



# CTC Laboratories, Inc.

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## TEST REPORT

**Report Reference No.**..... : **CTC20201784E08**

**FCC ID**..... : 2AYD5-M2-203

**Applicant's name**..... : **Imin Technology Pte Ltd**

Address..... : 63 Ubi Ave 1 #07-02 63@Ubi Singapore 408937

Manufacturer..... : Imin Technology Pte Ltd

Address..... : 63 Ubi Ave 1 #07-02 63@Ubi Singapore 408937

**Test item description**..... : **Mobile POS**

Trade Mark ..... : N/A

Model/Type reference..... : M2-203

Listed Model(s) ..... : N/A

**Standard** ..... : **FCC 47 CFR Part2.1093**  
**IEEE 1528: 2013**  
**ANSI/IEEE C95.1: 2005**

Date of receipt of test sample..... : Dec.02, 2020

Date of testing..... : Dec.03, 2020 ~ Dec.27, 2020

Date of issue..... : Dec.28, 2020

**Result**..... : **PASS**

Compiled by  
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**Testing Laboratory Name** ..... : **CTC Laboratories, Inc.**

Address..... : 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

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Any objections must be raised to CTC within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit. The test report merely correspond to the test sample.



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## 1 . Test Standards and Report version

### 1.1. Test Standards

The tests were performed according to following standards:

[FCC 47 Part 2.1093](#) Radiofrequency Radiation Exposure Evaluation:Portable Devices

[IEEE Std C95.1, 2005](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 KHz to 300 GHz.

[IEEE Std 1528™-2013](#): IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.

[KDB 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

[KDB 447498 D01 General RF Exposure Guidance v06](#): Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies

[KDB 248227 D01 802.11 Wi-Fi SAR v02r02](#): SAR Measurement Procedures for 802.11 a/b/g Transmitters

[KDB 648474 D04 Handset SAR v01r03](#): SAR Evaluation Considerations for Wireless Handsets

[KDB 941225 D01 3G SAR Procedures v03r01](#): SAR Measurement Procedures for 3G Devices

[KDB 941225 D06 Hotspot Mode v02r01](#): SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities

[KDB 941225 D07 UMPC Mini Tablet v01r02](#): SAR Evaluation Procedures for UMPC Mini-tablet Devices. Report version

[KDB 941225 D05 SAR for LTE Devices v02r05](#): SAR Evaluation Considerations for LTE Devices

### 1.2. Report version

Revision No.	Date of issue	Description
N/A	2020-12-28	Original



## 2. Summary

### 2.1. Client Information

Applicant:	Imin Technology Pte Ltd
Address:	63 Ubi Ave 1 #07-02 63@Ubi Singapore 408937
Manufacturer:	Imin Technology Pte Ltd
Address:	63 Ubi Ave 1 #07-02 63@Ubi Singapore 408937

### 2.2. Product Description

Name of EUT:	Mobile POS			
Trade Mark:	N/A			
Model No.:	M2-203			
Listed Model(s):	N/A			
Power supply:	5Vdc/2A from AC/DC Adapter 7.4Vdc from 2600mAh Li-ion Battery			
Device Category:	Portable			
Product stage:	Production unit			
RF Exposure Environment:	General Population / Uncontrolled			
Hardware version:	N/A			
Software version:	N/A			
<b>Maximum SAR Value</b>				
Separation Distance:	Limb: 0mm			
Max Report SAR Value (1g):	Test location:	PCE	DTS	Simultaneous TX
	Limb	2.798 W/Kg	1.155 W/Kg	2.840 W/Kg
<b>GSM</b>				
Support Network:	GPRS,EGPRS			
Support Band:	GSM850,PCS1900			
Modulation Type:	GPRS:GMSK EGRPS:8PSK			
Antenna type:	PIFA Antenna			
<b>WCDMA</b>				
Operation Band:	WCDMA Band II, WCDMA Band V			
Power Class:	Power Class 3			
Modulation Type:	QPSK/16QAM/64QAM/HSUPA/HSDPA			
Antenna type:	PIFA Antenna			



<b>LTE</b>	
Operation Band:	FDD Band 4, FDD Band 5, FDD Band 7, FDD Band 17, TDD Band 41
Modulation Type:	QPSK,16QAM
Antenna type:	PIFA Antenna
<b>WIFI 2.4G</b>	
Supported type:	802.11b/802.11g/802.11n(HT20)
Modulation Type:	DSSS for 802.11b OFDM for 802.11g/802.11n(HT20)/802.11n(HT40)
Operation frequency:	2412MHz~2462MHz
Channel number:	11
Channel separation:	5MHz
Antenna type:	PIFA Antenna
<b>WIFI 5G</b>	
Supported type:	802.11a/802.11n HT20/802.11n HT40/802.11ac VHT20/802.11ac VHT40
Modulation Type:	BPSK /QPSK /16 QAM/64 QAM/256 QAM
Operation frequency:	5.180GHz~5.825GHz
Channel Bandwidth	802.11a/n H20/ac VHT20:20MHz 802.11n H40/ac VHT40:40MHz
Antenna type:	PIFA Antenna
<b>Bluetooth</b>	
Version:	Supported BT4.2+EDR
Modulation:	GFSK, $\pi/4$ DQPSK, 8DPSK
Operation frequency:	2402MHz~2480MHz
Channel number:	79
Channel separation:	1MHz
Antenna type:	PIFA Antenna
<b>Bluetooth-BLE</b>	
Version:	Bluetooth-BLE
Modulation:	GFSK
Operation frequency:	2402MHz~2480MHz
Channel number:	40
Channel separation:	2MHz
Antenna type:	PIFA Antenna
<i>Remark:</i>	
<ol style="list-style-type: none"> <li>1. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power</li> <li>2. About the methods of testing, please refer to the Tracking Number 134125 of FCC.</li> </ol>	



### 3. Test Environment

#### 3.1. Test laboratory

**CTC Laboratories, Inc.**

Add: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

#### 3.2. Test Facility

##### Laboratory accreditation

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

##### **CNAS-Lab Code: L5365**

CTC Laboratories, Inc. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation. Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

##### **A2LA-Lab Cert. No.: 4340.01**

CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

##### **Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)**

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

##### **FCC (Registration No.: 951311, Designation Number CN1208)**

CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 951311, Aug 26, 2017.



#### 4. Equipments Used during the Test

Test Equipment	Manufacturer	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
Data Acquisition Electronics DAEx	SPEAG	DAE4	1423	2020/05/19	2021/05/18
E-field Probe	SPEAG	EX3DV4	3974	2020/05/14	2021/05/13
System Validation Dipole	SPEAG	D750V3	1105	2018/08/27	2021/08/26
System Validation Dipole	SPEAG	D900V2	1d163	2018/06/05	2021/06/04
System Validation Dipole	SPEAG	D1750V2	1110	2018/06/07	2021/06/06
System Validation Dipole	SPEAG	D1900V2	5d115	2018/08/26	2021/08/25
System Validation Dipole	SPEAG	D2450V2	928	2018/10/12	2021/10/11
System Validation Dipole	SPEAG	D2600V2	1126	2018/08/29	2021/08/28
System Validation Dipole	SPEAG	D5GHzV2	1171	2018/10/13	2021/10/12
Network analyzer	Agilent	E5071C	MY46520333	2020/08/11	2021/08/10
Universal Radio Communication Tester	ROHDE & SCHWARZ	CMU200	117824	2019/12/29	2020/12/28
Universal Radio Communication Tester	ROHDE & SCHWARZ	CMW500	102414	2019/12/29	2020/12/28
Signal Generator	Agilent	N5182A	MY47420864	2019/12/28	2020/12/27
Power sensor	Mini-Circuits	PWR-8GHS	11609010017	2020/08/11	2021/08/10
Power sensor	Mini-Circuits	PWR-8GHS	11607130056	2020/08/11	2021/08/10
Power Amplifier	Mini-Circuits	ZHL-42W+	051701624	2020/08/11	2021/08/10
BI-DIRECTIONAL COUPLER	Mini-Circuits	ZGBDC20-33HP+	996201615	2020/08/11	2021/08/10
Attenuator	MCL	BW-N20W5+	1552	2020/08/11	2021/08/10
Attenuator	MCL	BW-N3W5+	1608	2020/08/11	2021/08/10
Attenuator	MCL	/	/	2020/08/11	2021/08/10

Note:

1. The Probe, Dipole and DAE calibration reference to the Appendix A
2. Referring to KDB865664 D01, the dipole calibration interval can be extended to 3 years with justification. The dipole are also not physically damaged or repaired during the interval.



### 5. Measurement Uncertainty

Measurement Uncertainty										
No.	Error Description	Type	Uncertainty Value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
<b>Measurement System</b>										
1	Probe calibration	B	6.0%	N	1	1	1	6.0%	6.0%	∞
2	Axial isotropy	B	4.70%	R	$\sqrt{3}$	0.7	0.7	1.90%	1.90%	∞
3	Hemispherical isotropy	B	9.60%	R	$\sqrt{3}$	0.7	0.7	3.90%	3.90%	∞
4	Boundary Effects	B	1.00%	R	$\sqrt{3}$	1	1	0.60%	0.60%	∞
5	Probe Linearity	B	4.70%	R	$\sqrt{3}$	1	1	2.70%	2.70%	∞
6	Detection limit	B	1.00%	R	$\sqrt{3}$	1	1	0.60%	0.60%	∞
7	RF ambient conditions-noise	B	0.00%	R	$\sqrt{3}$	1	1	0.00%	0.00%	∞
8	RF ambient conditions-reflection	B	0.00%	R	$\sqrt{3}$	1	1	0.00%	0.00%	∞
9	Response time	B	0.80%	R	$\sqrt{3}$	1	1	0.50%	0.50%	∞
10	Integration time	B	5.00%	R	$\sqrt{3}$	1	1	2.90%	2.90%	∞
11	RF ambient	B	3.00%	R	$\sqrt{3}$	1	1	1.70%	1.70%	∞
12	Probe positioned mech. restrictions	B	0.40%	R	$\sqrt{3}$	1	1	0.20%	0.20%	∞
13	Probe positioning with respect to phantom shell	B	2.90%	R	$\sqrt{3}$	1	1	1.70%	1.70%	∞
14	Max.SAR evaluation	B	3.90%	R	$\sqrt{3}$	1	1	2.30%	2.30%	∞
<b>Test Sample Related</b>										
15	Test sample positioning	A	1.86%	N	1	1	1	1.86%	1.86%	∞
16	Device holder uncertainty	A	1.70%	N	1	1	1	1.70%	1.70%	∞
17	Drift of output power	B	5.00%	R	$\sqrt{3}$	1	1	2.90%	2.90%	∞
<b>Phantom and Set-up</b>										
18	Phantom uncertainty	B	4.00%	R	$\sqrt{3}$	1	1	2.30%	2.30%	∞
19	Liquid conductivity (target)	B	5.00%	R	$\sqrt{3}$	0.64	0.43	1.80%	1.20%	∞
20	Liquid conductivity (meas.)	A	0.50%	N	1	0.64	0.43	0.32%	0.26%	∞
21	Liquid permittivity (target)	B	5.00%	R	$\sqrt{3}$	0.64	0.43	1.80%	1.20%	∞
22	Liquid cpermittivity (meas.)	A	0.16%	N	1	0.64	0.43	0.10%	0.07%	∞
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$		/	/	/	/	9.79%	9.67%	∞
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		R	K=2	/	/	19.57%	19.34%	∞





System Check Uncertainty										
No.	Error Description	Type	Uncertainty Value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement System										
1	Probe calibration	B	6.0%	N	1	1	1	6.0%	6.0%	∞
2	Axial isotropy	B	4.70%	R	$\sqrt{3}$	0.7	0.7	1.90%	1.90%	∞
3	Hemispherical isotropy	B	9.60%	R	$\sqrt{3}$	0.7	0.7	3.90%	3.90%	∞
4	Boundary Effects	B	1.00%	R	$\sqrt{3}$	1	1	0.60%	0.60%	∞
5	Probe Linearity	B	4.70%	R	$\sqrt{3}$	1	1	2.70%	2.70%	∞
6	Detection limit	B	1.00%	R	$\sqrt{3}$	1	1	0.60%	0.60%	∞
7	RF ambient conditions-noise	B	0.00%	R	$\sqrt{3}$	1	1	0.00%	0.00%	∞
8	RF ambient conditions-reflection	B	0.00%	R	$\sqrt{3}$	1	1	0.00%	0.00%	∞
9	Response time	B	0.80%	R	$\sqrt{3}$	1	1	0.50%	0.50%	∞
10	Integration time	B	5.00%	R	$\sqrt{3}$	1	1	2.90%	2.90%	∞
11	RF ambient	B	3.00%	R	$\sqrt{3}$	1	1	1.70%	1.70%	∞
12	Probe positioned mech. restrictions	B	0.40%	R	$\sqrt{3}$	1	1	0.20%	0.20%	∞
13	Probe positioning with respect to phantom shell	B	2.90%	R	$\sqrt{3}$	1	1	1.70%	1.70%	∞
14	Max.SAR evaluation	B	3.90%	R	$\sqrt{3}$	1	1	2.30%	2.30%	∞
System validation source-dipole										
15	Deviation of experimental dipole from numerical dipole	A	1.58%	N	1	1	1	1.58%	1.58%	∞
16	Dipole axis to liquid distance	A	1.35%	N	1	1	1	1.35%	1.35%	∞
17	Input power and SAR drift	B	4.00%	R	$\sqrt{3}$	1	1	2.30%	2.30%	∞
Phantom and Set-up										
18	Phantom uncertainty	B	4.00%	R	$\sqrt{3}$	1	1	2.30%	2.30%	∞
20	Liquid conductivity (meas.)	A	0.50%	N	1	0.64	0.43	0.32%	0.26%	∞
22	Liquid permittivity (meas.)	A	0.16%	N	1	0.64	0.43	0.10%	0.07%	∞
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$		/	/	/	/	8.80%	8.79%	∞
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		R	K=2	/	/	17.59%	17.58%	∞

## 6. SAR Measurements System Configuration

### 6.1. SAR Measurement Set-up

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

A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating 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 electronic (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.

A unit to operate the optical surface detector which is connected to the EOC.

The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.

The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003.

DASY5 software and SEMCAD data evaluation software.

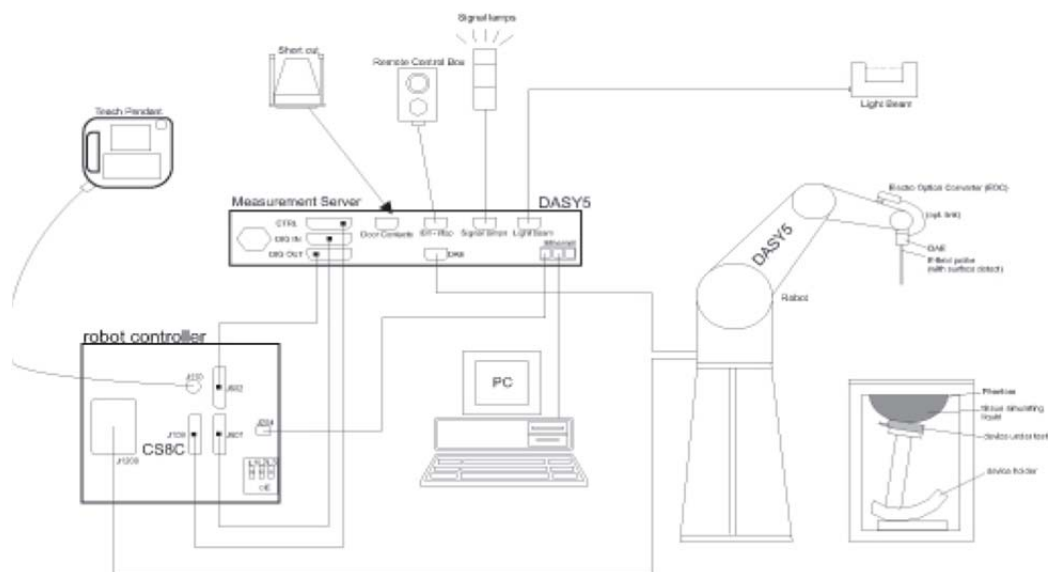
Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.

The generic twin phantom enabling the testing of left-hand and right-hand usage.

The device holder for handheld Mobile Phones.

Tissue simulating liquid mixed according to the given recipes.

System validation dipoles allowing to validate the proper functioning of the system.



## 6.2. DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

### ● Probe Specification

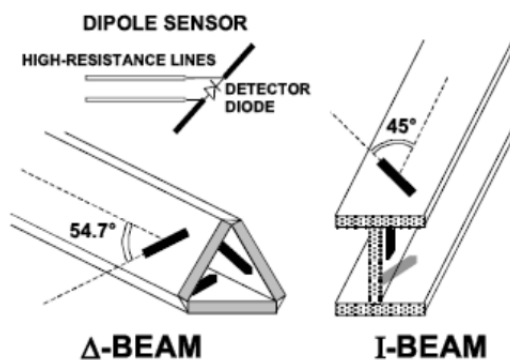
Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	4 MHz to 10 GHz; Linearity: $\pm 0.2$ dB (30 MHz to 6 GHz)
Directivity	$\pm 0.3$ dB in HSL (rotation around probe axis) $\pm 0.5$ dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 $\mu$ W/g to > 100 W/kg; Linearity: $\pm 0.2$ dB
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Distance from probe tip to dipole centers: 1.0 mm
Application	General dosimetry up to 6 GHz Dosimetry in strong gradient fields Compliance tests of Mobile Phones
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI



### ● Isotropic E-Field Probe

The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



### 6.3. Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SPEAG. The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6mm).

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



SAM Twin Phantom

### 6.4. Device Holder

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

The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.



Device holder supplied by SPEAG



## 7. SAR Test Procedure

### 7.1. Scanning Procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

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. The indicated drift is mainly the variation of the DUT’s output power and should vary max.  $\pm 5\%$ .

The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above  $\pm 0.1\text{mm}$ ). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe (It does not depend on the surface reflectivity or the probe angle to the surface within  $\pm 30^\circ$ .)

#### Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot. Before starting the area scan a grid spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged. After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

#### Zoom Scan

After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm.

#### Spatial Peak Detection

The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses. The DASY5 system allows evaluations that combine measured data and robot positions, such as:

- maximum search
- extrapolation
- boundary correction
- peak search for averaged SAR

During a maximum search, global and local maxima searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard’s method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space.

They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard’s method for extrapolation.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.



**Table 1: Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v04**

		≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface		5 mm ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2)$ mm ± 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: $\Delta x_{Area}$ , $\Delta y_{Area}$		≤ 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: $\Delta x_{Zoom}$ , $\Delta y_{Zoom}$		≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$	≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$ : between 1 <sup>st</sup> two points closest to phantom surface	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 · $\Delta z_{Zoom}(n-1)$ mm
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: $\delta$ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details. * When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB Publication 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.			

## 7.2. Data Storage and Evaluation

### Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors),s 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 “.DA4”. The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [W/kg], [mW/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.

### Data Evaluation

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:	σ
	Density:	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 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:

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

- Vi: compensated signal of channel ( i = x, y, z )
- Ui: input signal of channel ( i = x, y, z )
- cf: crest factor of exciting field (DASY parameter)
- dcp<sub>i</sub>: diode compression point (DASY parameter)

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

$$E - \text{fieldprobes} : \quad E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

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

- Vi: compensated signal of channel ( i = x, y, z )
- Norm<sub>i</sub>: sensor sensitivity of channel ( i = x, y, z ), [mV/(V/m)²] for E-field Probes
- ConvF: sensitivity enhancement in solution
- a<sub>ij</sub>: sensor sensitivity factors for H-field probes
- f: carrier frequency [GHz]
- E<sub>i</sub>: electric field strength of channel i in V/m
- H<sub>i</sub>: magnetic field strength of channel i in A/m

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

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

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

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

- SAR: local specific absorption rate in W/kg
- Etot: total field strength in V/m
- $\sigma$ : conductivity in [mho/m] or [Siemens/m]
- $\rho$ : equivalent tissue density in g/cm<sup>3</sup>

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.

### 7.3. LTE (TDD) Considerations

According to KDB 941225 D05 SAR for LTE Devices for Time-Division Duplex(TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

TDD LTE Band 41 supports 3GPP TS 36 For Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

TDD LTE Band 41 supports 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Figure 4.2-1: Frame structure type 2

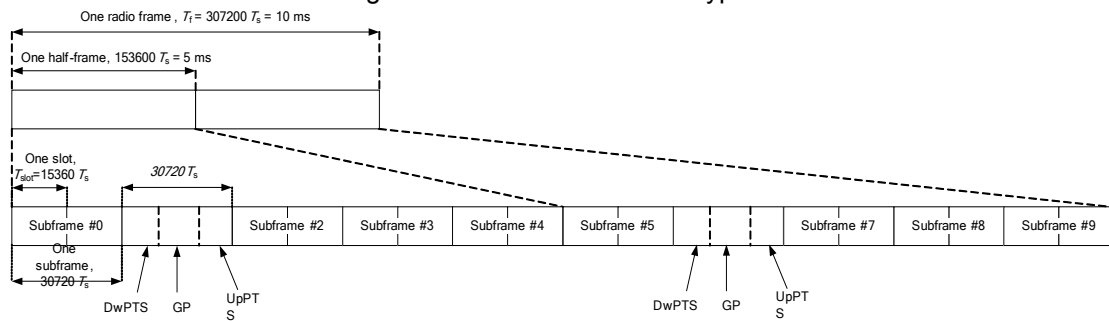


Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

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





Table 4.2-2: Uplink-downlink configurations

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.3%
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.3%
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.3%
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.7%
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.7%
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.7%
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.3%

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

Note(s):

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

## 8. Position of the wireless device in relation to the phantom

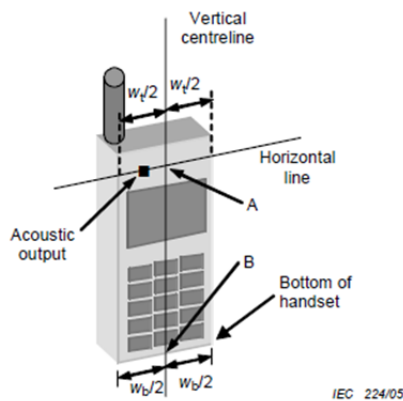
### 8.1. Head Position

The wireless device define two imaginary lines on the handset, the vertical centreline and the horizontal line, for the handset in vertical orientation as shown in Figures 5a and 5b.

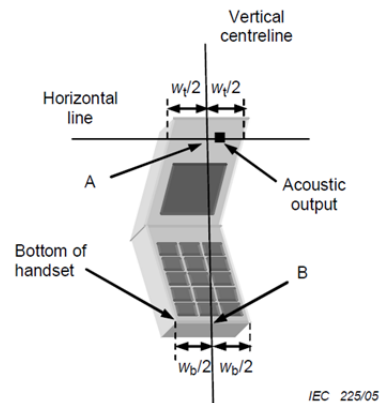
**The vertical centreline** passes through two points on the front side of the handset: the midpoint of the width  $W_t$  of the handset at the level of the acoustic output (point A in Figures 5a and 5b), and the midpoint of the width  $W_b$  of the bottom of the handset (point B).

**The horizontal line** is perpendicular to the vertical centreline and passes through the centre of the acoustic output (see Figures 5a and 5b). The two lines intersect at point A.

Note that for many handsets, point A coincides with the centre of the acoustic output. However, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centreline is not necessarily parallel to the front face of the handset (see Figure 5b), especially for clam-shell handsets, handsets with flip cover pieces, and other irregularly shaped handsets.



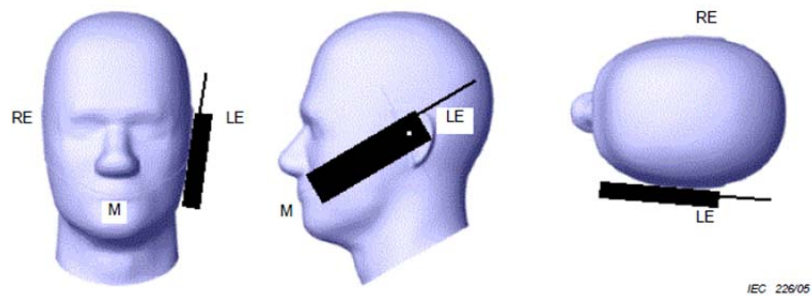
Figures 5a



Figures 5b

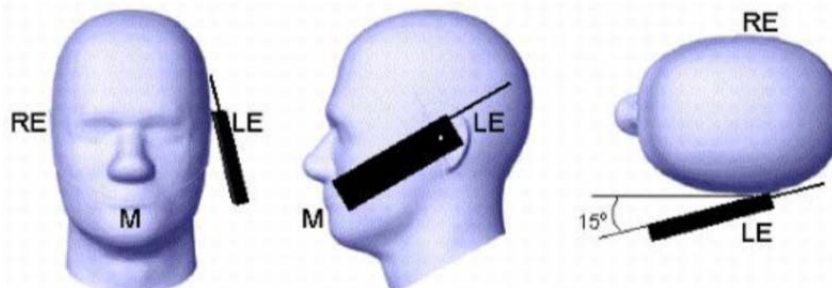
- $W_t$  Width of the handset at the level of the acoustic
- $W_b$  Width of the bottom of the handset
- A Midpoint of the width  $w_t$  of the handset at the level of the acoustic output
- B Midpoint of the width  $w_b$  of the bottom of the handset

### Cheek position



Picture 2 Cheek position of the wireless device on the left side of SAM

### Tilt position

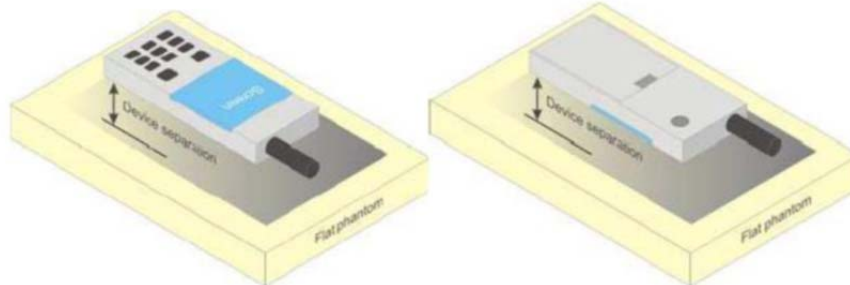


Picture 3 Tilt position of the wireless device on the left side of SAM



## 8.2. Body Position

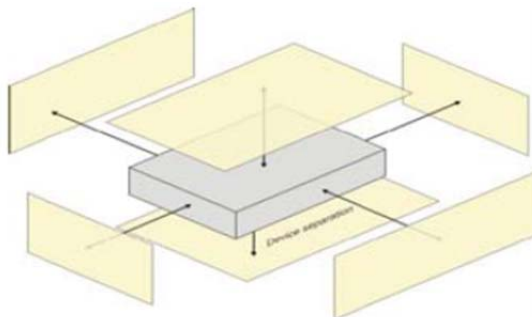
Devices that support transmission while used with body-worn accessories must be tested for body-worn accessory SAR compliance, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics. Devices that are designed to operate on the body of users using lanyards and straps or without requiring additional body-worn accessories must be tested for SAR compliance using a conservative minimum test separation distance  $\leq 10$  mm to support compliance.



Picture 4 Test positions for body-worn devices

## 8.3. Hotspot Mode Exposure conditions

The hotspot mode and body-worn accessory SAR test configurations may overlap for handsets. When the same wireless mode transmission configurations for voice and data are required for SAR measurements, the more conservative configuration with a smaller separation distance should be tested for the overlapping SAR configurations. This typically applies to the back and front surfaces of a handset when SAR is required for both hotspot mode and body-worn accessory exposure conditions. Depending on the form factor and dimensions of a device, the test separation distance used for hotspot mode SAR measurement is either 10 mm or that used in the body-worn accessory configuration, whichever is less for devices with dimension  $> 9$  cm x 5 cm. For smaller devices with dimensions  $\leq 9$  cm x 5 cm because of a greater potential for next to body use a test separation of  $\leq 5$  mm must be used.



Picture 5 Test positions for Hotspot Mode



## 9. System Check

### 9.1. Tissue Dielectric Parameters

The liquid is consisted of water,salt,Glycol,Sugar,Preventol and Cellulose.The liquid has previously been proven to be suited for worst-case. It's satisfying the latest tissue dielectric parameters requirements proposed by the KDB865664.

Tissue dielectric parameters for body		
Target Frequency (MHz)	Body	
	$\epsilon_r$	$\sigma$ (s/m)
750	55.50	0.96
835	55.20	0.97
1750	53.40	1.49
1800-2000	53.30	1.52
2450	52.70	1.95
2600	52.50	2.16
5250	48.95	5.36
5600	48.47	5.77
5750	48.27	5.94

**Check Result:**

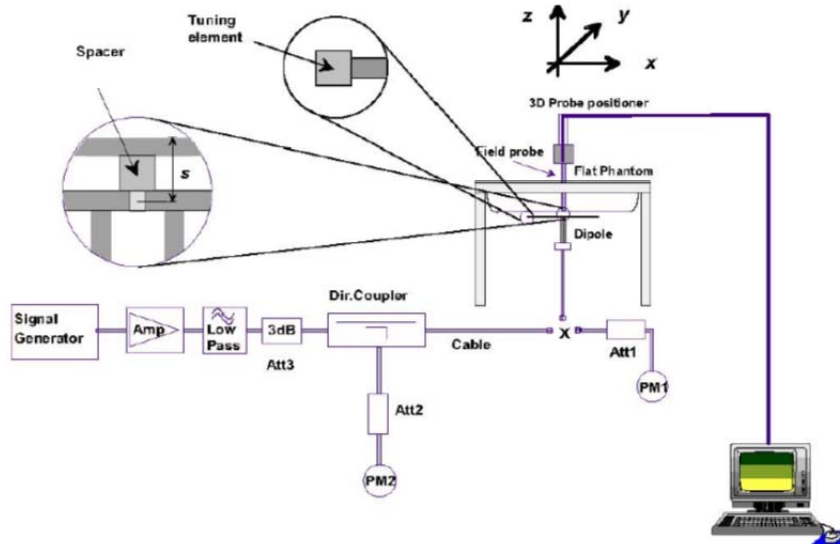
Dielectric performance of Body tissue simulating liquid									
Frequency (MHz)	$\epsilon_r$		$\sigma$ (s/m)		Delta ( $\epsilon_r$ )	Delta ( $\sigma$ )	Limit	Temp (°C)	Date
	Target	Measured	Target	Measured					
750	55.50	55.65	0.96	0.93	0.27%	-3.12%	±5%	22	2020-12-21
835	55.20	55.40	0.97	0.97	0.36%	0.00%	±5%	22	2020-12-21
1750	53.40	53.91	1.49	1.44	0.96%	-3.36%	±5%	22	2020-12-22
1900	53.30	53.72	1.52	1.55	0.79%	1.97%	±5%	22	2020-12-22
2450	52.70	53.03	1.95	2.00	0.63%	2.56%	±5%	22	2020-12-23
2600	52.51	52.78	2.16	2.15	0.51%	-0.46%	±5%	22	2020-12-23
5250	48.95	47.94	5.36	5.52	-2.07%	2.89%	±5%	22	2020-12-24
5600	48.47	47.35	5.77	5.96	-2.31%	3.34%	±5%	22	2020-12-24
5750	48.27	46.94	5.94	6.20	-2.75%	4.44%	±5%	22	2020-12-25

## 9.2. SAR System Check

The purpose of the system check is to verify that the system operates within its specifications at the device test frequency. The system check is a simple check of repeatability to make sure that the system works correctly at the time of the compliance test;

System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system ( $\pm 10\%$ ).

System check is performed regularly on all frequency bands where tests are performed with the DASY5 system.



System Performance Check Setup

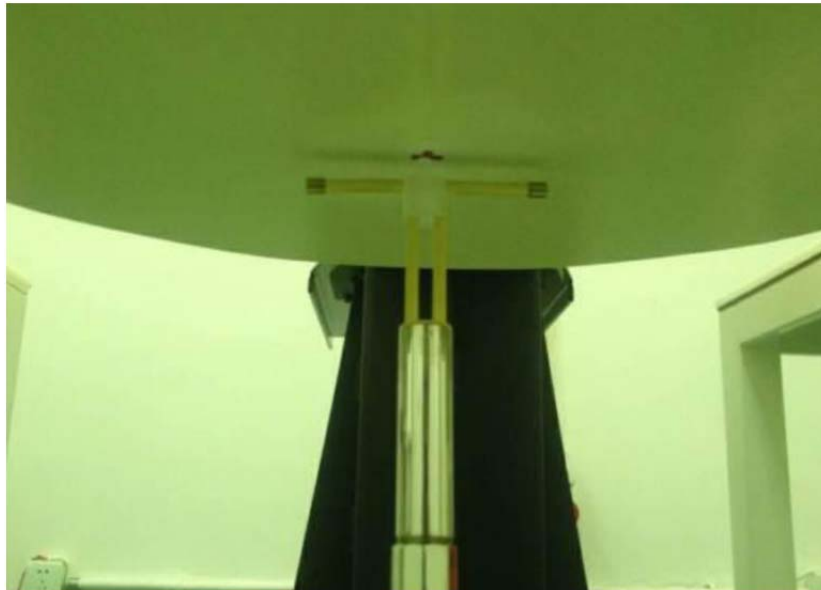


Photo of Dipole Setup

**Check Result:**

<b>Body</b>									
Frequency (MHz)	1g SAR		10g SAR		Delta (1g)	Delta (10g)	Limit	Temp (°C)	Date
	Target	Measured	Target	Measured					
750	2.16	2.10	1.45	1.40	-2.78%	-3.45%	±10%	22	2020-12-21
835	2.36	2.52	1.57	1.66	6.78%	5.73%	±10%	22	2020-12-21
1750	9.57	9.39	5.11	5.04	-1.88%	-1.37%	±10%	22	2020-12-22
1900	10.10	10.40	5.30	5.42	2.97%	2.26%	±10%	22	2020-12-22
2450	12.60	12.50	5.96	5.83	-0.79%	-2.18%	±10%	22	2020-12-23
2600	13.50	14.70	6.00	6.59	8.89%	9.83%	±10%	22	2020-12-23
5250	7.58	7.37	2.14	2.07	-2.77%	-3.27%	±10%	22	2020-12-24
5600	8.10	7.80	2.28	2.16	-3.70%	-5.26%	±10%	22	2020-12-24
5750	7.47	7.28	2.10	2.02	-2.54%	-3.81%	±10%	22	2020-12-25

Note:

1. the graph results see below.



**System Performance Check at 750 MHz Body**

DUT: D750V3; Type: D750V3; Serial: 1105

Date: 2020-12-21

Communication System: UID 0, CW (0); Frequency: 750 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 750 \text{ MHz}$ ;  $\sigma = 0.931 \text{ S/m}$ ;  $\epsilon_r = 55.65$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

## DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(10.62, 10.62, 10.62); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/d=10mm,Pin=250mW/Area Scan (5x12x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 2.78 W/kg

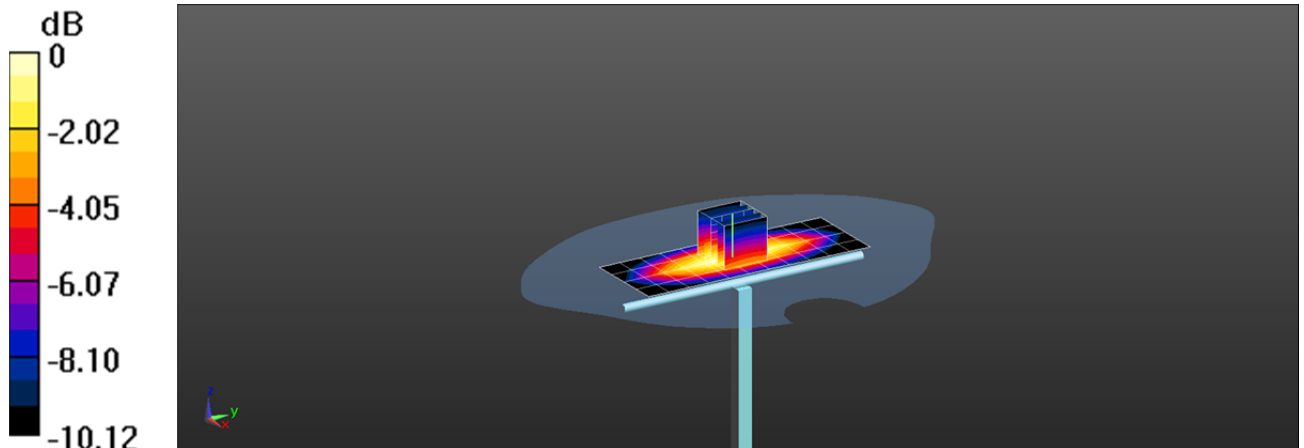
**Body/d=10mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 57.056 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.18 W/kg

**SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.4 W/kg**

Maximum value of SAR (measured) = 2.81 W/kg



0 dB = 2.81 W/kg = 4.49 dBW/kg

**System Performance Check at 835 MHz Body**

DUT: D835V2; Type: D835V2; Serial: 4d134

Date: 2020-12-21

Communication System: UID 0, CW (0); Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 835$  MHz;  $\sigma = 0.966$  S/m;  $\epsilon_r = 55.403$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY5 Configuration:**

- Probe: EX3DV4 - SN3974; ConvF(10.33, 10.33, 10.33); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/d=15mm,Pin=250mW/Area Scan (5x11x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 3.39 W/kg

**Body/d=15mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm,

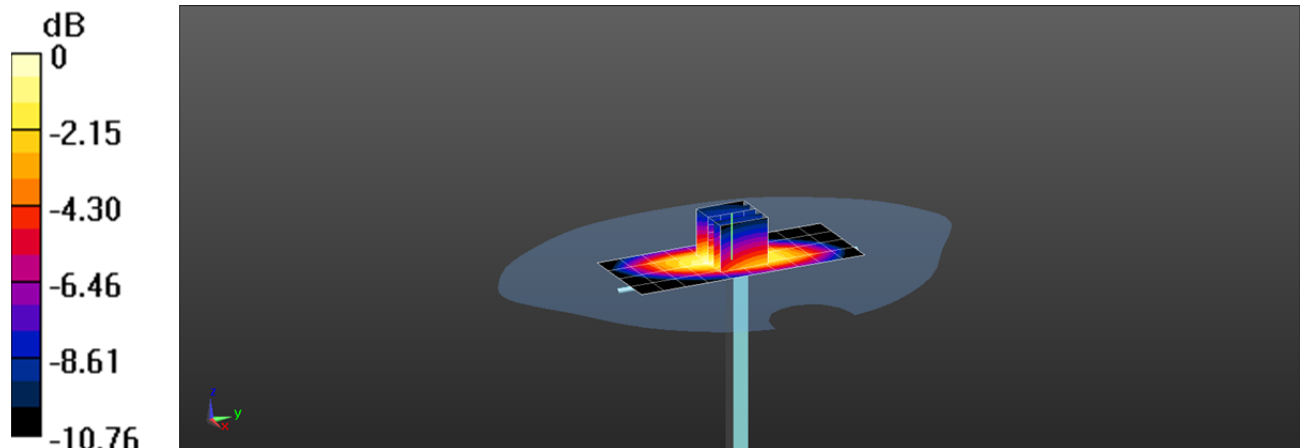
dy=8mm, dz=5mm

Reference Value = 61.674 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 3.97 W/kg

**SAR(1 g) = 2.52 W/kg; SAR(10 g) = 1.66 W/kg**

Maximum value of SAR (measured) = 3.44 W/kg



0 dB = 3.44 W/kg = 5.37 dBW/kg

**System Performance Check at 1750 MHz Body**

DUT: D1750V2; Type: D1750V2; Serial: 1110

Date: 2020-12-22

Communication System: UID 0, CW (0); Frequency: 1750 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1750$  MHz;  $\sigma = 1.441$  S/m;  $\epsilon_r = 53.908$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.42, 8.42, 8.42); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/d=10mm,Pin=250mW/Area Scan (5x7x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 14.1 W/kg

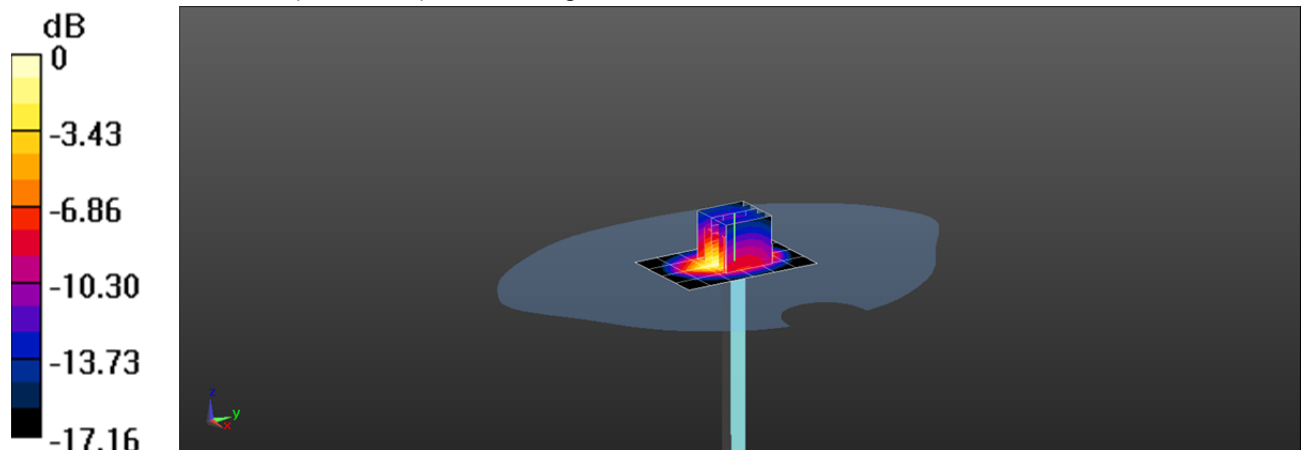
**Body/d=10mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 102.2 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 16.8 W/kg

**SAR(1 g) = 9.39 W/kg; SAR(10 g) = 5.04 W/kg**

Maximum value of SAR (measured) = 14.1 W/kg



0 dB = 14.1 W/kg = 11.49 dBW/kg

**System Performance Check at 1900 MHz Body**

DUT: D1900V2; Type: D1900V2; Serial: 5d115

Date: 2020-12-22

Communication System: UID 0, CW (0); Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.553$  S/m;  $\epsilon_r = 53.719$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.09, 8.09, 8.09); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/d=10mm,Pin=250mW/Area Scan (5x7x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 16.3 W/kg

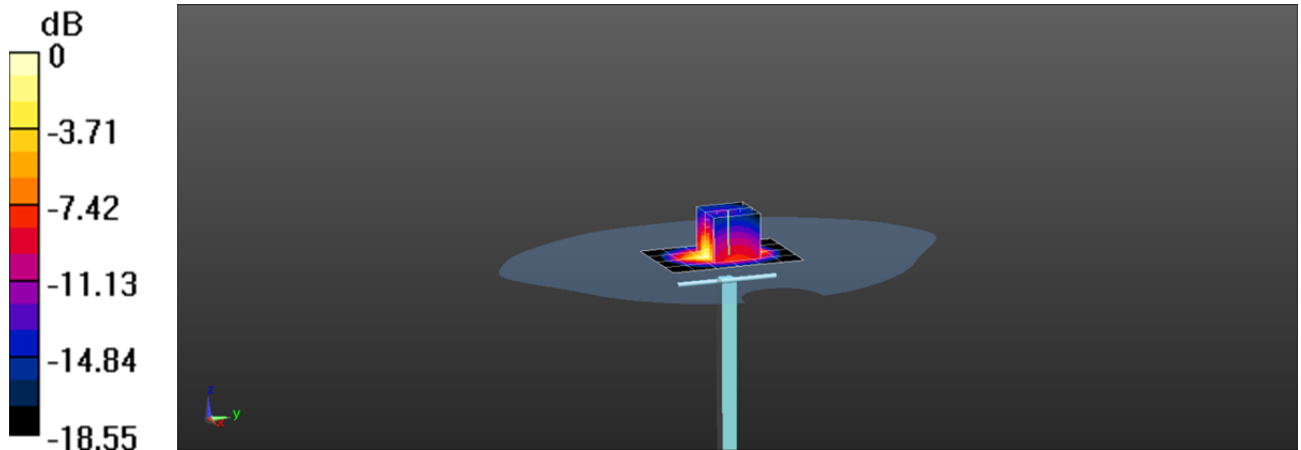
**Body/d=10mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 105.9 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 18.9 W/kg

**SAR(1 g) = 10.4 W/kg; SAR(10 g) = 5.42 W/kg**

Maximum value of SAR (measured) = 15.7 W/kg



0 dB = 15.7 W/kg = 11.96 dBW/kg

**System Performance Check at 2450 MHz Body**

DUT: D2450V2; Type: D2450V2; Serial: 928

Date: 2020-12-23

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 2.001$  S/m;  $\epsilon_r = 53.03$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

## DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.00, 8.00, 8.00); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/d=10mm,Pin=250mW/Area Scan (5x7x1):** Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 21.1 W/kg

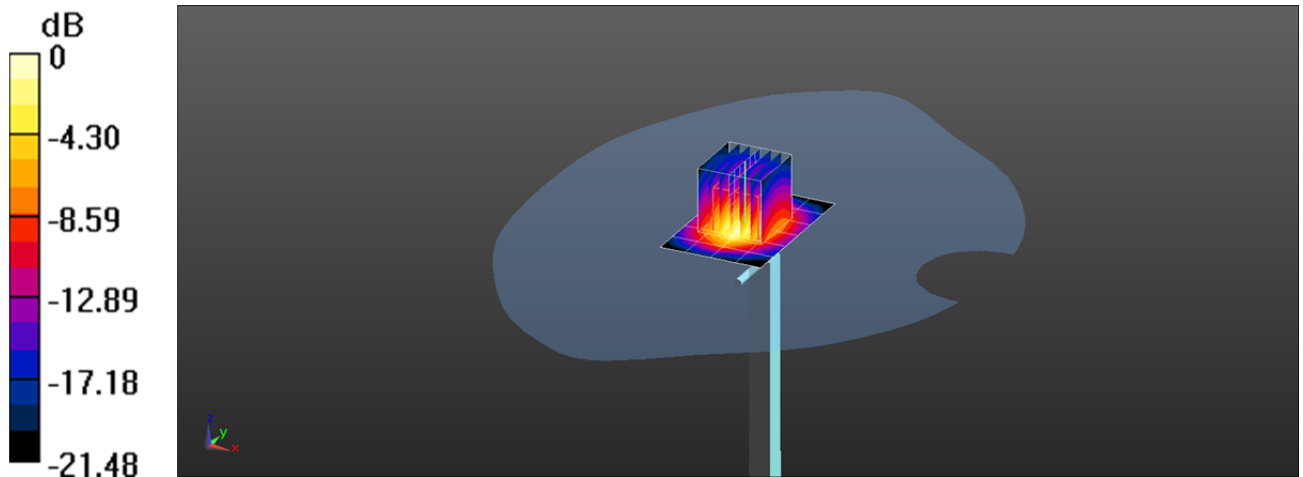
**Body/d=10mm,Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 105.6 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 25.7 W/kg

**SAR(1 g) = 12.5 W/kg; SAR(10 g) = 5.83 W/kg**

Maximum value of SAR (measured) = 20.7 W/kg



0 dB = 20.7 W/kg = 13.16 dBW/kg

**System Performance Check at 2600 MHz Body**

DUT: D2600V2; Type: D2600V2; Serial: 1126

Date: 2020-12-23

Communication System: UID 0, CW (0); Frequency: 2600 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2600$  MHz;  $\sigma = 2.15$  S/m;  $\epsilon_r = 52.78$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(7.52, 7.52, 7.52); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

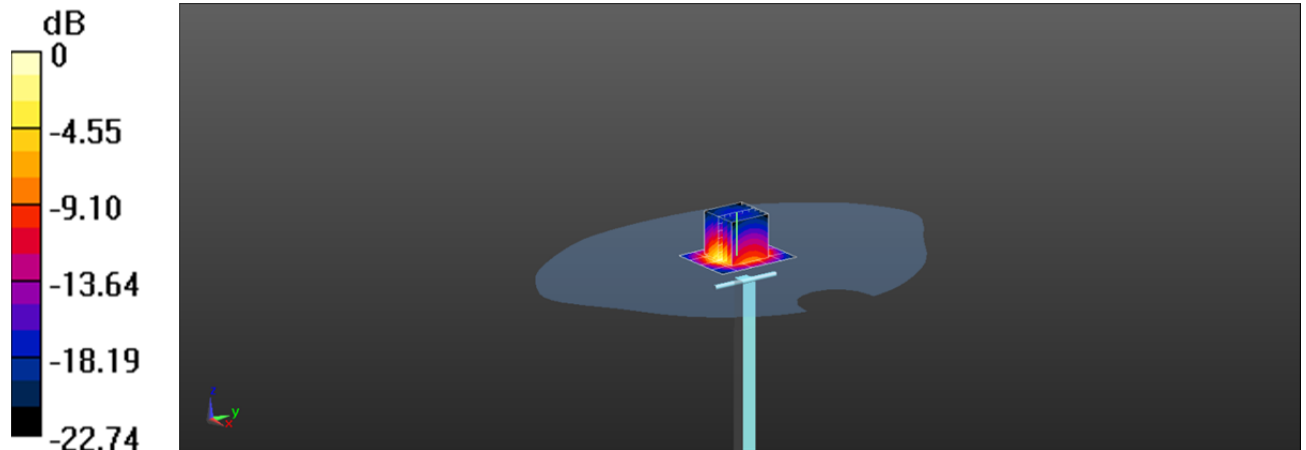
**Body/d=10mm,Pin=250mW/Area Scan (5x6x1):** Measurement grid: dx=12mm, dy=12mm  
Maximum value of SAR (measured) = 22.6 W/kg**Body/d=10mm,Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 110.2 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 31.6 W/kg

**SAR(1 g) = 14.7 W/kg; SAR(10 g) = 6.59 W/kg**

Maximum value of SAR (measured) = 25.1 W/kg



0 dB = 25.1 W/kg = 14.00 dBW/kg

**System Performance Check at 5250 MHz Body**

DUT: D5GHzV2; Type: D5GHzV2; Serial: 1171

Date: 2020-12-24

Communication System: UID 0, A-CW (0); Frequency: 5250 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 5250$  MHz;  $\sigma = 5.515$  S/m;  $\epsilon_r = 47.936$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

## DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(5.72, 5.72, 5.72); Calibrated: 2020/05/14;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/d=10mm, Pin=100mW/Area Scan (10x10x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 11.1 W/kg

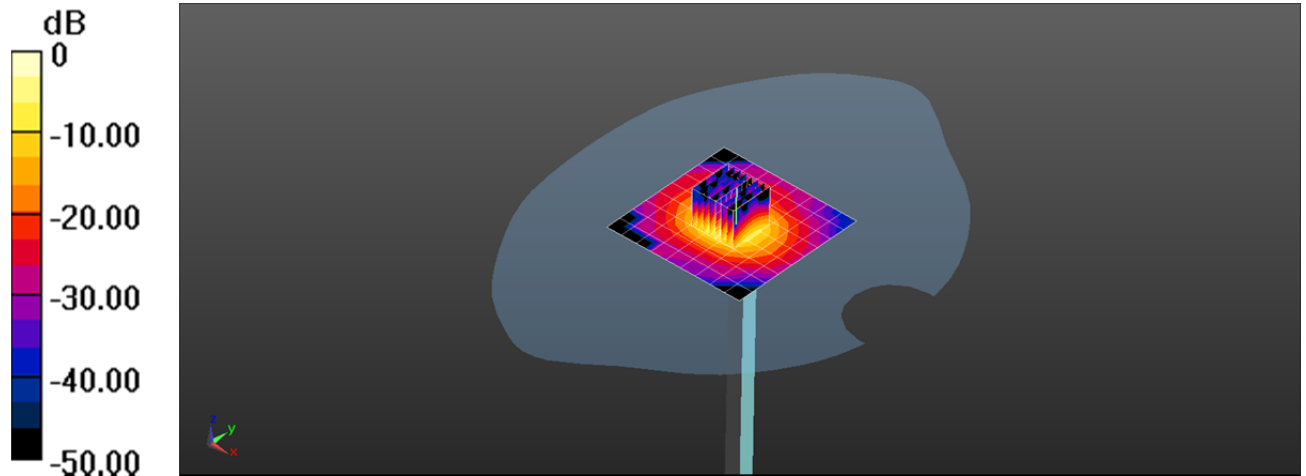
**Body/d=10mm, Pin=100mW/Zoom Scan (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 65.132 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 31.6 W/kg

**SAR(1 g) = 7.37 W/kg; SAR(10 g) = 2.07 W/kg**

Maximum value of SAR (measured) = 17.8 W/kg



0 dB = 17.8 W/kg = 12.50 dBW/kg

**System Performance Check at 5600 MHz Body**

DUT: D5GHzV2; Type: D5GHzV2; Serial: 1171

Date: 2020-12-24

Communication System: UID 0, A-CW (0); Frequency: 5600 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 5600$  MHz;  $\sigma = 5.963$  S/m;  $\epsilon_r = 47.347$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(4.85, 4.85, 4.85); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM2; Type: Twin SAM V5.0; Serial: 1811
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/d=10mm, Pin=100mW/Area Scan (10x10x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 14.6 W/kg

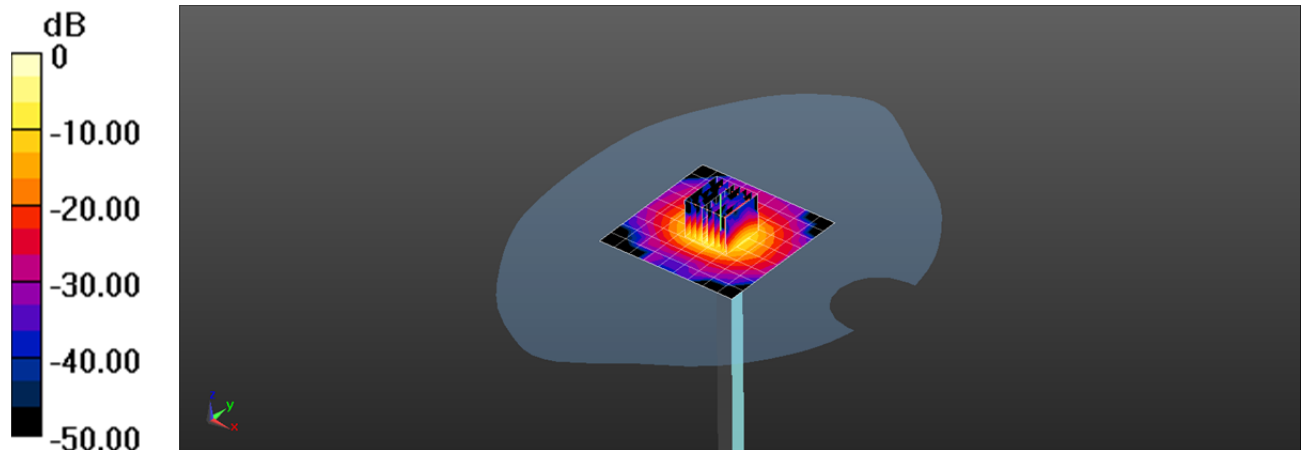
**Body/d=10mm, Pin=100mW/Zoom Scan (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 63.095 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 36.9 W/kg

**SAR(1 g) = 7.8 W/kg; SAR(10 g) = 2.16 W/kg**

Maximum value of SAR (measured) = 19.7 W/kg



0 dB = 19.7 W/kg = 12.94 dBW/kg



**System Performance Check at 5750 MHz Body**

DUT: D5GHzV2; Type: D5GHzV2; Serial: 1171

Date: 2020-12-25

Communication System: UID 0, A-CW (0); Frequency: 5750 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 5725$  MHz;  $\sigma = 6.20$  S/m;  $\epsilon_r = 46.943$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(5.01, 5.01, 5.01); Calibrated: 2020/05/14;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Head/d=10mm, Pin=100mW/Area Scan (10x10x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 12.1 W/kg

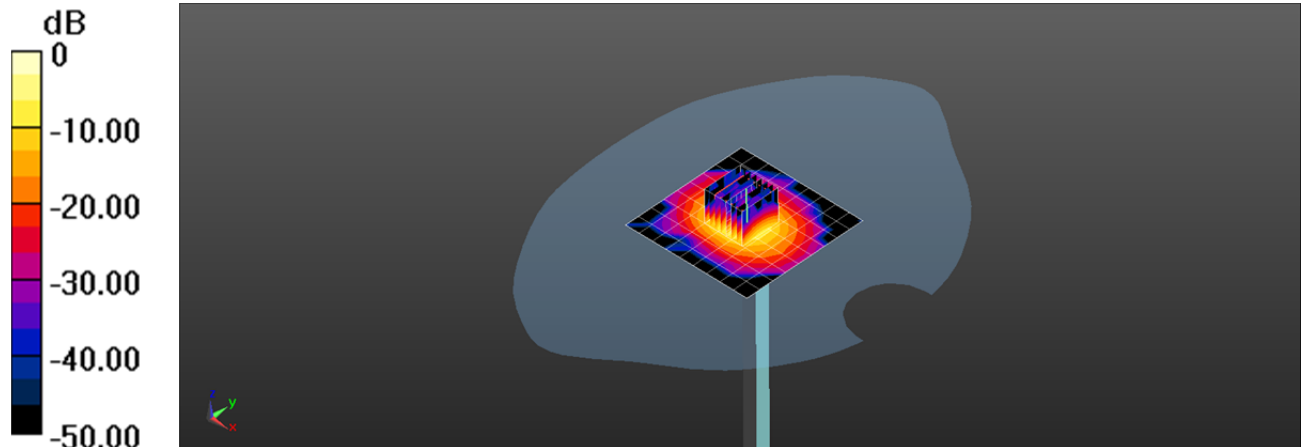
**Head/d=10mm, Pin=100mW/Zoom Scan (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 62.072 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 36.2 W/kg

**SAR(1 g) = 7.28 W/kg; SAR(10 g) = 2.02 W/kg**

Maximum value of SAR (measured) = 18.8 W/kg



0 dB = 18.8 W/kg = 12.74 dBW/kg



## 10. SAR Exposure Limits

SAR assessments have been made in line with the requirements of ANSI/IEEE C95.1-1992

Type Exposure	Limit (W/kg)	
	General Population / Uncontrolled Exposure Environment	Occupational / Controlled Exposure Environment
Spatial Average SAR (whole body)	0.08	0.4
Spatial Peak SAR (1g cube tissue for head and trunk)	1.6	8.0
Spatial Peak SAR (10g for limb)	4.0	20.0

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

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

## 11. Conducted Power Measurement Results

### GSM Conducted Power

1. Per KDB 447498 D01, the maximum output power channel is used for SAR testing and further SAR test reduction
2. Per KDB 941225 D01, considering the possibility of e.g. 3rd party VoIP operation for Head and Body-worn SAR test reduction for GSM and GPRS modes is determined by the source-base time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the EUT was set in GPRS (2Tx slots) for GSM850 and GPRS (2Tx slots) for PCS1900.
3. Per KDB941225 D01, for hotspot SAR test reduction for GPRS modes is determined by the source-based time-averaged output power including tune-up tolerance, For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the EUT was set in GPRS (4Tx slots) for GSM850 and GPRS (2Tx slots) for PCS1900.

Mode: GSM850		Conducted Power (dBm)			Division Factors	Averager Power (dBm)		
		CH128	CH190	CH251		CH128	CH190	CH251
		824.2MHz	836.6MHz	848.8MHz		824.2MHz	836.6MHz	848.8MHz
GPRS (GMSK)	1TXslot	32.41	32.38	32.34	-9.03	23.38	23.35	23.31
	2TXslots	31.73	31.70	31.67	-6.02	25.71	25.68	25.65
	3TXslots	30.04	30.01	29.98	-4.26	25.78	25.75	25.72
	4TXslots	28.74	28.90	28.85	-3.01	25.73	<b>25.89</b>	25.84
EGPRS (8PSK)	1TXslot	26.28	25.74	25.67	-9.03	17.25	16.71	16.64
	2TXslots	24.68	24.46	24.47	-6.02	18.66	18.44	18.45
	3TXslots	22.10	21.90	21.98	-4.26	17.84	17.64	17.72
	4TXslots	20.50	20.34	20.52	-3.01	17.49	17.33	17.51
Mode: PCS1900		Conducted Power (dBm)			Division Factors	Averager Power (dBm)		
		CH512	CH661	CH810		CH512	CH661	CH810
		1850.2MHz	1880.0MHz	1909.8MHz		1850.2MHz	1880.0MHz	1909.8MHz
GPRS (GMSK)	1TXslot	28.93	29.01	29.11	-9.03	19.90	19.98	20.08
	2TXslots	28.24	<b>28.54</b>	28.43	-6.02	22.22	<b>22.52</b>	22.41
	3TXslots	26.43	26.52	26.62	-4.26	22.17	22.26	22.36
	4TXslots	25.21	25.29	25.40	-3.01	22.20	22.28	22.39
EGPRS (8PSK)	1TXslot	23.66	23.70	23.98	-9.03	14.63	14.67	14.95
	2TXslots	22.27	22.50	22.93	-6.02	16.25	16.48	16.91
	3TXslots	19.78	20.07	20.43	-4.26	15.52	15.81	16.17
	4TXslots	18.20	18.63	18.90	-3.01	15.19	15.62	15.89

Note:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

### WCDMA Conducted Power

1. The following tests were conducted according to the test requirements outlines in 3GPP TS34.121 specification.
2. The procedures in KDB 941225 D01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode to determine SAR test exclusion

A summary of these settings are illustrated below:

#### HSDPA Setup Configuration:

- a) The EUT was connected to base station RS CMU200 referred to the setup configuration
- b) The RF path losses were compensated into the measurements
- c) A call was established between EUT and base station with following setting:
  - i. Set Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters were set according to each specific sub-test in the following table, C10.1.4, Quoted from the TS 34.121
  - ii. Set RMC 12.2Kbps + HSDPA mode
  - iii. Set Cell Power=-86dBm
  - iv. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
  - v. Select HSDPA uplink parameters
  - vi. Set Delta ACK, Delta NACK and Delta CQI=8
  - vii. Set Ack-Nack repetition Factor to 3
  - viii. Set CQI Feedback Cycle (K) to 4ms
  - ix. Set CQI repetition factor to 2
  - x. Power ctrl mode= all up bits
- d) The transmitter maximum output power was recorded.

**Table C.10.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH**

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$ (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

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

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA,  $\Delta_{ACK}$  and  $\Delta_{NACK} = 30/15$  with  $\beta_{HS} = 30/15 * \beta_c$ , and  $\Delta_{CQI} = 24/15$  with  $\beta_{HS} = 24/15 * \beta_c$ .

Note 3: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{HS}/\beta_c = 24/15$ . For all other combinations of DPDCCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$ .

#### Setup Configuration

#### HSUPA Setup Configuration:

- a) The EUT was connected to base station RS CMU200 referred to the setup configuration
- b) The RF path losses were compensated into the measurements
- c) A call was established between EUT and base station with following setting:
  - i. Call configs = 5.2b, 5.9b, 5.10b, and 5.13.2B with QPSK
  - ii. Set Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters (AG index) were set according to each specific sub-test in the following table, C11.1.3, Quoted from the TS 34.121
  - iii. Set Cell Power=-86dBm
  - iv. Set channel type= 12.2Kbps + HSPA mode
  - v. Set UE Target power
  - vi. Set Ctrl mode=Alternating bits
  - vii. Set and observe the E-TFCI
  - viii. Confirm that E-TFCI is equal the target E-TFCI of 75 for Sub-test 1, and other subtest's E-TFCI
- d) The transmitter maximum output power was recorded.



**Table C.11.1.3:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH**

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$ (Note 1)	$\beta_{ec}$	$\beta_{ed}$ (Note 5) (Note 6)	$\beta_{ed}$ (SF)	$\beta_{ed}$ (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

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

Note 2: CM = 1 for  $\beta_c/\beta_d=12/15, \beta_{HS}/\beta_c=24/15$ . For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the  $\beta_c/\beta_d$  ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 10/15$  and  $\beta_d = 15/15$ .

Note 4: For subtest 5 the  $\beta_c/\beta_d$  ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 14/15$  and  $\beta_d = 15/15$ .

Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 6:  $\beta_{ed}$  can not be set directly, it is set by Absolute Grant Value.

**Setup Configuration**

**General Note:**

- Per KDB 941225 D01, SAR for Head / Hotspot / Body-worn Exposure is measured using a 12.2Kbps RMC with TPC bit configured to all 1s
- Per KDB 941225 D01 RMC12.2Kbps setting is used to evaluate SAR. If the maximum output power and Tune-up tolerance specified for production units in HSDPA/HSUPA is  $\cong 1/4$ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio fo specified maximum output power and tune-up tolerance of HSDPA / HSUPA to RMC 12.2Kbps and the adjusted SAR is  $\cong 1.2$  W/kg, SAR measurement is not required for HSDPA / HSUPA.

Mode		WCDMA Band II			WCDMA Band V		
		Conducted Power (dBm)			Conducted Power (dBm)		
		CH9262	CH9400	CH9538	CH4132	CH4183	CH4233
RMC 12.2K		22.33	<b>22.48</b>	22.39	22.54	<b>22.90</b>	22.85
HSDPA	Subtest-1	21.44	21.39	21.48	21.52	21.69	21.83
	Subtest-2	21.02	20.95	20.99	20.96	21.12	21.31
	Subtest-3	21.09	21.01	21.00	21.00	21.17	21.29
	Subtest-4	21.06	20.97	21.02	20.96	21.14	21.27
HSUPA	Subtest-1	19.43	19.37	19.41	19.44	19.62	19.72
	Subtest-2	19.92	19.86	19.94	19.53	19.65	19.72
	Subtest-3	20.50	20.44	20.46	19.51	19.64	19.79
	Subtest-4	19.54	19.38	19.39	19.51	19.66	19.78
	Subtest-5	21.33	20.48	20.59	19.55	19.64	19.85



## LTE Conducted Power

### General Note:

1. CMW500 base station simulator was used to setup the connection with EUT; the frequency band, channel, bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r03, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r03, 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.
4. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r03, 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 are  $\leq 0.8$  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.
6. Per KDB 941225 D05v02r03, 16QAM output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r03, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r03, smaller bandwidth output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r03, smaller bandwidth SAR testing is not required.



LTE-FDD Band 4				Actual output Power (dBm)			
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High	
1.4	QPSK	1	Low	21.15	21.67	21.53	
			Middle	21.06	21.64	21.35	
			High	21.10	21.59	21.42	
		3	Low	19.86	20.29	19.98	
			Middle	19.84	20.34	19.91	
			High	19.81	20.21	19.88	
		6	/	19.78	19.95	19.44	
		16QAM	1	Low	20.89	21.34	21.17
				Middle	20.87	21.28	20.96
	High			20.81	21.27	21.08	
	3		Low	19.26	19.67	19.48	
			Middle	19.24	19.61	19.29	
			High	19.18	19.61	19.40	
	6	/	18.98	19.42	19.13		
	3	QPSK	1	Low	21.21	21.66	21.49
Middle				21.12	21.63	21.31	
High				21.16	21.57	21.39	
8			Low	19.91	20.27	19.95	
			Middle	19.90	20.32	19.88	
			High	19.87	20.19	19.85	
15			/	19.84	19.94	19.40	
16QAM			1	Low	20.95	21.33	21.13
				Middle	20.93	21.26	20.93
		High		20.87	21.26	21.05	
		8	Low	19.32	19.65	19.45	
			Middle	19.29	19.60	19.26	
			High	19.24	19.59	19.37	
15		/	19.03	19.40	19.10		



5	QPSK	1	Low	21.16	21.70	21.46	
			Middle	21.08	21.67	21.28	
			High	21.12	21.62	21.35	
		12	Low	19.87	20.31	19.91	
			Middle	19.85	20.36	19.85	
			High	19.83	20.24	19.82	
	25	/	19.80	19.98	19.37		
	16QAM	1	Low	20.91	21.37	21.10	
			Middle	20.88	21.31	20.89	
			High	20.82	21.30	21.01	
		12	Low	19.28	19.70	19.42	
			Middle	19.25	19.64	19.23	
High			19.20	19.63	19.34		
25		/	18.99	19.44	19.07		
10		QPSK	1	Low	21.14	21.73	21.44
				Middle	21.06	21.70	21.26
	High			21.10	21.65	21.34	
	25		Low	19.85	20.34	19.90	
			Middle	19.83	20.39	19.83	
			High	19.81	20.26	19.80	
	50	/	19.78	20.00	19.36		
	16QAM	1	Low	20.89	21.40	21.08	
			Middle	20.86	21.33	20.88	
			High	20.80	21.33	21.00	
		25	Low	19.25	19.72	19.40	
			Middle	19.23	19.66	19.22	
			High	19.17	19.65	19.33	
		50	/	18.97	19.47	19.06	





15	QPSK	1	Low	21.18	21.70	21.47
			Middle	21.10	21.67	21.29
			High	21.14	21.62	21.36
		38	Low	19.89	20.31	19.92
			Middle	19.87	20.36	19.86
			High	19.85	20.24	19.83
	75	/	19.82	19.98	19.38	
	16QAM	1	Low	20.93	21.37	21.11
			Middle	20.90	21.31	20.90
			High	20.84	21.30	21.02
		38	Low	19.29	19.69	19.43
			Middle	19.27	19.64	19.24
High			19.21	19.63	19.35	
75	/	19.01	19.44	19.08		
20	QPSK	1	Low	21.23	<b>21.77</b>	21.54
			Middle	21.15	21.74	21.36
			High	21.18	21.69	21.44
		50	Low	19.93	20.38	19.99
			Middle	19.92	20.43	19.92
			High	19.89	20.30	19.89
	100	/	19.86	20.04	19.45	
	16QAM	1	Low	20.69	21.19	20.95
			Middle	20.66	21.13	20.75
			High	20.60	21.12	20.87
		50	Low	19.07	19.53	19.28
			Middle	19.05	19.47	19.10
			High	18.99	19.46	19.21
	100	/	18.79	19.28	18.94	



LTE-FDD Band 5				Actual output Power (dBm)			
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High	
1.4	QPSK	1	Low	23.07	22.68	22.92	
			Middle	22.98	22.20	22.73	
			High	23.03	22.21	22.81	
		3	Low	21.67	22.14	21.27	
			Middle	21.65	21.52	21.20	
			High	21.62	21.68	21.17	
	6	/	21.59	21.78	20.69		
	16QAM	1	Low	22.80	22.34	22.53	
			Middle	22.77	21.83	22.31	
			High	22.70	21.84	22.44	
		3	Low	21.02	21.86	20.74	
			Middle	20.99	20.77	20.54	
			High	20.93	21.22	20.66	
		6	/	20.70	21.36	20.37	
		3	QPSK	1	Low	23.05	23.17
Middle					22.96	23.14	22.71
High	23.00				23.09	22.79	
8	Low			21.64	21.69	21.26	
	Middle			21.62	21.74	21.18	
	High			21.60	21.61	21.15	
15	/		21.56	21.33	20.68		
16QAM	1		Low	22.77	22.82	22.52	
			Middle	22.74	22.75	22.30	
			High	22.68	22.74	22.43	
	8		Low	20.99	21.03	20.72	
			Middle	20.97	20.97	20.52	
			High	20.91	20.96	20.64	
	15		/	20.68	20.76	20.35	



5	QPSK	1	Low	23.10	23.14	22.93
			Middle	23.00	23.11	22.74
			High	23.05	23.06	22.82
		12	Low	21.69	21.66	21.28
			Middle	21.67	21.72	21.21
			High	21.64	21.58	21.18
	25	/	21.61	21.31	20.70	
	16QAM	1	Low	22.82	22.79	22.54
			Middle	22.79	22.73	22.32
			High	22.72	22.72	22.45
		12	Low	21.03	21.01	20.75
			Middle	21.01	20.94	20.55
High			20.95	20.94	20.67	
25	/	20.72	20.74	20.38		
10	QPSK	1	Low	23.17	<b>23.22</b>	23.01
			Middle	23.08	23.19	22.82
			High	23.12	23.13	22.90
		25	Low	21.76	21.73	21.35
			Middle	21.74	21.79	21.28
			High	21.71	21.65	21.25
	50	/	21.68	21.38	20.77	
	16QAM	1	Low	22.58	22.60	22.38
			Middle	22.55	22.53	22.16
			High	22.48	22.52	22.29
		25	Low	20.81	20.83	20.60
			Middle	20.79	20.77	20.40
			High	20.73	20.76	20.52
	50	/	20.51	20.56	20.23	



LTE-FDD Band 7				Actual output Power (dBm)			
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High	
5	QPSK	1	Low	22.10	22.28	22.26	
			Middle	22.01	21.81	22.07	
			High	22.05	21.82	22.15	
		12	Low	20.75	21.75	20.66	
			Middle	20.73	21.14	20.59	
			High	20.71	21.30	20.56	
		25	/	20.67	21.39	20.10	
		16QAM	1	Low	21.83	21.94	21.89
				Middle	21.81	21.44	21.67
	High			21.74	21.45	21.80	
	12		Low	20.13	21.47	20.14	
			Middle	20.10	20.40	19.95	
			High	20.04	20.84	20.06	
	25	/	19.83	20.99	19.78		
	10	QPSK	1	Low	22.07	22.76	22.25
Middle				21.99	22.73	22.06	
High				22.03	22.68	22.14	
25			Low	20.73	21.31	20.65	
			Middle	20.71	21.36	20.58	
			High	20.68	21.23	20.55	
50			/	20.65	20.96	20.08	
16QAM			1	Low	21.81	22.42	21.87
				Middle	21.78	22.35	21.66
		High		21.72	22.34	21.78	
		25	Low	20.10	20.66	20.13	
			Middle	20.08	20.60	19.94	
			High	20.02	20.59	20.05	
50		/	19.81	20.40	19.77		



15	QPSK	1	Low	22.12	22.74	22.27	
			Middle	22.03	22.70	22.08	
			High	22.07	22.65	22.16	
		38	Low	20.77	21.28	20.67	
			Middle	20.75	21.33	20.60	
			High	20.72	21.20	20.57	
		75	/	20.69	20.93	20.11	
		16QAM	1	Low	21.85	22.39	21.90
				Middle	21.83	22.32	21.68
	High			21.76	22.32	21.81	
	38		Low	20.15	20.63	20.15	
			Middle	20.12	20.57	19.96	
			High	20.06	20.57	20.07	
	75		/	19.85	20.37	19.79	
	20		QPSK	1	Low	22.19	<b>22.81</b>
Middle					22.10	22.78	22.16
High		22.14			22.73	22.24	
50		Low		20.84	21.35	20.74	
		Middle		20.82	21.40	20.67	
		High		20.79	21.27	20.64	
100		/		20.76	21.00	20.18	
16QAM		1		Low	21.62	22.20	21.74
				Middle	21.60	22.13	21.53
			High	21.53	22.13	21.65	
		50	Low	19.93	20.46	20.01	
			Middle	19.91	20.40	19.81	
			High	19.85	20.39	19.93	
100		/	19.64	20.20	19.65		



LTE-FDD Band 17				Actual output Power (dBm)			
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High	
5	QPSK	1	Low	19.69	19.91	19.77	
			Middle	19.61	19.88	19.60	
			High	19.64	19.83	19.67	
		12	Low	18.49	18.63	18.35	
			Middle	18.47	18.68	18.29	
			High	18.45	18.56	18.26	
		25	/	18.42	18.33	17.85	
		16QAM	1	Low	19.45	19.60	19.44
				Middle	19.43	19.55	19.25
	High			19.37	19.54	19.36	
	12		Low	17.93	18.07	17.89	
			Middle	17.91	18.01	17.72	
			High	17.86	18.01	17.82	
	25	/	17.67	17.83	17.57		
	10	QPSK	1	Low	19.75	<b>19.97</b>	19.84
Middle				19.67	19.94	19.67	
High				19.71	19.90	19.74	
25			Low	18.54	18.69	18.41	
			Middle	18.53	18.74	18.35	
			High	18.50	18.62	18.32	
50			/	18.48	18.39	17.91	
16QAM			1	Low	19.24	19.44	19.30
				Middle	19.22	19.38	19.11
		High		19.16	19.37	19.22	
		25	Low	17.74	17.91	17.76	
			Middle	17.72	17.86	17.59	
			High	17.67	17.85	17.69	
50		/	17.48	17.68	17.44		



LTE Band 41				Actual output Power (dBm)			
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High	
5	QPSK	1	Low	21.00	21.34	21.19	
			Middle	20.92	20.89	21.01	
			High	20.96	20.90	21.08	
		12	Low	19.72	20.83	19.66	
			Middle	19.70	20.25	19.60	
			High	19.68	20.40	19.57	
		25	/	19.65	20.49	19.13	
		16QAM	1	Low	20.75	21.02	20.83
				Middle	20.73	20.54	20.63
	High			20.66	20.55	20.75	
	12		Low	19.13	20.57	19.17	
			Middle	19.11	19.54	18.98	
			High	19.05	19.97	19.09	
	25	/	18.85	20.10	18.83		
	10	QPSK	1	Low	20.98	21.81	21.17
Middle				20.90	21.78	20.99	
High				20.94	21.72	21.07	
25			Low	19.70	20.41	19.65	
			Middle	19.68	20.46	19.58	
			High	19.66	20.33	19.55	
50			/	19.63	20.08	19.11	
16QAM			1	Low	20.73	21.47	20.81
				Middle	20.70	21.41	20.61
		High		20.64	21.40	20.73	
		25	Low	19.11	19.79	19.16	
			Middle	19.09	19.73	18.97	
			High	19.03	19.73	19.08	
50		/	18.83	19.54	18.81		



15	QPSK	1	Low	21.02	21.78	21.20	
			Middle	20.94	21.75	21.02	
			High	20.98	21.70	21.09	
		38	Low	19.74	20.39	19.67	
			Middle	19.72	20.43	19.61	
			High	19.70	20.31	19.58	
	75	/	19.67	20.05	19.14		
	16QAM	1	Low	20.77	21.45	20.84	
			Middle	20.74	21.39	20.64	
			High	20.68	21.38	20.76	
		38	Low	19.15	19.77	19.18	
			Middle	19.12	19.71	18.99	
High			19.07	19.70	19.10		
75		/	18.86	19.51	18.83		
20		QPSK	1	Low	21.09	<b>21.85</b>	21.27
				Middle	21.01	21.82	21.09
	High			21.04	21.77	21.17	
	50		Low	19.80	20.45	19.74	
			Middle	19.79	20.50	19.67	
			High	19.76	20.38	19.64	
	100	/	19.73	20.12	19.20		
	16QAM	1	Low	20.55	21.26	20.69	
			Middle	20.53	21.20	20.49	
			High	20.46	21.19	20.61	
		50	Low	18.94	19.60	19.04	
			Middle	18.92	19.54	18.86	
			High	18.87	19.53	18.97	
		100	/	18.66	19.35	18.70	



**WLAN Conducted Power**

For 2.4GHz WLAN SAR testing, highest average RF output power channel for the lowest data rate for 802.11b were for SAR evaluation. 802.11g/n were not investigated since the average putput powers over all channels and data rates were not more than 0.25dB higher than the tested channel in the lowest data rate of 802.11b mode.

<b>WIFI 2.4G</b>			
Mode	Channel	Frequency (MHz)	Conducted Average Power (dBm)
802.11b	01	2412	16.77
	06	2437	<b>16.79</b>
	11	2462	17.48
802.11g	01	2412	16.54
	06	2437	16.46
	11	2462	16.07
802.11n(HT20)	01	2412	16.26
	06	2437	15.76
	11	2462	16.02
802.11n(HT40)	03	2422	14.19
	06	2437	14.31
	09	2452	13.45

<b>U-NII-1(WIFI 5G)</b>			
Mode	Channel	Frequency (MHz)	Conducted Average Power (dBm)
802.11a	36	5180	<b>11.14</b>
	40	5200	11.06
	48	5240	10.44
802.11n HT20	36	5180	11.11
	40	5200	11.10
	48	5240	10.56
802.11n HT40	38	5190	11.00
	46	5230	10.53
802.11ac VHT20	36	5180	10.91
	40	5200	10.58
	48	5240	10.21
802.11ac VHT40	38	5190	10.89
	46	5230	10.47



U-NII-2A (WIFI 5G)			
Mode	Channel	Frequency (MHz)	Conducted Average Power (dBm)
802.11a	52	5260	<b>10.97</b>
	56	5280	10.93
	64	5320	10.14
802.11n HT20	52	5260	10.01
	56	5280	10.76
	64	5320	10.06
802.11n HT40	54	5270	10.10
	62	5310	9.51
802.11ac VHT20	52	5260	10.80
	56	5280	10.65
	64	5320	10.26
802.11ac VHT40	54	5270	9.93
	62	5310	9.42

U-NII-2C(WIFI 5G)			
Mode	Channel	Frequency (MHz)	Conducted Average Power (dBm)
802.11a	100	5500	10.10
	116	5580	<b>11.76</b>
	140	5700	9.63
802.11n HT20	100	5500	10.50
	116	5580	11.01
	140	5700	10.03
802.11n HT40	102	5510	10.77
	110	5550	11.50
	134	5670	11.03
802.11ac VHT20	100	5500	10.40
	116	5580	11.05
	140	5700	9.87
802.11ac VHT40	102	5510	10.61
	110	5550	11.50
	134	5670	10.92



U-NII-3(WIFI 5G)			
Mode	Channel	Frequency (MHz)	Conducted Average Power (dBm)
802.11a	149	5745	9.60
	157	5785	<b>11.08</b>
	165	5825	10.58
802.11n HT20	149	5745	9.57
	157	5785	10.90
	165	5825	10.54
802.11n HT40	151	5755	9.19
	159	5795	9.72
802.11ac VHT20	149	5745	9.53
	157	5785	10.22
	165	5825	10.72
802.11ac VHT40	151	5755	8.96
	159	5795	10.13

**Note**

1. The output power was test all data rate and recorded worst case at recorded data rate.

**2. Bluetooth Conducted Power**

Bluetooth			
Mode	Channel	Frequency (MHz)	Conducted power (dBm)
GFSK	0	2402	3.26
	39	2441	0.50
	78	2480	3.71
$\pi/4$ QPSK	0	2402	2.10
	39	2441	-0.44
	78	2480	2.40
8DPSK	0	2402	2.36
	39	2441	-0.29
	78	2480	2.56
BLE	0	2402	3.28
	19	2440	0.70
	39	2480	<b>3.97</b>

**12. Maximum Tune-up Limit**

GSM		
Mode	Maximum Tune-up (dBm)	
	GSM850	PCS1900
GPRS (GMSK, 1Tx Slot)	32.50	29.50
GPRS (GMSK, 2Tx Slot)	32.00	29.00
GPRS (GMSK, 3Tx Slot)	30.50	27.00
GPRS (GMSK, 4Tx Slot)	29.00	25.50
EGPRS (8PSK, 1Tx Slot)	26.50	24.00
EGPRS (8PSK, 2Tx Slot)	24.50	23.00
EGPRS (8PSK, 3Tx Slot)	22.00	20.50
EGPRS (8PSK, 4Tx Slot)	21.00	19.00

WCDMA		
Mode	Maximum Tune-up (dBm)	
	WCDMA Band II	WCDMA Band V
RMC 12.2Kbps	22.50	23.00
HSDPA Subtest-1	21.50	22.00
HSDPA Subtest-2	21.50	21.50
HSDPA Subtest-3	21.50	21.50
HSDPA Subtest-4	21.50	21.50
HSUPA Subtest-1	19.50	20.00
HSUPA Subtest-2	20.00	20.00
HSUPA Subtest-3	20.50	20.00
HSUPA Subtest-4	20.00	20.00
HSUPA Subtest-5	21.50	20.00



LTE				
Frequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 4	1.4	QPSK	1	22.00
			3	20.50
			6	20.00
		16QAM	1	21.50
			3	20.00
			6	19.50
	3	QPSK	1	22.00
			8	20.50
			15	20.00
		16QAM	1	21.50
			8	20.00
			15	19.50
	5	QPSK	1	22.00
			12	20.50
			25	20.00
		16QAM	1	21.50
			12	20.00
			25	19.50
	10	QPSK	1	22.00
			25	20.50
			50	20.00
		16QAM	1	21.50
			25	20.00
			50	19.50
	15	QPSK	1	22.00
			38	20.50
			75	20.00
		16QAM	1	21.50
			38	20.00
			75	19.50
20	QPSK	1	22.00	
		50	20.50	
		100	20.50	
	16QAM	1	21.50	
		50	20.00	
		100	19.50	



LTE				
Fequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 5	1.4	QPSK	1	23.50
			3	22.50
			6	22.00
		16QAM	1	23.00
			3	22.00
			6	21.50
	3	QPSK	1	23.50
			8	22.00
			15	22.00
		16QAM	1	23.00
			8	21.50
			15	21.00
	5	QPSK	1	23.50
			12	22.00
			25	21.50
		16QAM	1	23.00
			12	21.50
			25	21.00
	10	QPSK	1	23.50
			25	22.00
			50	21.50
16QAM		1	23.00	
		25	21.00	
		50	21.00	



LTE				
Fequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 7	5	QPSK	1	22.50
			12	22.00
			25	21.50
		16QAM	1	22.00
			12	21.50
			25	21.00
	10	QPSK	1	23.00
			25	21.50
			50	21.00
		16QAM	1	22.50
			25	21.00
			50	20.50
	15	QPSK	1	23.00
			38	21.50
			75	21.00
		16QAM	1	22.50
			38	21.00
			75	20.50
	20	QPSK	1	23.00
			50	21.50
			100	21.00
16QAM		1	22.50	
		50	20.50	
		100	20.50	



LTE				
Fequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 17	5	QPSK	1	20.00
			12	19.00
			25	18.50
		16QAM	1	20.00
			12	18.50
			25	18.00
	10	QPSK	1	20.00
			25	19.00
			50	18.50
		16QAM	1	19.50
			25	18.00
			50	18.00





LTE				
Fequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 41	5	QPSK	1	21.50
			12	21.00
			25	20.50
		16QAM	1	21.50
			12	21.00
			25	20.50
	10	QPSK	1	22.00
			25	20.50
			50	20.50
		16QAM	1	21.50
			25	20.00
			50	20.00
	15	QPSK	1	22.00
			38	20.50
			75	20.50
		16QAM	1	21.50
			38	20.00
			75	20.00
	20	QPSK	1	22.00
			50	20.50
			100	20.50
16QAM		1	21.50	
		50	20.00	
		100	19.50	



WIFI 2.4G	
Mode	Maximum Tune-up (dBm) Burst Average Power
802.11b	17.00
802.11g	17.00
802.11n(HT20)	16.50
802.11n(HT40)	14.50

WIFI 5G		
Band	Mode	Maximum Tune-up (dBm) Burst Average Power
U-NII-1	802.11a	11.50
U-NII-2A		11.00
U-NII-2C		12.00
U-NII-3		11.50
U-NII-1	802.11n HT20	11.50
U-NII-2A		11.00
U-NII-2C		11.50
U-NII-3		11.00
U-NII-1	802.11n HT40	11.00
U-NII-2A		10.50
U-NII-2C		11.50
U-NII-3		10.00
U-NII-1	802.11ac VHT20	11.00
U-NII-2A		11.00
U-NII-2C		11.50
U-NII-3		11.00
U-NII-1	802.11ac VHT40	11.00
U-NII-2A		10.00
U-NII-2C		11.50
U-NII-3		10.50



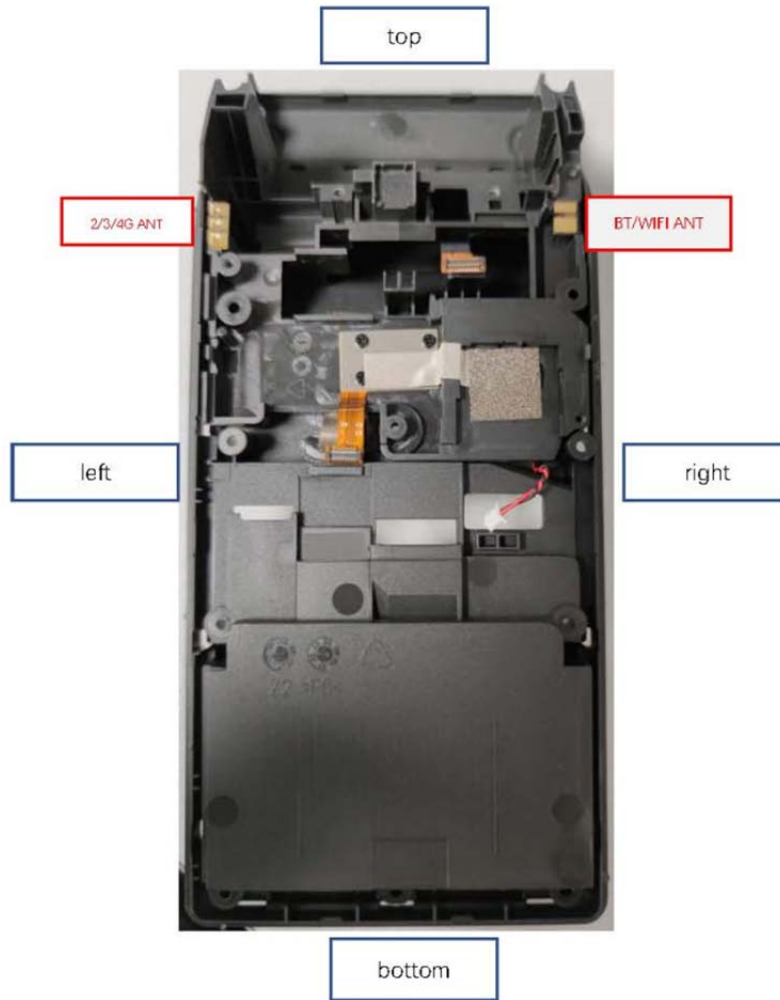
Bluetooth	
Mode	Maximum Tune-up (dBm)
GFSK	4.00
$\pi/4$ QPSK	2.50
8DPSK	3.00
BLE	4.00

Band/Mode	F(GHz)	Position	RF output power		SAR test exclusion	Estimated 1g SAR (W/kg)
			dBm	mW		
Bluetooth	2.48	Limb	4.00	2.51	Yes	0.042

*General note:*

1. Per KDB 447498 D01, the 1-g and 10-g SAR test exclusion thresholds for 100MHz to 6GHz at test separation distances  $\leq 50$ mm are determined by:  $[(\text{max. Power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] * [\sqrt{f(\text{GHz})}] \leq 7.5$  for 10-g extremity SAR
2. When the standalone SAR test exclusion is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to the following to determine simultaneous transmission SAR test exclusion:  $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f(\text{GHz})} / x] \text{ W/kg}$  for test separation distances  $\leq 50$  mm; Where  $x = 7.5$  for 1-g SAR, and  $x = 18.75$  for 10-g SAR. 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.

### 13. Antenna Location



**FRONT VIEW**

Antenna	Distance of the Antenna to the EUT surface/edge(mm)					
	Front side	Back side	Left side	Right side	Top side	Bottom side
2/3/4G ANT	<25	>25	<25	>25	>25	>25
BT/WIFI ANT	<25	>25	>25	<25	>25	>25
SAR Test for MAIN ANT	Yes	No	Yes	No	No	No
SAR Test for WIFI ANT	Yes	No	No	Yes	No	No

*General note:*

*Referring to KDB941225 D06 , when the overall device length and width are >9cm\*5cm, a test separation distance of 10 mm is required for hotspot mode SAR measurements; Hotspot mode SAR is measured for all edges and surfaces of the device with a transmitting antenna located within 25 mm from that surface or edge*



## 14. SAR Measurement Results

### 10-g Extremity SAR

GSM850											
Mode	Test Position (side)	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(10g) (W/kg)	Report SAR(10g) (W/kg)	Limit (W/kg)	Test Plot
		CH	MHz								
GPRS (4Tx slot)	Front	128	824.2	28.74	29.00	1.06	-	-	-	4.00	-
		190	836.6	28.90	29.00	1.02	-0.05	0.378	0.386	4.00	-
		251	848.8	28.85	29.00	1.04	-	-	-	4.00	-
	Left	128	824.2	28.74	29.00	1.06	-	-	-	4.00	-
		190	836.6	28.90	29.00	1.02	-0.13	<b>0.876</b>	<b>0.894</b>	4.00	B1
		251	848.8	28.85	29.00	1.04	-	-	-	4.00	-

GSM1900											
Mode	Test Position (side)	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(10g) (W/kg)	Report SAR(10g) (W/kg)	Limit (W/kg)	Test Plot
		CH	MHz								
GPRS (2Tx slot)	Front	512	1850.2	28.24	29.00	1.19	-	-	-	4.00	-
		661	1880.0	28.54	29.00	1.11	0.06	0.711	0.789	4.00	-
		810	1909.8	28.43	29.00	1.14	-	-	-	4.00	-
	Left	512	1850.2	28.24	29.00	1.19	-	-	-	4.00	-
		661	1880.0	28.54	29.00	1.11	0.09	<b>1.570</b>	<b>1.743</b>	4.00	B2
		810	1909.8	28.43	29.00	1.14	-	-	-	4.00	-

Note:

If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 2.0$  W/kg then testing at the other channels is not required for such test configuration(s).



WCDMA Band II											
Mode	Test Position (side)	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(10g) (W/kg)	Report SAR(10g) (W/kg)	Limit (W/kg)	Test Plot
		CH	MHz								
RMC 12.2Kbps	Front	9262	1852.4	22.33	22.50	1.04	-	-	-	4.00	-
		9400	1880.0	22.48	22.50	1.00	-0.04	0.965	0.965	4.00	-
		9538	1907.6	22.39	22.50	1.03	-	-	-	4.00	-
	Left	9262	1852.4	22.33	22.50	1.04	0.08	1.97	1.970	4.00	-
		9400	1880.0	22.48	22.50	1.00	0.11	2.21	<b>2.210</b>	4.00	B3
		9538	1907.6	22.39	22.50	1.03	0.12	2.03	2.030	4.00	-

WCDMA Band V											
Mode	Test Position (side)	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(10g) (W/kg)	Report SAR(10g) (W/kg)	Limit (W/kg)	Test Plot
		CH	MHz								
RMC 12.2Kbps	Front	4132	826.4	22.54	23.00	1.11	-	-	-	4.00	-
		4183	836.6	22.90	23.00	1.02	-0.05	0.314	0.320	4.00	-
		4233	846.6	22.85	23.00	1.04	-	-	-	4.00	-
	Left	4132	826.4	22.54	23.00	1.11	-	-	-	4.00	-
		4183	836.6	22.90	23.00	1.02	0.08	<b>0.830</b>	<b>0.847</b>	4.00	B4
		4233	846.6	22.85	23.00	1.04	-	-	-	4.00	-

**Note:**

If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 2.0$  W/kg then testing at the other channels is not required for such test configuration(s).



LTE Band 4											
Mode	Test Position (side)	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(10g) (W/kg)	Report SAR(10g) (W/kg)	Limit (W/kg)	Test Plot
		CH	MHz								
20M_1RB	Front	20050	1720.0	21.23	22.00	1.19	-	-	-	4.00	-
		20175	1732.5	21.77	22.00	1.05	0.04	1.010	1.061	4.00	-
		20300	1745.0	21.54	22.00	1.11	-	-	-	4.00	-
	Left	20050	1720.0	21.23	22.00	1.19	-0.04	2.010	2.392	4.00	-
		20175	1732.5	21.77	22.00	1.05	0.17	<b>2.130</b>	<b>2.237</b>	4.00	B5
		20300	1745.0	21.54	22.00	1.11	-0.20	2.070	2.298	4.00	-
20M_50RB	Front	20050	1720.0	19.92	20.50	1.14	-	-	-	4.00	-
		20175	1732.5	20.43	20.50	1.02	0.09	0.941	0.960	4.00	-
		20300	1745.0	19.92	20.50	1.14	-	-	-	4.00	-
	Left	20050	1720.0	19.92	20.50	1.14	-	-	-	4.00	-
		20175	1732.5	20.43	20.50	1.02	0.07	1.740	1.775	4.00	-
		20300	1745.0	19.92	20.50	1.14	-	-	-	4.00	-
20M_100RB	Front	20050	1720.0	19.86	20.50	1.16	-	-	-	4.00	-
		20175	1732.5	20.04	20.50	1.11	0.02	0.842	0.935	4.00	-
		20300	1745.0	19.45	20.50	1.27	-	-	-	4.00	-
	Left	20050	1720.0	19.86	20.50	1.16	-	-	-	4.00	-
		20175	1732.5	20.04	20.50	1.11	0.05	1.518	1.685	4.00	-
		20300	1745.0	19.45	20.50	1.27	-	-	-	4.00	-

**Note:**

1. If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 2.0$  W/kg then testing at the other channels is not required for such test configuration(s).



LTE Band 5											
Mode	Test Position (side)	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(10g) (W/kg)	Report SAR(10g) (W/kg)	Limit (W/kg)	Test Plot
		CH	MHz								
10M_1RB	Front	20450	829.0	23.17	23.50	1.08	-	-	-	4.00	-
		20525	836.5	23.22	23.50	1.07	0.12	0.127	0.136	4.00	-
		20600	844.0	23.01	23.50	1.12	-	-	-	4.00	-
	Left	20450	829.0	23.17	23.50	1.08	-	-	-	4.00	-
		20525	836.5	23.22	23.50	1.07	-0.07	<b>0.569</b>	<b>0.609</b>	4.00	B6
		20600	844.0	23.01	23.50	1.12	-	-	-	4.00	-
10M_25RB	Front	20450	829.0	21.74	22.00	1.06	-	-	-	4.00	-
		20525	836.5	21.79	22.00	1.05	-0.09	0.108	0.113	4.00	-
		20600	844.0	21.28	22.00	1.18	-	-	-	4.00	-
	Left	20450	829.0	21.74	22.00	1.06	-	-	-	4.00	-
		20525	836.5	21.79	22.00	1.05	0.08	0.316	0.332	4.00	-
		20600	844.0	21.28	22.00	1.18	-	-	-	4.00	-

Note:

1. If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 2.0$  W/kg then testing at the other channels is not required for such test configuration(s).





LTE Band 7											
Mode	Test Position (side)	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(10g) (W/kg)	Report SAR(10g) (W/kg)	Limit (W/kg)	Test Plot
		CH	MHz								
20M_1RB	Front	20850	2510	22.19	23.00	1.21	-	-	-	4.00	-
		21100	2535	22.81	23.00	1.04	0.12	1.320	1.373	4.00	-
		21350	2560	22.35	23.00	1.16	-	-	-	4.00	-
	Left	20850	2510	22.19	23.00	1.21	0.06	2.030	2.456	4.00	-
		21100	2535	22.81	23.00	1.04	0.10	<b>2.690</b>	<b>2.798</b>	4.00	B7
		21350	2560	22.35	23.00	1.16	-0.01	2.150	2.494	4.00	-
20M_50RB	Front	20850	2510	20.82	21.50	1.17	-	-	-	4.00	-
		21100	2535	21.40	21.50	1.02	0.20	0.911	0.929	4.00	-
		21350	2560	20.67	21.50	1.21	-	-	-	4.00	-
	Left	20850	2510	20.82	21.50	1.17	-	-	-	4.00	-
		21100	2535	21.40	21.50	1.02	0.09	1.710	1.744	4.00	-
		21350	2560	20.67	21.50	1.21	-	-	-	4.00	-
20M_100RB	Front	20850	2510	20.76	21.50	1.19	-	-	-	4.00	-
		21100	2535	21.00	21.50	1.12	0.03	0.817	0.915	4.00	-
		21350	2560	20.18	21.50	1.36	-	-	-	4.00	-
	Left	20850	2510	20.76	21.50	1.19	-	-	-	4.00	-
		21100	2535	21.00	21.50	1.12	0.08	1.529	1.712	4.00	-
		21350	2560	20.18	21.50	1.36	-	-	-	4.00	-

**Note:**

- If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 2.0$  W/kg then testing at the other channels is not required for such test configuration(s).



LTE Band 17											
Mode	Test Position (side)	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(10g) (W/kg)	Report SAR(10g) (W/kg)	Limit (W/kg)	Test Plot
		CH	MHz								
10M_1RB	Front	23780	709.0	19.75	20.00	1.06	-	-	-	4.00	-
		23790	710.0	19.97	20.00	1.01	0.05	0.043	0.043	4.00	-
		23800	711.0	19.84	20.00	1.04	-	-	-	4.00	-
	Left	23780	709.0	19.75	20.00	1.06	-	-	-	4.00	-
		23790	710.0	19.97	20.00	1.01	0.18	<b>0.180</b>	<b>0.182</b>	4.00	B8
		23800	711.0	19.84	20.00	1.04	-	-	-	4.00	-
10M_25RB	Front	23780	709.0	18.53	19.00	1.11	-	-	-	4.00	-
		23790	710.0	18.74	19.00	1.06	-0.19	0.011	0.012	4.00	-
		23800	711.0	18.35	19.00	1.16	-	-	-	4.00	-
	Left	23780	709.0	18.53	19.00	1.11	-	-	-	4.00	-
		23790	710.0	18.74	19.00	1.06	0.07	0.119	0.126	4.00	-
		23800	711.0	18.35	19.00	1.16	-	-	-	4.00	-

Note:

1. If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 2.0$  W/kg then testing at the other channels is not required for such test configuration(s).



LTE Band 41												
Mode	Test Position (side)	Frequency		Duty Cycle	Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(10g) (W/kg)	Report SAR(10g) (W/kg)	Limit (W/kg)	Test Plot
		CH	MHz									
20M_1RB	Front	40340	2565.0	1:1.58	21.09	22.00	1.23	-	-	-	4.00	-
		40740	2605.0	1:1.58	21.85	22.00	1.04	-0.15	0.537	0.558	4.00	-
		41140	2645.0	1:1.58	21.27	22.00	1.18	-	-	-	4.00	-
	Left	40340	2565.0	1:1.58	21.09	22.00	1.23	-	-	-	4.00	-
		40740	2605.0	1:1.58	21.85	22.00	1.04	0.19	<b>1.200</b>	<b>1.248</b>	4.00	B9
		41140	2645.0	1:1.58	21.27	22.00	1.18	-	-	-	4.00	-
20M_50RB	Front	40340	2565.0	1:1.58	19.79	20.50	1.18	-	-	-	4.00	-
		40740	2605.0	1:1.58	20.50	20.50	1.00	-0.07	0.202	0.202	4.00	-
		41140	2645.0	1:1.58	19.67	20.50	1.21	-	-	-	4.00	-
	Left	40340	2565.0	1:1.58	19.79	20.50	1.18	-	-	-	4.00	-
		40740	2605.0	1:1.58	20.50	20.50	1.00	0.05	0.864	0.864	4.00	-
		41140	2645.0	1:1.58	19.67	20.50	1.21	-	-	-	4.00	-

**Note:**

- If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 2.0$  W/kg then testing at the other channels is not required for such test configuration(s).



WIFI 2.4G											
Mode	Test Position (side)	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(10g) (W/kg)	Report SAR(10g) (W/kg)	Limit (W/kg)	Test Plot
		CH	MHz								
802.11b 1Mbps	Front	1	2412	16.77	17.00	1.05	-	-	-	4.00	-
		6	2437	16.79	17.00	1.05	0.17	0.412	0.433	4.00	-
		11	2462	17.48	17.00	0.90	-	-	-	4.00	-
	Right	1	2412	16.77	17.00	1.05	-	-	-	4.00	-
		6	2437	16.79	17.00	1.05	0.19	<b>0.891</b>	<b>0.936</b>	4.00	B10
		11	2462	17.48	17.00	0.90	-	-	-	4.00	-

Note:

If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 2.0$  W/kg then testing at the other channels is not required for such test configuration(s).



ANT1 U-NII-1 (WIFI 5G)											
Mode	Test Position (side)	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(10g) (W/kg)	Report SAR(10g) (W/kg)	Limit (W/kg)	Test Plot
		CH	MHz								
802.11a 6Mbps	Front	36	5180	11.14	11.50	1.09	0.15	0.393	0.428	4.00	-
		44	5220	11.06	11.50	1.11	-	-	-	4.00	-
		48	5240	10.44	11.50	1.28	-	-	-	4.00	-
	Right	36	5180	11.14	11.50	1.09	0.86	<b>0.914</b>	<b>0.996</b>	4.00	B11
		40	5200	11.06	11.50	1.11	-	-	-	4.00	-
		48	5240	10.44	11.50	1.28	-	-	-	4.00	-

ANT1 U-NII-2A(WIFI 5G)											
Mode	Test Position (side)	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(10g) (W/kg)	Report SAR(10g) (W/kg)	Limit (W/kg)	Test Plot
		CH	MHz								
802.11a 6Mbps	Front	52	5260	10.97	11.00	1.01	0.20	0.427	0.431	4.00	-
		56	5280	10.93	11.00	1.02	-	-	-	4.00	-
		64	5320	10.14	11.00	1.22	-	-	-	4.00	-
	Right	52	5260	10.97	11.00	1.01	0.13	<b>0.986</b>	<b>0.996</b>	4.00	B12
		56	5280	10.93	11.00	1.02	-	-	-	4.00	-
		64	5320	10.14	11.00	1.22	-	-	-	4.00	-

**Note:**

If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 2.0$  W/kg then testing at the other channels is not required for such test configuration(s).



ANT1 U-NII-2C(WIFI 5G)											
Mode	Test Position (side)	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(10g) (W/kg)	Report SAR(10g) (W/kg)	Limit (W/kg)	Test Plot
		CH	MHz								
802.11a 6Mbps	Front	100	5500	10.10	12.00	1.55	-	-	-	4.00	-
		116	5580	11.76	12.00	1.06	-0.19	0.501	0.531	4.00	-
		140	5700	9.63	12.00	1.73	-	-	-	4.00	-
	Right	100	5500	10.10	12.00	1.55	-	-	-	4.00	-
		116	5580	11.76	12.00	1.06	0.11	<b>1.090</b>	<b>1.155</b>	4.00	B13
		140	5700	9.63	12.00	1.73	-	-	-	4.00	-

ANT1 U-NII-3(WIFI 5G)											
Mode	Test Position (side)	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(10g) (W/kg)	Report SAR(10g) (W/kg)	Limit (W/kg)	Test Plot
		CH	MHz								
802.11a 6Mbps	Front	144	5720	9.60	11.50	1.55	-	-	-	4.00	-
		157	5785	11.08	11.50	1.10	0.05	0.489	0.538	4.00	-
		165	5825	10.58	11.50	1.24	-	-	-	4.00	-
	Right	144	5720	9.60	11.50	1.55	-	-	-	4.00	-
		157	5785	11.08	11.50	1.10	0.14	<b>1.030</b>	<b>1.133</b>	4.00	B14
		165	5825	10.58	11.50	1.24	-	-	-	4.00	-

Note:

If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 2.0$  W/kg then testing at the other channels is not required for such test configuration(s).

## SAR Test Data Plots

Test band: GSM850

Test Position: Left side

Test Plot: B1

Date:2020-12-21

Communication System: UID 0, Generic GPRS 4TS (0); Frequency: 836.6 MHz;Duty Cycle: 1:4

Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.967$  S/m;  $\epsilon_r = 55.399$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(10.33, 10.33, 10.33); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/back side/Area Scan (9x11x1):** Measurement grid: dx=12mm, dy=12mmInfo: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.68 W/kg

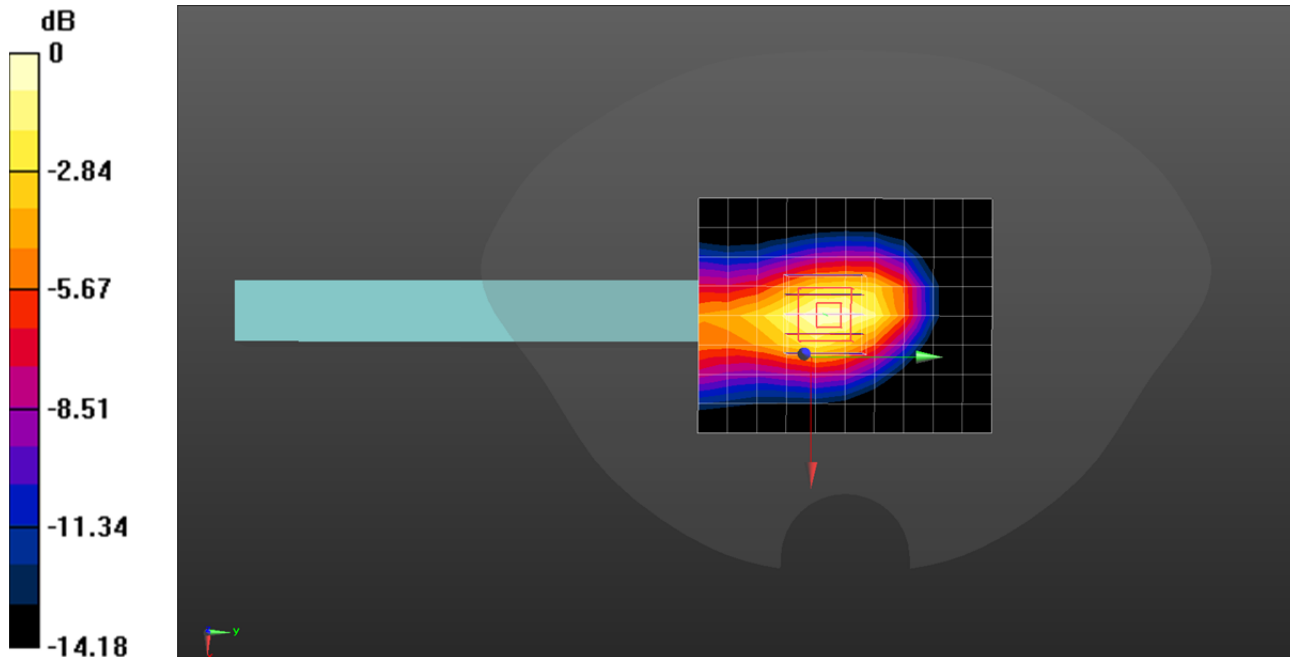
**Body/back side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 41.68 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 2.65 W/kg

**SAR(1 g) = 1.54 W/kg; SAR(10 g) = 0.876 W/kg**Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.70 W/kg



Test band: GSM1900

Test Position: Left side

Test Plot: B2

Date:2020-12-22

Communication System: UID 0, Generic GPRS 4TS (0); Frequency: 1880 MHz;Duty Cycle: 1:4

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.539$  S/m;  $\epsilon_r = 53.741$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.09, 8.09, 8.09); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/back side/Area Scan (9x11x1):** Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 3.33 W/kg

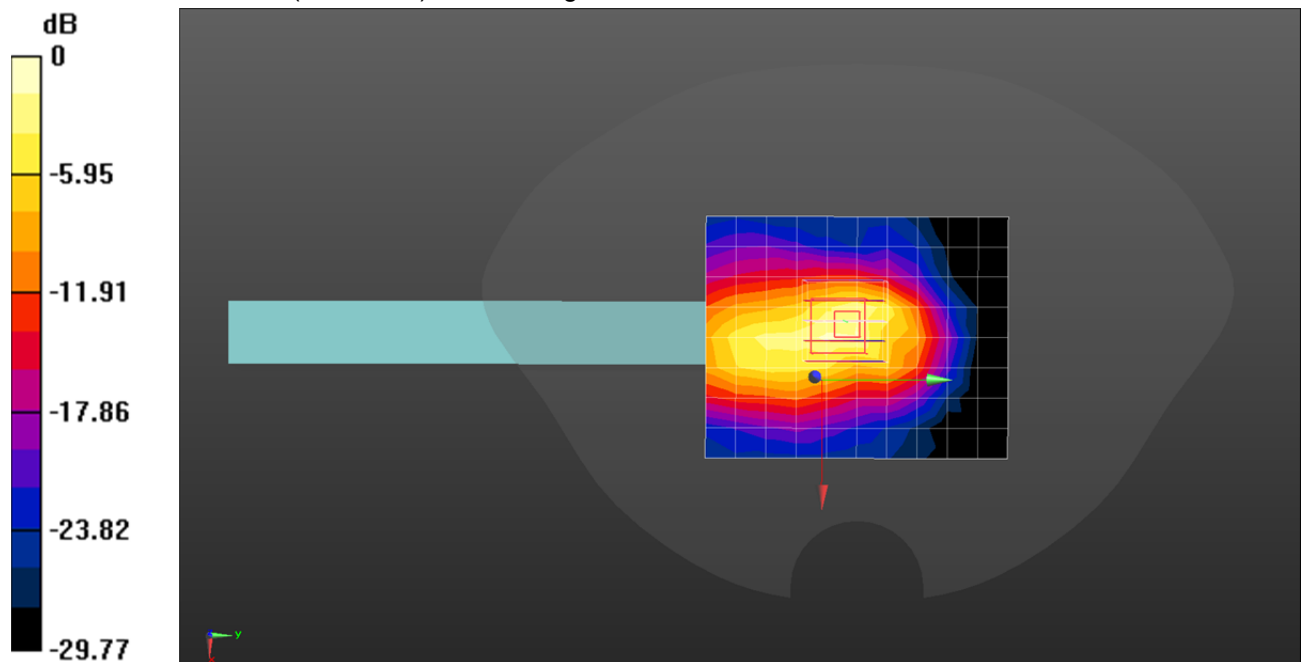
**Body/back side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 50.55 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 9.23 W/kg

**SAR(1 g) = 3.79 W/kg; SAR(10 g) = 1.57 W/kg**

Maximum value of SAR (measured) = 4.68 W/kg





Test band: WCDMA Band II

Test Position: Left side

Test Plot: B3

Date:2020-12-22

Communication System: UID 0, Generic UMTS (WCDMA) (0); Frequency: 1880 MHz;Duty Cycle: 1:1

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.539$  S/m;  $\epsilon_r = 53.741$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.09, 8.09, 8.09); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/Left side/Area Scan (9x11x1):** Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 5.08 W/kg

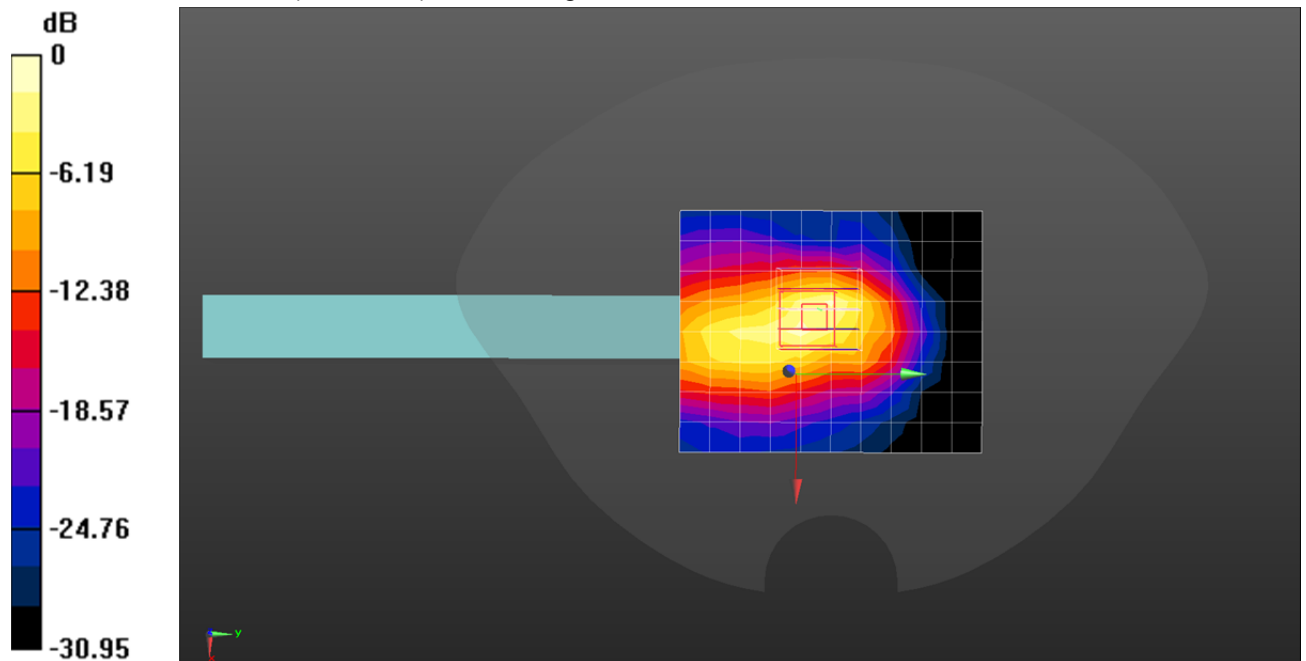
**Body/Left side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 49.69 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 16.0 W/kg

**SAR(1 g) = 5.6 W/kg; SAR(10 g) = 2.21 W/kg**

Maximum value of SAR (measured) = 6.59 W/kg



Test band: WCDMA Band V

Test Position: Left side

Test Plot: B4

Date:2020-12-21

Communication System: UID 0, Generic UMTS (WCDMA) (0); Frequency: 836.6 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.967$  S/m;  $\epsilon_r = 55.399$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(10.33, 10.33, 10.33); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/Left side/Area Scan (9x11x1):** Measurement grid: dx=12mm, dy=12mmInfo: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.69 W/kg

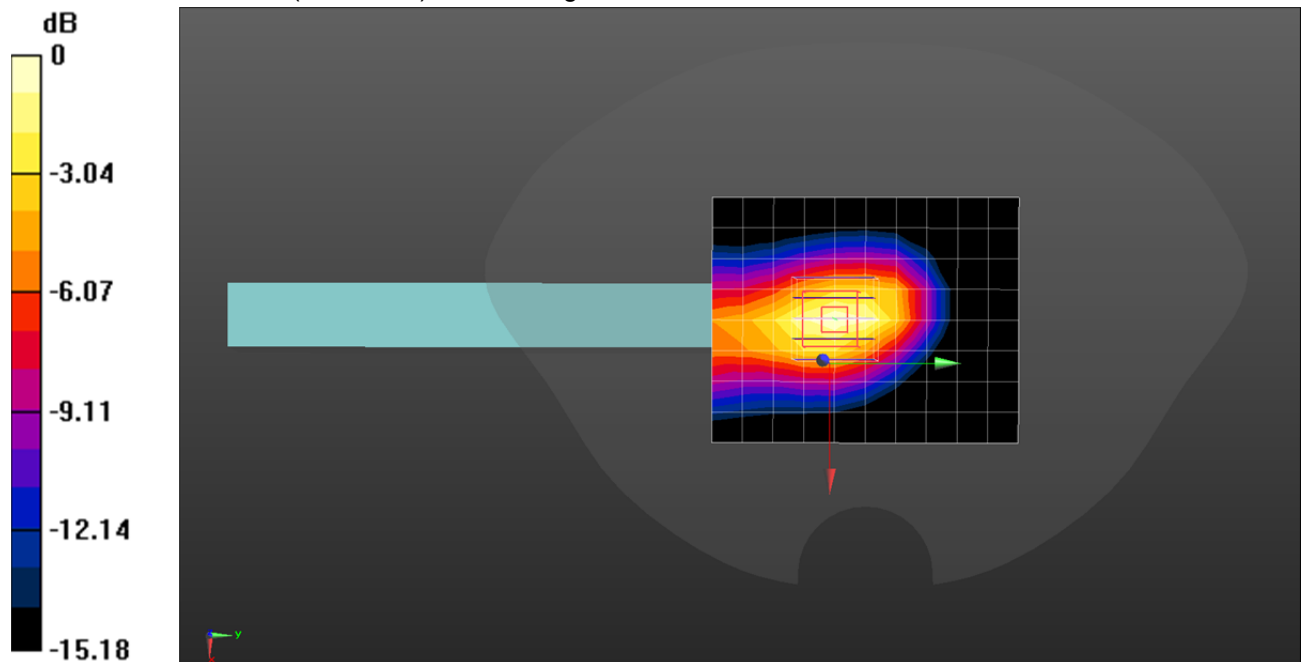
**Body/Left side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 38.65 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 2.87 W/kg

**SAR(1 g) = 1.53 W/kg; SAR(10 g) = 0.830 W/kg**Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.70 W/kg



Test band: LTE Band 4

Test Position: Left side

Test Plot: B5

Date:2020-12-22

Communication System: UID 0, Generic LTE (0); Frequency: 1732.5 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1732.5$  MHz;  $\sigma = 1.43$  S/m;  $\epsilon_r = 53.892$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.42, 8.42, 8.42); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/Left side/Area Scan (9x11x1):** Measurement grid: dx=12mm, dy=12mm[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 5.39 W/kg

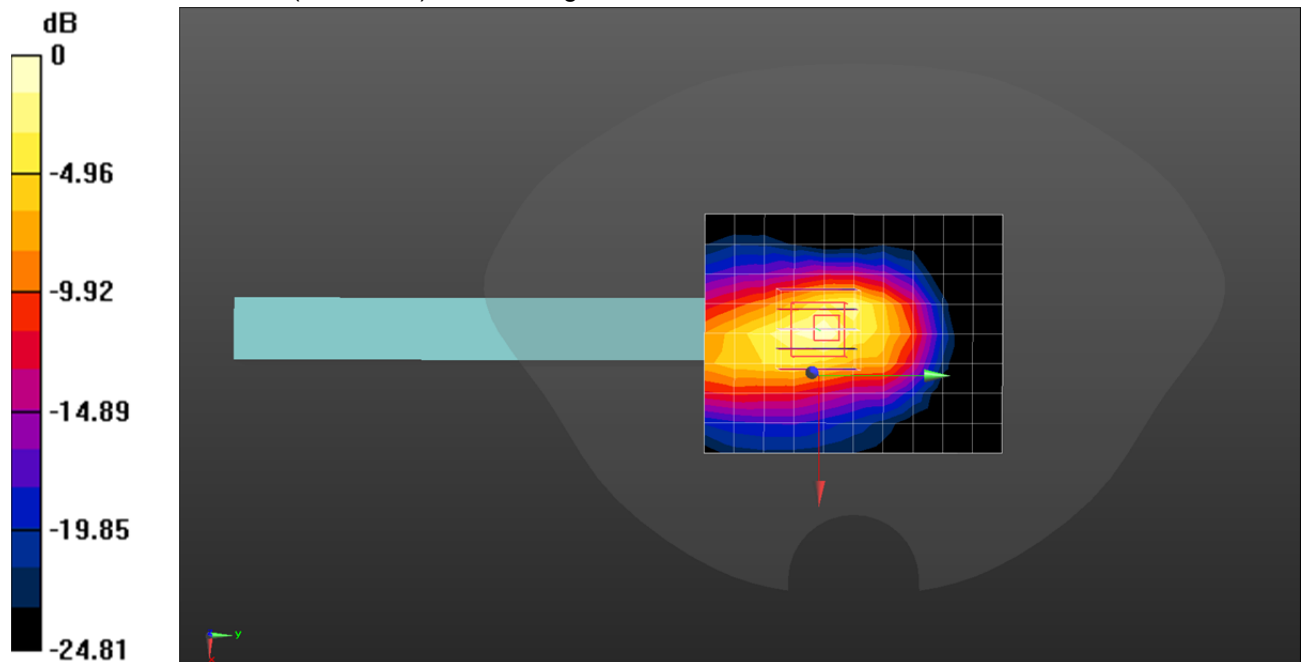
**Body/Left side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 45.42 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 10.8 W/kg

**SAR(1 g) = 4.74 W/kg; SAR(10 g) = 2.13 W/kg**[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 5.41 W/kg



Test band: LTE Band 5

Test Position: Left side

Test Plot: B6

Date:2020-12-21

Communication System: UID 0, Generic LTE (0); Frequency: 836.5 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 836.5$  MHz;  $\sigma = 0.967$  S/m;  $\epsilon_r = 55.399$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(10.33, 10.33, 10.33); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/Left side/Area Scan (9x11x1):** Measurement grid: dx=12mm, dy=12mm[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.11 W/kg

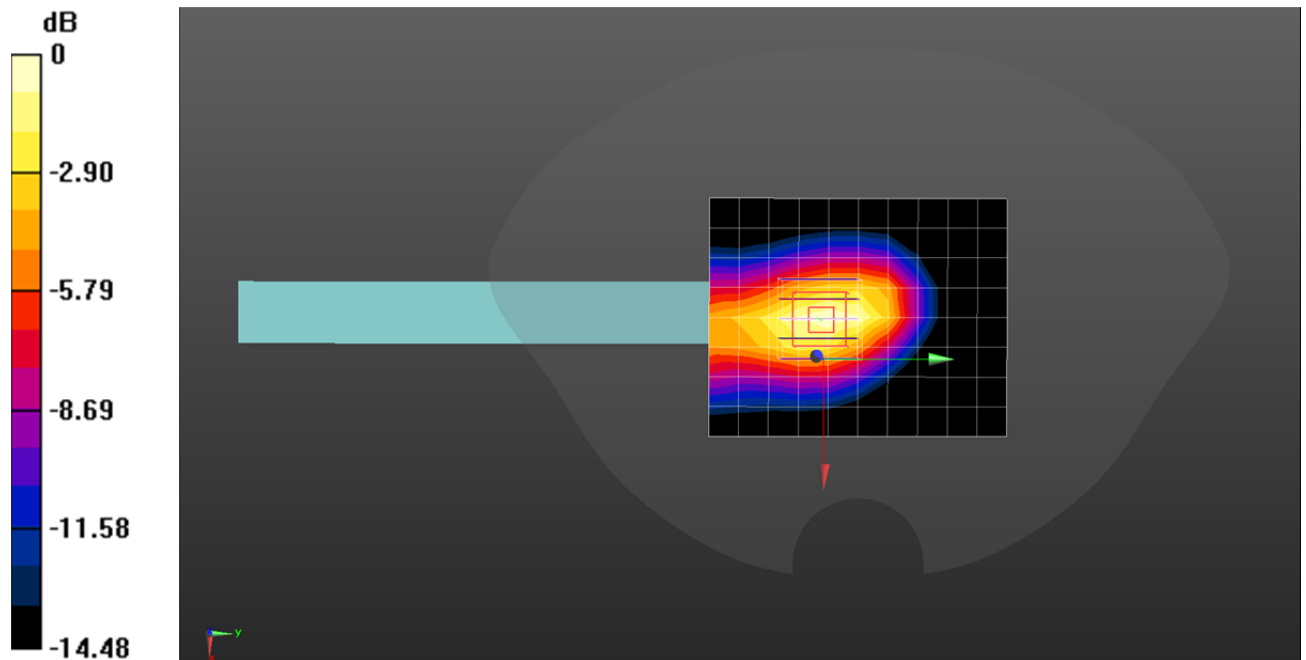
**Body/Left side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 31.08 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 1.76 W/kg

**SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.569 W/kg**[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.12 W/kg



Test band: LTE Band 7

Test Position: Left side

Test Plot: B7

Date:2020-12-23

Communication System: UID 0, Generic LTE (0); Frequency: 2535 MHz;Duty Cycle: 1:1

Medium parameters used:  $f = 2535$  MHz;  $\sigma = 2.082$  S/m;  $\epsilon_r = 52.884$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8, 8, 8); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/Left side/Area Scan (9x11x1):** Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 8.45 W/kg

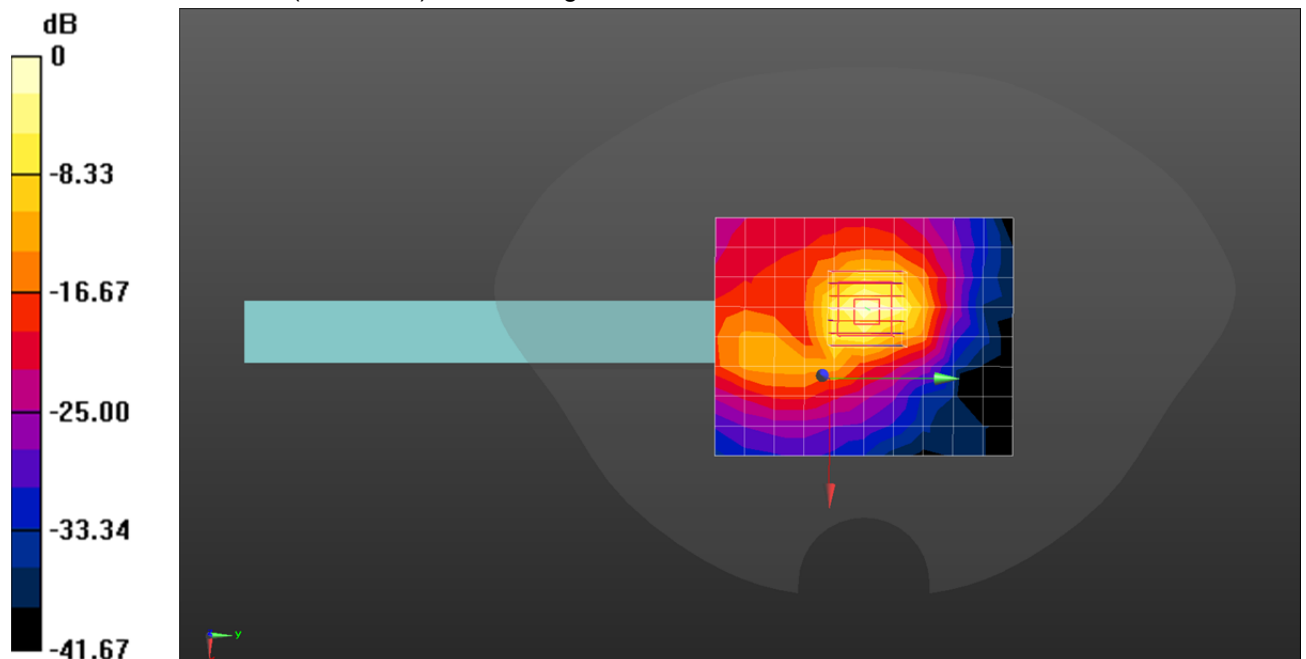
**Body/Left side/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 43.17 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 26.1 W/kg

**SAR(1 g) = 8.26 W/kg; SAR(10 g) = 2.69 W/kg**

Maximum value of SAR (measured) = 9.73 W/kg



Test band: LTE Band 17

Test Position: Left side

Test Plot: B8

Date:2020-12-21

Communication System: UID 0, Generic LTE (0); Frequency: 710 MHz;Duty Cycle: 1:1

Medium parameters used:  $f = 710 \text{ MHz}$ ;  $\sigma = 0.919 \text{ S/m}$ ;  $\epsilon_r = 55.736$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(10.62, 10.62, 10.62); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/Left side/Area Scan (7x9x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ 

Maximum value of SAR (measured) = 0.317 W/kg

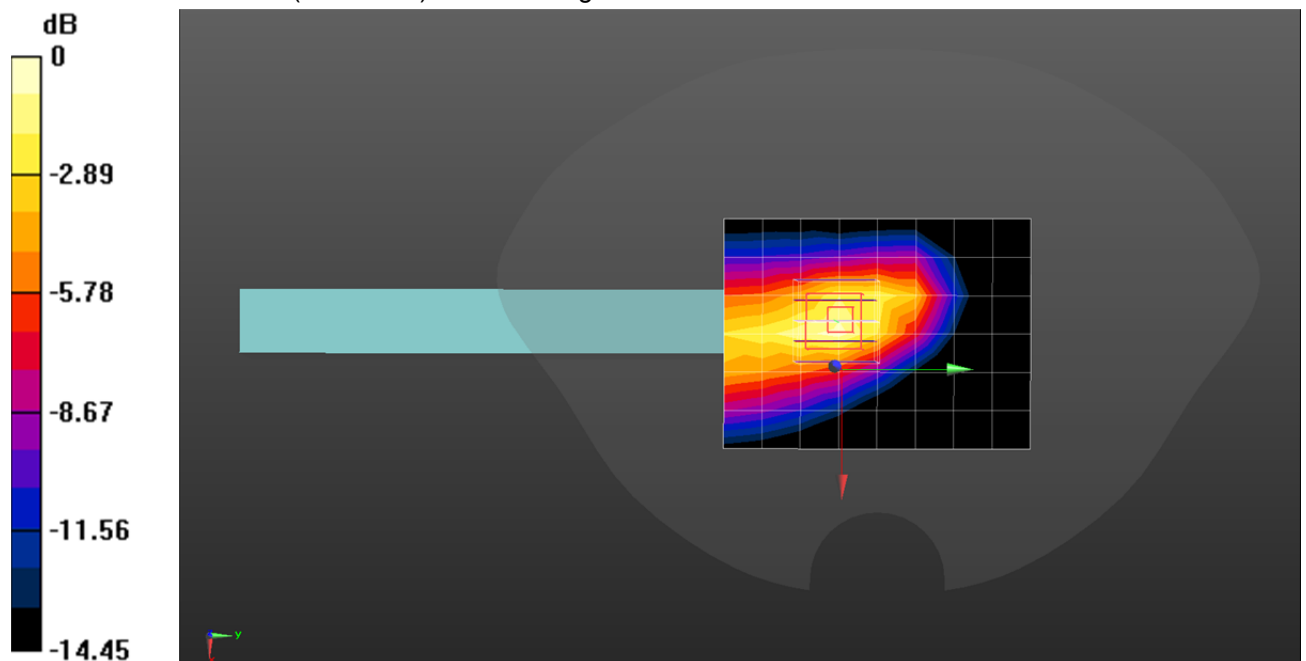
**Body/Left side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$ 

Reference Value = 16.52 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.571 W/kg

**SAR(1 g) = 0.320 W/kg; SAR(10 g) = 0.180 W/kg**

Maximum value of SAR (measured) = 0.352 W/kg



Test band: LTE Band 41

Test Position: Left side

Test Plot: B9

Date:2020-12-23

Communication System: UID 0, Generic LTE (0); Frequency: 2593 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 2593$  MHz;  $\sigma = 2.143$  S/m;  $\epsilon_r = 52.791$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(7.52, 7.52, 7.52); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/Left side/Area Scan (9x11x1):** Measurement grid: dx=12mm, dy=12mm[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 3.24 W/kg

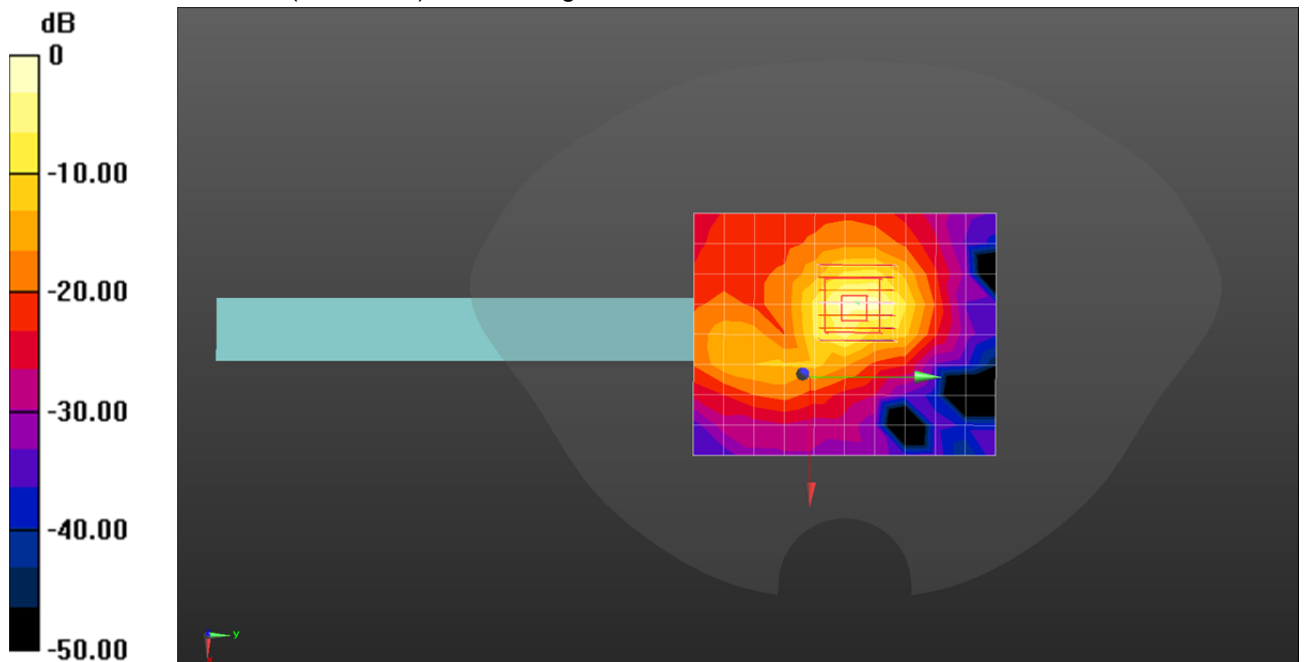
**Body/Left side/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 30.78 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 11.9 W/kg

**SAR(1 g) = 3.73 W/kg; SAR(10 g) = 1.2 W/kg**[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 4.28 W/kg



Test band: WIFI 2.4G

Test Position: Right side

Test Plot: B10

Date:2020-12-23

Communication System: UID 0, WI-FI(2412-2462) (0); Frequency: 2437 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 2437$  MHz;  $\sigma = 1.991$  S/m;  $\epsilon_r = 53.023$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8, 8, 8); Calibrated: 2020/05/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/Right side/Area Scan (9x11x1):** Measurement grid: dx=12mm, dy=12mm[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 2.92 W/kg

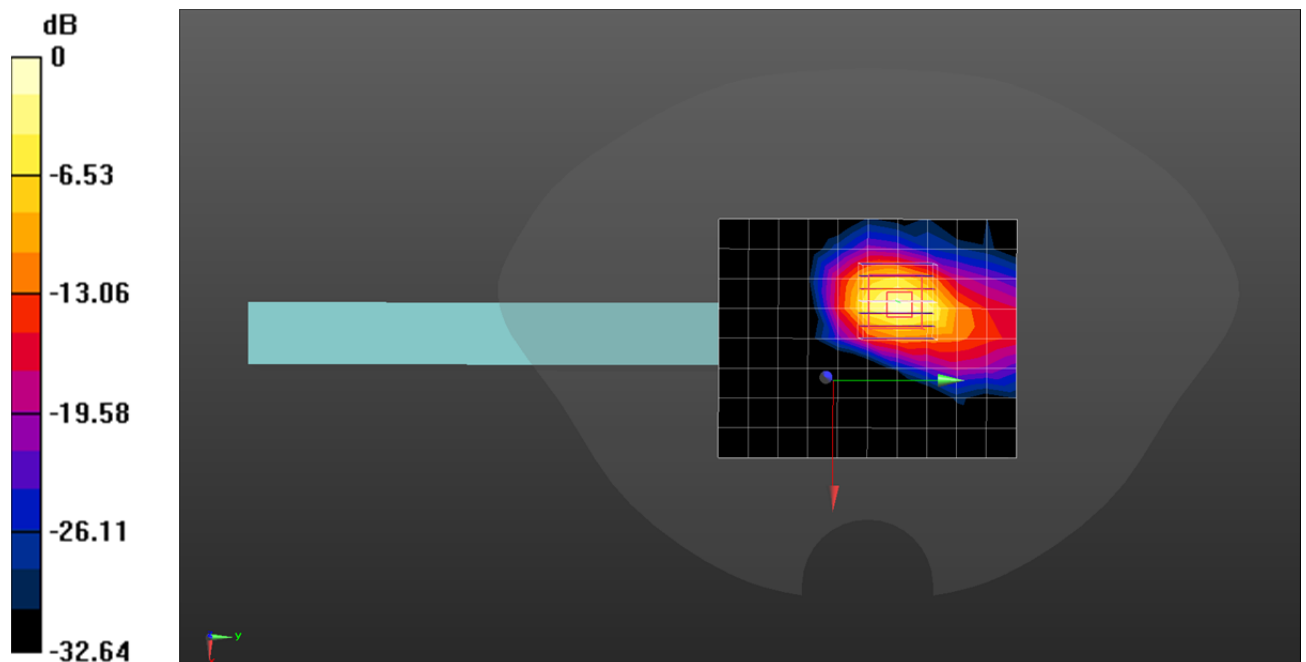
**Body/Right side/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.896 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 7.80 W/kg

**SAR(1 g) = 2.59 W/kg; SAR(10 g) = 0.891 W/kg**[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 3.09 W/kg





Test band: U-NII-1 (WIFI 5G)

Test Position: Right side

Test Plot: B11

Date:2020-12-24

Communication System: UID 0, WI-FI(U-NII-1) (0); Frequency: 5180 MHz;Duty Cycle: 1:1

Medium parameters used:  $f = 5180$  MHz;  $\sigma = 5.441$  S/m;  $\epsilon_r = 48.046$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(5.24, 5.24, 5.24); Calibrated: 2020/05/14;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM2; Type: Twin SAM V5.0; Serial: 1811
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/Right side/Area Scan (11x13x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 3.58 W/kg

**Body/Right side/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm,

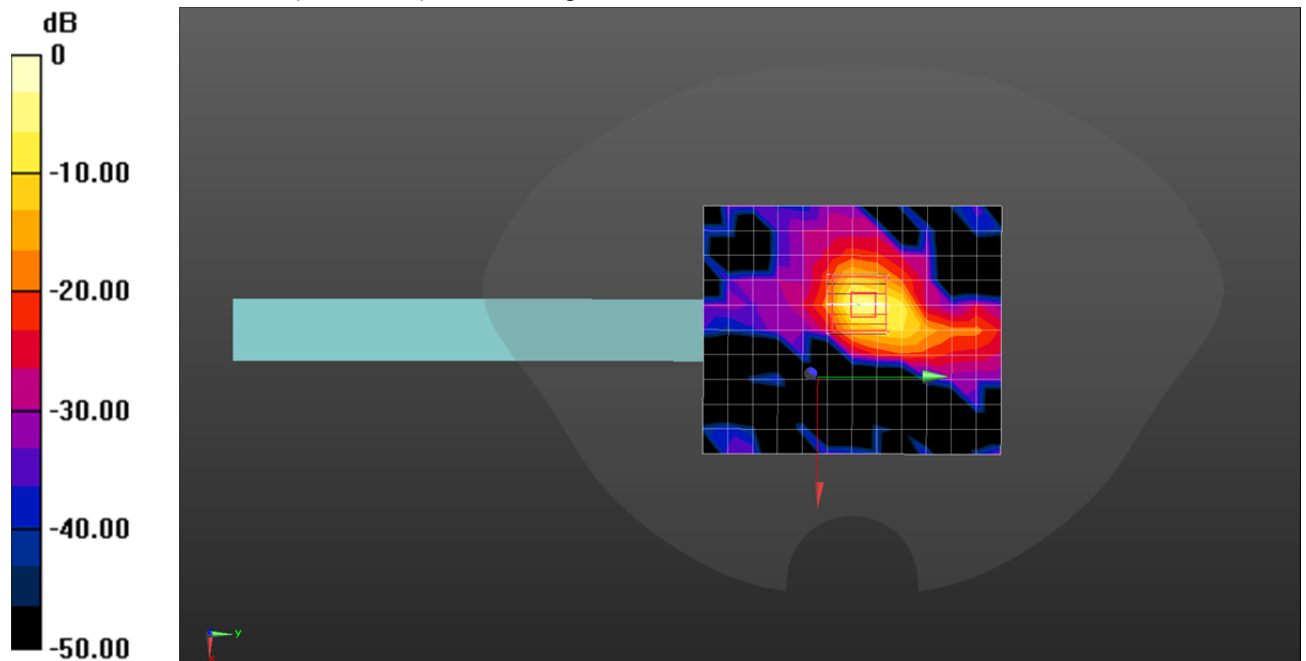
dz=2mm

Reference Value = 9.387 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 19.5 W/kg

**SAR(1 g) = 4.09 W/kg; SAR(10 g) = 0.914 W/kg**

Maximum value of SAR (measured) = 9.23 W/kg



Test band: U-NII-2A (WIFI 5G)

Test Position: Right side

Test Plot: B12

Date:2020-12-24

Communication System: UID 0, WI-FI(U-NII-2A) (0); Frequency: 5260 MHz;Duty Cycle: 1:1

Medium parameters used:  $f = 5260$  MHz;  $\sigma = 5.556$  S/m;  $\epsilon_r = 47.883$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(5.24, 5.24, 5.24); Calibrated: 2020/05/14;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM2; Type: Twin SAM V5.0; Serial: 1811
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/Right side/Area Scan (11x13x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 4.95 W/kg

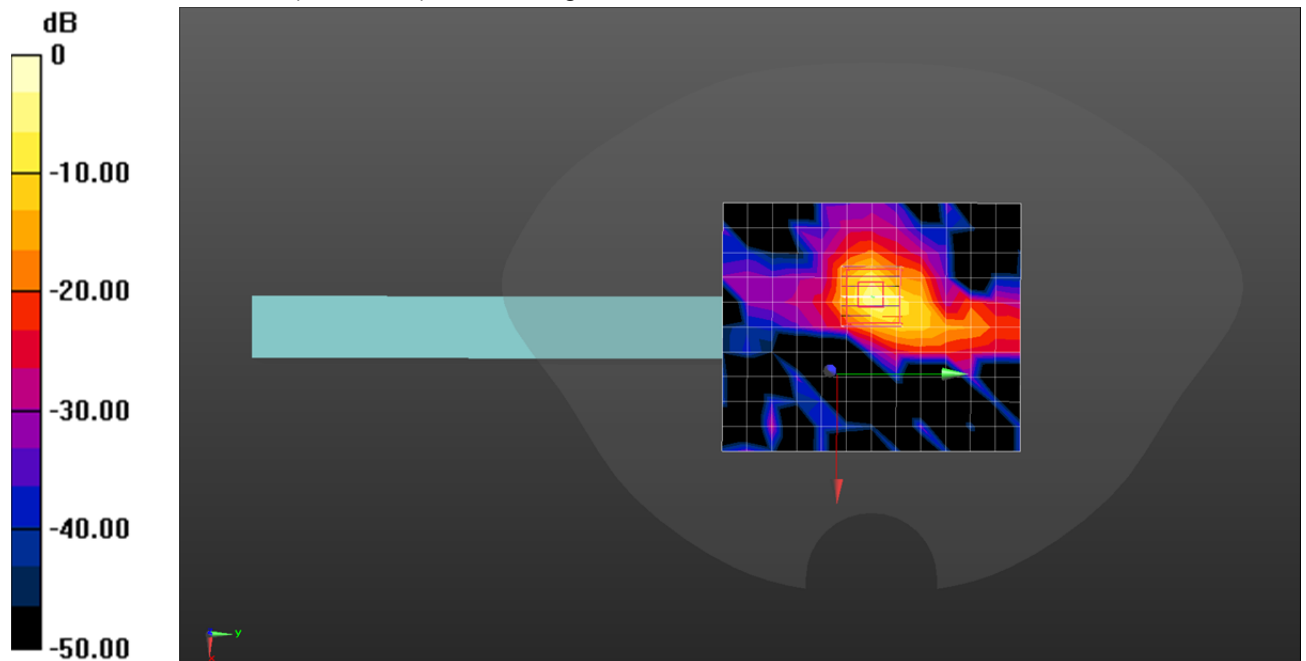
**Body/Right side/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 7.325 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 20.9 W/kg

**SAR(1 g) = 4.32 W/kg; SAR(10 g) = 0.986 W/kg**

Maximum value of SAR (measured) = 10.4 W/kg



Test band: U-NII-2C(WIFI 5G)

Test Position: Right side

Test Plot: B13

Date:2020-12-24

Communication System: UID 0, WI-FI(U-NII-2C) (0); Frequency: 5580 MHz;Duty Cycle: 1:1

Medium parameters used:  $f = 5580$  MHz;  $\sigma = 5.825$  S/m;  $\epsilon_r = 47.515$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(4.46, 4.46, 4.46); Calibrated: 2020/05/14;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM2; Type: Twin SAM V5.0; Serial: 1811
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/Right side/Area Scan (11x13x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 5.47 W/kg

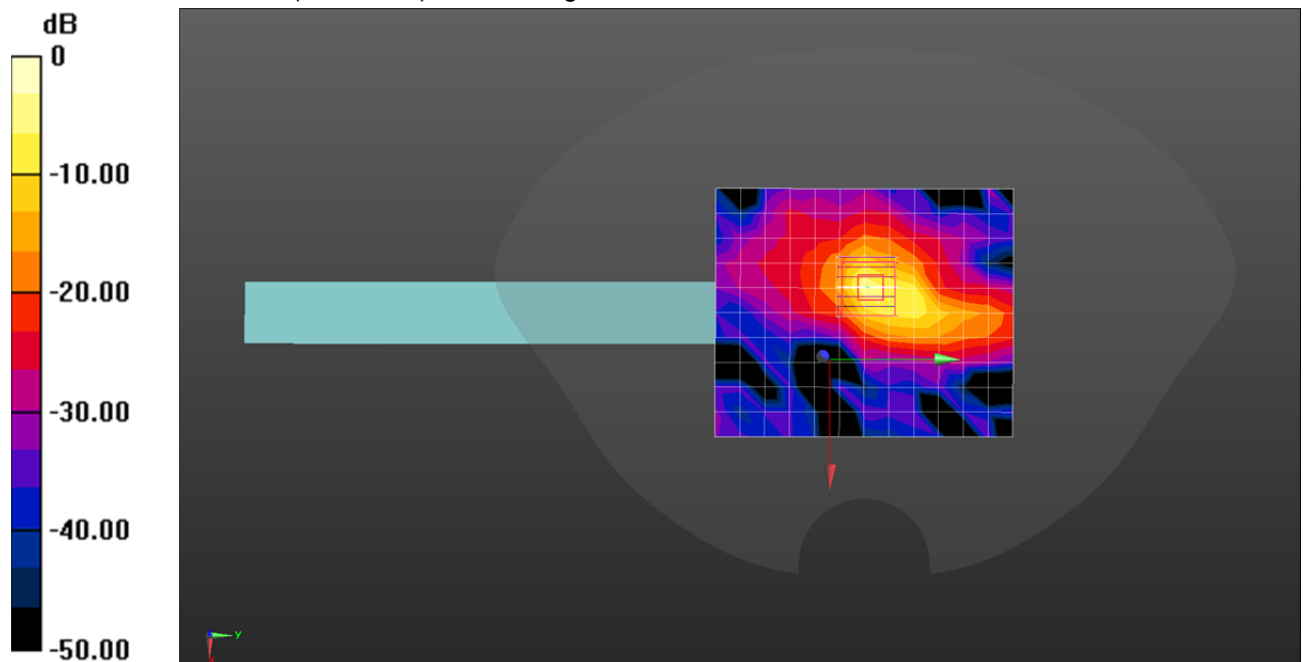
**Body/Right side/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 12.50 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 26.1 W/kg

**SAR(1 g) = 4.11 W/kg; SAR(10 g) = 1.09 W/kg**

Maximum value of SAR (measured) = 12.2 W/kg



Test band: U-NII-3(WIFI 5G)

Test Position: Right side

Test Plot: B14

Date:2020-12-25

Communication System: UID 0, WI-FI(U-NII-3) (0); Frequency: 5785 MHz;Duty Cycle: 1:1

Medium parameters used:  $f = 5785$  MHz;  $\sigma = 6.319$  S/m;  $\epsilon_r = 46.88$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(4.58, 4.58, 4.58); Calibrated: 2020/05/14;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2020/05/19
- Phantom: SAM2; Type: Twin SAM V5.0; Serial: 1811
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Body/Right side/Area Scan (11x13x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 5.20 W/kg

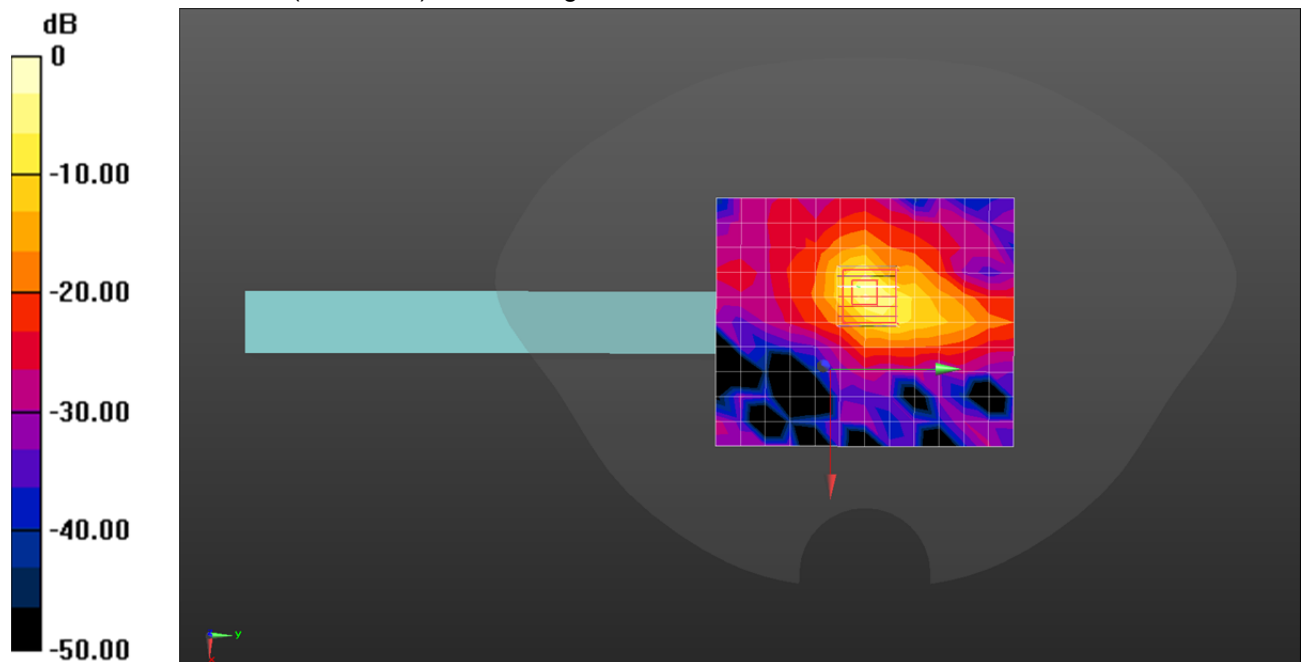
**Body/Right side/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 10.86 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 22.0 W/kg

**SAR(1 g) = 3.77 W/kg; SAR(10 g) = 1.03 W/kg**

Maximum value of SAR (measured) = 9.55 W/kg



## 15. Simultaneous Transmission analysis

No.	Simultaneous Transmission Configurations	Limb	Note
1	GPRS + WIFI	Yes	-
2	WCDMA + WIFI	Yes	-
3	LTE + WIFI	Yes	-
4	GPRS + BT	Yes	-
5	WCDMA + BT	Yes	-
6	LTE + BT	Yes	-

General note:

1. EUT will choose either GPRS or WCDMA LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
2. The reported SAR summation is calculated based on the same configuration and test position.

**Maximum reported SAR value for Limb**

WWAN Band		Exposure Position	Max SAR (W/kg)				Summed SAR		
			① WWAN	② 2.4G WIFI	③ MAX BT	④ 5G WIFI	①+②	①+③	①+④
GSM	GSM850	Front side	0.386	0.433	0.042	0.538	0.819	0.428	0.924
		Back side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Left side	0.894	0.000	0.042	0.000	0.894	0.936	0.894
		Right side	0.000	0.936	0.042	1.155	0.936	0.042	1.155
		Top side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Bottom side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
	PCS1900	Front side	0.789	0.433	0.042	0.538	1.222	0.831	1.327
		Back side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Left side	1.743	0.000	0.042	0.000	1.743	1.785	1.743
		Right side	0.000	0.936	0.042	1.155	0.936	0.042	1.155
		Top side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Bottom side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
WCDMA	Band II	Front side	0.965	0.433	0.042	0.538	1.398	1.007	1.503
		Back side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Left side	2.210	0.000	0.042	0.000	2.210	2.252	2.210
		Right side	0.000	0.936	0.042	1.155	0.936	0.042	1.155
		Top side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Bottom side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
	Band V	Front side	0.320	0.433	0.042	0.538	0.753	0.362	0.858
		Back side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Left side	0.847	0.000	0.042	0.000	0.847	0.889	0.847
		Right side	0.000	0.936	0.042	1.155	0.936	0.042	1.155
		Top side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Bottom side	0.000	0.000	0.042	0.000	0.000	0.042	0.000



LTE	B4 1RB	Front side	1.061	0.433	0.042	0.538	1.494	1.103	1.599
		Back side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Left side	2.392	0.000	0.042	0.000	2.392	2.434	2.392
		Right side	0.000	0.936	0.042	1.155	0.936	0.042	1.155
		Top side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Bottom side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
	B4 50RB	Front side	0.960	0.433	0.042	0.538	1.393	1.002	1.498
		Back side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Left side	1.775	0.000	0.042	0.000	1.775	1.817	1.775
		Right side	0.000	0.936	0.042	1.155	0.936	0.042	1.155
		Top side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Bottom side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
	B5 1RB	Front side	0.136	0.433	0.042	0.538	0.569	0.178	0.674
		Back side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Left side	0.609	0.000	0.042	0.000	0.609	0.651	0.609
		Right side	0.000	0.936	0.042	1.155	0.936	0.042	1.155
		Top side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Bottom side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
	B5 25RB	Front side	0.113	0.433	0.042	0.538	0.546	0.155	0.651
		Back side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Left side	0.332	0.000	0.042	0.000	0.332	0.374	0.332
		Right side	0.000	0.936	0.042	1.155	0.936	0.042	1.155
		Top side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Bottom side	0.000	0.000	0.042	0.000	0.000	0.042	0.000



LTE	B7 1RB	Front side	1.373	0.433	0.042	0.538	1.806	1.415	1.911
		Back side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Left side	2.798	0.000	0.042	0.000	2.798	<b>2.840</b>	2.798
		Right side	0.000	0.936	0.042	1.155	0.936	0.042	1.155
		Top side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Bottom side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
	B7 50RB	Front side	0.929	0.433	0.042	0.538	1.362	0.971	1.467
		Back side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Left side	1.744	0.000	0.042	0.000	1.744	1.786	1.744
		Right side	0.000	0.936	0.042	1.155	0.936	0.042	1.155
		Top side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Bottom side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
	B17 1RB	Front side	0.043	0.433	0.042	0.538	0.476	0.085	0.581
		Back side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Left side	0.182	0.000	0.042	0.000	0.182	0.224	0.182
		Right side	0.000	0.936	0.042	1.155	0.936	0.042	1.155
		Top side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Bottom side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
	B17 25RB	Front side	0.012	0.433	0.042	0.538	0.445	0.054	0.550
		Back side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Left side	0.126	0.000	0.042	0.000	0.126	0.168	0.126
		Right side	0.000	0.936	0.042	1.155	0.936	0.042	1.155
		Top side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
		Bottom side	0.000	0.000	0.042	0.000	0.000	0.042	0.000
B41 1RB	Front side	0.558	0.433	0.042	0.538	0.991	0.600	1.096	
	Back side	0.000	0.000	0.042	0.000	0.000	0.042	0.000	
	Left side	1.248	0.000	0.042	0.000	1.248	1.290	1.248	
	Right side	0.000	0.936	0.042	1.155	0.936	0.042	1.155	
	Top side	0.000	0.000	0.042	0.000	0.000	0.042	0.000	
	Bottom side	0.000	0.000	0.042	0.000	0.000	0.042	0.000	
B41 50RB	Front side	0.202	0.433	0.042	0.538	0.635	0.244	0.740	
	Back side	0.000	0.000	0.042	0.000	0.000	0.042	0.000	
	Left side	0.864	0.000	0.042	0.000	0.864	0.906	0.864	
	Right side	0.000	0.936	0.042	1.155	0.936	0.042	1.155	
	Top side	0.000	0.000	0.042	0.000	0.000	0.042	0.000	
	Bottom side	0.000	0.000	0.042	0.000	0.000	0.042	0.000	



## 16. TestSetup Photos



## 17. External and Internal Photos of the EUT

Please reference to the report of Internal Photographs and External Photographs

-----End of Report-----