FCC SAR Compliance Test Report

Product Name:	Tablet
Model:	CMR-AL09
Report No.:	SYBH(Z-SAR) 003012018-2
FCC ID:	QISCMR-AL09

	APPROVED (Lab Manager)	PREPARED (Test Engineer)
BY	Wei Huanbin	Cao Ting
DATE	2018-01-24	2018-01-24

Reliability Laboratory of Huawei Technologies Co., Ltd.

(Global Compliance and Testing Center of Huawei Technologies Co., Ltd)

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
Tel: +86 755 28780808 Fax: +86 755 89652518

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2. The laboratory has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01 & 2174.02 & 2174.03

3. The laboratory (Reliability Lab of Huawei Technologies Co., Ltd) is also named “Global Compliance and Testing Center of Huawei Technologies Co., Ltd”, the both names have coexisted since 2009.

4. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

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※ ※ Modified History ※ ※

REV.	DESCRIPTION	ISSUED DATE	REMARK
Rev.1.0	Initial Test Report Release	2018-01-24	Cao Ting

1 General Information

1.1 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for CMR-AL09 are as below Table 1.

Band	1-g Max Reported SAR(W/kg)
	Body
GSM850	0.48
GSM1900	**0.92**
UMTS Band 5	0.57
UMTS Band 2	0.68
LTE Band 4	0.52
LTE Band 5	0.73
LTE Band 7	0.78
LTE Band 12	0.52
LTE Band 17	0.60
LTE Band 26	0.70
LTE Band 38	0.43
LTE Band 41	0.63
WiFi 2.4G	0.28
WiFi 5G	0.43
BT	0.20
The highest reported SAR for Body and Simultaneous transmission exposure conditions are 0.92W/kg and 1.54W/kg	

Table 1:Summary of test result

Note:

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

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 C95.1:1992/IEEE C95.1:1991, the NCRP Report Number 86 for uncontrolled environment, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013.

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:	Tablet		
Model:	CMR-AL09		
FCC ID :	QISCMR-AL09		
SN:	1#:CMR0117A20000221 2#:CMR0117A20000257 3#:CMR0117A20000195 4#:CMR0117A20000152 5#:BXY0117A16000027		
Device Type :	Portable device		
Device Phase:	Identical Prototype		
Exposure Category:	Uncontrolled environment / general population		
Hardware Version :	SH1CMRONLM		
Software Version :	CMR-AL09 8.0.1.3(SP1C331)		
Antenna Type :	Internal antenna		
Others Accessories	Protected Cover (Non-metallic)		
Device Operating Configurations:			
Supporting Mode(s)	GSM850/1900, UMTS Band 2/5, LTE Band 4/5/7/12/17/26/38/41, WiFi 2.4G/5G;BT		
Test Modulation	GSM(GMSK/8PSK),UMTS(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 2	1850-1910	1930-1990
	UMTS Band 5	824-849	869-894
	LTE Band 4	1710-1755	2110-2155
	LTE Band 5	824-849	869-894
	LTE Band 7	2500-2570	2620-2690
	LTE Band 12	699-716	729-746
	LTE Band 17	704-716	734-746
	LTE Band 26	814-849	859-894
	LTE Band 38	2570-2620	2570-2620
	LTE Band 41	2545-2655	2545-2655
	BT	2402-2480	
	WiFi 2.4G	2412-2462	
	WiFi 5G	5150-5350 5470-5850	
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 2)
	3, tested with power control “all 1”(UMTS Band 5)
	3, tested with power control all Max.(LTE Band 4)
	3, tested with power control all Max.(LTE Band 5)
	3, tested with power control all Max.(LTE Band 7)
	3, tested with power control all Max.(LTE Band 12)
	3, tested with power control all Max.(LTE Band 17)
	3, tested with power control all Max.(LTE Band 26)
	3, tested with power control all Max.(LTE Band 38)
	3, tested with power control all Max.(LTE Band 41)
Test Channels (low-mid-high):	128-190-251(GSM850)
	512-661-810(GSM1900)
	9262-9400-9538(UMTS Band 2)
	4132-4182-4233(UMTS Band 5)
	19957-20175-20393(LTE Band 4 BW=1.4MHz)
	19965-20175-20385(LTE Band 4 BW=3MHz)
	19975-20175-20375(LTE Band 4 BW=5MHz)
	20000-20175-20350 (LTE Band 4 BW=10MHz)
	20025-20175-20325 (LTE Band 4 BW=15MHz)
	20050-20175-20300(LTE Band 4 BW=20MHz)
	20407-20525-20643(LTE Band 5 BW=1.4MHz)
	20415-20525-20635(LTE Band 5 BW=3MHz)
	20425-20525-20625(LTE Band 5 BW=5MHz)
	20450-20525-20600(LTE Band 5 BW=10MHz)
	20775-21100-21425(LTE Band 7 BW=5MHz)
	20800-21100-21400(LTE Band 7 BW=10MHz)
	20825-21100-21375(LTE Band 7 BW=15MHz)
	20850-21100-21350 (LTE Band 7 BW=20MHz)
	23017-23095-23173(Band 12 BW=1.4MHz)
	23025-23095-23165(Band 12 BW=3MHz)
	23035-23095-23155(Band 12 BW=5MHz)
	23060-23095-23130(Band 12 BW=10MHz)
	23755-23790-23825(Band 17 BW=5MHz)
	23780-23790-23800(Band 17 BW=10MHz)
	26697-26865-27033(Band 26 BW=1.4MHz)
	26705-26865-27025(Band 26 BW=3MHz)
	26715-26865-27015(Band 26 BW=5MHz)
	26750-26865-26990(Band 26 BW=10MHz)
	26775-26865-26965(Band 26 BW=15MHz)
	37775-38000-38225(Band 38 BW=5MHz)
	37800-38000-38200(Band 38 BW=10MHz)
	37825-38000-38175(Band 38 BW=15MHz)
	37850-38000-38150(Band 38 BW=20MHz)
	40165-40515-40865-41215(Band 41 BW=5MHz)
	40190-40520-40850-41190(Band 41 BW=10MHz)
	40215-40535-40855-41165(Band 41 BW=15MHz)
	40240-40540-40840-41140(Band 41 BW=20MHz)

Test Channels (low-mid-high):	802.11b/g/n 20M:1-6-11 802.11n 40M:3-6-9(WiFi 2.4G)
	802.11a/n/ac 20M: 36-40-44-48-52-56-60-64-100-104-108-112-116-120-124-128-132-136-140-149-153-157-161-165 802.11 n/ac 40M: 38-46-54-62-102-110-118-126-134-151-159 802.11ac 80M: 42-58-106-122-138-155(WiFi 5G)
	BT: 0-19-39-78

Table 3:Device information and operating configuration

1.3.1 General Description

CMR-AL09 run on Huawei's latest EMUI 8.0 system based on Google Android Oreo (8.0) system, providing easy access to Huawei Cloud services.

Name	Manufacture	Description
Li-ion	SCUD (FUJIAN) Electronics Co., Ltd	Battery Model: HB2994I8ECW Rated capacity: 7350 mAh Nominal Voltage: +3.82V Charging Voltage: +4.4V
Li-ion	Sunwoda Electronic Co., LTD.	Battery Model: HB2994I8ECW Rated capacity: 7350 mAh Nominal Voltage: +3.82V Charging Voltage: +4.4V
Li-ion	Huizhou Desay Battery Co., Ltd	Battery Model: HB2994I8ECW Rated capacity: 7350 mAh Nominal Voltage: +3.82V Charging Voltage: +4.4V

Difference description

The differences between CMR-AL19 and CMR-AL09 are showed in the following table. Other parts of the Tablet are the same, including the antenna, Chipset, Bluetooth mode, Wifi mode, Adapter, Battery, Mainboard and so on.

Model (FCC)	CMR-AL19	CMR-AL09
GSM Band 2/5	the same	the same
WCDMA Band 2/5	the same	the same
LTE B4/B5/B7/B12/B17/B26 /B38/B41（2545-2655MHz）	the same	the same
WIFI 2.4G/5G&BT&GPS	the same	the same
SIM card (Singal)	the same	the same
Rear camera	the same	the same
Front camera	the same	the same
FLASH	the same	the same
Mainboard	the same	the same
PCB layout	the same	the same
Appearance	the same	the same
Bluetooth mode	the same	the same
WLAN mode	the same	the same
BT/ WLAN antenna	the same	the same
GSM/ WCDMA /LTE antenna	the same	the same
Adapter	the same	the same
Battery	the same	the same
WIFI/BT/GPS Chipset	the same	the same
Main Chipset	the same	the same
RF Parameter	The same	The same
Dimension	the same	the same
Memory	4GB+64GB	4GB+64GB ;4GB+32GB
Touch Panel	Support Active Pen	Not support Active Pen

Note:According to the difference description above, for each same band, CMR-AL09 is tested at the SAR worst case of CMR-AL19(Report NO.: SYBH(Z-SAR)008122017-2).

1.3.2 TDD LTE additional specification

The device supports TDD LTE bands. According to KDB 941225 D05 SAR for LTE Devices, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.
For this device, TDD LTE SAR should be tested with the highest transmission duty factor (63.33%) , which using Uplink-downlink configuration 0.The detailed TDD LTE test configuration description are provided in Section 6.5 of this report.

1.3.3 Power reduction specification

This device uses a mobile country code (MCC) detection and proximity sensor mechanism that share the same metallic electrode as the transmitting antenna to facilitate triggering in typical user interactivity with the device. This device uses the mobile country code (MCC) to indicate whether the users in FCC countries or not. It utilizes the proximity sensor to reduce the output power in specific wireless and operating modes to ensure SAR compliance when the MCC information accomplished by operator network is in FCC countries and the DUT is held close to a user's body exposure condition with sensor on.

The following tables summarize the key power reduction information. The detailed full power and reduced conducted power measurement results are provided in Section 6.7 and section 7 of this report per KDB 616217:

Band	Power Reduction amount(dB)	
	Sensor off (Full power level)	Sensor on,MCC of FCC countries (Reduced power level)
GSM850	0	9
GSM1900	0	10
UMTS Band 5	0	6
UMTS Band 2	0	10
LTE Band 4	0	10
LTE Band 5	0	6
LTE Band 7	0	15
LTE Band 12	0	8
LTE Band 17	0	7
LTE Band 26	0	7
LTE Band 38	0	12
LTE Band 41	0	13
WiFi 2.4G 11b	0	8
WiFi 2.4G 11g	0	3
WiFi 2.4G 11n(20M)	0	2
WiFi 5G 11a(20M) (U-NII-1 & U-NII-2A)	0	12
WiFi 5G 11a(20M) (U-NII-2C & U-NII-3)	0	13
WiFi 5G 11n(20M) (U-NII-1 & U-NII-2A)	0	11
WiFi 5G 11n(20M) (U-NII-2C & U-NII-3)	0	12
WiFi 5G 11n(40M) (U-NII-1 & U-NII-2A)	0	9
WiFi 5G 11n(40M) (U-NII-2C & U-NII-3)	0	10
WiFi 5G 11ac(20M) (U-NII-1 & U-NII-2A)	0	11
WiFi 5G 11ac(20M) (U-NII-2C & U-NII-3)	0	12
WiFi 5G 11ac(40M) (U-NII-1 & U-NII-2A)	0	9
WiFi 5G 11ac(40M) (U-NII-2C & U-NII-3)	0	10
WiFi 5G 11ac(80M) (U-NII-1 & U-NII-2A)	0	8
WiFi 5G 11ac(80M) (U-NII-2C & U-NII-3)	0	9

1.3.4 Downlink LTE CA specification

The device supports downlink Release 10 LTE Carrier Aggregation (CA) only. It supports a maximum of 2 carriers in the downlink. Other Release 10 features are not supported, including Uplink Carrier Aggregation, Enhanced SC-FDMA and Uplink MIMO or other antenna diversity configurations etc. All uplink communications are identical to the Release 8 Specifications.

The possible downlink LTE CA combinations supported by this device are as below tables per 3GPP TS 36.101 V12.13.0. The conducted power measurement results of downlink LTE CA are provided in Section 7 of this report per 3GPP TS 36.521-1 V12.8.0. According to KDB 941225 D05A, the downlink LTE CA SAR test is not required and PAG requirements can be excluded.

intra-band contiguous CA (per 3GPP TS 36.101 V12.8.0 Table 5.6A.1-1)

E-UTRA CA configuration / Bandwidth combination set						
E-UTRA CA configuration	Uplink CA configurations (NOTE 3)	Component carriers in order of increasing carrier frequency			Maximum aggregated bandwidth [MHz]	Bandwidth combination set
		Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]		
CA_5B	NA	5,10	10		20	0
		10	5			
CA_7C	NA	15	15		40	0
		20	20			
		10	20		40	1
		15	15, 20			
		20	10, 15, 20			
		15	10,15		40	2
		20	15,20			
CA_12B	NA	5	5,10		15	0
CA_38C	NA	15	15		40	0
		20	20			
CA_41C	NA	10	20		40	0
		15	15, 20			
		20	10, 15, 20			
		5, 10	20		40	1
		15	15, 20			
		20	5, 10, 15, 20			
		10	15, 20		40	2
		15	10, 15, 20			
		20	10, 15, 20			
		10	20		40	3
		20	20			

NOTE 1: The CA configuration refers to an operating band and a CA bandwidth class specified in Table 5.6A-1 (the indexing letter). Absence of a CA bandwidth class for an operating band implies support of all classes.

NOTE 2: For the supported CC bandwidth combinations, the CC downlink and uplink bandwidths are equal.

inter-band CA (per 3GPP TS 36.101 V12.8.0 Table 5.6A.1-2)

E-UTRA CA configuration / Bandwidth combination set									
E-UTRA CA Configuration	E-UTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum aggregated bandwidth [MHz]	Bandwidth combination set
CA_5A-7A	5	Yes	Yes	Yes	Yes			30	0
	7				Yes	Yes	Yes		
NOTE 1:The CA Configuration refers to a combination of an operating band and a CA bandwidth class specified in Table 5.4.2A-1 (the indexing letter). Absence of a CA bandwidth class for an operating band implies support of all classes. NOTE 2:For each band combination, all combinations of indicated bandwidths belong to the set NOTE 3:For the supported CC bandwidth combinations, the CC downlink and uplink bandwidths are equal									

Note:
1) All the listed bands above can be used as PCC or SCC.
2) The channel spacing and aggregated channel bandwidth for CA are identical to the associated specification in 3GPP TS 36.101 V12.13.0.
3) The reference test frequencies for CA refers to 3GPP TS 36.508 V12.10.0

1.4 Test specification(s)

ANSI C95.1:1992 /IEEE C95.1:1991	Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.
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
KDB941225 D01	3G SAR Procedures v03r01
KDB941225 D05	SAR for LTE Devices v02r05
KDB941225 D05A	LTE Rel.10 KDB Inquiry Sheet v01r02
KDB447498 D01	General RF Exposure Guidance v06
KDB648474 D04	Handsets SAR v01r03
KDB248227 D01	SAR Guidance for IEEE 802 11 Wi-Fi SAR v02r02
KDB865664 D01	SAR measurement 100 MHz to 6 GHz v01r04
KDB865664 D02	RF Exposure Reporting v01r02
KDB690783 D01	SAR Listings on Grants v01r03
KDB616217 D04	SAR for laptop and tablets v01r02

1.5 Testing laboratory

Test Site	The Reliability Laboratory of Huawei Technologies Co., Ltd.
Test Location	Section G1,Huawei Base Bantian, Longgang District, Shenzhen 518129, P.R. 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 & 2174.02 & 2174.03

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

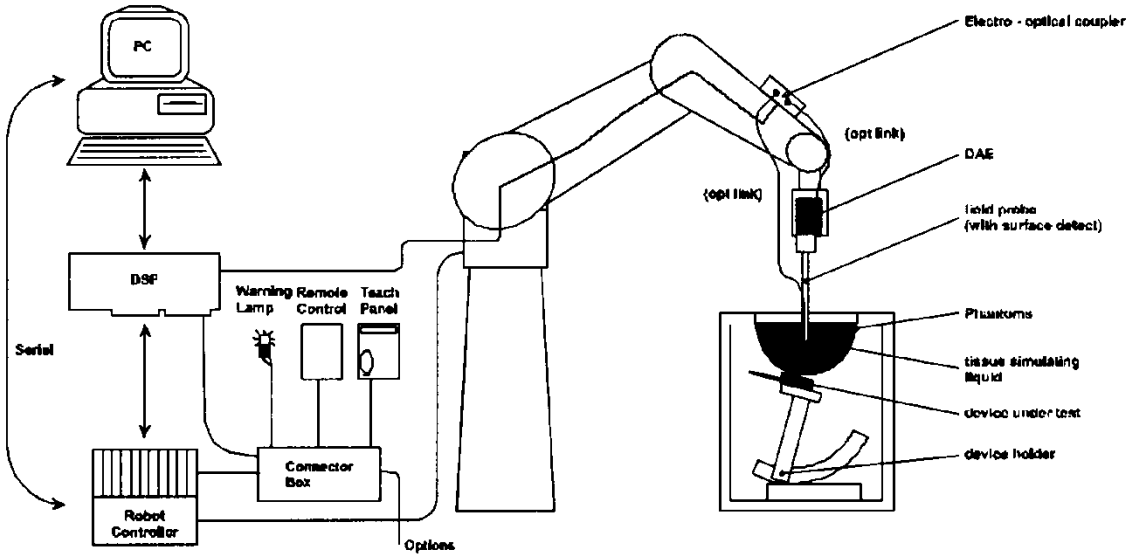
Start Date of test	2017-12-20
End Date of test	2018-01-05

1.8 Ambient Condition

Ambient temperature	18°C – 25°C
Relative Humidity	30% – 70%

2 SAR Measurement System

2.1 SAR Measurement Set-up



The DASY 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 DASY measurement server.
- The DASY 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.
- DASY 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 DASY 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

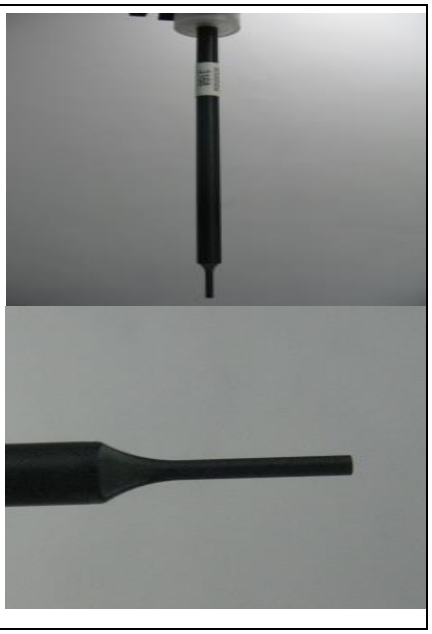
Input Impedance	200MOhm	
The Inputs	symmetrical and floating	
Common mode rejection	above 80 dB	

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.

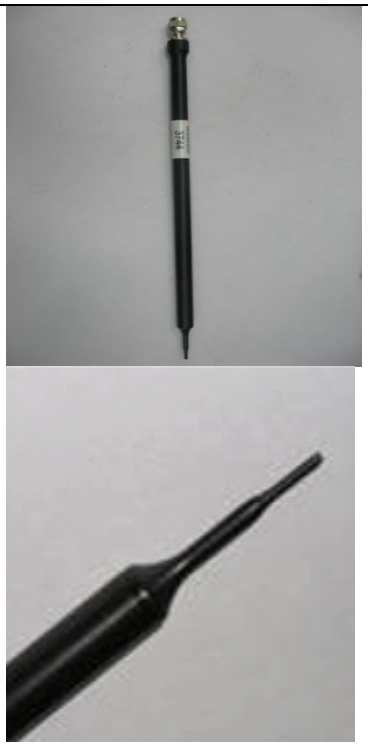
Isotropic E-Field Probe ES3DV3 for Dosimetric Measurements

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%

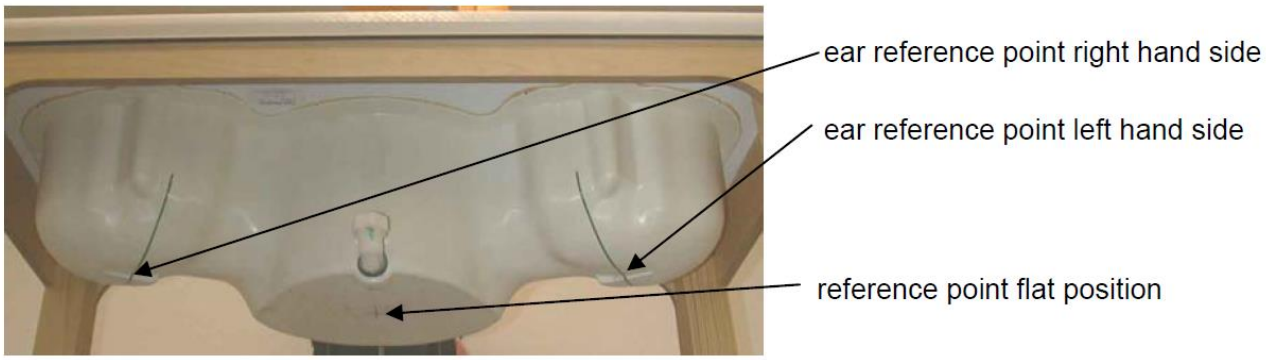


2.5 Phantom description

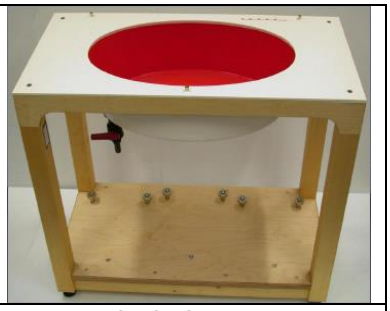
SAM Twin Phantom

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 DASY 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	7381	2017-10-24	One year
☒	SPEAG	Dosimetric E-Field Probe	EX3DV4	3743	2017-11-23	One year
☒	SPEAG	Data acquisition electronics	DAE4	1492	2017-09-25	One year
☒	SPEAG	Data acquisition electronics	DAE4	1235	2017-11-16	One year
☒	SPEAG	750 MHz Dipole	D705V3	1044	2017-09-21	Three years
☒	SPEAG	835 MHz Dipole	D835V2	4d126	2015-07-23	Three years
☒	SPEAG	1750 MHz Dipole	D1750V2	1145	2016-02-02	Three years
☒	SPEAG	1900 MHz Dipole	D1900V2	5d091	2015-09-21	Three years
☒	SPEAG	2450 MHz Dipole	D2450V2	978	2016-02-08	Three years
☒	SPEAG	2600 MHz Dipole	D2600V2	1119	2016-02-03	Three years
☒	SPEAG	5 GHz Dipole	D5GHzV2	1155	2017-04-26	Three years
☒	SPEAG	Software	DASY 5	N/A	NCR	NCR
☒	SPEAG	Twin Phantom	SAM6	TP-1892	NCR	NCR
☒	SPEAG	Flat Phantom	ELI 4.0	TP-1110	NCR	NCR
☒	R & S	Universal Radio Communication Tester	CMU 200	113989	2017-05-21	One year
☒	R & S	Universal Radio Communication Tester	CMW 500	158850	2017-06-13	One year
☒	Agilent	Wireless Connectivity Test Set	N4010A	MY49081592	2017-07-31	One year
☒	Agilent	Signal Analyzer	N9030A	MY49431698	2017-07-31	One year
☒	Agilent	Network Analyser	E5071C	MY46109355	2017-01-25	One year
☒	Agilent	Dielectric Probe Kit	85070E	2484	NCR	NCR
☒	Agilent	Signal Generator	E8257D	MY49281095	2017-02-15	One year
☒	MINI-CIRCUITS	Amplifier	ZHL-42W	QA1402001	NCR	NCR
☒	AR	Directional Coupler	DC7144AM1	0423264	2017-04-12	One year
☒	SHX	Directional Coupler	DDTO-4-20	07122401	2017-08-07	One year
☒	MINI-CIRCUITS	Amplifier	ZVE-8G+	N523101139	NCR	NCR
☒	Agilent	Dual Directional Coupler	772D	MY52180173	2017-01-03	One year
☒	Agilent	Power Meter	E4417A	MY54100027	2017-04-10	One year
☒	Agilent	Power Meter Sensor	E9321A	MY54130007	2017-04-10	One year
☒	Agilent	Power Meter Sensor	E9321A	MY54130001	2017-04-10	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 DASY 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 DASY 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

DASY 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 DASY 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 DASY 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):

$$Etot = (Ex2 + EY2 + Ez2)1/2$$

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

Table 4: Tissue Dielectric Properties

☐**Simulating Head Liquid (HBBL600-6000MHz), Manufactured by SPEAG:**

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

☒**Simulating Body Liquid(MBBL600-6000MHz),Manufactured by SPEAG:**

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

Table 5: 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

Tissue Type	Target Frequency	Target Tissue		Measured Tissue		Deviation (Within +/-5%)		Liquid Temp.	Test Date
		Permit-tivity	Conduc-tivity [S/m]	Permit-tivity	Conduc-tivity [S/m]	$\Delta\varepsilon_r$	$\Delta\sigma$		
750MHz Body	705	55.70	0.96	55.91	0.933	0.38%	-2.82%	22.0°C	2017/12/25
	710	55.70	0.96	55.90	0.935	0.36%	-2.60%		
	750	55.50	0.96	55.86	0.953	0.65%	-0.78%		
835MHz Body	825	55.20	0.97	53.44	0.995	-3.19%	2.60%	21.4°C	2017/12/21
	835	55.20	0.97	53.42	1.000	-3.22%	3.05%		
	850	55.20	0.99	53.45	1.007	-3.17%	1.72%		
835MHz Body	825	55.20	0.97	55.70	0.930	0.91%	-4.12%	22.0°C	2017/12/23
	835	55.20	0.97	55.68	0.934	0.87%	-3.71%		
	850	55.20	0.99	55.64	0.947	0.80%	-4.34%		
835MHz Body	825	55.20	0.97	54.69	0.999	-0.92%	2.94%	21.5°C	2017/12/27
	835	55.20	0.97	54.68	1.003	-0.94%	3.40%		
	850	55.20	0.99	54.66	1.007	-0.98%	1.72%		
1750MHz Body	1710	53.50	1.46	53.86	1.398	0.67%	-4.25%	21.4°C	2017/12/21
	1730	53.50	1.48	53.80	1.412	0.56%	-4.59%		
	1750	53.40	1.49	53.81	1.426	0.77%	-4.30%		
	1800	53.30	1.52	53.68	1.461	0.71%	-3.88%		
1900MHz Body	1850	53.30	1.52	54.69	1.489	2.61%	-2.04%	21.4°C	2017/12/20
	1880	53.30	1.52	54.65	1.510	2.53%	-0.66%		
	1900	53.30	1.52	54.63	1.526	2.50%	0.39%		
	1910	53.30	1.52	54.61	1.534	2.46%	0.92%		
1900MHz Body	1850	53.30	1.52	52.75	1.548	-1.03%	1.84%	21.5°C	2017/12/26
	1880	53.30	1.52	52.68	1.565	-1.16%	2.96%		
	1900	53.30	1.52	52.65	1.579	-1.22%	3.88%		
	1910	53.30	1.52	52.65	1.586	-1.22%	4.34%		
2450MHz Body	2410	52.80	1.91	51.91	1.958	-1.69%	2.51%	22.3°C	2017/12/22
	2435	52.70	1.94	51.85	1.975	-1.61%	1.80%		
	2450	52.70	1.95	51.80	1.994	-1.71%	2.26%		
	2460	52.70	1.96	51.79	2.006	-1.73%	2.35%		
2450MHz Body	2410	52.80	1.91	51.09	1.990	-3.24%	4.19%	22.2°C	2018/1/5
	2435	52.70	1.94	51.06	2.016	-3.11%	3.92%		
	2450	52.70	1.95	51.05	2.028	-3.13%	4.00%		
	2460	52.70	1.96	51.05	2.035	-3.13%	3.83%		
2600MHz Body	2510	52.62	2.03	52.06	2.006	-1.06%	-1.18%	22.0°C	2017/12/21
	2535	52.59	2.07	52.04	2.025	-1.05%	-2.17%		
	2560	52.57	2.09	51.96	2.040	-1.16%	-2.39%		
	2600	52.50	2.16	51.87	2.087	-1.20%	-3.38%		
2600MHz Body	2510	52.62	2.03	51.12	2.092	-2.85%	3.05%	22.2°C	2017/12/27
	2535	52.59	2.07	51.05	2.116	-2.93%	2.22%		
	2560	52.57	2.09	51.05	2.141	-2.89%	2.44%		
	2600	52.50	2.16	50.98	2.180	-2.90%	0.93%		
5G Hz Body	5250	48.90	5.36	46.90	5.378	-4.09%	0.34%	22.0°C	2017/12/25
	5600	48.50	5.77	46.24	5.867	-4.66%	1.68%		
	5750	48.30	5.94	46.05	6.090	-4.66%	2.53%		

Table 6: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

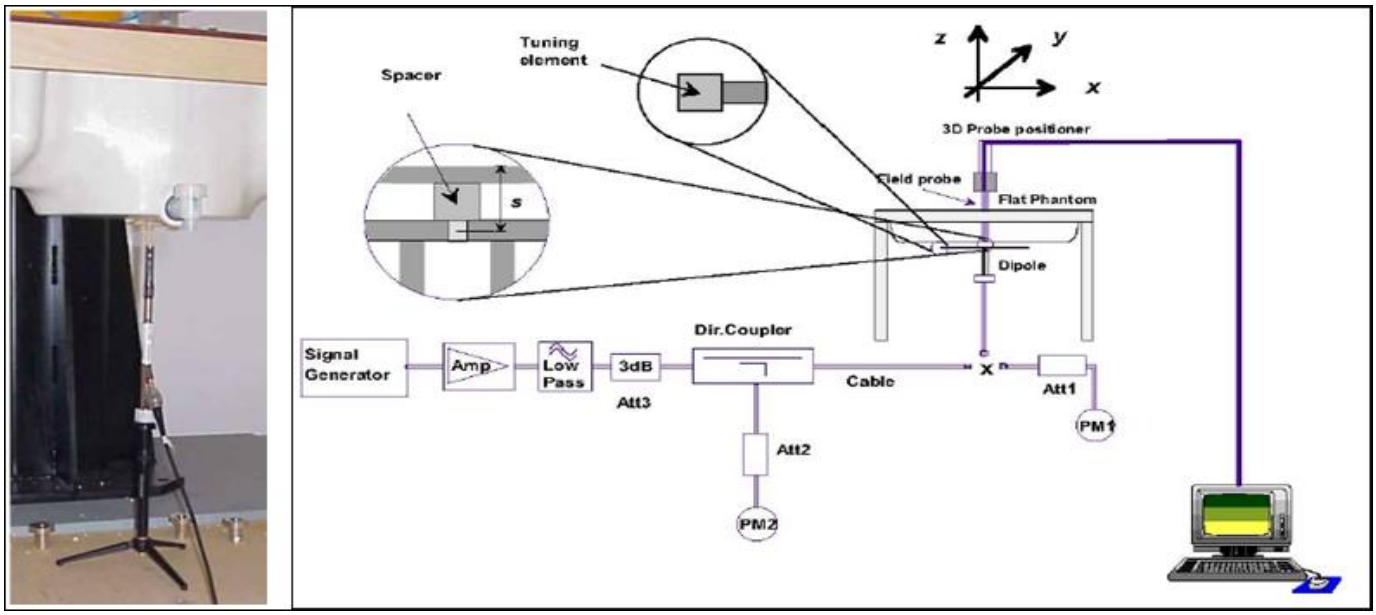
The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE 1528 (described above). The following table shows system check results for all frequency bands and tissue liquids used during the tests(Graphic Plot(s) see Appendix A).

System Check	Target SAR (Normalized to 1W)		Measured SAR (Normalized to 1W)		Deviation (Within +/-10%)		Liquid Temp.	Test Date
	1-g (mW/g)	10-g (mW/g)	1-g (mW/g)	10-g (mW/g)	Δ1-g	Δ10-g		
750MHz Body	8.56	5.64	8.44	5.68	-1.40%	0.71%	22.0°C	2017/12/25
835MHz Body	9.41	6.16	10.08	6.68	7.12%	8.44%	21.4°C	2017/12/21
835MHz Body	9.41	6.16	9.40	6.36	-0.11%	3.25%	22.0°C	2017/12/23
835MHz Body	9.41	6.16	9.72	6.44	3.29%	4.55%	21.5°C	2017/12/27
1750MHz Body	36.50	19.40	36.52	19.76	0.05%	1.86%	21.4°C	2017/12/21
1900MHz Body	39.90	21.00	42.80	22.52	7.27%	7.24%	21.4°C	2017/12/20
1900MHz Body	39.90	21.00	43.20	22.40	8.27%	6.67%	21.5°C	2017/12/26
2450MHz Body	52.10	24.70	54.80	25.20	5.18%	2.02%	22.3°C	2017/12/22
2450MHz Body	52.10	24.70	52.80	24.36	1.34%	-1.38%	22.2°C	2017/1/5
2600MHz Body	51.60	23.00	55.20	24.80	6.98%	7.83%	22.0°C	2017/12/21
2600MHz Body	51.60	23.00	54.40	24.04	5.43%	4.52%	22.2°C	2017/12/27
5250MHz Body	74.80	20.90	69.40	19.40	-7.22%	-7.18%	22.0°C	2017/12/25
5600MHz Body	78.70	22.10	77.80	21.60	-1.14%	-2.26%	22.0°C	2017/12/25
5750MHz Body	75.90	21.20	72.50	20.20	-4.48%	-4.72%	22.0°C	2017/12/25

Table 7: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 3GHz) or 100mW(3-6GHz). 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, 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,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.

The device does not have telephone receiver. Next to the ear operation is not supported. Voice mode is limited to speaker mode and headset operations only, so additional Head SAR testing for this type of voice use is not required per KDB616217D04.

6.2 3G SAR Test Reduction Procedure

Per KDB941225 D01, 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

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 D01, 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: ΔACK, ΔNACK and ΔCQI = 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 8: 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 9: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 10: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 D01, 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 11: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 12: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 13: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.

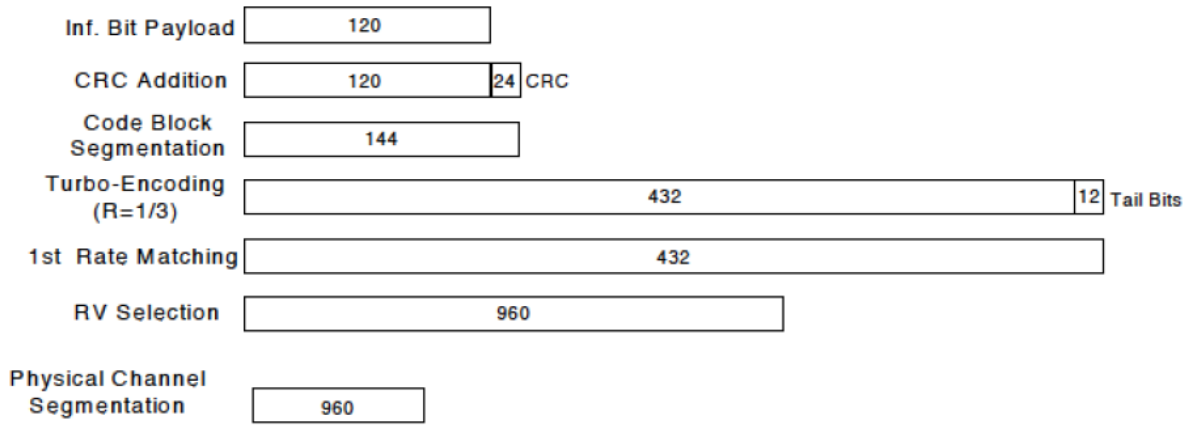


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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 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

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. 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.

5) TDD LTE test configuration

According to KDB 941225 D05 SAR for LTE Devices, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

TDD LTE Band supports 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Figure 4.2-1: Frame structure type 2

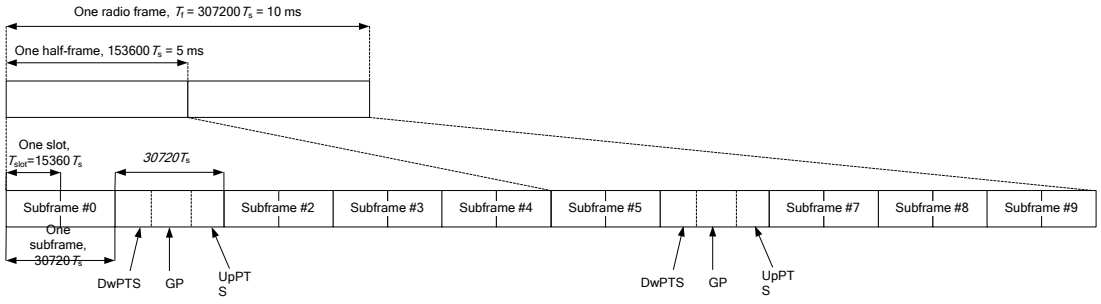


Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

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

Table 4.2-2: Uplink-downlink configurations

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

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

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

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

Uplink Component=UpPTS

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

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

And we can get different Duty cycles under different configurations:

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

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

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. Per KDB 248227D01, a minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

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 248227D01). 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 248227D01) 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 248227D01). 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 a/g/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.

6.6.5 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.

6.6.6 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, the channels at 5.60 – 5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification to avoid SAR requirements.10 TDWR restriction does not apply under the new rules; 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.11 When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

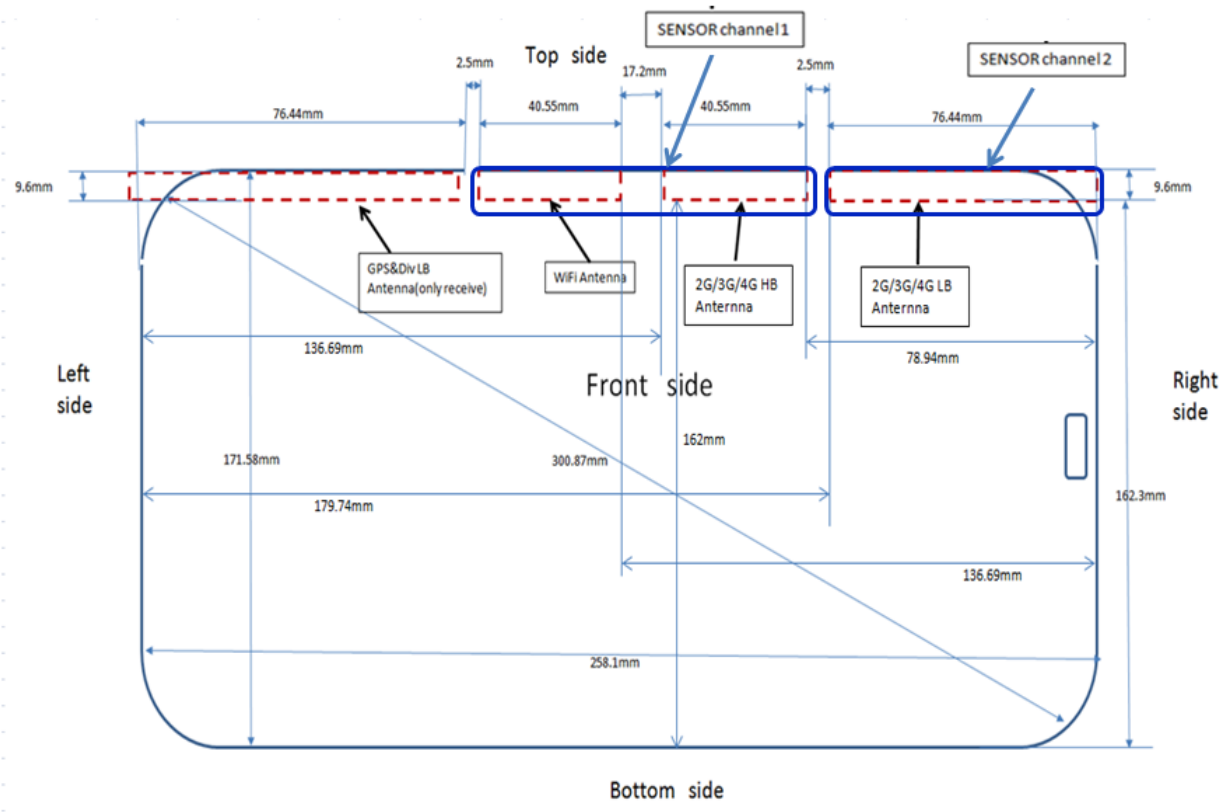
6.6.7 OFDM Transmission Mode SAR Test Channel Selection Requirements

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

6.7 Proximity sensor power reduction test configurations

This device uses a mobile country code (MCC) detection and proximity sensor mechanism that share the same metallic electrode as the transmitting antenna to facilitate triggering in typical user interactivity with the device. This device uses the mobile country code (MCC) to indicate whether the users in FCC countries or not. It utilizes the proximity sensor to reduce the output power in specific wireless and operating modes to ensure SAR compliance when the MCC information accomplished by operator network is in FCC countries and the DUT is held close to a user's body exposure condition with sensor on.

The following tables summerize the key power reduction information for proximity sensor. The test procedures in KDB 616217 should be applied to determine proximity sensor triggering distances, and sensor coverage for normal and tilt positions. To ensure all production units are compliant, it is generally necessary to reduce the triggering distance determined from the triggering tests by 1 mm, or more if it is necessary, and use the smallest distance for movements to and from the phantom, minus 1 mm, as the sensor triggering distance for determining the SAR measurement distance.



Note:

1) Sensor channel1 shares the same position with WIFI Antenna &2G/3G/4G HB Antenna. Sensor channel2 shares the same position with 2G/3G/4G LB Antenna. The proximity sensor channel-1 and sensor channel-2 are ndependent. It can be triggered by its own capacitance changes.
2) The 2G/3G/4G LB antenna supports frequency bands at frequency of 698-960MHz
3) The 2G/3G/4G HB antenna supports frequency bands at frequency of 1710-2690MHz

Band	Power Reduction(dB)	
	Sensor off (Full power level)	Sensor on,MCC of FCC countries (Reduced power level)
GSM850	0	9
GSM1900	0	10
UMTS Band 5	0	6
UMTS Band 2	0	10
LTE Band 4	0	10
LTE Band 5	0	6
LTE Band 7	0	15
LTE Band 12	0	8
LTE Band 17	0	7
LTE Band 26	0	7
LTE Band 38	0	12
LTE Band 41	0	13
WiFi 2.4G 11b	0	8
WiFi 2.4G 11g	0	3
WiFi 2.4G 11n(20M)	0	2
WiFi 5G 11a(20M) (U-NII-1 & U-NII-2A)	0	12
WiFi 5G 11a(20M) (U-NII-2C & U-NII-3)	0	13
WiFi 5G 11n(20M) (U-NII-1 & U-NII-2A)	0	11
WiFi 5G 11n(20M) (U-NII-2C & U-NII-3)	0	12
WiFi 5G 11n(40M) (U-NII-1 & U-NII-2A)	0	9
WiFi 5G 11n(40M) (U-NII-2C & U-NII-3)	0	10
WiFi 5G 11ac(20M) (U-NII-1 & U-NII-2A)	0	11
WiFi 5G 11ac(20M) (U-NII-2C & U-NII-3)	0	12
WiFi 5G 11ac(40M) (U-NII-1 & U-NII-2A)	0	9
WiFi 5G 11ac(40M) (U-NII-2C & U-NII-3)	0	10
WiFi 5G 11ac(80M) (U-NII-1 & U-NII-2A)	0	8
WiFi 5G 11ac(80M) (U-NII-2C & U-NII-3)	0	9

Band	Sensor Trigger Distance
GSM850	Top side: 17mm Back side: 12mm
GSM1900	Top side: 18mm Back side: 15mm
UMTS Band 2	Top side: 18mm Back side: 15mm
UMTS Band 5	Top side: 17mm Back side: 12mm
LTE Band 4	Top side: 18mm Back side: 15mm
LTE Band 5	Top side: 17mm Back side: 12mm
LTE Band 7	Top side: 18mm Back side: 15mm
LTE Band 12	Top side: 17mm Back side: 12mm
LTE Band 17	Top side: 17mm Back side: 12mm
LTE Band 26	Top side: 17mm Back side: 12mm
LTE Band 38	Top side: 18mm Back side: 15mm
LTE Band 41	Top side: 18mm Back side: 15mm
WiFi 2.4G 11b	Top side: 18mm Back side: 15mm
WiFi 2.4G 11g	Top side: 18mm Back side: 15mm
WiFi 2.4G 11n(20M)	Top side: 18mm Back side: 15mm
WiFi 5G 11a(20M) (U-NII-1 & U-NII-2A)	Top side: 18mm Back side: 15mm
WiFi 5G 11a(20M) (U-NII-2C & U-NII-3)	Top side: 18mm Back side: 15mm
WiFi 5G 11n(20M) (U-NII-1 & U-NII-2A)	Top side: 18mm Back side: 15mm
WiFi 5G 11n(20M) (U-NII-2C & U-NII-3)	Top side: 18mm Back side: 15mm
WiFi 5G 11n(40M) (U-NII-1 & U-NII-2A)	Top side: 18mm Back side: 15mm
WiFi 5G 11n(40M) (U-NII-2C & U-NII-3)	Top side: 18mm Back side: 15mm
WiFi 5G 11ac(20M) (U-NII-1 & U-NII-2A)	Top side: 18mm Back side: 15mm
WiFi 5G 11ac(20M) (U-NII-2C & U-NII-3)	Top side: 18mm Back side: 15mm

WiFi 5G 11ac(40M) (U-NII-1 & U-NII-2A)	Top side: 18mm Back side: 15mm
WiFi 5G 11ac(40M) (U-NII-2C & U-NII-3)	Top side: 18mm Back side: 15mm
WiFi 5G 11ac(80M) (U-NII-1 & U-NII-2A)	Top side: 18mm Back side: 15mm
WiFi 5G 11ac(80M) (U-NII-2C & U-NII-3)	Top side: 18mm Back side: 15mm

Note:
1）To ensure all production units are compliant, the smallest separation distance determined by the sensor triggering minus 1 mm, must be used as the test separation distance for SAR testing.
2) SAR tests with proximity sensor power reduction are only required for the sides of frequency bands in the table above. For the other sides or other frequency bands of the device, SAR is still tested at the maximum power level with sensor off.

The following procedures in KDB 616217 are applied to determine proximity sensor triggering distances and sensor coverage for normal and tilt positions.

1) Procedures for determining proximity sensor triggering distances
The device was tested by the test lab to determine the proximity sensor triggering distances for the front side, back side and bottom side of the device. To ensure all production units are compliant, the smallest separation distance determined by the sensor triggering minus 1 mm, must be used as the test separation distance for SAR testing.

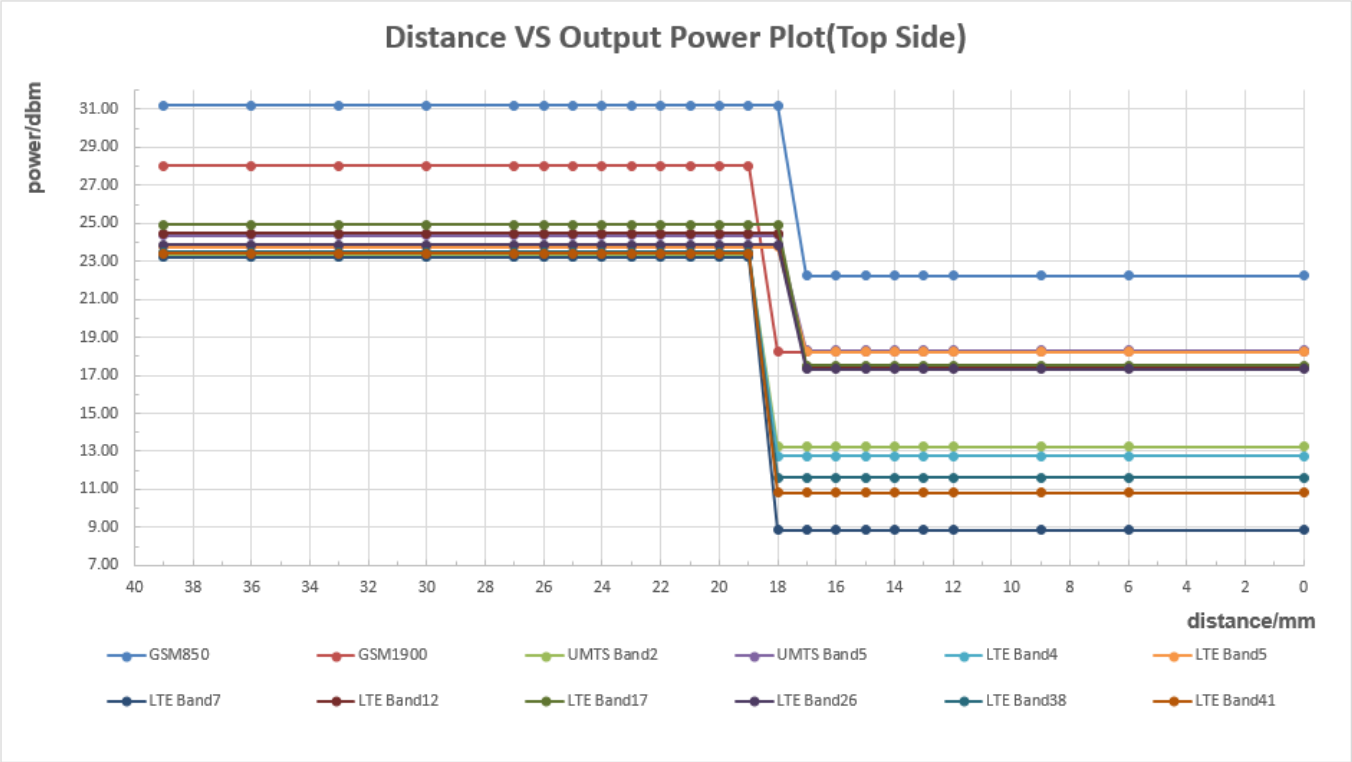
the proximity sensor triggering distance measurement method are as below:

Table: Summary of Trigger Distances

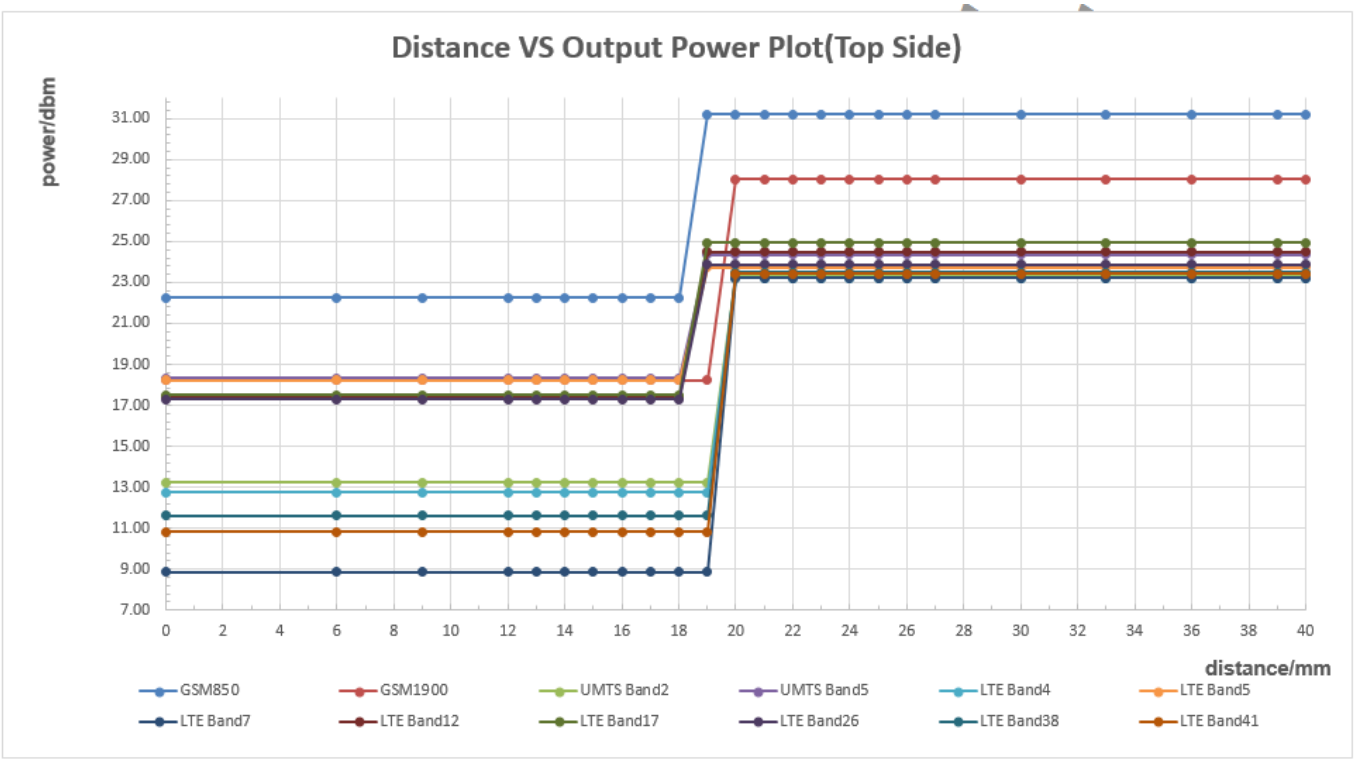
Band(MHz)	Trigger distance-Top Side		Trigger distance-Back Side	
	Moving toward phantom	Moving away from phantom	Moving toward phantom	Moving away from phantom
GSM850	17mm	19mm	12mm	14mm
GSM1900	18mm	20mm	15mm	17mm
UMTS Band 2	18mm	20mm	15mm	17mm
UMTS Band 5	17mm	19mm	12mm	14mm
LTE Band 4	18mm	20mm	15mm	17mm
LTE Band 5	17mm	19mm	12mm	14mm
LTE Band 7	18mm	20mm	15mm	17mm
LTE Band 12	17mm	19mm	12mm	14mm
LTE Band 17	17mm	19mm	12mm	14mm
LTE Band 26	17mm	19mm	12mm	14mm
LTE Band 38	18mm	20mm	15mm	17mm
LTE Band 41	18mm	20mm	15mm	17mm
WiFi 2.4G 11b	18mm	19mm	15mm	16mm
WiFi 2.4G 11g	18mm	19mm	15mm	16mm
WiFi 2.4G 11n(20M)	18mm	19mm	15mm	16mm
WiFi 5G 11a(20M) (U-NII-1 & U-NII-2A)	18mm	19mm	15mm	16mm
WiFi 5G 11a(20M) (U-NII-2C & U-NII-3)	18mm	19mm	15mm	16mm
WiFi 5G 11n(20M) (U-NII-1 & U-NII-2A)	18mm	19mm	15mm	16mm
WiFi 5G 11n(20M) (U-NII-2C & U-NII-3)	18mm	19mm	15mm	16mm
WiFi 5G 11n(40M) (U-NII-1 & U-NII-2A)	18mm	19mm	15mm	16mm
WiFi 5G 11n(40M) (U-NII-2C & U-NII-3)	18mm	19mm	15mm	16mm
WiFi 5G 11ac(20M) (U-NII-1 & U-NII-2A)	18mm	19mm	15mm	16mm
WiFi 5G 11ac(20M) (U-NII-2C & U-NII-3)	18mm	19mm	15mm	16mm
WiFi 5G 11ac(40M) (U-NII-1 & U-NII-2A)	18mm	19mm	15mm	16mm
WiFi 5G 11ac(40M) (U-NII-2C & U-NII-3)	18mm	19mm	15mm	16mm
WiFi 5G 11ac(80M) (U-NII-1 & U-NII-2A)	18mm	19mm	15mm	16mm
WiFi 5G 11ac(80M) (U-NII-2C & U-NII-3)	18mm	19mm	15mm	16mm

The detailed conducted power measurement data to determine the triggering distances is as below:

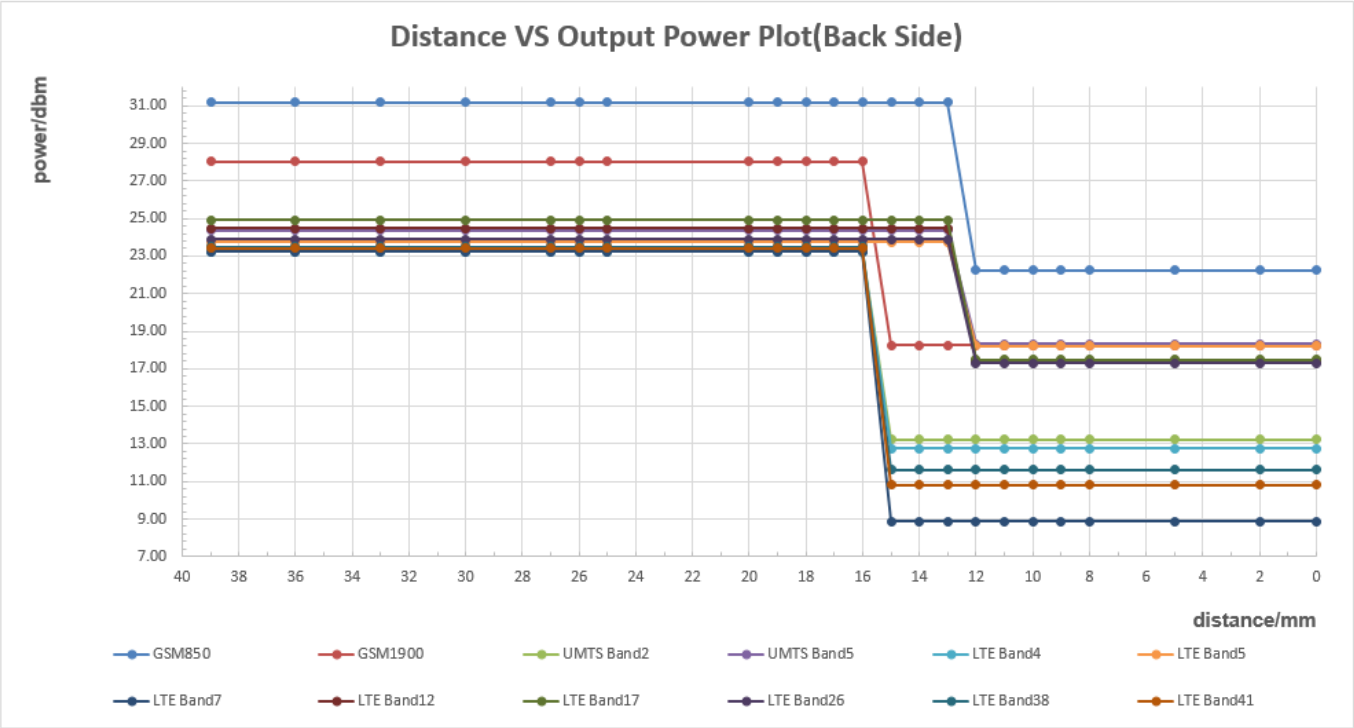
The DUT(top side) is moved towards the flat phantom(2G/3G/4G antenna):



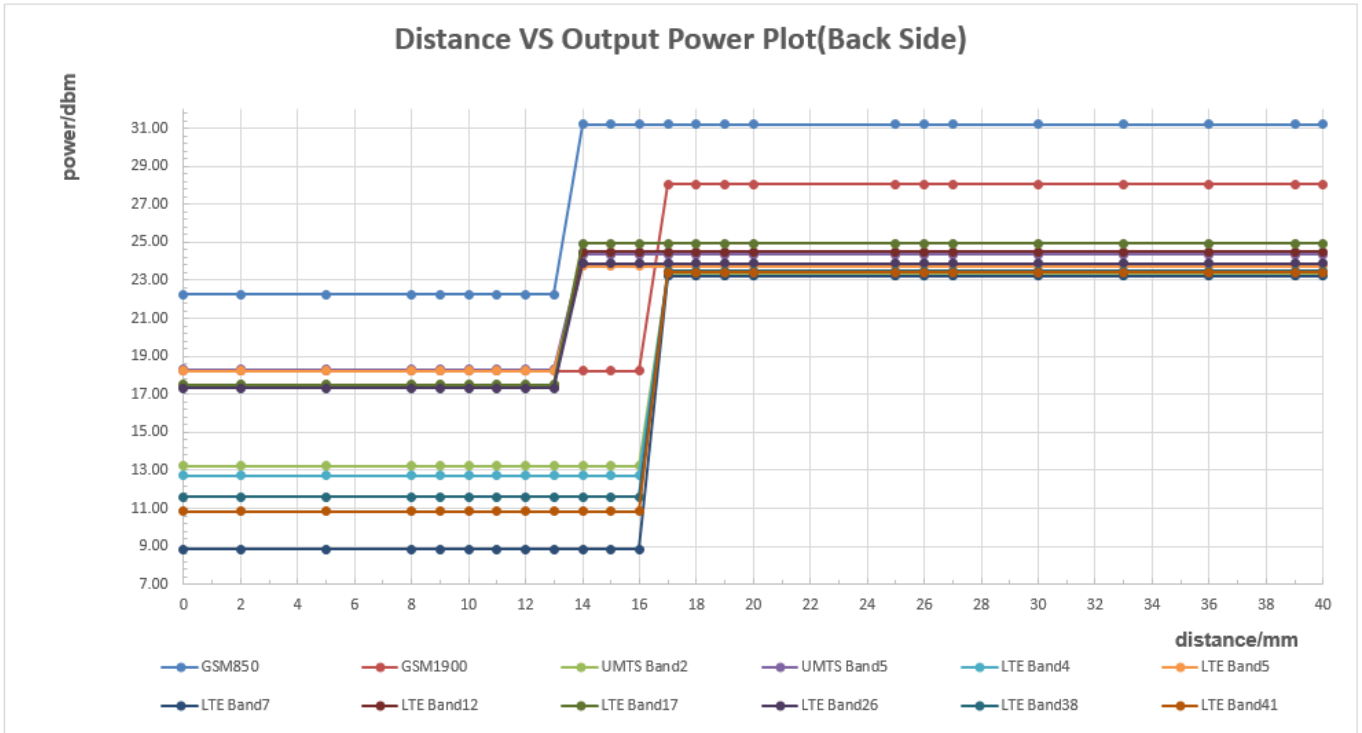
The DUT(top side) is moved awar from the flat phantom(2G/3G/4G antenna):



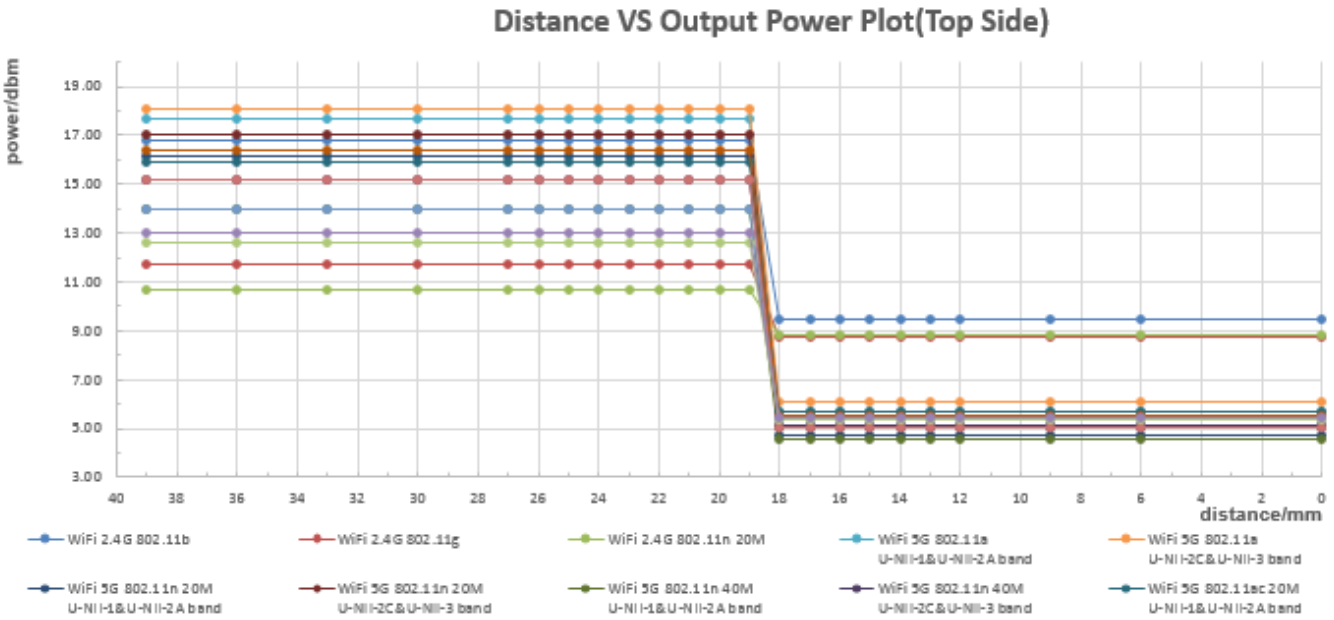
The DUT(back side) is moved towards the flat phantom(2G/3G/4G antenna):



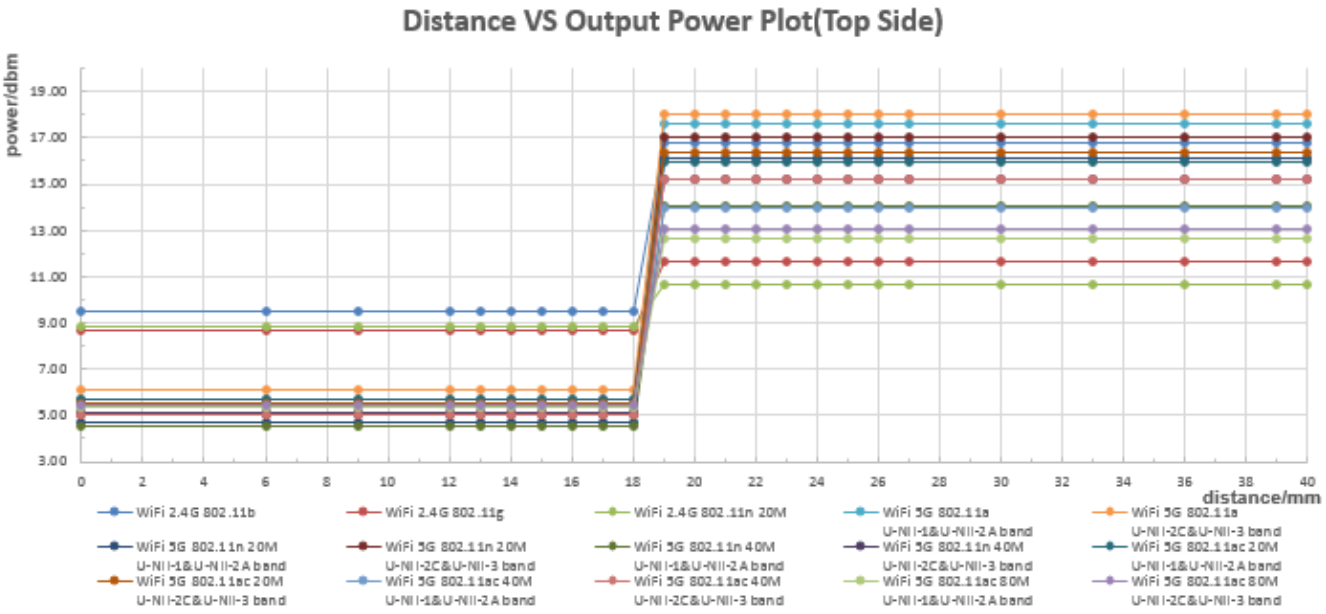
The DUT(back side) is moved away from the flat phantom(2G/3G/4G antenna):



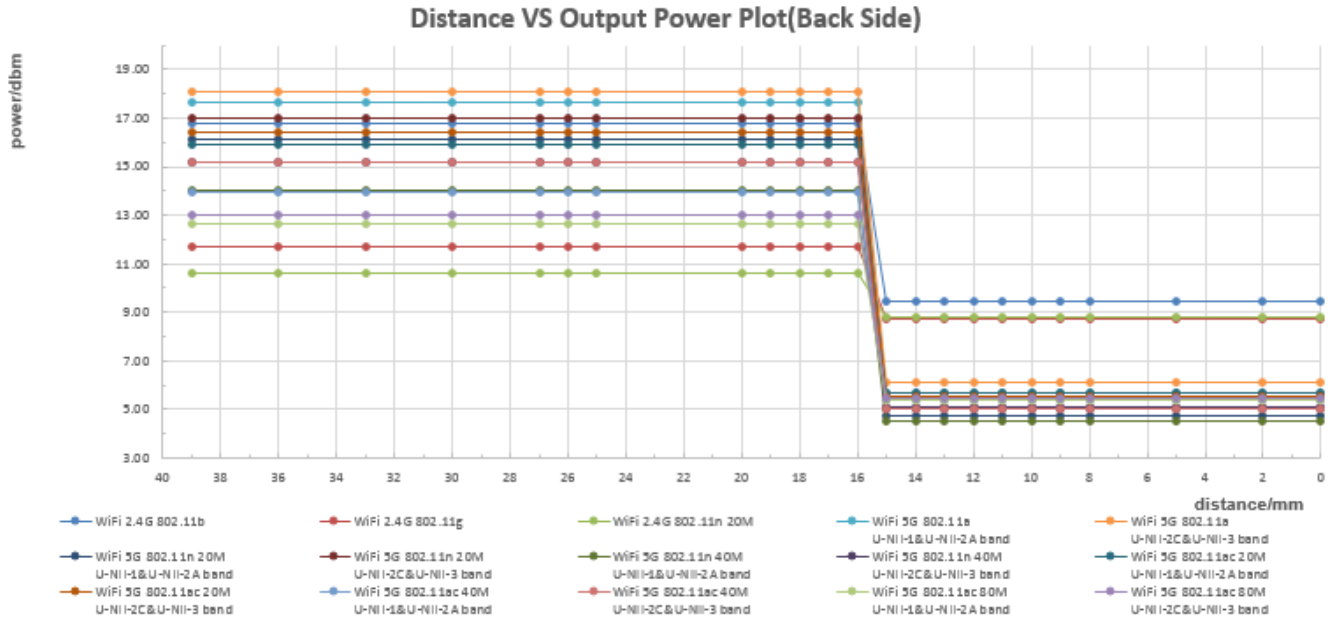
The DUT(top side) is moved towards the flat phantom(WiFi antenna):



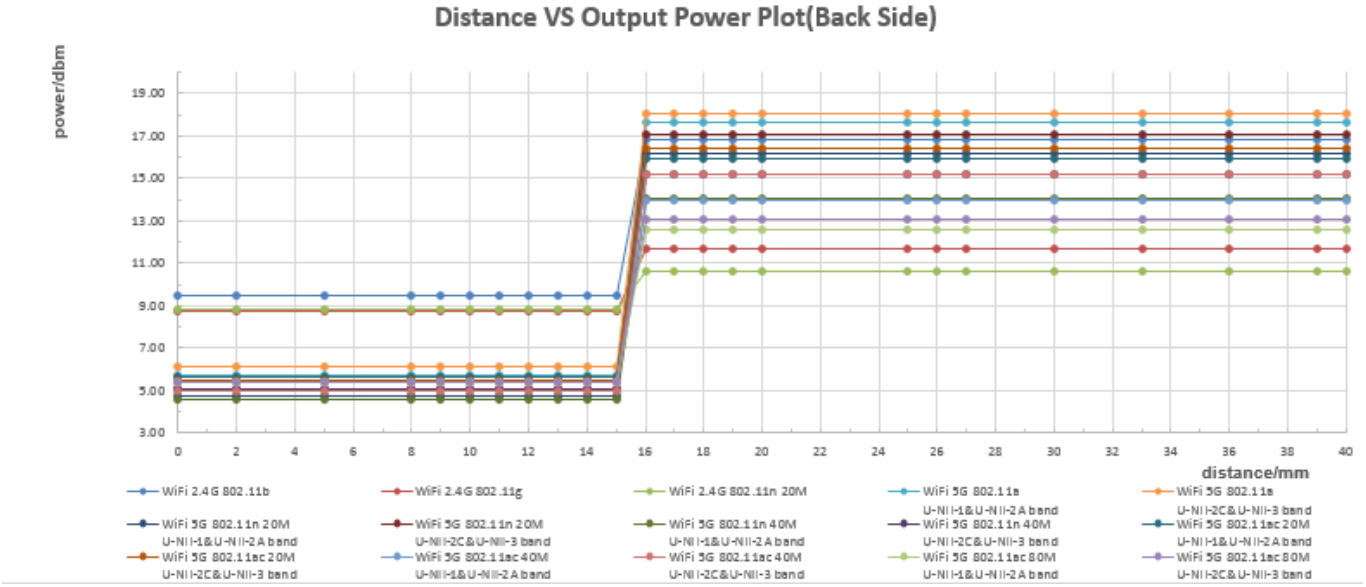
The DUT(top side) is moved away from the flat phantom(WiFi antenna):



The DUT(back side) is moved towards the flat phantom(WiFi antenna):



The DUT(back side) is moved away from the flat phantom(WiFi antenna):



Conclusion: It can be ensured that the proximity sensor can be valid triggered.

2) Procedures for determining antenna and proximity sensor coverage

There is no spatial offset between the Tx antenna and the proximity sensor element, so procedures for determining the proximity sensor coverage does not need to be assessed per KDB616217.

3) Procedures for determining device tilt angle influences to proximity sensor triggering

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

The EUT was rotated about Bottom 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°.

The proximity sensor triggering tilt angle measurement method are as below:

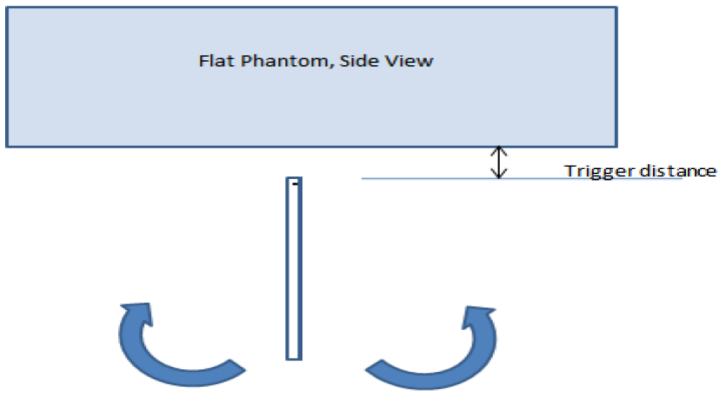


Table: Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering(Top side)

Band(MHz)	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	17mm	on	on	on	on	on	on	on	on	on	on	on
GSM1900	18mm	on	on	on	on	on	on	on	on	on	on	on
UMTS Band 2	18mm	on	on	on	on	on	on	on	on	on	on	on
UMTS Band 5	17mm	on	on	on	on	on	on	on	on	on	on	on
LTE Band 4	18mm	on	on	on	on	on	on	on	on	on	on	on
LTE Band 5	17mm	on	on	on	on	on	on	on	on	on	on	on
LTE Band 7	18mm	on	on	on	on	on	on	on	on	on	on	on
LTE Band 12	17mm	on	on	on	on	on	on	on	on	on	on	on
LTE Band 17	17mm	on	on	on	on	on	on	on	on	on	on	on
LTE Band 26	17mm	on	on	on	on	on	on	on	on	on	on	on
LTE Band 38	18mm	on	on	on	on	on	on	on	on	on	on	on
LTE Band 41	18mm	on	on	on	on	on	on	on	on	on	on	on
WiFi 2.4G 11b	18mm	on	on	on	on	on	on	on	on	on	on	on

WiFi 2.4G 11g	18mm	on	on	on	on	on	on	on	on	on	on	on
WiFi 2.4G 11n(20M)	18mm	on	on	on	on	on	on	on	on	on	on	on
WiFi 5G 11a(20M) (U-NII-1 & U-NII-2A)	18mm	on	on	on	on	on	on	on	on	on	on	on
WiFi 5G 11a(20M) (U-NII-2C & U-NII-3)	18mm	on	on	on	on	on	on	on	on	on	on	on
WiFi 5G 11n(20M) (U-NII-1 & U-NII-2A)	18mm	on	on	on	on	on	on	on	on	on	on	on
WiFi 5G 11n(20M) (U-NII-2C & U-NII-3)	18mm	on	on	on	on	on	on	on	on	on	on	on
WiFi 5G 11n(40M) (U-NII-1 & U-NII-2A)	18mm	on	on	on	on	on	on	on	on	on	on	on
WiFi 5G 11n(40M) (U-NII-2C & U-NII-3)	18mm	on	on	on	on	on	on	on	on	on	on	on
WiFi 5G 11ac(20M) (U-NII-1 & U-NII-2A)	18mm	on	on	on	on	on	on	on	on	on	on	on
WiFi 5G 11ac(20M) (U-NII-2C & U-NII-3)	18mm	on	on	on	on	on	on	on	on	on	on	on
WiFi 5G 11ac(40M) (U-NII-1 & U-NII-2A)	18mm	on	on	on	on	on	on	on	on	on	on	on
WiFi 5G 11ac(40M) (U-NII-2C & U-NII-3)	18mm	on	on	on	on	on	on	on	on	on	on	on
WiFi 5G 11ac(80M) (U-NII-1 & U-NII-2A)	18mm	on	on	on	on	on	on	on	on	on	on	on
WiFi 5G 11ac(80M) (U-NII-2C & U-NII-3)	18mm	on	on	on	on	on	on	on	on	on	on	on

Conclusion: It can be ensured that the proximity sensor can be valid triggered for the DUT tilt coverage exposure condition.

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		Tune-up	Burst-Averaged output Power (dBm)			Division	Tune-up	Frame-Averaged output Power (dBm)		
		Max.	128CH	190CH	251CH	Factors	Max.	128CH	190CH	251CH
GSM (CS)		34.0	33.23	33.31	33.26	-9.19	24.81	24.04	24.12	24.07
GPRS (GMSK)	1 Tx Slot	34.0	33.33	33.30	33.34	-9.19	24.81	24.14	24.11	24.15
	2 Tx Slots	**32.0**	**31.23**	**31.20**	**31.22**	**-6.13**	**25.87**	**25.10**	**25.07**	**25.09**
	3 Tx Slots	30.0	29.32	29.24	29.23	-4.42	25.58	24.90	24.82	24.81
	4 Tx Slots	28.0	27.23	27.20	27.19	-3.18	24.82	24.05	24.02	24.01
EDGE (GMSK)	1 Tx Slot	34.0	33.33	33.30	33.34	-9.19	24.81	24.14	24.11	24.15
	2 Tx Slots	32.0	31.23	31.20	31.22	-6.13	25.87	25.10	25.07	25.09
	3 Tx Slots	30.0	29.32	29.24	29.23	-4.42	25.58	24.90	24.82	24.81
	4 Tx Slots	28.0	27.23	27.20	27.19	-3.18	24.82	24.05	24.02	24.01
EDGE (8PSK)	1 Tx Slot	27.2	26.16	26.17	26.10	-9.19	18.01	16.97	16.98	16.91
	2 Tx Slots	26.4	25.26	25.30	25.36	-6.13	20.27	19.13	19.17	19.23
	3 Tx Slots	24.0	23.06	23.16	23.10	-4.42	19.58	18.64	18.74	18.68
	4 Tx Slots	23.0	21.92	21.96	22.03	-3.18	19.82	18.74	18.78	18.85

Table 14:Conducted power measurement results of GSM850(Full Power)

GSM850		Tune-up	Burst-Averaged output Power (dBm)			Division	Tune-up	Frame-Averaged output Power (dBm)		
		Max.	128CH	190CH	251CH	Factors	Max.	128CH	190CH	251CH
GSM (CS)		25.0	24.16	24.31	24.32	-9.19	15.81	14.97	15.12	15.13
GPRS (GMSK)	1 Tx Slot	25.0	24.33	24.33	24.32	-9.19	15.81	15.14	15.14	15.13
	2 Tx Slots	**23.0**	**22.28**	**22.26**	**22.24**	**-6.13**	**16.87**	**16.15**	**16.13**	**16.11**
	3 Tx Slots	21.0	20.40	20.25	20.23	-4.42	16.58	15.98	15.83	15.81
	4 Tx Slots	19.0	18.32	18.23	18.20	-3.18	15.82	15.14	15.05	15.02
EDGE (GMSK)	1 Tx Slot	25.0	24.33	24.33	24.32	-9.19	15.81	15.14	15.14	15.13
	2 Tx Slots	23.0	22.28	22.26	22.24	-6.13	16.87	16.15	16.13	16.11
	3 Tx Slots	21.0	20.40	20.25	20.23	-4.42	16.58	15.98	15.83	15.81
	4 Tx Slots	19.0	18.32	18.23	18.20	-3.18	15.82	15.14	15.05	15.02
EDGE (8PSK)	1 Tx Slot	18.2	16.85	17.01	17.02	-9.19	9.01	7.66	7.82	7.83
	2 Tx Slots	17.4	16.16	16.29	16.37	-6.13	11.27	10.03	10.16	10.24
	3 Tx Slots	15.0	14.22	14.34	14.32	-4.42	10.58	9.80	9.92	9.90
	4 Tx Slots	14.0	13.21	13.32	13.15	-3.18	10.82	10.03	10.14	9.97

Table 15:Conducted power measurement results of GSM850(Sensor On, reduced power)

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 D01, 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		Tune-up	Burst-Averaged output Power (dBm)			Division	Tune-up	Frame-Averaged output Power (dBm)		
		Max.	512CH	661CH	810CH	Factors	Max.	512CH	661CH	810CH
GSM (CS)		31.0	30.13	29.96	29.82	-9.19	21.81	20.94	20.77	20.63
GPRS (GMSK)	1 Tx Slot	31.0	30.22	30.01	29.80	-9.19	21.81	21.03	20.82	20.61
	2 Tx Slots	**29.0**	**28.15**	**28.04**	**27.85**	**-6.13**	**22.87**	**22.02**	**21.91**	**21.72**
	3 Tx Slots	27.0	26.11	26.03	25.92	-4.42	22.58	21.69	21.61	21.50
	4 Tx Slots	25.0	24.08	23.98	23.87	-3.18	21.82	20.90	20.80	20.69
EDGE (GMSK)	1 Tx Slot	31.0	30.22	30.01	29.80	-9.19	21.81	21.03	20.82	20.61
	2 Tx Slots	29.0	28.15	28.04	27.85	-6.13	22.87	22.02	21.91	21.72
	3 Tx Slots	27.0	26.11	26.03	25.92	-4.42	22.58	21.69	21.61	21.50
	4 Tx Slots	25.0	24.08	23.98	23.87	-3.18	21.82	20.90	20.80	20.69
EDGE (8PSK)	1 Tx Slot	27.7	26.74	26.35	26.17	-9.19	18.51	17.55	17.16	16.98
	2 Tx Slots	25.0	24.12	23.95	24.07	-6.13	18.87	17.99	17.82	17.94
	3 Tx Slots	23.0	21.85	22.02	21.75	-4.42	18.58	17.43	17.60	17.33
	4 Tx Slots	20.5	19.33	19.21	19.45	-3.18	17.32	16.15	16.03	16.27

Table 16: Conducted power measurement results of GSM1900(Full Power)

GSM1900		Tune-up	Burst-Averaged output Power (dBm)			Division	Tune-up	Frame-Averaged output Power (dBm)		
		Max.	512CH	661CH	810CH	Factors	Max.	512CH	661CH	810CH
GSM (CS)		21.0	20.17	20.11	20.07	-9.19	11.81	10.98	10.92	10.88
GPRS (GMSK)	1 Tx Slot	21.0	20.25	20.17	20.10	-9.19	11.81	11.06	10.98	10.91
	2 Tx Slots	**19.0**	**18.32**	**18.24**	**18.22**	**-6.13**	**12.87**	**12.19**	**12.11**	**12.09**
	3 Tx Slots	17.0	16.29	16.16	16.19	-4.42	12.58	11.87	11.74	11.77
	4 Tx Slots	15.0	14.25	14.16	14.24	-3.18	11.82	11.07	10.98	11.06
EDGE (GMSK)	1 Tx Slot	21.0	20.25	20.17	20.10	-9.19	11.81	11.06	10.98	10.91
	2 Tx Slots	19.0	18.32	18.24	18.22	-6.13	12.87	12.19	12.11	12.09
	3 Tx Slots	17.0	16.29	16.16	16.19	-4.42	12.58	11.87	11.74	11.77
	4 Tx Slots	15.0	14.25	14.16	14.24	-3.18	11.82	11.07	10.98	11.06
EDGE (8PSK)	1 Tx Slot	17.7	16.48	16.36	16.31	-9.19	8.51	7.29	7.17	7.12
	2 Tx Slots	15.0	14.08	14.01	13.95	-6.13	8.87	7.95	7.88	7.82
	3 Tx Slots	13.0	11.70	11.61	11.60	-4.42	8.58	7.28	7.19	7.18
	4 Tx Slots	10.5	9.49	9.45	9.45	-3.18	7.32	6.31	6.27	6.27

Table 17: Conducted power measurement results of GSM1900(Sensor On, reduced power)

Note:

1) The conducted power of GSM1900 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 D01, 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 5

UMTS Band 5		Tune-up	Average Power (dBm)		
		Max.	4132CH	4182CH	4233CH
WCDMA	12.2kbps RMC	25.2	24.42	**24.36**	24.35
	12.2kbps AMR	25.2	24.41	24.39	24.42
HSDPA	Subtest 1	24.0	23.15	23.09	23.20
	Subtest 2	23.9	22.84	22.90	22.86
	Subtest 3	23.6	22.49	22.51	22.56
	Subtest 4	23.6	22.51	22.52	22.55
HSUPA	Subtest 1	24.0	22.97	23.21	22.92
	Subtest 2	22.0	20.81	21.21	21.04
	Subtest 3	23.5	22.44	22.26	22.16
	Subtest 4	22.0	20.83	20.51	21.12
	Subtest 5	24.5	23.77	23.71	23.69
DC-HSDPA	Subtest 1	24.0	22.81	22.87	22.83
	Subtest 2	23.9	23.12	23.06	23.17
	Subtest 3	23.6	22.46	22.48	22.53
	Subtest 4	23.6	22.48	22.49	22.52

Table 18: Conducted power measurement results of UMTS Band 5(Full Power)

UMTS Band 5		Tune-up	Average Power (dBm)		
		Max.	4132CH	4182CH	4233CH
WCDMA	12.2kbps RMC	19.2	18.37	**18.32**	18.35
	12.2kbps AMR	19.2	18.37	18.34	18.37
HSDPA	Subtest 1	18.0	17.27	17.21	17.32
	Subtest 2	17.9	16.96	17.02	16.98
	Subtest 3	17.6	16.61	16.63	16.68
	Subtest 4	17.6	16.6	16.64	16.67
HSUPA	Subtest 1	18.0	17.09	17.33	17.04
	Subtest 2	16.0	14.93	15.33	15.16
	Subtest 3	17.5	16.56	16.38	16.28
	Subtest 4	16.0	14.95	14.63	15.24
	Subtest 5	18.5	17.77	17.69	17.70
DC-HSDPA	Subtest 1	18.0	16.93	16.99	16.95
	Subtest 2	17.9	17.24	17.18	17.29
	Subtest 3	17.6	16.58	16.60	16.65
	Subtest 4	17.6	16.60	16.61	16.64

Table 19: Conducted power measurement results of UMTS Band 5(Sensor On, reduced power)

Note: 1) The conducted power of UMTS Band 5 is measured with RMS detector.

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

3) Per KDB941225 D01, 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 2

UMTS Band 2		Tune-up	Average Power (dBm)		
		Max.	9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	24.2	23.26	**23.31**	23.21
	12.2kbps AMR	24.2	23.30	23.32	23.29
HSDPA	Subtest 1	24.0	23.23	23.28	22.81
	Subtest 2	23.9	23.20	22.98	22.60
	Subtest 3	23.4	22.23	22.16	21.81
	Subtest 4	23.4	22.27	22.20	21.85
HSUPA	Subtest 1	23.5	22.85	22.78	22.44
	Subtest 2	20.5	19.77	19.80	19.45
	Subtest 3	21.8	20.84	20.88	20.72
	Subtest 4	20.4	19.78	19.80	19.24
	Subtest 5	24.0	22.92	23.11	22.99
DC-HSDPA	Subtest 1	24.0	23.12	23.17	22.70
	Subtest 2	23.9	23.09	22.87	22.49
	Subtest 3	23.4	22.12	22.05	21.70
	Subtest 4	23.4	22.16	22.09	21.74

Table 20: Conducted power measurement results of UMTS Band 2(Full Power)

UMTS Band 2		Tune-up	Average Power (dBm)		
		Max.	9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	14.2	13.26	**13.25**	12.88
	12.2kbps AMR	14.2	13.39	13.41	12.89
HSDPA	Subtest 1	14.0	13.34	13.39	12.92
	Subtest 2	13.9	13.31	13.09	12.71
	Subtest 3	13.4	12.34	12.27	11.92
	Subtest 4	13.4	12.38	12.31	11.96
HSUPA	Subtest 1	13.5	12.79	12.93	12.20
	Subtest 2	10.5	9.73	9.47	8.92
	Subtest 3	11.8	10.23	10.89	10.75
	Subtest 4	10.4	9.02	8.89	8.63
	Subtest 5	14.0	13.50	13.47	13.04
DC-HSDPA	Subtest 1	14.0	13.22	13.27	12.80
	Subtest 2	13.9	13.19	12.97	12.59
	Subtest 3	13.4	12.22	12.15	11.80
	Subtest 4	13.4	12.26	12.19	11.84

Table 21: Conducted power measurement results of UMTS Band 2(Sensor On, reduced power)

Note: 1) The conducted power of UMTS Band 2 is measured with RMS detector.

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

3) Per KDB941225 D01, 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 LTE Band 4

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 19957CH	Channel 20175CH	Channel 20393CH
1.4MHz	QPSK	1	0	24.0	22.93	23.20	23.23
		1	3	24.0	23.02	23.30	23.27
		1	5	24.0	22.88	23.15	23.02
		3	0	24.0	22.94	23.20	23.09
		3	2	24.0	22.98	23.24	23.11
		3	3	24.0	22.90	23.16	23.03
		6	0	23.3	22.08	22.37	22.36
	16QAM	1	0	23.0	22.16	22.34	22.43
		1	3	23.0	22.10	22.53	22.40
		1	5	23.0	22.12	22.29	22.38
		3	0	23.0	22.04	22.42	22.39
		3	2	23.0	22.07	22.46	22.43
		3	3	23.0	22.03	22.39	22.16
		6	0	23.0	22.07	22.28	22.35
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 19965CH	Channel 20175CH	Channel 20385CH
3MHz	QPSK	1	0	24.0	22.78	23.02	23.06
		1	7	24.0	23.07	23.27	23.21
		1	14	24.0	22.70	22.96	22.88
		8	0	23.3	22.08	22.34	22.29
		8	4	23.3	22.18	22.37	22.34
		8	7	23.3	22.08	22.28	22.24
		15	0	23.3	22.11	22.28	22.29
	16QAM	1	0	23.0	21.90	22.29	22.15
		1	7	23.0	22.08	22.48	22.45
		1	14	23.0	21.96	22.13	22.08
		8	0	23.0	22.02	22.29	22.29
		8	4	23.0	22.03	22.25	22.30
		8	7	23.0	22.01	22.21	22.23
		15	0	23.0	21.91	22.16	22.22

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 19975CH	Channel 20175CH	Channel 20375CH
5MHz	QPSK	1	0	24.0	22.98	22.87	23.12
		1	13	24.0	23.06	23.24	23.19
		1	24	24.0	22.99	23.07	23.09
		12	0	23.3	22.25	22.40	22.45
		12	6	23.3	22.31	22.53	22.54
		12	13	23.3	22.08	22.31	22.36
		25	0	23.3	22.16	22.33	22.40
	16QAM	1	0	23.0	21.97	21.88	22.17
		1	13	23.0	22.07	22.38	22.35
		1	24	23.0	22.08	22.33	22.24
		12	0	23.0	22.13	22.29	22.34
		12	6	23.0	22.19	22.43	22.45
		12	13	23.0	22.00	22.26	22.29
		25	0	23.0	21.97	22.19	22.31
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20000CH	Channel 20175CH	Channel 20350CH
10MHz	QPSK	1	0	24.0	22.87	23.07	23.08
		1	25	24.0	22.96	23.17	23.07
		1	49	24.0	22.73	22.91	22.92
		25	0	23.3	22.16	22.24	22.38
		25	13	23.3	22.29	22.41	22.41
		25	25	23.3	22.16	22.32	22.26
		50	0	23.3	22.17	22.33	22.32
	16QAM	1	0	23.0	21.96	22.17	22.08
		1	25	23.0	22.18	22.29	22.14
		1	49	23.0	22.19	22.16	22.10
		25	0	23.0	22.04	22.13	22.24
		25	13	23.0	22.17	22.30	22.28
		25	25	23.0	22.09	22.19	22.17
		50	0	23.0	22.03	22.28	22.18

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20025CH	Channel 20175CH	Channel 20325CH
15MHz	QPSK	1	0	24.0	22.08	23.08	23.04
		1	38	24.0	23.23	23.36	23.31
		1	74	24.0	23.08	22.97	22.96
		36	0	23.3	22.33	22.33	22.36
		36	18	23.3	22.35	22.46	22.39
		36	39	23.3	22.33	22.38	22.42
		75	0	23.3	22.31	22.40	22.23
	16QAM	1	0	23.0	22.04	22.42	22.18
		1	38	23.0	22.40	22.60	22.37
		1	74	23.0	22.26	22.27	22.18
		36	0	23.0	22.19	22.32	22.24
		36	18	23.0	22.27	22.38	22.26
		36	39	23.0	22.25	22.27	22.30
		75	0	23.0	22.22	22.31	22.06
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20050CH	Channel 20175CH	Channel 20300CH
20MHz	QPSK	1	0	24.0	22.86	22.91	22.97
		1	50	24.0	23.11	23.19	**23.22**
		1	99	24.0	22.99	22.90	22.94
		50	0	23.3	22.20	22.23	22.43
		50	25	23.3	22.30	**22.46**	22.31
		50	50	23.3	22.26	22.34	22.39
		100	0	23.3	22.20	22.26	22.34
	16QAM	1	0	23.0	22.00	22.37	22.35
		1	50	23.0	22.38	22.57	22.38
		1	99	23.0	22.23	22.23	22.31
		50	0	23.0	22.12	22.13	22.28
		50	25	23.0	22.18	22.34	22.14
		50	50	23.0	22.22	22.21	22.18
		100	0	23.0	22.07	22.16	22.20

Table 22: Conducted power measurement results of LTE Band 4(Full Power)

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 19957CH	Channel 20175CH	Channel 20393CH
1.4MHz	QPSK	1	0	14.0	12.26	12.63	12.51
		1	3	14.0	12.41	12.77	12.55
		1	5	14.0	12.29	12.74	12.44
		3	0	14.0	12.36	12.71	12.54
		3	2	14.0	12.37	12.79	12.51
		3	3	14.0	12.36	12.75	12.47
		6	0	13.3	11.37	11.69	11.40
	16QAM	1	0	13.0	11.40	11.60	11.30
		1	3	13.0	11.48	12.01	11.45
		1	5	13.0	11.42	11.74	11.26
		3	0	13.0	11.46	11.82	11.62
		3	2	13.0	11.51	11.89	11.65
		3	3	13.0	11.36	11.91	11.55
		6	0	13.0	11.34	11.56	11.36
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 19965CH	Channel 20175CH	Channel 20385CH
3MHz	QPSK	1	0	14.0	12.05	12.05	12.23
		1	7	14.0	12.41	12.76	12.45
		1	14	14.0	12.07	12.51	12.18
		8	0	13.3	11.31	11.45	11.40
		8	4	13.3	11.38	11.66	11.44
		8	7	13.3	11.30	11.61	11.34
		15	0	13.3	11.30	11.51	11.37
	16QAM	1	0	13.0	11.25	11.06	11.12
		1	7	13.0	11.55	11.83	11.35
		1	14	13.0	11.26	11.49	11.00
		8	0	13.0	11.29	11.43	11.37
		8	4	13.0	11.42	11.61	11.35
		8	7	13.0	11.27	11.60	11.32
		15	0	13.0	11.19	11.40	11.25

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 19975CH	Channel 20175CH	Channel 20375CH
5MHz	QPSK	1	0	14.0	12.19	12.41	12.41
		1	13	14.0	12.49	12.73	12.44
		1	24	14.0	12.42	12.76	12.47
		12	0	13.3	11.50	11.56	11.58
		12	6	13.3	11.59	11.85	11.66
		12	13	13.3	11.36	11.73	11.42
		25	0	13.3	11.42	11.59	11.53
	16QAM	1	0	13.0	11.21	11.42	11.46
		1	13	13.0	11.46	11.75	11.50
		1	24	13.0	11.31	11.82	11.53
		12	0	13.0	11.45	11.48	11.52
		12	6	13.0	11.54	11.78	11.60
		12	13	13.0	11.31	11.66	11.37
		25	0	13.0	11.28	11.46	11.45
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20000CH	Channel 20175CH	Channel 20350CH
10MHz	QPSK	1	0	14.0	12.13	12.29	12.61
		1	25	14.0	12.28	12.63	12.50
		1	49	14.0	12.01	12.70	12.28
		25	0	13.3	11.42	11.44	11.63
		25	13	13.3	11.42	11.69	11.64
		25	25	13.3	11.25	11.75	11.41
		50	0	13.3	11.29	11.68	11.53
	16QAM	1	0	13.0	11.20	11.28	11.50
		1	25	13.0	11.22	11.69	11.31
		1	49	13.0	11.03	11.72	11.03
		25	0	13.0	11.34	11.34	11.54
		25	13	13.0	11.35	11.59	11.54
		25	25	13.0	11.17	11.65	11.32
		50	0	13.0	11.19	11.58	11.41

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20025CH	Channel 20175CH	Channel 20325CH
15MHz	QPSK	1	0	14.0	12.23	12.34	12.73
		1	38	14.0	12.47	12.92	12.77
		1	74	14.0	12.27	12.80	12.34
		36	0	13.3	11.46	11.49	11.85
		36	18	13.3	11.36	11.77	11.72
		36	39	13.3	11.29	11.85	11.64
		75	0	13.3	11.38	11.78	11.67
	16QAM	1	0	13.0	11.51	11.44	11.78
		1	38	13.0	11.66	12.04	11.83
		1	74	13.0	11.44	11.89	11.39
		36	0	13.0	11.36	11.41	11.77
		36	18	13.0	11.25	11.69	11.63
		36	39	13.0	11.19	11.77	11.54
		75	0	13.0	11.28	11.65	11.55
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20050CH	Channel 20175CH	Channel 20300CH
20MHz	QPSK	1	0	14.0	12.23	12.24	**12.75**
		1	50	14.0	12.33	12.71	12.74
		1	99	14.0	12.32	12.59	12.30
		50	0	13.3	11.37	11.30	**11.95**
		50	25	13.3	11.37	11.77	11.72
		50	50	13.3	11.28	11.82	11.61
		100	0	13.3	11.25	11.59	11.81
	16QAM	1	0	13.0	11.37	11.32	11.83
		1	50	13.0	11.40	11.83	11.91
		1	99	13.0	11.41	11.66	11.40
		50	0	13.0	11.26	11.20	11.84
		50	25	13.0	11.26	11.67	11.62
		50	50	13.0	11.17	11.71	11.50
		100	0	13.0	11.15	11.50	11.71

Table 23: Conducted power measurement results of LTE Band 4(Sensor On)

7.1.6 Conducted power measurements of LTE Band 5

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20407CH	Channel 20525CH	Channel 20643CH
1.4MHz	QPSK	1	0	24.7	23.46	23.53	23.45
		1	3	24.7	23.40	23.53	23.40
		1	5	24.7	23.40	23.39	23.27
		3	0	24.7	23.41	23.46	23.34
		3	2	24.7	23.40	23.50	23.29
		3	3	24.7	23.38	23.41	23.32
		6	0	24.2	22.58	22.63	22.43
	16QAM	1	0	24.0	22.60	22.83	22.50
		1	3	24.0	22.60	22.89	22.57
		1	5	24.0	22.55	22.73	22.36
		3	0	24.0	22.69	22.60	22.60
		3	2	24.0	22.72	22.72	22.56
		3	3	24.0	22.63	22.49	22.43
		6	0	23.3	21.55	21.48	21.50
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20415CH	Channel 20525CH	Channel 20635CH
3MHz	QPSK	1	0	24.7	23.26	23.39	23.41
		1	7	24.7	23.37	23.55	23.43
		1	14	24.7	23.13	23.28	23.19
		8	0	24.2	22.54	22.65	22.48
		8	4	24.2	22.55	22.63	22.55
		8	7	24.2	22.44	22.56	22.41
		15	0	24.2	22.49	22.61	22.45
	16QAM	1	0	24.0	22.53	22.57	22.57
		1	7	24.0	22.74	22.83	22.74
		1	14	24.0	22.41	22.46	22.36
		8	0	23.3	21.44	21.55	21.66
		8	4	23.3	21.55	21.66	21.72
		8	7	23.3	21.36	21.53	21.54
		15	0	23.3	21.46	21.60	21.58

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20425CH	Channel 20525CH	Channel 20625CH
5MHz	QPSK	1	0	24.7	23.67	23.72	23.75
		1	13	24.7	23.83	23.92	23.87
		1	24	24.7	23.67	23.66	23.59
		12	0	24.2	22.94	22.96	23.01
		12	6	24.2	23.03	23.04	23.04
		12	13	24.2	22.81	22.84	22.84
		25	0	24.2	22.89	23.02	22.84
	16QAM	1	0	24.0	22.68	22.74	23.08
		1	13	24.0	22.95	22.99	23.17
		1	24	24.0	22.75	22.72	22.84
		12	0	23.3	21.99	22.05	22.16
		12	6	23.3	22.13	22.07	22.20
		12	13	23.3	21.93	21.97	22.03
		25	0	23.3	21.89	22.02	21.91
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20450CH	Channel 20525CH	Channel 20600CH
10MHz	QPSK	1	0	24.7	23.68	23.70	23.73
		1	25	24.7	23.73	23.74	**23.75**
		1	49	24.7	23.62	23.57	23.41
		25	0	24.2	22.96	23.05	23.07
		25	13	24.2	22.98	**23.11**	23.09
		25	25	24.2	22.86	22.94	22.82
		50	0	24.2	22.87	23.03	22.95
	16QAM	1	0	24.0	22.76	22.90	23.00
		1	25	24.0	22.83	22.98	23.01
		1	49	24.0	22.74	22.77	22.68
		25	0	23.3	21.96	22.05	22.11
		25	13	23.3	22.00	22.22	22.13
		25	25	23.3	21.88	22.05	21.89
		50	0	23.3	21.84	22.12	21.99

Table 24: Conducted power measurement results of LTE Band 5(Full Power)

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20407CH	Channel 20525CH	Channel 20643CH
1.4MHz	QPSK	1	0	18.7	17.66	17.86	18.05
		1	3	18.7	17.75	17.94	18.04
		1	5	18.7	17.65	17.74	17.91
		3	0	18.7	17.68	17.90	18.05
		3	2	18.7	17.73	17.95	18.00
		3	3	18.7	17.66	17.86	17.96
		6	0	18.2	16.70	16.94	16.97
	16QAM	1	0	18.0	16.94	16.92	16.94
		1	3	18.0	16.90	17.02	17.38
		1	5	18.0	16.88	16.85	17.01
		3	0	18.0	16.88	16.85	17.08
		3	2	18.0	16.90	16.96	17.15
		3	3	18.0	16.85	16.80	17.12
		6	0	17.3	15.70	15.89	15.97
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20415CH	Channel 20525CH	Channel 20635CH
3MHz	QPSK	1	0	18.7	17.47	17.52	17.76
		1	7	18.7	17.75	17.86	18.08
		1	14	18.7	17.25	17.42	17.65
		8	0	18.2	16.71	16.90	16.82
		8	4	18.2	16.72	16.95	16.99
		8	7	18.2	16.62	16.86	16.86
		15	0	18.2	16.67	16.91	16.83
	16QAM	1	0	18.0	16.68	16.90	16.75
		1	7	18.0	16.83	16.99	17.11
		1	14	18.0	16.51	16.81	16.79
		8	0	17.3	15.64	15.77	15.91
		8	4	17.3	15.69	15.94	16.02
		8	7	17.3	15.55	15.75	15.90
		15	0	17.3	15.57	15.79	15.87

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20425CH	Channel 20525CH	Channel 20625CH
5MHz	QPSK	1	0	18.7	17.89	17.78	18.21
		1	13	18.7	18.25	17.77	18.47
		1	24	18.7	18.06	17.76	18.19
		12	0	18.2	17.13	17.89	17.28
		12	6	18.2	17.24	17.79	17.38
		12	13	18.2	17.00	17.84	17.35
		25	0	18.2	17.08	17.88	17.22
	16QAM	1	0	18.0	17.01	16.85	17.21
		1	13	18.0	17.30	16.85	17.52
		1	24	18.0	17.07	16.85	17.34
		12	0	17.3	16.25	17.00	16.44
		12	6	17.3	16.35	16.95	16.46
		12	13	17.3	16.12	16.93	16.33
		25	0	17.3	16.15	16.95	16.18
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20450CH	Channel 20525CH	Channel 20600CH
10MHz	QPSK	1	0	18.7	17.85	17.95	18.09
		1	25	18.7	17.98	18.22	**18.23**
		1	49	18.7	17.82	17.90	18.00
		25	0	18.2	17.05	17.21	17.27
		25	13	18.2	17.11	**17.39**	17.37
		25	25	18.2	17.00	17.19	17.15
		50	0	18.2	17.04	17.26	17.22
	16QAM	1	0	18.0	16.84	17.24	17.08
		1	25	18.0	17.08	17.58	17.29
		1	49	18.0	16.74	17.23	17.09
		25	0	17.3	16.19	16.32	16.23
		25	13	17.3	16.24	16.45	16.31
		25	25	17.3	16.14	16.26	16.09
		50	0	17.3	16.09	16.31	16.11

Table 25: Conducted power measurement results of LTE Band 5(Sensor On)

7.1.7 Conducted power measurements of LTE Band 7

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20775CH	Channel 21100CH	Channel 21425CH
5MHz	QPSK	1	0	24.2	21.64	23.11	23.00
		1	13	24.2	21.63	23.15	23.15
		1	24	24.2	21.61	23.04	23.13
		12	0	23.5	21.63	22.35	22.17
		12	6	23.5	21.92	22.36	22.24
		12	13	23.5	22.10	22.04	21.98
		25	0	23.5	22.11	22.13	22.07
	16QAM	1	0	23.5	21.60	22.24	21.99
		1	13	23.5	21.66	22.25	22.14
		1	24	23.5	21.65	22.26	22.14
		12	0	23.0	21.43	21.91	21.67
		12	6	23.0	21.43	21.92	21.75
		12	13	23.0	21.61	21.66	21.61
		25	0	23.0	21.53	21.74	21.54
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20800CH	Channel 21100CH	Channel 21400CH
10MHz	QPSK	1	0	24.2	22.71	23.23	23.24
		1	25	24.2	22.65	23.26	23.15
		1	49	24.2	22.58	23.08	23.15
		25	0	23.5	22.16	22.28	22.17
		25	13	23.5	22.21	22.19	22.23
		25	25	23.5	22.38	22.06	22.13
		50	0	23.5	22.18	22.09	22.17
	16QAM	1	0	23.5	22.15	22.46	22.21
		1	25	23.5	22.08	22.36	22.17
		1	49	23.5	22.11	22.24	22.15
		25	0	23.0	21.67	21.80	21.73
		25	13	23.0	21.67	21.76	21.69
		25	25	23.0	21.94	21.66	21.60
		50	0	23.0	21.74	21.66	21.59

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20825CH	Channel 21100CH	Channel 21375CH
15MHz	QPSK	1	0	24.2	22.66	23.14	22.90
		1	38	24.2	22.59	23.08	23.15
		1	74	24.2	22.52	22.86	22.97
		36	0	23.5	22.06	22.26	22.24
		36	18	23.5	22.27	22.31	22.22
		36	39	23.5	22.12	22.07	22.16
		75	0	23.5	22.22	22.16	22.07
	16QAM	1	0	23.5	21.77	22.58	22.22
		1	38	23.5	21.65	22.59	22.47
		1	74	23.5	21.57	22.32	22.20
		36	0	23.0	21.72	21.69	21.74
		36	18	23.0	21.93	21.85	21.74
		36	39	23.0	21.70	21.62	21.68
		75	0	23.0	21.78	21.70	21.53
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20850CH	Channel 21100CH	Channel 21350CH
20MHz	QPSK	1	0	24.2	22.66	23.09	22.84
		1	50	24.2	22.78	23.23	**23.23**
		1	99	24.2	22.83	22.92	23.03
		50	0	23.5	**22.26**	22.13	22.10
		50	25	23.5	22.25	22.16	22.06
		50	50	23.5	22.10	22.09	22.18
		100	0	23.5	22.18	22.05	22.07
	16QAM	1	0	23.5	21.93	22.37	22.34
		1	50	23.5	22.06	22.59	22.67
		1	99	23.5	22.17	22.31	22.59
		50	0	23.0	21.76	21.60	21.58
		50	25	23.0	21.75	21.63	21.55
		50	50	23.0	21.60	21.56	21.67
		100	0	23.0	21.70	21.55	21.52

Table 26: Conducted power measurement results of LTE Band 7(Full Power)

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20775CH	Channel 21100CH	Channel 21425CH
5MHz	QPSK	1	0	9.2	8.26	8.76	8.43
		1	13	9.2	8.70	9.08	8.67
		1	24	9.2	8.66	9.02	8.69
		12	0	8.5	7.64	8.10	7.71
		12	6	8.5	7.73	8.15	7.79
		12	13	8.5	7.97	7.88	7.56
		25	0	8.5	7.84	7.95	7.62
	16QAM	1	0	8.5	7.47	7.90	7.63
		1	13	8.5	7.88	8.03	7.91
		1	24	8.5	7.84	7.99	7.93
		12	0	8.0	7.11	7.51	7.13
		12	6	8.0	7.20	7.55	7.22
		12	13	8.0	7.43	7.30	6.98
		25	0	8.0	7.44	7.31	6.96
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20800CH	Channel 21100CH	Channel 21400CH
10MHz	QPSK	1	0	9.2	8.43	8.95	8.75
		1	25	9.2	8.68	9.04	8.62
		1	49	9.2	8.59	8.81	8.62
		25	0	8.5	8.00	8.01	7.68
		25	13	8.5	8.07	8.00	7.68
		25	25	8.5	8.31	7.87	7.60
		50	0	8.5	8.12	7.90	7.62
	16QAM	1	0	8.5	7.76	8.08	7.66
		1	25	8.5	7.96	8.15	7.44
		1	49	8.5	7.85	7.91	7.43
		25	0	8.0	7.43	7.39	7.03
		25	13	8.0	7.50	7.39	7.03
		25	25	8.0	7.74	7.26	6.95
		50	0	8.0	7.55	7.25	6.97

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20825CH	Channel 21100CH	Channel 21375CH
15MHz	QPSK	1	0	9.2	8.39	8.76	8.55
		1	38	9.2	8.54	8.89	8.64
		1	74	9.2	8.30	8.60	8.37
		36	0	8.5	7.99	7.91	7.65
		36	18	8.5	8.23	8.03	7.64
		36	39	8.5	7.98	7.78	7.56
		75	0	8.5	8.06	7.83	7.48
	16QAM	1	0	8.5	7.30	8.09	7.53
		1	38	8.5	7.54	8.30	7.73
		1	74	8.5	7.26	7.92	7.44
		36	0	8.0	7.43	7.28	7.10
		36	18	8.0	7.67	7.40	7.00
		36	39	8.0	7.37	7.16	6.94
		75	0	8.0	7.47	7.16	6.82
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 20850CH	Channel 21100CH	Channel 21350CH
20MHz	QPSK	1	0	9.2	8.41	8.73	8.56
		1	50	9.2	8.70	**8.89**	8.86
		1	99	9.2	8.69	8.86	8.62
		50	0	8.5	**8.18**	7.86	7.66
		50	25	8.5	8.18	7.95	7.63
		50	50	8.5	7.93	7.88	7.65
		100	0	8.5	8.06	7.86	7.68
	16QAM	1	0	8.5	7.61	7.95	7.84
		1	50	8.5	7.94	8.38	8.20
		1	99	8.5	7.85	8.06	7.96
		50	0	8.0	7.63	7.21	7.14
		50	25	8.0	7.54	7.31	7.12
		50	50	8.0	7.30	7.23	7.01
		100	0	8.0	7.48	7.22	7.08

Table 27: Conducted power measurement results of LTE Band 7(Sensor on)

7.1.8 Conducted power measurements of LTE Band 12

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 23017CH	Channel 23095CH	Channel 23173CH
1.4MHz	QPSK	1	0	25.7	24.33	24.57	24.54
		1	3	25.7	24.33	24.71	24.56
		1	5	25.7	24.20	24.58	24.40
		3	0	25.7	24.30	24.59	24.40
		3	2	25.7	24.29	24.66	24.47
		3	3	25.7	24.29	24.60	24.44
		6	0	25.1	22.95	23.12	23.13
	16QAM	1	0	24.7	22.85	23.11	23.05
		1	3	24.7	23.10	23.36	23.29
		1	5	24.7	22.87	23.19	23.07
		3	0	24.7	23.05	23.18	23.20
		3	2	24.7	23.11	23.28	23.29
		3	3	24.7	23.01	23.22	23.26
		6	0	23.7	22.07	22.24	22.14
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 23025CH	Channel 23095CH	Channel 23165CH
3MHz	QPSK	1	0	25.7	24.19	24.39	24.31
		1	7	25.7	24.34	24.63	24.45
		1	14	25.7	24.02	24.36	24.35
		8	0	25.1	22.92	23.01	23.06
		8	4	25.1	22.86	23.10	23.12
		8	7	25.1	22.74	23.06	23.03
		15	0	25.1	22.81	23.00	23.11
	16QAM	1	0	24.7	22.90	22.94	22.94
		1	7	24.7	22.89	23.33	23.44
		1	14	24.7	22.82	23.03	23.01
		8	0	23.7	22.06	22.11	22.02
		8	4	23.7	22.01	22.29	22.03
		8	7	23.7	21.89	22.10	21.98
		15	0	23.7	21.83	22.09	22.00

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 23035CH	Channel 23095CH	Channel 23155CH
5MHz	QPSK	1	0	25.7	24.52	24.57	24.56
		1	13	25.7	24.67	24.93	24.53
		1	24	25.7	24.48	24.61	24.55
		12	0	25.1	23.50	23.46	23.69
		12	6	25.1	23.46	23.65	23.72
		12	13	25.1	23.31	23.49	23.46
		25	0	25.1	23.32	23.46	23.56
	16QAM	1	0	24.7	23.06	23.16	23.42
		1	13	24.7	23.32	23.57	23.55
		1	24	24.7	23.04	23.27	23.55
		12	0	23.7	22.47	22.50	22.60
		12	6	23.7	22.44	22.73	22.75
		12	13	23.7	22.29	22.57	22.58
		25	0	23.7	22.24	22.50	22.41
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 23060CH	Channel 23095CH	Channel 23130CH
10MHz	QPSK	1	0	25.7	24.74	24.67	24.86
		1	25	25.7	24.82	**24.94**	24.88
		1	49	25.7	24.71	24.40	24.47
		25	0	25.1	23.42	23.51	23.71
		25	13	25.1	23.54	23.73	**23.77**
		25	25	25.1	23.42	23.57	23.38
		50	0	25.1	23.38	23.54	23.51
	16QAM	1	0	24.7	23.38	23.64	23.51
		1	25	24.7	23.50	23.93	23.74
		1	49	24.7	23.23	23.60	23.25
		25	0	23.7	22.30	22.44	22.70
		25	13	23.7	22.43	22.73	22.70
		25	25	23.7	22.33	22.52	22.30
		50	0	23.7	22.28	22.43	22.40

Table 28: Conducted power measurement results of LTE Band 12(Full Power)

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 23017CH	Channel 23095CH	Channel 23173CH
1.4MHz	QPSK	1	0	17.7	16.75	16.92	16.94
		1	3	17.7	16.82	17.07	16.99
		1	5	17.7	16.61	16.98	16.90
		3	0	17.7	16.80	16.90	16.84
		3	2	17.7	16.87	17.00	16.88
		3	3	17.7	16.78	16.94	16.88
		6	0	17.1	15.30	15.51	15.37
	16QAM	1	0	16.7	15.42	15.51	15.40
		1	3	16.7	15.28	15.81	15.54
		1	5	16.7	15.38	15.62	15.42
		3	0	16.7	15.52	15.59	15.48
		3	2	16.7	15.55	15.68	15.56
		3	3	16.7	15.37	15.64	15.54
		6	0	15.7	14.44	14.51	14.48
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 23025CH	Channel 23095CH	Channel 23165CH
3MHz	QPSK	1	0	17.7	16.57	16.64	16.82
		1	7	17.7	16.73	16.96	16.99
		1	14	17.7	16.39	16.81	16.77
		8	0	17.1	15.24	15.42	15.42
		8	4	17.1	15.28	15.53	15.43
		8	7	17.1	15.12	15.45	15.30
		15	0	17.1	15.20	15.44	15.43
	16QAM	1	0	16.7	15.18	15.28	15.24
		1	7	16.7	15.63	15.71	15.47
		1	14	16.7	15.11	15.44	15.21
		8	0	15.7	14.35	14.41	14.54
		8	4	15.7	14.24	14.53	14.54
		8	7	15.7	14.20	14.44	14.43
		15	0	15.7	14.11	14.44	14.43

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 23035CH	Channel 23095CH	Channel 23155CH
5MHz	QPSK	1	0	17.7	16.98	16.99	17.21
		1	13	17.7	17.19	17.44	17.38
		1	24	17.7	16.94	17.19	17.17
		12	0	17.1	15.76	15.80	16.09
		12	6	17.1	15.73	16.04	16.11
		12	13	17.1	15.57	15.94	15.87
		25	0	17.1	15.59	15.88	15.90
	16QAM	1	0	16.7	15.63	15.40	15.83
		1	13	16.7	15.85	15.88	16.05
		1	24	16.7	15.61	15.59	15.82
		12	0	15.7	14.87	14.90	15.13
		12	6	15.7	14.85	15.12	15.10
		12	13	15.7	14.70	15.03	14.86
		25	0	15.7	14.56	14.83	14.91
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 23060CH	Channel 23095CH	Channel 23130CH
10MHz	QPSK	1	0	17.7	17.23	17.06	17.24
		1	25	17.7	17.27	17.44	**17.56**
		1	49	17.7	17.11	17.12	17.05
		25	0	17.1	15.65	15.74	16.03
		25	13	17.1	15.77	16.01	**16.18**
		25	25	17.1	15.64	15.93	15.72
		50	0	17.1	15.59	15.83	15.84
	16QAM	1	0	16.7	15.70	15.80	15.80
		1	25	16.7	15.97	16.40	16.18
		1	49	16.7	15.81	15.86	15.58
		25	0	15.7	14.64	14.74	15.03
		25	13	15.7	14.78	15.02	15.21
		25	25	15.7	14.64	14.93	14.71
		50	0	15.7	14.57	14.83	14.85

Table 29: Conducted power measurement results of LTE Band 12(Sensor On)

7.1.9 Conducted power measurements of LTE Band 17

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 23755CH	Channel 23790CH	Channel 23825CH
5MHz	QPSK	1	0	25.7	24.39	24.73	24.66
		1	13	25.7	24.80	24.93	24.62
		1	24	25.7	24.67	24.66	24.60
		12	0	25.0	23.76	24.16	24.11
		12	6	25.0	23.94	24.17	24.08
		12	13	25.0	23.92	24.12	23.94
		25	0	25.0	23.82	24.03	23.90
	16QAM	1	0	25.0	23.66	23.88	23.74
		1	13	25.0	24.06	24.18	23.89
		1	24	25.0	24.01	23.90	23.84
		12	0	24.0	22.68	23.12	23.27
		12	6	24.0	22.88	23.16	23.24
		12	13	24.0	22.87	23.10	23.10
		25	0	24.0	22.74	23.00	23.01
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 23780CH	Channel 23790CH	Channel 23800CH
10MHz	QPSK	1	0	25.7	24.62	24.59	24.75
		1	25	25.7	**24.93**	24.85	24.80
		1	49	25.7	24.37	24.29	24.49
		25	0	25.0	23.95	24.06	24.10
		25	13	25.0	**24.16**	24.15	24.16
		25	25	25.0	23.89	23.86	23.76
		50	0	25.0	23.89	23.89	23.84
	16QAM	1	0	25.0	23.48	23.99	23.84
		1	25	25.0	24.01	24.35	23.98
		1	49	25.0	23.83	23.93	23.75
		25	0	24.0	22.83	22.95	23.03
		25	13	24.0	23.06	23.08	23.09
		25	25	24.0	22.79	22.93	22.83
		50	0	24.0	22.79	22.76	22.75

Table 30: Conducted power measurement results of LTE Band 17(Full Power)

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 23755CH	Channel 23790CH	Channel 23825CH
5MHz	QPSK	1	0	18.7	17.62	18.03	18.15
		1	13	18.7	18.05	18.45	18.30
		1	24	18.7	18.06	18.02	17.97
		12	0	18.0	16.95	17.42	17.54
		12	6	18.0	17.15	17.51	17.50
		12	13	18.0	17.15	17.47	17.26
		25	0	18.0	17.04	17.33	17.30
	16QAM	1	0	18.0	16.69	16.98	17.15
		1	13	18.0	17.11	17.48	17.43
		1	24	18.0	17.11	17.16	17.17
		12	0	17.0	15.96	16.44	16.55
		12	6	17.0	16.19	16.53	16.52
		12	13	17.0	16.18	16.49	16.28
		25	0	17.0	16.00	16.30	16.23
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 23780CH	Channel 23790CH	Channel 23800CH
10MHz	QPSK	1	0	18.7	17.91	17.97	17.96
		1	25	18.7	18.35	**18.41**	18.26
		1	49	18.7	17.82	17.73	17.70
		25	0	18.0	17.11	17.24	17.38
		25	13	18.0	17.41	17.42	**17.50**
		25	25	18.0	17.18	17.22	17.14
		50	0	18.0	17.10	17.11	17.13
	16QAM	1	0	18.0	16.86	16.84	17.08
		1	25	18.0	17.26	17.35	17.56
		1	49	18.0	16.89	16.88	17.17
		25	0	17.0	16.06	16.21	16.34
		25	13	17.0	16.37	16.41	16.49
		25	25	17.0	16.13	16.19	16.10
		50	0	17.0	16.05	16.07	16.06

Table 31: Conducted power measurement results of LTE Band 17(Sensor On)

7.1.10 Conducted power measurements of LTE Band 26

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 26697CH	Channel 26865CH	Channel 27033CH
1.4MHz	QPSK	1	0	25.0	23.48	23.71	23.59
		1	3	25.0	23.53	23.77	23.58
		1	5	25.0	23.44	23.61	23.32
		3	0	25.0	23.49	23.69	23.48
		3	2	25.0	23.49	23.74	23.48
		3	3	25.0	23.47	23.66	23.37
		6	0	24.3	22.52	22.72	22.67
	16QAM	1	0	24.2	22.47	22.86	22.83
		1	3	24.2	22.54	22.95	22.91
		1	5	24.2	22.45	22.81	22.57
		3	0	24.2	22.49	22.83	22.72
		3	2	24.2	22.52	22.86	22.70
		3	3	24.2	22.49	22.80	22.60
		6	0	23.4	21.60	21.78	21.54
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 26705CH	Channel 26865CH	Channel 27025CH
3MHz	QPSK	1	0	25.0	23.27	23.69	23.42
		1	7	25.0	23.41	23.73	23.55
		1	14	25.0	23.19	23.45	23.19
		8	0	24.3	22.58	22.72	22.79
		8	4	24.3	22.61	22.69	22.79
		8	7	24.3	22.51	22.59	22.65
		15	0	24.3	22.55	22.63	22.71
	16QAM	1	0	24.2	22.65	22.77	22.45
		1	7	24.2	22.68	22.81	22.75
		1	14	24.2	22.58	22.53	22.24
		8	0	23.4	21.68	21.82	21.74
		8	4	23.4	21.65	21.72	21.82
		8	7	23.4	21.64	21.71	21.58
		15	0	23.4	21.54	21.68	21.62

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 26715CH	Channel 26865CH	Channel 27015CH
5MHz	QPSK	1	0	25.0	23.86	24.04	24.11
		1	13	25.0	24.16	24.20	24.19
		1	24	25.0	24.02	23.96	23.80
		12	0	24.3	23.10	23.30	23.39
		12	6	24.3	23.16	23.31	23.25
		12	13	24.3	23.00	23.12	23.11
		25	0	24.3	23.04	23.17	23.07
	16QAM	1	0	24.2	22.92	23.13	23.41
		1	13	24.2	23.24	23.37	23.41
		1	24	24.2	23.02	23.25	23.05
		12	0	23.4	22.19	22.42	22.27
		12	6	23.4	22.27	22.42	22.32
		12	13	23.4	22.06	22.25	22.29
		25	0	23.4	22.13	22.30	22.09
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 26750CH	Channel 26865CH	Channel 26990CH
10MHz	QPSK	1	0	25.0	23.76	23.85	23.85
		1	25	25.0	24.10	24.16	24.28
		1	49	25.0	23.59	23.61	23.75
		25	0	24.3	23.02	23.12	23.33
		25	13	24.3	23.02	23.17	23.37
		25	25	24.3	22.97	23.03	23.06
		50	0	24.3	23.04	23.07	23.25
	16QAM	1	0	24.2	22.94	23.27	23.06
		1	25	24.2	23.18	23.52	23.41
		1	49	24.2	22.82	23.00	22.80
		25	0	23.4	22.04	22.22	22.24
		25	13	23.4	22.10	22.28	22.23
		25	25	23.4	22.08	22.15	22.09
		50	0	23.4	22.09	22.14	22.09

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 26775CH	Channel 26865CH	Channel 26965CH
15MHz	QPSK	1	0	25.0	23.71	23.68	23.63
		1	38	25.0	23.79	**23.88**	23.78
		1	74	25.0	23.56	23.39	23.42
		36	0	24.3	23.03	23.07	23.22
		36	18	24.3	23.09	23.20	**23.24**
		36	39	24.3	22.88	23.06	23.03
		75	0	24.3	22.93	22.97	23.06
	16QAM	1	0	24.2	22.72	22.84	22.64
		1	38	24.2	22.95	23.18	22.99
		1	74	24.2	22.55	22.93	22.40
		36	0	23.4	22.02	22.19	22.17
		36	18	23.4	22.16	22.31	22.19
		36	39	23.4	21.98	22.00	21.94
		75	0	23.4	21.97	22.06	21.99

Table 32: Conducted power measurement results of LTE Band 26(Full Power)

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 26697CH	Channel 26865CH	Channel 27033CH
1.4MHz	QPSK	1	0	18.0	16.16	17.21	17.41
		1	3	18.0	16.07	17.13	17.28
		1	5	18.0	16.09	17.12	17.20
		3	0	18.0	16.15	17.17	17.27
		3	2	18.0	17.07	17.17	17.30
		3	3	18.0	17.00	17.13	17.20
		6	0	17.3	16.01	16.06	16.30
	16QAM	1	0	17.2	16.12	16.18	16.17
		1	3	17.2	16.15	16.26	16.61
		1	5	17.2	16.07	15.94	15.98
		3	0	17.2	16.13	16.21	16.34
		3	2	17.2	16.15	16.17	16.37
		3	3	17.2	16.07	16.19	16.25
		6	0	16.4	15.08	15.11	15.28
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 26705CH	Channel 26865CH	Channel 27025CH
3MHz	QPSK	1	0	18.0	16.94	17.10	16.93
		1	7	18.0	17.09	17.14	17.33
		1	14	18.0	16.84	16.87	16.87
		8	0	17.3	15.96	16.15	16.32
		8	4	17.3	15.98	16.12	16.33
		8	7	17.3	15.89	16.03	16.21
		15	0	17.3	15.98	16.06	16.18
	16QAM	1	0	17.2	15.78	16.29	16.16
		1	7	17.2	16.03	16.28	16.38
		1	14	17.2	15.70	16.12	15.94
		8	0	16.4	15.05	15.14	15.29
		8	4	16.4	15.06	15.11	15.37
		8	7	16.4	14.98	15.06	15.27
		15	0	16.4	14.87	14.97	15.23

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 26715CH	Channel 26865CH	Channel 27015CH
5MHz	QPSK	1	0	18.0	17.33	17.57	17.65
		1	13	18.0	17.70	17.88	17.97
		1	24	18.0	17.37	17.58	17.65
		12	0	17.3	16.67	16.85	16.80
		12	6	17.3	16.72	16.86	16.89
		12	13	17.3	16.46	16.68	16.82
		25	0	17.3	16.57	16.72	16.68
	16QAM	1	0	17.2	16.51	16.84	16.74
		1	13	17.2	16.82	17.04	17.11
		1	24	17.2	16.55	16.78	16.80
		12	0	16.4	15.59	15.83	15.82
		12	6	16.4	15.68	15.87	15.91
		12	13	16.4	15.43	15.70	15.85
		25	0	16.4	15.45	15.55	15.71
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 26750CH	Channel 26865CH	Channel 26990CH
10MHz	QPSK	1	0	18.0	17.20	17.24	17.41
		1	25	18.0	17.72	17.74	17.80
		1	49	18.0	16.98	17.10	17.23
		25	0	17.3	16.49	16.61	16.68
		25	13	17.3	16.56	16.68	16.74
		25	25	17.3	16.52	16.57	16.58
		50	0	17.3	16.55	16.58	16.60
	16QAM	1	0	17.2	16.34	16.59	16.70
		1	25	17.2	16.92	17.09	17.01
		1	49	17.2	16.33	16.58	16.39
		25	0	16.4	15.40	15.52	15.76
		25	13	16.4	15.47	15.60	15.78
		25	25	16.4	15.43	15.49	15.64
		50	0	16.4	15.44	15.48	15.65

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 26775CH	Channel 26865CH	Channel 26965CH
15MHz	QPSK	1	0	18.0	16.96	16.83	17.05
		1	38	18.0	17.27	17.31	**17.31**
		1	74	18.0	16.69	16.72	16.97
		36	0	17.3	16.46	16.59	16.70
		36	18	17.3	16.58	**16.73**	16.59
		36	39	17.3	16.43	16.50	16.36
		75	0	17.3	16.50	16.51	16.38
	16QAM	1	0	17.2	16.25	16.37	16.31
		1	38	17.2	16.28	16.62	16.42
		1	74	17.2	16.02	16.28	15.89
		36	0	16.4	15.41	15.52	15.58
		36	18	16.4	15.56	15.69	15.64
		36	39	16.4	15.34	15.45	15.45
		75	0	16.4	15.40	15.41	15.47

Table 33: Conducted power measurement results of LTE Band 26(Sensor On)

7.1.11 Conducted power measurements of LTE Band 38

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
				Max.	37775CH	38000CH	38225CH
5MHz	QPSK	1	0	24.0	22.63	22.94	22.98
		1	13	24.0	22.76	22.88	23.08
		1	24	24.0	22.83	22.78	22.95
		12	0	23.0	21.91	22.12	22.25
		12	6	23.0	22.01	22.19	22.29
		12	13	23.0	22.07	22.07	22.34
		25	0	23.0	21.89	22.06	22.19
	16QAM	1	0	23.2	21.88	22.00	22.06
		1	13	23.2	22.04	21.91	22.25
		1	24	23.2	22.08	21.87	22.07
		12	0	23.0	21.90	22.12	22.22
		12	6	23.0	21.95	22.21	22.30
		12	13	23.0	22.06	22.07	22.31
		25	0	23.0	21.87	22.00	22.17
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
				Max.	37800CH	38000CH	38200CH
10MHz	QPSK	1	0	24.0	22.66	23.00	22.76
		1	25	24.0	23.14	23.13	23.11
		1	49	24.0	22.98	22.76	22.95
		25	0	23.0	21.93	22.14	22.12
		25	13	23.0	22.10	22.12	22.20
		25	25	23.0	22.13	22.05	22.18
		50	0	23.0	22.06	22.07	22.13
	16QAM	1	0	23.2	21.74	21.99	21.90
		1	25	23.2	22.21	22.12	22.24
		1	49	23.2	22.06	21.88	22.07
		25	0	23.0	21.95	22.05	22.07
		25	13	23.0	22.05	22.04	22.15
		25	25	23.0	22.08	21.96	22.14
		50	0	23.0	21.99	22.03	22.06

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 37825CH	Channel 38000CH	Channel 38175CH
15MHz	QPSK	1	0	24.0	22.43	22.86	22.58
		1	38	24.0	22.93	22.95	22.98
		1	74	24.0	22.81	22.48	22.70
		36	0	23.0	21.99	22.17	21.99
		36	18	23.0	22.23	22.19	22.13
		36	39	23.0	22.17	22.02	22.11
		75	0	23.0	22.13	22.07	22.04
	16QAM	1	0	23.2	21.56	21.70	21.52
		1	38	23.2	22.08	21.90	21.88
		1	74	23.2	21.95	21.50	21.76
		36	0	23.0	21.95	22.20	21.94
		36	18	23.0	22.22	22.22	22.09
		36	39	23.0	22.20	22.04	22.07
		75	0	23.0	22.09	22.03	21.98
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 37850CH	Channel 38000CH	Channel 38150CH
20MHz	QPSK	1	0	24.0	22.88	23.21	22.92
		1	50	24.0	**23.49**	23.29	23.10
		1	99	24.0	23.21	22.78	23.08
		50	0	23.0	22.23	22.36	22.17
		50	25	23.0	22.35	22.29	22.22
		50	50	23.0	**22.40**	22.15	22.26
		100	0	23.0	22.30	22.25	22.21
	16QAM	1	0	23.2	22.04	22.50	22.13
		1	50	23.2	22.68	22.60	22.19
		1	99	23.2	22.38	22.20	22.34
		50	0	23.0	22.21	22.32	22.14
		50	25	23.0	22.34	22.25	22.19
		50	50	23.0	22.36	22.11	22.24
		100	0	23.0	22.23	22.19	22.14

Table 34: Conducted power measurement results of LTE Band 38(Full Power)

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 37775CH	Channel 38000CH	Channel 38225CH
5MHz	QPSK	1	0	12.0	10.43	11.22	11.29
		1	13	12.0	10.64	11.12	11.28
		1	24	12.0	10.65	11.13	11.27
		12	0	11.0	9.58	10.31	10.46
		12	6	11.0	9.68	10.34	10.51
		12	13	11.0	9.52	10.31	10.53
		25	0	11.0	9.56	10.23	10.39
	16QAM	1	0	11.2	9.50	10.03	10.20
		1	13	11.2	9.73	9.97	10.28
		1	24	11.2	9.81	9.97	10.21
		12	0	11.0	9.49	10.21	10.37
		12	6	11.0	9.58	10.27	10.44
		12	13	11.0	9.43	10.21	10.46
		25	0	11.0	9.47	10.16	10.33
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 37800CH	Channel 38000CH	Channel 38200CH
10MHz	QPSK	1	0	12.0	10.69	11.24	11.17
		1	25	12.0	11.13	11.29	11.44
		1	49	12.0	11.10	10.98	11.25
		25	0	11.0	10.11	10.31	10.31
		25	13	11.0	10.23	10.30	10.39
		25	25	11.0	10.26	10.22	10.36
		50	0	11.0	10.20	10.26	10.32
	16QAM	1	0	11.2	9.89	10.22	10.10
		1	25	11.2	10.37	10.29	10.43
		1	49	11.2	10.24	9.99	10.19
		25	0	11.0	10.01	10.21	10.24
		25	13	11.0	10.13	10.17	10.32
		25	25	11.0	10.17	10.11	10.29
		50	0	11.0	10.12	10.15	10.21

Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 37825CH	Channel 38000CH	Channel 38175CH
15MHz	QPSK	1	0	12.0	10.57	11.12	10.92
		1	38	12.0	11.09	11.12	11.09
		1	74	12.0	11.05	10.81	11.02
		36	0	11.0	10.07	10.31	10.19
		36	18	11.0	10.32	10.32	10.31
		36	39	11.0	10.28	10.16	10.29
		75	0	11.0	10.24	10.22	10.17
	16QAM	1	0	11.2	9.62	10.32	9.96
		1	38	11.2	10.23	10.41	10.19
		1	74	11.2	10.04	10.02	10.09
		36	0	11.0	9.99	10.23	10.09
		36	18	11.0	10.21	10.22	10.21
		36	39	11.0	10.22	10.06	10.20
		75	0	11.0	10.13	10.11	10.03
Bandwidth	Modulation	RB size	RB offset	Tune-up Max.	Channel 37850CH	Channel 38000CH	Channel 38150CH
20MHz	QPSK	1	0	12.0	10.90	11.52	11.32
		1	50	12.0	**11.62**	11.50	11.47
		1	99	12.0	11.37	11.17	11.48
		50	0	11.0	10.39	10.52	10.32
		50	25	11.0	10.54	10.44	10.37
		50	50	11.0	**10.55**	10.31	10.41
		100	0	11.0	10.43	10.39	10.30
	16QAM	1	0	11.2	9.97	10.18	10.34
		1	50	11.2	10.45	10.29	10.52
		1	99	11.2	10.40	9.84	10.53
		50	0	11.0	10.27	10.40	10.21
		50	25	11.0	10.40	10.32	10.25
		50	50	11.0	10.44	10.19	10.30
		100	0	11.0	10.31	10.27	10.18

Table 35: Conducted power measurement results of LTE Band 38(Sensor On)

7.1.12 Conducted power measurements of LTE Band 41

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel 40165CH	Channel 40515CH	Channel 40865CH	Channel 41215CH
5MHz	QPSK	1	0	24.0	23.12	23.02	22.93	22.80
		1	13	24.0	23.30	23.28	23.14	23.03
		1	24	24.0	23.01	23.11	23.06	23.07
		12	0	23.1	22.45	22.45	22.31	22.25
		12	6	23.1	22.48	22.55	22.52	22.45
		12	13	23.1	22.32	22.33	22.26	22.28
		25	0	23.1	22.59	22.49	22.54	22.52
	16QAM	1	0	23.0	22.05	22.05	22.14	22.23
		1	13	23.0	21.87	21.98	22.01	22.13
		1	24	23.0	22.11	22.09	22.20	22.30
		12	0	23.0	21.96	21.99	22.00	22.08
		12	6	23.0	21.91	21.79	21.85	21.78
		12	13	23.0	21.88	21.83	21.73	21.67
		25	0	23.0	21.86	21.89	21.96	21.94
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel 40190CH	Channel 40520CH	Channel 40850CH	Channel 41190CH
10MHz	QPSK	1	0	24.0	23.05	22.95	22.84	22.95
		1	25	24.0	23.24	23.17	23.02	23.02
		1	49	24.0	22.80	22.78	22.69	22.60
		25	0	23.1	22.64	22.68	22.79	22.71
		25	13	23.1	22.48	22.46	22.56	22.58
		25	25	23.1	22.52	22.51	22.41	22.32
		50	0	23.1	22.37	22.39	22.36	22.38
	16QAM	1	0	23.0	22.19	22.11	22.11	21.98
		1	25	23.0	22.05	22.06	22.08	22.09
		1	49	23.0	22.15	22.20	22.18	22.05
		25	0	23.0	21.95	22.06	21.99	21.94
		25	13	23.0	22.00	22.02	22.01	21.99
		25	25	23.0	21.66	21.77	21.68	21.60
		50	0	23.0	22.00	22.14	22.04	22.15

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel	Channel
					40215CH	40535CH	40855CH	41165CH
15MHz	QPSK	1	0	24.0	23.15	23.22	23.29	23.21
		1	38	24.0	23.01	23.10	23.10	23.06
		1	74	24.0	22.87	23.00	22.87	22.89
		36	0	23.1	22.51	22.46	22.45	22.58
		36	18	23.1	22.35	22.24	22.37	22.37
		36	39	23.1	22.32	22.38	22.40	22.48
		75	0	23.1	22.31	22.31	22.40	22.36
	16QAM	1	0	23.0	22.13	22.19	22.27	22.38
		1	38	23.0	21.96	22.02	21.93	21.97
		1	74	23.0	22.14	22.26	22.28	22.17
		36	0	23.0	21.98	22.04	22.05	22.11
		36	18	23.0	21.82	21.68	21.73	21.65
		36	39	23.0	21.75	21.69	21.78	21.86
		75	0	23.0	21.75	21.80	21.79	21.69
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel	Channel
					40240CH	40540CH	40840CH	41140CH
20MHz	QPSK	1	0	24.0	22.75	23.17	22.61	**23.22**
		1	50	24.0	22.71	23.16	22.86	23.00
		1	99	24.0	22.80	22.87	22.99	22.65
		50	0	23.1	22.00	**22.53**	22.02	22.49
		50	25	23.1	21.97	22.48	22.14	22.31
		50	50	23.1	21.89	22.39	22.25	22.03
		100	0	23.1	21.97	22.45	22.10	22.32
	16QAM	1	0	23.0	22.10	22.69	21.92	22.53
		1	50	23.0	21.94	22.67	22.17	22.14
		1	99	23.0	22.14	22.50	22.36	21.92
		50	0	23.0	21.97	22.50	21.97	22.40
		50	25	23.0	21.88	22.45	22.06	22.23
		50	50	23.0	21.80	22.30	22.13	21.93
		100	0	23.0	21.90	22.41	22.00	22.19

Table 36: Conducted power measurement results of LTE Band 41(Full Power)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel 40165CH	Channel 40515CH	Channel 40865CH	Channel 42215CH
5MHz	QPSK	1	0	11.0	10.13	10.17	10.28	10.41
		1	13	11.0	9.93	9.97	9.84	9.78
		1	24	11.0	10.20	10.29	10.39	10.45
		12	0	10.1	9.22	9.12	9.01	9.05
		12	6	10.1	9.34	9.40	9.39	9.46
		12	13	10.1	9.21	9.13	9.24	9.14
		25	0	10.1	9.28	9.40	9.43	9.41
	16QAM	1	0	10.0	9.04	9.11	8.98	8.86
		1	13	10.0	9.33	9.36	9.37	9.39
		1	24	10.0	9.42	9.57	9.51	9.56
		12	0	10.0	9.37	9.24	9.35	9.21
		12	6	10.0	9.47	9.44	9.56	9.56
		12	13	10.0	9.05	9.02	9.02	9.13
		25	0	10.0	9.23	9.10	9.18	9.05
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel 40190CH	Channel 40520CH	Channel 40850CH	Channel 41190CH
10MHz	QPSK	1	0	11.0	10.01	10.00	9.94	9.85
		1	25	11.0	10.00	9.97	10.08	10.01
		1	49	11.0	10.41	10.32	10.31	10.27
		25	0	10.1	9.04	9.13	9.15	9.24
		25	13	10.1	9.08	9.00	9.01	9.14
		25	25	10.1	9.10	9.14	9.14	9.18
		50	0	10.1	9.27	9.39	9.25	9.20
	16QAM	1	0	10.0	9.20	9.23	9.27	9.30
		1	25	10.0	9.30	9.35	9.25	9.27
		1	49	10.0	9.45	9.51	9.48	9.62
		25	0	10.0	9.47	9.46	9.49	9.62
		25	13	10.0	9.30	9.37	9.49	9.37
		25	25	10.0	9.22	9.32	9.33	9.29
		50	0	10.0	9.19	9.09	8.99	9.13

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel 40215CH	Channel 40535CH	Channel 40855CH	Channel 41165CH
15MHz	QPSK	1	0	11.0	10.03	10.01	10.03	9.93
		1	38	11.0	10.15	10.16	10.29	10.21
		1	74	11.0	10.34	10.28	10.20	10.26
		36	0	10.1	9.10	9.00	9.06	9.02
		36	18	10.1	9.18	9.06	8.94	8.90
		36	39	10.1	9.17	9.11	8.96	9.01
		75	0	10.1	9.17	9.20	9.08	8.97
	16QAM	1	0	10.0	9.16	9.13	9.12	9.00
		1	38	10.0	9.29	9.39	9.52	9.47
		1	74	10.0	9.39	9.52	9.39	9.31
		36	0	10.0	9.25	9.28	9.22	9.13
		36	18	10.0	9.27	9.37	9.46	9.32
		36	39	10.0	9.17	9.23	9.24	9.17
		75	0	10.0	9.13	9.13	9.20	9.29
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel 40240CH	Channel 40540CH	Channel 40840CH	Channel 41140CH
20MHz	QPSK	1	0	11.0	10.14	10.69	10.49	10.63
		1	50	11.0	10.01	10.67	10.44	10.54
		1	99	11.0	10.26	10.37	**10.70**	10.23
		50	0	10.1	9.19	**9.78**	9.33	9.65
		50	25	10.1	9.21	9.76	9.37	9.50
		50	50	10.1	9.15	9.58	9.45	9.28
		100	0	10.1	9.16	9.64	9.32	9.52
	16QAM	1	0	10.0	9.45	9.24	9.39	9.70
		1	50	10.0	9.37	9.19	9.13	9.65
		1	99	10.0	9.31	9.14	9.51	9.30
		50	0	10.0	9.33	9.60	9.02	9.49
		50	25	10.0	9.32	9.44	9.04	9.34
		50	50	10.0	9.11	9.11	9.11	9.09
		100	0	10.0	9.56	9.18	9.10	9.40

Table 37: Conducted power measurement results of LTE Band 41(Sensor On)

7.1.13 Conducted power measurements of LTE CA

In this section, the following conducted power measurement results of downlink LTE carrier aggregation are provided to quantify downlink only carrier aggregation SAR test exclusion per KDB 941225 D05A.

Uplink maximum output power is measured with downlink carrier aggregation active, using the channel with highest measured maximum output power when downlink carrier aggregation is inactive, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.

Power test equipment: a R&S Radio Communication Tester CMW500 was used.

Initial Conditions						
Test Environment as specified in TS 36.508[7] subclause 4.1			NC[, TL/VL, TL/VH, TH/VL, TH/VH]			
Test Frequencies as specified in TS36.508 [7] subclause 4.3.1 for different CA bandwidth classes.			A: Mid range for PCC and SCC			
Test CC Combination setting (N_{RB_agg}) as specified in subclause 5.4.2A.1 for the CA Configuration			Lowest N_{RB_agg} Highest N_{RB_agg}			
Test Parameters for CA Configurations						
CA Configuration / N_{RB_agg}		DL Allocation	CC MOD	UL Allocation		
PCC N_{RB}	SCCs N_{RB}	PCC & SCC RB allocation		N_{RB_alloc}	PCC RB allocations (L_{CRB} @ RB_{start})	
6	25	N/A for this test	QPSK	5	P_5@0	-
15	25		QPSK	4	P_4@0	-
25	50		QPSK	8	P_8@0	-
50	75		QPSK	12	P_12@0	-
75	100		QPSK	16	P_16@0	-
100	75		QPSK	18	P_18@0	-
Note 1: CA Configuration Test CC Combination settings are checked separately for each CA Configuration, which applicable aggregated channel bandwidths are specified in Table 5.4.2A.1-1						

DL LTE CA Class	PCC								SCC1			Power		
	PCC Band	PCC Bandwidth (MHz)	PCC UL RB size	PCC UL RB offset	PCC DL RB size	PCC DL RB offset	PCC UL Channel	PCC DL Channel	SCC Band	SCC Bandwidth (MHz)	SCC DL Channel	Rel 8 LTE Tx Power (dBm)	DL LTE CA Tx Power (dBm)	Tune-up
CA_5B	5	10	1	25	50	0	20600	2600	5	10	2501	23.75	23.61	24.7
CA_7C	7	20	1	50	100	0	21350	3350	7	20	3152	23.23	23.42	24.2
CA_12B	12	10	1	25	25	0	23117	5117	12	5	5045	24.94	24.85	25.7
CA_38C	38	20	1	50	100	0	37850	37850	38	20	38048	23.49	23.48	24.0
CA_41C	41	20	1	0	100	0	41140	41140	41	20	40942	23.22	22.75	24.0
CA_5A-7A	5	10	1	25	50	0	20600	2600	7	20	3100	23.75	23.71	24.7
	7	20	1	50	100	0	21350	3350	5	10	2525	23.23	23.18	24.2

Table 38: Conducted power measurement results of DL LTE CA(Full Power).

DL LTE CA Class	PCC								SCC1			Power		
	PCC Band	PCC Bandwidth (MHz)	PCC UL RB size	PCC UL RB offset	PCC DL RB size	PCC DL RB offset	PCC UL Channel	PCC DL Channel	SCC Band	SCC Bandwidth (MHz)	SCC DL Channel	Rel 8 LTE Tx Power (dBm)	DL LTE CA Tx Power (dBm)	Tune-up
CA_5B	5	10	1	25	50	0	20600	2600	5	10	2501	18.23	18.16	18.7
CA_7C	7	20	1	50	100	0	21100	3100	7	20	3298	8.89	8.68	9.2
CA_12B	12	10	1	25	25	0	23130	5130	12	5	5058	17.56	17.54	17.7
CA_38C	38	20	1	50	100	0	37850	37850	38	20	38048	11.62	11.65	12.0
CA_41C	41	20	1	99	100	0	40840	40840	41	20	40642	10.70	10.33	11.0
CA_5A-7A	5	10	1	25	50	0	20600	2600	7	20	3100	18.23	18.24	18.7
	7	20	1	50	50	0	21100	3100	5	10	2525	8.89	9.06	9.2

Table 39: Conducted power measurement results of DL LTE CA(Sensor On,reduced power).

7.1.14 Conducted power measurements of WiFi 2.4G

The output power of WiFi antenna is as following:

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11b	1	2412	1Mbps	18.0	16.67	No
	6	2437		18.0	**16.81**	Yes
	11	2462		18.0	16.21	No
802.11g	1	2412	6Mbps	13.0	11.48	No
	6	2437		13.0	11.69	No
	11	2462		13.0	11.16	No
802.11n 20M	1	2412	MCS0	12.0	10.12	No
	6	2437		12.0	10.64	No
	11	2462		12.0	10.47	No
802.11n 40M	3	2422	MCS0	10.0	8.35	No
	6	2437		10.0	8.95	No
	9	2452		10.0	8.36	No

Table 40: Conducted power measurement results of WiFi 2.4G(Full Power).

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

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11b	1	2412	1Mbps	10.0	8.72	No
	6	2437		10.0	**9.48**	Yes
	11	2462		10.0	8.56	No
802.11g	1	2412	6Mbps	10.0	8.42	No
	6	2437		10.0	8.71	No
	11	2462		10.0	8.08	No
802.11n 20M	1	2412	MCS0	10.0	8.1	No
	6	2437		10.0	8.81	No
	11	2462		10.0	8.21	No
802.11n 40M	3	2422	MCS0	10.0	8.35	No
	6	2437		10.0	8.95	No
	9	2452		10.0	8.36	No

Table 41: Conducted power measurement results of WiFi 2.4G(Sensor On).

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

7.1.15 Conducted power measurements of WiFi 5G

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11a	CH 36	5180	6Mbps	19.0	17.17	No
	CH 40	5200		19.0	17.18	No
	CH 44	5220		19.0	17.22	No
	CH 48	5240		19.0	17.32	No
	CH 52	5260		19.0	17.42	No
	CH 56	5280		19.0	17.61	No
	CH 60	5300		19.0	**17.80**	Yes
	CH 64	5320		19.0	17.64	No
	CH 100	5500		19.0	17.75	No
	CH 104	5520		19.0	17.68	No
	CH 108	5540		19.0	17.27	No
	CH 112	5560		19.0	17.59	No
	CH 116	5580		19.0	17.39	No
	CH 120	5600		19.0	17.53	No
	CH 124	5620		19.0	17.65	No
	CH 128	5640		19.0	17.38	No
	CH 132	5660		19.0	17.10	No
	CH 136	5680		19.0	17.30	No
	CH 140	5700		19.0	17.88	No
	CH 144	5720		19.0	**18.01**	Yes
	CH 149	5745		19.0	17.63	No
	CH 153	5765		19.0	17.45	No
	CH 157	5785		19.0	17.67	No
	CH 161	5805		19.0	17.68	No
	CH 165	5825		19.0	**18.06**	Yes

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11n 20M (5GHz)	CH 36	5180	MCS0	18.0	15.52	No
	CH 40	5200		18.0	15.35	No
	CH 44	5220		18.0	15.9	No
	CH 48	5240		18.0	16.1	No
	CH 52	5260		18.0	15.74	No
	CH 56	5280		18.0	15.96	No
	CH 60	5300		18.0	15.73	No
	CH 64	5320		18.0	16.13	No
	CH 100	5500		18.0	16.32	No
	CH 104	5520		18.0	16.16	No
	CH 108	5540		18.0	16.07	No
	CH 112	5560		18.0	16.01	No
	CH 116	5580		18.0	16.48	No
	CH 120	5600		18.0	16.39	No
	CH 124	5620		18.0	16.73	No
	CH 128	5640		18.0	16.41	No
	CH 132	5660		18.0	16.55	No
	CH 136	5680		18.0	16.21	No
	CH 140	5700		18.0	16.42	No
	CH 144	5720		18.0	16.52	No
	CH 149	5745		18.0	16.00	No
	CH 153	5765		18.0	16.47	No
	CH 157	5785		18.0	16.29	No
	CH 161	5805		18.0	16.38	No
	CH 165	5825		18.0	17.03	No
Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11n 40M (5GHz)	CH 38	5190	MCS0	16.0	13.64	No
	CH 46	5230		16.0	13.97	No
	CH 54	5270		16.0	13.64	No
	CH 62	5310		16.0	14.01	No
	CH 102	5510		16.0	14.46	No
	CH 110	5550		16.0	14.45	No
	CH 118	5590		16.0	15.01	No
	CH 126	5630		16.0	15.21	No
	CH 134	5670		16.0	14.60	No
	CH 142	5710		16.0	14.89	No
	CH 151	5755		16.0	14.31	No
	CH 159	5795		16.0	14.59	No

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11ac 20M (5GHz)	CH 36	5180	Mcsac0	18.0	15.43	No
	CH 40	5200		18.0	15.58	No
	CH 44	5220		18.0	15.74	No
	CH 48	5240		18.0	15.94	No
	CH 52	5260		18.0	15.40	No
	CH 56	5280		18.0	15.62	No
	CH 60	5300		18.0	15.43	No
	CH 64	5320		18.0	15.95	No
	CH 100	5500		18.0	16.67	No
	CH 104	5520		18.0	16.50	No
	CH 108	5540		18.0	16.41	No
	CH 112	5560		18.0	16.34	No
	CH 116	5580		18.0	16.88	No
	CH 120	5600		18.0	16.50	No
	CH 124	5620		18.0	17.07	No
	CH 128	5640		18.0	16.51	No
	CH 132	5660		18.0	16.39	No
	CH 136	5680		18.0	16.57	No
	CH 140	5700		18.0	16.73	No
	CH 144	5720		18.0	16.39	No
	CH 149	5745		18.0	16.41	No
	CH 153	5765		18.0	16.10	No
	CH 157	5785		18.0	16.23	No
	CH 161	5805		18.0	16.59	No
	CH 165	5825		18.0	16.47	No
Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11ac 40M (5GHz)	CH 38	5190	Mcsac0	16.0	13.62	No
	CH 46	5230		16.0	13.94	No
	CH 54	5270		16.0	13.62	No
	CH 62	5310		16.0	13.98	No
	CH 102	5510		16.0	14.66	No
	CH 110	5550		16.0	14.43	No
	CH 118	5590		16.0	14.98	No
	CH 126	5630		16.0	15.17	No
	CH 134	5670		16.0	14.55	No
	CH 142	5710		16.0	14.84	No
	CH 151	5755		16.0	14.24	No
	CH 159	5795		16.0	14.55	No

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11ac 80M (5GHz)	CH 42	5210	Mcsac0	15.0	12.67	No
	CH 58	5290		15.0	12.61	No
	CH 106	5530		15.0	13.23	No
	CH 122	5610		15.0	13.66	No
	CH 138	5690		15.0	13.57	No
	CH 155	5775		15.0	13.03	No

Table 42: Conducted power measurement results of WiFi 5G(Full Power).

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11a	CH 36	5180	6Mbps	7.0	5.22	No
	CH 40	5200		7.0	5.47	No
	CH 44	5220		7.0	5.68	No
	CH 48	5240		7.0	5.98	No
	CH 52	5260		7.0	4.78	No
	CH 56	5280		7.0	5.10	No
	CH 60	5300		7.0	5.41	No
	CH 64	5320		7.0	5.69	No
	CH 100	5500		6.0	5.51	No
	CH 104	5520		6.0	5.60	No
	CH 108	5540		6.0	5.68	No
	CH 112	5560		6.0	5.84	No
	CH 116	5580		6.0	4.85	No
	CH 120	5600		6.0	5.17	No
	CH 124	5620		6.0	5.49	No
	CH 128	5640		6.0	5.73	No
	CH 132	5660		6.0	4.72	No
	CH 136	5680		6.0	5.07	No
	CH 140	5700		6.0	5.52	No
	CH 144	5720		6.0	5.86	No
	CH 149	5745		6.0	4.70	No
	CH 153	5765		6.0	5.09	No
	CH 157	5785		6.0	5.49	No
	CH 161	5805		6.0	5.91	No
	CH 165	5825		6.0	6.12	No

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11n 20M(5GHz)	CH 36	5180	MCS0	7.0	4.33	No
	CH 40	5200		7.0	4.38	No
	CH 44	5220		7.0	4.62	No
	CH 48	5240		7.0	4.91	No
	CH 52	5260		7.0	3.98	No
	CH 56	5280		7.0	4.12	No
	CH 60	5300		7.0	4.45	No
	CH 64	5320		7.0	4.72	No
	CH 100	5500		6.0	4.10	No
	CH 104	5520		6.0	4.11	No
	CH 108	5540		6.0	4.38	No
	CH 112	5560		6.0	4.33	No
	CH 116	5580		6.0	3.43	No
	CH 120	5600		6.0	3.65	No
	CH 124	5620		6.0	4.06	No
	CH 128	5640		6.0	4.22	No
	CH 132	5660		6.0	3.41	No
	CH 136	5680		6.0	3.60	No
	CH 140	5700		6.0	4.16	No
	CH 144	5720		6.0	4.46	No
	CH 149	5745		6.0	3.38	No
	CH 153	5765		6.0	3.74	No
	CH 157	5785		6.0	4.14	No
	CH 161	5805		6.0	4.56	No
	CH 165	5825		6.0	5.05	No

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11n 40M(5GHz)	CH 38	5190	MCS0	7.0	4.20	No
	CH 46	5230		7.0	4.71	No
	CH 54	5270		7.0	3.93	No
	CH 62	5310		7.0	4.55	No
	CH 102	5510		6.0	3.79	No
	CH 110	5550		6.0	3.95	No
	CH 118	5590		6.0	4.04	No
	CH 126	5630		6.0	4.61	No
	CH 134	5670		6.0	4.05	No
	CH 142	5710		6.0	5.09	No
	CH 151	5755		6.0	4.03	No
	CH 159	5795		6.0	4.10	No
Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11ac 80M (5GHz)	CH 36	5180	Mcsac0	7.0	4.19	No
	CH 40	5200		7.0	5.26	No
	CH 44	5220		7.0	4.52	No
	CH 48	5240		7.0	5.83	No
	CH 52	5260		7.0	4.74	No
	CH 56	5280		7.0	5.08	No
	CH 60	5300		7.0	5.39	No
	CH 64	5320		7.0	5.67	No
	CH 100	5500		6.0	4.79	No
	CH 104	5520		6.0	4.76	No
	CH 108	5540		6.0	4.88	No
	CH 112	5560		6.0	5.02	No
	CH 116	5580		6.0	4.19	No
	CH 120	5600		6.0	4.49	No
	CH 124	5620		6.0	4.78	No
	CH 128	5640		6.0	5.08	No
	CH 132	5660		6.0	4.32	No
	CH 136	5680		6.0	4.69	No
	CH 140	5700		6.0	5.12	No
	CH 144	5720		6.0	5.52	No
	CH 149	5745		6.0	3.29	No
	CH 153	5765		6.0	3.67	No
	CH 157	5785		6.0	4.09	No
	CH 161	5805		6.0	4.56	No
	CH 165	5825		6.0	5.27	No

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11ac 40M (5GHz)	CH 38	5190	Mcsac0	7.0	5.01	No
	CH 46	5230		7.0	5.51	No
	CH 54	5270		7.0	4.75	No
	CH 62	5310		7.0	5.38	No
	CH 102	5510		6.0	5.14	No
	CH 110	5550		6.0	5.26	No
	CH 118	5590		6.0	4.68	No
	CH 126	5630		6.0	5.22	No
	CH 134	5670		6.0	4.26	No
	CH 142	5710		6.0	5.02	No
	CH 151	5755		6.0	4.13	No
	CH 159	5795		6.0	5.14	No
Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11ac 80M (5GHz)	CH 42	5210	Mcsac0	7.0	5.15	No
	CH 58	5290		7.0	**5.38**	Yes
	CH 106	5530		6.0	5.18	No
	CH 122	5610		6.0	**5.71**	Yes
	CH 138	5690		6.0	5.15	No
	CH 155	5775		6.0	**5.43**	Yes

Table 43: Conducted power measurement results of WiFi 5G(Sensor On).

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

7.1.16 Conducted power measurements of BT

The output power of BT antenna is as following:

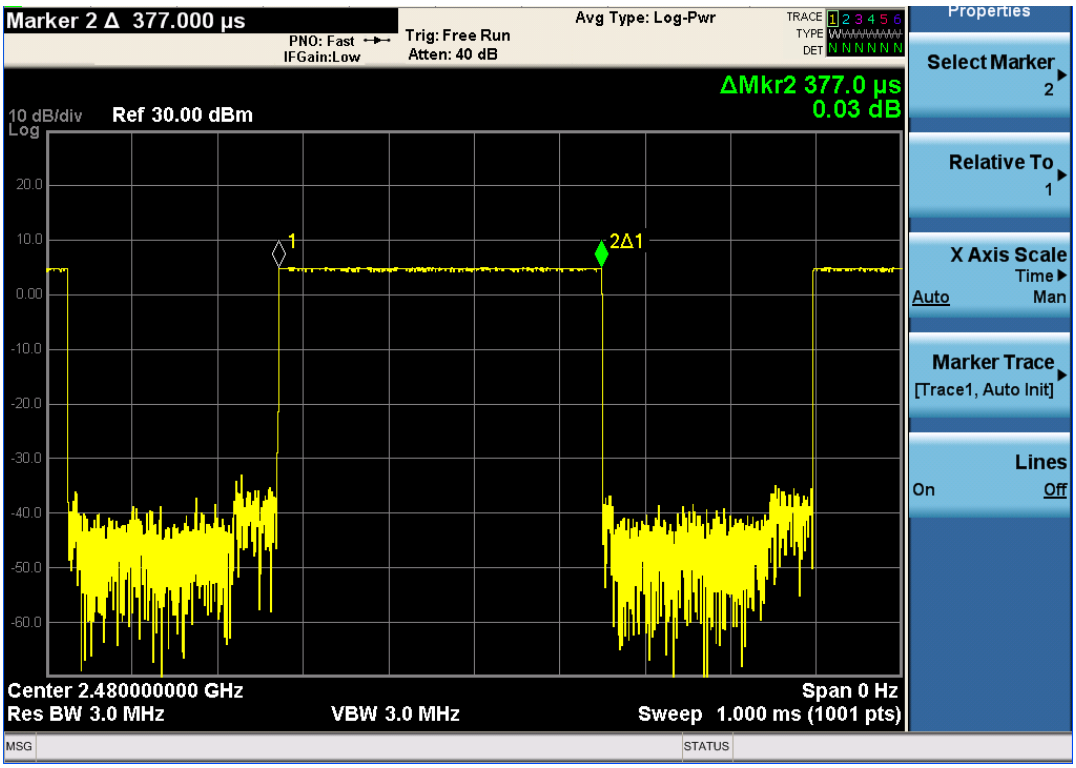
BT 2450	Tune-up	Average Conducted Power (dBm)		
		0CH	39CH	78CH
DH5	9.5	6.98	8.28	6.30
2DH5	9.5	6.97	8.26	6.27
3DH5	9.5	6.96	8.25	6.27

BT 2450	Tune-up	Average Conducted Power (dBm)		
		0CH	19CH	39CH
BLE	**9.5**	**8.04**	**9.40**	**7.98**

Table 44: Conducted power measurement results of BT.

Note:

1) The conducted power of BT is measured with RMS detector.
2) The bolded mode was selected for SAR testing.



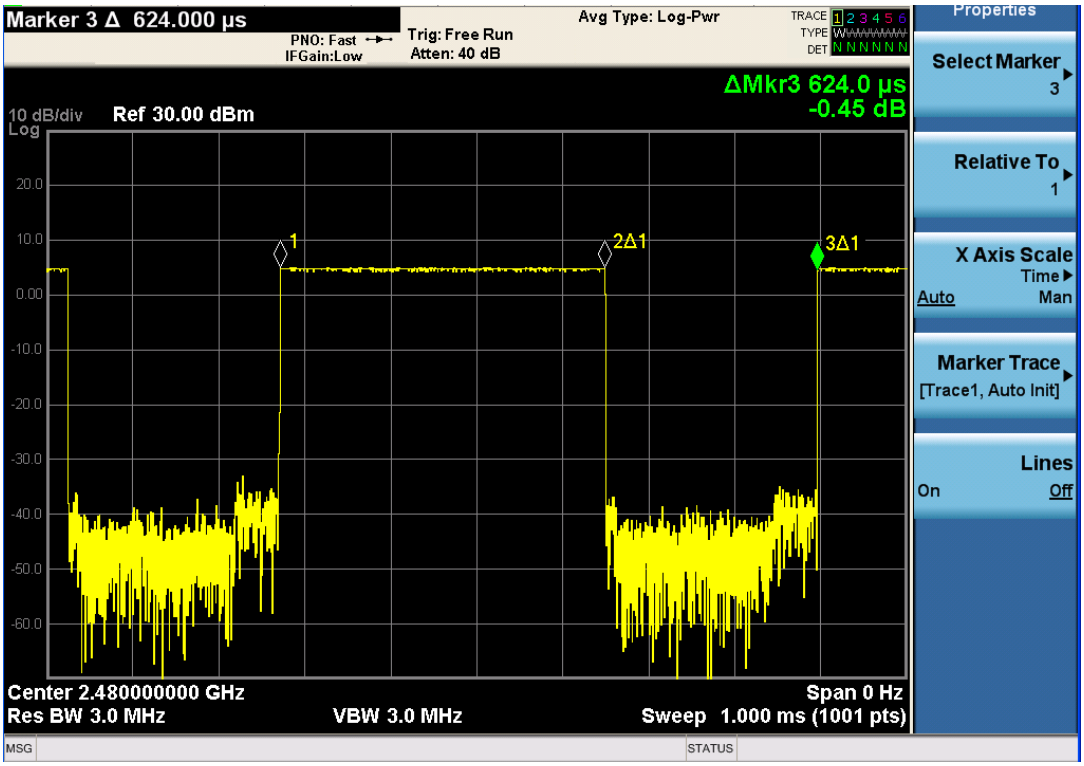


Figure: Bluetooth Transmission Plot

So the bluetooth duty cycle is calculated as below:

$$Duty\ \ Cycle = \frac{Pulse\ \ Width}{Period} * 100\% = \frac{377}{624} * 100\% = 60.42\%$$

7.2 SAR measurement Results

General Notes:

1) Per KDB447498 D01, all SAR measurement results are scaled to the maximum tune-up tolerance limit to demonstrate SAR compliance.

2) Per KDB447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

● ≤ 0.8W/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 D01,for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/Kg; if the deviation among the repeated measurement is ≤20%, and the measured SAR <1.45W/Kg, only one repeated measurement is required.

4) Per KDB 447498D01, body-worn accessories that do not contain metallic or conductive components is tested according to worst-case exposure configurations, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics.

5) Per KDB865664 D02, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is > 1.5 W/kg, or > 7.0 W/kg for occupational exposure. The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-processing(Refer to appendix B for details).

GSM Notes:

1) Per KDB941225 D01, 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.

UMTS Notes:

1) Per KDB941225 D01, 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.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)

3) According to KDB 941225 D05 SAR for LTE Devices, for Time-Division Duplex (TDD) systems, SAR is tested using a fixed periodic duty factor according to the highest transmission duty factor (63.33%) implemented for the device and supported by the defined 3GPP LTE TDD configurations.

WiFi Notes:

Per KDB248227D01:

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) When the DSSS *reported* SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.

3) When the highest *reported* SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations

4) 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 447498. 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.

BT Notes:

1) Per KDB 447498D01, BT SAR test can be excluded. But for certain situations where the estimated SAR of BT is overly conservative for simultaneous transmission SAR test exclusion, the test lab may still choose to perform standalone SAR measurements for certain positions, then use the measured reported SAR to determine simultaneous transmission SAR test exclusion in this report.
2) The reported SAR is scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

7.2.1 SAR measurement Result of GSM850

Test Position of Body	Dist.	Test Channel /Freq.(MHz)	Test Mode	Measured SAR(W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Accessory Information	SAR Plot.
				1-g	10-g						
Test data of CMR-AL19											
Back Side	0mm	190/836.6	GPRS 2TS	0.269	0.141	0.09	22.26	23.00	0.319	Battery 1#	/
Right Side	0mm	190/836.6	GPRS 2TS	0.217	0.117	-0.08	31.20	32.00	0.261	Battery 1#	/
Top Side	0mm	190/836.6	GPRS 2TS	0.394	0.179	-0.07	22.26	23.00	0.467	Battery 1#	/
Top Side	0mm	190/836.6	GPRS 2TS	**0.404**	0.179	-0.06	22.26	23.00	**0.479**	Battery 2#	/
Top Side	0mm	190/836.6	GPRS 2TS	0.392	0.174	-0.13	22.26	23.00	0.465	Battery 3#	/
Additional SAR test with Sensor off											
Top Side	16mm	190/836.6	GPRS 2TS	0.261	0.173	-0.04	31.20	32.00	0.314	Battery 2#	/
Back Side	11mm	190/836.6	GPRS 2TS	0.303	0.192	0.03	31.20	32.00	0.364	Battery 2#	/
CMR-AL09 test data at the SAR worst case of CMR-AL19											
Top Side	0mm	190/836.6	GPRS 2TS	**0.397**	0.177	-0.06	22.26	23.00	**0.471**	/	Yes

Table 45: Body SAR test results of GSM850

7.2.2 SAR measurement Result of GSM1900

Test Position of Body	Dist.	Test Channel /Freq.(MHz)	Test Mode	Measured SAR(W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Accessory Information	SAR Plot.
				1-g	10-g						
Test data of CMR-AL19											
Back Side	0mm	661/1880	GPRS 2TS	0.290	0.137	0.00	18.24	19.00	0.345	Battery 1#	/
Top Side	0mm	661/1880	GPRS 2TS	**0.772**	0.307	-0.05	18.24	19.00	**0.920**	Battery 1#	/
Top Side	0mm	512/1850.2	GPRS 2TS	0.709	0.281	-0.16	18.32	19.00	0.829	Battery 1#	/
Top Side	0mm	810/1909.8	GPRS 2TS	0.689	0.270	-0.18	18.22	19.00	0.825	Battery 1#	/
Top Side	0mm	661/1880	GPRS 2TS	0.738	0.303	-0.11	18.24	19.00	0.879	Battery 2#	/
Top Side	0mm	661/1880	GPRS 2TS	0.754	0.309	0.19	18.24	19.00	0.898	Battery 3#	/
Top Side	0mm	661/1880	GPRS 2TS	0.528	0.234	0.00	18.24	19.00	0.629	with Protected cover	/
Additional SAR test with Sensor off											
Top Side	17mm	661/1880	GPRS 2TS	0.303	0.180	0.11	28.04	29.00	0.378	Battery 1#	/
Back Side	14mm	661/1880	GPRS 2TS	0.281	0.160	0.16	28.04	29.00	0.351	Battery 1#	/
CMR-AL09 test data at the SAR worst case of CMR-AL19											
Top Side	0mm	661/1880	GPRS 2TS	**0.673**	0.264	-0.18	18.24	19.00	**0.802**	/	Yes

Table 46: Body SAR test results of GSM1900

7.2.3 SAR measurement Result of UMTS Band 5

Test Position of Body	Dist.	Test Channel /Freq.(MHz)	Test Mode	Measured SAR(W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Accessory Information	SAR Plot.
				1-g	10-g			Power(dBm)	Result(W/kg)		
Test data of CMR-AL19											
Back Side	0mm	4182/836.4	RMC	0.277	0.147	0.09	18.32	19.20	0.339	Battery 1#	/
Right Side	0mm	4182/836.4	RMC	0.213	0.115	-0.08	24.36	25.20	0.258	Battery 1#	/
Top Side	0mm	4182/836.4	RMC	0.427	0.201	-0.06	18.32	19.20	0.523	Battery 1#	/
Top Side	0mm	4182/836.4	RMC	0.448	0.209	0.00	18.32	19.20	0.549	Battery 2#	/
Top Side	0mm	4182/836.4	RMC	**0.465**	0.209	-0.08	18.32	19.20	**0.569**	Battery 3#	/
Additional SAR test with Sensor off											
Top Side	16mm	4182/836.4	RMC	0.153	0.098	-0.01	24.36	25.20	0.186	Battery 3#	/
Back Side	11mm	4182/836.4	RMC	0.178	0.117	0.07	24.36	25.20	0.216	Battery 3#	/
CMR-AL09 test data at the SAR worst case of CMR-AL19											
Top Side	0mm	4182/836.4	RMC	**0.381**	0.175	-0.07	18.32	19.20	**0.467**	/	Yes

Table 47: Body SAR test results of UMTS Band 5

7.2.4 SAR measurement Result of UMTS Band 2

Test Position of Body	Dist.	Test Channel /Freq.(MHz)	Test Mode	Measured SAR(W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Accessory Information	SAR Plot.
				1-g	10-g						
Test data of CMR-AL19											
Back Side	0mm	9400/1880	RMC	0.537	0.246	-0.11	13.25	14.20	0.668	Battery 1#	/
Top Side	0mm	9400/1880	RMC	0.317	0.134	0.07	13.25	14.20	0.395	Battery 1#	/
Back Side	0mm	9400/1880	RMC	0.519	0.235	-0.06	13.25	14.20	0.646	Battery 2#	/
Back Side	0mm	9400/1880	RMC	**0.549**	0.249	-0.01	13.25	14.20	**0.683**	Battery 3#	/
Additional SAR test with Sensor off											
Back Side	14mm	9400/1880	RMC	0.465	0.263	0.15	23.31	24.20	0.571	Battery 1#	/
Top Side	17mm	9400/1880	RMC	0.442	0.262	-0.02	23.31	24.20	0.543	Battery 1#	/
CMR-AL09 test data at the SAR worst case of CMR-AL19											
Back Side	0mm	9400/1880	RMC	**0.496**	0.225	-0.01	13.25	14.20	**0.617**	/	Yes

Table 48: Body SAR test results of UMTS Band 2

7.2.5 SAR measurement Result of LTE Band 4

Test Position of Body	Dist.	Test Channel /Freq.(MHz)	Test Mode	Measured SAR(W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Accessory Information	SAR Plot.
				1-g	10-g						
Test data of CMR-AL19											
Back Side	0mm	20300/1745	20M QPSK 1RB#0	0.364	0.171	-0.16	12.75	14.00	0.485	Battery 1#	/
Top Side	0mm	20300/1745	20M QPSK 1RB#0	0.364	0.153	0.13	12.75	14.00	0.485	Battery 1#	/
Back Side	0mm	20300/1745	20M QPSK 50%RB#0	0.304	0.143	-0.18	11.95	13.30	0.415	Battery 1#	/
Top Side	0mm	20300/1745	20M QPSK 50%RB#0	0.348	0.146	0.19	11.95	13.30	0.475	Battery 1#	/
Back Side	0mm	20300/1745	20M QPSK 1RB#0	0.327	0.153	-0.12	12.75	14.00	0.436	Battery 2#	/
Back Side	0mm	20300/1745	20M QPSK 1RB#0	**0.386**	0.179	0.15	12.75	14.00	**0.515**	Battery 3#	/
Additional SAR test with Sensor off											
Back Side	14mm	20300/1745	20M QPSK 1RB#50	0.271	0.166	0.02	23.22	24.00	0.324	Battery 3#	/
Top Side	17mm	20300/1745	20M QPSK 1RB#50	0.186	0.115	0.04	23.22	24.00	0.223	Battery 3#	/
Back Side	14mm	20175/1732.5	20M QPSK 50%RB#25	0.208	0.128	-0.05	22.46	23.30	0.252	Battery 3#	/
Top Side	17mm	20175/1732.5	20M QPSK 50%RB#25	0.136	0.084	-0.02	22.46	23.30	0.165	Battery 3#	/
CMR-AL09 test data at the SAR worst case of CMR-AL19											
Back Side	0mm	20300/1745	20M QPSK 1RB#0	**0.210**	0.129	-0.05	12.75	14.00	**0.280**	/	Yes

Table 49: Body SAR test results of LTE Band 4

7.2.6 SAR measurement Result of LTE Band 5

Test Position of Body	Dist.	Test Channel /Freq.(MHz)	Test Mode	Measured SAR(W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Accessory Information	SAR Plot.
				1-g	10-g						
Test data of CMR-AL19											
Back Side	0mm	20600/844	10M QPSK 1RB#25	**0.655**	0.340	-0.02	18.23	18.70	**0.730**	Battery 1#	/
Top Side	0mm	20600/844	10M QPSK 1RB#25	0.499	0.264	0.02	18.23	18.70	0.556	Battery 1#	/
Right Side	0mm	20600/844	10M QPSK 1RB#25	0.330	0.179	0.04	23.75	24.70	0.411	Battery 1#	/
Back Side	0mm	20525/836.5	10M QPSK 50%RB#13	0.556	0.290	-0.06	17.39	18.20	0.670	Battery 1#	/
Top Side	0mm	20525/836.5	10M QPSK 50%RB#13	0.543	0.286	0.04	17.39	18.20	0.654	Battery 1#	/
Right Side	0mm	20525/836.5	10M QPSK 50%RB#13	0.263	0.143	0.09	23.11	24.20	0.338	Battery 1#	/
Back Side	0mm	20600/844	10M QPSK 1RB#25	0.428	0.226	0.09	18.23	18.70	0.477	Battery 2#	/
Back Side	0mm	20600/844	10M QPSK 1RB#25	0.272	0.145	0.18	18.23	18.70	0.303	Battery 3#	/
Additional SAR test with Sensor off											
Back Side	11mm	20600/844	10M QPSK 1RB#25	0.398	0.252	0.04	23.75	24.70	0.495	Battery 1#	/
Top Side	16mm	20600/844	10M QPSK 1RB#25	0.232	0.153	0.02	23.75	24.70	0.289	Battery 1#	/
Back Side	11mm	20525/836.5	10M QPSK 50%RB#13	0.325	0.207	0.19	23.11	24.20	0.418	Battery 1#	/
Top Side	16mm	20525/836.5	10M QPSK 50%RB#13	0.211	0.140	0.03	23.11	24.20	0.271	Battery 1#	/
CMR-AL09 test data at the SAR worst case of CMR-AL19											
Back Side	0mm	20600/844	10M QPSK 1RB#25	**0.559**	0.291	-0.06	18.23	18.70	**0.623**	/	Yes

Table 50: Body SAR test results of LTE Band 5

7.2.7 SAR measurement Result of LTE Band 7

Test Position of Body	Dist.	Test Channel /Freq.(MHz)	Test Mode	Measured SAR(W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Accessory Information	SAR Plot.
				1-g	10-g						
Test data of CMR-AL19											
Back Side	0mm	21100/2535	20M QPSK 1RB#50	0.389	0.148	0.16	8.89	9.20	0.418	Battery 1#	/
Top Side	0mm	21100/2535	20M QPSK 1RB#50	0.192	0.071	0.14	8.89	9.20	0.206	Battery 1#	/
Back Side	0mm	20850/2510	20M QPSK 50%RB#0	0.283	0.108	0.18	8.18	8.50	0.305	Battery 1#	/
Top Side	0mm	20850/2510	20M QPSK 50%RB#0	0.192	0.071	0.11	8.18	8.50	0.207	Battery 1#	/
Back Side	0mm	21100/2535	20M QPSK 1RB#50	0.388	0.148	-0.04	8.89	9.20	0.417	Battery 2#	/
Back Side	0mm	21100/2535	20M QPSK 1RB#50	0.396	0.151	0.13	8.89	9.20	0.425	Battery 3#	/
Additional SAR test with Sensor off											
Back Side	14mm	21350/2560	20M QPSK 1RB#50	0.511	0.268	-0.07	23.23	24.20	0.639	Battery 1#	/
Top Side	17mm	21350/2560	20M QPSK 1RB#50	**0.623**	0.337	-0.03	23.23	24.20	**0.779**	Battery 1#	/
Back Side	14mm	20850/2510	20M QPSK 50%RB#0	0.411	0.215	-0.05	22.26	23.50	0.547	Battery 1#	/
Top Side	17mm	20850/2510	20M QPSK 50%RB#0	0.423	0.230	0.05	22.26	23.50	0.563	Battery 1#	/
CMR-AL09 test data at the SAR worst case of CMR-AL19											
Top Side	17mm	21350/2560	20M QPSK 1RB#50	**0.594**	0.324	-0.05	23.23	24.20	**0.743**	/	Yes

Table 51: Body SAR test results of LTE Band 7

7.2.8 SAR measurement Result of LTE Band 12

Test Position of Body	Dist.	Test Channel /Freq.(MHz)	Test Mode	Measured SAR(W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Accessory Information	SAR Plot.
				1-g	10-g						
Test data of CMR-AL19											
Back Side	0mm	23130/711	10M QPSK 1RB#25	**0.506**	0.270	-0.07	17.56	17.70	**0.523**	Battery 1#	/
Top Side	0mm	23130/711	10M QPSK 1RB#25	0.374	0.189	0.03	17.56	17.70	0.386	Battery 1#	/
Right Side	0mm	23095/707.5	10M QPSK 1RB#25	0.216	0.106	0.10	24.94	25.70	0.257	Battery 1#	/
Back Side	0mm	23130/711	10M QPSK 50%RB#13	0.358	0.191	0.13	16.18	17.10	0.442	Battery 1#	/
Top Side	0mm	23130/711	10M QPSK 50%RB#13	0.283	0.142	0.05	16.18	17.10	0.350	Battery 1#	/
Right Side	0mm	23130/711	10M QPSK 50%RB#13	0.270	0.129	0.05	23.77	25.10	0.367	Battery 1#	/
Back Side	0mm	23130/711	10M QPSK 1RB#25	0.437	0.227	-0.14	17.56	17.70	0.451	Battery 2#	/
Back Side	0mm	23130/711	10M QPSK 1RB#25	0.385	0.207	0.05	17.56	17.70	0.398	Battery 3#	/
Additional SAR test with Sensor off											
Back Side	11mm	23095/707.5	10M QPSK 1RB#25	0.243	0.153	0.17	24.94	25.70	0.289	Battery 1#	/
Top Side	16mm	23095/707.5	10M QPSK 1RB#25	0.103	0.066	0.00	24.94	25.70	0.123	Battery 1#	/
Back Side	11mm	23130/711	10M QPSK 50%RB#13	0.267	0.167	0.13	23.77	25.10	0.363	Battery 1#	/
Top Side	16mm	23130/711	10M QPSK 50%RB#13	0.110	0.071	0.01	23.77	25.10	0.149	Battery 1#	/
CMR-AL09 test data at the SAR worst case of CMR-AL19											
Back Side	0mm	23130/711	10M QPSK 1RB#25	0.437	0.227	-0.08	17.56	17.70	**0.451**	/	Yes

Table 52: Body SAR test results of LTE Band 12

7.2.9 SAR measurement Result of LTE Band 17

Test Position of Body	Dist.	Test Channel /Freq.(MHz)	Test Mode	Measured SAR(W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Accessory Information	SAR Plot.
				1-g	10-g						
Test data of CMR-AL19											
Back Side	0mm	23790/710	10M QPSK 1RB#25	0.560	0.291	-0.07	18.41	18.70	0.599	Battery 1#	/
Top Side	0mm	23790/710	10M QPSK 1RB#25	0.419	0.211	-0.06	18.41	18.70	0.448	Battery 1#	/
Right Side	0mm	23780/709	10M QPSK 1RB#25	0.364	0.173	0.07	24.93	25.70	0.435	Battery 1#	/
Back Side	0mm	23800/711	10M QPSK 50%RB#13	0.458	0.236	-0.16	17.50	18.00	0.514	Battery 1#	/
Top Side	0mm	23800/711	10M QPSK 50%RB#13	0.477	0.254	0.06	17.50	18.00	0.535	Battery 1#	/
Right Side	0mm	23780/709	10M QPSK 50%RB#13	0.363	0.173	0.06	24.16	25.00	0.440	Battery 1#	/
Back Side	0mm	23790/710	10M QPSK 1RB#25	**0.565**	0.292	-0.15	18.41	18.70	**0.604**	Battery 2#	/
Back Side	0mm	23790/710	10M QPSK 1RB#25	0.484	0.263	-0.15	18.41	18.70	0.517	Battery 3#	/
Additional SAR test with Sensor off											
Back Side	11mm	23780/709	10M QPSK 1RB#25	0.289	0.182	0.20	24.93	25.70	0.345	Battery 1#	/
Top Side	16mm	23780/709	10M QPSK 1RB#25	0.122	0.078	0.03	24.93	25.70	0.146	Battery 1#	/
Back Side	11mm	23780/709	10M QPSK 50%RB#13	0.134	0.093	0.06	24.16	25.00	0.163	Battery 1#	/
Top Side	16mm	23780/709	10M QPSK 50%RB#13	0.104	0.066	-0.01	24.16	25.00	0.126	Battery 1#	/
CMR-AL09 test data at the SAR worst case of CMR-AL19											
Back Side	0mm	23790/710	10M QPSK 1RB#25	**0.457**	0.236	-0.16	18.41	18.70	**0.489**	/	/

Table 53: Body SAR test results of LTE Band 17

7.2.10 SAR measurement Result of LTE Band 26

Test Position of Body	Dist.	Test Channel /Freq.(MHz)	Test Mode	Measured SAR(W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Accessory Information	SAR Plot.
				1-g	10-g				Result(W/kg)		
Test data of CMR-AL19											
Back Side	0mm	26965/841.5	15M QPSK 1RB#38	**0.596**	0.316	0.19	17.31	18.00	**0.699**	Battery 1#	/
Top Side	0mm	26965/841.5	15M QPSK 1RB#38	0.441	0.231	0.02	17.31	18.00	0.517	Battery 1#	/
Back Side	0mm	26865/831.5	15M QPSK 50%RB#18	0.507	0.268	-0.08	16.73	17.30	0.578	Battery 1#	/
Top Side	0mm	26865/831.5	15M QPSK 50%RB#18	0.406	0.210	0.05	16.73	17.30	0.463	Battery 1#	/
Right Side	0mm	26865/831.5	15M QPSK 1RB#38	0.359	0.195	0.08	23.88	25.00	0.465	Battery 1#	/
Right Side	0mm	26965/841.5	15M QPSK 50%RB#18	0.286	0.155	0.09	23.24	24.30	0.365	Battery 1#	/
Back Side	0mm	26965/841.5	15M QPSK 1RB#38	0.435	0.288	0.14	17.31	18.00	0.510	Battery 2#	/
Back Side	0mm	26965/841.5	15M QPSK 1RB#38	0.277	0.145	0.16	17.31	18.00	0.325	Battery 3#	/
Additional SAR test with Sensor off											
Back Side	11mm	26865/831.5	15M QPSK 1RB#38	0.412	0.262	0.08	23.88	25.00	0.533	Battery 1#	/
Top Side	16mm	26865/831.5	15M QPSK 1RB#38	0.271	0.181	0.00	23.88	25.00	0.351	Battery 1#	/
Back Side	11mm	26965/841.7	15M QPSK 50%RB#18	0.354	0.225	0.20	23.24	24.30	0.452	Battery 1#	/
Top Side	16mm	26965/841.7	15M QPSK 50%RB#18	0.213	0.141	0.03	23.24	24.30	0.272	Battery 1#	/
CMR-AL09 test data at the SAR worst case of CMR-AL19											
Back Side	0mm	26965/841.5	15M QPSK 1RB#38	**0.511**	0.270	-0.08	17.31	18.00	**0.599**	/	Yes

Table 54: Body SAR test results of LTE Band 26

7.2.11 SAR measurement Result of LTE Band 38

Test Position of Body	Dist.	Test Channel /Freq.(MHz)	Test Mode	Measured SAR(W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Accessory Information	SAR Plot.
				1-g	10-g						
Test data of CMR-AL19											
Back Side	0mm	37850/2580	20M QPSK 1RB#50	0.369	0.137	0.14	11.62	12.00	0.403	Battery 1#	/
Top Side	0mm	37850/2580	20M QPSK 1RB#50	0.142	0.051	-0.13	11.62	12.00	0.155	Battery 1#	/
Back Side	0mm	37850/2580	20M QPSK 50%RB#50	0.284	0.105	0.04	10.55	11.00	0.315	Battery 1#	/
Top Side	0mm	37850/2580	20M QPSK 50%RB#50	0.104	0.038	0.19	10.55	11.00	0.115	Battery 1#	/
Back Side	0mm	37850/2580	20M QPSK 1RB#50	**0.390**	0.144	0.08	11.62	12.00	**0.426**	Battery 2#	/
Back Side	0mm	37850/2580	20M QPSK 1RB#50	0.380	0.140	0.16	11.62	12.00	0.415	Battery 3#	/
Additional SAR test with Sensor off											
Back Side	14mm	37850/2580	20M QPSK 1RB#50	0.297	0.151	-0.14	23.49	24.00	0.334	Battery 2#	/
Top Side	17mm	37850/2580	20M QPSK 1RB#50	0.367	0.197	-0.03	23.49	24.00	0.413	Battery 2#	/
Back Side	14mm	37850/2580	20M QPSK 50%RB#50	0.233	0.113	-0.18	22.40	23.00	0.268	Battery 2#	/
Top Side	17mm	37850/2580	20M QPSK 50%RB#50	0.292	0.155	0.03	22.40	23.00	0.335	Battery 2#	/
CMR-AL09 test data at the SAR worst case of CMR-AL19											
Back Side	0mm	37850/2580	20M QPSK 1RB#50	**0.297**	0.151	-0.11	11.62	12.00	**0.324**	/	Yes

Table 55: Body SAR test results of LTE Band 38

7.2.12 SAR measurement Result of LTE Band 41

Test Position of Body	Dist.	Test Channel /Freq.(MHz)	Test Mode	Measured SAR(W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Accessory Information	SAR Plot.
				1-g	10-g						
Test data of CMR-AL19											
Back Side	0mm	40840/2615	20M QPSK 1RB#99	0.270	0.104	0.00	10.70	11.00	0.289	Battery 1#	/
Top Side	0mm	40840/2615	20M QPSK 1RB#99	0.240	0.079	-0.03	10.70	11.00	0.257	Battery 1#	/
Back Side	0mm	40540/2585	20M QPSK 50%RB#0	0.201	0.078	0.00	9.78	10.10	0.216	Battery 1#	/
Top Side	0mm	40540/2585	20M QPSK 50%RB#0	0.122	0.040	-0.03	9.78	10.10	0.131	Battery 1#	/
Back Side	0mm	40840/2615	20M QPSK 1RB#99	0.285	0.110	0.09	10.70	11.00	0.305	Battery 2#	/
Back Side	0mm	40840/2615	20M QPSK 1RB#99	0.299	0.114	0.00	10.70	11.00	0.320	Battery 3#	/
Additional SAR test with Sensor off											
Back Side	14mm	41140/2645	20M QPSK 1RB#0	0.347	0.170	0.07	23.22	24.00	0.415	Battery 1#	/
Top Side	17mm	41140/2645	20M QPSK 1RB#0	**0.522**	0.271	-0.04	23.22	24.00	**0.625**	Battery 1#	/
Back Side	14mm	40540/2585	20M QPSK 50%RB#0	0.271	0.135	0.01	22.53	23.10	0.309	Battery 1#	/
Top Side	17mm	40540/2585	20M QPSK 50%RB#0	0.220	0.048	0.00	22.53	23.10	0.251	Battery 1#	/
CMR-AL09 test data at the SAR worst case of CMR-AL19											
Top Side	17mm	41140/2645	20M QPSK 1RB#0	**0.231**	0.050	0.00	23.22	24.00	**0.276**	/	Yes

Table 56: Body SAR test results of LTE Band 41

7.2.13 SAR measurement Result of WiFi 2.4G

Test Position of Body	Dist.	Test Channel /Freq.(MHz)	Test Mode	Area Scan 1-g SAR（W/kg）	Measured SAR(W/kg)		Power Drift (dB)	Actual duty factor	Scaled 1-g SAR (W/kg)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Accessory Information	SAR Plot.
					1-g	10-g								
Test data of CMR-AL19														
Back Side	0mm	6/2437	802.11 b	0.174	0.184	0.080	0.00	98%	0.188	9.48	10.00	0.212	Battery 1#	/
Top Side	0mm	6/2437	802.11 b	0.249	0.240	0.086	-0.05	98%	0.245	9.48	10.00	0.276	Battery 1#	/
Top Side	0mm	6/2437	802.11 b	0.170	0.239	0.085	-0.07	98%	0.244	9.48	10.00	0.275	Battery 2#	/
Top Side	0mm	6/2437	802.11 b	0.189	**0.244**	0.085	-0.10	98%	0.249	9.48	10.00	**0.281**	Battery 3#	/
Additional SAR test with Sensor off														
Back Side	14mm	6/2437	802.11b	0.150	0.153	0.078	-0.03	98%	0.156	16.81	18.00	0.205	Battery 3#	/
Top Side	17mm	6/2437	802.11b	0.182	0.180	0.093	0.14	98%	0.184	16.81	18.00	0.242	Battery 3#	/
CMR-AL09 test data at the SAR worst case of CMR-AL19														
Top Side	0mm	6/2437	802.11 b	0.167	**0.234**	0.084	-0.17	98%	0.236	9.48	10.00	**0.266**	/	Yes

Table 57: Body SAR test results of WiFi 2.4G

Adjusted SAR (Full power level):

WiFi 2.4G	Tune-up Limit（dBm）	Tune-up Limit（mW）	Hightest Reported SAR(W/kg)	Adjusted SAR (W/kg)	SAR test
802.11b	18.00	63.10	0.242	/	Yes
802.11g	13.00	19.95	/	0.077	No
802.11n 20M	12.00	15.85	/	0.061	No
802.11n 40M	10.00	10.00	/	0.038	No

Adjusted SAR (Sensor on,reduced power level):

WiFi 2.4G	Tune-up Limit（dBm）	Tune-up Limit（mW）	Hightest Reported SAR(W/kg)	Adjusted SAR (W/kg)	SAR test
802.11b	10.00	10.00	0.281	/	Yes
802.11g	10.00	10.00	/	0.281	No
802.11n 20M	10.00	10.00	/	0.281	No
802.11n 40M	10.00	10.00	/	0.281	No

Note: Per KDB248227D01, for Body SAR test of WiFi 2.4G, SAR is measured for 2.4 GHz 802.11b DSSS using the initial test position procedure.The highest reported SAR for DSSS is adjusted by the ratio of OFDM 802.11g/n to DSSS specified maximum output power and the adjusted SAR is < 1.2 W/kg, so SAR for 802.11g/n is not required.

7.2.14 SAR measurement Result of WiFi 5G

Test Position of Body	Dist.	Test Channel /Freq.(MHz)	Test Mode	Area Scan 1-g SAR（W/kg）	Measured SAR(W/kg)		Power Drift (dB)	Actual duty factor	Scaled 1-g SAR (W/kg)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Accessory Information	SAR Plot.
					1-g	10-g								
Test data of CMR-AL19														
Test data of U-NII-1&U-NII-2A band														
Back Side	0mm	58/5290	802.11ac(80M)	0.141	/	/	0.00	98%	/	5.38	7.00	/	Battery 1#	/
Top Side	0mm	58/5290	802.11ac(80M)	0.220	**0.287**	0.064	-0.07	98%	**0.293**	5.38	7.00	**0.425**	Battery 1#	/
Top Side	0mm	58/5290	802.11ac(80M)	0.206	0.249	0.056	0.00	98%	0.254	5.38	7.00	0.369	Battery 2#	/
Top Side	0mm	58/5290	802.11ac(80M)	0.222	0.249	0.054	0.00	98%	0.254	5.38	7.00	0.369	Battery 3#	/
Additional SAR test with Sensor off														
Back Side	14mm	60/5300	802.11a	0.091	0.087	0.033	0.03	98%	0.088	17.80	19.00	0.116	Battery 1#	/
Top Side	17mm	60/5300	802.11a	0.144	0.121	0.049	-0.02	98%	0.122	17.80	19.00	0.161	Battery 1#	/
Test data of U-NII-2C band														
Back Side	0mm	122/5610	802.11ac(80M)	0.068	0.065	0.019	0.00	98%	0.066	5.71	6.00	0.070	Battery 1#	/
Top Side	0mm	122/5610	802.11ac(80M)	0.190	0.201	0.042	-0.02	98%	0.205	5.71	6.00	0.219	Battery 1#	/
Top Side	0mm	122/5610	802.11ac(80M)	0.179	0.197	0.041	0.01	98%	0.201	5.71	6.00	0.215	Battery 2#	/
Top Side	0mm	122/5610	802.11ac(80M)	0.152	0.198	0.041	0.06	98%	0.202	5.71	6.00	0.216	Battery 3#	/
Additional SAR test with Sensor off														
Back Side	14mm	144/5720	802.11a	0.045	0.044	0.017	-0.08	98%	0.045	18.01	19.00	0.056	Battery 1#	/
Top Side	17mm	144/5720	802.11a	0.119	0.115	0.044	-0.05	98%	0.116	18.01	19.00	0.146	Battery 1#	/
Test data of U-NII-3 band														
Back Side	0mm	155/5775	802.11ac(80M)	0.029	0.023	0.009	0.00	98%	0.023	5.43	6.00	0.026	Battery 1#	/
Top Side	0mm	155/5775	802.11ac(80M)	0.148	0.172	0.033	0.01	98%	0.176	5.43	6.00	0.200	Battery 1#	/
Top Side	0mm	155/5775	802.11ac(80M)	0.152	0.174	0.034	0.00	98%	0.178	5.43	6.00	0.202	Battery 2#	/
Top Side	0mm	155/5775	802.11ac(80M)	0.137	0.179	0.035	0.10	98%	0.183	5.43	6.00	0.208	Battery 3#	/
Additional SAR test with Sensor off														
Back Side	14mm	165/5825	802.11a	0.029	0.023	0.087	-0.02	98%	0.023	18.06	19.00	0.028	Battery 1#	/
Top Side	17mm	165/5825	802.11a	0.148	0.147	0.057	0.04	98%	0.148	18.06	19.00	0.184	Battery 1#	/
CMR-AL09 test data at the SAR worst case of CMR-AL19														
Top Side	0mm	58/5290	802.11ac(80M)	0.161	**0.162**	0.034	-0.02	98%	**0.165**	5.38	7.00	0.240	/	Yes

Table 58: Body SAR test results of WiFi 5G

Adjusted SAR (Full power level):

WiFi 5G	Tune-up Limit（dBm）	Tune-up Limit（mW）	Hightest Reported SAR(W/kg)	Adjusted SAR (W/kg)	SAR test
802.11a	19.00	79.43	0.184	/	Yes
802.11n 20M	18.00	63.10	/	0.146	No
802.11n 40M	16.00	39.81	/	0.092	No
802.11ac 20M	18.00	63.10	/	0.146	No
802.11ac 40M	16.00	39.81	/	0.092	No
802.11ac 80M	15.00	31.62	/	0.073	No

Note:

1) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power.
2) Per KDB248227D01, for Body SAR test of WiFi 5G , SAR is measured for 5GHz 802.11a using the initial test position procedure.The highest reported SAR is adjusted by the ratio of 802.11a to other WiFi 5G mode specified maximum output power and the adjusted SAR is < 1.2 W/kg, so SAR for other WiFi 5G mode is not required.
3) 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. As 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);

Adjusted SAR (Sensor on,reduced power level):

WiFi 5G	Tune-up Limit（dBm）	Tune-up Limit（mW）	Hightest Reported SAR(W/kg)	Adjusted SAR (W/kg)	SAR test
802.11ac 80M	7.00	5.01	0.425	/	Yes
802.11a 20M	7.00	5.01	/	0.425	No
802.11n 20M	7.00	5.01	/	0.425	No
802.11n 40M	7.00	5.01	/	0.425	No
802.11ac 20M	7.00	5.01	/	0.425	No
802.11ac 40M	7.00	5.01	/	0.425	No

Note:

1) For Sensor on,reduced power level condition, the 802.11ac 80M mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power and bandwidth per KDB 248227.
2) Per KDB248227D01, for Body SAR test of WiFi 5G , SAR is measured for 5GHz 802.11ac 80M using the initial test position procedure.The highest reported SAR is adjusted by the ratio of 802.11ac 80M to other WiFi 5G mode specified maximum output power and the adjusted SAR is < 1.2 W/kg, so SAR for other WiFi 5G mode is not required.
3) 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. As 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).

7.2.15 SAR measurement Result of BT

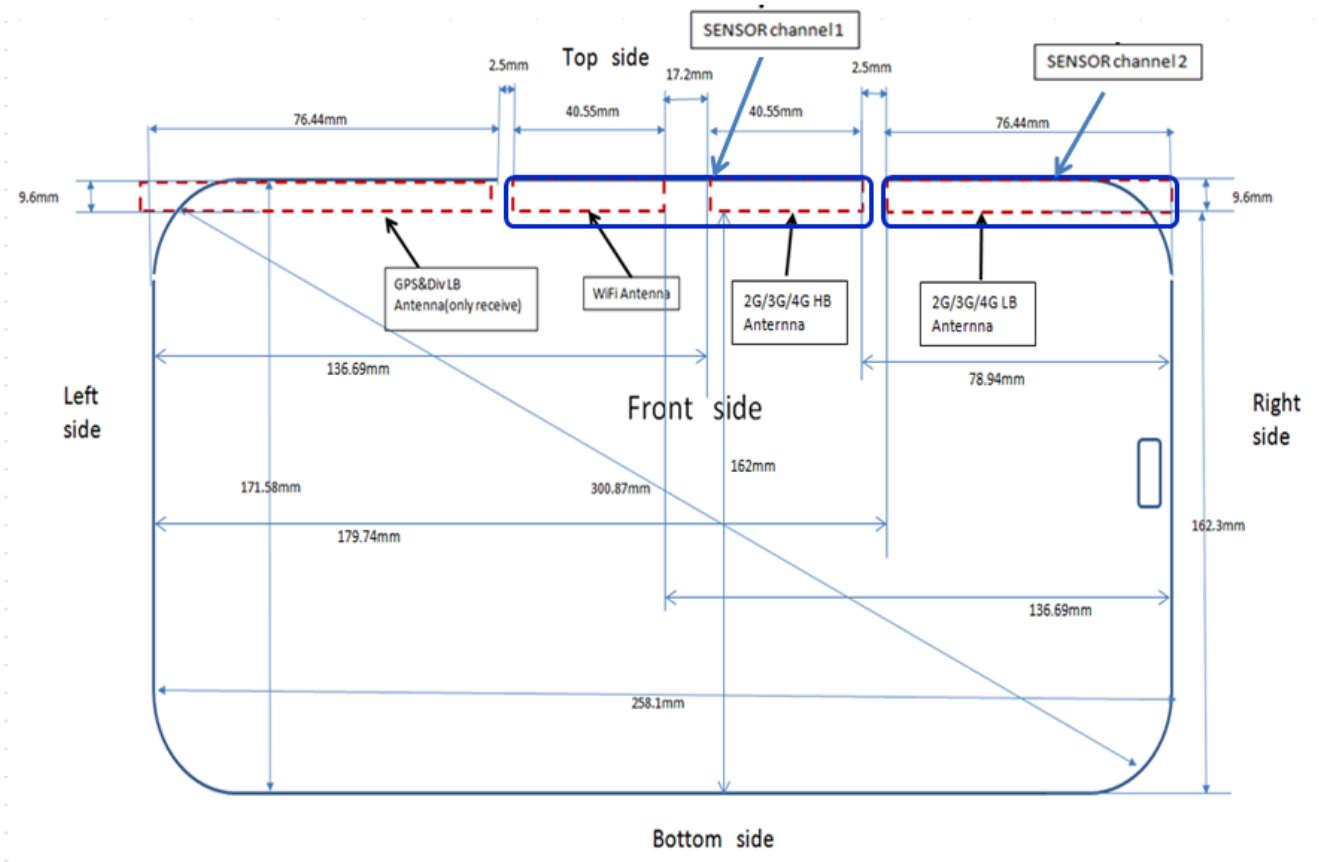
Test Position of Body	Dist.	Test Channel /Freq.(MHz)	Test Mode	Measured SAR(W/kg)		Power Drift (dB)	Actual duty factor	Scaled 1-g SAR (W/kg)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Accessory Information	SAR Plot.
				1-g	10-g								
Test data of CMR-AL19													
Back Side	0mm	19/2440	BLE	0.028	0.011	0.17	60.24%	0.046	9.40	9.50	0.047	Battery 1#	/
Top Side	0mm	19/2440	BLE	0.052	0.018	0.15	60.24%	0.086	9.40	9.50	0.089	Battery 1#	/
Top Side	0mm	19/2440	BLE	0.052	0.019	-0.18	60.24%	0.087	9.40	9.50	0.089	Battery 2#	/
Top Side	0mm	19/2440	BLE	0.115	0.042	0.16	60.24%	0.191	9.40	9.50	**0.195**	Battery 3#	/
CMR-AL09 test data at the SAR worst case of CMR-AL19													
Top Side	0mm	19/2440	BLE	**0.053**	0.019	0.05	60.24%	0.089	9.40	9.50	**0.091**	/	Yes

Table 59: Body SAR test results of BT

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 .

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



<Front View>

Note:

1) Per KDB 616217, because the diagonal Length is ＞200mm, it is considered a “ tablet” device and need to test 0mm 1g Body SAR.

2) The 2G/3G/4G LB antenna supports frequency bands at frequency of 698-960MHz.

3) The 2G/3G/4G HB antenna supports frequency bands at frequency of 1710-2690MHz

7.3.1 Standalone SAR exclusion calculation

Per FCC KDB 447498D01:

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

(Antenna to adjacent sides<50mm)

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 GPRS 2TS	Body 0mm	0.850	32.00	572.16	5.0	179.7	5.0	5.0	162.0	105.502	>50mm	105.502	105.502	>50mm	Yes	>50mm	Yes	Yes	>50mm
GSM1900 GPRS 2TS	Body 0mm	1.910	29.00	381.89	5.0	136.7	78.9	5.0	162.0	105.556	>50mm	>50mm	105.556	>50mm	Yes	>50mm	>50mm	Yes	>50mm
UMTS B2	Body 0mm	1.910	24.00	251.19	5.0	136.7	78.9	5.0	162.0	69.430	>50mm	>50mm	69.430	>50mm	Yes	>50mm	>50mm	Yes	>50mm
UMTS B5	Body 0mm	0.850	24.80	302.00	5.0	179.7	5.0	5.0	162.0	55.685	>50mm	55.685	55.685	>50mm	Yes	>50mm	Yes	Yes	>50mm
LTE B4	Body 0mm	1.755	24.00	251.19	5.0	136.7	78.9	5.0	162.0	66.553	>50mm	>50mm	66.553	>50mm	Yes	>50mm	>50mm	Yes	>50mm
LTE B5	Body 0mm	0.850	24.70	295.12	5.0	179.7	5.0	5.0	162.0	54.418	>50mm	54.418	54.418	>50mm	Yes	>50mm	Yes	Yes	>50mm
LTE B7	Body 0mm	2.600	24.20	263.03	5.0	136.7	78.9	5.0	162.0	84.824	>50mm	>50mm	84.824	>50mm	Yes	>50mm	>50mm	Yes	>50mm
LTE B12	Body 0mm	0.750	25.70	371.54	5.0	179.7	5.0	5.0	162.0	64.352	>50mm	64.352	64.352	>50mm	Yes	>50mm	Yes	Yes	>50mm
LTE B17	Body 0mm	0.750	25.70	371.54	5.0	179.7	5.0	5.0	162.0	64.352	>50mm	64.352	64.352	>50mm	Yes	>50mm	Yes	Yes	>50mm
LTE B26	Body 0mm	0.850	25.00	316.23	5.0	179.7	5.0	5.0	162.0	58.310	>50mm	58.310	58.310	>50mm	Yes	>50mm	Yes	Yes	>50mm
LTE B38	Body 0mm	2.620	24.00	251.19	5.0	136.7	78.9	5.0	162.0	81.317	>50mm	>50mm	81.317	>50mm	Yes	>50mm	>50mm	Yes	>50mm
LTE B41	Body 0mm	2.655	24.00	251.19	5.0	136.7	78.9	5.0	162.0	81.858	>50mm	>50mm	81.858	>50mm	Yes	>50mm	>50mm	Yes	>50mm
WiFi 2.4G	Body 0mm	2.480	18.00	63.10	5.0	78.9	136.7	5.0	162.0	19.873	>50mm	>50mm	19.873	>50mm	Yes	>50mm	>50mm	Yes	>50mm
WiFi 5.2G	Body 0mm	5.250	19.00	79.43	5.0	78.9	136.7	5.0	162.0	36.401	>50mm	>50mm	36.401	>50mm	Yes	>50mm	>50mm	Yes	>50mm
WiFi 5.3G	Body 0mm	5.350	19.00	79.43	5.0	78.9	136.7	5.0	162.0	36.746	>50mm	>50mm	36.746	>50mm	Yes	>50mm	>50mm	Yes	>50mm
WiFi 5.5G	Body 0mm	5.730	19.00	79.43	5.0	78.9	136.7	5.0	162.0	38.028	>50mm	>50mm	38.028	>50mm	Yes	>50mm	>50mm	Yes	>50mm
WiFi 5.8G	Body 0mm	5.850	19.00	79.43	5.0	78.9	136.7	5.0	162.0	38.424	>50mm	>50mm	38.424	>50mm	Yes	>50mm	>50mm	Yes	>50mm
BT	Body 0mm	2.480	9.50	8.91	5.0	78.9	136.7	5.0	162.0	2.807	>50mm	>50mm	2.807	>50mm	No	>50mm	>50mm	No	>50mm

(Antenna to adjacent sides >50mm)

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 GPRS 2TS	Body 0mm	0.850	32.00	572.16	5.0	179.7	5.0	5.0	162.0	<50mm	899.19	<50mm	<50mm	798.67	<50mm	No	<50mm	<50mm	No
GSM1900 GPRS 2TS	Body 0mm	1.910	29.00	381.89	5.0	136.7	78.9	5.0	162.0	<50mm	975.90	398.40	<50mm	1229.00	<50mm	No	No	<50mm	No
UMTS B2	Body 0mm	1.910	24.00	251.19	5.0	136.7	78.9	5.0	162.0	<50mm	975.90	398.40	<50mm	1229.00	<50mm	No	No	<50mm	No
UMTS B5	Body 0mm	0.850	24.80	302.00	5.0	179.7	5.0	5.0	162.0	<50mm	899.19	<50mm	<50mm	798.67	<50mm	No	<50mm	<50mm	No
LTE B4	Body 0mm	1.755	24.00	251.19	5.0	136.7	78.9	5.0	162.0	<50mm	1866.90	1289.40	<50mm	1220.00	<50mm	No	No	<50mm	No
LTE B5	Body 0mm	0.850	24.70	295.12	5.0	179.7	5.0	5.0	162.0	<50mm	899.19	<50mm	<50mm	734.67	<50mm	No	<50mm	<50mm	No
LTE B7	Body 0mm	2.600	24.20	263.03	5.0	136.7	78.9	5.0	162.0	<50mm	959.93	382.43	<50mm	1213.03	<50mm	No	No	<50mm	No
LTE B12	Body 0mm	0.750	25.70	371.54	5.0	179.7	5.0	5.0	162.0	<50mm	1648.70	<50mm	<50mm	1560.00	<50mm	No	<50mm	<50mm	No
LTE B17	Body 0mm	0.750	25.70	371.54	5.0	179.7	5.0	5.0	162.0	<50mm	1648.70	<50mm	<50mm	1560.00	<50mm	No	<50mm	<50mm	No
LTE B26	Body 0mm	0.850	25.00	316.23	5.0	179.7	5.0	5.0	162.0	<50mm	1735.19	<50mm	<50mm	1634.67	<50mm	No	<50mm	<50mm	No
LTE B38	Body 0mm	2.620	24.00	251.19	5.0	136.7	78.9	5.0	162.0	<50mm	959.93	382.43	<50mm	1213.03	<50mm	No	No	<50mm	No
LTE B41	Body 0mm	2.655	24.00	251.19	5.0	136.7	78.9	5.0	162.0	<50mm	959.93	382.43	<50mm	1213.03	<50mm	No	No	<50mm	No
WiFi 2.4G	Body 0mm	2.480	18.00	63.10	5.0	78.9	136.7	5.0	162.0	<50mm	385.40	962.90	<50mm	1216.00	<50mm	No	No	<50mm	No
WiFi 5.2G	Body 0mm	5.250	19.00	79.43	5.0	78.9	136.7	5.0	162.0	<50mm	351.40	928.90	<50mm	1182.00	<50mm	No	No	<50mm	No
WiFi 5.3G	Body 0mm	5.350	19.00	79.43	5.0	78.9	136.7	5.0	162.0	<50mm	354.40	931.90	<50mm	1185.00	<50mm	No	No	<50mm	No
WiFi 5.5G	Body 0mm	5.730	19.00	79.43	5.0	78.9	136.7	5.0	162.0	<50mm	353.40	930.90	<50mm	1184.00	<50mm	No	No	<50mm	No
WiFi 5.8G	Body 0mm	5.850	19.00	79.43	5.0	78.9	136.7	5.0	162.0	<50mm	351.40	928.90	<50mm	1182.00	<50mm	No	No	<50mm	No
BT	Body 0mm	2.480	9.50	8.91	5.0	78.9	136.7	5.0	162.0	<50mm	385.40	962.90	<50mm	1216.00	<50mm	No	No	<50mm	No

According to the table above, the standalone test configurations summary required for this device are as below:

Test configurations	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side
GSM850 GPRS 2TS	No	Yes	No	Yes	Yes	No
GSM1900 GPRS 2TS	No	Yes	No	No	Yes	No
UMTS Band 2	No	Yes	No	No	Yes	No
UMTS Band 5	No	Yes	No	Yes	Yes	No
LTE Band 4	No	Yes	No	No	Yes	No
LTE Band 5	No	Yes	No	Yes	Yes	No
LTE Band 7	No	Yes	No	No	Yes	No
LTE Band 12	No	Yes	No	Yes	Yes	No
LTE Band 17	No	Yes	No	Yes	Yes	No
LTE Band 26	No	Yes	No	Yes	Yes	No
LTE Band 38	No	Yes	No	No	Yes	No
LTE Band 41	No	Yes	No	No	Yes	No
WiFi 2.4G	No	Yes	No	No	Yes	No
WiFi 5G	No	Yes	No	No	Yes	No
BT*	No	Yes	No	No	Yes	No

Note*： Per KDB 447498D01, BT SAR test can be excluded. But for certain situations where the estimated SAR of BT is overly conservative for simultaneous transmission SAR test exclusion, the test lab may still choose to perform standalone SAR measurements for certain positions, then use the measured SAR to determine simultaneous transmission SAR test exclusion in this report.

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:

1) (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

2) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distance is > 50 mm.

mode	Position	Pmax (dBm)*	Pmax (mW)	test separation distance(mm)					f (GHz)	X	Estimated SAR (W/kg)*				
				Back side	Top side	Left side	Right side	Bottom side			Back side	Top side	Left side	Right side	Bottom side
GSM850 GPRS 2TS	Body 0mm	32.00	1584.89	5.0	5.0	179.7	5.0	162.0	0.850	7.50	measure	measure	0.400	measure	0.400
GSM1900 GPRS 2TS	Body 0mm	29.00	794.33	5.0	5.0	136.7	78.9	162.0	1.910	7.50	measure	measure	0.400	0.400	0.400
UMTS Band 2	Body 0mm	24.00	251.19	5.0	5.0	136.7	78.9	162.0	1.910	7.50	measure	measure	0.400	0.400	0.400
UMTS Band 5	Body 0mm	24.80	302.00	5.0	5.0	179.7	5.0	162.0	0.850	7.50	measure	measure	0.400	measure	0.400
LTE Band 4	Body 0mm	24.00	251.19	5.0	5.0	136.7	78.9	162.0	1.755	7.50	measure	measure	0.400	0.400	0.400
LTE Band 5	Body 0mm	24.70	295.12	5.0	5.0	179.7	5.0	162.0	0.850	7.50	measure	measure	0.400	measure	0.400
LTE Band 7	Body 0mm	24.20	263.03	5.0	5.0	136.7	78.9	162.0	2.600	7.50	measure	measure	0.400	0.400	0.400
LTE Band 12	Body 0mm	25.70	371.54	5.0	5.0	179.7	5.0	162.0	0.750	7.50	measure	measure	0.400	measure	0.400
LTE Band 17	Body 0mm	25.70	371.54	5.0	5.0	179.7	5.0	162.0	0.750	7.50	measure	measure	0.400	measure	0.400
LTE Band 26	Body 0mm	25.00	316.23	5.0	5.0	179.7	5.0	162.0	0.850	7.50	measure	measure	0.400	measure	0.400
LTE Band 38	Body 0mm	24.00	251.19	5.0	5.0	136.7	78.9	162.0	2.620	7.50	measure	measure	0.400	0.400	0.400
LTE Band 41	Body 0mm	24.00	251.19	5.0	5.0	136.7	78.9	162.0	2.655	7.50	measure	measure	0.400	0.400	0.400
WiFi 2.4G	Body 0mm	18.00	63.10	5.0	5.0	78.9	136.7	162.0	2.480	7.50	measure	measure	0.400	0.400	0.400
WiFi 5G	Body 0mm	19.00	79.43	5.0	5.0	78.9	136.7	162.0	5.850	7.50	measure	measure	0.400	0.400	0.400
BT	Body 0mm	9.50	8.91	5.0	5.0	78.9	136.7	162.0	2.480	7.50	measure	measure	0.400	0.400	0.400

Table 60: Estimated SAR calculation for the device.

Note: 1) * - maximum possible output power declared by manufacturer

7.3.2 Simultaneous Transmission Possibilities

The Simultaneous Transmission Possibilities of this device are as below:

No.	Configuration	Body
1	GSM Voice(Ant 1) + BT	Yes
2	GSM DATA (Ant 1)+ BT	Yes
3	GSM Voice(Ant 1) + WiFi	Yes
4	GSM DATA(Ant 1) + WiFi	Yes
5	UMTS Voice(Ant 1) + BT	Yes
6	UMTS Data(Ant 1) + BT	Yes
7	UMTS Voice (Ant 1) + WiFi	Yes
8	UMTS Data (Ant 1)+ WiFi	Yes
9	LTE (Ant 1) + BT	Yes
10	LTE (Ant 1) + WiFi	Yes
11	GSM Voice(Ant 2) + BT	Yes
12	GSM DATA (Ant 2)+ BT	Yes
13	GSM Voice(Ant 2) + WiFi	Yes
14	GSM DATA(Ant 2) + WiFi	Yes
15	UMTS Voice(Ant 2) + BT	Yes
16	UMTS Data(Ant 2) + BT	Yes
17	UMTS Voice (Ant 2) + WiFi	Yes
18	UMTS Data (Ant 2)+ WiFi	Yes
19	LTE (Ant 2) + BT	Yes
20	LTE (Ant 2) + WiFi	Yes
21	WiFi 5G+BT	Yes
22	GSM Voice(Ant 1) + WiFi 5G + BT	Yes
23	GSM DATA (Ant 1) + WiFi 5G + BT	Yes
24	UMTS Voice(Ant 1) + WiFi 5G + BT	Yes
25	UMTS Data(Ant 1) + WiFi 5G + BT	Yes
26	LTE(Ant 1) + WiFi 5G + BT	Yes
27	GSM Voice(Ant 2) + WiFi 5G + BT	Yes
28	GSM DATA (Ant 2) + WiFi 5G + BT	Yes
29	UMTS Voice(Ant 2) + WiFi 5G + BT	Yes
30	UMTS Data(Ant 2) + WiFi 5G + BT	Yes
31	LTE(Ant 2) + WiFi 5G + BT	Yes

Table 61: Simultaneous Transmission Possibilities

Note:

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

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

3) The device does not support GSM DTM .

4) Ant 1 = 2G/3G/4G LB antenna(2G/3G/4G frequency bands at frequency of 698-960MHz).
Ant 2 = 2G/3G/4G HB antenna (2G/3G/4G frequency bands at frequency of 1710-2690MHz).
2G/3G/4G HB antenna and 2G/3G/4G LB antenna can't transmit simutanously.

7.3.3 SAR Summation Scenario

The sum SAR is as below:

Test Position		Main antenna SARMax												WiFi/BT antenna SARMax	Σ1-g SAR (1.6W/kg Limit)
		GSM850	GSM1900	UMTS Band 2	UMTS Band 5	LTE Band 4	LTE Band 5	LTE Band 7	LTE Band 12	LTE Band 17	LTE Band 26	LTE Band 38	LTE Band 41	WiFi 2.4G	
Body	Front Side	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	Back Side	0.364	0.351	0.652	0.309	0.515	0.730	0.639	0.523	0.604	0.699	0.426	0.415	0.212	0.942
	Left Side	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.800
	Right Side	0.261	0.400	0.400	0.236	0.400	0.411	0.400	0.367	0.440	0.465	0.400	0.400	0.400	0.865
	Top Side	0.479	0.920	0.518	0.519	0.485	0.654	0.779	0.386	0.535	0.517	0.413	0.625	0.281	1.201
	Bottom Side	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.800

Table 62: 1-g SAR Simultaneous Tx Combination of GSM/UMTS/LTE & WiFi 2.4G.

Test Position		Main antenna SARMax												WiFi/BT antenna SARMax		Σ1-g SAR (1.6W/kg Limit)
		GSM850	GSM1900	UMTS Band 2	UMTS Band 5	LTE Band 4	LTE Band 5	LTE Band 7	LTE Band 12	LTE Band 17	LTE Band 26	LTE Band 38	LTE Band 41	WiFi 5G	BT	
Body	Front Side	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	Back Side	0.364	0.351	0.652	0.309	0.515	0.730	0.639	0.523	0.604	0.699	0.426	0.415	0.070	0.047	0.847
	Left Side	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	1.200
	Right Side	0.261	0.400	0.400	0.236	0.400	0.411	0.400	0.367	0.440	0.465	0.400	0.400	0.400	0.400	1.265
	Top Side	0.479	0.920	0.518	0.519	0.485	0.654	0.779	0.386	0.535	0.517	0.413	0.625	0.425	0.195	**1.540**
	Bottom Side	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	1.200

Table 63: 1-g SAR Simultaneous Tx Combination of GSM/UMTS/LTE & WiFi 5G & BT.

7.3.4 Simultaneous Transmission Conclusion

The above numeral summed SAR results and 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 D01

Appendix A. System Check Plots
(Pls See Appendix No.: SYBH(Z-SAR)003012018-2A, total: 18 pages)

Appendix B. SAR Measurement Plots
(Pls See Appendix No.: SYBH(Z-SAR)003012018-2B, total: 16 pages)

Appendix C. Calibration Certificate
(Pls See Appendix No.: SYBH(Z-SAR) 003012018-2C, total: 128 pages)

Appendix D. Photo documentation
(Pls See Appendix No.: SYBH(Z-SAR) 003012018-2D, total: 5 pages)

End