

TEST REPORT FOR SAR TESTING

Report No: SRTC2021-9004(F)-21072601(H)

Product Name: LTE USB Modem

Product Model: Dongle400

Applicant: WuXi Beetech Data Communications Co., Ltd.

Manufacturer: WuXi Beetech Data Communications Co., Ltd.

Specification: Part 2.1093

IEEE Std 1528

KDB Procedures

FCC ID: 2A23ODONGLE400

The State Radio_monitoring_center Testing Center (SRTC)

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1. GENERAL INFORMATION

1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio_monitoring_center Testing Center (SRTC).

The test results relate only to individual items of the samples which have been tested.

The certification and accreditation identifiers used in this report shall not be applicable to the tested or calibrated samples thereof. The manufacturer shall not mark the tested samples or items (or a separate part of the item) with the identifiers of certification and accreditation to mislead relevant parties about the tested samples or items.

1.2 Information about the testing laboratory

Company:	The State Radio_monitoring_center Testing Center (SRTC)
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1.3 Applicant's details

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City:	Wu Xi
Country or Region:	Jiang Su, China
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1.4 Manufacturer's details

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Country or Region:	Jiang Su, China
Contacted person:	Gao Caixia
Tel:	0086 18801281544
Email:	gaocaixia@beetech.cn

1.5 Test Environment

Date of Receipt of test sample at SRTC:	2021.07.26	
Testing Start Date:	2021.07.27	
Testing End Date:	2021.09.13	
Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	25	35
Normal Supply Voltage (V d.c.):	5	

2. DESCRIPTION OF THE DEVICE UNDER TEST

Wireless Technology and Frequency Bands	☐ GSM Band : ☒ WCDMA Band: II/IV/V ☒ LTE Band: 2/4/5/7/12/17 ☐ Wi-Fi Band: ☐ BT/BLE
Mode	GSM ☐ Voice (GMSK) ☐ GPRS (GMSK) ☐ EGPRS (8PSK) WCDMA ☒ UMTS Rel. 99 ☒ HSDPA (Rel. 5) ☒ HSUPA (Rel. 6) ☐ HSPA+ (Rel. 7) ☐ DC-HSDPA (Rel. 8) LTE ☒ QPSK ☒ 16QAM ☒ 64QAM Wi-Fi2.4GHz (802.11b/g/n/ax) ☐ 802.11b ☐ 802.11g ☐ 802.11n (20MHz/40MHz) ☐ 802.11ax (20MHz/40MHz) Wi-Fi5GHz ☐ 802.11a ☐ 802.11n (20MHz/40MHz) ☐ 802.11ac (20MHz/40MHz/80MHz) ☐ 802.11ax (20MHz/40MHz/80MHz) Bluetooth ☐ BR(GFSK) ☐ EDR($\pi/4$ DQPSK , 8-DPSK) ☐ BLE(GFSK)
Duty Cycle	GPRS/EDGE: 12.5% (1 Slot), 25% (2 Slots), 37.5% (3 Slots), 50% (4 Slots) WCDMA: 100% LTE(FDD): 100% LTE(TDD): 63.3% maximum Bluetooth: 77% (DH5) WLAN2.4GHz 802.11b:99.2% WLAN5GHz 802.11a:99.21%
GPRS Multi-Slot Class	☐ Class 8 - One Up ☐ Class 10 - Two Up ☐ Class 12 - Four Up ☐ Class 33 - Four Up
Mobile Phone	☐ Class A - Mobile phones can be connected to both GPRS and GSM services simultaneously.

Capability	☐ Class B - Mobile phones can be attached to both GPRS and GSM services, using one service at a time. ☐ Class C - Mobile phones are attached to either GPRS or GSM voice service. You need to switch manually between services
H/W Version	SLT773_V1.01_PCB
S/W Version	RW_Dongle400_V1.0.0_B01
IMEI	865171050955064

3. REFERENCE SPECIFICATION

Specification	Version	Title
Part 2.1093	2020	Radio frequency radiation exposure evaluation: portable devices.
IEEE Std 1528	2013	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 248227 D01	v02r02	SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS
KDB 447498 D01	v06	General RF Exposure Guidance
KDB 447498 D02	v02r01	SAR MEASUREMENT PROCEDURES FOR USB DONGLE TRANSMITTERS
KDB 643646 D01	v01r03	SAR TEST REDUCTION CONSIDERATIONS FOR OCCUPATIONAL PTT RADIOS
KDB 616217 D04	v01r02	SAR for laptop and tablets
KDB 648474 D04	v01r03	Handset SAR
KDB 865664 D01	v01r04	SAR Measurement from 100 MHz to 6 GHz
KDB 865664 D02	v01r02	RF Exposure Reporting
KDB 941225 D01	v03r01	3G SAR MEASUREMENT PROCEDURES
KDB 941225 D05	v02r05	SAR for LTE Devices
KDB 941225 D06	v02r01	SAR EVALUATION PROCEDURES FOR PORTABLE DEVICES WITH WIRELESS ROUTER CAPABILITIES
KDB 941225 D07	v01r02	SAR EVALUATION PROCEDURES FOR UMPC MINI-TABLET DEVICES

4. TEST CONDITIONS

4.1 Picture to demonstrate the required liquid depth

The liquid depth is large than 15cm in the used SAM phantoms in flat section, and the depth of the tissue simulant was 15.0 ± 0.5 cm measured from the ear reference point during system checking and device measurements.



Liquid depth for SAR Measurement

4.2 Test Signal, Frequencies and Output Power

The device was put into operation by using a call tester. Communication between the device and the call tester was established by air link.

The device output power was set to maximum power level for all tests; a fully charged battery was used for every test sequence.

In all operating bands the measurements were performed on middle channel, and few of them were also performed on lowest and highest channels.

4.3 SAR Measurement Set-up

The system is based on a high precision robot (working range greater than 0.9m), which positions the probes with a positional repeatability of better than ± 0.02 mm. Special E-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines (length =300mm) to the data acquisition unit. A cell controller system contains the power supply, robot controller, teaches pendant (Joystick), and remote control, is used to drive the robot motors.

The PC consists of the Micron Pentium IV computer with Win7 system and SAR Measurement Software DASY5 Professional, A/D interface card, monitor, mouse, and

keyboard. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot.

A data acquisition electronic (DAE) circuit performs the signal amplification; signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card. The DAE consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines.

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

The robot uses its own controller with a built in VME-bus computer.

4.4 Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twin headed "SAM Phantom", manufactured by SPEAG. The phantom conforms to the requirements of IEEE 1528.

System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

The SPEAG device holder was used to position the device in all tests whilst a tripod was used to position the validation dipoles against the flat section of phantom.

4.5 Tissue Simulants

Recommended values for the dielectric parameters of the tissue simulants are given in IEEE 1528. All tests were carried out using simulants whose dielectric parameters were within $\pm 10\%$ below 3GHz and $\pm 5\%$ above 3GHz of the recommended values when use DASY system according to KDB865664D01. All tests were carried out within 24 hours of measuring the dielectric parameters.

Tissue Stimulant Recipes	
Name	Broadband tissue-equivalent liquid
Type	HBBL600-6000V6 Simulating Liquid
Note: The stimulant could be the same for head and body.	

4.6 DESCRIPTION OF THE TEST PROCEDURE

4.6.1 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the Dasy system.



Device holder supplied by SPEAG

4.6.2 Test Exposure Conditions

4.6.2.1 Head Configuration

Measurements were made in “cheek” and “tilt” positions on both the left hand and right-hand sides of the phantom.

The positions used in the measurements were according to IEEE 1528 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

4.6.2.2 Body Worn Configuration

The device was placed in the SPEAG holder below the flat section of the phantom. The distance between the device and the phantom was kept at the separation distance using a separate flat spacer that was removed before the start of the measurements. And the distance is normally determined according to the actual scene which might be the worst use condition for general exposure. The device's front and rear were oriented facing the phantom since these orientations give higher results for most regular portable devices.

4.6.2.3 Hotspot Configuration

Hotspot mode SAR is measured for all edges and surfaces of the device with a transmitting antenna located within 25 mm from that surface or edge; for the data modes, wireless technologies and frequency bands supporting hotspot mode.

4.6.3 Scan Procedure

First, area scans were used for determination of the field distribution and the approximate location of the local peak SAR values. The SAR distribution is scanned along the inside surface, at least for an area larger than the projection of the handset and antenna. The angle between the probe axis and the surface normal line is recommended but not required to be less than 30°. The SAR distribution is first measured on a 2-D coarse grid. The scan region should cover all areas that are exposed and encompassed by the projection of the handset. There are 15 mm × 15 mm (equal or less than 2GHz), 12 mm × 12 mm (from 2GHz~4GHz) and 10mm x 10mm (from 4GHz~6GHz) measurement grid used when two staggered one-dimensional cubic splines are used to estimate the maximum SAR location.

When the reported 1g-SAR estimated by area scan is less than 1.40 w/kg.

Zoom scan was performed by using the configuration mentioned below or more conservative scan area and step to determine the averaged SAR value. Drift was determined by measuring the same point at the start of the area scan and again at the end of the zoom scan.

Below 3GHz: 32mmX32mmX30mm scan area with 8 mm X8 mm X5 mm steps

2GHz-3GHz: 32mmX32mmX30mm scan area with 8 mm X8 mm X5 mm steps

3GHz-4GHz: 28mmX28mmX28mm scan area with 7 mm X7 mm X4 mm steps

4GHz-5GHz: 25mmX25mmX24mm scan area with 5 mm X5 mm X3 mm steps

5GHz-6GHz: 25mmX25mmX22mm scan area with 5 mm X5 mm X2 mm steps

4.6.4 SAR Averaging Methods

The maximum SAR value was averaged over a cube of tissue using interpolation and extrapolation.

The interpolation, extrapolation and maximum search routines within DASY5 are all based on the modified Quadratic Shepard's method (Robert J. Renka, Multivariate Interpolation of Large Sets of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988, pp. 139-148).

The interpolation scheme combines a least-square fitted function method with a weighted average method. A triradiate 3-D / bivariate 2-D quadratic function is computed for each measurement point and fitted to neighboring points by a least-square method. For the zoom scan, inverse distance weighting is incorporated to fit distant points more accurately. The interpolating function is finally calculated as a weighted average of the quadratics.

In the zoom scan, the interpolation function is used to extrapolate the Peak SAR from the deepest measurement points to the inner surface of the phantom.

5 RESULT SUMMARY

The maximum reported SAR values for Body exposure conditions are given as follows. The device conforms to the requirements of the standard(s) when the maximum reported SAR value is less than or equal to the limit.

Standalone Transmission Summary

Note: Proximity sensor with power reduction only work on WCDMA Band II/ IV and LTE Band2/4

Standalone Transmission Summary					
Exposure Position	Frequency Band	SAR Result(W/kg)	Highest SAR Result(W/kg)	Limit(W/kg)	Result
Body 5mm (Reduced power)	WCDMA Band II	1.01	1.18	1.60	Pass
	WCDMA Band IV	0.99			
	WCDMA Band V	0.80			
	LTE Band2	1.00			
	LTE Band4	0.97			
	LTE Band5	0.78			
	LTE Band7	0.90			
	LTE Band12	1.18			
	LTE Band17	0.40			
Body 19mm (Trigger distance -1 with full power)	WCDMA Band II	0.86	0.95	1.60	Pass
	WCDMA Band IV	0.95			
	LTE Band2	0.53			
	LTE Band4	0.79			

This Test Report Is Approved by: Mr. Peng Zhen 	Review by: Mr. Li Bin 
Tested and issued by: Miss LiJin 	Approved date: 2021.09.14

6 TEST RESULT

6.1 Measurement result

WCDMA Measurement result

Release 99

The following procedures are according to FCC KDB Publication 941225 D01.

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 1
	RMC mode AMR mode	12.2kbps RMC 12.2kbps RMC in 3.4 kbps SRB
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

Release 5

The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	$\beta_{hs}^{(1)}$	CM(dB) ⁽²⁾
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 ⁽³⁾	15/15 ⁽³⁾	64	12/15 ⁽³⁾	24/15	1.0
3	15/15	8/15	64	15/18	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.

Note2: CM=1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$.

Note3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC(TF1,TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.

Release 6

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121.

Sub-test	β_c	β_d	β_d (S F)	β_c/β_d	$\beta_{hs}^{(1)}$	β_{ec}	β_{ed}	β_{ed} (S F)	β_{ed} (code s)	CM (⁽²⁾ dB)	MP R (dB)	AG ⁽⁴⁾ Index	E-TF CI
1	11/15 ⁽³⁾	15/15 ⁽³⁾	64	11/15 ⁽³⁾	22/15	209/25	1039/25	4	1	1.0	2.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}:47/15$ $\beta_{ed2}:47/15$	4	2	2.0	2.0	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	2.0	21	81

Note1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.

Note2: 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.

Note3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC(TF1,TF1) to $\beta_c=10/15$ and $\beta_d=15/15$.

Note4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC(TF1,TF1) to $\beta_c=14/15$ and $\beta_d=15/15$.

NOTE5: Testing UE using E-DPDCH Physical layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.

NOTE6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Release 7

The following 1 Sub-test was completed according to Release 7 procedures in section 5.2 of 3GPP TS34.121.

Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	β_c (Note 3)	β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$.

Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).

Note 3: DPDCH is not configured, therefore the β_c is set to 1 and $\beta_d = 0$ by default.

Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

Release 8

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

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
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.		
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

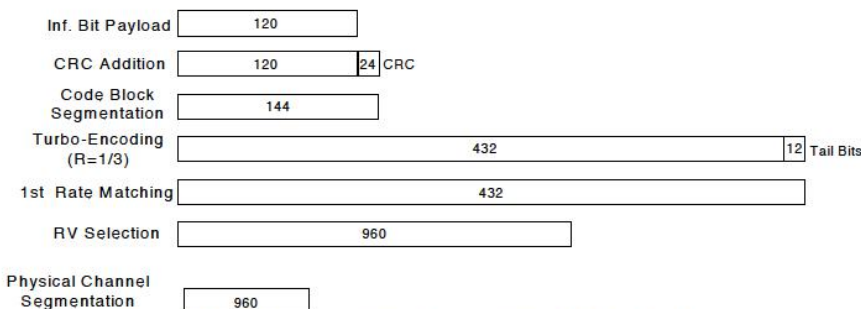


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 8 procedures in section 5.2 of 3GPP TS34.121.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	$\beta_{hs}^{(1)}$	CM(dB) ⁽²⁾
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 ⁽³⁾	15/15 ⁽³⁾	64	12/15 ⁽³⁾	24/15	1.0
3	15/15	8/15	64	15/18	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.

Note2: CM=1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$.

Note3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC(TF1,TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.

WCDMA band II

Full power

Mode		RF Output Power(dBm)			Tuneup Tolerance (dBm)
		9262	9400	9538	
		1852.4	1880	1907.6	
Release 99	RMC,12.2kbps	22.06	22.03	22.06	22.5
HSDPA	Subtest1	20.98	20.82	20.85	21.0
	Subtest2	20.97	20.85	20.80	21.0
	Subtest3	20.43	20.33	20.27	20.5
	Subtest4	20.39	20.39	20.34	20.5
HSUPA	Subtest1	20.73	20.04	20.50	21.0
	Subtest2	19.50	19.40	19.47	19.5
	Subtest3	19.61	19.57	19.68	20.0
	Subtest4	19.77	20.03	19.22	20.5
	Subtest5	20.66	20.65	20.71	21.0
DC-HSDPA	Subtest1	20.71	20.61	20.82	21.0
	Subtest2	20.64	20.66	20.72	21.0
	Subtest3	20.23	20.16	20.26	20.5
	Subtest4	20.21	20.16	20.25	20.5

Reduced power

Mode		RF Output Power(dBm)			Tuneup Tolerance (dBm)
		9262	9400	9538	
		1852.4	1880	1907.6	
Release 99	RMC,12.2kbps	15.56	15.53	15.56	16.0
HSDPA	Subtest1	14.48	14.32	14.35	14.5
	Subtest2	14.47	14.35	14.30	14.5
	Subtest3	13.93	13.83	13.77	14.0
	Subtest4	13.89	13.89	13.84	14.0
HSUPA	Subtest1	14.23	13.54	14.00	14.5
	Subtest2	13.00	12.90	12.97	13.0
	Subtest3	13.11	13.07	13.18	13.5
	Subtest4	13.27	13.53	12.72	14.0
	Subtest5	14.16	14.15	14.21	14.5
DC-HSDPA	Subtest1	14.21	14.11	14.32	14.5
	Subtest2	14.14	14.16	14.22	14.5
	Subtest3	13.73	13.66	13.76	14.0
	Subtest4	13.71	13.66	13.75	14.0

WCDMA band IV

Full power

Mode		RF Output Power(dBm)			Tuneup Tolerance (dBm)
		1312	1413	1513	
		1712.4	1732.6	1752.6	
Release 99	RMC,12.2kbps	22.43	22.36	22.40	22.5
HSDPA	Subtest1	21.47	21.22	21.05	21.5
	Subtest2	21.43	21.29	21.09	21.5
	Subtest3	20.81	20.76	20.60	21.0
	Subtest4	20.79	20.64	20.56	21.0
HSUPA	Subtest1	20.59	20.95	20.13	21.0
	Subtest2	19.81	19.73	19.52	20.0
	Subtest3	19.95	19.87	19.70	20.0
	Subtest4	20.01	20.12	20.25	20.5
	Subtest5	21.00	20.94	20.78	21.0
DC-HSDPA	Subtest1	21.01	20.88	20.81	21.5
	Subtest2	21.07	20.96	20.94	21.5
	Subtest3	20.58	20.47	20.46	21.0
	Subtest4	20.56	20.45	20.40	21.0

Reduced power

Mode		RF Output Power(dBm)			Tuneup Tolerance (dBm)
		1312	1413	1513	
		1712.4	1732.6	1752.6	
Release 99	RMC,12.2kbps	15.43	15.36	15.40	15.5
HSDPA	Subtest1	14.47	14.22	14.05	14.5
	Subtest2	14.43	14.29	14.09	14.5
	Subtest3	13.81	13.76	13.60	14.0
	Subtest4	13.79	13.64	13.56	14.0
HSUPA	Subtest1	13.59	13.95	13.13	14.0
	Subtest2	12.81	12.73	12.52	13.0
	Subtest3	12.95	12.87	12.70	13.0
	Subtest4	13.01	13.12	13.25	13.5
	Subtest5	14.00	13.94	13.78	14.0
DC-HSDPA	Subtest1	14.01	13.88	13.81	14.5
	Subtest2	14.07	13.96	13.94	14.5
	Subtest3	13.58	13.47	13.46	14.0
	Subtest4	13.56	13.45	13.40	14.0

WCDMA band V

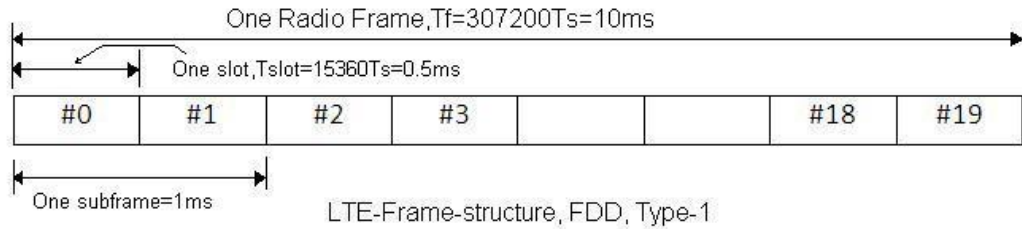
Mode		RF Output Power(dBm)			Tuneup Tolerance (dBm)
		4132	4183	4233	
		826.4	836.6	846.6	
Release 99	RMC,12.2kbps	22.82	22.74	22.91	23.0
HSDPA	Subtest1	22.13	21.86	21.92	22.5
	Subtest2	22.12	21.84	21.87	22.5
	Subtest3	21.59	21.31	21.41	22.0
	Subtest4	21.63	21.29	21.40	22.0
HSUPA	Subtest1	21.79	21.13	21.21	22.0
	Subtest2	20.61	20.64	20.59	21.0
	Subtest3	20.19	20.69	20.80	21.0
	Subtest4	21.13	20.98	20.87	21.5
	Subtest5	21.96	21.93	22.10	22.5
DC-HSDPA	Subtest1	21.90	21.80	21.87	22.0
	Subtest2	21.90	21.80	21.82	22.0
	Subtest3	21.38	21.37	21.30	21.5
	Subtest4	21.34	21.33	21.32	21.5

Note: UMTS SAR was tested under Rel.99 RMC 12.2kbps mode per KDB Publication 941225 D01.for other higher release configuration, SAR was not required since any average output power was not more than 0.25 dB higher than the RMC level.

LTE Measurement result

General description:

FDD-LTE frame structure



Type 1 is used as LTE FDD frame structure. As shown in the figure above, an LTE TDD frame is made of total 20 slots, each of 0.5ms. Two consecutive time slots will form one subframe. 10 such subframes form one radio frame. One subframe duration is about 1 ms. and the duty cycle is inherent as 100%

LTE Band2

Full power

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				18607	18900	19193	Tune-up
				1850.7	1880	1909.3	Tolerance
1.4	QPSK	1	0	21.83	21.59	21.48	22.0
		1	3	21.97	21.68	21.51	22.0
		1	5	21.92	21.65	21.40	22.0
		3	0	21.85	21.73	21.23	22.0
		3	1	21.87	21.73	21.26	22.0
		3	3	21.82	21.68	21.19	22.0
		6	0	20.93	20.58	20.40	21.0
	16QAM	1	0	20.80	20.97	20.53	21.0
		1	3	20.85	21.00	20.56	21.0
		1	5	20.95	20.97	20.49	21.0
		3	0	20.96	20.46	19.97	21.0
		3	1	20.84	20.39	20.02	21.0
		3	3	20.82	20.31	19.96	21.0
		6	0	20.11	19.62	19.23	20.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				18615	18900	19185	Tune-up
				1851.5	1880	1908.5	Tolerance
3	QPSK	1	0	21.61	21.32	21.06	22.0
		1	8	21.75	21.33	21.02	22.0
		1	14	21.70	21.38	21.19	22.0
		8	0	20.50	20.25	20.18	20.5
		8	4	20.54	20.31	20.19	21.0
		8	7	20.63	20.31	20.11	21.0
		15	0	20.50	20.27	20.16	20.5
	16QAM	1	0	21.18	20.71	20.45	21.5
		1	8	21.14	20.69	20.27	21.5
		1	14	21.26	20.63	19.99	21.5
		8	0	19.70	19.27	18.97	20.0
		8	4	19.82	19.21	18.97	20.0
		8	7	19.83	19.22	18.92	20.0
		15	0	19.53	19.37	19.06	20.0

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				18625	18900	19175	Tune-up Tolerance
				1852.5	1880	1907.5	
5	QPSK	1	0	21.26	20.76	20.84	21.5
		1	12	21.35	20.91	21.25	21.5
		1	24	21.06	20.89	20.82	21.5
		12	0	20.23	20.03	19.87	20.5
		12	7	20.22	20.11	19.89	20.5
		12	13	20.28	20.09	19.77	20.5
		25	0	20.27	20.06	19.82	20.5
	16QAM	1	0	20.00	19.94	19.76	20.0
		1	12	20.21	20.16	19.98	20.5
		1	24	20.03	20.06	19.41	20.5
		12	0	19.04	18.81	18.50	19.5
		12	7	19.23	18.89	18.54	19.5
		12	13	19.30	18.87	18.42	19.5
		25	0	19.27	18.84	18.71	19.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				18650	18900	19150	Tune-up Tolerance
				1855	1880	1905	
10	QPSK	1	0	21.46	20.86	21.07	21.5
		1	25	21.47	21.01	20.94	21.5
		1	49	21.14	20.93	20.84	21.5
		25	0	20.04	19.82	19.66	20.5
		25	12	20.10	19.98	19.79	20.5
		25	25	20.07	19.91	19.65	20.5
		50	0	20.01	19.87	19.65	20.5
	16QAM	1	0	20.80	20.53	19.94	21.0
		1	25	20.93	20.51	20.02	21.0
		1	49	20.79	20.28	20.03	21.0
		25	0	19.12	18.86	18.77	19.5
		25	12	19.03	19.11	18.92	19.5
		25	25	18.99	19.15	18.88	19.5
		50	0	19.02	18.97	18.68	19.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				18675	18900	19125	Tune-up Tolerance
				1857.5	1880	1902.5	
15	QPSK	1	0	21.17	20.75	20.72	21.5
		1	37	21.31	21.37	20.97	21.5
		1	74	20.99	20.87	20.50	21.0
		36	0	19.86	19.62	19.53	20.0
		36	29	19.82	19.75	19.63	20.0
		36	30	19.81	19.73	19.62	20.0
		75	0	19.90	19.68	19.59	20.0
	16QAM	1	0	20.55	20.19	20.02	21.0
		1	37	20.81	20.54	20.13	21.0
		1	74	20.43	20.19	19.91	20.5
		36	0	18.88	18.57	18.64	19.0
		36	29	18.88	18.85	18.67	19.0
		36	30	18.88	18.83	18.65	19.0
		75	0	18.91	18.74	18.45	19.0

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				18700	18900	19100	Tune-up Tolerance
				1860	1880	1900	
20	QPSK	1	0	20.55	20.68	20.60	21.0
		1	49	20.74	20.84	20.64	21.0
		1	99	20.43	20.75	20.38	21.0
		50	0	19.91	19.68	19.66	20.0
		50	24	19.74	19.71	19.67	20.0
		50	50	19.61	19.71	19.62	20.0
		100	0	19.63	19.64	19.64	20.0
	16QAM	1	0	19.87	19.53	20.36	20.5
		1	49	20.37	19.99	20.53	21.0
		1	99	19.28	19.42	20.32	20.5
		50	0	18.91	18.60	18.63	19.0
		50	24	18.90	18.70	18.65	19.0
		50	50	18.65	18.68	18.53	19.0
		100	0	18.85	18.65	18.57	19.0

Reduced power

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				18607	18900	19193	Tune-up Tolerance
				1850.7	1880	1909.3	
1.4	QPSK	1	0	20.83	20.59	20.48	21.0
		1	3	20.97	20.68	20.51	21.0
		1	5	20.92	20.65	20.40	21.0
		3	0	20.85	20.73	20.23	21.0
		3	1	20.87	20.73	20.26	21.0
		3	3	20.82	20.68	20.19	21.0
		6	0	19.93	19.58	19.40	20.0
	16QAM	1	0	19.80	19.97	19.53	20.0
		1	3	19.85	20.00	19.56	20.0
		1	5	19.95	19.97	19.49	20.0
		3	0	19.96	19.46	18.97	20.0
		3	1	19.84	19.39	19.02	20.0
		3	3	19.82	19.31	18.96	20.0
		6	0	19.11	18.62	18.23	19.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				18615	18900	19185	Tune-up Tolerance
				1851.5	1880	1908.5	
3	QPSK	1	0	20.61	20.32	20.06	21.0
		1	8	20.75	20.33	20.02	21.0
		1	14	20.70	20.38	20.19	21.0
		8	0	19.50	19.25	19.18	19.5
		8	4	19.54	19.31	19.19	20.0
		8	7	19.63	19.31	19.11	20.0
		15	0	19.50	19.27	19.16	19.5
	16QAM	1	0	20.18	19.71	19.45	20.5
		1	8	20.14	19.69	19.27	20.5
		1	14	20.26	19.63	18.99	20.5
		8	0	18.70	18.27	17.97	19.0
		8	4	18.82	18.21	17.97	19.0
		8	7	18.83	18.22	17.92	19.0
		15	0	18.53	18.37	18.06	19.0

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				18625	18900	19175	Tune-up Tolerance
				1852.5	1880	1907.5	
5	QPSK	1	0	20.26	19.76	19.84	20.5
		1	12	20.35	19.91	20.25	20.5
		1	24	20.06	19.89	19.82	20.5
		12	0	19.23	19.03	18.87	19.5
		12	7	19.22	19.11	18.89	19.5
		12	13	19.28	19.09	18.77	19.5
		25	0	19.27	19.06	18.82	19.5
	16QAM	1	0	19.00	18.94	18.76	19.0
		1	12	19.21	19.16	18.98	19.5
		1	24	19.03	19.06	18.41	19.5
		12	0	18.04	17.81	17.50	18.5
		12	7	18.23	17.89	17.54	18.5
		12	13	18.30	17.87	17.42	18.5
		25	0	18.27	17.84	17.71	18.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				18650	18900	19150	Tune-up Tolerance
				1855	1880	1905	
10	QPSK	1	0	20.46	19.86	20.07	20.5
		1	25	20.47	20.01	19.94	20.5
		1	49	20.14	19.93	19.84	20.5
		25	0	19.04	18.82	18.66	19.5
		25	12	19.10	18.98	18.79	19.5
		25	25	19.07	18.91	18.65	19.5
		50	0	19.01	18.87	18.65	19.5
	16QAM	1	0	19.80	19.53	18.94	20.0
		1	25	19.93	19.51	19.02	20.0
		1	49	19.79	19.28	19.03	20.0
		25	0	18.12	17.86	17.77	18.5
		25	12	18.03	18.11	17.92	18.5
		25	25	17.99	18.15	17.88	18.5
		50	0	18.02	17.97	17.68	18.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				18675	18900	19125	Tune-up Tolerance
				1857.5	1880	1902.5	
15	QPSK	1	0	20.17	19.75	19.72	20.5
		1	37	20.31	20.37	19.97	20.5
		1	74	19.99	19.87	19.50	20.0
		36	0	18.86	18.62	18.53	19.0
		36	29	18.82	18.75	18.63	19.0
		36	30	18.81	18.73	18.62	19.0
		75	0	18.90	18.68	18.59	19.0
	16QAM	1	0	19.55	19.19	19.02	20.0
		1	37	19.81	19.54	19.13	20.0
		1	74	19.43	19.19	18.91	19.5
		36	0	17.88	17.57	17.64	18.0
		36	29	17.88	17.85	17.67	18.0
		36	30	17.88	17.83	17.65	18.0
		75	0	17.91	17.74	17.45	18.0

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				18700	18900	19100	Tune-up Tolerance
				1860	1880	1900	
20	QPSK	1	0	19.55	19.68	19.60	20.0
		1	49	19.74	19.84	19.64	20.0
		1	99	19.43	19.75	19.38	20.0
		50	0	18.91	18.68	18.66	19.0
		50	24	18.74	18.71	18.67	19.0
		50	50	18.61	18.71	18.62	19.0
		100	0	18.63	18.64	18.64	19.0
	16QAM	1	0	18.87	18.53	19.36	19.5
		1	49	19.37	18.99	19.53	20.0
		1	99	18.28	18.42	19.32	19.5
		50	0	17.91	17.60	17.63	18.0
		50	24	17.90	17.70	17.65	18.0
		50	50	17.65	17.68	17.53	18.0
		100	0	17.85	17.65	17.57	18.0

LTE Band4

Full power

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				19957	20175	20393	Tune-up
				1710.7	1732.5	1754.3	Tolerance
1.4	QPSK	1	0	21.36	21.19	21.29	21.5
		1	3	21.37	21.38	21.45	21.5
		1	5	21.22	21.31	21.40	21.5
		3	0	21.38	21.32	21.36	21.5
		3	1	21.43	21.35	21.31	21.5
		3	3	21.39	21.29	21.28	21.5
		6	0	20.42	20.31	20.31	20.5
	16QAM	1	0	20.53	20.69	20.42	21.0
		1	3	20.55	20.77	20.39	21.0
		1	5	20.44	20.72	20.37	21.0
		3	0	20.54	20.00	19.91	21.0
		3	1	20.52	20.04	19.97	21.0
		3	3	20.44	19.97	20.03	20.5
		6	0	19.41	19.12	19.22	19.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				19965	20175	20385	Tune-up
				1711.5	1732.5	1753.5	Tolerance
3	QPSK	1	0	21.79	21.86	21.56	22.0
		1	8	21.71	21.84	21.67	22.0
		1	14	21.57	21.73	21.47	22.0
		8	0	20.67	20.60	20.52	21.0
		8	4	20.64	20.62	20.58	21.0
		8	7	20.63	20.58	20.53	21.0
		15	0	20.68	20.58	20.52	21.0
	16QAM	1	0	20.88	21.20	20.66	21.5
		1	8	20.90	21.18	20.76	21.5
		1	14	20.69	21.19	20.84	21.5
		8	0	19.42	19.65	19.55	20.0
		8	4	19.31	19.68	19.60	20.0
		8	7	19.61	19.66	19.56	20.0
		15	0	19.68	19.63	19.44	20.0

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				19975	20175	20375	Tune-up
				1712.5	1732.5	1752.5	Tolerance
5	QPSK	1	0	21.48	21.62	21.68	22.0
		1	12	21.47	21.71	21.70	22.0
		1	24	21.39	21.53	21.94	22.0
		12	0	20.64	20.61	20.60	21.0
		12	7	20.69	20.64	20.64	21.0
		12	13	20.58	20.56	20.68	21.0
		25	0	20.59	20.55	20.69	21.0
	16QAM	1	0	20.44	20.55	20.81	21.0
		1	12	20.56	21.06	20.66	21.5
		1	24	20.40	20.47	20.60	21.0
		12	0	19.69	19.36	19.29	20.0
		12	7	19.54	19.22	19.33	20.0
		12	13	19.43	19.55	19.66	20.0
		25	0	19.45	19.67	19.74	20.0

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				20000	20175	20350	Tune-up
				1715	1732.5	1750	Tolerance
10	QPSK	1	0	22.11	21.57	21.61	22.5
		1	25	22.14	21.57	21.81	22.5
		1	49	21.80	21.43	21.62	22.0
		25	0	20.67	20.55	20.51	21.0
		25	12	20.70	20.54	20.50	21.0
		25	25	20.68	20.48	20.39	21.0
		50	0	20.66	20.45	20.48	21.0
	16QAM	1	0	21.55	21.37	20.91	22.0
		1	25	21.43	20.87	20.82	21.5
		1	49	21.40	21.09	20.73	21.5
		25	0	19.66	19.48	19.55	20.0
		25	12	19.80	19.49	19.55	20.0
		25	25	19.70	19.30	19.44	20.0
		50	0	19.68	19.34	19.44	20.0

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				20025	20175	20325	Tune-up
				1717.5	1732.5	1747.5	Tolerance
15	QPSK	1	0	21.90	21.51	21.33	22.0
		1	37	22.31	21.82	21.69	22.5
		1	74	22.10	21.18	21.29	22.5
		36	0	20.55	20.35	20.52	21.0
		36	29	20.64	20.41	20.56	21.0
		36	30	20.62	20.39	20.54	21.0
		75	0	20.53	20.38	20.45	21.0
	16QAM	1	0	21.46	21.28	20.92	21.5
		1	37	21.57	21.22	21.23	22.0
		1	74	21.45	21.27	20.80	21.5
		36	0	19.61	19.48	19.57	20.0
		36	29	19.78	19.43	19.61	20.0
		36	30	19.76	19.42	19.59	20.0
		75	0	19.39	19.28	19.34	19.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				20050	20175	20300	Tune-up
				1720	1732.5	1745	Tolerance
20	QPSK	1	0	21.20	21.82	21.63	22.0
		1	49	21.55	21.62	21.40	22.0
		1	99	21.09	21.30	21.08	21.5
		50	0	20.50	20.45	20.42	20.5
		50	24	20.57	20.40	20.42	21.0
		50	50	20.57	20.33	20.40	21.0
		100	0	20.53	20.29	20.41	21.0
	16QAM	1	0	20.56	20.45	21.29	21.5
		1	49	21.11	20.71	21.37	21.5
		1	99	20.01	20.17	20.63	21.0
		50	0	19.36	19.29	19.53	20.0
		50	24	19.54	19.19	19.25	20.0
		50	50	19.45	19.17	19.21	19.5
		100	0	19.40	19.15	19.27	19.5

Reduced power

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				19957	20175	20393	Tune-up
				1710.7	1732.5	1754.3	Tolerance
1.4	QPSK	1	0	19.86	19.69	19.79	20.0
		1	3	19.87	19.88	19.95	20.0
		1	5	19.72	19.81	19.90	20.0
		3	0	19.88	19.82	19.86	20.0
		3	1	19.93	19.85	19.81	20.0
		3	3	19.89	19.79	19.78	20.0
		6	0	18.92	18.81	18.81	19.0
	16QAM	1	0	19.03	19.19	18.92	19.5
		1	3	19.05	19.27	18.89	19.5
		1	5	18.94	19.22	18.87	19.5
		3	0	19.04	18.50	18.41	19.5
		3	1	19.02	18.54	18.47	19.5
		3	3	18.94	18.47	18.53	19.0
		6	0	17.91	17.62	17.72	18.0

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				19965	20175	20385	Tune-up
				1711.5	1732.5	1753.5	Tolerance
3	QPSK	1	0	20.29	20.36	20.06	20.5
		1	8	20.21	20.34	20.17	20.5
		1	14	20.07	20.23	19.97	20.5
		8	0	19.17	19.10	19.02	19.5
		8	4	19.14	19.12	19.08	19.5
		8	7	19.13	19.08	19.03	19.5
		15	0	19.18	19.08	19.02	19.5
	16QAM	1	0	19.38	19.70	19.16	20.0
		1	8	19.40	19.68	19.26	20.0
		1	14	19.19	19.69	19.34	20.0
		8	0	17.92	18.15	18.05	18.5
		8	4	17.81	18.18	18.10	18.5
		8	7	18.11	18.16	18.06	18.5
		15	0	18.18	18.13	17.94	18.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				19975	20175	20375	Tune-up
				1712.5	1732.5	1752.5	Tolerance
5	QPSK	1	0	19.98	20.12	20.18	20.5
		1	12	19.97	20.21	20.20	20.5
		1	24	19.89	20.03	20.44	20.5
		12	0	19.14	19.11	19.10	19.5
		12	7	19.19	19.14	19.14	19.5
		12	13	19.08	19.06	19.18	19.5
		25	0	19.09	19.05	19.19	19.5
	16QAM	1	0	18.94	19.05	19.31	19.5
		1	12	19.06	19.56	19.16	20.0
		1	24	18.90	18.97	19.10	19.5
		12	0	18.19	17.86	17.79	18.5
		12	7	18.04	17.72	17.83	18.5
		12	13	17.93	18.05	18.16	18.5
		25	0	17.95	18.17	18.24	18.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				20000	20175	20350	Tune-up
				1715	1732.5	1750	Tolerance
10	QPSK	1	0	20.61	20.07	20.11	21.0
		1	25	20.64	20.07	20.31	21.0
		1	49	20.30	19.93	20.12	20.5
		25	0	19.17	19.05	19.01	19.5
		25	12	19.20	19.04	19.00	19.5
		25	25	19.18	18.98	18.89	19.5
		50	0	19.16	18.95	18.98	19.5
	16QAM	1	0	20.05	19.87	19.41	20.5
		1	25	19.93	19.37	19.32	20.0
		1	49	19.90	19.59	19.23	20.0
		25	0	18.16	17.98	18.05	18.5
		25	12	18.30	17.99	18.05	18.5
		25	25	18.20	17.80	17.94	18.5
		50	0	18.18	17.84	17.94	18.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				20025	20175	20325	Tune-up
				1717.5	1732.5	1747.5	Tolerance
15	QPSK	1	0	20.40	20.01	19.83	20.5
		1	37	20.81	20.32	20.19	21.0
		1	74	20.60	19.68	19.79	21.0
		36	0	19.05	18.85	19.02	19.5
		36	29	19.14	18.91	19.06	19.5
		36	30	19.12	18.89	19.04	19.5
		75	0	19.03	18.88	18.95	19.5
	16QAM	1	0	19.96	19.78	19.42	20.0
		1	37	20.07	19.72	19.73	20.5
		1	74	19.95	19.77	19.30	20.0
		36	0	18.11	17.98	18.07	18.5
		36	29	18.28	17.93	18.11	18.5
		36	30	18.26	17.92	18.09	18.5
		75	0	17.89	17.78	17.84	18.0

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				20050	20175	20300	Tune-up
				1720	1732.5	1745	Tolerance
20	QPSK	1	0	19.70	20.32	20.13	20.5
		1	49	20.05	20.12	19.90	20.5
		1	99	19.59	19.80	19.58	20.0
		50	0	19.00	18.95	18.92	19.0
		50	24	19.07	18.90	18.92	19.5
		50	50	19.07	18.83	18.90	19.5
		100	0	19.03	18.79	18.91	19.5
	16QAM	1	0	19.06	18.95	19.79	20.0
		1	49	19.61	19.21	19.87	20.0
		1	99	18.51	18.67	19.13	19.5
		50	0	17.86	17.79	18.03	18.5
		50	24	18.04	17.69	17.75	18.5
		50	50	17.95	17.67	17.71	18.0
		100	0	17.90	17.65	17.77	18.0

LTE Band5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				20407	20525	20643	Tune-up
				824.7	836.5	848.3	Tolerance
1.4	QPSK	1	0	22.81	22.77	22.88	23.0
		1	3	22.90	22.90	23.11	23.5
		1	5	22.81	22.67	22.96	23.0
		3	0	22.82	22.84	23.06	23.5
		3	1	22.85	22.96	23.07	23.5
		3	3	22.78	22.91	23.05	23.5
		6	0	21.91	21.92	22.06	22.5
	16QAM	1	0	21.98	22.24	21.97	22.5
		1	3	22.00	22.32	21.97	22.5
		1	5	21.65	22.28	21.98	22.5
		3	0	21.97	21.61	21.76	22.0
		3	1	21.79	21.65	21.99	22.0
		3	3	21.93	21.59	21.95	22.0
		6	0	21.20	20.99	21.03	21.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				20415	20525	20635	Tune-up
				825.5	836.5	847.5	Tolerance
3	QPSK	1	0	22.94	23.06	22.96	23.5
		1	8	22.94	22.98	23.17	23.5
		1	14	22.88	22.85	23.16	23.5
		8	0	22.06	21.95	22.00	22.5
		8	4	21.94	21.99	22.09	22.5
		8	7	21.85	21.96	22.00	22.0
		15	0	21.92	21.95	21.98	22.0
	16QAM	1	0	22.52	22.71	22.20	23.0
		1	8	22.43	22.47	22.11	22.5
		1	14	22.46	22.33	22.16	22.5
		8	0	21.10	21.31	20.72	21.5
		8	4	21.07	21.18	20.68	21.5
		8	7	21.00	21.32	20.62	21.5
		15	0	20.95	21.11	20.83	21.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				20425	20525	20625	Tune-up
				826.5	836.5	846.5	Tolerance
5	QPSK	1	0	22.58	22.78	22.83	23.0
		1	12	22.69	22.78	23.03	23.5
		1	24	22.53	22.66	22.95	23.0
		12	0	21.90	22.00	22.08	22.5
		12	7	21.93	22.06	22.12	22.5
		12	13	21.90	21.99	22.05	22.5
		25	0	21.96	22.00	21.99	22.0
	16QAM	1	0	21.66	21.93	21.90	22.0
		1	12	21.84	22.02	22.19	22.5
		1	24	21.61	21.90	21.80	22.0
		12	0	20.78	20.78	20.66	21.0
		12	7	20.73	20.85	20.72	21.0
		12	13	20.79	20.79	20.76	21.0
		25	0	20.83	20.89	20.79	21.0

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				20450	20525	20600	Tune-up
				829	836.5	844	Tolerance
10	QPSK	1	0	23.21	22.83	22.86	23.5
		1	25	23.27	23.01	23.40	23.5
		1	49	23.16	22.85	23.03	23.5
		25	0	21.97	22.01	22.06	22.5
		25	12	21.99	21.96	21.93	22.0
		25	25	21.95	21.98	21.96	22.0
		50	0	22.06	21.96	22.05	22.5
	16QAM	1	0	22.64	22.42	22.19	23.0
		1	25	22.75	22.53	22.38	23.0
		1	49	21.88	22.42	22.16	22.5
		25	0	20.97	21.11	21.16	21.5
		25	12	21.08	21.17	21.03	21.5
		25	25	20.97	21.07	21.06	21.5
		50	0	20.89	20.88	20.98	21.0

LTE Band7

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				20775	21100	21425	Tune-up
				2502.5	2535	2567.5	Tolerance
5	QPSK	1	0	21.78	21.75	21.59	22.0
		1	12	21.89	21.92	21.89	22.0
		1	24	21.66	21.42	21.62	22.0
		12	0	21.03	20.91	20.82	21.5
		12	7	20.99	20.93	20.84	21.0
		12	13	20.87	20.84	20.75	21.0
		25	0	20.88	20.94	20.75	21.0
	16QAM	1	0	20.95	20.93	20.57	21.0
		1	12	20.98	21.29	20.92	21.5
		1	24	20.77	20.61	20.51	21.0
		12	0	20.06	19.28	19.43	20.5
		12	7	20.05	19.32	19.52	20.5
		12	13	19.95	19.27	19.43	20.0
		25	0	19.95	19.72	19.56	20.0

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				20800	21100	21400	Tune-up
				2505	2535	2565	Tolerance
10	QPSK	1	0	22.20	21.88	21.85	22.5
		1	25	21.94	21.91	21.68	22.0
		1	49	22.14	21.53	21.90	22.5
		25	0	20.77	20.63	20.45	21.0
		25	12	20.87	20.67	20.50	21.0
		25	25	20.77	20.52	20.41	21.0
		50	0	20.82	20.58	20.47	21.0
	16QAM	1	0	21.54	21.19	20.93	22.0
		1	25	21.75	21.28	20.84	22.0
		1	49	21.62	21.20	20.36	22.0
		25	0	19.54	19.73	19.66	20.0
		25	12	19.77	19.78	19.60	20.0
		25	25	19.67	19.53	19.42	20.0
		50	0	19.81	19.66	19.39	20.0

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				20825	21100	21375	Tune-up
				2507.5	2535	2562.5	Tolerance
15	QPSK	1	0	21.97	20.84	21.29	22.0
		1	37	21.94	21.84	21.77	22.0
		1	74	21.27	21.46	20.78	21.5
		36	0	20.57	20.45	20.37	21.0
		36	29	20.72	20.43	20.31	21.0
		36	30	20.72	20.39	20.30	21.0
		75	0	20.65	20.29	20.34	21.0
	16QAM	1	0	21.49	21.22	20.91	21.5
		1	37	21.44	21.41	21.18	21.5
		1	74	22.17	21.06	20.60	22.5
		36	0	19.31	19.46	19.46	19.5
		36	29	19.74	19.43	19.33	20.0
		36	30	19.75	19.49	19.32	20.0
		75	0	19.58	19.34	19.32	20.0

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				20850	21100	21350	Tune-up
				2510	2535	2560	Tolerance
20	QPSK	1	0	21.43	21.56	21.20	22.0
		1	49	21.55	21.72	21.47	22.0
		1	99	21.17	21.40	21.42	21.5
		50	0	20.51	20.23	20.30	21.0
		50	24	20.68	20.35	20.32	21.0
		50	50	20.64	20.20	20.20	21.0
		100	0	20.61	20.35	20.21	21.0
	16QAM	1	0	20.67	19.84	20.98	21.0
		1	49	21.10	20.73	21.02	21.5
		1	99	20.26	20.23	20.87	21.0
		50	0	19.40	19.40	19.36	19.5
		50	24	19.59	19.34	19.19	20.0
		50	50	19.54	19.20	18.99	20.0
		100	0	19.40	19.27	19.13	19.5

LTE Band12

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				23017	23095	23173	Tune-up
				699.7	707.5	715.3	Tolerance
1.4	QPSK	1	0	22.82	23.06	22.74	23.5
		1	3	22.89	23.15	22.87	23.5
		1	5	22.78	23.01	23.01	23.5
		3	0	22.94	23.03	23.07	23.5
		3	1	23.03	23.07	23.06	23.5
		3	3	22.85	23.04	23.05	23.5
		6	0	21.98	22.08	22.10	22.5
	16QAM	1	0	21.94	22.45	22.40	22.5
		1	3	21.92	22.59	22.44	23.0
		1	5	21.82	22.66	22.41	23.0
		3	0	22.04	21.94	21.96	22.5
		3	1	22.23	21.88	22.21	22.5
		3	3	22.25	21.76	22.11	22.5
		6	0	21.24	21.21	21.27	21.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				23025	23095	23165	Tune-up
				700.5	707.5	714.5	Tolerance
3	QPSK	1	0	23.21	23.05	22.94	23.5
		1	8	23.10	23.13	22.74	23.5
		1	14	22.93	22.95	22.86	23.0
		8	0	22.22	21.99	21.86	22.5
		8	4	22.17	21.99	21.78	22.5
		8	7	22.15	22.00	21.74	22.5
		15	0	22.24	21.93	21.84	22.5
	16QAM	1	0	22.81	22.60	22.04	23.0
		1	8	22.81	22.52	21.81	23.0
		1	14	22.74	22.38	21.80	23.0
		8	0	21.28	20.91	20.68	21.5
		8	4	21.49	20.82	20.68	21.5
		8	7	21.46	20.83	20.68	21.5
		15	0	21.25	20.76	20.89	21.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				23035	23095	23155	Tune-up
				701.5	707.5	713.5	Tolerance
5	QPSK	1	0	22.57	22.37	22.63	23.0
		1	12	22.71	22.59	22.61	23.0
		1	24	22.75	22.44	22.26	23.0
		12	0	21.69	21.48	21.49	22.0
		12	7	21.63	21.63	21.38	22.0
		12	13	21.51	21.59	21.45	22.0
		25	0	21.53	21.57	21.51	22.0
	16QAM	1	0	21.75	21.56	21.31	22.0
		1	12	21.61	21.81	21.66	22.0
		1	24	21.45	21.51	21.51	22.0
		12	0	20.52	20.36	20.31	21.0
		12	7	20.56	20.42	20.38	21.0
		12	13	20.53	20.40	20.35	21.0
		25	0	20.61	20.47	20.53	21.0

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				23060	23095	23130	Tune-up
				704	707.5	711	Tolerance
10	QPSK	1	0	22.48	22.34	22.43	22.5
		1	25	22.90	22.60	22.60	23.0
		1	49	22.87	22.18	22.36	23.0
		25	0	21.31	21.32	21.31	21.5
		25	12	21.35	21.35	21.19	21.5
		25	25	21.33	21.30	21.39	21.5
		50	0	21.40	21.30	21.30	21.5
	16QAM	1	0	22.40	21.81	21.47	22.5
		1	25	22.22	21.94	21.54	22.5
		1	49	22.00	21.65	21.08	22.0
		25	0	20.23	20.39	20.46	20.5
		25	12	20.48	20.59	20.43	21.0
		25	25	20.50	20.46	20.19	20.5
		50	0	20.37	20.26	20.28	20.5

LTE Band17

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				23755	23790	23825	Tune-up
				706.5	710	713.5	Tolerance
5	QPSK	1	0	22.51	22.66	22.77	23.0
		1	12	23.08	22.87	22.83	23.5
		1	24	22.67	22.51	22.92	23.0
		12	0	21.93	21.97	22.08	22.5
		12	7	22.03	22.06	22.05	22.5
		12	13	22.03	21.98	21.90	22.5
		25	0	21.91	22.03	22.06	22.5
	16QAM	1	0	21.71	22.07	21.83	22.5
		1	12	21.91	22.37	22.15	22.5
		1	24	21.73	22.14	21.78	22.5
		12	0	20.69	20.90	21.09	21.5
		12	7	20.81	20.82	21.08	21.5
		12	13	20.90	20.92	20.86	21.0
		25	0	20.86	20.98	21.03	21.5

BW	Modulation	RB Size	RB Offset	Conducted power(dBm)			
				23780	23790	23800	Tune-up
				709	710	711	Tolerance
10	QPSK	1	0	23.16	22.96	22.88	23.5
		1	25	23.00	23.07	23.21	23.5
		1	49	23.03	22.74	22.83	23.5
		25	0	22.09	22.06	22.09	22.5
		25	12	22.12	22.12	22.09	22.5
		25	25	21.96	22.06	21.97	22.5
		50	0	22.03	22.06	22.06	22.5
	16QAM	1	0	22.83	22.76	22.19	23.0
		1	25	22.70	22.80	22.32	23.0
		1	49	22.83	22.47	21.80	23.0
		25	0	21.32	21.22	21.34	21.5
		25	12	21.18	21.20	21.37	21.5
		25	25	21.04	21.14	21.08	21.5
		50	0	21.11	21.06	21.01	21.5

6.2 Standalone SAR Test Exclusion Considerations

SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

Method1:

According to the KDB447498 4.3.1 (1)

For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f} \text{ (GHz)}] \leq 3.0$ for 1-g SAR, where

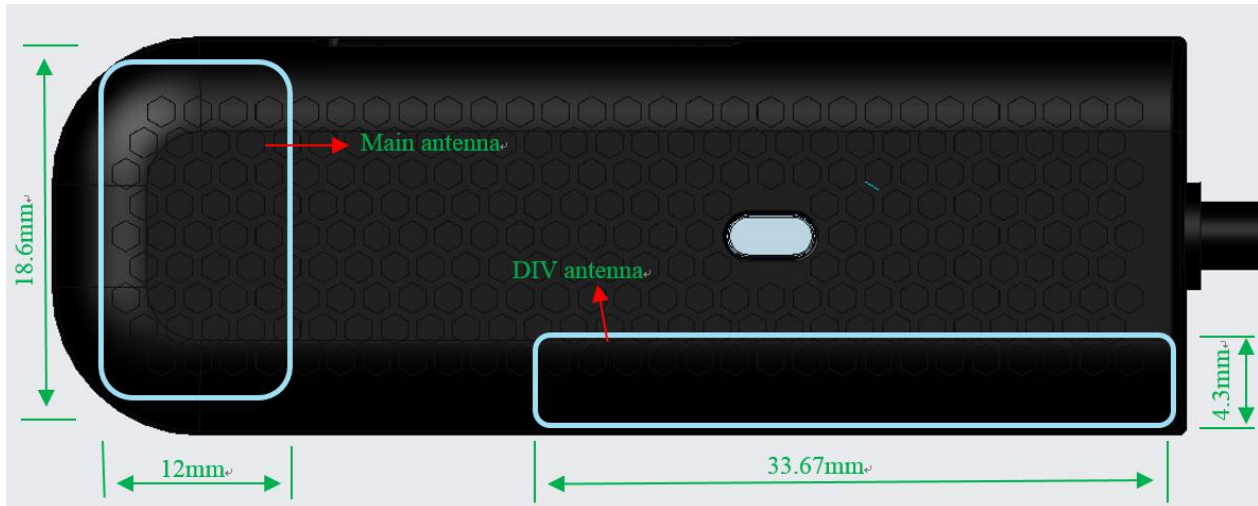
- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

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.

This is equivalent to $[(\text{max. power of channel, including tune-up tolerance, mW}) / (60 / \sqrt{f}(\text{GHz}) \text{ mW})] \cdot [20 \text{ mm} / (\text{min. test separation distance, mm})] \leq 1.0$ for 1-g SAR; also see Appendix A for approximate exclusion threshold values at selected frequencies and distances.

6.3 RF exposure conditions

Refer to the follow picture “Antenna information” for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.



SAR test Position: back, front, Top, Bottom, Left

Note: DIV antenna is receiver only, and “right” position is not test.

6.4 System Checking

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulants were measured every day using the dielectric probe kit and the network analyser. A power level of 250 mW was supplied to the dipole antenna, which was placed under the flat section of the twin SAM phantom. For the measurement of the following parameters the SPEAG DAKS-3.5 dielectric parameter probe is used, representing the open-ended coaxial probe measurement procedure.

Freq.(MHz)	Liquid parameters	measured	Target	Delta (%)	Tolerance (%)	Verdict
750	ϵ_r	40.77	41.9	-2.70	± 10	Pass
	σ [S/m]	0.87	0.89	-2.25	± 10	Pass
835	ϵ_r	42.7	41.50	2.89	± 10	Pass
	σ [S/m]	0.94	0.90	4.44	± 10	Pass
1800	ϵ_r	38.37	40.00	-4.08	± 10	Pass
	σ [S/m]	1.48	1.40	5.71	± 10	Pass
2000	ϵ_r	39.65	40.00	-0.88	± 10	Pass
	σ [S/m]	1.43	1.40	2.14	± 10	Pass
2600	ϵ_r	38	39.00	-2.56	± 10	Pass
	σ [S/m]	2.01	1.96	2.55	± 10	Pass

Note: For DASY system, the conservative tolerance 5% could expand to 10% when the frequency under 3GHz system check measurement was made following once the determination of the dielectric parameters of the simulant, using the dipole validation kit. The system checking results (dielectric parameters and SAR values) are given in the table below.

Freq. (MHz)	SAR measured (normalized to 1W)		Target (Ref. Value)	Delta (%)	Tolerance (%)
750	1g	8.28	8.40	-1.43	± 10
835	1g	9.04	9.38	-3.62	± 10
1800	1g	38.64	38.9	-0.67	± 10
2000	1g	40.92	41.0	-0.20	± 10
2600	1g	53.60	56.5	-5.13	± 10

6.5 SAR TEST RESULT

In order to determine the largest value of the peak spatial-average SAR of a handset, all device positions, configurations, and operational modes should be tested for each frequency band according to Steps 1 to 3 below.

Step 1: The tests should be performed at the channel that is closest to the center of the transmit frequency band.

- a) All device positions (cheek and tilt, for both left and right sides of the SAM phantom),
- b) All configurations for each device position in a), e.g., antenna extended and retracted, and
- c) All operational modes for each device position in item a) and configuration in item b) in each frequency band, e.g., analog and digital, If more than three frequencies need to be tested (i.e., $N_c > 3$), then all frequencies, configurations and modes shall be tested for all of the above test conditions.

Step 2: For the condition providing the highest peak spatial-average SAR determined in Step 1 for each frequency, perform all tests at all other test frequency channels, e.g., lowest and highest frequencies. In addition, for all other conditions (device position, configuration, and operational mode) where the peak spatial-average SAR value determined in Step 1 is within 3 dB of the applicable SAR limit, it is recommended that all other test frequencies should be tested as well.

Step 3: Examine all data to determine the largest value of the peak.

Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.

Scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.

Duty Factor = 1 / Duty Cycle(%)

For cellular network:

Reported SAR (W/kg) = Measured SAR (W/kg) * Scaling Factor

For WLAN

Reported SAR (W/kg) = Measured SAR (W/kg) * Scaling Factor * Duty factor

2. Per KDB 447498 D01v06, for each exposure position, if the highest output channel reported SAR ≤ 0.8 W/kg, other channels SAR testing are not necessary.

3. The distance between the EUT and the phantom bottom is 5mm and 19mm (trigger distance-1).

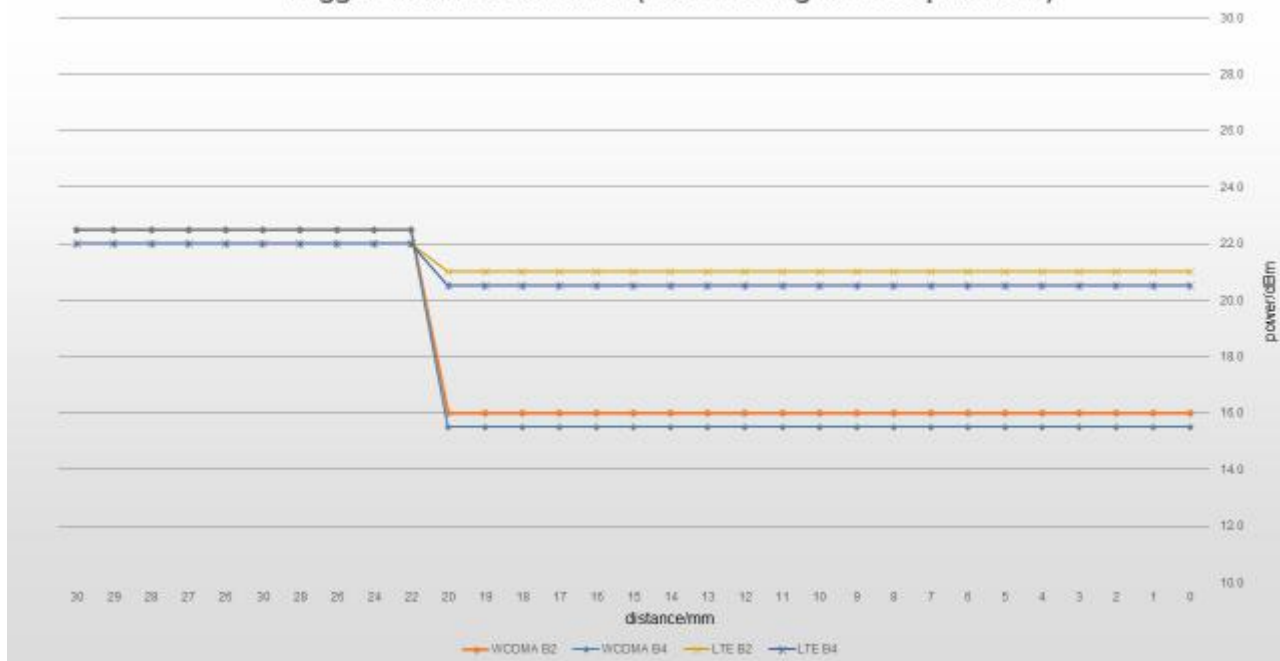
Refers to KDB 616217 D04 Section6 procedure for determining triggering distances/ sensor coverage/ tilt angle influences

1: Proximity sensor triggering distances

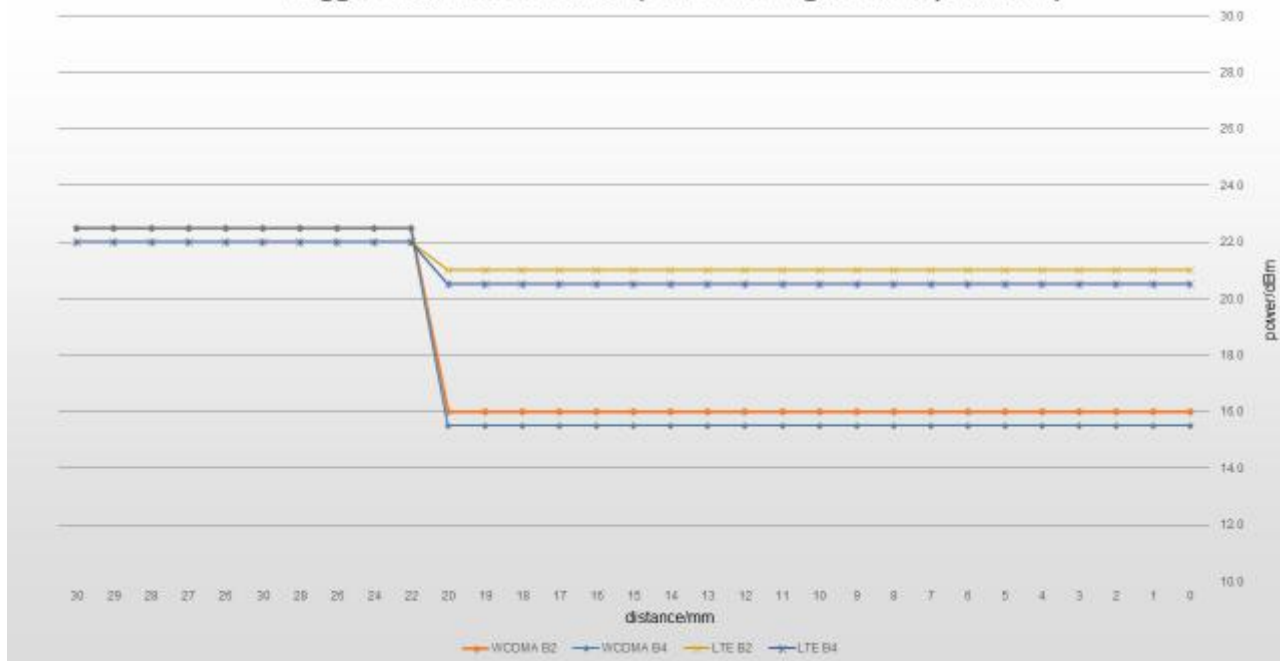


Band	Trigger distance-Front Side		Trigger distance-Back Side		Trigger distance-Top Side		Trigger distance-Bottom Side		Trigger distance-Right Side	
	Moving toward phantom	Moving away from phantom	Moving toward phantom	Moving away from phantom	Moving toward phantom	Moving away from phantom	Moving toward phantom	Moving away from phantom	Moving toward phantom	Moving away from phantom
W2	20	22	20	22	20	22	20	22	20	22
W4	20	22	20	22	20	22	20	22	20	22
L2	20	22	20	22	20	22	20	22	20	22
L4	20	22	20	22	20	22	20	22	20	22

Trigger distance evaluation (back moving towards phantom)



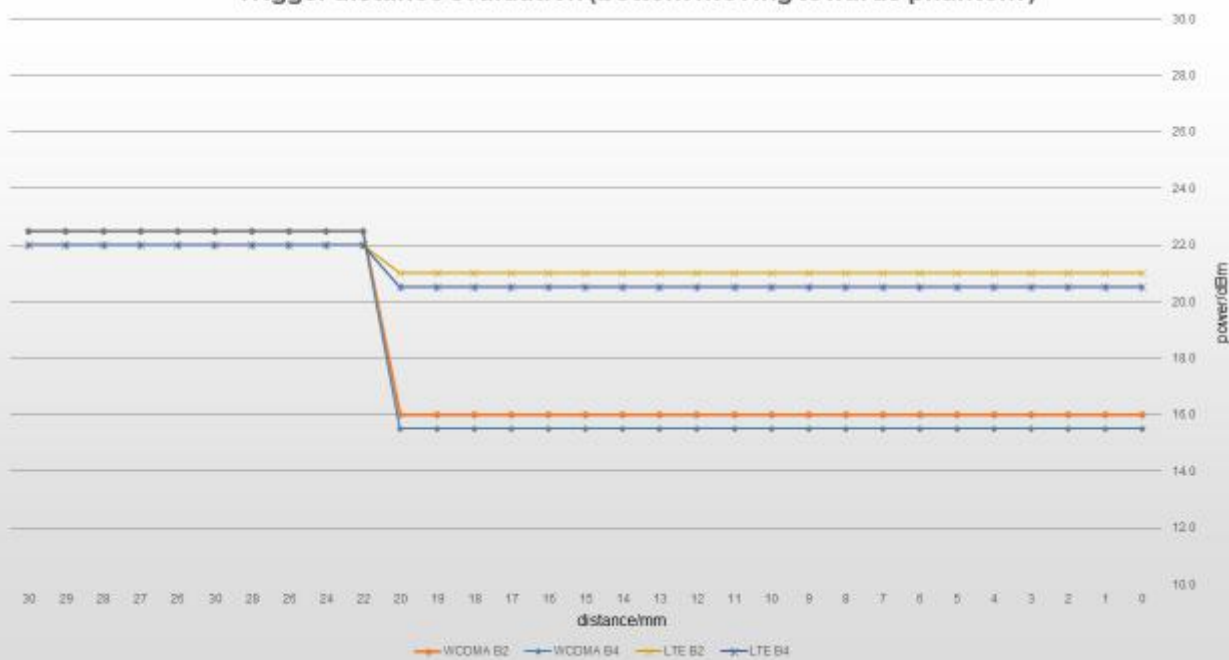
Trigger distance evaluation (Front moving towards phantom)



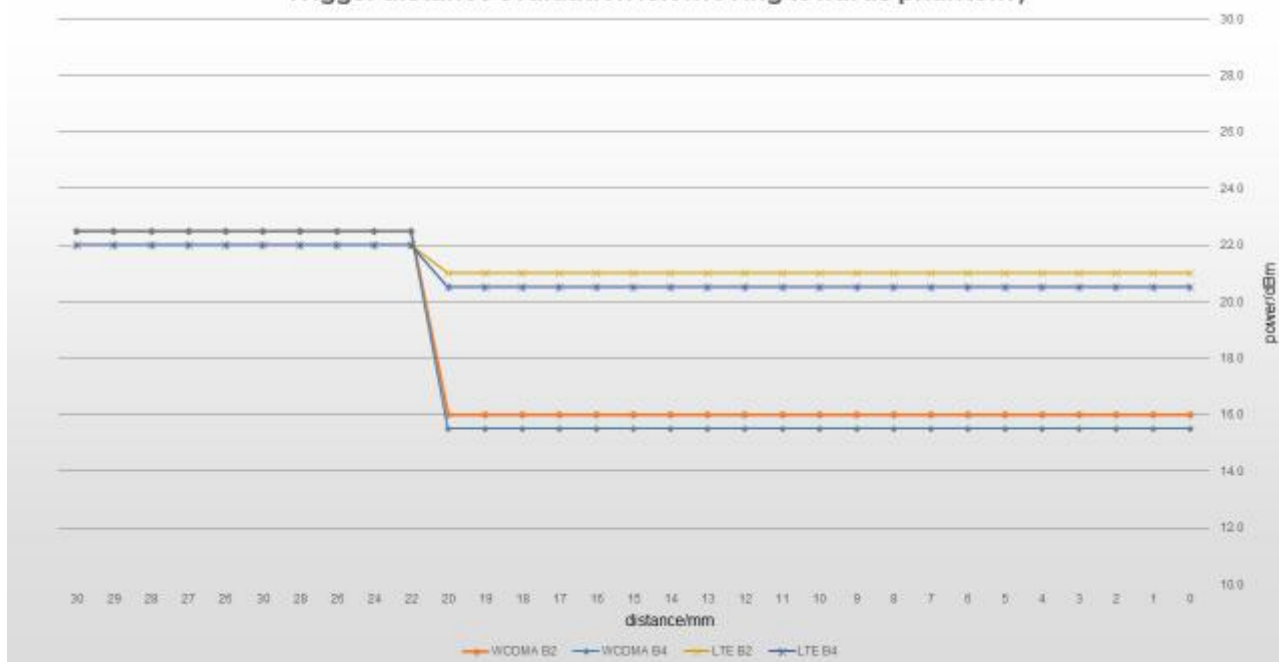
Trigger distance evaluation (top moving towards phantom)



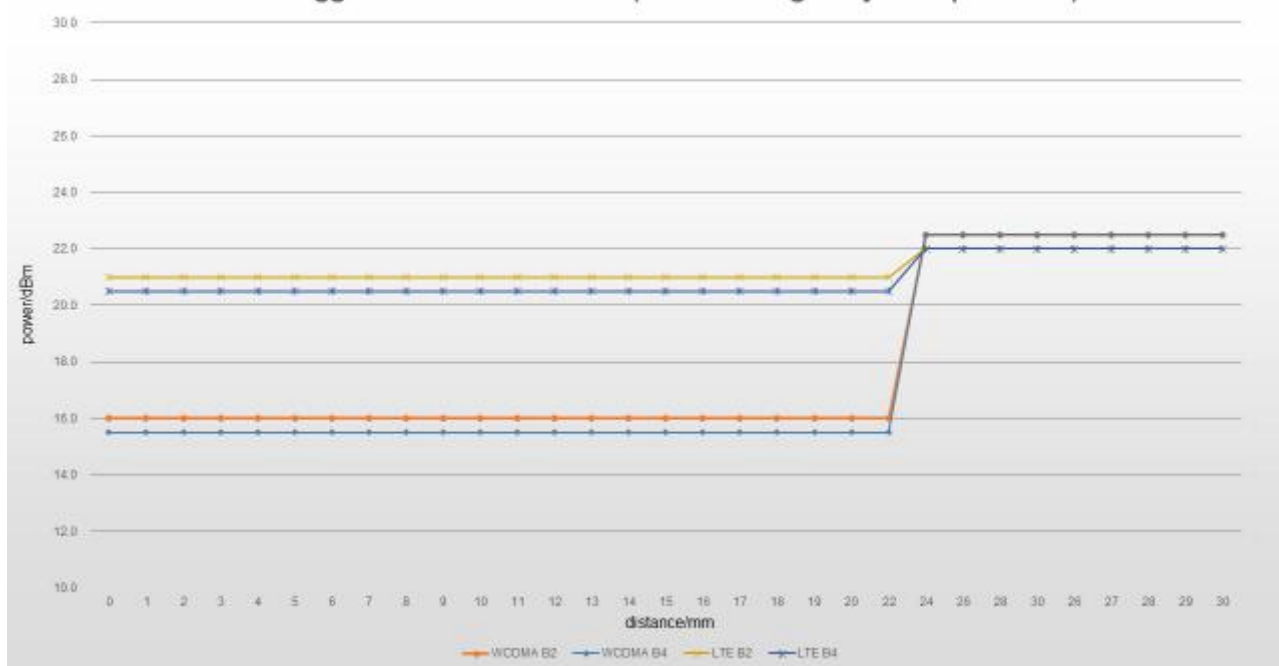
Trigger distance evaluation (bottom moving towards phantom)



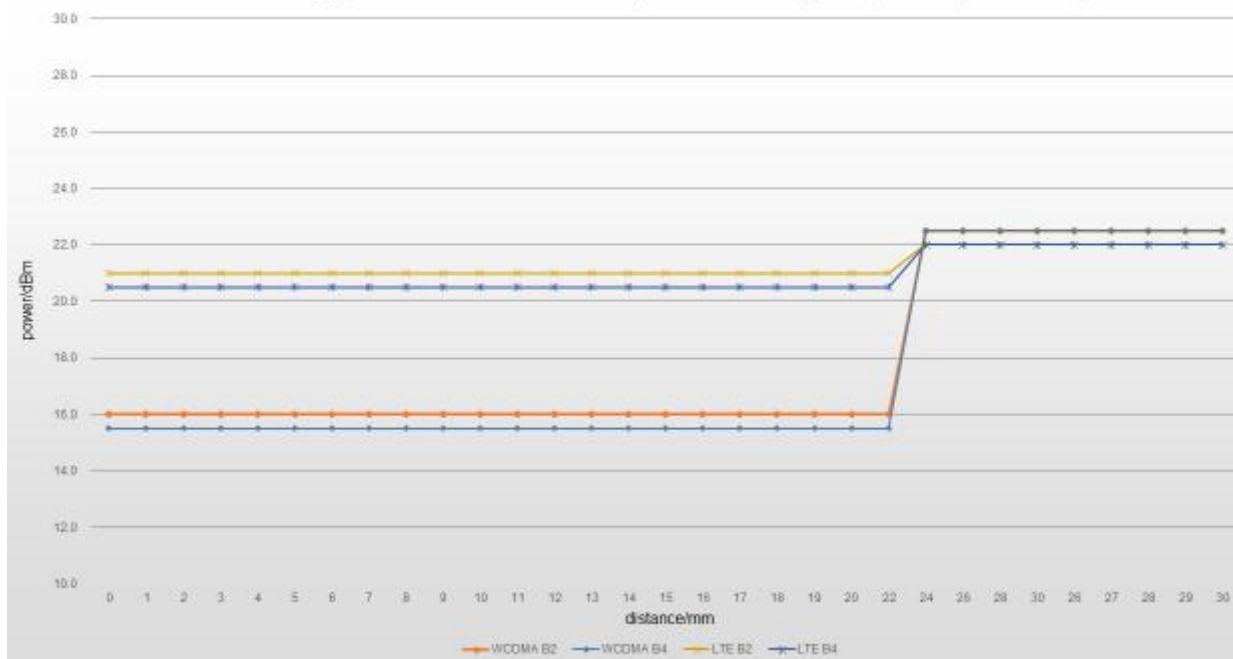
Trigger distance evaluation left moving towards phantom)



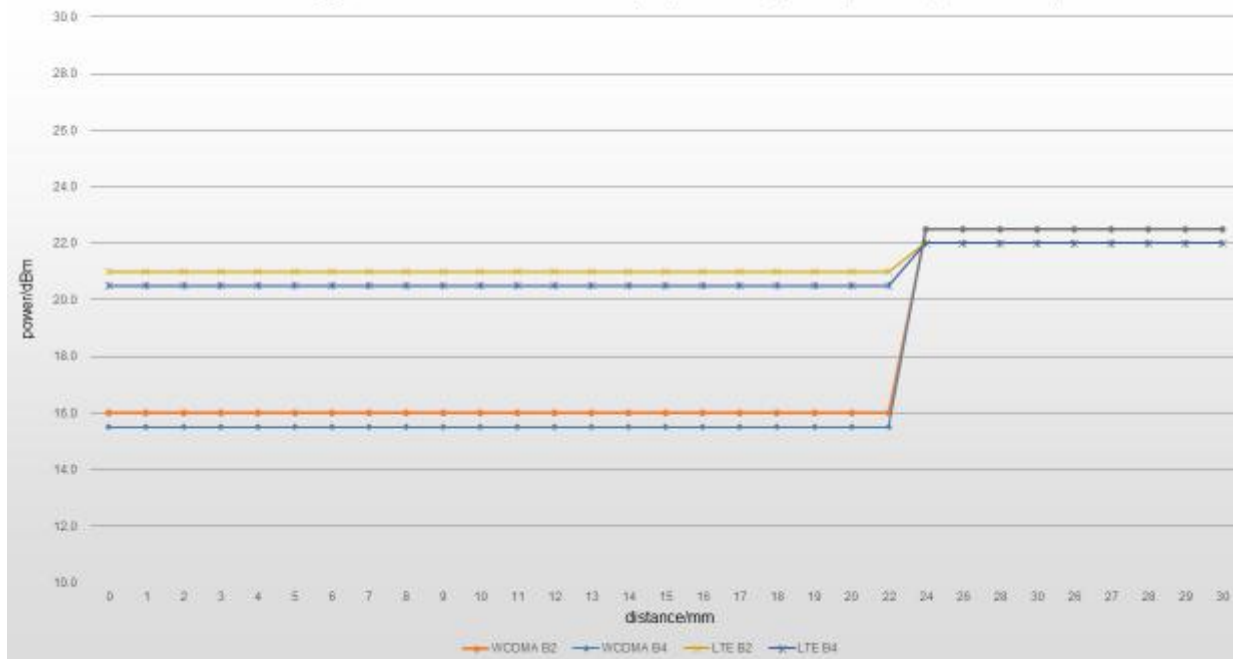
Trigger distance evaluation (back moving away from phantom)



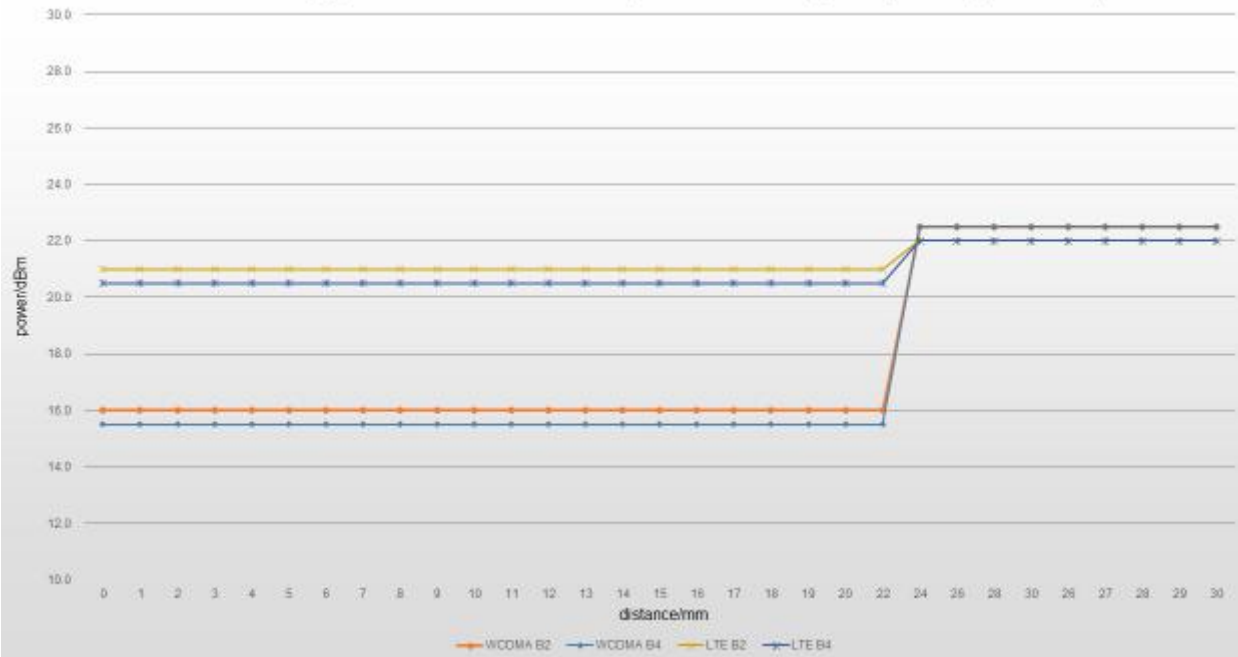
Trigger distance evaluation (Front moving away from phantom)



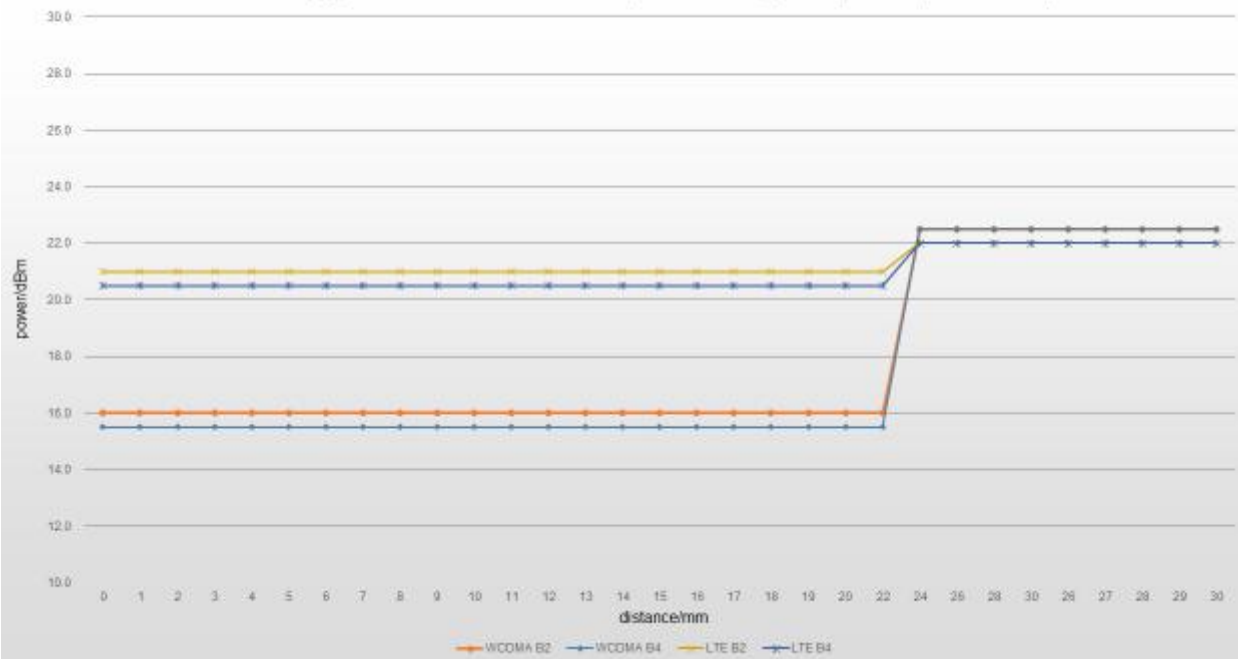
Trigger distance evaluation (top moving away from phantom)



Trigger distance evaluation (bottom moving away from phantom)



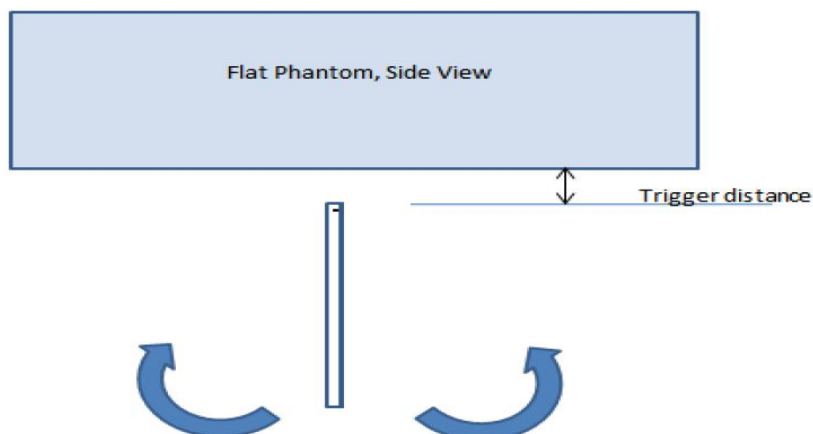
Trigger distance evaluation (left moving away from phantom)



2: Proximity sensor coverage

There is no spatial offset between sensor and antenna. Proximity sensor can fully overwrite antenna (physically), so the proximity sensor coverage not need to be assessed. An object that completely covers more than twice the area of the entire antenna area will trigger the operation of SAR sensor if it is close to the antenna.

3: Tilt angle influences to proximity sensor triggering



Position	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°	
top	W2	20	on	on	on	on	on	on	on	on	on	on	on	
	W4	20	on	on	on	on	on	on	on	on	on	on	on	
	L2	20	on	on	on	on	on	on	on	on	on	on	on	
	L4	20	on	on	on	on	on	on	on	on	on	on	on	
bottom	W2	20	on	on	on	on	on	on	on	on	on	on	on	
	W4	20	on	on	on	on	on	on	on	on	on	on	on	
	L2	20	on	on	on	on	on	on	on	on	on	on	on	
	L4	20	on	on	on	on	on	on	on	on	on	on	on	
left	W2	20	on	on	on	on	on	on	on	on	on	on	on	
	W4	20	on	on	on	on	on	on	on	on	on	on	on	
	L2	20	on	on	on	on	on	on	on	on	on	on	on	
	L4	20	on	on	on	on	on	on	on	on	on	on	on	

The measured and reported body SAR values for the test device are tabulated below:

Mode: WCDMA BAND II

fL (MHz)= 1852.4MHz

fM (MHz)= 1880.0MHz

fH (MHz)= 1907.6MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test case				Meas power(dBm)	Tune-up(dBm)	Scaling factor	Meas SAR(w/kg)		Report SAR(w/kg)	
Mode	Exposure condition	Position	Channel				First	Second	First	Second
RMC	Body 5mm	Back	L	15.56	16.00	1.11	0.85	0.81	0.94	0.90
			M	15.53	16.00	1.11	0.91	0.90	1.01	1.00
			H	15.56	16.00	1.11	0.90	0.89	1.00	0.99
		Front	L	15.56	16.00	1.11	---	---	---	---
			M	15.53	16.00	1.11	0.49	---	0.54	---
			H	15.56	16.00	1.11	---	---	---	---
		Top	L	15.56	16.00	1.11	---	---	---	---
			M	15.53	16.00	1.11	0.68	---	0.76	---
			H	15.56	16.00	1.11	---	---	---	---
		Bottom	L	15.56	16.00	1.11	---	---	---	---
			M	15.53	16.00	1.11	0.36	---	0.40	---
			H	15.56	16.00	1.11	---	---	---	---
		Left	L	15.56	16.00	1.11	---	---	---	---
			M	15.53	16.00	1.11	0.04	---	0.05	---
			H	15.56	16.00	1.11	---	---	---	---
		Right	L	15.56	16.00	1.11	---	---	---	---
			M	15.53	16.00	1.11	---	---	---	---
			H	15.56	16.00	1.11	---	---	---	---
RMC	Body 19mm	Back	L	22.06	22.50	1.11	---	---	---	---
			M	22.03	22.50	1.11	0.78	---	0.86	---
			H	22.06	22.50	1.11	---	---	---	---
		Front	L	22.06	22.50	1.11	---	---	---	---
			M	22.03	22.50	1.11	0.26	---	0.29	---
			H	22.06	22.50	1.11	---	---	---	---
		Top	L	22.06	22.50	1.11	---	---	---	---
			M	22.03	22.50	1.11	0.22	---	0.24	---
			H	22.06	22.50	1.11	---	---	---	---
		Bottom	L	22.06	22.50	1.11	---	---	---	---
			M	22.03	22.50	1.11	0.31	---	0.34	---
			H	22.06	22.50	1.11	---	---	---	---
		Left	L	22.06	22.50	1.11	---	---	---	---
			M	22.03	22.50	1.11	0.06	---	0.07	---
			H	22.06	22.50	1.11	---	---	---	---
		Right	L	22.06	22.50	1.11	---	---	---	---
			M	22.03	22.50	1.11	---	---	---	---
			H	22.06	22.50	1.11	---	---	---	---

Mode: WCDMA BAND IV

fL (MHz)=1712.4MHz fM (MHz)=1732.4MHz

fH (MHz)= 1752.6MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test case				Meas power(dBm)	Tune-up(dBm)	Scaling factor	Meas SAR(w/kg)		Report SAR(w/kg)	
Mode	Exposure condition	Position	Channel				First	Second	First	Second
RMC	Body 5mm	Back	L	15.43	15.50	1.02	0.94	0.94	0.96	0.96
			M	15.36	15.50	1.03	0.96	0.96	0.99	0.99
			H	15.40	15.50	1.02	0.93	0.93	0.95	0.95
		Front	L	15.43	15.50	1.02	---	---	---	---
			M	15.36	15.50	1.03	0.61	---	0.63	---
			H	15.40	15.50	1.02	---	---	---	---
		Top	L	15.43	15.50	1.02	---	---	---	---
			M	15.36	15.50	1.03	0.65	---	0.67	---
			H	15.40	15.50	1.02	---	---	---	---
		Bottom	L	15.43	15.50	1.02	---	---	---	---
			M	15.36	15.50	1.03	0.57	---	0.59	---
			H	15.40	15.50	1.02	---	---	---	---
		Left	L	15.43	15.50	1.02	---	---	---	---
			M	15.36	15.50	1.03	0.05	---	0.06	---
			H	15.40	15.50	1.02	---	---	---	---
		Right	L	15.43	15.50	1.02	---	---	---	---
			M	15.36	15.50	1.03	---	---	---	---
			H	15.40	15.50	1.02	---	---	---	---
RMC	Body 19mm	Back	L	22.43	22.50	1.02	0.90	0.90	0.92	0.92
			M	22.36	22.50	1.03	0.92	0.92	0.95	0.95
			H	22.40	22.50	1.02	0.89	0.89	0.91	0.91
		Front	L	22.43	22.50	1.02	---	---	---	---
			M	22.36	22.50	1.03	0.36	---	0.37	---
			H	22.40	22.50	1.02	---	---	---	---
		Top	L	22.43	22.50	1.02	---	---	---	---
			M	22.36	22.50	1.03	0.53	---	0.55	---
			H	22.40	22.50	1.02	---	---	---	---
		Bottom	L	22.43	22.50	1.02	---	---	---	---
			M	22.36	22.50	1.03	0.60	---	0.62	---
			H	22.40	22.50	1.02	---	---	---	---
		Left	L	22.43	22.50	1.02	---	---	---	---
			M	22.36	22.50	1.03	0.04	---	0.04	---
			H	22.40	22.50	1.02	---	---	---	---
		Right	L	22.43	22.50	1.02	---	---	---	---
			M	22.36	22.50	1.03	---	---	---	---
			H	22.40	22.50	1.02	---	---	---	---

Mode: WCDMA BAND V

fL (MHz)=826.4MHz fM (MHz)=836.6MHz fH (MHz)= 846.6MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test case				Meas power(dBm)	Tune-up(dBm)	Scaling factor	Meas SAR(w/kg)		Report SAR(w/kg)	
Mode	Exposure condition	Position	Channel				First	Second	First	Second
RMC	Body 5mm	Back	L	22.82	23.00	1.04	---	---	---	---
			M	22.74	23.00	1.06	0.55	---	0.58	---
			H	22.91	23.00	1.02	---	---	---	---
		Front	L	22.82	23.00	1.04	---	---	---	---
			M	22.74	23.00	1.06	0.68	---	0.72	---
			H	22.91	23.00	1.02	---	---	---	---
		Top	L	22.82	23.00	1.04	---	---	---	---
			M	22.74	23.00	1.06	0.40	---	0.43	---
			H	22.91	23.00	1.02	---	---	---	---
		Bottom	L	22.82	23.00	1.04	---	---	---	---
			M	22.74	23.00	1.06	0.75	---	0.80	---
			H	22.91	23.00	1.02	---	---	---	---
		Left	L	22.82	23.00	1.04	---	---	---	---
			M	22.74	23.00	1.06	0.34	---	0.36	---
			H	22.91	23.00	1.02	---	---	---	---
		Right	L	22.82	23.00	1.04	---	---	---	---
			M	22.74	23.00	1.06	---	---	---	---
			H	22.91	23.00	1.02	---	---	---	---

Mode: LTE Band 2

fL (MHz)= 1860MHz

fM (MHz)= 1880MHz

fH (MHz)= 1900MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test case				Meas power (dBm)	Tune-up(dBm)	Scaling factor	Meas SAR(w/kg)		Report SAR(w/kg)	
Mode	Exposure condition	Position	Channel				First	Second	First	Second
QPSK 1RB	Body 5mm	Back	L	19.74	20.00	1.06	0.94	0.92	1.00	0.98
			M	19.84	20.00	1.04	0.97	0.96	1.00	1.00
			H	19.64	20.00	1.09	0.90	0.87	0.98	0.95
		Front	L	19.74	20.00	1.06	---	---	---	---
			M	19.84	20.00	1.04	0.75	---	0.78	---
			H	19.64	20.00	1.09	---	---	---	---
		Top	L	19.74	20.00	1.06	---	---	---	---
			M	19.84	20.00	1.04	0.76	---	0.79	---
			H	19.64	20.00	1.09	---	---	---	---
		Bottom	L	19.74	20.00	1.06	---	---	---	---
			M	19.84	20.00	1.04	0.66	---	0.69	---
			H	19.64	20.00	1.09	---	---	---	---
		Left	L	19.74	20.00	1.06	---	---	---	---
			M	19.84	20.00	1.04	0.06	---	0.06	---
			H	19.64	20.00	1.09	---	---	---	---
		Right	L	19.74	20.00	1.06	---	---	---	---
			M	19.84	20.00	1.04	---	---	---	---
			H	19.64	20.00	1.09	---	---	---	---
QPSK 1RB	Body 19mm	Back	L	20.74	21.00	1.06	---	---	---	---
			M	20.84	21.00	1.04	0.51	---	0.53	---
			H	20.64	21.00	1.09	---	---	---	---
		Front	L	20.74	21.00	1.06	---	---	---	---
			M	20.84	21.00	1.04	0.34	---	0.35	---
			H	20.64	21.00	1.09	---	---	---	---
		Top	L	20.74	21.00	1.06	---	---	---	---
			M	20.84	21.00	1.04	0.37	---	0.38	---
			H	20.64	21.00	1.09	---	---	---	---
		Bottom	L	20.74	21.00	1.06	---	---	---	---
			M	20.84	21.00	1.04	0.29	---	0.30	---
			H	20.64	21.00	1.09	---	---	---	---
		Left	L	20.74	21.00	1.06	---	---	---	---
			M	20.84	21.00	1.04	0.05	---	0.05	---
			H	20.64	21.00	1.09	---	---	---	---
		Right	L	20.74	21.00	1.06	---	---	---	---
			M	20.84	21.00	1.04	---	---	---	---
			H	20.64	21.00	1.09	---	---	---	---
QPSK 50%RB	Body 5mm	Back	L	18.91	19.00	1.02	0.84	0.82	0.86	0.84
			M	18.68	19.00	1.08	0.86	0.84	0.93	0.91
			H	18.66	19.00	1.08	0.81	0.80	0.87	0.86
		Front	L	18.91	19.00	1.02	---	---	---	---

			M	18.68	19.00	1.08	0.65	---	0.70	---
			H	18.66	19.00	1.08	---	---	---	---
		Top	L	18.91	19.00	1.02	---	---	---	---
			M	18.68	19.00	1.08	0.70	---	0.76	---
			H	18.66	19.00	1.08	---	---	---	---
		Bottom	L	18.91	19.00	1.02	---	---	---	---
			M	18.68	19.00	1.08	0.54	---	0.58	---
			H	18.66	19.00	1.08	---	---	---	---
		Left	L	18.91	19.00	1.02	---	---	---	---
			M	18.68	19.00	1.08	0.04	---	0.04	---
			H	18.66	19.00	1.08	---	---	---	---
		Right	L	18.91	19.00	1.02	---	---	---	---
			M	18.68	19.00	1.08	---	---	---	---
			H	18.66	19.00	1.08	---	---	---	---
QPSK 50%RB	Body 19mm	Back	L	19.91	20.00	1.02	---	---	---	---
			M	19.68	20.00	1.08	0.42	---	0.45	---
			H	19.66	20.00	1.08	---	---	---	---
		Front	L	19.91	20.00	1.02	---	---	---	---
			M	19.68	20.00	1.08	0.30	---	0.32	---
			H	19.66	20.00	1.08	---	---	---	---
		Top	L	19.91	20.00	1.02	---	---	---	---
			M	19.68	20.00	1.08	0.35	---	0.38	---
			H	19.66	20.00	1.08	---	---	---	---
		Bottom	L	19.91	20.00	1.02	---	---	---	---
			M	19.68	20.00	1.08	0.25	---	0.27	---
			H	19.66	20.00	1.08	---	---	---	---
		Left	L	19.91	20.00	1.02	---	---	---	---
			M	19.68	20.00	1.08	0.02	---	0.02	---
			H	19.66	20.00	1.08	---	---	---	---
		Right	L	19.91	20.00	1.02	---	---	---	---
			M	19.68	20.00	1.08	---	---	---	---
			H	19.66	20.00	1.08	---	---	---	---
QPSK 100%RB	Body 5mm	Back	L	18.63	19.00	1.09	0.78	0.75	0.85	0.82
			M	18.64	19.00	1.09	0.82	0.79	0.89	0.86
			H	18.64	19.00	1.09	0.80	0.78	0.87	0.85

Mode: LTE Band 4

fL (MHz)= 1720MHz

fM (MHz)= 1732.5MHz

fH (MHz)= 1745MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test case				Meas power(dBm)	Tune-up(dBm)	Scaling factor	Meas SAR(w/kg)		Report SAR(w/kg)	
Mode	Exposure condition	Position	Channel				First	Second	First	Second
QPSK 1RB	Body 5mm	Back	L	19.70	20.50	1.20	0.80	0.78	0.96	0.94
			M	20.32	20.50	1.04	0.94	0.91	0.97	0.95
			H	20.13	20.50	1.09	0.85	0.81	0.93	0.88
		Front	L	19.70	20.50	1.20	---	---	---	---
			M	20.32	20.50	1.04	0.63	---	0.66	---
			H	20.13	20.50	1.09	---	---	---	---
		Top	L	19.70	20.50	1.20	---	---	---	---
			M	20.32	20.50	1.04	0.75	---	0.78	---
			H	20.13	20.50	1.09	---	---	---	---
		Bottom	L	19.70	20.50	1.20	---	---	---	---
			M	20.32	20.50	1.04	0.66	---	0.69	---
			H	20.13	20.50	1.09	---	---	---	---
		Left	L	19.70	20.50	1.20	---	---	---	---
			M	20.32	20.50	1.04	0.06	---	0.06	---
			H	20.13	20.50	1.09	---	---	---	---
		Right	L	19.70	20.50	1.20	---	---	---	---
			M	20.32	20.50	1.04	---	---	---	---
			H	20.13	20.50	1.09	---	---	---	---
QPSK 1RB	Body 19mm	Back	L	21.20	22.00	1.20	---	---	---	---
			M	21.82	22.00	1.04	0.76	---	0.79	---
			H	21.63	22.00	1.09	---	---	---	---
		Front	L	21.20	22.00	1.20	---	---	---	---
			M	21.82	22.00	1.04	0.36	---	0.37	---
			H	21.63	22.00	1.09	---	---	---	---
		Top	L	21.20	22.00	1.20	---	---	---	---
			M	21.82	22.00	1.04	0.40	---	0.42	---
			H	21.63	22.00	1.09	---	---	---	---
		Bottom	L	21.20	22.00	1.20	---	---	---	---
			M	21.82	22.00	1.04	0.40	---	0.42	---
			H	21.63	22.00	1.09	---	---	---	---
		Left	L	21.20	22.00	1.20	---	---	---	---
			M	21.82	22.00	1.04	0.05	---	0.05	---
			H	21.63	22.00	1.09	---	---	---	---
		Right	L	21.20	22.00	1.20	---	---	---	---
			M	21.82	22.00	1.04	---	---	---	---
			H	21.63	22.00	1.09	---	---	---	---
QPSK 50%RB	Body 5mm	Back	L	19.07	19.50	1.10	0.78	---	0.86	---
			M	18.90	19.50	1.15	0.81	0.80	0.93	0.92
			H	18.92	19.50	1.14	0.80	0.77	0.91	0.88
		Front	L	19.07	19.50	1.10	---	---	---	---

			M	18.90	19.50	1.15	0.57	---	0.66	---
			H	18.92	19.50	1.14	---	---	---	---
		Top	L	19.07	19.50	1.10	---	---	---	---
			M	18.90	19.50	1.15	0.65	---	0.75	---
			H	18.92	19.50	1.14	---	---	---	---
		Bottom	L	19.07	19.50	1.10	---	---	---	---
			M	18.90	19.50	1.15	0.54	---	0.62	---
			H	18.92	19.50	1.14	---	---	---	---
		Left	L	19.07	19.50	1.10	---	---	---	---
			M	18.90	19.50	1.15	0.04	---	0.04	---
			H	18.92	19.50	1.14	---	---	---	---
		Right	L	19.07	19.50	1.10	---	---	---	---
			M	18.90	19.50	1.15	---	---	---	---
			H	18.92	19.50	1.14	---	---	---	---
QPSK 50%RB	Body 19mm	Back	L	20.57	21.00	1.10	---	---	---	---
			M	20.40	21.00	1.15	0.56	---	0.64	---
			H	20.42	21.00	1.14	---	---	---	---
		Front	L	20.57	21.00	1.10	---	---	---	---
			M	20.40	21.00	1.15	0.31	---	0.36	---
			H	20.42	21.00	1.14	---	---	---	---
		Top	L	20.57	21.00	1.10	---	---	---	---
			M	20.40	21.00	1.15	0.32	---	0.37	---
			H	20.42	21.00	1.14	---	---	---	---
		Bottom	L	20.57	21.00	1.10	---	---	---	---
			M	20.40	21.00	1.15	0.33	---	0.38	---
			H	20.42	21.00	1.14	---	---	---	---
		Left	L	20.57	21.00	1.10	---	---	---	---
			M	20.40	21.00	1.15	0.02	---	0.02	---
			H	20.42	21.00	1.14	---	---	---	---
		Right	L	20.57	21.00	1.10	---	---	---	---
			M	20.40	21.00	1.15	---	---	---	---
			H	20.42	21.00	1.14	---	---	---	---
QPSK 100%RB	Body 5mm	Back	L	19.03	19.50	1.11	0.71	---	0.79	---
			M	18.79	19.50	1.18	0.75	---	0.89	---
			H	18.91	19.50	1.15	0.73	---	0.84	---

Mode: LTE Band 5

fL (MHz)= 829MHz

fM (MHz)= 836.5MHz

fH (MHz)= 844MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test case				Meas power(dBm)	Tune-up(dBm)	Scaling factor	Meas SAR(w/kg)		Report SAR(w/kg)	
Mode	Exposure condition	Position	Channel				First	Second	First	Second
QPSK 1RB	Body 5mm	Back	L	23.27	23.50	1.05	---	---	---	---
			M	23.01	23.50	1.12	0.35	---	0.39	---
			H	23.40	23.50	1.02	---	---	---	---
		Front	L	23.27	23.50	1.05	---	---	---	---
			M	23.01	23.50	1.12	0.69	---	0.78	---
			H	23.40	23.50	1.02	---	---	---	---
		Top	L	23.27	23.50	1.05	---	---	---	---
			M	23.01	23.50	1.12	0.28	---	0.31	---
			H	23.40	23.50	1.02	---	---	---	---
		Bottom	L	23.27	23.50	1.05	---	---	---	---
			M	23.01	23.50	1.12	0.26	---	0.29	---
			H	23.40	23.50	1.02	---	---	---	---
		Left	L	23.27	23.50	1.05	---	---	---	---
			M	23.01	23.50	1.12	0.21	---	0.23	---
			H	23.40	23.50	1.02	---	---	---	---
		Right	L	23.27	23.50	1.05	---	---	---	---
			M	23.01	23.50	1.12	---	---	---	---
			H	23.40	23.50	1.02	---	---	---	---
QPSK 50%RB	Body 5mm	Back	L	21.97	22.50	1.13	---	---	---	---
			M	22.01	22.50	1.12	0.25	---	0.28	---
			H	22.06	22.50	1.11	---	---	---	---
		Front	L	21.97	22.50	1.13	---	---	---	---
			M	22.01	22.50	1.12	0.49	---	0.55	---
			H	22.06	22.50	1.11	---	---	---	---
		Top	L	21.97	22.50	1.13	---	---	---	---
			M	22.01	22.50	1.12	0.21	---	0.24	---
			H	22.06	22.50	1.11	---	---	---	---
		Bottom	L	21.97	22.50	1.13	---	---	---	---
			M	22.01	22.50	1.12	0.16	---	0.18	---
			H	22.06	22.50	1.11	---	---	---	---
		Left	L	21.97	22.50	1.13	---	---	---	---
			M	22.01	22.50	1.12	0.11	---	0.12	---
			H	22.06	22.50	1.11	---	---	---	---
		Right	L	21.97	22.50	1.13	---	---	---	---
			M	22.01	22.50	1.12	---	---	---	---
			H	22.06	22.50	1.11	---	---	---	---

Mode: LTE Band 7

fL (MHz)= 2510MHz

fM (MHz)= 2535MHz

fH (MHz)= 2560MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test case				Meas power(dBm)	Tune-up(dBm)	Scaling factor	Meas SAR(w/kg)		Report SAR(w/kg)	
Mode	Exposure condition	Position	Channel				First	Second	First	Second
QPSK 1RB	Body 5mm	Back	L	21.55	22.00	1.11	---	---	---	---
			M	21.72	22.00	1.07	0.74	---	0.79	---
			H	21.47	22.00	1.13	---	---	---	---
		Front	L	21.55	22.00	1.11	---	---	---	---
			M	21.72	22.00	1.07	0.66	---	0.71	---
			H	21.47	22.00	1.13	---	---	---	---
		Top	L	21.55	22.00	1.11	---	---	---	---
			M	21.72	22.00	1.07	0.47	---	0.50	---
			H	21.47	22.00	1.13	---	---	---	---
		Bottom	L	21.55	22.00	1.11	0.76	---	0.84	---
			M	21.72	22.00	1.07	0.83	0.83	0.89	0.89
			H	21.47	22.00	1.13	0.80	0.80	0.90	0.90
		Left	L	21.55	22.00	1.11	---	---	---	---
			M	21.72	22.00	1.07	0.37	---	0.39	---
			H	21.47	22.00	1.13	---	---	---	---
		Right	L	21.55	22.00	1.11	---	---	---	---
			M	21.72	22.00	1.07	---	---	---	---
			H	21.47	22.00	1.13	---	---	---	---
QPSK 50%RB	Body 5mm	Back	L	20.68	21.00	1.08	---	---	---	---
			M	20.35	21.00	1.16	0.67	---	0.78	---
			H	20.32	21.00	1.17	---	---	---	---
		Front	L	20.68	21.00	1.08	---	---	---	---
			M	20.35	21.00	1.16	0.51	---	0.59	---
			H	20.32	21.00	1.17	---	---	---	---
		Top	L	20.68	21.00	1.08	---	---	---	---
			M	20.35	21.00	1.16	0.38	---	0.44	---
			H	20.32	21.00	1.17	---	---	---	---
		Bottom	L	20.68	21.00	1.08	---	---	---	---
			M	20.35	21.00	1.16	0.74	---	0.86	---
			H	20.32	21.00	1.17	---	---	---	---
		Left	L	20.68	21.00	1.08	---	---	---	---
			M	20.35	21.00	1.16	0.26	---	0.30	---
			H	20.32	21.00	1.17	---	---	---	---
		Right	L	20.68	21.00	1.08	---	---	---	---
			M	20.35	21.00	1.16	---	---	---	---
			H	20.32	21.00	1.17	---	---	---	---
QPSK 100%RB	Body 5mm	Bottom	L	20.61	21.00	1.09	---	---	---	---
			M	20.35	21.00	1.16	0.62	---	0.72	---
			H	20.21	21.00	1.20	---	---	---	---

Mode: LTE Band 12

fL (MHz)=704 MHz fM (MHz)=707.5MHz fH (MHz)= 711MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test case				Meas power(dBm)	Tune-up(dBm)	Scaling factor	Meas SAR(w/kg)		Report SAR(w/kg)	
Mode	Exposure condition	Position	Channel				First	Second	First	Second
QPSK 1RB	Body 5mm	Back	L	22.90	23.00	1.02	1.04	1.01	1.06	1.03
			M	22.60	23.00	1.10	1.07	1.04	1.18	1.14
			H	22.60	23.00	1.10	1.03	0.99	1.13	1.09
		Front	L	22.90	23.00	1.02	0.95	0.91	0.97	0.93
			M	22.60	23.00	1.10	0.96	0.95	1.05	1.05
			H	22.60	23.00	1.10	0.93	0.92	1.02	1.01
		Top	L	22.90	23.00	1.02	1.01	1.00	1.03	1.02
			M	22.60	23.00	1.10	1.02	1.01	1.12	1.11
			H	22.60	23.00	1.10	0.99	0.98	1.09	1.08
		Bottom	L	22.90	23.00	1.02	---	---	---	---
			M	22.60	23.00	1.10	0.60	---	0.66	---
			H	22.60	23.00	1.10	---	---	---	---
		Left	L	22.90	23.00	1.02	---	---	---	---
			M	22.60	23.00	1.10	0.35	---	0.39	---
			H	22.60	23.00	1.10	---	---	---	---
		Right	L	22.90	23.00	1.02	---	---	---	---
			M	22.60	23.00	1.10	---	---	---	---
			H	22.60	23.00	1.10	---	---	---	---
QPSK 50%RB	Body 5mm	Back	L	21.33	21.50	1.04	0.85	0.84	0.88	0.87
			M	21.30	21.50	1.05	0.88	0.86	0.92	0.90
			H	21.39	21.50	1.03	0.85	0.85	0.88	0.88
		Front	L	21.33	21.50	1.04	0.84	0.83	0.87	0.86
			M	21.30	21.50	1.05	0.86	0.84	0.90	0.88
			H	21.39	21.50	1.03	0.83	0.81	0.85	0.83
		Top	L	21.33	21.50	1.04	0.91	0.86	0.95	0.89
			M	21.30	21.50	1.05	0.90	0.88	0.95	0.92
			H	21.39	21.50	1.03	0.88	0.85	0.91	0.88
		Bottom	L	21.33	21.50	1.04	---	---	---	---
			M	21.30	21.50	1.05	0.51	---	0.54	---
			H	21.39	21.50	1.03	---	---	---	---
		Left	L	21.33	21.50	1.04	---	---	---	---
			M	21.30	21.50	1.05	0.22	---	0.23	---
			H	21.39	21.50	1.03	---	---	---	---

		Right	L	21.33	21.50	1.04	---	---	---	---
			M	21.30	21.50	1.05	---	---	---	---
			H	21.39	21.50	1.03	---	---	---	---
QPSK 100%RB	Body 5mm	Back	L	21.40	21.50	1.02	0.80	0.79	0.82	0.81
			M	21.30	21.50	1.05	0.78	0.76	0.82	0.80
			H	21.30	21.50	1.05	0.76	0.75	0.80	0.79
		Front	L	21.40	21.50	1.02	0.73	0.71	0.74	0.72
			M	21.30	21.50	1.05	0.75	0.70	0.79	0.74
			H	21.30	21.50	1.05	0.76	0.75	0.80	0.79
		Top	L	21.40	21.50	1.02	0.82	0.79	0.84	0.81
			M	21.30	21.50	1.05	0.79	0.78	0.83	0.82
			H	21.30	21.50	1.05	0.76	0.72	0.80	0.76

Mode: LTE Band 17

fL (MHz)= 706.5 MHz fM (MHz)= 710MHz fH (MHz)= 713.5MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test case				Meas power(dBm)	Tune-up(dBm)	Scaling factor	Meas SAR(w/kg)		Report SAR(w/kg)	
Mode	Exposure condition	Position	Channel				First	Second	First	Second
QPSK 1RB	Body 5mm	Back	L	23.00	23.50	1.12	---	---	---	---
			M	23.07	23.50	1.10	0.36	---	0.40	---
			H	23.21	23.50	1.07	---	---	---	---
		Front	L	23.00	23.50	1.12	---	---	---	---
			M	23.07	23.50	1.10	0.33	---	0.36	---
			H	23.21	23.50	1.07	---	---	---	---
		Top	L	23.00	23.50	1.12	---	---	---	---
			M	23.07	23.50	1.10	0.30	---	0.33	---
			H	23.21	23.50	1.07	---	---	---	---
		Bottom	L	23.00	23.50	1.12	---	---	---	---
			M	23.07	23.50	1.10	0.25	---	0.27	---
			H	23.21	23.50	1.07	---	---	---	---
		Left	L	23.00	23.50	1.12	---	---	---	---
			M	23.07	23.50	1.10	0.10	---	0.11	---
			H	23.21	23.50	1.07	---	---	---	---
		Right	L	23.00	23.50	1.12	---	---	---	---
			M	23.07	23.50	1.10	---	---	---	---
			H	23.21	23.50	1.07	---	---	---	---
QPSK 50%RB	Body 5mm	Back	L	22.12	22.50	1.09	---	---	---	---
			M	22.12	22.50	1.09	0.29	---	0.32	---
			H	22.09	22.50	1.10	---	---	---	---
		Front	L	22.12	22.50	1.09	---	---	---	---
			M	22.12	22.50	1.09	0.25	---	0.27	---
			H	22.09	22.50	1.10	---	---	---	---
		Top	L	22.12	22.50	1.09	---	---	---	---
			M	22.12	22.50	1.09	0.22	---	0.24	---
			H	22.09	22.50	1.10	---	---	---	---
		Bottom	L	22.12	22.50	1.09	---	---	---	---
			M	22.12	22.50	1.09	0.18	---	0.20	---
			H	22.09	22.50	1.10	---	---	---	---
		Left	L	22.12	22.50	1.09	---	---	---	---
			M	22.12	22.50	1.09	0.08	---	0.09	---
			H	22.09	22.50	1.10	---	---	---	---
		Right	L	22.12	22.50	1.09	---	---	---	---
			M	22.12	22.50	1.09	---	---	---	---
			H	22.09	22.50	1.10	---	---	---	---

6.6 SAR Measurement Variability

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. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.

The following procedures are applied to determine if repeated measurements are required.

- 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 ($\sim 10\%$ 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 .

7 MEASUREMENT UNCERTAINTY

(0.3 - 3 GHz range)								
Error Description	Uncert. value	Prob. Dist.	Div.	(c_i) 1g	(c_i) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	±6.0 %	N	1	1	1	±6.0 %	±6.0 %	∞
Axial Isotropy	±4.7 %	R	√3	0.7	0.7	±1.9 %	±1.9 %	∞
Hemispherical Isotropy	±9.6 %	R	√3	0.7	0.7	±3.9 %	±3.9 %	∞
Boundary Effects	±1.0 %	R	√3	1	1	±0.6 %	±0.6 %	∞
Linearity	±4.7 %	R	√3	1	1	±2.7 %	±2.7 %	∞
System Detection Limits	±1.0 %	R	√3	1	1	±0.6 %	±0.6 %	∞
Modulation Response ^m	±2.4 %	R	√3	1	1	±1.4 %	±1.4 %	∞
Readout Electronics	±0.3 %	N	1	1	1	±0.3 %	±0.3 %	∞
Response Time	±0.8 %	R	√3	1	1	±0.5 %	±0.5 %	∞
Integration Time	±2.6 %	R	√3	1	1	±1.5 %	±1.5 %	∞
RF Ambient Noise	±3.0 %	R	√3	1	1	±1.7 %	±1.7 %	∞
RF Ambient Reflections	±3.0 %	R	√3	1	1	±1.7 %	±1.7 %	∞
Probe Positioner	±0.4 %	R	√3	1	1	±0.2 %	±0.2 %	∞
Probe Positioning	±2.9 %	R	√3	1	1	±1.7 %	±1.7 %	∞
Max. SAR Eval.	±2.0 %	R	√3	1	1	±1.2 %	±1.2 %	∞
Test Sample Related								
Device Positioning	±2.9 %	N	1	1	1	±2.9 %	±2.9 %	145
Device Holder	±3.6 %	N	1	1	1	±3.6 %	±3.6 %	5
Power Drift	±5.0 %	R	√3	1	1	±2.9 %	±2.9 %	∞
Power Scaling ^P	±0 %	R	√3	1	1	±0.0 %	±0.0 %	∞
Phantom and Setup								
Phantom Uncertainty	±6.1 %	R	√3	1	1	±3.5 %	±3.5 %	∞
SAR correction	±1.9 %	R	√3	1	0.84	±1.1 %	±0.9 %	∞
Liquid Conductivity (mea.) ^{DAK}	±2.5 %	R	√3	0.78	0.71	±1.1 %	±1.0 %	∞
Liquid Permittivity (mea.) ^{DAK}	±2.5 %	R	√3	0.26	0.26	±0.3 %	±0.4 %	∞
Temp. unc. - Conductivity ^{BB}	±3.4 %	R	√3	0.78	0.71	±1.5 %	±1.4 %	∞
Temp. unc. - Permittivity ^{BB}	±0.4 %	R	√3	0.23	0.26	±0.1 %	±0.1 %	∞
Combined Std. Uncertainty						±11.2 %	±11.1 %	361
Expanded STD Uncertainty						±22.3 %	±22.2 %	

(3 - 6 GHz range)								
Error Description	Uncert. value	Prob. Dist.	Div.	(c _i) 1g	(c _i) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v _i) v _{eff}
Measurement System								
Probe Calibration	±6.55 %	N	1	1	1	±6.55 %	±6.55 %	∞
Axial Isotropy	±4.7 %	R	√3	0.7	0.7	±1.9 %	±1.9 %	∞
Hemispherical Isotropy	±9.6 %	R	√3	0.7	0.7	±3.9 %	±3.9 %	∞
Boundary Effects	±2.0 %	R	√3	1	1	±1.2 %	±1.2 %	∞
Linearity	±4.7 %	R	√3	1	1	±2.7 %	±2.7 %	∞
System Detection Limits	±1.0 %	R	√3	1	1	±0.6 %	±0.6 %	∞
Modulation Response ^m	±2.4 %	R	√3	1	1	±1.4 %	±1.4 %	∞
Readout Electronics	±0.3 %	N	1	1	1	±0.3 %	±0.3 %	∞
Response Time	±0.8 %	R	√3	1	1	±0.5 %	±0.5 %	∞
Integration Time	±2.6 %	R	√3	1	1	±1.5 %	±1.5 %	∞
RF Ambient Noise	±3.0 %	R	√3	1	1	±1.7 %	±1.7 %	∞
RF Ambient Reflections	±3.0 %	R	√3	1	1	±1.7 %	±1.7 %	∞
Probe Positioner	±0.8 %	R	√3	1	1	±0.5 %	±0.5 %	∞
Probe Positioning	±6.7 %	R	√3	1	1	±3.9 %	±3.9 %	∞
Max. SAR Eval.	±4.0 %	R	√3	1	1	±2.3 %	±2.3 %	∞
Test Sample Related								
Device Positioning	±2.9 %	N	1	1	1	±2.9 %	±2.9 %	145
Device Holder	±3.6 %	N	1	1	1	±3.6 %	±3.6 %	5
Power Drift	±5.0 %	R	√3	1	1	±2.9 %	±2.9 %	∞
Power Scaling ^p	±0 %	R	√3	1	1	±0.0 %	±0.0 %	∞
Phantom and Setup								
Phantom Uncertainty	±6.6 %	R	√3	1	1	±3.8 %	±3.8 %	∞
SAR correction	±1.9 %	R	√3	1	0.84	±1.1 %	±0.9 %	∞
Liquid Conductivity (mea.) ^{DAK}	±2.5 %	R	√3	0.78	0.71	±1.1 %	±1.0 %	∞
Liquid Permittivity (mea.) ^{DAK}	±2.5 %	R	√3	0.26	0.26	±0.3 %	±0.4 %	∞
Temp. unc. - Conductivity ^{BB}	±3.4 %	R	√3	0.78	0.71	±1.5 %	±1.4 %	∞
Temp. unc. - Permittivity ^{BB}	±0.4 %	R	√3	0.23	0.26	±0.1 %	±0.1 %	∞
Combined Std. Uncertainty						±12.3 %	±12.2 %	748
Expanded STD Uncertainty						±24.6 %	±24.5 %	

8 TEST EQUIPMENTS

The measurements were performed using an automated near-field scanning system, DASY5, manufactured by Schmid & Partner Engineering AG (SPEAG) in Switzerland. The SAR extrapolation algorithm used in all measurements was the ‘advanced extrapolation’ algorithm.

The following table lists calibration dates of SPEAG components:

Test Equipment	Model	Serial Number	Calibration date	Calibration Due data
DAE	DAE4	720	2020.09.30	2021.09.29
Dosimetric E-field Probe	EX3DV4	3708	2020.10.30	2021.10.29
Dipole Validation Kit	D750V3	1101	2020.10.16	2021.10.15
Dipole Validation Kit	D835V2	4d023	2020.10.16	2021.10.15
Dipole Validation Kit	D1800V2	2d084	2020.09.18	2021.09.17
Dipole Validation Kit	D2000V2	1009	2020.10.14	2021.10.13
Dipole Validation Kit	D2450V2	738	2020.10.13	2021.10.12
Dipole Validation Kit	D2600V2	1166	2019.11.08	2022.11.07
Dipole Validation Kit	D5GHzV2	1079	2020.10.10	2023.10.09

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration date	Calibration Due data
Signal Generator	E4428C	MY45280865	2021.08.20	2022.08.19
Signal Generator	SML 03	103514	2021.08.20	2022.08.19
Power meter	E4417A	MY45101182	2021.08.20	2022.08.19
Power Sensor	E4412A	MY41502214	2021.08.20	2022.08.19
Power Sensor	E4412A	MY41502130	2021.08.20	2022.08.19
Power meter	E4417A	MY45101004	2021.08.20	2022.08.19
Power Sensor	E9300B	MY41496001	2021.08.20	2022.08.19
Power Sensor	E9300B	MY41496003	2021.08.20	2022.08.19
Communication Tester	E5515C	MY48367401	2021.08.20	2022.08.19
Communication Tester	CMW500	161702	2021.08.20	2022.08.19
Communication Tester	MT8820C	6201300660	2021.08.20	2022.08.19
Communication Tester	MT8821C	6201547819	2021.08.20	2022.08.19
Vector Network Analyzer	VNA R140	0011213	2020.09.18	2021.09.17
Dielectric Parameter Probe	DAKS-3.5	1042	2020.09.17	2021.09.16
Vector Network Analyzer	E5071C	MY43030474	2021.08.20	2022.08.19
Calibration Kit	85054D	MY39200751	2021.08.20	2022.08.19

Detailed information of Isotropic E-field Probe Type EX3DV4

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Calibration certificate in Appendix C
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Optical Surface Detection	± 0.3 mm repeatability in air and clear liquids over diffuse reflecting surfaces
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Dynamic Range	10 μ W/g to > 100 W/kg Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

According to KDB 865664 D01 section 3.2.2, instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the **SAR target, impedance and return loss** of a dipole have remain stable according to the following requirements.

- 1) The test laboratory must ensure that the required supporting information and documentation are included in the SAR report to qualify for the three-year extended calibration interval; otherwise, the IEEE Std 1528-2013 recommended annual calibration applies.
- 2) Immediate re-calibration is required for the following conditions.
 - a) After a dipole is damaged and properly repaired to meet required specifications.
 - b) When the measured SAR deviates from the calibrated SAR value by more than 10% due to changes in physical, mechanical, electrical or other relevant dipole conditions; i.e., the error is not introduced by incorrect measurement procedures or other issues relating to the SAR measurement system.
 - c) When the most recent return-loss result, measured at least annually, deviates by more than 20% from the previous measurement (i.e. value in dB $\times$ 0.2) or not meeting the required 20 dB minimum return-loss requirement.
 - d) When the most recent measurement of the real or imaginary parts of the impedance, measured at least annually, deviates by more than 5 Ω from the previous measurement

Dipole

SAR target

Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

Impedance and Return loss measured by Network analyzer

The most recent measurement of the real or imaginary parts of the impedance deviates within 5 Ω from the previous measurement. (Data from the last calibration report)

The most recent return-loss result deviates within 20% from the previous measurement. (Data from the last calibration report)

Dipole450 TSL Parameters		
Parameters	Measured data	Target (Ref. Value)
Impedance	59.1 Ω +0.06j Ω	55.5 Ω +6.40j Ω
Return loss	-21.6 dB	-21.9 dB

Dipole750 TSL Parameters		
Parameters	Measured data	Target (Ref. Value)
Impedance	53.8 Ω -4.02j Ω	53.7 Ω -1.63j Ω
Return loss	-25.5 dB	-28.2dB

Dipole835 TSL Parameters		
Parameters	Measured data	Target (Ref. Value)
Impedance	54.5 Ω -6.16j Ω	52.6 Ω -2.37j Ω
Return loss	-34.1 dB	-29.3dB

Dipole900 TSL Parameters		
Parameters	Measured data	Target (Ref. Value)
Impedance	53.0 Ω -5.24j Ω	49.1 Ω -6.69j Ω
Return loss	-23.2 dB	-23.4dB

Dipole1450 TSL Parameters		
Parameters	Measured data	Target (Ref. Value)
Impedance	54.7 Ω +3.95j Ω	52.4 Ω -1.35j Ω
Return loss	-33.1 dB	-31.5dB

Dipole1800 TSL Parameters		
Parameters	Measured data	Target (Ref. Value)
Impedance	44.2 Ω +5.06j Ω	48.9 Ω -2.71j Ω
Return loss	-31.8 dB	-30.6dB

Dipole2000 TSL Parameters		
Parameters	Measured data	Target (Ref. Value)
Impedance	51.9Ω-3.37jΩ	49.4Ω-2.46jΩ
Return loss	-28.4 dB	-31.9dB

Dipole2450 TSL Parameters		
Parameters	Measured data	Target (Ref. Value)
Impedance	53.2Ω-9.98jΩ	53.3Ω+6.38jΩ
Return loss	-19.9 dB	-23.1dB

Dipole2600 TSL Parameters		
Parameters	Measured data	Target (Ref. Value)
Impedance	50.4Ω+6.71jΩ	47.9Ω-7.80jΩ
Return loss	-23.5 dB	-21.7dB

Dipole3500 TSL Parameters		
Parameters	Measured data	Target (Ref. Value)
Impedance	53.3Ω-10.48jΩ	52.6Ω+3.5jΩ
Return loss	-29.5 dB	-27.4dB

Dipole3700 TSL Parameters		
Parameters	Measured data	Target (Ref. Value)
Impedance	46.0Ω+6.99jΩ	48.3Ω+1.1jΩ
Return loss	-34.5 dB	-33.6dB

Dipole3900 TSL Parameters (3900MHz)		
Parameters	Measured data	Target (Ref. Value)
Impedance	51.8Ω-11.48jΩ	48.3Ω-4.9jΩ
Return loss	-28.7 dB	-25.6dB

Dipole3900 TSL Parameters (4100MHz)		
Parameters	Measured data	Target (Ref. Value)
Impedance	51.6Ω+9.70jΩ	59.0Ω-0.8jΩ
Return loss	-17.1 dB	-21.6dB

Dipole4200 TSL Parameters		
Parameters	Measured data	Target (Ref. Value)
Impedance	43.9Ω+1.52jΩ	48.3Ω+1.10jΩ
Return loss	-33.5 dB	-33.6dB

Dipole4600 TSL Parameters (4500MHz)		
Parameters	Measured data	Target (Ref. Value)
Impedance	46.0Ω-1.14jΩ	46.4Ω-4.5jΩ
Return loss	-27.2 dB	-24.5dB

Dipole4600 TSL Parameters (4600MHz)		
Parameters	Measured data	Target (Ref. Value)
Impedance	49.0Ω-7.87jΩ	51.8Ω-6.35jΩ
Return loss	-20.7 dB	-23.8dB

Dipole4600 TSL Parameters (4700MHz)		
Parameters	Measured data	Target (Ref. Value)
Impedance	55.0Ω+0.91jΩ	55.9Ω-3.20jΩ
Return loss	-26.2 dB	-24.0dB

Dipole4900 TSL Parameters		
Parameters	Measured data	Target (Ref. Value)
Impedance	45.8Ω-1.40jΩ	50.6Ω-5.2jΩ
Return loss	-26.7 dB	-25.7dB

Dipole5GHz TSL Parameters (5200MHz)		
Parameters	Measured data	Target (Ref. Value)
Impedance	51.2Ω+13.89jΩ	50.2Ω-10.0jΩ
Return loss	-17.0 dB	-20.0dB

Dipole5GHz TSL Parameters (5300MHz)		
Parameters	Measured data	Target (Ref. Value)
Impedance	52.0Ω-11.40jΩ	47.2Ω-7.33jΩ
Return loss	-18.4 dB	-21.9dB

Dipole5GHz TSL Parameters (5500MHz)		
Parameters	Measured data	Target (Ref. Value)
Impedance	51.6Ω+6.61jΩ	52.0Ω-7.96jΩ
Return loss	-18.6 dB	-21.9dB

Dipole5GHz TSL Parameters (5600MHz)		
Parameters	Measured data	Target (Ref. Value)
Impedance	$53.6\Omega + 7.31j\Omega$	$55.7\Omega - 3.78j\Omega$
Return loss	-22.1 dB	-23.8dB

Dipole5GHz TSL Parameters (5800MHz)		
Parameters	Measured data	Target (Ref. Value)
Impedance	$51.6\Omega - 5.96j\Omega$	$53.7\Omega - 5.87j\Omega$
Return loss	-19.0 dB	-23.5dB