RB									
Back Side	20525/836.5	10M QPSK 1RB#0	0	0.477	0.254	0.000	21.93	22.50	0.544
Top Side	20525/836.5	10M QPSK 1RB#0	0	0.841	0.444	-0.010	21.93	22.50	0.959
Top Side	20450/829	10M QPSK 1RB#0	0	0.804	0.429	0.140	21.50	22.50	1.012
Top Side	20600/844	10M QPSK 1RB#25	0	0.893	0.468	0.090	21.45	22.50	**1.137**
Top Side-Repeated	20600/844	10M QPSK 1RB#25	0	0.871	0.457	0.110	21.45	22.50	1.109
50%RB									
Back Side	20600/844	10M QPSK 50%RB#25	0	0.466	0.248	0.170	21.27	21.50	0.491
Top Side	20600/844	10M QPSK 50%RB#25	0	0.764	0.407	0.030	21.27	21.50	0.806
Top Side	20525/836.5	10M QPSK 50%RB#0	0	0.881	0.468	0.020	21.25	21.50	0.933
Top Side	20450/829	10M QPSK 50%RB#25	0	0.845	0.448	0.020	21.23	21.50	0.899
100%RB									
Top Side	20600/844	10M QPSK 100%RB#0	0	0.871	0.458	0.130	21.23	21.50	0.927
Proximity sensor is deactivated									
1RB									
Left Side	20600/844	10M QPSK 1RB#25	0	0.170	0.104	0.120	23.13	23.50	0.185
Back Side	20600/844	10M QPSK 1RB#25	16	0.267	0.174	0.140	23.13	23.50	**0.291**
Top Side	20600/844	10M QPSK 1RB#25	19	0.224	0.151	0.090	23.13	23.50	0.244
50%RB									
Left Side	20525/836.5	10M QPSK 50%RB#25	0	0.131	0.080	0.160	21.85	22.50	0.152
Back Side	20525/836.5	10M QPSK 50%RB#25	16	0.184	0.122	0.030	21.85	22.50	0.214
Top Side	20525/836.5	10M QPSK 50%RB#25	19	0.175	0.119	0.100	21.85	22.50	0.203

Table 44: Body SAR test results of LTE Band V

7.2.9 SAR measurement Result of LTE Band VII

Test Position of Body	Test channel /Freq.(MHz)	Test Mode	Test Dist. (mm)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)
				1-g	10-g				
Proximity sensor is activated									
1RB									
Back Side	21100/2535	20M QPSK 1RB#0	0	0.618	0.217	0.000	12.99	14.50	0.875
Back Side	20850/2510	20M QPSK 1RB#0	0	0.697	0.247	0.150	12.94	14.50	0.998
Back Side	21350/2560	20M QPSK 1RB#0	0	0.612	0.215	0.150	12.86	14.50	0.893
Top Side	21100/2535	20M QPSK 1RB#50	0	0.562	0.222	0.090	12.99	14.50	0.314
50%RB									
Back Side	21100/2535	20M QPSK 50%RB#0	0	0.752	0.259	0.000	12.23	13.50	**1.007**
Back Side	20850/2510	20M QPSK 50%RB#0	0	0.652	0.246	0.120	12.14	13.50	0.892
Back Side	21350/2560	20M QPSK 50%RB#0	0	0.666	0.242	0.000	12.18	13.50	0.903
Top Side	21100/2535	20M QPSK 50%RB#0	0	0.558	0.217	0.150	12.23	13.50	0.748
100%RB									
Back Side	20850/2510	20M QPSK 100%RB#0	0	0.674	0.237	0.150	12.21	13.50	0.907
Proximity sensor is deactivated									
1RB									
Left Side	21100/2535	20M QPSK 1RB#50	0	0.345	0.154	0.190	21.28	23.00	0.513
Back Side	21100/2535	20M QPSK 1RB#50	16	0.508	0.251	0.140	21.28	23.00	**0.755**
Top Side	21100/2535	20M QPSK 1RB#50	19	0.417	0.225	-0.160	21.28	23.00	0.620
50%RB									
Left Side	21100/2535	20M QPSK 50%RB#0	0	0.273	0.122	0.140	20.24	22.00	0.409
Back Side	21100/2535	20M QPSK 50%RB#0	16	0.404	0.195	-0.180	20.24	22.00	0.606
Top Side	21100/2535	20M QPSK 50%RB#0	19	0.336	0.180	0.140	20.24	22.00	0.504

Table 45: Body SAR test results of LTE Band VII

7.2.10 SAR measurement Result of LTE Band XVII

Test Position of Body	Test channel /Freq.(MHz)	Test Mode	Test Dist. (mm)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)
				1-g	10-g				
Proximity sensor is activated									
1RB									
Back Side	23800/711	10M QPSK 1RB#0	0	0.859	0.484	0.180	21.36	23.00	1.253
Back Side	23780/709	10M QPSK 1RB#0	0	0.879	0.488	0.180	21.20	23.00	1.330
Back Side-Repeated	23780/709	10M QPSK 1RB#0	0	0.935	0.482	0.000	21.20	23.00	**1.415**
Back Side	23790/710	10M QPSK 1RB#0	0	0.847	0.480	0.190	21.29	23.00	1.256
Top Side	23800/711	10M QPSK 1RB#0	0	0.744	0.413	0.150	21.36	23.00	1.085
Top Side	23780/709	10M QPSK 1RB#0	0	0.711	0.390	0.130	21.20	23.00	1.076
Top Side	23790/710	10M QPSK 1RB#0	0	0.725	0.395	0.130	21.29	23.00	1.075
50%RB									
Back Side	23780/709	10M QPSK 50%RB#0	0	0.808	0.463	0.140	20.99	22.00	1.020
Back Side	23790/710	10M QPSK 50%RB#0	0	0.811	0.465	0.120	20.98	22.00	1.026
Back Side	23800/711	10M QPSK 50%RB#0	0	0.817	0.468	0.120	20.99	22.00	1.031
Top Side	23780/709	10M QPSK 50%RB#0	0	0.733	0.407	0.150	20.99	22.00	0.925
Top Side	23790/710	10M QPSK 50%RB#0	0	0.735	0.408	0.140	20.98	22.00	0.930
Top Side	23800/711	10M QPSK 50%RB#0	0	0.734	0.408	0.150	20.99	22.00	0.926
100%RB									
Back Side	23780/709	10M QPSK 100%RB#0	0	0.834	0.535	0.060	20.98	22.00	1.055
Top Side	23780/709	10M QPSK 100%RB#0	0	0.724	0.395	0.120	20.98	22.00	0.916
Proximity sensor is deactivated									
1RB									
Left Side	23790/710	10M QPSK 1RB#0	0	0.173	0.103	0.180	23.24	24.00	0.206
Back Side	23790/710	10M QPSK 1RB#0	16	0.262	0.181	0.020	23.24	24.00	**0.312**
Top Side	23790/710	10M QPSK 1RB#0	19	0.112	0.080	0.160	23.24	24.00	0.133
50%RB									
Left Side	23780/709	10M QPSK 50%RB#0	0	0.137	0.082	0.040	21.73	23.00	0.184
Back Side	23780/709	10M QPSK 50%RB#0	16	0.212	0.146	0.180	21.73	23.00	0.284
Top Side	23780/709	10M QPSK 50%RB#0	19	0.086	0.059	0.160	21.73	23.00	0.115

Table 46: Body SAR test results of LTE Band XVII

7.2.11 SAR measurement Result of LTE Band XXVI

Test Position of Body	Test channel /Freq.(MHz)	Test Mode	Test Dist. (mm)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)
				1-g	10-g				
1RB									
Back Side	26775/822.5	15M QPSK 1RB#0	0	0.660	0.352	0.140	23.09	23.50	0.725
Left Side	26775/822.5	15M QPSK 1RB#0	0	0.131	0.078	0.160	23.09	23.50	0.144
Top Side	26775/822.5	15M QPSK 1RB#0	0	0.885	0.472	0.130	23.09	23.50	0.973
Top Side	26965/841.5	15M QPSK 1RB#74	0	0.866	0.457	-0.130	22.40	23.50	1.116
Top Side	26865/831.5	15M QPSK 1RB#0	0	0.859	0.454	0.160	22.59	23.50	1.059
50%RB									
Left Side	26775/822.5	15M QPSK 50%RB#0	0	0.131	0.078	0.160	21.43	22.50	0.168
Back Side	26775/822.5	15M QPSK 50%RB#0	0	0.609	0.325	0.140	21.43	22.50	0.779
Top Side	26775/822.5	15M QPSK 50%RB#0	0	0.848	0.450	0.180	21.43	22.50	1.085
Top Side	26865/831.5	15M QPSK 50%RB#0	0	0.840	0.445	0.170	21.15	22.50	1.146
Top Side	26965/841.5	15M QPSK 50%RB#0	0	0.902	0.474	0.110	21.30	22.50	**1.189**
Top Side-Repeated	26965/841.5	15M QPSK 50%RB#0	0	0.855	0.453	0.190	21.30	22.50	1.127
100%RB									
Top Side	26965/841.5	15M QPSK 100%RB#0	0	0.877	0.460	0.100	21.27	22.50	1.164

Table 47: Body SAR test results of LTE Band XXVI

7.2.12 SAR measurement Result of WiFi 2.4G

Test Position of Body	Test channel /Freq.(MHz)	Test Mode	Test Dist. (mm)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)
				1-g Area Scan	1-g Zoom Scan				
Back Side	6/2437	802.11 b	0	0.941	0.956	0.110	11.02	12.00	**1.198**
Back Side-Repeated	6/2437	802.11 b	0	0.825	0.830	-0.150	11.02	12.00	1.040
Left Side	6/2437	802.11 b	0	0.020	0.018	-0.140	11.02	12.00	0.023
Right Side	6/2437	802.11 b	0	0.254	0.275	0.180	11.02	12.00	0.345
Bottom Side	6/2437	802.11 b	0	0.179	0.201	0.170	11.02	12.00	0.252
Back Side	1/2412	802.11 b	0	0.801	0.805	0.000	10.79	12.00	1.064
Back Side	11/2462	802.11 b	0	0.819	0.862	0.000	10.91	12.00	1.108

Table 48: Body SAR test results of WiFi 2450MHz

7.2.13 SAR measurement Result of WiFi 5G

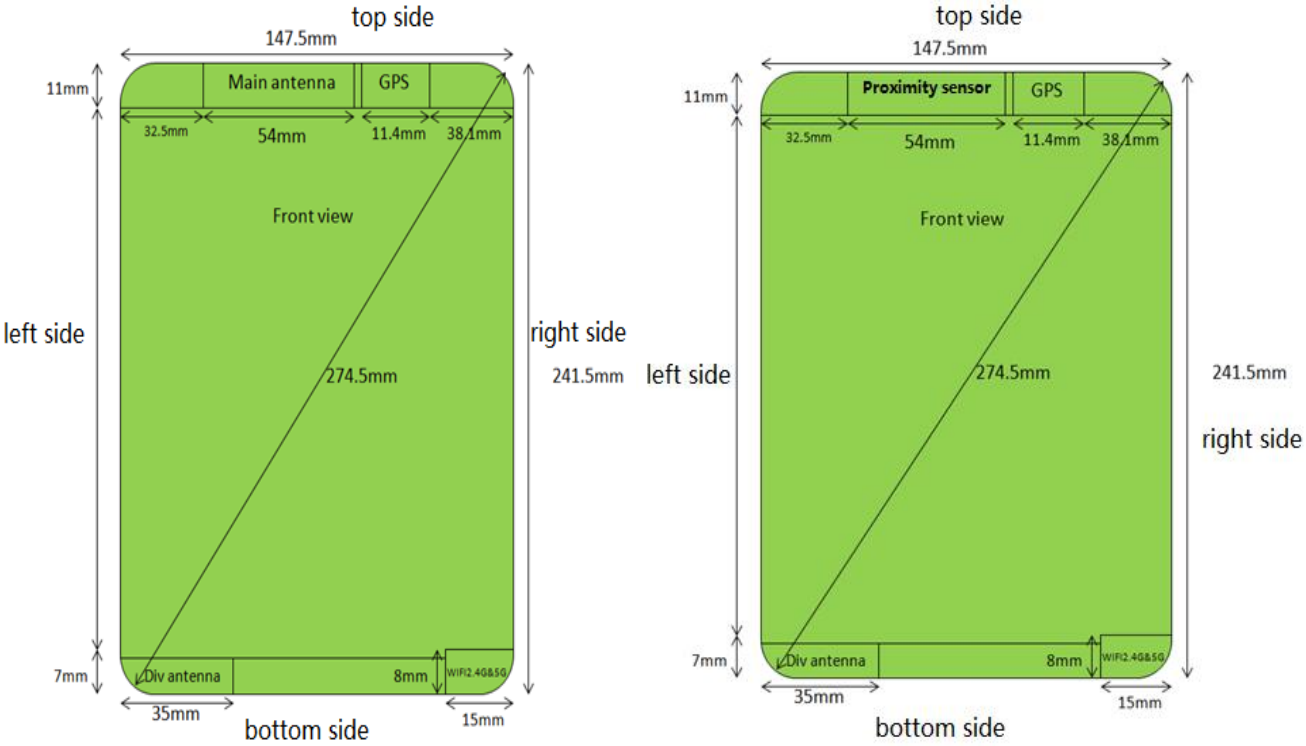
Test Position of Body	Test channel /Freq.(MHz)	Test Mode	Test Dist. (mm)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)
				1-g Area Scan	1-g Zoom Scan				
5.2G(U-NII-1 Band)									
Back Side	38/5190	802.11n 40M	0	0.480	0.617	0.000	9.17	10.50	0.838
Back Side	46/5230	802.11n 40M	0	0.421	0.605	0.000	8.85	10.50	0.885
Right Side	38/5190	802.11n 40M	0	0.251	/	0.000	9.17	10.50	/
Bottom Side	38/5190	802.11n 40M	0	0.378	0.434	0.010	9.17	10.50	0.590
5.6G(U-NII-2C Band)									
Back Side	110/5500	802.11n 40M	0	0.467	0.814	0.000	9.03	10.50	1.142
Back Side	102/5510	802.11n 40M	0	0.594	0.850	0.160	9.02	10.50	**1.195**
Right Side	110/5500	802.11n 40M	0	0.320	0.342	0.160	9.03	10.50	0.480
Bottom Side	110/5500	802.11n 40M	0	0.508	0.651	0.000	9.03	10.50	0.913
Bottom Side	102/5510	802.11n 40M	0	0.551	0.650	-0.020	8.95	10.50	0.929
5.8G(U-NII-3 Band)									
Back Side	159/5795	802.11n 40M	0	0.708	0.867	0.090	9.27	10.50	1.151
Back Side-Repeated	159/5795	802.11n 40M	0	0.789	0.894	0.070	9.27	10.50	1.187
Back Side	151/5755	802.11n 40M	0	0.629	0.836	0.140	8.98	10.50	1.186
Right Side	159/5795	802.11n 40M	0	0.254	0.266	0.000	9.27	10.50	0.353
Bottom Side	159/5795	802.11n 40M	0	0.675	0.802	0.000	9.27	10.50	1.065
Bottom Side	151/5755	802.11n 40M	0	0.551	0.682	0.190	8.98	10.50	0.968

Table 49: Body SAR test results of WiFi 5G

Note: For WiFi 5G U-NII-1 and U-NII-2A bands, as the 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.

7.3 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 447498 D01 General RF Exposure Guidance v06.
The location of the antennas inside the device is shown as below picture:



Note:
1)The overall dimension of the device (Length* Width) is 147.5mm*241.5mm . Per KDB 616217, because the diagonal Length is about 274.5mm＞200mm, it is conssidered a “ tablet” device and need to test 0mm 1g Body SAR.
2) The Div antenna does not have transmit function.
3) There is no spatial offset between the main antenna and the proximity sensor element.

7.3.1 Standalone SAR exclusion calculation

Per FCC KDB 447498D01v06:

1) The 1-g SAR and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where:

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation

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

2) At 100 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following

a) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz

b) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) • 10] mW at > 1500 MHz and ≤ 6 GHz

(Antennas <50mm to adjacent sides)

1）Standalone SAR exclusion calculation(Antennas <50mm to adjacent sides)

Band	Exposure Condition	f(GHz)	Pmax	Pmax	Seperation Distance(mm)					Calculated Value					SAR Test(yes or no)				
			(dBm)*	(mW)	Back side	Left side	Right side	Top side	Bottom side	Back side	Left side	Right side	Top side	Bottom side	Back side	Left side	Right side	Top side	Bottom side
GSM850	Body 0mm	0.850	33.00	1995.26	5.0	32.5	61.0	5.0	230.5	367.908	56.601	>50mm	367.908	>50mm	Yes	Yes	>50mm	Yes	>50mm
GSM1900	Body 0mm	1.900	30.50	1122.02	5.0	32.5	61.0	5.0	230.5	309.319	47.588	>50mm	309.319	>50mm	Yes	Yes	>50mm	Yes	>50mm
UMTS B2	Body 0mm	1.900	23.50	223.87	5.0	32.5	61.0	5.0	230.5	61.717	9.495	>50mm	61.717	>50mm	Yes	Yes	>50mm	Yes	>50mm
UMTS B4	Body 0mm	1.700	23.50	223.87	5.0	32.5	61.0	5.0	230.5	58.379	8.981	>50mm	58.379	>50mm	Yes	Yes	>50mm	Yes	>50mm
UMTS B5	Body 0mm	0.850	24.00	251.19	5.0	32.5	61.0	5.0	230.5	46.317	7.126	>50mm	46.317	>50mm	Yes	Yes	>50mm	Yes	>50mm
LTE B2	Body 0mm	1.900	23.00	199.53	5.0	32.5	61.0	5.0	230.5	55.006	8.462	>50mm	55.006	>50mm	Yes	Yes	>50mm	Yes	>50mm
LTE B4	Body 0mm	1.700	23.00	199.53	5.0	32.5	61.0	5.0	230.5	52.030	8.005	>50mm	52.030	>50mm	Yes	Yes	>50mm	Yes	>50mm
LTE B5	Body 0mm	0.850	23.50	223.87	5.0	32.5	61.0	5.0	230.5	41.280	6.351	>50mm	41.280	>50mm	Yes	Yes	>50mm	Yes	>50mm
LTE B7	Body 0mm	2.600	23.00	199.53	5.0	32.5	61.0	5.0	230.5	64.345	9.899	>50mm	64.345	>50mm	Yes	Yes	>50mm	Yes	>50mm
LTE B17	Body 0mm	0.750	24.00	251.19	5.0	32.5	61.0	5.0	230.5	43.507	6.693	>50mm	43.507	>50mm	Yes	Yes	>50mm	Yes	>50mm
LTE B26	Body 0mm	0.850	23.50	223.87	5.0	32.5	61.0	5.0	230.5	41.280	6.351	>50mm	41.280	>50mm	Yes	Yes	>50mm	Yes	>50mm
WiFi 2.4G	Body 0mm	2.450	12.00	15.85	5.0	132.5	5.0	233.1	5.0	4.962	>50mm	4.962	>50mm	4.962	Yes	>50mm	Yes	>50mm	Yes
WiFi 5G	Body 0mm	5.800	10.50	11.22	5.0	132.5	5.0	233.1	5.0	5.404	>50mm	5.404	>50mm	5.404	Yes	>50mm	Yes	>50mm	Yes
BT	Body 0mm	2.450	5.00	3.16	5.0	132.5	5.0	233.1	5.0	0.990	>50mm	0.990	>50mm	0.990	No	>50mm	No	>50mm	No

(Antennas >50mm to adjacent sides)

2）Standalone SAR exclusion calculation(Antennas >50mm to adjacent sides)

Band	Exposure Condition	f(GHz)	Pmax	Pmax	Seperation Distance(mm)					Calculated Threshold Value					SAR Test(yes or no)				
			(dBm)*	(mW)	Back side	Left side	Right side	Top side	Bottom side	Back side	Left side	Right side	Top side	Bottom side	Back side	Left side	Right side	Top side	Bottom side
GSM850	Body 0mm	0.850	33.00	1995.26	5.0	32.5	61.0	5.0	230.5	<50mm	<50mm	226.33	<50mm	2022.83	<50mm	<50mm	No	<50mm	No
GSM1900	Body 0mm	1.900	30.50	1122.02	5.0	32.5	61.0	5.0	230.5	<50mm	<50mm	219.00	<50mm	2805.00	<50mm	<50mm	No	<50mm	No
UMTS B2	Body 0mm	1.900	23.50	223.87	5.0	32.5	61.0	5.0	230.5	<50mm	<50mm	1110.00	<50mm	2805.00	<50mm	<50mm	No	<50mm	No
UMTS B4	Body 0mm	1.700	23.50	223.87	5.0	32.5	61.0	5.0	230.5	<50mm	<50mm	1110.00	<50mm	2805.00	<50mm	<50mm	No	<50mm	No
UMTS B5	Body 0mm	0.850	24.00	251.19	5.0	32.5	61.0	5.0	230.5	<50mm	<50mm	1062.33	<50mm	1122.83	<50mm	<50mm	No	<50mm	No
LTE B2	Body 0mm	1.900	23.00	199.53	5.0	32.5	61.0	5.0	230.5	<50mm	<50mm	1110.00	<50mm	1905.00	<50mm	<50mm	No	<50mm	No
LTE B4	Body 0mm	1.700	23.00	199.53	5.0	32.5	61.0	5.0	230.5	<50mm	<50mm	1110.00	<50mm	1905.00	<50mm	<50mm	No	<50mm	No
LTE B5	Body 0mm	0.850	23.50	223.87	5.0	32.5	61.0	5.0	230.5	<50mm	<50mm	1062.33	<50mm	1122.83	<50mm	<50mm	No	<50mm	No
LTE B7	Body 0mm	2.600	23.00	199.53	5.0	32.5	61.0	5.0	230.5	<50mm	<50mm	1110.00	<50mm	1905.00	<50mm	<50mm	No	<50mm	No
LTE B17	Body 0mm	0.750	24.00	251.19	5.0	32.5	61.0	5.0	230.5	<50mm	<50mm	1055.00	<50mm	1002.50	<50mm	<50mm	No	<50mm	No
LTE B26	Body 0mm	0.850	23.50	223.87	5.0	32.5	61.0	5.0	230.5	<50mm	<50mm	1062.33	<50mm	1122.83	<50mm	<50mm	No	<50mm	No
WiFi 2.4G	Body 0mm	2.450	12.00	15.85	5.0	132.5	5.0	233.1	5.0	<50mm	925.00	<50mm	2831.00	<50mm	<50mm	No	<50mm	No	<50mm
WiFi 5G	Body 0mm	5.800	10.50	11.22	5.0	132.5	5.0	233.1	5.0	<50mm	925.00	<50mm	2831.00	<50mm	<50mm	No	<50mm	No	<50mm
BT	Body 0mm	2.450	5.00	3.16	5.0	132.5	5.0	233.1	5.0	<50mm	925.00	<50mm	2831.00	<50mm	<50mm	No	<50mm	No	<50mm

7.3.2 Estimated SAR for Simultaneous Transmission SAR Analysis

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [√f(GHz)/x] W/kg for test separation distances ≤ 50 mm,where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR.

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

When the minimum test separation distance is > 50 mm, the estimated SAR value is 0.4 W/kg

For conditions where the estimated SAR is overly conservative for certain conditions, the test lab may choose to perform standalone SAR measurements and use the measured SAR to determine simultaneous transmission SAR test exclusion.

Band	Exposure Condition	f(GHz)	Pmax	Pmax	Seperation Distance(mm)					Estimated 1-g SAR Value (W/kg)				
			(dBm)*	(mW)	Back side	Left side	Right side	Top side	Bottom side	Back side	Left side	Right side	Top side	Bottom side
GSM850	Body 0mm	0.850	33.00	1995.26	5.0	32.5	61.0	5.0	230.5	Measure	Measure	0.400	Measure	0.400
GSM1900	Body 0mm	1.900	30.50	1122.02	5.0	32.5	61.0	5.0	230.5	Measure	Measure	0.400	Measure	0.400
UMTS B2	Body 0mm	1.900	23.50	223.87	5.0	32.5	61.0	5.0	230.5	Measure	Measure	0.400	Measure	0.400
UMTS B4	Body 0mm	1.700	23.50	223.87	5.0	32.5	61.0	5.0	230.5	Measure	Measure	0.400	Measure	0.400
UMTS B5	Body 0mm	0.850	24.00	251.19	5.0	32.5	61.0	5.0	230.5	Measure	Measure	0.400	Measure	0.400
LTE B2	Body 0mm	1.900	23.00	199.53	5.0	32.5	61.0	5.0	230.5	Measure	Measure	0.400	Measure	0.400
LTE B4	Body 0mm	1.700	23.00	199.53	5.0	32.5	61.0	5.0	230.5	Measure	Measure	0.400	Measure	0.400
LTE B5	Body 0mm	0.850	23.50	223.87	5.0	32.5	61.0	5.0	230.5	Measure	Measure	0.400	Measure	0.400
LTE B7	Body 0mm	2.600	23.00	199.53	5.0	32.5	61.0	5.0	230.5	Measure	Measure	0.400	Measure	0.400
LTE B17	Body 0mm	0.750	24.00	251.19	5.0	32.5	61.0	5.0	230.5	Measure	Measure	0.400	Measure	0.400
LTE B26	Body 0mm	0.850	23.50	223.87	5.0	32.5	61.0	5.0	230.5	Measure	Measure	0.400	Measure	0.400
WiFi 2.4G	Body 0mm	2.450	12.00	15.85	5.0	132.5	5.0	233.1	5.0	Measure	0.400	Measure	0.400	Measure
WiFi 5G	Body 0mm	5.800	10.50	11.22	5.0	132.5	5.0	233.1	5.0	Measure	0.400	Measure	0.400	Measure
BT	Body 0mm	2.450	5.00	3.16	5.0	132.5	5.0	233.1	5.0	0.132	0.400	0.132	0.400	0.132

Note: * - maximum possible output power(including tune-up tolerance) declared by manufacturer

7.3.3 Simultaneous Transmission Possibilities

The Simultaneous Transmission Possibilities of this device are as below:

No.	Configuration	Body
1	GSM/UMTS/LTE + WiFi 2.4G	Yes
2	GSM/UMTS/LTE + WiFi 5G	Yes
3	GSM/UMTS/LTE + BT	Yes

Table 50: Simultaneous Transmission Possibilities

Note:

1) WiFi 2.4G and WiFi 5G can't transmit simutanously.

2) WiFi 2.4G/5G and BT can't transmit simutanously.

7.3.4 SAR Summation Scenario

Test Position	Main antenna SARMax											WiFi/BT antenna SARMax			Σ1-g SAR (1.6W/kg Limit)	SPLSR
	GSM850	GSM1900	UMTS Band II	UMTS Band IV	UMTS Band V	LTE Band II	LTE Band IV	LTE Band V	LTE Band VII	LTE Band XVII	LTE Band XXVI	WiFi 2.4G	WiFi 5G	BT		
Sensor on																
Back Side 0mm	0.732	1.095	1.324	1.230	0.420	1.244	1.358	0.544	1.007	**1.415**	0.779	1.198	1.195	0.132	2.613	See 7.3.6
Left Side 0mm	0.165	0.151	0.417	0.440	0.121	0.248	0.395	0.185	0.513	0.206	0.168	0.400	0.400	0.400	0.913	N/A
Right Side 0mm	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.347	0.480	0.132	0.880	N/A
Top Side 0mm	1.113	0.672	0.717	0.535	0.693	0.712	0.398	1.137	0.748	1.085	1.189	0.400	0.400	0.400	1.589	N/A
Bottom Side 0mm	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.254	1.065	0.132	1.465	N/A
Sensor off																
Back Side 16mm	0.260	0.905	1.088	0.947	0.153	1.268	0.961	0.291	0.755	0.312	<0.779	<1.198	<1.195	<0.132	<2.466	See 7.3.6
Left Side 0mm	0.165	0.151	0.417	0.440	0.121	0.248	0.395	0.185	0.513	0.206	0.168	0.400	0.400	0.400	0.913	N/A
Right Side 0mm	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.347	0.480	0.132	0.880	N/A
Top Side 19mm	0.289	0.317	0.710	0.765	0.130	0.580	0.549	0.244	0.620	0.133	<1.189	<0.400	<0.400	<0.400	<1.589	N/A
Bottom Side 0mm	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.254	1.065	0.132	1.465	N/A

Table 51: SAR Simultaneous Tx Combination of Main Antenna and WiFi/BT.

Test Position	Main antenna SAR_{Max}											WiFi antenna SARMax	Σ1-g SAR (1.6W/kg Limit)	SPLSR	Volume scan
	GSM850	GSM1900	UMTS Band II	UMTS Band IV	UMTS Band V	LTE Band II	LTE Band IV	LTE Band V	LTE Band VII	LTE Band XVII	LTE Band XXVI	WiFi 2.4G			
Back Side 0mm	0.732	/	/	/	/	/	/	/	/	/	/	1.198	1.930	0.011	Not required
Back Side 0mm	/	1.095	/	/	/	/	/	/	/	/	/	1.198	2.293	0.014	Not required
Back Side 0mm	/	/	1.324	/	/	/	/	/	/	/	/	1.198	2.522	0.016	Not required
Back Side 0mm	/	/	/	1.230	/	/	/	/	/	/	/	1.198	2.428	0.016	Not required
Back Side 0mm	/	/	/	/	0.420	/	/	/	/	/	/	1.198	1.618	0.008	Not required
Back Side 0mm	/	/	/	/	/	1.244	/	/	/	/	/	1.198	2.442	0.015	Not required
Back Side 0mm	/	/	/	/	/	/	1.358	/	/	/	/	1.198	2.556	0.018	Not required
Back Side 0mm	/	/	/	/	/	/	/	0.544	/	/	/	1.198	1.742	0.009	Not required
Back Side 0mm	/	/	/	/	/	/	/	/	1.007	/	/	1.198	2.205	0.014	Not required
Back Side 0mm	/	/	/	/	/	/	/	/	/	1.415	/	1.198	2.613	0.018	Not required
Back Side 0mm	/	/	/	/	/	/	/	/	/	/	0.779	1.198	1.977	0.012	Not required

Table 52: SAR Simultaneous Tx Combination of Main Antenna(Back side, Sensor on) and WiFi 2.4G

Test Position	Main antenna SAR_{Max}											WiFi antenna SARMax	Σ1-g SAR (1.6W/kg Limit)	SPLSR	Volume scan
	GSM850	GSM1900	UMTS Band II	UMTS Band IV	UMTS Band V	LTE Band II	LTE Band IV	LTE Band V	LTE Band VII	LTE Band XVII	LTE Band XXVI	WiFi 5G			
Back Side 0mm	0.732	/	/	/	/	/	/	/	/	/	/	1.195	1.927	0.011	Not required
Back Side 0mm	/	1.095	/	/	/	/	/	/	/	/	/	1.195	2.290	0.014	Not required
Back Side 0mm	/	/	1.324	/	/	/	/	/	/	/	/	1.195	2.519	0.016	Not required
Back Side 0mm	/	/	/	1.230	/	/	/	/	/	/	/	1.195	2.425	0.015	Not required
Back Side 0mm	/	/	/	/	0.420	/	/	/	/	/	/	1.195	1.615	0.008	Not required
Back Side 0mm	/	/	/	/	/	1.244	/	/	/	/	/	1.195	2.439	0.015	Not required
Back Side 0mm	/	/	/	/	/	/	1.358	/	/	/	/	1.195	2.553	0.018	Not required
Back Side 0mm	/	/	/	/	/	/	/	0.544	/	/	/	1.195	1.739	0.009	Not required
Back Side 0mm	/	/	/	/	/	/	/	/	1.007	/	/	1.195	2.202	0.018	Not required
Back Side 0mm	/	/	/	/	/	/	/	/	/	1.415	/	1.195	2.610	0.018	Not required
Back Side 0mm	/	/	/	/	/	/	/	/	/	/	0.779	1.195	1.974	0.012	Not required

Table 53: SAR Simultaneous Tx Combination of Main Antenna(Back side,Sensor on) and WiFi 5G

Test Position	Main antenna SAR_{Max}											WiFi antenna SARMax	Σ1-g SAR (1.6W/kg Limit)	SPLSR	Volume scan
	GSM850	GSM1900	UMTS Band II	UMTS Band IV	UMTS Band V	LTE Band II	LTE Band IV	LTE Band V	LTE Band VII	LTE Band XVII	LTE Band XXVI	WiFi 2.4G			
Back Side 16mm	0.260	/	/	/	/	/	/	/	/	/	/	<1.198	<1.458	N/A	Not required
Back Side 16mm	/	0.905	/	/	/	/	/	/	/	/	/	<1.198	<2.103	<0.013	Not required
Back Side 16mm	/	/	1.088	/	/	/	/	/	/	/	/	<1.198	<2.286	<0.014	Not required
Back Side 16mm	/	/	/	0.947	/	/	/	/	/	/	/	<1.198	<2.145	<0.013	Not required
Back Side 16mm	/	/	/	/	0.153	/	/	/	/	/	/	<1.198	<1.351	N/A	Not required
Back Side 16mm	/	/	/	/	/	1.268	/	/	/	/	/	<1.198	<2.466	<0.016	Not required
Back Side 16mm	/	/	/	/	/	/	0.961	/	/	/	/	<1.198	<2.159	<0.013	Not required
Back Side 16mm	/	/	/	/	/	/	/	0.291	/	/	/	<1.198	<1.489	N/A	Not required
Back Side 16mm	/	/	/	/	/	/	/	/	0.755	/	/	<1.198	<1.953	<0.011	Not required
Back Side 16mm	/	/	/	/	/	/	/	/	/	0.312	/	<1.198	<1.510	N/A	Not required
Back Side 16mm	/	/	/	/	/	/	/	/	/	/	<0.779	<1.198	<1.977	<0.012	Not required

Table 54: SAR Simultaneous Tx Combination of Main Antenna(Back side,Sensor off) and WiFi 2.4G

Test Position	Main antenna SAR_{Max}											WiFi antenna SARMax	Σ1-g SAR (1.6W/kg Limit)	SPLSR	Volume scan
	GSM850	GSM1900	UMTS Band II	UMTS Band IV	UMTS Band V	LTE Band II	LTE Band IV	LTE Band V	LTE Band VII	LTE Band XVII	LTE Band XXVI	WiFi 5G			
Back Side 16mm	0.260	/	/	/	/	/	/	/	/	/	/	<1.195	<1.455	N/A	Not required
Back Side 16mm	/	0.905	/	/	/	/	/	/	/	/	/	<1.195	<2.100	<0.013	Not required
Back Side 16mm	/	/	1.088	/	/	/	/	/	/	/	/	<1.195	<2.283	<0.014	Not required
Back Side 16mm	/	/	/	0.947	/	/	/	/	/	/	/	<1.195	<2.142	<0.013	Not required
Back Side 16mm	/	/	/	/	0.153	/	/	/	/	/	/	<1.195	<1.348	N/A	Not required
Back Side 16mm	/	/	/	/	/	1.268	/	/	/	/	/	<1.195	<2.463	<0.016	Not required
Back Side 16mm	/	/	/	/	/	/	0.961	/	/	/	/	<1.195	<2.156	<0.013	Not required
Back Side 16mm	/	/	/	/	/	/	/	0.291	/	/	/	<1.195	<1.486	N/A	Not required
Back Side 16mm	/	/	/	/	/	/	/	/	0.755	/	/	<1.195	<1.950	<0.011	Not required
Back Side 16mm	/	/	/	/	/	/	/	/	/	0.312	/	<1.195	<1.507	N/A	Not required
Back Side 16mm	/	/	/	/	/	/	/	/	/	/	<0.779	<1.195	<1.974	<0.012	Not required

Table 55: SAR Simultaneous Tx Combination of Main Antenna(Back side,Sensor off) and WiFi 5G

7.3.5 SPLSR Evaluation Analysis

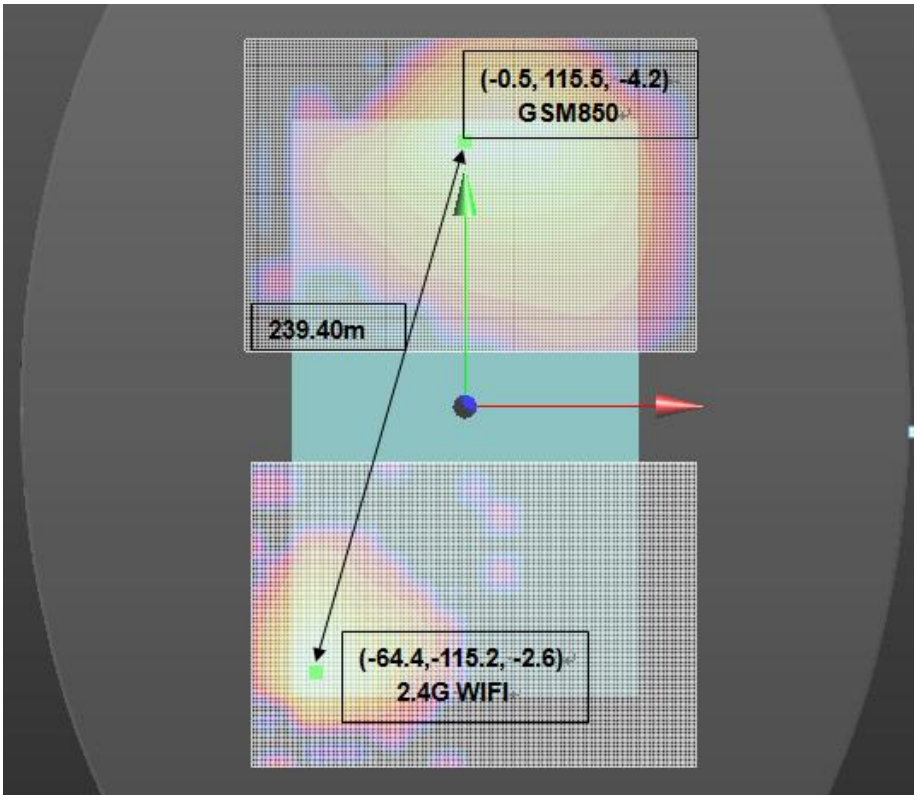
According to KDB447498 D01v06, When the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR to peak location separation ratio(SPLSR).When the SAR to peak location ratio for each pair of antennas is ≤1-g 0.04 and 10-g 0.10，simultaneous SAR evaluation is not required. When SAR is measured for both antennas in the pair, the peak location separation distance is computed by the following fomula:

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

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

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.

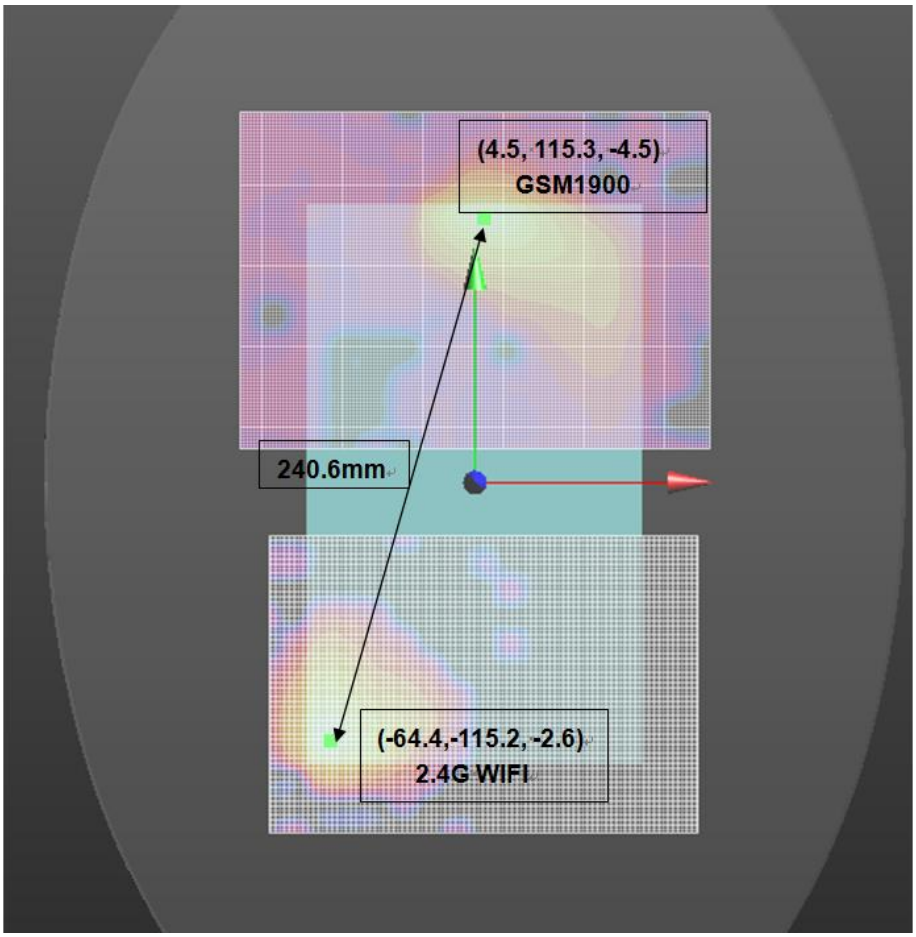
1) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with GSM850(Sensor on) and WiFi 2.4G.
   The Peak SAR location plot is as below:



   The SAR to peak location ratio calculation is as below:

Test Position	GSM850 (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	0.732	1.198	239.4	0.011	0.04	Not required

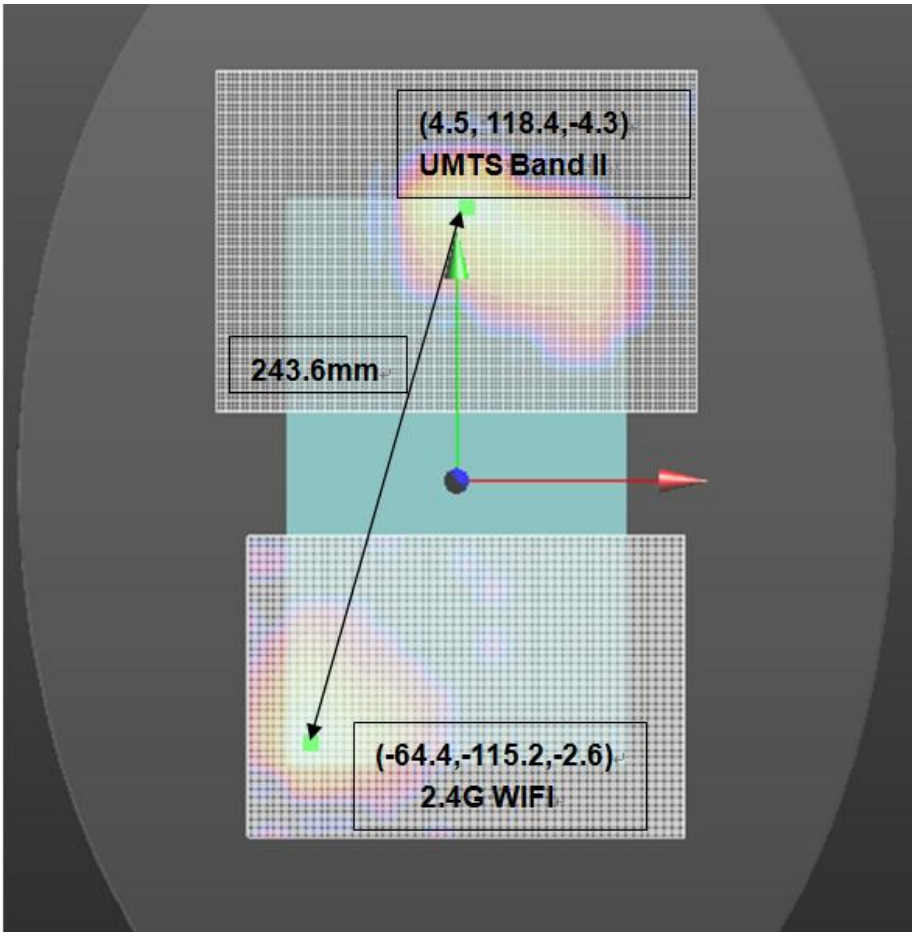
2) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with GSM1900(Sensor on) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	GSM1900 (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	1.095	1.198	240.6	0.014	0.04	Not required

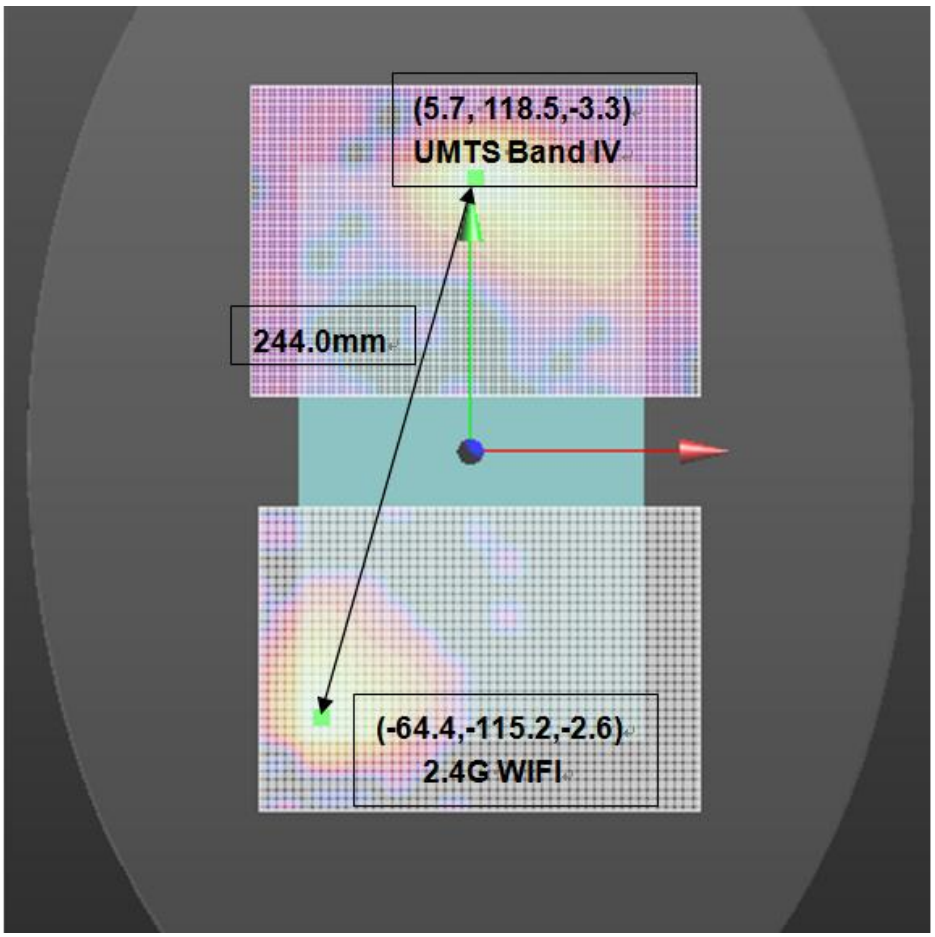
3) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band II(Sensor on) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	UMTS Band II (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	1.324	1.198	243.6	0.016	0.04	Not required

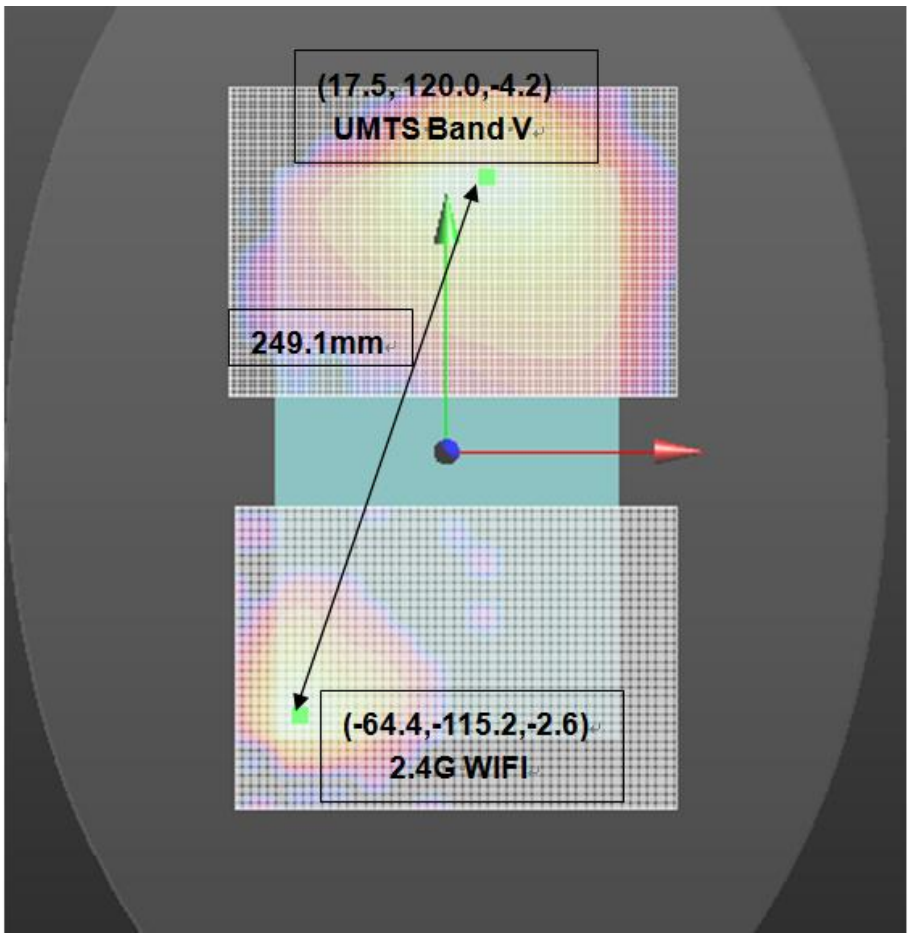
4) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band IV(Sensor on) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	MUTS Band IV (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	1.230	1.198	244.0	0.016	0.04	Not required

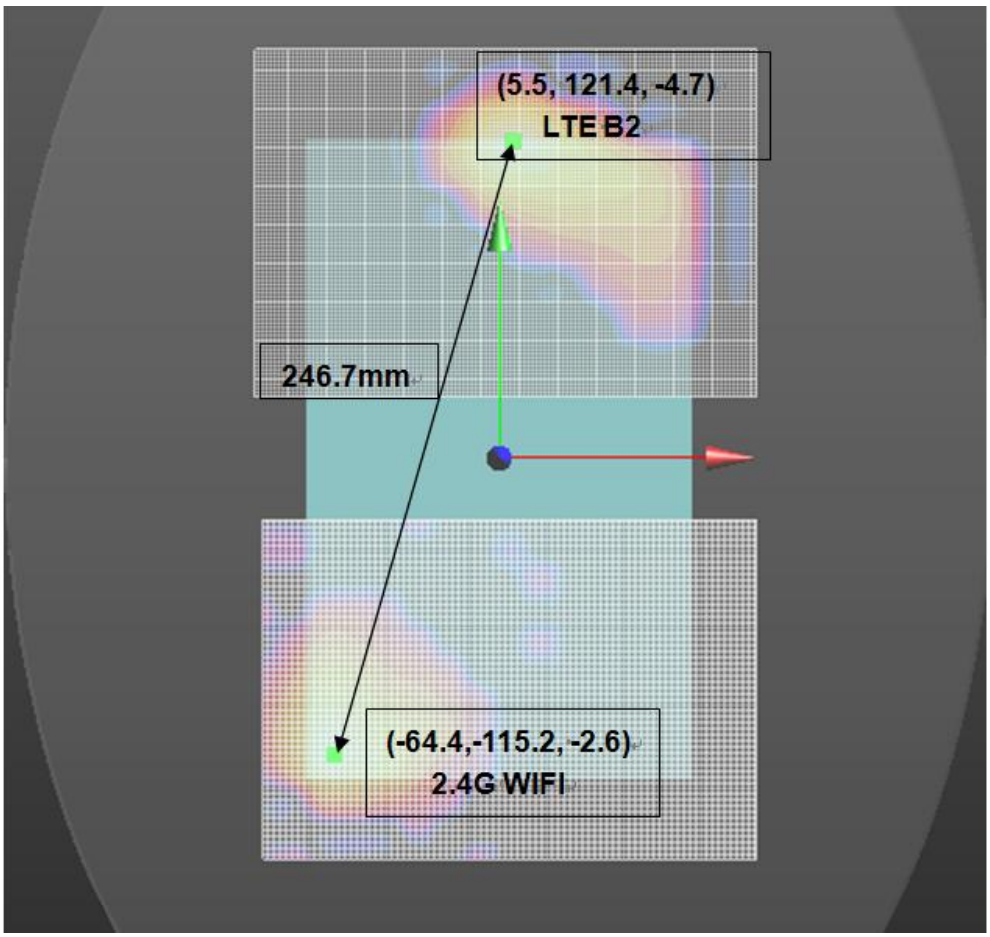
5) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band V(Sensor on) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	UMTS Band V (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	0.407	1.198	249.1	0.008	0.04	Not required

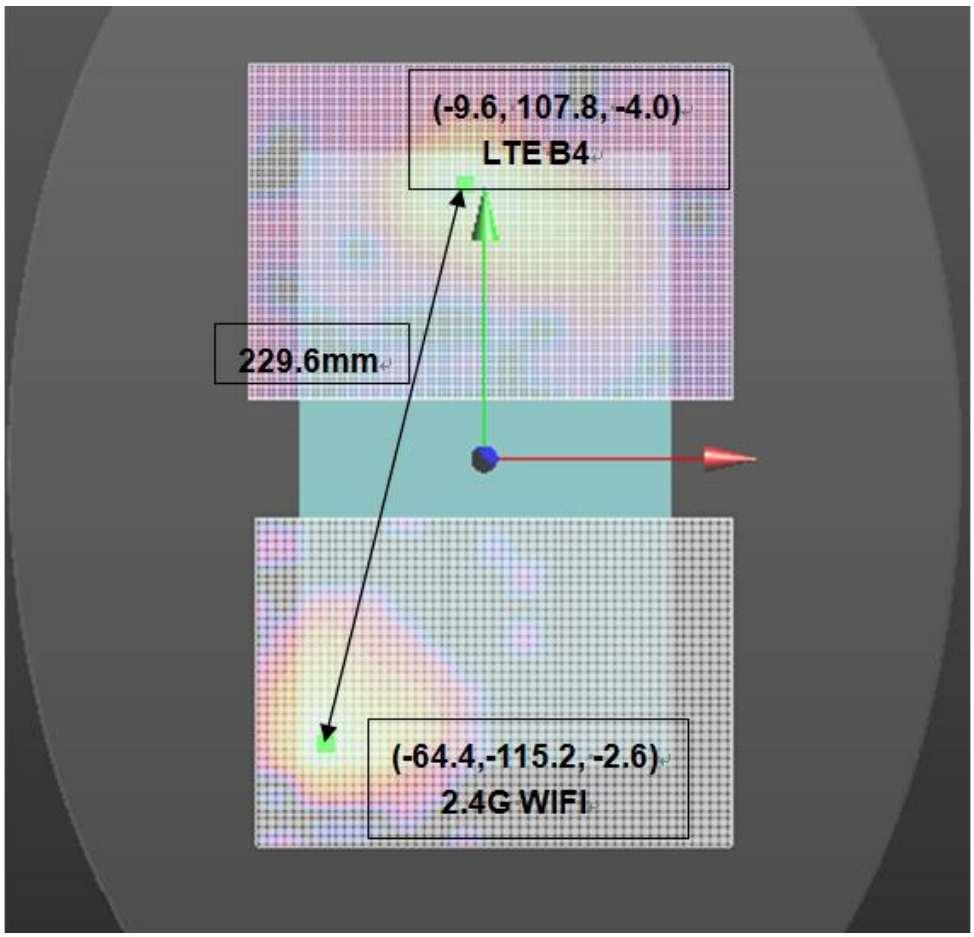
6) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B2(Sensor on) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B2 (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	1.244	1.198	246.7	0.015	0.04	Not required

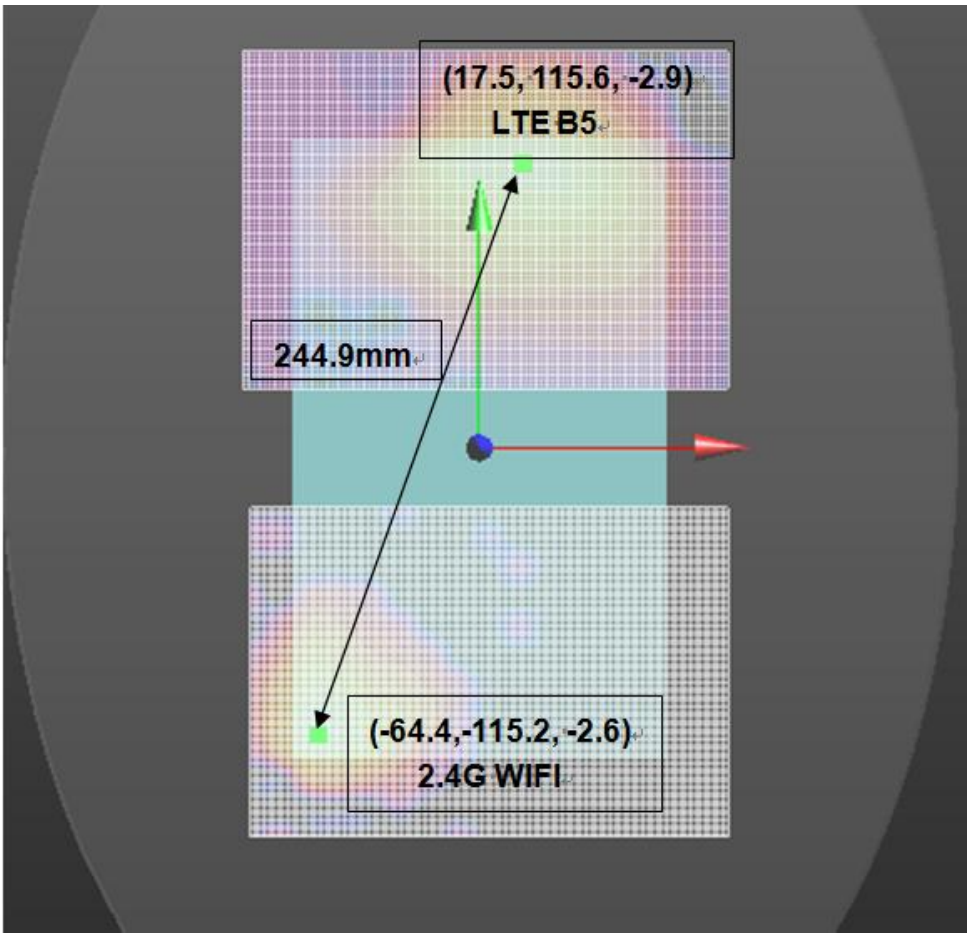
7) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B4(Sensor on) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B4 (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	1.358	1.198	229.6	0.018	0.04	Not required

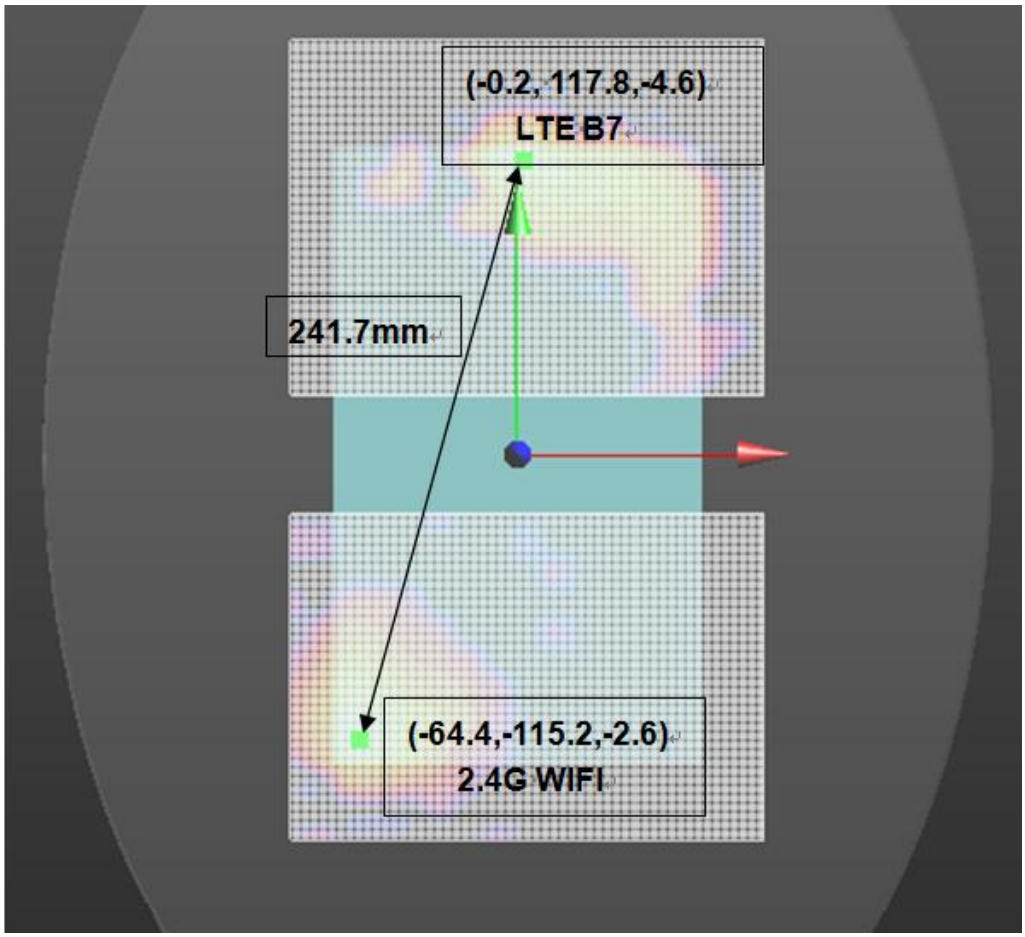
8) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B5(Sensor on) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B5 (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	0.544	1.198	244.9	0.009	0.04	Not required

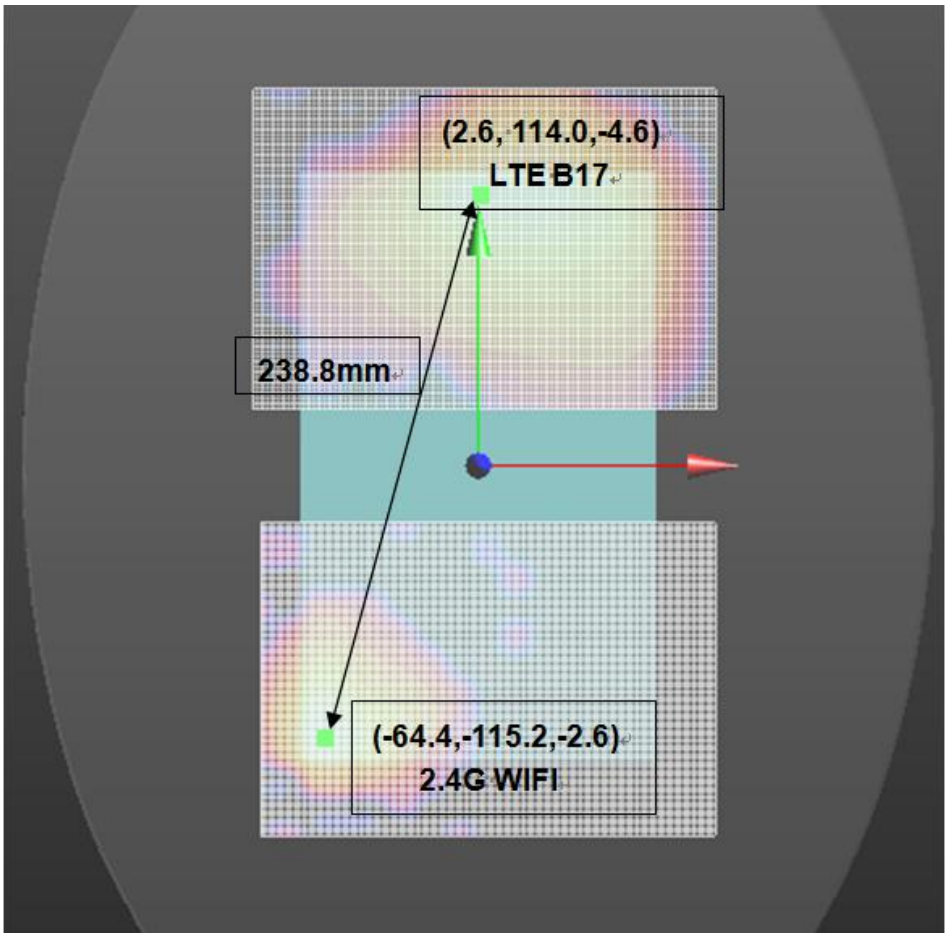
9) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B7(Sensor on) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B7 (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	1.007	1.198	241.7	0.014	0.04	Not required

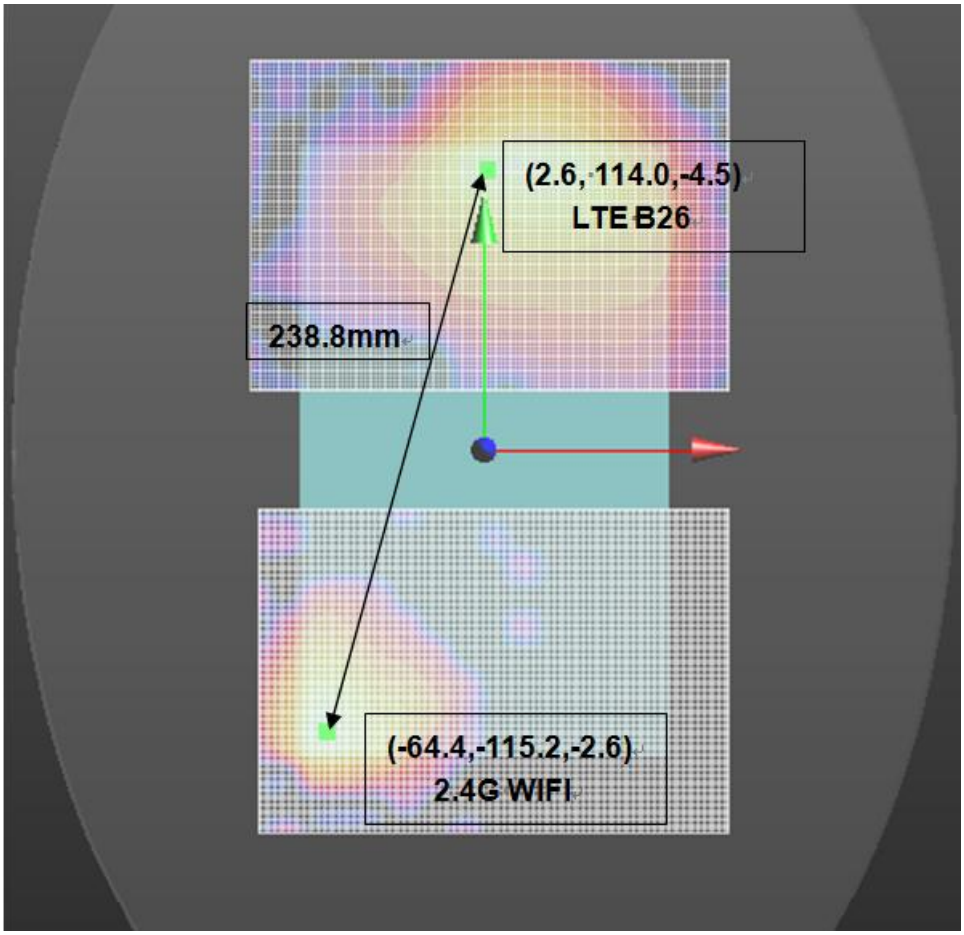
10) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B17(Sensor on) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B17 (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	1.415	1.198	238.8	0.018	0.04	Not required

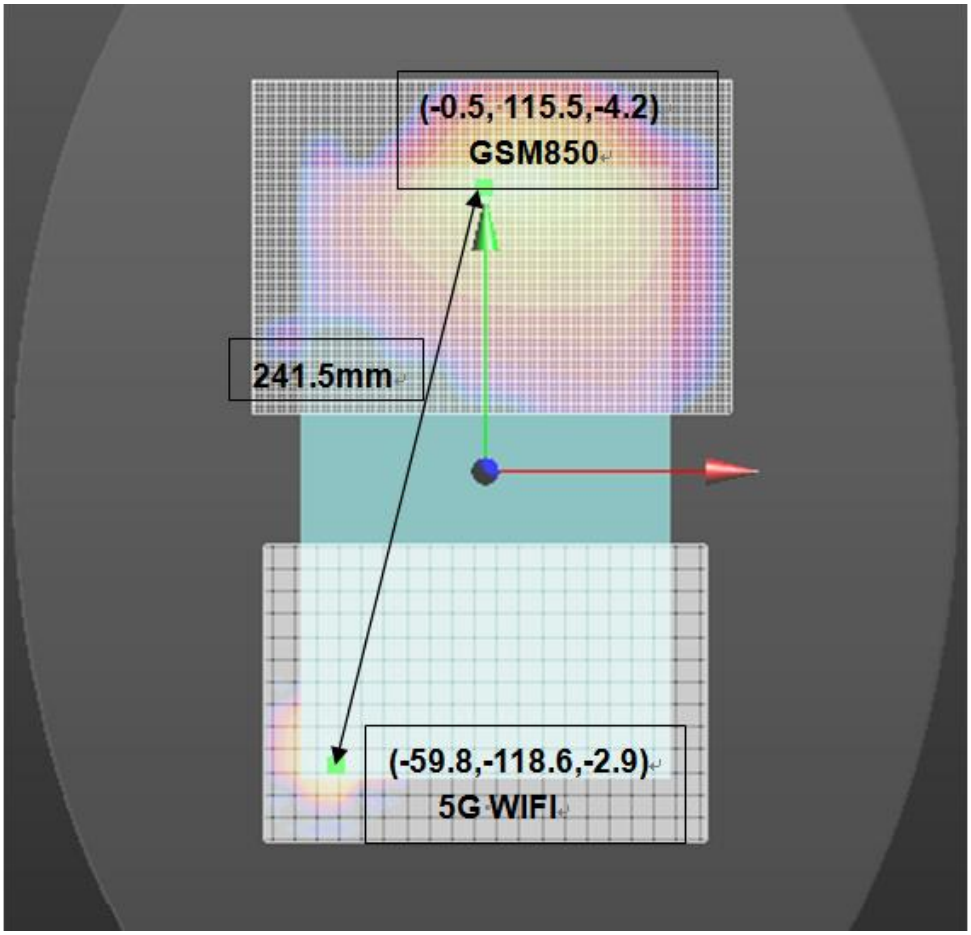
11) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B26(Sensor on) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B26 (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	0.779	1.198	238.8	0.012	0.04	Not required

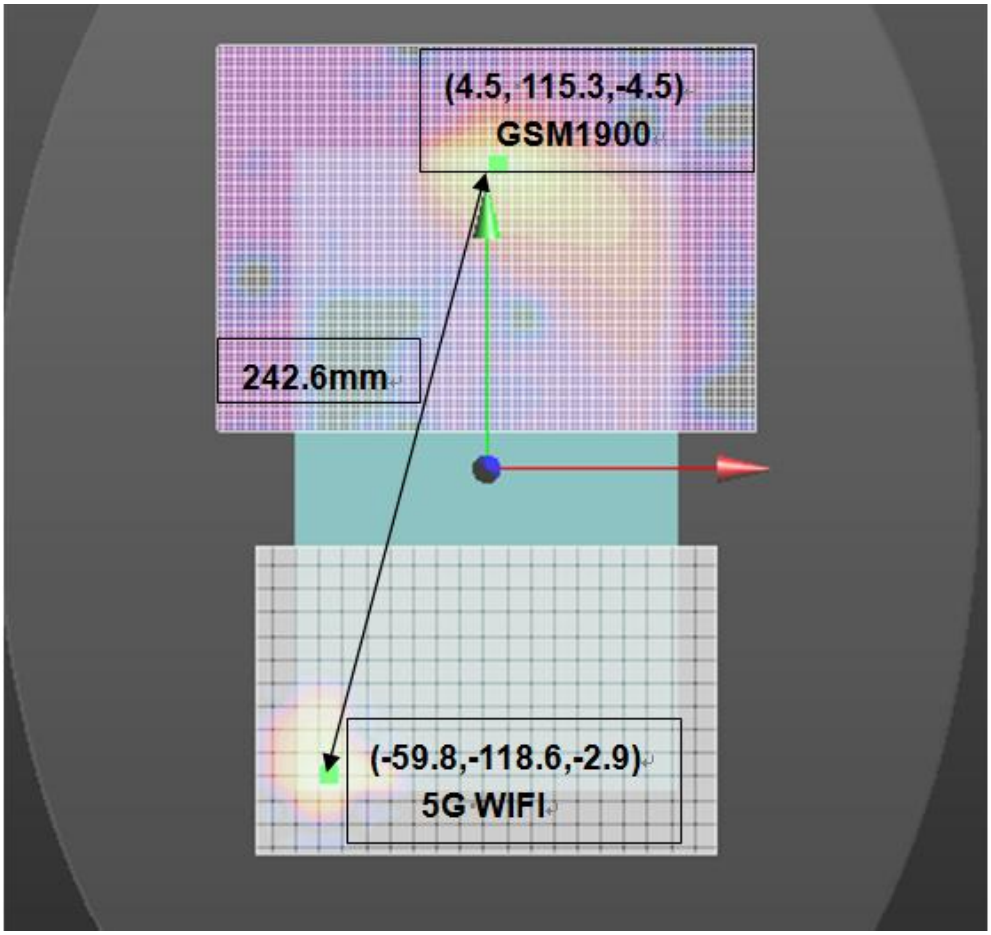
12) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with GSM850(Sensor on) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	GSM850 (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	0.732	1.195	241.5	0.011	0.04	Not required

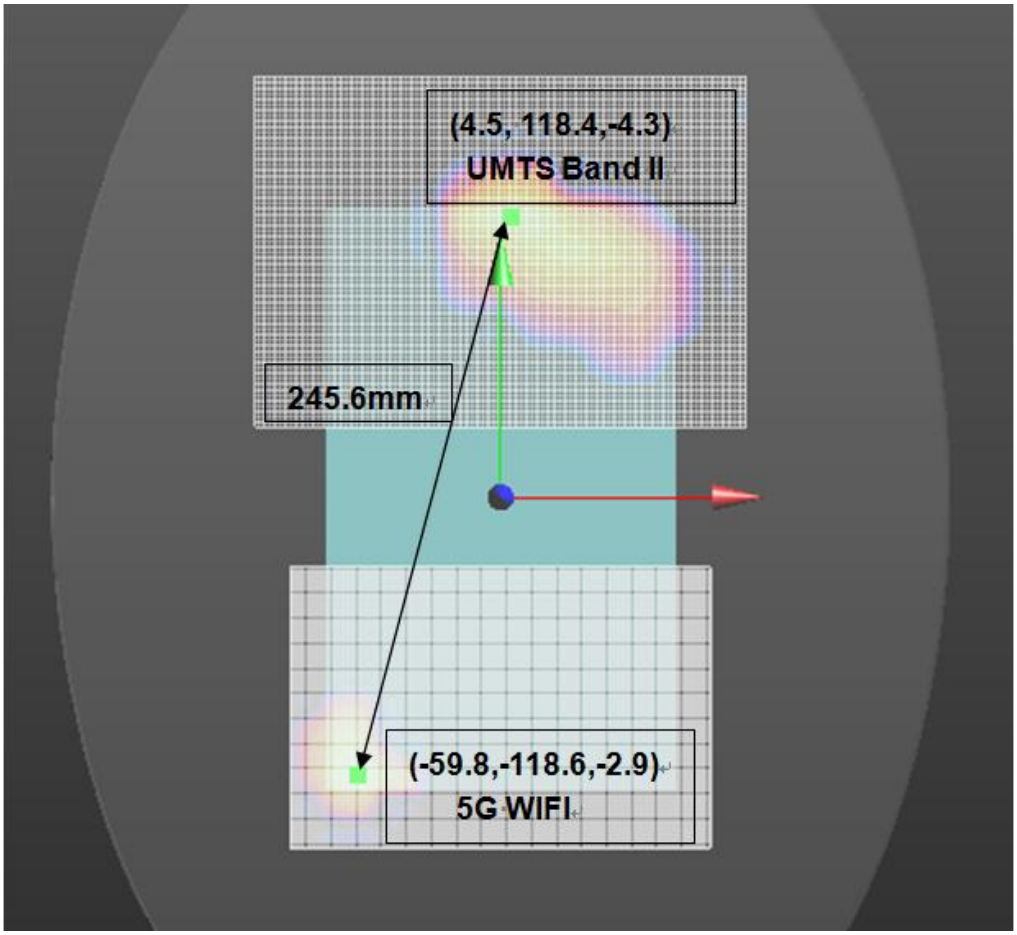
13) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with GSM1900(Sensor on) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	GSM1900 (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	1.095	1.195	242.6	0.014	0.04	Not required

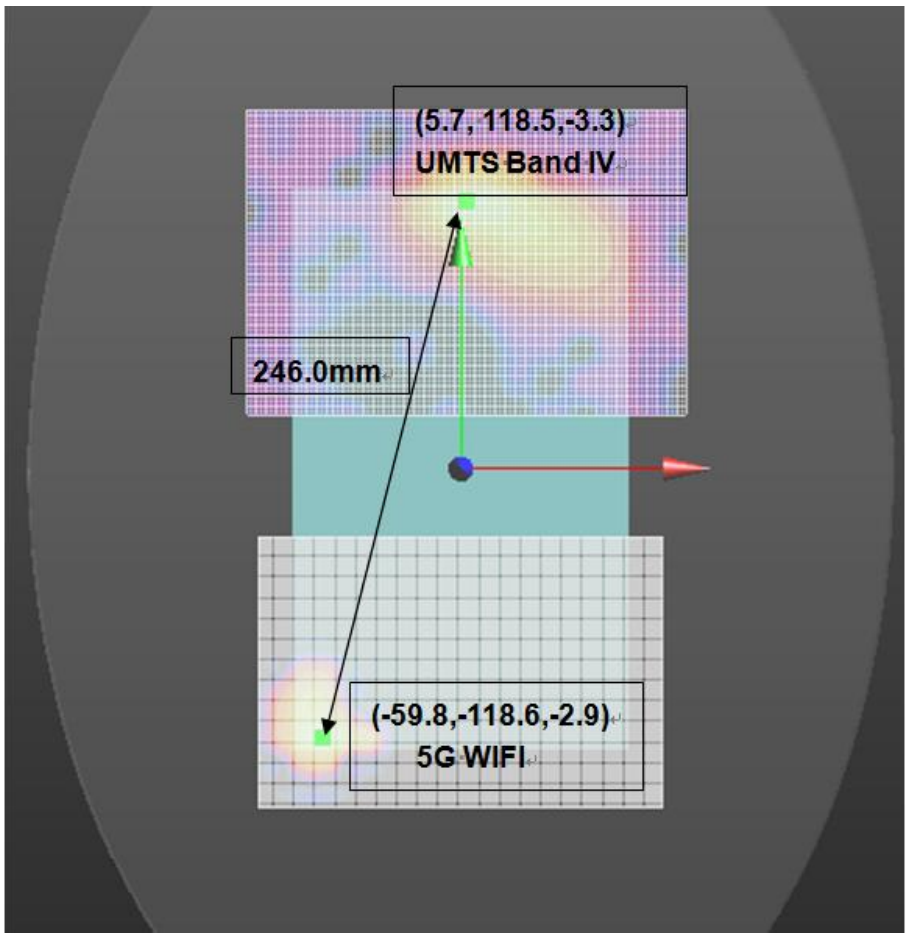
14) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band II(Sensor on) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	UMTS Band II (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	1.324	1.195	245.6	0.016	0.04	Not required

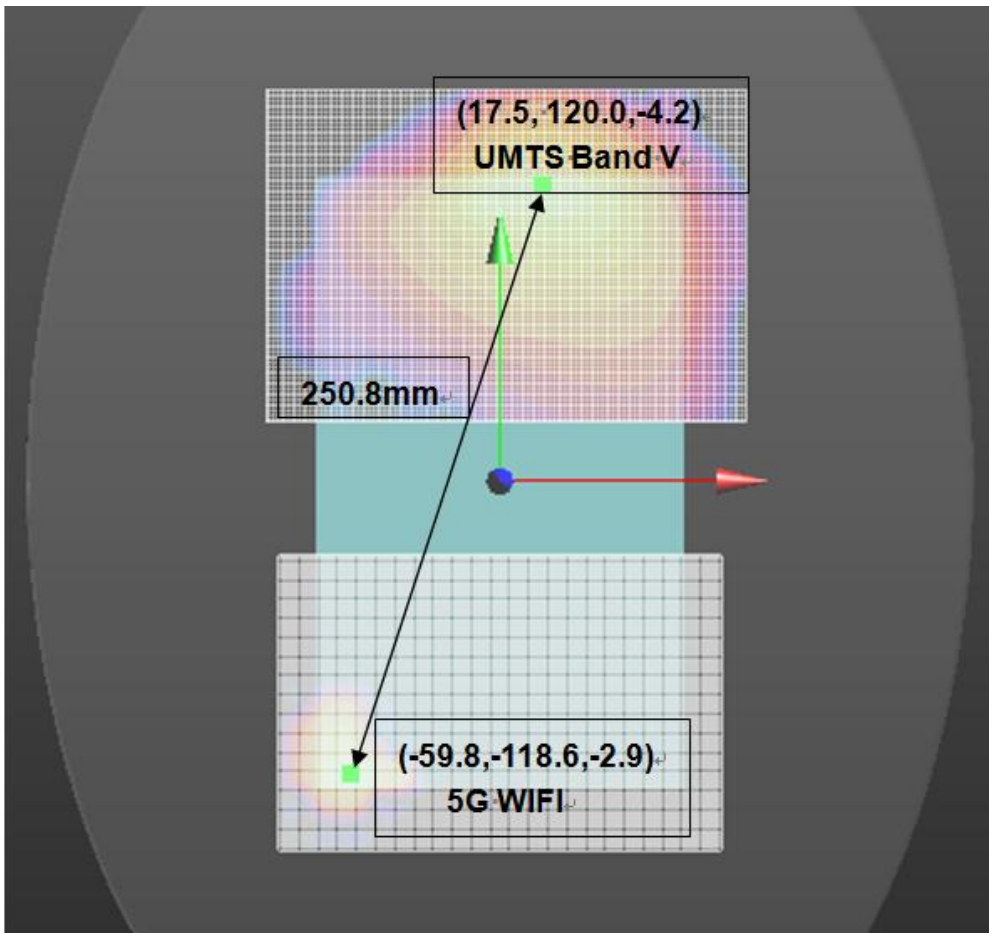
15) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band IV(Sensor on) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	UMTS Band IV (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	1.230	1.195	246.0	0.015	0.04	Not required

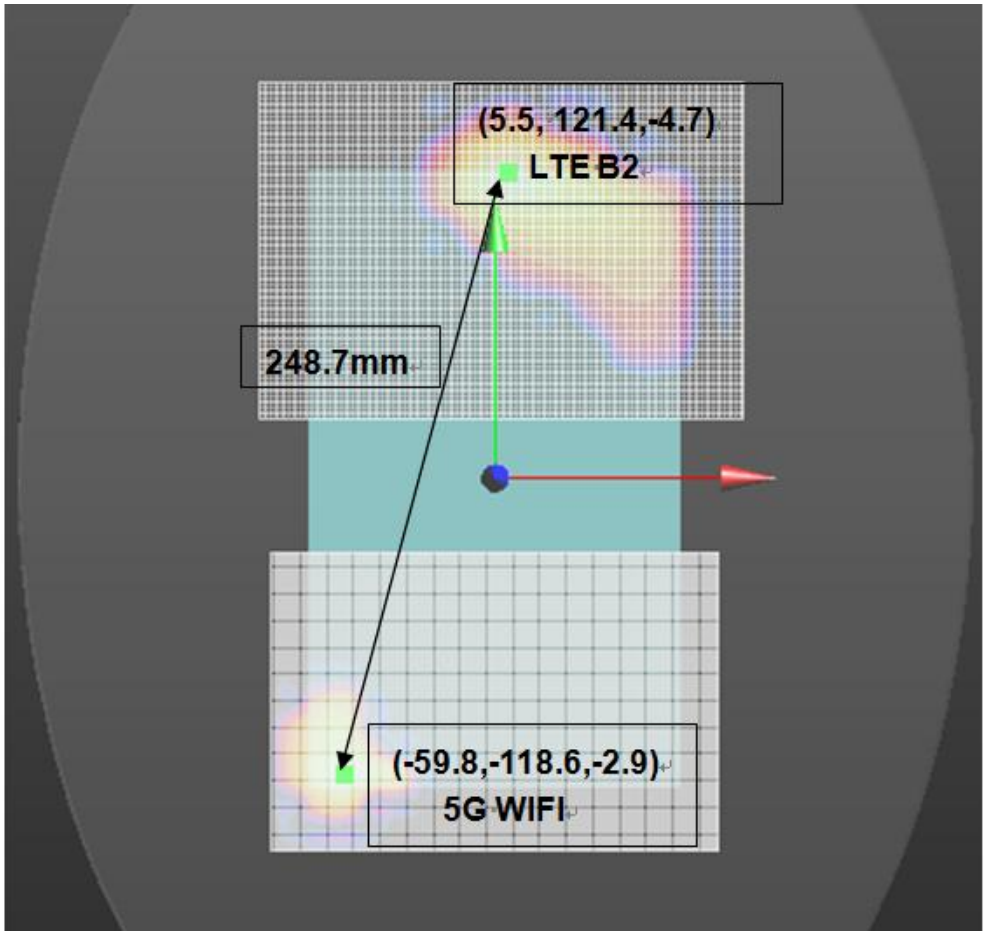
16) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band V(Sensor on) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	UMTS Band V (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	0.407	1.195	250.8	0.008	0.04	Not required

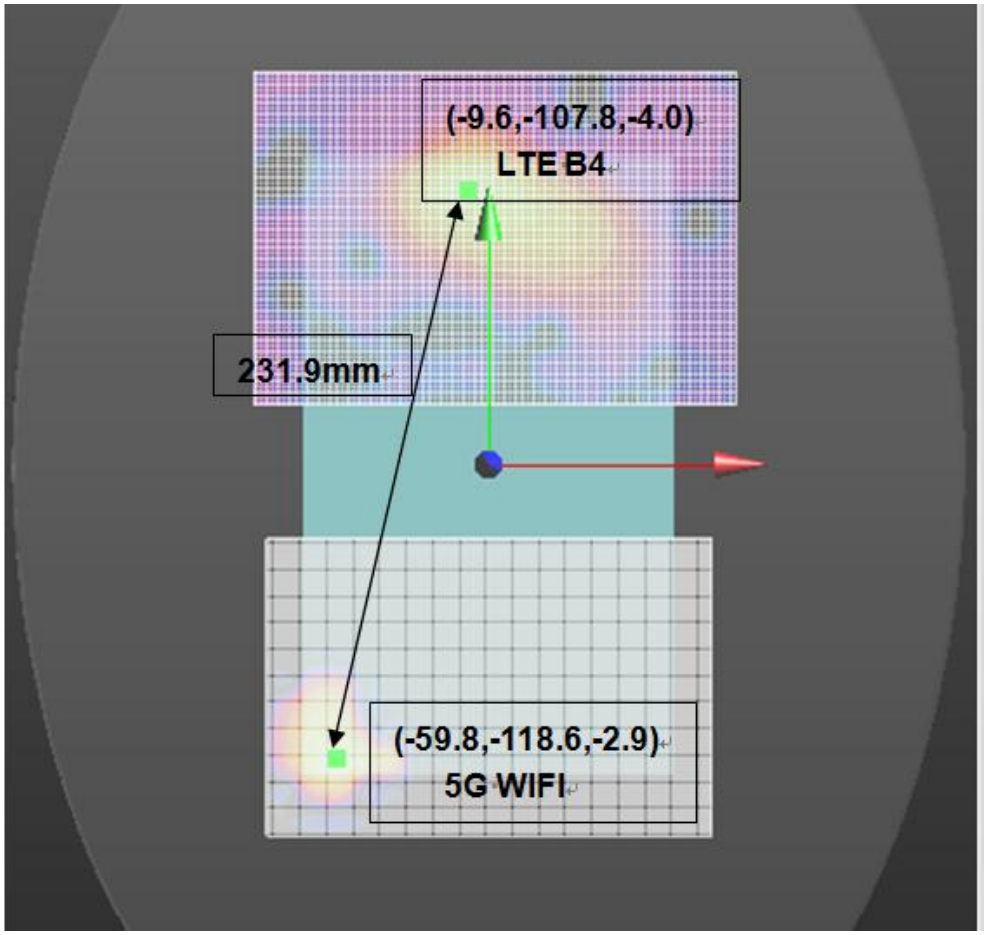
17) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B2(Sensor on) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B2 (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	1.244	1.195	248.7	0.015	0.04	Not required

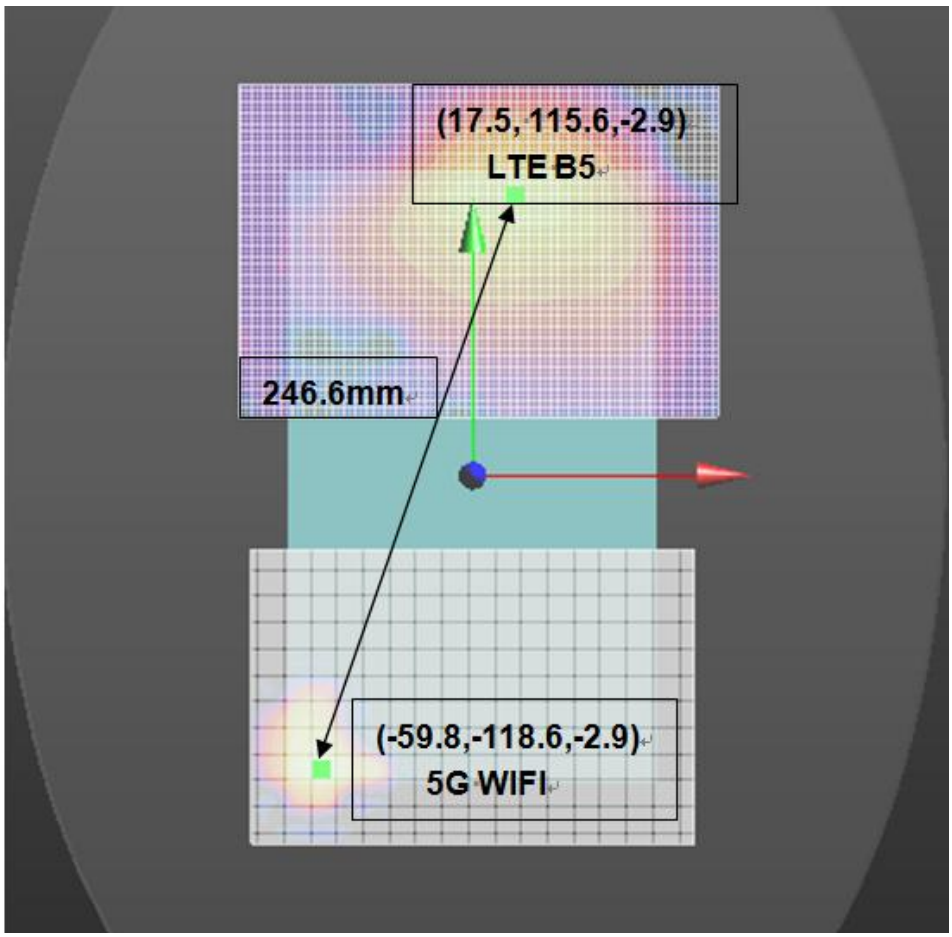
18) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B4(Sensor on) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B4 (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	1.358	1.195	231.9	0.018	0.04	Not required

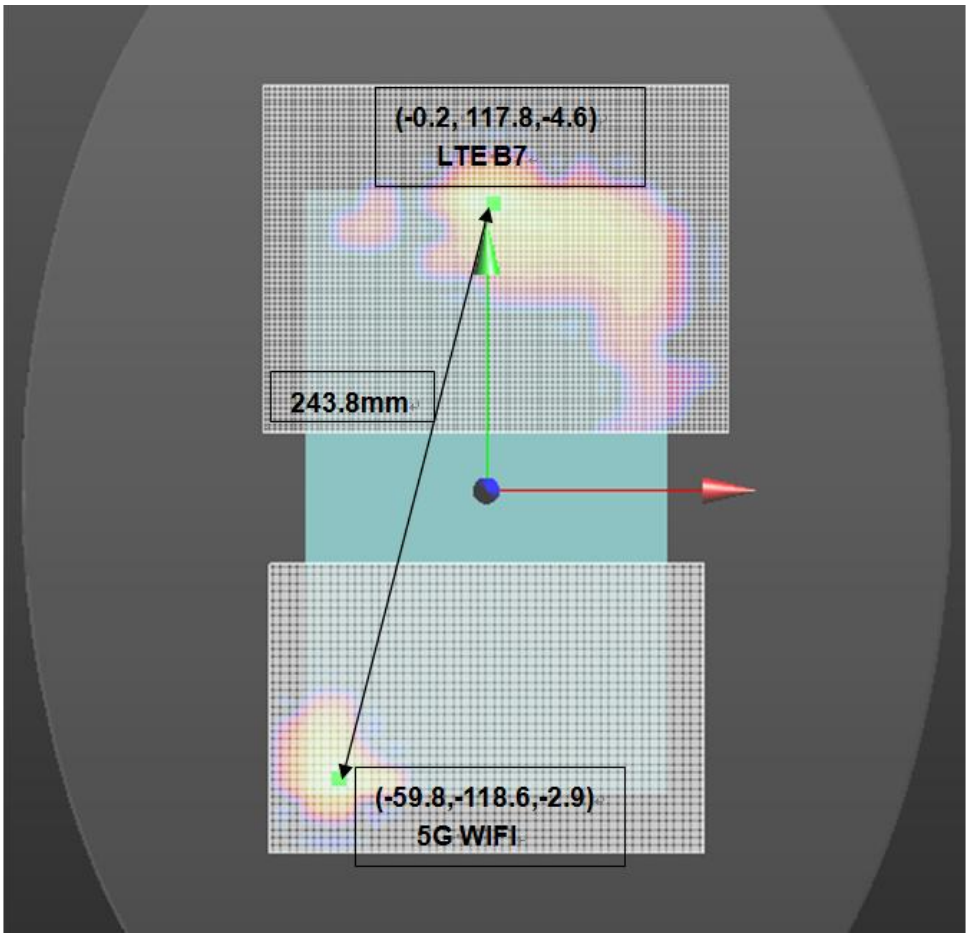
19) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B5(Sensor on) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B5 (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	0.544	1.195	246.6	0.009	0.04	Not required

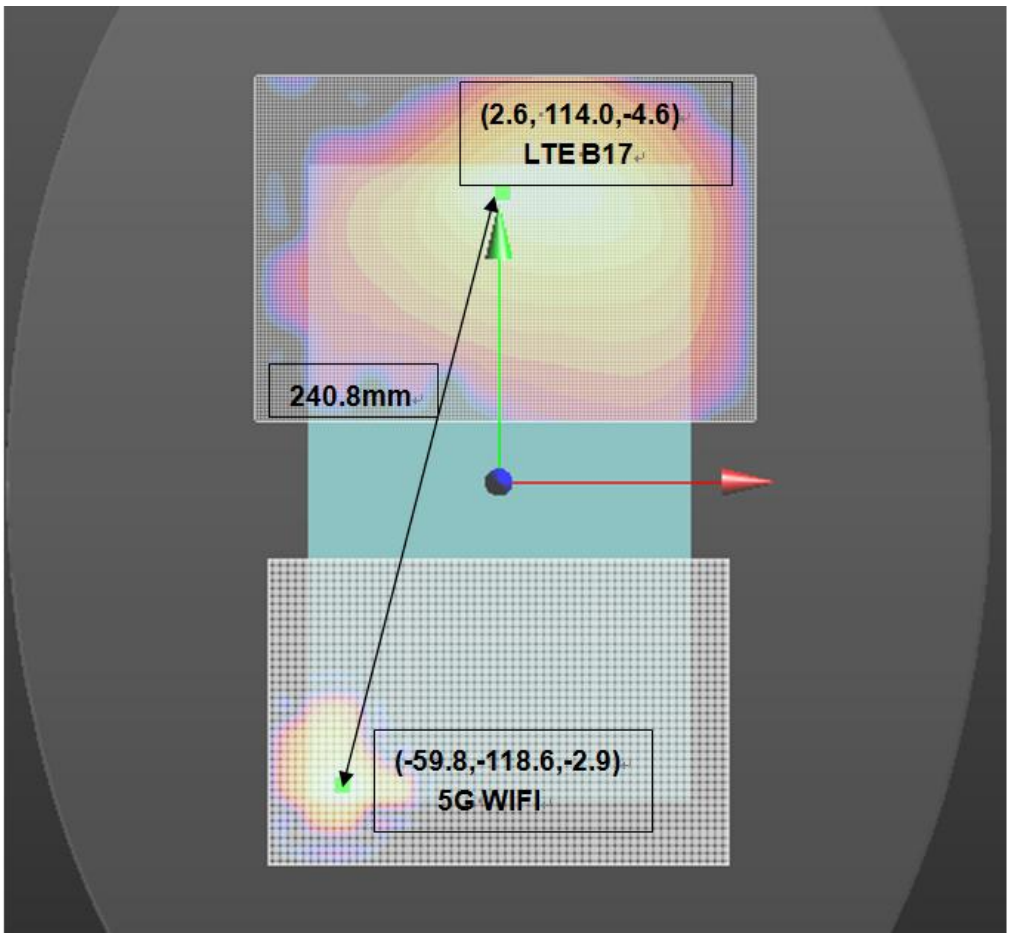
20) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B7(Sensor on) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B7 (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	1.007	1.195	243.8	0.018	0.04	Not required

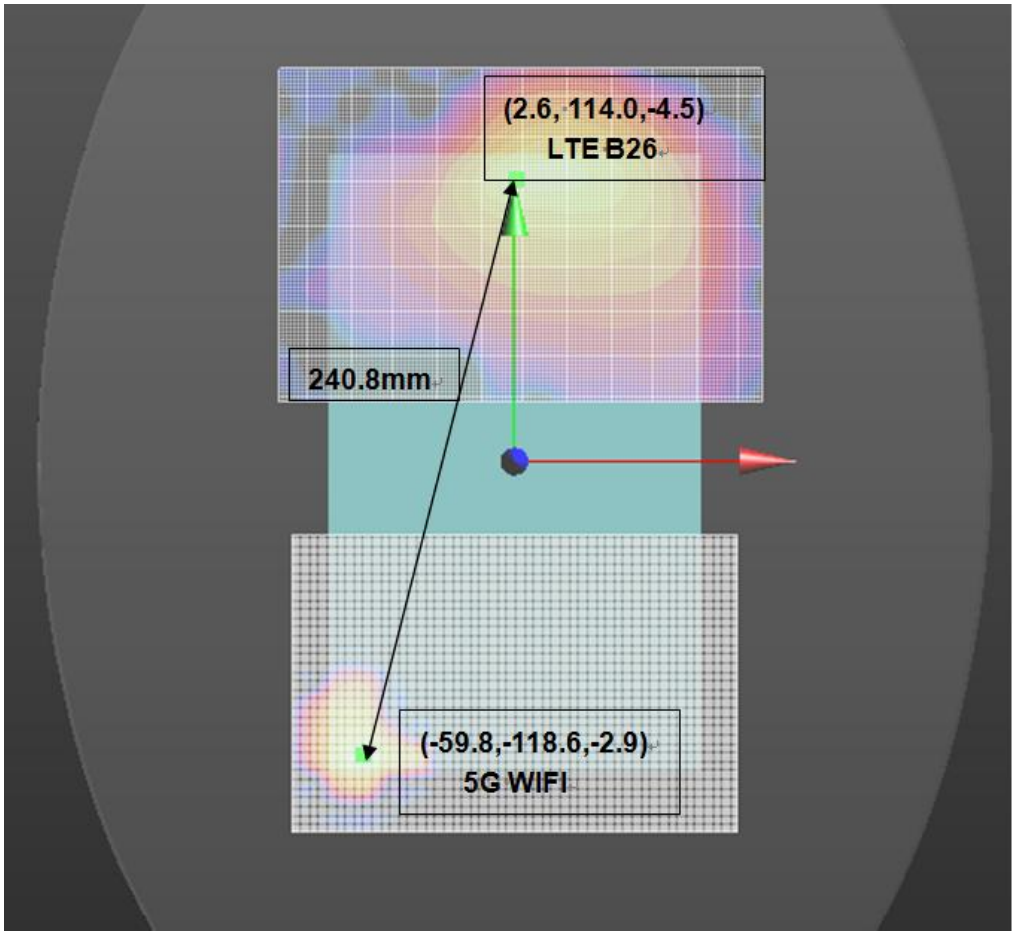
21) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B17(Sensor on) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B17 (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	1.415	1.195	240.8	0.018	0.04	Not required

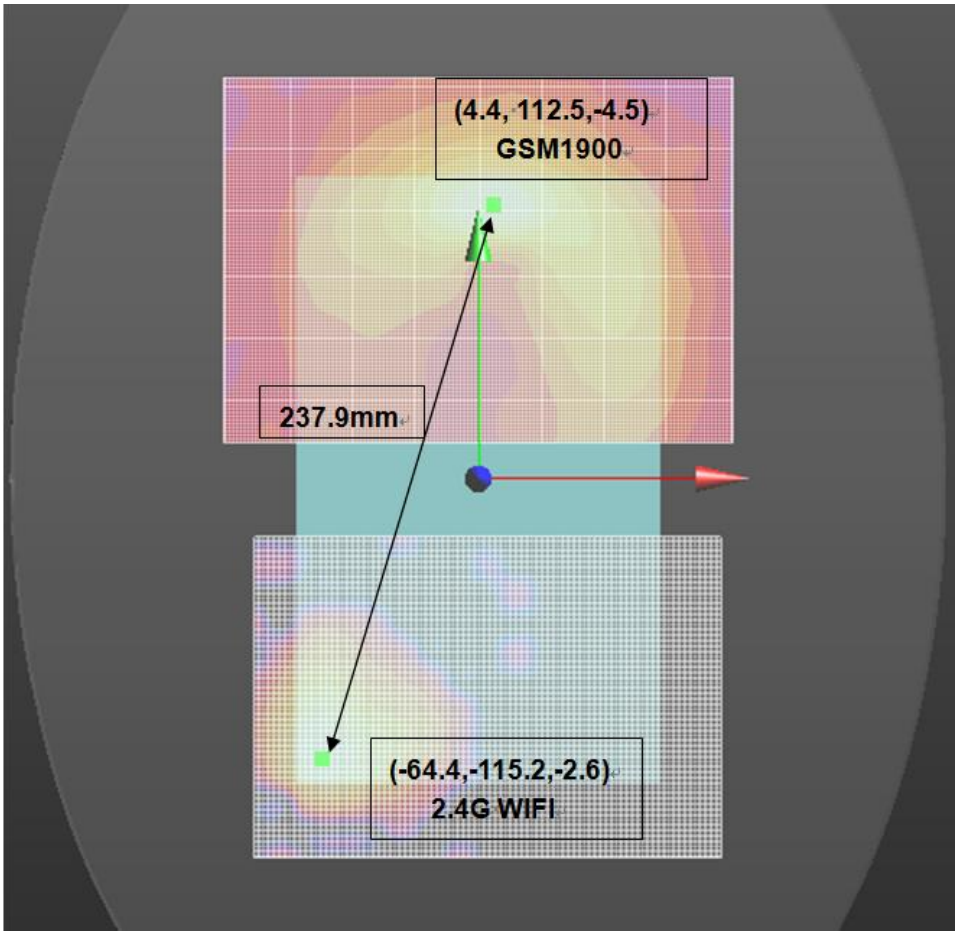
22) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B26(Sensor on) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B26 (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 0mm	0.779	1.195	240.8	0.012	0.04	Not required

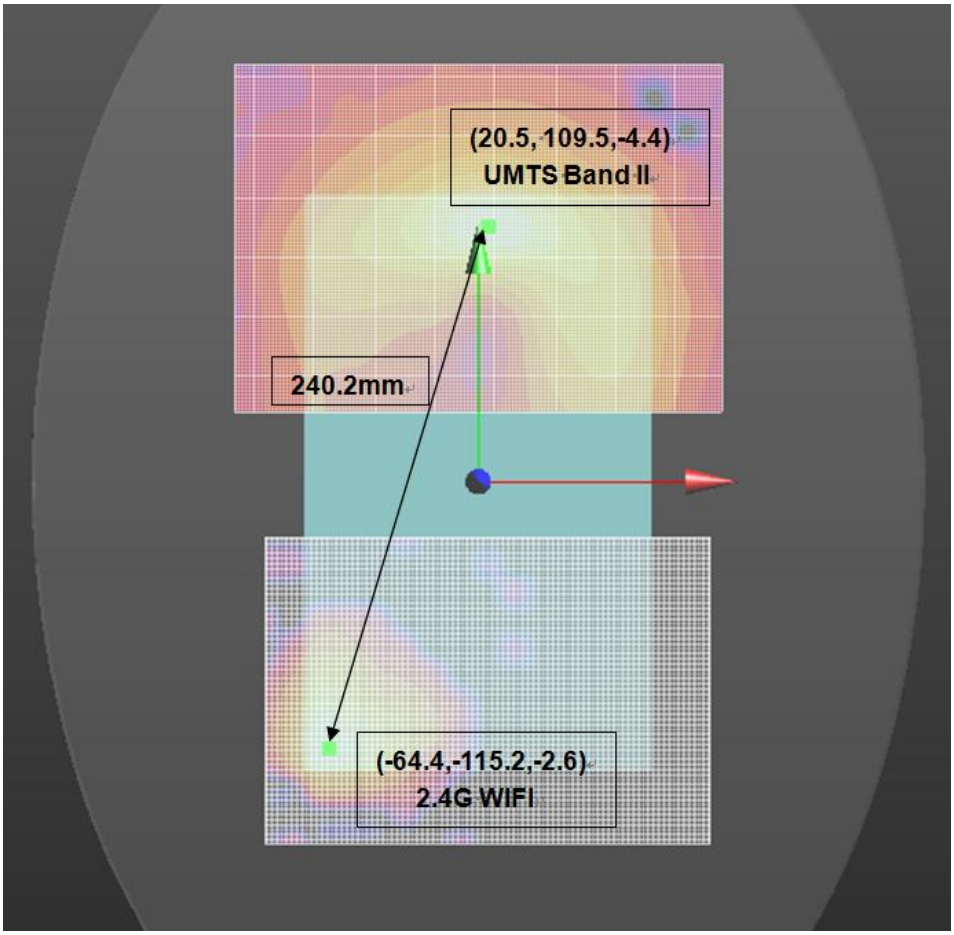
23) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with GSM1900(Sensor off) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	GSM1900 (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 16mm	0.905	<1.198	237.9	<0.013	0.04	Not required

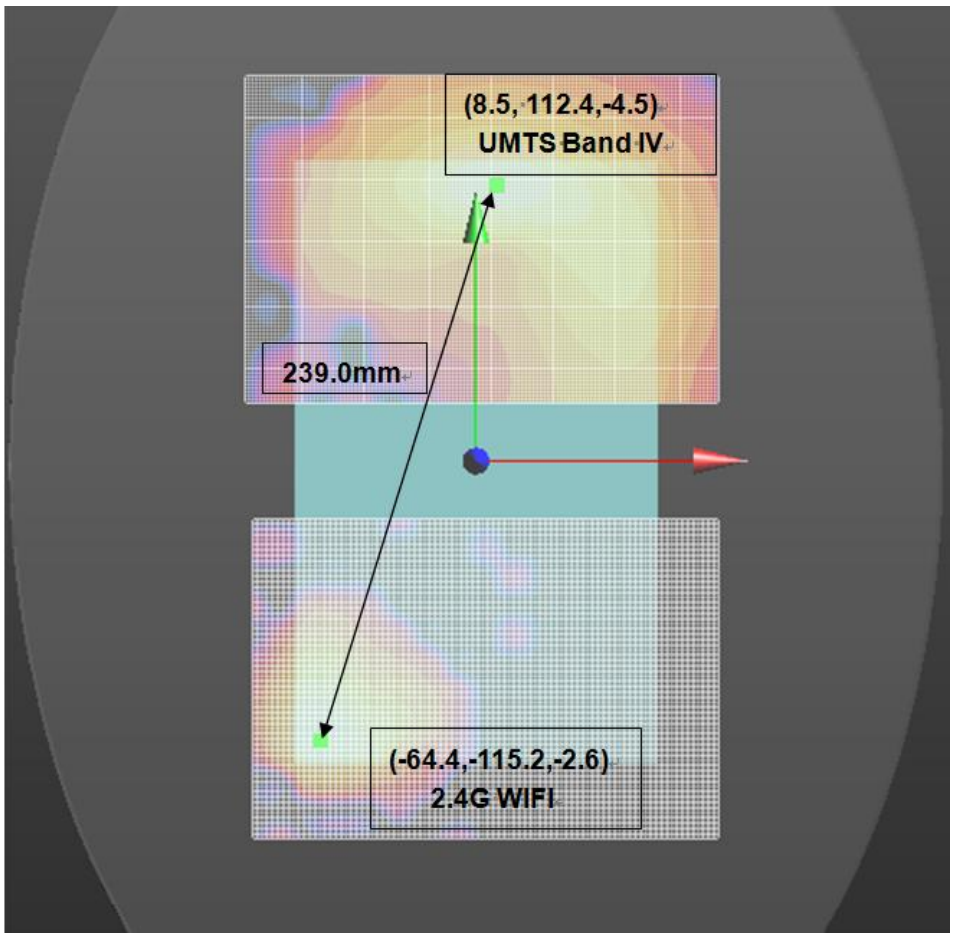
24) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band II(Sensor off) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	UMTS Band II (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 16mm	1.088	<1.198	240.2	<0.014	0.04	Not required

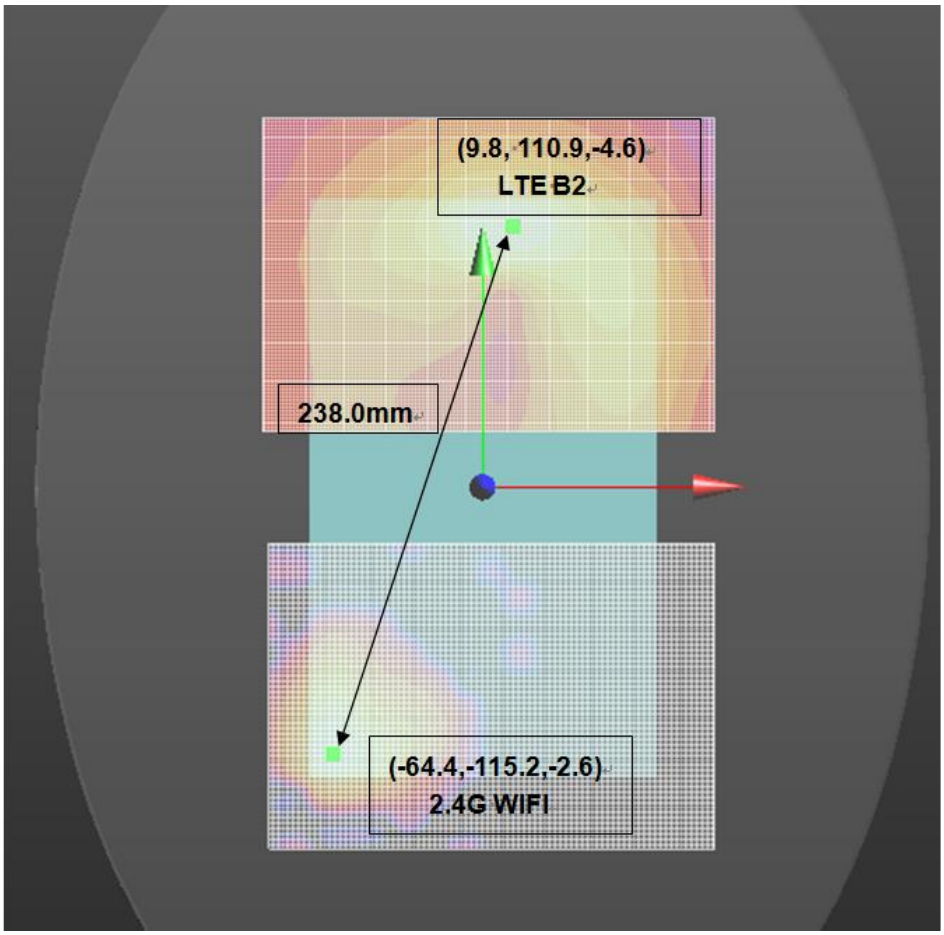
25) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band IV(Sensor off) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	UMTS Band IV (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 16mm	0.947	<1.198	239.0	<0.013	0.04	Not required

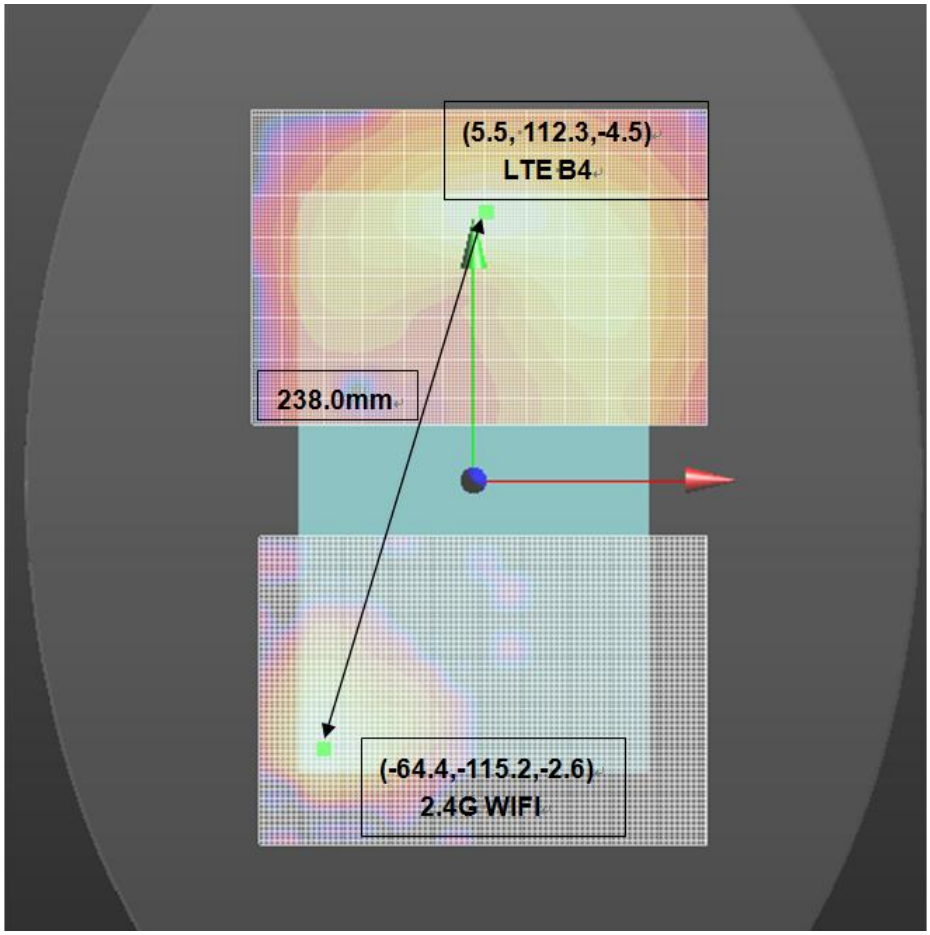
26) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B2(Sensor off) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B2 (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 16mm	1.268	<1.198	238.0	<0.016	0.04	Not required

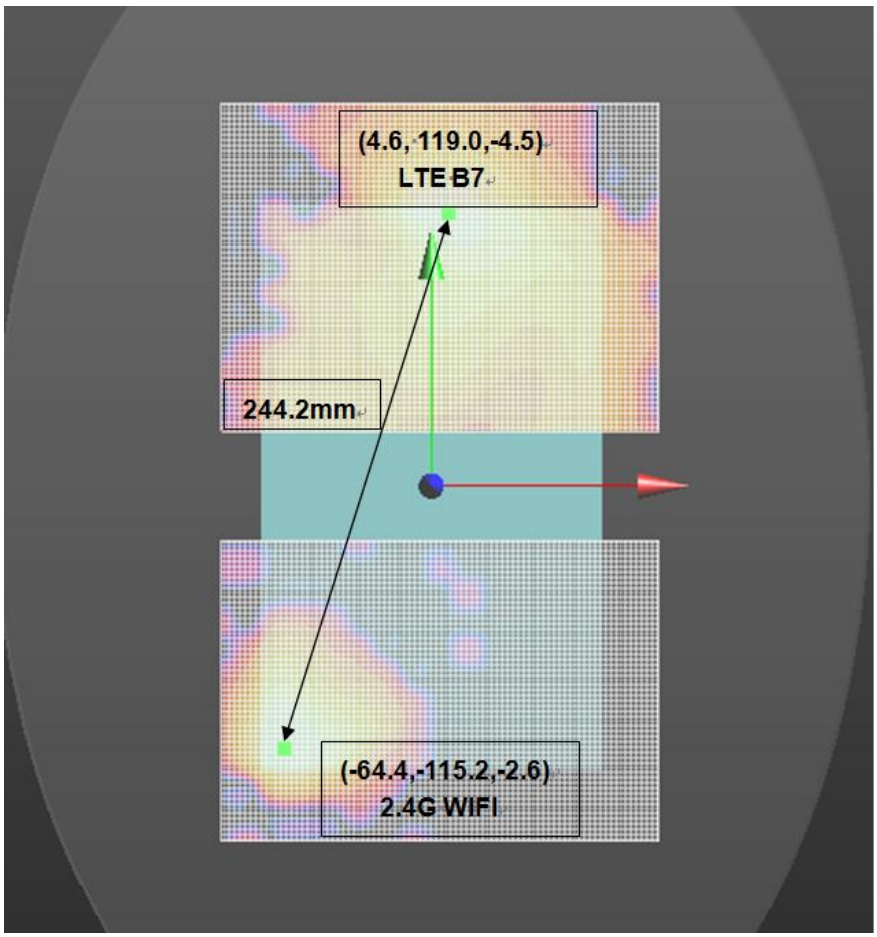
27) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B4(Sensor off) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B4 (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 16mm	0.961	<1.198	238.0	<0.013	0.04	Not required

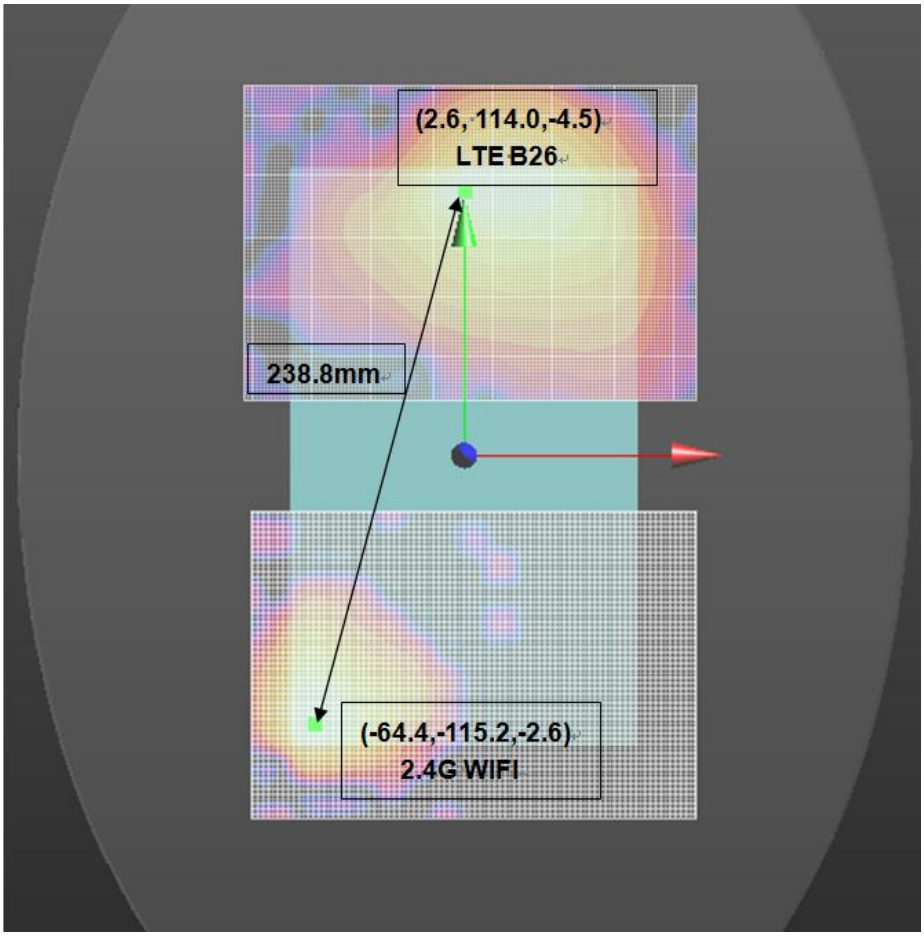
28) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B7(Sensor off) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B7 (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 16mm	0.755	<1.198	244.2	<0.011	0.04	Not required

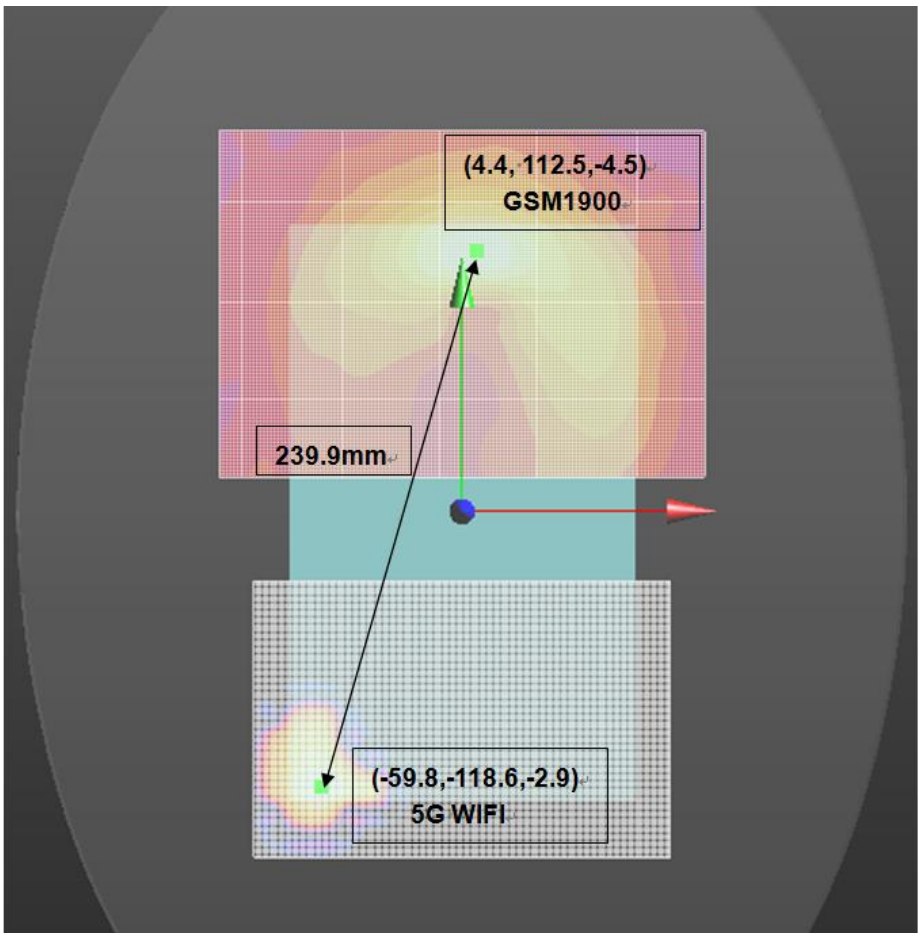
29) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B26(Sensor off) and WiFi 2.4G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B26 (W/kg)	WIFI 2.4G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 16mm	<0.779	<1.198	238.8	<0.012	0.04	Not required

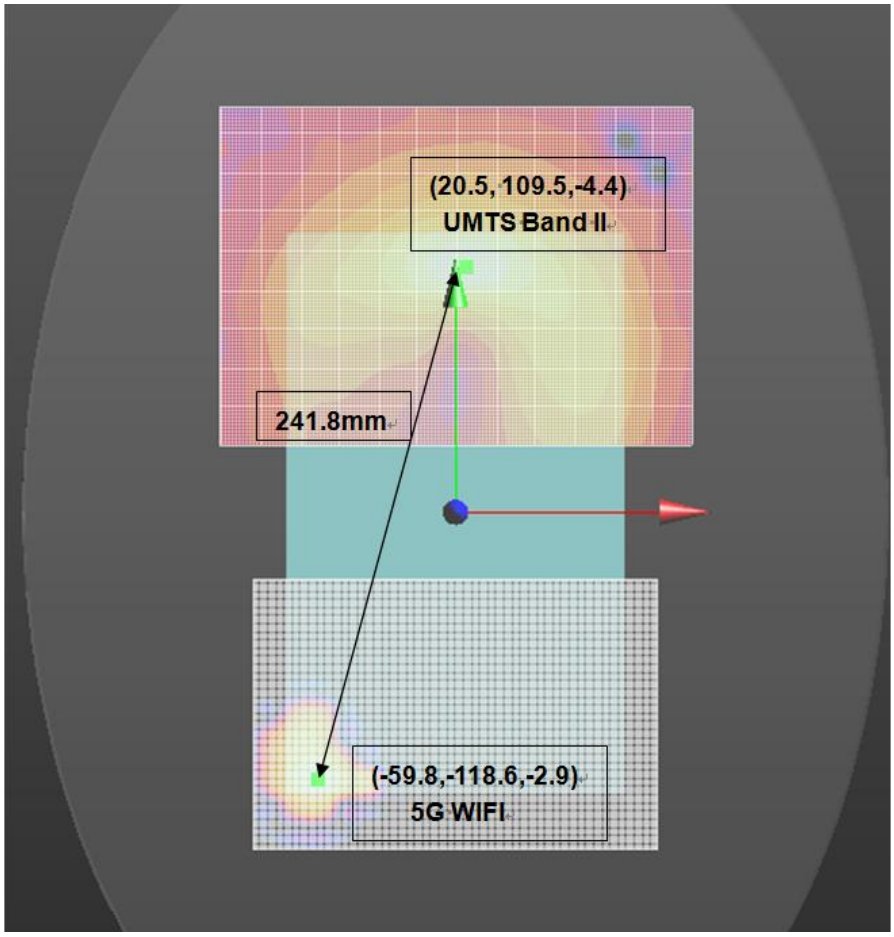
30) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with GSM1900(Sensor off) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	GSM1900 (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 16mm	0.905	<1.195	239.9	<0.013	0.04	Not required

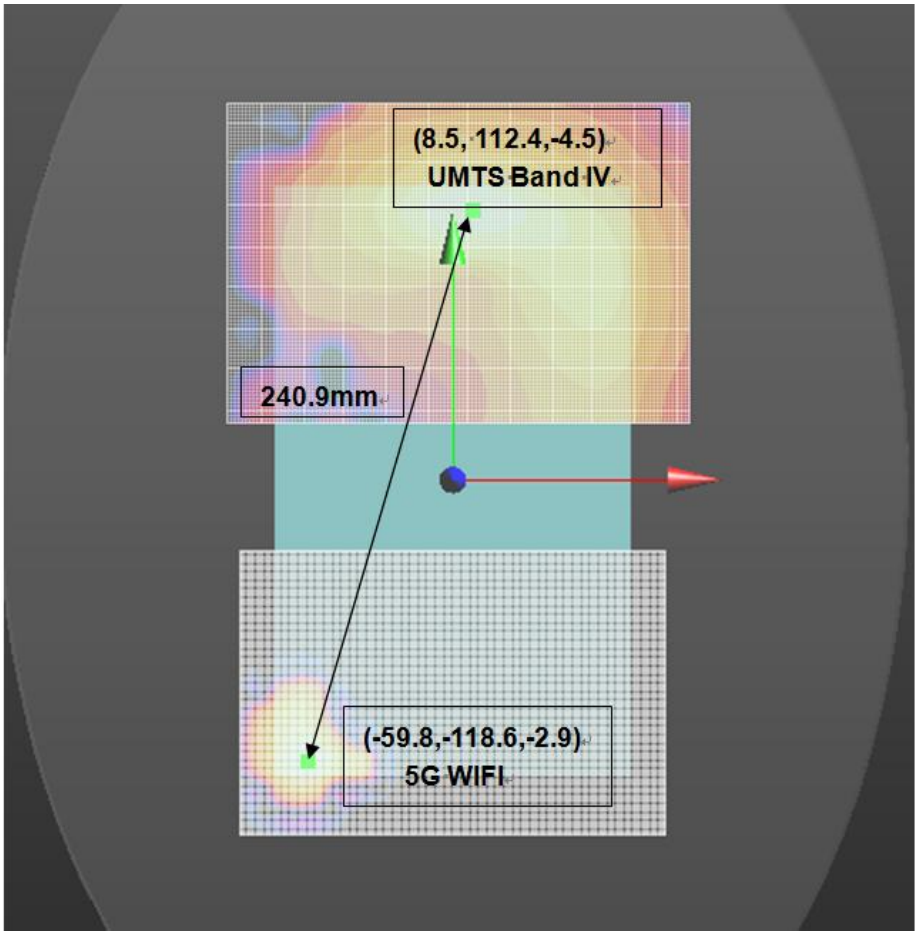
31) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band II(Sensor off) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	UMTS Band II (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 16mm	1.088	<1.195	241.8	<0.014	0.04	Not required

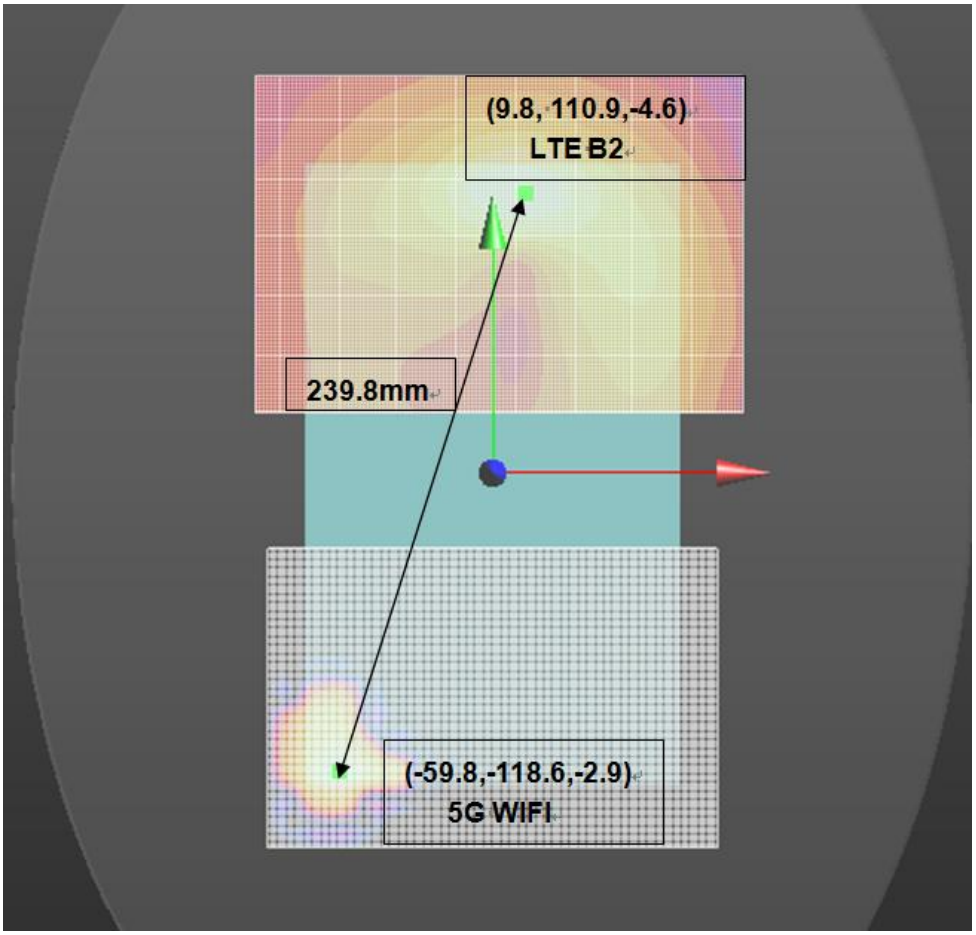
32) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band IV(Sensor off) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	UMTS Band IV (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 16mm	0.947	<1.195	240.9	<0.013	0.04	Not required

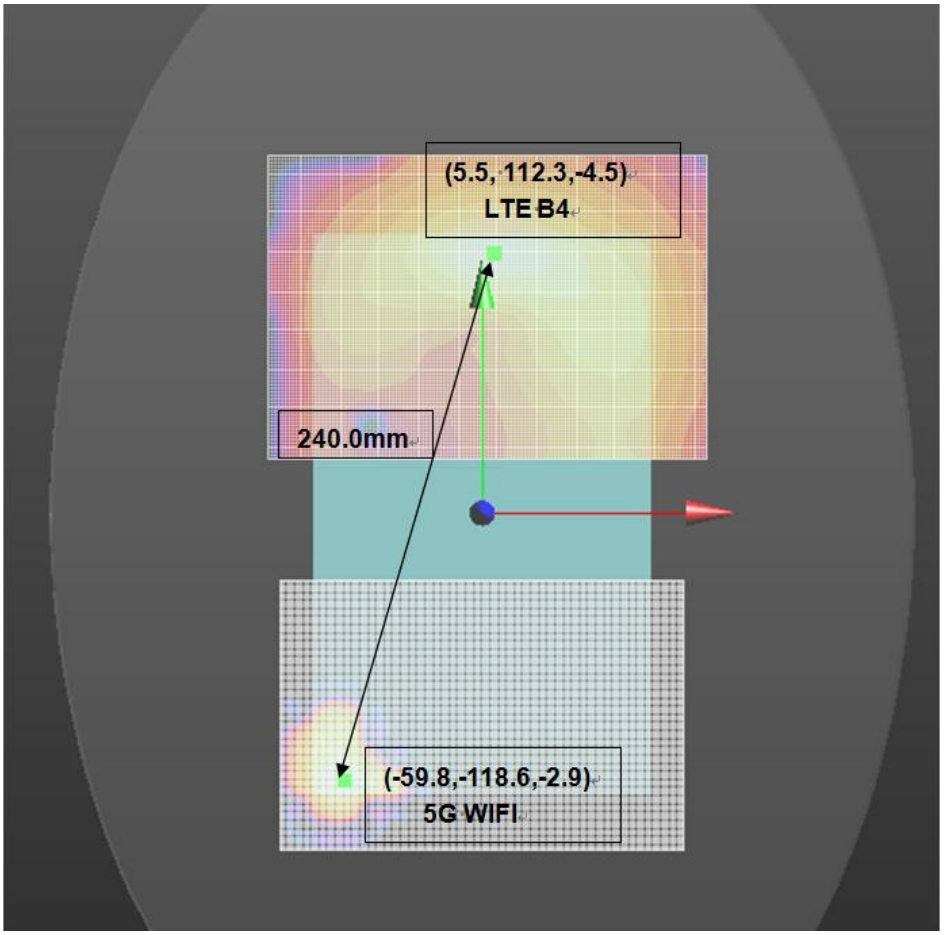
33) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B2(Sensor off) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B2 (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 16mm	1.268	<1.195	239.8	<0.016	0.04	Not required

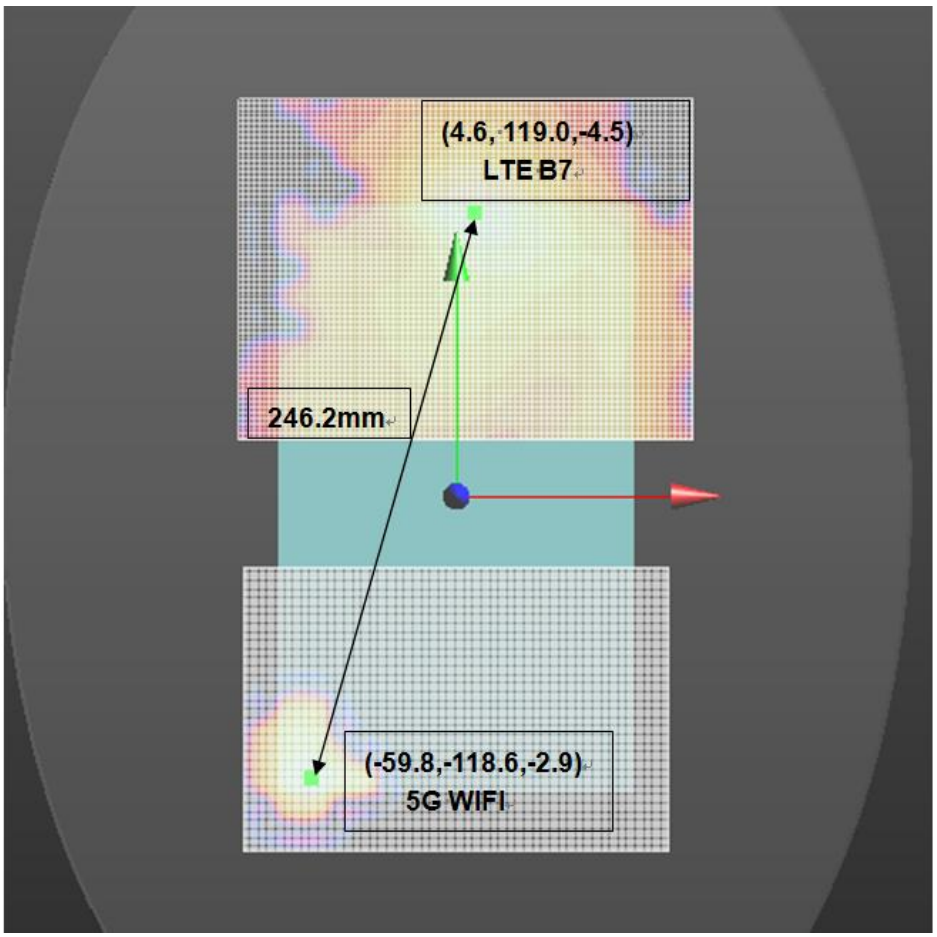
34) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B4(Sensor off) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B4 (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 16mm	0.961	<1.195	240.0	<0.013	0.04	Not required

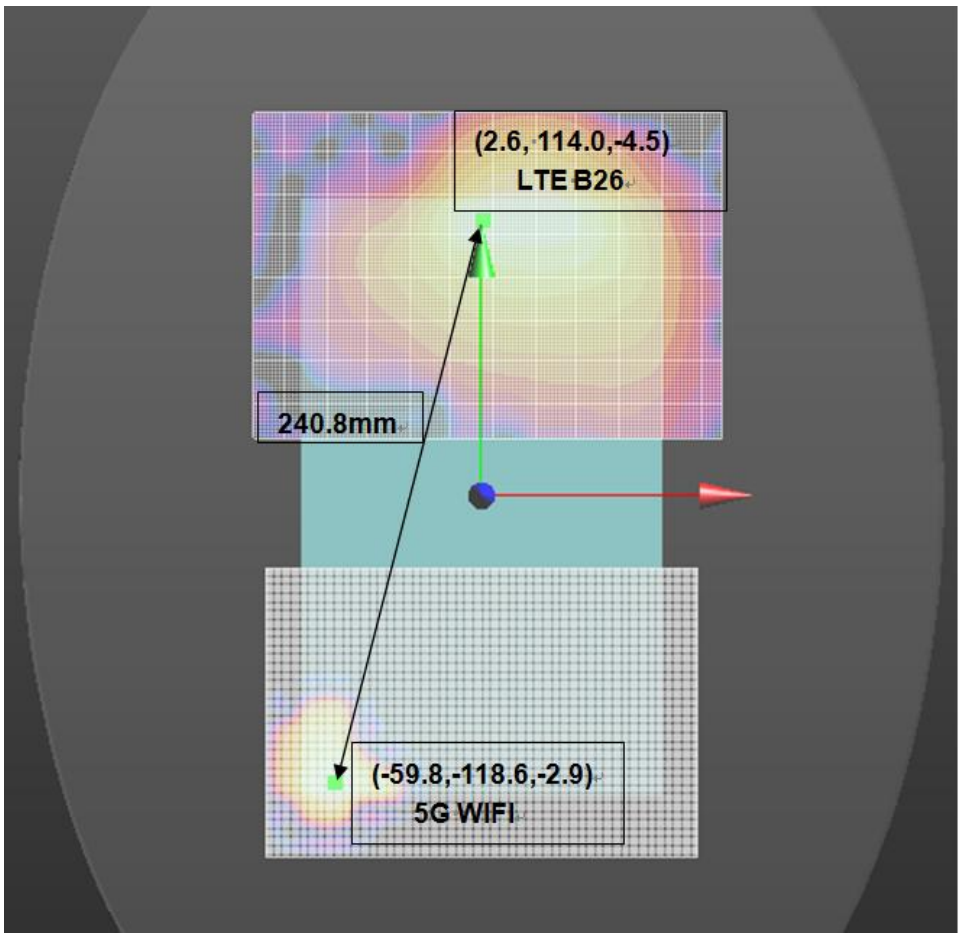
35) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B7(Sensor off) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B7 (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 16mm	0.755	<1.195	246.2	<0.011	0.04	Not required

36) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B26(Sensor off) and WiFi 5G.
The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

Test Position	LTE B26 (W/kg)	WIFI 5G (W/kg)	Ri(mm)	SPLSR	Ratio Limit	Simultaneous SAR
Back Side 16mm	<0.779	<1.195	240.8	<0.012	0.04	Not required

7.3.6 Simultaneous Transmission Conlcusion

The above numeral summed SAR results and/or SPLSR analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore simultaneous transmission SAR with Volume Scans is not required per KDB 447498 D01v06.

Appendix A. System Check Plots
(Pls See Appendix A.)

Appendix B. SAR Measurement Plots
(Pls See Appendix B.)

Appendix C. Calibration Certificate
(Pls See Appendix C.)

Appendix D. Photo documentation
(Pls See Appendix D.)

End