REPORT No.: XM19020007S01

TEST REPORT

APPLICANT	:	Hot Pepper, Inc.
PRODUCT NAME	:	4G Smart Phone
MODEL NAME	:	HPP-GS1
BRAND NAME	:	Hot Pepper
FCC ID	:	2APD4-A81C
STANDARD(S)	:	47CFR 2.1093 IEEE 1528-2013
RECEIPT DATE	:	2019-03-01
TEST DATE	:	2019-03-23 to 2019-03-29
ISSUE DATE	:	2019-05-25

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DIRECTORY

Annex B Test Setup Photos

Annex C Plots of System Performance Check

Annex D Plots of Maximum SAR Test Results

Annex E DASY Calibration Certificate

Change History		
Version	**Date**	**Description**
1.0	2019-05-25	Original

1 SAR Results Summary

The maximum results of Specific Absorption Rate (SAR) found during test as bellows:

<Highest Reported standalone SAR Summary>

Frequency Band		Highest SAR Summary (1g SAR (W/kg))		
		Head	Body-worn	Hotspot
		Separation (0mm)	Separation (10mm)	Separation (10mm)
GSM	GSM 850	0.214	0.364	0.364
	GSM 1900	0.132	0.488	0.577
WCDMA	Band II	0.185	0.801	0.801
	Band IV	0.175	0.733	0.733
	Band V	0.181	0.346	0.346
CDMA2000	BC0	0.228	0.403	0.403
	BC1	0.275	0.718	0.777
	BC10	0.326	0.336	0.336
LTE	Band 2	0.271	0.740	0.764
	Band 4	0.183	0.869	0.869
	Band 5	0.240	0.412	0.412
	Band 7	0.059	0.427	0.427
	Band 12	0.196	0.221	0.221
	Band 13	0.180	0.256	0.256
	Band 14	0.192	0.23	0.23
	Band 17	0.160	0.257	0.257
	Band 25	0.201	0.620	0.781
	Band 26	0.218	0.25	0.25
	Band 41	0.034	0.333	0.333
	Band 66	0.208	0.284	0.36
	Band 71	0.131	0.096	0.096
WLAN	2.4GHz WLAN	0.686	0.113	0.142
	5GHz WLAN	0.484	0.097	0.125
2.4GHz Band	Bluetooth(Estimated)	N/A	0.165	0.165
Highest Simultaneous Transmission 1g SAR (W/kg)		Head	Body-worn	Hotspot
WWAN+WLAN 2.4GHz		1.012	0.982	0.982
WWAN+WLAN 5GHz		0.81	0.919	0.919
WWAN+BT		N/A	1.034	1.034

Max Scaled SAR1g (W/Kg):	Head	0.686 W/kg	Limit(W/kg): 1.6 W/kg
	Body-worn	0.869 W/kg	
	Hotspot	0.869 W/kg	

Note:

1. The highest simultaneous transmission is scalar summation of Reported standalone SAR per FCC KDB 690783 D01 v01r03, and scalar SAR summation of all possible simultaneous transmission scenarios are < 1.6W/kg.
2. This device is compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-2005, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013.
3. The test data of CDMA2000 BC10 and LTE band 14 frequency bands please refer to R1903A0130-S1 MOERHUANYU_A81C.

2 Technical Information

Note: Provide by manufacturer.

2.1 Applicant and Manufacturer Information

Applicant:	Hot Pepper, Inc.
Applicant Address:	5151 California Ave., Suite 100, Irvine 92617, USA
Manufacturer:	Hot Pepper, Inc.
Manufacturer Address:	5151 California Ave., Suite 100, Irvine 92617, USA

2.2 Equipment Under Test (EUT) Description

EUT Type:	4G Smart Phone
Hardware Version:	A81C_MAINBOARD_P1
Software Version:	HPP-GS1-V1.0.4-190121
Frequency Bands:	GSM 850: 824.2 MHz ~ 848.8 MHz GSM 1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz CDMA2000 BC 0: 824.7 MHz ~ 848.31 MHz CDMA2000 BC 1: 1850 MHz ~1910 MHz CDMA2000 BC 10: 806 MHz ~ 901 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 14: 787 MHz ~ 798 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 71: 665.5 MHz ~ 695.5 MHz WLAN 2.4GHz: 2412 MHz ~ 2462 MHz WLAN 5.2GHz: 5180 MHz ~ 5240 MHz WLAN 5.3GHz: 5260 MHz ~ 5320 MHz WLAN 5.8GHz: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz

Modulation Mode:	GSM/GPRS: GMSK, EDGE: 8PSK WCDMA: QPSK/16QAM CDMA2000 1XRTT: QPSK CDMA2000 1XEV-DO: QPSK LTE: QPSK/16QAM/64QAM 802.11b: DSSS 802.11a/g/n-HT20/HT40/ac-VHT40/VHT80: OFDM Bluetooth BR+EDR: GFSK, π/4-DQPSK, 8-DPSK Bluetooth LE: GFSK	
LTE description:	Supports CA Downlink：25A_26A, 4A_13A, 2A_13A, 2A_4A, 2A_5A, 4A_5A, 25A_25A, 2A_2A, 4A_4A, 5A_5A, 5B	
	VoLTE	
Antenna type:	PIFA Antenna	
SIM cards description:	For dual SIM card version, both SIM 1 and SIM 2 are the same chipset unit and tested as a single chipset, the SIM 1 was selected for test.	
Ancillary Equipment:	**Barrery**	
	Manufacturer:	SHENZHEN HUATIANTONG TECHNOLOGY CO., LTD
	Model Name:	H2019GS1
	Manufacturer:	Shenzhen Nine Liyuan Electronic Technology Co., Ltd
	Model Name:	H2019GS1A

Note:

1. For a more detailed description, please refer to specification or user's manual supplied by the applicant and/or manufacturer.

2.3 Environment of Test Site

Temperature:	20 ... 25 ° C
Humidity:	30 ... 75 %
Atmospheric Pressure:	980 ... 1020 hPa

Test frequency:	GSM 850MHz/1900MHz; CDMA 2000 BC0/BC1; WCDMA Band II/IV/V; FDD-LTE Band 2/4/5/12/13/17/25/26/66/71; TDD-LTE Band 41; WLAN; Bluetooth;
Operation mode:	Call established
Power Level:	GSM 850MHz Maximum output power(level 5); GSM 1900MHz Maximum output power(level 0); CDMA 2000 BC0/BC1(All Up Bits); WCDMA Band II/IV/V (All Up Bits); FDD-LTE Band 2/4/5/12/13/17/25/26/66/71(Maximum output power); TDD-LTE Band 41(Maximum output power);; WLAN; Bluetooth;

During SAR test, EUT is in Traffic Mode (Channel Allocated) at Normal Voltage Condition. A communication link is set up with a System Simulator (SS) by air link, and a call is established.

The EUT shall use its internal transmitter. The antenna(s), battery and accessories shall be those specified by the Factory. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. If a wireless link is used, the antenna connected to the output of the base station simulator shall be placed at least 50 cm away from the handset.

The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the handset by at least 35 dB.

For SAR testing, EUT is in GPRS mode. In GPRS link mode, its crest factor is 2, because EUT is set in GPRS multi-slot class 12 with 4 uplink slots. In WCDMA mode, its crest factor is 1.

3 Introduction

3.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

3.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$\text{SAR}=\frac{d}{dt}\left(\frac{dU}{dm}\right)=\frac{d}{dt}\left(\frac{dU}{\rho dv}\right)$$

SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be either related to the temperature elevation in tissue by

$$\text{SAR} = C\left(\frac{\delta T}{\delta t}\right)$$

Where: C is the specific heat capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

$$\text{SAR} = \frac{\sigma \cdot E^2}{\rho}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

4 RF Exposure Limits

Limits for General Population/Uncontrolled Exposure (W/kg)

Type Exposure	Uncontrolled Environment Limit
Spatial Peak SAR (1g cube tissue for head and trunk)	1.60W/kg
Spatial Peak SAR (10g cube tissue for limbs)	4.00W/kg
Spatial Peak SAR (1g cube tissue for whole body)	0.08W/kg

Note:
1. This limit is according to recommendation1999/519/EC, Annex II (Basic Restrictions)
2. Occupational/Uncontrolled Environments are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure,(i.e. as a result of employment or occupation)

5 Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	47 CFR§2.1093	Radio Frequency Radiation Exposure Evaluation: Portable Devices
2	IEEE 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
3	KDB 248227 D01v02r02	802.11 Wi-Fi SAR
4	KDB 447498 D01v06	General RF Exposure Guidance
5	KDB 865664 D01v01r04	SAR Measurement 100 MHz to 6 GHz
6	KDB 865664 D02v01r02	RF Exposure Reporting
7	KDB 648474 D04v01r03	Handset SAR
8	KDB 941225 D01v03r01	3G SAR Measurement Procedures
9	KDB 941225 D02v02r02	HSPA and 1x Advanced
10	KDB 941225 D03v01	SAR Test Reduction GSM GPRS EDGE
11	KDB 941225 D04v01	SAR for GSM E GPRS Dual Xfer Mode
12	KDB 941225 D05v02r05	SAR for LTE Devices
13	KDB 941225 D05Av01r02	LTE Rel.10 KDB Inquiry Sheet
14	KDB 941225 D06v02r01	Hot Spot SAR
15	KDB 941225 D07v01r02	UMPC Mini Tablet

6 SAR Measurement System

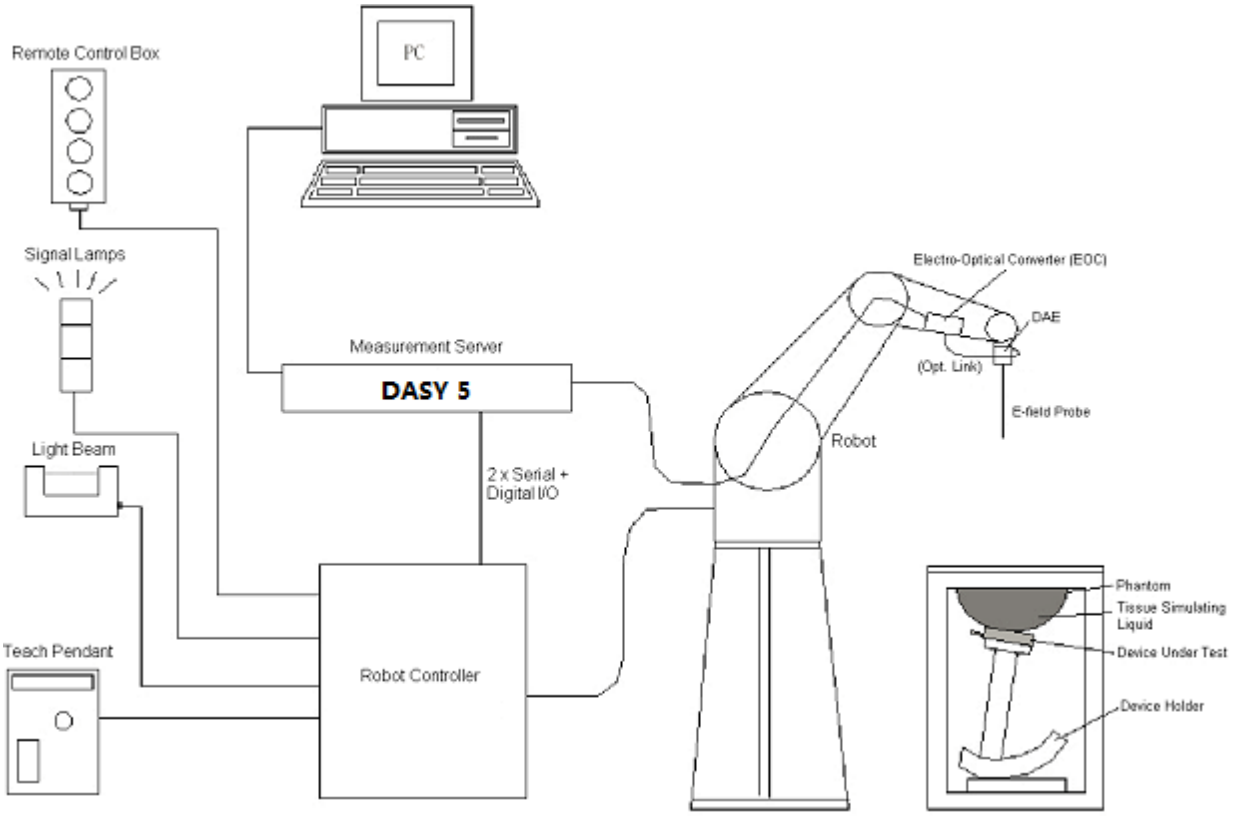


Fig.6.1 SPEAG DASY System Configurations

The DASY system for performance compliance tests is illustrated above graphically. This system consists of the following items:

- A standard high precision 6-axis robot with controller, a teach pendant and software
- A data acquisition electronic (DAE) attached to the robot arm extension
- A dosimetric probe equipped with an optical surface detector system
- The electro-optical converter (EOC) performs the conversion between optical and electrical signals
- A measurement server performs the time critical tasks such as signal filtering, control of the robot operationand fast movement interrupts.
- A probe alignment unit which improves the accuracy of the probe positioning
- A computer operating Windows XP
- DASY software
- Remove control with teach pendant and additional circuitry for robot safety such as warming lamps, etc.
- The SAM twin phantom
- A device holder
- Tissue simulating liquid
- Dipole for evaluating the proper functioning of the system

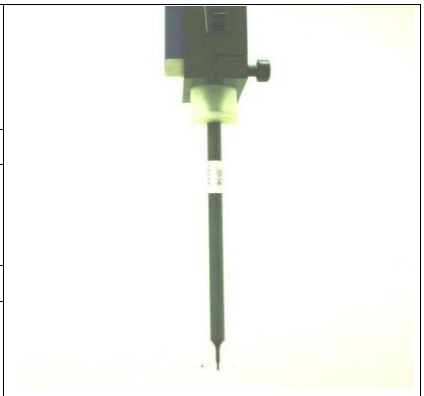
Component details are described in the following sub-sections.

6.1 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG). The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

➢ **E-Field Probe Specification**

<EX3DV4 Probe>

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz to 6 GHz; Linearity: ± 0.2 dB	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 µW/g to 100 mW/g; Linearity: ± 0.2 dB	
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

➢ **E-Field Probe Calibration**

Each probe needs to be calibrated according to a dosimetric assessment procedure with accuracy better than ±10%. The spherical isotropy shall be evaluated and within ±0.25 dB. The sensitivity parameters (Norm X, Norm Y and Norm Z), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested. The calibration data can be referred to appendix E of this report.

6.2 Data Acquisition Electronics (DAE)

The Data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock. The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig. 6.2 Photo of DAE

6.3 Robot

The SPEAG DASY system uses the high precision robots (DASY5: TX60XL) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY5: CS8c) from Stäubliis used. The Stäublirobot series have many features that are important for our application:

- High precision (repeat ability 0.02 mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)

Fig. 6.3 Photo of Robot

6.4 Measurement Server

The measurement server is based on a PC/104 CPU board with CPU (DASY 5: 400MHz, Intel Celeron), chip-disk (DASY5: 128 MB), RAM (DASY5: 128 MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O board, which is directly connected to the PC/104 bus of the CPU board.
The measurement server performs all the real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operations.

Fig. 6.4 Photo of Server for DASY5

6.5 Light Beam Unit

The light beam switch allows automatic "tooling" of the probe. During the process, the actual position of the probe tip with respect to the robot arm is measured, as well as the probe length and the horizontal probe offset. The software then corrects all movements, such that the robot coordinates are valid for the probe tip.
The repeat ability of this process is better than0.1 mm. If a position has been taught with an aligned probe, the same position will be reached with another aligned probe within 0.1 mm, even if the other probe has different dimensions. During probe rotations, the probe tip will keep its actual position.

Fig. 6.5 Photo of Light Beam

6.6 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%) Center ear point: 6 ± 0.2 mm
Filling Volume Dimensions	Approx. 25 liters Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Head, Right Head, Flat phantom

Fig. 6.6Photo of SAM Phantom

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

6.7 Device Holder

<Device Holder for SAM Twin Phantom>

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5 mm distance, a positioning uncertainty of ±0.5 mm would produce a SAR uncertainty of ± 20 %. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (ERP).

Thus the device needs no repositioning when changing the angles.

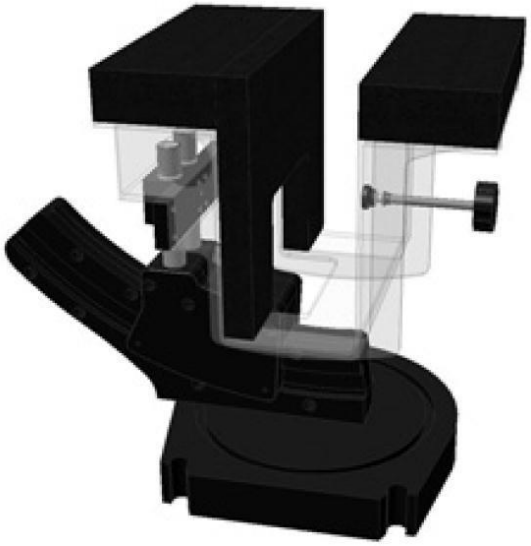
The DASY device holder is constructed of low-low POM material having the following dielectric parameters: relative permittivity ε = 3 and loss tangent δ = 0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

Fig. 6.7Photo of Device Holder

<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

Fig 6.8 Laptop Extension Kit



6.8 Data storage and Evaluation

- **Data Storage**

The DASY software stores the assessed data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all the necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files. The post-processing software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verifications of the complete software setup even after the measurement and allows correction of erroneous parameter settings. For example, if a measurement has been performed with an incorrect crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be reevaluated.

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

- **Data Evaluation**

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

Probe Parameters:	- Sensitivity	$Norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion	$ConvF_i$
	- Diode compression point	dcp_i
Device Parameters:	- Frequency	f
	- Crest	cf
Media Parameters:	- Conductivity	σ

	- Density	ρ

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

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power.

The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

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

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

E- Field Probes: $E_i = \sqrt{\frac{v_i}{Norm_i \cdot ConvF}}$

H-Field Probes: $H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$

WithV_i = compensated signal of channel i, (i = x, y, z)
$Norm_i$= senor sensitivity of channel i, (i = x, y, z), μV/ $(V/m)^2$
ConvF = sensitivity enhancement in solution
a_{ij} = sensor sensitivity factors for H-field probes
f = carrier frequency (GHz)
E_i = electric field strength of channel i in V/m
Hi = magnetic field strength of channel i in A/m

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

$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$

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

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1000}$$

With SAR = local specific absorption rate in mW/g
E_{tot}= total field strength in V/m
σ = conductivity in (mho/m) or (Siemens/m)
ρ= equipment tissue density in g/cm^3
Note that the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid.

6.9 Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1173	2018.06.21	2019.06.20
SPEAG	835MHz System Validation Kit	D835V2	4d227	2018.06.22	2019.06.21
SPEAG	1750MHz System Validation Kit	D1750V2	1160	2018.06.25	2019.06.24
SPEAG	1900MHz System Validation Kit	D1900V2	5d221	2018.06.22	2019.06.21
SPEAG	2450MHz System Validation Kit	D2450V2	997	2018.06.26	2019.06.25
SPEAG	2600MHz System Validation Kit	D2600V2	1139	2018.06.25	2019.06.24
SPEAG	5000MHz System Validation Kit	D5GHzV2	1176	2018.11.06	2019.11.05
SPEAG	Dosimetric E-Field Probe	EX3DV4	7445	2018.09.04	2019.09.03
SPEAG	Data Acquisition Electronics	DAE4	1516	2018.07.14	2019.07.13
SPEAG	Dielectric Assessment KIT	DAK-3.5	1279	2018.11.03	2019.11.02
SPEAG	SAM Twin Phantom 1	QD 000 P40 CB	TP-1471	NCR	NCR
SPEAG	SAM Twin Phantom 2	QD 000 P40 CB	TP-1464	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
R&S	Network Emulator	CMW500	124534	2018.04.17	2019.04.16
Agilent	Network Analyzer	E5071B	MY42404762	2018.04.17	2019.04.16
mini-circuits	Amplifier	ZHL-42W+	608501717	NCR	NCR
mini-circuits	Amplifier	ZVE-8G+	754401735	NCR	NCR
Agilent	Signal Generator	N5182B	MY53050509	2019.04.17	2020.04.16
Agilent	Power Senor	N8482A	MY41090849	2018.11.23	2019.11.22
Agilent	Power Meter	E4416A	MY45102093	2018.11.23	2019.11.22
R&S	Power Meter	NRVD	101066	2018.11.23	2019.11.22
MCL	Attenuation1	351-218-010	N/A	NA	NA
THERMOMETER	Thermo meter	DC-803	N/A	2018.11.22	2019.11.21
N/A	Tissue Simulating Liquids	HSL600-6000MHz MSL600-6000MHz	N/A	24H	

1. The calibration certificate of DASY can be referred to appendix E of this report.
2. The Insertion Loss calibration of Dual Directional Coupler and Attenuator were characterized via the network analyzer and compensated during system check.
3. The dielectric probe kit was calibrated via the network analyzer, with the specified procedure (calibrated in pure water) and calibration kit (standard) short circuit, before the dielectric measurement. The specific procedure and calibration kit are provided by Speag.
4. In system check we need to monitor the level on the power meter, and adjust the power amplifier level to have precise power level to the dipole; the measured SAR will be normalized to 1W input power according to the ratio of1W to the input power to the dipole. For system check, the calibration of the

power amplifier is deemed not critically required for correct measurement; the power meter is critical and we do have calibration for it

5. Attenuator insertion loss is calibrated by the network Analyzer, which the calibration is valid, before system check.
6. N.C.R means No Calibration Requirement.

6.10 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 6.11, for body SAR testing, the liquid height from the center of the flat phantom to liquid top surface is larger than 15 cm, which is shown in Fig. 6.12.

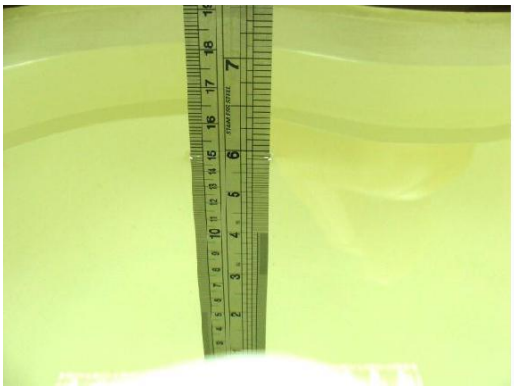


Fig 6.10 Photo of Liquid Height for Head SAR

Fig 6.11 Photo of Liquid Height for Body SAR

The following table gives the recipes for tissue simulating liquids

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0
Body								
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.96	52.7
2600	68.1	0	0	0.1	0	31.8	2.16	52.5

Simulating Liquid for 5GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

The relative permittivity and conductivity of the tissue material should be within±5% of the values given in the table below recommended by the FCC OET 65supplement C and RSS 102 Issue 5.

Target Frequency	Head		Body	
(MHz)	ε r	σ (S/m)	ε r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800-2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

(ε r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)

The dielectric parameters of liquids were verified prior to the SAR evaluation using a Speag Dielectric Probe Kit and an Agilent Network Analyzer.
The following table shows the measuring results for simulating liquid.

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Conductivity Target (σ)	Delta (σ) (%)	Limit (%)	Date
750	HSL	22.1	0.885	0.89	-0.56	±5	2019/4/1
835	HSL	22.2	0.910	0.90	1.11	±5	2019/3/11
1750	HSL	22.1	1.420	1.37	3.65	±5	2019/3/29
1900	HSL	22.3	1.430	1.40	2.14	±5	2019/3/12
2450	HSL	22.5	1.820	1.80	1.11	±5	2019/3/12
2600	HSL	22.5	2.046	1.96	4.39	±5	2019/3/13
5250	HSL	22.6	4.484	4.71	-4.80	±5	2019/3/12
5600	HSL	22.6	5.019	5.07	-1.01	±5	2019/3/12
5750	HSL	22.6	5.002	5.22	-4.18	±5	2019/3/12

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Permittivity (εr)	Permittivity Target (εr)	Delta (εr) (%)	Limit (%)	Date
750	HSL	22.1	40.799	41.90	-2.63	±5	2019/4/1
835	HSL	22.2	41.750	41.50	0.60	±5	2019/3/11
1750	HSL	22.1	41.266	40.10	2.91	±5	2019/3/29
1900	HSL	22.3	40.882	40.00	2.20	±5	2019/3/12
2450	HSL	22.5	40.021	39.20	2.09	±5	2019/3/12
2600	HSL	22.5	37.758	39.00	-3.18	±5	2019/3/13
5250	HSL	22.6	35.031	35.95	-2.56	±5	2019/3/12
5600	HSL	22.6	34.456	35.50	-2.94	±5	2019/3/12
5750	HSL	22.6	35.815	35.35	1.32	±5	2019/3/12

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Conductivity Target (σ)	Delta (σ) (%)	Limit (%)	Date
750	MSL	22.1	0.963	0.96	0.96	±5	2019/3/26
835	MSL	22.2	0.943	0.97	0.97	±5	2019/3/6
1750	MSL	22.1	1.536	1.49	1.49	±5	2019/3/20
1900	MSL	22.3	1.531	1.52	1.52	±5	2019/3/8
2450	MSL	22.5	2.036	1.95	1.95	±5	2019/3/27
2600	MSL	22.5	2.178	2.16	2.16	±5	2019/3/18
5250	MSL	22.6	5.123	5.36	-4.42	±5	2019/3/27
5600	MSL	22.6	5.540	5.77	-3.99	±5	2019/3/28
5750	MSL	22.6	5.691	5.94	-4.19	±5	2019/3/28

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Permittivity (εr)	Permittivity Target (εr)	Delta (εr) (%)	Limit (%)	Date
750	MSL	22.1	54.224	55.50	-2.30	±5	2019/3/26
835	MSL	22.2	54.343	55.20	-1.55	±5	2019/3/6
1750	MSL	22.1	53.912	53.40	0.96	±5	2019/3/20
1900	MSL	22.3	52.395	53.30	-1.70	±5	2019/3/8
2450	MSL	22.5	50.655	52.70	-3.88	±5	2019/3/27
2600	MSL	22.5	50.984	52.50	-2.89	±5	2019/3/18
5250	MSL	22.6	49.278	48.95	0.67	±5	2019/3/27
5600	MSL	22.6	47.088	48.50	-2.91	±5	2019/3/28
5750	MSL	22.6	46.444	48.28	-3.80	±5	2019/3/28

7 SAR System Verification

Each DASY system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system performance check and system validation. System validation kit includes a dipole, tripod holder to fix it underneath the flat phantom and a corresponding distance holder.

- **Purpose of System Performance check**
  The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

- **System Setup**
  In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:

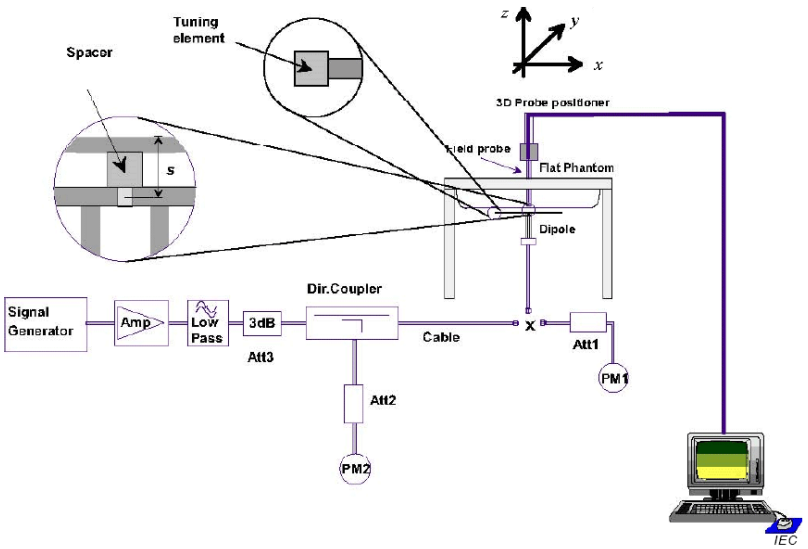


Fig.7.1 System Verification Setup Diagram

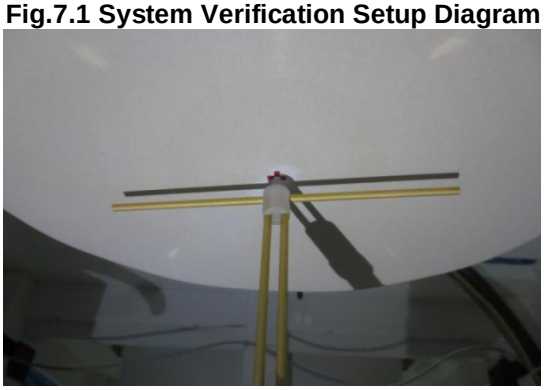


Fig.7.2 Photo of Dipole setup

➢ **System Verification Results**

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10%. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table as below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix C of this report.

Dipole S/N	Probe S/N	DAE S/N
D750V3-1173	7445	1516
D835V2-4d227	7445	1516
D1750V2-1160	7445	1516
D1900V2_5d221	7445	1516
D2450V2-997	7445	1516
D2600V2-1139	7445	1516
D5GHzV2-1176-5250	7445	1516
D5GHzV2-1176-5600	7445	1516
D5GHzV2-1128-5750	7445	1516

<Head SAR>

Date	Freq. (MHz)	Tissue Type	Input Power (mW)	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2019/4/1	750	HSL	250	2.07	8.26	8.28	0.24
2019/3/11	835	HSL	250	2.43	9.34	9.72	4.07
2019/3/29	1750	HSL	250	9.28	37.10	37.12	0.05
2019/3/12	1900	HSL	250	10.23	39.50	40.92	3.59
2019/3/12	2450	HSL	250	13.21	52.90	52.84	1.75
2019/3/13	2600	HSL	250	13.63	54.00	54.52	0.96
2019/3/12	5250	HSL	100	7.81	78.90	78.1	-1.01
2019/3/12	5600	HSL	100	7.93	80.90	79.3	-1.98
2019/3/12	5750	HSL	100	8.02	80.00	80.2	0.25

Date	Freq. (MHz)	Tissue Type	Input Power (mW)	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2019/4/1	750	HSL	250	1.39	5.45	5.56	2.02
2019/3/11	835	HSL	250	1.56	6.07	6.24	2.80
2019/3/29	1750	HSL	250	4.88	20.00	19.52	-2.40
2019/3/12	1900	HSL	250	5.26	20.60	21.04	2.14
2019/3/12	2450	HSL	250	6.15	24.90	24.6	3.63
2019/3/13	2600	HSL	250	6.02	24.50	24.08	-1.71
2019/3/12	5250	HSL	100	2.24	22.50	22.4	-0.44
2019/3/12	5600	HSL	100	2.22	23.10	22.2	-3.90
2019/3/12	5750	HSL	100	2.29	22.60	22.9	1.33

<Body SAR>

Date	Freq. (MHz)	Tissue Type	Input Power (mW)	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2019/3/26	750	MSL	250	2.12	8.65	8.48	-1.97
2019/3/6	835	MSL	250	2.45	9.61	9.8	1.98
2019/3/20	1750	MSL	250	9.49	37.40	37.96	1.50
2019/3/8	1900	MSL	250	9.92	39.90	39.68	-0.55
2019/3/27	2450	MSL	250	13.19	51.50	52.76	4.48
2019/3/18	2600	MSL	250	13.25	54.00	53	-1.85
2019/3/27	5250	MSL	100	7.69	72.70	76.9	5.78
2019/3/28	5600	MSL	100	8.00	77.30	80	3.49
2019/3/28	5750	MSL	100	7.81	75.30	78.1	3.72
Date	**Freq. (MHz)**	**Tissue Type**	**Input Power (mW)**	**Measured 10g SAR (W/kg)**	**Targeted 10g SAR (W/kg)**	**Normalized 10g SAR (W/kg)**	**Deviation (%)**
2019/3/26	750	MSL	250	1.42	5.71	5.68	-0.53
2019/3/6	835	MSL	250	1.62	6.31	6.48	2.69
2019/3/20	1750	MSL	250	4.96	19.90	19.84	-0.30
2019/3/8	1900	MSL	250	5.29	20.70	21.16	2.22
2019/3/27	2450	MSL	250	6.12	23.80	24.48	4.17
2019/3/18	2600	MSL	250	5.95	24.20	23.8	-1.65
2019/3/27	5250	MSL	100	2.13	20.60	21.3	3.40
2019/3/28	5600	MSL	100	2.23	21.80	22.3	2.29
2019/3/28	5750	MSL	100	2.15	21.10	21.5	1.90

Note: System checks the specific test data please see Annex C

8 EUT Testing Position

This EUT was tested in ten different positions. They are right cheek/right tilted/left cheek/left tilted for head, Front/Back/Right Side/Top Side/Bottom Side of the EUT with phantom 10 mm gap, as illustrated below, please refer to Appendix B for the test setup photos.

8.1 Handset Reference Points

- The vertical centreline passes through two points on the front side of the handset – the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.
- The horizontal line is perpendicular to the vertical centreline and passes the center of the acoustic output. The horizontal line is also tangential to the handset at point A.
- The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centreline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

Fig.8.1 Illustration for Front, Back and Side of SAM Phantom

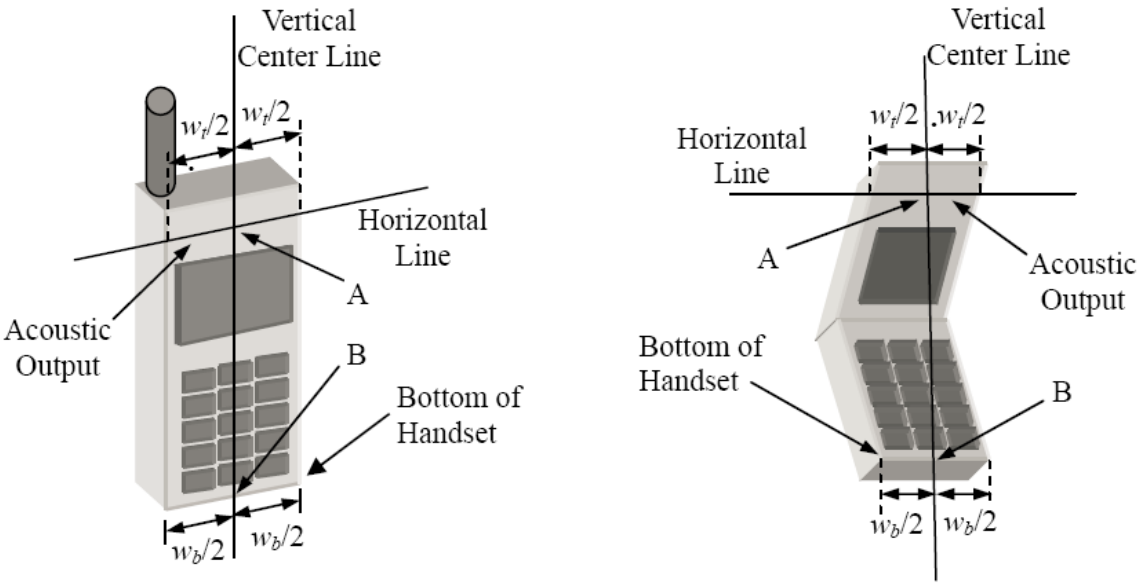


Fig. 8.2Illustration for Handset Vertical and Horizontal Reference Lines

8.2 Positioning for Cheek / Touch

- To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear and LE: Left Ear) and align the center of the ear piece with the line RE-LE.
- To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see below figure)

Fig. 8.3 Illustration for Cheek Position

8.3 Positioning for Ear / 15º Tilt

- To position the device in the “cheek” position described above.
- While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (see figure below).

Fig.8.4 Illustration for Tilted Position

8.4 SAR Evaluations near the Mouth/Jaw Regions of the SAM Phantom

Antennas located near the bottom of a phone may require SAR measurements around the mouth and jaw regions of the SAM head phantom. This typically applies to clam-shell style phones that are generally longer in the unfolded normal use positions or to certain older style long rectangular phones.
Under these circumstances, the following procedures apply, adopted from the FCC guidance on SAR handsets document FCC KDB Publication 648474 D04v01r03. The SAR required in these regions of SAM should be measured using a flat phantom. The phone should be positioned with a separation distance of 4 mm between the ear reference point (ERP) and the outer surface of the flat phantom shell. While maintaining this distance at the ERP location, the low (bottom) edge of the phone should be lowered from the phantom to establish the same separation distance between the peak SAR locations identified by the truncated partial SAR distribution measured with the SAM phantom. The distance from the peak SAR location to the phone is determined by the straight line passing perpendicularly through the phantom surface. When it is not feasible to maintain 4 mm separation at the ERP while also establishing the required separation at the peak SAR location, the top edge of the phone will be allowed to touch the phantom with a separation < 4 mm at the ERP. The phone should not be tilted to the left or right while placed in this inclined position to the flat phantom.

8.5 Body Worn Accessory Configurations

- To position the device parallel to the phantom surface with either keypad up or down.
- To adjust the device parallel to the flat phantom.
- To adjust the distance between the device surface and the flat phantom to 10 mm or holster surface and the flat phantom to 0 mm.

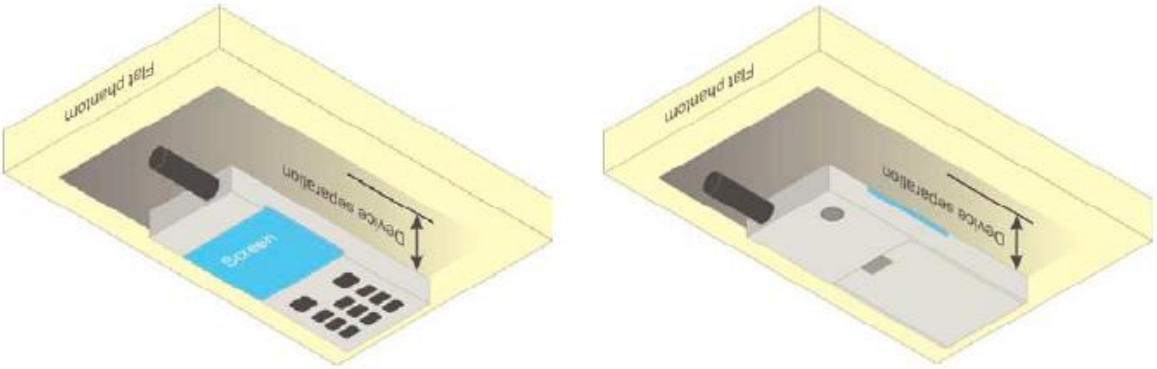


Fig.8.5 Illustration for Body Worn Position

8.6 Hotspot Mode Exposure Position Conditions

For handsets that support hotspot mode operations, with wireless router capabilities and various web browsing functions, the relevant hand and body exposure conditions are tested according to the hotspot SAR procedures in KDB 941225. A test separation distance of 10 mm is required between the phantom and all surfaces and edges with a transmitting antenna located within 25 mm from that surface or edge. When the form factor of a handset is smaller than 9 cm x 5 cm, a test separation distance of 5 mm (instead of 10 mm) is required for testing hotspot mode. When the separation distance required for body-worn accessory testing is larger than or equal to that tested for hotspot mode, in the same wireless mode and for the same surface of the phone, the hotspot mode SAR data may be used to support body-worn accessory SAR compliance for that particular configuration (surface).

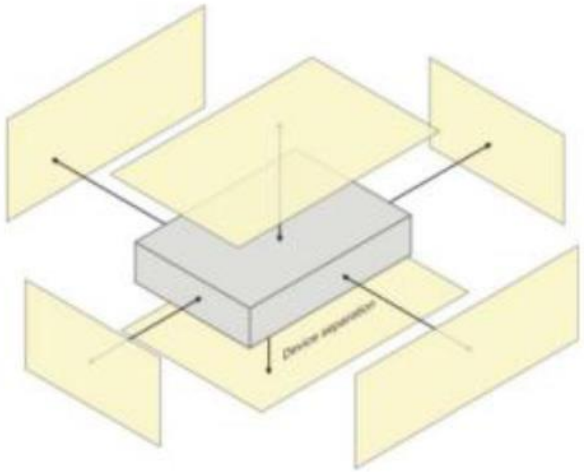


Fig 8.6 Illustration for Hotspot Position

9 Measurement Procedures

The measurement procedures are as bellows:

<Conducted power measurement>
- For WWAN power measurement, use base station simulator to configure EUT WWAN transition in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
- Read the WWAN RF power level from the base station simulator.
- For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band.
- Connect EUT RF port through RF cable to the power meter or spectrum analyzer, and measure WLAN/BT output power.

<Conducted power measurement>
- Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
- Place the EUT in positions as Appendix B demonstrates.
- Set scan area, grid size and other setting on the DASY software.
- Measure SAR results for the highest power channel on each testing position.
- Find out the largest SAR result on these testing positions of each band.
- Measure SAR results for other channels in worst SAR testing position if the Reported SAR or highest power channel is larger than 0.8 W/kg.

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- Power reference measurement
- Area scan
- Zoom scan
- Power drift measurement

9.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a “cube” measurement. The measured volume must include the 1g and 10 g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:
- Extraction of the measured data (grid and values) from the Zoom Scan.
- Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters).
- Generation of a high-resolution mesh within the measured volume.
- Interpolation of all measured values form the measurement grid to the high-resolution grid
- Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface

- Calculation of the averaged SAR within masses of 1g and 10g.

9.2 Power Reference Measurement

The Power Reference Measurement and Power Drift Measurement are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

9.3 Area Scan Procedures

Area scans are defined prior to the measurement process being executed with a user defined variable spacing between each measurement point (integral) allowing low uncertainty measurements to be conducted. Scans defined for FCC applications utilize a10mm^2 step integral, with 1mm interpolation used to locate the peak SAR area used for zoom scan assessments.
When an Area Scan has measured all reachable points, it computes the field maxima found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE1528-2003, EN 50361 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan).

9.4 Zoom Scan Procedures

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. A density of 1000 kg/m^3 is used to represent the head and body tissue density and not the phantom liquid density, in order to be consistent with the definition of the liquid dielectric properties, i.e. the side length of the 1g cube is 10mm, with the side length of the 10 g cube 21,5mm.The zoom scan integer steps can be user defined so as to reduce uncertainty, but normal practice for typical test applications utilize a physical step of 5x5x7 (8mmx8mmx5mm)providing a volume of 32mm in the X & Y axis, and 30mm in the Z axis.

9.5 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Sheppard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1g and 10g cubes, the extrapolation distance should not be larger than 5 mm.

9.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

10 Conducted RF Output Power

10.1 GSM Conducted Power

GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	128	190	251		128	190	251	
Frequency (MHz)	824.2	836.6	848.8		824.2	836.6	848.8	
GSM	32.53	32.54	32.47	33.00	23.53	23.54	23.47	24.00
GPRS 1Tx slots	32.50	32.54	32.45	33.00	23.50	23.54	23.45	24.00
GPRS 2Tx slots	31.32	31.36	31.25	31.50	25.32	25.36	25.25	25.50
GPRS 3Tx slots	29.38	29.40	29.27	29.50	25.12	25.14	25.01	25.24
GPRS 4Tx slots	28.43	**28.44**	28.32	28.50	25.43	25.44	25.32	**25.50**
EDGE 1Tx slots	26.81	27.07	26.82	27.50	17.81	18.07	17.82	18.50
EDGE 2Tx slots	25.36	25.03	25.12	25.50	19.36	19.03	19.12	19.50
EDGE 3Tx slots	22.76	22.92	22.90	23.00	18.50	18.66	18.64	18.74
EDGE 4Tx slots	21.56	21.50	21.68	22.00	18.56	18.50	18.68	19.00

GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM	29.47	29.46	29.48	29.50	20.47	20.46	20.48	20.50
GPRS 1Tx slots	29.43	29.44	29.46	29.50	20.43	20.44	20.46	20.50
GPRS 2Tx slots	27.84	27.84	27.87	28.00	21.84	21.84	21.87	22.00
GPRS 3Tx slots	25.82	25.81	25.85	26.00	21.56	21.55	21.59	21.74
GPRS 4Tx slots	24.87	24.87	**24.90**	25.00	21.87	21.87	21.90	**22.00**
EDGE 1Tx slots	25.16	25.26	25.42	25.50	16.16	16.26	16.42	16.50
EDGE 2Tx slots	24.36	24.02	24.06	24.50	18.36	18.02	18.06	18.50
EDGE 3Tx slots	22.00	21.76	21.95	22.50	17.74	17.50	17.69	18.24
EDGE 4Tx slots	20.15	20.24	20.31	20.50	17.15	17.24	17.31	17.50

Timeslot consignations:

Remark:

1. The frame-averaged power is linearly reported the maximum burst averaged power over 8 time slots. The calculated method are shown as below:
   The duty cycle "x" of different time slots as below:
   1 TX slot is 1/8, 2 TX slots is 2/8, 3 TX slots is 3/8 and 4 TX slots is 4/8
   Based on the calculation formula:
   Frame-averaged power = Burst averaged power + 10 1og (x)
   So,
   Frame-averaged power (1 TX slot) = Burst averaged power (1 TX slot)– 9.03
   Frame-averaged power (2 TX slots) = Burst averaged power (2 TX slots)– 6.02
   Frame-averaged power (3 TX slots) = Burst averaged power (3 TX slots)– 4.26
   Frame-averaged power (4 TX slots) = Burst averaged power (4 TX slots) – 3.01
2. CS1 coding scheme was used in GPRS conducted power measurements and SAR testing, MCS5 coding scheme was used in EGPRS conducted power measurements and SAR testing (if necessary).

No. of Slots:	Slot 1	Slot 2	Slot 3	Slot 4

Slot Consignation:	1Up4Down	2Up3Down	3Up2Down	4Up1Down
Duty Cycle:	1:8.3	1:4.15	1:2.77	1:2.08
Correct Factor:	-9.03dB	-6.02dB	-4.26dB	-3.01dB

10.2 WCDMA Conducted Power

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
A summary of these settings are illustrated below:

HSDPA Setup Configuration:

a. The EUT was connected to Base Station Rohde & Schwarz CMW500 referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set Gain Factors (βc and βd) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

Table 1

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	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15.
Note 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

HSDPA Sub-test setup configuration

HSUPA Setup Configuration:

a. The EUT was connected to Base Station Rohde & Schwarz CMW500 referred to the SetupConfiguration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   ii. Set the Gain Factors (βc and βd) and parameters (AG Index) were set according to each specific sub-test inthe following table, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table 2

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	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}: 47/15 β_{ed2}: 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (4)	15/15 (4)	64	15/15 (4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
Note 6: β_{ed} cannot be set directly; it is set by Absolute Grant Value.

HSUPA Sub-test setup configuration

Band		WCDMA II			Tune-up Limit (dBm)
TX Channel		9262	9400	9538	
Rx Channel		9662	9800	9938	
Frequency (MHz)		1852.4	1880	1907.6	
3GPP Rel 99	AMR 12.2Kbps	21.73	21.72	21.80	22.00
3GPP Rel 99	RMC 12.2Kbps	22.73	22.72	**22.80**	23.00
3GPP Rel 6	HSDPA Subtest-1	21.59	21.63	21.70	22.00
3GPP Rel 6	HSDPA Subtest-2	21.42	21.51	21.64	22.00
3GPP Rel 6	HSDPA Subtest-3	21.04	21.09	21.12	21.50
3GPP Rel 6	HSDPA Subtest-4	21.00	21.05	21.09	21.50
3GPP Rel 6	HSUPA Subtest-1	20.13	20.26	20.15	20.50
3GPP Rel 6	HSUPA Subtest-2	18.44	18.25	18.31	18.50
3GPP Rel 6	HSUPA Subtest-3	19.46	19.41	19.45	19.50
3GPP Rel 6	HSUPA Subtest-4	18.46	18.44	18.42	18.50
3GPP Rel 6	HSUPA Subtest-5	20.10	20.09	20.11	20.50

Band		WCDMA IV			Tune-up Limit (dBm)
TX Channel		1312	1413	1513	
Rx Channel		1537	1638	1738	
Frequency (MHz)		1712.4	1732.6	1752.6	
3GPP Rel 99	AMR 12.2Kbps	21.60	21.75	21.68	22.00
3GPP Rel 99	RMC 12.2Kbps	22.63	22.69	22.70	23.00
3GPP Rel 6	HSDPA Subtest-1	21.96	21.33	21.53	22.00
3GPP Rel 6	HSDPA Subtest-2	21.95	21.75	21.54	22.00
3GPP Rel 6	HSDPA Subtest-3	21.41	21.42	21.32	21.50
3GPP Rel 6	HSDPA Subtest-4	21.48	21.48	21.43	21.50
3GPP Rel 6	HSUPA Subtest-1	20.47	20.41	20.46	20.50
3GPP Rel 6	HSUPA Subtest-2	18.49	18.40	18.24	18.50
3GPP Rel 6	HSUPA Subtest-3	19.34	19.13	19.46	19.50
3GPP Rel 6	HSUPA Subtest-4	18.45	18.40	18.41	18.50
3GPP Rel 6	HSUPA Subtest-5	20.09	20.10	20.13	20.50

Band		WCDMA V			Tune-up Limit (dBm)
TX Channel		4132	4182	4233	
Rx Channel		4357	4407	4458	
Frequency (MHz)		826.4	836.6	846.6	
3GPP Rel 99	AMR 12.2Kbps	21.37	21.35	21.38	221.50
3GPP Rel 99	RMC 12.2Kbps	23.35	23.37	23.36	23.50
3GPP Rel 6	HSDPA Subtest-1	22.19	22.23	22.16	22.50
3GPP Rel 6	HSDPA Subtest-2	22.06	21.42	21.83	22.50
3GPP Rel 6	HSDPA Subtest-3	21.87	21.92	21.95	22.00
3GPP Rel 6	HSDPA Subtest-4	21.84	21.90	21.66	22.00
3GPP Rel 6	HSUPA Subtest-1	21.23	21.43	21.45	21.50
3GPP Rel 6	HSUPA Subtest-2	19.49	19.47	19.15	19.50
3GPP Rel 6	HSUPA Subtest-3	20.12	20.46	20.11	20.50
3GPP Rel 6	HSUPA Subtest-4	19.31	19.42	19.48	19.50
3GPP Rel 6	HSUPA Subtest-5	21.30	21.05	21.07	21.50

10.3 CDMA2000 Conducted Power

Note:

1. Per KDB 941225 D01v03r01, SAR for head exposure is measured in RC3 with the handset configured to transmit at full rate in SO55.
2. Per KDB 941225 D01v03r01, in Hotspot mode EUT is treated as data device and SAR is tested with Ev-Do Rev 0 (RTAP 153.6kbps) as the primary mode.
3. Per KDB 941225 D01v03r01, for Body-worn accessory SAR is measured in RC3 with the handset configured in TDSO/SO32 to transmit at full rate on FCH only with all other code channels disabled. The body-worn accessory procedures in KDB Publication 447498 are applied. The 3G SAR test reduction procedure is applied to the multiple code channel configuration (FCH+SCH), with FCH only as the primary mode.

Band	CDMA2000 BC0			Tune-up Limit (dBm)
TX Channel	1013	384	777	
Frequency (MHz)	824.7	836.52	848.31	
RC1 SO55	24.50	24.80	24.61	25.00
RC3 SO55	24.60	24.81	24.66	25.00
RC3 SO32 (F+SCH)	23.65	23.95	**24.49**	24.50
RC3 SO32 (+SCH)	23.95	23.86	24.16	24.50
RTAP 153.6Kbps	**23.08**	23.01	22.92	23.50
RETAP 4096Bits	23.10	23.13	23.12	23.50

Band	CDMA2000 BC1			Tune-up Limit (dBm)
TX Channel	25	600	1175	
Frequency (MHz)	1851.25	1880	1908.75	
RC1 SO55	24.88	24.85	24.90	25.00
RC3 SO55	24.90	24.86	24.94	25.00
RC3 SO32 (F+SCH)	24.62	24.16	24.50	25.00
RC3 SO32 (+SCH)	24.48	23.99	24.25	24.50
RTAP 153.6Kbps	22.82	22.89	23.01	23.50
RETAP 4096Bits	22.80	23.13	23.25	23.50

10.4 LTE Conducted Power

Largest channel bandwidth standalone SAR test requirements

QPSK with 1 RB allocation
Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel.8 When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

QPSK with 50% RB allocation
The procedures required for 1 RB allocation in section 4.2.1 are applied to measure the SAR for QPSK with 50% RB allocation.9

QPSK with 100% RB allocation
For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in sections 4.2.1 and 4.2.2 are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

Higher order modulations
For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in sections 4.2.1, 5.2.2 and 4.2.3 to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section 4.2 to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg. The equivalent channel configuration for the RB allocation, RB offset and modulation etc. is determined for the smaller channel bandwidth according to the same number of RB allocated in the largest channel bandwidth. For example, 50 RB in 10 MHz channel bandwidth does not apply to 5 MHz channel bandwidth; therefore, this cannot be tested in the smaller channel bandwidth. However, 50% RB allocation in 10 MHz channel bandwidth is equivalent to 100% RB allocation in 5 MHz channel bandwidth; therefore, these are the equivalent configurations to be compared to determine the specific channel and configuration in the smaller channel bandwidth that need SAR testing.

10.4.1 TDD LTE configuration setup for SAR measurement

According to KDB 941225 D05v02r03 and April 2013 TCB workshop slides, SAR must be tested with a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by 3GPP.

- see 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations
- "special subframe S" contains both uplink and downlink transmissions and must be taken into consideration to determine the transmission duty factor
  –according to the worst case uplink and downlink cyclic prefix requirements for UpPTS to determine the highest SAR test duty factor

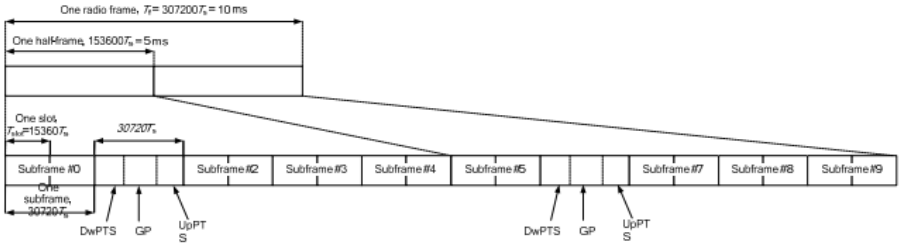


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity)

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

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

Per 3GPP 36.211 section 4.2, each radio frame of length T_f=37200·T_s = 10 ms consists of two half-frames of length 153600·Ts = 5ms each. Each half-frame consists of five subframes of length 30720 ·T_s = 1ms. So, the uplink duty factor in special subframe as below:

Special Subframe configuration	Normal cyclic prefix in downlink		Extended cyclic prefix in downlink	
	Duty factor of Uplink		Duty factor of Uplink	
	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink

0	7.14%	8.33%	7.14%	8.33%
1	7.14%	8.33%	7.14%	8.33%
2	7.14%	8.33%	7.14%	8.33%
3	7.14%	8.33%	7.14%	8.33%
4	7.14%	8.33%	14.27%	16.67%
5	14.27%	16.67%	14.27%	16.67%
6	14.27%	16.67%	14.27%	16.67%
7	14.27%	16.67%	14.27%	16.67%
8	14.27%	16.67%	/	/
9	14.27%	16.67%	/	/

Table 4.2-2: Uplink-downlink configurations

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

According to above table:

1. The highest duty factor is configuration 0;
2. The duty factor of uplink in one half-frame with normal cyclic prefix is: (3ms + 0.143ms)/5ms=62.9%;
3. The duty factor of uplink in one half-frame with extended cyclic prefix is: (3ms + 0.167ms)/5ms=63.3%;
4. For purpose to get the worst case SAR test duty factor, the duty factor of normal cyclic prefix in uplink scaled-up to the extended cyclic prefix in uplink, the scaling factor is 63.3%/62.9%=1.006, and the scaling factor will be taken into the final measured SAR.

<FDD LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				18700	18900	19100	
Frequency (MHz)				1860	1880	1900	
20	QPSK	1	0	23.45	23.37	23.43	24
20	QPSK	1	49	23.48	23.41	23.43	
20	QPSK	1	99	**23.59**	23.35	23.35	
20	QPSK	50	0	23.46	23.48	23.44	24
20	QPSK	50	24	23.42	23.40	23.40	
20	QPSK	50	50	**23.55**	23.49	23.36	
20	QPSK	100	0	22.60	22.62	22.51	
20	16QAM	1	0	22.87	22.75	22.63	23
20	16QAM	1	49	22.65	22.70	22.67	
20	16QAM	1	99	22.71	22.53	22.68	
20	16QAM	50	0	22.58	22.47	22.43	23
20	16QAM	50	24	22.71	22.56	22.63	
20	16QAM	50	50	22.60	22.51	22.65	
20	16QAM	100	0	21.65	21.60	21.54	
20	64QAM	1	0	22.39	22.39	22.30	23
20	64QAM	1	49	22.30	22.33	22.24	
20	64QAM	1	99	22.43	22.41	22.39	
20	64QAM	50	0	22.36	22.28	22.17	23
20	64QAM	50	24	22.41	22.09	22.36	
20	64QAM	50	50	22.37	22.30	22.20	
20	64QAM	100	0	21.44	21.34	21.28	
Channel				18675	18900	19125	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	QPSK	1	0	23.49	23.37	23.43	24
15	QPSK	1	37	23.42	23.43	23.51	
15	QPSK	1	74	23.48	23.35	23.43	
15	QPSK	36	0	23.27	23.47	23.48	24
15	QPSK	36	20	23.51	23.40	23.50	
15	QPSK	36	39	23.42	22.34	23.41	
15	QPSK	75	0	22.65	22.53	22.63	
15	16QAM	1	0	22.85	22.78	22.75	23
15	16QAM	1	37	22.90	22.86	22.89	
15	16QAM	1	74	22.93	22.93	22.91	
15	16QAM	36	0	22.61	22.55	22.59	23
15	16QAM	36	20	22.95	22.91	22.91	
15	16QAM	36	39	22.79	22.86	22.91	
15	16QAM	75	0	21.65	21.59	21.60	
15	64QAM	1	0	22.53	22.52	22.57	23
15	64QAM	1	37	22.69	22.46	22.45	

15	64QAM	1	74	22.77	22.55	22.53	
15	64QAM	36	0	22.62	22.38	22.51	23
15	64QAM	36	20	22.80	22.33	22.62	
15	64QAM	36	39	22.72	22.26	22.49	
15	64QAM	75	0	21.47	21.44	21.37	
Channel				18650	18900	19150	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	QPSK	1	0	23.53	23.44	23.54	24
10	QPSK	1	25	23.52	23.55	23.50	
10	QPSK	1	49	23.40	23.46	23.49	
10	QPSK	25	0	23.57	23.52	23.54	24
10	QPSK	25	12	23.51	23.40	23.56	
10	QPSK	25	25	23.50	23.29	23.33	
10	QPSK	50	0	22.61	22.60	22.57	
10	16QAM	1	0	22.95	22.75	22.82	23
10	16QAM	1	25	22.90	22.70	22.96	
10	16QAM	1	49	22.98	22.68	22.95	
10	16QAM	25	0	22.69	22.59	22.60	23
10	16QAM	25	12	22.94	22.77	22.77	
10	16QAM	25	25	23.00	22.69	22.90	
10	16QAM	50	0	21.64	21.67	21.59	
10	64QAM	1	0	22.47	22.40	22.41	23
10	64QAM	1	25	22.41	22.57	22.38	
10	64QAM	1	49	22.46	22.41	22.32	
10	64QAM	25	0	22.42	22.42	22.35	23
10	64QAM	25	12	22.49	22.38	22.27	
10	64QAM	25	25	22.43	22.25	22.43	
10	64QAM	50	0	21.46	21.40	21.33	
Channel				18625	18900	19175	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	QPSK	1	0	23.45	23.55	23.45	24
5	QPSK	1	12	23.44	23.57	23.43	
5	QPSK	1	24	23.54	23.50	23.38	
5	QPSK	12	0	23.44	23.53	23.46	23
5	QPSK	12	7	23.48	23.51	23.40	
5	QPSK	12	13	23.52	23.50	23.36	
5	QPSK	25	0	22.50	22.52	22.57	
5	16QAM	1	0	22.42	22.54	22.34	23
5	16QAM	1	12	22.35	22.47	22.29	
5	16QAM	1	24	22.29	22.49	22.27	
5	16QAM	12	0	22.57	22.67	22.48	23
5	16QAM	12	7	22.29	22.50	22.28	
5	16QAM	12	13	22.35	22.48	22.33	
5	16QAM	25	0	21.61	21.63	21.64	
5	64QAM	1	0	22.48	22.15	22.10	23

5	64QAM	1	12	22.35	22.08	21.99	
5	64QAM	1	24	22.51	22.01	22.01	
5	64QAM	12	0	22.40	22.27	22.05	23
5	64QAM	12	7	22.50	22.11	22.13	
5	64QAM	12	13	22.52	22.08	22.00	
5	64QAM	25	0	21.35	21.40	21.38	
Channel				18615	18900	19185	Tune-up limit (dBm)
Frequency (MHz)				1851.5	1880	1908.5	
3	QPSK	1	0	23.54	23.54	23.54	24
3	QPSK	1	8	23.50	23.41	23.51	
3	QPSK	1	14	23.53	23.50	23.39	
3	QPSK	8	0	23.58	23.31	23.55	24
3	QPSK	8	4	23.56	23.57	23.56	
3	QPSK	8	7	23.49	23.55	23.41	
3	QPSK	15	0	22.52	22.58	22.55	
3	16QAM	1	0	22.98	22.71	22.84	23
3	16QAM	1	8	22.83	22.95	22.97	
3	16QAM	1	14	22.57	22.98	22.90	
3	16QAM	8	0	22.87	22.60	21.58	23
3	16QAM	8	4	23.00	22.99	22.96	
3	16QAM	8	7	22.69	22.97	22.94	
3	16QAM	15	0	21.59	21.61	21.62	
3	64QAM	1	0	22.38	22.49	22.52	23
3	64QAM	1	8	22.44	22.43	22.47	
3	64QAM	1	14	22.48	22.28	22.35	
3	64QAM	8	0	21.40	22.33	22.32	23
3	64QAM	8	4	22.42	22.18	22.44	
3	64QAM	8	7	22.47	22.41	22.36	
3	64QAM	15	0	21.31	21.44	21.39	
Channel				18607	18900	19193	Tune-up limit (dBm)
Frequency (MHz)				1850.7	1880	1909.3	
1.4	QPSK	1	0	23.55	23.56	23.51	24
1.4	QPSK	1	3	23.58	23.53	23.52	
1.4	QPSK	1	5	23.48	23.55	23.54	
1.4	QPSK	3	0	23.54	23.40	23.54	
1.4	QPSK	3	1	23.55	23.54	23.57	
1.4	QPSK	3	3	23.52	23.56	23.55	
1.4	QPSK	6	0	22.59	22.63	22.60	23
1.4	16QAM	1	0	22.60	22.46	22.55	23
1.4	16QAM	1	3	22.58	22.48	22.49	
1.4	16QAM	1	5	22.59	22.53	22.44	
1.4	16QAM	3	0	22.56	22.60	22.72	
1.4	16QAM	3	1	22.50	22.46	22.45	
1.4	16QAM	3	3	22.59	22.54	22.45	
1.4	16QAM	6	0	21.64	21.58	21.61	22

1.4	64QAM	1	0	22.28	22.35	22.22	23
1.4	64QAM	1	3	22.17	22.33	22.29	
1.4	64QAM	1	5	22.21	22.38	22.25	
1.4	64QAM	3	0	22.10	22.25	22.30	
1.4	64QAM	3	1	22.09	22.37	22.19	
1.4	64QAM	3	3	22.15	22.35	22.27	
1.4	64QAM	6	0	21.33	21.43	21.31	22

<FDD LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20050	20175	20300	
Frequency (MHz)				1720	1732.5	1745	
20	QPSK	1	0	**23.53**	23.35	23.43	24
20	QPSK	1	49	23.36	23.28	23.31	
20	QPSK	1	99	23.45	23.41	23.35	
20	QPSK	50	0	**23.48**	23.43	23.47	23.5
20	QPSK	50	24	23.45	23.40	23.35	
20	QPSK	50	50	23.40	23.33	23.31	
20	QPSK	100	0	22.59	22.51	22.57	
20	16QAM	1	0	22.72	22.65	22.69	23
20	16QAM	1	49	22.74	22.68	22.57	
20	16QAM	1	99	22.58	22.76	22.62	
20	16QAM	50	0	22.59	22.47	22.55	23
20	16QAM	50	24	22.64	22.74	22.36	
20	16QAM	50	50	22.57	22.71	22.43	
20	16QAM	100	0	21.65	21.56	21.59	
20	64QAM	1	0	22.37	22.31	22.36	23
20	64QAM	1	49	22.41	22.28	22.43	
20	64QAM	1	99	22.45	22.15	22.48	
20	64QAM	50	0	22.22	22.19	22.27	23
20	64QAM	50	24	22.40	22.27	22.24	
20	64QAM	50	50	22.43	22.21	22.40	
20	64QAM	100	0	21.27	21.27	21.31	
Channel				20025	20175	20325	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1732.5	1747.5	
15	QPSK	1	0	23.53	23.41	23.39	24
15	QPSK	1	37	23.42	23.35	23.35	
15	QPSK	1	74	23.51	23.50	23.36	
15	QPSK	36	0	23.53	23.50	23.42	24
15	QPSK	36	20	23.49	23.43	23.38	
15	QPSK	36	39	23.40	23.37	23.34	
15	QPSK	75	0	22.68	22.61	22.63	
15	16QAM	1	0	22.53	22.58	22.68	23
15	16QAM	1	37	22.66	22.53	22.63	

15	16QAM	1	74	22.47	22.62	22.70	
15	16QAM	36	0	22.67	22.60	22.57	23
15	16QAM	36	20	22.87	22.66	22.53	
15	16QAM	36	39	22.51	22.51	22.65	
15	16QAM	75	0	21.70	21.46	21.50	
15	64QAM	1	0	22.19	22.19	22.39	23
15	64QAM	1	37	22.24	22.37	22.26	
15	64QAM	1	74	22.16	22.25	22.33	
15	64QAM	36	0	22.27	22.27	22.31	23
15	64QAM	36	20	22.04	22.10	22.18	
15	64QAM	36	39	22.23	22.33	22.25	
15	64QAM	75	0	21.29	21.35	21.32	
Channel				20000	20175	20350	Tune-up limit (dBm)
Frequency (MHz)				1715	1732.5	1750	
10	QPSK	1	0	23.50	23.50	23.37	24
10	QPSK	1	25	23.49	23.42	23.42	
10	QPSK	1	49	23.51	23.47	23.43	
10	QPSK	25	0	23.46	22.56	23.35	24
10	QPSK	25	12	23.49	23.48	23.40	
10	QPSK	25	25	23.52	23.40	23.44	
10	QPSK	50	0	22.60	22.58	22.64	
10	16QAM	1	0	22.75	22.74	22.50	23
10	16QAM	1	25	22.63	22.60	22.63	
10	16QAM	1	49	22.51	22.68	22.56	
10	16QAM	25	0	22.76	22.61	22.68	23
10	16QAM	25	12	22.43	22.69	22.72	
10	16QAM	25	25	22.56	22.63	22.65	
10	16QAM	50	0	21.68	21.65	21.68	
10	64QAM	1	0	22.24	22.21	22.25	23
10	64QAM	1	25	22.12	22.33	22.32	
10	64QAM	1	49	22.15	22.29	22.18	
10	64QAM	25	0	22.20	22.34	22.26	23
10	64QAM	25	12	22.04	22.26	22.07	
10	64QAM	25	25	22.17	22.13	22.29	
10	64QAM	50	0	21.34	21.38	21.34	
Channel				19975	20175	20375	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1732.5	1752.5	
5	QPSK	1	0	23.48	23.50	23.43	24
5	QPSK	1	12	23.42	23.41	23.36	
5	QPSK	1	24	23.46	23.43	23.44	
5	QPSK	12	0	22.59	23.47	23.50	23
5	QPSK	12	7	23.43	23.44	23.37	
5	QPSK	12	13	23.41	23.40	23.41	
5	QPSK	25	0	22.56	22.51	22.56	
5	16QAM	1	0	22.48	22.61	22.48	23

5	16QAM	1	12	22.32	22.67	22.31	
5	16QAM	1	24	22.41	22.68	22.35	
5	16QAM	12	0	22.63	22.54	22.43	23
5	16QAM	12	7	22.40	22.69	22.37	
5	16QAM	12	13	22.37	22.63	22.39	
5	16QAM	25	0	21.69	21.56	21.64	
5	64QAM	1	0	22.07	22.18	22.10	23
5	64QAM	1	12	21.99	22.00	22.04	
5	64QAM	1	24	22.05	22.02	22.07	
5	64QAM	12	0	22.25	22.15	22.15	23
5	64QAM	12	7	22.07	22.08	22.07	
5	64QAM	12	13	22.00	22.03	22.09	
5	64QAM	25	0	21.30	21.35	21.36	
Channel				19965	20175	20385	Tune-up limit (dBm)
Frequency (MHz)				1711.5	1732.5	1753.5	
3	QPSK	1	0	23.51	23.50	23.46	24
3	QPSK	1	8	23.47	23.52	23.49	
3	QPSK	1	14	23.50	23.50	23.51	
3	QPSK	8	0	23.50	23.49	23.47	23
3	QPSK	8	4	23.51	23.50	23.50	
3	QPSK	8	7	23.52	23.50	23.52	
3	QPSK	15	0	22.60	22.54	22.55	
3	16QAM	1	0	22.69	22.57	22.58	23
3	16QAM	1	8	22.56	22.61	22.52	
3	16QAM	1	14	22.64	22.56	22.60	
3	16QAM	8	0	22.85	22.62	22.48	23
3	16QAM	8	4	22.53	22.67	22.61	
3	16QAM	8	7	22.54	22.63	22.52	
3	16QAM	15	0	21.65	21.56	21.64	
3	64QAM	1	0	22.21	22.14	22.29	23
3	64QAM	1	8	22.26	22.12	22.17	
3	64QAM	1	14	22.13	22.28	22.32	
3	64QAM	8	0	22.19	22.25	22.30	23
3	64QAM	8	4	22.27	22.19	22.28	
3	64QAM	8	7	22.30	22.01	22.16	
3	64QAM	15	0	21.33	21.33	21.38	
Channel				19957	20175	20393	Tune-up limit (dBm)
Frequency (MHz)				1710.7	1732.5	1754.3	
1.4	QPSK	1	0	23.49	23.47	23.39	24
1.4	QPSK	1	3	23.53	23.53	23.40	
1.4	QPSK	1	5	23.50	23.50	23.43	
1.4	QPSK	3	0	23.50	23.53	23.50	
1.4	QPSK	3	1	23.53	23.50	23.41	
1.4	QPSK	3	3	23.50	23.50	23.43	
1.4	QPSK	6	0	22.64	22.61	22.59	23

1.4	16QAM	1	0	22.67	22.89	22.53	23
1.4	16QAM	1	3	22.60	22.95	22.46	
1.4	16QAM	1	5	22.66	22.84	22.42	
1.4	16QAM	3	0	22.60	22.81	22.65	
1.4	16QAM	3	1	22.63	22.76	22.46	
1.4	16QAM	3	3	22.68	22.87	22.49	
1.4	16QAM	6	0	21.66	22.57	21.50	23
1.4	64QAM	1	0	22.29	22.23	22.30	23
1.4	64QAM	1	3	22.26	22.29	22.29	
1.4	64QAM	1	5	22.30	22.30	22.31	
1.4	64QAM	3	0	22.25	22.26	22.21	
1.4	64QAM	3	1	22.22	22.29	22.27	
1.4	64QAM	3	3	22.29	22.21	22.23	
1.4	64QAM	6	0	21.30	21.26	21.31	22

<FDD LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20450	20525	20600	
Frequency (MHz)				829	836.5	844	
10	QPSK	1	0	23.87	23.34	22.95	24.5
10	QPSK	1	25	23.65	23.40	23.00	
10	QPSK	1	49	**24.05**	23.37	23.14	
10	QPSK	25	0	23.92	23.34	22.91	24.5
10	QPSK	25	12	**24.02**	23.39	23.34	
10	QPSK	25	25	23.67	23.41	23.01	
10	QPSK	50	0	23.09	22.68	22.31	
10	16QAM	1	0	23.16	22.38	22.54	23.5
10	16QAM	1	25	23.13	22.45	22.57	
10	16QAM	1	49	23.18	22.59	22.49	
10	16QAM	25	0	23.02	22.61	22.46	23.5
10	16QAM	25	12	23.17	22.36	22.38	
10	16QAM	25	25	23.11	22.34	22.50	
10	16QAM	50	0	22.09	21.70	21.32	
10	64QAM	1	0	23.01	22.45	22.05	23.5
10	64QAM	1	25	22.94	22.59	22.18	
10	64QAM	1	49	23.18	22.43	22.01	
10	64QAM	25	0	23.04	22.39	21.84	23.5
10	64QAM	25	12	23.07	22.53	22.18	
10	64QAM	25	25	22.91	22.56	21.91	
10	64QAM	50	0	21.76	21.34	21.00	
Channel				20425	20525	20625	Tune-up limit (dBm)
Frequency (MHz)				826.5	836.5	846.5	
5	QPSK	1	0	23.98	23.32	23.65	24.5
5	QPSK	1	12	23.84	23.54	23.44	

5	QPSK	1	24	24.15	23.52	23.31	
5	QPSK	12	0	24.07	23.56	23.39	23.5
5	QPSK	12	7	24.13	23.33	23.51	
5	QPSK	12	13	23.89	23.49	23.34	
5	QPSK	25	0	23.17	22.61	22.60	
5	16QAM	1	0	22.99	22.47	22.48	23.5
5	16QAM	1	12	22.81	22.69	22.54	
5	16QAM	1	24	23.13	22.52	22.41	
5	16QAM	12	0	22.85	22.45	22.46	22.5
5	16QAM	12	7	23.10	22.61	22.33	
5	16QAM	12	13	22.81	22.56	22.60	
5	16QAM	25	0	22.27	21.48	21.45	
5	64QAM	1	0	22.85	22.05	22.15	22.5
5	64QAM	1	12	22.72	21.99	22.18	
5	64QAM	1	24	22.78	22.17	21.94	
5	64QAM	12	0	22.68	22.12	22.08	21.5
5	64QAM	12	7	22.84	22.19	21.93	
5	64QAM	12	13	22.90	21.95	22.01	
5	64QAM	25	0	21.93	21.29	20.90	
Channel				20415	20525	20635	Tune-up limit (dBm)
Frequency (MHz)				825.5	836.5	847.5	
3	QPSK	1	0	24.10	23.45	23.44	24.5
3	QPSK	1	8	24.03	23.52	23.78	
3	QPSK	1	14	24.28	23.42	23.67	
3	QPSK	8	0	24.12	23.47	23.71	23.5
3	QPSK	8	4	24.32	23.56	23.59	
3	QPSK	8	7	24.06	23.51	23.37	
3	QPSK	15	0	23.24	22.56	22.45	
3	16QAM	1	0	23.59	22.66	22.53	23.5
3	16QAM	1	8	23.62	22.72	22.47	
3	16QAM	1	14	23.86	22.47	22.66	
3	16QAM	8	0	23.21	22.54	22.51	22.5
3	16QAM	8	4	23.87	22.41	22.68	
3	16QAM	8	7	23.64	22.53	22.52	
3	16QAM	15	0	22.33	21.60	21.17	
3	64QAM	1	0	23.05	22.45	22.04	22.5
3	64QAM	1	8	22.89	22.31	22.17	
3	64QAM	1	14	23.07	22.43	22.36	
3	64QAM	8	0	22.85	22.20	22.11	21.5
3	64QAM	8	4	23.11	22.35	22.17	
3	64QAM	8	7	22.94	22.41	22.14	
3	64QAM	15	0	21.88	21.32	20.89	
Channel				20407	20525	20643	Tune-up limit (dBm)
Frequency (MHz)				824.7	836.5	848.3	

1.4	QPSK	1	0	24.22	23.41	23.36	24.5
1.4	QPSK	1	3	24.29	23.50	23.37	
1.4	QPSK	1	5	24.29	23.45	23.33	
1.4	QPSK	3	0	24.37	23.58	23.39	
1.4	QPSK	3	1	24.33	23.53	23.14	
1.4	QPSK	3	3	24.28	23.45	23.31	
1.4	QPSK	6	0	23.42	22.63	22.25	23.5
1.4	16QAM	1	0	23.39	22.57	22.41	23.5
1.4	16QAM	1	3	23.44	22.55	22.35	
1.4	16QAM	1	5	23.45	22.58	22.32	
1.4	16QAM	3	0	23.37	22.80	22.46	
1.4	16QAM	3	1	23.43	22.65	22.48	
1.4	16QAM	3	3	23.37	22.52	22.38	
1.4	16QAM	6	0	22.45	21.66	21.40	22.5
1.4	64QAM	1	0	23.03	22.31	21.99	22.5
1.4	64QAM	1	3	23.19	22.37	21.87	
1.4	64QAM	1	5	23.10	22.35	22.01	
1.4	64QAM	3	0	23.00	22.27	21.98	
1.4	64QAM	3	1	23.12	22.38	22.15	
1.4	64QAM	3	3	23.03	22.33	22.08	
1.4	64QAM	6	0	22.08	21.34	20.82	21.5

<FDD LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Measured Power			Tune-up limit (dBm)
Channel				20850	21100	21350	
Frequency (MHz)				2510	2535	2560	
20	QPSK	1	0	22.79	22.69	**22.95**	23
20	QPSK	1	49	22.73	22.63	22.81	
20	QPSK	1	99	22.82	22.69	22.77	
20	QPSK	50	0	22.79	22.81	**22.82**	23
20	QPSK	50	24	22.58	22.63	22.79	
20	QPSK	50	50	22.72	22.69	22.82	
20	QPSK	100	0	21.85	21.79	21.90	
20	16QAM	1	0	22.14	22.18	22.10	22.5
20	16QAM	1	49	21.95	22.06	22.03	
20	16QAM	1	99	22.01	22.12	22.02	
20	16QAM	50	0	21.89	21.85	21.88	22.5
20	16QAM	50	24	22.01	22.10	22.00	
20	16QAM	50	50	21.93	22.07	22.04	
20	16QAM	100	0	21.86	21.85	21.93	
20	64QAM	1	0	21.19	21.32	21.21	22
20	64QAM	1	49	21.15	21.29	21.26	
20	64QAM	1	99	21.07	21.48	21.35	
20	64QAM	50	0	21.22	21.14	21.09	22

20	64QAM	50	24	21.05	21.48	21.35	
20	64QAM	50	50	21.12	21.30	21.27	
20	64QAM	100	0	21.26	21.18	21.23	
Channel				20825	21100	21375	Tune-up limit (dBm)
Frequency (MHz)				2507.5	2535	2562.5	
15	QPSK	1	0	22.74	22.83	22.83	23
15	QPSK	1	37	22.77	22.67	22.76	
15	QPSK	1	74	22.82	22.75	22.80	
15	QPSK	36	0	22.90	22.81	22.90	23
15	QPSK	36	20	22.83	22.74	22.80	
15	QPSK	36	39	22.78	22.76	22.80	
15	QPSK	75	0	21.87	21.82	21.86	
15	16QAM	1	0	22.13	22.07	22.15	22.5
15	16QAM	1	37	22.07	22.19	22.03	
15	16QAM	1	74	22.04	22.04	22.11	
15	16QAM	36	0	21.95	21.87	21.94	22.5
15	16QAM	36	20	22.02	22.19	21.87	
15	16QAM	36	39	21.89	22.13	21.49	
15	16QAM	75	0	21.56	21.85	21.92	
15	64QAM	1	0	21.24	21.40	21.09	21.5
15	64QAM	1	37	21.29	21.33	21.24	
15	64QAM	1	74	21.17	21.31	21.18	
15	64QAM	36	0	21.22	21.17	21.14	21.5
15	64QAM	36	20	21.26	21.28	21.07	
15	64QAM	36	39	21.07	21.26	21.21	
15	64QAM	75	0	21.33	21.22	21.14	
Channel				20800	21100	21400	Tune-up limit (dBm)
Frequency (MHz)				2505	2535	2565	
10	QPSK	1	0	22.90	22.92	22.89	23
10	QPSK	1	25	22.84	22.75	22.91	
10	QPSK	1	49	22.86	22.82	22.88	
10	QPSK	25	0	22.90	22.90	22.90	23
10	QPSK	25	12	22.87	22.83	22.88	
10	QPSK	25	25	22.89	22.80	22.94	
10	QPSK	50	0	21.92	21.83	21.93	
10	16QAM	1	0	21.89	21.99	22.18	22.5
10	16QAM	1	25	21.86	21.91	22.10	
10	16QAM	1	49	22.02	21.93	22.03	
10	16QAM	25	0	21.87	21.96	21.03	22.5
10	16QAM	25	12	21.71	21.97	22.05	
10	16QAM	25	25	21.74	21.90	21.82	
10	16QAM	50	0	21.98	21.84	21.78	
10	64QAM	1	0	21.23	21.49	21.31	22
10	64QAM	1	25	21.18	21.38	21.44	

10	64QAM	1	49	21.06	21.43	21.37	
10	64QAM	25	0	21.13	21.34	21.30	22
10	64QAM	25	12	21.16	21.38	21.22	
10	64QAM	25	25	21.11	21.41	21.38	
10	64QAM	50	0	21.32	21.30	21.25	
Channel				20775	21100	21425	Tune-up limit (dBm)
Frequency (MHz)				2502.5	2535	2567.5	
5	QPSK	1	0	22.72	22.86	22.86	23
5	QPSK	1	12	22.78	22.78	22.81	
5	QPSK	1	24	22.80	22.75	22.79	
5	QPSK	12	0	22.61	22.81	22.64	23
5	QPSK	12	7	22.63	22.74	22.77	
5	QPSK	12	13	22.80	22.77	22.83	
5	QPSK	25	0	21.91	21.81	21.91	
5	16QAM	1	0	21.72	22.09	21.98	22.5
5	16QAM	1	12	21.68	22.01	21.92	
5	16QAM	1	24	21.71	22.05	21.88	
5	16QAM	12	0	21.82	21.84	21.93	22
5	16QAM	12	7	21.70	22.04	21.91	
5	16QAM	12	13	21.73	22.02	21.90	
5	16QAM	25	0	21.05	21.12	21.13	
5	64QAM	1	0	21.15	21.29	21.33	21.5
5	64QAM	1	12	21.08	21.34	21.37	
5	64QAM	1	24	21.10	21.44	21.31	
5	64QAM	12	0	21.27	21.18	21.19	21.5
5	64QAM	12	7	21.09	21.43	21.35	
5	64QAM	12	13	21.05	21.37	21.41	
5	64QAM	25	0	21.33	21.18	21.21	

<FDD LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				23060	23095	23130	
Frequency (MHz)				704	707.5	711	
10	QPSK	1	0	23.72	23.73	**23.78**	24
10	QPSK	1	25	23.68	23.71	23.71	
10	QPSK	1	49	23.66	23.76	23.67	
10	QPSK	25	0	23.74	**23.75**	23.70	24
10	QPSK	25	12	23.62	23.70	23.68	
10	QPSK	25	25	23.70	23.67	23.75	
10	QPSK	50	0	22.88	22.84	22.72	
10	16QAM	1	0	23.13	22.69	22.99	23.5
10	16QAM	1	25	23.27	22.73	23.07	
10	16QAM	1	49	23.28	22.81	23.11	
10	16QAM	25	0	22.98	22.70	22.83	23.5
10	16QAM	25	12	23.29	22.78	23.14	
10	16QAM	25	25	23.27	22.74	23.08	
10	16QAM	50	0	21.95	21.92	21.81	
10	64QAM	1	0	22.57	22.50	22.53	23
10	64QAM	1	25	22.50	22.57	22.45	
10	64QAM	1	49	22.56	22.49	22.32	
10	64QAM	25	0	22.60	22.61	22.49	23
10	64QAM	25	12	22.51	22.48	22.51	
10	64QAM	25	25	22.54	22.35	22.37	
10	64QAM	50	0	21.63	21.64	21.54	
Channel				23035	23095	23155	Tune-up limit (dBm)
Frequency (MHz)				701.5	707.5	713.5	
5	QPSK	1	0	23.78	22.72	23.75	24
5	QPSK	1	12	23.73	23.66	23.67	
5	QPSK	1	24	23.66	23.64	23.60	
5	QPSK	12	0	23.76	23.51	23.71	24
5	QPSK	12	7	23.66	23.63	23.62	
5	QPSK	12	13	23.73	23.69	23.64	
5	QPSK	25	0	22.75	22.83	22.76	
5	16QAM	1	0	22.91	22.67	22.85	23.5
5	16QAM	1	12	23.05	22.62	22.91	
5	16QAM	1	24	22.96	22.61	22.97	
5	16QAM	12	0	22.79	22.79	22.79	23.5
5	16QAM	12	7	22.95	22.61	22.83	
5	16QAM	12	13	23.03	22.65	22.90	
5	16QAM	25	0	21.87	21.92	21.85	
5	64QAM	1	0	22.53	22.49	22.39	23
5	64QAM	1	12	22.69	22.31	22.25	
5	64QAM	1	24	22.64	22.29	22.26	

5	64QAM	12	0	22.50	22.57	22.19	23
5	64QAM	12	7	22.62	22.30	22.27	
5	64QAM	12	13	22.69	22.29	22.24	
5	64QAM	25	0	21.53	21.65	21.61	
Channel				23025	23095	23165	Tune-up limit (dBm)
Frequency (MHz)				700.5	707.5	714.5	
3	QPSK	1	0	23.65	23.79	23.75	24
3	QPSK	1	8	23.73	23.75	23.67	
3	QPSK	1	14	23.76	23.73	23.59	
3	QPSK	8	0	23.69	23.66	23.73	24
3	QPSK	8	4	23.78	23.76	23.80	
3	QPSK	8	7	23.72	23.70	23.72	
3	QPSK	15	0	22.77	22.78	22.77	
3	16QAM	1	0	22.73	22.82	22.94	23.5
3	16QAM	1	8	22.78	22.94	23.12	
3	16QAM	1	14	22.81	22.89	23.08	
3	16QAM	8	0	22.70	22.82	21.83	23.5
3	16QAM	8	4	22.82	22.79	23.09	
3	16QAM	8	7	22.75	22.90	23.16	
3	16QAM	15	0	21.85	21.79	21.93	
3	64QAM	1	0	22.48	22.61	22.50	23
3	64QAM	1	8	22.55	22.58	22.67	
3	64QAM	1	14	22.41	22.62	22.59	
3	64QAM	8	0	22.45	22.49	22.45	23
3	64QAM	8	4	22.39	22.64	22.61	
3	64QAM	8	7	22.30	22.60	22.42	
3	64QAM	15	0	21.55	21.48	21.65	
Channel				23017	23095	23173	Tune-up limit (dBm)
Frequency (MHz)				699.7	707.5	715.3	
1.4	QPSK	1	0	23.71	23.69	23.69	24
1.4	QPSK	1	3	23.73	23.64	23.72	
1.4	QPSK	1	5	23.77	23.60	23.67	
1.4	QPSK	3	0	23.85	23.85	23.70	
1.4	QPSK	3	1	23.70	23.67	23.69	
1.4	QPSK	3	3	23.72	23.66	23.73	
1.4	QPSK	6	0	22.78	22.71	22.75	23
1.4	16QAM	1	0	22.85	22.73	22.70	23
1.4	16QAM	1	3	22.82	22.74	22.73	
1.4	16QAM	1	5	22.84	22.70	22.71	
1.4	16QAM	3	0	22.81	22.89	22.98	
1.4	16QAM	3	1	22.86	22.77	22.75	
1.4	16QAM	3	3	22.88	22.73	22.68	
1.4	16QAM	6	0	21.87	21.76	21.85	22
1.4	64QAM	1	0	22.49	22.44	22.51	23
1.4	64QAM	1	3	22.54	22.36	22.56	

1.4	64QAM	1	5	22.50	22.42	22.50	
1.4	64QAM	3	0	22.52	22.63	22.46	
1.4	64QAM	3	1	22.47	22.44	22.51	
1.4	64QAM	3	3	22.39	22.42	22.49	
1.4	64QAM	6	0	21.56	21.50	21.56	22

<FDD LTE Band 13>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				23230			
Frequency (MHz)				782			
10	QPSK	1	0	23.90			24
10	QPSK	1	25	**23.99**			
10	QPSK	1	49	23.94			
10	QPSK	25	0	22.91			24
10	QPSK	25	12	23.98			
10	QPSK	25	25	**23.96**			
10	QPSK	50	0	22.84			
10	16QAM	1	0	22.67			23
10	16QAM	1	25	22.52			
10	16QAM	1	49	22.58			
10	16QAM	25	0	22.61			23
10	16QAM	25	12	22.59			
10	16QAM	25	25	22.55			
10	16QAM	50	0	21.82			
10	64QAM	1	0	22.53			23
10	64QAM	1	25	22.45			
10	64QAM	1	49	22.51			
10	64QAM	25	0	22.39			23
10	64QAM	25	12	22.48			
10	64QAM	25	25	22.45			
10	64QAM	50	0	21.58			
Channel				23205	23230	23255	Tune-up limit (dBm)
Frequency (MHz)				779.5	782	784.5	
5	QPSK	1	0	23.72	23.93	22.81	24
5	QPSK	1	12	23.79	23.90	23.83	
5	QPSK	1	24	23.85	23.99	23.75	
5	QPSK	12	0	22.75	23.94	23.78	24
5	QPSK	12	7	23.86	23.89	23.74	
5	QPSK	12	13	23.84	23.95	23.85	
5	QPSK	25	0	22.72	22.85	22.79	
5	16QAM	1	0	22.94	22.84	22.80	23
5	16QAM	1	12	22.97	22.78	22.88	
5	16QAM	1	24	22.95	22.79	22.89	

5	16QAM	12	0	22.83	22.82	22.97	23
5	16QAM	12	7	22.96	22.75	22.90	
5	16QAM	12	13	22.91	22.71	22.87	
5	16QAM	25	0	21.73	21.87	21.90	
5	64QAM	1	0	22.44	22.39	22.62	23
5	64QAM	1	12	22.46	22.31	22.59	
5	64QAM	1	24	22.39	22.33	22.65	
5	64QAM	12	0	22.45	22.52	22.41	23
5	64QAM	12	7	22.47	22.30	22.68	
5	64QAM	12	13	22.33	22.32	22.63	
5	64QAM	25	0	21.41	21.59	21.45	

<FDD LTE Band 17>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				23780	23790	23800	
Frequency (MHz)				709	710	711	
10	QPSK	1	0	23.72	23.78	23.84	24
10	QPSK	1	25	23.76	**23.85**	23.79	
10	QPSK	1	49	23.79	23.81	23.71	
10	QPSK	25	0	22.80	23.79	23.77	24
10	QPSK	25	12	23.79	**23.84**	23.81	
10	QPSK	25	25	23.77	23.82	23.83	
10	QPSK	50	0	22.87	22.83	22.87	
10	16QAM	1	0	23.04	22.80	22.99	23.5
10	16QAM	1	25	23.07	22.84	23.03	
10	16QAM	1	49	23.11	22.85	23.05	
10	16QAM	25	0	22.94	22.93	22.91	23.5
10	16QAM	25	12	23.02	22.80	23.08	
10	16QAM	25	25	23.09	22.83	23.02	
10	16QAM	50	0	21.91	21.91	21.91	
10	64QAM	1	0	22.52	22.53	22.44	23
10	64QAM	1	25	22.68	22.64	22.49	
10	64QAM	1	49	22.65	22.50	22.37	
10	64QAM	25	0	22.55	22.61	22.58	23
10	64QAM	25	12	22.70	22.48	22.31	
10	64QAM	25	25	22.65	22.41	22.25	
10	64QAM	50	0	21.63	21.56	21.59	
Channel				23755	23790	23825	Tune-up limit (dBm)
Frequency (MHz)				706.5	710	713.5	
5	QPSK	1	0	23.72	23.79	23.79	24
5	QPSK	1	12	23.77	23.75	23.71	
5	QPSK	1	24	23.79	23.77	23.74	
5	QPSK	12	0	23.71	23.82	23.80	24
5	QPSK	12	7	23.76	23.71	23.70	

5	QPSK	12	13	23.81	23.78	23.75	
5	QPSK	25	0	22.90	22.77	22.86	
5	16QAM	1	0	22.94	22.72	22.60	23
5	16QAM	1	12	22.85	22.65	22.62	
5	16QAM	1	24	22.98	22.70	22.65	
5	16QAM	12	0	22.98	22.81	22.72	23
5	16QAM	12	7	22.97	22.69	22.67	
5	16QAM	12	13	22.94	22.67	22.59	
5	16QAM	25	0	21.99	21.93	21.98	
5	64QAM	1	0	22.47	22.73	22.35	23
5	64QAM	1	12	22.40	22.76	22.47	
5	64QAM	1	24	22.42	22.80	22.39	
5	64QAM	12	0	22.64	22.55	22.30	23
5	64QAM	12	7	22.39	22.81	22.45	
5	64QAM	12	13	22.44	22.77	22.28	
5	64QAM	25	0	21.70	21.56	21.61	

<FDD LTE Band 25>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				26140	26365	26590	
Frequency (MHz)				1860	1882.5	1905	
20	QPSK	1	0	**23.48**	23.31	23.26	23.5
20	QPSK	1	49	23.25	23.16	23.18	
20	QPSK	1	99	23.32	23.25	23.22	
20	QPSK	50	0	**23.42**	23.24	23.13	23.5
20	QPSK	50	24	23.30	23.24	23.29	
20	QPSK	50	50	23.25	23.20	23.22	
20	QPSK	100	0	22.40	22.36	22.31	
20	16QAM	1	0	22.57	22.38	22.44	23
20	16QAM	1	49	22.49	22.35	22.40	
20	16QAM	1	99	22.53	22.40	22.48	
20	16QAM	50	0	22.44	22.29	22.18	23
20	16QAM	50	24	22.58	22.42	22.47	
20	16QAM	50	50	22.49	22.35	22.43	
20	16QAM	100	0	22.46	22.41	22.36	
20	64QAM	1	0	22.39	22.32	22.10	23
20	64QAM	1	49	22.35	22.27	22.07	
20	64QAM	1	99	22.47	22.43	22.22	
20	64QAM	50	0	22.20	22.14	21.93	22.5
20	64QAM	50	24	22.47	22.39	22.18	
20	64QAM	50	50	22.32	22.21	22.07	
20	64QAM	100	0	21.52	21.56	21.65	
Channel				26115	26365	26615	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1882.5	1907.5	

15	QPSK	1	0	23.30	23.38	23.19	23.5
15	QPSK	1	37	23.24	23.20	23.22	
15	QPSK	1	74	23.37	23.31	23.27	
15	QPSK	36	0	23.49	23.42	23.33	23.5
15	QPSK	36	20	23.36	23.32	23.28	
15	QPSK	36	39	23.29	23.29	23.26	
15	QPSK	75	0	22.44	22.47	22.42	
15	16QAM	1	0	22.52	22.43	22.35	23
15	16QAM	1	37	22.36	22.39	22.30	
15	16QAM	1	74	22.47	22.40	22.37	
15	16QAM	36	0	22.44	22.36	22.29	23
15	16QAM	36	20	22.48	22.41	22.37	
15	16QAM	36	39	22.35	22.32	22.33	
15	16QAM	75	0	22.43	22.46	22.42	
15	64QAM	1	0	22.30	22.50	22.19	23
15	64QAM	1	37	22.24	22.52	22.06	
15	64QAM	1	74	22.31	22.66	22.25	
15	64QAM	36	0	22.34	22.24	22.09	23
15	64QAM	36	20	22.39	22.69	22.21	
15	64QAM	36	39	22.27	22.51	22.06	
15	64QAM	75	0	22.37	22.33	22.24	
Channel				26090	26365	26640	Tune-up limit (dBm)
Frequency (MHz)				1855	1882.5	1910	
10	QPSK	1	0	23.39	23.20	23.31	23.5
10	QPSK	1	25	23.28	23.23	23.27	
10	QPSK	1	49	23.33	23.29	23.23	
10	QPSK	25	0	23.37	23.35	23.20	23.5
10	QPSK	25	12	23.34	23.31	23.24	
10	QPSK	25	25	23.31	23.22	23.28	
10	QPSK	50	0	22.36	22.37	22.22	
10	16QAM	1	0	22.72	22.78	22.68	23
10	16QAM	1	25	22.79	22.72	22.65	
10	16QAM	1	49	22.85	22.74	22.70	
10	16QAM	25	0	22.48	22.69	22.57	23
10	16QAM	25	12	22.83	22.75	22.74	
10	16QAM	25	25	22.81	22.73	22.68	
10	16QAM	50	0	22.41	22.44	22.44	
10	64QAM	1	0	22.60	22.49	22.39	23
10	64QAM	1	25	22.67	22.54	22.43	
10	64QAM	1	49	22.76	22.60	22.36	
10	64QAM	25	0	22.37	22.29	22.10	23
10	64QAM	25	12	22.75	22.66	22.25	
10	64QAM	25	25	22.66	22.57	22.33	
10	64QAM	50	0	22.38	22.28	22.18	
Channel				26065	26365	26665	Tune-up

Frequency (MHz)				1852.5	1882.5	1912.5	limit (dBm)
5	QPSK	1	0	23.31	23.36	23.27	23.5
5	QPSK	1	12	23.25	23.22	23.20	
5	QPSK	1	24	23.34	23.27	23.21	
5	QPSK	12	0	23.35	23.35	23.19	23.5
5	QPSK	12	7	23.33	23.28	23.22	
5	QPSK	12	13	23.26	23.25	23.23	
5	QPSK	25	0	22.32	22.32	22.27	
5	16QAM	1	0	22.65	22.41	22.18	23
5	16QAM	1	12	22.51	22.45	22.05	
5	16QAM	1	24	22.54	22.49	22.06	
5	16QAM	12	0	22.37	22.33	22.21	23
5	16QAM	12	7	22.58	22.48	22.05	
5	16QAM	12	13	22.53	22.46	22.06	
5	16QAM	25	0	22.31	22.31	22.35	
5	64QAM	1	0	22.39	22.47	22.15	23
5	64QAM	1	12	22.42	22.55	22.22	
5	64QAM	1	24	22.46	22.48	22.20	
5	64QAM	12	0	22.28	22.41	21.99	23
5	64QAM	12	7	22.34	22.38	22.27	
5	64QAM	12	13	22.40	22.50	22.24	
5	64QAM	25	0	22.22	22.27	22.06	
Channel				26055	26365	26675	Tune-up limit (dBm)
Frequency (MHz)				1851.5	1882.5	1913.5	
3	QPSK	1	0	23.39	23.31	23.39	23.5
3	QPSK	1	8	23.32	23.34	23.36	
3	QPSK	1	14	23.44	23.40	23.40	
3	QPSK	8	0	22.33	22.28	23.28	23.5
3	QPSK	8	4	23.41	23.38	23.32	
3	QPSK	8	7	23.30	23.32	23.37	
3	QPSK	15	0	22.34	22.28	22.31	
3	16QAM	1	0	22.85	22.29	22.34	23
3	16QAM	1	8	22.80	22.23	22.22	
3	16QAM	1	14	22.89	22.37	22.37	
3	16QAM	8	0	22.92	22.24	22.25	23
3	16QAM	8	4	22.87	22.31	22.29	
3	16QAM	8	7	22.85	22.30	22.26	
3	16QAM	15	0	22.46	22.38	22.36	
3	64QAM	1	0	22.30	22.68	22.28	23
3	64QAM	1	8	22.37	22.71	22.25	
3	64QAM	1	14	22.43	22.65	22.21	
3	64QAM	8	0	22.29	22.25	22.12	23
3	64QAM	8	4	22.41	22.68	22.29	
3	64QAM	8	7	22.36	22.60	22.10	

3	64QAM	15	0	22.23	22.22	22.05	
Channel				26047	26365	26683	Tune-up limit (dBm)
Frequency (MHz)				1850.7	1882.5	1914.3	
1.4	QPSK	1	0	23.34	23.28	23.27	23.5
1.4	QPSK	1	3	23.35	23.34	23.28	
1.4	QPSK	1	5	23.36	23.30	23.21	
1.4	QPSK	3	0	23.33	23.35	23.29	
1.4	QPSK	3	1	23.37	23.30	23.25	
1.4	QPSK	3	3	23.38	23.33	23.33	
1.4	QPSK	6	0	22.46	22.40	22.36	23
1.4	16QAM	1	0	22.42	22.22	22.18	23
1.4	16QAM	1	3	22.46	22.25	22.22	
1.4	16QAM	1	5	22.41	22.27	22.20	
1.4	16QAM	3	0	22.45	22.47	22.41	
1.4	16QAM	3	1	22.47	22.25	22.28	
1.4	16QAM	3	3	22.49	22.30	22.24	
1.4	16QAM	6	0	21.52	21.59	21.55	22
1.4	64QAM	1	0	22.34	22.35	22.19	22.5
1.4	64QAM	1	3	22.38	22.20	22.16	
1.4	64QAM	1	5	22.29	22.23	22.13	
1.4	64QAM	3	0	22.23	22.15	22.04	
1.4	64QAM	3	1	22.40	22.26	22.17	
1.4	64QAM	3	3	22.36	22.24	22.15	
1.4	64QAM	6	0	22.41	22.49	22.20	22.5

<FDD LTE Band 26>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				26765	26865	26965	
Frequency (MHz)				821.5	831.5	841.5	
15	QPSK	1	0	**24.79**	23.84	23.37	25
15	QPSK	1	37	24.73	23.68	23.30	
15	QPSK	1	74	24.71	24.11	23.63	
15	QPSK	36	0	24.32	24.04	22.52	25
15	QPSK	36	20	24.61	24.15	23.68	
15	QPSK	36	39	**24.62**	23.87	23.53	
15	QPSK	75	0	23.36	23.31	22.80	
15	16QAM	1	0	23.32	23.05	22.74	24
15	16QAM	1	37	23.28	23.10	22.68	
15	16QAM	1	74	23.77	23.27	22.50	
15	16QAM	36	0	22.46	22.98	22.48	24
15	16QAM	36	20	23.73	23.28	23.35	
15	16QAM	36	39	23.29	23.14	22.70	
15	16QAM	75	0	22.38	22.26	21.75	
15	64QAM	1	0	23.92	22.74	22.29	24

15	64QAM	1	37	23.85	22.92	22.04	
15	64QAM	1	74	23.95	23.17	22.28	
15	64QAM	36	0	23.52	22.66	21.13	24
15	64QAM	36	20	23.63	22.78	22.21	
15	64QAM	36	39	23.85	22.93	22.08	
15	64QAM	75	0	22.52	21.96	21.42	
Channel				26740	26865	26990	Tune-up limit (dBm)
Frequency (MHz)				819	831.5	844	
10	QPSK	1	0	24.49	23.96	23.54	25
10	QPSK	1	25	24.46	23.90	23.33	
10	QPSK	1	49	24.77	24.35	23.57	
10	QPSK	25	0	24.36	24.10	23.41	25
10	QPSK	25	12	24.70	24.34	23.63	
10	QPSK	25	25	24.42	23.87	23.30	
10	QPSK	50	0	23.41	23.27	22.61	
10	16QAM	1	0	23.60	23.19	22.80	24
10	16QAM	1	25	23.66	23.07	22.52	
10	16QAM	1	49	23.73	23.12	22.89	
10	16QAM	25	0	23.39	23.14	22.75	24
10	16QAM	25	12	23.64	23.06	22.88	
10	16QAM	25	25	23.70	23.09	22.76	
10	16QAM	50	0	22.49	22.26	21.64	
10	64QAM	1	0	23.92	22.93	22.32	24
10	64QAM	1	25	23.79	23.10	22.49	
10	64QAM	1	49	23.86	23.16	22.27	
10	64QAM	25	0	23.85	22.83	22.30	24
10	64QAM	25	12	23.86	23.08	22.36	
10	64QAM	25	25	23.76	23.12	22.21	
10	64QAM	50	0	22.64	21.98	21.34	
Channel				26715	26865	27015	Tune-up limit (dBm)
Frequency (MHz)				816.5	831.5	846.5	
5	QPSK	1	0	24.65	24.08	23.29	25
5	QPSK	1	12	24.39	23.94	23.21	
5	QPSK	1	24	24.77	24.17	23.38	
5	QPSK	12	0	24.51	24.11	23.35	25
5	QPSK	12	7	24.74	24.18	23.40	
5	QPSK	12	13	24.37	23.95	23.24	
5	QPSK	25	0	23.59	23.20	22.45	
5	16QAM	1	0	23.46	23.34	22.49	24
5	16QAM	1	12	23.24	23.25	22.42	
5	16QAM	1	24	23.51	23.37	22.36	
5	16QAM	12	0	23.52	23.13	22.31	24
5	16QAM	12	7	23.49	23.43	22.34	
5	16QAM	12	13	23.21	23.26	22.16	

5	16QAM	25	0	22.72	22.22	21.53	
5	64QAM	1	0	23.90	22.89	22.15	24
5	64QAM	1	12	23.96	22.72	22.22	
5	64QAM	1	24	23.68	22.96	22.47	
5	64QAM	12	0	23.87	22.74	22.21	24
5	64QAM	12	7	23.70	22.98	22.48	
5	64QAM	12	13	23.57	22.73	22.25	
5	64QAM	25	0	22.84	21.89	21.12	
Channel				26705	26865	27025	Tune-up limit (dBm)
Frequency (MHz)				815.5	831.5	847.5	
3	QPSK	1	0	24.67	24.16	23.32	25
3	QPSK	1	8	24.65	24.00	23.27	
3	QPSK	1	14	24.55	24.20	23.45	
3	QPSK	8	0	24.62	23.13	23.30	25
3	QPSK	8	4	24.75	24.21	23.43	
3	QPSK	8	7	24.66	24.01	23.34	
3	QPSK	15	0	23.72	23.23	22.40	
3	16QAM	1	0	23.96	23.67	22.78	24
3	16QAM	1	8	23.85	23.59	22.83	
3	16QAM	1	14	23.76	23.79	23.00	
3	16QAM	8	0	23.70	23.13	22.56	24
3	16QAM	8	4	23.86	23.46	23.01	
3	16QAM	8	7	23.75	23.58	22.64	
3	16QAM	15	0	22.78	22.27	21.49	
3	64QAM	1	0	23.90	23.21	22.23	24
3	64QAM	1	8	23.87	23.26	22.15	
3	64QAM	1	14	24.07	23.29	22.32	
3	64QAM	8	0	23.85	23.13	22.05	24
3	64QAM	8	4	23.85	23.06	22.27	
3	64QAM	8	7	23.80	23.30	22.15	
3	64QAM	15	0	22.85	21.98	21.04	
Channel				26697	26865	27033	Tune-up limit (dBm)
Frequency (MHz)				814.7	831.5	848.3	
1.4	QPSK	1	0	24.75	24.05	23.30	25
1.4	QPSK	1	3	24.70	24.14	23.34	
1.4	QPSK	1	5	24.62	24.16	23.31	
1.4	QPSK	3	0	24.76	24.21	23.43	
1.4	QPSK	3	1	24.65	24.13	23.35	
1.4	QPSK	3	3	24.78	24.05	23.28	
1.4	QPSK	6	0	23.89	23.23	22.41	24
1.4	16QAM	1	0	23.62	23.28	22.36	24
1.4	16QAM	1	3	23.71	23.31	22.42	
1.4	16QAM	1	5	23.67	23.23	22.40	
1.4	16QAM	3	0	23.82	23.21	22.47	
1.4	16QAM	3	1	23.70	23.35	22.38	

1.4	16QAM	3	3	23.60	23.22	22.40	
1.4	16QAM	6	0	22.85	22.28	21.36	23
1.4	64QAM	1	0	23.93	22.93	22.13	23
1.4	64QAM	1	3	23.85	22.97	22.15	
1.4	64QAM	1	5	23.74	23.03	22.10	
1.4	64QAM	3	0	23.84	22.86	22.07	
1.4	64QAM	3	1	23.86	23.02	22.20	
1.4	64QAM	3	3	23.94	22.94	22.12	
1.4	64QAM	6	0	22.98	21.95	21.13	22

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BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				39750	40185	40620	41055	41490	
Frequency (MHz)				2506	2549.5	2593	2636.5	2680	
20	QPSK	1	0	26.90	26.84	26.78	26.92	26.84	27.5
20	QPSK	1	49	27.15	27.18	27.10	27.12	27.19	
20	QPSK	1	99	26.97	26.82	26.74	26.81	26.77	
20	QPSK	50	0	25.74	25.81	25.88	25.93	25.94	26.5
20	QPSK	50	24	25.77	25.80	25.86	25.94	25.95	
20	QPSK	50	50	25.81	25.80	25.89	25.94	25.78	
20	QPSK	100	0	25.75	25.79	25.85	25.95	25.86	
20	16QAM	1	0	26.05	26.01	25.76	25.90	25.85	26.5
20	16QAM	1	49	26.31	26.37	26.12	26.15	26.14	
20	16QAM	1	99	25.89	25.99	25.71	25.77	25.79	
20	16QAM	50	0	24.75	24.82	24.90	25.01	24.93	25.5
20	16QAM	50	24	24.78	24.84	24.97	25.02	24.93	
20	16QAM	50	50	24.83	24.81	24.92	24.98	24.82	
20	16QAM	100	0	24.80	24.80	24.86	24.96	24.85	
20	64QAM	1	0	25.57	25.48	25.25	25.38	25.36	26
20	64QAM	1	49	25.84	25.86	25.59	25.64	25.66	
20	64QAM	1	99	25.45	25.46	25.20	25.26	25.29	
20	64QAM	50	0	24.29	24.33	24.41	24.52	24.45	25
20	64QAM	50	24	24.28	24.33	24.42	24.53	24.43	
20	64QAM	50	50	24.37	24.30	24.45	24.47	24.33	
20	64QAM	100	0	24.30	24.29	24.37	24.46	24.41	
Channel				39725	40173	40620	41068	41515	Tune-up limit (dBm)
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5	
15	QPSK	1	0	26.80	26.86	26.90	26.95	26.87	27.5
15	QPSK	1	37	26.82	26.92	26.99	27.04	26.90	
15	QPSK	1	74	26.70	26.84	26.87	26.87	26.82	
15	QPSK	36	0	25.94	25.89	26.04	26.06	25.78	26.5
15	QPSK	36	20	25.98	25.90	26.12	26.03	25.82	
15	QPSK	36	39	25.88	25.91	26.06	26.03	25.73	

15	QPSK	75	0	25.95	25.93	26.08	26.08	26.03	
15	16QAM	1	0	25.93	25.99	26.02	25.87	25.76	
15	16QAM	1	37	25.98	26.07	26.13	25.90	25.81	26.5
15	16QAM	1	74	25.86	25.95	25.98	25.74	25.72	
15	16QAM	36	0	25.97	24.90	26.06	24.97	25.81	
15	16QAM	36	20	25.96	24.87	26.12	24.95	25.81	26
15	16QAM	36	39	25.90	24.87	25.99	24.92	25.71	
15	16QAM	75	0	24.84	24.87	24.95	25.02	24.98	
15	64QAM	1	0	25.51	24.34	24.44	24.49	24.44	
15	64QAM	1	37	25.57	25.55	25.33	25.39	25.52	26
15	64QAM	1	74	25.41	25.48	25.21	25.23	25.45	
15	64QAM	36	0	25.53	24.37	25.27	24.43	25.55	
15	64QAM	36	20	25.56	24.38	25.35	24.42	25.56	26
15	64QAM	36	39	25.45	24.38	25.23	24.40	25.46	
15	64QAM	75	0	24.42	24.38	24.46	24.51	24.44	
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)
Frequency (MHz)				2501	2547	2593	2639	2685	
10	QPSK	1	0	26.93	26.87	26.90	26.98	26.83	
10	QPSK	1	25	27.19	27.17	27.19	27.27	27.16	27.5
10	QPSK	1	49	26.80	26.89	26.89	26.93	26.83	
10	QPSK	25	0	25.85	25.86	25.93	26.05	25.96	
10	QPSK	25	12	25.86	25.89	25.98	26.05	25.97	26.5
10	QPSK	25	25	25.87	25.86	25.92	25.98	25.86	
10	QPSK	50	0	25.81	25.86	25.86	25.99	25.91	
10	16QAM	1	0	25.89	25.90	25.77	25.87	26.00	
10	16QAM	1	25	26.17	26.17	26.08	26.13	26.29	26.5
10	16QAM	1	49	25.84	25.90	25.72	25.81	25.98	
10	16QAM	25	0	24.87	24.90	24.95	25.06	24.97	
10	16QAM	25	12	24.88	24.89	24.99	25.06	24.90	25.5
10	16QAM	25	25	24.89	24.89	24.94	25.01	24.85	
10	16QAM	50	0	24.85	24.85	24.89	24.99	24.92	
10	64QAM	1	0	25.44	24.36	24.35	24.46	24.46	
10	64QAM	1	25	25.70	25.68	25.56	25.62	25.81	26
10	64QAM	1	49	25.37	25.39	25.29	25.31	25.51	
10	64QAM	25	0	24.42	24.39	24.46	24.60	24.52	
10	64QAM	25	12	24.43	24.38	24.41	24.59	24.51	25
10	64QAM	25	25	24.45	24.40	24.44	24.51	24.41	
10	64QAM	50	0	24.32	24.36	24.39	24.46	24.45	
Channel				39675	40148	40620	41093	41565	Tune-up limit (dBm)
Frequency (MHz)				2498.5	2545.8	2593	2640.30	2687.5	
5	QPSK	1	0	26.75	26.71	26.75	26.88	26.71	
5	QPSK	1	12	26.91	26.92	26.98	27.05	26.89	27.5
5	QPSK	1	24	26.76	26.70	26.79	26.85	26.71	

5	QPSK	12	0	25.77	25.76	25.83	25.94	25.87	26.5
5	QPSK	12	7	25.89	25.81	25.82	25.96	25.86	
5	QPSK	12	13	25.81	25.82	25.86	25.90	25.83	
5	QPSK	25	0	25.82	25.78	25.84	25.93	25.87	
5	16QAM	1	0	25.92	25.71	25.77	26.07	25.74	26.5
5	16QAM	1	12	26.07	25.89	25.93	26.21	25.92	
5	16QAM	1	24	25.94	25.68	25.70	26.04	25.72	
5	16QAM	12	0	24.78	24.77	24.88	24.96	24.83	25.5
5	16QAM	12	7	24.80	24.77	24.87	24.97	24.87	
5	16QAM	12	13	24.82	24.78	24.85	24.94	24.80	
5	16QAM	25	0	24.79	24.82	24.97	24.92	24.90	
5	64QAM	1	0	25.26	25.19	24.34	24.41	24.49	26
5	64QAM	1	12	25.42	25.42	25.67	25.71	25.49	
5	64QAM	1	24	25.26	25.21	25.50	25.55	25.32	
5	64QAM	12	0	24.31	24.25	24.32	24.45	24.42	24.5
5	64QAM	12	7	24.37	24.28	24.41	24.45	24.45	
5	64QAM	12	13	24.35	24.29	24.38	24.44	24.42	
5	64QAM	25	0	24.39	24.32	24.37	24.43	24.49	

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BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				132072	132322	132572	
Frequency (MHz)				1720	1745	1770	
20	QPSK	1	0	23.24	23.19	23.17	23.5
20	QPSK	1	49	**23.39**	23.39	23.37	
20	QPSK	1	99	23.17	23.14	23.19	
20	QPSK	50	0	23.26	22.83	22.83	23.5
20	QPSK	50	24	23.28	22.95	22.91	
20	QPSK	50	50	**23.31**	22.93	22.89	
20	QPSK	100	0	22.28	22.88	22.36	
20	16QAM	1	0	22.35	22.36	22.27	23
20	16QAM	1	49	22.47	22.47	22.41	
20	16QAM	1	99	22.28	22.22	22.22	
20	16QAM	50	0	22.32	21.84	21.95	22.5
20	16QAM	50	24	22.32	21.90	21.87	
20	16QAM	50	50	22.30	21.93	21.90	
20	16QAM	100	0	21.30	21.29	21.37	
20	64QAM	1	0	21.86	21.78	21.88	22.5
20	64QAM	1	49	21.95	21.97	22.11	
20	64QAM	1	99	21.83	21.69	21.88	
20	64QAM	50	0	21.79	21.83	21.96	22
20	64QAM	50	24	21.79	21.84	21.90	
20	64QAM	50	50	21.82	21.82	21.82	
20	64QAM	100	0	20.77	20.79	20.85	
Channel				132047	132322	132597	Tune-up

Frequency (MHz)				1717.5	1745	1772.5	limit (dBm)
15	QPSK	1	0	23.18	23.10	23.22	23.5
15	QPSK	1	37	23.21	23.23	23.29	
15	QPSK	1	74	23.08	23.07	23.17	
15	QPSK	36	0	22.95	22.87	22.51	23
15	QPSK	36	20	22.91	22.96	22.60	
15	QPSK	36	39	22.85	22.82	22.44	
15	QPSK	75	0	22.39	22.34	22.47	
15	16QAM	1	0	22.50	22.42	22.53	23
15	16QAM	1	37	22.46	22.46	22.59	
15	16QAM	1	74	22.38	22.35	22.40	
15	16QAM	36	0	22.47	22.39	22.43	23
15	16QAM	36	20	22.49	22.45	22.42	
15	16QAM	36	39	22.38	22.36	22.49	
15	16QAM	75	0	21.34	21.30	21.41	
15	64QAM	1	0	21.97	21.94	22.05	22.5
15	64QAM	1	37	22.00	21.96	22.12	
15	64QAM	1	74	21.90	21.85	21.95	
15	64QAM	36	0	21.97	21.96	21.56	22
15	64QAM	36	20	21.97	21.98	21.85	
15	64QAM	36	39	21.88	21.84	21.93	
15	64QAM	75	0	20.83	20.85	20.89	
Channel				132022	132322	132622	Tune-up limit (dBm)
Frequency (MHz)				1715	1745	1775	
10	QPSK	1	0	23.22	23.17	23.19	23.5
10	QPSK	1	25	23.30	23.20	23.35	
10	QPSK	1	49	23.22	23.15	23.15	
10	QPSK	25	0	22.41	22.83	22.91	23
10	QPSK	25	12	22.98	22.90	22.84	
10	QPSK	25	25	23.13	22.93	22.90	
10	QPSK	50	0	22.42	22.29	22.38	
10	16QAM	1	0	22.57	22.44	22.47	23
10	16QAM	1	25	22.63	22.57	22.52	
10	16QAM	1	49	22.48	22.44	22.38	
10	16QAM	25	0	22.44	22.33	21.97	22.5
10	16QAM	25	12	22.42	22.36	21.80	
10	16QAM	25	25	22.49	22.30	21.92	
10	16QAM	50	0	21.44	21.28	21.41	
10	64QAM	1	0	22.02	21.93	21.96	22.5
10	64QAM	1	25	22.16	22.07	22.06	
10	64QAM	1	49	21.97	21.86	21.95	
10	64QAM	25	0	21.92	21.86	21.81	22
10	64QAM	25	12	21.99	21.84	21.97	
10	64QAM	25	25	21.95	21.88	21.93	

10	64QAM	50	0	20.97	20.83	20.88	
Channel				131997	132322	132647	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1745	1777.5	
5	QPSK	1	0	23.26	23.15	23.21	23.5
5	QPSK	1	12	23.39	23.30	23.35	
5	QPSK	1	24	23.17	23.13	23.19	
5	QPSK	12	0	23.32	23.24	22.31	23.5
5	QPSK	12	7	23.37	23.26	22.34	
5	QPSK	12	13	23.36	23.26	22.28	
5	QPSK	25	0	22.37	22.30	22.35	
5	16QAM	1	0	22.32	22.30	22.45	23
5	16QAM	1	12	22.41	22.36	22.57	
5	16QAM	1	24	22.30	22.24	22.40	
5	16QAM	12	0	22.36	22.31	21.38	22.5
5	16QAM	12	7	22.35	22.29	21.39	
5	16QAM	12	13	22.40	22.26	21.32	
5	16QAM	25	0	21.46	21.38	21.34	
5	64QAM	1	0	21.80	21.78	21.94	22.5
5	64QAM	1	12	21.93	21.84	22.07	
5	64QAM	1	24	21.79	21.75	21.96	
5	64QAM	12	0	21.86	21.80	21.86	22
5	64QAM	12	7	21.86	21.78	21.88	
5	64QAM	12	13	21.93	21.71	20.83	
5	64QAM	25	0	20.94	20.83	20.83	
Channel				131987	132322	132657	Tune-up limit (dBm)
Frequency (MHz)				1711.5	1745	1778.5	
3	QPSK	1	0	23.18	23.21	23.30	23.5
3	QPSK	1	8	23.22	23.27	23.28	
3	QPSK	1	14	23.20	23.23	23.31	
3	QPSK	8	0	23.13	23.20	22.99	23.5
3	QPSK	8	4	23.28	23.28	22.85	
3	QPSK	8	7	23.30	23.24	22.90	
3	QPSK	15	0	22.43	22.22	22.33	
3	16QAM	1	0	22.57	22.50	22.24	23
3	16QAM	1	8	22.49	22.45	22.25	
3	16QAM	1	14	22.47	22.36	22.27	
3	16QAM	8	0	22.42	22.33	21.98	23
3	16QAM	8	4	22.45	22.29	21.94	
3	16QAM	8	7	22.39	22.29	21.89	
3	16QAM	15	0	21.40	21.22	21.25	
3	64QAM	1	0	21.95	22.00	21.81	22.5
3	64QAM	1	8	22.00	21.94	21.70	
3	64QAM	1	14	22.00	21.90	21.78	
3	64QAM	8	0	21.93	21.83	21.91	22
3	64QAM	8	4	21.92	21.85	20.86	

3	64QAM	8	7	21.92	21.81	20.88	
3	64QAM	15	0	20.89	20.75	20.78	
Channel				131979	132322	132665	Tune-up limit (dBm)
Frequency (MHz)				1710.7	1745	1779.3	
1.4	QPSK	1	0	23.14	23.07	23.20	23.5
1.4	QPSK	1	3	23.29	23.19	23.33	
1.4	QPSK	1	5	23.16	23.09	23.17	
1.4	QPSK	3	0	23.34	23.25	23.30	
1.4	QPSK	3	1	23.37	23.25	23.15	
1.4	QPSK	3	3	23.34	23.26	23.03	
1.4	QPSK	6	0	22.26	22.18	22.28	23
1.4	16QAM	1	0	22.38	22.27	22.31	23
1.4	16QAM	1	3	22.56	22.41	22.45	
1.4	16QAM	1	5	22.33	22.29	22.30	
1.4	16QAM	3	0	22.29	22.22	22.28	
1.4	16QAM	3	1	22.31	22.24	22.22	
1.4	16QAM	3	3	22.26	22.16	22.19	
1.4	16QAM	6	0	21.33	21.24	21.33	21.5
1.4	64QAM	1	0	21.86	21.81	21.90	22.5
1.4	64QAM	1	3	22.04	22.06	22.01	
1.4	64QAM	1	5	21.88	21.85	21.91	
1.4	64QAM	3	0	21.81	21.72	21.77	
1.4	64QAM	3	1	21.80	21.75	21.78	
1.4	64QAM	3	3	21.79	21.66	21.77	
1.4	64QAM	6	0	20.86	20.81	20.71	21

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BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				133222	133297	133372	
Frequency (MHz)				673	680.5	688	
20	QPSK	1	0	23.98	23.85	23.76	24.5
20	QPSK	1	49	**24.21**	24.16	23.94	
20	QPSK	1	99	24.02	23.93	23.86	
20	QPSK	50	0	23.76	23.90	23.92	24
20	QPSK	50	24	23.74	23.95	23.88	
20	QPSK	50	50	23.95	**23.97**	23.80	
20	QPSK	100	0	22.87	23.09	22.86	
20	16QAM	1	0	23.00	23.07	22.89	23.5
20	16QAM	1	49	23.17	23.35	23.14	
20	16QAM	1	99	23.03	23.10	22.95	
20	16QAM	50	0	22.77	22.83	22.98	23
20	16QAM	50	24	22.81	23.09	22.94	
20	16QAM	50	50	22.75	22.78	22.90	
20	16QAM	100	0	21.91	22.13	21.90	

20	64QAM	1	0	22.45	22.42	22.59	23
20	64QAM	1	49	22.69	22.72	22.79	
20	64QAM	1	99	22.49	22.49	22.67	
20	64QAM	50	0	22.36	22.32	22.47	23
20	64QAM	50	24	22.37	22.38	22.48	
20	64QAM	50	50	22.53	22.47	22.45	
20	64QAM	100	0	21.39	21.60	21.38	
Channel				133197	133297	133397	Tune-up limit (dBm)
Frequency (MHz)				670.5	680.5	690.5	
15	QPSK	1	0	23.90	23.88	23.89	24.5
15	QPSK	1	37	23.99	23.97	23.98	
15	QPSK	1	74	23.80	23.86	24.00	
15	QPSK	36	0	23.77	23.71	23.92	24
15	QPSK	36	20	23.70	23.77	23.77	
15	QPSK	36	39	23.85	23.83	23.79	
15	QPSK	75	0	23.11	23.18	23.05	
15	16QAM	1	0	23.14	23.10	23.20	23.5
15	16QAM	1	37	23.17	23.19	23.25	
15	16QAM	1	74	23.14	23.05	23.27	
15	16QAM	36	0	23.14	23.10	23.22	23.5
15	16QAM	36	20	23.24	23.21	23.20	
15	16QAM	36	39	23.10	23.06	23.25	
15	16QAM	75	0	22.07	22.07	22.05	
15	64QAM	1	0	22.65	22.57	22.76	23
15	64QAM	1	37	22.71	22.68	22.78	
15	64QAM	1	74	22.64	22.60	22.71	
15	64QAM	36	0	22.65	22.64	22.75	23
15	64QAM	36	20	22.70	22.69	22.77	
15	64QAM	36	39	22.60	22.60	22.79	
15	64QAM	75	0	21.62	21.66	21.53	
Channel				133172	133297	133422	Tune-up limit (dBm)
Frequency (MHz)				668	680.5	693	
10	QPSK	1	0	24.00	23.94	23.94	24.5
10	QPSK	1	25	24.09	24.11	24.16	
10	QPSK	1	49	23.96	24.02	24.04	
10	QPSK	25	0	24.06	23.93	23.92	24.5
10	QPSK	25	12	24.06	23.88	23.89	
10	QPSK	25	25	24.20	23.94	22.91	
10	QPSK	50	0	23.16	23.09	23.08	
10	16QAM	1	0	23.20	23.11	23.15	23.5
10	16QAM	1	25	23.36	23.31	23.31	
10	16QAM	1	49	23.19	23.23	23.24	
10	16QAM	25	0	23.09	23.21	23.18	23.5
10	16QAM	25	12	23.10	23.16	23.18	

10	16QAM	25	25	23.31	23.21	23.11	
10	16QAM	50	0	22.21	22.14	22.15	
10	64QAM	1	0	22.68	22.61	22.64	23
10	64QAM	1	25	22.82	22.79	22.78	
10	64QAM	1	49	22.66	22.70	22.73	
10	64QAM	25	0	22.58	22.71	22.73	23
10	64QAM	25	12	22.61	22.67	22.71	
10	64QAM	25	25	22.43	22.72	22.61	
10	64QAM	50	0	21.71	21.64	21.63	
Channel				133147	133297	133447	Tune-up limit (dBm)
Frequency (MHz)				665.5	680.5	695.5	
5	QPSK	1	0	24.03	24.00	23.94	24.5
5	QPSK	1	12	24.10	24.04	24.06	
5	QPSK	1	24	24.06	24.00	24.02	
5	QPSK	12	0	23.90	23.91	23.96	24
5	QPSK	12	7	23.87	23.91	23.91	
5	QPSK	12	13	23.95	23.97	23.99	
5	QPSK	25	0	23.03	23.02	23.10	
5	16QAM	1	0	23.01	22.98	23.14	23.5
5	16QAM	1	12	23.10	23.06	23.30	
5	16QAM	1	24	23.05	23.03	23.25	
5	16QAM	12	0	23.06	23.04	23.15	23.5
5	16QAM	12	7	23.06	23.06	23.16	
5	16QAM	12	13	23.13	23.04	23.04	
5	16QAM	25	0	22.17	22.13	22.08	
5	64QAM	1	0	22.57	22.53	22.60	23
5	64QAM	1	12	22.66	22.59	22.80	
5	64QAM	1	24	22.50	22.52	22.74	
5	64QAM	12	0	22.58	22.56	22.65	23
5	64QAM	12	7	22.57	22.59	22.63	
5	64QAM	12	13	22.64	22.57	22.55	
5	64QAM	25	0	21.65	21.63	21.60	

10.5 WLAN 2.4 GHz Band Conducted Power

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	CH 1	2412	16.51	17.00	18	100.00
		CH 6	2437	**17.07**	17.50	18	
		CH 11	2462	17.24	17.50	18	
	802.11g 6Mbps	CH 1	2412	14.57	15.00	17	100.00
		CH 6	2437	15.31	15.50	17	
		CH 11	2462	14.85	15.00	17	
	802.11n-HT20 MCS0	CH 1	2412	13.08	13.50	15	100.00
		CH 6	2437	13.50	14.00	15	
		CH 11	2462	12.75	13.00	15	
	802.11n-HT40 MCS0	CH 3	2422	12.19	12.50	14	100.00
		CH 6	2437	12.61	13.00	14	
		CH 9	2452	12.47	12.50	14	

Note:

1. Per KDB 447498 D01v06, the 1-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
   [(*max. power of channel, including tune-up tolerance, mW*) / (*min. test separation distance, mm*)] · [√f(GHz)] ≤ 3.0 for 1-g SAR, 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

Channel	Frequency (GHz)	Max. Tune-up Power (dBm)	Max. Power (mW)	Test distance (mm)	Result	exclusion thresholds for 1-g SAR
b/CH 06	2.437	17.50	56.23	5	17.56	3.0
g/CH 06	2.437	15.50	35.48	5	11.08	3.0

2. Base on the result of note1, RF exposure evaluation of 802.11 b and g mode is required.
3. Per KDB 248227 D01v02r02, choose the highest output power channel to test SAR and determine further SAR exclusion.
4. Per KDB 248227 D01v02r02, In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. SAR is not required for the following 2.4 GHz OFDM conditions:
   1) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
   2) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
5. The output power of all data rate were pre-scan, just the worst case (the lowest data rate) of all mode were shown in report.

10.6 WLAN 5GHz Band Conducted Power

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	CH 36	5180	**15.89**	16.00	17	100.00
		CH 40	5200	15.69	16.00	17	
		CH 44	5220	15.70	16.00	17	
		CH 48	5240	15.74	16.00	17	
	802.11n-HT20 MCS0	CH 36	5180	13.45	13.50	15	100.00
		CH 40	5200	13.41	13.50	15	
		CH 44	5220	13.32	13.50	15	
		CH 48	5240	13.19	13.50	15	
	802.11n-HT40 MCS0	CH 38	5190	13.80	14.00	14.00	100.00
		CH 46	5230	13.52	14.00	14.00	
	802.11ac-VHT20 MCS0	CH 36	5180	13.31	13.50	15	100.00
		CH 40	5200	13.23	13.50	15	
		CH 44	5220	13.18	13.50	15	
		CH 48	5240	13.08	13.50	15	
	802.11ac-VHT40 MCS0	CH 38	5190	13.64	14.00	14.00	100.00
		CH 46	5230	13.33	13.50	14.00	
	802.11ac-VHT80 MCS0	CH 42	5210	13.42	13.50	13.00	100.00

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	CH 52	5260	15.49	15.50	17	100.00
		CH 56	5280	15.41	15.50	17	
		CH 60	5300	**15.60**	16.00	17	
		CH 64	5320	15.36	15.50	17	
	802.11n-HT20 MCS0	CH 52	5260	13.59	14.00	15	100.00
		CH 56	5280	13.50	14.00	15	
		CH 60	5300	13.28	13.50	15	
		CH 64	5320	13.41	13.50	15	
	802.11n-HT40 MCS0	CH 54	5270	13.40	13.50	14.00	100.00
		CH 62	5310	13.66	14.00	14.00	
	802.11ac-	CH 52	5260	13.38	13.50	15	100.00

	VHT20 MCS0	CH 56	5280	13.15	13.50	15	
		CH 60	5300	13.20	13.50	15	
		CH 64	5320	13.24	13.50	15	
	802.11ac-VHT40 MCS0	CH 54	5270	13.31	13.50	14.00	100.00
		CH 62	5310	13.59	14.00	14.00	
	802.11ac-VHT80 MCS0	CH 58	5290	13.17	13.50	13.00	100.00

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
5.8GHz WLAN ANT 1	802.11a MCS0	CH 149	5745	**15.73**	16.00	17	100.00
		CH 157	5785	15.48	15.50	17	
		CH 165	5825	15.15	15.50	17	
	802.11n-HT20 MCS0	CH 149	5745	13.35	13.50	15	100.00
		CH 157	5785	13.51	14.00	15	
		CH 165	5825	13.12	13.50	15	
	802.11n-HT40 MCS0	CH 151	5755	13.31	13.50	14.00	100.00
		CH 159	5795	13.45	13.50	14.00	
	802.11ac-VHT20 MCS0	CH 149	5745	13.16	13.50	15	100.00
		CH 157	5785	13.38	13.50	15	
		CH 165	5825	13.06	13.50	15	
	802.11ac-VHT40 MCS0	CH 151	5755	13.19	13.50	14.00	100.00
		CH 159	5795	13.23	13.50	14.00	
	802.11ac-VHT80 MCS0	CH 155	5775	13.34	13.50	13.00	100.00

Note:

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

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

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

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

3)The two U-NII bands may be aggregated to support a 160 MHz channel on channel number 50.

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

B)U-NII-2C and U-NII-3 Bands

The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. when Terminal Doppler Weather Radar (TDWR) restriction applies, all channels that operate at 5.60 – 5.65 GHz must be included to apply the SAR test reduction and measurement procedures. When the same transmitter and antenna(s) are used for U-NII-2C band and U-NII-3 band or 5.8 GHz band of §15.247, the bands may be aggregated to enable additional channels with 20, 40 or 80 MHz bandwidth to span across the band gap, as illustrated in Appendix B. The maximum output power for the additional band gap channels is limited to the lower of those certified for the bands. Unless band gap channels are permanently disabled, they must be considered for SAR testing. The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz may be grouped with the 5.8 GHz channels in U-NII-3 or §15.247 band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels. When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

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

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

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

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

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

4)When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power,largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n. After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement

procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.
1)The channel closest to mid-band frequency is selected for SAR measurement.
2)For channels with equal separation from mid-band frequency; for example, high and low channels ortwo mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

D)SAR Test Requirements for OFDM configurations

When SAR measurement is required for 802.11 a/n/ac OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. When the sametransmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction Vapplies. When band gap channels between U-NII-2C band and 5.8 GHz U-NII-3 or §15.247 bandare supported, the highest maximum output power transmission mode configuration and maximumoutput power channel across the bands must be used to determine SAR test reduction, accordingto the initial test configuration and subsequent test configuration requirements. In applying theinitial test configuration and subsequent test configuration procedures, the 802.11 transmissionconfiguration with the highest specified maximum output power and the channel within a testconfiguration with the highest measured maximum output power should be clearly distinguished toapply the procedures.

10.7 Bluetooth Conducted Power

Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
BR / EDR	CH 00	2402	6.21	5.37	5.38
	CH 39	2441	**8.67**	7.94	7.97
	CH 78	2480	8.20	7.46	7.48
Tune-up Limit (dBm)			9.0	8.0	8.0

Mode	Channel	Frequency (MHz)	Peak power	Tune-up Limit (dBm)
			GFSK	
1M PHY	CH 00	2402	-1.208	0.50
	CH 19	2440	-0.186	
	CH 39	2480	-1.546	
2M PHY	CH 00	2402	-1.211	0.50
	CH 19	2440	-0.199	
	CH 39	2480	-1.545	
Code	CH 00	2402	-1.247	0.50
	CH 19	2440	-0.253	
	CH 39	2480	-1.641	

Note:

1. Per KDB 447498 D01v06, the 1-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
   [(*max. power of channel, including tune-up tolerance, mW*) / (*min. test separation distance, mm*)] · [√f(GHz)] ≤ 3.0 for 1-g SAR, 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

Channel	Frequency (GHz)	Max. tune-up Power (dBm)	Max. Power (mW)	Test distance (mm)	Result	exclusion thresholds for 1-g SAR
CH 39	2.441	9.0	7.94	5	2.48	3.0

2. The max. tune-up power was provided by manufacturer, base on the result of note 1, RF exposure evaluation is not required.
3. The output power of all data rate were pre-scan, just the worst case of all mode were shown in report.
4. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm according is applied to determine SAR test exclusion.

11 LTE Carrier Aggregation

➢ The Configuration for Carrier Aggregation

This device supports Carrier Aggregation on downlink for inter. For the device supports bands and bandwidths and configurations are provided as follow table was according to 3GPP.

Downlink CA Configuration	Uplink CA Config.	Component Carriers in order of Increasing Carrier Frequency			Maximum Aggregated Bandwidth [MHz]	Bandwidth Combination Set
		Channel Bandwidths for Carrier-1 [MHz]	Channel Bandwidths for Carrier-2 [MHz]	Channel Bandwidths for Carrier-3 [MHz]		
CA_2A-2A	-	5, 10, 15, 20	5, 10, 15, 20		40	0
CA_4A-4A	-	5, 10, 15, 20	5, 10, 15, 20		40	0
		5, 10	5, 10		20	1
CA_5A-5A	-	5,10	5,10		20	0
		3	5		8	1
CA_25A-25A	-	5, 10	5, 10		20	0
		5, 10, 15, 20	5, 10, 15, 20		40	1

Downlink CA Configuration	Uplink CA Config.	LTE Bands	Channel Bandwidths for Carrier [MHz]	Channel Bandwidths for Carrier-3 [MHz]	Maximum Aggregated Bandwidth [MHz]	Bandwidth Combination Set
CA_2A-4A	-	2	1.4, 3, 5, 10, 15, 20		40	0
		4	5, 10, 15, 20			
		2	5, 10		20	1
		4	5, 10			
		2	5, 10, 15, 20		40	2
		4	5, 10, 15, 20			
CA_2A-5A	-	2	5, 10, 15, 20		30	0
		5	5, 10			
		2	5, 10		20	1
		5	5, 10			
CA_2A-13A	-	2	5, 10, 15, 20		30	0
		13	10			
		2	5, 10		20	1
		13	10			

Downlink CA Configuration	Uplink CA Config.	LTE Bands	Channel Bandwidths for Carrier [MHz]	Channel Bandwidths for Carrier-3 [MHz]	Maximum Aggregated Bandwidth [MHz]	Bandwidth Combination Set
CA_4A-5A	-	4	5, 10		20	0
		5	5, 10			
		4	5, 10, 15, 20		30	1
		5	5, 10			
CA_4A-13A	-	4	5, 10, 15, 20		30	0
		13	10			
		4	5, 10		20	1
		13	10			
CA_25A-26A	-	26	1.4, 3, 5, 10, 15		35	0
		25	3, 5, 10		20	1
		26	3, 5, 10			
		25	5, 10		20	2
		26	5, 10			
CA_5B	-	5, 10	10		20	0
		10	5			
		3	5		8	1
		5	3			

➢ Conducted Power of Carrier Aggregation

1. According to KDB941225 D05A v01r02, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.
2. Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.
3. For power measurement were control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
4. Selected highest measured power when downlink carrier aggregation is inactive for conducted power comparison with downlink carrier aggregation is active, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.
5. For non-contiguous intra-band CA, the SCC selected to provide maximum separation from the PCC and must remain fully within the downlink transmission band.
6. For Intra-band, contiguous CA, the downlink channels selected to perform the uplink power measurement must satisfy
7. 3GPP channel spacing (5.4.1A of 3GPP TS 36.521 or equivalent) and channel bandwidth (5.4.2A) requirements.

$$\text{Nominal channel spacing} = \left\lfloor \frac{BW_{Channel(1)} + BW_{Channel(2)} - 0.1\left|BW_{Channel(1)} - BW_{Channel(2)}\right|}{0.6} \right\rfloor 0.3 \ \text{[MHz]}$$

PCC						SCC				Power	
Band	BW (MHz)	Ch.	Fre. (MHz)	UL RB	UL Offset	Band	BW (MHz)	Ch.	Fre. (MHz)	Rel 8 Tx.(dBm)	Rel 10 Tx.(dBm)
Inter-Band											
Band 2	20	18700	1860	1	99	Band 4	20	2050	2120	23.59	23.48
Band 4	20	20050	1720	1	0	Band 2	20	700	1940	23.53	23.39
Band 2	20	18700	1860	1	99	Band 5	10	2450	874	23.59	23.51
Band 5	10	20450	829	1	49	Band 2	20	700	1940	24.05	23.97
Band 2	20	18700	1860	1	99	Band 13	10	5230	751	23.59	23.62
Band 13	10	23230	782	1	25	Band 2	20	700	1940	23.99	24.1
Band 4	20	20050	1720	1	0	Band 5	10	2450	874	23.53	23.41
Band 5	10	20450	829	1	49	Band 4	20	2050	2120	24.05	23.89
Band 4	20	20050	1720	1	0	Band 13	10	5230	751	23.53	23.4
Band 13	10	23230	782	1	25	Band 4	20	2050	2120	23.99	23.76
Band 25	20	26140	1860	1	0	Band 26	15	8765	866.5	23.48	23.51
Band 26	15	26765	821.5	1	0	Band 25	20	8140	1940	24.79	24.63
Intra-Band Contiguous											
Band 5 CA_5B	10	20450	829	1	49	Band 5 CA_5B	5	2549	883.9	24.05	23.51
Intra-Band Non-Contiguous											
Band 2	20	18700	1860	1	99	Band 2	20	900	1960	23.59	23.5
Band 4	20	20050	1720	1	0	Band 4	20	2300	2145	23.53	23.63
Band 5	10	20450	829	1	49	Band 5	10	2600	889	24.05	23.42
Band 25	20	26140	1860	1	0	Band 25	20	8590	1985	23.48	23.37

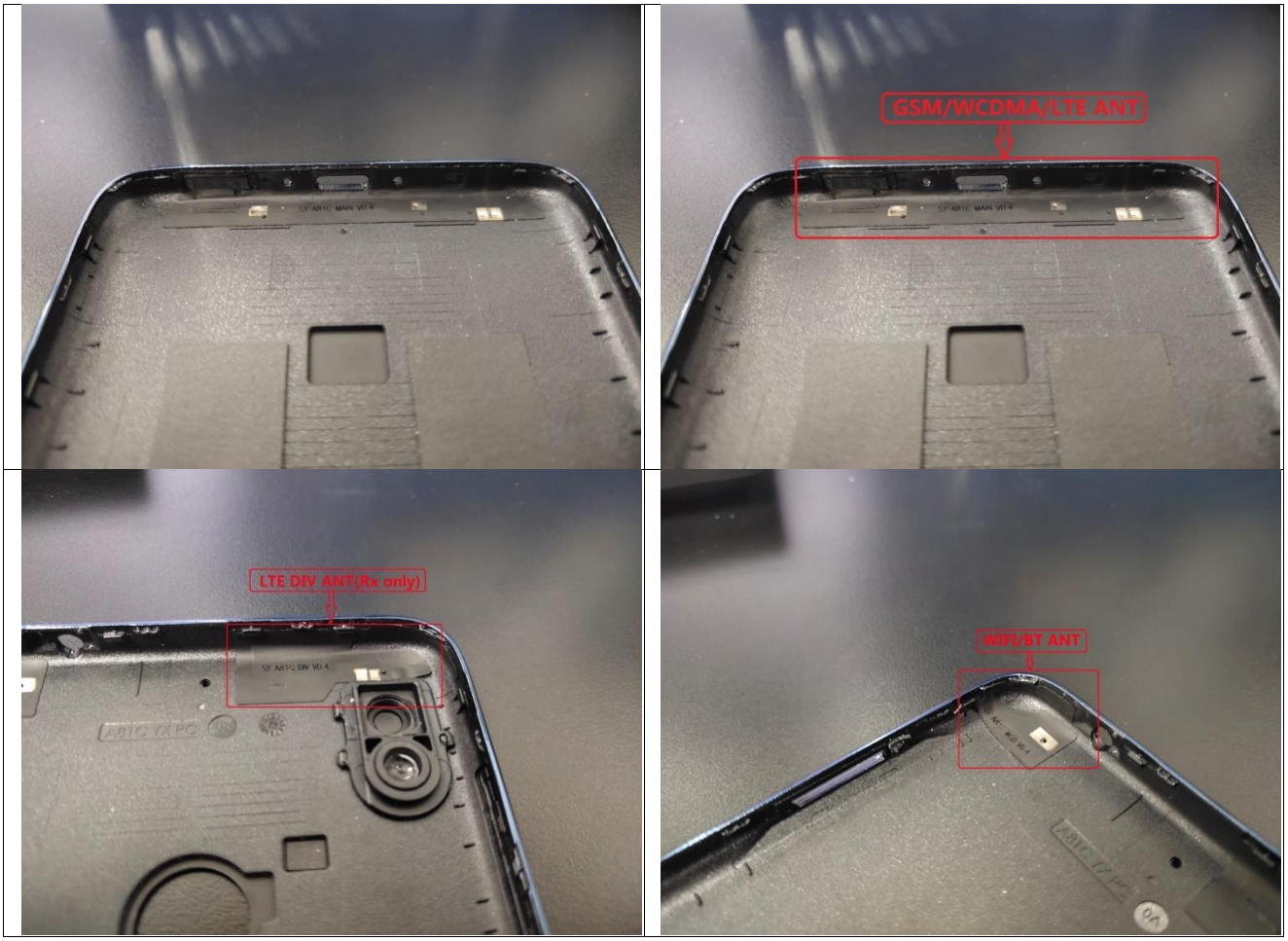
Note:

Rel 8 -> Power w/o DL CA active

Rel 10 -> Power w DL CA active

12 Exposure Positions Consideration

12.1 EUT Antenna Location



12.2 Test Positions Consideration

Distance of Antennas to EUT edge/surface Test distance: 10mm						
Antennas	**Back**	**Front**	**Top Side**	**Bottom Side**	**Right Side**	**Left Side**
GSM/CDMA/WCDMA/LTE	<25mm	<25mm	130mm	<25mm	<25mm	<25mm
WLAN/Bluetooth	<25mm	<25mm	<25mm	122mm	58mm	<25mm

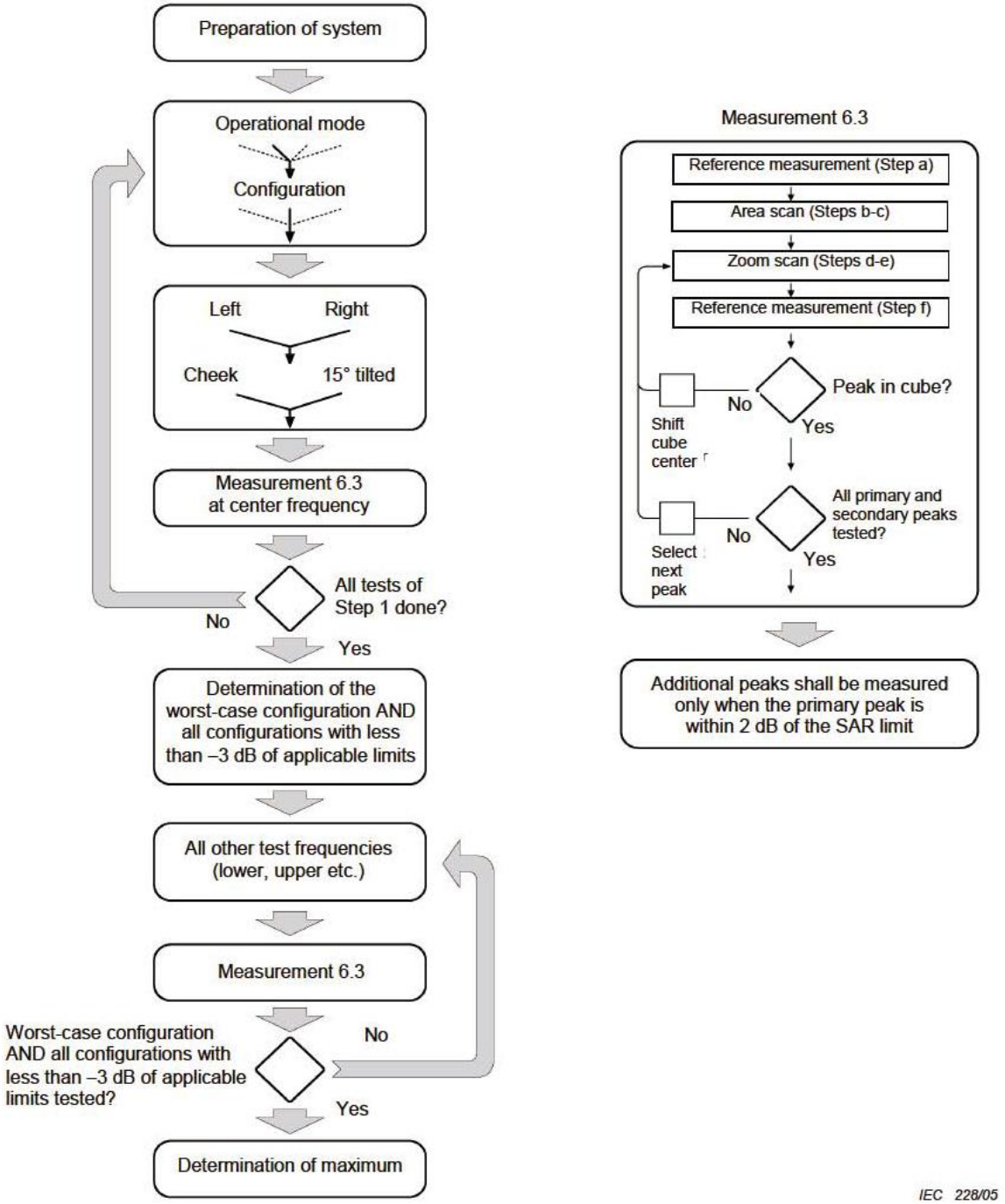
Test Positions Test distance: 10mm						
Antennas	**Back**	**Front**	**Top Side**	**Bottom Side**	**Right Side**	**Left Side**
GSM/CDMA/WCDMA/LTE	Yes	Yes	No	Yes	Yes	Yes
WLAN/Bluetooth	Yes	Yes	Yes	No	No	Yes

Note:

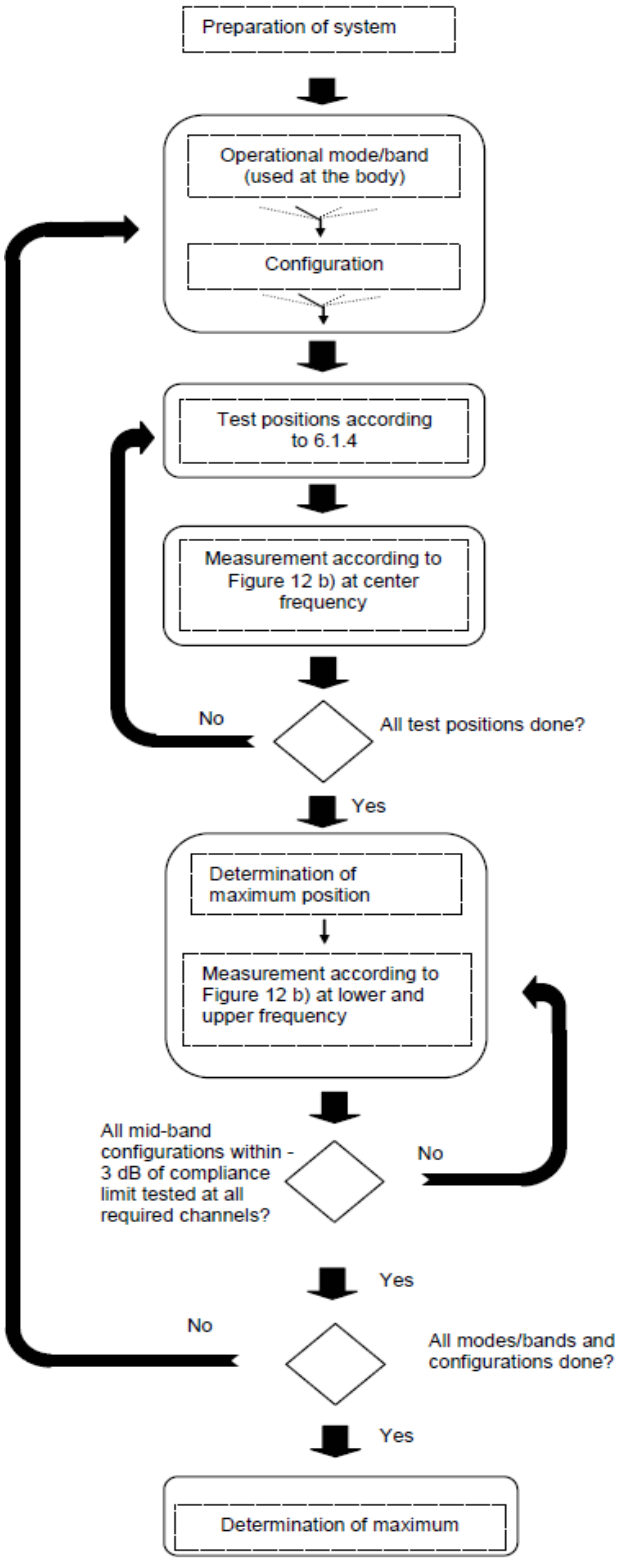
1. Head/Body-worn/hotspot mode SAR assessments are required.
2. Per KDB 447498 D01v06, for handsets the test separation distance is determined by the smallest distance between the outer surface of the device and the user, which is 0 mm for head SAR and 10 mm for body-worn and hotspot SAR.

13 Block diagram of the tests to be performed

13.1 Head



13.2 Body



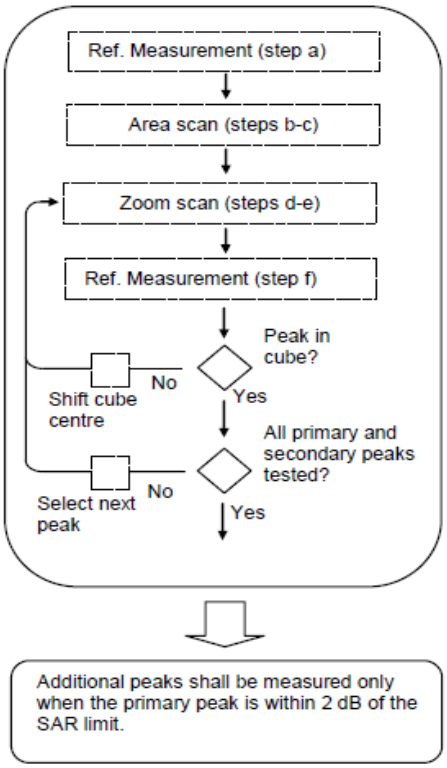


Figure 12b – General procedure

14 SAR Test Results Summary

Test Guidance:

1. The reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
2. Per KDB 447498 D01v06, for each exposure position, if the highest output power channel Reported SAR ≤ 0.8W/kg, other channels SAR testing is not necessary.
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥ 0.8W/kg.
4. Per KDB 941225 D05v02r05, 100% RB allocation SAR measurement is not required when the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg.
5. Per KDB 248227 D01v02r02, for 802.11b DSSS , when the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required in that exposure configuration.
6. Per KDB 648474 D04v01r03, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.
7. LTE band 17 SAR test was covered by Band 12; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. the maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion.
   b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

14.1 Standalone Head SAR

➢ **GSM Head SAR**

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	GSM850/4Tx slots	Right Cheek	189	28.44	28.50	1.014	0.154	0.156
	GSM850/4Tx slots	Right Tilt	189	28.44	28.50	1.014	0.072	0.073
1#	GSM850/4Tx slots	Left Cheek	189	28.44	28.50	1.014	0.211	**0.214**
	GSM850/4Tx slots	Left Tilt	189	28.44	28.50	1.014	0.115	0.117
	GSM1900/4Tx slots	Right Cheek	810	24.90	25.00	1.023	0.120	0.123
2#	GSM1900/4Tx slots	Right Tilt	810	24.90	25.00	1.023	0.129	**0.132**
	GSM1900/4Tx slots	Left Cheek	810	24.90	25.00	1.023	0.111	0.114
	GSM1900/4Tx slots	Left Tilt	810	24.90	25.00	1.023	0.127	0.130

➢ **WCDMA Head SAR**

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	Band II/RMC	Right Cheek	9538	22.80	23.00	1.047	0.163	0.171
	Band II/RMC	Right Tilt	9538	22.80	23.00	1.047	0.149	0.156
3#	Band II/RMC	Left Cheek	9538	22.80	23.00	1.047	0.177	**0.185**
	Band II/RMC	Left Tilt	9538	22.80	23.00	1.047	0.157	0.164
	Band IV/RMC	Right Cheek	1513	22.70	23.00	1.072	0.152	0.163
	Band IV/RMC	Right Tilt	1513	22.70	23.00	1.072	0.106	0.114
4#	Band IV/RMC	Left Cheek	1513	22.70	23.00	1.072	0.163	**0.175**
	Band IV/RMC	Left Tilt	1513	22.70	23.00	1.072	0.124	0.133
5#	Band V/RMC	Right Cheek	4182	23.37	23.50	1.030	0.176	**0.181**
	Band V/RMC	Right Tilt	4182	23.37	23.50	1.030	0.091	0.093
	Band V/RMC	Left Cheek	4182	23.37	23.50	1.030	0.132	0.136
	Band V/RMC	Left Tilt	4182	23.37	23.50	1.030	0.092	0.094

➢ **CDMA2000 Head SAR**

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
6#	BC0 RC3 SO55	Right Cheek	384	24.81	25.00	1.045	0.218	**0.228**
	BC0 RC3 SO55	Right Tilt	384	24.81	25.00	1.045	0.098	0.102
	BC0 RC3 SO55	Left Cheek	384	24.81	25.00	1.045	0.132	0.138
	BC0 RC3 SO55	Left Tilt	384	24.81	25.00	1.045	0.072	0.075
	BC1 RC3 SO55	Right Cheek	1175	24.94	25.00	1.014	0.208	0.211
7#	BC1 RC3 SO55	Right Tilt	1175	24.94	25.00	1.014	0.271	**0.275**
	BC1 RC3 SO55	Left Cheek	1175	24.94	25.00	1.014	0.224	0.227
	BC1 RC3 SO55	Left Tilt	1175	24.94	25.00	1.014	0.211	0.214

Note:

1. Per KDB 447498 D01v06, for each exposure position, if the highest output channel Reported SAR ≤0.8W/kg, other channels SAR testing is not necessary.
2. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥ 0.8W/kg.

➢ **LTE 20MHz QPSK Head SAR**

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
8#	Band 2/1RB#99	Right Cheek	18700	23.59	24.00	1.099	0.247	**0.271**
	Band 2/1RB#99	Right Tilt	18700	23.59	24.00	1.099	0.220	0.242
	Band 2/1RB#99	Left Cheek	18700	23.59	24.00	1.099	0.139	0.153
	Band 2/1RB#99	Left Tilt	18700	23.59	24.00	1.099	0.163	0.179
	Band 2/50RB#50	Right Cheek	18700	23.55	24.00	1.109	0.139	0.154
	Band 2/50RB#50	Right Tilt	18700	23.55	24.00	1.109	0.117	0.130
	Band 2/50RB#50	Left Cheek	18700	23.55	24.00	1.109	0.138	0.153
	Band 2/50RB#50	Left Tilt	18700	23.55	24.00	1.109	0.127	0.141
	Band 4/1RB#0	Right Cheek	20050	23.53	24.00	1.114	0.147	0.164
	Band 4/1RB#0	Right Tilt	20050	23.53	24.00	1.114	0.104	0.116
9#	Band 4/1RB#0	Left Cheek	20050	23.53	24.00	1.114	0.164	**0.183**
	Band 4/1RB#0	Left Tilt	20050	23.53	24.00	1.114	0.114	0.127
	Band 4/50RB#0	Right Cheek	20050	23.48	23.50	1.005	0.098	0.099
	Band 4/50RB#0	Right Tilt	20050	23.48	23.50	1.005	0.080	0.081
	Band 4/50RB#0	Left Cheek	20050	23.48	23.50	1.005	0.130	0.131
	Band 4/50RB#0	Left Tilt	20050	23.48	23.50	1.005	0.088	0.089

➢ **LTE 10MHz QPSK Head SAR**

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
10#	Band 5/1RB#49	Right Cheek	20450	24.05	24.50	1.109	0.216	**0.240**
	Band 5/1RB#49	Right Tilt	20450	24.05	24.50	1.109	0.105	0.116
	Band 5/1RB#49	Left Cheek	20450	24.05	24.50	1.109	0.166	0.184
	Band 5/1RB#49	Left Tilt	20450	24.05	24.50	1.109	0.112	0.124
	Band 5/25RB#12	Right Cheek	20450	24.02	24.50	1.117	0.179	0.200
	Band 5/25RB#12	Right Tilt	20450	24.02	24.50	1.117	0.087	0.098
	Band 5/25RB#12	Left Cheek	20450	24.02	24.50	1.117	0.139	0.155
	Band 5/25RB#12	Left Tilt	20450	24.02	24.50	1.117	0.092	0.103

➢ **LTE 20MHz QPSK Head SAR**

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	Band 7/1RB#0	Right Cheek	21350	22.95	23.00	1.012	0.055	0.056
	Band 7/1RB#0	Right Tilt	21350	22.95	23.00	1.012	0.054	0.055
11#	Band 7/1RB#0	Left Cheek	21350	22.95	23.00	1.012	0.058	**0.059**
	Band 7/1RB#0	Left Tilt	21350	22.95	23.00	1.012	0.035	0.036
	Band 7/50RB#0	Right Cheek	21350	22.82	23.00	1.042	0.037	0.038
	Band 7/50RB#0	Right Tilt	21350	22.82	23.00	1.042	0.046	0.048
	Band 7/50RB#0	Left Cheek	21350	22.82	23.00	1.042	0.044	0.045
	Band 7/50RB#0	Left Tilt	21350	22.82	23.00	1.042	0.025	0.026

➢ **LTE 10MHz QPSK Head SAR**

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	Band 12/1RB#49	Right Cheek	23130	23.78	24.00	1.052	0.167	0.176
	Band 12/1RB#49	Right Tilt	23130	23.78	24.00	1.052	0.095	0.100
12#	Band 12/1RB#49	Left Cheek	23130	23.78	24.00	1.052	0.186	**0.196**
	Band 12/1RB#49	Left Tilt	23130	23.78	24.00	1.052	0.128	0.135
	Band 12/25RB#0	Right Cheek	23095	23.75	24.00	1.035	0.121	0.125
	Band 12/25RB#0	Right Tilt	23095	23.75	24.00	1.035	0.075	0.077
	Band 12/25RB#0	Left Cheek	23095	23.75	24.00	1.035	0.122	0.126
	Band 12/25RB#0	Left Tilt	23095	23.75	24.00	1.035	0.099	0.103
13#	Band 13/1RB#24	Right Cheek	23230	23.99	24.00	1.002	0.180	**0.180**
	Band 13/1RB#24	Right Tilt	23230	23.99	24.00	1.002	0.114	0.114
	Band 13/1RB#24	Left Cheek	23230	23.99	24.00	1.002	0.172	0.172
	Band 13/1RB#24	Left Tilt	23230	23.99	24.00	1.002	0.140	0.140
	Band 13/25RB#25	Right Cheek	23230	23.96	24.00	1.009	0.134	0.135
	Band 13/25RB#25	Right Tilt	23230	23.96	24.00	1.009	0.084	0.085
	Band 13/25RB#25	Left Cheek	23230	23.96	24.00	1.009	0.130	0.131
	Band 13/25RB#25	Left Tilt	23230	23.96	24.00	1.009	0.100	0.101
14#	Band 17/1RB#24	Right Cheek	23790	23.85	24.00	1.035	0.155	**0.160**
	Band 17/1RB#24	Right Tilt	23790	23.85	24.00	1.035	0.082	0.084
	Band 17/1RB#24	Left Cheek	23790	23.85	24.00	1.035	0.128	0.132
	Band 17/1RB#24	Left Tilt	23790	23.85	24.00	1.035	0.079	0.081
	Band 17/25RB#12	Right Cheek	23790	23.84	24.00	1.038	0.120	0.125
	Band 17/25RB#12	Right Tilt	23790	23.84	24.00	1.038	0.064	0.066
	Band 17/25RB#12	Left Cheek	23790	23.84	24.00	1.038	0.098	0.102
	Band 17/25RB#12	Left Tilt	23790	23.84	24.00	1.038	0.061	0.063

➢ **LTE 15/20MHz QPSK Head SAR**

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
15#	Band 25/1RB#0	Right Cheek	26140	23.48	23.50	1.028	0.196	**0.201**
	Band 25/1RB#0	Right Tilt	26140	23.48	23.50	1.028	0.137	0.141
	Band 25/1RB#0	Left Cheek	26140	23.48	23.50	1.028	0.175	0.180
	Band 25/1RB#0	Left Tilt	26140	23.48	23.50	1.028	0.143	0.147
	Band 25/50RB#0	Right Cheek	26140	23.42	23.50	1.019	0.134	0.136
	Band 25/50RB#0	Right Tilt	26140	23.42	23.50	1.019	0.107	0.109
	Band 25/50RB#0	Left Cheek	26140	23.42	23.50	1.019	0.135	0.138
	Band 25/50RB#0	Left Tilt	26140	23.42	23.50	1.019	0.112	0.114
16#	Band 26/1RB#0	Right Cheek	26765	24.79	25.00	1.050	0.208	**0.218**
	Band 26/1RB#0	Right Tilt	26765	24.79	25.00	1.050	0.122	0.128
	Band 26/1RB#0	Left Cheek	26765	24.79	25.00	1.050	0.179	0.188
	Band 26/1RB#0	Left Tilt	26765	24.79	25.00	1.050	0.135	0.142
	Band 26/39RB#39	Right Cheek	26765	24.62	25.00	1.091	0.177	0.193
	Band 26/39RB#39	Right Tilt	26765	24.62	25.00	1.091	0.100	0.109
	Band 26/39RB#39	Left Cheek	26765	24.62	25.00	1.091	0.139	0.152
	Band 26/39RB#39	Left Tilt	26765	24.62	25.00	1.091	0.107	0.117

17#	Band 41/1RB#49	Right Cheek	41490	27.19	27.50	1.074	0.032	**0.034**
	Band 41/1RB#49	Right Tilt	41490	27.19	27.50	1.074	0.015	0.016
	Band 41/1RB#49	Left Cheek	41490	27.19	27.50	1.074	0.025	0.027
	Band 41/1RB#49	Left Tilt	41490	27.19	27.50	1.074	0.013	0.014
	Band 41/50RB#24	Right Cheek	41490	25.95	26.50	1.135	0.023	0.026
	Band 41/50RB#24	Right Tilt	41490	25.95	26.50	1.135	0.018	0.020
	Band 41/50RB#24	Left Cheek	41490	25.95	26.50	1.135	0.027	0.031
	Band 41/50RB#24	Left Tilt	41490	25.95	26.50	1.135	0.011	0.013
18#	Band 66/1RB#49	Right Cheek	132072	23.39	23.50	1.026	0.203	**0.208**
	Band 66/1RB#49	Right Tilt	132072	23.39	23.50	1.026	0.080	0.082
	Band 66/1RB#49	Left Cheek	132072	23.39	23.50	1.026	0.199	0.204
	Band 66/1RB#49	Left Tilt	132072	23.39	23.50	1.026	0.128	0.131
	Band 66/50RB#50	Right Cheek	132072	23.31	23.50	1.045	0.161	0.168
	Band 66/50RB#50	Right Tilt	132072	23.31	23.50	1.045	0.064	0.066
	Band 66/50RB#50	Left Cheek	132072	23.31	23.50	1.045	0.153	0.160
	Band 66/50RB#50	Left Tilt	132072	23.31	23.50	1.045	0.097	0.102
19#	Band 71/1RB#49	Right Cheek	133222	24.21	24.50	1.069	0.123	**0.131**
	Band 71/1RB#49	Right Tilt	133222	24.21	24.50	1.069	0.066	0.070
	Band 71/1RB#49	Left Cheek	133222	24.21	24.50	1.069	0.117	0.125
	Band 71/1RB#49	Left Tilt	133222	24.21	24.50	1.069	0.060	0.064
	Band 71/50RB#50	Right Cheek	133322	23.97	24.00	1.007	0.099	0.100
	Band 71/50RB#50	Right Tilt	133322	23.97	24.00	1.007	0.053	0.053
	Band 71/50RB#50	Left Cheek	133322	23.97	24.00	1.007	0.098	0.099
	Band 71/50RB#50	Left Tilt	133322	23.97	24.00	1.007	0.054	0.054

Note：

1. Per KDB 447498 D01v06, for each exposure position, if the highest output power channel Reported SAR ≤ 0.8W/kg, other channels SAR testing is not necessary.
2. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥ 0.8W/kg.
3. Per KDB 941225 D05v02r05, 100% RB allocation SAR measurement is not required when the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg.
4. According to KDB 865664 D02v01r02, SAR plot is required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination.

➢ **WLAN 2.4 GHz Head SAR**

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
20#	2.4GHz/802.11b	Right Cheek	11	17.24	17.50	1.062	0.646	**0.686**
	2.4GHz/802.11b	Right Tilt	11	17.24	17.50	1.062	0.469	0.498
	2.4GHz/802.11b	Left Cheek	11	17.24	17.50	1.062	0.218	0.231
	2.4GHz/802.11b	Left Tilt	11	17.24	17.50	1.062	0.171	0.182

Note：

1. Per KDB 248227 D01v02r02, for 802.11b DSSS , when the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required in that exposure configuration.
2. Per KDB 248227 D01v02r02, OFDM SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg. Cuz the maximum output power specified for OFDM and DSSS are 33.96mW(15.31dBm) and 52.97mW(17.24dBm), the scaled SAR would be 0.686×(33.96/52.97)=0.44W/Kg<1.2W/kg, therefore, SAR is not required for OFDM.

➢ **WLAN 5GHz Head SAR**

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
21#	5.2GHz/802.11a	Right Cheek	36	15.89	16.00	1.026	0.440	**0.451**
	5.2GHz/802.11a	Right Tilt	36	15.89	16.00	1.026	0.414	0.425
	5.2GHz/802.11a	Left Cheek	36	15.89	16.00	1.026	0.223	0.229
	5.2GHz/802.11a	Left Tilt	36	15.89	16.00	1.026	0.233	0.239
22#	5.3GHz/802.11a	Right Cheek	60	15.60	16.00	1.096	0.441	**0.484**
	5.3GHz/802.11a	Right Tilt	60	15.60	16.00	1.096	0.329	0.361
	5.3GHz/802.11a	Left Cheek	60	15.60	16.00	1.096	0.173	0.190
	5.3GHz/802.11a	Left Tilt	60	15.60	16.00	1.096	0.192	0.211
23#	5.8GHz/802.11a	Right Cheek	149	15.73	16.00	1.064	0.211	**0.225**
	5.8GHz/802.11a	Right Tilt	149	15.73	16.00	1.064	0.175	0.186
	5.8GHz/802.11a	Left Cheek	149	15.73	16.00	1.064	0.151	0.161
	5.8GHz/802.11a	Left Tilt	149	15.73	16.00	1.064	0.147	0.156

14.2 Standalone Hotspot SAR

➢ GSM Hotspot SAR

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	GPRS850/4TX Slots	Front Side	190	28.44	28.50	1.014	0.210	0.213
24#	GPRS850/4TX Slots	Back Side	190	28.44	28.50	1.014	0.359	**0.364**
	GPRS850/4TX Slots	Left Side	190	28.44	28.50	1.014	0.098	0.100
	GPRS850/4TX Slots	Right Side	190	28.44	28.50	1.014	0.241	0.244
	GPRS850/4TX Slots	Bottom Side	190	28.44	28.50	1.014	0.159	0.161
	GPRS1900/4TX Slots	Front Side	810	24.90	25.00	1.023	0.455	0.466
	GPRS1900/4TX Slots	Back Side	810	24.90	25.00	1.023	0.477	0.488
	GPRS1900/4TX Slots	Left Side	810	24.90	25.00	1.023	0.219	0.224
	GPRS1900/4TX Slots	Right Side	810	24.90	25.00	1.023	0.162	0.166
25#	GPRS1900/4TX Slots	Bottom Side	810	24.90	25.00	1.023	0.564	**0.577**

➢ WCDMA Hotspot SAR

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
26#	Band II/RMC	Front Side	9538	22.80	23.00	1.047	0.765	**0.801**
	Band II/RMC	Back Side	9538	22.80	23.00	1.047	0.706	0.739
	Band II/RMC	Left Side	9538	22.80	23.00	1.047	0.303	0.317
	Band II/RMC	Right Side	9538	22.80	23.00	1.047	0.140	0.147
	Band II/RMC	Bottom Side	9538	22.80	23.00	1.047	0.711	0.745
27#	Band IV/RMC	Front Side	1513	22.70	23.00	1.072	0.684	**0.733**
	Band IV/RMC	Back Side	1513	22.70	23.00	1.072	0.417	0.447
	Band IV/RMC	Left Side	1513	22.70	23.00	1.072	0.113	0.121
	Band IV/RMC	Right Side	1513	22.70	23.00	1.072	0.120	0.129
	Band IV/RMC	Bottom Side	1513	22.70	23.00	1.072	0.659	0.706
	Band V/RMC	Front Side	4182	23.37	23.50	1.030	0.185	0.191
28#	Band V/RMC	Back Side	4182	23.37	23.50	1.030	0.336	**0.346**
	Band V/RMC	Left Side	4182	23.37	23.50	1.030	0.089	0.092
	Band V/RMC	Right Side	4182	23.37	23.50	1.030	0.175	0.180
	Band V/RMC	Bottom Side	4182	23.37	23.50	1.030	0.146	0.150

➢ CDMA2000 Hotspot SAR

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	BC0 RC3 SO32	Front Side	777	24.49	24.50	1.002	0.231	0.232
	BC0 RC3 SO32	Back Side	777	24.49	24.50	1.002	0.376	0.377
	BC0 RC3 SO32	Left Side	777	24.49	24.50	1.002	0.047	0.047
	BC0 RC3 SO32	Right Side	777	24.49	24.50	1.002	0.235	0.236
	BC0 RC3 SO32	Bottom Side	777	24.49	24.50	1.002	0.251	0.252
	BC0 EVDO Rev.A	Front Side	1013	23.08	23.50	1.102	0.202	0.223
29#	BC0 EVDO Rev.A	Back Side	1013	23.08	23.50	1.102	0.366	**0.403**
	BC0 EVDO Rev.A	Left Side	1013	23.08	23.50	1.102	0.032	0.036
	BC0 EVDO Rev.A	Right Side	1013	23.08	23.50	1.102	0.150	0.165
	BC0 EVDO Rev.A	Bottom Side	1013	23.08	23.50	1.102	0.244	0.269

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	BC1 RC3 SO32	Front Side	25	24.62	25.00	1.091	0.364	0.397
	BC1 RC3 SO32	Back Side	25	24.62	25.00	1.091	0.595	0.649
	BC1 RC3 SO32	Left Side	25	24.62	25.00	1.091	0.458	0.500
	BC1 RC3 SO32	Right Side	25	24.62	25.00	1.091	0.261	0.285
	BC1 RC3 SO32	Bottom Side	25	24.62	25.00	1.091	0.711	0.776
	BC1 EVDO Rev.A	Front Side	1175	23.01	23.50	1.119	0.641	0.718
	BC1 EVDO Rev.A	Back Side	1175	23.01	23.50	1.119	0.500	0.560
	BC1 EVDO Rev.A	Left Side	1175	23.01	23.50	1.119	0.445	0.498
	BC1 EVDO Rev.A	Right Side	1175	23.01	23.50	1.119	0.210	0.235
30#	BC1 EVDO Rev.A	Bottom Side	1175	23.01	23.50	1.119	0.694	**0.777**

➢ **LTE 10/15/20MHz QPSK Hotspot SAR**

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	Band 2/1RB#99	Front Side	18700	23.59	24.00	1.099	0.634	0.697
	Band 2/1RB#99	Back Side	18700	23.59	24.00	1.099	0.673	0.740
	Band 2/1RB#99	Left Side	18700	23.59	24.00	1.099	0.333	0.366
	Band 2/1RB#99	Right Side	18700	23.59	24.00	1.099	0.176	0.193
31#	Band 2/1RB#99	Bottom Side	18700	23.59	24.00	1.099	0.695	**0.764**
	Band 2/50RB#50	Front Side	18700	23.55	24.00	1.109	0.629	0.698
	Band 2/50RB#50	Back Side	18700	23.55	24.00	1.109	0.499	0.553
	Band 2/50RB#50	Left Side	18700	23.55	24.00	1.109	0.259	0.287
	Band 2/50RB#50	Right Side	18700	23.55	24.00	1.109	0.140	0.155
	Band 2/50RB#50	Bottom Side	18700	23.55	24.00	1.109	0.679	0.753
32#	Band 4/1RB#0	Front Side	20050	23.53	24.00	1.114	0.780	**0.869**
	Band 4/1RB#0	Back Side	20050	23.53	24.00	1.114	0.493	0.549
	Band 4/1RB#0	Left Side	20050	23.53	24.00	1.114	0.262	0.292
	Band 4/1RB#0	Right Side	20050	23.53	24.00	1.114	0.236	0.263
	Band 4/1RB#0	Bottom Side	20050	23.53	24.00	1.114	0.426	0.475
	Band 4/50RB#0	Front Side	20050	23.48	23.50	1.005	0.618	0.621
	Band 4/50RB#0	Back Side	20050	23.48	23.50	1.005	0.393	0.395
	Band 4/50RB#0	Left Side	20050	23.48	23.50	1.005	0.197	0.198
	Band 4/50RB#0	Right Side	20050	23.48	23.50	1.005	0.187	0.188
	Band 4/50RB#0	Bottom Side	20050	23.48	23.50	1.005	0.728	0.731
	Band 5/1RB#49	Front Side	20450	24.05	24.50	1.109	0.221	0.245
33#	Band 5/1RB#49	Back Side	20450	24.05	24.50	1.109	0.371	**0.412**
	Band 5/1RB#49	Left Side	20450	24.05	24.50	1.109	0.067	0.074
	Band 5/1RB#49	Right Side	20450	24.05	24.50	1.109	0.201	0.223
	Band 5/1RB#49	Bottom Side	20450	24.05	24.50	1.109	0.216	0.240
	Band 5/25RB#12	Front Side	20450	24.02	24.50	1.117	0.168	0.188
	Band 5/25RB#12	Back Side	20450	24.02	24.50	1.117	0.283	0.316
	Band 5/25RB#12	Left Side	20450	24.02	24.50	1.117	0.058	0.064
	Band 5/25RB#12	Right Side	20450	24.02	24.50	1.117	0.163	0.182
	Band 5/25RB#12	Bottom Side	20450	24.02	24.50	1.117	0.162	0.181

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	Band 7/1RB#0	Front Side	21350	22.95	23.00	1.012	0.135	0.137

34#	Band 7/1RB#0	Back Side	21350	22.95	23.00	1.012	0.422	**0.427**
	Band 7/1RB#0	Left Side	21350	22.95	23.00	1.012	0.043	0.043
	Band 7/1RB#0	Right Side	21350	22.95	23.00	1.012	0.048	0.048
	Band 7/1RB#0	Bottom Side	21350	22.95	23.00	1.012	0.160	0.162
	Band 7/50RB#0	Front Side	21350	22.82	23.00	1.042	0.104	0.108
	Band 7/50RB#0	Back Side	21350	22.82	23.00	1.042	0.325	0.339
	Band 7/50RB#0	Left Side	21350	22.82	23.00	1.042	0.032	0.033
	Band 7/50RB#0	Right Side	21350	22.82	23.00	1.042	0.036	0.037
	Band 7/50RB#0	Bottom Side	21350	22.82	23.00	1.042	0.128	0.133
	Band 12/1RB#49	Front Side	23130	23.78	24.00	1.052	0.168	0.177
35#	Band 12/1RB#49	Back Side	23130	23.78	24.00	1.052	0.210	**0.221**
	Band 12/1RB#49	Left Side	23130	23.78	24.00	1.052	0.040	0.042
	Band 12/1RB#49	Right Side	23130	23.78	24.00	1.052	0.127	0.134
	Band 12/1RB#49	Bottom Side	23130	23.78	24.00	1.052	0.112	0.118
	Band 12/25RB#0	Front Side	23092	23.75	24.00	1.035	0.136	0.141
	Band 12/25RB#0	Back Side	23092	23.75	24.00	1.035	0.169	0.175
	Band 12/25RB#0	Left Side	23092	23.75	24.00	1.035	0.030	0.031
	Band 12/25RB#0	Right Side	23092	23.75	24.00	1.035	0.099	0.103
	Band 12/25RB#0	Bottom Side	23092	23.75	24.00	1.035	0.090	0.093
	Band 13/1RB#25	Front Side	23230	23.99	24.00	1.002	0.148	0.148
36#	Band 13/1RB#25	Back Side	23230	23.99	24.00	1.002	0.255	**0.256**
	Band 13/1RB#25	Left Side	23230	23.99	24.00	1.002	0.085	0.085
	Band 13/1RB#25	Right Side	23230	23.99	24.00	1.002	0.220	0.221
	Band 13/1RB#25	Bottom Side	23230	23.99	24.00	1.002	0.150	0.150
	Band 13/25RB#25	Front Side	23230	23.96	24.00	1.009	0.112	0.113
	Band 13/25RB#25	Back Side	23230	23.96	24.00	1.009	0.195	0.197
	Band 13/25RB#25	Left Side	23230	23.96	24.00	1.009	0.061	0.061
	Band 13/25RB#25	Right Side	23230	23.96	24.00	1.009	0.154	0.155
	Band 13/25RB#25	Bottom Side	23230	23.96	24.00	1.009	0.114	0.115
	Band 17/1RB#25	Front Side	23790	23.85	24.00	1.035	0.193	0.200
37#	Band 17/1RB#25	Back Side	23790	23.85	24.00	1.035	0.248	**0.257**
	Band 17/1RB#25	Left Side	23790	23.85	24.00	1.035	0.040	0.042
	Band 17/1RB#25	Right Side	23790	23.85	24.00	1.035	0.120	0.124
	Band 17/1RB#25	Bottom Side	23790	23.85	24.00	1.035	0.111	0.115
	Band 17/25RB#12	Front Side	23790	23.84	24.00	1.038	0.154	0.160
	Band 17/25RB#12	Back Side	23790	23.84	24.00	1.038	0.192	0.199
	Band 17/25RB#12	Left Side	23790	23.84	24.00	1.038	0.031	0.032
	Band 17/25RB#12	Right Side	23790	23.84	24.00	1.038	0.093	0.097
	Band 17/25RB#12	Bottom Side	23790	23.84	24.00	1.038	0.085	0.088
	Band 25/1RB#0	Front Side	26140	23.48	23.50	1.028	0.489	0.503
	Band 25/1RB#0	Back Side	26140	23.48	23.50	1.028	0.603	0.620
	Band 25/1RB#0	Left Side	26140	23.48	23.50	1.028	0.300	0.308
	Band 25/1RB#0	Right Side	26140	23.48	23.50	1.028	0.132	0.136
	Band 25/1RB#0	Bottom Side	26140	23.48	23.50	1.028	0.656	0.674

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	Band 25/50RB#0	Front Side	26140	23.42	23.50	1.019	0.607	0.618

	Band 25/50RB#0	Back Side	26140	23.42	23.50	1.019	0.477	0.486
	Band 25/50RB#0	Left Side	26140	23.42	23.50	1.019	0.234	0.238
	Band 25/50RB#0	Right Side	26140	23.42	23.50	1.019	0.111	0.113
38#	Band 25/50RB#0	Bottom Side	26140	23.42	23.50	1.019	0.767	**0.781**
39#	Band 26/1RB#0	Front Side	26765	24.79	25.00	1.050	0.238	**0.250**
	Band 26/1RB#0	Back Side	26765	24.79	25.00	1.050	0.155	0.163
	Band 26/1RB#0	Left Side	26765	24.79	25.00	1.050	0.045	0.047
	Band 26/1RB#0	Right Side	26765	24.79	25.00	1.050	0.177	0.186
	Band 26/1RB#0	Bottom Side	26765	24.79	25.00	1.050	0.211	0.221
	Band 26/39RB#39	Front Side	26765	24.62	25.00	1.091	0.208	0.227
	Band 26/39RB#39	Back Side	26765	24.62	25.00	1.091	0.170	0.186
	Band 26/39RB#39	Left Side	26765	24.62	25.00	1.091	0.040	0.043
	Band 26/39RB#39	Right Side	26765	24.62	25.00	1.091	0.109	0.119
	Band 26/39RB#39	Bottom Side	26765	24.62	25.00	1.091	0.188	0.205
	Band 41/1RB#49	Front Side	41490	27.19	27.50	1.074	0.070	0.075
40#	Band 41/1RB#49	Back Side	41490	27.19	27.50	1.074	0.310	**0.333**
	Band 41/1RB#49	Left Side	41490	27.19	27.50	1.074	0.029	0.031
	Band 41/1RB#49	Right Side	41490	27.19	27.50	1.074	0.069	0.074
	Band 41/1RB#49	Bottom Side	41490	27.19	27.50	1.074	0.100	0.107
	Band 41/50RB#24	Front Side	41490	25.95	26.00	1.012	0.055	0.056
	Band 41/50RB#24	Back Side	41490	25.95	26.00	1.012	0.244	0.247
	Band 41/50RB#24	Left Side	41490	25.95	26.00	1.012	0.023	0.023
	Band 41/50RB#24	Right Side	41490	25.95	26.00	1.012	0.047	0.047
	Band 41/50RB#24	Bottom Side	41490	25.95	26.00	1.012	0.075	0.076
	Band 66/1RB#49	Front Side	132072	23.39	23.50	1.026	0.277	0.284
	Band 66/1RB#49	Back Side	132072	23.39	23.50	1.026	0.204	0.209
	Band 66/1RB#49	Left Side	132072	23.39	23.50	1.026	0.096	0.099
	Band 66/1RB#49	Right Side	132072	23.39	23.50	1.026	0.103	0.106
	Band 66/1RB#49	Bottom Side	132072	23.39	23.50	1.026	0.344	0.353
	Band 66/50RB#50	Front Side	132072	23.31	23.50	1.045	0.270	0.282
	Band 66/50RB#50	Back Side	132072	23.31	23.50	1.045	0.199	0.208
	Band 66/50RB#50	Left Side	132072	23.31	23.50	1.045	0.091	0.095
	Band 66/50RB#50	Right Side	132072	23.31	23.50	1.045	0.100	0.104
41#	Band 66/50RB#50	Bottom Side	132072	23.31	23.50	1.045	0.345	**0.360**
	Band 71/1RB#49	Front Side	133222	24.21	24.50	1.069	0.074	0.079
42#	Band 71/1RB#49	Back Side	133222	24.21	24.50	1.069	0.090	**0.096**
	Band 71/1RB#49	Left Side	133222	24.21	24.50	1.069	0.019	0.020
	Band 71/1RB#49	Right Side	133222	24.21	24.50	1.069	0.054	0.058
	Band 71/1RB#49	Bottom Side	133222	24.21	24.50	1.069	0.035	0.037
	Band 71/50RB#50	Front Side	133322	23.97	24.00	1.007	0.074	0.074
	Band 71/50RB#50	Back Side	133322	23.97	24.00	1.007	0.091	0.092
	Band 71/50RB#50	Left Side	133322	23.97	24.00	1.007	0.018	0.018
	Band 71/50RB#50	Right Side	133322	23.97	24.00	1.007	0.048	0.048
	Band 71/50RB#50	Bottom Side	133322	23.97	24.00	1.007	0.038	0.038

- **WLAN 2.4GHz Hotspot SAR**

Plot No.	Band/Mode	Test Position	CH.	Ave. Power	Tune-up Limit	Tune-up Scaling	Meas. SAR_{1g}	Reported SAR_{1g}

				(dBm)	(dBm)	Factor	(W/kg)	(W/kg)
	2.4GHz/802.11b	Front Side	11	17.24	17.50	1.062	0.106	0.113
	2.4GHz/802.11b	Back Side	11	17.24	17.50	1.062	0.098	0.104
43#	2.4GHz/802.11b	Left Side	11	17.24	17.50	1.062	0.134	**0.142**
	2.4GHz/802.11b	Top Side	11	17.24	17.50	1.062	0.030	0.032

Note:

1. Per KDB 447498 D01v06, for each exposure position, if the highest output channel Reported SAR ≤ 0.8W/kg, other channels SAR testing is not necessary.
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA output power is < 0.25dB higher than RMC 12.2kbps, or Reported SAR with RMC 12.2kbps setting is ≤ 1.2W/kg, HSDPA SAR evaluation can be excluded.
3. According to KDB 865664 D02v01r02, SAR plot is required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination.

➢ **WLAN 5GHz Hotspot SAR**

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	5.2GHz/802.11a	Front Side	36	15.89	16.00	1.026	0.049	0.050
	5.2GHz/802.11a	Back Side	36	15.89	16.00	1.026	0.094	0.097
	5.2GHz/802.11a	Left Side	36	15.89	16.00	1.026	0.019	0.019
44#	5.2GHz/802.11a	Top Side	36	15.89	16.00	1.026	0.122	**0.125**
	5.3GHz/802.11a	Front Side	60	15.60	16.00	1.096	0.035	0.038
	5.3GHz/802.11a	Back Side	60	15.60	16.00	1.096	0.079	0.087
	5.3GHz/802.11a	Left Side	60	15.60	16.00	1.096	0.012	0.013
45#	5.3GHz/802.11a	Top Side	60	15.60	16.00	1.096	0.091	0.099
	5.8GHz/802.11a	Front Side	149	15.73	16.00	1.064	0.016	0.017
	5.8GHz/802.11a	Back Side	149	15.73	16.00	1.064	0.035	0.038
	5.8GHz/802.11a	Left Side	149	15.73	16.00	1.064	0.039	0.042
46#	5.8GHz/802.11a	Top Side	149	15.73	16.00	1.064	0.040	0.043

14.3 Standalone Body worn SAR

➢ GSM Body worn SAR

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	GPRS850/4TX Slots	Front Side	190	28.44	28.50	1.014	0.210	0.213
47#	GPRS850/4TX Slots	Back Side	190	28.44	28.50	1.014	0.359	**0.364**
	GPRS1900/4TX Slots	Front Side	810	24.90	25.00	1.023	0.455	0.466
48#	GPRS1900/4TX Slots	Back Side	810	24.90	25.00	1.023	0.477	**0.488**

➢ WCDMA Body worn SAR

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
49#	Band II/RMC	Front Side	9538	22.80	23.00	1.047	0.765	**0.801**
	Band II/RMC	Back Side	9538	22.80	23.00	1.047	0.706	0.739
50#	Band IV/RMC	Front Side	1513	22.70	23.00	1.072	0.684	**0.733**
	Band IV/RMC	Back Side	1513	22.70	23.00	1.072	0.417	0.447
	Band V/RMC	Front Side	4182	23.37	23.50	1.030	0.185	0.191
51#	Band V/RMC	Back Side	4182	23.37	23.50	1.030	0.336	**0.346**

➢ CDMA2000 Body worn SAR

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	BC0 RC3 SO32	Front Side	777	24.49	24.50	1.002	0.231	0.232
	BC0 RC3 SO32	Back Side	777	24.49	24.50	1.002	0.376	0.377
	BC0 EVDO Rev.A	Front Side	1013	23.08	23.50	1.102	0.202	0.223
52#	BC0 EVDO Rev.A	Back Side	1013	23.08	23.50	1.102	0.366	**0.403**
	BC1 RC3 SO32	Front Side	25	24.62	25.00	1.091	0.364	0.397
	BC1 RC3 SO32	Back Side	25	24.62	25.00	1.091	0.595	0.649
53#	BC1 EVDO Rev.A	Front Side	1175	23.01	23.50	1.119	0.641	**0.718**
	BC1 EVDO Rev.A	Back Side	1175	23.01	23.50	1.119	0.500	0.560

➢ LTE 10/15/20MHz QPSK Body worn SAR

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	Band 2/1RB#99	Front Side	18700	23.59	24.00	1.099	0.634	0.697
54#	Band 2/1RB#99	Back Side	18700	23.59	24.00	1.099	0.673	**0.740**
	Band 2/50RB#50	Front Side	18700	23.55	24.00	1.109	0.629	0.698
	Band 2/50RB#50	Back Side	18700	23.55	24.00	1.109	0.499	0.553
55#	Band 4/1RB#0	Front Side	20050	23.53	24.00	1.114	0.780	**0.869**
	Band 4/1RB#0	Back Side	20050	23.53	24.00	1.114	0.493	0.549
	Band 4/50RB#0	Front Side	20050	23.48	23.50	1.005	0.618	0.621
	Band 4/50RB#0	Back Side	20050	23.48	23.50	1.005	0.393	0.395

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	Band 5/1RB#49	Front Side	20450	24.05	24.50	1.109	0.221	0.245
56#	Band 5/1RB#49	Back Side	20450	24.05	24.50	1.109	0.371	**0.412**
	Band 5/25RB#12	Front Side	20450	24.02	24.50	1.117	0.168	0.188
	Band 5/25RB#12	Back Side	20450	24.02	24.50	1.117	0.283	0.316
	Band 7/1RB#0	Front Side	21350	22.95	23.00	1.012	0.135	0.137
57#	Band 7/1RB#0	Back Side	21350	22.95	23.00	1.012	0.422	**0.427**
	Band 7/50RB#0	Front Side	21350	22.82	23.00	1.042	0.104	0.108
	Band 7/50RB#0	Back Side	21350	22.82	23.00	1.042	0.325	0.339
	Band 12/1RB#49	Front Side	23130	23.78	24.00	1.052	0.168	0.177
58#	Band 12/1RB#49	Back Side	23130	23.78	24.00	1.052	0.210	**0.221**
	Band 12/25RB#0	Front Side	23092	23.75	24.00	1.035	0.136	0.141
	Band 12/25RB#0	Back Side	23092	23.75	24.00	1.035	0.169	0.175
	Band 13/1RB#25	Front Side	23230	23.99	24.00	1.002	0.148	0.148
59#	Band 13/1RB#25	Back Side	23230	23.99	24.00	1.002	0.255	**0.256**
	Band 13/25RB#25	Front Side	23230	23.96	24.00	1.009	0.112	0.113
	Band 13/25RB#25	Back Side	23230	23.96	24.00	1.009	0.195	0.197
	Band 17/1RB#25	Front Side	23790	23.85	24.00	1.035	0.193	0.200
60#	Band 17/1RB#25	Back Side	23790	23.85	24.00	1.035	0.248	**0.257**
	Band 17/25RB#12	Front Side	23790	23.84	24.00	1.038	0.154	0.160
	Band 17/25RB#12	Back Side	23790	23.84	24.00	1.038	0.192	0.199
	Band 25/1RB#0	Front Side	26140	23.48	23.50	1.028	0.489	0.503
61#	Band 25/1RB#0	Back Side	26140	23.48	23.50	1.028	0.603	**0.620**
	Band 25/50RB#0	Front Side	26140	23.42	23.50	1.019	0.607	0.618
	Band 25/50RB#0	Back Side	26140	23.42	23.50	1.019	0.477	0.486
62#	Band 26/1RB#0	Front Side	26765	24.79	25.00	1.050	0.238	**0.250**
	Band 26/1RB#0	Back Side	26765	24.79	25.00	1.050	0.155	0.163
	Band 26/39RB#39	Front Side	26765	24.62	25.00	1.091	0.208	0.227
	Band 26/39RB#39	Back Side	26765	24.62	25.00	1.091	0.170	0.186
	Band 41/1RB#49	Front Side	41490	27.19	27.50	1.074	0.070	0.075
63#	Band 41/1RB#49	Back Side	41490	27.19	27.50	1.074	0.310	**0.333**
	Band 41/50RB#24	Front Side	41490	25.95	26.00	1.012	0.055	0.056
	Band 41/50RB#24	Back Side	41490	25.95	26.00	1.012	0.244	0.247
64#	Band 66/1RB#49	Front Side	132072	23.39	23.50	1.026	0.277	**0.284**
	Band 66/1RB#49	Back Side	132072	23.39	23.50	1.026	0.204	0.209
	Band 66/50RB#50	Front Side	132072	23.31	23.50	1.045	0.270	0.282
	Band 66/50RB#50	Back Side	132072	23.31	23.50	1.045	0.199	0.208
	Band 71/1RB#49	Front Side	133222	24.21	24.50	1.069	0.074	0.079
65#	Band 71/1RB#49	Back Side	133222	24.21	24.50	1.069	0.090	**0.096**
	Band 71/50RB#50	Front Side	133322	23.97	24.00	1.007	0.074	0.074
	Band 71/50RB#50	Back Side	133322	23.97	24.00	1.007	0.091	0.092

- **WLAN 2.4GHz Body worn SAR**

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
66#	2.4GHz/802.11b	Front Side	11	17.24	17.50	1.062	0.106	**0.113**
	2.4GHz/802.11b	Back Side	11	17.24	17.50	1.062	0.098	0.104

- **WLAN 5GHz Body worn SAR**

Plot No.	Band/Mode	Test Position	CH.	Ave. Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Meas. SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
	5.2GHz/802.11a	Front Side	36	15.89	16.00	1.026	0.049	0.050
67#	5.2GHz/802.11a	Back Side	36	15.89	16.00	1.026	0.094	**0.097**
	5.3GHz/802.11a	Front Side	60	15.60	16.00	1.096	0.035	0.038
68#	5.3GHz/802.11a	Back Side	60	15.60	16.00	1.096	0.079	**0.087**
	5.8GHz/802.11a	Front Side	149	15.73	16.00	1.064	0.016	0.017
69#	5.8GHz/802.11a	Back Side	149	15.73	16.00	1.064	0.035	**0.038**

15 Multi-Band Simultaneous Transmission Considerations

➢ **Simultaneous Transmission Capabilities**

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the EUT are shown in below Figure and are color-coded to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

Fig.15.1 Simultaneous Transmission Paths

➢ **Simultaneous Transmission Procedures**

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v06, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas ina specific a physical test configuration is ≤1.6 W/kg. When standalone SAR is not required to be measured, per FCC KDB 447498 D01v06 4.3.2), the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

$$\text{Estimated SAR} = \frac{\sqrt{f(GHz)}}{7.5} \cdot \frac{\text{Max. power of channel, mW}}{\text{Min. Separation Distance, mm}}$$

Mode	Max. tune-up Power (dBm)	Exposure Position	Body
		Test Distance (mm)	10
Bluetooth	9.0	Estimated SAR (W/kg)	0.165

Note:

1. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm according is applied to determine estimated SAR.

➢ **Multi-Band simultaneous Transmission Consideration**

	Position	Applicable Combination
Simultaneous Transmission Consideration	Head	2G/3G/4G+WLAN 2.4GHz
		2G/3G/4G+WLAN 5GHz
	Body Worn	2G/3G/4G+WLAN 2.4GHz
		2G/3G/4G+WLAN 5GHz
		2G/3G/4G+Bluetooth
	Hotspot	2G/3G/4G+WLAN 2.4GHz
		2G/3G/4G+WLAN 5GHz
		2G/3G/4G+Bluetooth

Note:

1. GSM/CDMA/WCDMA/LTE shares the same antenna, and cannot transmit simultaneously.
2. WLAN/Bluetooth shares the same antenna, and cannot transmit simultaneously.
3. The Report SAR summation is calculated based on the same configuration and test position.
4. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i. Scalar SAR summation < 1.6W/kg.
   ii. SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (*min. separation distance, mm*), and the peak separation distance is determined from the square root of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$, where (x_1, y_1, z_1) and (x_2, y_2, z_2) are the coordinates of the extrapolated peak SAR locations in the zoom scan If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary
   iii. Simultaneously transmission SAR measurement, and the Reported multi-band SAR < 1.6W/kg

16 SAR Simultaneous Transmission Analysis

➢ **Head Simultaneous Transmission**

WWAN Band	Exposure Position	WWAN	2.4GHz WLAN	5GHz WLAN	WWAN +2.4G Summed 1g SAR (W/kg)	WWAN +5G Summed 1g SAR (W/kg)
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
GSM850	Right Cheek	0.156	0.686	0.484	0.842	0.640
	Right Tilt	0.073	0.498	0.425	0.571	0.498
	Left Cheek	0.214	0.231	0.229	0.445	0.443
	Left Tilt	0.117	0.182	0.239	0.299	0.356
GSM1900	Right Cheek	0.123	0.686	0.484	0.809	0.607
	Right Tilt	0.132	0.498	0.425	0.630	0.557
	Left Cheek	0.114	0.231	0.229	0.345	0.343
	Left Tilt	0.130	0.182	0.239	0.312	0.369
WCDMA II	Right Cheek	0.171	0.686	0.484	0.857	0.655
	Right Tilt	0.156	0.498	0.425	0.654	0.581
	Left Cheek	0.185	0.231	0.229	0.416	0.414
	Left Tilt	0.164	0.182	0.239	0.346	0.403
WCDMA IV	Right Cheek	0.163	0.686	0.484	0.849	0.647
	Right Tilt	0.114	0.498	0.425	0.612	0.539
	Left Cheek	0.175	0.231	0.229	0.406	0.404
	Left Tilt	0.133	0.182	0.239	0.315	0.372
WCDMA V	Right Cheek	0.181	0.686	0.484	0.867	0.665
	Right Tilt	0.093	0.498	0.425	0.591	0.518
	Left Cheek	0.136	0.231	0.229	0.367	0.365
	Left Tilt	0.094	0.182	0.239	0.276	0.333
CDMA2000 BC0	Right Cheek	0.228	0.686	0.484	0.914	0.712
	Right Tilt	0.102	0.498	0.425	0.600	0.527
	Left Cheek	0.138	0.231	0.229	0.369	0.367
	Left Tilt	0.075	0.182	0.239	0.257	0.314
CDMA2000 BC1	Right Cheek	0.211	0.686	0.484	0.897	0.695
	Right Tilt	0.275	0.498	0.425	0.773	0.700
	Left Cheek	0.227	0.231	0.229	0.458	0.456
	Left Tilt	0.214	0.182	0.239	0.396	0.453
CDMA2000 BC10	Right Cheek	0.326	0.686	0.484	1.012	0.81
	Right Tilt	0.194	0.498	0.425	0.692	0.619
	Left Cheek	0.268	0.231	0.229	0.499	0.497
	Left Tilt	0.182	0.182	0.239	0.364	0.421
LTE Band 2	Right Cheek	0.271	0.686	0.484	0.957	0.755
	Right Tilt	0.242	0.498	0.425	0.740	0.667

	Left Cheek	0.153	0.231	0.229	0.384	0.382
	Left Tilt	0.179	0.182	0.239	0.361	0.418

WWAN Band	Exposure Position	WWAN 1g SAR (W/kg)	2.4GHz WLAN 1g SAR (W/kg)	5GHz WLAN 1g SAR (W/kg)	WWAN +2.4G Summed 1g SAR (W/kg)	WWAN +5G Summed 1g SAR (W/kg)
LTE Band 4	Right Cheek	0.164	0.686	0.484	0.850	0.648
	Right Tilt	0.116	0.498	0.425	0.614	0.541
	Left Cheek	0.183	0.231	0.229	0.414	0.412
	Left Tilt	0.127	0.182	0.239	0.309	0.366
LTE Band 5	Right Cheek	0.240	0.686	0.484	0.926	0.724
	Right Tilt	0.116	0.498	0.425	0.614	0.541
	Left Cheek	0.187	0.231	0.229	0.418	0.416
	Left Tilt	0.124	0.182	0.239	0.306	0.363
LTE Band 7	Right Cheek	0.056	0.686	0.484	0.742	0.540
	Right Tilt	0.055	0.498	0.425	0.553	0.480
	Left Cheek	0.059	0.231	0.229	0.290	0.288
	Left Tilt	0.036	0.182	0.239	0.218	0.275
LTE Band 12	Right Cheek	0.176	0.686	0.484	0.862	0.660
	Right Tilt	0.100	0.498	0.425	0.598	0.525
	Left Cheek	0.196	0.231	0.229	0.427	0.425
	Left Tilt	0.135	0.182	0.239	0.317	0.374
LTE Band 13	Right Cheek	0.180	0.686	0.484	0.866	0.664
	Right Tilt	0.114	0.498	0.425	0.612	0.539
	Left Cheek	0.172	0.231	0.229	0.403	0.401
	Left Tilt	0.140	0.182	0.239	0.322	0.379
LTE Band 14	Right Cheek	0.192	0.686	0.484	0.878	0.676
	Right Tilt	0.104	0.498	0.425	0.602	0.529
	Left Cheek	0.145	0.231	0.229	0.376	0.374
	Left Tilt	0.081	0.182	0.239	0.263	0.32
LTE Band 17	Right Cheek	0.160	0.686	0.484	0.846	0.644
	Right Tilt	0.084	0.498	0.425	0.582	0.509
	Left Cheek	0.132	0.231	0.229	0.363	0.361
	Left Tilt	0.081	0.182	0.239	0.263	0.320
LTE Band 25	Right Cheek	0.201	0.686	0.484	0.887	0.685
	Right Tilt	0.141	0.498	0.425	0.639	0.566
	Left Cheek	0.180	0.231	0.229	0.411	0.409
	Left Tilt	0.147	0.182	0.239	0.329	0.386

LTE Band 26	Right Cheek	0.218	0.686	0.484	0.904	0.702
	Right Tilt	0.128	0.498	0.425	0.626	0.553
	Left Cheek	0.188	0.231	0.229	0.419	0.417
	Left Tilt	0.142	0.182	0.239	0.324	0.381
LTE Band 41	Right Cheek	0.034	0.686	0.484	0.720	0.518
	Right Tilt	0.020	0.498	0.425	0.518	0.445
	Left Cheek	0.031	0.231	0.229	0.262	0.260
	Left Tilt	0.014	0.182	0.239	0.196	0.253
LTE Band 66	Right Cheek	0.208	0.686	0.484	0.894	0.692
	Right Tilt	0.082	0.498	0.425	0.580	0.507
	Left Cheek	0.204	0.231	0.229	0.435	0.433
	Left Tilt	0.131	0.182	0.239	0.313	0.370
LTE Band 71	Right Cheek	0.131	0.686	0.484	0.817	0.615
	Right Tilt	0.070	0.498	0.425	0.568	0.495
	Left Cheek	0.125	0.231	0.229	0.356	0.354
	Left Tilt	0.064	0.182	0.239	0.246	0.303

➢ **Hotspot Simultaneous Transmission**

WWAN Band	Exposure Position	WWAN 1g SAR (W/kg)	2.4GHz WLAN 1g SAR (W/kg)	5GHz WLAN 1g SAR (W/kg)	WWAN+2.4G Summed 1g SAR (W/kg)	WWAN+5G Summed 1g SAR (W/kg)	WWAN+BT Summed 1g SAR (W/kg)
GSM850	Front	0.213	0.113	0.050	0.326	0.263	0.378
	Back	0.364	0.104	0.097	0.468	0.461	0.529
	Left side	0.100	0.142	0.042	0.242	0.142	0.265
	Right side	0.244	0.000	0.000	0.244	0.244	0.409
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.161	0.000	0.000	0.161	0.161	0.326
GSM1900	Front	0.466	0.113	0.050	0.579	0.516	0.631
	Back	0.488	0.104	0.097	0.592	0.585	0.653
	Left side	0.224	0.142	0.042	0.366	0.266	0.389
	Right side	0.166	0.000	0.000	0.166	0.166	0.331
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.577	0.000	0.000	0.577	0.577	0.742
WCDMA II	Front	0.801	0.113	0.050	0.914	0.851	0.966
	Back	0.739	0.104	0.097	0.843	0.836	0.904
	Left side	0.317	0.142	0.042	0.459	0.359	0.482

	Right side	0.147	0.000	0.000	0.147	0.147	0.312
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.745	0.000	0.000	0.745	0.745	0.910

WWAN Band	Exposure Position	WWAN 1g SAR (W/kg)	2.4GHz WLAN 1g SAR (W/kg)	5GHz WLAN 1g SAR (W/kg)	WWAN+2.4G Summed 1g SAR (W/kg)	WWAN+5G Summed 1g SAR (W/kg)	WWAN+BT Summed 1g SAR (W/kg)
WCDMA IV	Front	0.733	0.113	0.050	0.846	0.783	0.898
	Back	0.447	0.104	0.097	0.551	0.544	0.612
	Left side	0.121	0.142	0.042	0.263	0.163	0.286
	Right side	0.129	0.000	0.000	0.129	0.129	0.294
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.706	0.000	0.000	0.706	0.706	0.871
WCDMA V	Front	0.191	0.113	0.050	0.304	0.241	0.356
	Back	0.346	0.104	0.097	0.450	0.443	0.511
	Left side	0.092	0.142	0.042	0.234	0.134	0.257
	Right side	0.180	0.000	0.000	0.180	0.180	0.345
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.150	0.000	0.000	0.150	0.150	0.315
CDMA2000 BC0	Front	0.232	0.113	0.050	0.345	0.282	0.397
	Back	0.403	0.104	0.097	0.507	0.500	0.568
	Left side	0.047	0.142	0.042	0.189	0.089	0.212
	Right side	0.236	0.000	0.000	0.236	0.236	0.401
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.269	0.000	0.000	0.269	0.269	0.434
CDMA2000 BC1	Front	0.718	0.113	0.050	0.831	0.768	0.883
	Back	0.649	0.104	0.097	0.753	0.746	0.814
	Left side	0.500	0.142	0.042	0.642	0.542	0.665
	Right side	0.285	0.000	0.000	0.285	0.285	0.450
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.777	0.000	0.000	0.777	0.777	0.942
CDMA2000 BC10	Front	0.301	0.113	0.050	0.414	0.351	0.466
	Back	0.336	0.104	0.097	0.44	0.433	0.501
	Left side	0.312	0.142	0.042	0.454	0.354	0.477
	Right side	0.016	0.000	0.000	0.016	0.016	0.181
	Top side	0.284	0.032	0.125	0.316	0.409	0.449
	Bottom side	0.192	0.000	0.000	0.192	0.192	0.357
LTE Band 2	Front	0.697	0.113	0.050	0.811	0.748	0.863

	Back	0.740	0.104	0.097	0.844	0.837	0.905
	Left side	0.366	0.142	0.042	0.508	0.408	0.531
	Right side	0.193	0.000	0.000	0.193	0.193	0.358
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.764	0.000	0.000	0.764	0.764	0.929
LTE Band 4	Front	0.869	0.113	0.050	0.982	0.919	1.034
	Back	0.549	0.104	0.097	0.653	0.646	0.714
	Left side	0.292	0.142	0.042	0.434	0.334	0.457
	Right side	0.263	0.000	0.000	0.263	0.263	0.428
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.731	0.000	0.000	0.731	0.731	0.896
LTE Band 5	Front	0.245	0.113	0.050	0.358	0.295	0.410
	Back	0.412	0.104	0.097	0.516	0.509	0.577
	Left side	0.074	0.142	0.042	0.216	0.116	0.239
	Right side	0.223	0.000	0.000	0.223	0.223	0.388
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.240	0.000	0.000	0.240	0.240	0.405
LTE Band 7	Front	0.137	0.113	0.050	0.250	0.187	0.302
	Back	0.427	0.104	0.097	0.531	0.524	0.592
	Left side	0.043	0.142	0.042	0.185	0.085	0.208
	Right side	0.048	0.000	0.000	0.048	0.048	0.213
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.162	0.000	0.000	0.162	0.162	0.327
LTE Band 12	Front	0.177	0.113	0.050	0.290	0.227	0.342
	Back	0.221	0.104	0.097	0.325	0.318	0.386
	Left side	0.042	0.142	0.042	0.184	0.084	0.207
	Right side	0.134	0.000	0.000	0.134	0.134	0.299
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.118	0.000	0.000	0.118	0.118	0.283
LTE Band 13	Front	0.148	0.113	0.050	0.261	0.198	0.313
	Back	0.256	0.104	0.097	0.360	0.353	0.421
	Left side	0.085	0.142	0.042	0.227	0.127	0.250
	Right side	0.221	0.000	0.000	0.221	0.221	0.386
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.150	0.000	0.000	0.150	0.150	0.315
LTE Band 14	Front	0.206	0.113	0.050	0.319	0.256	0.371
	Back	0.230	0.104	0.097	0.334	0.327	0.395
	Left side	0.059	0.142	0.042	0.201	0.101	0.224
	Right side	0.161	0.000	0.000	0.161	0.161	0.326
	Top side	0.000	0.032	0.125	0.032	0.125	0.165

	Bottom side	0.142	0.000	0.000	0.142	0.142	0.307
LTE Band 17	Front	0.200	0.113	0.050	0.313	0.250	0.365
	Back	0.257	0.104	0.097	0.361	0.354	0.422
	Left side	0.042	0.142	0.042	0.184	0.084	0.207
	Right side	0.124	0.000	0.000	0.124	0.124	0.289
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.115	0.000	0.000	0.115	0.115	0.280
LTE Band 25	Front	0.618	0.113	0.050	0.731	0.668	0.783
	Back	0.620	0.104	0.097	0.724	0.717	0.785
	Left side	0.308	0.142	0.042	0.450	0.350	0.473
	Right side	0.136	0.000	0.000	0.136	0.136	0.301
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.781	0.000	0.000	0.781	0.781	0.946

WWAN Band	Exposure Position	WWAN 1g SAR (W/kg)	2.4GHz WLAN 1g SAR (W/kg)	5GHz WLAN 1g SAR (W/kg)	WWAN+2.4G Summed 1g SAR (W/kg)	WWAN+5G Summed 1g SAR (W/kg)	WWAN+BT Summed 1g SAR (W/kg)
LTE Band 26	Front	0.250	0.113	0.050	0.363	0.300	0.415
	Back	0.186	0.104	0.097	0.290	0.283	0.351
	Left side	0.047	0.142	0.042	0.189	0.089	0.212
	Right side	0.186	0.000	0.000	0.186	0.186	0.351
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.221	0.000	0.000	0.221	0.221	0.386
LTE Band 41	Front	0.075	0.113	0.050	0.188	0.125	0.240
	Back	0.333	0.104	0.097	0.437	0.430	0.498
	Left side	0.031	0.142	0.042	0.173	0.073	0.196
	Right side	0.074	0.000	0.000	0.074	0.074	0.239
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.107	0.000	0.000	0.107	0.107	0.272
LTE Band 66	Front	0.284	0.113	0.050	0.397	0.334	0.449
	Back	0.209	0.104	0.097	0.313	0.306	0.374
	Left side	0.099	0.142	0.042	0.241	0.141	0.264
	Right side	0.106	0.000	0.000	0.106	0.106	0.271
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.360	0.000	0.000	0.360	0.360	0.525
LTE Band 71	Front	0.079	0.113	0.050	0.192	0.129	0.244
	Back	0.096	0.104	0.097	0.200	0.193	0.261
	Left side	0.020	0.142	0.042	0.162	0.062	0.185

	Right side	0.058	0.000	0.000	0.058	0.058	0.223
	Top side	0.000	0.032	0.125	0.032	0.125	0.165
	Bottom side	0.038	0.000	0.000	0.038	0.038	0.203

➢ **Body worn Simultaneous Transmission**

WWAN Band	Exposure Position	WWAN 1g SAR (W/kg)	2.4GHz WLAN 1g SAR (W/kg)	5GHz WLAN 1g SAR (W/kg)	WWAN+2.4G Summed 1g SAR (W/kg)	WWAN+5G Summed 1g SAR (W/kg)	WWAN+BT Summed 1g SAR (W/kg)
GSM850	Front	0.213	0.113	0.050	0.326	0.263	0.378
	Back	0.364	0.104	0.097	0.468	0.461	0.529
GSM1900	Front	0.466	0.113	0.050	0.579	0.516	0.631
	Back	0.488	0.104	0.097	0.592	0.585	0.653
WCDMA II	Front	0.801	0.113	0.050	0.914	0.851	0.966
	Back	0.739	0.104	0.097	0.843	0.836	0.904
WCDMA IV	Front	0.733	0.113	0.050	0.846	0.783	0.898
	Back	0.447	0.104	0.097	0.551	0.544	0.612
WCDMA V	Front	0.191	0.113	0.050	0.304	0.241	0.356
	Back	0.346	0.104	0.097	0.450	0.443	0.511
CDMA2000 BC0	Front	0.232	0.113	0.050	0.345	0.282	0.397
	Back	0.403	0.104	0.097	0.507	0.500	0.568
CDMA2000 BC1	Front	0.718	0.113	0.050	0.831	0.768	0.883
	Back	0.649	0.104	0.097	0.753	0.746	0.814
CDMA2000 BC10	Front	0.301	0.104	0.097	0.405	0.398	0.466
	Back	0.336	0.113	0.050	0.449	0.386	0.501
LTE Band 2	Front	0.697	0.113	0.050	0.811	0.748	0.863
	Back	0.740	0.104	0.097	0.844	0.837	0.905
LTE Band 4	Front	0.869	0.113	0.050	0.982	0.919	1.034
	Back	0.549	0.104	0.097	0.653	0.646	0.714
LTE Band 5	Front	0.245	0.113	0.050	0.358	0.295	0.41
	Back	0.412	0.104	0.097	0.516	0.509	0.577
LTE Band 7	Front	0.137	0.113	0.050	0.250	0.187	0.302
	Back	0.427	0.104	0.097	0.531	0.524	0.592
LTE Band 12	Front	0.177	0.113	0.050	0.290	0.227	0.342
	Back	0.221	0.104	0.097	0.325	0.318	0.386
LTE Band 13	Front	0.148	0.113	0.050	0.261	0.198	0.313
	Back	0.256	0.104	0.097	0.360	0.353	0.421
LTE Band 14	Front	0.206	0.113	0.050	0.319	0.256	0.371
	Back	0.230	0.104	0.097	0.334	0.327	0.395
LTE Band 17	Front	0.200	0.113	0.050	0.313	0.250	0.365

	Back	0.257	0.104	0.097	0.361	0.354	0.207
LTE Band 25	Front	0.618	0.113	0.050	0.731	0.668	0.783
	Back	0.620	0.104	0.097	0.724	0.717	0.785
LTE Band 26	Front	0.250	0.113	0.050	0.363	0.300	0.415
	Back	0.186	0.104	0.097	0.290	0.283	0.351
LTE Band 41	Front	0.075	0.113	0.050	0.188	0.125	0.240
	Back	0.333	0.104	0.097	0.437	0.430	0.498

WWAN Band	**Exposure Position**	**WWAN 1g SAR (W/kg)**	**2.4GHz WLAN 1g SAR (W/kg)**	**5GHz WLAN 1g SAR (W/kg)**	**WWAN+2.4G Summed 1g SAR (W/kg)**	**WWAN+5G Summed 1g SAR (W/kg)**	**WWAN+BT Summed 1g SAR (W/kg)**
LTE Band 66	Front	0.284	0.113	0.050	0.397	0.334	0.449
	Back	0.209	0.104	0.097	0.313	0.306	0.374
LTE Band 71	Front	0.079	0.113	0.050	0.192	0.129	0.244
	Back	0.096	0.104	0.097	0.200	0.193	0.261

17 Measurement Uncertainty

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type A evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A Type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution,rectangular or triangular distributions indicated in below Table.

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor	1/k(b)	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	Vi
Measurement System									
Probe calibration	E.2.1	5.83	N	1	1	1	5.83	5.83	∞
Axial Isotropy	E.2.2	3.5	R	$\sqrt{3}$	1	1	2.02	2.02	∞
Hemispherical Isotropy	E.2.2	5.9	R	$\sqrt{3}$	1	1	3.41	3.41	∞
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	E.2.4	4.7	R	$\sqrt{3}$	1	1	2.71	2.71	∞
System detection limits	E.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Readout Electronics	E.2.6	0.5	N	1	1	1	0.5	0.5	∞
Reponse Time	E.2.7	3.0	R	$\sqrt{3}$	1	1	3.0	3.0	∞
Integration Time	E.2.8	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
RF ambient Conditions	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner Mechanical Tolerance	E.6.2	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Probe positioning with respect to Phantom Shell	E.6.3	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Extrapolation, interpolation and integration Algoritms for Max. SAR Evaluation	E.5.2	2.3	R	$\sqrt{3}$	1	1	1.33	1.33	∞
Test sample Related									
Test sample positioning	E.4.2.1	2.6	N	1	1	1	2.6	2.6	N-1
Device Holder Uncertainty	E.4.1.1	3.0	N	1	1	1	5.11	5.11	∞
Output power Power drift - SAR drift measurement	6.6.2	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	4.0	R	$\sqrt{3}$	1	1	2.31	2.31	∞
Liquid conductivity - deviation from target value	E.3.2	2.0	R	$\sqrt{3}$	0.64	0.43	1.69	1.13	∞
Liquid conductivity - measurement uncertainty	E.3.3	2.5	N	1	0.64	0.43	3.20	2.15	M
Liquid permittivity - deviation from target value	E.3.2	2.5	R	$\sqrt{3}$	0.6	0.49	1.28	1.04	∞
Liquid permittivity - measurement uncertainty	E.3.3	5.0	N	1	0.6	0.49	6.00	4.90	M
Liquid conductivity – temperature uncertainty	E.3.4		R	$\sqrt{3}$	0.78	0.41			∞
Liquid permittivity – temperature uncertainty	E.3.4		R	$\sqrt{3}$	0.23	0.26			∞
Combined Standard Uncertainty			RSS				11.55	12.07	

Expanded Uncertainty (95% Confidence interval)			K=2				±23.20	±24.17	

18 Measurement Conclusion

The SAR evaluation indicates that the EUT complies with the RF radiation exposure limits of the India, with respect to all parameters subject to this test. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested. Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because various factors may interact with one another to vary the specific biological outcome of an exposure to electromagnetic fields, any protection guide should consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables.

END OF REPORT