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DEKRA

ENAC ENSAYOS Nº 51/LE147

Test report No:
NIE: 59334RAN.002A3

Test report
IEEE Std 1528™-2013

Identification of item tested	Telematic Control Unit for giving to the user information of the bike and control the bike
Trademark	Advanced Automotive Antennas, S.L.
Model and /or type reference	HD MY20 NA
Other identification of the product	FCC ID: NKRUMC-9628FHN IC: 4441A-UMC9628FHN
Features	Telephony (GSM, WCDMA, LTE), GNSS (GPS, GLONASS)
Manufacturer	Advanced Automotive Antennas, S.L. Gran Via De Carles III 98 Planta 5. 08028, Barcelona
Test method requested, standard	1. IEEE Std 1528™-2013: Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques. 2. FCC 47 CFR Part 2.1093. (10-1-15 Edition) Radiofrequency radiation exposure evaluation: portable devices. 3. ISED RSS-102 Issue 5 (2015-03) – Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
Summary	Considering the results of the performed test according to IEEE Std 1528™-2013, the item under test is IN COMPLIANCE with FCC 47CFR Part 2.1093 and IC RSS-102 Issue 5 exposure limits. The maximum 1-g SAR found during this test into the body exposure condition has been 1.441 W/kg, for GPRS 850 MHz, 4 slots mode. NOTE: The results presented in this Test Report apply only to the particular item under test established in page 6 of this document, as presented for test on the date(s) shown in section, “USAGE OF SAMPLES, TESTING PERIOD AND ENVIRONMENTAL CONDITIONS”.

Approved by (name / position & signature)	Miguel Lacave Antennas Lab Manager	 MIGUEL LACAVE GARCÍA 2019.08.21 14:17:15 +02'00'
Date of issue	2019-08-21	
Report template No	FDT08_21	

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Uncertainty

Uncertainty (factor k=2) was calculated according to the following documents:

1. FCC OET KDB 865664 D01 - SAR Measurement Requirements for 100 MHz to 6 GHz v01r04 (August 2015).

Data provided by the client

DEKRA declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Instrumentation

The instrumentation utilized to perform the tests covered in this test report is listed in the following table.

Equipment	S/N	Calibration date / Calibration period
Dosimetric E-field probe SPEAG EX3DV4	7461	2018-06-25/ 1 year
Data acquisition device SPEAG DAE4	669	2018-06-18/ 1 year
Electro-optical converter SPEAG EOC3	391	Not applicable
Robot Stäubli RX60BL, Robot controller Stäubli CS7MB	F04/SOP5A1/A/01	Not applicable
Measurement server SPEAG DASY5 SE UMS 011 BS	1227	Not applicable
SAM head-body simulator TWIN SAM V4.0	-	Not applicable
SAR measurement software SPEAG DASY52 V52.8.8.1222	-	Not applicable
SAR postprocessing software SPEAG SEMCAD X	-	Not applicable
750 MHz dipole validation kit SPEAG D750V3	1036	2017-08-21 / 2 years
900 MHz dipole validation kit SPEAG D900V2	1D007	2017-08-21 / 2 years
1800 MHz dipole validation kit SPEAG D1800V2	2D099	2017-08-21 / 2 years
2600 MHz dipole validation kit SPEAG D2600V2	1023	2017-08-17 / 2 years
Head Tissue Equivalent Liquid for 750MHz, 850 MHz, 1700 MHz, 1900 MHz and 2600 MHz bands	-	Not applicable
Universal Radio Communication Tester R&S CMW 500	1201.0002K50-113616-jG	2018-05-07 / 1 year
Vector network analyzer Agilent FieldFox N9923A	US49470126	2018-11-30 / 1 year
Dielectric probe kit SPEAG DAK-3.5	1080	2018-06-19 / 2 years
Power meter Agilent E4419B	MY45103349	2018-04-23 / 1 year
RF Generator R&S SMU200	102234	Not applicable
DC Power supply Agilent U8002A	MY53500016	Not applicable
Dual directional coupler HP 778D	15821	Not applicable
Power amplifier MITEQ AMF-4D-00400600-50-30P	1456425	Not applicable
6 dB attenuator Weinschel 75 A-6-11	902	Not applicable
SPEAG Mounting Device for Hand-held devices.	-	Not applicable
Power sensor DC 50 MHz to 18 GHz R&S model NRP-Z81	100527	2017-04-12 / 2 years
Digital thermometer LKM Electronics model DTM300-Spezial	2989	2018-06-18 / 1 year
Temperature and humidity probe HUMIDIPROBE Pico Tech.	UAL02/077	2019-04-04 / 1 year

Usage of samples

Samples undergoing test have been selected by: the client

Sample M/01 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
59334/22	SMA conducted	HD MY20 NA	201904204962	25-03-2019

Sample M/02 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
59334/16	Radiated	HD MY20 NA	201905200182	25-03-2019

1. Sample M/01 has undergone the test(s) specified in subclause “Test method requested”: Conducted average output power.
2. Sample M/02 has undergone the test(s) specified in subclause “Test method requested”: SAR evaluation for 2G, 3G and LTE.

Test sample description

Description of product ..... :	Telematic Control Unit		
Software version..... :	MY20.9		
Hardware version ..... :	41000644		
Mounting position ..... :	☐	Table top equipment	
	☐	Wall/Ceiling mounted equipment	
	☐	Floor standing equipment	
	☐	Hand-held equipment	
	☒	Other: Fixed device	
Accessories (not part of the test item)..... :	Description	Type	Manufacturer
	Charging adapter	---	
	USB cable	---	

Identification of the client

Advanced Automotive Antennas, S.L.

Gran Vía De Carles III 98 Planta 5 08028, Barcelona

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2019-03-27
Date (finish)	2019-04-24

Document history

Report number	Date	Description
59334RAN.002	2019-05-07	First release.
59334RAN.002A1	2019-05-09	IC identification information has been included in the cover of the report. This modification test report cancels and replaces the test report 59334RAN.002.
59334RAN.002A2	2019-08-09	Calibration and scale factor calculation information updated according to TCB request. This modification test report cancels and replaces the test report 59334RAN.002A1.
59334RAN.002A3	2019-08-21	Measured values information for extended dipole calibration included according to TCB request. This modification test report cancels and replaces the test report 59334RAN.002A2.

Environmental conditions

Date	Max. Temp. ºC	Min. Temp. ºC	Max. Hum. %	Min. Hum. %	Limit
From 2019-03-27 to 2019-04-24	24.32	20.88	58.25	34.39	18-25 ºC, 30-70%

References

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IC RSS-102 Issue 5 (2015-03) – Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) and the following FCC Published RF exposure KDB procedures:

1. FCC OET KDB 447498 D01 General RF Exposure Guidance v06 (October 2015)
2. FCC OET KDB 865664 D01 SAR Measurement Requirements for 100 MHz to 6 GHz v01r04 (August 2015).
3. FCC OET KDB 865664 D02 RF Exposure Reporting v01r02 (October 2015)
4. FCC OET KDB 941225 D01 3G SAR Procedures v03r01 (October 2015).
5. FCC OET KDB 941225 D05 SAR for LTE Devices v02r05 (October 2015).

Remarks and comments

1: Zoom scan is not required according to FCC OET KDB 447498 D01 General RF Exposure Guidance v06, paragraph “4.4.2. Area scan based 1-g estimation”.

2: SAR for left position has not been measured due to SAR testing reduction because this position is the position with the largest distance between antenna and edge.

3: Only the plots of the highest reported SAR for each test position and mode/band are included in appendix C.

4: Scale factor used to calculate 1-g reported SAR values, has been calculated following IEE Std 1528-2013, section ¨6.3.3 SAR scaling procedure for power or signal variations.¨. As this scale factor has been applied for the same signal, points a) to g) of the mentioned section are satisfied:

$$Rp = \frac{ModY}{ModX}$$

Where:
Rp: Time-averaged RF output power ratio
ModX: Measured output power
ModY: Maximum declared output power including tune-up tolerance

Reported 1-g SAR (W/kg) = Rp * Measured 1-g SAR (W/kg)

Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

FCC 47CFR Part 2.1093 & ISED RSS-102 Issue 5	VERDICT			
	N/A	P	F	NM
GSM 850		P		
GSM 1900		P		
WCDMA II		P		
WCDMA V		P		
LTE 2		P		
LTE 4		P		
LTE 5		P		
LTE 7		P		
LTE 12		P		
LTE 17		P		

Appendix A: Test configuration

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1. GENERAL INTRODUCTION

1.1. Application Standard

The Federal Communications Commission (FCC) sets the limits for General Population/Uncontrolled exposure to radio frequency electromagnetic fields for transmitting devices designed to be used within 20 centimetres of the body of the user under FCC 47 CFR Part 2.1093 - "Radiofrequency radiation exposure evaluation: portable devices", paragraph (d)(2).

Industry of Canada (ISED) sets the limits for General Population/Uncontrolled environment when the expsosure occurs at a distance of 0.2 m or less into the RSS-102 Issue 5, paragraph 4 "Exposure Limits", Table 3.

1.2. General requirements

The SAR measurement has been performed continuing the following considerations and environment conditions:

- The ambient temperature shall be in the range of 18ºC to 25ºC and the variation shall not exceed +/- 2ºC during the test.
- The ambient humidity shall be in the range of and 30% - 70%.
- The device battery shall be fully charged before each measurement.

1.3. Measurement system requirements

The measurement system used for SAR tests fulfils the procedural and technical requirements described at the reference standards used.

1.4. Phantom requirements

The phantom model for body measurements is an elliptical open-top container with a flat bottom, with the following shape and dimensions:

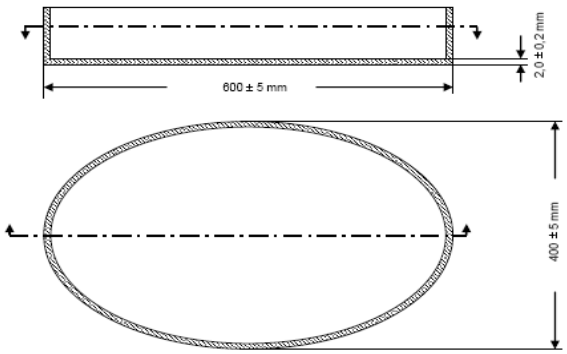

Figure 1: Proportions and shape of Phantom shell

1.5. Measurement Liquids requirements.

The liquids used to simulate the human tissues, must fulfils the requirements of the dielectric properties required. These target dielectric properties per FCC OET KDB 865664 D01 instructions come from the dipole and probe calibration data which are included in Appendix B, Section 3, of this document.

To minimize the effect of reflections on peak spatial-average SAR values, from the upper surface of the tissue-equivalent liquid, the depth of the liquid should be at least 15 cm.

2. MEASUREMENT SYSTEM

2.1. Measurement System

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

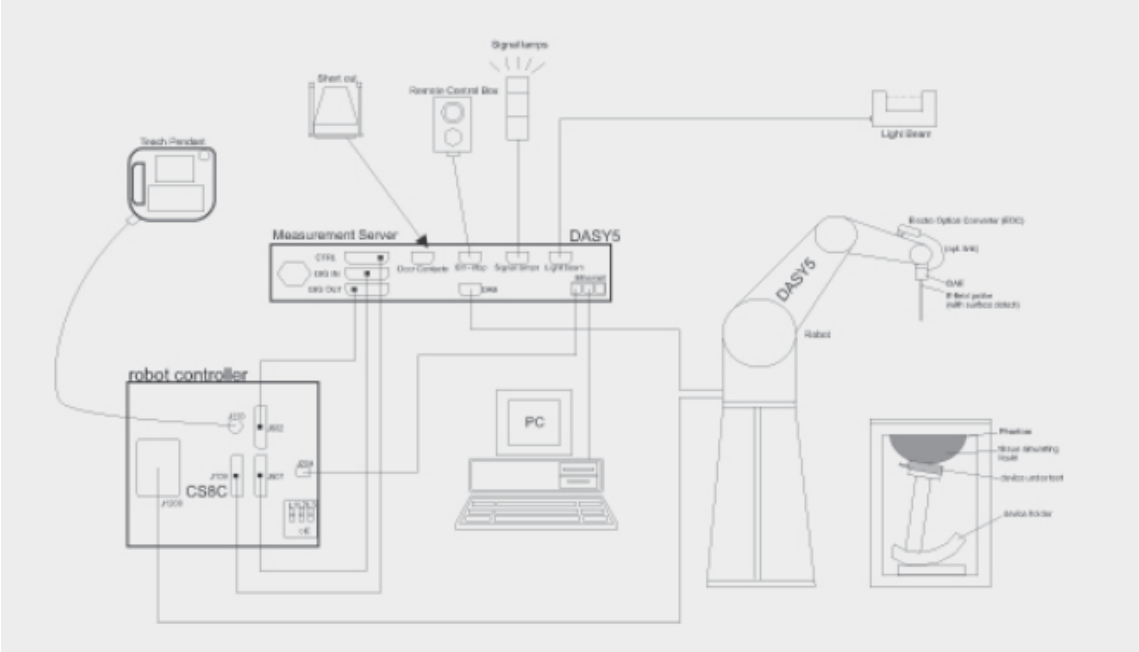

Figure 2: SAR Measurement system

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

An isotropic field probe optimized and calibrated for the targeted measurement.

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

The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.

The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.

The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.

A computer running Win7 professional operating system and the DASY5 software.

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

The phantom, the device holder and other accessories according to the targeted measurement.

	Model	EX3DV4
	**Construction**	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).
	Frequency	10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 6 GHz)
	Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)
	Dynamic Range	10 µW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
	Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1.0 mm

	Model	DAE4
	**Construction**	Signal amplifier, multiplexer, A/D converter, and control logic. Serial optical link communication with DASY4/5 embedded system (fully remote controlled). Two-step probe touch detector for mechanical surface detection and emergency robot stop.
	Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV, 400mV)
	Input Offset Voltage	< 5 µV (with auto zero)
	Input Resistance	200 MOhm
	Input Bias Current	< 50 fA

	Model	ELI
	**Construction**	Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.
	Material	Vinylester, glass fiber reinforced (VE-GF)
	Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
	Shell Thickness	2 ± 0.2 mm (bottom plate)
	Dimensions	Major axis: 600 mm Minor axis: 400 mm
	Filling Volume	Approx. 30 liters
	Wooden Support	SPEAG standard phantom table

Model	Mounting Device for Hand-Held Transmitters
Construction	In combination with the Twin SAM V5.0/V5.0c or ELI Phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).
Material	Polyoxymethylene (POM)

Model	System Validations Kits 450 MHz – 6 GHz		
Construction	Symmetrical dipole with I/4 balun. Enables measurement of feedpoint impedance with NWA. Matched for use near flat phantoms filled with tissue simulating solutions.		
Frequency	450 MHz to 5800 MHz		
Return Loss	20 dB at specified validation position		
Dimensions (length and overall height in mm)	**Product**	**Dipole length**	**Overall height**
	D450V3	290.0	330.0
	D750V3	179.0	330.0
	D900V2	148.5	340.0
	D1800V2	72.5	300.0
	D2000V2	65.0	300.0
	D2450V2	52.0	290.0
	D2600V2	49.2	290.0
	D5GHzV2	20.6	300.0

2.2. Test Positions of device relative to body

The device under test consists of Telematic Control Unit, which will be installed on a motorbike. According to the manufacturer, once installed, the minimum installation distance for the hand and the torso of the user will be 95.52 mm and 191.41 mm respectively. According to the manufacturer request, SAR measurements have been performed at a conservative 35 mm test separation distance.

SAR testing have been performed for all faces and edges of the device except for left edge position, due to the highest antenna-edge distance for this position and the low SAR results found for the rest of the measured test positions.

2.3. Test to be performed

Test shall be performed at the device position previously described, using the centre frequency of each operating band.

Additionally, the configuration giving to the maximum mass averaged SAR shall be used to test the low-end and the high-end frequencies of each transmitting band. Thus, the tests to be performed are as follows:

- Measurements at Central Channel of application band: SAR measurement with back face of the DUT against the phantom.
- Measurements at Low Channel of application band: SAR measurement at the side and position where the maximum SAR level, measured at Central channel, was found.
- Measurements at High Channel of application band: SAR measurement at the side and position where the maximum SAR level, measured at Central channel, was found.

2.4. Description of interpolation/extrapolation scheme

The local SAR inside the Phantom is measured using small dipole sensing elements inside a probe element. The probe tip must not be in contact with the Phantoms surface in order to minimise measurement errors, but the highest local SAR is obtained from measurements at a certain distances from the shell trough extrapolation. The accurate assessment of the maximum SAR averaged over 1 gr and 10 gr. requires a very fine resolution in the three dimensional scanned data array. Since the measurements have to be performed over a limited time, the measured data have to be interpolated to provide an array of sufficient resolution.

The interpolation of 2D area scan is used after the initial area scan, at a fixed distance from the Phantom shell wall. The initial scan data is collected with approx. 15 mm spatial resolution and this interpolation is used to find the location of the local maximum for positioning the subsequent 3D scanning within a 1 mm resolution.

For the 3D scan, data is collected on a spatially regular 3D grid having 5 mm steps in both directions. After the data collection by the SAR probe, the data are extrapolated in the depth direction to assign values to points in the 3D array closer to the shell wall. A notional extrapolation value is also assigned to the first point outside the shell wall so that subsequent interpolation schemes will be applicable right up to the shell wall boundary.

2.5. Determination of the largest peak spatial-average SAR

To determine the maximum value of the peak spatial-average SAR of a DUT, all device positions, configurations and operational modes should be tested for each frequency band.

The averaging volume shall be chosen as 1gr. of contiguous tissue. The cubic volumes, over which the SAR measurements are averaged after extrapolation and interpolation, are chosen in order to include the highest values of local SAR.

The maximum SAR level for the DUT will be the maximum level obtained of the performed measurements, and indicated in the previous points.

2.6. System Validation

Prior to the SAR measurements, system verification is done to verify the system accuracy. A complete SAR evaluation is done using a half-wavelength dipole as source with the frequency of the mid-band channel of the operating band, or within 10% of this channel.

The measured 1 gr. and 10 gr. SAR should be within 10% of the expected target values specified in the calibration certificate of the dipole, for the specific tissue and frequency used.

3. UNCERTAINTY

According to FCC OET KDB 865664 D01 - SAR Measurement Requirements for 100 MHz to 6 GHz v01r04 (August 2015), as the highest measured 1-g SAR has been < 1.5 W/kg, SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in the actual SAR report, but it has been included for ISO 17025 accreditation.

Uncertainty for 300 MHz – 6 GHz

ERROR SOURCES	Uncertainty value (± %)	Probability distribution	Divisor	(ci) 1g	(ci) 10g	Standard uncertainty (1g) (± %)	Standard uncertainty (10g) (± %)
Measurement Equipment							
Probe Calibration	6.550	N	1	1	1	6.550	6.550
Axial Isotropy	4.700	R	√3	0.7	0.7	1.899	1.899
Hemisfericall Isotropy	9.600	R	√3	0.7	0.7	3.880	3.880
Boundary effect	2.000	R	√3	1	1	1.155	1.155
Linearity	4.700	R	√3	1	1	2.714	2.714
System Detection limits	1.000	R	√3	1	1	0.577	0.577
Probe modulation response	6.100	R	√3	1	1	3.522	3.522
Readout electronics	0.300	N	1	1	1	0.300	0.300
Response time	0.800	R	√3	1	1	0.462	0.462
Integration time	2.600	R	√3	1	1	1.501	1.501
RF Ambient noise	3.000	R	√3	1	1	1.732	1.732
RF Ambient reflections	3.000	R	√3	1	1	1.732	1.732
Probe positioner mech. restrictions	0.800	R	√3	1	1	0.462	0.462
Probe positioning with respect to phantom shell	6.700	R	√3	1	1	3.868	3.868
Max. SAR Eval.	4.000	R	√3	1	1	2.309	2.309
Test Sample Related							
Device holder uncertainty	2.900	N	1	1	1	2.900	2.900
Test sample positioning	3.600	N	1	1	1	3.600	3.600
Drift of output power	5.000	R	√3	1	1	2.887	2.887
Phantom and Setup							
Phantom uncertainty (shape and thickness tolerances)	6.600	R	√3	1	1	3.811	3.811
Algorithm for correcting SAR for deviations in permittivity and conductivity	1.900	R	√3	1	0.84	1.097	0.921
Liquid conductivity (meas.)	2.454	N	1	0.78	0.71	1.914	1.742
Liquid permittivity (meas.)	2.454	N	1	0.26	0.26	0.6.38	0.638
Liquid conductivity – temperature uncertainty	3.400	R	√3	0.78	0.71	1.531	1.394
Liquid permittivity – temperature uncertainty	0.400	R	√3	0.23	0.26	0.053	0.060
Combined standard uncertainty	$u_c = \sqrt{\sum_{1=1}^{m} c_i^2 \cdot u_i^2}$					**12.82**	**12.76**
Expanded uncertainty (confidence interval of 95%)	*ue =2.00 uc*					**25.64**	**25.53**

Table 1: Uncertainty Assessment for 300 MHz - 6 GHz

4. SAR LIMIT

Having a worst case measurement, the SAR limit is valid for general population/uncontrolled exposure.

The SAR values have to be averaged over a mass of 1 gr. (SAR 1 gr.) with the shape of a cube and averaged over a mass of 10 gr (Extremity SAR 10 gr). These levels couldn't exceed the values indicated in the application Standard:

Standard	Exposure	SAR	SAR Limit (W/kg)
FCC 47 CFR Part 2.1093, Paragraph (d)(2) RSS-102 Issue 5 (2015-03), Paragraph 4	General population/Uncontrolled	SAR 1-g.	1.6

Table 2: SAR limit

5. DEVICE UNDER TEST

5.1. Dimensions

Dimensions	Millimetres
Height x Width x Depth	140.0 x 90.0 x 30.0
Overall Diagonal:	160.0

Table 3: Dimensions

5.2. Wireless Technology

Wireless Technology	SAR Testing	Frequency Bands	Modes
GSM	Required	850 / 1900	- GPRS (GMSK, Multi-slot class 12) - EGPRS (8PSK, Multi-slot class 12)
W-CDMA	Required	II/V	- UMTS Rel. 99 - HSDPA (Rel. 5) - HSPA (Rel. 6) - HSPA+ (Rel. 7) - DC-HSDPA (Rel. 8)
LTE	Required	2/4/5/7/12/17	- QPSK and 16-QAM (Rel. 9)

Table 4: Supported modes

5.3. Simultaneous Transmission

The DUT does not support simultaneous transmission.

5.4. Antenna Location

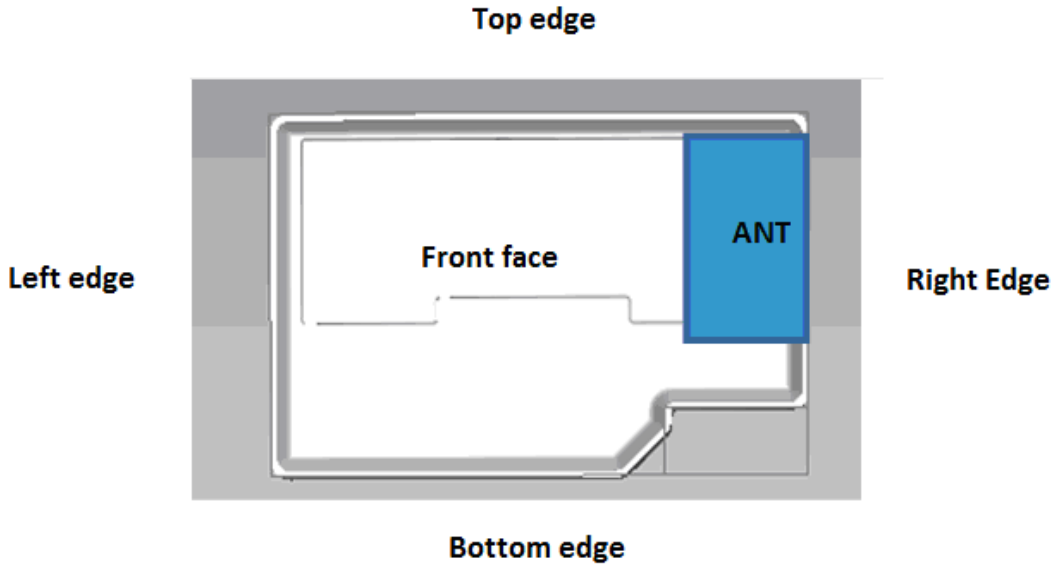

Figure 3: Antenna diagram location sketch

Position	Front	Back	Left	Right	Top	Bottom
Distance to antenna (mm)	7	25	100	7	7	35

Appendix B: Test results

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1. TEST CONDITIONS

1.1. Power supply (V):

Type of power supply = External power supply 12.8 V.

1.2. Temperature (ºC):

T_n = +20.00 to +25.00

The subscript n indicates normal test conditions.

1.3. Test signal, Output Power and Frequencies

The sample was put into operation by using an R&S CMW 500 as base station simulator for cellular technologies. The output power of the device was set to its maximum level for all tests.

For all operating bands and test positions, the measurements were performed on the middle channel. In each band, for those positions where the maximum averaged SAR was found, measurements were performed on the remaining required.

The actual SAR sample (M/02) does not have accessible antenna connector for Cellular technologies, so the conducted average output power for all technologies was measured using other identical sample (M/01) provided by the manufacturer with an auxiliary external connector. See 'usage of samples' paragraph of this report.

The maximum conducted time-averaged power of the device for each mode was measured with a power sensor R&S NRP-Z81.

The target power alignments including tune-up for RF components declared by the manufacturer for each supported technology are:

Band	Burst Averaged Output Power (dBm)				Frame Averaged Output Power (dBm)			
	1 Tx slot	2 Tx slots	3 Tx slots	4 Tx Slots	1 Tx slot	2 Tx slots	3 Tx slots	4 Tx slots
GPRS/E-GPRS 850	35.0	35.0	35.0	35.0	26.0	29.0	30.75	32.0
GPRS/E-GPRS 1900	32.0	32.0	32.0	32.0	23.0	26.0	27.75	29.0

Output Power (dBm)	Mode						
	WCDMA I	WCDMA VII	LTE B1	LTE B3	LTE B7	LTE B8	LTE B20
Maximum	25.7	25.7	25.7	25.7	25.7	25.7	25.7

1.4. DUT and test-site configurations

For all modes supported by the device, the DUT has been tested with each face and edge face facing the flat phantom surface using a test separation distance of 35 mm, except for the left edge due to testing reduction.

2. CONDUCTED AVERAGE POWER MEASUREMENTS

2.1. GSM/GPRS/EGPRS Bands

- GPRS 850: For data mode. PCL 5, CS1 coding scheme and Gamma 3 were set to allow DUT's max power transmission for each slot.

GPRS 850 - Frame Average Output Power							
Channel Number	Frequency (MHz)	Power (dBm) 1 Slot	Power (dBm) 2 Slots	Power (dBm) 3 Slots	Power (dBm) 4 Slots	PCL	Modulation
128	824.2	23.3	26.1	27.6	28.9	5	GMSK-CS1
190	836.6	23.4	26.3	27.8	29.0	5	GMSK-CS1
251	848.8	23.3	26.2	27.7	28.8	5	GMSK-CS1

GPRS 850 - Average Burst Output Power							
Channel Number	Frequency (MHz)	Power (dBm) 1 Slot	Power (dBm) 2 Slots	Power (dBm) 3 Slots	Power (dBm) 4 Slots	PCL	Modulation
128	824.2	32.3	32.1	31.9	31.9	5	GMSK-CS1
190	836.6	32.5	32.3	32.0	32.0	5	GMSK-CS1
251	848.8	32.3	32.2	31.9	31.8	5	GMSK-CS1

- EGPRS 850: For data mode. PCL 8, MCS5 coding scheme and Gamma 6 were set to allow DUT's max power transmission for each slot.

EDGE 850 - Frame Average Output Power							
Channel Number	Frequency (MHz)	Power (dBm) 1 Slot	Power (dBm) 2 Slots	Power (dBm) 3 Slots	Power (dBm) 4 Slots	PCL	Modulation
128	824.2	16.9	19.7	21.2	22.3	8	8PSK-MCS5
190	836.6	17.1	19.9	21.4	22.5	8	8PSK-MCS5
251	848.8	16.9	19.8	21.2	22.3	8	8PSK-MCS5

EDGE 850 - Average Burst Output Power							
Channel Number	Frequency (MHz)	Power (dBm) 1 Slot	Power (dBm) 2 Slots	Power (dBm) 3 Slots	Power (dBm) 4 Slots	PCL	Modulation
128	824.2	25.9	25.7	25.5	25.3	8	8PSK-MCS5
190	836.6	26.1	26.0	25.7	25.5	8	8PSK-MCS5
251	848.8	25.9	25.8	25.5	25.3	8	8PSK-MCS5

- GPRS1900: For data mode. PCL 0, CS1 coding scheme and Gamma 3 were set to allow max power transmission for each slot.

GPRS 1900 - Frame Average Output Power							
Channel Number	Frequency (MHz)	Power (dBm) 1 Slot	Power (dBm) 2 Slots	Power (dBm) 3 Slots	Power (dBm) 4 Slots	PCL	Modulation
512	1850.2	21.1	23.9	25.5	26.7	0	GMSK-CS1
661	1880.0	21.3	24.3	25.9	27.1	0	GMSK-CS1
810	1909.8	21.2	24.0	25.7	26.9	0	GMSK-CS1

GPRS 1900 - Average Burst Output Power							
Channel Number	Frequency (MHz)	Power (dBm) 1 Slot	Power (dBm) 2 Slots	Power (dBm) 3 Slots	Power (dBm) 4 Slots	PCL	Modulation
512	1850.2	30.1	30.0	29.8	29.7	0	GMSK-CS1
661	1880.0	30.3	30.3	30.1	30.1	0	GMSK-CS1
810	1909.8	30.2	30.1	29.9	29.9	0	GMSK-CS1

- EGPRS 1900: For data mode, PCL 2, MCS5 coding scheme and Gamma 5 were set to allow max power transmission for each slot.

EDGE 1900 - Frame Average Output Power							
Channel Number	Frequency (MHz)	Power (dBm) 1 Slot	Power (dBm) 2 Slots	Power (dBm) 3 Slots	Power (dBm) 4 Slots	PCL	Modulation
512	1850.2	17.2	20.0	21.6	22.6	2	8PSK-MCS5
661	1880.0	17.5	20.3	22.0	23.0	2	8PSK-MCS5
810	1909.8	17.5	20.3	21.9	23.0	2	8PSK-MCS5

EDGE 1900 - Average Burst Output Power							
Channel Number	Frequency (MHz)	Power (dBm) 1 Slot	Power (dBm) 2 Slots	Power (dBm) 3 Slots	Power (dBm) 4 Slots	PCL	Modulation
512	1850.2	26.2	26.0	25.8	25.6	2	8PSK-MCS5
661	1880.0	26.5	26.4	26.2	26.1	2	8PSK-MCS5
810	1909.8	26.6	26.3	26.2	26.0	2	8PSK-MCS5

2.2. WCDMA/HSDPA/HSPA/HSPA+ Bands

- WCDMA: The DUT supports power Class 3, with a nominal maximum output power of 24 dBm. Tests were completed according to 3GPP TS34.121, section 5.

Mode	Subtest	Rel99
WCDMA	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2Kbps RMC
	Power Control Algorithm	Algorithm2
	βc/βd	8/15

Band	Mode	Channel Number	Frequency (MHz)	Average Output Power (dBm)
FDD II 1900	WCDMA	9262	1852.4	23.46
FDD II 1900	WCDMA	9400	1880.0	23.55
FDD II 1900	WCDMA	9538	1907.6	23.70

Band	Mode	Channel Number	Frequency (MHz)	Average Output Power (dBm)
FDD V 850	WCDMA	4132	826.4	23.34
FDD V 850	WCDMA	4182	836.4	23.49
FDD V 850	WCDMA	4233	846.6	23.53

- HSDPA:

Mode	Subtest	1	2	3	4
HSDPA	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2Kbps RMC			
	HSDPA FRC	H-Set1			
	HSUPA Test	HSUPA Loopback			
	Power Control Algorithm	Algorithm 2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64	64	64	64
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR	0	0	0.5	0.5
	Dack	8			
	Dnak	8			
	Ack-Nack repetition factor	3			
	DCQI	8			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs =βhs/βc	30/15			

				Average Output Power (dBm)			
Band	**Mode**	**Channel Number**	**Frequency (MHz)**	**Subtest 1**	**Subtest 2**	**Subtest 3**	**Subtest 4**
FDD II 1900	HSDPA	9262	1852.4	22.99	21.89	22.58	23.05
FDD II 1900	HSDPA	9400	1880.0	23.56	22.41	23.52	23.50
FDD II 1900	HSDPA	9538	1907.6	23.61	22.38	23.13	23.41

				Average Output Power (dBm)			
Band	**Mode**	**Channel Number**	**Frequency (MHz)**	**Subtest 1**	**Subtest 2**	**Subtest 3**	**Subtest 4**
FDD V 850	HSDPA	4132	826.4	23.24	22.32	22.59	22.66
FDD V 850	HSDPA	4182	836.4	23.45	21.96	22.75	22.77
FDD V 850	HSDPA	4233	846.6	23.49	21.88	22.71	22.73

- HSPA:

Mode	Subtest	1	2	3	4	5
HSPA	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2Kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm 2				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	15/15
	βec	209/225	12/15	30/15	2/15	24/15
	βc/βd	11/15	6/15	15/9	2/15	15/15
	βhs	22/15	12/15	30/15	4/15	30/15
	βed	1309/225	94/75	47/15	56/75	134/15
	MPR (dB)	0	2	1	2	0
	Dack	8				
	Dnak	8				
	Ack-Nack repetition factor	3				
	DCQI	8				
	CQI Feedback	4ms				
	CQI Repetition Factor	2				
	Ahs =βhs/βc	30/15				
	AG Index	20	12	15	17	21
	ETFCI	75	67	92	71	81
	Associated Max UL DataRate Kbps	242.1	174.9	482.8	205.8	308.9

				Average Output Power (dBm)				
Band	**Mode**	**CH**	**Frequency (MHz)**	**Subtest 1**	**Subtest 2**	**Subtest 3**	**Subtest 4**	**Subtest 5**
FDD II 1900	HSPA	9262	1852.4	21.47	21.28	21.75	21.74	21.75
FDD II 1900	HSPA	9400	1880.0	22.16	21.78	22.28	22.25	22.31
FDD II 1900	HSPA	9538	1907.6	22.10	21.62	22.19	22.04	22.42

				Average Output Power (dBm)				
Band	**Mode**	**CH**	**Frequency (MHz)**	**Subtest 1**	**Subtest 2**	**Subtest 3**	**Subtest 4**	**Subtest 5**
FDD V 850	HSPA	4132	826.4	21.50	21.61	21.70	21.47	21.70
FDD V 850	HSPA	4182	836.4	21.73	21.18	21.78	21.64	21.87
FDD V 850	HSPA	4233	846.6	21.71	21.15	21.79	21.62	21.87

- HSPA+

Mode	Subtest	1
HSPA+	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2Kbps RMC
	HSDPA FRC	H-Set1
	HSUPA Test	HSUPA Loopback
	Power Control Algorithm	Algorithm 2
	βc	1
	βd	0
	βec	30/15
	βhs	30/15
	βed (2xSF2)	βed1: 30/15
		βed2: 30/15
	βed (2xSF4)	βed3: 24/15
		βed4: 24/15
	CM (dB)	3.5
	MPR (dB)	2.5
	D E-DPCCH	7
	AG Index	14
	ETFCI	105

Band	Mode	CH	Frequency (MHz)	Average Output Power (dBm)
FDD II 1900	HSPA+	9262	1852.4	22.81
FDD II 1900	HSPA+	9400	1880.0	23.40
FDD II 1900	HSPA+	9538	1907.6	23.35

Band	Mode	CH	Frequency (MHz)	Average Output Power (dBm)
FDD V 850	HSPA+	4132	826.4	22.65
FDD V 850	HSPA+	4182	836.4	22.80
FDD V 850	HSPA+	4233	846.6	22.80

- DC-HSDPA

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	**1**	**2**	**3**	**4**
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2 Kbps RMC			
	HSDPA FRC	H-Set 12			
	Power Control Algorithm	Algorithm 2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	CM (dB)	0	1	1.5	1.5
	MPR	0.0	0.0	0.5	0.5
HSDPA Specific Settings	Dack	8			
	Dnak	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs =βhs/βc	30/15			

				Average Output Power (dBm)			
Band	**Mode**	**CH**	**Frequency (MHz)**	**Subtest 1**	**Subtest 2**	**Subtest 3**	**Subtest 4**
FDD II 1900	DC-HSDPA	9262	1852.4	22.99	23.23	23.30	23.18
FDD II 1900	DC-HSDPA	9400	1880.0	23.64	23.69	23.64	23.53
FDD II 1900	DC-HSDPA	9538	1907.6	23.55	23.48	23.56	23.39

				Average Output Power (dBm)			
Band	**Mode**	**CH**	**Frequency (MHz)**	**Subtest 1**	**Subtest 2**	**Subtest 3**	**Subtest 4**
FDD V 850	DC-HSDPA	4132	826.4	23.23	23.28	23.26	23.24
FDD V 850	DC-HSDPA	4182	836.4	23.46	23.43	23.44	23.46
FDD V 850	DC-HSDPA	4233	846.6	23.42	23.41	23.56	23.41

2.3. LTE Bands.

LTE MPR is permanently implemented for the device. The specific target MPR is indicated into the following tables. A-MPR was disabled for all SAR tests.

					Average Output Power (dBm)		
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					1860.0 MHz	**1880.0 MHz**	**1900.0 MHz**
LTE B2	20 MHz	QPSK	1RB Low	0	23.17	23.27	23.22
			1RB Mid	0	23.41	23.20	23.30
			1RB High	0	23.34	23.29	23.31
			50% Low	1	22.10	21.64	22.14
			50% Mid	1	22.02	21.84	22.07
			50% High	1	22.27	21.81	22.04
			100%	1	21.96	21.91	22.15
		16-QAM	1RB Low	1	21.86	21.60	22.03
			1RB Mid	1	21.88	21.84	22.11
			1RB High	1	21.91	21.79	22.21
			50% Low	2	20.87	20.64	20.95
			50% Mid	2	21.00	20.83	20.95
			50% High	2	20.89	20.95	20.92
			100%	2	20.71	20.92	20.94
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					1857.5 MHz	**1880.0 MHz**	**1902.5 MHz**
LTE B2	15 MHz	QPSK	1RB Low	0	22.92	23.19	23.02
			1RB Mid	0	23.02	22.88	23.09
			1RB High	0	22.91	23.05	23.15
			50% Low	1	21.64	21.92	21.87
			50% Mid	1	21.80	21.96	21.95
			50% High	1	21.76	22.09	22.02
			100%	1	21.69	21.89	22.05
		16-QAM	1RB Low	1	21.57	21.86	21.98
			1RB Mid	1	21.56	21.87	21.98
			1RB High	1	21.54	21.92	22.12
			50% Low	2	20.64	20.70	20.86
			50% Mid	2	20.57	20.89	20.91
			50% High	2	20.67	20.92	20.99
			100%	2	20.58	20.99	21.00

Band	BW	Modulation	Mode	MPR	Average Output Power (dBm)		
					Low CH	Mid CH	High CH
					1855.0 MHz	1880.0 MHz	1905.0 MHz
LTE B2	10 MHz	QPSK	1RB Low	0	22.76	22.98	23.05
			1RB Mid	0	22.79	23.06	23.22
			1RB High	0	22.78	23.16	23.20
			50% Low	1	21.48	21.94	22.18
			50% Mid	1	21.79	21.89	22.05
			50% High	1	21.75	21.93	22.10
			100%	1	21.65	21.87	22.05
		16-QAM	1RB Low	1	21.73	21.79	21.96
			1RB Mid	1	21.75	21.91	22.09
			1RB High	1	21.65	21.95	22.04
			50% Low	2	20.49	20.74	21.07
			50% Mid	2	20.56	20.87	20.98
			50% High	2	20.72	21.03	21.02
			100%	2	20.68	20.98	21.00
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					1852.5 MHz	**1880.0 MHz**	**1907.5 MHz**
LTE B2	5 MHz	QPSK	1RB Low	0	22.63	23.01	23.17
			1RB Mid	0	22.72	22.90	23.29
			1RB High	0	22.59	22.91	23.20
			50% Low	1	21.77	21.85	22.21
			50% Mid	1	21.61	22.00	22.13
			50% High	1	21.51	21.92	22.11
			100%	1	21.49	21.95	22.11
		16-QAM	1RB Low	1	21.44	22.03	21.97
			1RB Mid	1	21.39	21.89	22.02
			1RB High	1	21.54	21.85	21.95
			50% Low	2	20.66	20.91	20.91
			50% Mid	2	20.73	21.08	21.11
			50% High	2	20.50	20.96	20.92
			100%	2	20.46	20.85	20.90

					Average Output Power (dBm)		
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					1851.5 MHz	**1880.0 MHz**	**1908.5 MHz**
LTE B2	3 MHz	QPSK	1RB Low	0	22.31	22.99	22.98
			1RB Mid	0	22.32	22.72	22.97
			1RB High	0	22.31	22.89	22.88
			50% Low	1	21.34	21.71	21.92
			50% Mid	1	21.33	21.85	21.92
			50% High	1	21.33	21.70	21.77
			100%	1	21.30	21.75	21.95
		16-QAM	1RB Low	1	21.10	21.97	21.59
			1RB Mid	1	21.09	21.79	21.58
			1RB High	1	21.15	21.77	21.65
			50% Low	2	20.31	20.68	20.69
			50% Mid	2	20.30	20.88	20.96
			50% High	2	20.29	20.69	20.79
			100%	2	20.27	20.68	20.72
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					1850.7 MHz	**1880.0 MHz**	**1909.3 MHz**
LTE B2	1.4 MHz	QPSK	1RB Low	0	22.31	22.70	23.06
			1RB Mid	0	22.32	22.82	23.11
			1RB High	0	22.28	22.75	22.91
			50% Low	0	22.23	22.73	22.97
			50% Mid	0	22.22	22.91	23.09
			50% High	0	22.25	22.74	22.92
			100%	1	21.38	21.70	22.27
		16-QAM	1RB Low	1	21.03	21.72	21.69
			1RB Mid	1	21.17	21.89	21.85
			1RB High	1	20.92	21.76	21.75
			50% Low	1	21.07	20.75	20.77
			50% Mid	1	21.23	20.90	20.86
			50% High	1	21.11	20.77	20.78
			100%	2	20.01	20.70	20.77

					Average Output Power (dBm)		
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					1720.0 MHz	**1732.5 MHz**	**1745.0 MHz**
LTE B4	20 MHz	QPSK	1RB Low	0	23.57	23.28	23.39
			1RB Mid	0	23.65	23.37	23.06
			1RB High	0	23.53	23.50	23.01
			50% Low	1	22.30	22.15	22.19
			50% Mid	1	22.54	22.38	22.17
			50% High	1	22.28	22.22	21.80
			100%	1	22.26	22.14	22.01
		16-QAM	1RB Low	1	22.04	22.28	22.43
			1RB Mid	1	22.22	22.41	22.16
			1RB High	1	22.02	22.15	22.05
			50% Low	2	21.30	21.21	21.30
			50% Mid	2	21.69	21.45	21.25
			50% High	2	21.31	21.21	20.77
			100%	2	21.28	21.19	21.04
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					1717.5 MHz	**1732.5 MHz**	**1747.5 MHz**
LTE B4	15 MHz	QPSK	1RB Low	0	23.43	23.11	23.54
			1RB Mid	0	23.48	23.21	23.08
			1RB High	0	23.41	23.12	23.30
			50% Low	1	22.11	22.09	22.14
			50% Mid	1	22.37	22.37	22.06
			50% High	1	22.22	22.14	21.89
			100%	1	22.26	22.13	22.02
		16-QAM	1RB Low	1	22.13	22.07	22.04
			1RB Mid	1	22.10	22.22	21.75
			1RB High	1	22.11	22.06	21.91
			50% Low	2	21.21	21.23	20.99
			50% Mid	2	21.44	21.40	21.06
			50% High	2	21.24	21.21	20.79
			100%	2	21.21	21.21	20.96

					Average Output Power (dBm)		
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					1715.0 MHz	**1732.5 MHz**	**1750.0 MHz**
LTE B4	10 MHz	QPSK	1RB Low	0	23.48	23.45	23.26
			1RB Mid	0	23.59	23.62	23.13
			1RB High	0	23.50	23.36	23.27
			50% Low	1	22.54	22.32	21.97
			50% Mid	1	22.41	22.33	22.05
			50% High	1	22.51	22.32	22.01
			100%	1	22.52	22.31	21.97
		16-QAM	1RB Low	1	22.35	22.37	22.01
			1RB Mid	1	22.45	22.55	21.91
			1RB High	1	22.35	22.36	22.05
			50% Low	2	21.42	21.31	20.93
			50% Mid	2	21.44	21.36	21.03
			50% High	2	21.41	21.31	21.05
			100%	2	21.43	21.32	21.12
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					1712.5 MHz	**1732.5 MHz**	**1752.5 MHz**
LTE B4	5 MHz	QPSK	1RB Low	0	23.15	23.20	22.80
			1RB Mid	0	23.33	23.35	22.87
			1RB High	0	23.20	23.28	22.89
			50% Low	1	22.17	22.10	21.85
			50% Mid	1	22.76	22.58	22.31
			50% High	1	22.30	22.23	21.83
			100%	1	22.24	22.09	21.84
		16-QAM	1RB Low	1	22.15	22.15	22.00
			1RB Mid	1	22.33	22.27	22.15
			1RB High	1	22.19	22.25	22.22
			50% Low	2	21.18	21.09	21.05
			50% Mid	2	21.64	21.55	21.36
			50% High	2	21.30	21.21	21.10
			100%	2	21.24	21.13	21.11

					Average Output Power (dBm)		
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					1711.5 MHz	**1732.5 MHz**	**1753.5 MHz**
LTE B4	3 MHz	QPSK	1RB Low	0	23.34	23.24	23.20
			1RB Mid	0	23.39	23.32	23.26
			1RB High	0	23.35	23.32	23.24
			50% Low	1	22.24	22.20	22.03
			50% Mid	1	22.60	22.56	22.06
			50% High	1	22.28	22.21	22.15
			100%	1	22.21	22.15	22.02
		16-QAM	1RB Low	1	22.13	22.01	21.91
			1RB Mid	1	22.20	22.08	21.98
			1RB High	1	22.24	22.09	22.02
			50% Low	2	21.26	21.18	21.08
			50% Mid	2	21.58	21.57	21.13
			50% High	2	21.38	21.27	21.20
			100%	2	21.29	21.18	21.08
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					1710.7 MHz	**1732.5 MHz**	**1754.3 MHz**
LTE B4	1.4 MHz	QPSK	1RB Low	0	23.17	23.67	23.19
			1RB Mid	0	23.28	23.85	23.31
			1RB High	0	23.23	23.78	23.22
			50% Low	0	23.05	23.55	23.25
			50% Mid	0	23.10	23.37	23.29
			50% High	0	23.10	23.63	23.23
			100%	1	21.98	22.58	22.16
		16-QAM	1RB Low	1	21.97	22.60	22.04
			1RB Mid	1	22.20	22.81	22.20
			1RB High	1	22.10	22.57	22.06
			50% Low	1	21.99	22.46	22.18
			50% Mid	1	22.06	22.35	22.18
			50% High	1	22.08	22.57	22.17
			100%	2	21.01	21.45	21.22

					Average Output Power (dBm)		
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					829.0 MHz	**836.5 MHz**	**844.0 MHz**
LTE B5	10 MHz	QPSK	1RB Low	0	22.32	22.64	22.74
			1RB Mid	0	22.53	22.83	22.72
			1RB High	0	22.53	22.61	22.57
			50% Low	1	21.41	21.72	21.72
			50% Mid	1	21.68	21.99	21.82
			50% High	1	21.50	21.64	21.55
			100%	1	21.52	21.65	21.49
		16-QAM	1RB Low	1	21.21	21.67	21.57
			1RB Mid	1	21.38	21.99	21.58
			1RB High	1	21.42	21.61	21.36
			50% Low	2	20.47	20.71	20.70
			50% Mid	2	20.70	20.94	20.79
			50% High	2	20.54	20.73	20.59
			100%	2	20.52	20.70	20.60
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					826.5 MHz	**836.5 MHz**	**846.5 MHz**
LTE B5	5 MHz	QPSK	1RB Low	0	22.20	22.45	22.45
			1RB Mid	0	22.45	22.70	22.47
			1RB High	0	22.36	22.71	22.36
			50% Low	1	21.38	21.68	21.50
			50% Mid	1	21.52	21.79	21.74
			50% High	1	21.38	21.81	21.43
			100%	1	21.41	21.55	21.51
		16-QAM	1RB Low	1	21.26	21.55	21.51
			1RB Mid	1	21.49	21.74	21.52
			1RB High	1	21.31	21.70	21.37
			50% Low	2	20.43	20.67	20.53
			50% Mid	2	20.53	20.81	20.69
			50% High	2	20.41	20.68	20.45
			100%	2	20.44	20.63	20.55

Band	BW	Modulation	Mode	MPR	Average Output Power (dBm)		
					Low CH	Mid CH	High CH
					825.5 MHz	836.5 MHz	847.5 MHz
LTE B5	3 MHz	QPSK	1RB Low	0	22.30	22.65	22.58
			1RB Mid	0	22.37	22.75	22.46
			1RB High	0	22.45	22.76	22.50
			50% Low	1	21.30	21.74	21.53
			50% Mid	1	21.57	21.85	21.63
			50% High	1	21.37	21.75	21.44
			100%	1	21.38	21.70	21.47
		16-QAM	1RB Low	1	21.18	21.72	21.44
			1RB Mid	1	21.25	21.79	21.31
			1RB High	1	21.33	21.81	21.35
			50% Low	2	20.36	20.71	20.63
			50% Mid	2	20.56	20.90	20.65
			50% High	2	20.42	20.81	20.52
			100%	2	20.47	20.72	20.50
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					824.7 MHz	**836.5 MHz**	**848.3 MHz**
LTE B5	1.4 MHz	QPSK	1RB Low	0	22.62	22.60	22.47
			1RB Mid	0	22.64	22.75	22.55
			1RB High	0	22.53	22.63	22.47
			50% Low	0	22.45	22.67	22.38
			50% Mid	0	22.44	22.88	22.54
			50% High	0	22.46	22.64	22.38
			100%	1	21.49	21.78	21.41
		16-QAM	1RB Low	1	21.60	21.62	21.47
			1RB Mid	1	21.61	21.75	21.56
			1RB High	1	21.50	21.61	21.48
			50% Low	1	21.48	21.74	21.40
			50% Mid	1	21.48	21.92	21.58
			50% High	1	21.45	21.73	21.42
			100%	2	20.52	20.74	20.43

					Average Output Power (dBm)		
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					2510 MHz	**2535 MHz**	**2560 MHz**
LTE B7	20 MHz	QPSK	1RB Low	0	21.93	21.88	21.93
			1RB Mid	0	21.75	21.80	22.10
			1RB High	0	21.72	21.73	21.84
			50% Low	1	20.66	20.73	20.81
			50% Mid	1	20.63	20.69	20.93
			50% High	1	20.66	20.55	20.87
			100%	1	20.61	20.64	20.79
		16-QAM	1RB Low	1	20.94	20.90	20.62
			1RB Mid	1	20.74	20.76	20.88
			1RB High	1	20.67	20.77	20.61
			50% Low	2	19.71	19.76	19.87
			50% Mid	2	19.69	19.71	19.97
			50% High	2	19.70	19.65	19.84
			100%	2	19.69	19.67	19.92
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					2507.5 MHz	**2535 MHz**	**2562.5 MHz**
LTE B7	15 MHz	QPSK	1RB Low	0	21.92	21.86	21.92
			1RB Mid	0	21.72	21.67	22.01
			1RB High	0	21.83	21.65	21.87
			50% Low	1	20.82	20.74	20.99
			50% Mid	1	21.01	20.67	20.98
			50% High	1	20.64	20.66	20.86
			100%	1	20.72	20.63	20.87
		16-QAM	1RB Low	1	20.98	20.73	20.76
			1RB Mid	1	20.61	20.51	20.87
			1RB High	1	20.56	20.50	20.73
			50% Low	2	19.86	19.85	19.94
			50% Mid	2	19.67	19.81	19.98
			50% High	2	19.73	19.66	19.83
			100%	2	19.75	19.69	19.85

					Average Output Power (dBm)		
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					2505 MHz	**2535 MHz**	**2565 MHz**
LTE B7	10 MHz	QPSK	1RB Low	0	21.75	21.82	22.16
			1RB Mid	0	21.83	21.77	22.07
			1RB High	0	21.66	21.74	21.94
			50% Low	1	20.66	20.62	21.07
			50% Mid	1	20.65	20.69	20.95
			50% High	1	20.54	20.63	20.90
			100%	1	20.49	20.61	20.94
		16-QAM	1RB Low	1	20.70	20.58	21.17
			1RB Mid	1	20.63	20.56	21.05
			1RB High	1	20.45	20.47	20.97
			50% Low	2	19.71	19.78	20.05
			50% Mid	2	19.70	19.69	19.93
			50% High	2	19.62	19.63	19.89
			100%	2	19.71	19.78	19.92
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					2502.5 MHz	**2535 MHz**	**2567.5 MHz**
LTE B7	5 MHz	QPSK	1RB Low	0	21.79	21.59	21.73
			1RB Mid	0	21.57	21.56	21.75
			1RB High	0	21.53	21.50	21.69
			50% Low	1	20.52	20.59	20.74
			50% Mid	1	20.52	20.56	20.78
			50% High	1	20.44	20.50	20.77
			100%	1	20.77	20.52	20.80
		16-QAM	1RB Low	1	20.62	20.54	20.73
			1RB Mid	1	20.51	20.52	20.77
			1RB High	1	20.43	20.49	20.72
			50% Low	2	19.62	19.71	19.75
			50% Mid	2	19.60	19.58	19.79
			50% High	2	19.55	19.55	19.74
			100%	2	19.59	19.61	19.77

					Average Output Power (dBm)		
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					-	**707.5 MHz**	**-**
LTE B12	10 MHz	QPSK	1RB Low	0		22.37	
			1RB Mid	0		22.74	
			1RB High	0		22.39	
			50% Low	1		21.45	
			50% Mid	1		21.49	
			50% High	1		21.51	
			100%	1		21.37	
		16-QAM	1RB Low	1		21.08	
			1RB Mid	1		21.44	
			1RB High	1		21.04	
			50% Low	2		20.31	
			50% Mid	2		20.38	
			50% High	2		20.35	
			100%	2		20.34	
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					701.5 MHz	**707.5 MHz**	**713.5 MHz**
LTE B12	5 MHz	QPSK	1RB Low	0	22.23	22.05	22.05
			1RB Mid	0	22.25	22.22	22.10
			1RB High	0	22.05	22.02	21.94
			50% Low	1	21.24	21.16	21.09
			50% Mid	1	21.28	21.20	21.09
			50% High	1	21.08	21.24	21.08
			100%	1	21.12	21.25	21.15
		16-QAM	1RB Low	1	21.24	21.19	21.02
			1RB Mid	1	21.22	21.39	21.15
			1RB High	1	21.03	21.09	20.95
			50% Low	2	20.21	20.19	20.22
			50% Mid	2	20.27	20.32	20.23
			50% High	2	20.16	20.31	20.16
			100%	2	20.22	20.30	20.19

*Note: According to KDB941225 D05 SAR for LTE Devices, for LTE bands that do not support at least three non-overlapping channels in certain channel bandwidths, test the available non-overlapping channels instead. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

					Average Output Power (dBm)		
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					700.5 MHz	**707.5 MHz**	**714.5 MHz**
LTE B12	3 MHz	QPSK	1RB Low	0	22.20	22.20	22.19
			1RB Mid	0	22.02	22.40	22.22
			1RB High	0	22.13	22.34	22.19
			50% Low	1	21.13	21.16	21.17
			50% Mid	1	21.02	21.20	21.17
			50% High	1	21.11	21.19	21.02
			100%	1	21.10	21.21	21.11
		16-QAM	1RB Low	1	21.15	21.32	21.05
			1RB Mid	1	20.99	21.35	20.92
			1RB High	1	21.04	21.27	20.89
			50% Low	2	20.17	20.25	20.24
			50% Mid	2	20.15	21.23	20.19
			50% High	2	20.25	20.29	20.09
			100%	2	20.25	20.28	20.19
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					699.7 MHz	**707.5 MHz**	**715.3 MHz**
LTE B12	1.4 MHz	QPSK	1RB Low	0	22.12	22.26	22.29
			1RB Mid	0	22.11	22.39	22.36
			1RB High	0	22.02	22.34	22.24
			50% Low	0	22.16	22.19	22.15
			50% Mid	0	22.11	21.35	22.09
			50% High	0	22.06	22.27	22.07
			100%	1	21.10	21.23	21.02
		16-QAM	1RB Low	1	21.14	21.35	21.05
			1RB Mid	1	21.16	21.52	21.21
			1RB High	1	21.06	21.30	20.99
			50% Low	1	21.23	21.32	21.01
			50% Mid	1	21.17	21.37	21.03
			50% High	1	21.10	21.24	21.00
			100%	2	20.18	20.25	20.05

Band	BW	Modulation	Mode	MPR	Average Output Power (dBm)		
					Low CH	Mid CH	High CH
					-	710 MHz	-
LTE B17	10 MHz	QPSK	1RB Low	0		21.93	
			1RB Mid	0		22.12	
			1RB High	0		21.83	
			50% Low	1		20.96	
			50% Mid	1		20.90	
			50% High	1		20.94	
			100%	1		20.91	
		16-QAM	1RB Low	1		20.68	
			1RB Mid	1		21.02	
			1RB High	1		20.75	
			50% Low	2		19.94	
			50% Mid	2		19.93	
			50% High	2		20.01	
			100%	2		19.94	
Band	**BW**	**Modulation**	**Mode**	**MPR**	**Low CH**	**Mid CH**	**High CH**
					-	710 MHz	-
LTE B17	5 MHz	QPSK	1RB Low	0		21.96	
			1RB Mid	0		21.96	
			1RB High	0		21.88	
			50% Low	1		20.90	
			50% Mid	1		20.89	
			50% High	1		20.87	
			100%	1		20.86	
		16-QAM	1RB Low	1		20.94	
			1RB Mid	1		20.95	
			1RB High	1		20.91	
			50% Low	2		19.89	
			50% Mid	2		19.90	
			50% High	2		19.87	
			100%	2		19.86	

*Note: According to KDB941225 D05 SAR for LTE Devices, for LTE bands that do not support at least three non-overlapping channels in certain channel bandwidths, test the available non-overlapping channels instead. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

3. TISSUE PARAMETERS MEASUREMENTS

Frequency (MHz)	Target Body Tissue		Measured Body Tissue		Deviation %		Measured Date
	Permittivity ε	Conductivity σ [S/m]	Permittivity ε	Conductivity σ [S/m]	Permittivity ε	Conductivity σ [S/m]	
750	55.5	0.96	54.97	0.98	-1.02	1.97	2019-04-22
835	55.2	0.97	55.03	0.96	-0.31	-0.67	2019-04-15
900	55.0	1.05	54.48	1.03	-0.95	-1.64	2019-04-15
1750	53.4	1.49	52.84	1.52	-1.10	2.22	2019-04-23
1800	53.3	1.52	52.80	1.57	-0.93	3.44	2019-04-23
1800	53.3	1.52	52.53	1.47	-1.45	-3.32	2019-04-23
2450	52.7	1.95	52.87	2.00	0.33	2.55	2019-04-22
2600	52.5	2.16	52.46	2.18	-0.09	0.64	2019-04-22

Note: The dielectric properties have been measured by the contact probe method at 22° C.

- Composition / Information on ingredients

Head and Muscle Tissue Simulation Liquids HSL750V2/MSL750V2

Water	Water, 35 – 58%
Sucrose	Sugar, white, refined, 40 – 60%
NaCl	Sodium Chloride, 0 – 6%
Hydroxyethyl-cellulose	Medium Viscosity (CAS# 9004-62-0), <0.3%
Preventol-D7	Preservative: aqueous preparation, (CAS# 55965-84-9), containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyyl-3(2H)-isothiazolone, 0.1 – 0.7%

Head and Muscle Tissue Simulation Liquids HSL900/MSL900

Water	Water, 35 – 58%
Sucrose	Sugar, white, refined, 40 – 60%
NaCl	Sodium Chloride, 0 – 6%
Hydroxyethyl-cellulose	Medium Viscosity (CAS# 9004-62-0), <0.3%
Preventol-D7	Preservative: aqueous preparation, (CAS# 55965-84-9), containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyyl-3(2H)-isothiazolone, 0.1 – 0.7%

Head and Muscle Tissue Simulation Liquids HBBL1350-1850V3/M HBBL1350-1850V3

Water	50 – 73 %
Non-ionic detergents	27 – 50 % polyoxyethylenesorbitan monolaurate
NaCl	0 – 2 %
Preservative	0.05 – 0.1% Preventol-D7
Safety relevant ingredients:	
CAS-No. 55965-84-9	< 0.1 % aqueous preparation, containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyyl-3(2H)-isothiazolone
CAS-No. 9005-64-5	<50 % polyoxyethylenesorbitan monolaurate

Head and Muscle Tissue Simulation Liquids HSL1800/MSL1800

Water	Water, 52 – 75%
C8H18O3	Diethylene glycol monobutyl ether (DGBE), 25 – 48% (CAS-No. 112-34-5, EC-No. 203-961-6, EC-index-No. 603-096-00-8)
NaCl	Sodium Chloride, <1.0%

Head and Muscle Tissue Simulation Liquids HBBL1900-3800V3/M HBBL1900-3800V3

Water	50 – 73 %
Non-ionic detergents	27 – 50 % polyoxyethylenesorbitan monolaurate
NaCl	0 – 2 %
Preservative	0.05 – 0.1% Preventol-D7
Safety relevant ingredients:	
CAS-No. 55965-84-9	< 0.1 % aqueous preparation, containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyyl-3(2H)-isothiazolone
CAS-No. 9005-64-5	<50 % polyoxyethylenesorbitan monolaurate

4. SYSTEM CHECK MEASUREMENTS

4.1. Validation results for Body TSL

Date	Frequency (MHz)	SAR over	Fast SAR (W/kg)	SAR (W/kg)	1 W Target SAR (W/kg)	1 W Norm. SAR (W/kg)	Drift (%)
2019/04/22	750	1 gr.	2.20	2.14	8.68	8.54	-1.57
		10 gr.	1.50	1.44	5.72	5.75	0.50
2019/04/15	900	1 gr.	2.69	2.63	11.1	10.66	-3.98
		10 gr.	1.79	1.71	7.25	6.93	-4.41
2019/04/23	1800	1 gr.	10.10	9.88	38.7	39.40	1.80
		10 gr.	5.23	5.15	20.5	20.54	0.18
2019/04/23	1800	1 gr.	9.70	9.46	38.7	37.98	-1.85
		10 gr.	4.99	4.89	20.5	19.63	-4.22
2019/04/22	2450	1 gr.	14.50	14.30	54.7	56.35	3.02
		10 gr.	6.38	6.30	24.4	24.83	1.74

5. MEASUREMENT RESULTS FOR SAR (SPECIFIC ABSORPTION RATE)

5.1. Summary maximum results for 1-g body SAR measurements.

Mode	Position/ Distance	Channel (Frequency)	Reported SAR 1-g (W/kg)	Limit SAR 1-g (W/kg)
GPRS 4 slots 850 MHz	Front face 35 mm	CH 128 (824.2 MHz)	1.441	1.6
GPRS 4 slots 1900 MHz	Front face 35 mm	CH 810 (1909.8 MHz)	0.670	1.6
WCDMA Band II	Front face 35 mm	CH 9262 (1852.4 MHz)	0.273	1.6
WCDMA Band V	Front face 35 mm	CH 4183 (836.6 MHz)	0.343	1.6
LTE Band 2 1RB	Front face 35 mm	CH 19100 (1900 MHz)	0.222	1.6
LTE Band 4 1RB	Front face 35 mm	CH 20300 (1745 MHz)	0.209	1.6
LTE Band 5 1RB	Front face 35 mm	CH 20450 (829 MHz)	0.237	1.6
LTE Band 7 1RB	Front face 35 mm	CH 21350 (2560 MHz)	0.287	1.6
LTE Band 12 1RB	Front face 35 mm	CH 23095 (707.5 MHz)	0.472	1.6

5.2. Results for GPRS 850 MHz band – 4 slots.

Position	Dist (mm)	Channel (Frequency)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Plot No.
Front face	35	CH 189 (836.6 MHz)	0.638	0.682	1.51	1.995	1.361	
Back face	35	CH 189 (836.6 MHz)	0.53	N/M[1]	2.09	1.995	1.057	
Left edge	35	CH 189 (836.6 MHz)	N/M[2]					
Right edge	35	CH 189 (836.6 MHz)	0.0464	N/M[1]	3.40	1.995	0.093	
Top edge	35	CH 189 (836.6 MHz)	0.324	N/M[1]	2.45	1.995	0.646	
Bottom edge	35	CH 189 (836.6 MHz)	0.145	N/M[1]	-3.17	1.995	0.309	
Front face	35	CH 128 (824.2 MHz)	0.71	0.706	0.12	2.042	1.441	1
Front face	35	CH 251 (848.8 MHz)	0.67	0.624	-4.72	2.089	1.436	

1 and 2: See Remarks and Comments

Testing of GPRS EDGE mode is not required according to test reductions mentioned in FCC OET KDB 941225 D01 3G SAR Procedures, paragraph “5. GSM, GPRS and EDGE”

5.3. Results for GPRS 1900 MHz Band – 4 slots.

Position	Dist (mm)	Channel (Frequency)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Plot No.
Front face	35	CH 661 (1880 MHz)	0.32	0.31	1.27	1.95	0.604	
Back face	35	CH 661 (1880 MHz)	0.252	N/M[1]	0.46	1.95	0.491	
Left edge	35	CH 661 (1880 MHz)	N/M[2]					
Right edge	35	CH 661 (1880 MHz)	0.162	N/M[1]	0.46	1.95	0.316	
Top edge	35	CH 661 (1880 MHz)	0.25	N/M[1]	-1.14	1.95	0.499	
Bottom edge	35	CH 661 (1880 MHz)	0.0241	N/M[1]	1.51	1.95	0.047	
Front face	35	CH 512 (1850.2 MHz)	0.311	0.311	0.69	2.138	0.665	
Front face	35	CH 810 (1909.8 MHz)	0.337	0.328	1.04	2.042	0.670	2

1 and 2: See Remarks and Comments

Testing of GPRS EDGE mode is not required according to test reductions mentioned in FCC OET KDB 941225 D01 3G SAR Procedures, paragraph “5. GSM, GPRS and EDGE”

5.4. Results for WCDMA Band II

Position	Dist (mm)	Channel (Frequency)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Plot No.
Front face	35	CH 9400 (1880 MHz)	0.133	0.137	0.69	1.641	0.225	
Back face	35	CH 9400 (1880 MHz)	0.111	N/M[1]	-2.73	1.641	0.192	
Left edge	35	CH 9400 (1880 MHz)	N/M[2]					
Right edge	35	CH 9400 (1880 MHz)	0.0515	N/M[1]	-0.92	1.641	0.086	
Top edge	35	CH 9400 (1880 MHz)	0.100	N/M[1]	1.86	1.641	0.164	
Bottom edge	35	CH 9400 (1880 MHz)	0.011	N/M[1]	3.75	1.641	0.018	
Front face	35	CH 9262 (1852.4 MHz)	0.16	0.162	-0.34	1.675	0.273	3
Front face	35	CH 9538 (1907.6 MHz)	0.122	0.122	2.21	1.585	0.193	

1 and 2: See Remarks and Comments

Testing of HSDPA/HSPA/HSPA+/DC-HSPA modes are not required according to paragraph “2.1 3G SAR test reduction procedure” mentioned in FCC OET KDB 941225 D01 3G SAR Procedures.

5.5. Results for WCDMA Band V

Position	Dist (mm)	Channel (Frequency)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Plot No.
Front face	35	CH 4183 (836.6 MHz)	0.200	0.206	-0.12	1.663	0.343	4
Back face	35	CH 4183 (836.6 MHz)	0.144	N/M[1]	-0.12	1.663	0.24	
Left edge	35	CH 4183 (836.6 MHz)	N/M[2]					
Right edge	35	CH 4183 (836.6 MHz)	0.0129	N/M[1]	2.68	1.663	0.021	
Top edge	35	CH 4183 (836.6 MHz)	0.129	N/M[1]	-1.60	1.663	0.222	
Bottom edge	35	CH 4183 (836.6 MHz)	0.0426	N/M[1]	1.51	1.663	0.071	
Front face	35	CH 4132 (826.4 MHz)	0.190	0.19	-2.05	1.722	0.341	
Front face	35	CH 4233 (846.6 MHz)	0.174	0.157	-0.69	1.648	0.262	

1 and 2: See Remarks and Comments

Testing of HSDPA/HSPA/HSPA+/DC-HSPA modes are not required according to paragraph “2.1 3G SAR test reduction procedure” mentioned in FCC OET KDB 941225 D01 3G SAR Procedures.

5.6. Results for LTE Band 2 (1 Rb, 20 MHz, QPSK)

Position	Dist (mm)	Channel (Frequency)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Plot No.
Front face	35	CH 18700 (1860 MHz)	0.112	0.113	4.11	1.694	0.191	
Back face	35	CH 18700 (1860 MHz)	0.0897	N/M[1]	-2.95	1.694	0.161	
Left edge	35	CH 18700 (1860 MHz)	N/M[2]					
Right edge	35	CH 18700 (1860 MHz)	0.0519	N/M[1]	-0.34	1.694	0.089	
Top edge	35	CH 18700 (1860 MHz)	0.0857	N/M[1]	1.39	1.694	0.145	
Bottom edge	35	CH 18700 (1860 MHz)	0.00734	N/M[1]	2.57	1.694	0.012	
Front face	35	CH 18900 (1880 MHz)	0.124	0.125	1.39	1.702	0.213	
Front face	35	CH 19100 (1900 MHz)	0.128	0.128	0.93	1.734	0.222	5

1 and 2: See Remarks and Comments

5.7. Results for LTE Band 2 (50% Rb, 20 MHz, QPSK)

Position	Dist (mm)	Channel (Frequency)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Plot No.
Front face	35	CH 18700 (1860 MHz)	0.097	0.1	2.21	1.995	0.2	

Testing of additional LTE channels for 50% RB and 100% RB modes is not required due to the SAR test procedures mentioned in FCC OET KDB 941225 D05 – SAR for LTE Devices v02r05.

5.8. Results for LTE Band 4 (1 Rb, 20 MHz, QPSK)

Position	Dist (mm)	Channel (Frequency)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Plot No.
Front face	35	CH 20050 (1720 MHz)	0.115	0.112	-0.23	1.603	0.18	
Back face	35	CH 20050 (1720 MHz)	0.0857	N/M[1]	1.62	1.603	0.137	
Left edge	35	CH 20050 (1720 MHz)	N/M[2]					
Right edge	35	CH 20050 (1720 MHz)	0.0369	N/M[1]	1.04	1.603	0.059	
Top edge	35	CH 20050 (1720 MHz)	0.063	N/M[1]	0.69	1.603	0.101	
Bottom edge	35	CH 20050 (1720 MHz)	0.0116	N/M[1]	2.57	1.603	0.019	
Front face	35	CH 20175 (1732.5 MHz)	0.118	0.119	2.80	1.66	0.197	
Front face	35	CH 20300 (1745 MHz)	0.122	0.123	1.27	1.702	0.209	6

1 and 2: See Remarks and Comments

5.9. Results for LTE Band 4 (50% Rb, 20 MHz, QPSK)

Position	Dist (mm)	Channel (Frequency)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Plot No.
Back face	35	CH 20050 (1720 MHz)	0.0811	0.0829	0.93	1.644	0.136	

Testing of additional LTE channels for 50% RB and 100% RB modes is not required due to the SAR test procedures mentioned in FCC OET KDB 941225 D05 – SAR for LTE Devices v02r05.

5.10. Results for LTE Band 5 (1 Rb, 10 MHz, QPSK)

Position	Dist (mm)	Channel (Frequency)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Plot No.
Front face	35	CH 20525 (836.5 MHz)	0.116	0.119	0.46	1.936	0.23	
Back face	35	CH 20525 (836.5 MHz)	0.0673	N/M[1]	0.35	1.936	0.13	
Left edge	35	CH 20525 (836.5 MHz)	N/M[2]					
Right edge	35	CH 20525 (836.5 MHz)	0.0106	N/M[1]	-0.46	1.936	0.021	
Top edge	35	CH 20525 (836.5 MHz)	0.0824	N/M[1]	-0.46	1.936	0.161	
Bottom edge	35	CH 20525 (836.5 MHz)	0.0216	N/M[1]	0.81	1.936	0.042	
Front face	35	CH 20450 (829 MHz)	0.112	0.114	0.23	2.075	0.237	7
Front face	35	CH 20600 (844 MHz)	0.113	0.116	1.04	1.977	0.229	

1 and 2: See Remarks and Comments

5.11. Results for LTE Band 5 (50% Rb, 10 MHz, QPSK)

Position	Dist (mm)	Channel (Frequency)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Plot No.
Back face	35	CH 20525 (836.5 MHz)	0.0922	0.093	-1.14	1.866	0.178	

Testing of additional LTE channels for 50% RB and 100% RB modes is not required due to the SAR test procedures mentioned in FCC OET KDB 941225 D05 – SAR for LTE Devices v02r05.

5.12. Results for LTE Band 7 (1 Rb, 20 MHz, QPSK)

Position	Dist (mm)	Channel (Frequency)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Plot No.
Front face	35	CH 21350 (2560 MHz)	0.121	0.118	-2.95	2.291	0.287	8
Back face	35	CH 21350 (2560 MHz)	0.095	N/M[1]	2.33	2.291	0.218	
Left edge	35	CH 21350 (2560 MHz)	N/M[2]					
Right edge	35	CH 21350 (2560 MHz)	0.079	N/M[1]	-0.34	2.291	0.182	
Top edge	35	CH 21350 (2560 MHz)	0.086	N/M[1]	-1.83	2.291	0.204	
Bottom edge	35	CH 21350 (2560 MHz)	0.042	N/M[1]	-1.71	2.291	0.1	
Front face	35	CH 20850 (2510 MHz)	0.0807	0.0779	0.69	2.382	0.186	
Front face	35	CH 21100 (2535 MHz)	0.0786	0.0789	2.33	2.41	0.19	

1 and 2: See Remarks and Comments

5.13. Results for LTE Band 7 (50% Rb, 20 MHz, QPSK)

Position	Dist (mm)	Channel (Frequency)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Plot No.
Front face	35	CH 21350 (2560 MHz)	0.0789	0.0757	1.86	2.382	0.18	

Testing of additional LTE channels for 50% RB and 100% RB modes is not required due to the SAR test procedures mentioned in FCC OET KDB 941225 D05 – SAR for LTE Devices v02r05.

5.14. Results for LTE Band 12 (1 Rb, 10 MHz, QPSK)

Position	Dist (mm)	Channel (Frequency)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Plot No.
Front face	35	CH 23095 (707.5 MHz)	0.233	0.239	0.58	1.977	0.472	9
Back face	35	CH 23095 (707.5 MHz)	0.099	N/M[1]	0.58	1.977	0.196	
Left edge	35	CH 23095 (707.5 MHz)	N/M[2]					
Right edge	35	CH 23095 (707.5 MHz)	0.0236	N/M[1]	-0.57	1.977	0.047	
Top edge	35	CH 23095 (707.5 MHz)	0.0962	N/M[1]	-1.03	1.977	0.194	
Bottom edge	35	CH 23095 (707.5 MHz)	0.0378	N/M[1]	-1.60	1.977	0.077	

1 and 2: See Remarks and Comments

5.15. Results for LTE Band 12 (50% Rb, 10 MHz, QPSK)

Position	Dist (mm)	Channel (Frequency)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Plot No.
Back face	35	CH 23095 (707.5 MHz)	0.168	0.171	0.81	2.084	0.356	

Testing of additional LTE channels for 50% RB and 100% RB modes is not required due to the SAR test procedures mentioned in FCC OET KDB 941225 D05 – SAR for LTE Devices v02r05.

5.16. Results for LTE Band 17 (1 Rb, 10 MHz, QPSK)

SAR for LTE Band 17 has not been measured because it is covered by LTE Band 12 due to overlapping frequency range ((LTE Band 17 frequency range: 704 – 716 MHz, LTE Band 12 frequency range: 699 – 716 MHz) and same maximum tune-up and channel bandwidth.

5.17. Variability results.

According to KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, paragraph "2.8.1. SAR measurement variability", repeated measurements are required only when the measured SAR is ≥ 0.80 W/kg, using the highest measured SAR configuration for that tissue-equivalent medium.

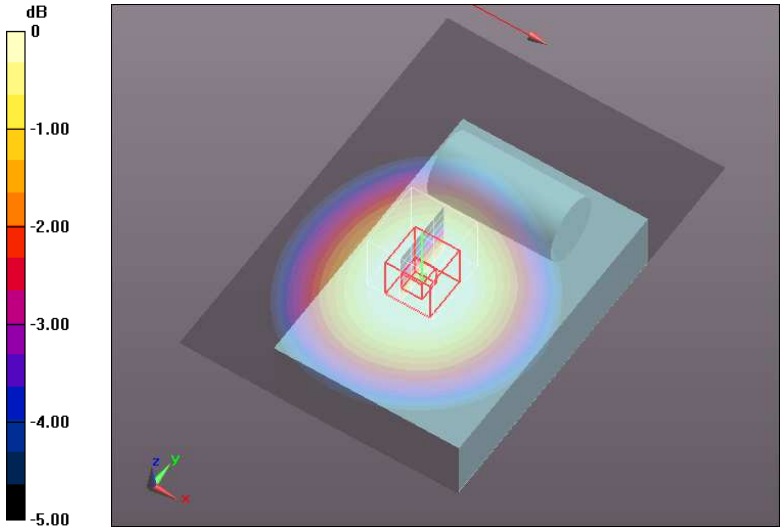
Appendix C: Measurement Reports

GPRS 850 MHz 4 slots – Front Face, d=35 mm – Lowest Channel – Plot Nº1

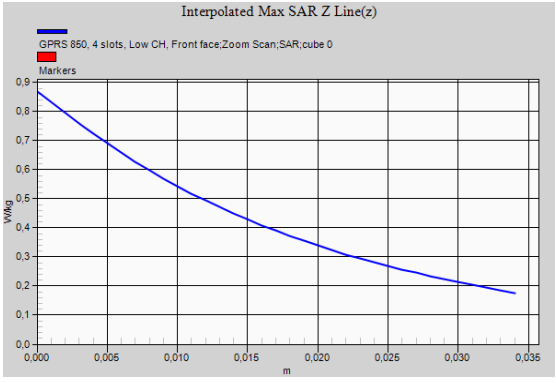
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 2019-04-16

DUT: HD MY20 NA; Type: TCU; Serial: IMEI:353042100013858
Communication System: UID 10028 - DAC, GPRS-FDD (TDMA, GMSK, TN 0-1-2-3); Frequency: 824.2 MHz; Duty Cycle: 1:2.26464
Medium parameters used: f = 825 MHz; σ = 0.95 S/m; ε_r = 55.16; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(9.78, 9.78, 9.78); Calibrated: 2018-06-25;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 2018-06-18
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Faces, d=35mm/GPRS 850, 4 slots, Low CH, Front face/Area Scan (91x131x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.791 W/kg
Flat Phantom, Faces, d=35mm/GPRS 850, 4 slots, Low CH, Front face/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.75 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.869 W/kg
SAR(1 g) = 0.706 W/kg; SAR(10 g) = 0.546 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.724 W/kg



0 dB = 0.724 W/kg = -1.40 dBW/kg

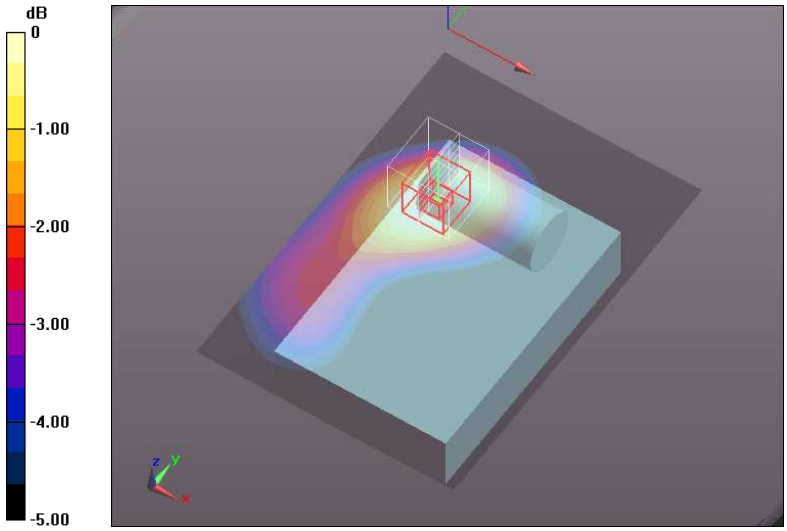


GPRS 1900 MHz 4 slots – Front Face, d=35 mm – Highest Channel – Plot Nº2

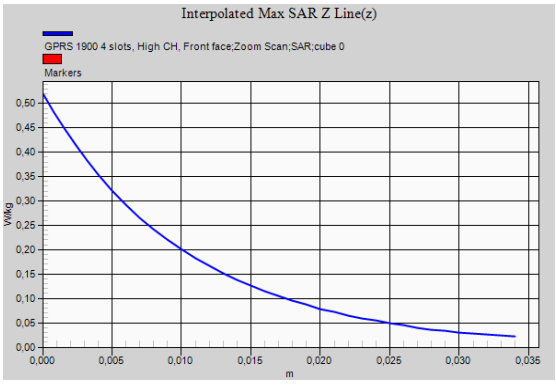
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 2019-04-24

DUT: HD MY20 NA; Type: TCU; Serial: IMEI:353042100013858
Communication System: UID 10028 - DAC, GPRS-FDD (TDMA, GMSK, TN 0-1-2-3); Frequency: 1909.8 MHz;
Duty Cycle: 1:2.26464
Medium parameters used: f = 1910 MHz; σ = 1.55 S/m; ε_r = 52.19; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(8.24, 8.24, 8.24); Calibrated: 2018-06-25;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 2018-06-18
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Faces, d=35mm/GPRS 1900 4 slots, High CH, Front face/Area Scan (91x131x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.402 W/kg
Flat Phantom, Faces, d=35mm/GPRS 1900 4 slots, High CH, Front face/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.700 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.520 W/kg
SAR(1 g) = 0.328 W/kg; SAR(10 g) = 0.206 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.353 W/kg



0 dB = 0.353 W/kg = -4.52 dBW/kg

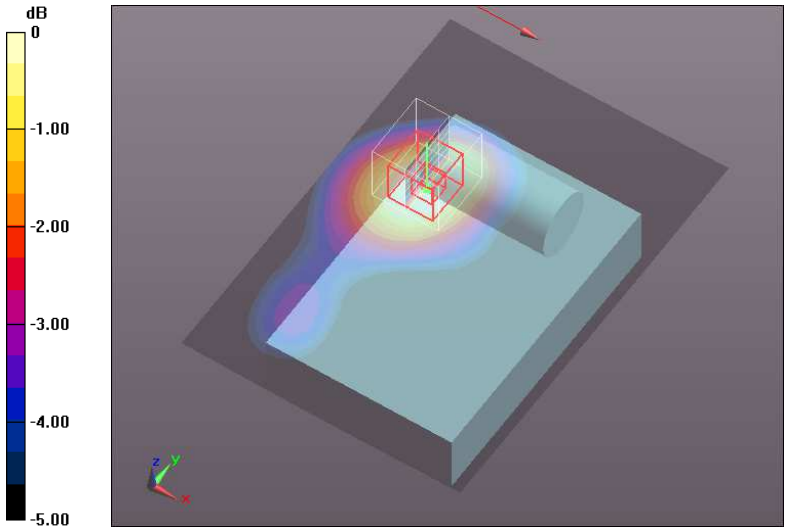


WCDMA Band II – Front Face, d=35 mm – Lowest Channel – Plot Nº3

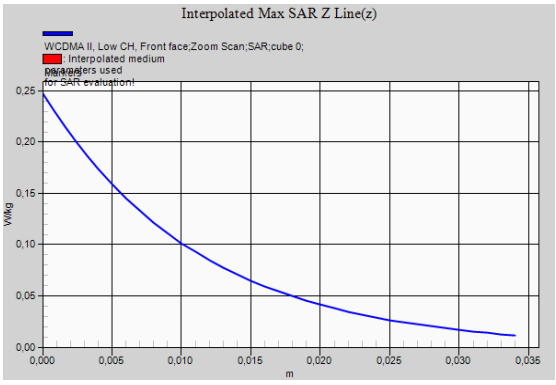
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 2019-04-24

DUT: HD MY20 NA; Type: TCU; Serial: IMEI:353042100013858
Communication System: UID 10011 - CAB, UMTS-FDD (WCDMA); Frequency: 1852.4 MHz; Duty Cycle: 1:1.95434
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.5 S/m; ε_r = 52.158; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(8.24, 8.24, 8.24); Calibrated: 2018-06-25;
- Sensor-Surface: 3mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 2018-06-18
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Faces, d=35mm/WCDMA II, Low CH, Front face/Area Scan (91x131x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.190 W/kg
Flat Phantom, Faces, d=35mm/WCDMA II, Low CH, Front face/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.094 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.247 W/kg
SAR(1 g) = 0.162 W/kg; SAR(10 g) = 0.102 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.174 W/kg



0 dB = 0.174 W/kg = -7.59 dBW/kg

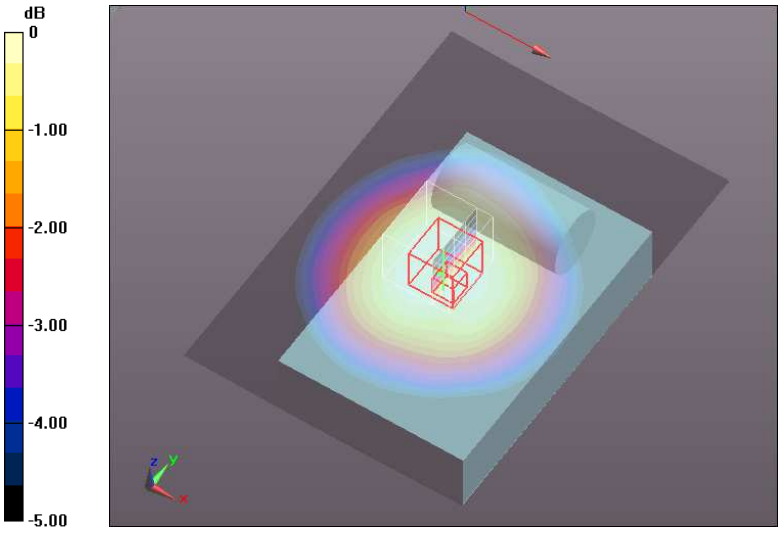


WCDMA Band V – Front Face, d=35 mm – Middle Channel – Plot Nº4

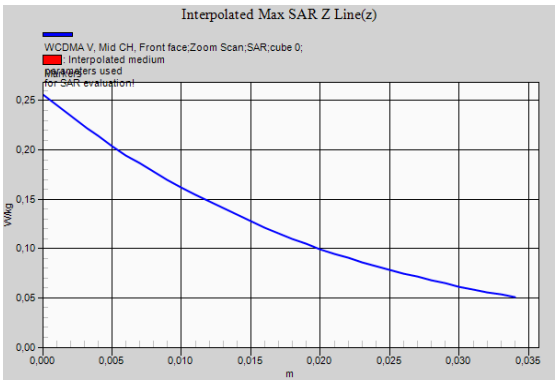
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 2019-04-15

DUT: HD MY20 NA; Type: TCU; Serial: IMEI:353042100013858
Communication System: UID 10011 - CAB, UMTS-FDD (WCDMA); Frequency: 836.6 MHz; Duty Cycle: 1:1.95434
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.963 S/m; ε_r = 55.008; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(9.78, 9.78, 9.78); Calibrated: 2018-06-25;
- Sensor-Surface: 3mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 2018-06-18
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Faces, d=35mm/WCDMA V, Mid CH, Front face/Area Scan (91x131x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.225 W/kg
Flat Phantom, Faces, d=35mm/WCDMA V, Mid CH, Front face/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.05 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.256 W/kg
SAR(1 g) = 0.206 W/kg; SAR(10 g) = 0.158 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.214 W/kg



0 dB = 0.214 W/kg = -6.70 dBW/kg

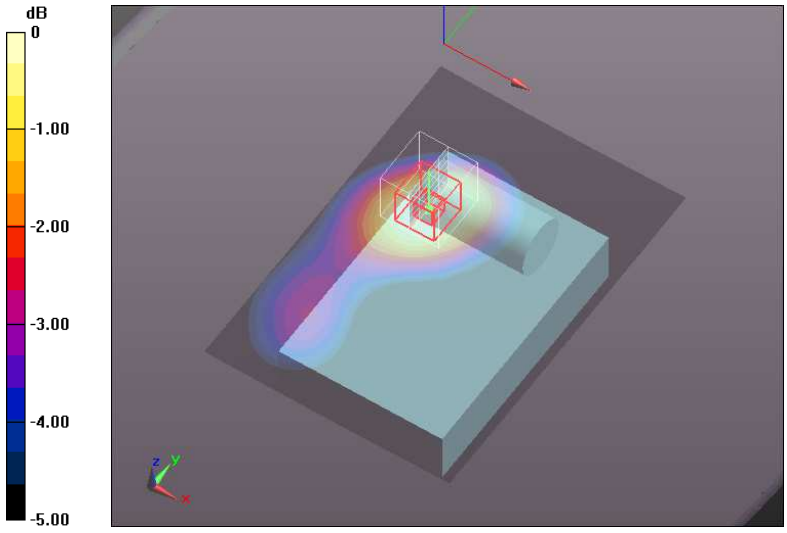


LTE Band 2 – Front Face, d=35 mm – Highest Channel – Plot Nº5

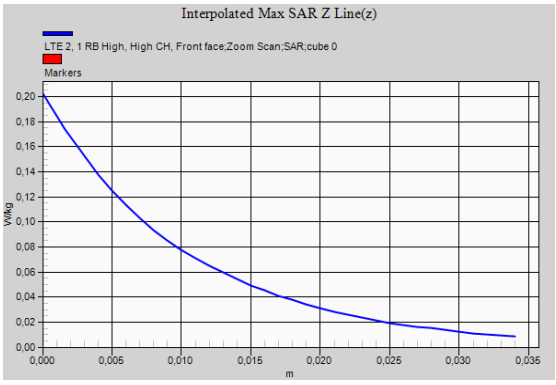
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 2019-04-24

DUT: HD MY20 NA; Type: TCU; Serial: IMEI:353042100013858
Communication System: UID 10169 - CAD, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1899.9 MHz; Duty Cycle: 1:3.74111
Medium parameters used: f = 1900 MHz; σ = 1.55 S/m; ε_r = 52.25; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(8.24, 8.24, 8.24); Calibrated: 2018-06-25;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 2018-06-18
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Faces, d=35mm/LTE 2, 1 RB High, High CH, Front face/Area Scan (91x131x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.152 W/kg
Flat Phantom, Faces, d=35mm/LTE 2, 1 RB High, High CH, Front face/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.673 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.202 W/kg
SAR(1 g) = 0.128 W/kg; SAR(10 g) = 0.080 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.138 W/kg



0 dB = 0.138 W/kg = -8.60 dBW/kg

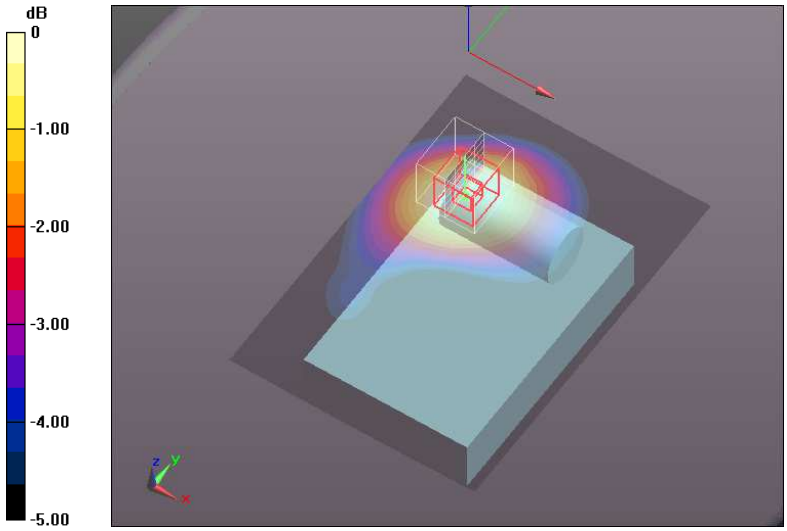


LTE Band 4 – Front Face, d=35 mm – Middle Channel – Plot Nº6

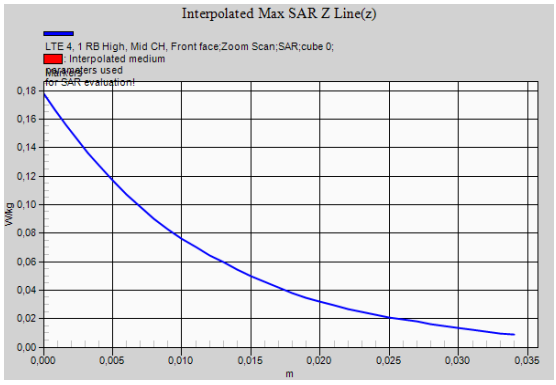
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 2019-04-23

DUT: HD MY20 NA; Type: TCU; Serial: IMEI:353042100013858
Communication System: UID 10169 - CAD, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1732.5 MHz; Duty Cycle: 1:3.74111
Medium parameters used (interpolated): f = 1732.5 MHz; σ = 1.502 S/m; ε_r = 52.953; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(8.24, 8.24, 8.24); Calibrated: 2018-06-25;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 2018-06-18
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Faces, d=35mm/LTE 4, 1 RB High, Mid CH, Front face/Area Scan (91x131x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.139 W/kg
Flat Phantom, Faces, d=35mm/LTE 4, 1 RB High, Mid CH, Front face/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.619 V/m; Power Drift = 0.24 dB
Peak SAR (extrapolated) = 0.178 W/kg
SAR(1 g) = 0.119 W/kg; SAR(10 g) = 0.077 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.127 W/kg



0 dB = 0.127 W/kg = -8.96 dBW/kg

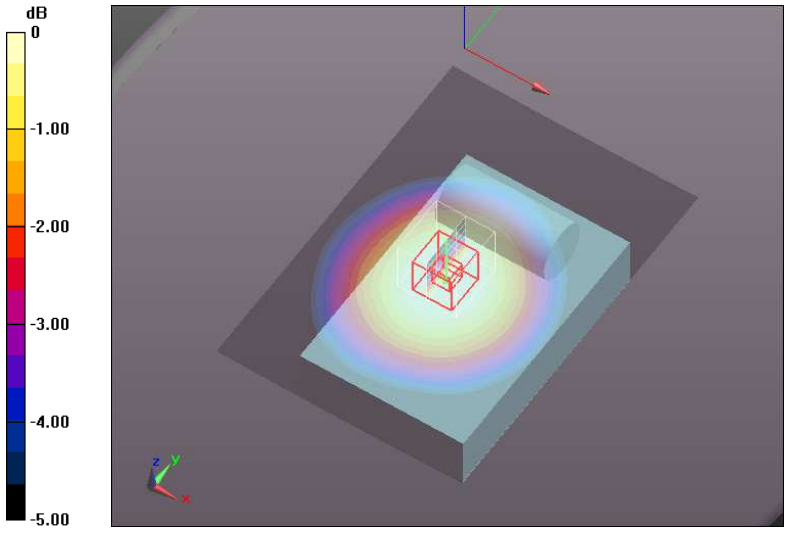


LTE Band 5 – Front Face, d=35 mm – Lowest Channel – Plot №7

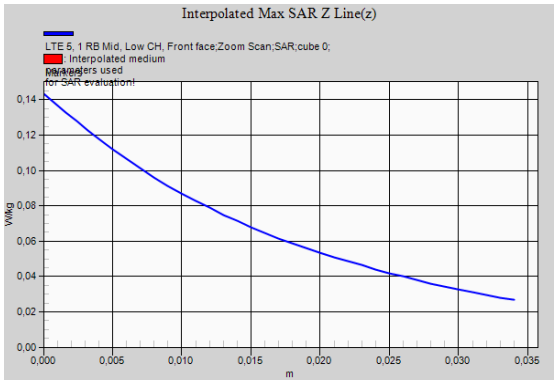
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 2019-04-16

DUT: HD MY20 NA; Type: TCU; Serial: IMEI:353042100013858
Communication System: UID 10175 - CAE, LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK); Frequency: 829 MHz; Duty Cycle: 1:3.7325
Medium parameters used (interpolated): f = 829 MHz; σ = 0.958 S/m; ε_r = 55.08; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(9.78, 9.78, 9.78); Calibrated: 2018-06-25;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 2018-06-18
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Faces, d=35mm/LTE 5, 1 RB Mid, Low CH, Front face/Area Scan (91x131x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.125 W/kg
Flat Phantom, Faces, d=35mm/LTE 5, 1 RB Mid, Low CH, Front face/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.03 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.143 W/kg
SAR(1 g) = 0.114 W/kg; SAR(10 g) = 0.088 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.118 W/kg



0 dB = 0.118 W/kg = -9.28 dBW/kg

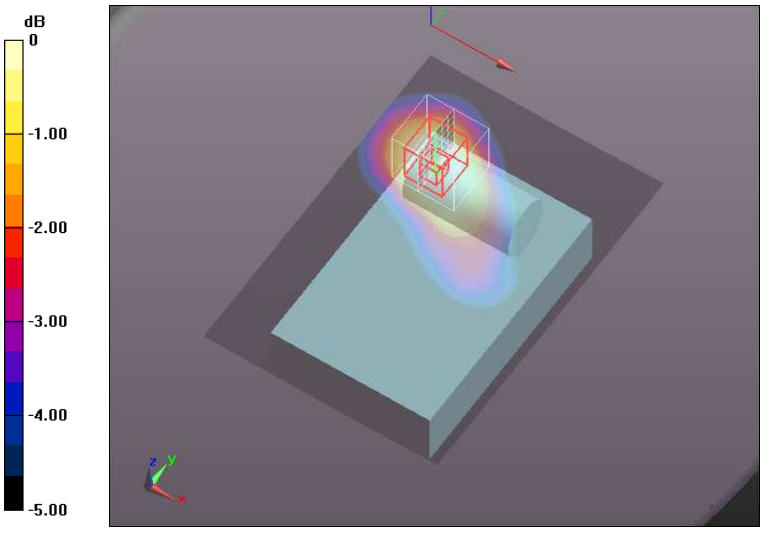


LTE Band 7 – Front Face, d=35 mm – Highest Channel – Plot Nº8

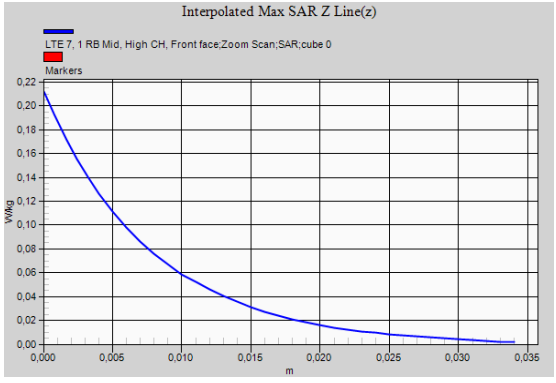
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 2019-04-23

DUT: HD MY20 NA; Type: TCU; Serial: IMEI:353042100013858
Communication System: UID 10169 - CAD, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 2559.9 MHz; Duty Cycle: 1:3.74111
Medium parameters used: f = 2560 MHz; σ = 2.12 S/m; ε_r = 52.54; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(7.52, 7.52, 7.52); Calibrated: 2018-06-25;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 2018-06-18
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Faces, d=35mm/LTE 7, 1 RB Mid, High CH, Front face/Area Scan (111x161x1):
Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.148 W/kg
Flat Phantom, Faces, d=35mm/LTE 7, 1 RB Mid, High CH, Front face/Zoom Scan (8x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.597 V/m; Power Drift = -0.26 dB
Peak SAR (extrapolated) = 0.212 W/kg
SAR(1 g) = 0.118 W/kg; SAR(10 g) = 0.066 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.127 W/kg



0 dB = 0.127 W/kg = -8.96 dBW/kg

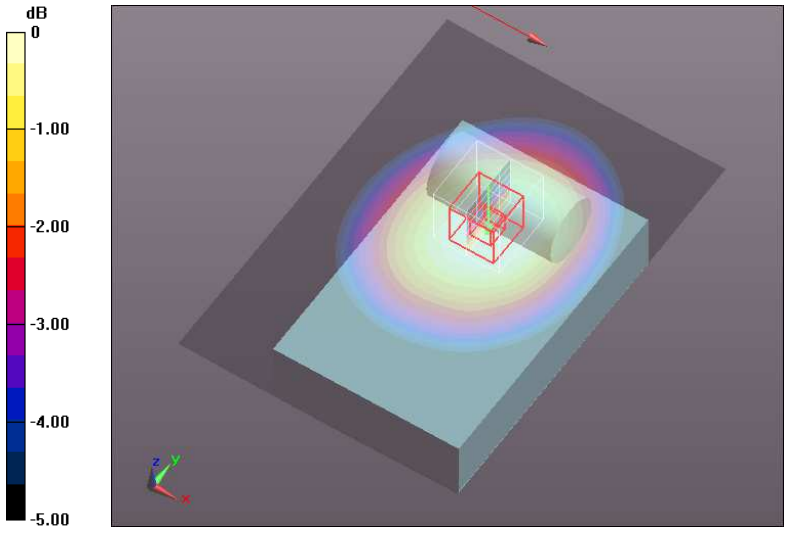


LTE Band 12 – Front Face, d=35 mm – Middle Channel – Plot Nº9

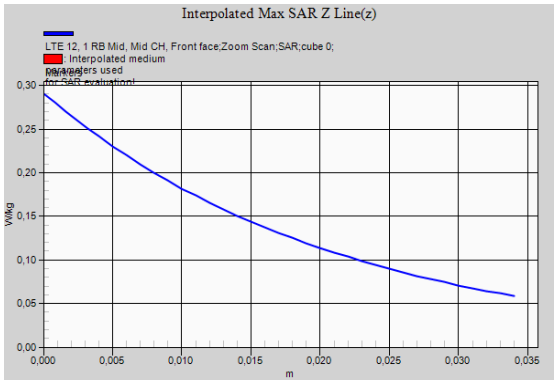
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 2019-04-22

DUT: HD MY20 NA; Type: TCU; Serial: IMEI:353042100013858
Communication System: UID 10175 - CAE, LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK); Frequency: 707.5 MHz; Duty Cycle: 1:3.7325
Medium parameters used (interpolated): f = 707.5 MHz; σ = 0.92 S/m; ε_r = 55.54; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(10.11, 10.11, 10.11); Calibrated: 2018-06-25;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 2018-06-18
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Faces, d=35mm/LTE 12, 1 RB Mid, Mid CH, Front face/Area Scan (91x131x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.254 W/kg
Flat Phantom, Faces, d=35mm/LTE 12, 1 RB Mid, Mid CH, Front face/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.47 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.291 W/kg
SAR(1 g) = 0.239 W/kg; SAR(10 g) = 0.184 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.242 W/kg



0 dB = 0.242 W/kg = -6.16 dBW/kg



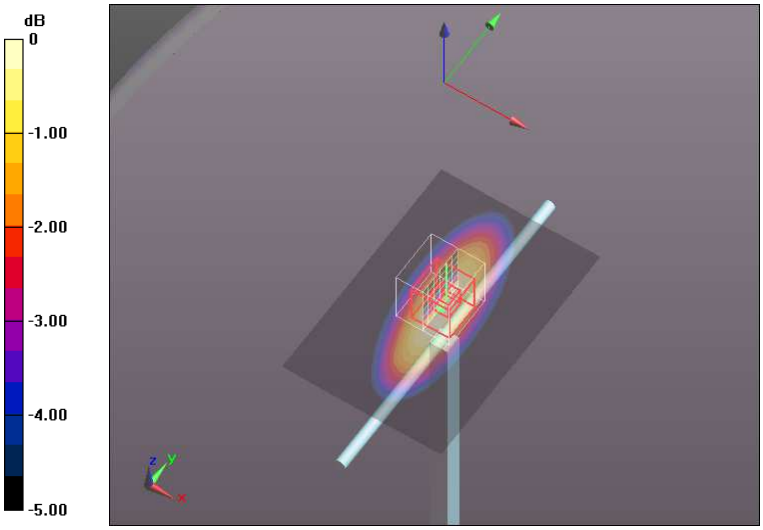
Appendix D: System Validation Reports

Validation results in 750 MHz Band for Body TSL

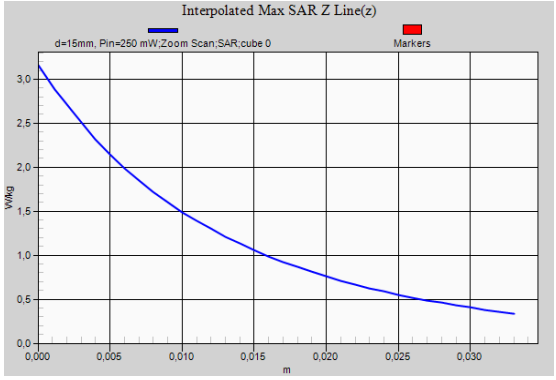
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 2019-04-22

DUT: Dipole 750 MHz D750V3; Type: D750V3; Serial: D750V3 - SN:1036
Communication System: UID 0, CW (0); Frequency: 750 MHz; Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; σ = 0.98 S/m; ε_r = 54.97; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(10.11, 10.11, 10.11); Calibrated: 2018-06-25;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 2018-06-18
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration 750MHz, 2019-04-22/d=15mm, Pin=250 mW/Area Scan (61x91x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.53 W/kg
Configuration 750MHz, 2019-04-22/d=15mm, Pin=250 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.69 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.16 W/kg
SAR(1 g) = 2.14 W/kg; SAR(10 g) = 1.44 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 2.51 W/kg



0 dB = 2.51 W/kg = 4.00 dBW/kg

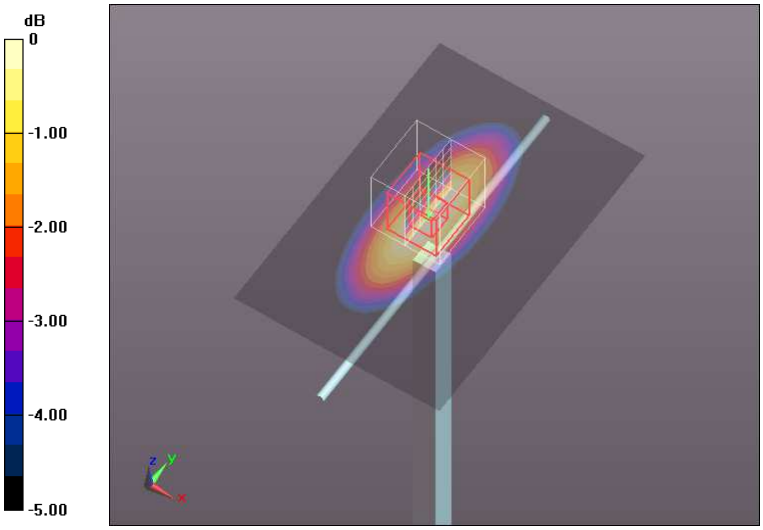


Validation results in 900 MHz Band for Body TSL

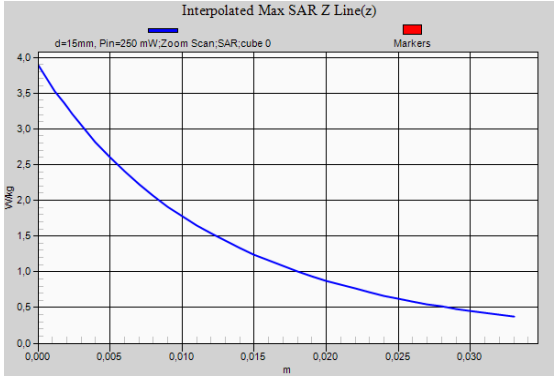
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 2019-04-15

DUT: Dipole 900 MHz D900V2; Type: D900V2; Serial: D900V2 - SN:1d007
Communication System: UID 0, CW; Frequency: 900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 900 MHz; σ = 1.03 S/m; ε_r = 54.48; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(9.78, 9.78, 9.78); Calibrated: 2018-06-25;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 2018-06-18
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration 900MHz, 2019-04-15/d=15mm, Pin=250 mW/Area Scan (61x91x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.08 W/kg
Configuration 900MHz, 2019-04-15/d=15mm, Pin=250 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.13 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 3.89 W/kg
SAR(1 g) = 2.63 W/kg; SAR(10 g) = 1.71 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 3.06 W/kg



0 dB = 3.06 W/kg = 4.86 dBW/kg

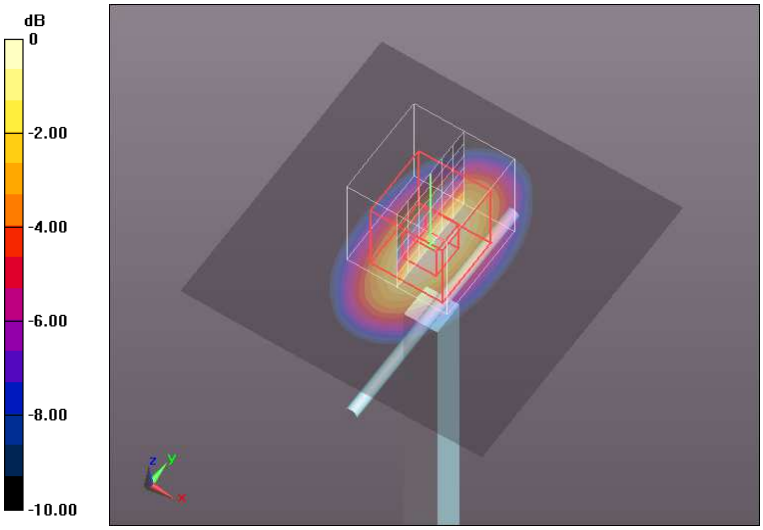


Validation results in 1800 MHz Band for Body TSL

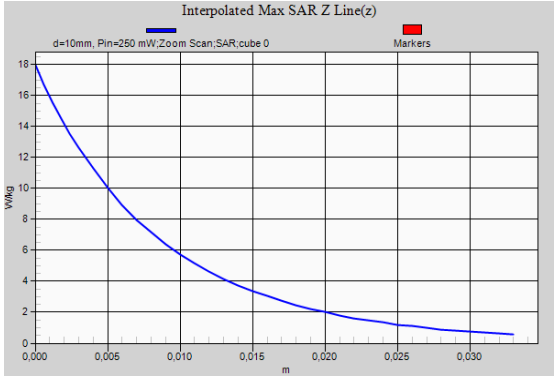
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 2019-04-23

DUT: Dipole 1800 MHz D1800V2; Type: D1800V2; Serial: D1800V2 - SN:2d099
Communication System: UID 0, CW (0); Frequency: 1800 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1800 MHz; σ = 1.57 S/m; ε_r = 52.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(8.24, 8.24, 8.24); Calibrated: 2018-06-25;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 2018-06-18
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration 1800MHz, 2019-04-23/d=10mm, Pin=250 mW/Area Scan (91x91x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 12.6 W/kg
Configuration 1800MHz, 2019-04-23/d=10mm, Pin=250 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.25 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 17.9 W/kg
SAR(1 g) = 9.88 W/kg; SAR(10 g) = 5.15 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 12.7 W/kg



0 dB = 12.7 W/kg = 11.04 dBW/kg

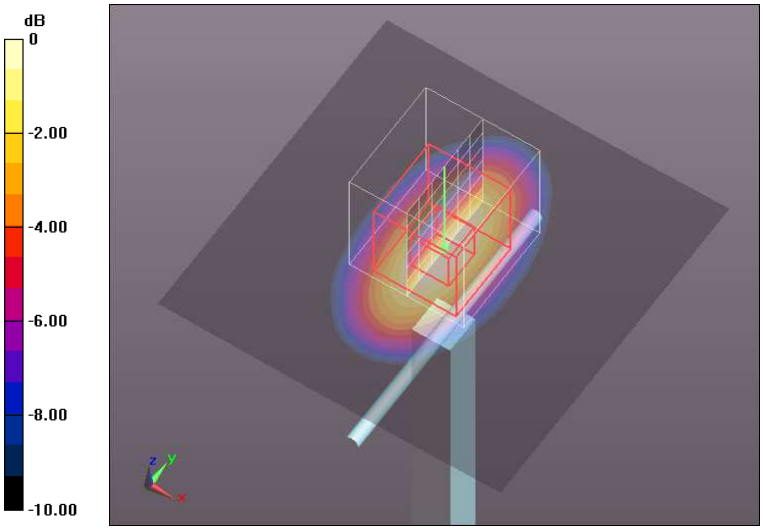


Validation results in 1800 MHz Band for Body TSL

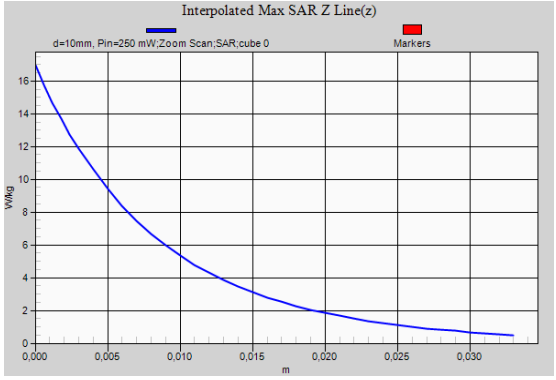
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 2019-04-23

DUT: Dipole 1800 MHz D1800V2; Type: D1800V2; Serial: D1800V2 - SN:2d099
Communication System: UID 0, CW (0); Frequency: 1800 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1800 MHz; σ = 1.47 S/m; ε_r = 52.53; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(8.24, 8.24, 8.24); Calibrated: 2018-06-25;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 2018-06-18
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration 1800MHz, 2019-04 23/d=10mm, Pin=250 mW/Area Scan (91x91x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 12.0 W/kg
Configuration 1800MHz, 2019-04 23/d=10mm, Pin=250 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.04 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 16.9 W/kg
SAR(1 g) = 9.46 W/kg; SAR(10 g) = 4.89 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 11.9 W/kg



0 dB = 11.9 W/kg = 10.76 dBW/kg

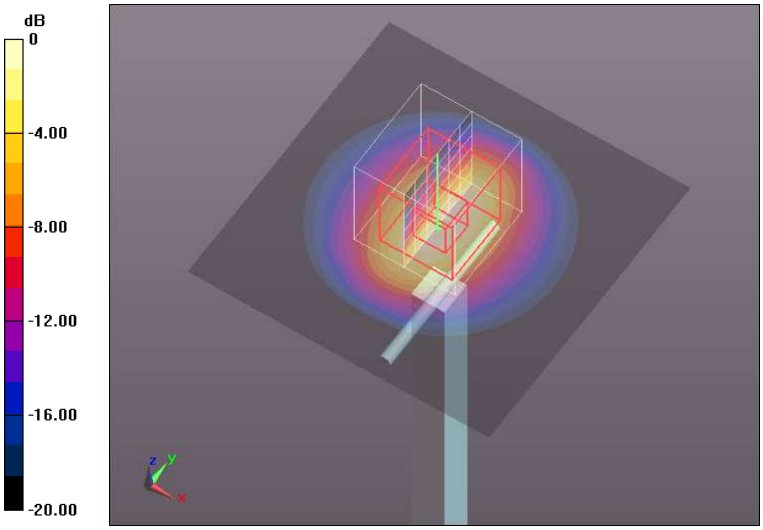


Validation results in 2450 MHz Band for Body TSL

Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 2019-04-22

DUT: Dipole 2600 MHz D2600V2; Type: D2600V2; Serial: D2600V2 - SN:1023
Communication System: UID 0, CW (0); Frequency: 2600 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.18 S/m; ε_r = 52.46; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(7.52, 7.52, 7.52); Calibrated: 2018-06-25;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 2018-06-18
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration 2600MHz, 2019-04-22/d=10mm, Pin=250 mW/Area Scan (91x91x1):
nterpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 19.5 W/kg
Configuration 2600MHz, 2019-04-22/d=10mm, Pin=250 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.48 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 31.2 W/kg
SAR(1 g) = 14.3 W/kg; SAR(10 g) = 6.3 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 19.3 W/kg



0 dB = 19.3 W/kg = 12.86 dBW/kg