Certificate Number: 5055.02

TEST REPORT FOR SAR TESTING

Report No.: SRTC2020-9004(F)-20091506(H)

Product Name: LTE Ufi

Product Model: A004ZT

Applicant: ZTE Corporation

Manufacturer: ZTE Corporation

Specification: Part 2.1093

IEEE Std 1528

KDB Procedures

FCC ID: SRQ-A004ZT

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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City:	Shenzhen
Country or Region:	P.R.China
Contacted person:	Zhao Yang
Tel:	86-029-83637990
Email:	zhao.yangxa@zte.com.cn

1.5 Test Environment

Date of Receipt of test sample at SRTC:	2020.09.08
Testing Start Date:	2020.09.08
Testing End Date:	2020.09.12

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	20	40

Normal Supply Voltage (Vdc.):	3.8

2. DESCRIPTION OF THE DEVICE UNDER TEST

2.1 Final Equipment Build Status

<table>
<tr><td>Wireless Technology and Frequency Bands</td><td>☐GSM Band: GSM850/GSM1900
☒WCDMA Band: FDD II/IV
☒LTE Band: 2/4/12/17/41
☒Wi-Fi Band: 2.4GHz/5GHz(UNII-1)
☐BT/BLE</td></tr>
<tr><td>Mode</td><td>GSM
☐GPRS (GMSK)
☐EGPRS (GMSK/8PSK)
WCDMA
☒UMTS Rel. 99
☒HSDPA (Rel. 5)
☒HSUPA (Rel. 6)
☒HSPA+ (Rel.7)
☒DC-HSDPA (Rel.8)
Wi-Fi
☒802.11a
☒802.11b
☒802.11g
☒802.11n HT20
☒802.11n HT40
☒802.11ac VHT20
☒802.11ac VHT40
☒802.11ac VHT80
☒802.11ax HE20
☒802.11ax HE40
☒802.11ax HE80
LTE
☒QPSK
☒16QAM
☒64QAM</td></tr>
<tr><td>Duty Cycle*</td><td>WCDMA: 100%
LTE(FDD): 100% LTE(TDD): 63.3% maximum
WIFI2.4GHz:
<table>
<tr><th>Test Mode</th><th>Duty Cycle (%)</th></tr>
<tr><td>802.11b</td><td>99.1</td></tr>
<tr><td>802.11g</td><td>99</td></tr>
<tr><td>802.11n HT20</td><td>99.6</td></tr>
<tr><td>802.11n HT40</td><td>99.6</td></tr>
<tr><td>802.11ax HE20</td><td>99.6</td></tr>
<tr><td>802.11ax HE40</td><td>97.8</td></tr>
</table>
<table>
<tr><th>Test Mode</th><th>Duty Cycle (%)</th></tr>
<tr><td>802.11a</td><td>99</td></tr>
</table></td></tr>
</table>

	802.11n HT20	99.6
	802.11n HT40	99.6
	802.11ac VHT20	99.6
	802.11ac VHT40	99.6
	802.11ac VHT80	99.6
	802.11ax HE20	99.6
	802.11ax HE40	97.8
	802.11ax HE80	98
Multi-Slot Class for GPRS/EDGE	☐Class 8 - One Up ☐Class 10 - Two Up ☐Class 12 - Four Up ☐Class 33- Four Up	
Mobile Phone Capability	☐Class A - Mobile phones can be connected to both GPRS and GSM services simultaneously. ☐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	
DTM	Not Supported	
Note	For licensed cellular network duty cycle is inherent. For unlicensed network WLAN Duty cycle is depends on the data traffic, and the traffic allocation in operating mode could be the most conservative condition which with 100% duty cycle. SAR measurement also use non signalling mode, so the duty factor shall be taken into consideration.	

2.2 Support Equipment

The following support equipment was used to exercise the DUT during testing:

State of sample	Normal
H/W Version S/W Version	H01 S01
IMEI	861046050001776
Battery	ZHUHAI COSMX BATTERY CO.,LTD.
Data Cable	Shenz luxshare-ict co.ltd
Notes	As the information described above, we use test sample offered by the customer. The relevant tests have been performed in order to verify in which combination case the EUT would have the worst features.

3. REFERENCE SPECIFICATION

Specification	Version	Title
Part 2.1093	2019	Radiofrequency 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 447498 D01	v06	General RF Exposure Guidance
KDB 447498 D02	v02r01	SAR MEASUREMENT PROCEDURES FOR USB DONGLE TRANSMITTERS
KDB 648474 D04	v01r03	Handset SAR
KDB 941225 D01	v03r01	3G SAR Procedures
KDB 248227 D01	v02r02	SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS
KDB 865664 D01	v01r04	SAR Measurement from 100 MHz to 6 GHz
KDB 865664 D02	v01r02	RF Exposure Reporting
KDB 941225 D05	v02r05	SAR for LTE 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 ± 0.02mm. 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 ± 10% below 3GHz and ± 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 SUMMAR

The maximum reported SAR values for Body-Worn/Hotspot 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(1g- SAR)						
Exposure Position	Frequency Band	SAR Result(W/kg)	Highest SAR Result(W/kg)		Limit(W/kg)	Result
Body-Worn (10mm Gap)	WCDMA Band II	0.46	0.69	0.77	1.60	Pass
	WCDMA Band IV	0.45				
	LTE Band 2	0.40				
	LTE Band 4	0.42				
	LTE Band 12	0.53				
	LTE Band 17	0.54				
	LTE Band 41	0.69				
	WLAN 2.4GHz	0.32				
	WLAN 5GHz UNII-1	0.32				
Hotspot (10mm Gap)	WCDMA Band II	0.46	0.77			
	WCDMA Band IV	0.45				
	LTE Band 2	0.40				
	LTE Band 4	0.42				
	LTE Band 12	0.53				
	LTE Band 17	0.54				
	LTE Band 41	0.77				
	WLAN 2.4GHz	0.33				
	WLAN 5GHz UNII-1	0.59				

Simultaneous Transmission Summary

Simultaneous Transmission Summary(1g- SAR)					
Exposure Position	Frequency Band	SAR Result(W/kg)	Highest SAR Result(W/kg)	Limit(W/kg)	Result
Body-Worn	WWAN+WLAN	1.15	1.15	1.60	Pass
Hotspot	WWAN+WLAN	1.15			

This Test Report Is Approved by: Mr. Peng Zhen	Review by: Mr. Li Bin
Tested and issued by: Mr. Chang Tianyu	Approved date: 2020/09/23

6 TEST RESULT

6.1 Average conducted power and tune up

WCDMA

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
	βc/βd	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	β_{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 Δ_{CQI} =8⇔ $A_{hs}=\beta_{hs}/\beta_c=30/15 \Leftrightarrow \beta_{hs}=30/15*\beta_c$.

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 (SF)	β_c/β_d	β_{hs}(1)	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM(2) (dB)	MPR (dB)	AG(4) Index	E-TFCI
1	11/15(3)	15/15 (3)	64	11/15(3)	22/15	209/225	1039/225	4	1	1.0	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	β_{ed1}:47/15 β_{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 Δ_{CQI} =8⇔$A_{hs}=\beta_{hs}/\beta_c$=30/15⇔$\beta_{hs}$=30/15*$\beta_c$.

Note2: CM=1 for β_c/β_d =12/15,β_{hs}/β_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 β_c=10/15 and β_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 β_c=14/15 and β_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 (Note3)	β_d	β_{HS} (Note1)	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_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_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 β_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.		

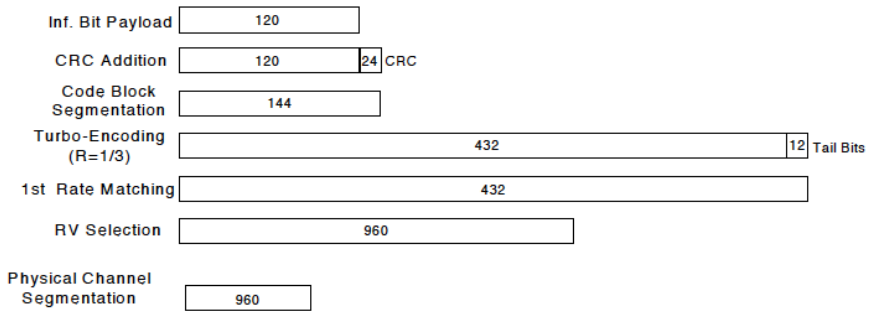


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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	β_{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 Δ_{CQI} =8⇔ $A_{hs}=\beta_{hs}/\beta_c=30/15 \Leftrightarrow \beta_{hs}=30/15*\beta_c$.
Note2:CM=1 for β_c/β_d=12/15, β_{hs}/β_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 β_c=11/15 and β_d=15/15.

WCDMA Band II

Mode		Carrier frequency(MHz)	Channel No.	RF Power Output(dBm)	QPSK Tune-up(dBm)
Release 99	RMC,12.2kbps	1852.4	9262	23.63	24.0
		1880	9400	23.56	
		1907.6	9538	23.43	
HSDPA	Subtest 1	1852.4	9262	21.73	22.0
		1880	9400	21.61	
		1907.6	9538	21.49	
	Subtest 2	1852.4	9262	21.66	
		1880	9400	21.66	
		1907.6	9538	21.49	
	Subtest 3	1852.4	9262	21.68	
		1880	9400	21.57	
		1907.6	9538	21.52	
	Subtest 4	1852.4	9262	21.72	
		1880	9400	21.60	
		1907.6	9538	21.44	
HSUPA	Subtest 1	1852.4	9262	21.68	22.5
		1880	9400	21.58	
		1907.6	9538	21.45	
	Subtest 2	1852.4	9262	21.74	
		1880	9400	21.65	
		1907.6	9538	21.44	
	Subtest 3	1852.4	9262	21.68	
		1880	9400	21.57	
		1907.6	9538	21.44	
	Subtest 4	1852.4	9262	21.67	
		1880	9400	21.59	
		1907.6	9538	21.48	
	Subtest 5	1852.4	9262	22.11	
		1880	9400	22.03	
		1907.6	9538	21.84	
HSPA+	QPSK	1852.4	9262	21.72	22.0
		1880	9400	21.58	
		1907.6	9538	21.49	
	16QAM	1852.4	9262	21.71	
		1880	9400	21.60	
		1907.6	9538	21.45	
DC-HSDPA	Subtest 1	1852.4	9262	21.69	22.0
		1880	9400	21.58	
		1907.6	9538	21.51	

	Subtest 2	1852.4	9262	21.70	
		1880	9400	21.60	
		1907.6	9538	21.46	
	Subtest 3	1852.4	9262	21.73	
		1880	9400	21.59	
		1907.6	9538	21.49	
	Subtest 4	1852.4	9262	21.74	
		1880	9400	21.64	
		1907.6	9538	21.49	

WCDMA Band IV

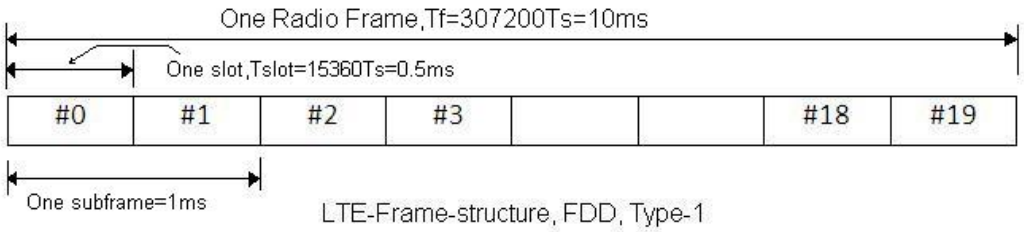
Mode		Carrier frequency(MHz)	Channel No.	RF Power Output(dBm)	QPSK Tune-up(dBm)
Release 99	RMC,12.2kbps	1712.4	1312	23.27	24.0
		1732.4	1412	23.48	
		1752.6	1513	23.64	
HSDPA	Subtest 1	1712.4	1312	21.31	22.0
		1732.4	1412	21.51	
		1752.6	1513	21.70	
	Subtest 2	1712.4	1312	21.33	
		1732.4	1412	21.59	
		1752.6	1513	21.69	
	Subtest 3	1712.4	1312	21.29	
		1732.4	1412	21.50	
		1752.6	1513	21.68	
	Subtest 4	1712.4	1312	21.38	
		1732.4	1412	21.53	
		1752.6	1513	21.68	
HSUPA	Subtest 1	1712.4	1312	21.30	22.5
		1732.4	1412	21.49	
		1752.6	1513	21.66	
	Subtest 2	1712.4	1312	21.30	
		1732.4	1412	21.53	
		1752.6	1513	21.69	
	Subtest 3	1712.4	1312	21.28	
		1732.4	1412	21.55	
		1752.6	1513	21.71	
	Subtest 4	1712.4	1312	21.32	
		1732.4	1412	21.53	

		1752.6	1513	21.66	
	Subtest 5	1712.4	1312	21.74	
		1732.4	1412	21.99	
		1752.6	1513	22.11	
HSPA+	QPSK	1712.4	1312	21.28	22.0
		1732.4	1412	21.50	
		1752.6	1513	21.70	
	16QAM	1712.4	1312	21.34	
		1732.4	1412	21.50	
		1752.6	1513	21.66	
DC-HSDPA	Subtest 1	1712.4	1312	21.28	22.0
		1732.4	1412	21.58	
		1752.6	1513	21.66	
	Subtest 2	1712.4	1312	21.28	
		1732.4	1412	21.53	
		1752.6	1513	21.68	
	Subtest 3	1712.4	1312	21.28	
		1732.4	1412	21.59	
		1752.6	1513	21.69	
	Subtest 4	1712.4	1312	21.33	
		1732.4	1412	21.55	
		1752.6	1513	21.66	

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

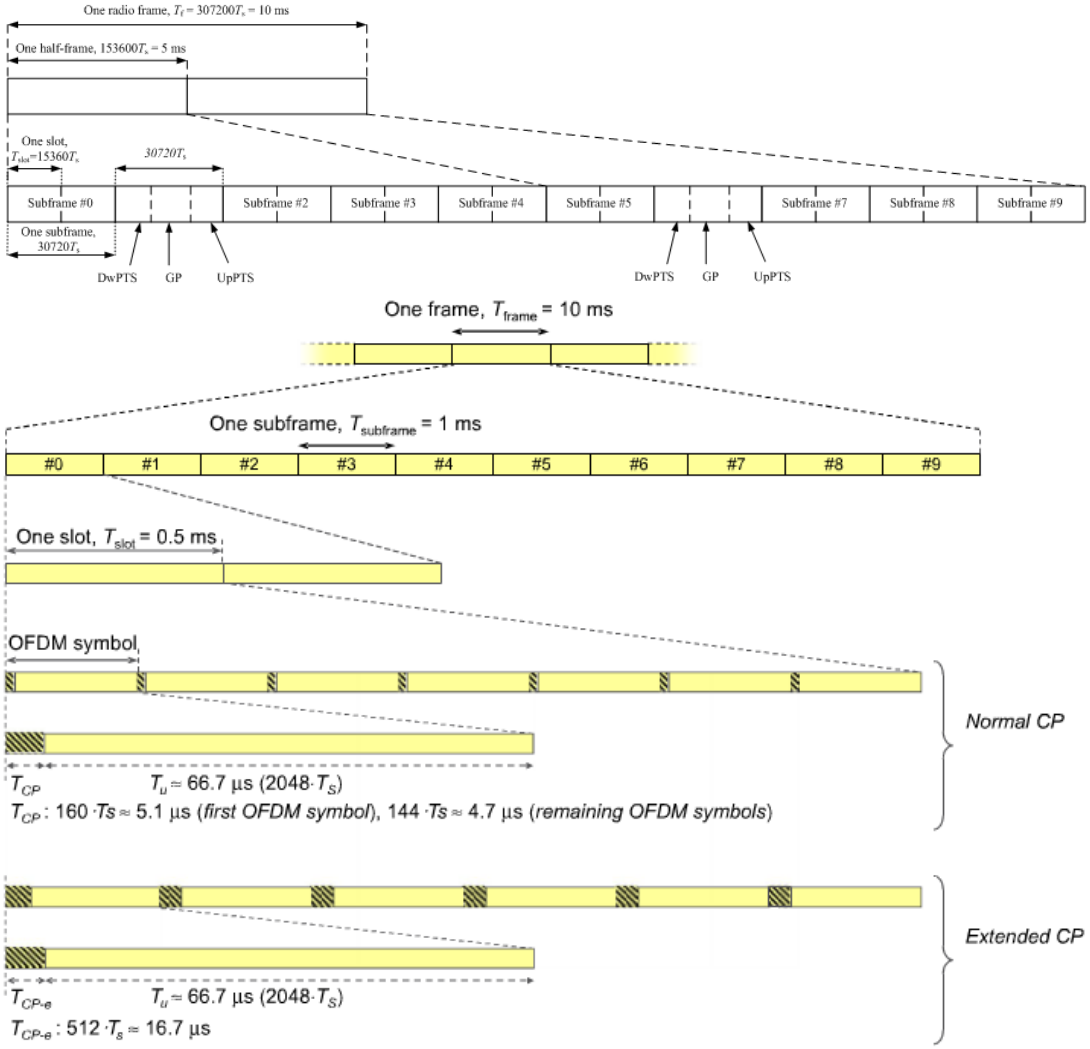
General description:
FDD-LTE frame structure



LTE-Frame-structure, FDD, Type-1

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 as100%

TDD-LTE frame structure



Uplink-downlink configuration

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

Special sub-frame configuration

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

Special sub-frame with cyclic prefix uplink

Special sub-frame configuration		Duty factor with normal cyclic prefix in uplink	Duty factor with extended cyclic prefix in uplink
Normal cyclic prefix in downlink	0~4	7.13%	8.33%
	5~9	14.3%	16.7%
Extended cyclic prefix in downlink	0~3	7.13%	8.33%
	4~7	14.3%	16.7%

So we perform SAR test with maximum duty factor equal to 63.3% by using uplink-downlink configuration 0.

Note: One sub-frame is 30720Ts=1ms, when UpPTS(uplink) in special sub-frame with extended cyclic prefix, duty factor = 5120/30720=0.167.There are 5 sub-frames in half frame(3up link),so the final duty factor is (30720*3+5120)/(30720*5)=63.3% which we used to evaluate the SAR compliance (worst case)

LTE Band2

BANDWIDTH	Number of RBs	Frequency (MHZ)	QPSK Power(dBm)	16QAM Power(dBm)	64QAM Power(dBm)	QPSK Tune-up(dBm)	16QAM Tune-up(dBm)	64QAM Tune-up(dBm)
1.4MHz	1RB-High (5)	1909.3 (19193)	22.97	22.30	22.24	23.5	23.0	23.0
		1880 (18900)	23.21	22.49	22.49			
		1850.7 (18607)	23.24	22.55	22.51			
	1RB-Middle (3)	1909.3 (19193)	23.00	22.36	22.31			
		1880 (18900)	23.30	22.61	22.55			
		1850.7 (18607)	23.30	22.63	22.51			
	1RB-Low (0)	1909.3 (19193)	22.95	22.32	22.21			
		1880 (18900)	23.17	22.46	22.45			
		1850.7 (18607)	23.25	22.56	22.47			
	3RB-High (3)	1909.3 (19193)	22.99	22.06	22.10	23.5	22.5	22.5
		1880 (18900)	23.28	22.39	22.39			
		1850.7 (18607)	23.27	22.38	22.35			
	3RB-Middle (1)	1909.3 (19193)	23.03	22.08	22.12			
		1880 (18900)	23.23	22.36	22.37			
		1850.7 (18607)	23.31	22.40	22.39			
	3RB-Low (0)	1909.3 (19193)	23.02	22.05	22.12			
		1880 (18900)	23.18	22.32	22.33			
		1850.7 (18607)	23.26	22.33	22.38			
	6RB (0)	1909.3 (19193)	22.07	21.19	21.07	22.5	21.5	21.5
		1880 (18900)	22.26	21.38	21.27			
		1850.7 (18607)	22.36	21.42	21.35			
3MHz	1RB-High (14)	1908.5 (19185)	23.11	22.38	22.44	23.5	23.0	23.0
		1880 (18900)	23.33	22.66	22.60			
		1851.5 (18615)	23.33	22.55	22.49			
	1RB-Middle (7)	1908.5 (19185)	23.11	22.39	22.42			
		1880 (18900)	23.27	22.58	22.48			
		1851.5 (18615)	23.25	22.57	22.48			
	1RB-Low (0)	1908.5 (19185)	23.07	22.39	22.38			
		1880 (18900)	23.23	22.56	22.49			
		1851.5 (18615)	23.34	22.64	22.58			
	8RB-High (7)	1908.5 (19185)	22.16	21.25	21.21	22.5	21.5	21.5
		1880 (18900)	22.41	21.48	21.43			
		1851.5 (18615)	22.41	21.47	21.36			
	8RB-Middle (4)	1908.5 (19185)	22.18	21.27	21.22			
		1880 (18900)	22.36	21.42	21.42			
		1851.5 (18615)	22.40	21.49	21.42			
	8RB-Low (0)	1908.5 (19185)	22.17	21.20	21.18			

		1880 (18900)	22.31	21.37	21.40			
		1851.5 (18615)	22.39	21.49	21.45			
	15RB (0)	1908.5 (19185)	22.18	21.17	21.21	22.5	21.5	21.5
		1880 (18900)	22.37	21.38	21.39			
		1851.5 (18615)	22.37	21.41	21.38			
5MHz	1RB-High (24)	1907.5 (19175)	23.15	22.41	22.43	23.5	23.0	23.0
		1880 (18900)	23.32	22.60	22.69			
		1852.5 (18625)	23.29	22.58	22.53			
	1RB-Middle (12)	1907.5 (19175)	23.12	22.45	22.41			
		1880 (18900)	23.29	22.61	22.58			
		1852.5 (18625)	23.29	22.61	22.53			
	1RB-Low (0)	1907.5 (19175)	23.11	22.42	22.42			
		1880 (18900)	23.25	22.50	22.56			
		1852.5 (18625)	23.33	22.65	22.52			
	12RB-High (13)	1907.5 (19175)	22.18	21.23	21.16	22.5	21.5	21.5
		1880 (18900)	22.41	21.47	21.41			
		1852.5 (18625)	22.37	21.39	21.36			
	12RB-Middle (6)	1907.5 (19175)	22.21	21.27	21.22			
		1880 (18900)	22.39	21.42	21.42			
		1852.5 (18625)	22.40	21.46	21.43			
	12RB-Low (0)	1907.5 (19175)	22.21	21.22	21.16			
		1880 (18900)	22.32	21.37	21.35			
		1852.5 (18625)	22.40	21.40	21.38			
	25RB (0)	1907.5 (19175)	22.16	21.20	21.21	22.5	21.5	21.5
		1880 (18900)	22.35	21.38	21.38			
		1852.5 (18625)	22.36	21.41	21.41			
10MHz	1RB-High (49)	1905 (19150)	23.11	22.39	22.37	23.5	23.0	23.0
		1880 (18900)	23.25	22.64	22.74			
		1855 (18650)	23.18	22.67	22.49			
	1RB-Middle (24)	1905 (19150)	23.04	22.48	22.55			
		1880 (18900)	23.30	22.67	22.82			
		1855 (18650)	23.25	22.69	22.63			
	1RB-Low (0)	1905 (19150)	23.16	22.49	22.47			
		1880 (18900)	23.33	22.68	22.66			
		1855 (18650)	23.30	22.67	22.78			
	25RB-High (25)	1905 (19150)	22.24	21.25	21.24	22.5	21.5	21.5
		1880 (18900)	22.41	21.46	21.43			
		1855 (18650)	22.36	21.34	21.35			
	25RB-Middle (12)	1905 (19150)	22.20	21.14	21.20			
		1880 (18900)	22.38	21.40	21.40			
		1855 (18650)	22.42	21.35	21.44			
	25RB-Low (0)	1905 (19150)	22.18	21.13	21.14			

		1880 (18900)	22.35	21.37	21.35			
		1855 (18650)	22.40	21.38	21.39			
	50RB (0)	1905 (19150)	22.19	21.15	21.18	22.5	21.5	21.5
		1880 (18900)	22.32	21.36	21.33			
		1855 (18650)	22.37	21.39	21.37			
15MHz	1RB-High (74)	1902.5 (19125)	23.11	22.28	22.16	23.5	23.0	23.0
		1880 (18900)	23.29	22.59	22.45			
		1857.5 (18675)	23.32	22.59	22.44			
	1RB-Middle (37)	1902.5 (19125)	23.16	22.39	22.40			
		1880 (18900)	23.36	22.68	22.60			
		1857.5 (18675)	23.22	22.57	22.36			
	1RB-Low (0)	1902.5 (19125)	23.26	22.41	22.44			
		1880 (18900)	23.29	22.68	22.67			
		1857.5 (18675)	23.36	22.68	22.56			
	36RB-High (38)	1902.5 (19125)	22.28	21.21	21.24	22.5	21.5	21.5
		1880 (18900)	22.45	21.46	21.47			
		1857.5 (18675)	22.38	21.40	21.38			
	36RB-Middle (19)	1902.5 (19125)	22.25	21.23	21.21			
		1880 (18900)	22.38	21.37	21.41			
		1857.5 (18675)	22.40	21.43	21.36			
	36RB-Low (0)	1902.5 (19125)	22.20	21.23	21.22			
		1880 (18900)	22.39	21.38	21.35			
		1857.5 (18675)	22.35	21.35	21.32			
	75RB (0)	1902.5 (19125)	22.17	21.21	21.20	22.5	21.5	21.5
		1880 (18900)	22.39	21.38	21.38			
		1857.5 (18675)	22.43	21.41	21.40			
20MHz	1RB-High (99)	1900 (19100)	23.05	22.36	22.33	23.5	23.0	23.0
		1880 (18900)	23.24	22.50	22.40			
		1860 (18700)	23.21	22.57	22.49			
	1RB-Middle (50)	1900 (19100)	23.21	22.40	22.40			
		1880 (18900)	23.37	22.62	22.64			
		1860 (18700)	23.28	22.61	22.54			
	1RB-Low (0)	1900 (19100)	23.28	22.60	22.58			
		1880 (18900)	23.34	22.57	22.61			
		1860 (18700)	23.43	22.77	22.75			
	50RB-High (50)	1900 (19100)	22.29	21.28	21.26	22.5	21.5	21.5
		1880 (18900)	22.45	21.46	21.44			
		1860 (18700)	22.38	21.41	21.38			
	50RB-Middle (25)	1900 (19100)	22.32	21.36	21.33			
		1880 (18900)	22.40	21.46	21.42			
		1860 (18700)	22.45	21.42	21.44			
	50RB-Low (0)	1900 (19100)	22.26	21.25	21.24			
		1880 (18900)	22.37	21.44	21.38			

		1860 (18700)	22.38	21.35	21.41			
	100RB (0)	1900 (19100)	22.29	21.26	21.21	22.5	21.5	21.5
		1880 (18900)	22.41	21.38	21.35			
		1860 (18700)	22.45	21.40	21.38			

LTE Band4

BANDWIDTH	Number of RBs	Frequency (MHZ)	QPSK Power(dBm)	16QAM Power(dBm)	64QAM Power(dBm)	QPSK Tune-up(dBm)	16QAM Tune-up(dBm)	64QAM Tune-up(dBm)
1.4MHz	1RB-High (5)	1754.3 (20393)	23.52	22.82	22.74	24.0	23.0	23.0
		1732.5 (20175)	23.25	22.58	22.54			
		1710.7 (19957)	23.13	22.49	22.41			
	1RB-Middle (3)	1754.3 (20393)	23.60	22.88	22.57			
		1732.5 (20175)	23.29	22.63	22.59			
		1710.7 (19957)	23.18	22.60	22.37			
	1RB-Low (0)	1754.3 (20393)	23.55	22.80	22.58			
		1732.5 (20175)	23.13	22.47	22.48			
		1710.7 (19957)	23.15	22.48	22.38			
	3RB-High (3)	1754.3 (20393)	23.52	22.58	22.58	24.0	23.0	23.0
		1732.5 (20175)	23.27	22.29	22.41			
		1710.7 (19957)	23.16	22.22	22.27			
	3RB-Middle (1)	1754.3 (20393)	23.48	22.63	22.68			
		1732.5 (20175)	23.25	22.44	22.40			
		1710.7 (19957)	23.23	22.26	22.30			
	3RB-Low (0)	1754.3 (20393)	23.52	22.61	22.64			
		1732.5 (20175)	23.21	22.26	22.34			
		1710.7 (19957)	20.96	22.22	22.26			
	6RB (0)	1754.3 (20393)	22.55	21.67	21.57	23.0	22.0	22.0
		1732.5 (20175)	22.30	21.41	21.32			
		1710.7 (19957)	20.03	21.26	21.19			
3MHz	1RB-High (14)	1753.5 (20385)	23.58	22.91	22.81	24.0	23.0	23.0
		1732.5 (20175)	23.36	22.67	22.53			
		1711.5 (19965)	23.25	22.56	22.48			
	1RB-Middle (7)	1753.5 (20385)	23.44	22.83	22.72			
		1732.5 (20175)	23.30	22.65	22.46			
		1711.5 (19965)	23.21	22.58	22.46			
	1RB-Low (0)	1753.5 (20385)	23.58	22.89	22.83			
		1732.5 (20175)	23.24	22.58	22.38			
		1711.5 (19965)	23.22	22.59	22.47			
	8RB-High (7)	1753.5 (20385)	22.67	21.68	21.70	23.0	22.0	22.0

		1732.5 (20175)	22.43	21.47	21.42			
		1711.5 (19965)	22.31	21.37	21.33			
	8RB-Middle (4)	1753.5 (20385)	22.68	21.74	21.68			
		1732.5 (20175)	22.39	21.48	21.42			
		1711.5 (19965)	22.27	21.39	21.34			
	8RB-Low (0)	1753.5 (20385)	22.64	21.69	21.68			
		1732.5 (20175)	22.34	21.37	21.33			
		1711.5 (19965)	20.10	21.34	21.33			
	15RB (0)	1753.5 (20385)	22.66	21.69	21.66			
		1732.5 (20175)	22.41	21.41	21.45	23.0	22.0	22.0
		1711.5 (19965)	20.13	21.36	21.28			
5MHz	1RB-High (24)	1752.5 (20375)	23.60	22.93	22.81			
		1732.5 (20175)	23.37	22.69	22.65			
		1712.5 (19975)	23.27	22.61	22.45			
	1RB-Middle (12)	1752.5 (20375)	23.52	22.87	22.76			
		1732.5 (20175)	23.30	22.64	22.58	24.0	23.0	23.0
		1712.5 (19975)	23.25	22.61	22.43			
	1RB-Low (0)	1752.5 (20375)	23.58	22.88	22.77			
		1732.5 (20175)	23.25	22.54	22.49			
		1712.5 (19975)	23.24	22.55	22.43			
	12RB-High (13)	1752.5 (20375)	22.69	21.68	21.66			
		1732.5 (20175)	22.43	21.46	21.41			
		1712.5 (19975)	20.30	21.32	21.35			
	12RB-Middle (6)	1752.5 (20375)	22.72	21.72	21.67			
		1732.5 (20175)	22.41	21.51	21.45	23.0	22.0	22.0
		1712.5 (19975)	20.38	21.39	21.38			
	12RB-Low (0)	1752.5 (20375)	22.29	21.67	21.68			
		1732.5 (20175)	22.39	21.39	21.32			
		1712.5 (19975)	20.24	21.35	21.31			
	25RB (0)	1752.5 (20375)	22.39	21.66	21.70			
		1732.5 (20175)	22.44	21.42	21.44	22.5	22.0	22.0
		1712.5 (19975)	20.30	20.23	19.27			
10MHz	1RB-High (49)	1750 (20350)	23.60	22.90	22.87			
		1732.5 (20175)	23.43	22.78	22.81			
		1715 (20000)	23.24	22.61	22.55			
	1RB-Middle (24)	1750 (20350)	23.69	22.98	23.21	24.0	23.0	23.5
		1732.5 (20175)	23.36	22.73	22.79			
		1715 (20000)	23.24	22.58	22.55			

	1RB-Low (0)	1750 (20350)	23.55	22.87	23.04			
		1732.5 (20175)	23.30	22.66	22.69			
		1715 (20000)	23.25	22.59	22.56			
	25RB-High (25)	1750 (20350)	22.75	21.76	21.71	23.0	22.0	22.0
		1732.5 (20175)	22.51	21.48	21.44			
		1715 (20000)	22.37	21.29	21.36			
	25RB-Middle (12)	1750 (20350)	22.69	21.66	21.70			
		1732.5 (20175)	22.48	21.49	21.48			
		1715 (20000)	22.39	21.38	21.39			
	25RB-Low (0)	1750 (20350)	22.67	21.64	21.62			
		1732.5 (20175)	22.35	21.37	21.36			
		1715 (20000)	22.38	21.36	21.36			
	50RB (0)	1750 (20350)	22.65	21.69	21.63	23.0	22.0	22.0
		1732.5 (20175)	22.48	21.45	21.41			
		1715 (20000)	22.38	19.50	20.44			
15MHz	1RB-High (74)	1747.5 (20325)	23.58	22.93	22.93	24.0	23.0	23.0
		1732.5 (20175)	23.42	22.68	22.61			
		1717.5 (20025)	23.32	22.52	22.46			
	1RB-Middle (37)	1747.5 (20325)	23.62	22.95	22.79			
		1732.5 (20175)	23.36	22.64	22.51			
		1717.5 (20025)	23.27	22.59	22.53			
	1RB-Low (0)	1747.5 (20325)	23.64	22.96	22.68			
		1732.5 (20175)	23.47	22.75	22.77			
		1717.5 (20025)	23.39	22.66	22.57			
	36RB-High (38)	1747.5 (20325)	22.72	21.73	21.67	23.0	22.0	22.0
		1732.5 (20175)	22.50	21.44	21.48			
		1717.5 (20025)	22.41	21.35	21.35			
	36RB-Middle (19)	1747.5 (20325)	22.70	21.64	21.65			
		1732.5 (20175)	22.49	21.51	21.49			
		1717.5 (20025)	22.42	21.42	21.39			
	36RB-Low (0)	1747.5 (20325)	22.74	21.72	21.70			
		1732.5 (20175)	22.46	21.48	21.47			
		1717.5 (20025)	20.69	21.38	21.37			
	75RB (0)	1747.5 (20325)	22.66	21.62	21.67	23.0	22.0	22.0
		1732.5 (20175)	22.54	21.52	21.48			
		1717.5 (20025)	21.02	21.43	19.96			
20MHz	1RB-High (99)	1745 (20300)	23.65	22.98	22.89	24.0	23.0	23.0
		1732.5 (20175)	23.57	22.88	22.77			

		1720 (20050)	23.39	22.65	22.46			
	1RB-Middle (50)	1745 (20300)	23.62	22.91	22.97			
		1732.5 (20175)	23.41	22.68	22.51			
		1720 (20050)	23.31	22.62	22.61			
	1RB-Low (0)	1745 (20300)	23.62	22.89	22.67			
		1732.5 (20175)	23.51	22.77	22.72			
		1720 (20050)	23.49	22.77	22.68			
	50RB-High (50)	1745 (20300)	22.71	21.73	21.69			
		1732.5 (20175)	22.59	21.58	21.57			
		1720 (20050)	22.45	21.44	21.39			
	50RB-Middle (25)	1745 (20300)	22.81	21.76	21.73			
		1732.5 (20175)	22.58	21.61	21.55	23.0	22.0	22.0
		1720 (20050)	22.52	21.50	21.47			
	50RB-Low (0)	1745 (20300)	22.70	21.69	21.64			
		1732.5 (20175)	22.56	21.57	21.52			
		1720 (20050)	21.78	21.47	21.43			
	100RB (0)	1745 (20300)	22.70	21.62	21.59			
		1732.5 (20175)	22.60	21.57	21.56	23.0	22.0	22.0
		1720 (20050)	22.54	21.48	19.95			

LTE Band12

BANDWIDTH	Number of RBs	Frequency (MHZ)	QPSK Power(dBm)	16QAM Power(dBm)	64QAM Power(dBm)	QPSK Tune-up(dBm)	16QAM Tune-up(dBm)	64QAM Tune-up(dBm)
1.4MHz	1RB-High (5)	715.3	24.04	23.22	23.12	24.5	23.5	23.5
		707.5	24.05	23.23	23.23			
		699.7	23.86	23.08	23.18			
	1RB-Middle (3)	715.3	24.12	23.27	23.34			
		707.5	24.07	23.31	23.31			
		699.7	23.90	23.21	23.24			
	1RB-Low (0)	715.3	24.08	23.29	23.36			
		707.5	23.94	23.17	23.19			
		699.7	23.85	23.19	23.22			
	3RB-High (3)	715.3	24.04	23.05	23.20	24.5	23.5	23.5
		707.5	24.04	23.08	23.18			
		699.7	23.83	22.90	23.00			
	3RB-Middle (1)	715.3	24.12	23.13	23.25			
		707.5	24.00	23.07	23.16			
		699.7	23.89	22.98	22.99			
	3RB-Low (0)	715.3	24.11	23.08	23.22			

		707.5	23.97	23.04	23.11			
		699.7	23.83	22.94	23.01			
	6RB (0)	715.3	23.15	22.14	22.19	23.5	22.5	22.5
		707.5	23.01	22.09	22.03			
		699.7	22.93	22.01	21.95			
3MHz	1RB-High (14)	714.5	24.15	23.30	23.30	24.5	23.5	23.5
		707.5	24.15	23.28	23.28			
		700.5	23.92	23.22	23.11			
	1RB-Middle (7)	714.5	24.15	23.32	23.37			
		707.5	24.11	23.28	23.26			
		700.5	23.90	23.18	23.08			
	1RB-Low (0)	714.5	24.18	23.37	23.36			
		707.5	24.08	23.27	23.23			
		700.5	24.02	23.22	23.21			
	8RB-High (7)	714.5	23.24	22.21	22.13	23.5	22.5	22.5
		707.5	23.17	22.18	22.12			
		700.5	23.01	22.04	22.05			
	8RB-Middle (4)	714.5	23.26	22.27	22.20			
		707.5	23.21	22.20	22.15			
		700.5	23.03	22.13	22.08			
	8RB-Low (0)	714.5	23.22	22.20	22.13			
		707.5	23.13	22.19	22.10			
		700.5	23.03	22.08	22.09			
	15RB (0)	714.5	23.20	22.15	22.12	23.5	22.5	22.5
		707.5	23.11	22.15	22.08			
		700.5	23.06	22.08	22.05			
5MHz	1RB-High (24)	713.5	24.20	23.37	23.24	24.5	23.5	23.5
		707.5	24.19	23.39	23.46			
		701.5	24.03	23.28	23.27			
	1RB-Middle (12)	713.5	24.18	23.44	23.37			
		707.5	24.12	23.37	23.44			
		701.5	23.93	23.20	23.20			
	1RB-Low (0)	713.5	24.15	23.34	23.35			
		707.5	24.08	23.32	23.37			
		701.5	23.98	23.24	23.24			
	12RB-High (13)	713.5	23.28	22.18	22.25	23.5	22.5	22.5
		707.5	23.20	22.17	22.19			
		701.5	22.99	22.07	22.06			
	12RB-Middle (6)	713.5	23.26	22.17	22.25			
		707.5	23.15	22.15	22.18			

		701.5	23.05	22.09	22.09			
	12RB-Low (0)	713.5	23.23	22.15	22.23			
		707.5	23.13	22.14	22.15			
		701.5	23.01	22.04	22.06			
	25RB (0)	713.5	23.21	22.17	22.23	23.5	22.5	22.5
		707.5	23.17	22.11	22.13			
		701.5	23.05	22.08	22.07			
10MHz	1RB-High (49)	711	24.20	23.44	23.39	24.5	24.0	24.0
		707.5	24.18	23.53	23.51			
		704	24.09	23.44	23.44			
	1RB-Middle (24)	711	24.18	23.47	23.49			
		707.5	24.12	23.46	23.49			
		704	23.93	23.26	23.38			
	1RB-Low (0)	711	24.10	23.32	23.34			
		707.5	24.03	23.24	23.23			
		704	23.88	23.19	23.14			
	25RB-High (25)	711	23.34	22.13	22.27	23.5	22.5	22.5
		707.5	23.27	22.21	22.20			
		704	23.13	22.09	22.15			
	25RB-Middle (12)	711	23.28	22.19	22.20			
		707.5	23.18	22.16	22.14			
		704	23.17	22.17	22.10			
	25RB-Low (0)	711	23.28	22.18	22.16			
		707.5	23.15	22.12	22.13			
		704	23.05	22.04	22.03			
	50RB (0)	711	23.26	22.15	22.13	23.5	22.5	22.5
		707.5	23.14	22.15	22.09			
		704	23.15	22.11	22.13			

LTE Band17

BANDWIDTH	Number of RBs	Frequency (MHZ)	QPSK Power(dBm)	16QAM Power(dBm)	64QAM Power(dBm)	QPSK Tune-up(dBm)	16QAM Tune-up(dBm)	64QAM Tune-up(dBm)
5MHz	1RB-High (24)	713.5 (23825)	24.11	23.27	23.22	24.5	23.5	23.5
		710 (23790)	24.10	23.29	23.28			
		706.5 (23755)	24.04	23.35	23.34			
	1RB-Middle (12)	713.5 (23825)	24.08	23.27	23.22			
		710 (23790)	23.99	23.31	23.24			
		706.5 (23755)	23.86	23.20	23.21			
	1RB-Low (0)	713.5 (23825)	24.03	23.20	23.12			
		710 (23790)	23.93	23.15	23.11			

		706.5 (23755)	23.81	23.15	23.19			
	12RB-High (13)	713.5 (23825)	23.17	22.08	22.09	23.5	22.5	22.5
		710 (23790)	23.11	22.13	22.08			
		706.5 (23755)	23.08	22.06	22.02			
	12RB-Middle (6)	713.5 (23825)	23.10	22.06	22.03			
		710 (23790)	23.07	22.09	22.02			
		706.5 (23755)	23.03	22.07	22.05			
	12RB-Low (0)	713.5 (23825)	23.14	22.02	21.99			
		710 (23790)	23.01	22.06	22.00			
		706.5 (23755)	22.92	21.95	21.99			
	25RB (0)	713.5 (23825)	23.08	22.02	22.02	23.5	22.5	22.5
		710 (23790)	23.01	22.05	22.04			
		706.5 (23755)	23.04	22.03	22.05			
10MHz	1RB-High (49)	711 (23800)	24.04	23.33	23.34	24.5	23.5	23.5
		710 (23790)	24.03	23.38	23.41			
		709 (23780)	24.03	23.39	23.46			
	1RB-Middle (24)	711 (23800)	24.11	23.33	23.31			
		710 (23790)	24.05	23.37	23.40			
		709 (23780)	23.92	23.28	23.41			
	1RB-Low (0)	711 (23800)	23.97	23.17	23.29			
		710 (23790)	23.86	23.14	23.24			
		709 (23780)	23.80	23.21	23.26			
	25RB-High (25)	711 (23800)	23.24	22.07	22.13	23.5	22.5	22.5
		710 (23790)	23.14	22.07	22.13			
		709 (23780)	23.11	22.16	22.11			
	25RB-Middle (12)	711 (23800)	23.15	22.00	22.04			
		710 (23790)	23.04	22.05	22.08			
		709 (23780)	23.12	22.15	22.14			
	25RB-Low (0)	711 (23800)	23.10	21.98	22.00			
		710 (23790)	23.00	21.99	22.00			
		709 (23780)	22.99	21.96	21.95			
	50RB (0)	711 (23800)	23.10	22.04	22.03	23.5	22.5	22.5
		710 (23790)	23.01	22.06	21.97			
		709 (23780)	23.03	21.99	22.00			

LTE Band41

BANDWIDTH	Number of RBs	Frequency (MHZ)	QPSK Power(dBm)	16QAM Power(dBm)	64QAM Power(dBm)	QPSK Tune-up(dBm)	16QAM Tune-up(dBm)	64QAM Tune-up(dBm)
5MHz	1RB-High (24)	2687.5 (41565)	23.18	22.49	22.36	23.5	23.0	22.5
		2640.3(41093)	23.20	22.46	22.38			

		2593 (40620)	23.00	22.29	22.17			
		2545.8(40148)	23.16	22.46	22.32			
		2498.5 (39675)	23.18	22.43	22.34			
	1RB-Middle (12)	2687.5 (41565)	23.26	22.52	22.40			
		2640.3(41093)	23.15	22.40	22.34			
		2593 (40620)	23.02	22.27	22.16			
		2545.8(40148)	23.13	22.43	22.33			
		2498.5 (39675)	23.15	22.43	22.35			
	1RB-Low (0)	2687.5 (41565)	23.22	22.48	22.40			
		2640.3(41093)	23.03	22.36	22.22			
		2593 (40620)	22.94	22.20	22.11			
		2545.8(40148)	23.09	22.36	22.26			
		2498.5 (39675)	23.20	22.48	22.36			
	12RB-High (13)	2687.5 (41565)	22.29	21.35	21.31			
		2640.3(41093)	22.31	21.36	21.28			
		2593 (40620)	22.11	21.14	21.10			
		2545.8(40148)	22.22	21.30	21.24			
		2498.5 (39675)	22.26	21.28	21.24			
	12RB-Middle (6)	2687.5 (41565)	22.31	21.40	21.33			
		2640.3(41093)	22.28	21.34	21.28			
		2593 (40620)	22.11	21.19	21.12	22.5	21.5	21.5
		2545.8(40148)	22.27	21.32	21.30			
		2498.5 (39675)	22.29	21.32	21.28			
	12RB-Low (0)	2687.5 (41565)	22.35	21.39	21.31			
		2640.3(41093)	22.18	21.24	21.19			
		2593 (40620)	22.01	21.09	21.02			
		2545.8(40148)	22.22	21.28	21.24			
		2498.5 (39675)	22.26	21.28	21.26			
	25RB (0)	2687.5 (41565)	22.32	21.35	21.30			
		2640.3(41093)	22.27	21.33	21.25			
		2593 (40620)	22.11	21.16	21.07	22.5	21.5	21.5
		2545.8(40148)	22.26	21.26	21.22			
		2498.5 (39675)	22.23	21.32	21.22			
10MHz	1RB-High (49)	2685 (41540)	23.14	22.46	22.46			
		2639(41080)	23.16	22.41	22.43			
		2593 (40620)	23.01	22.32	22.26	23.5	23.0	23.0
		2547(40160)	23.12	22.39	22.38			
		2501 (39700)	23.17	22.44	22.49			

	1RB-Middle (24)	2685 (41540)	23.15	22.53	22.45			
		2639(41080)	23.06	22.45	22.43			
		2593 (40620)	22.92	22.31	22.30			
		2547(40160)	23.03	22.47	22.37			
		2501 (39700)	23.05	22.40	22.45			
	1RB-Low (0)	2685 (41540)	23.31	22.56	22.58			
		2639(41080)	23.12	22.43	22.44			
		2593 (40620)	23.00	22.29	22.36			
		2547(40160)	23.13	22.42	22.45			
		2501 (39700)	23.17	22.42	22.52			
	25RB-High (25)	2685 (41540)	22.34	21.32	21.31			
		2639(41080)	22.27	21.30	21.23			
		2593 (40620)	22.11	21.14	21.08			
		2547(40160)	22.23	21.27	21.24			
		2501 (39700)	22.24	21.28	21.22			
	25RB-Middle (12)	2685 (41540)	22.39	21.38	21.33			
		2639(41080)	22.31	21.28	21.25			
		2593 (40620)	22.14	21.17	21.13	22.5	21.5	21.5
		2547(40160)	22.28	21.29	21.26			
		2501 (39700)	22.29	21.29	21.24			
	25RB-Low (0)	2685 (41540)	22.34	21.37	21.33			
		2639(41080)	22.15	21.18	21.13			
		2593 (40620)	22.03	21.02	21.00			
		2547(40160)	22.16	21.19	21.17			
		2501 (39700)	22.23	21.29	21.24			
	50RB (0)	2685 (41540)	22.35	21.37	21.33			
		2639(41080)	22.26	21.30	21.27			
		2593 (40620)	22.11	21.13	21.10	22.5	21.5	21.5
		2547(40160)	22.25	21.27	21.25			
		2501 (39700)	22.25	21.32	21.24			
15MHz	1RB-High (74)	2682.5 (41515)	23.17	22.42	22.17			
		2637.8(41068)	23.19	22.43	22.32			
		2593 (40620)	22.97	22.27	22.16			
		2548.3(40173)	23.11	22.43	22.31			
		2503.5 (39725)	22.98	22.34	22.15	23.5	23.0	22.5
	1RB-Middle (37)	2682.5 (41515)	23.20	22.40	22.25			
		2637.8(41068)	22.97	22.23	22.20			
		2593 (40620)	22.89	22.21	22.11			
		2548.3(40173)	23.06	22.36	22.22			

		2503.5 (39725)	23.07	22.33	22.20			
	1RB-Low (0)	2682.5 (41515)	23.20	22.51	22.46			
		2637.8(41068)	23.01	22.33	22.14			
		2593 (40620)	22.91	22.24	22.10			
		2548.3(40173)	23.04	22.38	22.24			
		2503.5 (39725)	23.05	22.31	22.22			
	36RB-High (38)	2682.5 (41515)	22.28	21.30	21.30	22.5	21.5	21.5
		2637.8(41068)	22.22	21.20	21.21			
		2593 (40620)	22.06	21.07	21.09			
		2548.3(40173)	22.19	21.17	21.21			
		2503.5 (39725)	22.18	21.19	21.21			
	36RB-Middle (19)	2682.5 (41515)	22.32	21.30	21.33			
		2637.8(41068)	22.20	21.18	21.21			
		2593 (40620)	22.08	21.07	21.07			
		2548.3(40173)	22.24	21.21	21.21			
		2503.5 (39725)	22.21	21.19	21.22			
	36RB-Low (0)	2682.5 (41515)	22.38	21.32	21.36			
		2637.8(41068)	22.12	21.09	21.11			
		2593 (40620)	22.01	20.98	21.03			
		2548.3(40173)	22.16	21.16	21.19			
		2503.5 (39725)	22.22	21.23	21.26			
	75RB (0)	2682.5 (41515)	22.34	21.37	21.33	22.5	21.5	21.5
		2637.8(41068)	22.20	21.21	21.23			
		2593 (40620)	22.08	21.09	21.09			
		2548.3(40173)	22.24	21.24	21.28			
		2503.5 (39725)	22.21	21.24	21.25			
20MHz	1RB-High (99)	2680 (41490)	23.12	22.34	22.12	23.5	23.0	22.5
		2636.5(41055)	23.15	22.42	22.25			
		2593 (40620)	22.92	22.20	22.04			
		2549.5(40185)	22.98	22.29	22.18			
		2506 (39750)	22.98	22.27	22.19			
	1RB-Middle (50)	2680 (41490)	23.12	22.42	22.27			
		2636.5(41055)	22.98	22.29	22.12			
		2593 (40620)	22.87	22.15	22.04			
		2549.5(40185)	23.00	22.33	22.18			
		2506 (39750)	22.99	22.30	22.16			
	1RB-Low (0)	2680 (41490)	23.26	22.70	22.50			
		2636.5(41055)	23.04	22.35	22.18			

		2593 (40620)	22.95	22.24	22.13			
		2549.5(40185)	23.01	22.33	22.27			
		2506 (39750)	23.00	22.33	22.23			
	50RB-High (50)	2680 (41490)	22.19	21.24	21.19	22.5	21.5	21.5
		2636.5(41055)	22.17	21.25	21.18			
		2593 (40620)	22.05	21.11	21.03			
		2549.5(40185)	22.20	21.24	21.15			
		2506 (39750)	22.20	21.23	21.17			
	50RB-Middle (25)	2680 (41490)	22.32	21.40	21.32			
		2636.5(41055)	22.15	21.22	21.16			
		2593 (40620)	22.08	21.12	21.06			
		2549.5(40185)	22.21	21.30	21.22			
		2506 (39750)	22.24	21.27	21.21			
	50RB-Low (0)	2680 (41490)	22.34	21.38	21.34			
		2636.5(41055)	22.09	21.13	21.10			
		2593 (40620)	21.98	21.05	20.96			
		2549.5(40185)	22.15	21.18	21.14			
		2506 (39750)	22.15	21.20	21.13			
	100RB (0)	2680 (41490)	22.32	21.38	21.43	22.5	21.5	21.5
		2636.5(41055)	22.17	21.24	21.24			
		2593 (40620)	22.07	21.11	21.13			
		2549.5(40185)	22.21	21.24	21.29			
		2506 (39750)	22.23	21.25	21.31			

WIFI 2.4GHz

Mode	Tones/RU Index	Freq.(MHz)	Average power output(dBm)			Tune-up(dBm)		
			Chain0	Chain1	MIMO	Chain0	Chain1	MIMO
802.11b	NA	2412	17.58	16.89	NA	18.0	17.5	NA
		2437	17.22	17.16	NA			
		2462	17.16	17.44	NA			
802.11g	NA	2412	14.82	14.98	NA	15.5	15.0	NA
		2437	14.86	14.97	NA			
		2462	15.07	14.98	NA			
802.11nHT20	NA	2412	13.95	13.62	16.80	14.0	14.0	17.0
		2437	13.56	13.74	16.66			
		2462	13.67	13.82	16.76			
802.11nHT40	NA	2422	13.65	13.56	16.62			
		2437	13.28	13.33	16.32			
		2452	13.46	13.16	16.32			
802.11ax HE20	26T/0	2412	11.56	11.63	14.61	12.0	12.0	15.0
		2437	11.50	11.42	14.47			
		2462	11.41	11.45	14.44			
	26T/4	2412	11.56	11.66	14.62			
		2437	11.53	11.40	14.48			
		2462	11.42	11.45	14.45			
	26T/8	2412	11.53	11.67	14.61			
		2437	11.53	11.40	14.48			
		2462	11.40	11.45	14.44			
	52T/37	2412	11.55	11.70	14.64			
		2437	11.53	11.39	14.47			
		2462	11.38	11.49	14.45			
	52T/39	2412	11.50	11.65	14.59			
		2437	11.50	11.41	14.47			
		2462	11.41	11.47	14.45			
	52T/40	2412	11.56	11.71	14.65			
		2437	11.53	11.38	14.47			
		2462	11.40	11.47	14.45			
	106T/53	2412	11.58	11.70	14.65			
		2437	11.51	11.35	14.44			
		2462	11.41	11.43	14.43			
	106T/54	2412	11.49	11.68	14.60			
		2437	11.52	11.36	14.45			
		2462	11.41	11.50	14.47			
	242T/61	2412	11.59	11.73	14.67			
		2437	11.58	11.44	14.52			
		2462	11.47	11.52	14.51			
802.11axHE40	26T/0	2422	11.23	11.54	14.40	12.0	12.5	15.0
		2437	11.75	11.26	14.52			
		2452	11.69	12.08	14.90			
	26T/10	2422	11.27	11.56	14.43			

		2437	11.80	11.26	14.55			
		2452	11.72	12.04	14.89			
	26T/17	2422	11.28	11.52	14.41			
		2437	11.77	11.32	14.56			
		2452	11.70	12.08	14.90			
	52T/37	2422	11.23	11.51	14.38			
		2437	11.77	11.26	14.53			
		2452	11.71	12.03	14.88			
	52T/41	2422	11.23	11.49	14.37			
		2437	11.79	11.30	14.56			
		2452	11.69	12.10	14.91			
	52T/44	2422	11.29	11.51	14.41			
		2437	11.76	11.25	14.52			
		2452	11.72	12.07	14.91			
	106T/53	2422	11.27	11.49	14.39			
		2437	11.81	11.32	14.58			
		2452	11.71	12.09	14.91			
	106T/55	2422	11.27	11.57	14.43			
		2437	11.73	11.27	14.52			
		2452	11.68	12.08	14.89			
	106T/56	2422	11.24	11.57	14.42			
		2437	11.81	11.34	14.59			
		2452	11.67	12.10	14.90			
	242T/61	2422	11.23	11.51	14.38			
		2437	11.75	11.26	14.52			
		2452	11.68	12.10	14.91			
	242T/62	2422	11.25	11.54	14.41			
		2437	11.79	11.29	14.56			
		2452	11.66	12.02	14.85			
	484T/65	2422	11.32	11.58	14.46			
		2437	11.83	11.35	14.61			
		2452	11.75	12.12	14.95			

WIFI 5GHz

Mode	Tones/	Freq.	Average power output(dBm)			Tune-up(dBm)		
	RU Index	(MHz)	Chain0	Chain1	MIMO	Chain0	Chain1	MIMO
802.11a	NA	5180	12.24	15.28	NA	13.0	15.5	NA
		5220	12.67	14.59	NA			
		5240	12.46	14.34	NA			
802.11n HT20	NA	5180	10.78	14.08	15.75	11.5	14.5	16.0
		5220	11.08	13.49	15.46			
		5240	10.96	13.10	15.17			
802.11n HT40	NA	5190	10.07	12.91	14.73			
		5230	10.48	12.73	14.76			
802.11ac VHT20	NA	5180	10.68	14.05	15.69	11.5	14.5	16.0
		5220	11.05	13.37	15.37			
		5240	10.89	13.06	15.12			
802.11ac VHT40	NA	5190	10.03	12.87	14.69			
		5230	10.42	12.65	14.69			
802.11ac VHT80	NA	5210	9.85	12.54	14.41			
802.11ax HE20	26T/0	5180	10.89	14.07	15.78	11.5	14.5	16.0
		5220	11.03	13.40	15.39			
		5240	11.02	13.12	15.21			
	26T/4	5180	10.91	14.13	15.82			
		5220	11.04	13.37	15.37			
		5240	11.04	13.06	15.18			
	26T/8	5180	10.86	14.12	15.80			
		5220	11.07	13.37	15.38			
		5240	10.99	13.13	15.20			
	52T/37	5180	10.84	14.09	15.77			
		5220	11.03	13.45	15.42			
		5240	11.05	13.06	15.18			
	52T/39	5180	10.85	14.13	15.80			
		5220	11.07	13.41	15.41			
		5240	11.00	13.11	15.19			
	52T/40	5180	10.87	14.12	15.80			
		5220	11.08	13.39	15.40			
		5240	11.04	13.05	15.17			
	106T/53	5180	10.86	14.13	15.81			
		5220	11.05	13.43	15.41			
		5240	11.02	13.05	15.16			
	106T/54	5180	10.88	14.07	15.77			
		5220	11.10	13.37	15.39			
		5240	10.98	13.12	15.19			
	242T/61	5180	10.93	14.16	15.85			
		5220	11.12	13.46	15.46			

		5240	11.08	13.14	15.24			
802.11ax HE40	26T/0	5190	9.42	12.31	14.11	10.0	12.5	14.5
		5230	9.69	12.22	14.15			
	26T/10	5190	9.39	12.27	14.07			
		5230	9.72	12.21	14.15			
	26T/17	5190	9.43	12.29	14.10			
		5230	9.72	12.19	14.14			
	52T/37	5190	9.43	12.31	14.11			
		5230	9.70	12.15	14.11			
	52T/41	5190	9.04	11.34	13.35			
		5230	9.00	11.38	13.36			
	52T/44	5190	8.98	11.41	13.37			
		5230	9.04	11.33	13.34			
	106T/53	5190	9.04	11.37	13.37			
		5230	9.03	11.40	13.39			
	106T/55	5190	8.98	11.37	13.35			
		5230	9.06	11.35	13.36			
	106T/56	5190	9.00	11.39	13.37			
		5230	9.03	11.39	13.38			
	242T/61	5190	9.03	11.41	13.39			
		5230	9.04	11.37	13.37			
	242T/62	5190	9.03	11.40	13.39			
		5230	8.97	11.38	13.35			
	484T/65	5190	9.46	12.36	14.16			
		5230	9.78	12.24	14.19			
802.11ax HE80	26T/0	5210	9.02	11.37	13.36	9.5	11.5	13.5
	26T/18	5210	8.97	11.37	13.34			
	26T/36	5210	9.02	11.41	13.39			
	52T/37	5210	8.99	11.36	13.35			
	52T/45	5210	9.03	11.36	13.36			
	52T/52	5210	9.03	11.36	13.36			
	106T/53	5210	9.01	11.35	13.35			
	106T/57	5210	9.02	11.35	13.35			
	106T/60	5210	9.03	11.40	13.39			
	242T/61	5210	9.01	11.35	13.35			
	242T/63	5210	9.00	11.36	13.35			
	242T/64	5210	9.00	11.33	13.33			
	484T/65	5210	8.99	11.35	13.34			
	484T/66	5210	9.01	11.37	13.36			
	996T/67	5210	9.07	11.43	13.42			

6.2 Standalone SAR Test Exclusion Considerations

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

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

Mothod1:
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:

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f (GHz)] ≤ 3.0 for 1-g 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 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 [(max. power of channel, including tune-up tolerance, mW)/(60/√f(GHz) mW)] ·[20 mm/(min.test separation distance, mm)] ≤ 1.0 for 1-g SAR; also see Appendix A for approximate exclusion threshold values at selected frequencies and distances.

Mothod2:
According to the KDB447498 appendix A

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table.

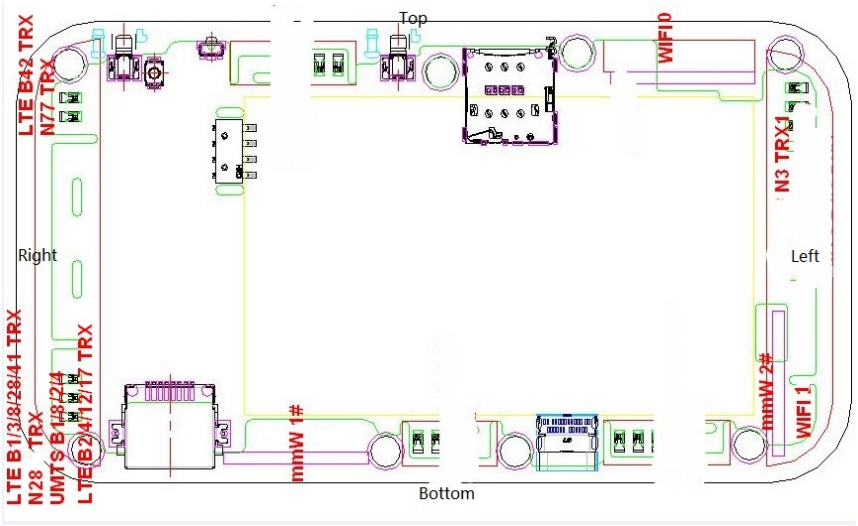
MHz	5	10	15	20	25	mm
150	39	77	116	155	194	*SAR Test Exclusion Threshold* (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

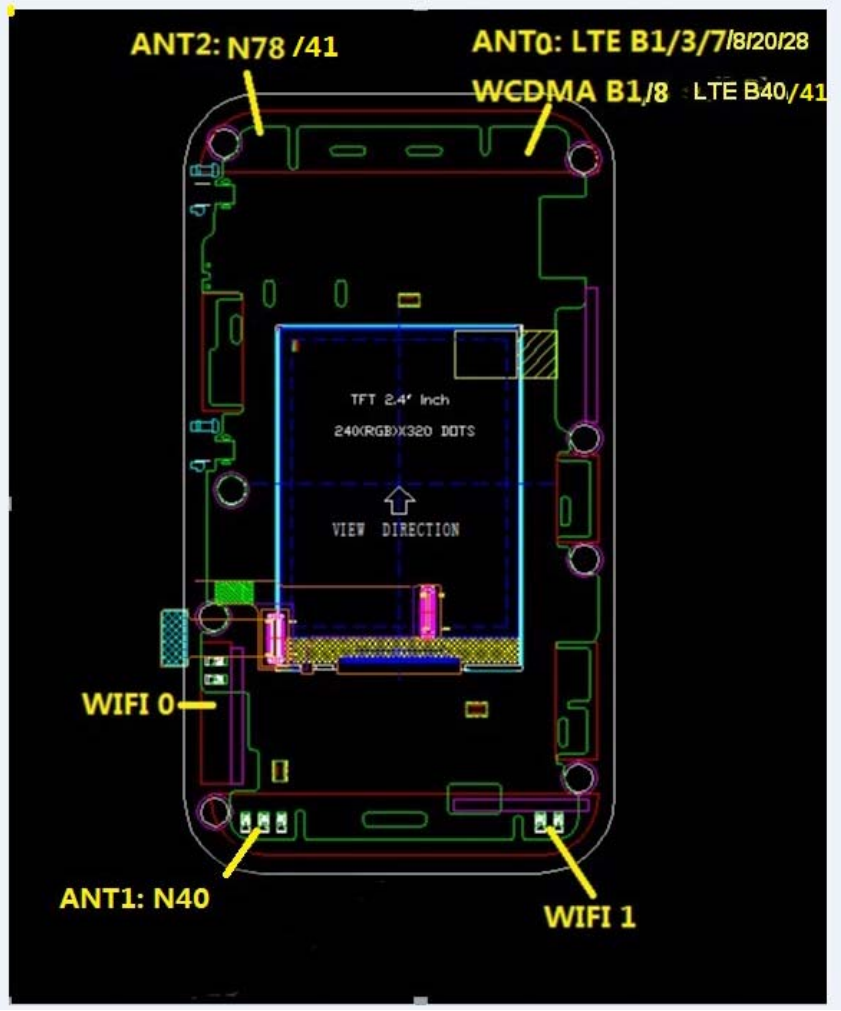
Summary of Transmitters

Band/Mode	Max conducted power adjusted for tune-up tolerance		Exposure condition	SAR test exclusion threshold (mW)	Standalone SAR Required
	dBm	mW			
Wi-Fi 2.4GHz	18.00	63.10	Head	10	Yes
			Body-worn/Hotspot	19	Yes
Wi-Fi 5GHz UNII-1	16.00	39.81	Head	7	Yes
			Body-worn/Hotspot	13	Yes

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.





Distance between antennas and edges				
Antenna	TOP	BOTTOM	LEFT	RIGHT
ANT0	20	5	119.5	3
ANT1	7	28.5	3	119.5
ANT2	9	53	119.5	3
WIFI0	2.5	65	15.5	93.5
WIFI1	47	2.75	3	122

Note: we defined these position when we face the screen of EUT, the reason why we perform SAR test for these edges is that the structures of antennas is close to our body, and for the other edges do not necessary cause we already consider the worst case.

6.3.1 Head Exposure Conditions

For WWAN

Test Configurations	SAR Required	Note
Left Touch	Yes	/
Left Tilt (15°)	Yes	/
Right Touch	Yes	/
Right Tilt (15°)	Yes	/

For WLAN

Test Configurations	SAR Required	Note
Left Touch	Yes	/
Left Tilt (15°)	Yes	/
Right Touch	Yes	/
Right Tilt (15°)	Yes	/

For BT/BLE

Test Configurations	SAR Required	Note
Left Touch	Yes	/
Left Tilt (15°)	Yes	/
Right Touch	Yes	/
Right Tilt (15°)	Yes	/

6.3.2 Body Worn Exposure conditions

For WWAN

Test Configurations	SAR Required	Note
Back	Yes	/
Front	Yes	/

For WLAN

Test Configurations	SAR Required	Note
Back	Yes	/
Front	Yes	/

For BT/BLE

Test Configurations	SAR Required	Note
Back	Yes	/
Front	Yes	/

6.3.3 Hotspot Exposure conditions

For WWAN

Test Configurations	SAR Required	Antenna-to-edge(s) distances
Back	Yes*	＜25mm
Front	Yes*	＜25mm
Top	Yes	＜25mm
Bottom	Yes	＜25mm
Left	No	＞25mm
Right	Yes	＜25mm

For WLAN

Test Configurations	SAR Required	Antenna-to-edge(s) distances
Back	Yes*	＜25mm
Front	Yes*	＜25mm
Top	Yes	＜25mm
Bottom	Yes	＜25mm
Left	Yes	＜25mm
Right	No	＞25mm

Note*: For hotspot mode, it's not necessary test Rear and Front position for bands which haven't "hotspot power reduction" scheme. Because we already test the these position without hotspot mode in Body Exposure conditions, Normally if the hotspot mode on, the technology "power reduction" used for mobile, so we consider the worst condition, and remain the data of body worn as hotspots mode.

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. 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.

Date Tested	Freq. (MHz)	Liquid parameters	measured	Target	Delta (%)	Tolerance (%)
2020.09.08	750	εr	41.352	41.90	-1.31	±10
		σ[S/m]	0.923	0.89	3.71	±10
2020.09.09	1800	εr	40.688	40.00	1.72	±10
		σ[S/m]	1.418	1.40	1.29	±10
2020.09.09	2000	εr	39.844	40.00	-0.39	±10
		σ[S/m]	1.427	1.40	1.93	±10
2020.09.10	2450	εr	38.343	39.20	-2.19	±10
		σ[S/m]	1.866	1.80	3.67	±10
2020.09.11	2600	εr	39.672	39.00	1.72	±10
		σ[S/m]	1.951	1.96	-0.46	±10
2020.09.12	5200	εr	36.811	36.0	2.25	±5
		σ[S/m]	4.72	4.66	1.29	±5

Note: For DASY system, the conservative tolerance 5% could expand to 10% when the frequency under 3GHz

A 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.

Date Tested	System dipole	SAR measured (normalized to 1W)		Target (Ref. Value)	Delta (%)	Tolerance (%)
2020.09.08	D750V3	1g	8.24	8.26	-0.24	±10
2020.09.09	D1800V2	1g	37.96	38.9	-2.42	±10
2020.09.09	D2000V2	1g	39.28	40.3	-2.53	±10
2020.09.10	D2450V2	1g	54.00	52.4	3.05	±10
2020.09.11	D2600V2	1g	56.40	56.6	-0.35	±10
2020.09.12	D5GHzV3	1g	82.10	77.6	5.80	±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., Nc > 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 ≤0.8W/kg, other channels SAR testing are not necessary.
3. The distance between the EUT and the phantom bottom is 10mm.

Mode		Duty cycle	Duty factor	Note
Licensed Frequency	WCDMA Band	100%	NA	According to the theory, for WWAN we configured duty cycle with relevant value on the communication tester, so correction factor do not need such as “duty factor”
	FDD-LTE Band	100%		
	TDD-LTE Band	63.3%		
	WIFI 2.4GHz 802.11b	99.1	1.01	
	WIFI 5GHz 802.11a	99	1.01	

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
Rel.99	Body-worn	Back	L	23.63	24.00	1.09	---	---	---	---
			M	23.56	24.00	1.11	0.328	---	0.364	---
			H	23.43	24.00	1.14	---	---	---	---
		Front	L	23.63	24.00	1.09	---	---	---	---
			M	23.56	24.00	1.11	0.417	---	0.463	---
			H	23.43	24.00	1.14	---	---	---	---
	Hotspot	Back	L	23.63	24.00	1.09	---	---	---	---
			M	23.56	24.00	1.11	0.328	---	0.364	---
			H	23.43	24.00	1.14	---	---	---	---
		Front	L	23.63	24.00	1.09	---	---	---	---
			M	23.56	24.00	1.11	0.417	---	0.463	---
			H	23.43	24.00	1.14	---	---	---	---
		Top	L	23.63	24.00	1.09	---	---	---	---
			M	23.56	24.00	1.11	0.109	---	0.121	---
			H	23.43	24.00	1.14	---	---	---	---
		Bottom	L	23.63	24.00	1.09	---	---	---	---
			M	23.56	24.00	1.11	0.256	---	0.284	---
			H	23.43	24.00	1.14	---	---	---	---
		Left	L	23.63	24.00	1.09	---	---	---	---
			M	23.56	24.00	1.11	---	---	---	---
			H	23.43	24.00	1.14	---	---	---	---
		Right	L	23.63	24.00	1.09	---	---	---	---
			M	23.56	24.00	1.11	0.200	---	0.222	---
			H	23.43	24.00	1.14	---	---	---	---

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
Rel.99	Body-worn	Back	L	23.27	24.00	1.18	---	---	---	---
			M	23.48	24.00	1.13	0.272	---	0.307	---
			H	23.64	24.00	1.09	---	---	---	---
		Front	L	23.27	24.00	1.18	---	---	---	---
			M	23.48	24.00	1.13	0.394	---	0.445	---
			H	23.64	24.00	1.09	---	---	---	---
	Hotspot	Back	L	23.27	24.00	1.18	---	---	---	---
			M	23.48	24.00	1.13	0.272	---	0.307	---
			H	23.64	24.00	1.09	---	---	---	---
		Front	L	23.27	24.00	1.18	---	---	---	---
			M	23.48	24.00	1.13	0.394	---	0.445	---
			H	23.64	24.00	1.09	---	---	---	---
		Top	L	23.27	24.00	1.18	---	---	---	---
			M	23.48	24.00	1.13	0.119	---	0.134	---
			H	23.64	24.00	1.09	---	---	---	---
		Bottom	L	23.27	24.00	1.18	---	---	---	---
			M	23.48	24.00	1.13	0.243	---	0.275	---
			H	23.64	24.00	1.09	---	---	---	---
		Left	L	23.27	24.00	1.18	---	---	---	---
			M	23.48	24.00	1.13	---	---	---	---
			H	23.64	24.00	1.09	---	---	---	---
		Right	L	23.27	24.00	1.18	---	---	---	---
			M	23.48	24.00	1.13	0.112	---	0.127	---
			H	23.64	24.00	1.09	---	---	---	---

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-worn	Back	L	23.28	23.50	1.05	---	---	---	---
			M	23.34	23.50	1.04	0.305	---	0.317	---
			H	23.43	23.50	1.02	---	---	---	---
		Front	L	23.28	23.50	1.05	---	---	---	---
			M	23.34	23.50	1.04	0.387	---	0.402	---
			H	23.43	23.50	1.02	---	---	---	---
	Hotspot	Back	L	23.28	23.50	1.05	---	---	---	---
			M	23.34	23.50	1.04	0.305	---	0.317	---
			H	23.43	23.50	1.02	---	---	---	---
		Front	L	23.28	23.50	1.05	---	---	---	---
			M	23.34	23.50	1.04	0.387	---	0.402	---
			H	23.43	23.50	1.02	---	---	---	---
		Top	L	23.28	23.50	1.05	---	---	---	---
			M	23.34	23.50	1.04	0.110	---	0.114	---
			H	23.43	23.50	1.02	---	---	---	---
		Bottom	L	23.28	23.50	1.05	---	---	---	---
			M	23.34	23.50	1.04	0.224	---	0.233	---
			H	23.43	23.50	1.02	---	---	---	---
		Left	L	23.28	23.50	1.05	---	---	---	---
			M	23.34	23.50	1.04	---	---	---	---
			H	23.43	23.50	1.02	---	---	---	---
		Right	L	23.28	23.50	1.05	---	---	---	---
			M	23.34	23.50	1.04	0.146	---	0.152	---
			H	23.43	23.50	1.02	---	---	---	---
QPSK 50%RB	Body-worn	Back	L	22.29	22.50	1.05	---	---	---	---
			M	22.45	22.50	1.01	0.232	---	0.234	---
			H	22.38	22.50	1.03	---	---	---	---
		Front	L	22.29	22.50	1.05	---	---	---	---
			M	22.45	22.50	1.01	0.294	---	0.297	---
			H	22.38	22.50	1.03	---	---	---	---
	Hotspot	Back	L	22.29	22.50	1.05	---	---	---	---
			M	22.45	22.50	1.01	0.232	---	0.234	---
			H	22.38	22.50	1.03	---	---	---	---
		Front	L	22.29	22.50	1.05	---	---	---	---
			M	22.45	22.50	1.01	0.294	---	0.297	---
			H	22.38	22.50	1.03	---	---	---	---
		Top	L	22.29	22.50	1.05	---	---	---	---
			M	22.45	22.50	1.01	0.096	---	0.097	---
			H	22.38	22.50	1.03	---	---	---	---
		Bottom	L	22.29	22.50	1.05	---	---	---	---
			M	22.45	22.50	1.01	0.187	---	0.189	---
			H	22.38	22.50	1.03	---	---	---	---
		Left	L	22.29	22.50	1.05	---	---	---	---
			M	22.45	22.50	1.01	---	---	---	---
			H	22.38	22.50	1.03	---	---	---	---
		Right	L	22.29	22.50	1.05	---	---	---	---
			M	22.45	22.50	1.01	0.126	---	0.127	---
			H	22.38	22.50	1.03	---	---	---	---

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-worn	Back	L	23.65	24.00	1.08	---	---	---	---
			M	23.57	24.00	1.10	0.270	---	0.297	---
			H	23.39	24.00	1.15	---	---	---	---
		Front	L	23.65	24.00	1.08	---	---	---	---
			M	23.57	24.00	1.10	0.378	---	0.416	---
			H	23.39	24.00	1.15	---	---	---	---
	Hotspot	Back	L	23.65	24.00	1.08	---	---	---	---
			M	23.57	24.00	1.10	0.270	---	0.297	---
			H	23.39	24.00	1.15	---	---	---	---
		Front	L	23.65	24.00	1.08	---	---	---	---
			M	23.57	24.00	1.10	0.378	---	0.416	---
			H	23.39	24.00	1.15	---	---	---	---
		Top	L	23.65	24.00	1.08	---	---	---	---
			M	23.57	24.00	1.10	0.109	---	0.120	---
			H	23.39	24.00	1.15	---	---	---	---
		Bottom	L	23.65	24.00	1.08	---	---	---	---
			M	23.57	24.00	1.10	0.214	---	0.235	---
			H	23.39	24.00	1.15	---	---	---	---
		Left	L	23.65	24.00	1.08	---	---	---	---
			M	23.57	24.00	1.10	---	---	---	---
			H	23.39	24.00	1.15	---	---	---	---
		Right	L	23.65	24.00	1.08	---	---	---	---
			M	23.57	24.00	1.10	0.118	---	0.130	---
			H	23.39	24.00	1.15	---	---	---	---
QPSK 50%RB	Body-worn	Back	L	22.81	23.00	1.04	---	---	---	---
			M	22.58	23.00	1.10	0.210	---	0.231	---
			H	22.52	23.00	1.12	---	---	---	---
		Front	L	22.81	23.00	1.04	---	---	---	---
			M	22.58	23.00	1.10	0.302	---	0.332	---
			H	22.52	23.00	1.12	---	---	---	---
	Hotspot	Back	L	22.81	23.00	1.04	---	---	---	---
			M	22.58	23.00	1.10	0.210	---	0.231	---
			H	22.52	23.00	1.12	---	---	---	---
		Front	L	22.81	23.00	1.04	---	---	---	---
			M	22.58	23.00	1.10	0.302	---	0.332	---
			H	22.52	23.00	1.12	---	---	---	---
		Top	L	22.81	23.00	1.04	---	---	---	---
			M	22.58	23.00	1.10	0.098	---	0.108	---
			H	22.52	23.00	1.12	---	---	---	---
		Bottom	L	22.81	23.00	1.04	---	---	---	---
			M	22.58	23.00	1.10	0.169	---	0.186	---
			H	22.52	23.00	1.12	---	---	---	---
		Left	L	22.81	23.00	1.04	---	---	---	---
			M	22.58	23.00	1.10	---	---	---	---
			H	22.52	23.00	1.12	---	---	---	---
		Right	L	22.81	23.00	1.04	---	---	---	---
			M	22.58	23.00	1.10	0.095	---	0.105	---
			H	22.52	23.00	1.12	---	---	---	---

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-worn	Back	L	24.20	24.50	1.07	---	---	---	---
			M	24.18	24.50	1.08	0.488	---	0.527	---
			H	24.09	24.50	1.10	---	---	---	---
		Front	L	24.20	24.50	1.07	---	---	---	---
			M	24.18	24.50	1.08	0.456	---	0.492	---
			H	24.09	24.50	1.10	---	---	---	---
	Hotspot	Back	L	24.20	24.50	1.07	---	---	---	---
			M	24.18	24.50	1.08	0.488	---	0.527	---
			H	24.09	24.50	1.10	---	---	---	---
		Front	L	24.20	24.50	1.07	---	---	---	---
			M	24.18	24.50	1.08	0.456	---	0.492	---
			H	24.09	24.50	1.10	---	---	---	---
		Top	L	24.20	24.50	1.07	---	---	---	---
			M	24.18	24.50	1.08	0.213	---	0.230	---
			H	24.09	24.50	1.10	---	---	---	---
		Bottom	L	24.20	24.50	1.07	---	---	---	---
			M	24.18	24.50	1.08	0.296	---	0.320	---
			H	24.09	24.50	1.10	---	---	---	---
		Left	L	24.20	24.50	1.07	---	---	---	---
			M	24.18	24.50	1.08	---	---	---	---
			H	24.09	24.50	1.10	---	---	---	---
		Right	L	24.20	24.50	1.07	---	---	---	---
			M	24.18	24.50	1.08	0.072	---	0.078	---
			H	24.09	24.50	1.10	---	---	---	---
QPSK 50%RB	Body-worn	Back	L	23.34	23.50	1.04	---	---	---	---
			M	23.27	23.50	1.05		---	0.000	---
			H	23.13	23.50	1.09	---	---	---	---
		Front	L	23.34	23.50	1.04	---	---	---	---
			M	23.27	23.50	1.05		---	0.000	---
			H	23.13	23.50	1.09	---	---	---	---
	Hotspot	Back	L	23.34	23.50	1.04	---	---	---	---
			M	23.27	23.50	1.05	0.404	---	0.424	---
			H	23.13	23.50	1.09	---	---	---	---
		Front	L	23.34	23.50	1.04	---	---	---	---
			M	23.27	23.50	1.05	0.383	---	0.402	---
			H	23.13	23.50	1.09	---	---	---	---
		Top	L	23.34	23.50	1.04	---	---	---	---
			M	23.27	23.50	1.05	0.177	---	0.186	---
			H	23.13	23.50	1.09	---	---	---	---
		Bottom	L	23.34	23.50	1.04	---	---	---	---
			M	23.27	23.50	1.05	0.253	---	0.266	---
			H	23.13	23.50	1.09	---	---	---	---
		Left	L	23.34	23.50	1.04	---	---	---	---
			M	23.27	23.50	1.05	---	---	---	---
			H	23.13	23.50	1.09	---	---	---	---
		Right	L	23.34	23.50	1.04	---	---	---	---
			M	23.27	23.50	1.05	0.066	---	0.069	---
			H	23.13	23.50	1.09	---	---	---	---

Mode: LTE Band 17

fL (MHz)=709 MHz fM (MHz)=710MHz 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-worn	Back	L	24.11	24.50	1.09	---	---	---	---
			M	24.05	24.50	1.11	0.482	---	0.535	---
			H	23.92	24.50	1.14	---	---	---	---
		Front	L	24.11	24.50	1.09	---	---	---	---
			M	24.05	24.50	1.11	0.458	---	0.508	---
			H	23.92	24.50	1.14	---	---	---	---
	Hotspot	Back	L	24.11	24.50	1.09	---	---	---	---
			M	24.05	24.50	1.11	0.482	---	0.535	---
			H	23.92	24.50	1.14	---	---	---	---
		Front	L	24.11	24.50	1.09	---	---	---	---
			M	24.05	24.50	1.11	0.458	---	0.508	---
			H	23.92	24.50	1.14	---	---	---	---
		Top	L	24.11	24.50	1.09	---	---	---	---
			M	24.05	24.50	1.11	0.230	---	0.255	---
			H	23.92	24.50	1.14	---	---	---	---
		Bottom	L	24.11	24.50	1.09	---	---	---	---
			M	24.05	24.50	1.11	0.326	---	0.362	---
			H	23.92	24.50	1.14	---	---	---	---
		Left	L	24.11	24.50	1.09	---	---	---	---
			M	24.05	24.50	1.11	---	---	---	---
			H	23.92	24.50	1.14	---	---	---	---
		Right	L	24.11	24.50	1.09	---	---	---	---
			M	24.05	24.50	1.11	0.077	---	0.085	---
			H	23.92	24.50	1.14	---	---	---	---
QPSK 50%RB	Body-worn	Back	L	23.24	23.50	1.06	---	---	---	---
			M	23.14	23.50	1.09	0.395	---	0.431	---
			H	23.11	23.50	1.09	---	---	---	---
		Front	L	23.24	23.50	1.06	---	---	---	---
			M	23.14	23.50	1.09	0.373	---	0.407	---
			H	23.11	23.50	1.09	---	---	---	---
	Hotspot	Back	L	23.24	23.50	1.06	---	---	---	---
			M	23.14	23.50	1.09	0.395	---	0.431	---
			H	23.11	23.50	1.09	---	---	---	---
		Front	L	23.24	23.50	1.06	---	---	---	---
			M	23.14	23.50	1.09	0.373	---	0.407	---
			H	23.11	23.50	1.09	---	---	---	---
		Top	L	23.24	23.50	1.06	---	---	---	---
			M	23.14	23.50	1.09	0.189	---	---	---
			H	23.11	23.50	1.09	---	---	---	---
		Bottom	L	23.24	23.50	1.06	---	---	---	---
			M	23.14	23.50	1.09	0.269	---	0.293	---
			H	23.11	23.50	1.09	---	---	---	---
		Left	L	23.24	23.50	1.06	---	---	---	---
			M	23.14	23.50	1.09	---	---	---	---
			H	23.11	23.50	1.09	---	---	---	---
		Right	L	23.24	23.50	1.06	---	---	---	---
			M	23.14	23.50	1.09	0.061	---	0.066	---
			H	23.11	23.50	1.09	---	---	---	---

Mode: LTE Band 41

fL (MHz)= 2498.5 MHz fM (MHz)= 2593MHz fH (MHz)= 2687.5MHz

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-worn	Back	L	23.26	23.50	1.06	---	---	---	---
			L-M	23.04	23.50	1.11	---	---	---	---
			M	22.95	23.50	1.14	0.608	---	0.693	---
			M-H	23.01	23.50	1.12	---	---	---	---
			H	23.00	23.50	1.12	---	---	---	---
		Front	L	23.26	23.50	1.06	---	---	---	---
			L-M	23.04	23.50	1.11	---	---	---	---
			M	22.95	23.50	1.14	0.326	---	0.372	---
			M-H	23.01	23.50	1.12	---	---	---	---
			H	23.00	23.50	1.12	---	---	---	---
	Hotspot	Back	L	23.26	23.50	1.06	---	---	---	---
			L-M	23.04	23.50	1.11	---	---	---	---
			M	22.95	23.50	1.14	0.608	---	0.693	---
			M-H	23.01	23.50	1.12	---	---	---	---
			H	23.00	23.50	1.12	---	---	---	---
		Front	L	23.26	23.50	1.06	---	---	---	---
			L-M	23.04	23.50	1.11	---	---	---	---
			M	22.95	23.50	1.14	0.326	---	0.372	---
			M-H	23.01	23.50	1.12	---	---	---	---
			H	23.00	23.50	1.12	---	---	---	---
		Top	L	23.26	23.50	1.06	---	---	---	---
			L-M	23.04	23.50	1.11	---	---	---	---
			M	22.95	23.50	1.14	0.044	---	0.050	---
			M-H	23.01	23.50	1.12	---	---	---	---
			H	23.00	23.50	1.12	---	---	---	---
		Bottom	L	23.26	23.50	1.06	---	---	---	---
			L-M	23.04	23.50	1.11	---	---	---	---
			M	22.95	23.50	1.14	0.048	---	0.055	---
			M-H	23.01	23.50	1.12	---	---	---	---
			H	23.00	23.50	1.12	---	---	---	---
		Left	L	23.26	23.50	1.06	---	---	---	---
			L-M	23.04	23.50	1.11	---	---	---	---
			M	22.95	23.50	1.14	---	---	---	---
			M-H	23.01	23.50	1.12	---	---	---	---
			H	23.00	23.50	1.12	---	---	---	---
		Right	L	23.26	23.50	1.06	---	---	---	---
			L-M	23.04	23.50	1.11	---	---	---	---
			M	22.95	23.50	1.14	0.673	---	0.767	---
			M-H	23.01	23.50	1.12	---	---	---	---
			H	23.00	23.50	1.12	---	---	---	---
QPSK 50%RB	Body-worn	Back	L	22.34	22.50	1.04	---	---	---	---
			L-M	22.09	22.50	1.10	---	---	---	---
			M	21.98	22.50	1.13	0.534	---	0.603	---
			M-H	22.15	22.50	1.08	---	---	---	---
			H	22.15	22.50	1.08	---	---	---	---
		Front	L	22.34	22.50	1.04	---	---	---	---
			L-M	22.09	22.50	1.10	---	---	---	---
			M	21.98	22.50	1.13	0.259	---	0.293	---
			M-H	22.15	22.50	1.08	---	---	---	---
			H	22.15	22.50	1.08	---	---	---	---
	Hotspot	Back	L	22.34	22.50	1.04	---	---	---	---
			L-M	22.09	22.50	1.10	---	---	---	---
			M	21.98	22.50	1.13	0.504	---	0.570	---

			M-H	22.15	22.50	1.08	---	---	---	---
			H	22.15	22.50	1.08	---	---	---	---
		Front	L	22.34	22.50	1.04	---	---	---	---
			L-M	22.09	22.50	1.10	---	---	---	---
			M	21.98	22.50	1.13	0.259	---	0.293	---
			M-H	22.15	22.50	1.08	---	---	---	---
			H	22.15	22.50	1.08	---	---	---	---
		Top	L	22.34	22.50	1.04	---	---	---	---
			L-M	22.09	22.50	1.10	---	---	---	---
			M	21.98	22.50	1.13	0.043	---	0.049	---
			M-H	22.15	22.50	1.08	---	---	---	---
			H	22.15	22.50	1.08	---	---	---	---
		Bottom	L	22.34	22.50	1.04	---	---	---	---
			L-M	22.09	22.50	1.10	---	---	---	---
			M	21.98	22.50	1.13	0.039	---	0.044	---
			M-H	22.15	22.50	1.08	---	---	---	---
			H	22.15	22.50	1.08	---	---	---	---
		Left	L	22.34	22.50	1.04	---	---	---	---
			L-M	22.09	22.50	1.10	---	---	---	---
			M	21.98	22.50	1.13	---	---	---	---
			M-H	22.15	22.50	1.08	---	---	---	---
			H	22.15	22.50	1.08	---	---	---	---
		Right	L	22.34	22.50	1.04	---	---	---	---
			L-M	22.09	22.50	1.10	---	---	---	---
			M	21.98	22.50	1.13	0.527	---	0.596	---
			M-H	22.15	22.50	1.08	---	---	---	---
			H	22.15	22.50	1.08	---	---	---	---

Mode: Wi-Fi 2.4GHz

fL (MHz)=2412MHz fM (MHz)=2437MHz fH (MHz)= 2462MHz

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

Test case				Meas power(dBm)	Tune-up (dBm)	Scaling factor	Duty factor	Meas SAR(w/kg)		Report SAR(w/kg)	
Mode	Exposure condition	Position	Channel					First	Second	First	Second
802.11b (wifi ant0)	Body-worn	Back	L	17.58	18.00	1.10	1.01	---	---	---	---
			M	17.22	18.00	1.20	1.01	0.128	---	0.154	---
			H	17.16	18.00	1.21	1.01	---	---	---	---
		Front	L	17.58	18.00	1.10	1.01	---	---	---	---
			M	17.22	18.00	1.20	1.01	0.268	---	0.322	---
			H	17.16	18.00	1.21	1.01	---	---	---	---
	Hotspot	Back	L	17.58	18.00	1.10	1.01	---	---	---	---
			M	17.22	18.00	1.20	1.01	0.128	---	0.154	---
			H	17.16	18.00	1.21	1.01	---	---	---	---
		Front	L	17.58	18.00	1.10	1.01	---	---	---	---
			M	17.22	18.00	1.20	1.01	0.268	---	0.322	---
			H	17.16	18.00	1.21	1.01	---	---	---	---
		Top	L	17.58	18.00	1.10	1.01	---	---	---	---
			M	17.22	18.00	1.20	1.01	0.274	---	0.329	---
			H	17.16	18.00	1.21	1.01	---	---	---	---
		Bottom	L	17.58	18.00	1.10	1.01	---	---	---	---
			M	17.22	18.00	1.20	1.01	---	---	---	---
			H	17.16	18.00	1.21	1.01	---	---	---	---
		Left	L	17.58	18.00	1.10	1.01	---	---	---	---
			M	17.22	18.00	1.20	1.01	0.064	---	0.077	---
			H	17.16	18.00	1.21	1.01	---	---	---	---
		Right	L	17.58	18.00	1.10	1.01	---	---	---	---
			M	17.22	18.00	1.20	1.01	---	---	---	---
			H	17.16	18.00	1.21	1.01	---	---	---	---
802.11b (wifi ant1)	Body-worn	Back	L	16.89	17.50	1.15	1.01	---	---	---	---
			M	17.16	17.50	1.08	1.01	0.135	---	0.146	---
			H	17.44	17.50	1.01	1.01	---	---	---	---
		Front	L	16.89	17.50	1.15	1.01	---	---	---	---
			M	17.16	17.50	1.08	1.01	0.162	---	0.175	---
			H	17.44	17.50	1.01	1.01	---	---	---	---
	Hotspot	Back	L	16.89	17.50	1.15	1.01	---	---	---	---
			M	17.16	17.50	1.08	1.01	0.135	---	0.146	---
			H	17.44	17.50	1.01	1.01	---	---	---	---
		Front	L	16.89	17.50	1.15	1.01	---	---	---	---
			M	17.16	17.50	1.08	1.01	0.162	---	0.175	---
			H	17.44	17.50	1.01	1.01	---	---	---	---
		Top	L	16.89	17.50	1.15	1.01	---	---	---	---
			M	17.16	17.50	1.08	1.01	---	---	---	---
			H	17.44	17.50	1.01	1.01	---	---	---	---
		Bottom	L	16.89	17.50	1.15	1.01	---	---	---	---
			M	17.16	17.50	1.08	1.01	0.075	---	0.081	---
			H	17.44	17.50	1.01	1.01	---	---	---	---
		Left	L	16.89	17.50	1.15	1.01	---	---	---	---
			M	17.16	17.50	1.08	1.01	0.096	---	0.104	---
			H	17.44	17.50	1.01	1.01	---	---	---	---
		Right	L	16.89	17.50	1.15	1.01	---	---	---	---
			M	17.16	17.50	1.08	1.01	---	---	---	---
			H	17.44	17.50	1.01	1.01	---	---	---	---
802.11n20 MIMO	Body-worn	Back	L	16.80	17.00	1.05	1.00	---	---	---	---
			M	16.66	17.00	1.08	1.00	0.102	---	0.110	---
			H	16.76	17.00	1.06	1.00	---	---	---	---
		Front	L	16.80	17.00	1.05	1.00	---	---	---	---
			M	16.66	17.00	1.08	1.00	0.177	---	0.191	---

			H	16.76	17.00	1.06	1.00	---	---	---	---
	Hotspot	Back	L	16.80	17.00	1.05	1.00	---	---	---	---
			M	16.66	17.00	1.08	1.00	0.102	---	0.110	---
			H	16.76	17.00	1.06	1.00	---	---	---	---
		Front	L	16.80	17.00	1.05	1.00	---	---	---	---
			M	16.66	17.00	1.08	1.00	0.177	---	0.191	---
			H	16.76	17.00	1.06	1.00	---	---	---	---
		Top	L	16.80	17.00	1.05	1.00	---	---	---	---
			M	16.66	17.00	1.08	1.00	0.112	---	0.121	---
			H	16.76	17.00	1.06	1.00	---	---	---	---
		Bottom	L	16.80	17.00	1.05	1.00	---	---	---	---
			M	16.66	17.00	1.08	1.00	0.042	---	0.045	---
			H	16.76	17.00	1.06	1.00	---	---	---	---
		Left	L	16.80	17.00	1.05	1.00	---	---	---	---
			M	16.66	17.00	1.08	1.00	0.088	---	0.095	---
			H	16.76	17.00	1.06	1.00	---	---	---	---
		Right	L	16.80	17.00	1.05	1.00	---	---	---	---
			M	16.66	17.00	1.08	1.00	---	---	---	---
			H	16.76	17.00	1.06	1.00	---	---	---	---

Mode: Wi-Fi5GHz UNII-1

fL (MHz)=5180MHz fM (MHz)=5200MHz fH (MHz)= 5240MHz

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

Test case				Meas power(dBm)	Tune-up (dBm)	Scaling factor	Duty factor	Meas SAR(w/kg)		Report SAR(w/kg)	
Mode	Exposure condition	Position	Channel					First	Second	First	Second
802.11a (wifi ant0)	Body-worn	Back	L	12.24	13.00	1.19	1.01	---	---	---	---
			M	12.67	13.00	1.08	1.01	0.067	---	0.072	---
			H	12.46	13.00	1.13	1.01	---	---	---	---
		Front	L	12.24	13.00	1.19	1.01	---	---	---	---
			M	12.67	13.00	1.08	1.01	0.229	---	0.247	---
			H	12.46	13.00	1.13	1.01	---	---	---	---
	Hotspot	Back	L	12.24	13.00	1.19	1.01	---	---	---	---
			M	12.67	13.00	1.08	1.01	0.067	---	0.072	---
			H	12.46	13.00	1.13	1.01	---	---	---	---
		Front	L	12.24	13.00	1.19	1.01	---	---	---	---
			M	12.67	13.00	1.08	1.01	0.229	---	0.247	---
			H	12.46	13.00	1.13	1.01	---	---	---	---
		Top	L	12.24	13.00	1.19	1.01	---	---	---	---
			M	12.67	13.00	1.08	1.01	0.548	---	0.592	---
			H	12.46	13.00	1.13	1.01	---	---	---	---
		Bottom	L	12.24	13.00	1.19	1.01	---	---	---	---
			M	12.67	13.00	1.08	1.01	---	---	---	---
			H	12.46	13.00	1.13	1.01	---	---	---	---
		Left	L	12.24	13.00	1.19	1.01	---	---	---	---
			M	12.67	13.00	1.08	1.01	0.146	---	0.158	---
			H	12.46	13.00	1.13	1.01	---	---	---	---
		Right	L	12.24	13.00	1.19	1.01	---	---	---	---
			M	12.67	13.00	1.08	1.01	---	---	---	---
			H	12.46	13.00	1.13	1.01	---	---	---	---
802.11a (wifi ant0)	Body-worn	Back	L	15.28	15.50	1.05	1.01	---	---	---	---
			M	14.59	15.50	1.23	1.01	0.070	---	0.086	---
			H	14.34	15.50	1.31	1.01	---	---	---	---
		Front	L	15.28	15.50	1.05	1.01	---	---	---	---
			M	14.59	15.50	1.23	1.01	0.262	---	0.322	---
			H	14.34	15.50	1.31	1.01	---	---	---	---
	Hotspot	Back	L	15.28	15.50	1.05	1.01	---	---	---	---
			M	14.59	15.50	1.23	1.01	0.070	---	0.086	---
			H	14.34	15.50	1.31	1.01	---	---	---	---

		Front	L	15.28	15.50	1.05	1.01	---	---	---	---
			M	14.59	15.50	1.23	1.01	0.262	---	0.322	---
			H	14.34	15.50	1.31	1.01	---	---	---	---
		Top	L	15.28	15.50	1.05	1.01	---	---	---	---
			M	14.59	15.50	1.23	1.01	---	---	---	---
			H	14.34	15.50	1.31	1.01	---	---	---	---
		Bottom	L	15.28	15.50	1.05	1.01	---	---	---	---
			M	14.59	15.50	1.23	1.01	0.154	---	0.189	---
			H	14.34	15.50	1.31	1.01	---	---	---	---
		Left	L	15.28	15.50	1.05	1.01	---	---	---	---
			M	14.59	15.50	1.23	1.01	0.145	---	0.178	---
			H	14.34	15.50	1.31	1.01	---	---	---	---
		Right	L	15.28	15.50	1.05	1.01	---	---	---	---
			M	14.59	15.50	1.23	1.01	---	---	---	---
			H	14.34	15.50	1.31	1.01	---	---	---	---
802.11n20 MIMO	Body-worn	Back	L	15.75	16.00	1.06	1.30	---	---	---	---
			M	15.46	16.00	1.13	1.30	0.041	---	0.046	---
			H	15.17	16.00	1.21	1.30	---	---	---	---
		Front	L	15.75	16.00	1.06	1.30	---	---	---	---
			M	15.46	16.00	1.13	1.30	0.237	---	0.268	---
			H	15.17	16.00	1.21	1.30	---	---	---	---
	Hotspot	Back	L	15.75	16.00	1.06	1.30	---	---	---	---
			M	15.46	16.00	1.13	1.30	0.041	---	0.046	---
			H	15.17	16.00	1.21	1.30	---	---	---	---
		Front	L	15.75	16.00	1.06	1.30	---	---	---	---
			M	15.46	16.00	1.13	1.30	0.237	---	0.268	---
			H	15.17	16.00	1.21	1.30	---	---	---	---
		Top	L	15.75	16.00	1.06	1.30	---	---	---	---
			M	15.46	16.00	1.13	1.30	0.341	---	0.385	---
			H	15.17	16.00	1.21	1.30	---	---	---	---
		Bottom	L	15.75	16.00	1.06	1.30	---	---	---	---
			M	15.46	16.00	1.13	1.30	0.166	---	0.188	---
			H	15.17	16.00	1.21	1.30	---	---	---	---
		Left	L	15.75	16.00	1.06	1.30	---	---	---	---
			M	15.46	16.00	1.13	1.30	0.171	---	0.193	---
			H	15.17	16.00	1.21	1.30	---	---	---	---
		Right	L	15.75	16.00	1.06	1.30	---	---	---	---
			M	15.46	16.00	1.13	1.30	---	---	---	---
			H	15.17	16.00	1.21	1.30	---	---	---	---

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 (~ 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

6.7 Simultaneous Transmission SAR Analysis

Maximum Antenna numbers of Simultaneous Transmission	Antennas of Simultaneous Transmission	Simultaneous Transmission Modes
Three	WWAN + WLAN 2TX	Celluar2/3/4G +WIFI 2.4GHz MIMO Celluar2/3/4G +WIFI 5GHz MIMO Celluar2/3/4G +WIFI 2.4GHz +WIFI 5GHz

POSITION		**Cellular+WIFI2.4GHz+ WIFI5GHz**	**Celluar2/3/4G +WIFI MIMO**
Body worn	Back	0.933	0.803
	Front	1.152	0.776
Hotspot	Back	0.933	0.739
	Front	1.152	0.776
	Top	0.847	0.641
	Bottom	0.551	0.549
	Left	0.261	0.193
	Right	0.767	0.767

According to the above tables, all the exposure condition of SAR values＜1.6W/kg.

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	$\sqrt{3}$	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	$\sqrt{3}$	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effects	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Modulation Response^m	±2.4%	R	$\sqrt{3}$	1	1	±1.4%	±1.4%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	$\sqrt{3}$	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	$\sqrt{3}$	1	1	±1.5%	±1.5%	∞
RF Ambient Noise	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
RF Ambient Reflections	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.4%	R	$\sqrt{3}$	1	1	±0.2%	±0.2%	∞
Probe Positioning	±2.9%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Max. SAR Eval.	±2.0%	R	$\sqrt{3}$	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	$\sqrt{3}$	1	1	±2.9%	±2.9%	∞
Power Scaling^p	±0%	R	$\sqrt{3}$	1	1	±0.0%	±0.0%	∞
Phantom and Setup								
Phantom Uncertainty	±6.1%	R	$\sqrt{3}$	1	1	±3.5%	±3.5%	∞
SAR correction	±1.9%	R	$\sqrt{3}$	1	0.84	±1.1%	±0.9%	∞
Liquid Conductivity (mea.)^{DAK}	±2.5%	R	$\sqrt{3}$	0.78	0.71	±1.1%	±1.0%	∞
Liquid Permittivity (mea.)^{DAK}	±2.5%	R	$\sqrt{3}$	0.26	0.26	±0.3%	±0.4%	∞
Temp. unc. - Conductivity^{BB}	±3.4%	R	$\sqrt{3}$	0.78	0.71	±1.5%	±1.4%	∞
Temp. unc. - Permittivity^{BB}	±0.4%	R	$\sqrt{3}$	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	$\sqrt{3}$	0.7	0.7	±1.9 %	±1.9 %	∞
Hemispherical Isotropy	±9.6 %	R	$\sqrt{3}$	0.7	0.7	±3.9 %	±3.9 %	∞
Boundary Effects	±2.0 %	R	$\sqrt{3}$	1	1	±1.2 %	±1.2 %	∞
Linearity	±4.7 %	R	$\sqrt{3}$	1	1	±2.7 %	±2.7 %	∞
System Detection Limits	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
Modulation Response^m	±2.4 %	R	$\sqrt{3}$	1	1	±1.4 %	±1.4 %	∞
Readout Electronics	±0.3 %	N	1	1	1	±0.3 %	±0.3 %	∞
Response Time	±0.8 %	R	$\sqrt{3}$	1	1	±0.5 %	±0.5 %	∞
Integration Time	±2.6 %	R	$\sqrt{3}$	1	1	±1.5 %	±1.5 %	∞
RF Ambient Noise	±3.0 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
RF Ambient Reflections	±3.0 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
Probe Positioner	±0.8 %	R	$\sqrt{3}$	1	1	±0.5 %	±0.5 %	∞
Probe Positioning	±6.7 %	R	$\sqrt{3}$	1	1	±3.9 %	±3.9 %	∞
Max. SAR Eval.	±4.0 %	R	$\sqrt{3}$	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	$\sqrt{3}$	1	1	±2.9 %	±2.9 %	∞
Power Scaling^p	±0 %	R	$\sqrt{3}$	1	1	±0.0 %	±0.0 %	∞
Phantom and Setup								
Phantom Uncertainty	±6.6 %	R	$\sqrt{3}$	1	1	±3.8 %	±3.8 %	∞
SAR correction	±1.9 %	R	$\sqrt{3}$	1	0.84	±1.1 %	±0.9 %	∞
Liquid Conductivity (mea.)^{DAK}	±2.5 %	R	$\sqrt{3}$	0.78	0.71	±1.1 %	±1.0 %	∞
Liquid Permittivity (mea.) ^{DAK}	±2.5 %	R	$\sqrt{3}$	0.26	0.26	±0.3 %	±0.4 %	∞
Temp. unc. - Conductivity ^{BB}	±3.4 %	R	$\sqrt{3}$	0.78	0.71	±1.5 %	±1.4 %	∞
Temp. unc. - Permittivity ^{BB}	±0.4 %	R	$\sqrt{3}$	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	2019.10.02	2020.10.01
Dosimetric E-field Probe	EX3DV4	3708	2019.09.26	2020.09.25
Dipole Validation Kit	D750V3	4d023	2017.09.13	2020.09.12
Dipole Validation Kit	D1800V2	2d084	2017.09.15	2020.09.14
Dipole Validation Kit	D2000V2	1009	2018.02.01	2021.01.31
Dipole Validation Kit	D2450V2	738	2017.09.18	2020.09.17
Dipole Validation Kit	D2600V2	1166	2019.11.08	2022.11.08
Dipole Validation Kit	D5GHzV2	1079	2017.09.25	2020.09.24

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration date	Calibration Due data
Signal Generator	E4428C	MY45280865	2020.08.20	2021.08.19
Signal Generator	SML 03	103514	2020.08.20	2021.08.19
Power meter	E4417A	MY45101182	2020.08.20	2021.08.19
Power Sensor	E4412A	MY41502214	2020.08.20	2021.08.19
Power Sensor	E4412A	MY41502130	2020.08.20	2021.08.19
Power meter	E4417A	MY45101004	2020.08.20	2021.08.19
Power Sensor	E9300B	MY41496001	2020.08.20	2021.08.19
Power Sensor	E9300B	MY41496003	2020.08.20	2021.08.19
Communication Tester	E5515C	MY48367401	2020.08.20	2021.08.19
Communication Tester	CMW500	161702	2020.08.20	2021.08.19
Communication Tester	MT8820C	6201300660	2020.08.20	2021.08.19
Communication Tester	MT8821C	6201547819	2020.08.20	2021.08.19
Vector Network Analyzer	VNA R140	0011213	2019.09.18	2020.09.17
Dielectric Parameter Probe	DAKS-3.5	1042	2019.09.17	2020.09.16

Detailed information of Isotropic E-field Probe Type ES3DV3

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Calibration certificate in Appendix C
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Optical Surface Detection	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces
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
Dynamic Range	5 μW/g to > 100 W/kg; Linearity: ± 0.2 dB
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones

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 μW/g to > 100 W/kg Linearity: ± 0.2 dB (noise: typically < 1 μW/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×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 750

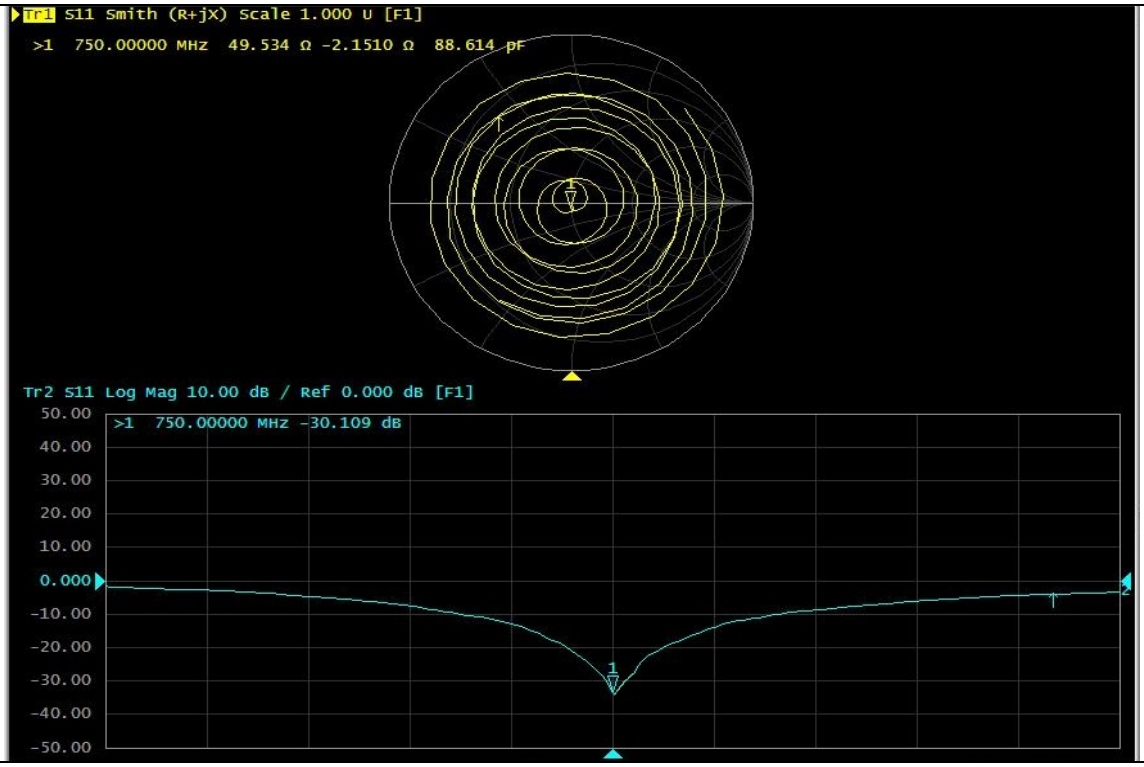
SAR target

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)

Head TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	Deviation
Impedance	53.9Ω+0.24jΩ	49.5Ω-2.15jΩ	<5Ω
Return loss	-28.4dB	-29.8dB	<20%



Head TSL Parameters

Dipole1800

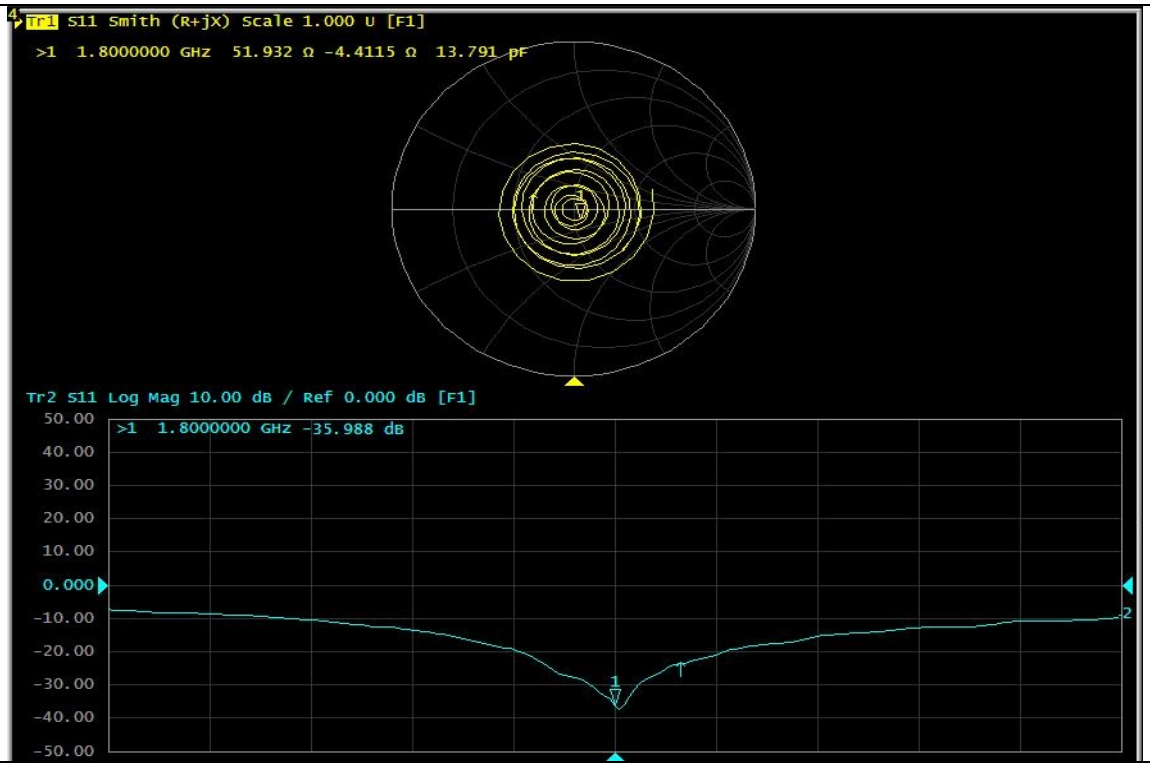
SAR target

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)

TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	Deviation
Impedance	49.3Ω-1.55jΩ	51.9Ω-4.41jΩ	<5Ω
Return loss	-35.4 dB	-36.0dB	<20%



TSL Parameters

Dipole2000

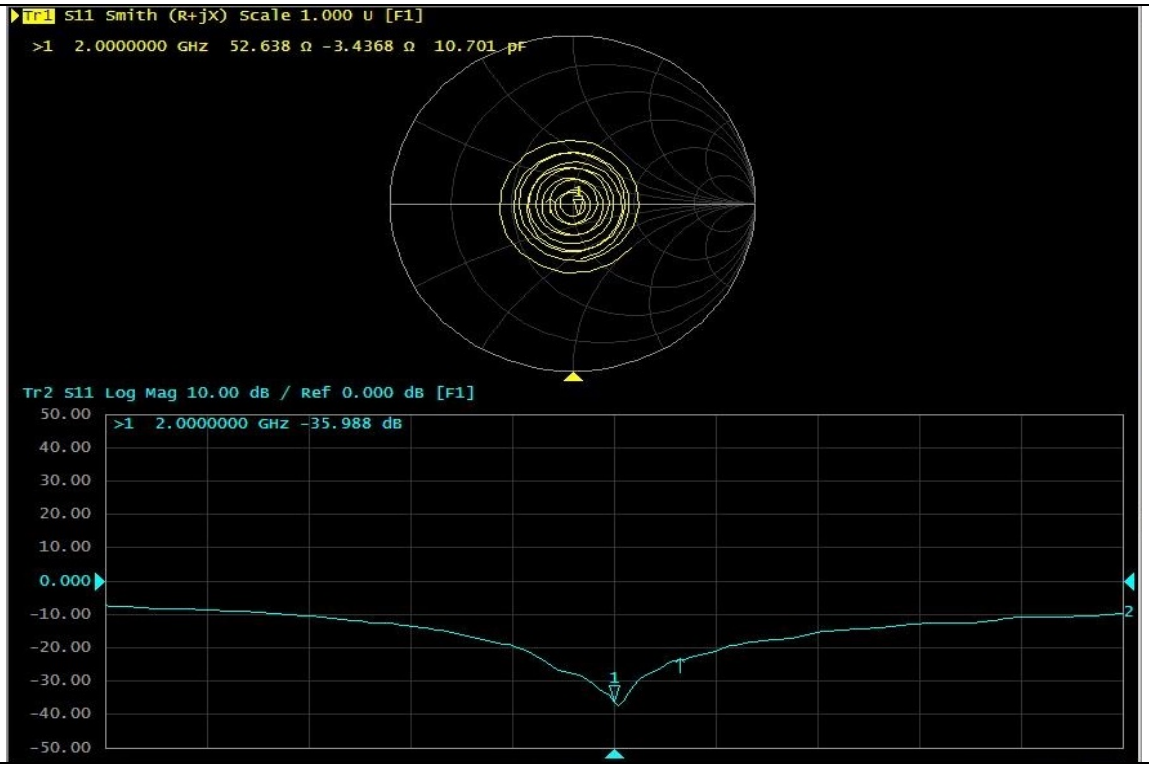
SAR target

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)

TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	Deviation
Impedance	49.8Ω-2.08jΩ	52.6Ω-3.44jΩ	<5Ω
Return loss	-33.6dB	-36.0dB	<20%



TSL Parameters

Dipole2450

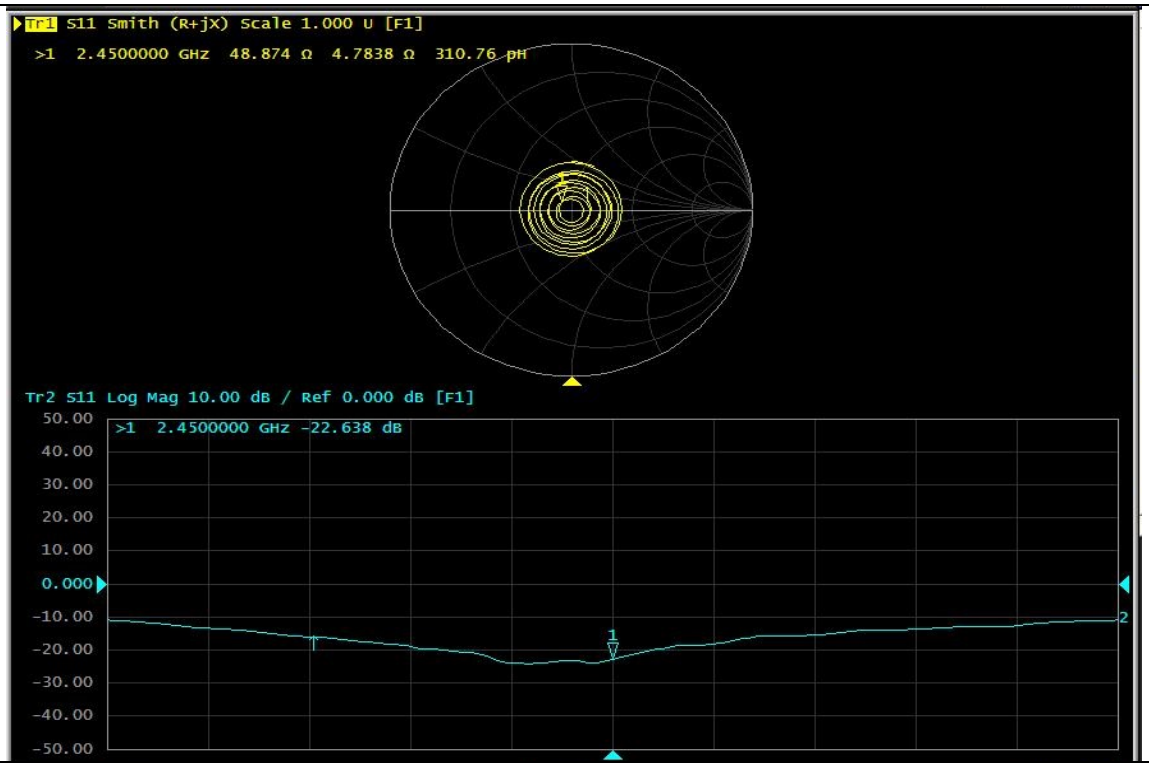
SAR target

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)

TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	Deviation
Impedance	51.3Ω+5.92jΩ	48.9Ω+4.78jΩ	<5Ω
Return loss	-24.5 dB	-22.6dB	<20%



TSL Parameters

Dipole5GHz

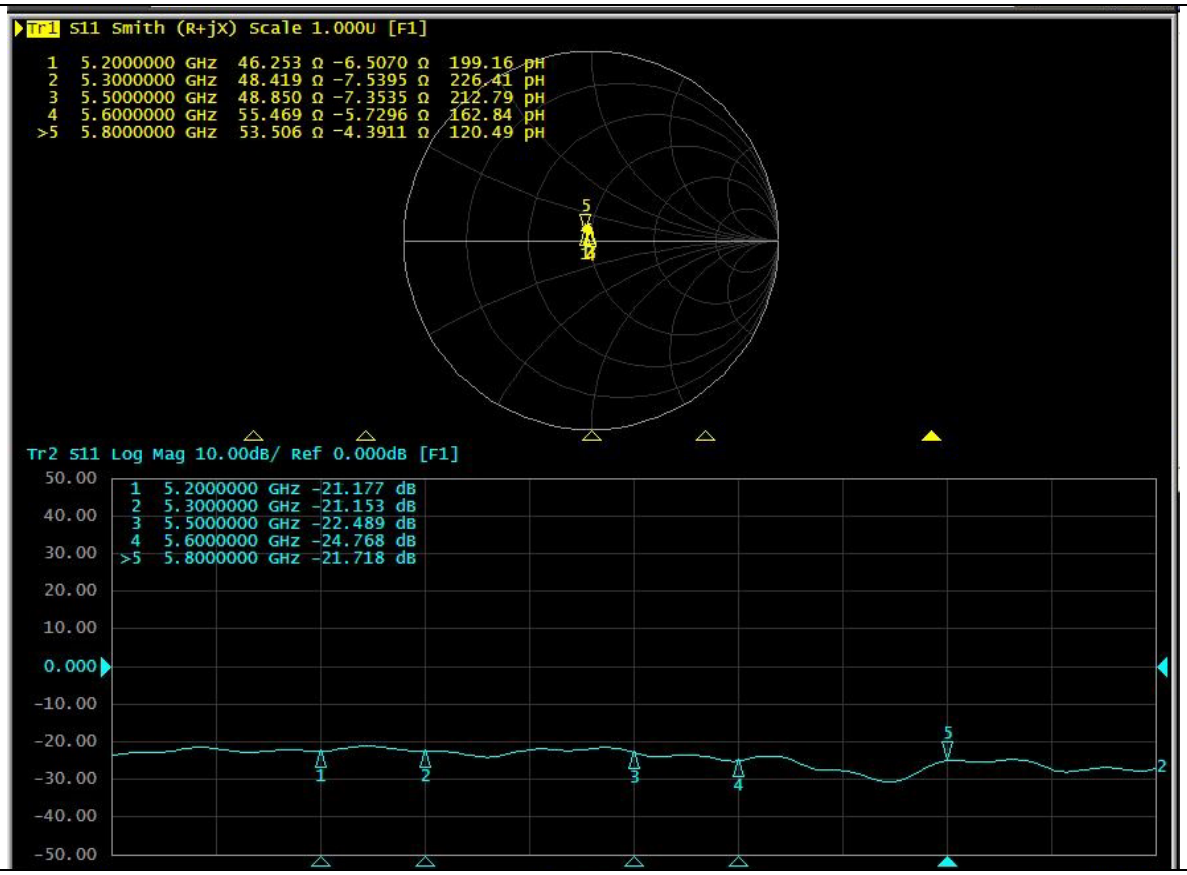
SAR target

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)

Head TSL Parameters				
Parameters	Target (Ref. Value)	Measured data	Deviation	Frequency (MHz)
Impedance	47.6Ω-8.77jΩ	46.3Ω-6.51jΩ	<5Ω	5200
Return loss	-20.7dB	-20.9dB	<20%	5200
Impedance	45.5Ω-6.82jΩ	48.4Ω-7.54jΩ	<5Ω	5300
Return loss	-21.4dB	-20.9dB	<20%	5300
Impedance	50.7Ω-7.14jΩ	48.9Ω-7.35jΩ	<5Ω	5500
Return loss	-23.0dB	-20.9dB	<20%	5500
Impedance	55.2Ω-4.00jΩ	55.5Ω-5.73jΩ	<5Ω	5600
Return loss	-24.1dB	-20.9dB	<20%	5600
Impedance	52.2Ω-8.20jΩ	53.5Ω-4.39jΩ	<5Ω	5800
Return loss	-21.6dB	-20.9dB	<20%	5800



TSL Parameters

ANNEX A – TEST PLOTS

Please refer to the attachment.

ANNEX B – RELEVANT PAGES FROM CALIBRATION REPORTS

Please refer to the attachment.