FCC SAR TEST REPORT

Application No.:	KSEM2005000543CR
Applicant:	DT Research, Inc.
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Manufacturer:	DT Research, Inc.
Address of Manufacturer:	2000 Concourse Drive, San Jose, CA 95131, USA
Factory:	DT Research, Inc.
Address of Factory:	6F., No.36 Wuquan 7 th Rd., Wugu Dist. New Taipei City 248 Taiwan
Product Name:	Rugged Tablet
Model No.(EUT):	DT300Q
Series Model:	DT300QXX(X=0-9,A-Z or blank)
Trade mark:	DT Research, Inc.
FCC ID:	YE3600-SC600TA
Standard(s) :	FCC 47CFR §2.1093
Date of Receipt:	2020-05-27
Date of Test:	2020-06-02 to 2020-06-08
Date of Issue:	2020-06-11
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Eric Lin

Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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REVISION HISTORY

Revision Record			
Version	**Description**	**Date**	**Remark**
00	Original	2020-06-11	Original

Authorized for issue by:				
		Richard.Kong **Richard.Kong/ Project Engineer**		
		Eric Lin **Eric.Lin/Reviewer**		

TEST SUMMARY

Frequency Band	Maximum Reported SAR(W/kg)
	Body
LTE Band 2	1.35
LTE Band 4	0.61
LTE Band 5	1.05
LTE Band 12	0.90
LTE Band 13	1.06
WI-FI (2.4GHz)	0.37
Bluetooth	0.17
WI-FI (5GHz)	0.95
SAR Limited(W/kg)	1.6
Maximum Simultaneous Transmission SAR (W/kg)	
Scenario	Body-worn
Sum SAR	1.72
SPLSR	0.03
SPLSR Limited	0.04

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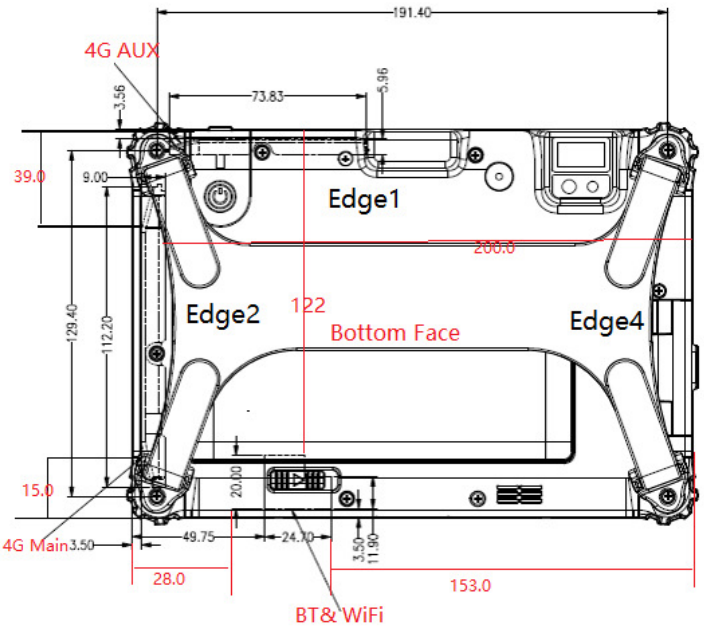
1 General Information

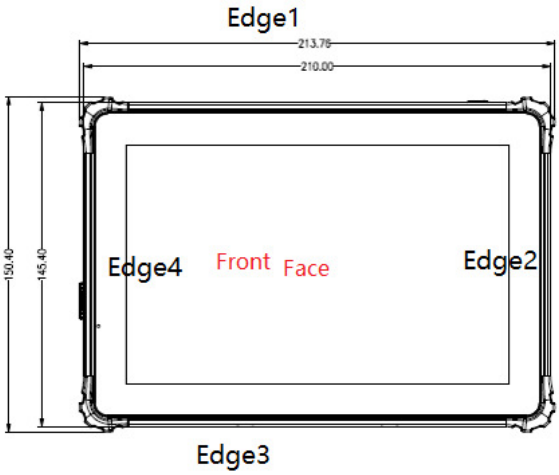
1.1 General Description of EUT

Device Type :	portable device		
Exposure Category:	uncontrolled environment / general population		
Product Phase:	production unit		
SN:	10ec9770		
Hardware Version:	BP01.005		
Software Version:	DT300QCMULSTA900.EVAL.05112020-TEST		
Antenna Type:	Integral Antenna		
Device Operating Configurations :			
Modulation Mode:	**LTE:** QPSK,16QAM; **WIFI:** DSSS; OFDM; **BT:** GFSK, π/4DQPSK,8DPSK		
Device Class:	B		
	3, tested with power control Max Power(LTE Band 2/4/5/12/13)		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	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 13	777~787	746~756
	WIFI 2.4G	2412~2462	2412~2462
	Bluetooth	2402~2480	2402~2480
	WIFI(U-NII-1)	5150~5250	5150~5250
	WIFI(U-NII-2A)	5250~5350	5250~5350
	WIFI(U-NII-2C)	5470~5725	5470~5725
	WIFI(U-NII-3)	5725~5850	5725~5850
Battery1 Information:	Model: ACC-006-317K		
	Rated capacity: 3.7V, 8800mAh, 32.56Wh		
	Manufacturer: GUANGDONG POW-TECH NEW POWER CO.,LTD		

Note1:
Model No.: DT300Q, DT300QXX(X=0-9,A-Z or blank)
Only the model DT300Q was tested, since the circuit design, PCB layout, electrical components used, internal wiring and functions were identical for the above models, with only different on model no.

1.1.1 DUT Antenna Locations(Back View)





The test device is a Rugged Tablet. The display diagonal dimension is 206mm and the overall diagonal dimension of this device is 250mm.

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

EUT Sides for SAR Testing					
Mode	Bottom Face	Edge1	Edge2	Edge3	Edge4
Main Antenna	Yes	Yes	Yes	Yes	No
2.4G WIFI	Yes	Yes	Yes	Yes	No
5G WiFi	Yes	Yes	Yes	Yes	No
Bluetooth	Yes	Yes	Yes	Yes	No

Table 1: EUT Sides for SAR Testing

Note:

1) Details please see Section 8.2 and 8.3

1.2 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radio frequency Radiation Exposure Evaluation: Portable Devices
ANSI/IEEE Std C95.1 – 1992	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 Procedures v03r01	3G SAR Measurement Procedures
KDB 248227 D01 802.11 Wi-Fi SAR v02r02	SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS
KDB 941225 D05 SAR for LTE Devices v02r05	SAR EVALUATION CONSIDERATIONS FOR LTE DEVICES
KDB 616217 D04 SAR for laptop and tablets v01r02	SAR EVALUATION CONSIDERATIONS FOR LAPTOP, NOTEBOOK, NETBOOK AND TABLET COMPUTERS
KDB447498 D01 General RF Exposure Guidance v06	Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies
KDB447498 D03 Supplement C Cross-Reference v01	OET Bulletin 65, Supplement C Cross-Reference
KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04	SAR Measurement Requirements for 100 MHz to 6 GHz
KDB 865664 D02 RF Exposure Reporting v01r02	RF Exposure Compliance Reporting and Documentation Considerations

1.3 RF exposure limits

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

Notes:

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

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

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

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

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

1.4 Test Location

Company: Compliance Certification Services Inc. Kun shan Laboratory
Address: No.10 Weiye Rd., Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China
Post code: 215300
Telephone: 86-512-57355888
Fax: 86-512-57370818
E-mail: sgs.china@sgs.com

1.5 Test Facility

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

- **CNAS (No. CNAS L4354)**

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 2541.01)**

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

- **FCC –Designation Number: CN1172**

Compliance Certification Services Inc. has been recognized as an accredited testing laboratory.

Designation Number: CN1172.

- **ISED (CAB identifier: CN0072)**

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory

CAB Identifier: CN0072.

- **VCCI (Member No.: 1938)**

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1600, C-1707, T-1499, G-10216 respectively.

2 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
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

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= σ (|Ei|2)/ ρ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

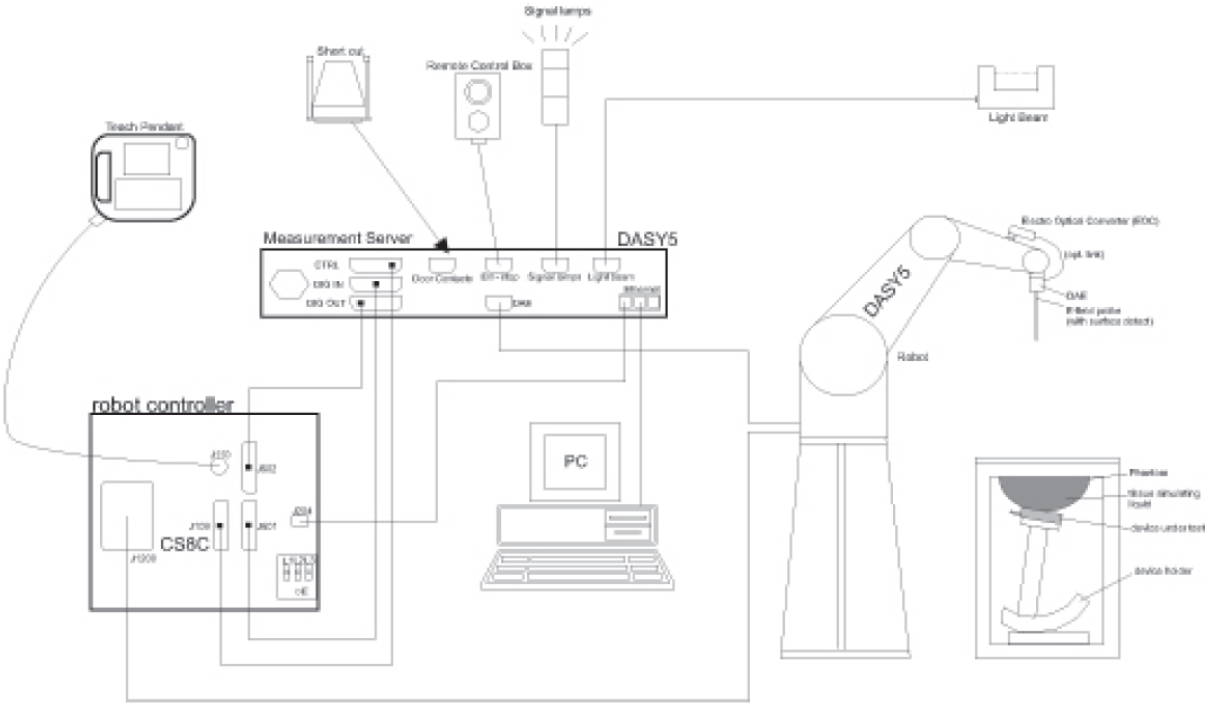
The DASY5 system for performing compliance tests consists of the following items:

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

- 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.

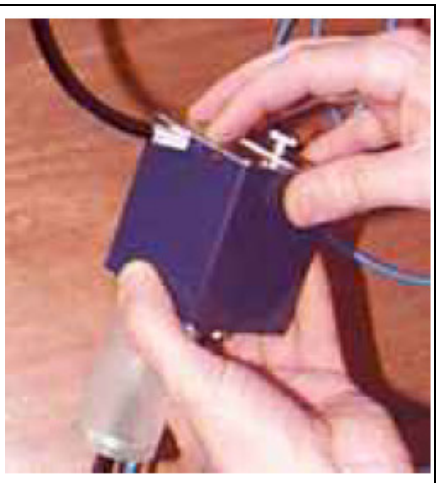
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 7.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand, right-hand 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 validat the proper functioning of the system.

3.2 Isotropic E-field Probe EX3DV4

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

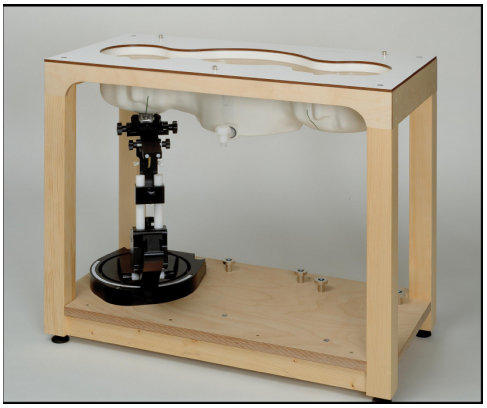
3.3 Data Acquisition Electronics (DAE)

Model	DAE4
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

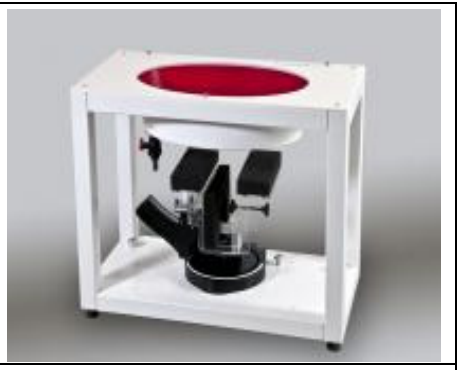
Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	approx.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

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.

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 ε=3 and loss tangent δ=0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

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 30mm*30mm*30mm (fine resolution volume scan, zoom scan) was assessed by measuring 5x5x7 points (≤2GHz)and 7x7x7 points (≥2GHz). 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. 1528-2003.

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
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 ≤ 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 1st 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	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details. * When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

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. ± 5 %

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 ".DAE3". 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], [℃], [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:

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

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

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

E-field probes:

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

H-field probes:

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

With Vi = compensated signal of channel i (i = x, y, z)
Normi = sensor sensitivity of channel I (i = x, y, z)
[mV/(V/m)2] for E-field Probes
ConvF = sensitivity enhancement in solution
aij = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strength of channel i in V/m
Hi = magnetic field strength of channel i in A/m

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

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

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

$$SAR = (Etot^2 \cdot \sigma) / (\varepsilon \cdot 1000)$$

With SAR = local specific absorption rate in mW/g
Etot = 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.

$$P_{pwe} = E_{tot}{}^2{}_2 / 3770 \quad \text{or} \quad P_{pwe} = H_{tot}^2 \cdot 37.7$$

with Ppwe = equivalent power density of a plane wave in mW/cm2
Etot = total electric field strength in V/m
Htot = total magnetic field strength in A/m

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 (~ 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.

5 Description of Test Position

5.1 Body Exposure Condition/ The Body Test Position

This EUT was tested in four different positions. They are Bottom Face, Edge 1, Edge 2 and Edge 3 of tablet. In these positions, the surface of EUT is touching phantom with 0 mm. The SAR Exclusion Threshold in KDB 447498 D01 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent device surface is used to determine if SAR testing is required for the adjacent surfaces, with the adjacent surface positioned against the phantom and the surface containing the antenna positioned perpendicular to the phantom.

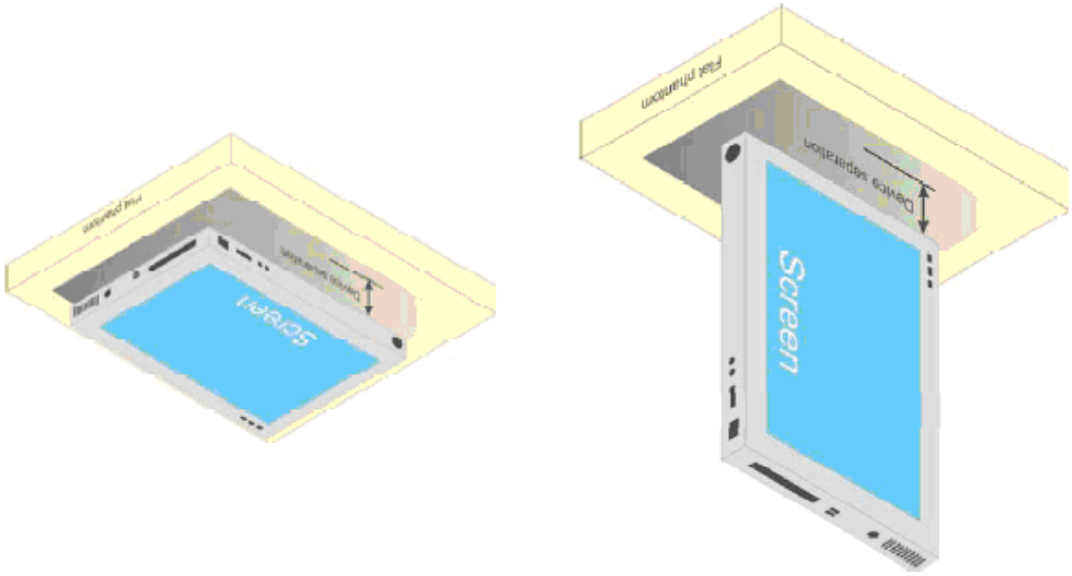


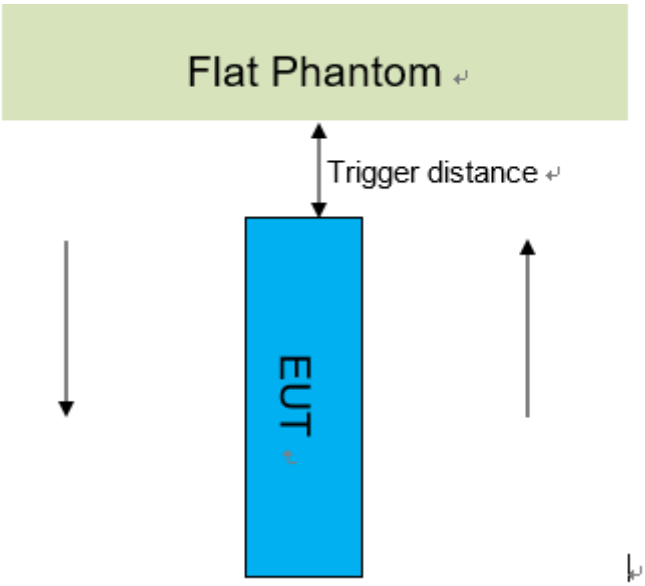
Fig Illustration for Lap-touching Position

5.2 Proximity Sensor Triggering Test

5.2.1 Proximity sensor triggering distances

1）. Proximity sensor triggering distances

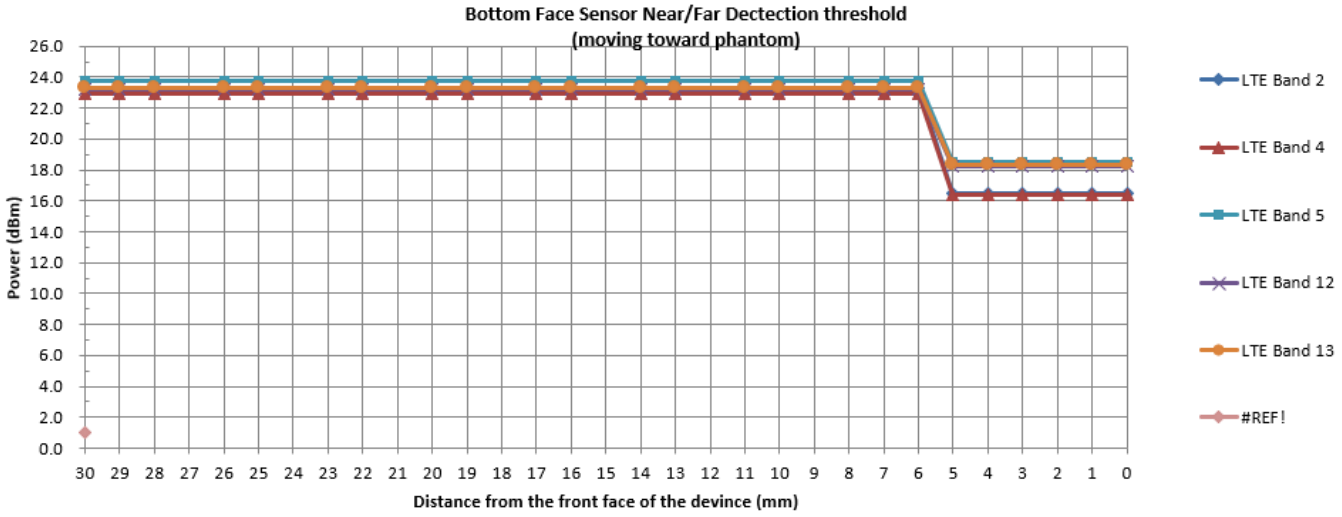
The Proximity sensor triggering was applied to LTE Band 2, 4,5,12 and 13. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, 6.3 and 6.4, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed.

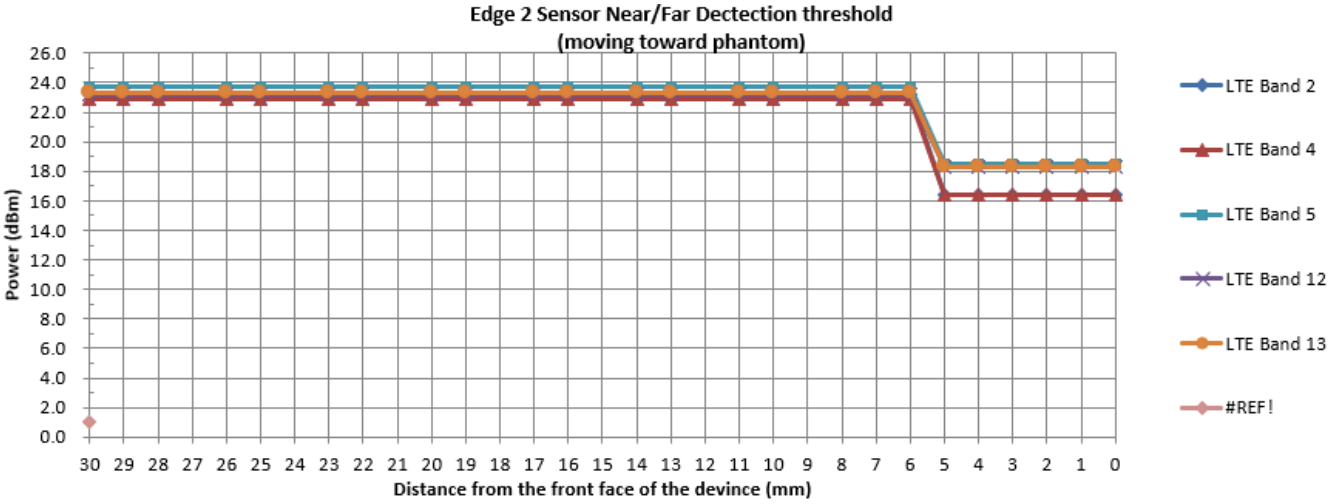


Position	Band	Measured Power(dBm)		Reduction levels(dB)
		Max. Power distance>5mm	Power back-off 0mm=<distance<=5mm	
for Bottom Face and Edge 2	LTE Band 2	23.26	16.44	6.82
	LTE Band 4	22.89	16.43	6.46
	LTE Band 5	23.72	18.55	5.17
	LTE Band 12	23.23	18.26	4.79
	LTE Band 13	23.3	18.3	5.00

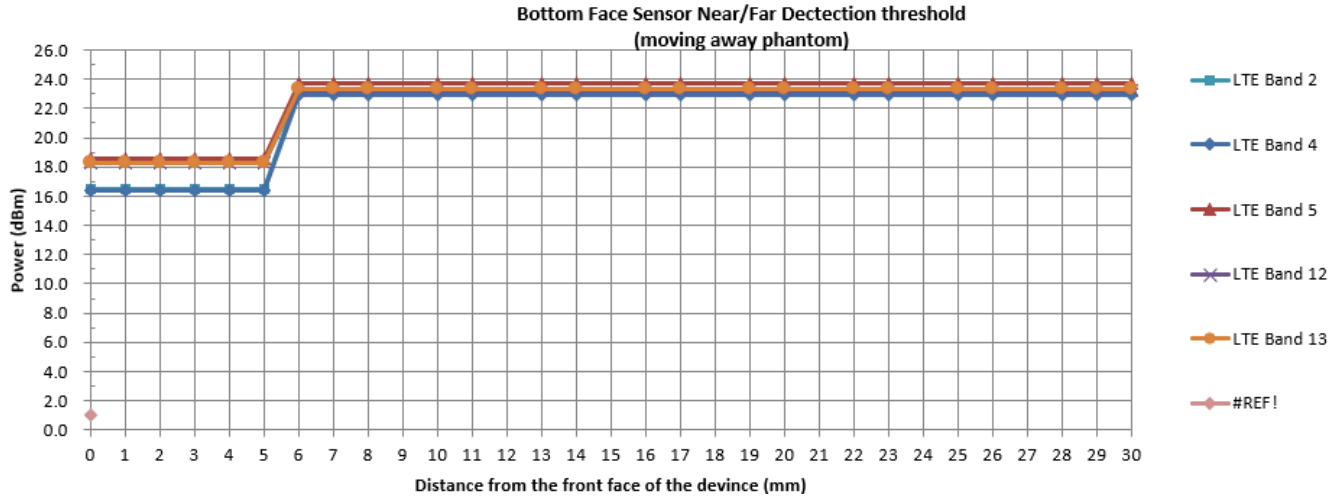
Note: SAR tests with proximity sensor power reduction are only required for the sides of frequency bands in the table above. For the other sides the device, SAR is still tested at the maximum power level with sensor off.

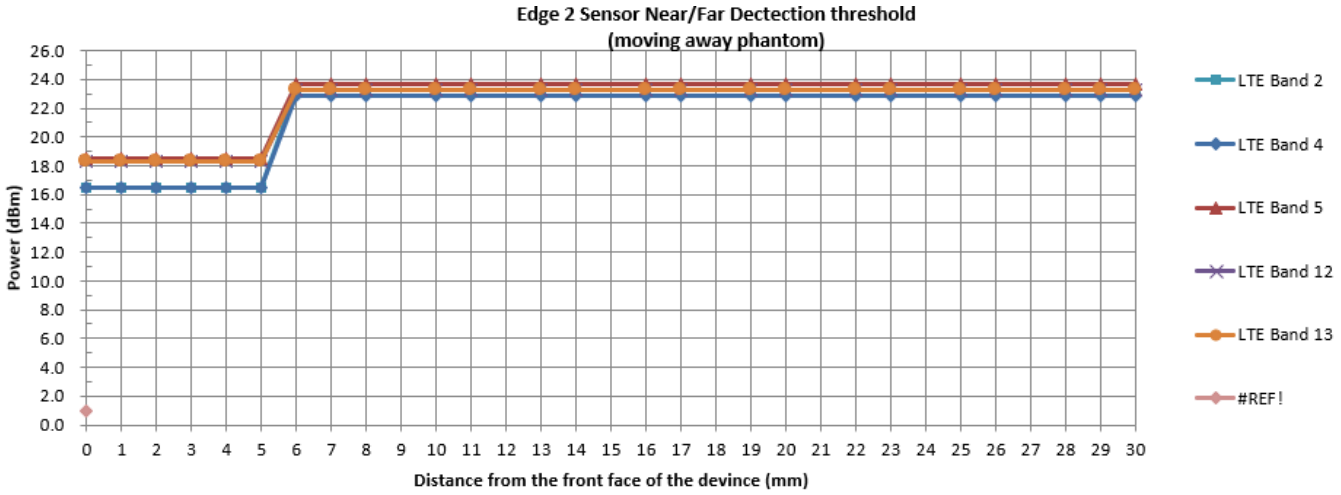
- DUT Moving Toward（Trigger）the Phantom





- DUT Moving Away（Release）from the Phantom





2）. Proximity sensor coverage

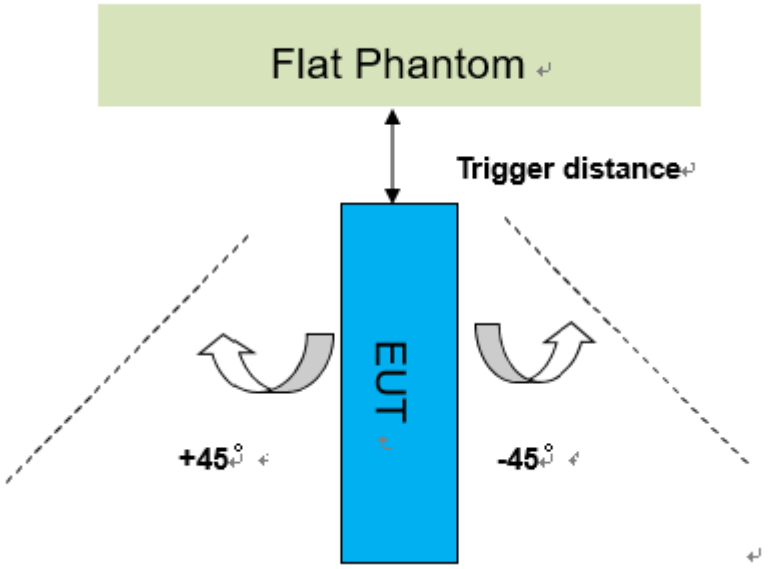
If a sensor is spatially offset from the antenna(s), it is necessary to verify sensor triggering for conditions where the antenna is next to the user but the sensor is laterally further away to ensure sensor coverage is sufficient for reducing the power to maintain compliance. For p-sensor coverage testing, the device is moved and “along the direction of maximum antenna and sensor offset”.

The proximity sensor and main antenna use same metallic electrode, so there is no spatial offset.

3）. Device tilt angle influences to proximity sensor triggering

The influence of device tilt angles to proximity sensor triggering was determined by positioning each tablet edge that contains a transmitting antenna, perpendicular to the flat phantom.

Rotating the tablet around the edge next to the phantom in ≤ 10° increments until the tablet is ± 45° from the vertical position at 0°, and the maximum output power remains in the reduced mode. The model prototype only take effect on surface of the Edge2.



	Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering for Edge2			

Band (MHz)	Minimum trigger distance Per KDB616217§6.2	Minimum trigger distance at which power reduction was maintained over ±45°	Power Reduction Status										
			-45°	-35°	-25°	-15°	-5°	0°	5°	15°	25°	35°	45°
LTE B2	5mm	5mm	on	on	on	on	on	on	on	on	on	on	on
LTE B4	5mm	5mm	on	on	on	on	on	on	on	on	on	on	on
LTE B5	5mm	5mm	on	on	on	on	on	on	on	on	on	on	on
LTE B12	5mm	5mm	on	on	on	on	on	on	on	on	on	on	on
LTE B13	5mm	5mm	on	on	on	on	on	on	on	on	on	on	on

6 SAR System Verification Procedure

6.1 Tissue Simulate Liquid

6.1.1 Recipes for Tissue Simulate Liquid

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

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78
HSL5GHz is composed of the following ingredients： Water：50-65% Mineral oil：10-30% Emulsifiers：8-25% Sodium salt：0-1.5%										
MSL5GHz is composed of the following ingredients： Water：64-78% Mineral oil：11-18% Emulsifiers：9-15% Sodium salt：2-3%										

Table 3：Recipe of Tissue Simulate Liquid

6.1.2 Test Liquids Confirmation

Simulated tissue liquid parameter confirmation

The dielectric parameters were checked prior to assessment using the SPEAG DAK3.5 dielectric probe kit. The dielectric parameters measured are reported in each correspondent section.

IEEE SCC-34/SC-2 P1528 recommended tissue dielectric parameters

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations and extrapolated according to the head parameters specified in P1528

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

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

6.1.3 Measurement for Tissue Simulate Liquid

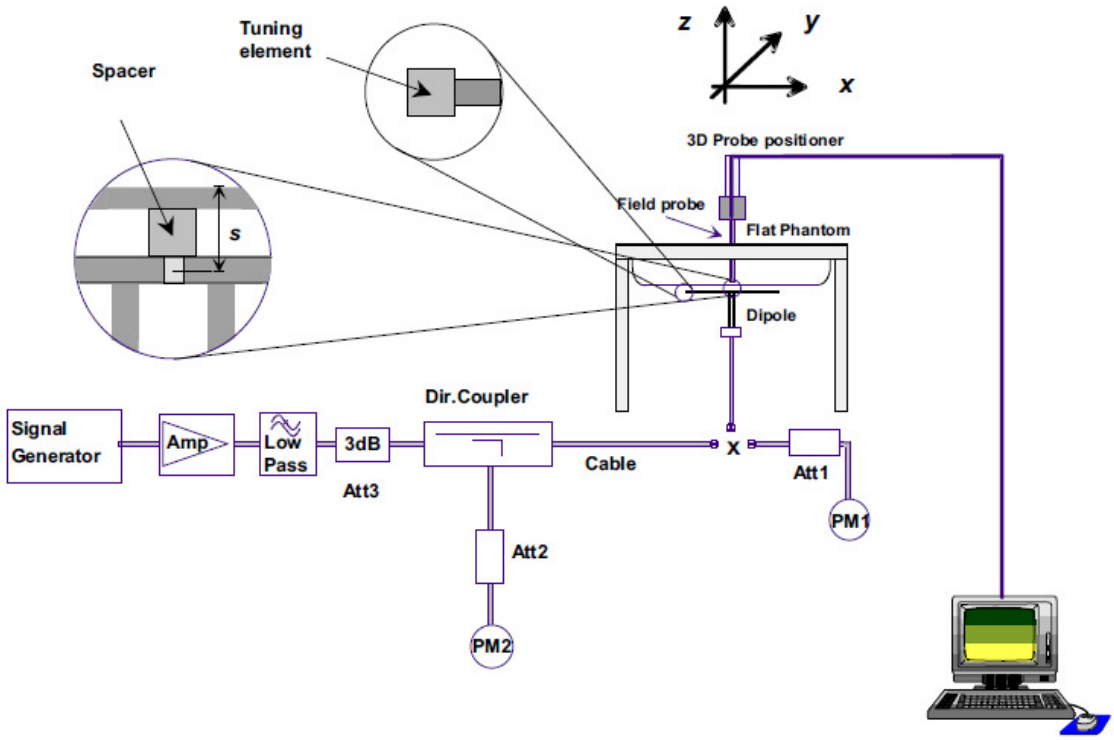
The dielectric properties for this Tissue Simulate Liquids were measured by using the Agilent Model 85070E Dielectric Probe in conjunction with Agilent E5071C Network Analyzer (300 KHz-8500 MHz). The Conductivity (σ) and Permittivity (ρ) are listed in bellow table. For the SAR measurement given in this report. The temperature variation of the Tissue Simulate Liquids was 22±2℃.

Tissue Type	Measured Frequency（MHz）	Target Tissue (±5%)		Measured Tissue		Liquid Temp.	Measured Date
		ε_r	σ(S/m)	ε_r	σ(S/m)	(℃)	
750 Head	750	41.9 (39.81~44)	0.89 (0.85~0.94)	41.649	0.895	22.1	2020/6/5
835 Head	835	41.5 (39.43~43.58)	0.90 (0.86~0.95)	40.849	0.886	22.1	2020/6/4
1800 Head	1800	40.0 (38.00~42.00)	1.40 (1.33~1.47)	40.258	1.384	22.2	2020/6/8
1900 Head	1900	40.0 (38.00~42.00)	1.40 (1.33~1.47)	40.640	1.372	22.3	2020/6/6
2450 Head	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	38.488	1.878	22	2020/6/2
5250Head	5250	35.9 (34.11~37.70)	4.71 (4.47~4.95)	36.389	4.768	22.2	2020/6/3
5600 Head	5600	35.5 (33.73~37.28)	5.07 (4.82~5.32)	35.759	5.182	22.2	2020/6/3
5750 Head	5750	35.4 (33.63~37.17)	5.22 (4.96~5.48)	35.267	5.332	22.2	2020/6/3

Table 4：Measurement result of Tissue electric parameters

6.2 SAR System Check

The microwave circuit arrangement for system check is sketched in bellow figure. 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. During the tests, the ambient temperature of the laboratory was in the range 22±2℃, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15 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-3. the microwave circuit arrangement used for SAR system verification

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.

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. (℃)	Measured Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)		
D750 V2	Head	2.19	1.45	8.76	5.8	8.23 (7.41~9.05)	5.41 (4.87~5.95)	22.1	2020/6/5
D835 V2	Head	2.45	1.63	9.8	6.52	9.41 (8.47~10.35)	6.25 (5.63~6.88)	22.1	2020/6/4
D1800 V2	Head	9.91	4.77	39.64	19.08	38.4 (34.56~42.24)	20.2 (18.18~22.22)	22.2	2020/6/8
D1900 V2	Head	9.98	4.76	39.92	19.04	39.7 (35.73~43.67)	20.5 (18.45~22.55)	22.3	2020/6/6
D2450 V2	Head	12.9	6	51.6	24	53 (47.70~58.30)	24.6 (22.14~27.60)	22	2020/6/2
Validation Kit		**Measured SAR 100mW**	**Measured SAR 100mW**	**Measured SAR (normalized to 1W)**	**Measured SAR (normalized to 1W)**	**Target SAR (normalized to 1W) (±10%)**	**Target SAR (normalized to 1W) (±10%)**	**Liquid Temp. (℃)**	**Measured Date**
		1g (W/kg)	**10g (W/kg)**	**1g (W/kg)**	**10g (W/kg)**	**1-g(W/kg)**	**10-g(W/kg)**		
D5GHz V2	Head	7.72	2.21	77.2	22.1	77.7 (69.93~85.47)	22.4 (20.16~24.64)	22.2	2020/6/3
	Head	8.4	2.45	84	24.5	81.2 (73.08~89.32)	23.5 (21.15~25.85)	22.2	2020/6/3
	Head	8.33	2.36	83.3	23.6	78.9 (71.01~86.79)	22.7 (20.43~24.97)	22.2	2020/6/3

Table 5: SAR System Check Result

6.2.3 Detailed System Check Results

Please see the Appendix A

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 ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

7.2 Operation Configurations

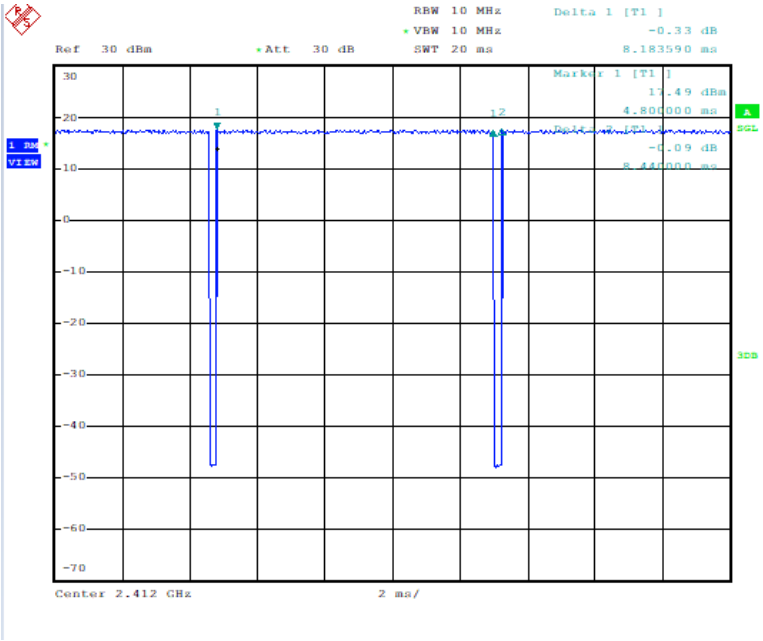
7.2.1 WiFi Test Configuration

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.

7.2.1.1 Duty cycle

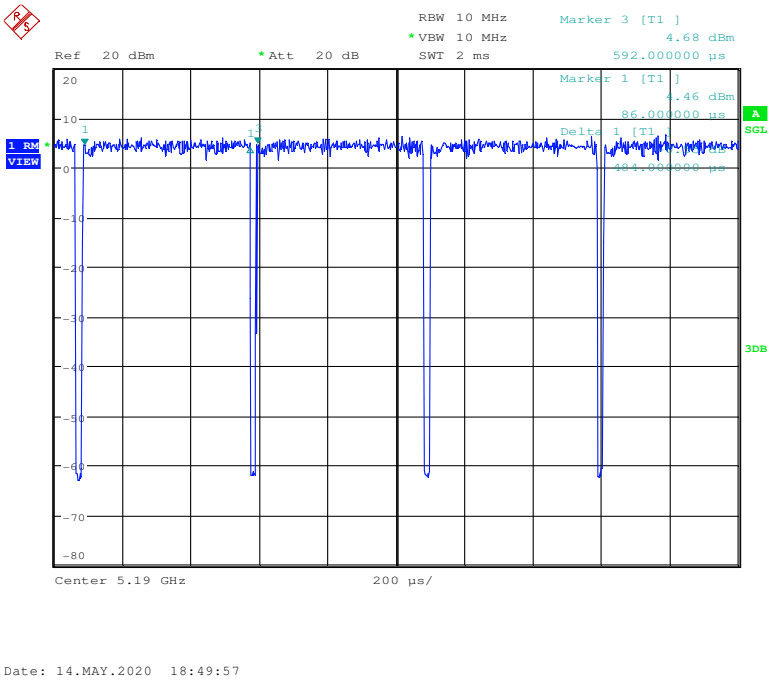
1) 2.4GHz Wi-Fi 802.11b:

WIFI1 802.11b 11M: Duty cycle=8.18359/8.44=96.96%



2) 5GHz Wi-Fi 802.11n HT40:

WIFI1 802.11n HT40 MCS0: Duty cycle=484/(592-86)=95.65%



7.2.1.2 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.

7.2.1.3 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.

7.2.1.4 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.

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”

7.2.1.5 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.

7.2.1.6 5 GHz WiFi SAR Procedures

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

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

1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, both bands are tested independently for SAR.
2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, both bands are tested independently for SAR.
3) The two U-NII bands may be aggregated to support a 160 MHz channel on channel number 50. Without additional testing, the maximum output power for this is limited to the lower of the maximum output power certified for the two bands. When SAR measurement is required for at least one of the bands and the highest reported SAR adjusted by the ratio of specified maximum output power of aggregated to standalone band is > 1.2 W/kg, SAR is required for the 160 MHz channel. This procedure does not apply to an aggregated band with maximum output higher than the standalone band(s); the aggregated band must be tested independently for SAR. SAR is not required when the 160 MHz channel is operating at a reduced maximum power and also qualifies for SAR test exclusion.

- **U-NII-2C and U-NII-3 Bands**

The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. when Terminal Doppler Weather Radar (TDWR) restriction applies, all channels that operate at 5.60 – 5.65 GHz must be included to apply the SAR test reduction and measurement procedures.

When the same transmitter and antenna(s) are used for U-NII-2C band and U-NII-3 band or 5.8 GHz band of §15.247, the bands may be aggregated to enable additional channels with 20, 40 or 80 MHz bandwidth to span across the band gap, as illustrated in Appendix B. The maximum output power for the additional band gap channels is limited to the lower of those certified for the bands. Unless band gap channels are permanently disabled, they must be considered for SAR testing. The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support

SAR measurements. To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz may be grouped with the 5.8 GHz channels in U-NII-3 or §15.247 band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels. When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

- **OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements**

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

1) The largest channel bandwidth configuration is selected among the multiple configurations with the same specified maximum output power.
2) If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
3) If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected.
4) When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n. After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.
    a) The channel closest to mid-band frequency is selected for SAR measurement.
    b) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

- **SAR Test Requirements for OFDM configurations**

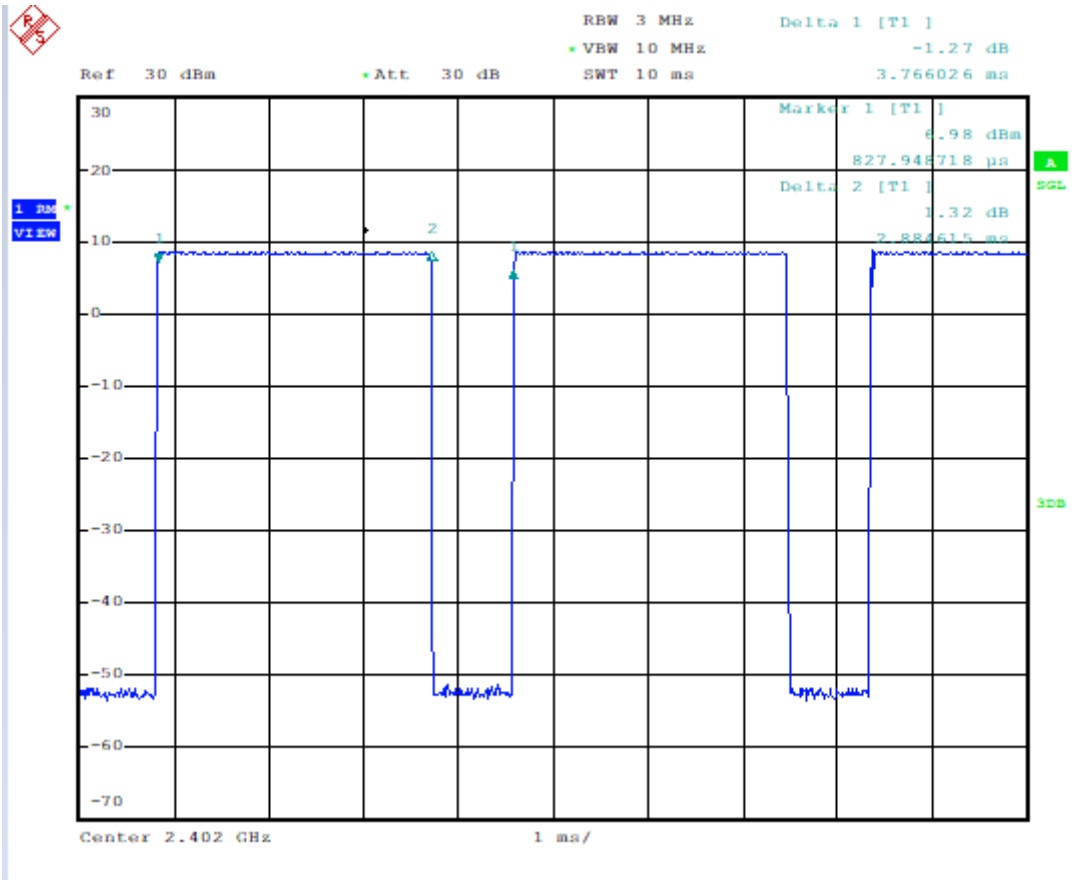
When SAR measurement is required for 802.11 a/n/ac OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. When the same transmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction applies. When band gap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

7.2.2 BluetoothTest Configuration

For the Bluetooth SAR tests, a communication link is set up with the test mode software for BT mode test. Bluetooth USES frequency hopping technology to divide the transmitted data into packets and transmit the packets respectively through 79 designated Bluetooth channels, 1MHz Bandwidth, frequency hops at 1600 hops/second per the Bluetooth standard. The Radio Frequency Channel Number (RFCN) is allocated to 0, 39 and 78 respectively in the case of 2402~2480 MHz during the test at each test frequency channel, the EUT is operated at the RF continuous emission mode.

7.2.2.1 Duty cycle

Bluetooth duty cycle: 2.884615/3.766026=76.60%



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 R&S CMW500 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.

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 V13.5.0 (201609) 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

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..

8 Test Result

8.1 Measurement of RF Conducted Power

8.1.1 Conducted Power Of LTE

LTE Band 2_Sensor Off				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 18607	Channel 18900	Channel 19193	Tune up
1.4MHz	QPSK	1	0	22.87	22.83	23.19	23.5
		1	2	22.92	22.84	23.16	23.5
		1	5	22.78	22.8	23.15	23.5
		3	0	23.02	23.09	23.18	23.5
		3	2	23.16	23.14	23.23	23.5
		3	3	22.98	23.08	23.19	23.5
		6	0	22.02	21.95	22.13	22.5
	16QAM	1	0	22.08	22.26	22.27	22.5
		1	2	22.13	22.15	22.21	22.5
		1	5	22.02	22.11	22.2	22.5
		3	0	22.34	22.25	22.1	22.5
		3	2	22.25	22.28	22.16	22.5
		3	3	22.37	22.26	22.17	22.5
		6	0	21.26	20.79	21.16	21.5
Bandwidth	Modulation	RB size	RB offset	Channel 18615	Channel 18900	Channel 19185	Tune up
3MHz	QPSK	1	0	22.97	23.18	23.2	23.5
		1	7	22.9	23.12	23.2	23.5
		1	14	22.9	23.01	22.99	23.5
		8	0	22	21.99	22.12	22.5
		8	4	22.09	21.99	22.18	22.5
		8	7	22.01	22.01	22.08	22.5
		15	0	21.99	21.97	22.22	22.5
	16QAM	1	0	22.15	22.31	22.11	22.5
		1	7	22.27	22.2	22.14	22.5
		1	14	22.07	22.01	21.97	22.5
		8	0	21.09	21.06	21.29	21.5
		8	4	21.2	21.13	21.26	21.5
		8	7	21.11	21.08	21.18	21.5
		15	0	20.97	21.06	21.22	21.5
Bandwidth	Modulation	RB size	RB offset	Channel 18625	Channel 18900	Channel 19175	Tune up
5MHz	QPSK	1	0	23.14	22.99	23.12	23.5
		1	13	23.15	22.81	23.18	23.5
		1	24	23.19	22.86	23.13	23.5
		12	0	22.14	22.01	22.31	22.5
		12	6	22.1	22	22.23	22.5

		12	13	22.14	21.91	22.29	22.5
		25	0	22.21	22.04	22.31	22.5
	16QAM	1	0	22.44	22.12	22.31	22.5
		1	13	22.29	22.29	22.43	22.5
		1	24	22.27	22.45	22.11	22.5
		12	0	21.34	21.1	21.38	21.5
		12	6	21.27	21.11	21.29	21.5
		12	13	21.22	21	21.34	21.5
		25	0	21.12	21.06	21.35	21.5
Bandwidth	Modulation	RB size	RB offset	Channel 18650	Channel 18900	Channel 19150	Tune up
10MHz	QPSK	1	0	23.19	23.18	23.14	23.5
		1	25	23.04	23.1	23.18	23.5
		1	49	22.8	23.19	22.75	23.5
		25	0	22.1	22.03	22.41	22.5
		25	13	22.12	22.03	22.33	22.5
		25	25	22.19	22.05	22.31	22.5
		50	0	22.25	22.07	22.36	22.5
	16QAM	1	0	22.34	22.28	22.21	22.5
		1	25	22.07	22.49	22.25	22.5
		1	49	22.07	22.2	21.74	22.5
		25	0	21.31	21.03	21.3	21.5
		25	13	21.24	21.08	21.28	21.5
		25	25	21.31	21.08	21.38	21.5
		50	0	21.23	21.11	21.24	21.5
Bandwidth	Modulation	RB size	RB offset	Channel 18675	Channel 18900	Channel 19125	Tune up
15MHz	QPSK	1	0	23.19	23.02	23.19	23.5
		1	38	22.94	22.77	23.05	23.5
		1	74	22.85	22.97	23.17	23.5
		36	0	22.01	21.85	21.98	22.5
		36	18	21.92	21.8	21.99	22.5
		36	39	21.92	21.72	22.2	22.5
		75	0	21.92	21.83	22.12	22.5
	16QAM	1	0	22.31	22.31	21.66	22.5
		1	38	22.13	22.18	21.67	22.5
		1	74	21.93	22.21	21.7	22.5
		36	0	21.08	20.86	20.92	21.5
		36	18	20.93	20.78	21	21.5
		36	39	20.96	20.83	20.98	21.5
		75	0	20.9	20.89	20.98	21.5
Bandwidth	Modulation	RB size	RB offset	Channel 18700	Channel 18900	Channel 19100	Tune up
20MHz	QPSK	1	0	**23.07**	**23.03**	**23.26**	23.5
		1	50	22.73	22.81	22.88	23.5

		1	99	23.03	23.02	23.21	23.5
		50	0	21.95	21.79	**22.16**	22.5
		50	25	21.77	21.75	21.99	22.5
		50	50	21.91	21.84	22.07	22.5
		100	0	22.04	21.86	**22.13**	22.5
	16QAM	1	0	22.41	22.4	22.42	22.5
		1	50	22.15	22.07	22.31	22.5
		1	99	22.13	22.04	22.31	22.5
		50	0	21.23	20.96	21.27	21.5
		50	25	21.17	20.99	21.28	21.5
		50	50	21.25	21	21.31	21.5
		100	0	21.22	21.02	21.26	21.5

LTE Band 4_Sensor Off				**Conducted Power(dBm)**			
Bandwidth	Modulation	RB size	RB offset	Channel 19957	Channel 20175	Channel 20393	Tune up
1.4MHz	QPSK	1	0	22.62	22.51	22.69	23.5
		1	3	22.82	22.64	22.74	23.5
		1	5	22.71	22.57	22.67	23.5
		3	0	22.57	22.62	22.7	23.5
		3	1	22.61	22.63	22.7	23.5
		3	3	22.6	22.56	22.67	23.5
		6	0	21.6	21.56	21.56	22.5
	16QAM	1	0	21.55	21.82	21.77	22.5
		1	3	21.66	21.94	21.72	22.5
		1	5	21.65	21.9	21.72	22.5
		3	0	21.73	21.73	21.64	22.5
		3	1	21.74	21.72	21.63	22.5
		3	3	21.7	21.74	21.65	22.5
		6	0	20.82	20.5	20.79	21.5
Bandwidth	Modulation	RB size	RB offset	Channel 19965	Channel 20175	Channel 20385	Tune up
3MHz	QPSK	1	0	22.74	22.64	22.58	23.5
		1	8	22.6	22.54	22.49	23.5
		1	14	22.74	22.6	22.52	23.5
		8	0	21.59	21.68	21.61	22.5
		8	4	21.61	21.66	21.66	22.5
		8	7	21.58	21.51	21.64	22.5
		15	0	21.62	21.49	21.59	22.5
	16QAM	1	0	21.71	21.96	21.65	22.5
		1	8	21.64	21.9	21.49	22.5
		1	14	21.65	21.88	21.5	22.5
		8	0	20.7	20.74	20.73	21.5
		8	4	20.73	20.62	20.8	21.5

		8	7	20.69	20.6	20.8	21.5
		15	0	20.59	20.58	20.69	21.5
Bandwidth	Modulation	RB size	RB offset	Channel 19975	Channel 20175	Channel 20375	Tune up
5MHz	QPSK	1	0	22.66	22.83	22.84	23.5
		1	12	22.66	22.65	22.8	23.5
		1	24	22.68	22.62	22.68	23.5
		12	0	21.66	21.7	21.73	22.5
		12	7	21.65	21.55	21.73	22.5
		12	13	21.7	21.46	21.63	22.5
		25	0	21.69	21.57	21.74	22.5
	16QAM	1	0	21.74	22.18	21.83	22.5
		1	1	21.74	22.11	21.81	22.5
		1	2	21.69	22.16	21.75	22.5
		12	3	20.84	20.91	20.85	21.5
		12	4	20.67	20.72	20.84	21.5
		12	5	20.69	20.65	20.74	21.5
		25	6	20.64	20.64	20.76	21.5
Bandwidth	Modulation	RB size	RB offset	Channel 20000	Channel 20175	Channel 20350	Tune up
10MHz	QPSK	1	0	22.72	22.71	22.85	23.5
		1	25	22.74	22.5	22.58	23.5
		1	49	22.82	22.83	22.6	23.5
		25	0	21.67	21.62	21.68	22.5
		25	12	21.65	21.55	21.62	22.5
		25	25	21.83	21.65	21.75	22.5
		50	0	21.82	21.64	21.82	22.5
	16QAM	1	0	21.9	22.12	21.91	22.5
		1	25	21.69	21.87	21.51	22.5
		1	49	21.92	22.21	21.65	22.5
		25	0	20.8	20.62	20.7	21.5
		25	12	20.71	20.56	20.72	21.5
		25	25	20.89	20.68	20.88	21.5
		50	0	20.8	20.68	20.84	21.5
Bandwidth	Modulation	RB size	RB offset	Channel 20025	Channel 20175	Channel 20325	Tune up
15MHz	QPSK	1	0	22.63	22.64	22.53	23.5
		1	37	22.59	22.52	22.41	23.5
		1	74	22.42	22.56	22.24	23.5
		36	0	21.59	21.56	21.58	22.5
		36	20	21.53	21.53	21.5	22.5
		36	39	21.57	21.48	21.51	22.5
		75	0	21.55	21.53	21.45	22.5
	16QAM	1	0	22.01	21.84	21.55	22.5
		1	37	21.84	21.75	21.46	22.5

		1	74	21.84	21.85	21.29	22.5
		36	0	20.57	20.6	20.56	21.5
		36	20	20.55	20.6	20.56	21.5
		36	39	20.61	20.52	20.47	21.5
		75	0	20.63	20.62	20.52	21.5
Bandwidth	Modulation	RB size	RB offset	Channel 20050	Channel 20175	Channel 20300	Tune up
20MHz	QPSK	1	0	**22.89**	**22.77**	**22.81**	23.5
		1	49	22.85	22.75	22.79	23.5
		1	99	22.72	22.74	22.64	23.5
		50	0	**21.87**	**21.79**	**21.77**	22.5
		50	24	21.8	21.78	21.69	22.5
		50	50	21.78	21.74	21.66	22.5
		100	0	**21.91**	21.83	21.8	22.5
	16QAM	1	0	22.21	21.98	21.67	22.5
		1	49	21.99	21.86	21.6	22.5
		1	99	21.97	22.01	21.44	22.5
		50	0	20.77	20.74	20.68	21.5
		50	24	20.7	20.71	20.7	21.5
		50	50	20.74	20.68	20.62	21.5
		100	0	20.83	20.76	20.64	21.5

LTE Band 5_Sensor Off				**Conducted Power(dBm)**			
Bandwidth	Modulation	RB size	RB offset	Channel 20407	Channel 20525	Channel 20643	Tune up
1.4MHz	QPSK	1	0	23.07	23.05	23.22	24
		1	3	23.08	23.41	23.61	24
		1	5	23.05	23.42	23.56	24
		3	0	23.02	23.36	23.46	24
		3	1	23.02	23.38	23.45	24
		3	3	23.06	23.37	23.45	24
		6	0	21.98	22.39	22.41	23
	16QAM	1	0	22.43	22.15	22.21	23
		1	3	22.43	22.6	22.5	23
		1	5	22.4	22.56	22.51	23
		3	0	22.19	22.45	22.61	23
		3	1	22.19	22.46	22.62	23
		3	3	22.19	22.44	22.61	23
		6	0	20.95	21.6	21.56	22
Bandwidth	Modulation	RB size	RB offset	Channel 20415	Channel 20525	Channel 20635	Tune up
3MHz	QPSK	1	0	23.16	23.43	23.08	24
		1	8	23.13	23.52	23.43	24
		1	14	22.94	23.36	23.47	24

		8	0	22.01	22.42	22.54	23
		8	4	22.02	22.34	22.49	23
		8	7	21.91	22.32	22.52	23
		15	0	22.05	22.41	22.51	23
	16QAM	1	0	22.21	22.48	22.07	23
		1	8	22.1	22.89	22.48	23
		1	14	22.01	22.79	22.4	23
		8	0	21.12	21.47	21.64	22
		8	4	21.15	21.47	21.65	22
		8	7	21.02	21.42	21.69	22
		15	0	21.02	21.43	21.52	22
Bandwidth	Modulation	RB size	RB offset	Channel 20425	Channel 20525	Channel 20625	Tune up
5MHz	QPSK	1	0	23.19	23.16	23.28	24
		1	12	23.08	23.46	23.65	24
		1	24	23.04	23.38	23.62	24
		12	0	22.11	22.45	22.58	23
		12	7	22.07	22.44	22.59	23
		12	13	22.04	22.38	22.48	23
		25	0	22.05	22.45	22.56	23
	16QAM	1	0	22.27	22.58	22.32	23
		1	1	22.18	22.89	22.69	23
		1	2	22.11	22.81	22.69	23
		12	3	21.19	21.58	21.65	22
		12	4	21.07	21.64	21.67	22
		12	5	21.02	21.58	21.56	22
		25	6	21.03	21.54	21.58	22
Bandwidth	Modulation	RB size	RB offset	Channel 20450	Channel 20525	Channel 20600	Tune up
10MHz	QPSK	1	0	22.98	23.34	23.49	24
		1	25	23.01	23.1	23.31	24
		1	49	**23.26**	**23.55**	**23.72**	24
		25	0	21.93	22.33	**22.41**	23
		25	12	21.95	22.18	22.38	23
		25	25	21.99	22.29	22.32	23
		50	0	21.91	22.23	**22.41**	23
	16QAM	1	0	22.34	22.64	22.35	23
		1	25	22.09	22.76	22.68	23
		1	49	22.21	22.83	22.48	23
		25	0	21.17	21.39	21.73	22
		25	12	21.17	21.46	21.73	22
		25	25	21.2	21.59	21.88	22
		50	0	21.16	21.55	21.82	22

LTE FDD Band 12_Sensor Off	Conducted Power(dBm)

Bandwidth	Modulation	RB size	RB offset	Channel 23017	Channel 23095	Channel 23173	Tune up
1.4MHz	QPSK	1	0	23.18	22.59	22.59	23.5
		1	3	23.16	22.66	22.92	23.5
		1	5	23.06	22.67	22.93	23.5
		3	0	23.07	22.57	22.79	23.5
		3	1	23.18	22.67	22.86	23.5
		3	3	23.01	22.67	22.87	23.5
		6	0	22.13	21.8	21.91	22.5
	16QAM	1	0	22.71	21.65	21.73	22.5
		1	3	22.7	21.68	22.03	22.5
		1	5	22.6	21.68	21.99	22.5
		3	0	22.31	21.65	22.08	22.5
		3	1	22.37	21.67	22.1	22.5
		3	3	22.24	21.67	22.09	22.5
		6	0	21.02	20.71	21.03	22.5
Bandwidth	Modulation	RB size	RB offset	Channel 23025	Channel 23095	Channel 23165	Tune up
3MHz	QPSK	1	0	22.98	23.02	23.15	23.5
		1	8	22.96	23.25	23.35	23.5
		1	14	22.77	23.04	23.33	23.5
		8	0	21.94	22.18	22.36	22.5
		8	4	21.88	22.2	22.34	22.5
		8	7	21.97	22.08	22.34	22.5
		15	0	21.92	22.2	22.37	22.5
	16QAM	1	0	22.13	22.59	22.03	22.5
		1	8	22.09	22.72	22.38	22.5
		1	14	21.86	22.56	22.22	22.5
		8	0	20.98	21.26	21.49	21.5
		8	4	21.11	21.33	21.4	21.5
		8	7	21.13	21.17	21.42	21.5
		15	0	20.94	21.23	21.38	21.5
Bandwidth	Modulation	RB size	RB offset	Channel 23035	Channel 23095	Channel 23155	Tune up
5MHz	QPSK	1	0	23.29	23.17	23.16	23.5
		1	12	23.16	2314	23.12	23.5
		1	24	23.16	23.22	23.18	23.5
		12	0	22.31	22.45	22.53	22.5
		12	7	22.25	22.43	22.51	22.5
		12	13	22.24	22.34	22.6	22.5
		25	0	22.25	22.46	22.57	22.5
	16QAM	1	0	22.32	22.74	22.54	22.5
		1	1	22.41	22.85	22.76	22.5
		1	2	22.47	22.75	22.72	22.5

		12	3	21.39	21.51	21.59	21.5
		12	4	21.35	21.5	21.58	21.5
		12	5	21.28	21.49	21.65	21.5
		25	6	21.16	21.5	21.61	21.5
Bandwidth	Modulation	RB size	RB offset	Channel 23060	Channel 23095	Channel 23130	Tune up
10MHz	QPSK	1	0	23.15	23.16	23.14	23.5
		1	25	22.81	22.95	23.01	23.5
		1	49	**23.17**	**23.17**	**23.23**	23.5
		25	0	22.11	22.18	**22.23**	22.5
		25	12	22	22.14	22.12	22.5
		25	25	22.04	22.07	22.07	22.5
		50	0	22.08	22.08	**22.1**	22.5
	16QAM	1	0	22.25	22.18	22.2	22.5
		1	25	21.96	22.16	22.1	22.5
		1	49	22.08	22.12	21.98	22.5
		25	0	21.15	21.18	21.13	21.5
		25	12	21.09	21.16	21.18	21.5
		25	25	21.19	21.08	21.18	21.5
		50	0	21	21.15	21.16	21.5

LTE FDD Band 13_Sensor Off				**Conducted Power(dBm)**			
Bandwidth	Modulation	RB size	RB offset	Channel 23205	Channel 23230	Channel 23255	Tune up
5MHz	QPSK	1	0	22.78	23.28	23.28	23.5
		1	12	23.09	23.26	23.28	23.5
		1	24	23.08	23.09	23.24	23.5
		12	0	22.06	22.32	22.36	23.5
		12	7	22.18	22.28	22.34	23.5
		12	13	22.26	22.26	22.27	23.5
		25	0	22.22	22.32	22.39	22.5
	16QAM	1	0	21.8	22.56	22.38	22.5
		1	12	22.16	22.8	22.43	22.5
		1	24	22.11	22.66	22.38	22.5
		12	0	21.3	21.48	21.43	22.5
		12	7	21.24	21.46	21.42	22.5
		12	13	21.17	21.39	21.37	22.5
		25	0	21.19	21.41	21.35	22.5
Bandwidth	Modulation	RB size	RB offset	Channel NA	Channel 23230	Channel NA	Tune up
10MHz	QPSK	1	0	NA	**23.3**	NA	23.5
		1	25	NA	23.01	NA	23.5
		1	49	NA	23.2	NA	23.5
		25	0	NA	**22.31**	NA	22.5

		25	12	NA	22.02	NA	22.5
		25	25	NA	22.07	NA	22.5
		50	0	NA	**22.19**	NA	22.5
	16QAM	1	0	NA	22.25	NA	22.5
		1	25	NA	22.46	NA	22.5
		1	49	NA	22.38	NA	22.5
		25	0	NA	21.40	NA	22.5
		25	12	NA	21.37	NA	22.5
		25	25	NA	21.31	NA	22.5
		50	0	NA	21.32	NA	22.5

LTE Band 2_Sensor ON				**Conducted Power(dBm)**			
Bandwidth	Modulation	RB size	RB offset	Channel 18607	Channel 18900	Channel 19193	Tune up
1.4MHz	QPSK	1	0	16.04	16.02	16.01	17
		1	2	16.22	16.14	16.4	17
		1	5	16.16	15.89	16.1	17
		3	0	16.11	16.13	16.27	17
		3	2	16.44	16.26	16.36	17
		3	3	16.36	16.17	16.25	17
		6	0	16.2	16.08	16.11	17
	16QAM	1	0	15.37	15.34	15.57	17
		1	2	15.44	15.58	15.68	17
		1	5	15.45	15.54	16.03	17
		3	0	16.23	16.28	16.28	17
		3	2	16.34	16.31	16.41	17
		3	3	16.42	16.05	16.38	17
		6	0	15.51	15.39	15.73	17
Bandwidth	Modulation	RB size	RB offset	Channel 18615	Channel 18900	Channel 19185	Tune up
3MHz	QPSK	1	0	16.25	16.12	16.09	17
		1	7	15.82	15.62	15.74	17
		1	14	16.2	16.01	16.23	17
		8	0	15.8	15.81	16.15	17
		8	4	16.21	15.92	16.14	17
		8	7	16.08	15.94	16.11	17
		15	0	16.06	16.01	16.16	17
	16QAM	1	0	16.15	16.37	16.34	17
		1	7	16.33	16.26	16.24	17
		1	14	16.37	16.34	16.03	17
		8	0	16.2	15.56	15.9	17
		8	4	16.26	15.87	16.14	17
		8	7	15.99	15.65	15.74	17
		15	0	16.05	16.1	16.17	17

Bandwidth	Modulation	RB size	RB offset	Channel 18625	Channel 18900	Channel 19175	Tune up
5MHz	QPSK	1	0	16.01	15.94	15.93	17
		1	13	15.93	15.62	15.62	17
		1	24	16.19	15.93	16.11	17
		12	0	15.95	15.91	16.1	17
		12	6	15.96	15.67	15.87	17
		12	13	16.24	16.14	16.07	17
		25	0	16.02	16.05	16.05	17
	16QAM	1	0	16.35	16.26	16.19	17
		1	13	16.26	16.22	16.24	17
		1	24	16.24	16.21	16.12	17
		12	0	15.82	15.85	16.01	17
		12	6	15.89	15.82	15.94	17
		12	13	15.9	15.75	15.95	17
		25	0	16.11	15.93	16.02	17
Bandwidth	Modulation	RB size	RB offset	Channel 18650	Channel 18900	Channel 19150	Tune up
10MHz	QPSK	1	0	15.92	15.82	16.09	17
		1	25	16.38	15.96	15.98	17
		1	49	16.03	16.03	15.89	17
		25	0	16.12	16.05	16.31	17
		25	13	15.99	15.8	15.94	17
		25	25	16.28	16.07	16.09	17
		50	0	16.16	16	16.13	17
	16QAM	1	0	16.39	16.28	16.17	17
		1	25	16.22	16.26	16.33	17
		1	49	16.07	16.24	16.15	17
		25	0	16.18	15.98	16	17
		25	13	15.96	15.85	16.08	17
		25	25	16.02	15.9	15.92	17
		50	0	16.16	16.02	16.05	17
Bandwidth	Modulation	RB size	RB offset	Channel 18675	Channel 18900	Channel 19125	Tune up
15MHz	QPSK	1	0	16.11	16.03	16.1	17
		1	38	16.26	15.69	16.06	17
		1	74	15.98	16	15.75	17
		36	0	16.18	16.02	16.39	17
		36	18	16.19	15.87	15.91	17
		36	39	16.37	16.15	16.06	17
		75	0	16.16	15.94	16.22	17
	16QAM	1	0	16.31	16.42	16.11	17
		1	38	16.22	16.41	16.28	17
		1	74	16.03	16.31	16.36	17
		36	0	15.98	15.71	16.02	17

		36	18	16.03	16.02	16.03	17
		36	39	16.19	15.85	15.97	17
		75	0	16.15	15.86	16.1	17
Bandwidth	Modulation	RB size	RB offset	Channel 18700	Channel 18900	Channel 19100	Tune up
20MHz	QPSK	1	0	16.09	15.93	16.16	17
		1	50	**16.44**	**16.05**	**16.29**	17
		1	99	16.04	16.04	16.01	17
		50	0	15.41	**16.41**	**16.31**	17
		50	25	**16.42**	15.76	15.99	17
		50	50	15.87	15.81	16.03	17
		100	0	**16.1**	15.77	15.91	17
	16QAM	1	0	16.04	16.06	16.11	17
		1	50	16.4	16.41	16.23	17
		1	99	15.96	15.95	15.36	17
		50	0	16.11	16.01	16.38	17
		50	25	16.43	16.24	16.39	17
		50	50	16.16	16.05	15.95	17
		100	0	16.18	16.23	16.22	17

LTE Band 4_Sensor ON				**Conducted Power(dBm)**			
Bandwidth	Modulation	RB size	RB offset	Channel 19957	Channel 20175	Channel 20393	Tune up
1.4MHz	QPSK	1	0	16.17	16.33	16.19	17
		1	3	16.32	16.35	16.18	17
		1	5	15.89	16.1	16.03	17
		3	0	16.23	16.27	16.13	17
		3	1	16.28	16.23	16.11	17
		3	3	16.1	16.15	15.86	17
		6	0	16.32	16.18	16.31	17
	16QAM	1	0	15.8	15.77	15.79	17
		1	3	15.89	16.01	16.04	17
		1	5	16.07	15.91	15.52	17
		3	0	16.03	15.94	15.89	17
		3	1	16.13	15.89	15.92	17
		3	3	16.03	16.16	15.75	17
		6	0	16.18	15.73	16.05	17
Bandwidth	Modulation	RB size	RB offset	Channel 19965	Channel 20175	Channel 20385	Tune up
3MHz	QPSK	1	0	16.15	16.42	16.28	17
		1	8	16.37	16.46	16.32	17
		1	14	15.97	16.23	16.11	17
		8	0	16.21	16.36	16.22	17
		8	4	16.33	16.34	16.25	17

		8	7	16.18	16.28	15.94	17
		15	0	16.3	16.27	16.4	17
	16QAM	1	0	15.85	15.88	15.93	17
		1	8	15.97	16.14	16.12	17
		1	14	16.05	16	15.61	17
		8	0	16.08	16.05	16.03	17
		8	4	16.21	16.02	16	17
		8	7	16.01	16.25	15.84	17
		15	0	16.23	15.84	16.19	17
Bandwidth	Modulation	RB size	RB offset	Channel 19975	Channel 20175	Channel 20375	Tune up
5MHz	QPSK	1	0	16.4	16.43	16.47	17
		1	12	16.4	16.42	16.31	17
		1	24	16.23	16.55	16.18	17
		12	0	16.45	16.49	16.25	17
		12	7	16.33	16.43	16.23	17
		12	13	16.2	16.38	16.22	17
		25	0	16.51	16.17	16.53	17
	16QAM	1	0	15.92	16.35	16.46	17
		1	1	16.08	16.31	15.75	17
		1	2	15.89	15.47	15.65	17
		12	3	16.04	16.09	15.89	17
		12	4	16.13	16.16	15.89	17
		12	5	15.98	15.97	15.95	17
		25	6	16.31	15.92	16.32	17
Bandwidth	Modulation	RB size	RB offset	Channel 20000	Channel 20175	Channel 20350	Tune up
10MHz	QPSK	1	0	16.21	16.47	16.33	17
		1	25	16.56	16.49	16.42	17
		1	49	16.24	16.33	16.12	17
		25	0	16.22	16.53	16.09	17
		25	12	16.19	16.54	16.15	17
		25	25	16.23	16.55	16.28	17
		50	0	16.5	16.01	16.56	17
	16QAM	1	0	15.81	16.33	15.96	17
		1	25	16.01	16.28	15.93	17
		1	49	16	15.98	15.52	17
		25	0	16.26	16.24	16.07	17
		25	12	16.06	16.2	15.93	17
		25	25	16.14	15.97	16.11	17
		50	0	16.39	15.83	16.09	17
Bandwidth	Modulation	RB size	RB offset	Channel 20025	Channel 20175	Channel 20325	Tune up
15MHz	QPSK	1	0	16.39	16.45	16.25	17
		1	37	16.41	16.49	16.23	17

		1	74	16.19	16.35	16.06	17
		36	0	16.34	16.38	16.13	17
		36	20	16.25	16.36	16.01	17
		36	39	16.23	16.2	15.96	17
		75	0	16.29	16.07	16.17	17
	16QAM	1	0	15.95	16.1	15.95	17
		1	37	16.12	16.15	15.97	17
		1	74	16	16.01	15.75	17
		36	0	16.25	16.04	15.96	17
		36	20	16.31	15.94	16.09	17
		36	39	15.97	15.98	15.8	17
		75	0	16.03	16.26	16.06	17
Bandwidth	Modulation	RB size	RB offset	Channel 20050	Channel 20175	Channel 20300	Tune up
20MHz	QPSK	1	0	16.28	16.3	16.26	17
		1	49	**16.43**	**16.32**	**16.26**	17
		1	99	15.99	16	15.89	17
		50	0	**16.39**	**16.28**	**16.29**	17
		50	24	16.28	16.23	16.26	17
		50	50	16.17	16.27	16.22	17
		100	0	**16.32**	16.13	16.12	17
	16QAM	1	0	16.43	16.09	16.11	17
		1	49	16.49	16.29	16.19	17
		1	99	16.45	15.76	16.11	17
		50	0	16.35	16.01	16.33	17
		50	24	16.36	15.62	16.33	17
		50	50	16.43	16.16	16.16	17
		100	0	16.19	16.02	16.12	17

LTE Band 5_Sensor ON				**Conducted Power(dBm)**			
Bandwidth	Modulation	RB size	RB offset	Channel 20407	Channel 20525	Channel 20643	Tune up
1.4MHz	QPSK	1	0	17.95	17.88	17.92	19
		1	3	17.93	17.78	18.11	19
		1	5	17.98	17.69	17.92	19
		3	0	17.9	17.82	18.06	19
		3	1	17.95	17.72	17.87	19
		3	3	17.93	17.67	17.82	19
		6	0	17.98	17.84	17.89	19
	16QAM	1	0	17.9	17.77	18.1	19
		1	3	17.95	18.04	18.19	19
		1	5	17.93	17.95	18.11	19
		3	0	17.98	18.01	18.03	19
		3	1	17.9	17.61	17.86	19

		3	3	17.95	17.53	17.91	19
		6	0	17.93	17.74	18.15	19
Bandwidth	Modulation	RB size	RB offset	Channel 20415	Channel 20525	Channel 20635	Tune up
3MHz	QPSK	1	0	18.18	18.05	18.17	19
		1	8	18.16	17.96	17.6	19
		1	14	18.21	18.02	18.15	19
		8	0	18.13	18.14	17.06	19
		8	4	18.18	17.89	16.82	19
		8	7	18.16	18.02	16.83	19
		15	0	18.21	18.16	18.08	19
	16QAM	1	0	18.13	18.15	17.93	19
		1	8	18.18	18.11	18.12	19
		1	14	18.16	18.13	18.06	19
		8	0	18.21	17.57	16.79	19
		8	4	18.13	17.74	16.6	19
		8	7	18.18	17.84	16.38	19
		15	0	18.16	18.21	18.08	19
Bandwidth	Modulation	RB size	RB offset	Channel 20425	Channel 20525	Channel 20625	Tune up
5MHz	QPSK	1	0	18.21	18.07	18.22	19
		1	12	18.11	17.94	17.5	19
		1	24	18.14	17.93	18.06	19
		12	0	18.16	18.16	17.11	19
		12	7	18.13	17.87	16.72	19
		12	13	18.09	17.93	16.74	19
		25	0	18.24	18.18	18.13	19
	16QAM	1	0	18.08	18.13	17.83	19
		1	1	18.11	18.02	18.03	19
		1	2	18.19	18.15	18.11	19
		12	3	18.16	17.55	16.69	19
		12	4	18.06	17.65	16.51	19
		12	5	18.21	17.86	16.43	19
		25	6	18.11	18.19	17.98	19
Bandwidth	Modulation	RB size	RB offset	Channel 20450	Channel 20525	Channel 20600	Tune up
10MHz	QPSK	1	0	**18.31**	**18.55**	**18.45**	19
		1	25	18.1	18.31	18.35	19
		1	49	17.99	18.11	17.82	19
		25	0	18.19	**18.54**	18.51	19
		25	12	18.02	18.41	18.44	19
		25	25	18.01	18.52	18.46	19
		50	0	18.02	**18.56**	18.39	19
	16QAM	1	0	18.13	18.15	17.93	19
		1	25	18.18	18.11	18.12	19

		1	49	18.22	18.17	18.16	19
		25	0	18.21	17.57	16.79	19
		25	12	18.13	17.74	16.6	19
		25	25	18.24	17.88	16.48	19
		50	0	18.16	18.21	18.08	19

LTE FDD Band 12_Sensor ON				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 23017	Channel 23095	Channel 23173	Tune up
1.4MHz	QPSK	1	0	18.07	18.15	18	18.5
		1	3	18.13	18.07	18.09	18.5
		1	5	18.06	17.84	17.99	18.5
		3	0	18.06	17.9	17.62	18.5
		3	1	17.39	18.07	17.86	18.5
		3	3	18.04	18.04	18.07	18.5
		6	0	17.95	17.91	17.83	18.5
	16QAM	1	0	18.04	18.22	18.14	18.5
		1	3	17.89	17.96	18.11	18.5
		1	5	18.04	18.12	17.69	18.5
		3	0	17.59	17.68	17.89	18.5
		3	1	17.53	17.65	17.68	18.5
		3	3	17.83	17.79	17.69	18.5
		6	0	18.05	17.84	17.95	18.5
Bandwidth	Modulation	RB size	RB offset	Channel 23025	Channel 23095	Channel 23165	Tune up
3MHz	QPSK	1	0	18.07	18.15	18	18.5
		1	8	18.13	18.07	18.09	18.5
		1	14	18.06	17.84	17.99	18.5
		8	0	18.06	17.9	17.62	18.5
		8	4	17.39	18.07	17.86	18.5
		8	7	18.04	18.04	18.07	18.5
		15	0	17.95	17.91	17.83	18.5
	16QAM	1	0	18.04	18.22	18.14	18.5
		1	8	17.89	17.96	18.11	18.5
		1	14	18.04	18.12	17.69	18.5
		8	0	17.59	17.68	17.89	18.5
		8	4	17.53	17.65	17.68	18.5
		8	7	17.83	17.79	17.69	18.5
		15	0	18.05	17.84	17.95	18.5
Bandwidth	Modulation	RB size	RB offset	Channel 23035	Channel 23095	Channel 23155	Tune up
5MHz	QPSK	1	0	18.12	18.14	18.11	18.5
		1	12	18.11	18.09	18.03	18.5
		1	24	18.1	17.89	18.02	18.5

		12	0	18.11	17.89	17.73	18.5
		12	7	17.37	18.09	17.8	18.5
		12	13	18.08	18.09	18.1	18.5
		25	0	18	17.9	17.94	18.5
	16QAM	1	0	18.02	18.24	18.08	18.5
		1	1	17.93	18.01	18.14	18.5
		1	2	18.09	18.11	17.8	18.5
		12	3	17.57	17.7	17.83	18.5
		12	4	17.57	17.7	17.71	18.5
		12	5	17.88	17.78	17.8	18.5
		25	6	18.03	17.86	17.89	18.5
Bandwidth	Modulation	RB size	RB offset	Channel 23060	Channel 23095	Channel 23130	Tune up
10MHz	QPSK	1	0	18.02	18.1	18.17	18.5
		1	25	18.04	18.14	18.06	18.5
		1	49	**18.19**	**18.16**	**18.26**	18.5
		25	0	18.15	18.07	**18.23**	18.5
		25	12	18.06	17.99	18.12	18.5
		25	25	18.03	18.01	18.08	18.5
		50	0	18.09	18.03	**18.12**	18.5
	16QAM	1	0	17.55	18.27	18.51	18.5
		1	25	16.96	18.44	18.37	18.5
		1	49	17.31	18.12	17.81	18.5
		25	0	16.61	17.74	17.87	18.5
		25	12	16.6	17.73	17.74	18.5
		25	25	16.91	17.81	17.83	18.5
		50	0	17.04	17.87	17.9	18.5

LTE FDD Band 13_Sensor On				**Conducted Power(dBm)**			
Bandwidth	Modulation	RB size	RB offset	Channel 23205	Channel 23230	Channel 23255	Tune up
5MHz	QPSK	1	0	17.96	18.25	18.14	18.5
		1	12	18.02	18.05	17.8	18.5
		1	24	17.92	18.09	18.02	18.5
		12	0	17.96	18.2	18.06	18.5
		12	7	18.02	17.94	17.63	18.5
		12	13	17.92	17.91	17.63	18.5
		25	0	17.96	18.04	18.07	18.5
	16QAM	1	0	18.02	18.05	18.15	18.5
		1	12	17.92	17.98	18.14	18.5
		1	24	17.96	17.92	18.15	18.5
		12	0	18.02	17.94	17.96	18.5
		12	7	17.92	17.8	17.67	18.5
		12	13	17.96	17.87	17.65	18.5

		25	0	18.02	17.67	18.08	18.5
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				NA	23230	NA	
10MHz	QPSK	1	0	NA	**18.3**	NA	18.5
		1	25	NA	18.03	NA	18.5
		1	49	NA	18.13	NA	18.5
		25	0	NA	**18.25**	NA	18.5
		25	12	NA	17.92	NA	18.5
		25	25	NA	17.95	NA	18.5
		50	0	NA	**18.09**	NA	18.5
	16QAM	1	0	NA	18.03	NA	18.5
		1	25	NA	18.02	NA	18.5
		1	49	NA	17.97	NA	18.5
		25	0	NA	17.92	NA	18.5
		25	12	NA	17.84	NA	18.5
		25	25	NA	17.92	NA	18.5
		50	0	NA	17.65	NA	18.5

Table 6: Conducted Power Of LTE

8.1.2 Conducted Power Of WIFI and BT

Mode	Antenna	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Tune up
802.11b	Ant0	1	2412	1	**17.18**	17.5
		6	2437		16.65	17.5
		11	2462		17.12	17.5
802.11g	Ant0	1	2412	6	15.24	15.5
		6	2437		14.54	15.5
		11	2462		15.03	15.5
802.11n HT20 SISO	Ant0	1	2412	6.5	13.93	14
		6	2437		13.57	14
		11	2462		13.65	14
802.11n HT40 SISO	Ant0	3	2422	13.5	12.86	13
		6	2437		12.78	13
		9	2452		12.19	13

5GHz	mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Tune up
802.11a	U-NII-1	36	5180	6	11.74	12.0
		44	5220		11.71	12.0
		48	5240		11.68	12.0
	U-NII-2A	52	5260		11.73	12.0
		60	5300		11.66	12.0
		64	5320		11.52	12.0
	U-NII-2C	100	5500		12.85	13.5
		116	5580		12.56	13.5
		140	5700		12.48	13.5
	U-NII-3	149	5745		12.55	13.0
		157	5785		12.45	13.0
		165	5825		12.33	13.0
5GHz	mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Tune up
802.11n-HT20	U-NII-1	36	5180	MCS0	11.82	12.0
		44	5220		11.48	12.0
		48	5240		11.52	12.0
	U-NII-2A	52	5260		11.55	12.0
		60	5300		11.44	12.0
		64	5320		11.38	12.0
	U-NII-2C	100	5500		12.67	13.0
		116	5580		12.42	13.0
		140	5700		12.28	13.0
	U-NII-3	149	5745		12.38	13.0
		157	5785		12.3	13.0
		165	5825		12.25	13.0
5GHz	mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Tune up
802.11n-HT40	U-NII-1	38	5190	MCS0	11.68	12.0
		46	5230		11.62	12.0
	U-NII-2A	54	5270		11.68	12.0
		62	5310		**11.72**	12.0
	U-NII-2C	102	5510		**13.11**	13.5
		110	5550		12.96	13.5
		134	5670		12.55	13.5
	U-NII-3	151	5755		**12.65**	13.0

		159	5795		12.51	13.0
5GHz	mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Tune up
802.11ac 20M	U-NII-1	36	5180	MCS0	11.66	12.0
		44	5220		11.71	12.0
		48	5240		11.62	12.0
	U-NII-2A	52	5260		11.59	12.0
		60	5300		11.56	12.0
		64	5320		11.57	12.0
	U-NII-2C	100	5500		12.72	13.0
		116	5580		12.52	13.0
		140	5700		12.31	13.0
	U-NII-3	149	5745		12.44	13.0
		157	5785		12.21	13.0
		165	5825		12.2	13.0
5GHz	mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Tune up
802.11ac 40M	U-NII-1	38	5190	MCS0	11.84	12.0
		46	5230		11.87	12.0
	U-NII-2A	54	5270		11.85	12.0
		62	5310		11.88	12.0
	U-NII-2C	102	5510		13.01	13.5
		110	5550		12.88	13.5
		134	5670		12.63	13.5
	U-NII-3	151	5755		12.66	13.0
		159	5795		12.56	13.0
5GHz	mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Tune up
802.11ac 80M	U-NII-1	42	5210	MCS0	10.8	11.0
	U-NII-2A	58	5290		10.82	11.0
	U-NII-2C	106	5530		12.05	13.0
	U-NII-3	122	5610		11.91	12.0
		155	5775		11.71	12.0

Table 7 : Conducted Power Of WIFI

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.

BT			Average Conducted Power (dBm)	Tune up (dBm)
Modulation	Channel	Frequency (MHz)		
GFSK	0	2402	9.8	11.0
	39	2441	**10.44**	11.0
	78	2480	9.28	11.0
π/4DQPSK	0	2402	8.1	9.0
	39	2441	8.78	9.0
	78	2480	7.6	9.0
8DPSK	0	2402	8.1	9.0
	39	2441	8.76	9.0
	78	2480	7.58	9.0

BLE			Average Conducted Power (dBm)	Tune up (dBm)
Modulation	Channel	Frequency (MHz)		
GFSK	0	2402	-0.26	0.5
	19	2440	0.21	0.5
	39	2480	-1.26	0.5

Table 8：Conducted Power Of BT

8.2 Stand-alone SAR test evaluation

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

Freq. Band	Frequency (GHz)	Position	Average Power		Test Separation (mm)	Calculate Value	Exclusion Threshold	Exclusion (Y/N)
			dBm	mW				
Wi-Fi2.4G	2.45	Body	17.5	56.2	0	17.6	3	N
Wi-Fi5G	5.85	Body	13.5	22.4	0	10.0	3	N
Bluetooth	2.48	Body	11.0	12.6	0	4.0	3	N

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

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

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

8.3 Body Test Exclusion Thresholds

Exposure Position	Wireless Interface_ Sensor off	LTE Band 12	LTE Band 13	LTE Band 5	LTE Band 4	LTE Band 2	BT	2.4GHz WLAN
	Calculated Frequency(MHz)	715	784	848	1754	1909	2480	2462
	Maximum power (dBm)	23.5	23.5	24	23.5	23.5	11	17.5
	Maximum rated power(mW)	224.0	224.0	251.0	224.0	224.0	13.0	56.0
Bottom Face	Separation distance(mm)	0.0					0.0	0.0
	exclusion threshold	37.9	39.7	46.2	59.3	61.9	4.1	17.6
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Edge 1	Separation distance(mm)	39.0					122.0	122.0
	exclusion threshold	4.9	5.1	5.9	7.6	7.9	815.0mW	816.0mW
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**
Edge 2	Separation distance(mm)	3.5					28.0	28.0
	exclusion threshold	37.9	39.7	46.2	59.3	61.9	0.7	3.1
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**Yes**
Edge 3	Separation distance(mm)	15.0					3.5	3.5
	exclusion threshold	12.6	13.2	15.4	19.8	20.6	4.1	17.6
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Edge 4	Separation distance(mm)	200.0					153.0	153.0
	exclusion threshold	892.0mW	953.0mW	1011.0mW	1613.0mW	1609.0mW	1125.0mW	1126.0mW
	Testing required?	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Exposure Position	Wireless Interface_ Sensor On	LTE Band 12	LTE Band 13	LTE Band 5	LTE Band 4	LTE Band 2	5GHz WLAN U-NII-2A	5GHz WLAN U-NII-2C	5GHz WLAN U-NII-3
	Calculated Frequency(MHz)	715	784	848	1754	1914MHz	5320	5700	5825
	Maximum power (dBm)	18.5	18.5	19	17	17	12	13.5	13.0
	Maximum rated power(mW)	71.0	71.0	79.0	50.0	50.0	16.0	22.0	22.0
Bottom Face	Separation distance(mm)	0.0					0.0	0.0	0.0
	exclusion threshold	12.0	12.6	14.6	13.2	13.8	7.4	10.5	10.6
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Edge 1	Separation distance(mm)	39.0					122.0	122.0	122.0
	exclusion threshold	1.5	1.6	1.9	1.7	1.8	785.0mW	783.0mW	782.0mW
	Testing required?	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Edge 2	Separation distance(mm)	3.5					28.0	28.0	28.0
	exclusion threshold	12.0	12.6	14.6	13.2	13.8	1.3	1.9	1.9
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**
Edge 3	Separation distance(mm)	15.0					3.5	3.5	3.5
	exclusion threshold	4.0	4.2	4.9	4.4	4.6	7.4	10.5	10.6
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Edge 4	Separation distance(mm)	200.0					153.0	153.0	153.0
	exclusion threshold	892mW	953mW	1011mW	1613mW	1609mW	1095mW	1093mW	1092mW
	Testing required?	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

The following SAR test exclusion Thresholds based on KDB 447498 D01 General RF Exposure Guidance v06) 4.3.1)

Note:

1. Maximum power is the source-based time-average power and represents the maximum RF output power among production units
2. Per KDB 447498 D01, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
3. Per KDB 447498 D01, standalone SAR test exclusion threshold is applied; If the distance of the antenna to the user is < 5mm, 5mm is used to determine SAR exclusion threshold
4. Per KDB 447498 D01, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test

separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] ·[√f(GHz)] ≤ 3.0 for

1-g SAR and ≤ 7.5 for 10-g extremity SAR

f(GHz) is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation

The result is rounded to one decimal place for comparison

For < 50 mm distance, we just calculate mW of the exclusion threshold value (3.0) to do compare.

This formula is [3.0] / [√f(GHz)] ·[(min. test separation distance, mm)] = exclusion threshold of mW.

5. Per KDB 447498 D01, at 100 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following

a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz

b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

6. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

8.4 Measurement of SAR Data

8.4.1 SAR Result Of LTE Band 2

Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power Drift (dB)	Conducted power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg) 1-g	Liquid Temp.	SAR limit (W/kg)
Body Test data Sensor On (Separate 0mm)													
Bottom Face	20	QPSK 1RB_50	18700/1860	1:1	0.119	0.063	0.05	16.44	17	1.138	0.135	22.3	1.6
Bottom Face	20	QPSK 50RB_25	18700/1860	1:1	0.117	0.062	0.04	16.42	17	1.143	0.134	22.3	1.6
Edge 2	20	QPSK 1RB_50	18700/1860	1:1	0.243	0.124	0.2	16.44	17	1.138	0.276	22.3	1.6
Edge 2	20	QPSK 50RB_25	18700/1860	1:1	0.246	0.126	0.06	16.42	17	1.143	**0.281**	22.3	1.6
Body Test data Sensor Off (Separate 4mm)													
Bottom Face	20	QPSK 1RB_0	19100/1900	1:1	0.442	0.256	0.08	23.26	23.5	1.057	0.467	22.3	1.6
Bottom Face	20	QPSK 50RB_0	19100/1900	1:1	0.337	0.194	-0.06	22.16	22.5	1.081	0.364	22.3	1.6
Edge 2	20	QPSK 1RB_0	19100/1900	1:1	1.28	0.65	0.08	23.26	23.5	1.057	**1.353**	22.3	1.6
Edge 2 Repeat SAR	20	QPSK 1RB_0	19100/1900	1:1	1.22	0.61	0.02	23.26	23.5	1.057	1.289	22.3	1.6
Edge 2	20	QPSK 1RB_0	18700/1860	1:1	0.906	0.465	-0.07	23.07	23.5	1.104	1.000	22.3	1.6
Edge 2	20	QPSK 1RB_0	18900/1880	1:1	1.04	0.535	-0.04	23.03	23.5	1.114	1.159	22.3	1.6
Edge 2	20	QPSK 50RB_0	19100/1900	1:1	1.06	0.532	0.06	22.16	22.5	1.081	1.146	22.3	1.6
Edge 2	20	QPSK 50RB_0	18700/1860	1:1	0.728	0.373	0.06	21.95	22.5	1.135	0.826	22.3	1.6
Edge 2	20	QPSK 50RB_0	18900/1880	1:1	0.824	0.42	-0.02	21.79	22.5	1.178	0.970	22.3	1.6
Edge 2	20	QPSK 100RB_0	19100/1900	1:1	0.833	0.369	0.01	22.13	22.5	1.089	0.907	22.3	1.6
Body Test data Sensor Off (Separate 0mm)													
Edge 1	20	QPSK 1RB_0	19100/1900	1:1	0.112	0.059	-0.11	23.26	23.5	1.057	0.118	22.3	1.6
Edge 1	20	QPSK 50RB_0	19100/1900	1:1	0.089	0.047	-0.09	22.16	22.5	1.081	0.096	22.3	1.6
Edge 3	20	QPSK 1RB_0	19100/1900	1:1	0.595	0.335	-0.04	23.26	23.5	1.057	**0.629**	22.3	1.6
Edge 3	20	QPSK 50RB_0	19100/1900	1:1	0.514	0.33	-0.07	22.16	22.5	1.081	0.556	22.3	1.6

Table 9: SAR Result of LTE Band 2

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B

2) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

8.4.2 SAR Result Of LTE Band 4

Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power Drift (dB)	Conducted power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg) 1-g	Liquid Temp.	SAR limit (W/kg)
Body Test data Sensor On (Separate 0mm)													
Bottom Face	20	QPSK 1RB_49	20050/1720	1:1	0.168	0.092	0.07	16.43	17	1.140	0.192	22.2	1.6
Bottom Face	20	QPSK 50RB_0	20050/1720	1:1	0.146	0.081	0.06	16.39	17	1.151	0.168	22.2	1.6
Edge 2	20	QPSK 1RB_49	20050/1720	1:1	0.392	0.206	-0.07	16.43	17	1.140	0.447	22.2	1.6
Edge 2	20	QPSK 50RB_0	20050/1720	1:1	0.436	0.228	0.03	16.39	17	1.151	**0.502**	22.2	1.6
Body Test data Sensor Off (Separate 4mm)													
Bottom Face	20	QPSK 1RB_0	20050/1720	1:1	0.312	0.173	-0.09	22.89	23.5	1.151	0.359	22.2	1.6
Bottom Face	20	QPSK 50RB_0	20050/1720	1:1	0.294	0.163	0.03	21.87	22.5	1.156	0.340	22.2	1.6
Edge 2	20	QPSK 1RB_0	20050/1720	1:1	0.473	0.252	-0.15	22.89	23.5	1.151	**0.544**	22.2	1.6
Edge 2	20	QPSK 50RB_0	20050/1720	1:1	0.425	0.227	-0.16	21.87	22.5	1.156	0.491	22.2	1.6
Body Test data Sensor Off (Separate 0mm)													
Edge 1	20	QPSK 1RB_0	20050/1720	1:1	0.149	0.067	0.04	22.89	23.5	1.151	0.171	22.2	1.6
Edge 1	20	QPSK 50RB_0	20050/1720	1:1	0.132	0.059	0.18	21.87	22.5	1.156	0.153	22.2	1.6
Edge 3	20	QPSK 1RB_0	20050/1720	1:1	0.529	0.308	-0.05	22.89	23.5	1.151	**0.609**	22.2	1.6
Edge 3	20	QPSK 50RB_0	20050/1720	1:1	0.488	0.284	-0.03	21.87	22.5	1.156	0.564	22.2	1.6

Table 10： SAR Result of LTE Band 4

Note:

3) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B

4) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

8.4.3 SAR Result Of LTE Band 5

Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power Drift (dB)	Conducted power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg) 1-g	Liquid Temp.	SAR limit (W/kg)
Body Test data Sensor On (Separate 0mm)													
Bottom Face	10	QPSK 1RB_0	20525/836.5	1:1	0.544	0.327	-0.03	18.55	19	1.109	0.603	22.1	1.6
Bottom Face	10	QPSK 25RB_0	20525/836.5	1:1	0.437	0.264	0.07	18.54	19	1.112	0.486	22.1	1.6
Edge 2	10	QPSK 1RB_0	20525/836.5	1:1	0.955	0.511	-0.02	18.55	19	1.109	**1.059**	22.1	1.6
Edge 2 Repeat SAR	10	QPSK 1RB_0	20525/836.5	1:1	0.948	0.507	0.14	18.55	19	1.109	1.051	22.1	1.6
Edge 2	10	QPSK 1RB_0	20450/829	1:1	0.879	0.423	-0.06	18.31	19	1.172	1.030	22.1	1.6
Edge 2	10	QPSK 1RB_0	20600/844	1:1	0.912	0.415	0.07	18.45	19	1.135	1.035	22.1	1.6
Edge 2	10	QPSK 25RB_0	20525/836.5	1:1	0.894	0.507	0.03	18.54	19	1.112	0.994	22.1	1.6
Edge 2	10	QPSK 25RB_0	20450/829	1:1	0.754	0.461	0.02	18.19	19	1.205	0.909	22.1	1.6
Edge 2	10	QPSK 25RB_0	20600/844	1:1	0.77	0.466	0.01	18.51	19	1.119	0.862	22.1	1.6
Edge 2	10	QPSK 50RB_0	20525/836.5	1:1	0.856	0.407	-0.01	18.56	19	1.107	0.947	22.1	1.6
Body Test data Sensor Off (Separate 4mm)													
Bottom Face	10	QPSK 1RB_49	20600/844	1:1	0.291	0.19	0.06	23.72	24	1.067	0.310	22.1	1.6
Bottom Face	10	QPSK 25RB_0	20600/844	1:1	0.289	0.189	-0.02	22.41	23	1.146	0.331	22.1	1.6
Edge 2	10	QPSK 1RB_49	20600/844	1:1	0.66	0.377	-0.19	23.72	24	1.067	**0.704**	22.1	1.6
Edge 2	10	QPSK 25RB_0	20600/844	1:1	0.546	0.313	0.03	22.41	23	1.146	0.625	22.1	1.6
Body Test data Sensor Off (Separate 0mm)													
Edge 1	10	QPSK 1RB_49	20600/844	1:1	0.069	0.035	-0.18	23.72	24	1.067	0.074	22.1	1.6
Edge 1	10	QPSK 25RB_0	20600/844	1:1	0.096	0.049	0.2	22.41	23	1.146	0.110	22.1	1.6
Edge 3	10	QPSK 1RB_49	20600/844	1:1	0.111	0.075	-0.01	23.72	24	1.067	0.118	22.1	1.6
Edge 3	10	QPSK 25RB_0	20600/844	1:1	0.111	0.075	0.03	22.41	23	1.146	**0.127**	22.1	1.6

Table 11： SAR Result of LTE Band 5
Note:

5) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B

6) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

8.4.4 SAR Result Of LTE Band 12

Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power Drift (dB)	Conducted power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg) 1-g	Liquid Temp.	SAR limit (W/kg)
Body Test data Sensor On (Separate 0mm)													
Bottom Face	10	QPSK 1RB_49	23130/711	1:1	0.329	0.206	0.12	18.26	18.5	1.057	0.348	22.1	1.6
Bottom Face	10	QPSK 25RB_0	23130/711	1:1	0.299	0.187	-0.06	18.23	18.5	1.064	0.318	22.1	1.6
Edge 2	10	QPSK 1RB_49	23130/711	1:1	0.856	0.513	-0.02	18.26	18.5	1.057	**0.905**	22.1	1.6
Edge 2 Repeat SAR	10	QPSK 1RB_49	23130/711	1:1	0.851	0.508	0.11	18.26	18.5	1.057	0.899	22.1	1.6
Edge 2	10	QPSK 1RB_49	23060/704	1:1	0.757	0.495	0.03	18.19	18.5	1.074	0.813	22.1	1.6
Edge 2	10	QPSK 1RB_49	23095/707	1:1	0.759	0.49	-0.01	18.16	18.5	1.081	0.821	22.1	1.6
Edge 2	10	QPSK 25RB_0	23130/711	1:1	0.8	0.489	-0.04	18.23	18.5	1.064	0.851	22.1	1.6
Edge 2	10	QPSK 25RB_0	23060/704	1:1	0.754	0.413	0.06	18.15	18.5	1.084	0.817	22.1	1.6
Edge 2	10	QPSK 25RB_0	23095/707	1:1	0.749	0.416	-0.05	18.07	18.5	1.104	0.827	22.1	1.6
Edge 2	10	QPSK 50RB_0	23130/711	1:1	0.75	0.41	0.03	18.12	18.5	1.091	0.819	22.1	1.6
Body Test data Sensor Off (Separate 4mm)													
Bottom Face	10	QPSK 1RB_49	23130/711	1:1	0.138	0.094	-0.04	23.23	23.5	1.064	0.147	22.1	1.6
Bottom Face	10	QPSK 25RB_0	23130/711	1:1	0.124	0.085	-0.03	22.23	22.5	1.064	0.132	22.1	1.6
Edge 2	10	QPSK 1RB_49	23130/711	1:1	0.369	0.236	-0.06	23.23	23.5	1.064	**0.393**	22.1	1.6
Edge 2	10	QPSK 25RB_0	23130/711	1:1	0.334	0.212	-0.04	22.23	22.5	1.064	0.355	22.1	1.6
Body Test data Sensor Off (Separate 0mm)													
Edge 1	10	QPSK 1RB_49	23130/711	1:1	0.05	0.028	0	23.23	23.5	1.064	0.053	22.1	1.6
Edge 1	10	QPSK 25RB_0	23130/711	1:1	0.051	0.027	-0.05	22.23	22.5	1.064	0.054	22.1	1.6
Edge 3	10	QPSK 1RB_49	23130/711	1:1	0.059	0.037	-0.17	22.23	22.5	1.064	**0.063**	22.1	1.6
Edge 3	10	QPSK 25RB_0	23130/711	1:1	0.049	0.031	0.01	22.23	22.5	1.064	0.052	22.1	1.6

Table 12: SAR Result of LTE Band 12

Note:

7) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B

8) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

8.4.5 SAR Result Of LTE Band 13

Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power Drift (dB)	Conducted power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg) 1-g	Liquid Temp.	SAR limit (W/kg)
Body Test data Sensor On (Separate 0mm)													
Bottom Face	10	QPSK 1RB_0	23230/782	1:1	0.423	0.268	0.03	18.3	18.5	1.047	0.443	22.1	1.6
Bottom Face	10	QPSK 25RB_0	23230/782	1:1	0.356	0.223	-0.02	18.25	18.5	1.059	0.377	22.1	1.6
Edge 2	10	QPSK 1RB_0	23230/782	1:1	1.03	0.593	-0.04	18.3	18.5	1.047	**1.079**	22.1	1.6
Edge 2 Repeat SAR	10	QPSK 1RB_0	23230/782	1:1	0.998	0.587	0.1	18.3	18.5	1.047	1.045	22.1	1.6
Edge 2	10	QPSK 25RB_0	23230/782	1:1	0.997	0.532	0.19	18.25	18.5	1.059	1.056	22.1	1.6
Edge 2	10	QPSK 50RB_0	23230/782	1:1	0.907	0.441	0.05	18.09	18.5	1.099	0.997	22.1	1.6
Body Test data Sensor Off (Separate 4mm)													
Bottom Face	10	QPSK 1RB_0	23230/782	1:1	0.192	0.126	0.04	23.3	23.5	1.047	0.201	22.1	1.6
Bottom Face	10	QPSK 25RB_0	23230/782	1:1	0.165	0.108	-0.04	22.31	22.5	1.045	0.172	22.1	1.6
Edge 2	10	QPSK 1RB_0	23230/782	1:1	0.638	0.402	-0.06	23.3	23.5	1.047	**0.668**	22.1	1.6
Edge 2	10	QPSK 25RB_0	23230/782	1:1	0.535	0.335	0.03	22.31	22.5	1.045	0.559	22.1	1.6
Body Test data Sensor Off (Separate 0mm)													
Edge 1	10	QPSK 1RB_0	23230/782	1:1	0.096	0.051	-0.15	23.3	23.5	1.047	**0.101**	22.1	1.6
Edge 1	10	QPSK 25RB_0	23230/782	1:1	0.084	0.045	0.03	22.31	22.5	1.045	0.088	22.1	1.6
Edge 3	10	QPSK 1RB_0	23230/782	1:1	0.079	0.053	-0.1	23.3	23.5	1.047	0.083	22.1	1.6
Edge 3	10	QPSK 25RB_0	23230/782	1:1	0.07	0.05	0.05	22.31	22.5	1.045	0.073	22.1	1.6

Table 13： SAR Result of LTE Band 5

Note:

9) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B

10) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

8.4.6 SAR Result Of 2.4GHz WIFI

Test position	Test mode	Test Ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.
Body Test data (Separate 0mm)												
Bottom Face	802.11b	1/2412	96.96%	1.031	0.054	0.028	0.06	17.18	17.50	1.076	0.060	22.0
Edge 1	802.11b	1/2412	96.96%	1.031	0.029	0.016	-0.13	17.18	17.50	1.076	0.032	22.0
Edge 2	802.11b	1/2412	96.96%	1.031	0.035	0.019	-0.02	17.18	17.50	1.076	0.039	22.0
Edge 3	802.11b	1/2412	96.96%	1.031	0.329	0.149	0.05	17.18	17.50	1.076	**0.365**	22.0

Table 14： SAR Result Of 2.4GHz WIFI

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B
2) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). Per Kdb248227 D01, When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel.
3) Each channel was tested at the lowest data rate.
4) Per KDB248227 D01, for Body SAR test of WiFi2.4G, SAR is measured for 2.4 GHz 802.11b DSSS using the initial test position procedure. The highest reported SAR for DSSS is adjusted by the ratio of OFDM 802.11g/n to DSSS specified maximum output power and the adjusted SAR is < 1.2 W/kg, so SAR for 802.11g/n is not required.

8.4.7 SAR Result Of 5GHz WIFI

Test position	Test mode	Test Ch./Freq.	Duty Cycle %	Duty Cycle Scaled factor	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg) 1-g	Liquid Temp.	SAR limit (W/kg)
Body Test data with U-NII-2A (Separate 0mm)													
Bottom Face	802.11n-HT40	62/5310	95.65	1.045	0.093	0.026	0.01	11.72	12	1.067	0.104	22.2	1.6
Edge 1	802.11n-HT40	62/5310	95.65	1.045	0.056	0.019	0.13	11.72	12	1.067	0.062	22.2	1.6
Edge 2	802.11n-HT40	62/5310	95.65	1.045	0.177	0.062	-0.02	11.72	12	1.067	0.197	22.2	1.6
Edge 3	802.11n-HT40	62/5310	95.65	1.045	0.766	0.224	-0.06	11.72	12	1.067	0.854	22.2	1.6
Edge 3	802.11n-HT40	54/5270	95.65	1.045	0.847	0.253	0.05	11.68	12	1.076	**0.953**	22.2	1.6
Edge 3 - Repeat SAR	802.11n-HT40	54/5270	95.65	1.045	0.843	0.244	0.01	11.68	12	1.076	0.948	22.2	1.6
Body Test data with U-NII-2C (Separate 0mm)													
Bottom Face	802.11n-HT40	102/5510	95.65	1.045	0.108	0.074	0.06	13.11	13.5	1.094	0.123	22.2	1.6
Edge 1	802.11n-HT40	102/5510	95.65	1.045	0.054	0.016	0.03	13.11	13.5	1.094	0.062	22.2	1.6
Edge 2	802.11n-HT40	102/5510	95.65	1.045	0.23	0.084	0.04	13.11	13.5	1.094	0.263	22.2	1.6
Edge 3	802.11n-HT40	102/5510	95.65	1.045	0.525	0.16	0.09	13.11	13.5	1.094	**0.600**	22.2	1.6
Body Test data with U-NII-3 (Separate 0mm)													
Bottom Face	802.11n-HT40	151/5755	95.65	1.045	0.102	0.054	0.03	12.65	13	1.084	0.116	22.2	1.6
Edge 1	802.11n-HT40	151/5755	95.65	1.045	0.041	0.018	0.18	12.65	13	1.084	0.046	22.2	1.6
Edge 2	802.11n-HT40	151/5755	95.65	1.045	0.325	0.13	0.07	12.65	13	1.084	0.368	22.2	1.6
Edge 3	802.11n-HT40	151/5755	95.65	1.045	0.381	0.111	0.08	12.65	13	1.084	**0.432**	22.2	1.6

Table 15： SAR Result Of 5GHz WIFI

Note:

5) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B

6) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). Per Kdb248227 D01, When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel.

7) Each channel was tested at the lowest data rate.

8) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. As the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration;

9) Per KDB248227 D01, 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.

8.4.8 SAR Result Of Bluetooth

Test position	Test mode	Test Ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift(dB)	Conducted power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.
Body Test data (Separate 0mm)												
Bottom Face	GFSK	39/2441	76.60%	1.305	0.011	0.006	-0.03	10.44	11.00	1.138	0.016	22.0
Edge 1	GFSK	39/2441	76.60%	1.305	0.004	0.002	0.01	10.44	11.00	1.138	0.006	22.0
Edge 2	GFSK	39/2441	76.60%	1.305	0.022	0.010	0.06	10.44	11.00	1.138	0.033	22.0
Edge 3	GFSK	39/2441	76.60%	1.305	0.117	0.054	-0.15	10.44	11.00	1.138	**0.174**	22.0

Table 16： SAR Result Of Bluetooth

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B

2) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). Per Kdb248227 D01, When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel.

8.4.9 Repeat SAR Measurement

Band	Mode	Test Position	Test Ch./Freq.	Original Measured SAR1g (mW/g)	1st Repeated SAR1g (mW/g)	Ratio	Original Measured SAR1g (mW/g)	2nd Repeated SAR1g (mW/g)	Ratio
LTE band 2	20M_QPSK 1RB_0	Edge 2	19100/1900	1.28	1.22	-4.69	NA	NA	NA
LTE band 5	10M_QPSK 1RB_0	Edge 2	20525/836.5	0.955	0.948	-0.73	NA	NA	NA
LTE band 12	10M_QPSK 1RB_49	Edge 2	23130/711	0.856	0.851	-0.58	NA	NA	NA
LTE band 13	10M_QPSK 1RB_0	Edge 2	23230/782	1.03	0.998	-3.11	NA	NA	NA
WiFi5GHz	802.11n-HT40	Edge 3	54/5270	0.847	0.843	-0.47	NA	NA	NA

Note：

1) Per KDB 865664 D01v01, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥ 0.8W/Kg
2) Per KDB 865664 D01v01, if the ratio of largest to smallest SAR for the original and first repeated measurement is ≤1.2 and the measured SAR ＜1.45W/Kg, only one repeated measurement is required
3) The ratio is the difference in percentage between original and repeated measured SAR.

8.5 Multiple Transmitter Evaluation

8.5.1 Simultaneous SAR SAR test evaluation

Simultaneous Transmission

NO.	Simultaneous Transmission Configuration	Body
1	LTE(Data) + WiFi	Yes
2	LTE(Data) + BT	Yes
3	BT+WIFI	No

Note:

1) Wi-Fi and Bluetooth share the same Tx antenna and can't transmit simultaneously.

1) Simultaneous Transmission SAR Summation Scenario for body

WWAN Band	Exposure position	① MAX. WWAN SAR (W/kg)	②MAX. WLAN 2.4GHz SAR (W/kg)	③MAX. WLAN 5GHz SAR (W/kg)	④ MAX. BT SAR (W/kg)	Summed SAR ①+②	Summed SAR ①+③	Summed SAR ①+④	SPLSR
LTE Band 2	Bottom Face	0.467	0.060	0.123	0.016	0.527	0.590	0.483	No
	Edge 1	0.118	0.032	0.062	0.006	0.150	0.180	0.124	No
	Edge 2	1.353	0.039	0.368	0.033	1.392	**1.721**	1.386	1
	Edge 3	0.629	0.365	0.953	0.174	0.994	1.582	0.803	No
	Edge 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	No
LTE Band 4	Bottom Face	0.359	0.060	0.123	0.016	0.419	0.482	0.375	No
	Edge 1	0.171	0.032	0.062	0.006	0.203	0.233	0.177	No
	Edge 2	0.544	0.039	0.368	0.033	0.583	0.912	0.577	No
	Edge 3	0.609	0.365	0.953	0.174	0.974	1.562	0.783	No
	Edge 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	No
LTE Band 5	Bottom Face	0.603	0.060	0.123	0.016	0.663	0.726	0.619	No
	Edge 1	0.110	0.032	0.062	0.006	0.142	0.172	0.116	No
	Edge 2	1.051	0.039	0.368	0.033	1.090	1.419	1.084	No
	Edge 3	0.127	0.365	0.953	0.174	0.492	1.080	0.301	No
	Edge 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	No
LTE Band 12	Bottom Face	0.348	0.060	0.123	0.016	0.408	0.471	0.364	No
	Edge 1	0.054	0.032	0.062	0.006	0.086	0.116	0.060	No
	Edge 2	0.899	0.039	0.368	0.033	0.938	1.267	0.932	No
	Edge 3	0.063	0.365	0.953	0.174	0.428	1.016	0.237	No
	Edge 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	No
LTE Band 13	Bottom Face	0.443	0.060	0.123	0.016	0.503	0.566	0.459	No
	Edge 1	0.101	0.032	0.062	0.006	0.133	0.163	0.107	No
	Edge 2	1.056	0.039	0.368	0.033	1.095	1.424	1.089	No
	Edge 3	0.083	0.365	0.953	0.174	0.448	1.036	0.257	No
	Edge 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	No

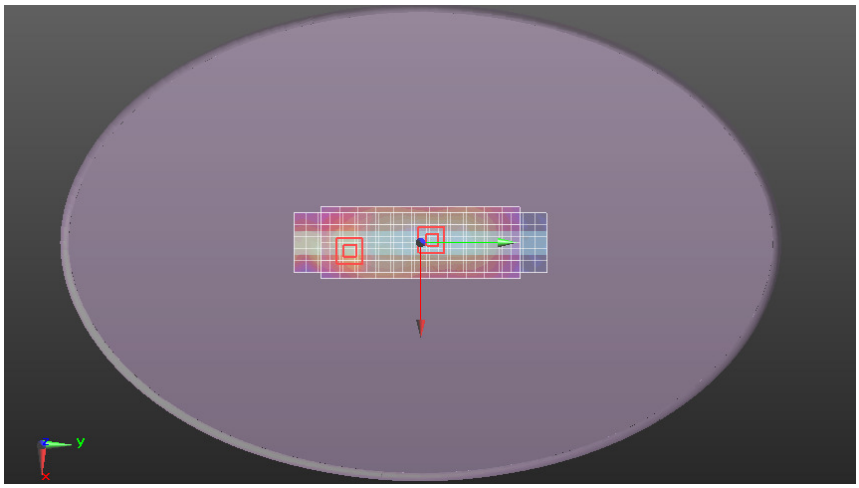
Note:

Simultaneous Transmission SAR Summation Scenario for body is only for the test surface, and the test distance is not considered.

The WWAN SAR is only choose the worst situation.

8.5.2 SAR MULTI XMITER ASSESSMENT

SPLSR No.	Position	Band	SAR (W/kg)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				X	Y	Z				
1	Edge2	WLAN5GHz	0.368	0.84	-5.88	0.22	70.313	**1.721**	0.032	Not Required
		LTE Band2	1.353	-0.15	1.08	0.09				



Note:

1: The reported SAR summation is calculated based on the same configuration and test position.

2: Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,

1) Scalar SAR summation < 1.6W/kg.

2) SPLSR = (SAR1 + SAR2)1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan

If SPLSR ≤ 0.04, simultaneously transmission SAR is compliant.

3) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg

3. According to KDB 447498 D01 simultaneous SAR testing can be excluded under the following conditions:

The sum of the SAR for all simultaneously transmitting antennas is within the SAR limit.

If the sum of the SAR for all simultaneously transmitting antennas exceeds the SAR limit testing can still be excluded if the SAR to Peak Location Ratio (SPLSR) between any pair of simultaneously transmitting antennas is ≤0.04

$$SPLSR = (SAR_1 + SAR_2)^{1.5} / Ri$$

Where:

SAR_1 is the highest measured or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

SAR_2 is the highest measured or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

Ri is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of $\mathbf{[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]}$

Conclusion:

When the Σ 1-g SAR is less than 1.6 W/kg simultaneous transmission testing is not required

When the Σ 1-g SAR is greater than 1.6 W/kg SPLSR evaluation is required

9 Equipment list

Test Platform	SPEAG DASY5 Professional
Location	SGS-CCS Standards Technical Services Co., Ltd. Kunshan Branch
Description	SAR Test System (Frequency range 300MHz-6GHz)
Software Reference	DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Hardware Reference

	Equipment	Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration
☒	P C	HP	Core(rm)3.16G	CZCO48171H	N/A	N/A
☒	Signal Generator	Agilent	E8257C	MY43321570	2019/10/24	2020/10/23
☒	S-Parameter Network Analyzer	Agilent	E5071B	MY42301382	2020/02/24	2021/02/23
☒	DAK-3.5 probe	SPEAG	DAK-3.5	1102	N/A	N/A
☒	Power meter	Anritsu	ML2495A	1445010	2020/04/21	2021/04/20
☒	Power sensor	Anritsu	MA2411B	1339220	2020/04/21	2021/04/20
☒	Wireless Communication Test Set	R&S	CMU200	109525	2019/12/19	2020/12/18
☒	Wireless Communications Test Set	Agilent	8960 E5515C	GB44051695	2019/7/3	2020/7/2
☒	Communication System	Anritsu	MT8820C	6201465349	2019/7/3	2020/7/2
☒	DAE	SPEAG	DAE3	360	2019/10/16	2020/10/15
☒	E-field PROBE	SPEAG	EX3DV4	3975	2020/05/20	2021/05/19
☒	Dipole	SPEAG	D750V3	1188	2019/03/07	2022/03/06
☒	Dipole	SPEAG	D835V2	4d114	2019/06/11	2022/06/10
☒	Dipole	SPEAG	D1800V2	2d170	2019/06/11	2021/06/10
☒	Dipole	SPEAG	D1900V2	5d136	2019/06/11	2021/06/10
☒	Dipole	SPEAG	D2450V2	817	2019/06/10	2022/06/09
☒	Dipole	SPEAG	D5GHzV2	1095	2019/06/14	2022/06/13
☒	Electro Thermometer	DTM	DTM3000	3030	2019/12/20	2020/12/19
☒	Amplifier	Mini-circuits	ZVE-8G	110405	N/A	N/A
☒	Amplifier	Mini-circuits	ZHL-42	QA1331003	N/A	N/A
☒	3db ATTENUATOR	MINI	MCL BW-S3W5	0533	N/A	N/A
☒	DUMMY PROBE	SPEAG	DP_2	SPDP2001AA	N/A	N/A
☒	Dual Directional Coupler	Woken	20W couple	DOM2BHW1A1	N/A	N/A
☒	SAM PHANTOM (ELI4 v4.0)	SPEAG	QDOVA001BB	1102	N/A	N/A
☒	Twin SAM Phantom	SPEAG	QD000P40CD	1609	N/A	N/A
☒	ROBOT	SPEAG	TX60	F10/5E6AA1/A101	N/A	N/A
☒	ROBOT KRC	SPEAG	CS8C	F10/5E6AA1/C101	N/A	N/A

☒	LIQUID CALIBRATION KIT	ANTENNESSA	41/05 OCP9	00425167	N/A	N/A

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

All measurement facilities used to collect the measurement data are located at

☒ No.10, Weiye Rd., Innovation Park, Eco & Tec. Development Part, Kunshan City, Jiangsu Province, China.

10 Calibration certificate

Please see the Appendix C

11 Photographs

Please see the Appendix D

Appendix A: Detailed System Check Results

The plots are showing as followings.

Date: 2020/06/05

Test Laboratory: Compliance Certification Services Inc.

SystemPerformanceCheck-Head 750MHz

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1188

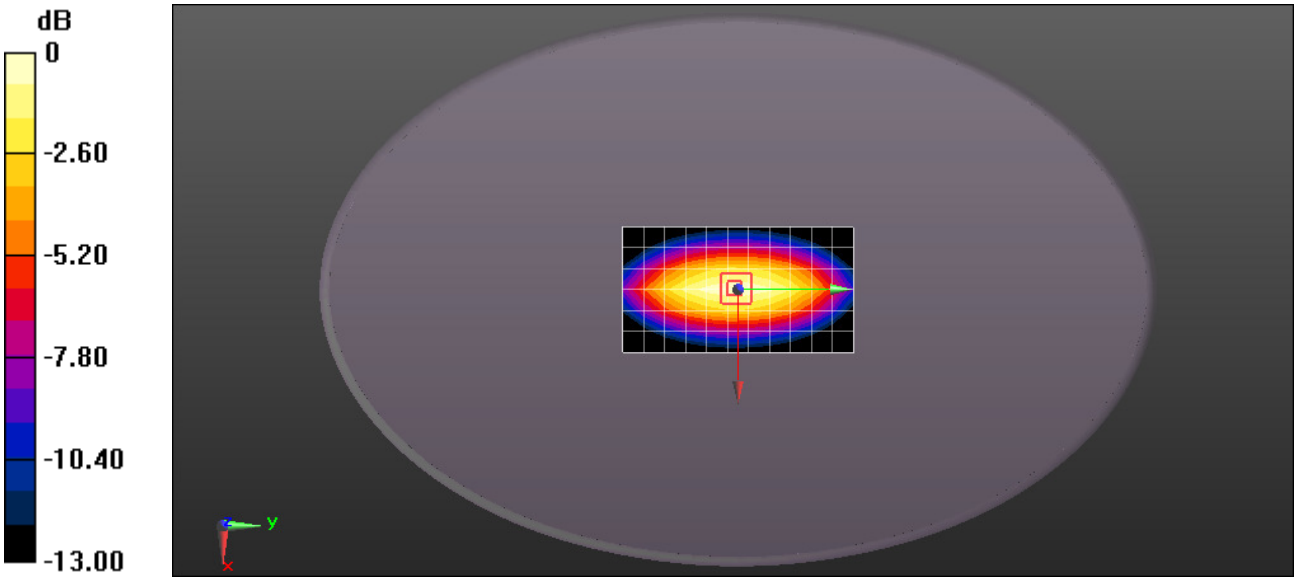
Communication System: UID 0, CW (0); Frequency: 750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; σ = 0.895 S/m; ε_r = 41.649; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(9.9, 9.9, 9.9); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Body/Pin=250 mW, dist=15 mm (EX-Probe)/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.92 W/kg

Body/Pin=250 mW, dist=15 mm (EX-Probe)/Zoom Scan (7x7x7) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 56.79 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 3.36 W/kg
SAR(1 g) = 2.19 W/kg; SAR(10 g) = 1.45 W/kg
Maximum value of SAR (measured) = 2.95 W/kg



0 dB = 2.95 W/kg = 4.70 dBW/kg

Date: 2020/06/04

Test Laboratory: Compliance Certification Services Inc.

SystemPerformanceCheck-Head 835MHz

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: 4d114

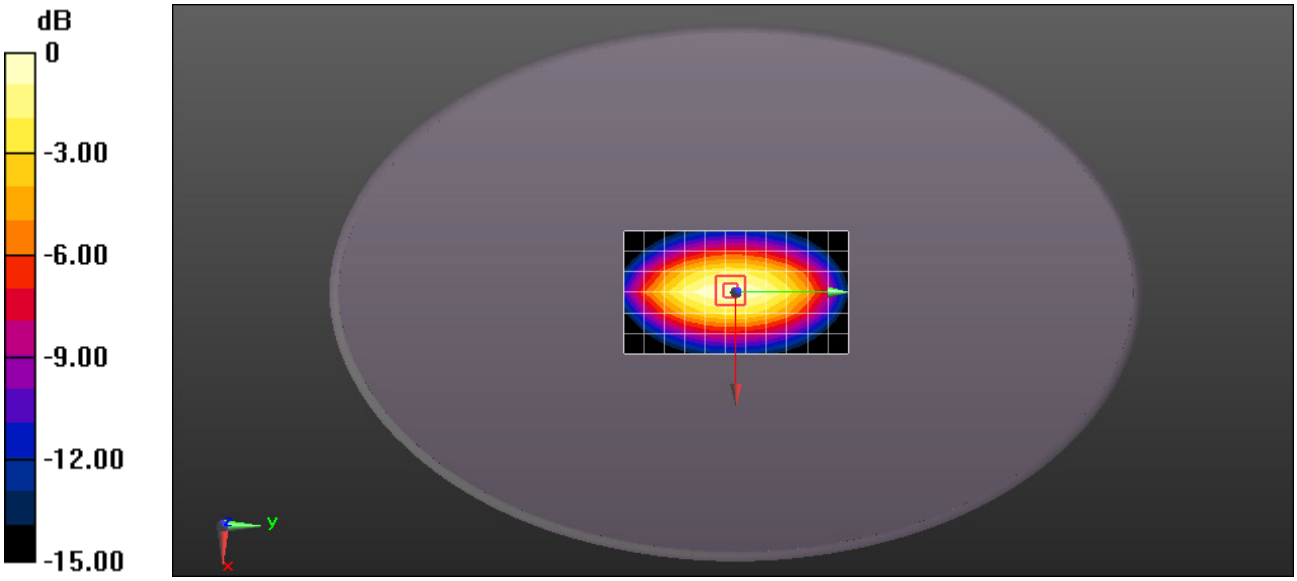
Communication System: UID 0, CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.886 S/m; ε_r = 40.849; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(9.56, 9.56, 9.56); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Body/dist=15mm, Pin=250 mW(EX-Probe)/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.46 W/kg

Body/dist=15mm, Pin=250 mW(EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 64.34 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 4.00 W/kg
SAR(1 g) = 2.45 W/kg; SAR(10 g) = 1.63 W/kg
Maximum value of SAR (measured) = 3.37 W/kg



0 dB = 3.37 W/kg = 5.28 dBW/kg

Date: 2020/06/08

Test Laboratory: Compliance Certification Services Inc.

SystemPerformanceCheck-1800MHz

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: 2d170

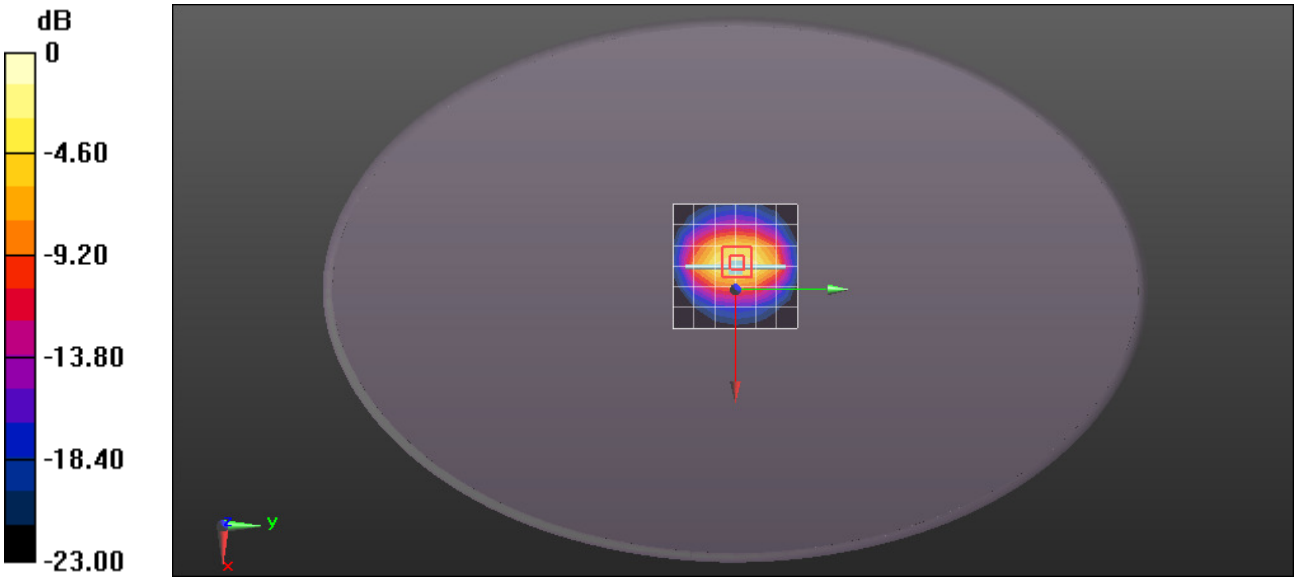
Communication System: UID 10000, CW; Frequency: 1800 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1800 MHz; σ = 1.384 S/m; ε_r = 40.258; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(8.36, 8.36, 8.36); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Body/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe) (23.6 dBm)/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 13.4 W/kg

Body/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe) (23.6 dBm)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 111.4 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 21.4 W/kg
SAR(1 g) = 9.91 W/kg; SAR(10 g) = 4.77 W/kg
Maximum value of SAR (measured) = 16.9 W/kg



0 dB = 16.9 W/kg = 12.28 dBW/kg

Date: 2020/06/06

Test Laboratory: Compliance Certification Services Inc.

SystemPerformanceCheck-Head 1900MHz

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d136

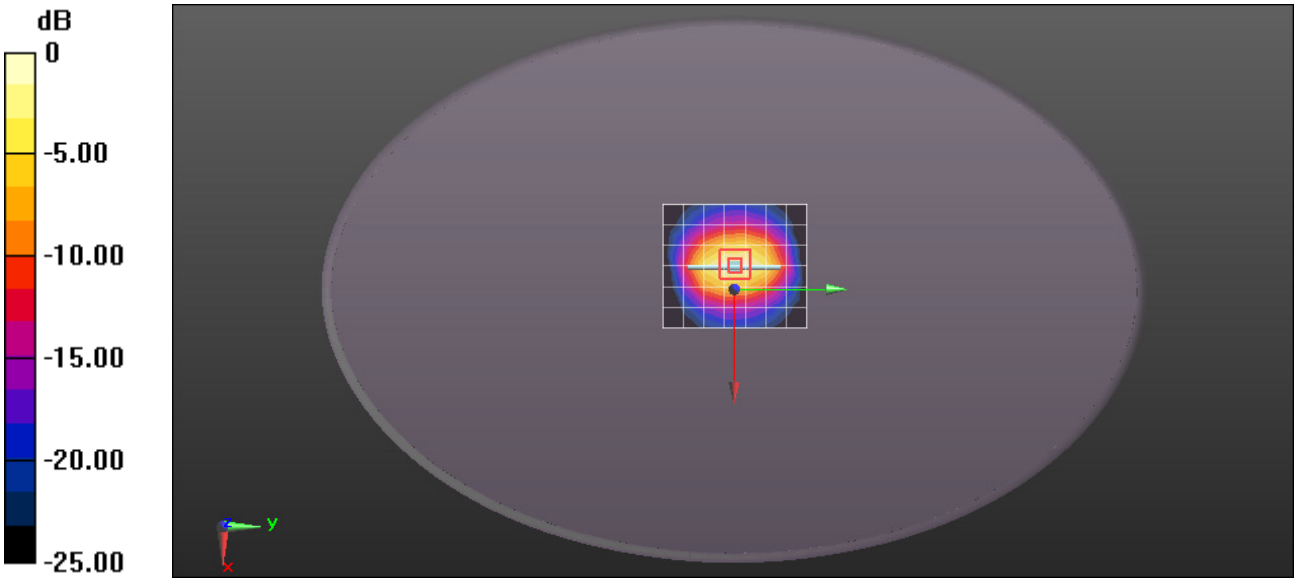
Communication System: UID 0, CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.372 S/m; ε_r = 40.64; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(7.95, 7.95, 7.95); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Body/Pin=250 mW, dist=10mm (EX-Probe)/Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 14.1 W/kg

Body/Pin=250 mW, dist=10mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 109.8 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 21.2 W/kg
SAR(1 g) = 9.98 W/kg; SAR(10 g) = 4.76 W/kg
Maximum value of SAR (measured) = 15.4 W/kg



0 dB = 15.4 W/kg = 11.88 dBW/kg

Date: 2020/06/02

Test Laboratory: Compliance Certification Services Inc.

SystemPerformanceCheck-Head 2450MHz

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 817

Communication System: UID 0, CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.878 S/m; ε_r = 38.488; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

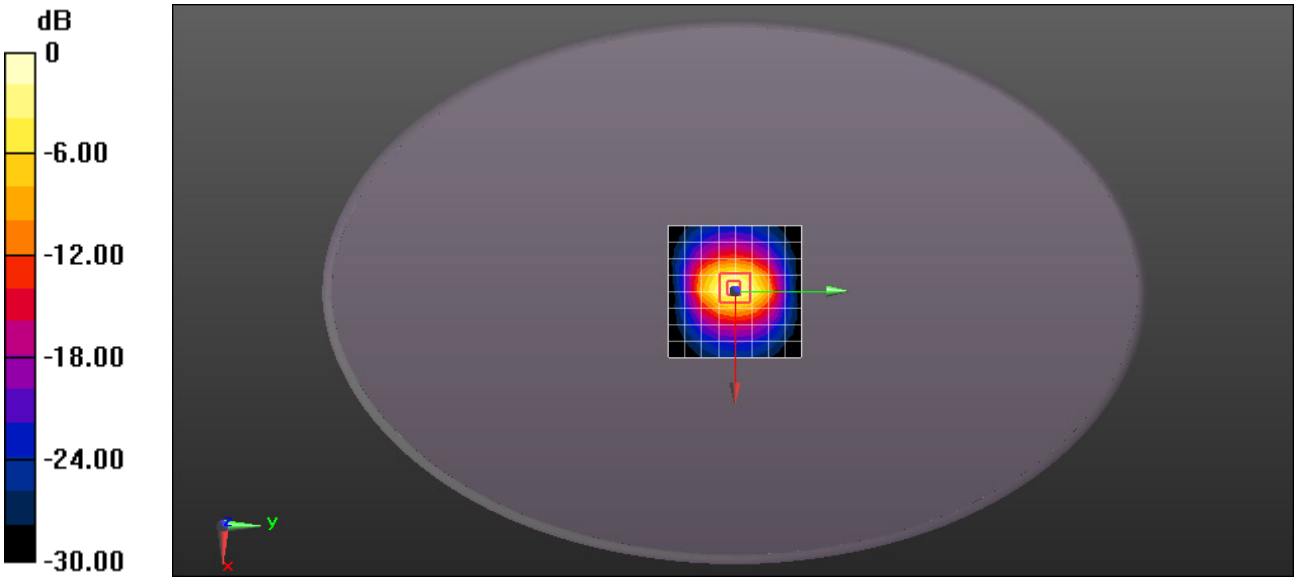
- Probe: EX3DV4 - SN3975; ConvF(7.56, 7.56, 7.56); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Body/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (9x9x1):

Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 16.1 W/kg

Body/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 94.31 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 25.8 W/kg
SAR(1 g) = 12.9 W/kg; SAR(10 g) = 6 W/kg
Maximum value of SAR (measured) = 19.5 W/kg



0 dB = 19.5 W/kg = 12.90 dBW/kg

Date: 2020/06/03

Test Laboratory: Compliance Certification Services Inc.

SystemPerformanceCheck-Head 5250MHz

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: 1095

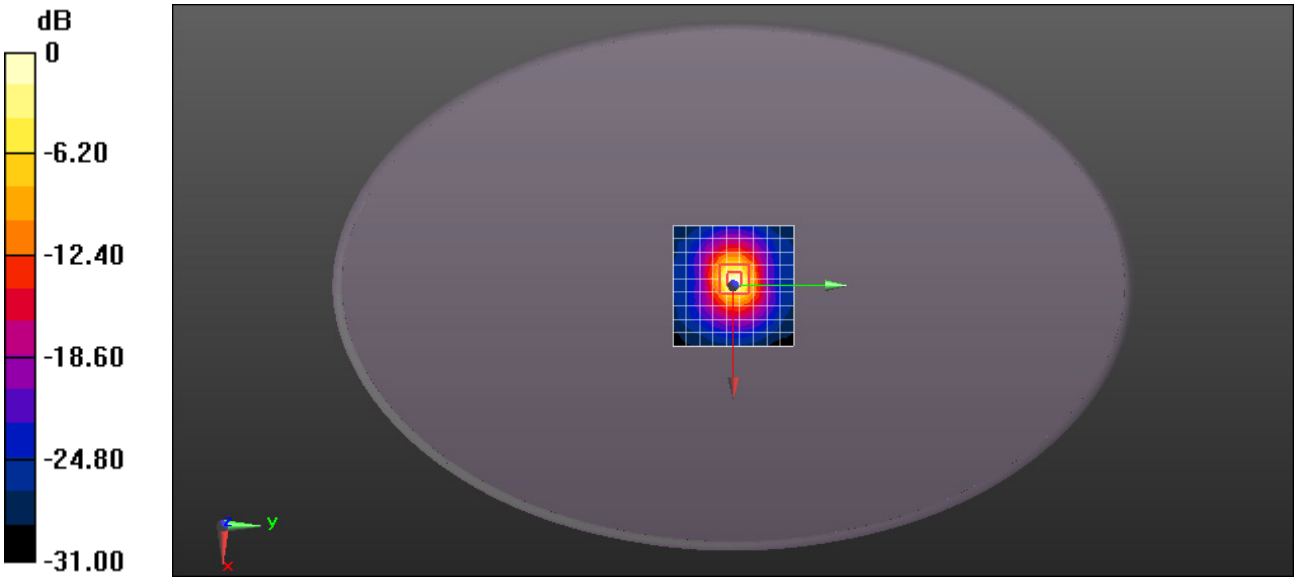
Communication System: UID 0, CW (0); Frequency: 5250 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5250 MHz; σ = 4.768 S/m; ε_r = 36.389; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(5.34, 5.34, 5.34); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Body/d=10mm, Pin=100mW, f=5200 MHz/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 16.5 W/kg

Body/d=10mm, Pin=100mW, f=5200 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 63.06 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 31.6 W/kg
SAR(1 g) = 7.72 W/kg; SAR(10 g) = 2.21 W/kg
Maximum value of SAR (measured) = 18.2 W/kg



0 dB = 18.2 W/kg = 12.60 dBW/kg

Date: 2020/06/03

Test Laboratory: Compliance Certification Services Inc.

SystemPerformanceCheck-Head 5600MHz

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: 1095

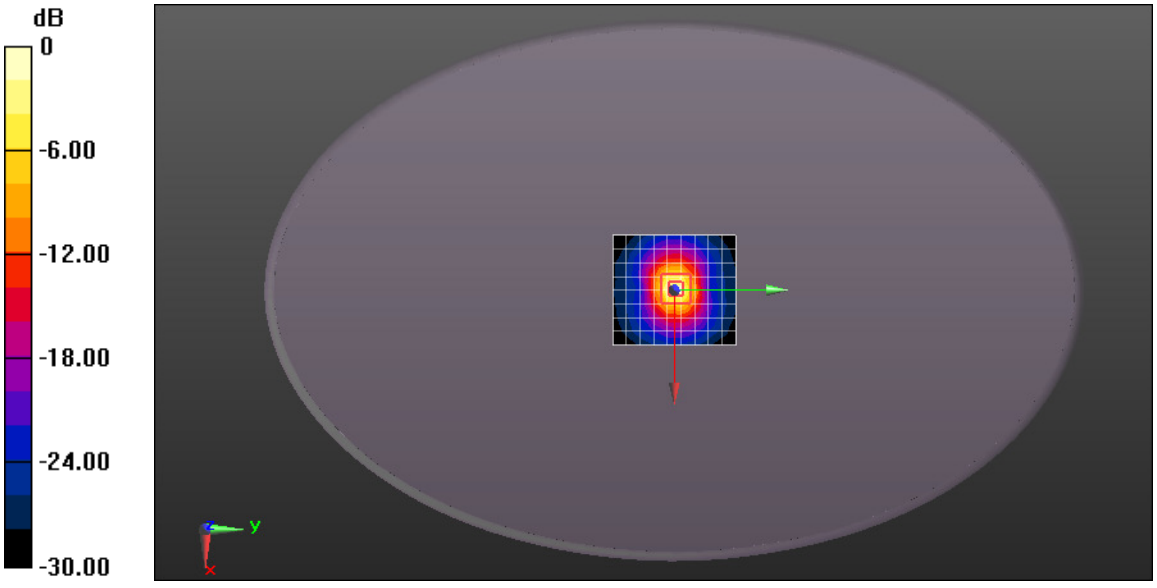
Communication System: UID 0, CW (0); Frequency: 5600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5600 MHz; σ = 5.182 S/m; ε_r = 35.759; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(4.76, 4.76, 4.76); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Body/d=10mm, Pin=100mW, f=5600 MHz/Area Scan (9x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 22.9 W/kg

Body/d=10mm, Pin=100mW, f=5600 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 80.61 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 48.7 W/kg
SAR(1 g) = 8.4 W/kg; SAR(10 g) = 2.45 W/kg
Maximum value of SAR (measured) = 26.8 W/kg



0 dB = 26.8 W/kg = 14.28 dBW/kg

Date: 2020/06/03

Test Laboratory: Compliance Certification Services Inc.

SystemPerformanceCheck-Head 5750MHz

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: 1095

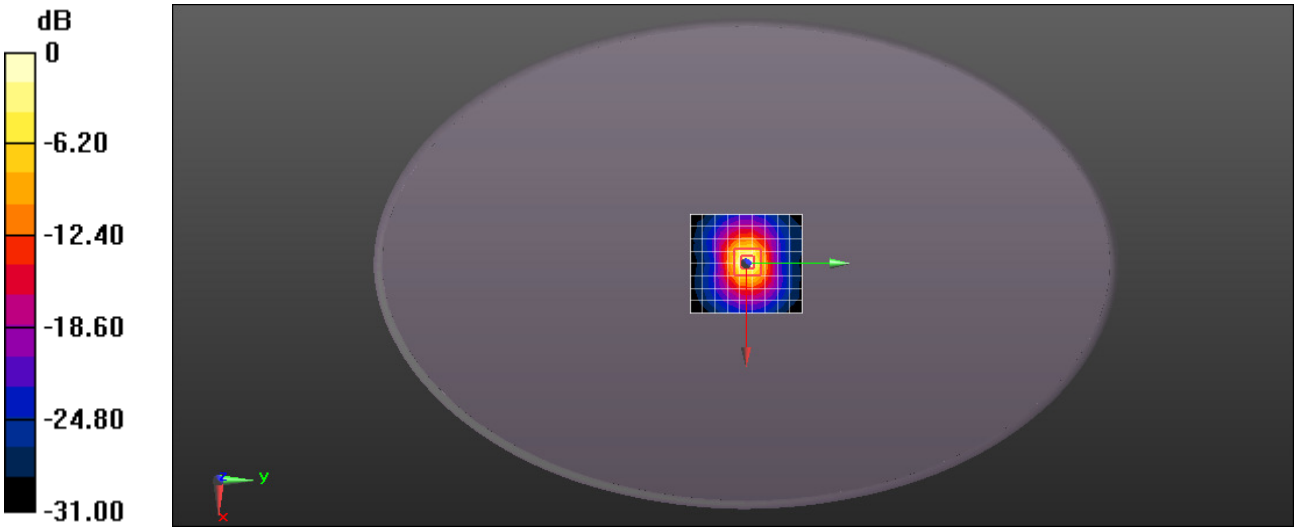
Communication System: UID 0, CW (0); Frequency: 5750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5750 MHz; σ = 5.332 S/m; ε_r = 35.267; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(4.79, 4.79, 4.79); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Body/d=10mm, Pin=100mW, f=5800 MHz/Area Scan (9x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 20.9 W/kg

Body/d=10mm, Pin=100mW, f=5800 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 76.31 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 45.3 W/kg
SAR(1 g) = 8.33 W/kg; SAR(10 g) = 2.36 W/kg
Maximum value of SAR (measured) = 24.5 W/kg



0 dB = 24.5 W/kg = 13.89 dBW/kg

Appendix B: Detailed Test Results

The plots of worse case are showing as followings.

Date: 2020/06/06

Test Laboratory: Compliance Certification Services Inc.

LTE Band 2 20M QPSK 50RB25 Edge 2 Ch18700 0mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

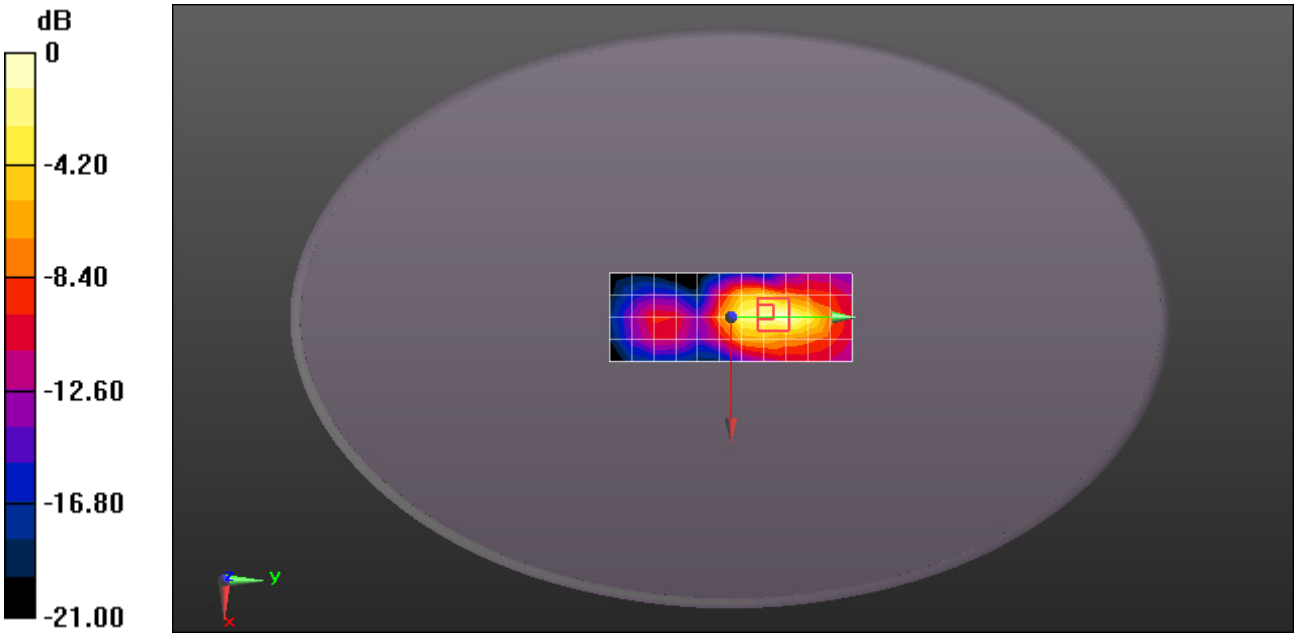
Communication System: UID 0, FDD_LTE (0); Frequency: 1860 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1860 MHz; σ = 1.35 S/m; ε_r = 40.814; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(7.95, 7.95, 7.95); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.429 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.37 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.516 W/kg
SAR(1 g) = 0.246 W/kg; SAR(10 g) = 0.126 W/kg
Maximum value of SAR (measured) = 0.415 W/kg



0 dB = 0.415 W/kg = -3.82 dBW/kg

Date: 2020/06/06

Test Laboratory: Compliance Certification Services Inc.

LTE Band 2 QPSK 1RB0 20M Edge 2 Ch19100 4mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

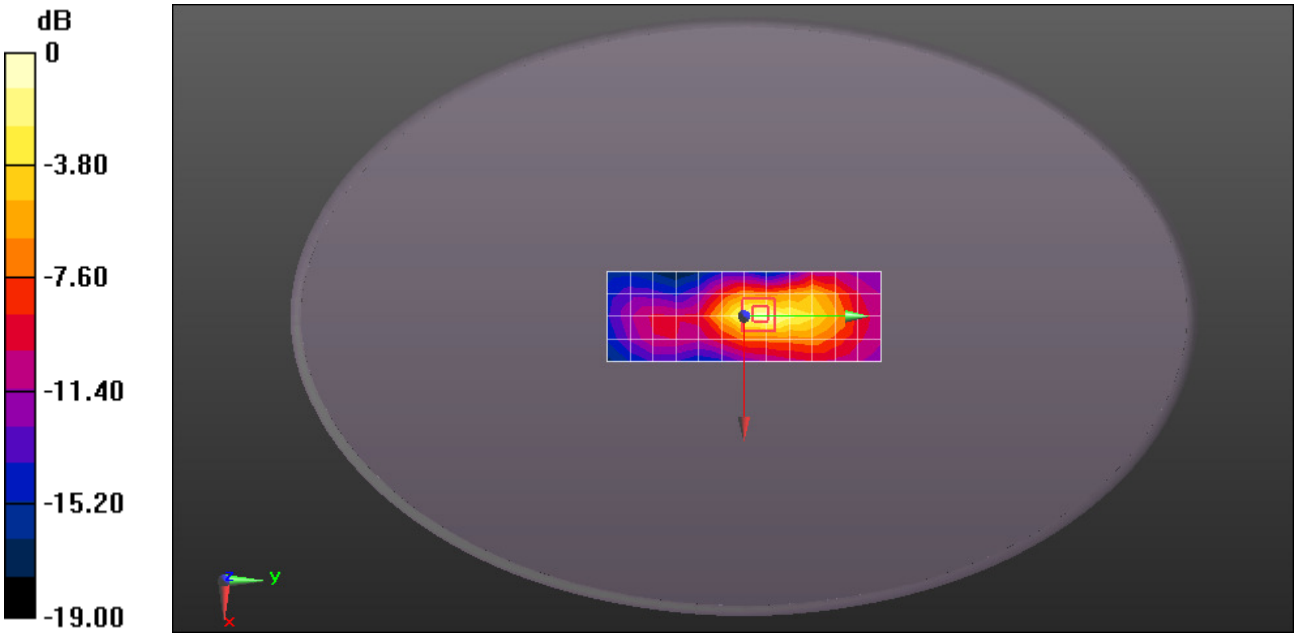
Communication System: UID 0, FDD_LTE (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.372 S/m; ε_r = 40.64; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(7.95, 7.95, 7.95); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.89 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 34.27 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 2.34 W/kg
SAR(1 g) = 1.28 W/kg; SAR(10 g) = 0.650 W/kg
Maximum value of SAR (measured) = 1.90 W/kg



0 dB = 1.90 W/kg = 2.79 dBW/kg

Test Laboratory: Compliance Certification Services Inc.

LTE Band 2 QPSK 1RB0 20M Edge 3 Ch19100 0mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

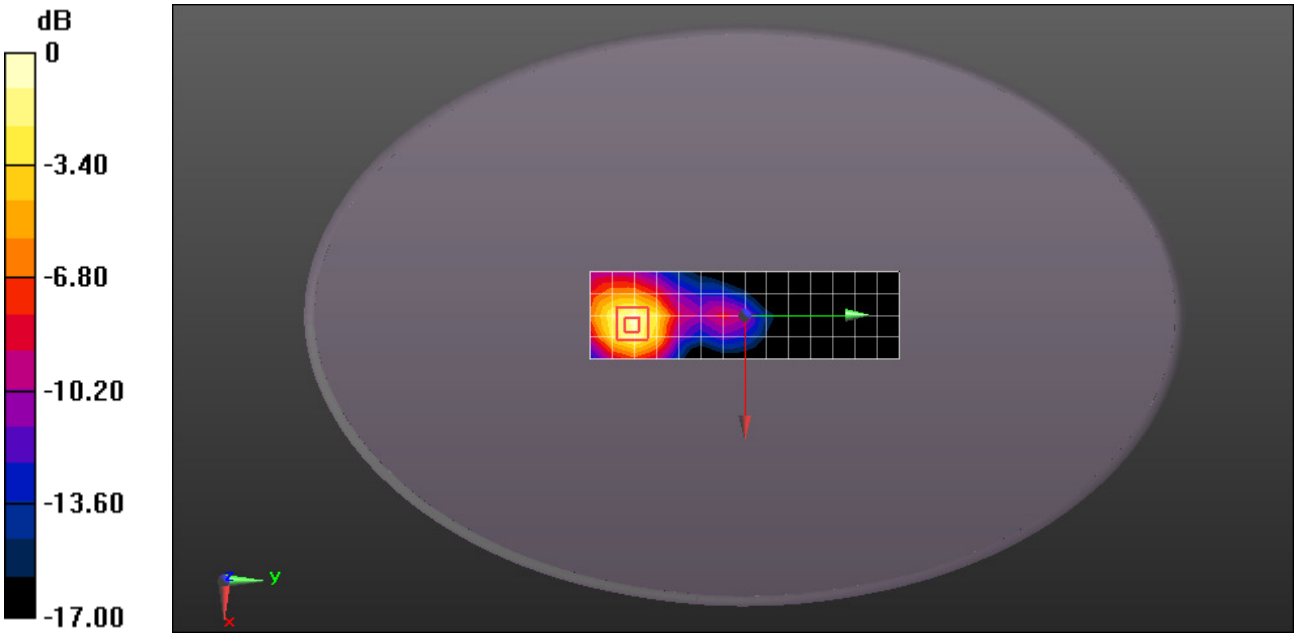
Communication System: UID 0, FDD_LTE (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.372 S/m; ε_r = 40.64; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(7.95, 7.95, 7.95); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x15x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.744 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.538 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.595 W/kg; SAR(10 g) = 0.335 W/kg
Maximum value of SAR (measured) = 0.865 W/kg



0 dB = 0.865 W/kg = -0.63 dBW/kg

Date: 2020/06/08

Test Laboratory: Compliance Certification Services Inc.

LTE Band 4 QPSK 50RB0 20M Edge 2 Ch20050 0mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

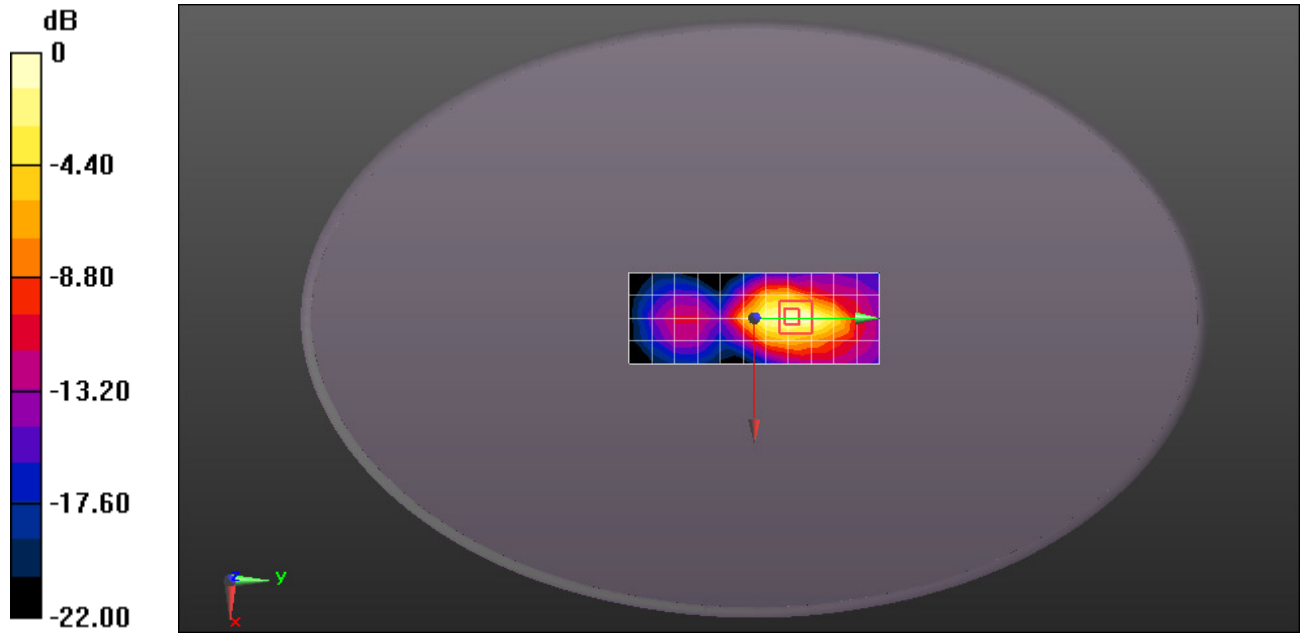
Communication System: UID 0, FDD_LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.316 S/m; ε_r = 40.633; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(8.36, 8.36, 8.36); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.626 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.17 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.765 W/kg
SAR(1 g) = 0.436 W/kg; SAR(10 g) = 0.228 W/kg
Maximum value of SAR (measured) = 0.621 W/kg



0 dB = 0.621 W/kg = -2.07 dBW/kg

Date: 2020/06/08

Test Laboratory: Compliance Certification Services Inc.

LTE Band 4 QPSK 1RB0 20M Edge 2 Ch20050 4mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

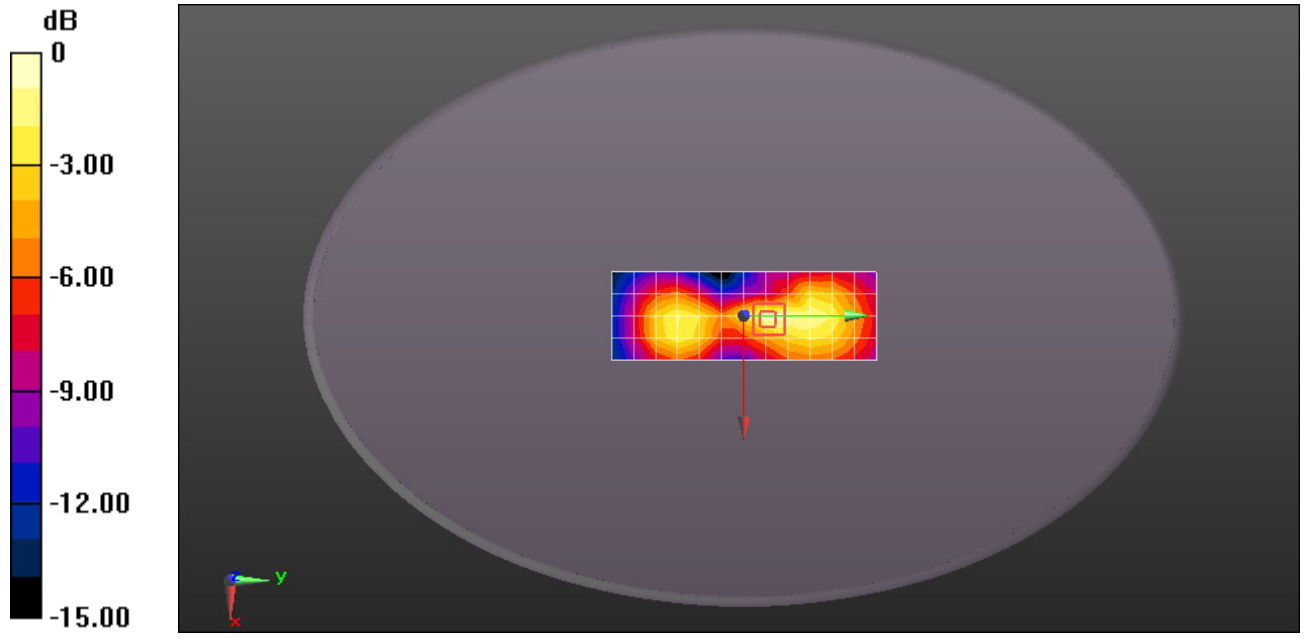
Communication System: UID 0, FDD_LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.316 S/m; ε_r = 40.633; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(8.36, 8.36, 8.36); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.710 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.28 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.840 W/kg
SAR(1 g) = 0.473 W/kg; SAR(10 g) = 0.252 W/kg
Maximum value of SAR (measured) = 0.725 W/kg



0 dB = 0.725 W/kg = -1.40 dBW/kg

Date: 2020/06/08

Test Laboratory: Compliance Certification Services Inc.

LTE Band 4 QPSK 1RB0 20M Edge 3 Ch20050 0mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

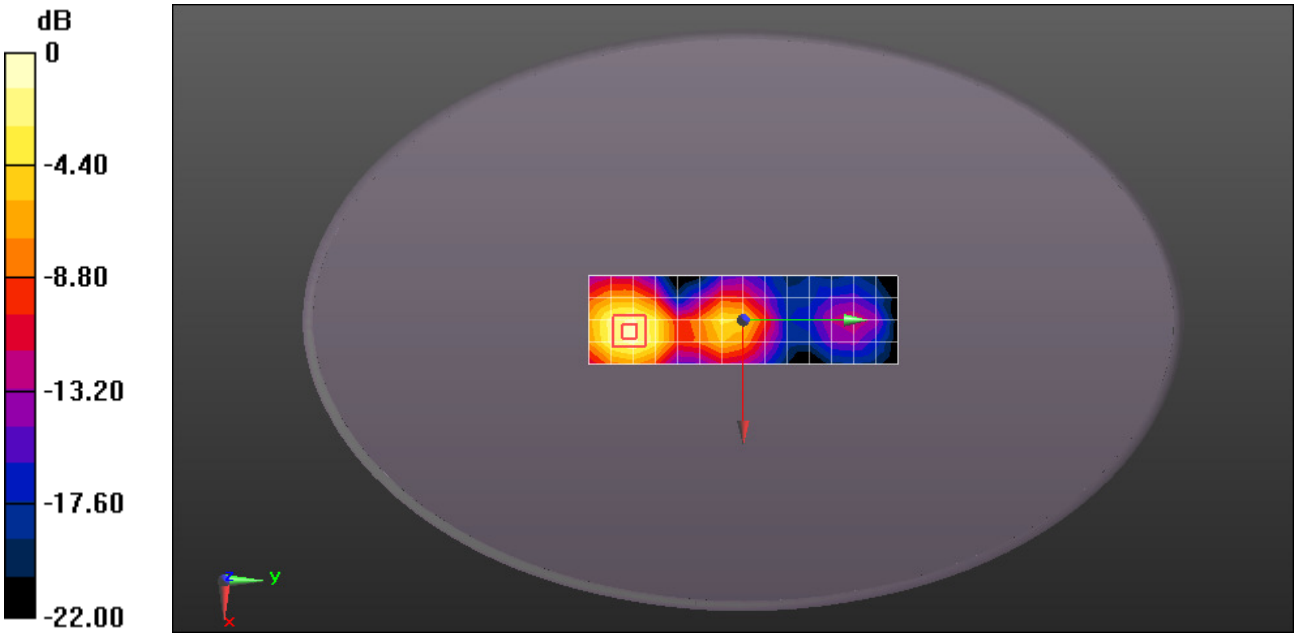
Communication System: UID 0, FDD_LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.316 S/m; ε_r = 40.633; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(8.36, 8.36, 8.36); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x15x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.621 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.77 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.891 W/kg
SAR(1 g) = 0.529 W/kg; SAR(10 g) = 0.308 W/kg
Maximum value of SAR (measured) = 0.762 W/kg



0 dB = 0.762 W/kg = -1.18 dBW/kg

Date: 2020/06/04

Test Laboratory: Compliance Certification Services Inc.

LTE Band 5 QPSK 1RB0 10M Edge 2 Ch20525 0mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

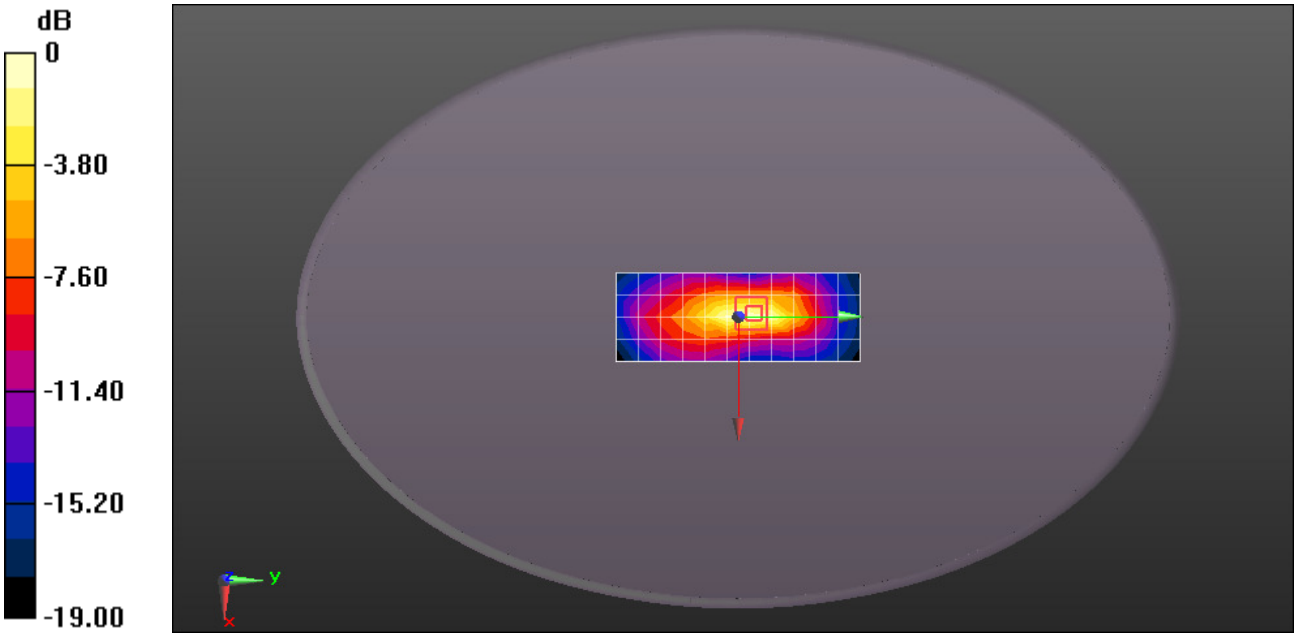
Communication System: UID 0, FDD_LTE (0); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium parameters used: f = 836.5 MHz; σ = 0.887 S/m; ε_r = 40.84; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(9.56, 9.56, 9.56); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.50 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 40.97 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.99 W/kg
SAR(1 g) = 0.955 W/kg; SAR(10 g) = 0.511 W/kg
Maximum value of SAR (measured) = 1.57 W/kg



0 dB = 1.57 W/kg = 1.96 dBW/kg

Date: 2020/06/04

Test Laboratory: Compliance Certification Services Inc.

LTE Band 5 QPSK 1RB49 10M Edge 2 Ch20600 4mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

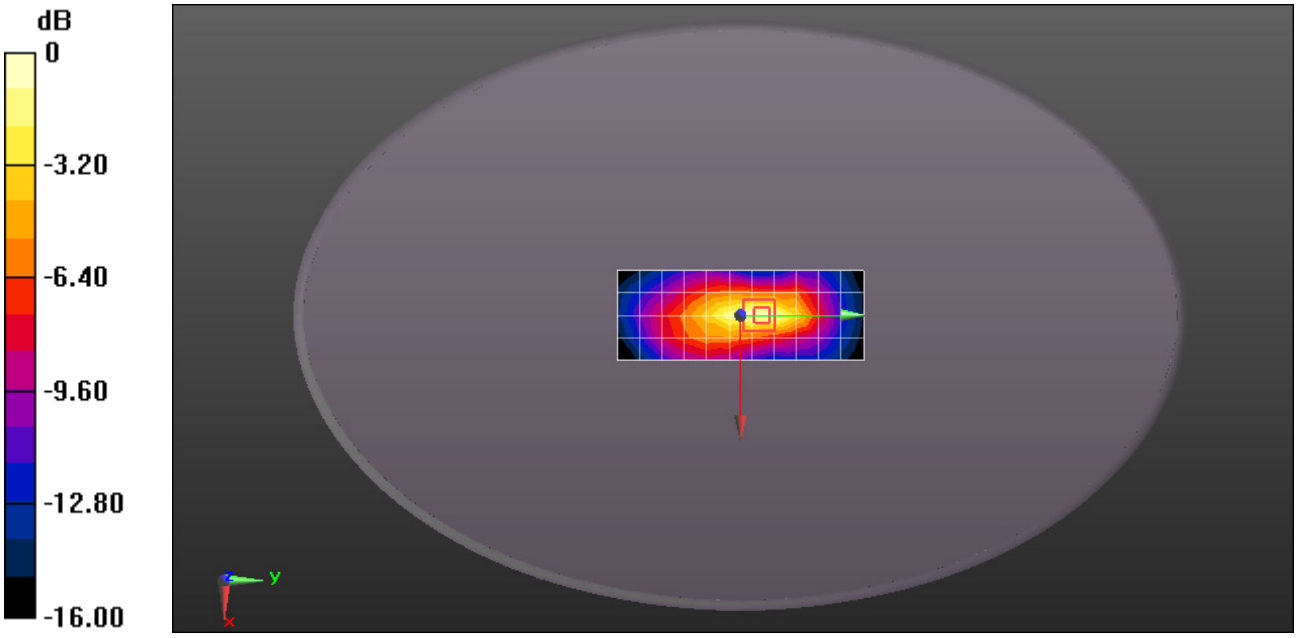
Communication System: UID 0, FDD_LTE (0); Frequency: 844 MHz;Duty Cycle: 1:1
Medium parameters used: f = 844 MHz; σ = 0.891 S/m; ε_r = 40.79; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(9.56, 9.56, 9.56); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.964 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 31.81 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.660 W/kg; SAR(10 g) = 0.377 W/kg
Maximum value of SAR (measured) = 1.01 W/kg



0 dB = 1.01 W/kg = 0.04 dBW/kg

Date: 2020/06/04

Test Laboratory: Compliance Certification Services Inc.

LTE Band 5 QPSK 25RB0 10M Edge 3 Ch20600 0mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

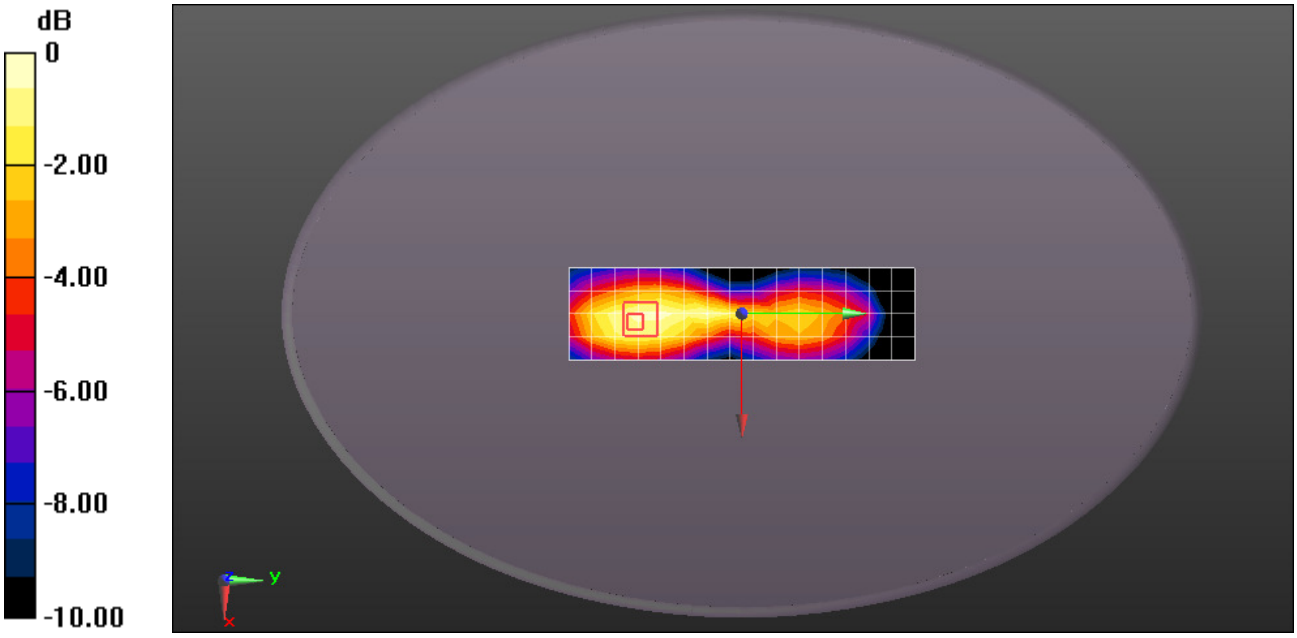
Communication System: UID 0, FDD_LTE (0); Frequency: 844 MHz;Duty Cycle: 1:1
Medium parameters used: f = 844 MHz; σ = 0.891 S/m; ε_r = 40.79; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(9.56, 9.56, 9.56); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x16x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.138 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.99 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.173 W/kg
SAR(1 g) = 0.111 W/kg; SAR(10 g) = 0.075 W/kg
Maximum value of SAR (measured) = 0.149 W/kg



0 dB = 0.149 W/kg = -8.27 dBW/kg

Date: 2020/06/05

Test Laboratory: Compliance Certification Services Inc.

LTE Band 12 QPSK 1RB49 10M Edge 2 Ch23130 0mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

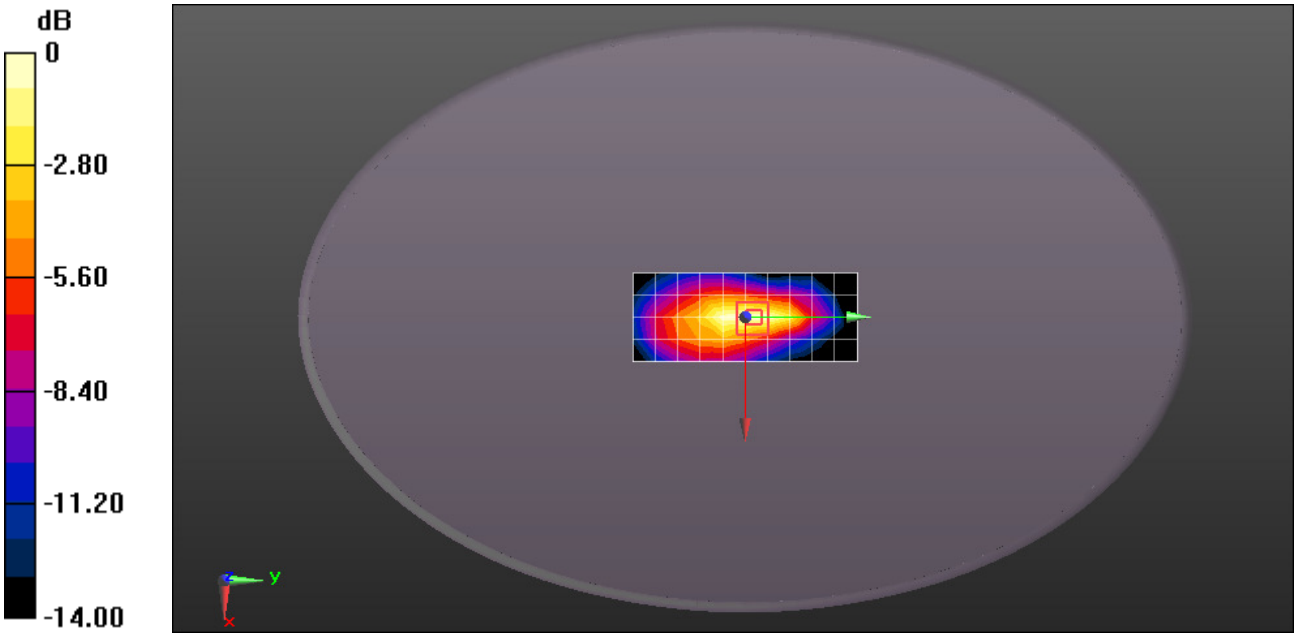
Communication System: UID 0, FDD_LTE (0); Frequency: 711 MHz;Duty Cycle: 1:1
Medium parameters used: f = 711 MHz; σ = 0.878 S/m; ε_r = 42.185; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(9.9, 9.9, 9.9); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.32 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 39.93 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.62 W/kg
SAR(1 g) = 0.856 W/kg; SAR(10 g) = 0.513 W/kg



0 dB = 1.32 W/kg = 1.21 dBW/kg

Date: 2020/06/05

Test Laboratory: Compliance Certification Services Inc.

LTE Band 12 QPSK 1RB49 10M Edge 2 Ch23130 4mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

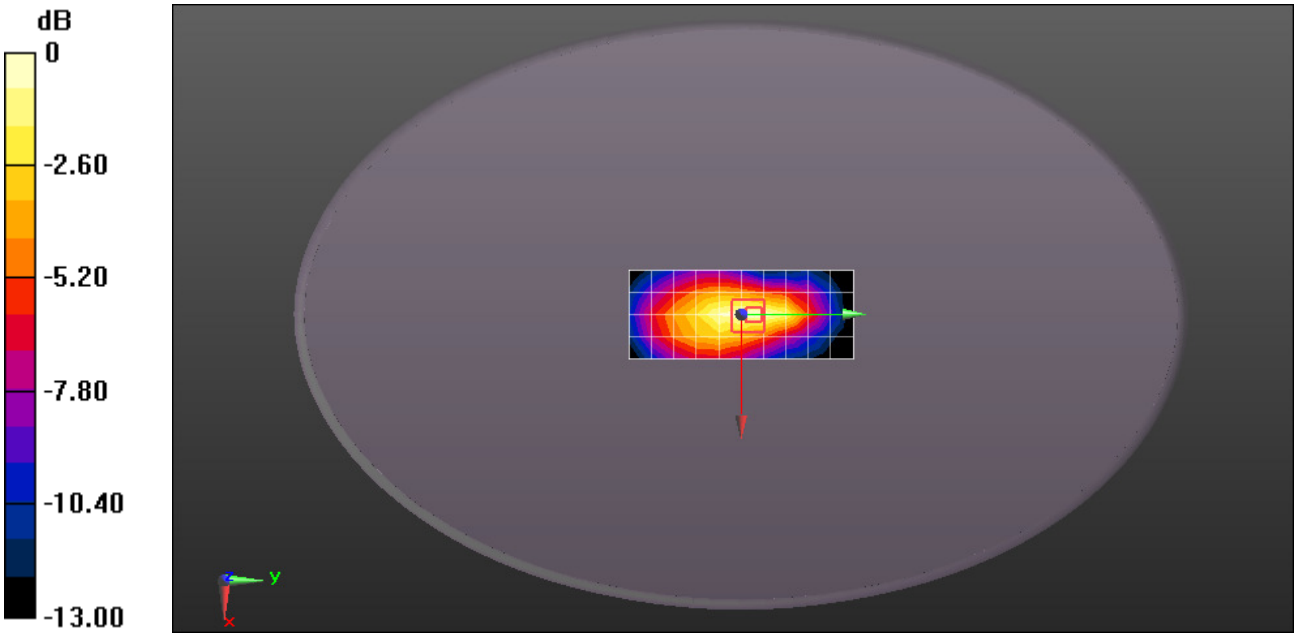
Communication System: UID 0, FDD_LTE (0); Frequency: 711 MHz;Duty Cycle: 1:1
Medium parameters used: f = 711 MHz; σ = 0.878 S/m; ε_r = 42.185; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(9.9, 9.9, 9.9); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.524 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.14 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.643 W/kg
SAR(1 g) = 0.369 W/kg; SAR(10 g) = 0.236 W/kg
Maximum value of SAR (measured) = 0.535 W/kg



0 dB = 0.535 W/kg = -2.72 dBW/kg

Date: 2020/06/05

Test Laboratory: Compliance Certification Services Inc.

LTE Band 12 QPSK 1RB49 10M Edge 3 Ch23130 0mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

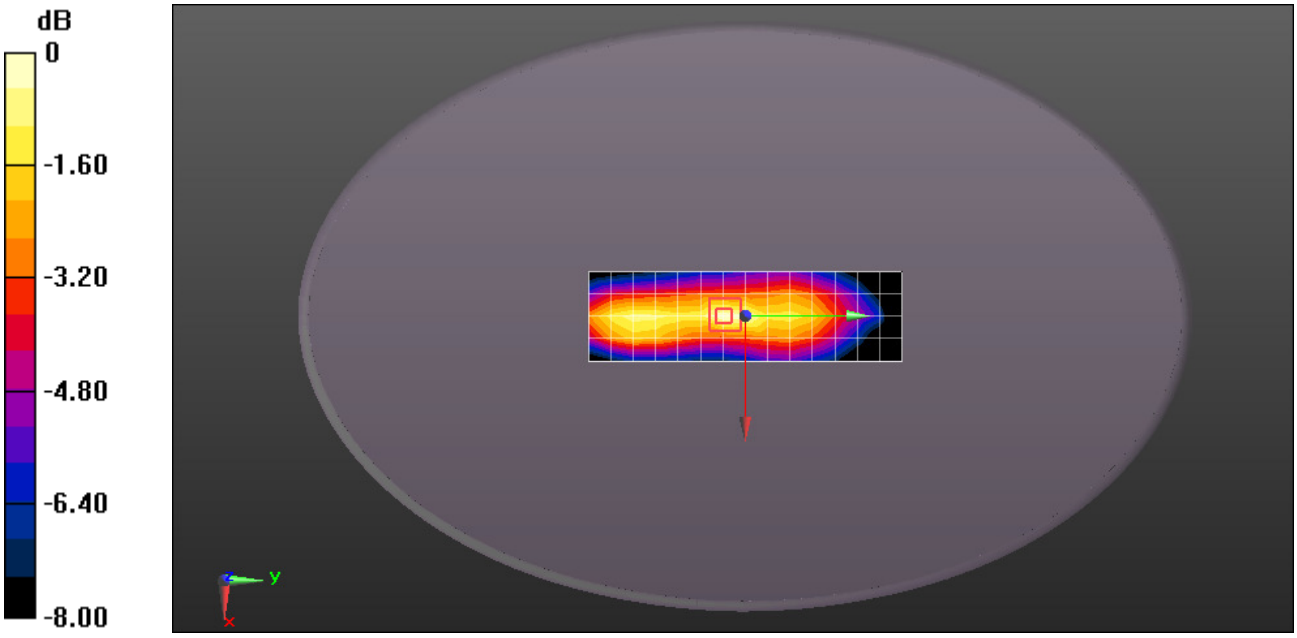
Communication System: UID 0, FDD_LTE (0); Frequency: 711 MHz;Duty Cycle: 1:1
Medium parameters used: f = 711 MHz; σ = 0.878 S/m; ε_r = 42.185; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(9.9, 9.9, 9.9); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x15x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.0890 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.974 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.110 W/kg
SAR(1 g) = 0.059 W/kg; SAR(10 g) = 0.037 W/kg
Maximum value of SAR (measured) = 0.0879 W/kg



0 dB = 0.0879 W/kg = -10.56 dBW/kg

Date: 2020/06/05

Test Laboratory: Compliance Certification Services Inc.

LTE Band 13 QPSK 1RB0 10M Edge 2 Ch23230 0mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

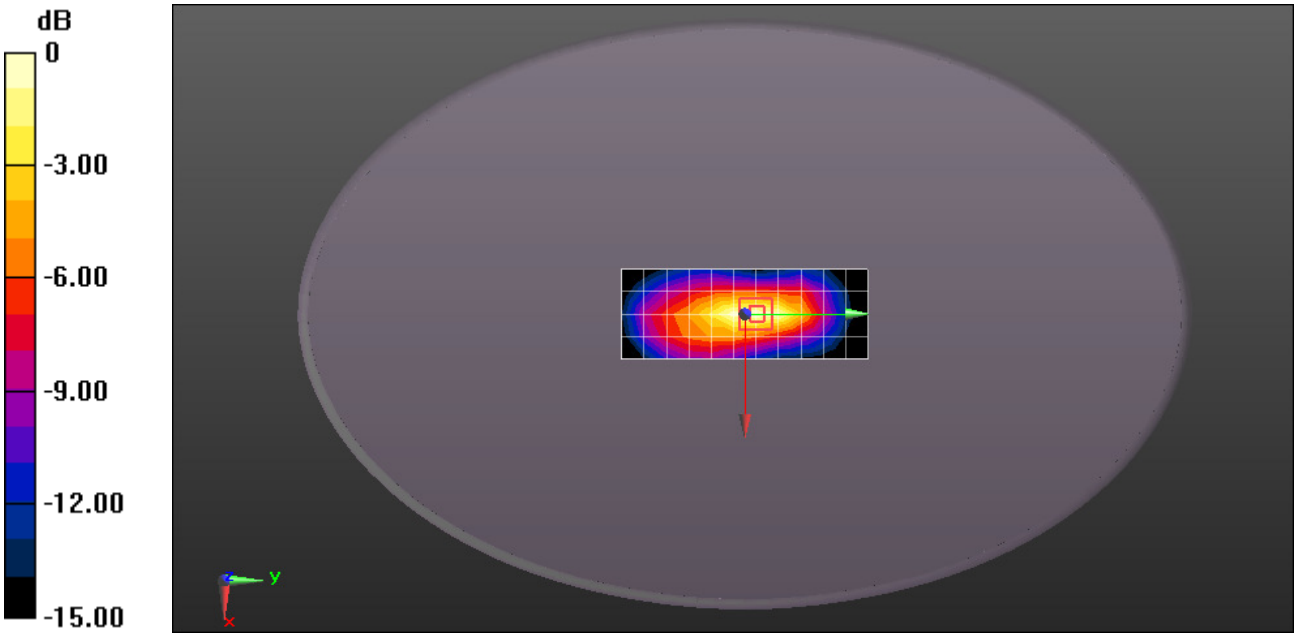
Communication System: UID 0, FDD_LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 0.913 S/m; ε_r = 41.386; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(9.9, 9.9, 9.9); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.03 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 41.68 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.96 W/kg
SAR(1 g) = 1.03 W/kg; SAR(10 g) = 0.593 W/kg
Maximum value of SAR (measured) = 1.60 W/kg



0 dB = 1.60 W/kg = 2.04 dBW/kg

Date: 2020/06/05

Test Laboratory: Compliance Certification Services Inc.

LTE Band 13 QPSK 1RB0 10M Edge 2 Ch23230 4mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

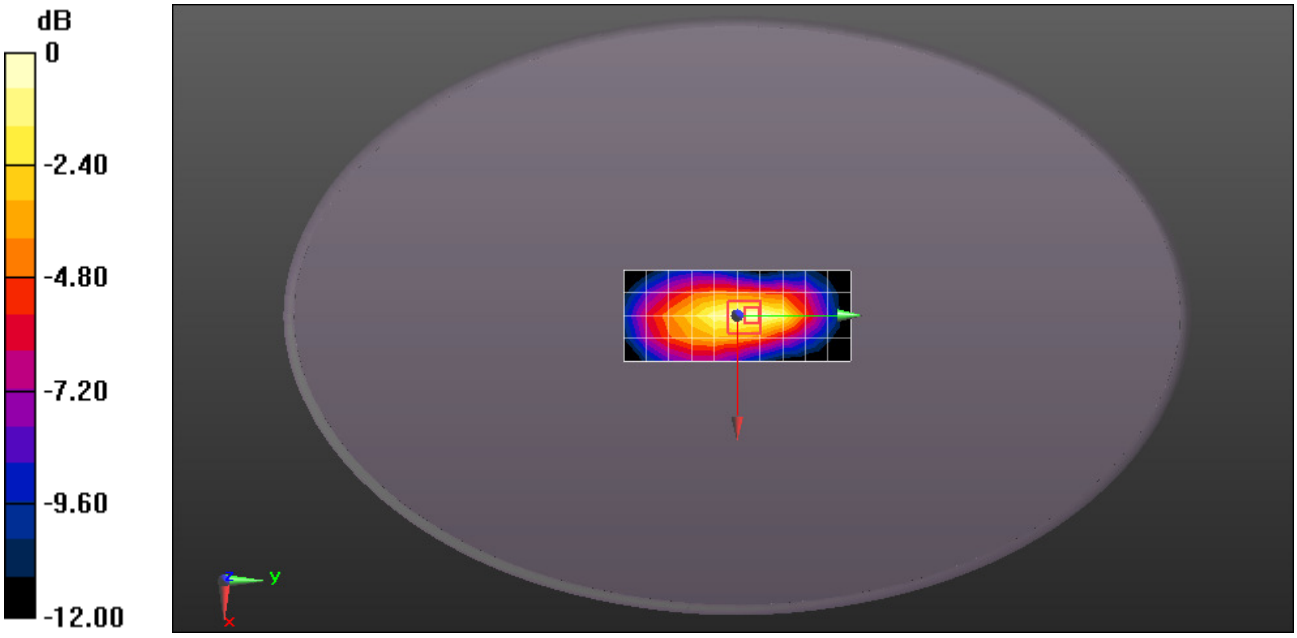
Communication System: UID 0, FDD_LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 0.913 S/m; ε_r = 41.386; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(9.9, 9.9, 9.9); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.907 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 31.84 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.638 W/kg; SAR(10 g) = 0.402 W/kg
Maximum value of SAR (measured) = 0.902 W/kg



0 dB = 0.902 W/kg = -0.45 dBW/kg

Date: 2020/06/05

Test Laboratory: Compliance Certification Services Inc.

LTE Band 13 QPSK 1RB0 10M Edge 1 Ch23230 0mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

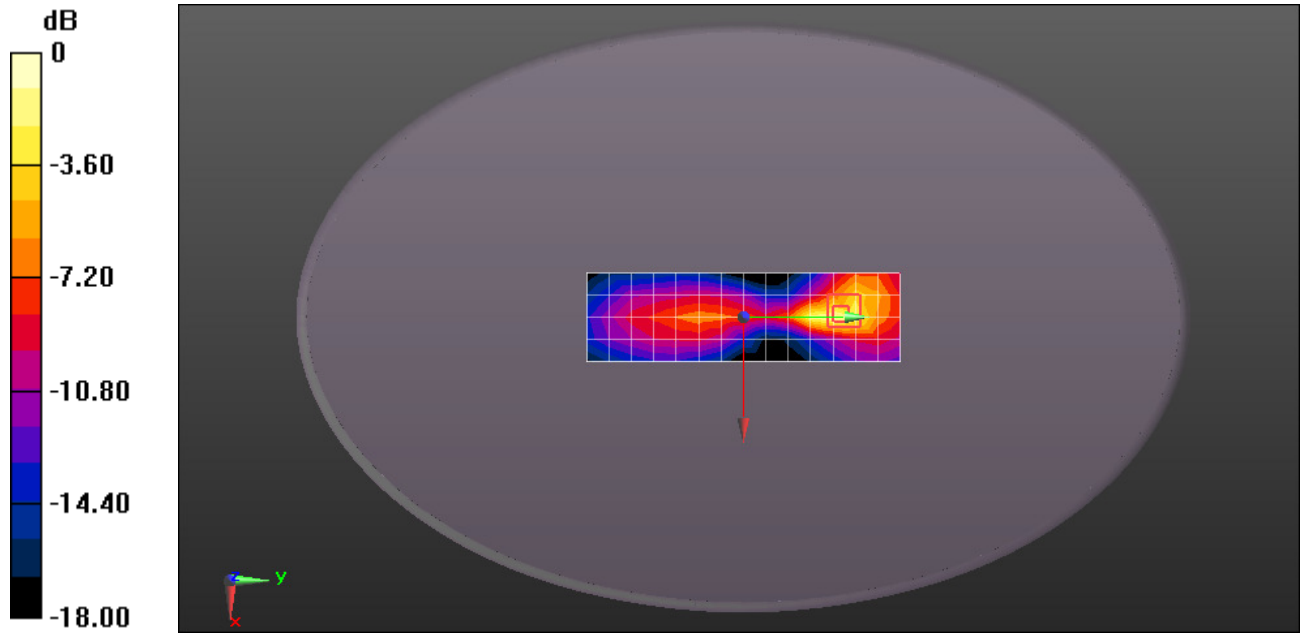
Communication System: UID 0, FDD_LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 0.913 S/m; ε_r = 41.386; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(9.9, 9.9, 9.9); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x15x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.146 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.998 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.229 W/kg
SAR(1 g) = 0.096 W/kg; SAR(10 g) = 0.051 W/kg
Maximum value of SAR (measured) = 0.168 W/kg



0 dB = 0.168 W/kg = -7.75 dBW/kg

Test Laboratory: Compliance Certification Services Inc.

WIFI 2.4G 802.11b 1Mbps Edge 3 Ch1 0mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

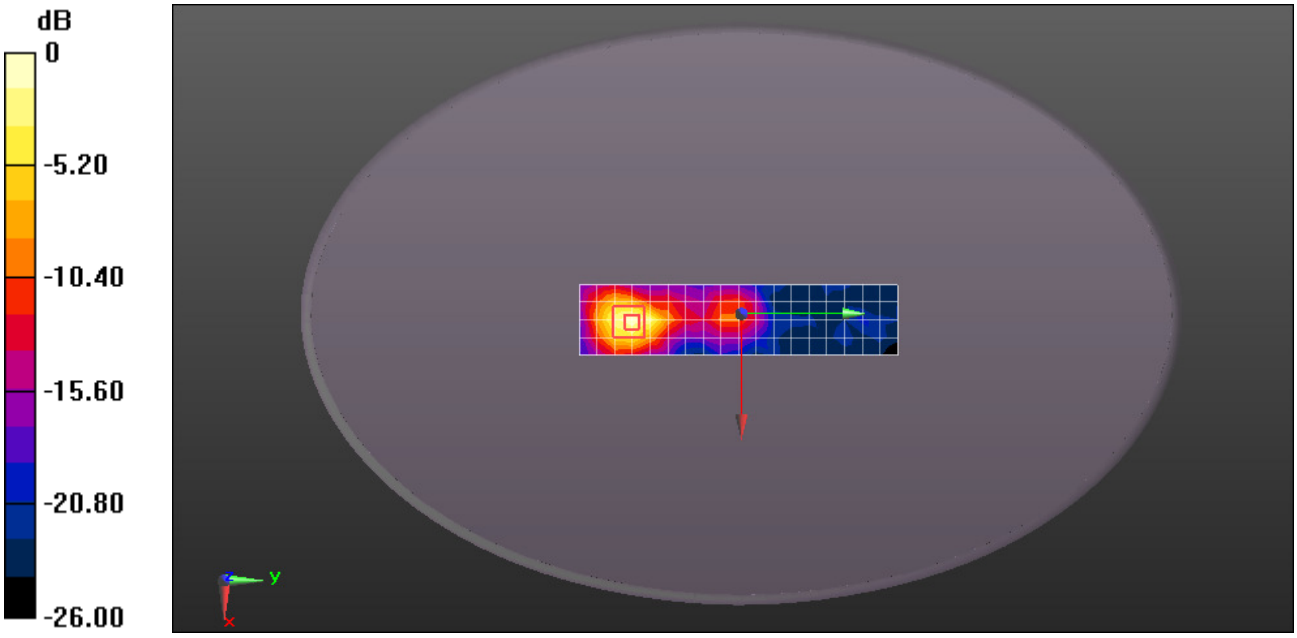
Communication System: UID 0, WiFi (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.834 S/m; ε_r = 38.668; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(7.56, 7.56, 7.56); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x19x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.522 W/kg

Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.022 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.705 W/kg
SAR(1 g) = 0.329 W/kg; SAR(10 g) = 0.149 W/kg
Maximum value of SAR (measured) = 0.555 W/kg



0 dB = 0.555 W/kg = -2.56 dBW/kg

Date: 2020/06/03

Test Laboratory: Compliance Certification Services Inc.

WIFI 5G 802.11n40 MCS0 Edge 3 Ch54 0mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

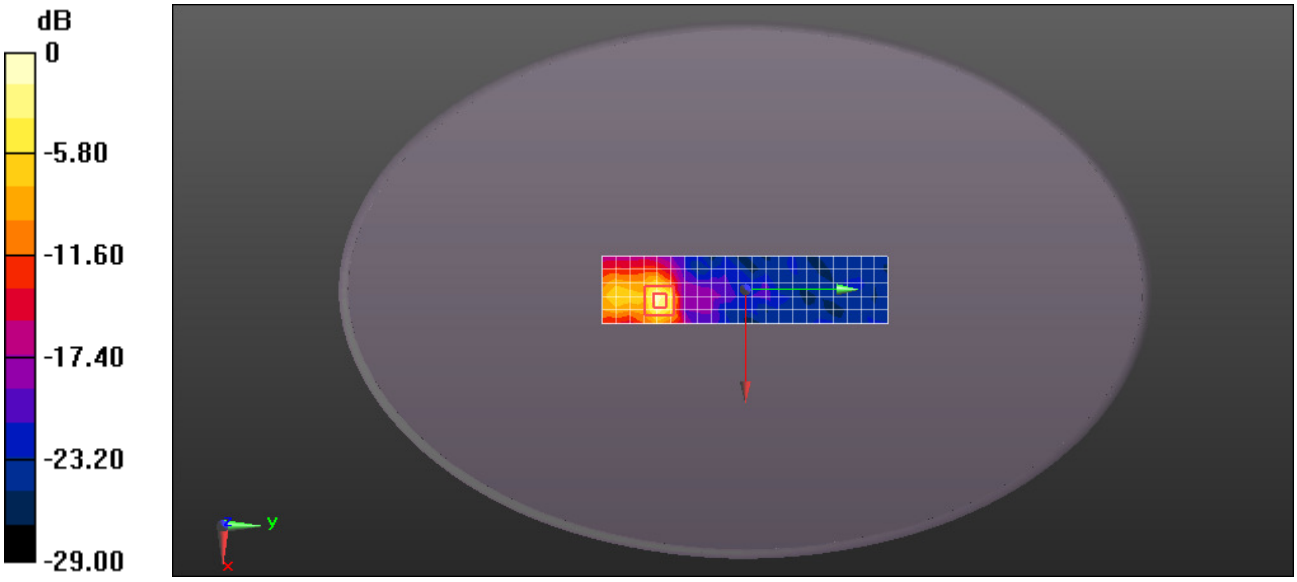
Communication System: UID 0, WiFi (0); Frequency: 5270 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5270 MHz; σ = 4.784 S/m; ε_r = 36.335; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(5.13, 5.13, 5.13); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (6x22x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.77 W/kg

Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 1.730 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 3.37 W/kg
SAR(1 g) = 0.847 W/kg; SAR(10 g) = 0.253 W/kg
Maximum value of SAR (measured) = 2.10 W/kg



0 dB = 2.10 W/kg = 3.22 dBW/kg

Date: 2020/06/03

Test Laboratory: Compliance Certification Services Inc.

WIFI 5G 802.11n40 MCS0 Edge 3 Ch102 0mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

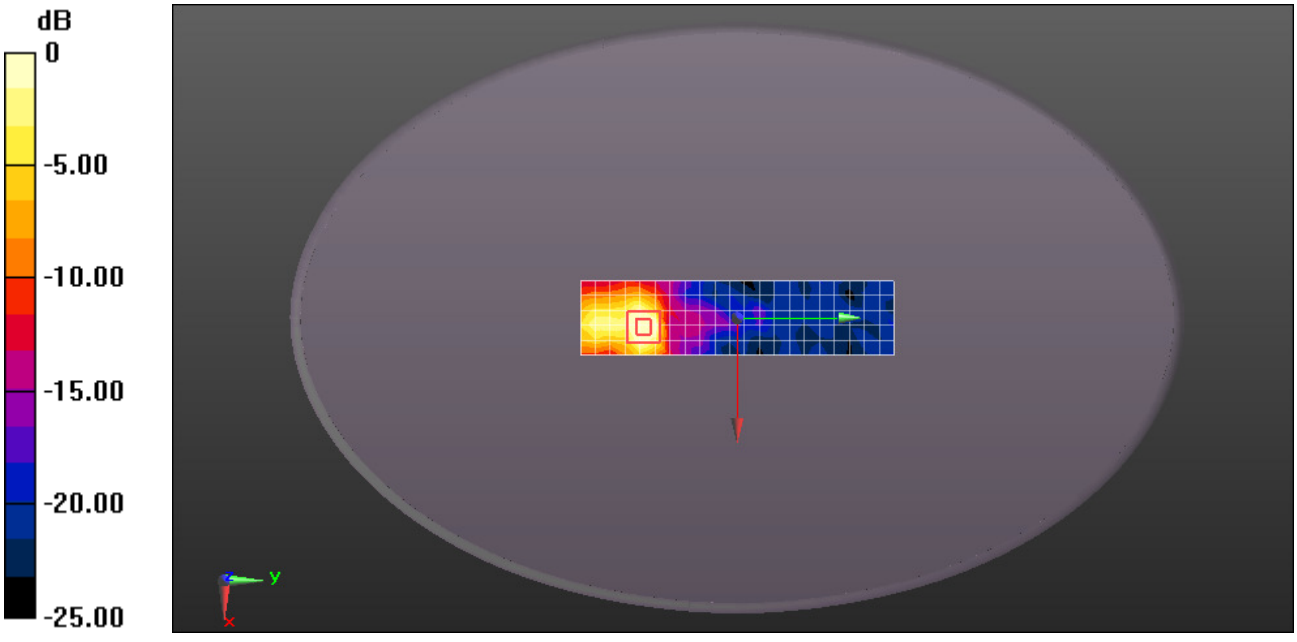
Communication System: UID 0, WiFi (0); Frequency: 5510 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5510 MHz; σ = 5.048 S/m; ε_r = 35.765; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(4.95, 4.95, 4.95); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (6x22x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 3.22 W/kg

Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 2.042 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 2.19 W/kg
SAR(1 g) = 0.525 W/kg; SAR(10 g) = 0.160 W/kg
Maximum value of SAR (measured) = 1.30 W/kg



0 dB = 1.30 W/kg = 1.14 dBW/kg

Date: 2020/06/03

Test Laboratory: Compliance Certification Services Inc.

WIFI 5G 802.11n40 MCS0 Edge 3 Ch151 0mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

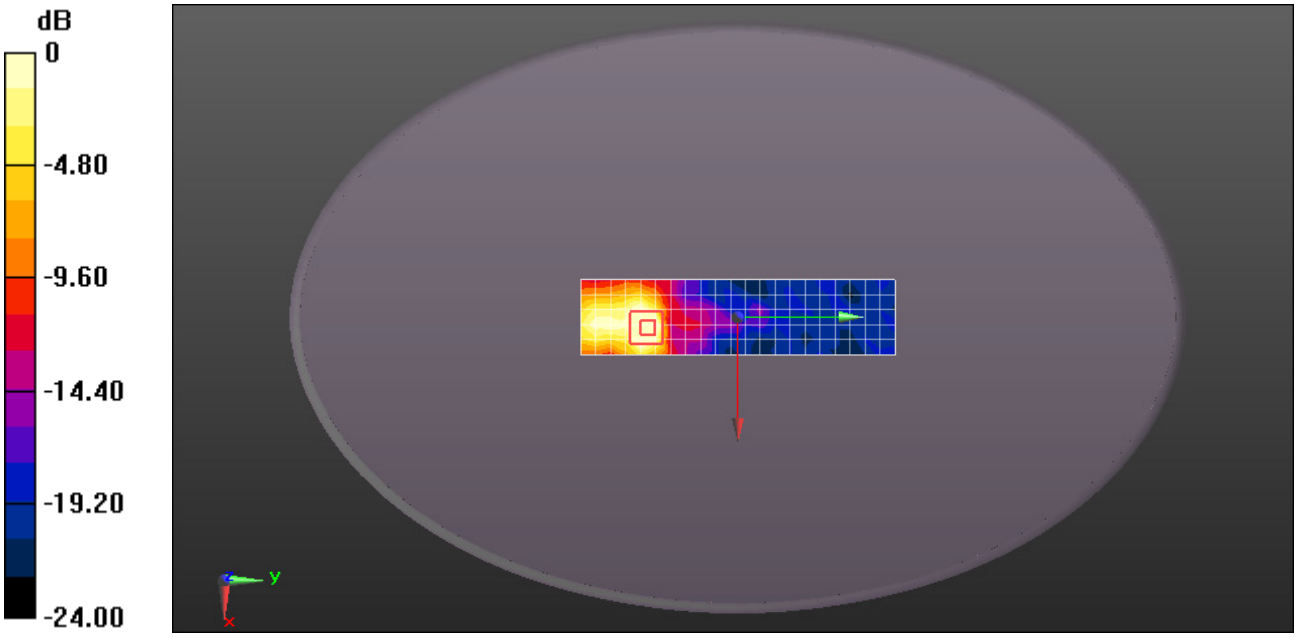
Communication System: UID 0, WiFi (0); Frequency: 5755 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5755 MHz; σ = 5.337 S/m; ε_r = 35.254; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(4.79, 4.79, 4.79); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (6x22x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 3.35 W/kg

Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 2.058 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.73 W/kg
SAR(1 g) = 0.381 W/kg; SAR(10 g) = 0.111 W/kg
Maximum value of SAR (measured) = 0.956 W/kg



0 dB = 0.956 W/kg = -0.20 dBW/kg

Date: 2020/06/03

Test Laboratory: Compliance Certification Services Inc.

Bluetooth GFSK 1Mbps Edge 3 Ch39 0mm

DUT: Rugged Tablet; Type: DT300QX; Serial: 10ec9770

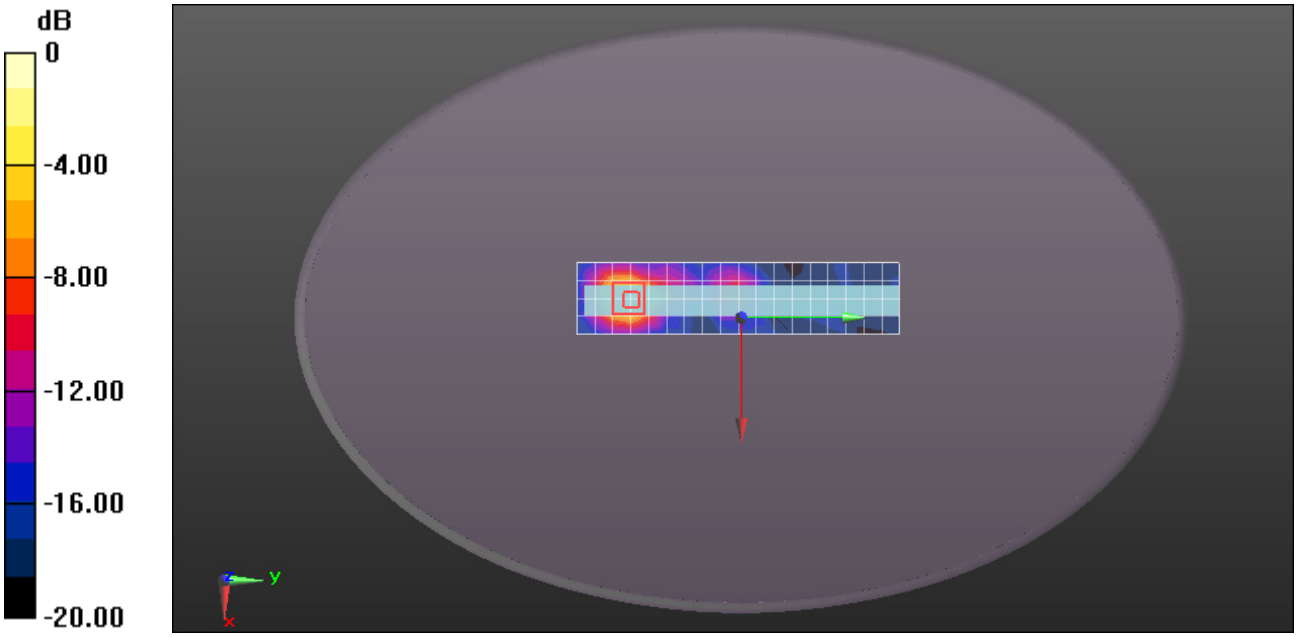
Communication System: UID 0, Bluetooth (0); Frequency: 2441 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2441 MHz; σ = 1.867 S/m; ε_r = 38.52; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3975; ConvF(7.56, 7.56, 7.56); Calibrated: 2020/05/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2019/10/16
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (5x19x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.191 W/kg

Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.081 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.241 W/kg
SAR(1 g) = 0.117 W/kg; SAR(10 g) = 0.054 W/kg



0 dB = 0.191 W/kg = -7.19 dBW/kg

Appendix C: Calibration certificate

Appendix D: Photographs

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