FCC SAR TEST REPORT

Report No.:	SET2019-10358
Product:	Handheld Data Terminal
Trade Name:	unitech
Model No.:	HT510A
FCC ID:	HLEHT510ABTNUFL
Applicant:	unitech Electronics Co., LTD
Address:	5F., No.136, Ln. 235, Baoqiao Rd., Xindian Dist., New Taipei City, Taiwan
Issued by:	CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.
Lab Location:	Building 28/29, East of Shigu, Xili Industrial Zone, Xili Road, Nanshan Districk, shenzhen, China
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Test Report

Product. ……..:	Handheld Data Terminal
Model No. ……..:	HT510A
Brand Name……..:	unitech
FCC ID…….…….:	HLEHT510ABTNUFL
Applicant……..:	unitech Electronics Co., LTD
Applicant Address…….:	5F., No.136, Ln. 235, Baoqiao Rd., Xindian Dist., New Taipei City, Taiwan
Manufacturer……:	unitech Electronics Co., LTD
Manufacturer Address:	5F., No.136, Ln. 235, Baoqiao Rd., Xindian Dist., New Taipei City, Taiwan
Test Standards…….:	**47CFR §2.1093-** Radiofrequency Radiation Exposure Evaluation: Portable Devices; **ANSI C95.1–1992:** Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.(IEEE Std C95.1-1991) **IEEE 1528–2013:** IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
Test Result……:	Pass
Test Date……:	2019.09.02-2019.09.11

Tested by ……..: Mei Chun 2019-09-18

Mei Chun, Test Engineer

Reviewed by…….: Chris You 2019-09-18

Chris You, Senior Engineer

Approved by……: Shuangwen Zhang 2019-09-18

Shuangwen Zhang, Manager

Contents

1. Administrative Data

1.1 Testing Laboratory

Test Site:	CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.
Address:	Building 28/29, East of Shigu, Xili Industrial Zone, Xili Road, Nanshan Districk, shenzhen, China
NVLAP Lab Code:	CCIC-SET is a third party testing organization accredited by NVLAP according to ISO/IEC 17025. The accreditation certificate number is 201008-0.
FCC Registration:	CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. 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. Designation Number: CN5031, valid time is until December 31, 2019.
ISED Registration:	CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until December 31, 2019.
Test Environment Condition:	Temperature (°C): 21°C Relative Humidity (%): 60% Atmospheric Pressure (kPa): 86KPa-106KPa

2. Equipment Under Test (EUT)

Identification of the Equipment under Test

Device Type:	Portable	
Exposure Category:	Population/Uncontrolled	
Sample Name:	Handheld Data Terminal	
Model Name:	HT510A	
General description:	Support Band	GSM850MHz/900MHz/1800MHz/1900MHz,CDMA BC0, WCDMA 850MHz/900MHz/1900MHz/2100MHz,GPS LTE Band 5/7/8//41,WIFI 2.4G/5G, BT,RFID(902-928MHz)
	Test Band	GSM850MHz/1900MHz,CDMA BC0, WCDMA 850MHz/1900MHz LTE Band 5/7/41,WIFI2.4G/5G,RFID(902-928MHz)
	IMEI No.	866485021517111/866485021517129
	Device Class	Class B
	Multi Class	GPRS: Class 12; EGPRS: Class 12
	Development Stage	Identical Prototype
	Accessories	Power Supply
	Hotspot	2.4GHz WLAN support Hotspot mode 5GHz WLAN Not support Hotspot mode
	Antenna type	Internal Antenna
	Operation mode	GSM /CDMA/WCDMA / LTE /WIFI
	Modulation mode	GSM(GMSK),CDMA(QPSK)UMTS(QPSK), LTE(QPSK,16QAM,WIFI(OFDM/DSSS), BT(GFSK/ π /4-DQPSK/8-DPSK) RFID:DSB-ASK
	DTM mode	Not support
	Hardware Version	B611_MB_V3.0
	Software Version	SQ31T_P1_00_XX_AU1616_D_R_190513_01
	Battery options :	Model No.: HBL5000S Capacitance:4500mAh Rated Voltage:3.8V Charge Limit:4.35V
	Max. SAR Value	Body: 1.157 W/Kg(Limit:1.6W/Kg, 5mm distance)

NOTE:

a. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

EUT testing configuration

Tested frequency range(s)	Transmitter Frequency Range	Receiver Frequency Range
GSM850:	824-849 MHz	869-894 MHz
GSM1900:	1850-1910 MHz	1930-1990 MHz
CDMA BC0:	815-850 MHz	860-895 MHz
UMTS Band II:	1850-1910 MHz	1930-1990 MHz
UMTS Band V:	824-849 MHz	869-894 MHz
LTE Band5:	824-849 MHz	869-894 MHz
LTE Band7:	2500-2570 MHz	2620-2690 MHz
LTE Band41:	2496-2690 MHz	
WIFI(tested):	2412-2462 MHz	
	5150-5250 MHz	
	5250-5350 MHz	
	5470-5725 MHz	
	5745-5825 MHz	
Bluetooth:	2402-2480 MHz	
RFID	902-928MHz	
Test channels(low-mid-high):	128-190-251(GSM850)	
	512-661-810(GSM1900)	
	1013-384-777(CDMA BC0)	
	9262-9400-9538(UMTS Band II)	
	4132-4183-4233(UMTS Band V)	
	20450-20525-20600(LTE Band 5 Bandwidth 10M)	
	20850-21100-21350(LTE Band 7 Bandwidth 20M)	
	23780-23790-23800(LTE Band 41 Bandwidth 20M)	
	1-6-11(Wi-Fi 2.4G 802.11b)	
	5180-5260-5500-5745 (WIFI 5G)	
	0-39-78(BT)	
	1-25-50(RFID)	

3. SAR Summary

Highest Standalone SAR Summary

Exposure Position	Frequency Band	Scaled 1g-SAR(W/kg)	Highest Scaled 1g-SAR(W/kg)
Body-Support (5mm Gap)	GSM850	1.094	1.157
	GSM1900	0.931	
	CDMA BC0	0.426	
	RFID	0.374	
	WCDMA Band II	0.751	
	WCDMA Band V	0.620	
	LTE Band 5	0.851	
	LTE Band 7	1.157	
	LTE Band 41	1.090	
	WIFI 2.4G 802.11b	0.583	
	5G WIFI	0.378	

Exposure Position	Frequency Band	Scaled 1g-SAR(W/kg)	Highest Scaled 1g-SAR(W/kg)
Hotspot (5mm Gap)	GSM850	1.094	1.157
	GSM1900	0.931	
	CDMA BC0	0.426	
	WCDMA Band II	0.751	
	WCDMA Band V	0.620	
	LTE Band 5	0.851	
	LTE Band 7	1.157	
	LTE Band 41	1.090	
	WIFI 2.4G 802.11b	0.583	

Highest Simultaneous SAR Summary

Exposure Position	Frequency Band	Highest Scaled 1g-SAR(W/kg)
Hotspot (10mmGap)	WWAN(LTE Band 5)&WIFI 2.4G	1.434

4. Specific Absorption Rate (SAR)

4.1 Introduction

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

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

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

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be either related to the temperature elevation in tissue by

$$SAR = C\frac{\delta T}{\delta t}$$

where C is the specific head capacity, δ T is the temperature rise and δ t the exposure duration, or related to the electrical field in the tissue by

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

where σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the rms electrical field strength.

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

4.2 Applicable Standards and Limits

4.2.1 Applicable Standards

47CFR § 2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
ANSI C95.1–1992	Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.(IEEE Std C95.1-1991)
IEEE 1528–2013	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 248227 D01	v02r02 802.11 Wi-Fi SAR
KDB 447498 D01	v06 General RF Exposure Guidance
KDB 648474 D04	v01r03 Handset SAR
KDB 865664 D01	v01r04 SAR Measurement 100MHz to 6GHz
KDB 865664 D02	v01r02 SAR Exposure Reporting
KDB 941225 D01	v03r01 3G SAR Procedures
KDB 941225 D05	v02r05 SAR for LTE Devices
KDB 941225 D05A	v01r02 LTE Rel.10 KDB Inquiry Sheet
KDB 941225 D06	v02r01 Hotspot Mode
KDB Inquired No: 349331	For models that do not support voice mode, you should use the test procedures in KDB 941225 D07 UMPC). The device must be tested for 1 gram SAR on all surfaces and side edges with a transmitting antenna located at ≤ 25 mm from that surface or edge, at 5 mm separation from a flat phantom.

4.2.2 RF exposure Limits

Human Exposure	**Uncontrolled Environment General Population**
Spatial Peak SAR* (Brain/Body)	**1.60 mW/g**
Spatial Average SAR** (Whole Body)	0.08 mW/g
Spatial Peak SAR*** (Limbs)	4.00 mW/g

The limit applied in this test report is shown in bold letters.

Notes:

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

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

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

4.3 Phantoms

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

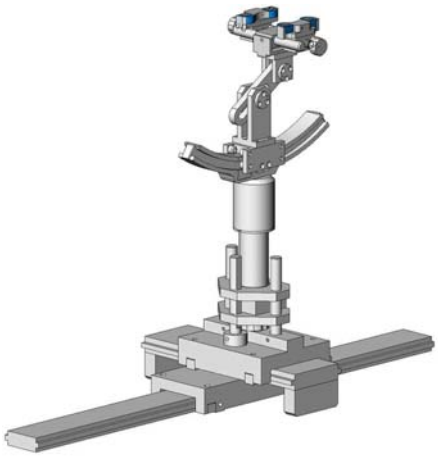
System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

SAM Twin Phantom

4.4 Device Holder

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

The 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

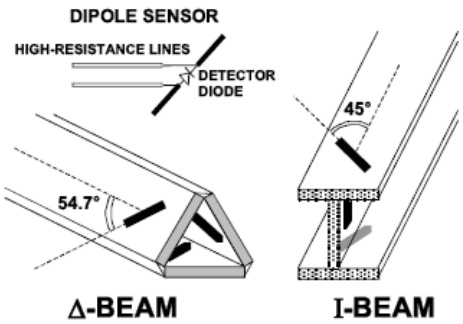
4.5 Probe Specification

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	700 MHz to 3 GHz; Linearity: ± 0.5 dB (700 MHz to 3 GHz)
Directivity	± 0.25 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	1.5 μW/g to 100 mW/g; Linearity: ± 0.5 dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 5 mm Distance from probe tip to dipole centers: <2.7 mm
Application	General dosimetry up to 3 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones
Compatibility	COMOSAR

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:



5. Tissue check and recommend Dielectric Parameters

5.1 Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness Power drifts in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

Table 1: Recommended Dielectric Performance of Tissue

Ingredients (% by weight)	Frequency (MHz)											
	450		835		915		1900		2450		2600	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.46	52.4	41.05	56.0	54.9	40.4	62.7	73.2	55.24	64.49
Salt (Nacl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04	0.5	0.024
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0	0.0	0.0
Triton x-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0	44.45	32.25
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.2	52.5	39.0	52.5
Conductivity (s/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.80	1.78	1.96	2.16

MSL/HSL750 (Body and Head liquid for 650 – 850 MHz)

Item	Head Tissue Simulation Liquid HSL750 Muscle(body)Tissue Simulation Liquid MSL750			
H2O	Water, 35 – 58%			
Sucrese	Sugar, white, refined, 40-60%			
NaCl	Sodium Chloride, 0-6%			
Hydroxyethel-cellulsoe	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%			
Frequency (MHz)	Head εr	Head σ(S/m)	Body εr	Bodyσ(S/m)
750	41.9	0.89	55.2	0.97

Note: The liquid of 700MHz&2600MHz typical liquid composition is provided by SATIMO.

Frequency:5200/5400/5600/5800MHz	
Ingredients	(% by weight)
Water	78
Mineral oil	11
Emulsifiers	9
Additives and Salt	2

Table 2 Recommended Tissue Dielectric Parameters

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

5.2 Simulate liquid

Liquid check results:

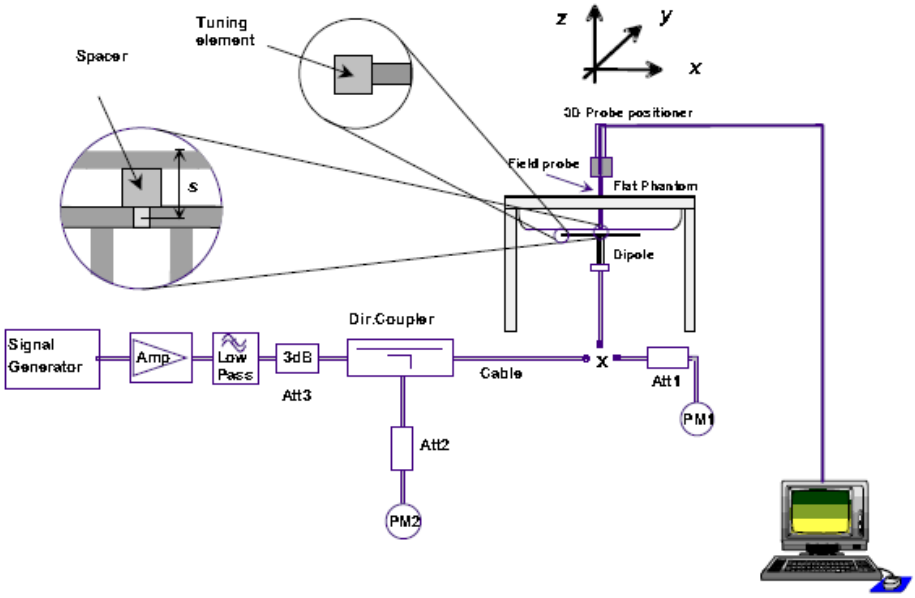
Table 3: Dielectric Performance of Body Tissue Simulating Liquid

Temperature: 23.2°C; Humidity: 64%;			
/	Frequency	Permittivity ε	Conductivity σ (S/m)
Target value	835MHz	55.2±5%	0.97±5%
Validation value (2019-09-02)	835MHz	55.56	0.97
Target value	1900MHz	53.3±5%	1.52±5%
Validation value (2019-09-03)	1900MHz	53.54	1.51
Target value	2450MHz	52.7±5%	1.95±5%
Validation value (2019-09-04)	2450MHz	53.23	1.95
Target value	2600MHz	52.5±5%	2.16±5%
Validation value (2019-09-05)	2600MHz	53.01	2.17
Target value	5200MHz	49.0±5%	5.30±5%
Validation value (2019-09-06)	5200MHz	50.45	5.24
Target value	5400MHz	48.7±5%	5.53±5%
Validation value (2019-09-09)	5400MHz	50.16	5.52
Target value	5600MHz	48.5±5%	5.77±5%
Validation value (2019-09-10)	5600MHz	49.89	5.66
Target value	5800MHz	48.2±5%	6.0±5%
Validation value (2019-09-11)	5800MHz	49.61	5.92

SAR System validation

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of ±10%. The validation results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

The following procedure, recommended for performing validation tests using box phantoms is based on the procedures described in the IEEE standard P1528. Setup according to the setup diagram below:



With the SG and Amp and with directional coupler in place, set up the source signal at the relevant frequency and use a power meter to measure the power at the end of the SMA cable that you intend to connect to the balanced dipole. Adjust the SG to make this, say, 0.01W (10 dBm). If this level is too high to read directly with the power meter sensor, insert a calibrated attenuator (e.g. 10 or 20 dB) and make a suitable correction to the power meter reading.

Note 1: In this method, the directional coupler is used for monitoring rather than setting the exact feed power level. If, however, the directional coupler is used for power measurement, you should check the frequency range and power rating of the coupler and measure the coupling factor (referred to output) at the test frequency using a VNA.

Note 2: Remember that the use of a 3dB attenuator (as shown in Figure 8.1 of P1528) means that you need an RF amplifier of 2 times greater power for the same feed power. The other issue is the cable length. You might get up to 1dB of loss per meter of cable, so the cable length after the coupler needs to be quite short.

Note 3: For the validation testing done using CW signals, most power meters are suitable. However, if you are measuring the output of a modulated signal from either a signal generator or a handset, you must ensure that the power meter correctly reads the modulated signals.

The measured 1-gram averaged SAR values of the device against the phantom are provided in Tables 5 and Table 6. The humidity and ambient temperature of test facility

were 64% and 23.2°C respectively. The body phantom were full of the body tissue simulating liquid. The EUT was supplied with full-charged battery for each measurement.

The distance between the back of the EUT and the bottom of the flat phantom is 10 mm (taking into account of the IEEE 1528 and the place of the antenna).

Table 4: Body SAR system validation (1g)

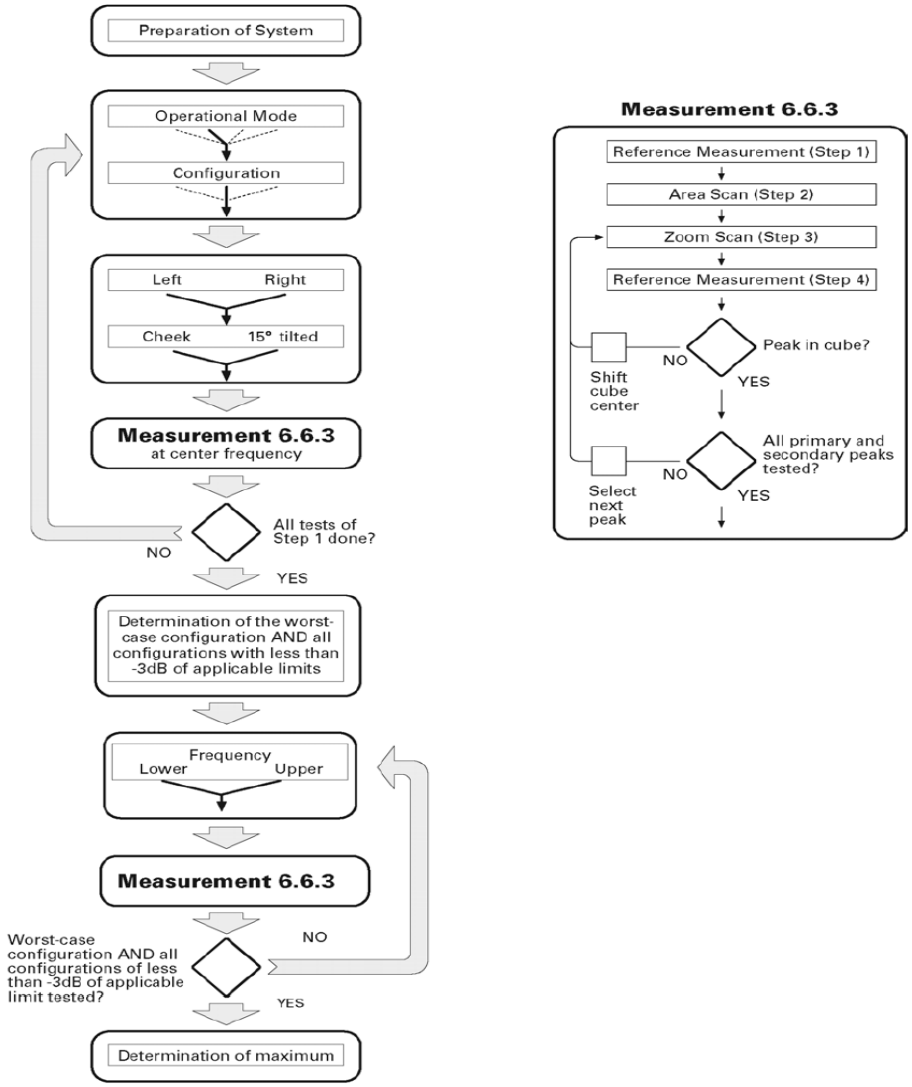
Frequency	Duty cycle	Target value （W/kg）	Test value (W/kg)	
			10 mW	1W
835MHz(2019-09-02)	1:1	9.88±10%	0.1052	10.52
1900MHz(2019-09-03)	1:1	38.84±10%	0.4231	42.31
2450MHz(2019-09-04)	1:1	51.42±10%	0.5591	55.91
2600MHz(2019-09-05)	1:1	53.45±10%	0.5865	58.65
5200MHz(2019-09-06)	1:1	155.78±10%	1.6968	169.68
5400MHz(2019-09-09)	1:1	160.24±10%	1.7403	174.03
5600MHz(2019-09-10)	1:1	167.61±10%	1.8101	181.01
5800MHz(2019-09-11)	1:1	170.49±10%	1.7949	179.49

* Note: Target value was referring to the measured value in the calibration certificate of reference dipole.

Note: All SAR values are normalized to 1W forward power.

6. SAR measurement procedure

The SAR test against the head phantom was carried out as follow:



Establish a call with the maximum output power with a base station simulator, the connection between the EUT and the base station simulator is established via air interface.

After an area scan has been done at a fixed distance of 2mm from the surface of the phantom on the source side, a 3D scan is set up around the location of the maximum spot SAR. First, a point within the scan area is visited by the probe and a SAR reading taken at the start of testing. At the end of testing, the probe is returned to the same point and a second reading is taken. Comparison between these start and end readings enables the power drift during measurement to be assessed.

Above is the scanning procedure flow chart and table from the IEEEp1528 standard. This is the procedure for which all compliant testing should be carried out to ensure that all variations of the device position and transmission behavior are tested.

7. Conducted RF Output Power

7.1 GSM Conducted Power

GSM850		Burst-Averaged output Power (dBm)			Division Factors	Frame-Averaged output Power (dBm)		
		128CH	190CH	251CH		28CH	190CH	251CH
GPRS (GMSK)	1 Tx Slot	31.71	32.00	31.62	-9.19	22.52	22.81	22.43
	2 Tx Slots	29.45	29.88	29.39	-6.13	23.32	23.75	23.26
	3 Tx Slots	27.65	27.92	27.61	-4.42	23.23	23.50	23.19
	4 Tx Slots	26.56	26.95	26.48	-3.18	23.38	23.77	23.30
EDGE (8PSK)	1 Tx Slot	25.58	26.00	25.49	-9.19	16.39	16.81	16.30
	2 Tx Slots	23.32	23.65	23.41	-6.13	17.19	17.52	17.28
	3 Tx Slots	21.54	21.81	21.63	-4.42	17.12	17.39	17.21
	4 Tx Slots	20.43	20.87	20.56	-3.18	17.25	17.69	17.38
GSM1900		Burst-Averaged output Power (dBm)			Division Factors	Frame-Averaged output Power (dBm)		
		512CH	661CH	810CH		512CH	661CH	810CH
GPRS (GMSK)	1 Tx Slot	28.30	28.34	27.63	-9.19	19.11	19.15	18.44
	2 Tx Slots	26.15	26.22	25.57	-6.13	20.02	20.09	19.44
	3 Tx Slots	24.46	24.65	24.52	-4.42	20.04	20.23	20.10
	4 Tx Slots	23.23	23.58	23.36	-3.18	20.05	20.40	20.18
EDGE (8PSK)	1 Tx Slot	23.18	23.41	23.33	-9.19	13.99	14.22	14.14
	2 Tx Slots	21.01	21.23	21.10	-6.13	14.88	15.10	14.97
	3 Tx Slots	19.32	19.58	19.44	-4.42	14.90	15.16	15.02
	4 Tx Slots	18.20	18.42	18.31	-3.18	15.02	15.24	15.13

Note: Per KDB 447498 D01 v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.

For hotspot SAR, EUT was performed at GPRS Class 12 multi-slots(4Tx) mode

For Head and Body-worn SAR testing, EUT was set in GSM Voice mode for both GSM850 and GSM1900

Timeslot consignations

No. Of Slots	Slot 1	Slot 2	Slot 3	Slot 4
Slot Consignation	1Up4Down	2UpDown	3UpDown	4Up1Down
Duty Cycle	1:8	1:4	1:2.67	1:2
Crest Factor	-9.03dB	-6.02dB	-4.26dB	-3.01dB

CDMA Conducted output Power

Conducted Power (Unit:dBm)			
Band	CDMA BC0		
Channel	1013	384	777
Frequency(MHz)	824.7	836.52	848.31
RC1 + SO55	22.42	22.64	22.61
RC3 + SO55	22.27	22.51	22.48
RC3 + SO32(+ F-SCH)	22.16	22.43	22.35
RC3 + SO32(+SCH)	22.11	22.30	22.27
1xEVDO Rev A RETAP	22.03	22.22	22.14

7.2 WCDMA Conducted output Power

UMTS1900 (Band II)		Average Power (dBm)		
		9262CH	9400CH	9538cH
WCDMA	12.2kbps RMC	19.08	19.15	18.97
HSDPA	Subtest 1	18.94	19.06	18.84
	Subtest 2	18.86	18.93	18.76
	Subtest 3	18.75	18.84	18.65
	Subtest 4	18.66	18.73	18.53
HSUPA	Subtest 1	18.54	18.62	18.43
	Subtest 2	18.45	18.51	18.32
	Subtest 3	18.37	18.42	18.21
	Subtest 4	18.26	18.34	18.14
	Subtest 5	18.15	18.21	18.02
UMTS850 (Band V)		Average Power (dBm)		
		4132CH	4183CH	4233CH
WCDMA	12.2kbps RMC	22.18	22.28	22.26
HSDPA	Subtest 1	22.07	22.17	22.15
	Subtest 2	21.95	22.06	21.02
	Subtest 3	21.84	21.94	21.91
	Subtest 4	21.73	21.86	21.84
HSUPA	Subtest 1	21.62	21.75	21.73
	Subtest 2	21.51	21.63	21.61
	Subtest 3	21.44	21.52	21.48
	Subtest 4	21.33	21.43	21.37
	Subtest 5	21.21	21.30	21.26

Note:

1. WCDMA SAR was tested under RMC 12.2kbps with HSPA Inactive per KDB Publication 941225 D01v03r01.HSPA SAR was not requires since the average output power of the HSPA subtests was not more than 0.25dB higher than the RMC level and SAR was less than 1.2W/kg.
2. It is expected by the manufacturer that MPR for some HSPA subtests may be up to 2dB more than specified by 3GPP, but also as low as 0dB according to the chipset implementation in this model

7.3 LTE Conducted peak output Power

LTE Test Configurations

The CMW500 Wide Band Radio Communication Tester was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR test were performed with the same number of RB and RB offsets transmitting on all frames.

1) Spectrum Plots for RB configurations

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

2) MPR

When MPR is implemented permanently within the UE, regardless of network requirements, only those RB configurations allowed by 3GPP for the channel bandwidth and modulation combinations may be tested with MPR active. Configurations with RB allocations less than the RB thresholds required by 3GPP must be tested without MPR.

The allowed Maximum Power Reduction(MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101:

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth configuration [RB]						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

3)A-MPR LTE procedures for SAR testing

A-MPR(Additional MPR) has been disabled for all SAR tests by using Network Signaling Value of “NS_01” on the base station simulator.

4)LTE procedures for SAR testing

A) Largest channel bandwidth standalone SAR test

requirements i) QPSK with 1 RB allocation

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

1. LTE Band 5 Conducted Power Test Verdict:

LTE FDD Band 5				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				20407/824.7	20525/836.5	20643/848.3	
1.4MHz	QPSK	1	0	22.66	22.4	22.57	22.0±1.0
		1	3	22.56	22.69	22.58	
		1	5	22.43	22.43	22.4	
		3	0	22.29	22.19	22.06	21.5±1.0
		3	2	22.08	22.2	22.33	
		3	3	22.34	22.08	22.1	
		6	0	21.95	21.94	21.94	21.0±1.0
	16QAM	1	0	21.69	21.64	21.77	21.0±1.0
		1	3	21.78	21.79	21.66	
		1	5	21.82	21.85	21.73	
		3	0	21.24	21.3	21.21	20.5±1.0
		3	2	21.25	21.49	21.35	
		3	3	21.5	21.44	21.36	
		6	0	21.13	21.14	21.14	20.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				20415/825.5	20525/836.5	20635/847.5	
3MHz	QPSK	1	0	22.64	22.63	22.59	22.0±1.0
		1	7	22.57	22.41	22.58	
		1	14	22.6	22.48	22.57	
		8	0	22.18	22.31	22.28	21.5±1.0
		8	4	22.13	22.22	22.19	
		8	7	22.29	22.26	22.34	
		15	0	21.98	21.9	21.91	21.0±1.0
	16QAM	1	0	21.59	21.85	21.65	21.0±1.0
		1	7	21.59	21.55	21.65	
		1	14	21.62	21.7	21.66	
		8	0	21.43	21.47	21.48	20.5±1.0
		8	4	21.24	21.29	21.48	
		8	7	21.29	21.26	21.37	
		15	0	21.11	21.06	21.14	20.5±1.0

LTE FDD Band 5				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				20425/826.5	20525/836.5	20625/846.5	
5MHz	QPSK	1	0	22.64	22.51	22.63	22.0±1.0
		1	13	22.42	22.45	22.5	
		1	24	22.63	22.48	22.41	
		12	0	22.31	22.25	22.15	21.5±1.0
		12	6	22.08	22.1	22.25	
		12	13	22.35	22.09	22.28	
		25	0	21.93	21.98	21.98	21.0±1.0
	16QAM	1	0	21.66	21.74	21.65	21.0±1.0
		1	13	21.7	21.68	21.59	
		1	24	21.56	21.77	21.76	
		12	0	21.33	21.23	21.46	20.5±1.0
		12	6	21.38	21.2	21.37	
		12	13	21.2	21.21	21.45	
		25	0	21.05	21.05	21.14	20.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				20450/829	20525/836.5	20600/844	
10MHz	QPSK	1	0	22.66	22.8	22.56	22.0±1.0
		1	25	22.61	22.69	22.68	
		1	49	22.63	22.54	22.44	
		25	0	22.25	22.32	22.26	21.5±1.0
		25	13	22.21	22.16	22.16	
		25	25	22.2	22.29	22.11	
		50	0	21.97	21.95	21.97	21.0±1.0
	16QAM	1	0	21.84	21.84	21.76	21.0±1.0
		1	25	21.63	21.8	21.6	
		1	49	21.55	21.78	21.57	
		25	0	21.49	21.23	21.45	20.5±1.0
		25	13	21.22	21.32	21.49	
		25	25	21.25	21.33	21.34	
		50	0	21.06	21.1	21.1	20.5±1.0

2. LTE Band 7 Conducted Power Test Verdict:

LTE FDD Band 7				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				20775/2502.5	21100/2535	21425/2567.5	
5MHz	QPSK	1	0	19.22	19.27	19.06	18.5±1.0
		1	13	19.25	19.19	19.2	
		1	24	19.27	19.14	19.27	
		12	0	18.8	18.92	18.95	18.0±1.0
		12	6	18.87	18.94	18.65	
		12	13	18.68	18.67	18.95	
		25	0	18.59	18.6	18.57	18.0±1.0
	16QAM	1	0	18.36	18.34	18.31	17.5±1.0
		1	13	18.19	18.25	18.41	
		1	24	18.44	18.16	18.16	
		12	0	17.99	18.08	18.01	17.5±1.0
		12	6	17.8	18.04	18.04	
		12	13	17.83	17.83	17.96	
		25	0	17.71	17.67	17.71	17.0±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				20800/2505	21100/2535	21400/2565	
10MHz	QPSK	1	0	19.13	19.09	19.13	18.5±1.0
		1	25	19.01	19.17	19.02	
		1	49	19.12	19.3	19.21	
		25	0	18.77	18.87	18.71	18.0±1.0
		25	13	18.75	18.89	18.84	
		25	25	18.8	18.79	18.93	
		50	0	18.57	18.59	18.55	18.0±1.0
	16QAM	1	0	18.45	18.31	18.42	17.5±1.0
		1	25	18.27	18.37	18.36	
		1	49	18.28	18.4	18.16	
		25	0	17.98	18.08	17.9	17.5±1.0
		25	13	17.86	17.87	17.88	
		25	25	17.93	17.91	17.84	
		50	0	17.74	17.69	17.65	17.0±1.0

LTE FDD Band 7				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				20825/2507.5	21100/2535	21375/2562.5	
15MHz	QPSK	1	0	19.12	19.02	19.07	18.5±1.0
		1	38	19.04	19.07	19.14	
		1	74	19.14	19.05	19.23	
		36	0	18.79	18.94	18.74	18.0±1.0
		36	18	18.85	18.69	18.74	
		36	39	18.81	18.66	18.74	
		75	0	18.6	18.6	18.5	18.0±1.0
	16QAM	1	0	18.36	18.35	18.15	17.5±1.0
		1	38	18.28	18.37	18.42	
		1	74	18.4	18.24	18.31	
		36	0	17.88	17.93	18.08	17.5±1.0
		36	18	17.8	17.8	17.97	
		36	39	17.94	17.8	17.9	
		75	0	17.72	17.72	17.71	17.0±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				20850/2510	21100/2535	21350/2560	
20MHz	QPSK	1	0	19.27	19.38	19.21	18.5±1.0
		1	50	19.04	19.06	19.05	
		1	99	19.1	19.1	19.1	
		50	0	18.88	18.95	18.68	18.0±1.0
		50	25	18.65	18.87	18.85	
		50	50	18.84	18.9	18.8	
		100	0	18.5	18.58	18.5	18.0±1.0
	16QAM	1	0	18.26	18.3	18.19	17.5±1.0
		1	50	18.43	18.18	18.4	
		1	99	18.24	18.45	18.27	
		50	0	17.84	18.02	18.01	17.5±1.0
		50	25	18.01	17.82	18.1	
		50	50	18	17.98	17.86	
		100	0	17.72	17.74	17.69	17.0±1.0

3. LTE Band 41 Conducted Power Test Verdict:

LTE TDD Band 41				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				39675/2498.5	40620/2593	41565/2687.5	
5MHz	QPSK	1	0	21.43	21.42	21.65	21.0±1.0
		1	13	21.51	21.52	21.63	
		1	24	21.62	21.5	21.69	
		12	0	21.19	21.06	21.32	20.5±1.0
		12	6	21.3	21.34	21.11	
		12	13	21.07	21.32	21.06	
		25	0	20.9	20.98	20.95	20.0±1.0
	16QAM	1	0	20.62	20.68	20.56	20.0±1.0
		1	13	20.81	20.57	20.66	
		1	24	20.85	20.76	20.74	
		12	0	20.49	20.45	20.29	19.5±1.0
		12	6	20.49	20.28	20.38	
		12	13	20.29	20.37	20.29	
		25	0	20.15	20.06	20.14	19.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				39700/2501	40620/2593	41540/2685	
10MHz	QPSK	1	0	21.44	21.59	21.48	21.0±1.0
		1	25	21.49	21.49	21.67	
		1	49	21.55	21.57	21.45	
		25	0	21.28	21.22	21.11	20.5±1.0
		25	13	21.21	21.08	21.32	
		25	25	21.13	21.29	21.14	
		50	0	20.96	20.91	20.9	20.0±1.0
	16QAM	1	0	20.65	20.72	20.7	20.0±1.0
		1	25	20.67	20.67	20.59	
		1	49	20.84	20.56	20.58	
		25	0	20.31	20.3	20.46	19.5±1.0
		25	13	20.44	20.45	20.37	
		25	25	20.42	20.34	20.43	
		50	0	20.1	20.06	20.07	19.5±1.0

LTE TDD Band 41				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				39725/2503.5	40620/2593	41515/2682.5	
15MHz	QPSK	1	0	21.47	21.69	21.52	21.0±1.0
		1	38	21.6	21.65	21.45	
		1	74	21.59	21.45	21.62	
		36	0	21.35	21.12	21.09	20.5±1.0
		36	18	21.17	21.13	21.33	
		36	39	21.13	21.09	21.12	
		75	0	20.96	20.94	20.96	20.0±1.0
	16QAM	1	0	20.8	20.77	20.55	20.0±1.0
		1	38	20.85	20.7	20.81	
		1	74	20.74	20.61	20.56	
		36	0	20.48	20.36	20.35	19.5±1.0
		36	18	20.31	20.3	20.29	
		36	39	20.48	20.4	20.2	
		75	0	20.06	20.13	20.11	19.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				39750/2506	40620/2593	41490/2680	
20MHz	QPSK	1	0	21.71	21.76	21.68	21.0±1.0
		1	50	21.52	21.67	21.48	
		1	99	21.65	21.47	21.67	
		50	0	21.18	21.35	21.12	20.5±1.0
		50	25	21.15	21.22	21.09	
		50	50	21.1	21.3	21.12	
		100	0	20.95	20.92	20.92	20.0±1.0
	16QAM	1	0	20.65	20.82	20.64	20.0±1.0
		1	50	20.61	20.72	20.82	
		1	99	20.75	20.85	20.85	
		50	0	20.32	20.47	20.22	19.5±1.0
		50	25	20.28	20.42	20.34	
		50	50	20.47	20.32	20.5	
		100	0	20.07	20.14	20.07	19.5±1.0

7.4 WIFI Conducted Power

WLAN 2.4GHz Band Conducted Power

Channel/Freq.(MHz)	Maximum Conducted Out Power (dBm)		
	802.11b	802.11g	802.11n(HT20)
1(2412)	16.20	15.12	12.63
6(2437)	16.69	16.41	13.59
11(2462)	16.50	16.53	13.72

WLAN 5GHz Band Conducted Power

Test results of band U-NII-1 (5150 ~ 5250 MHz)

U-NII-1 AVGSA Output Power		
Mode	Test Frequency (MHz)	Max Power (dBm)
802.11n (20MHz)	5180	12.12
802.11n (20MHz)	5220	11.91
802.11n (20MHz)	5240	11.51
802.11n (40MHz)	5190	13.18
802.11n (40MHz)	5230	12.91
802.11ac (20MHz)	5180	12.04
802.11ac (20MHz)	5220	11.75
802.11ac (20MHz)	5240	11.49
802.11ac (40MHz)	5190	13.17
802.11ac (40MHz)	5230	12.63
802.11ac (80MHz)	5210	10.94
802.11a (20MHz)	5180	14.52
802.11a (20MHz)	5220	14.00
802.11a (20MHz)	5240	13.62

U-NII-2a AVGSA Output Power

Mode	Test Frequency (MHz)	Max Power (dBm)
802.11n (20MHz)	5260	12.62
802.11n (20MHz)	5300	12.23
802.11n (20MHz)	5320	11.94
802.11n (40MHz)	5270	13.32
802.11n (40MHz)	5310	12.66
802.11ac (20MHz)	5260	12.55
802.11ac (20MHz)	5300	12.00
802.11ac (20MHz)	5320	11.80
802.11ac (40MHz)	5270	13.00
802.11ac (40MHz)	5310	12.28
802.11ac (80MHz)	5290	11.43
802.11a (20MHz)	5260	14.90
802.11a (20MHz)	5300	14.12
802.11a (20MHz)	5320	13.91

U-NII-2c AVGSA Output Power

U-NII-2C AVGSA Output Power		
Mode	Test Frequency (MHz)	Max Power (dBm)
802.11n (20MHz)	5500	12.13
802.11n (20MHz)	5600	12.09
802.11n (20MHz)	5700	12.92
802.11n (40MHz)	5510	11.86
802.11n (40MHz)	5590	12.20
802.11n (40MHz)	5670	13.55
802.11ac (20MHz)	5500	11.92
802.11ac (20MHz)	5600	11.92
802.11ac (20MHz)	5700	13.03
802.11ac (40MHz)	5510	11.87
802.11ac (40MHz)	5590	12.25
802.11ac (40MHz)	5670	13.56
802.11ac (80MHz)	5530	10.55
802.11ac (80MHz)	5610	10.99
802.11a (20MHz)	5500	14.82
802.11a (20MHz)	5600	14.76
802.11a (20MHz)	5700	15.44

U-NII-3 AVGSA Output Power

U-NII-3 AVGSA Output Power		
Mode	Test Frequency (MHz)	Max Power (dBm)
802.11n (20MHz)	5745	13.47
802.11n (20MHz)	5785	13.20
802.11n (20MHz)	5825	12.91
802.11n (40MHz)	5755	12.42
802.11n (40MHz)	5795	11.78
802.11ac (20MHz)	5745	13.54
802.11ac (20MHz)	5785	13.03
802.11ac (20MHz)	5825	12.56
802.11ac (40MHz)	5755	12.48
802.11ac (40MHz)	5795	11.80
802.11ac (80MHz)	5775	10.13
802.11a (20MHz)	5745	15.43
802.11a (20MHz)	5785	15.07
802.11a (20MHz)	5825	14.90

Note:

1. Per KDB248227 D01 v02r02, choose the highest output power channel to test SAR and determine further SAR exclusion
2. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4dB higher than those measured at lowest data rate
3. Per KDB248227 D01 v02r02, 802.11g /11n-HT20/11n-HT40 is not required. . When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤1.2W/Kg. Thus the SAR can be excluded.

7.5 Bluetooth Output Power

Channel	Frequency (MHz)	BT3.0 Output Power(dBm)		
		GFSK	π /4-DQPSK	8-DPSK
CH 0	2402	6.31	2.59	3.05
CH 39	2441	6.01	2.62	3.01
CH 78	2480	5.41	2.13	2.54

BLE	
Test Frequency	Power(dBm)
2402	6.250
2440	7.847
2480	7.078

7.6 RFID Output Power

Operation Mode	Frequency (MHz)	Output Power (dBm)
RFID	902.7MHz	28.57
	915.3MHz	28.63
	927.3MHz	28.34

8. SAR test Exclusion and estimate SAR calculation:

Note:

1. Per KDB 447498 D01v06, the 1-g and 10-g SAR test exclusion thresholds for 100MHz to 6GHz at test separation distances ≤ 50mm are determined by:[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [$\sqrt{f}$ (GHz)] ≤3.0 for 1-g SAR and ≤7.5 for 10-g extremity SAR
   (1) f(GHz) is the RF channel transmit frequency in GHz
   (2) Power and distance are round to the nearest mW and mm before calculation
   (3) The result is rounded to one decimal place for comparison
   (4) If the test separation distance(antenna-user) is < 5mm, 5mm is used for excluded SAR calculation

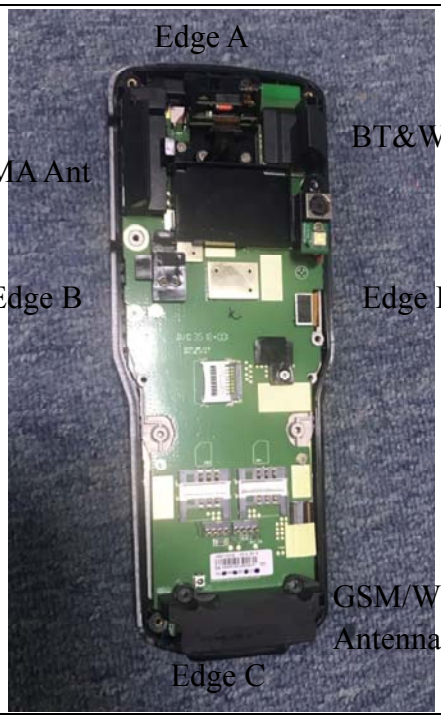
BT3.0 Max Power (dBm)	mW	Test Distance (mm)	Frequency(GHz)	Exclusion Thresholds
8.0	6.3	10	2.45	0.99

Per KDB 447498 D01v06 exclusion thresholds is0.99<3, RF exposure evaluation is not required.

BT estimated SAR value=Exclusion Thresholds/7.5=0.99/7.5=**0.132**W/Kg

The estimated SAR value is used for simultaneous transmission analysis.

Antenna Location:



Antenna-to-User (Edge Side) distance (mm):

Antenna	Front	Back	Edge A	Edge B	Edge C	Edge D
WWAN Main Antenna	13	125	173	9	4	9
WIFI2.4G/BT	13	125	15	4	137	59
WIFI 5G	13	125	15	65	154	4

Note: The diagonal distance of the overall section is 15.5cm.

The Body SAR measurement positions of each band are as below:

Antenna	Front	Back	Edge A	Edge B	Edge C	Edge D
WWAN Antenna Body-Support	Yes	No	No	Yes	Yes	Yes
WIFI Antenna Body-Support	Yes	No	Yes	Yes	No	No
WIFI 5G Antenna Body-Support	Yes	No	Yes	No	No	Yes

Note: According to KDB 941225 D06 v02r01, when antenna-to-edge>2.5cm, SAR is not required.

9. Scaling Factor calculation

Operation Mode	Channel /Frequency	Output Power(dBm)	Tune up Power in tolerance (dBm)	Max. Tune up(dBm)	Scaling Factor
GPRS850 (GPRS 4Tx)	128/824.2	26.56	26.0 ± 1.0	27.00	1.107
	190/836.6	26.95	26.0 ± 1.0	27.00	1.012
	251/848.8	26.48	26.0 ± 1.0	27.00	1.127
GPRS1900 (GPRS 4Tx)	512/1850.2	23.23	23.0 ± 1.0	24.00	1.194
	661/1880.0	23.58	23.0 ± 1.0	24.00	1.102
	810/1909.8	23.36	23.0 ± 1.0	24.00	1.159
WCDMA850	4132/826.4	22.18	21.5 ± 1.0	22.50	1.076
	4183/836.6	22.28	21.5 ± 1.0	22.50	1.052
	4233/846.6	22.26	21.5 ± 1.0	22.50	1.057
WCDMA1900	9262/1852.4	19.08	18.5 ± 1.0	19.50	1.102
	9400/1880.0	19.15	18.5 ± 1.0	19.50	1.084
	9538/1907.6	18.97	18.5 ± 1.0	19.50	1.130
LTE B5 10MHz 1RB#0	20450/829	22.66	22.0 ± 1.0	23.00	1.081
	20525/836.5	22.80	22.0 ± 1.0	23.00	1.047
	20600/844	22.56	22.0 ± 1.0	23.00	1.107
LTE B5 10MHz 25RB#0	20450/829	22.25	21.5 ± 1.0	22.50	1.059
	20525/836.5	22.32	21.5 ± 1.0	22.50	1.042
	20600/844	22.26	21.5 ± 1.0	22.50	1.057
LTE B7 20MHz 1RB#0	20850/2510	19.27	18.5 ± 1.0	19.50	1.054
	21100/2535	19.38	18.5 ± 1.0	19.50	1.028
	21350/2560	19.21	18.5 ± 1.0	19.50	1.069
LTE B7 20MHz 50RB#0	20850/2510	18.88	18.0 ± 1.0	19.00	1.028
	21100/2535	18.95	18.0 ± 1.0	19.00	1.012
	21350/2560	18.68	18.0 ± 1.0	19.00	1.076
LTE B41 20MHz 1RB#0	39750/2506	21.71	21.0 ± 1.0	22.00	1.069
	40620/2593	21.76	21.0 ± 1.0	22.00	1.057
	41490/2680	21.68	21.0 ± 1.0	22.00	1.076
LTE B41 20MHz 50RB#0	39750/2506	21.18	20.5 ± 1.0	21.50	1.076
	40620/2593	21.35	20.5 ± 1.0	21.50	1.035
	41490/2680	21.12	20.5 ± 1.0	21.50	1.091
WIFI 2.4G 802.11b	1/2412	16.20	16.0 ± 1.0	17.00	1.202
	6/2437	16.69	16.0 ± 1.0	17.00	1.074
	11/2462	16.50	16.0 ± 1.0	17.00	1.122

WIFI 5G BAND I	44/5220	14.52	14.0 ± 1.0	15.00	1.096
WIFI 5G BAND II	52/5260	14.90	14.5 ± 1.0	15.50	1.109
WIFI 5G BAND III	140/5700	15.44	15.5 ± 1.0	16.50	1.086
WIFI 5G BAND IV	149/5745	15.43	15.5 ± 1.0	15.00	1.086
CDMA BC0 1XRTT(RC1 SO55)	1013/824.7	22.42	22.0 ± 1.0	23.00	1.143
	384/836.5	22.64	22.0 ± 1.0	23.00	1.086
	777/848.3	22.61	22.0 ± 1.0	23.00	1.094
CDMA BC0 1XRTT(RC3 SO32)	1013/824.7	22.16	21.5 ± 1.0	22.50	1.081
	384/836.5	22.43	21.5 ± 1.0	22.50	1.016
	777/848.3	22.35	21.5 ± 1.0	22.50	1.035
CDMA BC0 (1xEVDO (Rel.A))	1013/824.7	22.03	21.5 ± 1.0	22.50	1.114
	384/836.5	22.22	21.5 ± 1.0	22.50	1.067
	777/848.3	22.14	21.5 ± 1.0	22.50	1.086
RFID	902.7MHz	28.57	28.0 ± 1.0	29.00	1.104
	915.3MHz	28.63	28.0 ± 1.0	29.00	1.089
	927.3MHz	28.34	28.0 ± 1.0	29.00	1.164

Note: for LTE power tolerance, only QPSK modulation mode was provide here.

10. Test Results

Results overview of GSM850

Body-Support &Hotspot Mode(5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Face Upward	190/836.6	GPRS 4Tx	0.759	1.52	1.012	0.768	/
Edge A	190/836.6	GPRS 4Tx	0.226	-0.24	1.012	0.229	/
Edge B	190/836.6	GPRS 4Tx	0.453	-3.26	1.012	0.458	/
Edge C	128/824.2	GPRS 4Tx	0.982	-2.44	1.107	1.087	/
Edge C	190/836.6	GPRS 4Tx	**1.081**	-2.53	1.012	**1.094**	Yes
Edge C	251/848.8	GPRS 4Tx	0.970	-1.66	1.127	1.093	/
Edge C repeat	128/824.2	GPRS 4Tx	0.901	-2.98	1.107	0.997	/
Edge C repeat	190/836.6	GPRS 4Tx	0.992	-1.31	1.012	1.004	/
Edge C repeat	251/848.8	GPRS 4Tx	0.889	-1.20	1.127	1.002	/
Edge D	190/836.6	GPRS 4Tx	0.538	3.31	1.012	0.544	/

Results overview of GSM1900

Body-Support &Hotspot Mode(5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Face Upward	661/1880.0	GPRS 4Tx	0.621	-4.84	1.102	0.684	/
Edge A	661/1880.0	GPRS 4Tx	0.103	4.25	1.102	0.114	/
Edge B	661/1880.0	GPRS 4Tx	0.126	1.05	1.102	0.139	/
Edge C	512/1850.2	GPRS 4Tx	0.776	-1.54	1.194	0.927	/
Edge C	661/1880.0	GPRS 4Tx	**0.845**	-2.02	1.102	**0.931**	Yes
Edge C	810/1909.8	GPRS 4Tx	0.800	-3.06	1.159	0.927	/
Edge C repeat	512/1850.2	GPRS 4Tx	0.734	-4.42	1.194	0.876	/
Edge C repeat	661/1880.0	GPRS 4Tx	0.813	-2.36	1.102	0.896	/
Edge C repeat	810/1909.8	GPRS 4Tx	0.766	-1.33	1.159	0.888	/
Edge D	661/1880.0	GPRS 4Tx	0.154	-1.79	1.102	0.170	/

Results overview of WCDMA1900

Body-Support &Hotspot Mode(5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Face Upward	9400/1880.0	RMC	0.326	-1.74	1.084	0.353	/
Edge A	9400/1880.0	RMC	0.102	-4.86	1.084	0.111	/
Edge B	9400/1880.0	RMC	0.098	-2.20	1.084	0.106	/
Edge C	9400/1880.0	RMC	**0.693**	-3.88	1.084	**0.751**	Yes
Edge D	9400/1880.0	RMC	0.165	-3.91	1.084	0.179	/

Results overview of WCDMA850

Body-Support &Hotspot Mode(5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Face Upward	4183/836.6	RMC	0.274	0.41	1.052	0.288	/
Edge A	4183/836.6	RMC	0.138	-4.23	1.052	0.145	/
Edge B	4183/836.6	RMC	0.107	-1.02	1.052	0.113	/
Edge C	4183/836.6	RMC	**0.589**	-3.34	1.052	**0.620**	Yes
Edge D	4183/836.6	RMC	0.188	-1.27	1.052	0.198	/

Results overview of FDD LTE Band 5, QPSK, 10MHz Bandwidth

Body-Support &Hotspot Mode(5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)
1RB#0							
Face Upward	20525/836.5	Data	0.467	-1.250	1.047	0.489	/
Edge A	20525/836.5	Data	0.144	-2.970	1.047	0.151	/
Edge B	20525/836.5	Data	0.492	-0.840	1.047	0.515	/
Edge C	20525/836.5	Data	0.763	-0.350	1.047	0.799	/
Edge D	20450/829	Data	0.784	-3.510	1.081	0.848	/
Edge D	20525/836.5	Data	**0.813**	0.350	1.047	**0.851**	Yes
Edge D	20600/844	Data	0.762	-1.510	1.107	0.844	/
Edge D repeat	20450/829	Data	0.760	1.630	1.081	0.822	/
Edge D repeat	20525/836.5	Data	0.796	-2.280	1.047	0.833	/
Edge D repeat	20600/844	Data	0.744	-2.490	1.107	0.824	/
50%RB#0							
Face Upward	20525/836.5	Data	0.426	-2.330	1.042	0.444	/
Edge A	20525/836.5	Data	0.120	-1.060	1.042	0.125	/
Edge B	20525/836.5	Data	0.458	-2.410	1.042	0.477	/
Edge C	20525/836.5	Data	0.721	-3.330	1.042	0.751	/
Edge D	20450/829	Data	0.755	-2.050	1.059	0.800	/
Edge D	20525/836.5	Data	0.789	-3.210	1.042	0.822	/
Edge D	20600/844	Data	0.762	-1.840	1.057	0.805	/

Results overview of FDD LTE Band 7, QPSK, 20MHz Bandwidth

Body-Support &Hotspot Mode(5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)
1RB#0							
Face Upward	21100/2535	Data	0.221	-2.160	1.028	0.227	/
Edge A	21100/2535	Data	0.131	-2.540	1.028	0.135	/
Edge B	21100/2535	Data	0.433	-2.180	1.028	0.445	/
Edge C	20850/2510	Data	1.046	-2.150	1.054	1.102	/
Edge C	21100/2535	Data	**1.125**	-0.960	1.028	**1.157**	Yes
Edge C	21350/2560	Data	1.030	-0.210	1.069	1.101	/
Edge C repeat	20850/2510	Data	1.022	-1.140	1.054	1.077	/
Edge C repeat	21100/2535	Data	1.067	-0.890	1.028	1.097	/
Edge C repeat	21350/2560	Data	1.008	-2.640	1.069	1.078	/
Edge D	21100/2535	Data	0.195	-0.070	1.028	0.200	/
50%RB#0							
Face Upward	21100/2535	Data	0.198	-1.400	1.012	0.200	/
Edge A	21100/2535	Data	0.103	-2.610	1.012	0.104	/
Edge B	21100/2535	Data	0.401	-3.350	1.012	0.406	/
Edge C	20850/2510	Data	1.001	-3.340	1.028	1.029	/
Edge C	21100/2535	Data	1.023	-0.320	1.012	1.035	/
Edge C	21350/2560	Data	0.958	-0.070	1.076	1.031	/
Edge C repeat	20850/2510	Data	0.978	-1.590	1.028	1.005	/
Edge C repeat	21100/2535	Data	0.999	-3.540	1.012	1.011	/
Edge C repeat	21350/2560	Data	0.934	-2.210	1.076	1.005	/
Edge D	21100/2535	Data	0.145	-1.170	1.012	0.147	/

Results overview of FDD LTE Band 41, QPSK, 20MHz Bandwidth

Body-Support &Hotspot Mode(5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)
1RB#0							
Face Upward	40620/2593	Data	0.200	-0.750	1.057	0.211	/
Edge A	40620/2593	Data	0.122	3.780	1.057	0.129	/
Edge B	40620/2593	Data	0.414	-0.930	1.057	0.438	/
Edge C	39750/2506	Data	1.010	-3.650	1.069	1.080	/
Edge C	40620/2593	Data	**1.031**	-2.730	1.057	**1.090**	Yes
Edge C	41490/2680	Data	1.006	-1.120	1.076	1.082	/
Edge C repeat	39750/2506	Data	0.985	-2.310	1.069	1.053	/
Edge C repeat	40620/2593	Data	1.001	-4.210	1.057	1.058	/
Edge C repeat	41490/2680	Data	0.974	-3.650	1.076	1.048	/
Edge D	40620/2593	Data	0.139	4.030	1.057	0.147	/
50%RB#0							
Face Upward	40620/2593	Data	0.171	-1.010	1.035	0.177	/
Edge A	40620/2593	Data	0.100	-0.080	1.035	0.104	/
Edge B	40620/2593	Data	0.388	0.610	1.035	0.402	/
Edge C	39750/2506	Data	0.844	-2.430	1.076	0.908	
Edge C	40620/2593	Data	0.892	-1.470	1.035	0.923	/
Edge C	41490/2680	Data	0.826	-1.850	1.091	0.901	
Edge C repeat	39750/2506	Data	0.816	-0.330	1.076	0.878	
Edge C repeat	40620/2593	Data	0.850	-1.890	1.035	0.880	
Edge C repeat	41490/2680	Data	0.804	-3.770	1.091	0.877	
Edge D	40620/2593	Data	0.110	-2.360	1.035	0.114	/

Results overview of BC0

Body-Support &Hotspot Mode(5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Face Upward	384/836.5	1XRTT (RC3 SO32)	0.262	-0.15	1.067	0.280	/
Edge A	384/836.5	1XRTT (RC3 SO32)	0.122	-4.72	1.067	0.130	/
Edge B	384/836.5	1XRTT (RC3 SO32)	**0.399**	-1.56	1.067	**0.426**	Yes
Edge C	384/836.5	1XRTT (RC3 SO32)	0.166	-4.84	1.067	0.177	/
Edge D	384/836.5	1XRTT (RC3 SO32)	0.301	-1.31	1.067	0.321	/

Results overview of RFID

Body-Support Mode(5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Face Upward	2/915.3	RFID	0.121	3.44	1.089	0.132	/
Edge A	2/915.3	RFID	**0.343**	-4.32	1.089	**0.374**	Yes
Edge B	2/915.3	RFID	0.112	4.77	1.089	0.122	/
Edge C	2/915.3	RFID	0.136	-2.15	1.089	0.148	/
Edge D	2/915.3	RFID	0.155	-1.06	1.089	0.169	/

Results overview of WIFI2.4G 802.11b

Body-Support &Hotspot Mode(5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Face Upward	6/2437	DSSS	0.417	-4.01	1.074	0.448	/
Edge A	6/2437	DSSS	0.156	-2.11	1.074	0.168	/
Edge B	6/2437	DSSS	0.332	-0.92	1.074	0.357	/
Edge C	6/2437	DSSS	0.129	3.37	1.074	0.139	/
Edge D	6/2437	DSSS	**0.543**	3.12	1.074	**0.583**	Yes

Results overview of 5G 802.11a(20MHz)

Body-Support (5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Face Upward	44/5220	OFDM	**0.303**	2.720	1.096	**0.332**	Yes
Edge A	44/5220	OFDM	0.122	-2.150	1.096	0.134	/
Edge B	44/5220	OFDM	0.154	-3.060	1.096	0.169	/
Edge C	44/5220	OFDM	0.108	-1.170	1.096	0.118	/
Edge D	44/5220	OFDM	0.189	-0.080	1.096	0.207	/

Results overview of 5G 802.11a(20MHz)

Body-Support (5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Face Upward	52/5260	OFDM	**0.288**	-3.340	1.109	**0.319**	Yes
Edge A	52/5260	OFDM	0.107	-0.180	1.109	0.119	/
Edge B	52/5260	OFDM	0.130	-0.450	1.109	0.144	/
Edge C	52/5260	OFDM	0.091	-2.690	1.109	0.101	/
Edge D	52/5260	OFDM	0.165	-3.310	1.109	0.183	/

Results overview of 5G 802.11a(20MHz)

Body-Support (5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Face Upward	140/5700	OFDM	**0.348**	-0.810	1.086	**0.378**	Yes
Edge A	140/5700	OFDM	0.145	-3.220	1.086	0.157	/
Edge B	140/5700	OFDM	0.173	-1.890	1.086	0.188	/
Edge C	140/5700	OFDM	0.136	-2.210	1.086	0.148	/
Edge D	140/5700	OFDM	0.202	-2.090	1.086	0.219	/

Results overview of 5G 802.11a(20MHz)

Body-Support (5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Face Upward	149/5745	OFDM	**0.265**	-0.640	1.086	**0.288**	Yes
Edge A	149/5745	OFDM	0.089	0.860	1.086	0.097	/
Edge B	149/5745	OFDM	0.111	1.620	1.086	0.121	/
Edge C	149/5745	OFDM	0.078	-2.740	1.086	0.085	/
Edge D	149/5745	OFDM	0.139	-1.590	1.086	0.151	/

Note:

Per KDB941225 D06 v02r01, When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. As the manufacture requirement the separation distance use 5mm for Hotspot mode.

Per KDB Publication 941225 D01v03r01. RMC 12.2kbps was as primary mode SAR, when the primary mode SAR less than 1.2W/kg, secondary SAR (HSPA) was not requires.

When the 1-g SAR for the mid-band channel or the channel with the highest output power satisfy the following conditions, testing of the other channels in the band is not required. (Per KDB 447498 D01 General RF Exposure Guidance v06)

- ≤ 0.8 W/kg, when the transmission band is ≤ 100 MHz
- ≤ 0.6 W/kg, when the transmission band is between 100 MHz and 200 MHz
- ≤ 0.4 W/kg, when the transmission band is ≥ 200 MHz

11. Simultaneous Transmissions Analysis

Localized Specific Absorption Rate (SAR) of this portable wireless device has been measured in all cases requested by the relevant standards cited in Clause 6 of this report. Maximum localized SAR is **below** exposure limits specified in the relevant standards.

Simultaneous SAR

No.	Transmitter Combinations	Scenario Supported or not	Supported for Mobile Hotspot or not
1	WWAN+BT	Yes	No
2	WWAN + WIFI 2.4G	Yes	Yes
3	WWAN + WIFI 5G	Yes	No
4	WWAN+RFID	Yes	No
5	WIFI 2.4G+BT	Yes	No
6	WIFI 2.4G+5G	No	No
7	WLAN+RFID	Yes	No

Simultaneous Tx Combination of GSM/WCDMA/LTE and WIFI&RFID (Body).

Test Position		Face	Back	Edge A	Edge B	Edge C	Edge D
Body-Support 5mm separation MAX 1-g SAR(W/Kg)	GSM850	0.768	/	0.229	0.458	1.094	0.544
	GSM1900	0.684	/	0.114	0.139	0.931	0.170
	WCDMA 850	0.288	/	0.145	0.113	0.620	0.198
	WCDMA 1900	0.353	/	0.111	0.106	0.751	0.179
	LTE Band5	0.489	/	0.151	0.515	0.799	0.851
	LTE Band7	0.227	/	0.135	0.445	1.157	0.200
	LTE Band 41	0.211	/	0.129	0.438	1.090	0.147
	CDMA BC0	0.280	/	0.130	0.426	0.177	0.321
	RFID	0.132	/	0.374	0.122	0.148	0.169
	2.4G WIFI 802.11b	0.448	/	0.168	0.357	0.139	0.583
	5G WIFI	0.378	/	0.157	0.188	0.148	0.219
2.4G WIFI Simultaneous ∑1-g SAR(W/Kg)		1.216	/	0.397	0.872	1.296	1.434
5G WIFI Simultaneous ∑1-g SAR(W/Kg)		1.146	/	0.386	0.703	1.305	1.070
RFID Simultaneous ∑1-g SAR(W/Kg)		0.900	/	0.603	0.637	1.305	1.020

The estimated SAR value with * Signal

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required

12.Measurement Uncertainty

No.	Uncertainty Component	Type	Uncertainty Value (%)	Probability Distribution	k	ci	Standard Uncertainty (%) ui(%)	Degree of freedom Veff or vi
	Measurement System							
1	- Probe Calibration	B	5.8	N	1	1	5.8	∞
2	- Axial isotropy	B	3.5	R	$\sqrt{3}$	0.5	1.43	∞
3	—Hemispherical Isotropy	B	5.9	R	$\sqrt{3}$	0.5	2.41	∞
4	- Boundary Effect	B	1	R	$\sqrt{3}$	1	0.58	∞
5	- Linearity	B	4.7	R	$\sqrt{3}$	1	2.71	∞
6	- System Detection Limits	B	1.0	R	$\sqrt{3}$	1	0.58	∞
7	Modulation response	B	3	N	1	1	3.00	
8	- Readout Electronics	B	0.5	N	1	1	0.50	∞
9	- Response Time	B	1.4	R	$\sqrt{3}$	1	0.81	∞
10	- Integration Time	B	3.0	R	$\sqrt{3}$	1	1.73	∞
11	- RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.73	∞
12	- Probe Position Mechanical tolerance	B	1.4	R	$\sqrt{3}$	1	0.81	∞
13	- Probe Position with respect to Phantom Shell	B	1.4	R	$\sqrt{3}$	1	0.81	∞
14	- Extrapolation, Interpolation and Integration Algorithms for Max. SAR evaluation	B	2.3	R	$\sqrt{3}$	1	1.33	∞

	Uncertainties of the DUT							
15	- Position of the DUT	A	2.6	N	$\sqrt{3}$	1	2.6	5
16	- Holder of the DUT	A	3	N	$\sqrt{3}$	1	3.0	5
17	- Output Power Variation –SAR drift measurement	B	5.0	R	$\sqrt{3}$	1	2.89	∞
Phantom and Tissue Parameters								
18	- Phantom Uncertainty(shape and thickness tolerances)	B	4	R	$\sqrt{3}$	1	2.31	∞
19	Uncertainty in SAR correction for deviation(in permittivity and conductivity)	B	2	N	1	1	2.00	
20	- Liquid Conductivity Target –tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
21	- Liquid Conductivity –measurement Uncertainty)	B	4	N	$\sqrt{3}$	1	0.92	9
22	- Liquid Permittivity Target tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
23	- Liquid Permittivity –measurement uncertainty	B	5	N	$\sqrt{3}$	1	1.15	∞
Combined Standard Uncertainty				RSS			10.63	
Expanded uncertainty (Confidence interval of 95 %)				K=2			21.26	

System Check Uncertainty

No.	Uncertainty Component	Type	Uncertainty Value (%)	Probability Distribution	k	ci	Standard Uncertainty (%) ui(%)	Degree of freedom Veff or vi
	Measurement System							
1	- Probe Calibration	B	5.8	N	1	1	5.8	∞

2	- Axial isotropy	B	3.5	R	$\sqrt{3}$	0.5	1.43	∞
3	—Hemispherical Isotropy	B	5.9	R	$\sqrt{3}$	0.5	2.41	∞
4	- Boundary Effect	B	1	R	$\sqrt{3}$	1	0.58	∞
5	- Linearity	B	4.7	R	$\sqrt{3}$	1	2.71	∞
6	- System Detection Limits	B	1	R	$\sqrt{3}$	1	0.58	∞
7	Modulation response	B	0	N	1	1	0.00	
8	- Readout Electronics	B	0.5	N	1	1	0.50	∞
9	- Response Time	B	0.00	R	$\sqrt{3}$	1	0.00	∞
10	- Integration Time	B	1.4	R	$\sqrt{3}$	1	0.81	∞
11	- RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.73	∞
12	- Probe Position Mechanical tolerance	B	1.4	R	$\sqrt{3}$	1	0.81	∞
13	- Probe Position with respect to Phantom Shell	B	1.4	R	$\sqrt{3}$	1	0.81	∞
14	- Extrapolation, Interpolation and Integration Algorithms for Max. SAR evaluation	B	2.3	R	$\sqrt{3}$	1	1.33	∞
	Uncertainties of the DUT							
15	Deviation of experimental source from numberical source	A	4	N	1	1	4.00	5
16	Input Power and SAR drift measurement	A	5	R	$\sqrt{3}$	1	2.89	5
17	Dipole Axis to Liquid Distance	B	2	R	$\sqrt{3}$	1	1.2	∞

Phantom and Tissue Parameters								
18	- Phantom Uncertainty(shape and thickness tolerances)	B	4	R	$\sqrt{3}$	1	2.31	∞
19	Uncertainty in SAR correction for deviation(in permittivity and conductivity)	B	2	N	1	1	2.00	
20	- Liquid Conductivity Target –tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
21	- Liquid Conductivity –measurement Uncertainty)	B	4	N	$\sqrt{3}$	1	0.92	9
22	- Liquid Permittivity Target tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
23	- Liquid Permittivity –measurement uncertainty	B	5	N	$\sqrt{3}$	1	1.15	∞
Combined Standard Uncertainty				RSS			10.15	
Expanded uncertainty (Confidence interval of 95 %)				K=2			20.29	

13. Equipment List

This table is a complete overview of the SAR measurement equipment. Devices used during the test described are marked ☒.

	EQUIPMENT	Model	Serial number	Calibration Date	Due Date
☒	SAR Probe	SSE2	SN27/15 EPGO261	2019/03/04	2020/03/03
☒	Dipole	SID750	SN 23/15 DIP0G750-378	2017/11/27	2019/11/26
☒	Dipole	SID835	SN 09/13 DIP0G835-217	2017/11/27	2019/11/26
☐	Dipole	SID900	SN 09/13 DIP0G900-215	2017/11/27	2019/11/26
☐	Dipole	SID1800	SN 09/13 DIP1G800-216	2017/11/27	2019/11/26
☒	Dipole	SID1900	SN 09/13 DIP2G000-218	2017/11/27	2019/11/26
☐	Dipole	SID2000	SN 09/13 DIP2G000-219	2017/11/27	2019/11/26
☒	Dipole	SID2450	SN_09/13_DIP2G450-220	2017/11/27	2019/11/26
☒	Dipole	SID2600	SN 32/14_DIP2G600-338	2017/11/27	2019/11/26
☒	Dipole	SWG5500	SN15/15 WGA39	2017/11/27	2019/11/26
☒	Multimeter	Keithley-2000	4085310	2018/09/06	2019/09/05
☒	System Simulator(Agilent 8960)	E5515C	GB 47200710	2017/11/08	2019/11/07
☒	System Simulator(R&S)	CMW500	130805	2017/08/29	2019/08/28
☒	KEYSIGHT	E7515A	MY56040357	2019/04/01	2020/04/01
☒	Vector Network Analyzer(R&S)	ZVB8	A0802530	2019/04/17	2020/04/17
☒	PC 3.5 Fixed Match Calibration Kit	ZV-Z32	100571	2017/11/29	2019/11/28
☒	Dielectric Probe Kit	SCLMP	SN 09/13 OCPG51	2017/11/27	2019/11/26
☒	Signal Generator	SMU200A	A140801888	2019/04/01	2020/04/01
☒	Amplifier	Nucletudes	143060	2019/03/26	2020/03/25
☒	Directional Coupler	DC6180A	305827	2019/03/26	2020/03/25
☒	Power Meter	NRP2	A140401673	2019/03/26	2020/03/25
☒	Power Sensor	NPR-Z11	1138.3004.02-114072-nq	2019/03/26	2020/03/25
☒	Power Meter	NRVS	A0802531	2019/03/26	2020/03/25
☒	Power Sensor	NRV-Z4	100069	2019/03/26	2020/03/25

ANNEX A: Appendix A: SAR System performance Check Plots

(Please See Appendix A)

ANNEX B: Appendix B: SAR Measurement results Plots

(Please See Appendix B)

ANNEX C: Appendix C: Calibration reports

(Please See Appendix C)

ANNEX D: Appendix D: SAR Test Setup

(Please See Appendix D)

—End of the Report—