

FCC SAR TEST REPORT

Application No.: ZR/2021/90026
Applicant: Great Talent Technology Limited
Manufacturer: Great Talent Technology Limited
Product Name: Smart Phone
Model No.(EUT): SP502
Trade Mark: SeNse
FCC ID: 2ALZM-SP502
Standards: FCC 47CFR §2.1093
Date of Receipt: 2021-11-09
Date of Test: 2022-01-15 to 2022-03-01
Date of Issue: 2022-03-07
Test conclusion: **PASS ***

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:

Pantu Sun

Wireless Laboratory Manager



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REVISION HISTORY

Report Number	Revision	Description	Issue Date
SUZR/2021/9002606	01	Original	2022-03-07



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TEST SUMMARY

Frequency Band	Maximum Reported SAR(W/kg)			
	Head	Body-worn	Hotspot	Product specific 10g SAR
CDMA BC0	0.17	0.24	0.35	/
CDMA BC1	0.30	0.44	0.79	/
CDMA BC10	0.13	0.21	0.31	/
LTE Band 12	0.23	0.43	0.47	/
LTE Band 2/25	0.21	0.23	0.53	/
LTE Band 5/26	0.12	0.15	0.16	/
LTE Band 41	0.35	0.26	0.46	/
LTE Band 4/66	0.19	0.28	0.47	/
LTE Band 71	<0.10	0.13	0.14	/
WI-FI (2.4GHz)	1.34	0.17	0.31	/
BT	0.16	<0.10	<0.10	/
SAR Limited(W/kg)	1.6			4.0
Maximum Simultaneous Transmission SAR (W/kg)				
Scenario	Head	Body-worn	Hotspot	Product specific 10g SAR
Sum SAR	1.57	0.60	1.10	/
SPLSR	0.03	N/A	N/A	N/A
SPLSR Limited	0.04			0.1

Note:
 1) The Simultaneous transmission SAR is the same test position of the WWAN antenna + WiFi/BT antenna.
 2) According to TCB workshop October,2014 RF Exposure Procedures Update(Overlapping LTE Bands), When the supported frequency range of an LTE Band falls completely within an LTE band with a larger transmission frequency range, both LTE bands have the same target power (or the band with the larger transmission frequency range has a higher target power), and both LTE bands share the same transmission path and signal characteristics, SAR was only assessed for the band with the larger transmission frequency range. For This device, LTE band 2/4/5 SAR test was covered by Band 25/66/26.

Reviewed by

Well Wei

Well Wei

Prepared by

Nature Shen

Nature Shen



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1 General Information

1.1 Details of Client

Applicant:	Great Talent Technology Limited
Address:	35F, HBC HuiLong Center Building-II Minzhi Street, Longhua, Shenzhen, P.R. China
Manufacturer:	Great Talent Technology Limited
Address:	35F, HBC HuiLong Center Building-II Minzhi Street, Longhua, Shenzhen, P.R. China

1.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test Engineer:	Nature Shen, KING-P li



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1.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.



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1.4 General Description of EUT

Device Type :	portable device		
Exposure Category:	uncontrolled environment / general population		
Product Name:	Smart Phone		
Model No.(EUT):	SP502		
Trade Mark:	SeNse		
FCC ID:	2ALZM-SP502		
Product Phase:	Identical Prototype		
IMEI:	990019120000064/990012679501426/990012679501418/990012679501400		
Hardware Version:	Q6003_V1.0		
Software Version:	SP502_01.01.04		
Antenna Type:	Integrated		
Device Operating Configurations :			
Modulation Mode:	CDMA: QPSK; LTE: QPSK,16QAM WIFI: DSSS, OFDM; BT: GFSK, π/4DQPSK,8DPSK		
Power Class:	3, tested with power control "all up"(CDMA Bands) 3, tested with power control Max Power(LTE Band)		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	CDMA BC0	824~849	869~894
	CDMA BC1	1850~1910	1930~1990
	CDMA BC10	817~824	862~869
	LTE Band 2	1850 ~1910	1930 ~1990
	LTE Band 4	1710~1755	2110~2155
	LTE Band 5	824~849	869-894
	LTE Band 12	699~716	729~746
	LTE Band 25	1850~1915	1930~1995
	LTE Band 26	814~849	859~894
	LTE Band 41 (Class 2/3)	2496~2690	2496~2690
	LTE Band 66	1710~1780	2110~2200
	LTE Band 71	663~698	617~652
	Bluetooth	2402~2480	2402~2480
Wi-Fi 2.4G	2412~2462	2412~2462	
RF Cable:	<input checked="" type="checkbox"/> Provided by the applicant <input type="checkbox"/> Provided by the laboratory		
Battery Information:	Model:	BTE-3402	
	Normal Voltage:	3.8V	
	Rated capacity:	3400mAh	
	Manufacturer:	Phenix New Energy (Huizhou) Co., Ltd.	

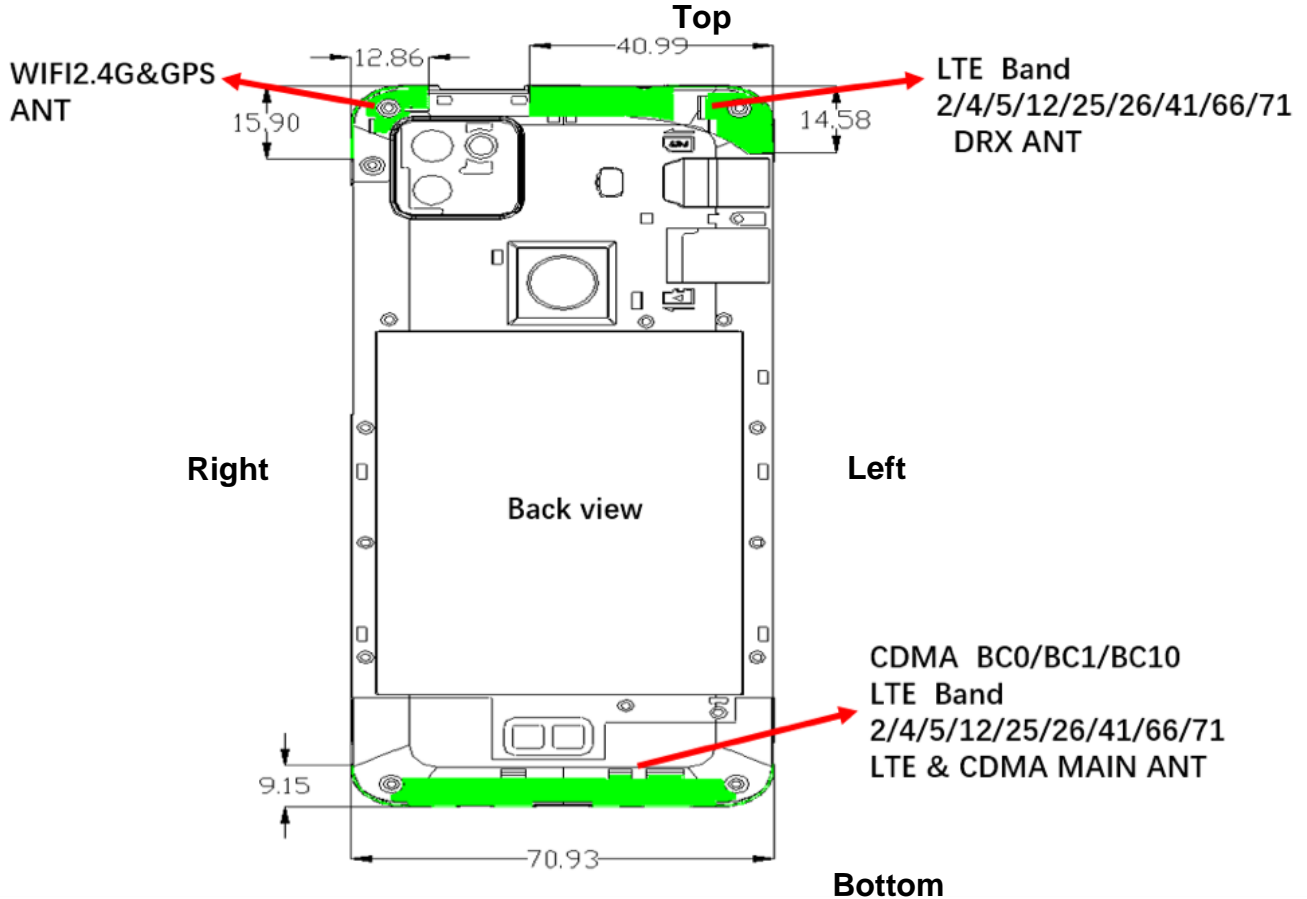


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1.4.1 DUT Antenna Locations(Back View)



Note:

- 1) DRX Antenna does not support transmitter function.
- 2) The test device is a smart phone. The overall diagonal dimension of this device is 169mm. Per KDB 648474 D04, because the diagonal distance of this device is ≥ 160 mm, so it is a phablet.

According to the distance between LTE/CDMA/WIFI&BT antennas and the sides of the EUT we can draw the conclusion that:

EUT Sides for SAR Testing							
Mode	Exposure Condition	Front	Back	Left	Right	Top	Bottom
Main Ant	Hotspot	Yes	Yes	Yes	Yes	No	Yes
WIFI 2.4G/BT	Hotspot	Yes	Yes	No	Yes	Yes	No

Table 1: EUT Sides for SAR Testing

Note:

- 1) When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. For Hotspot exposure of cover opened, the test case was considered each half of surface separately due to fold angle. And only keypad part was considered about SAR test because Display part has not any antennas.



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1.5 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
ANSI/IEEE C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.
IEEE 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 941225 D01	3G SAR Measurement Procedures v03r01
KDB 941225 D05	SAR for LTE Devices v02r05
KDB 941225 D06	Hotspot Mode SAR v02r01
KDB 248227 D01	SAR Guidance for IEEE 802 11 Wi-Fi SAR v02r02
KDB 648474 D04	Handset SAR v01r03
KDB 447498 D04	Interim General RF Exposure Guidance v01
KDB 865664 D01	SAR Measurement 100 MHz to 6 GHz v01r04
KDB 865664 D02	RF Exposure Reporting v01r02
KDB 690783 D01	SAR Listings on Grants v01r03



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1.6 RF exposure limits

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

Notes:

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

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

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

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

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



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2 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

Table 2: The Ambient Conditions



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3 SAR Measurements System Configuration

3.1 The SAR Measurement System

This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY5 professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation $SAR = \sigma (|E|)^2 / \rho$ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

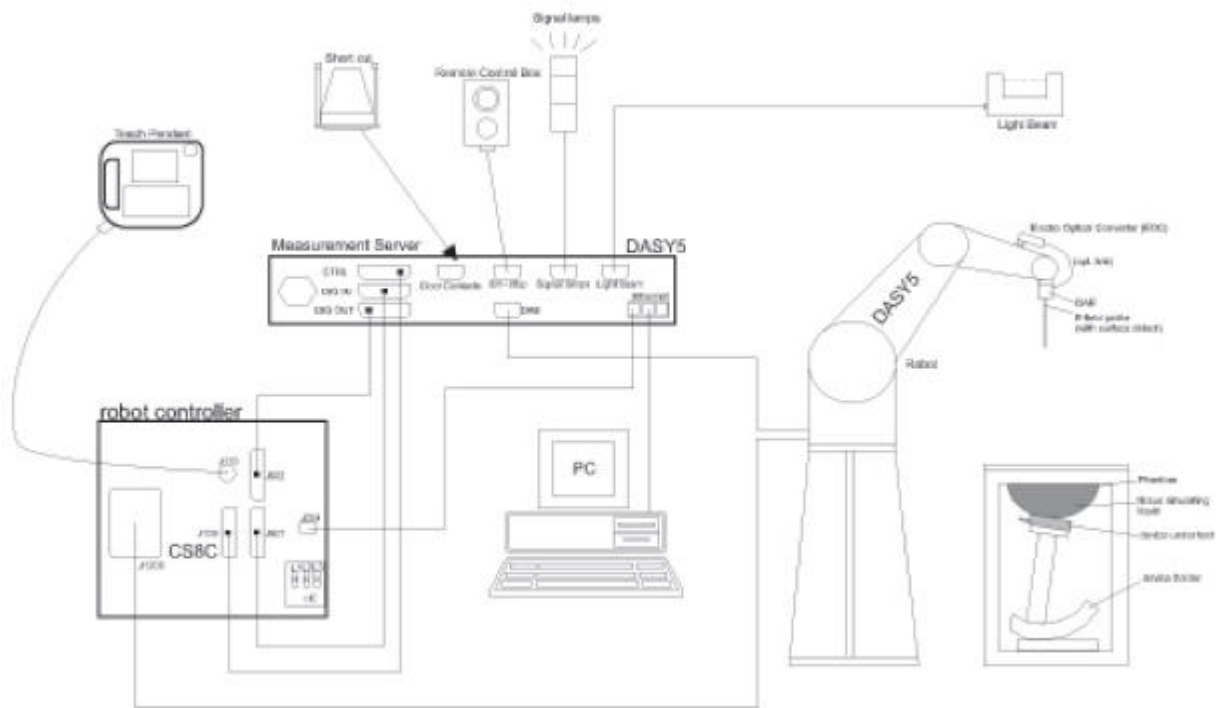
The DASY5 system for performing compliance tests consists of the following items:

A standard high precision 6-axis robot (Stabile RX family) with controller, teach pendant and software .An arm extension for accommodation the data acquisition electronics (DAE).

A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.



F-1. SAR Measurement System Configuration



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- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 7.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand, right-hand and Body Worn usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validating the proper functioning of the system.

3.2 Isotropic E-field Probe EX3DV4

	<p>Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)</p>
<p>Calibration</p>	<p>ISO/IEC 17025 calibration service available.</p>
<p>Frequency</p>	<p>10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)</p>
<p>Directivity</p>	<p>± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)</p>
<p>Dynamic Range</p>	<p>10 μW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μW/g)</p>
<p>Dimensions</p>	<p>Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm</p>
<p>Application</p>	<p>High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.</p>
<p>Compatibility</p>	<p>DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI</p>



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3.3 Data Acquisition Electronics (DAE)

Model	DAE	
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.	
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV,400mV)	
Input Offset Voltage	< 5µV (with auto zero)	
Input Bias Current	< 50 f A	
Dimensions	60 x 60 x 68 mm	

3.4 SAM Twin Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)	
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)	
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)	
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet	
Filling Volume	approx. 25 liters	
Wooden Support	SPEAG standard phantom table	

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.

Twin SAM V5.0 has the same shell geometry and is manufactured from the same material as Twin SAM V4.0, but has reinforced top structure.



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3.5 ELI Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2.0 ± 0.2 mm (bottom plate)
Dimensions	Major axis: 600 mm Minor axis: 400 mm
Filling Volume	approx. 30 liters
Wooden Support	SPEAG standard phantom table



Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.

ELI V5.0 has the same shell geometry and is manufactured from the same material as ELI4, but has reinforced top structure.



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3.6 Device Holder for Transmitters



F-2. Device Holder for Transmitters

- 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 centres for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.
- The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon=3$ and loss tangent $\delta=0.02$. 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.



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3.7 Measurement procedure

3.7.1 Scanning procedure

Step 1: Power reference measurement

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure.

Step 2: Area scan

The SAR distribution at the exposed side of the head was measured at a distance of 4mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15mm*15mm or 12mm*12mm or 10mm*10mm. Based on the area scan data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Zoom scan

Around this point, a volume of 32mm*32mm*30mm ($f \leq 2\text{GHz}$), 30mm*30mm*30mm (f for 2-3GHz) and 24mm*24mm*22mm (f for 5-6GHz) was assessed by measuring 5x5x7 points ($f \leq 2\text{GHz}$), 7x7x7 points (f for 2-3GHz) and 7x7x12 points (f for 5-6GHz). On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

The data at the surface was extrapolated, since the centre of the dipoles is 2.0mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. (This can be variable. Refer to the probe specification). The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The volume was integrated with the trapezoidal algorithm. One thousand points were interpolated to calculate the average. All neighbouring volumes were evaluated until no neighboring volume with a higher average value was found.

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements. Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std. 1528-2013.



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		≤ 3 GHz	> 3 GHz	
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface		5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm	
Maximum probe angle from probe axis to phantom surface normal at the measurement location		$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$	
Maximum area scan spatial resolution: Δx_{Area} , Δy_{Area}		≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm	
		When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be \leq the corresponding x or y dimension of the test device with at least one measurement point on the test device.		
Maximum zoom scan spatial resolution: Δx_{Zoom} , Δy_{Zoom}		≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*	
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$	≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm	
	graded grid	$\Delta z_{Zoom}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z	≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm	

Step 4: Power reference measurement (drift)

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The indicated drift is mainly the variation of the DUT's output power and should vary max. $\pm 5\%$



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3.7.2 Data Storage

The DASY software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension “.DAE4”. The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated. The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [m W/g], [m W/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

3.7.3 Data Evaluation by SEMCAD

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

Probe parameters:	- Sensitivity	Normi, ai0, ai1, ai2
	- Conversion factor	ConvFi
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	ε
	- Density	ρ

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

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf / dcpi$$

- With V_i = compensated signal of channel i ($i = x, y, z$)
- U_i = input signal of channel i ($i = x, y, z$)
- cf = crest factor of exciting field (DASY parameter)
- dcpi = diode compression point (DASY parameter)

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

E-field probes:

$$E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$$



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H-field probes:

$$H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1}f + a_{i2}f^2) / f$$

With V_i = compensated signal of channel i ($i = x, y, z$)

Norm i = sensor sensitivity of channel i ($i = x, y, z$)

[mV/(V/m)²] for E-field Probes

ConvF = sensitivity enhancement in solution

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

f = carrier frequency [GHz]

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

H_i = magnetic field strength of channel i in A/m

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

$$E_{tot} = (E_x^2 + E_y^2 + E_z^2)^{1/2}$$

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

$$SAR = (E_{tot}^2 \cdot \sigma) / (\epsilon \cdot 1000)$$

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]

ϵ = equivalent tissue density in g/cm³

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}^2 / 3770 \quad \text{or} \quad P_{pwe} = H_{tot}^2 \cdot 37.7$$

with P_{pwe} = equivalent power density of a plane wave in mW/cm²

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

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



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4 SAR measurement variability and uncertainty

4.1 SAR measurement variability

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. The additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

- 1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
 - 2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
 - 3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).
 - 4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .
- The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

4.2 SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.



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5 Description of Test Position

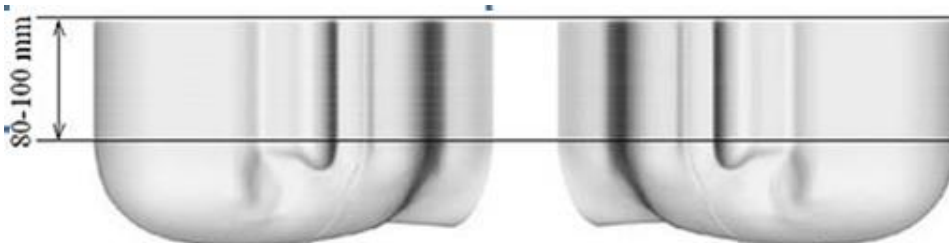
5.1 Head Exposure Condition

5.1.1 SAM Phantom Shape

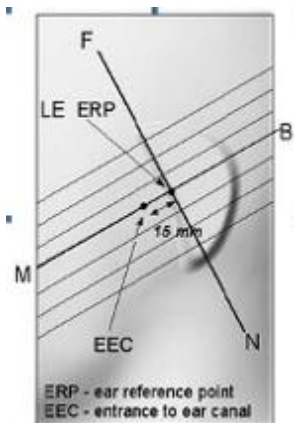


F-3. Front, back, and side views of SAM (model for the phantom shell). Full-head model is for illustration purposes only-procedures in this recommended practice are intended primarily for the phantom setup.

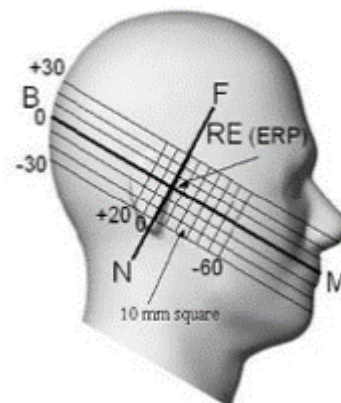
Note: The centre strip including the nose region has a different thickness tolerance.



F-4. Sagittally bisected phantom with extended perimeter (shown placed on its side as used for SAR measurements)



F-5. Close-up side view of phantom, showing the ear region, N-F and B-M lines, and seven cross-sectional plane locations



F-6. Side view of the phantom showing relevant markings and seven cross-sectional plane locations

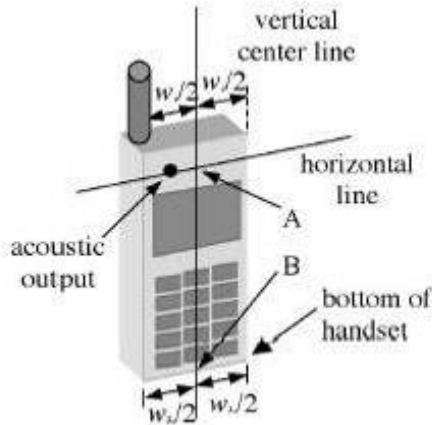


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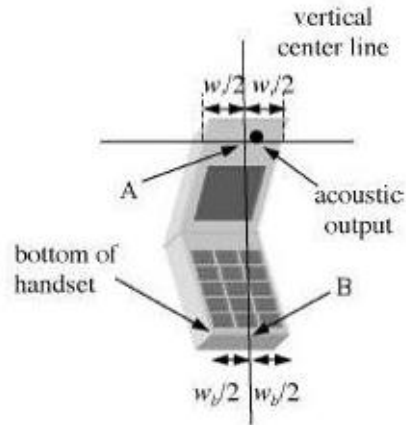
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5.1.2 EUT constructions



F-7. Handset vertical and horizontal reference lines-“fixed case”



F-8. Handset vertical and horizontal reference lines-“clam-shell case”

5.1.3 Definition of the “cheek” position

- a) Position the device with the vertical centre line of the body of the device and the horizontal line crossing the centre of the ear piece in a plane parallel to the sagittal plane of the phantom (“initial position”). While maintaining the device in this plane, align the vertical centre line with the reference plane containing the three ear and mouth reference points (M, RE and LE) and align the centre of the ear piece with the line RE-LE.
- b) Translate the mobile phone box towards the phantom with the ear piece aligned with the line LE-RE until telephone touches the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the box until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost.



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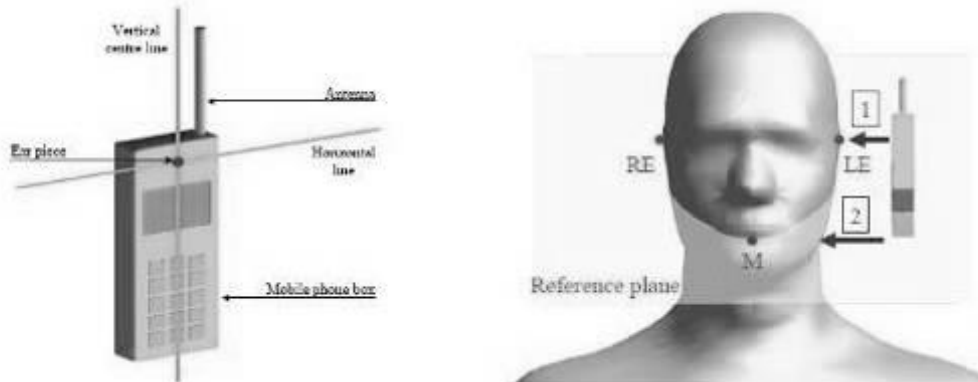
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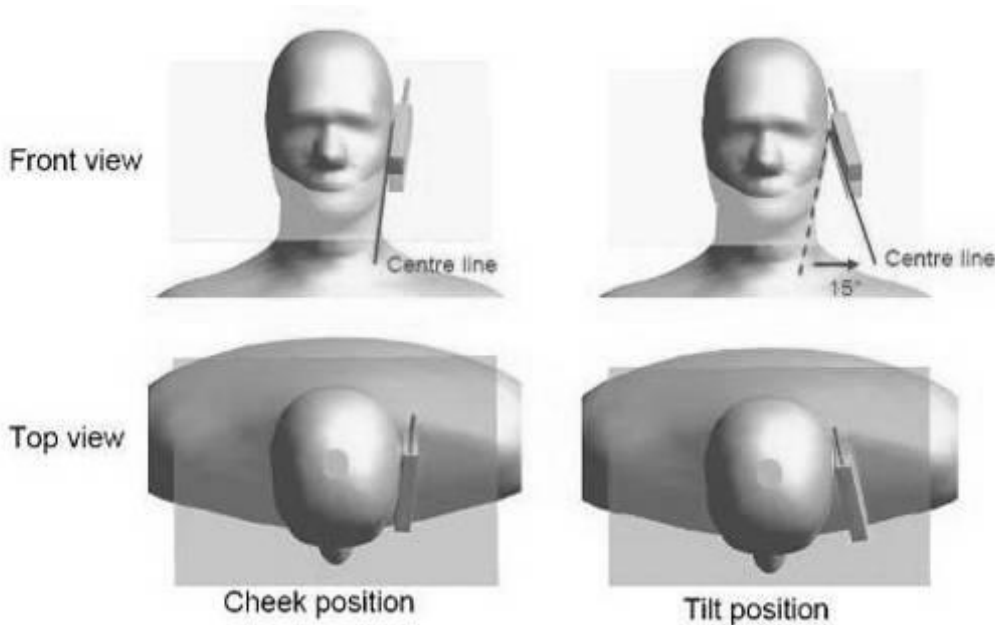
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5.1.4 Definition of the “tilted” position

- a) Position the device in the “cheek” position described above;
- b) While maintaining the device in the reference plane described above and pivoting against the ear, move it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost.



F-9. Definition of the reference lines and points, on the phone and on the phantom and initial position



F-10. “Cheek” and “tilt” positions of the mobile phone on the left side



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5.2 Body Exposure Condition

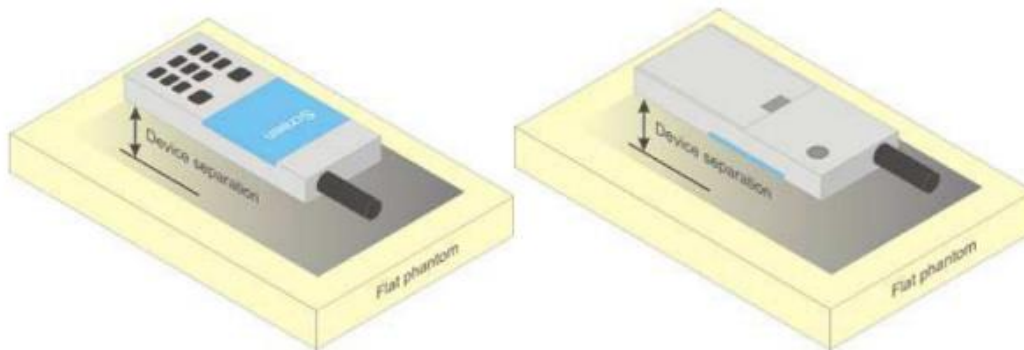
5.2.1 Body-worn accessory exposure conditions

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations.

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. Per FCC KDB Publication 648474 D04, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D04 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is $> 1.2 \text{ W/kg}$, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented. Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.



F-11. Test positions for body-worn devices



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5.2.2 Wireless Router exposure conditions

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 where SAR test considerations for handsets ($L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. For devices with form factors smaller than $9 \text{ cm} \times 5 \text{ cm}$, a test separation distance of 5 mm is required.

5.3 Extremity exposure conditions

Per FCC KDB 648474D04, for smart phones with a display diagonal dimension $> 15.0 \text{ cm}$ or an overall diagonal dimension $> 16.0 \text{ cm}$ that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the device is marketed as “Phablet”.

The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at $\leq 25 \text{ mm}$ from that surface or edge, in direct contact with a flat phantom, for Product Specific 10-g SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, Product Specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR $> 1.2 \text{ W/kg}$; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.

Due to the SAR result, the all frequency bands are not required to test with 0mm for the Product Specific 10-g SAR.



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6 SAR System Verification Procedure

6.1 Tissue Simulate Liquid

6.1.1 Recipes for Tissue Simulate Liquid

The following tables give the recipes for tissue simulating liquids to be used in different frequency bands:

Ingredients (% by weight)	Frequency (MHz)				
	450	700-900	1750-2000	2300-2500	2500-2700
Water	38.56	40.30	55.24	55.00	54.92
Salt (NaCl)	3.95	1.38	0.31	0.2	0.23
Sucrose	56.32	57.90	0	0	0
HEC	0.98	0.24	0	0	0
Bactericide	0.19	0.18	0	0	0
Tween	0	0	44.45	44.80	44.85
Salt: 99+% Pure Sodium Chloride Water: De-ionized, 16 MΩ ⁺ resistivity Tween: Polyoxyethylene (20) sorbitan monolaurate			Sucrose: 98+% Pure Sucrose HEC: Hydroxyethyl Cellulose		
HSL5GHz is composed of the following ingredients: Water: 50-65% Mineral oil: 10-30% Emulsifiers: 8-25% Sodium salt: 0-1.5%					

Table 3: Recipe of Tissue Simulate Liquid



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6.1.2 Measurement for Tissue Simulate Liquid

The Conductivity (σ) and Permittivity (ρ) are listed in bellow table. For the SAR measurement given in this report. The temperature variation of the Tissue Simulate Liquids was $22\pm 2^{\circ}\text{C}$.

Tissue Type	Measured Frequency (MHz)	Target Tissue ($\pm 5\%$)		Measured Tissue		Liquid Temp.($^{\circ}\text{C}$)	Measured Date
		ϵ_r	$\sigma(\text{S/m})$	ϵ_r	$\sigma(\text{S/m})$		
750 Head	750	41.9 (39.81~44)	0.89 (0.85~0.94)	41.643	0.893	21.7	2022/1/15
835 Head	835	41.5 (39.43~43.58)	0.90 (0.86~0.95)	42.278	0.901	22.1	2022/1/23
1750 Head	1750	40.1 (38.10~42.11)	1.37 (1.30~1.44)	38.751	1.331	22.0	2022/2/7
1900 Head	1900	40.0 (38.00~42.00)	1.40 (1.33~1.47)	40.061	1.401	21.9	2022/2/19
2450 Head	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	38.687	1.800	21.4	2022/2/27
2600 Head	2600	39.0 (37.05~40.95)	1.96 (1.86~2.06)	38.102	1.959	21.5	2022/3/1

Table 4: Measurement result of Tissue electric parameters



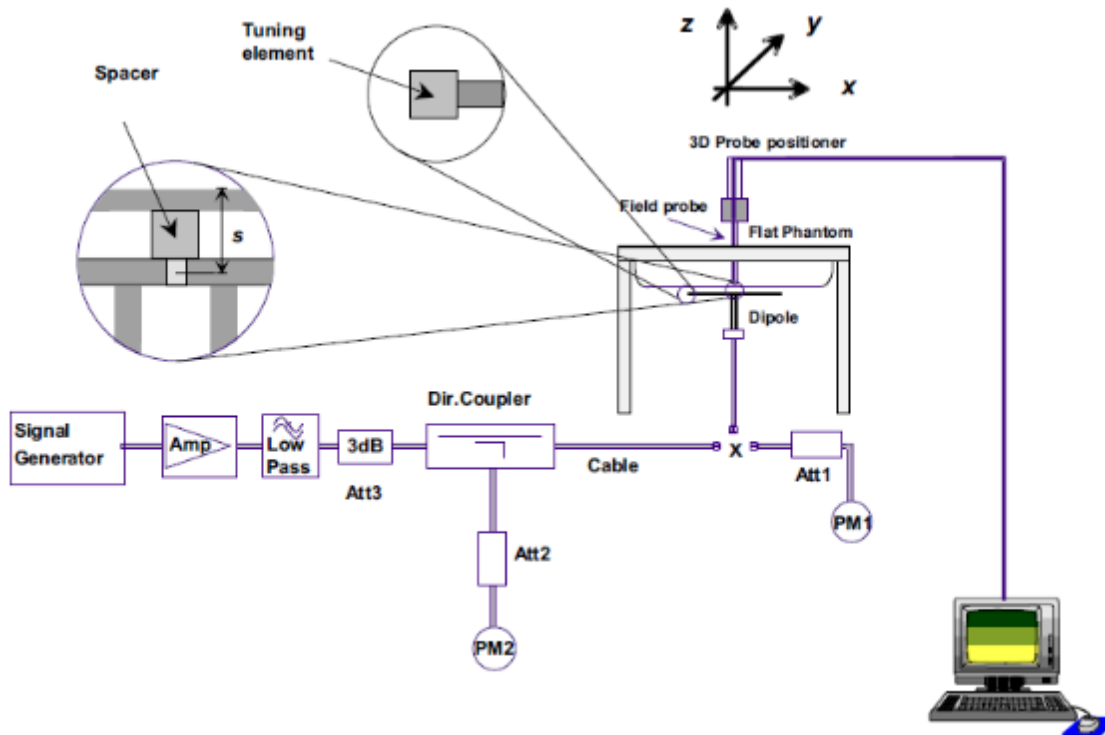
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6.2 SAR System Check

The microwave circuit arrangement for system Check is sketched in F-12. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the following table (A power level of 250mW (below 3GHz) or 100mW (3-6GHz) was input to the dipole antenna). During the tests, the ambient temperature of the laboratory was in the range 22±2°C, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15±0.5 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



F-12. the microwave circuit arrangement used for SAR system check



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6.2.1 Justification for Extended SAR Dipole Calibrations

1) Referring to KDB865664 D01 requirements for dipole calibration, instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the SAR target, impedance and return loss of a dipole have remain stable according to the following requirements. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.

- a) There is no physical damage on the dipole;
- b) System check with specific dipole is within 10% of calibrated value;
- c) Return-loss is within 10% of calibrated measurement;
- d) Impedance is within 5Ω from the previous measurement.

2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.



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6.2.2 Summary System Check Result(s)

Validation Kit		Measured SAR 250mW	Measured SAR 250mW	Measured SAR (normalized to 1W)	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W) (±10%)	Target SAR (normalized to 1W) (±10%)	Liquid Temp. (°C)	Measured Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)		
D750V3	Head	2.17	1.39	8.68	5.56	8.48 (7.63~9.33)	5.56 (5.00~6.12)	21.7	2022/1/15
D835V2	Head	2.29	1.49	9.16	5.96	9.52 (8.57~10.47)	6.17 (5.55~6.79)	22.1	2022/1/23
D1750V2	Head	8.33	4.39	33.32	17.56	35.3 (31.77~38.83)	18.7 (16.83~20.57)	22.0	2022/2/7
D1900V2	Head	9.61	4.91	38.44	19.64	39.7 (35.73~43.67)	20.3 (18.27~22.33)	21.9	2022/2/19
D2450V2	Head	13.50	6.30	54.00	25.20	52.2 (46.98~57.42)	24.5 (22.05~26.95)	21.4	2022/2/27
D2600V2	Head	13.90	6.13	55.60	24.52	57.1 (51.39~62.81)	25.4 (22.86~27.94)	21.5	2022/3/1

Table 5: SAR System Check Result

6.2.3 Detailed System Check Results

Please see the Appendix A



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7 Test Configuration

7.1 3G SAR Test Reduction Procedure

According to KDB 941225D01, in the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

7.2 Operation Configurations

7.2.1 CDMA Test Configuration

1) . 1x RTT Handsets

The following procedures apply to CDMA 2000 Release 0 and Release A single carrier (1x RTT) handsets operating with Mobile Protocol Revision 6 or 7 (MOB_P_REV 6 or 7). The default test configuration is to measure SAR in RC3 with an established radio link between the handset and a communication test set. SAR in RC1 is selectively confirmed according to the 3G SAR test reduction procedure with RC3 as the primary mode. The forward and reverse links are configured with the same RC for SAR measurement. Maximum output power is verified by applying the procedures defined in 3GPP2 C. S0011 and TIA-98-E. SAR must be measured according to these maximum output conditions and requirements in KDB Publication 447498 D01.

2) . Output Power Verification

Maximum output power is verified on the high, middle and low channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E. Results for at least steps 3, 4 and 10 of the power measurement procedures are required in the SAR report. Steps 3 and 4 are measured using Loopback Service Option SO55 with power control bits in “All Up” condition. TDSO/SO32 may be used instead of SO55 for step 4. Step 10 is measured using TDSO/SO32 with power control bits in the “Bits Hold” condition (i.e. alternative Up/Down Bits). All power measurements defined in C.S0011/TIA-98-E that are inapplicable to the handset or cannot be measured due to technical or equipment limitations must be clearly identified in the test report.

3) . Head SAR

SAR for next to the ear head exposure is measured in RC3 with the handset configured to transmit at full rate in SO55. The 3G SAR test reduction procedure is applied to RC1 with RC3 as the primary mode; otherwise, SAR is required for the channel with maximum measured output in RC1 using the head exposure configuration that results in the highest reported SAR in RC3.



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4) . Body-Worn Accessory SAR

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 D01 are applied. The 3G SAR test reduction procedure is applied to the multiple code channel configuration (FCH+SCHn), with FCH only as the primary mode. Otherwise, SAR is required for multiple code channel configuration (FCH + SCHn), with FCH at full rate and SCH0 enabled at 9600 bps, using the highest reported SAR configuration for FCH only. When multiple code channels are enabled, the transmitter output can shift by more than 0.5 dB and may lead to higher SAR drifts and SCH dropouts.

The 3G SAR test reduction procedure is applied to body-worn accessory SAR in RC1 with RC3 as the primary mode. Otherwise, SAR is required for RC1, with SO55 and full rate, using the highest reported SAR configuration for body-worn accessory exposure in RC3.

5) . Handsets with built-in Ev-Do

For handsets with Ev-Do capabilities, the 3G SAR test reduction procedure is applied to Ev-Do Rev. 0 with 1x RTT RC3 as the primary mode to determine body-worn accessory test requirements. Otherwise, body-worn accessory SAR is required for Rev. 0, at 153.6 kbps, using the highest reported SAR configuration for body-worn accessory exposure in RC3.

The 3G SAR test reduction procedure is applied separately to Rev. A and Rev. B, with Rev. 0 as the primary mode to determine body-worn accessory SAR test requirements. When SAR is not required for Rev. 0, the 3G SAR test reduction is applied with 1x RTT RC3 as the primary mode. Otherwise, SAR is required for Rev. A or Rev. B, with a Reverse Data Channel payload size of 4096 bits and a Termination Target of 16 slots defined for Subtype 2 and 3 Physical Layer configurations, using the highest reported SAR configuration for body-worn accessory exposure in Rev. 0 or RC3, as appropriate.

A Forward Traffic Channel data rate corresponding to the 2-slot version of 307.2 kbps with ACK Channel transmitting in all slots is configured in the downlink for Rev. 0, Rev. A and Rev. B



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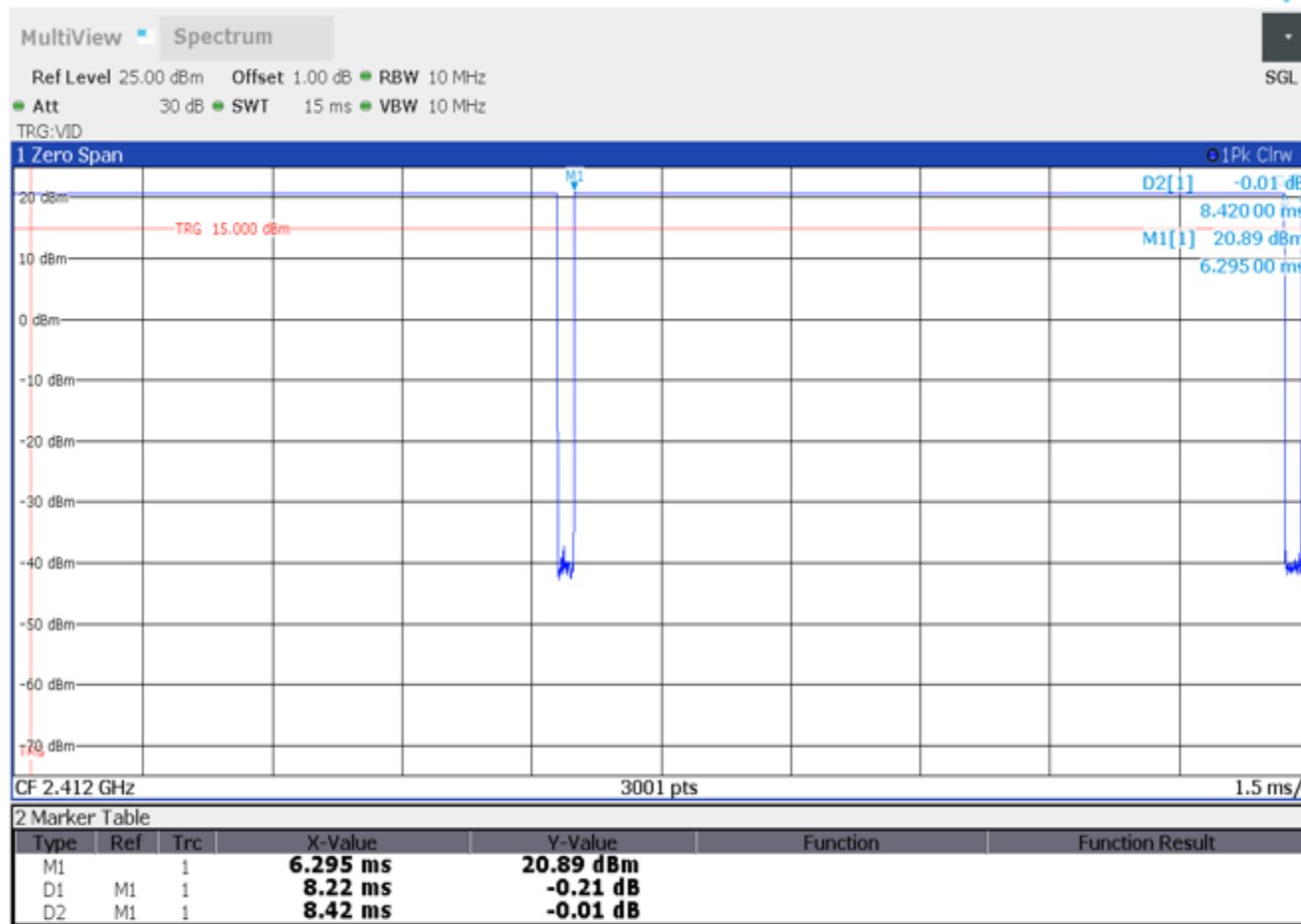
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7.2.2 WiFi Test Configuration

A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement.

7.2.2.1 Duty cycle

Wi-Fi 2.4GHz 802.11b:
 Duty cycle=8.22/8.42=97.62%



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7.2.2.2 Initial Test Position SAR Test Reduction Procedure

DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures. The initial test position procedure is described in the following:

- 1) . When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band. SAR is also not required for that exposure configuration in the subsequent test configuration(s).
- 2) . When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest extrapolated or estimated 1-g SAR conditions determined by area scans or next closest/smallest test separation distance and maximum RF coupling test positions based on manufacturer justification, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions (left, right, touch, tilt or subsequent surfaces and edges) are tested.
- 3) . For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested. a) Additional power measurements may be required for this step, which should be limited to those necessary for identifying the subsequent highest output power channels.

7.2.2.3 Initial Test Configuration Procedures

An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. For configurations with the same specified or measured maximum output power, additional transmission mode and test channel selection procedures are required. SAR test reduction for subsequent highest output test channels is determined according to *reported* SAR of the initial test configuration. For next to the ear, hotspot mode and UMC mini-tablet exposure configurations where multiple test positions are required, the initial test position procedure is applied to minimize the number of test positions required for SAR measurement using the initial test configuration transmission mode. For fixed exposure conditions that do not have multiple SAR test positions, SAR is measured in the transmission mode determined by the initial test configuration.

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

7.2.2.4 Subsequent Test Configuration Procedures

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. The initial test position procedure is applied to next to the ear, UMPC mini-tablet and hotspot mode configurations. When the same maximum output power is specified for multiple transmission modes, additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. The subsequent test configuration and SAR measurement procedures are described in the following.

- 1) . When SAR test exclusion provisions of KDB Publication 447498 are applicable and SAR measurement is not required for the initial test configuration, SAR is also not required for the next highest maximum output power transmission mode subsequent test configuration(s) in that frequency band or aggregated band and exposure configuration.



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- 2) . When the highest *reported* SAR for the initial test configuration (when applicable, include subsequent highest output channels), according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.
- 3) . The number of channels in the initial test configuration and subsequent test configuration can be different due to differences in channel bandwidth. When SAR measurement is required for a subsequent test configuration and the channel bandwidth is smaller than that in the initial test configuration, all channels in the subsequent test configuration that overlap with the larger bandwidth channel tested in the initial test configuration should be used to determine the highest maximum output power channel. This step requires additional power measurement to identify the highest maximum output power channel in the subsequent test configuration to determine SAR test reduction.
 - a) SAR should first be measured for the channel with highest measured output power in the subsequent test configuration.
 - b) SAR for subsequent highest measured maximum output power channels in the subsequent test configuration is required only when the *reported* SAR of the preceding higher maximum output power channel(s) in the subsequent test configuration is > 1.2 W/kg or until all required channels are tested. i) For channels with the same measured maximum output power, SAR should be measured using the channel closest to the center frequency of the larger channel bandwidth channel in the initial test configuration.
- 4) . SAR measurements for the remaining highest specified maximum output power OFDM transmission mode configurations that have not been tested in the initial test configuration (highest maximum output) or subsequent test configuration(s) (subsequent next highest maximum output power) is determined by recursively applying the subsequent test configuration procedures in this section to the remaining configurations according to the following:
 - a) replace “subsequent test configuration” with “next subsequent test configuration” (i.e., subsequent next highest specified maximum output power configuration)
 - b) replace “initial test configuration” with “all tested higher output power configurations”



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7.2.2.5 2.4 GHz WiFi SAR Procedures

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions. When SAR measurement is required for an OFDM configuration, the initial test configuration, subsequent test configuration and initial test position procedures are applied. The SAR test exclusion requirements for 802.11g/n OFDM configurations are described in following.

- **802.11b DSSS SAR Test Requirements**

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

- 1) . When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 2) . When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

- **2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements**

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3, including sub-sections). 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.

- **SAR Test Requirements for OFDM configurations**

When SAR measurement is required for 802.11 g/n OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.



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7.2.3 LTE Test Configuration

LTE modes were tested according to FCC KDB 941225 D05 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The Anritsu MT8820C was used for LTE output power measurements and SAR testing. Max power control was used so the UE transmits with maximum output power during SAR testing. SAR must be measured with the maximum TTI (transmit time interval) supported by the device in each LTE configuration.

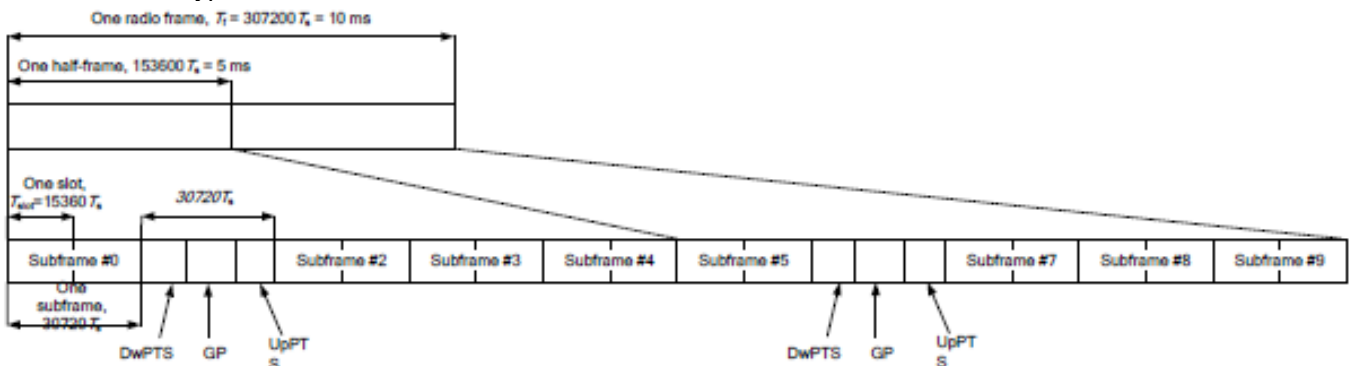
TDD LTE test consideration

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

SAR was tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7.

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

Frame structure type 2:



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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.Ts	2192.Ts	2560.Ts	7680.Ts	2192.Ts	2560.Ts
1	19760.Ts			20480.Ts		
2	21952.Ts			23040.Ts		
3	24144.Ts			25600.Ts		
4	26336.Ts	4384.Ts	5120.Ts	7680.Ts	4384.Ts	5120.Ts
5	6592.Ts			20480.Ts		
6	19760.Ts			23040.Ts		
7	21952.Ts			25600.Ts		
8	24144.Ts			-	-	-
9	13168.Ts			-	-	-

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

Calculated Duty Cycle=[Extended cyclic prefix in uplink x (Ts) x # of S + # of U]/10ms

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33



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A) Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

B) MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

Modulation	Channel bandwidth / Transmission bandwidth (N _{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3

C) A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

D) Largest channel bandwidth standalone SAR test requirements

1) QPSK with 1 RB allocation

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

2) QPSK with 50% RB allocation

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

3) 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 1) and 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.

4) Higher order modulations

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

E) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.



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8 Test Result

8.1 Measurement of RF conducted Power

8.1.1 Conducted Power of CDMA

Band	CDMA BC0			Tune-up Limit (dBm)
	Average Conducted Power(dBm)			
Channel	1013	384	777	
1XR TT RC1 SO55	23.54	23.61	23.42	25.00
1XR TT RC3 SO55	23.49	23.69	23.57	25.00
1XR TT RC3 SO32 (F+SCH)	23.48	23.59	23.51	25.00
1XR TT RC3 SO32 (+SCH)	23.51	23.66	23.49	25.00
1XE VDO RTAP 153.6Kbps	23.41	23.55	23.51	25.00
1XE VDO RETAP 4096Bits	23.43	23.72	23.49	25.00

Band	CDMA BC1			Tune-up Limit (dBm)
	Average Conducted Power(dBm)			
Channel	25	600	1175	
1XR TT RC1 SO55	23.51	23.68	23.47	25.00
1XR TT RC3 SO55	23.52	23.77	23.46	25.00
1XR TT RC3 SO32 (F+SCH)	23.46	23.71	23.48	25.00
1XR TT RC3 SO32 (+SCH)	23.56	23.74	23.54	25.00
1XE VDO RTAP 153.6Kbps	23.45	23.49	23.48	25.00
1XE VDO RETAP 4096Bits	23.65	23.79	23.62	25.00

Band	CDMA BC10			Tune-up Limit (dBm)
	Average Conducted Power(dBm)			
Channel	476	580	684	
1XR TT RC1 SO55	23.72	23.84	23.77	25.00
1XR TT RC3 SO55	23.71	23.95	23.80	25.00
1XR TT RC3 SO32 (F+SCH)	23.73	23.93	23.75	25.00
1XR TT RC3 SO32 (+SCH)	23.75	23.91	23.72	25.00
1XE VDO RTAP 153.6Kbps	23.69	23.91	23.69	25.00
1XE VDO RETAP 4096Bits	23.86	24.02	23.74	25.00



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8.1.2 Conducted Power of LTE

LTE Band 2				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18607	18900	19193	
1.4MHz	QPSK	1	0	23.21	23.30	23.33	23.50
		1	2	23.34	23.18	23.28	23.50
		1	5	23.29	23.36	23.41	23.50
		3	0	23.21	23.14	23.26	23.50
		3	1	23.39	23.25	23.41	23.50
		3	3	23.27	23.30	23.28	23.50
	16QAM	6	0	22.41	22.26	22.28	22.50
		1	0	21.91	21.86	21.95	22.50
		1	2	22.29	22.33	22.10	22.50
		1	5	22.01	21.84	22.45	22.50
		3	0	22.28	22.17	22.22	22.50
		3	1	22.34	22.32	22.23	22.50
		3	3	22.32	22.04	22.16	22.50
		6	0	21.35	21.06	20.88	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18615	18900	19185	
3MHz	QPSK	1	0	23.42	23.35	23.17	23.50
		1	8	23.34	23.07	23.26	23.50
		1	14	23.34	23.14	23.22	23.50
		8	0	22.39	22.27	22.42	22.50
		8	4	22.41	22.30	22.30	22.50
		8	7	22.31	22.26	22.30	22.50
		15	0	22.46	22.26	22.35	22.50
	16QAM	1	0	22.36	21.69	22.09	22.50
		1	8	22.36	21.52	21.83	22.50
		1	14	22.37	21.99	21.94	22.50
		8	0	21.45	21.06	21.45	21.50
		8	4	21.47	21.28	21.10	21.50
		8	7	21.50	21.32	21.46	21.50
		15	0	21.49	21.30	21.12	21.50



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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18625	18900	19175	
5MHz	QPSK	1	0	23.27	23.21	23.14	23.50
		1	12	23.33	23.28	23.39	23.50
		1	24	23.32	23.19	23.03	23.50
		12	0	22.42	22.23	22.32	22.50
		12	6	22.36	22.28	22.29	22.50
		12	13	22.38	22.25	22.34	22.50
	16QAM	25	0	22.46	22.25	22.40	22.50
		1	0	22.00	21.89	21.93	22.50
		1	12	22.09	22.05	22.05	22.50
		1	24	21.98	21.70	21.77	22.50
		12	0	21.48	21.28	21.18	21.50
		12	6	21.50	21.31	21.32	21.50
		12	13	21.48	21.19	21.19	21.50
		25	0	21.35	21.17	21.33	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18650	18900	19150	
10MHz	QPSK	1	0	23.42	23.23	23.37	23.50
		1	24	23.37	23.42	23.35	23.50
		1	49	23.34	23.42	23.36	23.50
		25	0	22.49	22.41	22.38	22.50
		25	12	22.50	22.31	22.42	22.50
		25	25	22.43	22.31	22.37	22.50
	16QAM	50	0	22.49	22.33	22.39	22.50
		1	0	22.34	21.65	22.39	22.50
		1	24	22.08	22.05	22.37	22.50
		1	49	21.91	22.10	21.85	22.50
		25	0	21.31	21.35	21.42	21.50
		25	12	21.30	21.34	21.36	21.50
		25	25	21.47	21.34	21.42	21.50
		50	0	21.42	21.36	21.42	21.50



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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18675	18900	19125	
15MHz	QPSK	1	0	23.17	23.12	23.12	23.50
		1	38	23.42	23.40	23.36	23.50
		1	74	23.33	23.31	23.37	23.50
		38	0	22.46	22.37	22.44	22.50
		38	18	22.42	22.40	22.48	22.50
		38	37	22.45	22.33	22.22	22.50
	16QAM	75	0	22.46	22.27	22.37	22.50
		1	0	21.86	21.90	21.92	22.50
		1	38	21.74	21.53	22.09	22.50
		1	74	20.98	21.61	21.15	22.50
		38	0	20.75	20.81	20.85	21.50
		38	18	21.07	20.96	21.15	21.50
		38	37	21.21	21.03	20.39	21.50
		75	0	20.50	20.27	19.72	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18700	18900	19100	
20MHz	QPSK	1	0	23.29	23.45	23.20	23.50
		1	49	23.41	23.37	23.36	23.50
		1	99	23.23	23.13	23.27	23.50
		50	0	22.49	22.49	22.39	22.50
		50	25	22.43	22.44	22.48	22.50
		50	50	22.43	22.38	22.37	22.50
	16QAM	100	0	22.46	22.29	22.39	22.50
		1	0	22.06	21.67	21.97	22.50
		1	49	22.14	22.35	22.09	22.50
		1	99	22.01	21.97	22.07	22.50
		50	0	21.32	21.42	21.42	21.50
		50	25	21.37	21.47	21.50	21.50
		50	50	21.36	21.30	21.50	21.50
		100	0	21.38	21.40	21.41	21.50



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LTE Band 4				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				19957	20175	20393	
1.4MHz	QPSK	1	0	22.93	23.34	23.04	24.50
		1	2	23.10	23.48	23.10	24.50
		1	5	23.23	23.42	22.96	24.50
		3	0	23.18	23.29	23.14	24.50
		3	1	23.23	23.41	23.18	24.50
		3	3	23.13	23.43	23.14	24.50
	16QAM	6	0	22.18	22.29	22.08	23.50
		1	0	21.50	22.09	21.66	23.50
		1	2	21.94	22.20	21.98	23.50
		1	5	21.63	22.43	22.16	23.50
		3	0	22.09	22.18	22.09	23.50
		3	1	22.40	22.59	22.18	23.50
		3	3	22.08	22.34	22.04	23.50
		6	0	21.08	21.20	21.01	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				19965	20175	20385	
3MHz	QPSK	1	0	23.15	23.21	23.15	24.50
		1	8	22.99	23.17	23.10	24.50
		1	14	23.18	23.22	23.05	24.50
		8	0	22.05	22.28	22.10	23.50
		8	4	22.21	22.29	22.24	23.50
		8	7	22.20	22.24	22.14	23.50
	16QAM	15	0	22.14	22.38	22.21	23.50
		1	0	21.75	21.84	21.62	23.50
		1	8	21.65	21.81	22.21	23.50
		1	14	21.62	22.03	21.58	23.50
		8	0	21.22	21.36	21.27	22.50
		8	4	21.29	21.20	21.22	22.50
		8	7	20.96	21.45	21.31	22.50
		15	0	20.99	21.12	20.91	22.50



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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				19975	20175	20375	
5MHz	QPSK	1	0	22.99	23.23	23.23	24.50
		1	12	23.12	23.52	23.12	24.50
		1	24	23.15	23.29	23.12	24.50
		12	0	22.08	22.24	22.13	23.50
		12	6	22.19	22.37	22.19	23.50
		12	13	22.14	22.29	22.18	23.50
	16QAM	25	0	22.06	22.34	22.16	23.50
		1	0	21.64	21.74	21.85	23.50
		1	12	22.02	22.44	22.14	23.50
		1	24	21.66	22.13	21.85	23.50
		12	0	21.22	21.40	21.17	22.50
		12	6	21.06	21.28	21.22	22.50
		12	13	21.06	21.34	21.14	22.50
		25	0	21.08	21.49	21.29	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20000	20175	20350	
10MHz	QPSK	1	0	22.77	23.06	23.41	24.50
		1	24	23.26	23.24	23.27	24.50
		1	49	23.20	23.07	23.17	24.50
		25	0	22.27	22.32	22.30	23.50
		25	12	22.22	22.28	22.26	23.50
		25	25	22.11	22.27	22.26	23.50
	16QAM	50	0	22.19	22.26	22.23	23.50
		1	0	21.91	21.66	21.80	23.50
		1	24	22.42	21.97	22.20	23.50
		1	49	21.94	21.79	21.96	23.50
		25	0	21.19	21.44	21.22	22.50
		25	12	21.25	21.43	21.28	22.50
		25	25	21.23	21.21	21.28	22.50
		50	0	21.21	21.20	21.35	22.50



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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20025	20175	20325	
15MHz	QPSK	1	0	22.88	22.99	23.17	24.50
		1	38	23.14	23.03	23.07	24.50
		1	74	23.06	23.01	23.24	24.50
		38	0	22.88	23.17	23.20	23.50
		38	18	23.27	23.08	23.26	23.50
		38	37	23.31	23.13	23.31	23.50
	16QAM	75	0	22.15	22.35	22.26	23.50
		1	0	21.87	21.61	21.95	23.50
		1	38	21.74	22.05	21.78	23.50
		1	74	22.05	21.79	21.80	23.50
		38	0	21.67	21.86	21.99	22.50
		38	18	21.45	21.92	22.19	22.50
		38	37	21.99	22.29	22.27	22.50
		75	0	21.26	21.38	21.28	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20050	20175	20300	
20MHz	QPSK	1	0	23.50	23.54	23.30	24.50
		1	49	23.42	23.15	23.46	24.50
		1	99	23.32	23.03	23.12	24.50
		50	0	22.26	22.44	22.37	23.50
		50	25	22.32	22.39	22.42	23.50
		50	50	22.20	22.22	22.22	23.50
	16QAM	100	0	22.19	22.26	22.16	23.50
		1	0	21.62	21.76	21.86	23.50
		1	49	22.39	22.21	22.18	23.50
		1	99	21.66	21.78	21.77	23.50
		50	0	21.18	21.40	21.41	22.50
		50	25	21.34	21.21	21.33	22.50
		50	50	21.32	21.25	21.32	22.50
		100	0	21.20	21.28	21.18	22.50



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LTE Band 5				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20407	20525	20643	
1.4MHz	QPSK	1	0	22.76	22.39	22.61	23.50
		1	2	22.78	22.62	22.48	23.50
		1	5	22.72	22.39	22.46	23.50
		3	0	22.74	22.70	22.53	23.50
		3	1	22.83	22.71	22.57	23.50
		3	3	22.71	22.70	22.50	23.50
	16QAM	6	0	21.82	21.68	21.56	22.50
		1	0	21.80	21.35	21.27	22.50
		1	2	22.06	21.60	21.32	22.50
		1	5	21.48	21.33	21.09	22.50
		3	0	21.69	21.65	21.72	22.50
		3	1	21.81	21.89	21.45	22.50
		3	3	21.76	21.46	21.65	22.50
		6	0	20.77	20.53	20.49	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20415	20525	20635	
3MHz	QPSK	1	0	22.72	22.59	22.36	23.50
		1	8	22.74	22.51	22.55	23.50
		1	14	22.62	22.51	22.61	23.50
		8	0	21.84	21.77	21.62	22.50
		8	4	21.80	21.72	21.56	22.50
		8	7	21.87	21.69	21.61	22.50
	16QAM	15	0	21.81	21.69	21.67	22.50
		1	0	21.31	21.18	21.05	22.50
		1	8	21.27	21.35	21.11	22.50
		1	14	21.95	21.40	21.33	22.50
		8	0	20.93	20.75	20.34	21.50
		8	4	20.90	20.81	20.67	21.50
		8	7	20.84	20.50	20.71	21.50
		15	0	20.87	20.64	20.53	21.50



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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20425	20525	20625	
5MHz	QPSK	1	0	22.58	22.61	22.61	23.50
		1	12	22.65	22.70	22.46	23.50
		1	24	22.40	22.50	22.36	23.50
		12	0	21.82	21.68	21.62	22.50
		12	6	21.83	21.77	21.59	22.50
		12	13	21.73	21.66	21.61	22.50
	16QAM	25	0	21.81	21.67	21.66	22.50
		1	0	21.39	21.37	21.41	22.50
		1	12	21.42	21.69	21.22	22.50
		1	24	21.20	21.35	21.03	22.50
		12	0	20.75	20.81	20.58	21.50
		12	6	20.70	20.52	20.46	21.50
		12	13	20.56	20.51	20.37	21.50
		25	0	20.84	20.67	20.61	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20450	20525	20600	
10MHz	QPSK	1	0	22.91	23.00	22.53	23.50
		1	24	22.76	22.64	22.62	23.50
		1	49	22.40	22.54	22.55	23.50
		25	0	21.87	21.89	21.73	22.50
		25	12	21.80	21.73	21.67	22.50
		25	25	21.71	21.64	21.64	22.50
	16QAM	50	0	21.79	21.73	21.67	22.50
		1	0	21.40	21.18	20.94	22.50
		1	24	21.58	21.53	21.56	22.50
		1	49	21.38	20.97	21.30	22.50
		25	0	20.91	20.84	20.76	21.50
		25	12	20.75	20.76	20.70	21.50
		25	25	20.74	20.68	20.57	21.50
		50	0	20.85	20.77	20.71	21.50



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LTE Band 12				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				23017	23095	23173	
1.4MHz	QPSK	1	0	23.08	23.41	23.33	23.50
		1	2	23.25	23.37	23.47	23.50
		1	5	23.14	23.16	23.17	23.50
		3	0	23.31	23.45	23.44	23.50
		3	1	23.33	23.31	23.39	23.50
		3	3	23.23	23.36	23.34	23.50
	16QAM	6	0	22.32	22.37	22.47	22.50
		1	0	22.12	22.11	22.39	22.50
		1	2	22.33	22.28	22.35	22.50
		1	5	22.07	22.05	22.38	22.50
		3	0	22.31	22.32	22.30	22.50
		3	1	22.32	22.31	22.31	22.50
		3	3	22.36	22.39	22.33	22.50
		6	0	21.21	21.49	21.23	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				23025	23095	23165	
3MHz	QPSK	1	0	23.19	23.42	23.22	23.50
		1	8	23.26	23.20	23.19	23.50
		1	14	23.07	23.37	23.26	23.50
		8	0	22.39	22.42	22.40	22.50
		8	4	22.34	22.45	22.27	22.50
		8	7	22.30	22.39	22.31	22.50
	16QAM	15	0	22.33	22.36	22.38	22.50
		1	0	21.74	21.93	22.36	22.50
		1	8	22.00	22.11	22.34	22.50
		1	14	22.34	21.81	21.52	22.50
		8	0	21.44	21.48	21.41	21.50
		8	4	21.29	21.44	21.33	21.50
		8	7	21.37	21.46	21.39	21.50
		15	0	21.13	21.28	21.34	21.50



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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				23035	23095	23155	
5MHz	QPSK	1	0	22.98	23.21	23.33	23.50
		1	12	23.48	23.38	23.28	23.50
		1	24	23.37	23.27	23.09	23.50
		12	0	22.32	22.34	22.28	22.50
		12	6	22.35	22.44	22.23	22.50
		12	13	22.26	22.35	22.14	22.50
	16QAM	25	0	22.32	22.38	22.30	22.50
		1	0	22.30	22.05	21.85	22.50
		1	12	22.09	22.10	21.91	22.50
		1	24	21.95	21.96	21.59	22.50
		12	0	21.15	21.50	21.33	21.50
		12	6	21.25	21.38	21.28	21.50
		12	13	21.06	21.28	21.19	21.50
		25	0	21.34	21.40	21.20	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				23060	23095	23130	
10MHz	QPSK	1	0	23.16	23.48	23.28	23.50
		1	24	23.44	23.47	23.36	23.50
		1	49	23.22	23.24	23.03	23.50
		25	0	22.28	22.45	22.44	22.50
		25	12	22.37	22.41	22.42	22.50
		25	25	22.27	22.36	22.32	22.50
	16QAM	50	0	22.37	22.40	22.44	22.50
		1	0	21.56	21.87	21.82	22.50
		1	24	22.06	22.28	22.35	22.50
		1	49	22.04	21.52	21.71	22.50
		25	0	21.40	21.39	21.47	21.50
		25	12	21.39	21.34	21.44	21.50
		25	25	21.29	21.46	21.33	21.50
		50	0	21.38	21.32	21.35	21.50



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LTE Band 25				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26047	26365	26683	
1.4MHz	QPSK	1	0	23.12	23.17	22.96	23.50
		1	2	23.13	23.09	23.10	23.50
		1	5	23.29	23.44	22.89	23.50
		3	0	23.22	23.26	22.95	23.50
		3	1	23.47	23.21	22.95	23.50
		3	3	23.27	23.26	22.99	23.50
	16QAM	6	0	22.25	22.30	22.00	22.50
		1	0	21.92	21.85	21.56	22.50
		1	2	22.04	21.78	21.40	22.50
		1	5	21.84	22.04	21.63	22.50
		3	0	22.19	22.18	21.94	22.50
		3	1	22.45	22.24	22.23	22.50
		3	3	22.26	22.15	21.84	22.50
		6	0	21.15	21.28	20.78	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26055	26365	26675	
3MHz	QPSK	1	0	22.28	23.00	22.79	23.50
		1	8	23.27	23.27	22.85	23.50
		1	14	23.18	23.28	22.86	23.50
		8	0	22.28	22.22	21.97	22.50
		8	4	22.29	22.15	21.93	22.50
		8	7	22.31	22.22	22.02	22.50
	16QAM	15	0	22.22	22.21	21.91	22.50
		1	0	21.69	21.60	21.44	22.50
		1	8	21.76	21.80	21.30	22.50
		1	14	21.59	21.83	21.74	22.50
		8	0	21.34	21.28	21.00	21.50
		8	4	21.23	21.23	20.96	21.50
		8	7	21.37	21.19	21.14	21.50
		15	0	21.15	21.25	20.81	21.50



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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26065	26365	26665	
5MHz	QPSK	1	0	23.17	23.11	22.54	23.50
		1	12	23.18	23.37	22.77	23.50
		1	24	23.01	23.04	22.88	23.50
		12	0	22.25	22.17	21.77	22.50
		12	6	22.23	22.21	21.83	22.50
		12	13	22.23	22.28	21.80	22.50
	16QAM	25	0	22.20	22.18	21.85	22.50
		1	0	22.33	21.80	21.24	22.50
		1	12	21.96	22.46	21.67	22.50
		1	24	21.73	21.78	21.46	22.50
		12	0	21.17	21.09	20.86	21.50
		12	6	21.16	21.05	20.85	21.50
		12	13	21.01	21.44	20.76	21.50
		25	0	21.31	21.22	20.90	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26090	26365	26640	
10MHz	QPSK	1	0	22.99	23.25	22.53	23.50
		1	24	23.33	23.38	22.84	23.50
		1	49	23.16	23.33	22.89	23.50
		25	0	22.23	22.22	21.90	22.50
		25	12	22.17	22.22	21.86	22.50
		25	25	22.23	22.28	21.88	22.50
	16QAM	50	0	22.24	22.26	21.84	22.50
		1	0	22.05	21.78	21.21	22.50
		1	24	22.04	22.11	21.23	22.50
		1	49	22.07	22.06	21.59	22.50
		25	0	21.25	21.12	20.77	21.50
		25	12	21.19	21.25	20.89	21.50
		25	25	21.24	21.17	20.91	21.50
		50	0	21.25	21.15	20.81	21.50



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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26115	26365	26615	
15MHz	QPSK	1	0	22.95	23.09	22.48	23.50
		1	38	23.18	23.31	22.77	23.50
		1	74	23.14	23.11	22.78	23.50
		38	0	22.29	22.15	21.77	22.50
		38	18	22.23	22.19	21.77	22.50
		38	37	22.31	22.44	21.78	22.50
	16QAM	75	0	22.13	22.20	21.72	22.50
		1	0	21.90	22.11	21.55	22.50
		1	38	21.73	21.89	21.42	22.50
		1	74	21.41	21.88	21.71	22.50
		38	0	20.94	20.63	20.01	21.50
		38	18	20.91	21.01	20.52	21.50
		38	37	21.36	21.24	20.79	21.50
		75	0	21.13	21.20	20.72	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26140	26365	26590	
20MHz	QPSK	1	0	23.09	23.46	22.40	23.50
		1	49	23.24	23.45	22.72	23.50
		1	99	22.90	23.03	22.81	23.50
		50	0	22.26	22.31	21.80	22.50
		50	25	22.26	22.30	21.89	22.50
		50	50	22.19	22.25	21.70	22.50
	16QAM	100	0	22.33	22.24	21.73	22.50
		1	0	21.61	21.70	21.21	22.50
		1	49	21.91	21.86	21.42	22.50
		1	99	21.81	21.77	21.52	22.50
		50	0	21.17	21.25	20.61	21.50
		50	25	21.19	21.32	20.92	21.50
		50	50	21.35	21.27	20.85	21.50
		100	0	21.25	21.24	20.75	21.50



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LTE Band 26				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26697	26865	27033	
1.4MHz	QPSK	1	0	22.94	22.86	22.49	23.50
		1	2	23.00	23.13	22.56	23.50
		1	5	22.86	23.03	22.48	23.50
		3	0	23.06	22.94	22.50	23.50
		3	1	23.11	22.99	22.59	23.50
		3	3	22.92	22.98	22.38	23.50
	16QAM	6	0	21.92	21.96	21.57	22.50
		1	0	21.59	21.65	20.72	22.50
		1	2	21.70	21.88	20.89	22.50
		1	5	21.63	21.73	20.94	22.50
		3	0	22.23	21.94	21.43	22.50
		3	1	21.86	21.97	21.66	22.50
		3	3	21.87	21.93	21.68	22.50
		6	0	21.16	20.95	20.29	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26705	26865	27025	
3MHz	QPSK	1	0	23.01	22.92	22.50	23.50
		1	8	23.04	22.93	22.33	23.50
		1	14	22.98	22.78	22.46	23.50
		8	0	22.14	22.01	21.70	22.50
		8	4	21.98	22.07	21.49	22.50
		8	7	22.17	22.03	21.47	22.50
	16QAM	15	0	22.15	22.02	21.57	22.50
		1	0	21.46	21.56	21.17	22.50
		1	8	22.25	21.63	21.08	22.50
		1	14	21.47	21.46	21.66	22.50
		8	0	21.21	21.06	20.59	21.50
		8	4	21.26	20.97	20.66	21.50
		8	7	21.04	21.00	20.74	21.50
		15	0	20.99	21.07	20.64	21.50



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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26715	26865	27015	
5MHz	QPSK	1	0	22.82	22.85	22.52	23.50
		1	12	23.17	22.99	22.44	23.50
		1	24	22.83	22.74	22.40	23.50
		12	0	22.05	21.95	21.67	22.50
		12	6	21.99	22.00	21.49	22.50
		12	13	22.01	21.87	21.54	22.50
	16QAM	25	0	21.95	21.98	21.55	22.50
		1	0	21.46	21.83	21.21	22.50
		1	12	21.70	21.99	21.69	22.50
		1	24	21.46	21.56	21.23	22.50
		12	0	20.90	20.77	20.66	21.50
		12	6	20.83	20.89	20.54	21.50
		12	13	20.93	20.89	20.53	21.50
		25	0	20.83	21.01	20.57	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26740	26865	26990	
10MHz	QPSK	1	0	22.77	22.50	22.74	23.50
		1	24	22.99	23.05	22.59	23.50
		1	49	22.62	22.54	22.38	23.50
		25	0	22.00	21.78	21.71	22.50
		25	12	21.90	21.80	21.70	22.50
		25	25	21.91	21.72	21.64	22.50
	16QAM	50	0	21.92	21.82	21.66	22.50
		1	0	21.43	21.60	21.31	22.50
		1	24	21.40	21.75	21.19	22.50
		1	49	21.35	21.60	21.02	22.50
		25	0	20.95	20.84	20.94	21.50
		25	12	21.14	20.64	20.65	21.50
		25	25	20.96	20.86	20.56	21.50
		50	0	20.78	20.78	20.59	21.50



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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26765	26865	26965	
15MHz	QPSK	1	0	23.20	23.23	22.65	23.50
		1	38	22.63	22.64	22.57	23.50
		1	74	22.51	22.46	22.24	23.50
		38	0	21.51	22.02	21.73	22.50
		38	18	22.01	21.74	21.76	22.50
		38	37	21.82	21.83	21.68	22.50
		75	0	21.87	21.87	21.66	22.50
	16QAM	1	0	21.49	21.70	21.59	22.50
		1	38	21.94	21.46	21.38	22.50
		1	74	21.37	21.82	21.44	22.50
		38	0	20.37	20.82	20.44	21.50
		38	18	20.75	20.66	20.33	21.50
		38	37	20.61	20.64	20.45	21.50
		75	0	20.81	20.82	20.80	21.50



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LTE Band 41 Class 2				Conducted Power(dBm)					
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Channel	Channel	Tune up
				39675	40148	40620	41093	41565	
5MHz	QPSK	1	0	23.41	23.63	24.25	24.19	24.18	25.00
		1	13	23.69	23.74	24.02	24.17	24.13	25.00
		1	24	23.66	23.71	24.11	24.12	24.18	25.00
		12	0	22.62	22.79	22.88	22.97	23.12	24.00
		12	6	22.69	22.81	22.91	23.14	23.18	24.00
		12	13	22.66	22.72	22.86	23.01	23.08	24.00
		25	0	22.71	22.76	22.91	23.16	23.21	24.00
	16QAM	1	0	22.16	22.24	22.38	22.69	22.79	24.00
		1	13	22.26	22.35	22.47	22.84	22.95	24.00
		1	24	22.13	22.31	22.35	22.74	22.84	24.00
		12	0	21.59	21.73	21.76	21.98	22.01	23.00
		12	6	21.69	21.77	21.82	22.01	22.16	23.00
		12	13	21.58	21.69	21.74	22.14	22.18	23.00
		25	0	21.71	21.74	21.84	22.13	22.10	23.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Channel	Channel	Tune up
10MHz	QPSK	1	0	23.43	23.78	24.38	24.19	24.17	25.00
		1	25	23.72	23.81	24.08	24.37	24.28	25.00
		1	49	23.78	23.81	24.11	24.22	24.18	25.00
		25	0	22.53	22.79	22.97	23.36	23.48	24.00
		25	13	22.85	22.82	22.91	23.29	23.41	24.00
		25	25	22.74	22.79	22.93	23.37	23.28	24.00
		50	0	22.69	22.73	22.96	23.34	23.30	24.00
	16QAM	1	0	22.14	22.37	22.61	22.84	22.97	24.00
		1	25	22.39	22.50	22.69	22.91	22.98	24.00
		1	49	22.34	22.36	22.45	22.89	22.71	24.00
		25	0	21.74	21.87	22.11	22.45	22.65	23.00
		25	13	22.03	22.02	22.12	22.48	22.46	23.00
		25	25	21.75	21.98	22.15	22.24	22.58	23.00
		50	0	21.73	21.79	21.99	22.28	22.36	23.00



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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Channel	Channel	Tune up
				39725	40173	40620	41068	41515	
15MHz	QPSK	1	0	23.39	23.73	24.36	24.29	24.31	25.00
		1	38	23.56	23.92	24.12	24.17	24.27	25.00
		1	74	23.78	24.04	24.19	24.22	24.23	25.00
		36	0	22.53	22.84	22.98	23.29	23.41	24.00
		36	18	22.77	22.78	22.95	23.23	23.22	24.00
		36	39	22.79	22.84	22.93	23.38	23.29	24.00
		75	0	22.81	22.87	22.93	23.41	23.33	24.00
	16QAM	1	0	22.02	22.42	22.57	22.77	22.96	24.00
		1	38	22.17	22.51	22.58	22.76	22.86	24.00
		1	74	22.33	22.69	22.62	22.91	22.74	24.00
		36	0	21.56	21.98	22.01	22.28	22.35	23.00
		36	18	21.73	22.15	21.98	22.23	22.38	23.00
		36	39	21.78	22.05	21.96	22.29	22.28	23.00
		75	0	21.68	21.96	22.06	22.36	22.41	23.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Channel	Channel	Tune up
				39750	40185	40620	41055	41490	
20MHz	QPSK	1	0	23.41	23.74	24.39	24.16	24.31	25.00
		1	50	23.68	23.81	24.18	24.35	24.29	25.00
		1	99	23.88	23.74	24.08	24.37	24.18	25.00
		50	0	22.64	22.78	22.91	23.26	23.47	24.00
		50	25	22.79	22.78	22.85	23.24	23.19	24.00
		50	50	22.74	22.87	22.94	23.35	23.16	24.00
		100	0	22.75	22.83	22.95	23.25	23.39	24.00
	16QAM	1	0	22.02	22.34	22.46	22.75	22.95	24.00
		1	50	22.48	22.59	22.42	22.91	22.99	24.00
		1	99	22.19	22.28	22.34	22.97	22.69	24.00
		50	0	21.61	21.75	21.97	22.19	22.47	23.00
		50	25	21.78	21.84	21.99	22.23	22.32	23.00
		50	50	21.68	21.73	21.93	22.27	22.19	23.00
		100	0	21.71	21.73	21.92	22.29	22.36	23.00



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LTE Band 41 class 3 power				Conducted Power(dBm)					
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Channel	Channel	Tune up
				39675	40148	40620	41093	41565	
5MHz	QPSK	1	0	21.37	21.33	21.44	21.52	21.65	23.00
		1	13	21.36	21.34	21.43	21.56	21.66	23.00
		1	24	21.24	21.24	21.32	21.37	21.51	23.00
		12	0	20.14	20.10	20.25	20.37	20.46	22.00
		12	6	20.12	20.10	20.20	20.32	20.39	22.00
		12	13	20.19	20.21	20.27	20.33	20.51	22.00
		25	0	20.20	20.19	20.31	20.39	20.55	22.00
	16QAM	1	0	20.05	20.11	20.17	20.22	20.38	22.00
		1	13	20.40	20.33	20.44	20.22	20.30	22.00
		1	24	20.22	20.25	20.33	20.10	20.22	22.00
		12	0	19.15	19.08	19.23	19.30	19.46	21.00
		12	6	19.16	19.09	19.21	19.27	19.43	21.00
		12	13	19.12	19.04	19.15	19.19	19.38	21.00
		25	0	19.04	19.05	19.12	19.25	19.29	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Channel	Channel	Tune up
10MHz	QPSK	1	0	21.21	21.34	21.56	21.70	21.64	23.00
		1	25	21.18	21.25	21.52	21.66	21.55	23.00
		1	49	21.18	21.37	21.23	21.38	21.36	23.00
		25	0	20.34	20.55	20.37	20.49	20.43	22.00
		25	13	20.32	20.42	20.29	20.47	20.42	22.00
		25	25	20.29	20.41	20.25	20.40	20.34	22.00
		50	0	20.16	20.38	20.21	20.31	20.32	22.00
	16QAM	1	0	20.20	20.23	20.15	20.29	20.26	22.00
		1	25	20.12	20.18	20.10	20.19	20.14	22.00
		1	49	20.08	20.19	20.08	20.17	20.14	22.00
		25	0	19.12	19.23	19.43	19.59	19.48	21.00
		25	13	19.09	19.22	19.41	19.58	19.52	21.00
		25	25	19.12	19.26	19.46	19.55	19.56	21.00
		50	0	19.22	19.05	19.25	19.44	19.36	21.00



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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Channel	Channel	Tune up
				39725	40173	40620	41068	41515	
15MHz	QPSK	1	0	21.39	21.64	21.83	21.80	22.09	23.00
		1	38	21.61	21.82	21.92	21.83	21.90	23.00
		1	74	21.52	21.72	21.91	21.85	21.88	23.00
		36	0	20.50	20.75	20.60	20.62	20.81	22.00
		36	18	20.46	20.79	20.60	20.56	20.88	22.00
		36	39	20.59	20.74	20.63	20.65	20.91	22.00
		75	0	20.59	20.88	20.68	20.65	20.89	22.00
	16QAM	1	0	20.49	20.70	20.58	20.51	20.54	22.00
		1	38	20.39	20.62	20.49	20.42	20.75	22.00
		1	74	20.55	20.80	20.63	20.59	20.89	22.00
		36	0	19.46	19.75	19.54	19.56	19.85	21.00
		36	18	19.41	19.74	19.55	19.47	19.79	21.00
		36	39	19.49	19.75	19.62	19.58	19.88	21.00
		75	0	19.50	19.78	19.64	19.58	19.91	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Channel	Channel	Tune up
				39750	40185	40620	41055	41490	
20MHz	QPSK	1	0	21.21	21.32	21.82	21.62	21.72	23.00
		1	50	21.06	21.18	21.63	21.47	21.59	23.00
		1	99	21.31	21.33	21.51	21.29	21.50	23.00
		50	0	20.27	20.31	20.41	20.51	20.50	22.00
		50	25	20.26	20.40	20.40	20.49	20.50	22.00
		50	50	20.43	20.38	20.41	20.74	20.37	22.00
		100	0	20.08	20.24	20.38	20.21	20.34	22.00
	16QAM	1	0	20.32	20.36	20.41	20.35	20.20	22.00
		1	50	20.19	20.31	20.30	20.21	20.02	22.00
		1	99	20.22	20.34	20.38	20.32	20.14	22.00
		50	0	19.10	19.22	19.23	19.14	19.39	21.00
		50	25	19.13	19.27	19.24	19.17	19.30	21.00
		50	50	19.16	19.33	19.29	19.21	19.43	21.00
		100	0	19.19	19.25	19.27	19.26	19.43	21.00



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LTE Band 66				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				131979	132322	132665	
1.4MHz	QPSK	1	0	23.11	23.29	23.51	24.50
		1	2	23.13	23.33	23.54	24.50
		1	5	23.18	23.00	23.18	24.50
		3	0	23.25	23.22	23.42	24.50
		3	1	23.31	23.25	23.44	24.50
		3	3	23.17	23.28	23.54	24.50
	16QAM	6	0	22.24	22.27	22.43	23.50
		1	0	21.63	22.47	21.96	23.50
		1	2	21.98	21.99	21.92	23.50
		1	5	21.71	22.02	21.95	23.50
		3	0	22.20	22.21	22.35	23.50
		3	1	22.11	22.20	22.63	23.50
		3	3	22.14	22.17	22.30	23.50
		6	0	21.07	21.07	21.51	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				131987	132322	132657	
3MHz	QPSK	1	0	23.28	23.26	23.35	24.50
		1	8	23.08	23.29	23.38	24.50
		1	14	23.32	23.27	23.50	24.50
		8	0	22.24	22.24	22.48	23.50
		8	4	22.31	22.26	22.46	23.50
		8	7	22.32	22.31	22.47	23.50
	16QAM	15	0	22.27	22.32	22.31	23.50
		1	0	21.91	21.93	22.02	23.50
		1	8	21.68	22.01	21.89	23.50
		1	14	22.33	22.15	22.21	23.50
		8	0	21.31	21.35	21.31	22.50
		8	4	21.03	21.36	21.29	22.50
		8	7	21.42	21.46	21.49	22.50
		15	0	21.33	20.98	21.49	22.50



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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				131997	132322	132647	
5MHz	QPSK	1	0	23.22	23.22	23.37	24.50
		1	12	23.43	23.27	23.57	24.50
		1	24	23.39	23.25	23.56	24.50
		12	0	22.19	22.27	22.53	23.50
		12	6	22.18	22.28	22.46	23.50
		12	13	22.23	22.32	22.51	23.50
	16QAM	25	0	22.27	22.26	22.45	23.50
		1	0	21.99	21.75	21.96	23.50
		1	12	22.68	22.13	22.29	23.50
		1	24	21.89	21.75	22.40	23.50
		12	0	21.11	21.09	21.43	22.50
		12	6	21.14	21.20	21.40	22.50
		12	13	21.18	21.13	21.27	22.50
		25	0	21.19	21.38	21.51	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				132022	132322	132622	
10MHz	QPSK	1	0	22.98	23.17	23.48	24.50
		1	24	23.14	23.39	23.26	24.50
		1	49	23.15	23.31	23.40	24.50
		25	0	22.24	22.31	22.40	23.50
		25	12	22.27	22.31	22.39	23.50
		25	25	22.29	22.27	22.53	23.50
	16QAM	50	0	22.26	22.30	22.49	23.50
		1	0	21.86	21.93	21.89	23.50
		1	24	21.89	22.64	22.60	23.50
		1	49	21.95	22.09	21.85	23.50
		25	0	21.28	21.35	21.45	22.50
		25	12	21.42	21.44	21.44	22.50
		25	25	21.31	21.40	21.28	22.50
		50	0	21.09	21.24	21.38	22.50



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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				132047	132322	132597	
15MHz	QPSK	1	0	22.83	23.14	23.27	24.50
		1	38	23.26	23.02	23.11	24.50
		1	74	23.29	23.33	23.25	24.50
		38	0	22.98	23.20	23.29	23.50
		38	18	23.27	23.34	23.40	23.50
		38	37	23.15	23.17	23.28	23.50
	16QAM	75	0	22.27	22.31	22.36	23.50
		1	0	22.39	22.08	22.63	23.50
		1	38	21.77	21.99	21.98	23.50
		1	74	22.54	22.63	22.22	23.50
		38	0	21.74	22.05	22.02	22.50
		38	18	22.37	22.42	22.13	22.50
		38	37	22.07	22.03	22.03	22.50
		75	0	21.19	21.33	21.39	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				132072	132322	132572	
20MHz	QPSK	1	0	23.34	23.60	23.01	24.50
		1	49	23.58	23.31	23.21	24.50
		1	99	23.14	23.23	23.30	24.50
		50	0	22.26	22.51	22.42	23.50
		50	25	22.31	22.42	22.40	23.50
		50	50	22.29	22.32	22.50	23.50
	16QAM	100	0	22.28	22.36	22.38	23.50
		1	0	21.71	21.63	21.94	23.50
		1	49	22.56	21.92	22.42	23.50
		1	99	21.85	22.14	21.96	23.50
		50	0	21.20	21.34	21.26	22.50
		50	25	21.25	21.26	21.33	22.50
		50	50	21.42	21.46	21.40	22.50
		100	0	21.20	21.38	21.19	22.50



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LTE Band 71				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				133147	133297	133447	
5MHz	QPSK	1	0	23.14	23.19	23.17	24.50
		1	12	23.50	23.21	23.07	24.50
		1	24	23.32	23.16	23.07	24.50
		12	0	22.20	22.32	22.27	23.50
		12	6	22.20	22.11	22.17	23.50
		12	13	22.25	22.25	22.16	23.50
		25	0	22.18	22.25	22.22	23.50
	16QAM	1	0	21.65	21.74	22.26	23.50
		1	12	21.92	22.43	22.51	23.50
		1	24	21.64	21.62	21.59	23.50
		12	0	21.12	21.36	21.20	22.50
		12	6	21.12	21.15	21.19	22.50
		12	13	21.27	21.19	21.19	22.50
		25	0	21.21	21.36	21.35	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				133172	133297	133442	
10MHz	QPSK	1	0	23.31	23.48	23.21	24.50
		1	24	23.51	23.23	23.04	24.50
		1	49	23.34	23.08	23.07	24.50
		25	0	22.25	22.41	22.31	23.50
		25	12	22.36	22.18	22.13	23.50
		25	25	22.36	22.13	22.24	23.50
	16QAM	50	0	22.36	22.28	22.19	23.50
		1	0	22.09	22.80	21.73	23.50
		1	24	21.77	22.03	22.40	23.50
		1	49	21.95	22.00	22.00	23.50
		25	0	21.16	21.34	21.24	22.50
		25	12	21.38	21.21	21.16	22.50
		25	25	21.29	21.14	21.17	22.50
		50	0	21.39	21.19	21.20	22.50



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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				133197	133297	133397	
15MHz	QPSK	1	0	23.19	23.32	23.13	24.50
		1	38	23.22	22.94	23.22	24.50
		1	74	23.07	23.16	23.24	24.50
		38	0	22.11	22.37	22.34	23.50
		38	18	22.32	22.15	22.33	23.50
		38	37	22.36	22.23	22.42	23.50
	16QAM	75	0	22.28	22.12	22.25	23.50
		1	0	22.53	21.70	22.12	23.50
		1	38	21.74	21.74	22.00	23.50
		1	74	21.74	21.70	21.98	23.50
		38	0	21.06	20.97	20.90	22.50
		38	18	21.42	20.96	21.00	22.50
		38	37	21.94	21.21	21.12	22.50
		75	0	21.27	21.20	21.15	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				133322	133297	133372	
20MHz	QPSK	1	0	23.50	23.00	22.94	24.50
		1	49	23.17	23.01	23.28	24.50
		1	99	22.78	23.16	22.80	24.50
		50	0	22.48	22.41	22.25	23.50
		50	25	22.32	22.07	22.15	23.50
		50	50	22.24	22.15	22.13	23.50
	16QAM	100	0	22.33	22.11	22.06	23.50
		1	0	22.29	21.62	21.65	23.50
		1	49	22.05	21.77	21.68	23.50
		1	99	21.77	21.50	21.55	23.50
		50	0	21.33	21.20	21.17	22.50
		50	25	21.24	21.09	21.17	22.50
		50	50	21.27	21.15	20.94	22.50
		100	0	21.23	21.11	20.95	22.50



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8.1.3 Conducted Power of WIFI

Wi-Fi	Average Power (dBm) for Data Rates (Mbps)			SAR Test
	Channel	1	Tune up	
2450MHz				
802.11b	1	16.79	17.00	Yes
	6	15.96	17.00	Yes
	11	16.87	17.00	Yes
802.11g	Channel	6	Tune up	SAR Test
	1	12.87	13.00	No
	6	11.56	13.00	No
	11	12.76	13.00	No
802.11n HT20	Channel	6.5	Tune up	SAR Test
	1	12.76	13.00	No
	6	11.66	13.00	No
	11	12.68	13.00	No
802.11n HT40	Channel	13.5	Tune up	SAR Test
	3	12.00	13.00	No
	6	12.05	13.00	No
	9	12.14	13.00	No

Note:

- a) Power must be measured at each transmit antenna port according to the DSSS and OFDM transmission configurations in each standalone and aggregated frequency band.
- b) Power measurement is required for the transmission mode configuration with the highest maximum output power specified for production units.
 - 1) When the same highest maximum output power specification applies to multiple transmission modes, the largest channel bandwidth configuration with the lowest order modulation and lowest data rate is measured.
 - 2) When the same highest maximum output power is specified for multiple largest channel bandwidth configurations with the same lowest order modulation or lowest order modulation and lowest data rate, power measurement is required for all equivalent 802.11 configurations with the same maximum output power.
- c) For each transmission mode configuration, power must be measured for the highest and lowest channels; and at the mid-band channel(s) when there are at least 3 channels. For configurations with multiple mid-band channels, due to an even number of channels, both channels should be measured.



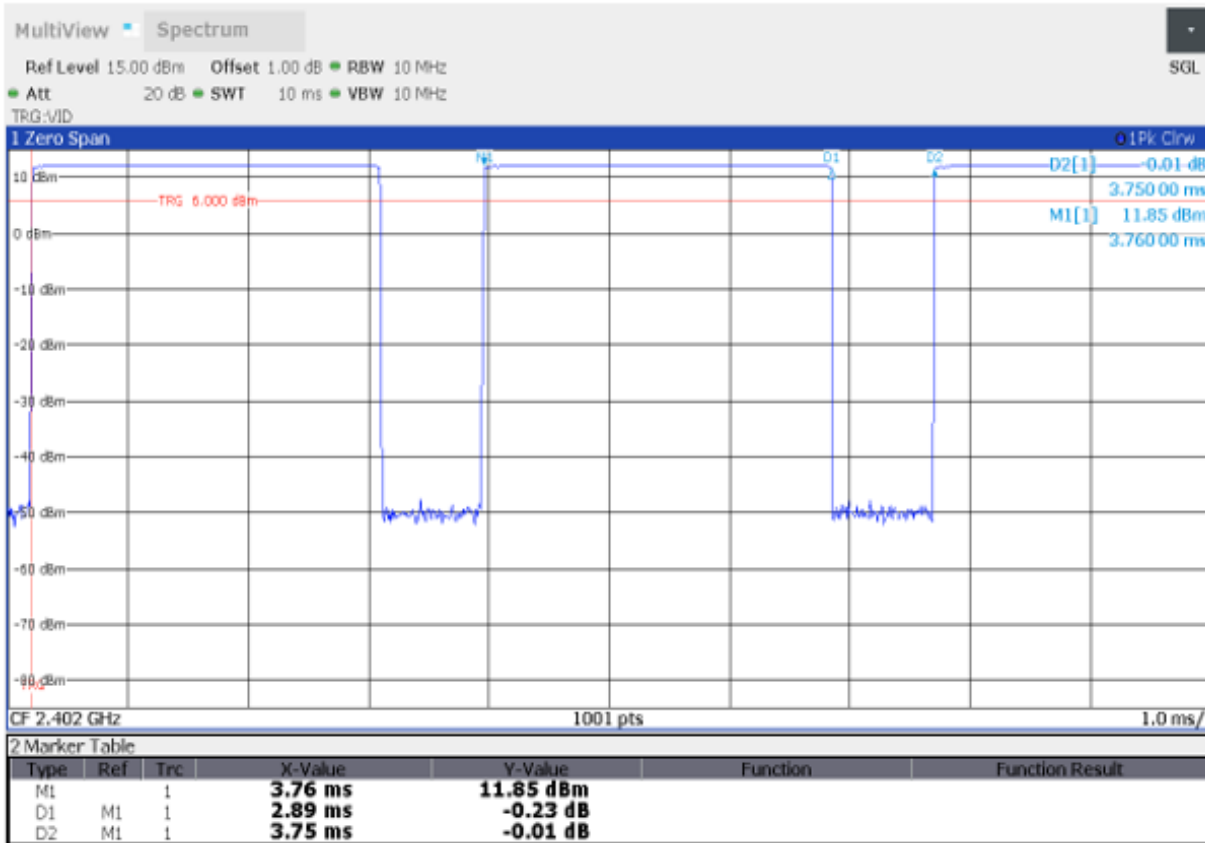
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8.1.4 Conducted Power of BT

BT DH5 Duty Cycle=2.89/3.75 =77.07%



BT		Average Conducted Power(dBm)			Tune up (dBm)
Band	Channel	0	39	78	
BT	GFSK	10.67	10.86	10.65	11.00
	π/4DQPSK	9.47	9.58	9.57	10.00
	8DPSK	8.74	8.53	8.78	10.00
Band	Channel	0	19	39	Tune up (dBm)
BLE	GFSK	0.78	0.88	0.80	2.50

Note:

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



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8.2 Measurement of SAR Data

Note:

- 1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per KDB447498 D04, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - $\leq 0.8\text{W/kg}$ for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is $\leq 100\text{MHz}$.
 - $\leq 0.6\text{ W/kg}$ or 1.5 W/kg , for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
 - $\leq 0.4\text{ W/kg}$ or 1.0 W/kg , for 1-g or 10-g respectively, when the transmission band is $\geq 200\text{ MHz}$.

WiFi 2.4G:

- 1) When the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is $\leq 1.2\text{ W/kg}$, SAR test for the other 802.11 modes are not required.



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8.2.1 SAR Result of CDMA BC0

Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data										
Left cheek	CDMA RC3+SO55	384/836.52	1:1	0.121	0.02	23.69	25.00	1.352	0.164	22.1
Left tilted	CDMA RC3+SO55	384/836.52	1:1	0.059	0.07	23.69	25.00	1.352	0.079	22.1
Right cheek	CDMA RC3+SO55	384/836.52	1:1	0.123	0.18	23.69	25.00	1.352	0.166	22.1
Right tilted	CDMA RC3+SO55	384/836.52	1:1	0.062	0.07	23.69	25.00	1.352	0.084	22.1
Body worn Test data(Separate 15mm)										
Front side	CDMA RC3+SO32	384/836.52	1:1	0.138	0.12	23.59	25.00	1.384	0.191	22.1
Back side	CDMA RC3+SO32	384/836.52	1:1	0.174	0.03	23.59	25.00	1.384	0.241	22.1
Hotspot Test data(Separate 10mm)										
Front side	CDMA RC3+SO32	384/836.52	1:1	0.148	0.07	23.59	25.00	1.384	0.205	22.1
Back side	CDMA RC3+SO32	384/836.52	1:1	0.206	0.15	23.59	25.00	1.384	0.285	22.1
Left side	CDMA RC3+SO32	384/836.52	1:1	0.109	0.08	23.59	25.00	1.384	0.151	22.1
Right side	CDMA RC3+SO32	384/836.52	1:1	0.163	0.08	23.59	25.00	1.384	0.226	22.1
Bottom side	CDMA RC3+SO32	384/836.52	1:1	0.042	0.06	23.59	25.00	1.384	0.058	22.1
Back side	EVDO RTAP 153.6Kbps	384/836.52	1:1	0.248	-0.02	23.55	25.00	1.396	0.346	22.1
Back side	EVDO RETAP 4096Bits	384/836.52	1:1	0.258	-0.08	23.72	25.00	1.343	0.346	22.1

Table 6: SAR of CDMA BC0 for Head and Body.



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8.2.2 SAR Result of CDMA BC1

Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data										
Left cheek	CDMA RC3+SO55	600/1880	1:1	0.225	-0.06	23.77	25.00	1.327	0.299	21.9
Left tilted	CDMA RC3+SO55	600/1880	1:1	0.110	0.07	23.77	25.00	1.327	0.146	21.9
Right cheek	CDMA RC3+SO55	600/1880	1:1	0.112	0.12	23.77	25.00	1.327	0.149	21.9
Right tilted	CDMA RC3+SO55	600/1880	1:1	0.108	0.18	23.77	25.00	1.327	0.143	21.9
Body worn Test data(Separate 15mm)										
Front side	CDMA RC3+SO32	600/1880	1:1	0.267	0.17	23.71	25.00	1.346	0.359	21.9
Back side	CDMA RC3+SO32	600/1880	1:1	0.324	0.12	23.71	25.00	1.346	0.436	21.9
Hotspot Test data(Separate 10mm)										
Front side	CDMA RC3+SO32	600/1880	1:1	0.466	0.16	23.71	25.00	1.346	0.627	21.9
Back side	CDMA RC3+SO32	600/1880	1:1	0.587	0.12	23.71	25.00	1.346	0.790	21.9
Left side	CDMA RC3+SO32	600/1880	1:1	0.385	-0.03	23.71	25.00	1.346	0.518	21.9
Right side	CDMA RC3+SO32	600/1880	1:1	0.038	0.13	23.71	25.00	1.346	0.052	21.9
Bottom side	CDMA RC3+SO32	600/1880	1:1	0.261	0.15	23.71	25.00	1.346	0.351	21.9
Back side	EVDO RTAP 153.6Kbps	600/1880	1:1	0.551	0.01	23.49	25.00	1.416	0.780	21.9
Back side	EVDO RETAP 4096Bits	600/1880	1:1	0.580	-0.16	23.79	25.00	1.321	0.766	21.9

Table 7: SAR of CDMA BC1 for Head and Body.



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8.2.1 SAR Result of CDMA BC10

Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data										
Left cheek	CDMA RC3+SO55	580/820.5	1:1	0.101	0.04	23.95	25.00	1.274	0.129	22.1
Left tilted	CDMA RC3+SO55	580/820.5	1:1	0.051	0.05	23.95	25.00	1.274	0.065	22.1
Right cheek	CDMA RC3+SO55	580/820.5	1:1	0.094	0.07	23.95	25.00	1.274	0.120	22.1
Right tilted	CDMA RC3+SO55	580/820.5	1:1	0.050	0.07	23.95	25.00	1.274	0.064	22.1
Body worn Test data(Separate 15mm)										
Front side	CDMA RC3+SO32	580/820.5	1:1	0.123	0.11	23.93	25.00	1.279	0.157	22.1
Back side	CDMA RC3+SO32	580/820.5	1:1	0.162	0.06	23.93	25.00	1.279	0.207	22.1
Hotspot Test data(Separate 10mm)										
Front side	CDMA RC3+SO32	580/820.5	1:1	0.124	0.11	23.93	25.00	1.279	0.159	22.1
Back side	CDMA RC3+SO32	580/820.5	1:1	0.188	0.03	23.93	25.00	1.279	0.241	22.1
Left side	CDMA RC3+SO32	580/820.5	1:1	0.099	0.12	23.93	25.00	1.279	0.127	22.1
Right side	CDMA RC3+SO32	580/820.5	1:1	0.146	0.12	23.93	25.00	1.279	0.187	22.1
Bottom side	CDMA RC3+SO32	580/820.5	1:1	0.042	0.05	23.93	25.00	1.279	0.054	22.1
Back side	EVDO RTAP 153.6Kbps	580/820.5	1:1	0.242	0.15	23.91	25.00	1.285	0.311	22.1
Back side	EVDO RETAP 4096Bits	580/820.5	1:1	0.245	0.13	24.02	25.00	1.253	0.307	22.1

Table 8: SAR of CDMA BC10 for Head and Body.



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8.2.2 SAR Result of LTE Band 12

Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data(1RB)											
Left cheek	10	QPSK 1_0	23095/707.5	1:1	0.226	-0.05	23.48	23.50	1.005	0.227	21.7
Left tilted	10	QPSK 1_0	23095/707.5	1:1	0.114	0.05	23.48	23.50	1.005	0.115	21.7
Right cheek	10	QPSK 1_0	23095/707.5	1:1	0.189	0.02	23.48	23.50	1.005	0.190	21.7
Right tilted	10	QPSK 1_0	23095/707.5	1:1	0.092	0.01	23.48	23.50	1.005	0.092	21.7
Head Test Data(50%RB)											
Left cheek	10	QPSK 25_0	23095/707.5	1:1	0.157	0.02	22.45	22.50	1.012	0.159	21.7
Left tilted	10	QPSK 25_0	23095/707.5	1:1	0.077	0.04	22.45	22.50	1.012	0.078	21.7
Right cheek	10	QPSK 25_0	23095/707.5	1:1	0.153	0.09	22.45	22.50	1.012	0.155	21.7
Right tilted	10	QPSK 25_0	23095/707.5	1:1	0.077	0.05	22.45	22.50	1.012	0.078	21.7
Body worn Test data(Separate 15mm 1RB)											
Front side	10	QPSK 1_0	23095/707.5	1:1	0.329	-0.06	23.48	23.50	1.005	0.331	21.7
Back side	10	QPSK 1_0	23095/707.5	1:1	0.423	0.01	23.48	23.50	1.005	0.425	21.7
Body worn Test data(Separate 15mm 50%RB)											
Front side	10	QPSK 25_0	23095/707.5	1:1	0.266	-0.03	22.45	22.50	1.012	0.269	21.7
Back side	10	QPSK 25_0	23095/707.5	1:1	0.370	0.02	22.45	22.50	1.012	0.374	21.7
Hotspot Test data(Separate 10mm 1RB)											
Front side	10	QPSK 1_0	23095/707.5	1:1	0.319	-0.08	23.48	23.50	1.005	0.320	21.7
Back side	10	QPSK 1_0	23095/707.5	1:1	0.465	0.06	23.48	23.50	1.005	0.467	21.7
Left side	10	QPSK 1_0	23095/707.5	1:1	0.099	0.01	23.48	23.50	1.005	0.100	21.7
Right side	10	QPSK 1_0	23095/707.5	1:1	0.035	0.07	23.48	23.50	1.005	0.035	21.7
Bottom side	10	QPSK 1_0	23095/707.5	1:1	0.038	0.05	23.48	23.50	1.005	0.038	21.7
Hotspot Test data(Separate 10mm 50%RB)											
Front side	10	QPSK 25_0	23095/707.5	1:1	0.261	0.03	22.45	22.50	1.012	0.264	21.7
Back side	10	QPSK 25_0	23095/707.5	1:1	0.377	0.06	22.45	22.50	1.012	0.381	21.7
Left side	10	QPSK 25_0	23095/707.5	1:1	0.089	0.04	22.45	22.50	1.012	0.090	21.7
Right side	10	QPSK 25_0	23095/707.5	1:1	0.149	0.09	22.45	22.50	1.012	0.151	21.7
Bottom side	10	QPSK 25_0	23095/707.5	1:1	0.030	0.08	22.45	22.50	1.012	0.030	21.7

Table 9: SAR of LTE Band 12 for Head and Body.



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8.2.3 SAR Result of LTE Band 25

Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data(1RB)											
Left cheek	20	QPSK 1_0	26365/1882.5	1:1	0.206	-0.02	23.46	23.50	1.009	0.208	21.9
Left tilted	20	QPSK 1_0	26365/1882.5	1:1	0.115	0.02	23.46	23.50	1.009	0.116	21.9
Right cheek	20	QPSK 1_0	26365/1882.5	1:1	0.101	0.03	23.46	23.50	1.009	0.102	21.9
Right tilted	20	QPSK 1_0	26365/1882.5	1:1	0.068	0.07	23.46	23.50	1.009	0.069	21.9
Head Test Data(50%RB)											
Left cheek	20	QPSK 50_0	26365/1882.5	1:1	0.159	0.08	22.31	22.50	1.045	0.166	21.9
Left tilted	20	QPSK 50_0	26365/1882.5	1:1	0.091	0.03	22.31	22.50	1.045	0.095	21.9
Right cheek	20	QPSK 50_0	26365/1882.5	1:1	0.081	0.02	22.31	22.50	1.045	0.084	21.9
Right tilted	20	QPSK 50_0	26365/1882.5	1:1	0.053	0.07	22.31	22.50	1.045	0.055	21.9
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1_0	26365/1882.5	1:1	0.210	0.08	23.46	23.50	1.009	0.212	21.9
Back side	20	QPSK 1_0	26365/1882.5	1:1	0.230	0.05	23.46	23.50	1.009	0.232	21.9
Body worn Test data(Separate 15mm 50%RB)											
Front side	20	QPSK 50_0	26365/1882.5	1:1	0.169	0.04	22.31	22.50	1.045	0.177	21.9
Back side	20	QPSK 50_0	26365/1882.5	1:1	0.208	0.03	22.31	22.50	1.045	0.217	21.9
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1_0	26365/1882.5	1:1	0.523	0.08	23.46	23.50	1.009	0.528	21.9
Back side	20	QPSK 1_0	26365/1882.5	1:1	0.507	-0.01	23.46	23.50	1.009	0.512	21.9
Left side	20	QPSK 1_0	26365/1882.5	1:1	0.340	0.02	23.46	23.50	1.009	0.343	21.9
Right side	20	QPSK 1_0	26365/1882.5	1:1	0.062	0.03	23.46	23.50	1.009	0.063	21.9
Bottom side	20	QPSK 1_0	26365/1882.5	1:1	0.280	0.06	23.46	23.50	1.009	0.283	21.9
Hotspot Test data(Separate 10mm 50%RB)											
Front side	20	QPSK 50_0	26365/1882.5	1:1	0.344	0.08	22.31	22.50	1.045	0.359	21.9
Back side	20	QPSK 50_0	26365/1882.5	1:1	0.438	0.17	22.31	22.50	1.045	0.458	21.9
Left side	20	QPSK 50_0	26365/1882.5	1:1	0.291	0.02	22.31	22.50	1.045	0.304	21.9
Right side	20	QPSK 50_0	26365/1882.5	1:1	0.054	0.00	22.31	22.50	1.045	0.056	21.9
Bottom side	20	QPSK 50_0	26365/1882.5	1:1	0.226	0.06	22.31	22.50	1.045	0.236	21.9

Table 10: SAR of LTE Band 25 for Head and Body.



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8.2.4 SAR Result of LTE Band 26

Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data(1RB)											
Left cheek	15	QPSK 1_0	26865/831.5	1:1	0.113	-0.02	23.23	23.50	1.064	0.120	22.1
Left tilted	15	QPSK 1_0	26865/831.5	1:1	0.026	0.09	23.23	23.50	1.064	0.028	22.1
Right cheek	15	QPSK 1_0	26865/831.5	1:1	0.090	0.03	23.23	23.50	1.064	0.096	22.1
Right tilted	15	QPSK 1_0	26865/831.5	1:1	0.06	-0.20	23.23	23.50	1.064	0.062	22.1
Head Test Data(50%RB)											
Left cheek	15	QPSK 36_0	26865/831.5	1:1	0.058	0.01	22.02	22.50	1.117	0.064	22.1
Left tilted	15	QPSK 36_0	26865/831.5	1:1	0.036	0.09	22.02	22.50	1.117	0.041	22.1
Right cheek	15	QPSK 36_0	26865/831.5	1:1	0.090	0.08	22.02	22.50	1.117	0.101	22.1
Right tilted	15	QPSK 36_0	26865/831.5	1:1	0.050	-0.17	22.02	22.50	1.117	0.056	22.1
Body worn Test data(Separate 15mm 1RB)											
Front side	15	QPSK 1_0	26865/831.5	1:1	0.104	0.13	23.23	23.50	1.064	0.111	22.1
Back side	15	QPSK 1_0	26865/831.5	1:1	0.140	-0.02	23.23	23.50	1.064	0.149	22.1
Body worn Test data(Separate 15mm 50%RB)											
Front side	15	QPSK 36_0	26865/831.5	1:1	0.095	0.15	22.02	22.50	1.117	0.106	22.1
Back side	15	QPSK 36_0	26865/831.5	1:1	0.113	0.01	22.02	22.50	1.117	0.126	22.1
Hotspot Test data(Separate 10mm 1RB)											
Front side	15	QPSK 1_0	26865/831.5	1:1	0.113	-0.09	23.23	23.50	1.064	0.120	22.1
Back side	15	QPSK 1_0	26865/831.5	1:1	0.140	0.02	23.23	23.50	1.064	0.149	22.1
Left side	15	QPSK 1_0	26865/831.5	1:1	0.095	0.16	23.23	23.50	1.064	0.101	22.1
Right side	15	QPSK 1_0	26865/831.5	1:1	0.109	0.19	23.23	23.50	1.064	0.116	22.1
Bottom side	15	QPSK 1_0	26865/831.5	1:1	0.045	-0.04	23.23	23.50	1.064	0.048	22.1
Hotspot Test data(Separate 10mm 50%RB)											
Front side	15	QPSK 36_0	26865/831.5	1:1	0.094	0.14	22.02	22.50	1.117	0.105	22.1
Back side	15	QPSK 36_0	26865/831.5	1:1	0.141	0.09	22.02	22.50	1.117	0.157	22.1
Left side	15	QPSK 36_0	26865/831.5	1:1	0.082	0.16	22.02	22.50	1.117	0.092	22.1
Right side	15	QPSK 36_0	26865/831.5	1:1	0.093	0.18	22.02	22.50	1.117	0.104	22.1
Bottom side	15	QPSK 36_0	26865/831.5	1:1	0.037	-0.15	22.02	22.50	1.117	0.041	22.1

Table 11: SAR of LTE Band 26 for Head and Body.



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8.2.5 SAR Result of LTE Band 41

Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data(1RB)											
Left cheek	20	QPSK 1_0	40620/2593	1:1.58	0.263	0.04	21.80	23.00	1.318	0.347	21.5
Left tilted	20	QPSK 1_0	40620/2593	1:1.58	0.107	0.08	21.80	23.00	1.318	0.141	21.5
Right cheek	20	QPSK 1_0	40620/2593	1:1.58	0.111	-0.15	21.80	23.00	1.318	0.146	21.5
Right tilted	20	QPSK 1_0	40620/2593	1:1.58	0.191	0.09	21.80	23.00	1.318	0.252	21.5
Left cheek-HPUE	20	QPSK 1_0	40620/2593	1:2.31	0.301	-0.05	24.39	25.00	1.151	0.346	21.5
Head Test Data(50%RB)											
Left cheek	20	QPSK 50_50	41055/2636.5	1:1.58	0.192	-0.02	20.74	22.00	1.337	0.257	21.5
Left tilted	20	QPSK 50_50	41055/2636.5	1:1.58	0.126	0.04	20.74	22.00	1.337	0.168	21.5
Right cheek	20	QPSK 50_50	41055/2636.5	1:1.58	0.113	0.09	20.74	22.00	1.337	0.151	21.5
Right tilted	20	QPSK 50_50	41055/2636.5	1:1.58	0.216	0.13	20.74	22.00	1.337	0.289	21.5
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1_0	40620/2593	1:1.58	0.170	0.19	21.80	23.00	1.318	0.224	21.5
Back side	20	QPSK 1_0	40620/2593	1:1.58	0.195	-0.17	21.80	23.00	1.318	0.257	21.5
Back side-HPUE	20	QPSK 1_0	40620/2593	1:2.31	0.219	0.04	24.39	25.00	1.151	0.252	21.5
Body worn Test data(Separate 15mm 50%RB)											
Front side	20	QPSK 50_50	41055/2636.5	1:1.58	0.166	0.20	20.74	22.00	1.337	0.222	21.5
Back side	20	QPSK 50_50	41055/2636.5	1:1.58	0.190	0.18	20.74	22.00	1.337	0.254	21.5
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1_0	40620/2593	1:1.58	0.337	0.20	21.80	23.00	1.318	0.444	21.5
Back side	20	QPSK 1_0	40620/2593	1:1.58	0.347	0.04	21.80	23.00	1.318	0.457	21.5
Left side	20	QPSK 1_0	40620/2593	1:1.58	0.297	-0.08	21.80	23.00	1.318	0.392	21.5
Right side	20	QPSK 1_0	40620/2593	1:1.58	0.048	0.01	21.80	23.00	1.318	0.064	21.5
Bottom side	20	QPSK 1_0	40620/2593	1:1.58	0.213	-0.12	21.80	23.00	1.318	0.281	21.5
Back side-HPUE	20	QPSK 1_0	40620/2593	1:2.31	0.392	0.05	24.39	25.00	1.151	0.451	21.5
Hotspot Test data(Separate 10mm 50%RB)											
Front side	20	QPSK 50_50	41055/2636.5	1:1.58	0.321	-0.11	20.74	22.00	1.337	0.429	21.5
Back side	20	QPSK 50_50	41055/2636.5	1:1.58	0.305	0.13	20.74	22.00	1.337	0.408	21.5
Left side	20	QPSK 50_50	41055/2636.5	1:1.58	0.289	-0.06	20.74	22.00	1.337	0.386	21.5
Right side	20	QPSK 50_50	41055/2636.5	1:1.58	0.037	0.05	20.74	22.00	1.337	0.050	21.5
Bottom side	20	QPSK 50_50	41055/2636.5	1:1.58	0.200	0.15	20.74	22.00	1.337	0.267	21.5

Table 12: SAR of LTE Band 41 for Head and Body.



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8.2.6 SAR Result of LTE Band 66

Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data(1RB)											
Left cheek	20	QPSK 1_0	132322/1745	1:1	0.157	-0.04	23.60	24.50	1.230	0.193	22.0
Left tilted	20	QPSK 1_0	132322/1745	1:1	0.097	0.05	23.60	24.50	1.230	0.119	22.0
Right cheek	20	QPSK 1_0	132322/1745	1:1	0.064	0.05	23.60	24.50	1.230	0.078	22.0
Right tilted	20	QPSK 1_0	132322/1745	1:1	0.066	0.08	23.60	24.50	1.230	0.081	22.0
Head Test Data(50%RB)											
Left cheek	20	QPSK 50_0	132322/1745	1:1	0.115	0.01	22.51	23.50	1.256	0.144	22.0
Left tilted	20	QPSK 50_0	132322/1745	1:1	0.072	0.05	22.51	23.50	1.256	0.090	22.0
Right cheek	20	QPSK 50_0	132322/1745	1:1	0.052	0.01	22.51	23.50	1.256	0.065	22.0
Right tilted	20	QPSK 50_0	132322/1745	1:1	0.049	0.09	22.51	23.50	1.256	0.061	22.0
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1_0	132322/1745	1:1	0.153	0.02	23.60	24.50	1.230	0.188	22.0
Back side	20	QPSK 1_0	132322/1745	1:1	0.224	0.08	23.60	24.50	1.230	0.276	22.0
Body worn Test data(Separate 15mm 50%RB)											
Front side	20	QPSK 50_0	132322/1745	1:1	0.122	0.00	22.51	23.50	1.256	0.153	22.0
Back side	20	QPSK 50_0	132322/1745	1:1	0.183	0.08	22.51	23.50	1.256	0.230	22.0
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1_0	132322/1745	1:1	0.343	0.08	23.60	24.50	1.230	0.422	22.0
Back side	20	QPSK 1_0	132322/1745	1:1	0.381	-0.09	23.60	24.50	1.230	0.469	22.0
Left side	20	QPSK 1_0	132322/1745	1:1	0.308	-0.10	23.60	24.50	1.230	0.379	22.0
Right side	20	QPSK 1_0	132322/1745	1:1	0.077	0.08	23.60	24.50	1.230	0.095	22.0
Bottom side	20	QPSK 1_0	132322/1745	1:1	0.370	0.06	23.60	24.50	1.230	0.455	22.0
Hotspot Test data(Separate 10mm 50%RB)											
Front side	20	QPSK 50_0	132322/1745	1:1	0.275	0.08	22.51	23.50	1.256	0.345	22.0
Back side	20	QPSK 50_0	132322/1745	1:1	0.316	0.11	22.51	23.50	1.256	0.397	22.0
Left side	20	QPSK 50_0	132322/1745	1:1	0.245	0.10	22.51	23.50	1.256	0.308	22.0
Right side	20	QPSK 50_0	132322/1745	1:1	0.061	0.01	22.51	23.50	1.256	0.077	22.0
Bottom side	20	QPSK 50_0	132322/1745	1:1	0.280	0.00	22.51	23.50	1.256	0.352	22.0

Table 13: SAR of LTE Band 66 for Head and Body.



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8.2.7 SAR Result of LTE Band 71

Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data(1RB)											
Left cheek	20	QPSK 1_0	133322/683	1:1	0.067	0.04	23.50	24.50	1.259	0.084	21.7
Left tilted	20	QPSK 1_0	133322/683	1:1	0.033	0.04	23.50	24.50	1.259	0.042	21.7
Right cheek	20	QPSK 1_0	133322/683	1:1	0.028	0.14	23.50	24.50	1.259	0.036	21.7
Right tilted	20	QPSK 1_0	133322/683	1:1	0.027	0.02	23.50	24.50	1.259	0.034	21.7
Head Test Data(50%RB)											
Left cheek	20	QPSK 50_0	133322/683	1:1	0.048	-0.11	22.48	23.50	1.265	0.061	21.7
Left tilted	20	QPSK 50_0	133322/683	1:1	0.026	0.10	22.48	23.50	1.265	0.033	21.7
Right cheek	20	QPSK 50_0	133322/683	1:1	0.052	-0.02	22.48	23.50	1.265	0.066	21.7
Right tilted	20	QPSK 50_0	133322/683	1:1	0.026	0.16	22.48	23.50	1.265	0.033	21.7
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1_0	133322/683	1:1	0.054	0.18	23.50	24.50	1.259	0.068	21.7
Back side	20	QPSK 1_0	133322/683	1:1	0.100	0.12	23.50	24.50	1.259	0.126	21.7
Body worn Test data(Separate 15mm 50%RB)											
Front side	20	QPSK 50_0	133322/683	1:1	0.024	0.10	22.48	23.50	1.265	0.030	21.7
Back side	20	QPSK 50_0	133322/683	1:1	0.078	0.19	22.48	23.50	1.265	0.098	21.7
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1_0	133322/683	1:1	0.071	-0.19	23.50	24.50	1.259	0.089	21.7
Back side	20	QPSK 1_0	133322/683	1:1	0.111	0.07	23.50	24.50	1.259	0.140	21.7
Left side	20	QPSK 1_0	133322/683	1:1	0.055	0.05	23.50	24.50	1.259	0.069	21.7
Right side	20	QPSK 1_0	133322/683	1:1	0.094	-0.19	23.50	24.50	1.259	0.119	21.7
Bottom side	20	QPSK 1_0	133322/683	1:1	0.035	0.09	23.50	24.50	1.259	0.044	21.7
Hotspot Test data(Separate 10mm 50%RB)											
Front side	20	QPSK 50_0	133322/683	1:1	0.066	0.17	22.48	23.50	1.265	0.084	21.7
Back side	20	QPSK 50_0	133322/683	1:1	0.097	0.19	22.48	23.50	1.265	0.122	21.7
Left side	20	QPSK 50_0	133322/683	1:1	0.063	0.09	22.48	23.50	1.265	0.079	21.7
Right side	20	QPSK 50_0	133322/683	1:1	0.110	0.07	22.48	23.50	1.265	0.139	21.7
Bottom side	20	QPSK 50_0	133322/683	1:1	0.031	0.05	22.48	23.50	1.265	0.039	21.7

Table 14: SAR of LTE Band 71 for Head and Body.



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8.2.8 SAR Result of WIFI 2.4G

Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test data											
Left cheek	802.11b	11/2462	97.62%	1.024	1.230	-0.07	16.87	17.00	1.030	1.298	21.4
Left cheek	802.11b	1/2412	97.62%	1.024	1.250	0.17	16.79	17.00	1.050	1.344	21.4
Left cheek-Repeat	802.11b	1/2412	97.62%	1.024	1.230	0.02	16.79	17.00	1.050	1.322	21.4
Left cheek	802.11b	6/2437	97.62%	1.024	1.020	0.11	15.96	17.00	1.271	1.328	21.4
Left tilted	802.11b	11/2462	97.62%	1.024	0.842	0.08	16.87	17.00	1.030	0.889	21.4
Left tilted	802.11b	1/2412	97.62%	1.024	0.676	0.05	16.79	17.00	1.050	0.727	21.4
Right cheek	802.11b	11/2462	97.62%	1.024	0.561	0.09	16.87	17.00	1.030	0.592	21.4
Right tilted	802.11b	11/2462	97.62%	1.024	0.422	0.06	16.87	17.00	1.030	0.445	21.4
Body worn Test data(Separate 15mm)											
Front side	802.11b	11/2462	97.62%	1.024	0.146	0.10	16.87	17.00	1.030	0.154	21.4
Back side	802.11b	11/2462	97.62%	1.024	0.158	0.16	16.87	17.00	1.030	0.167	21.4
Hotspot Test data (Separate 10mm)											
Front side	802.11b	11/2462	97.62%	1.024	0.234	0.02	16.87	17.00	1.030	0.247	21.4
Back side	802.11b	11/2462	97.62%	1.024	0.297	0.16	16.87	17.00	1.030	0.313	21.4
Right side	802.11b	11/2462	97.62%	1.024	0.280	0.11	16.87	17.00	1.030	0.296	21.4
Top side	802.11b	11/2462	97.62%	1.024	0.185	0.17	16.87	17.00	1.030	0.195	21.4

Table 15: SAR of WIFI 2.4G for Head and Body.

Note:

- When the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR test for the other 802.11 modes are not required.

Mode	Tune-up (dBm)	Tune-up (mw)	Highest Reported SAR1-g(W/kg)	Adjusted SAR1-g(W/kg)	SAR test
Head					
802.11b	17.00	50.12	1.344	/	Yes
802.11g	13.00	19.95	/	0.535	No
802.1n 20M	13.00	19.95	/	0.535	No
802.1n 40M	13.00	19.95	/	0.535	No
Body worn Test data(Separate 15mm)					
802.11b	17.00	50.12	0.167	/	Yes
802.11g	13.00	19.95	/	0.066	No
802.1n 20M	13.00	19.95	/	0.066	No
802.1n 40M	13.00	19.95	/	0.066	No
Hotspot Test data (Separate 10mm)					
802.11b	17.00	50.12	0.313	/	Yes
802.11g	13.00	19.95	/	0.125	No
802.1n 20M	13.00	19.95	/	0.125	No
802.1n 40M	13.00	19.95	/	0.125	No

Test Position	Channel/Frequency (MHz)	Measured SAR (1g)	1 st Repeated	Ratio	2 nd Repeated	3 rd Repeated
			SAR (1g)		SAR (1g)	SAR (1g)
Left cheek	1/2412	1.250	1.230	1.016	N/A	N/A

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
 2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
 3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .
 4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg



8.2.9 SAR Result of BT

Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test data											
Left cheek	DH5	39/2441	77.07%	1.298	0.157	0.02	10.86	11.00	1.033	0.162	21.4
Left tilted	DH5	39/2441	77.07%	1.298	0.112	0.18	10.86	11.00	1.033	0.116	21.4
Right cheek	DH5	39/2441	77.07%	1.298	0.067	0.00	10.86	11.00	1.033	0.069	21.4
Right tilted	DH5	39/2441	77.07%	1.298	0.054	0.17	10.86	11.00	1.033	0.056	21.4
Body worn Test data(Separate 15mm)											
Front side	DH5	39/2441	77.07%	1.298	0.022	-0.19	10.86	11.00	1.033	0.023	21.4
Back side	DH5	39/2441	77.07%	1.298	0.023	-0.02	10.86	11.00	1.033	0.024	21.4
Hotspot Test data (Separate 10mm)											
Front side	DH5	39/2441	77.07%	1.298	0.042	0.14	10.86	11.00	1.033	0.044	21.4
Back side	DH5	39/2441	77.07%	1.298	0.051	-0.01	10.86	11.00	1.033	0.052	21.4
Right side	DH5	39/2441	77.07%	1.298	0.041	0.18	10.86	11.00	1.033	0.043	21.4
Top side	DH5	39/2441	77.07%	1.298	0.025	0.08	10.86	11.00	1.033	0.026	21.4

Table 16: SAR of BT for Head and Body.



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8.3 LTE Band 41 Power Class 2 and Power Class 3 Linearity

This device supports Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operations is 43.3 % using UL-DL configuration 1. Per May 2017 TCB Workshop Notes based on the device behavior, all SAR tests were performed using Power Class 3. SAR with Power Class 2 at the highest power and available duty factor was additionally performed for the Power Class 3 configuration with the highest SAR for each exposure condition. The linearity between the Power Class 2 and Power Class 3 SAR results and the respective frame averaged powers was calculated to determine that the results were linear.

Per May 2017 TCB Workshop, no additional SAR measurements were required since the linearity between power classes was < 10% and all reported SAR values were < 1.4 W/kg for 1g and < 3.5 W/kg for 10g.

LTE Band 41 SAR testing with power class 2 at the highest power and available duty factor was additionally performed for the power class 3 configuration with the highest SAR for each exposure condition.

LTE Band 41 Head Linearity Data:

	Power Class 3	Power Class 2
Tune-up(dBm)	23.00	25.00
Measured power(dBm)	21.80	24.39
Measured SAR(W/kg)	0.263	0.301
Measured power(mw)	151.36	274.79
Duty Cycle	63.3%	43.3%
Frame Average power(mw)	95.81	118.98
% deviation from expected linearity		-7.84%

LTE Band 41 Body-Worn Linearity Data:

	Power Class 3	Power Class 2
Tune-up(dBm)	23.00	25.00
Measured power(dBm)	21.80	24.39
Measured SAR(W/kg)	0.195	0.219
Measured power(mw)	151.36	274.79
Duty Cycle	63.3%	43.3%
Frame Average power(mw)	95.81	118.98
% deviation from expected linearity		-9.57%

LTE Band 41 Hotspot Linearity Data:

	Power Class 3	Power Class 2
Tune-up(dBm)	23.00	25.00
Measured power(dBm)	21.80	24.39
Measured SAR(W/kg)	0.347	0.392
Measured power(mw)	151.36	274.79
Duty Cycle	63.3%	43.3%
Frame Average power(mw)	95.81	118.98
% deviation from expected linearity		-9.04%



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8.4 Multiple Transmitter Evaluation

8.4.1 Simultaneous SAR SAR test evaluation

- Simultaneous Transmission Possibilities

NO	Simultaneous TX Combination	Head	Body-worn	Hotspot	Product Specific 10-g (0mm)
1	WWAN+BT	Y	Y	Y	Y
2	WWAN+WIFI 2.4G	Y	Y	Y	Y
3	BT+WIFI 2.4G	N	N	N	N



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8.4.2 Simultaneous Transmission SAR Summation Scenario

Simultaneous Transmission SAR Summation Scenario for WLAN Head:

Test position		SARmax (W/kg)			Summed SAR			
		Main Ant	WiFi 2.4G	BT	1+2	SPLSR	Case No.	1+3
		1	2	3				
CDMA BC0	Left cheek	0.164	1.344	0.162	1.508	/	/	0.326
	Left tilted	0.079	0.889	0.116	0.968	/	/	0.195
	Right cheek	0.166	0.592	0.069	0.758	/	/	0.235
	Right tilted	0.084	0.445	0.056	0.529	/	/	0.140
CDMA BC1	Left cheek	0.299	1.344	0.162	1.643	0.02	1#	0.461
	Left tilted	0.146	0.889	0.116	1.035	/	/	0.262
	Right cheek	0.149	0.592	0.069	0.741	/	/	0.218
	Right tilted	0.143	0.445	0.056	0.588	/	/	0.199
CDMA BC10	Left cheek	0.129	1.344	0.162	1.473	/	/	0.291
	Left tilted	0.065	0.889	0.116	0.954	/	/	0.181
	Right cheek	0.120	0.592	0.069	0.712	/	/	0.189
	Right tilted	0.064	0.445	0.056	0.509	/	/	0.120
LTE B12	Left cheek	0.227	1.344	0.162	1.571	/	/	0.389
	Left tilted	0.115	0.889	0.116	1.004	/	/	0.231
	Right cheek	0.190	0.592	0.069	0.782	/	/	0.259
	Right tilted	0.092	0.445	0.056	0.537	/	/	0.148
LTE B25	Left cheek	0.208	1.344	0.162	1.552	/	/	0.370
	Left tilted	0.116	0.889	0.116	1.005	/	/	0.232
	Right cheek	0.102	0.592	0.069	0.694	/	/	0.171
	Right tilted	0.069	0.445	0.056	0.514	/	/	0.125
LTE B26	Left cheek	0.120	1.344	0.162	1.464	/	/	0.282
	Left tilted	0.041	0.889	0.116	0.930	/	/	0.157
	Right cheek	0.101	0.592	0.069	0.693	/	/	0.170
	Right tilted	0.062	0.445	0.056	0.507	/	/	0.118
LTE B41	Left cheek	0.347	1.344	0.162	1.691	0.03	2#	0.509
	Left tilted	0.168	0.889	0.116	1.057	/	/	0.284
	Right cheek	0.151	0.592	0.069	0.743	/	/	0.220
	Right tilted	0.289	0.445	0.056	0.734	/	/	0.345
LTE B66	Left cheek	0.193	1.344	0.162	1.537	/	/	0.355
	Left tilted	0.119	0.889	0.116	1.008	/	/	0.235
	Right cheek	0.078	0.592	0.069	0.670	/	/	0.147
	Right tilted	0.081	0.445	0.056	0.526	/	/	0.137
LTE B71	Left cheek	0.084	1.344	0.162	1.428	/	/	0.246
	Left tilted	0.042	0.889	0.116	0.931	/	/	0.158
	Right cheek	0.066	0.592	0.069	0.658	/	/	0.135
	Right tilted	0.034	0.445	0.056	0.479	/	/	0.090



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**Simultaneous Transmission SAR Summation Scenario for WLAN Body:
 Body-worn:**

Test position		SARmax (W/kg)			Summed SAR	
		Main Ant	WiFi 2.4G	BT		
		1	2	3	1+2	1+3
CDMA BC0	Front side	0.191	0.154	0.023	0.345	0.214
	Back side	0.241	0.167	0.024	0.408	0.265
CDMA BC1	Front side	0.359	0.154	0.023	0.513	0.382
	Back side	0.436	0.167	0.024	0.603	0.460
CDMA BC10	Front side	0.157	0.154	0.023	0.311	0.180
	Back side	0.207	0.167	0.024	0.374	0.231
LTE B12	Front side	0.331	0.154	0.023	0.485	0.354
	Back side	0.425	0.167	0.024	0.592	0.449
LTE B25	Front side	0.212	0.154	0.023	0.366	0.235
	Back side	0.232	0.167	0.024	0.399	0.256
LTE B26	Front side	0.111	0.154	0.023	0.265	0.134
	Back side	0.149	0.167	0.024	0.316	0.173
LTE B41	Front side	0.224	0.154	0.023	0.378	0.247
	Back side	0.257	0.167	0.024	0.424	0.281
LTE B66	Front side	0.188	0.154	0.023	0.342	0.211
	Back side	0.276	0.167	0.024	0.443	0.300
LTE B71	Front side	0.068	0.154	0.023	0.222	0.091
	Back side	0.126	0.167	0.024	0.293	0.150

Hotspot:

Test position		SARmax (W/kg)			Summed SAR	
		Main Ant	WiFi 2.4G	BT		
		1	2	3	1+2	1+3
CDMA BC0	Front side	0.205	0.247	0.044	0.452	0.249
	Back side	0.346	0.313	0.052	0.659	0.398
	Left side	0.151	/	/	0.151	0.151
	Right side	0.226	0.296	0.043	0.522	0.269
	Top side	/	0.195	0.026	0.195	0.026
	Bottom side	0.058	/	/	0.058	0.058
CDMA BC1	Front side	0.627	0.247	0.044	0.874	0.671
	Back side	0.790	0.313	0.052	1.103	0.842
	Left side	0.518	/	/	0.518	0.518
	Right side	0.052	0.296	0.043	0.348	0.095
	Top side	/	0.195	0.026	0.195	0.026
	Bottom side	0.351	/	/	0.351	0.351
CDMA BC10	Front side	0.159	0.247	0.044	0.406	0.203
	Back side	0.311	0.313	0.052	0.624	0.363
	Left side	0.127	/	/	0.127	0.127
	Right side	0.187	0.296	0.043	0.483	0.230
	Top side	/	0.195	0.026	0.195	0.026
	Bottom side	0.054	/	/	0.054	0.054



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LTE B12	Front side	0.320	0.247	0.044	0.567	0.364
	Back side	0.467	0.313	0.052	0.780	0.519
	Left side	0.100	/	/	0.100	0.100
	Right side	0.151	0.296	0.043	0.447	0.194
	Top side	/	0.195	0.026	0.195	0.026
	Bottom side	0.038	/	/	0.038	0.038
LTE B25	Front side	0.528	0.247	0.044	0.775	0.572
	Back side	0.512	0.313	0.052	0.825	0.564
	Left side	0.343	/	/	0.343	0.343
	Right side	0.063	0.296	0.043	0.359	0.106
	Top side	/	0.195	0.026	0.195	0.026
	Bottom side	0.283	/	/	0.283	0.283
LTE B26	Front side	0.120	0.247	0.044	0.367	0.164
	Back side	0.157	0.313	0.052	0.470	0.209
	Left side	0.101	/	/	0.101	0.101
	Right side	0.116	0.296	0.043	0.412	0.159
	Top side	/	0.195	0.026	0.195	0.026
	Bottom side	0.048	/	/	0.048	0.048
LTE B41	Front side	0.444	0.247	0.044	0.691	0.488
	Back side	0.457	0.313	0.052	0.770	0.509
	Left side	0.392	/	/	0.392	0.392
	Right side	0.064	0.296	0.043	0.360	0.107
	Top side	/	0.195	0.026	0.195	0.026
	Bottom side	0.281	/	/	0.281	0.281
LTE B66	Front side	0.422	0.247	0.044	0.669	0.466
	Back side	0.469	0.313	0.052	0.782	0.521
	Left side	0.379	/	/	0.379	0.379
	Right side	0.095	0.296	0.043	0.391	0.138
	Top side	/	0.195	0.026	0.195	0.026
	Bottom side	0.455	/	/	0.455	0.455
LTE B71	Front side	0.089	0.247	0.044	0.336	0.133
	Back side	0.140	0.313	0.052	0.453	0.192
	Left side	0.079	/	/	0.079	0.079
	Right side	0.139	0.296	0.043	0.435	0.182
	Top side	/	0.195	0.026	0.195	0.026
	Bottom side	0.044	/	/	0.044	0.044



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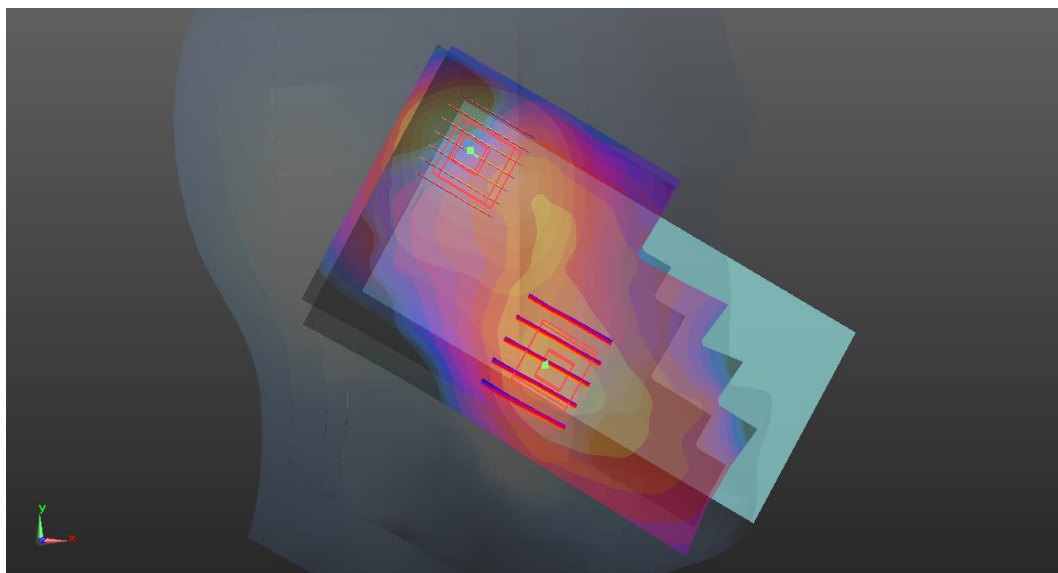
8.4.3 SPLSR Evaluation Analysis

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

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

$$\text{SPLS Ratio} = (\text{SAR}_1 + \text{SAR}_2)^{1.5} / R_i$$

Case No.	Position	Band	SAR (W/kg)	SAR peak location (cm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				X	Y	Z				
1#	Left cheek	CDMA BC1	0.299	46.84	-61.62	-4.57	86.653	1.643	0.02	Not Required
		WIFI 2.4GHZ	1.344	14.87	18.91	-3.32				

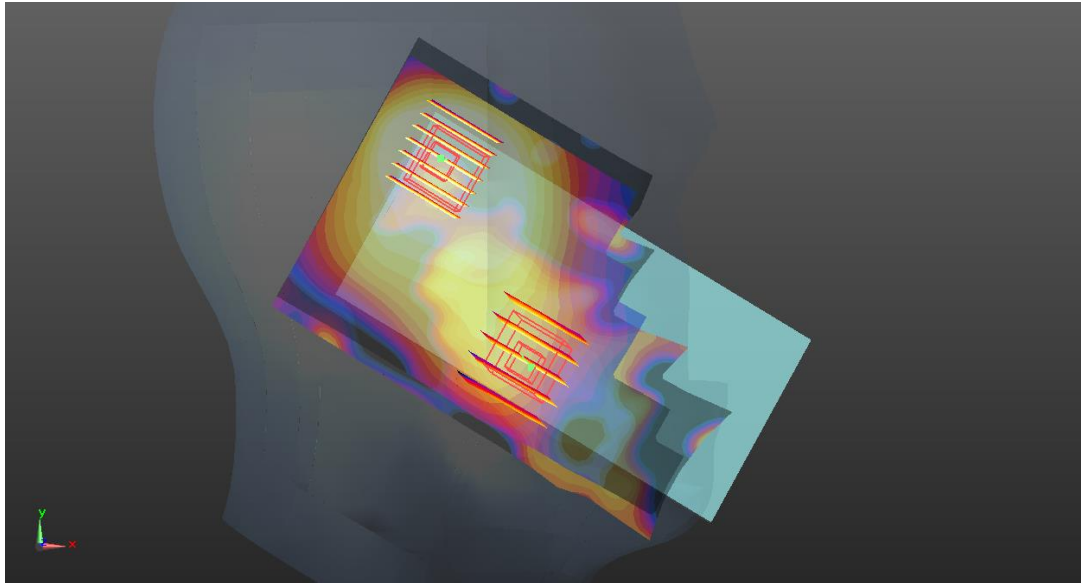


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Case No.	Position	Band	SAR (W/kg)	SAR peak location (cm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				X	Y	Z				
2#	Left cheek	LTE Band41	0.347	48.52	-58.43	-3.32	84.343	1.691	0.03	Not Required
		WIFI 2.4GHz	1.344	14.87	18.91	-3.32				



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9 Equipment list

Test Platform		SPEAG DASY5 Professional				
Description		SAR Test System (Frequency range 300MHz-6GHz)				
Software Reference		DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)				
Hardware Reference						
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration	
<input checked="" type="checkbox"/>	Twin Phantom	SPEAG	SAM 5	1481	NCR	NCR
<input checked="" type="checkbox"/>	Twin Phantom	SPEAG	SAM 6	1824	NCR	NCR
<input checked="" type="checkbox"/>	DAE	SPEAG	DAE4	1374	2021-11-05	2022-11-04
<input checked="" type="checkbox"/>	DAE	SPEAG	DAE4	1327	2021-11-05	2022-11-04
<input checked="" type="checkbox"/>	E-Field Probe	SPEAG	EX3DV4	3789	2021-08-12	2022-08-11
<input checked="" type="checkbox"/>	E-Field Probe	SPEAG	EX3DV4	7620	2021-08-24	2022-08-23
<input checked="" type="checkbox"/>	Validation Kits	SPEAG	D750V3	1210	2021-09-08	2024-09-07
<input checked="" type="checkbox"/>	Validation Kits	SPEAG	D835V2	4d256	2020-04-15	2023-04-14
<input checked="" type="checkbox"/>	Validation Kits	SPEAG	D1750V2	1105	2020-08-29	2023-08-28
<input checked="" type="checkbox"/>	Validation Kits	SPEAG	D1900V2	5d114	2020-08-27	2023-08-26
<input checked="" type="checkbox"/>	Validation Kits	SPEAG	D2450V2	1038	2020-04-08	2023-04-07
<input checked="" type="checkbox"/>	Validation Kits	SPEAG	D2600V2	1180	2021-05-12	2024-05-11
<input checked="" type="checkbox"/>	Dielectric parameter probes	SPEAG	DAKS-3.5	0005	2021-07-15	2022-07-14
<input checked="" type="checkbox"/>	Vector Network Analyzer and Vector Reflectometer	SPEAG	DAKS_VNA R140	0140913	2021-07-22	2022-07-21
<input checked="" type="checkbox"/>	Universal Radio Communication Tester	R&S	CMW500	169633	2021-02-20	2022-02-19
					2022-02-14	2023-02-13
<input checked="" type="checkbox"/>	Radio Communication Analyzer	Anritsu	MT8820C	6201010267	2021-04-01	2022-03-31
<input checked="" type="checkbox"/>	RF Bi-Directional Coupler	Agilent	86205-60001	MY31400031	NCR	NCR
<input checked="" type="checkbox"/>	Signal Generator	R&S	SMB100A	182393	2021-02-20	2022-02-19
					2022-02-15	2023-02-14
<input checked="" type="checkbox"/>	Preamplifier	Qiji	YX28980933	202104001	NCR	NCR
<input checked="" type="checkbox"/>	Power Meter	Aglient	E4419B	6843318103	2021-06-08	2022-06-07
<input checked="" type="checkbox"/>	Power Sensor	Aglient	E9301A	MY41496508	2021-09-09	2022-09-08
<input checked="" type="checkbox"/>	Power Sensor	Aglient	E9301H	MY41495605	2021-06-08	2022-06-07
<input checked="" type="checkbox"/>	Attenuator	SHX	TS2-3dB	30704	NCR	NCR
<input checked="" type="checkbox"/>	Coaxial low pass filter	Mini-Circuits	VLF-2500(+)	NA	NCR	NCR



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<input checked="" type="checkbox"/>	Coaxial low pass filter	Microlab Fxr	LA-F13	NA	NCR	NCR
<input checked="" type="checkbox"/>	DC POWER SUPPLY	SAKO	SK1730SL5A	NA	NCR	NCR
<input checked="" type="checkbox"/>	Speed reading thermometer	LKM	DTM3000	SUW201-30-01	2021-10-09	2022-10-08
<input checked="" type="checkbox"/>	Humidity and Temperature Indicator	MingGao	MingGao	NA	2021-06-16	2022-06-15

Note: All the equipments are within the valid period when the tests are performed.

10 Calibration certificate

Please see the Appendix C

11 Photographs

Please see the Appendix D

Appendix A: Detailed System Check Results

Appendix B: Detailed Test Results

Appendix C: Calibration certificate

Appendix D: Photographs

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