



SAR TEST REPORT

Report No.: SET2020-11708

Product: HARMAN VISION

Brand Name: HARMAN VISION

Model No.: HSV-10NA-AA

FCC ID: 2AHPN-HSV-10NA-AA

Applicant: Harman International Industries Incorporated

Address: 30001 , Cabot Drive, Novi, MI 48377, USA

Issued by: CCIC Southern Testing Co., Ltd.

Lab Location: Electronic Testing Building, No. 43 Shahe Road, Xili Street,
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Test Report

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Brand Name.....: HARMAN VISION
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Applicant.....: Harman International Industries Incorporated
Applicant Address.....: 30001 , Cabot Drive, Novi, MI 48377, USA
Manufacturer.....: Harman International Industries Incorporated
Manufacturer Address: 30001 , Cabot Drive, Novi, MI 48377, USA
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.....: 2020.09.22-2020.09.25
Tested by: Xinyuan Fang 2020-09-27
Xinyuan Fang, Test Engineer
Reviewed by.....: Chris You 2020-09-27
Chris You, Senior Engineer
Approved by.....: Shuangwen Zhang 2020-09-27
Shuangwen Zhang, Manager



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1. Administrative Data

1.1 Testing Laboratory

Test Site: CCIC Southern Testing Co., Ltd.

Address: Electronic Testing Building, No. 43 Shahe Road, Xili Street, Nanshan District, Shenzhen, Guangdong, China

CNAS Lab Code: CCIC-SET is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

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, 2020.

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, 2020.

Test Environment Temperature (°C): 21 °C

Condition: Relative Humidity (%): 60%

Atmospheric Pressure (kPa): 86KPa-106KPa



2. Equipment Under Test (EUT)

Identification of the Equipment under Test

Device Type: OBD II Telematics Device
Exposure Category: Population/Uncontrolled
Sample Name: HARMAN VISION
Brand Name: HARMAN VISION
Model Name: HSV-10NA-AA

Support Band	GSM850/1900MHz, WCDMA 850/1700/1900MHz LTE Band 2/4/5/7/12/13/25/26/66/71,WIFI 2.4G&5G, BT,GPS
Test Band	GSM850/1900MHz, WCDMA 850/1700/1900MHz LTE Band 2/4/5/7/12/13/25/26/66/71,WIFI 2.4G&5G, BT
Device Class	Class B
Multi Class	\
Development Stage	Identical Prototype
Accessories	Power Supply:DC 12V from Car Battery
General description: Hotspot	2.4GHz WLAN support Hotspot mode
Antenna type	Internal Antenna
Operation mode	GSM /WCDMA /LTE /WIFI /BT
Modulation mode	GSM(GMSK),UMTS(QPSK),LTE(QPSK,16QAM,64QAM), WIFI(OFDM/DSSS),BT(GFSK/ π /4-DQPSK/8-DPSK)
DTM mode	Not support
Hardware Version	V1.0
Software Version	/
Max. SAR Value	Body: 1.216 W/Kg(Limit:1.6W/Kg, 10mm 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
UMTS Band II:	1850-1910 MHz	1930-1990 MHz
UMTS Band IV:	1710-1755 MHz	2110-2155 MHz
UMTS Band V:	824-849 MHz	869-894 MHz
LTE Band2:	1850-1910 MHz	1930-1990 MHz
LTE Band4:	1710-1755 MHz	2110-2155 MHz
LTE Band5:	824-849 MHz	869-894 MHz
LTE Band7:	2500-2570 MHz	2620-2690 MHz
LTE Band12:	698-716 MHz	728-746 MHz
LTE Band13:	777-787 MHz	746-756 MHz
LTE Band25:	1850-1915 MHz	1930-1995 MHz
LTE Band26:	814-849 MHz	859-894 MHz
LTE Band66:	1710-1780 MHz	2110-2200 MHz
LTE Band71:	617-652MHz	663-698MHz
WIFI(tested):	2412-2462 MHz	
	5150-5250 MHz	
	5745-5825 MHz	
Test channels(low-mid-high):	128-190-251(GSM850)	
	512-661-810(GSM1900)	
	9262-9400-9538(UMTS Band II)	
	1312-1412-1513(UMTS Band IV)	
	4132-4183-4233(UMTS Band V)	
	18700-18900-19100(LTE Band 2 Bandwidth 20M)	
	20050-20175-20300(LTE Band 4 Bandwidth 20M)	
	20450-20525-20600(LTE Band 5 Bandwidth 10M)	
	20850-21100-21350(LTE Band 7 Bandwidth 20M)	
	23060-23095-23130(LTE Band 12 Bandwidth 10M)	
	23230(LTE Band 13 Bandwidth 10M)	
	26140-26365-26590(LTE Band 25 Bandwidth 20M)	
	26765-26865-26965(LTE Band 26 Bandwidth 15M)	
	132072-132322-132572(LTE Band 66 Bandwidth 20M)	
	133222-133322-133372(LTE Band 71 Bandwidth 20M)	
	1-6-11(Wi-Fi 2.4G 802.11b)	
5180-5825 (WIFI 5G)		
0-39-78(BT)		



3. SAR Summary

Highest Standalone SAR Summary

Exposure Position	Frequency Band	Scaled 1g-SAR(W/kg)	Highest Scaled 1g-SAR(W/kg)
Body & Hotspot (10mm Gap)	GSM850	0.432	1.216
	GSM1900	0.344	
	WCDMA Band II	0.905	
	WCDMA Band IV	1.121	
	WCDMA Band V	0.382	
	LTE Band 2	0.937	
	LTE Band 4	1.169	
	LTE Band 5	0.303	
	LTE Band 7	1.216	
	LTE Band 12	0.276	
	LTE Band 13	0.396	
	LTE Band 25	1.038	
	LTE Band 26	0.348	
	LTE Band 66	1.032	
	LTE Band 71	0.338	
	WIFI 2.4G 802.11b	0.051	
	WIFI 5G 802.11a	0.225	
	BT	0.114	

Highest Simultaneous SAR Summary

Exposure Position	Frequency Band	Highest Scaled 1g-SAR(W/kg)
Hotspot (10mmGap)	WWAN(LTE Band 7)&WIFI 5G	1.441

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 (ρ). The equation description is as below:

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

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

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

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

where C is the specific heat capacity, δT is the temperature rise and δt the exposure duration, or related to the electrical field in the tissue by

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

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

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

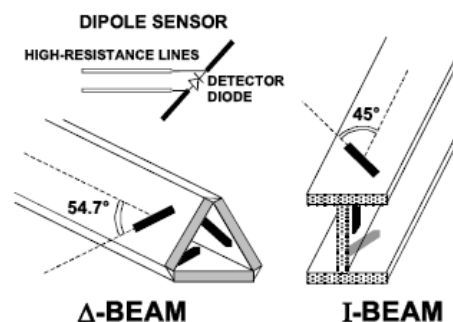


Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	700 MHz to 3 GHz; Linearity: ± 0.5 dB (700 MHz to 3 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 μ W/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%			
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-methyl-3(2H)-isothiazolone, 0.1-0.7%			
Frequency (MHz)	Head ϵ_r	Head σ (S/m)	Body ϵ_r	Body σ (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:

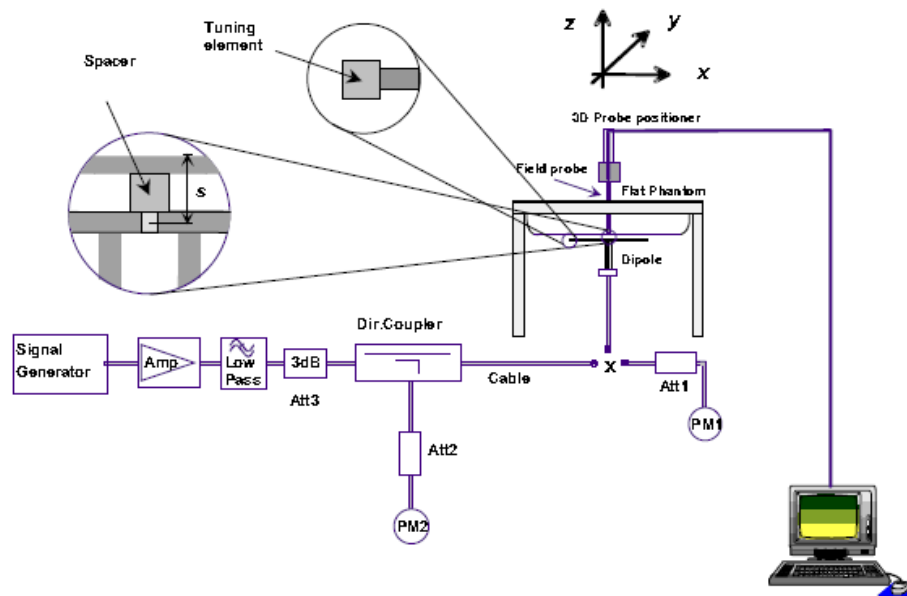
Table 3: Dielectric Performance of Body Tissue Simulating Liquid

Temperature: 23.2 °C; Humidity: 64%;			
/	Frequency	Permittivity ϵ	Conductivity σ (S/m)
Target value	750MHz	55.5 ±5%	0.96 ±5%
Validation value (2020-09-22)	750MHz	55.51	0.96
Target value	835MHz	55.2 ±5%	0.97 ±5%
Validation value (2020-09-22)	835MHz	55.19	0.97
Target value	1800MHz	53.3 ±5%	1.52 ±5%
Validation value (2020-09-23)	1800MHz	53.34	1.56
Target value	1900MHz	53.3 ±5%	1.52 ±5%
Validation value (2020-09-23)	1900MHz	53.28	1.51
Target value	2450MHz	52.7 ±5%	1.95 ±5%
Validation value (2020-09-24)	2450MHz	52.72	1.96
Target value	2600MHz	52.5 ±5%	2.16 ±5%
Validation value (2020-09-24)	2600MHz	52.50	2.16
Target value	5200MHz	49.0 ±5%	5.30 ±5%
Validation value (2020-09-25)	5200MHz	49.03	5.32
Target value	5800MHz	48.2 ±5%	6.0 ±5%
Validation value (2020-09-25)	5800MHz	48.22	6.01

SAR System validation

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of $\pm 10\%$. 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)

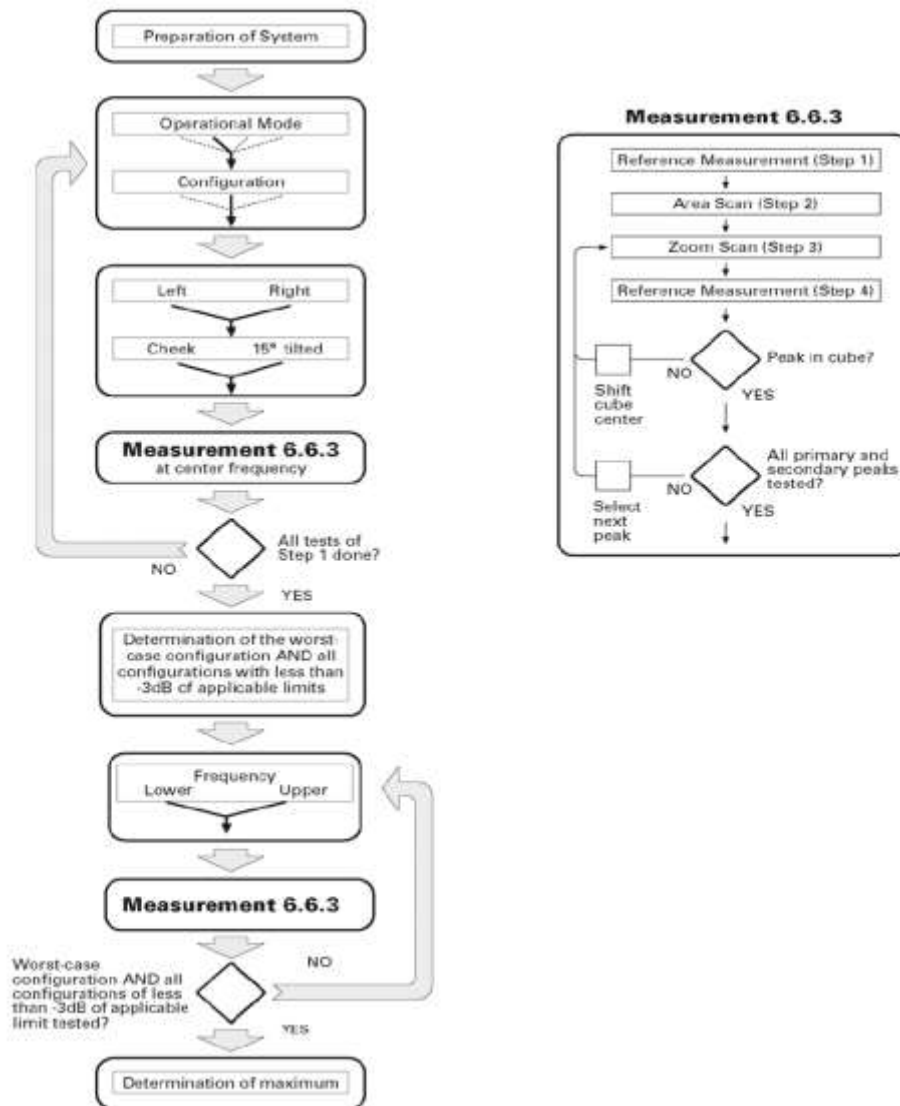
Frequency	Duty cycle	Target value (W/kg)	Test value (W/kg)	
			10 mW	1W
750MHz(2020-09-22)	1:1	8.82 ±10%	0.0891	8.91
835MHz(2020-09-22)	1:1	9.97 ±10%	0.0974	9.74
1800MHz(2020-09-23)	1:1	38.57 ±10%	0.3849	38.49
1900MHz(2020-09-23)	1:1	40.69 ±10%	0.4121	41.21
2450MHz(2020-09-24)	1:1	54.83 ±10%	0.5423	54.23
2600MHz(2020-09-24)	1:1	57.16 ±10%	0.5635	56.35
5200MHz(2020-09-25)	1:1	150.13 ±10%	1.5452	154.52
5800MHz(2020-09-25)	1:1	158.10 ±10%	1.6536	165.36

* 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 IEEE p1528 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	31.33	31.37	31.68	-9.03	22.30	22.34	22.65
	2 Tx Slots	29.27	29.29	29.34	-6.02	23.25	23.27	23.32
	3 Tx Slots	26.75	26.78	26.88	-4.26	22.49	22.52	22.62
	4 Tx Slots	24.55	24.56	24.68	-3.01	21.54	21.55	21.67
EDGE (8PSK)	1 Tx Slot	24.92	25.03	25.07	-9.03	15.89	16.00	16.04
	2 Tx Slots	24.51	24.64	24.67	-6.02	18.49	18.62	18.65
	3 Tx Slots	24.02	24.14	24.17	-4.26	19.76	19.88	19.91
	4 Tx Slots	23.89	23.97	24.01	-3.01	20.88	20.96	21.00
GSM1900		Burst-Averaged output Power (dBm)			Division Factors	Frame-Averaged output Power (dBm)		
		512CH	661CH	810CH		512CH	661CH	810CH
GPRS (GMSK)	1 Tx Slot	28.42	28.68	28.90	-9.03	19.39	19.65	19.87
	2 Tx Slots	26.45	26.66	26.69	-6.02	20.43	20.64	20.67
	3 Tx Slots	24.35	24.53	24.63	-4.26	20.09	20.27	20.37
	4 Tx Slots	21.96	22.14	22.28	-3.01	18.95	19.13	19.27
EDGE (8PSK)	1 Tx Slot	24.02	24.06	24.13	-9.03	14.99	15.03	15.10
	2 Tx Slots	23.51	23.64	23.87	-6.02	17.49	17.62	17.85
	3 Tx Slots	23.27	23.31	23.52	-4.26	19.01	19.05	19.26
	4 Tx Slots	22.64	22.65	22.77	-3.01	19.63	19.64	19.76

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

7.2 WCDMA Conducted output Power

UMTS1900 (Band II)		Average Power (dBm)		
		9262CH	9400CH	9538cH
WCDMA	12.2kbps RMC	22.35	22.54	22.58
HSDPA	Subtest 1	22.09	22.27	22.23
	Subtest 2	22.22	22.42	22.44
	Subtest 3	21.72	21.94	21.96
	Subtest 4	21.71	21.94	21.86
HSUPA	Subtest 1	22.10	22.29	22.24
	Subtest 2	20.23	20.39	20.42
	Subtest 3	20.56	20.61	20.68
	Subtest 4	20.33	20.41	20.71
	Subtest 5	22.25	22.30	22.36
UMTS1700 (Band IV)		Average Power (dBm)		
		1313CH	1413CH	1513CH
WCDMA	12.2kbps RMC	22.29	22.38	22.32
HSDPA	Subtest 1	21.86	22.01	21.87
	Subtest 2	22.05	22.09	22.03
	Subtest 3	21.57	21.62	21.54
	Subtest 4	21.48	21.64	21.49
HSUPA	Subtest 1	21.90	22.08	21.94
	Subtest 2	20.09	20.16	20.11
	Subtest 3	20.01	20.13	20.06
	Subtest 4	19.98	20.07	20.03
	Subtest 5	21.91	22.05	21.96
UMTS850 (Band V)		Average Power (dBm)		
		4132CH	4183CH	4233CH
WCDMA	12.2kbps RMC	22.10	22.15	22.12
HSDPA	Subtest 1	21.59	21.71	21.72
	Subtest 2	21.60	21.67	21.82
	Subtest 3	21.20	21.20	21.34
	Subtest 4	21.19	21.18	21.33
HSUPA	Subtest 1	21.63	21.76	21.78
	Subtest 2	20.16	20.24	20.19
	Subtest 3	20.08	20.21	20.07
	Subtest 4	19.86	19.88	19.73
	Subtest 5	21.55	21.80	21.76

Note:

- WCDMA SAR was tested under RMC 12.2kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. HSPA SAR was not required 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.
- 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 $\leq 0.8\text{W/kg}$, 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 $> 1.45\text{W/kg}$, SAR is required for all three RB offset configurations for that required test channel.



1. LTE Band 2 Conducted Power Test Verdict:

LTE FDD Band 2				Conducted Power(dBm)			Tune up
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			
				18607/1850.7	18900/1880	19193/1909.3	
1.4MHz	QPSK	1	0	22.06	22.26	22.34	21.5±1.0
		1	3	22.26	22.40	22.28	
		1	5	22.26	22.32	22.16	
		3	0	22.30	22.36	22.35	21.5±1.0
		3	2	22.32	22.39	22.37	
		3	3	22.33	22.45	22.33	
	6	0	21.12	21.27	21.22	20.5±1.0	
	16QAM	1	0	21.45	21.37	21.38	20.5±1.0
		1	3	21.22	21.26	21.45	
		1	5	21.36	21.04	21.39	
		3	0	21.28	21.22	21.35	20.0±1.0
		3	2	21.33	21.49	21.30	
		3	3	21.21	21.42	21.26	
		6	0	20.01	20.33	20.21	
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
3MHz	QPSK	1	0	22.28	22.38	22.29	22.0±1.0
		1	7	22.52	22.36	22.25	
		1	14	22.30	22.39	22.10	
		8	0	21.19	21.26	21.33	20.5±1.0
		8	4	21.30	21.31	21.36	
		8	7	21.25	21.34	21.36	
		15	0	21.38	21.33	21.34	20.5±1.0
	16QAM	1	0	21.15	21.19	21.20	21.0±1.0
		1	7	21.60	21.59	21.61	
		1	14	21.13	21.58	21.15	
		8	0	20.21	20.18	20.37	19.5±1.0
		8	4	20.23	20.47	20.29	
		8	7	20.30	20.48	20.26	
		15	0	20.30	20.40	20.43	



LTE FDD Band 2				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				18625/1852.5	18900/1880	19175/1907.5	
5MHz	QPSK	1	0	22.15	22.24	22.18	21.5±1.0
		1	13	22.24	22.31	22.43	
		1	24	22.07	22.33	22.09	
		12	0	21.27	21.33	21.39	20.5±1.0
		12	6	21.16	21.40	21.44	
		12	13	21.16	21.45	21.37	
		25	0	21.29	21.25	21.34	20.5±1.0
	16QAM	1	0	21.65	21.31	21.34	21.0±1.0
		1	13	21.78	21.67	21.75	
		1	24	21.36	21.38	21.39	
		12	0	20.14	20.53	20.38	20.0±1.0
		12	6	20.29	20.32	20.38	
		12	13	20.28	20.32	20.30	
		25	0	20.22	20.26	20.37	19.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				18650/1855	18900/1880	19150/1905	
10MHz	QPSK	1	0	21.97	21.98	22.01	21.5±1.0
		1	25	22.35	22.45	22.40	
		1	49	22.17	22.03	22.25	
		25	0	21.27	21.34	21.46	20.5±1.0
		25	13	21.33	21.32	21.48	
		25	25	21.31	21.26	21.39	
		50	0	21.27	21.32	21.34	20.5±1.0
	16QAM	1	0	21.18	21.06	21.15	20.5±1.0
		1	25	21.27	21.21	21.24	
		1	49	21.25	21.37	21.24	
		25	0	20.28	20.39	20.64	20.0±1.0
		25	13	20.44	20.40	20.34	
		25	25	20.22	20.38	20.30	
		50	0	20.28	20.22	20.45	19.5±1.0



LTE FDD Band 2				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				18675/1857.5	18900/1880	19125/1902.5	
15MHz	QPSK	1	0	22.05	22.06	22.13	22.0±1.0
		1	38	22.55	22.46	22.54	
		1	74	22.05	22.14	22.18	
		36	0	21.29	21.29	21.40	20.5±1.0
		36	18	21.45	21.29	21.43	
		36	39	21.16	21.29	21.35	
		75	0	21.23	21.34	21.37	20.5±1.0
	16QAM	1	0	21.59	21.57	21.41	21.0±1.0
		1	38	21.54	21.56	21.67	
		1	74	21.32	21.39	21.54	
		36	0	20.09	20.34	20.56	20.0±1.0
		36	18	20.38	20.32	20.33	
		36	39	20.27	20.28	20.39	
		75	0	20.36	20.30	20.35	19.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				18700/1860	18900/1880	19100/1900	
20MHz	QPSK	1	0	22.20	22.21	22.23	22.0±1.0
		1	50	22.55	22.34	22.63	
		1	99	22.22	22.32	22.43	
		50	0	21.26	21.33	21.37	20.5±1.0
		50	25	21.32	21.24	21.35	
		50	50	21.14	21.23	21.24	
		100	0	21.17	21.18	21.35	20.5±1.0
	16QAM	1	0	20.96	21.01	21.39	20.5±1.0
		1	50	21.09	21.18	21.29	
		1	99	20.90	21.07	20.90	
		50	0	20.38	20.10	20.48	19.5±1.0
		50	25	20.42	20.42	20.42	
		50	50	20.20	20.31	20.36	
		100	0	20.28	20.29	20.27	19.5±1.0



2. LTE Band 4 Conducted Power Test Verdict:

LTE FDD Band 4				Conducted Power(dBm)						
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up			
				19957/1710.7	20175/1732.5	20393/1754.3				
1.4MHz	QPSK	1	0	22.17	22.10	22.07	21.5±1.0			
		1	3	22.23	22.13	22.12				
		1	5	22.36	22.13	22.12				
		3	0	22.35	22.20	22.22	21.5±1.0			
		3	2	22.47	22.32	22.19				
		3	3	22.26	22.30	22.19				
	16QAM	16QAM	6	0	21.25	21.24	21.24	20.5±1.0		
			1	0	21.45	21.11	21.08	20.5±1.0		
			1	3	21.46	21.19	21.03			
			1	5	21.30	21.20	21.06			
			3	0	21.53	21.17	21.22	21.0±1.0		
			3	2	21.59	21.17	21.30			
			3	3	21.62	21.39	21.34			
			6	0	20.23	19.95	20.28	19.5±1.0		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up			
				19965/1711.5	20175/1732.5	20385/1753.5				
3MHz	QPSK	1	0	22.11	21.89	22.08	21.5±1.0			
		1	7	22.20	22.32	22.22				
		1	14	22.02	22.06	22.17				
		16QAM	16QAM	8	0	21.23	21.15	21.34	20.5±1.0	
				8	4	21.44	21.29	21.17		
				8	7	21.37	21.31	21.14		
				15	0	21.40	21.24	21.33	20.5±1.0	
	16QAM			16QAM	1	0	21.20	21.23	21.12	20.5±1.0
					1	7	21.27	21.05	21.31	
					1	14	21.34	20.90	21.24	
		8	0		20.56	20.18	20.25	20.0±1.0		
		8	4		20.35	20.14	20.17			
		8	7		20.35	20.25	20.13			
		15	0		20.18	20.23	20.27	19.5±1.0		



LTE FDD Band 4				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				19975/1712.5	20175/1732.5	20375/1752.5	
5MHz	QPSK	1	0	22.08	22.09	22.03	21.5±1.0
		1	13	22.18	22.37	22.20	
		1	24	22.11	22.23	22.04	
		12	0	21.40	21.16	21.45	20.5±1.0
		12	6	21.33	21.34	21.40	
		12	13	21.29	21.34	21.33	
		25	0	21.25	21.32	21.44	20.5±1.0
	16QAM	1	0	21.11	21.08	21.02	20.5±1.0
		1	13	21.05	21.07	21.08	
		1	24	20.84	20.61	20.86	
		12	0	20.15	20.28	20.37	19.5±1.0
		12	6	20.14	20.36	20.31	
		12	13	20.14	20.38	20.21	
		25	0	20.20	20.25	20.24	19.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
10MHz	QPSK	1	0	22.07	22.08	22.22	21.5±1.0
		1	25	22.45	22.39	22.31	
		1	49	22.19	22.08	22.16	
		25	0	21.41	21.34	21.53	21.0±1.0
		25	13	21.29	21.24	21.46	
		25	25	21.12	21.27	21.35	
		50	0	21.32	21.28	21.43	20.5±1.0
	16QAM	1	0	21.13	21.19	21.11	20.5±1.0
		1	25	21.10	21.12	21.15	
		1	49	21.07	21.20	21.30	
		25	0	20.38	20.21	20.41	19.5±1.0
		25	13	20.47	20.32	20.36	
		25	25	20.06	20.20	20.32	
		50	0	20.31	20.25	20.52	20.0±1.0



LTE FDD Band 4				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				20025/1717.5	20175/1732.5	20325/1747.5	
15MHz	QPSK	1	0	22.21	22.02	22.50	21.5±1.0
		1	38	22.43	22.49	22.29	
		1	74	22.00	22.41	22.33	
		36	0	21.31	21.31	21.51	21.0±1.0
		36	18	21.32	21.32	21.35	
		36	39	21.21	21.26	21.43	
		75	0	21.28	21.31	21.42	20.5±1.0
	16QAM	1	0	21.40	21.56	21.35	21.0±1.0
		1	38	21.27	21.39	21.12	
		1	74	21.08	21.19	21.16	
		36	0	20.26	20.16	20.55	20.0±1.0
		36	18	20.20	20.18	20.39	
		36	39	20.12	20.16	20.21	
		75	0	20.24	20.21	20.27	19.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				20050/1720	20175/1732.5	20300/1745	
20MHz	QPSK	1	0	22.20	22.15	22.36	22.0±1.0
		1	50	22.51	22.59	22.61	
		1	99	22.11	22.16	22.17	
		50	0	21.38	21.32	21.61	21.0±1.0
		50	25	21.30	21.33	21.48	
		50	50	21.27	21.26	21.35	
		100	0	21.33	21.29	21.44	20.5±1.0
	16QAM	1	0	21.41	21.43	21.45	21.0±1.0
		1	50	21.30	21.36	21.38	
		1	99	21.33	21.61	21.65	
		50	0	20.37	20.21	20.65	20.0±1.0
		50	25	20.30	20.34	20.51	
		50	50	20.29	20.28	20.22	
		100	0	20.18	20.11	20.38	19.5±1.0



3. LTE Band 5 Conducted Power Test Verdict:

LTE FDD Band 5				Conducted Power(dBm)			Tune up
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			
				20407/824.7	20525/836.5	20643/848.3	
1.4MHz	QPSK	1	0	22.10	22.20	22.23	21.5±1.0
		1	3	22.12	22.21	22.22	
		1	5	22.12	22.20	22.23	
		3	0	22.22	22.20	22.23	21.5±1.0
		3	2	22.18	22.22	22.28	
		3	3	22.21	22.12	22.20	
		6	0	21.23	21.34	21.30	20.5±1.0
	16QAM	1	0	21.24	21.43	21.01	20.5±1.0
		1	3	21.04	21.33	20.86	
		1	5	21.37	21.09	21.16	
		3	0	21.20	21.36	21.17	20.5±1.0
		3	2	21.28	21.38	21.30	
		3	3	21.50	21.45	21.17	
		6	0	20.28	20.28	20.19	19.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
3MHz	QPSK	1	0	22.03	22.20	22.24	21.5±1.0
		1	7	22.20	22.30	22.32	
		1	14	22.30	22.08	21.85	
		8	0	21.42	21.32	21.47	20.5±1.0
		8	4	21.43	21.23	21.37	
		8	7	21.37	21.23	21.17	
		15	0	21.19	21.39	21.38	20.5±1.0
	16QAM	1	0	21.37	21.42	21.45	20.5±1.0
		1	7	21.22	20.85	21.30	
		1	14	20.84	20.95	21.04	
		8	0	20.30	20.07	20.03	19.5±1.0
		8	4	20.24	20.36	20.46	
		8	7	20.20	20.35	20.19	
		15	0	20.09	20.30	20.32	19.5±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	22.01	22.25	21.96	21.5±1.0
		1	13	22.25	22.26	22.28	
		1	24	22.22	21.88	21.82	
		12	0	21.23	21.39	21.33	20.5±1.0
		12	6	21.21	21.42	21.40	
		12	13	21.25	21.30	21.35	
		25	0	21.23	21.39	21.34	20.5±1.0
	16QAM	1	0	21.18	21.00	20.94	20.5±1.0
		1	13	21.14	20.92	21.12	
		1	24	20.96	20.90	20.99	
		12	0	20.07	20.09	20.21	19.5±1.0
		12	6	20.26	20.41	20.49	
		12	13	20.26	20.34	20.38	
		25	0	20.22	20.21	20.42	19.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
10MHz	QPSK	1	0	21.89	22.09	22.13	21.5±1.0
		1	25	22.35	22.31	22.39	
		1	49	22.36	22.19	22.08	
		25	0	21.37	21.41	21.44	20.5±1.0
		25	13	21.45	21.42	21.47	
		25	25	21.46	21.31	21.49	
		50	0	21.30	21.41	21.42	20.5±1.0
	16QAM	1	0	21.10	21.12	21.15	20.5±1.0
		1	25	21.34	21.25	21.35	
		1	49	21.36	21.04	21.37	
		25	0	20.21	20.30	20.30	19.5±1.0
		25	13	20.31	20.35	20.36	
		25	25	20.31	20.34	20.38	
		50	0	20.22	20.36	20.39	19.5±1.0



4. 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	22.10	22.30	22.32	21.5±1.0
		1	13	22.27	22.30	22.33	
		1	24	22.15	22.13	22.15	
		12	0	21.22	21.48	21.48	20.5±1.0
		12	6	21.34	21.44	21.48	
		12	13	21.26	21.36	21.49	
		25	0	21.18	21.36	21.47	20.5±1.0
	16QAM	1	0	21.13	21.12	21.31	20.5±1.0
		1	13	21.06	21.31	21.29	
		1	24	20.91	21.27	21.50	
		12	0	20.19	20.58	20.33	20.0±1.0
		12	6	20.31	20.61	20.31	
		12	13	20.32	20.51	20.45	
		25	0	20.31	20.41	20.47	19.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
10MHz	QPSK	1	0	22.08	22.14	22.15	21.5±1.0
		1	25	22.30	22.32	22.33	
		1	49	21.99	22.15	22.16	
		25	0	21.25	21.48	21.65	21.0±1.0
		25	13	21.35	21.47	21.59	
		25	25	21.35	21.40	21.49	
		50	0	21.30	21.42	21.62	21.0±1.0
	16QAM	1	0	21.30	21.21	21.76	21.0±1.0
		1	25	21.29	21.61	21.60	
		1	49	21.24	21.45	21.20	
		25	0	20.31	20.54	20.56	20.0±1.0
		25	13	20.39	20.73	20.66	
		25	25	20.57	20.62	20.54	
		50	0	20.28	20.51	20.50	20.0±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	22.08	22.08	22.12	21.5±1.0
		1	38	22.19	22.32	22.35	
		1	74	22.14	22.16	22.18	
		36	0	21.33	21.45	21.75	21.0±1.0
		36	18	21.37	21.46	21.58	
		36	39	21.34	21.61	21.53	
		75	0	21.34	21.56	21.62	21.0±1.0
	16QAM	1	0	21.01	20.99	21.45	21.0±1.0
		1	38	21.45	21.27	21.45	
		1	74	21.05	21.54	21.22	
		36	0	20.22	20.47	20.66	20.0±1.0
		36	18	20.26	20.50	20.64	
		36	39	20.36	20.64	20.47	
		75	0	20.38	20.48	20.49	19.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				20850/2510	21100/2535	21350/2560	
20MHz	QPSK	1	0	21.94	21.96	22.26	21.5±1.0
		1	50	22.40	22.41	22.44	
		1	99	22.23	22.30	22.31	
		50	0	21.41	21.53	21.66	21.0±1.0
		50	25	21.44	21.54	21.70	
		50	50	21.38	21.55	21.57	
		100	0	21.33	21.59	21.65	21.0±1.0
	16QAM	1	0	21.30	21.31	21.60	21.0±1.0
		1	50	21.31	21.32	21.61	
		1	99	21.12	21.13	21.26	
		50	0	20.23	20.60	20.70	20.0±1.0
		50	25	20.27	20.55	20.67	
		50	50	20.47	20.53	20.49	
		100	0	20.36	20.61	20.56	20.0±1.0



5. LTE Band 12 Conducted Power Test Verdict:

LTE FDD Band 12				Conducted Power(dBm)			Tune up		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency					
				23017/699.7	23095/707.5	23173/715.3			
1.4MHz	QPSK	1	0	22.13	22.11	22.15	21.5±1.0		
		1	3	22.11	22.14	22.17			
		1	5	22.15	21.91	21.90			
		3	0	22.26	22.26	22.26	21.5±1.0		
		3	2	22.26	22.28	22.29			
		3	3	22.20	22.22	22.25			
	16QAM	6	0	21.15	21.34	21.31	20.5±1.0		
		1	0	21.12	21.15	21.16	20.5±1.0		
		1	3	21.09	20.82	21.12			
		1	5	20.97	20.78	21.00			
		3	0	21.01	21.50	21.50	20.5±1.0		
		3	2	21.36	21.38	21.35			
3	3	21.19	21.41	21.38					
		6	0	20.15	20.02	20.36	19.5±1.0		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up		
3MHz	QPSK	1	0	21.88	22.10	22.29	21.5±1.0		
		1	7	22.28	22.32	22.33			
		1	14	22.36	22.06	22.17			
		8	0	21.33	21.41	21.43	20.5±1.0		
		8	4	21.45	21.32	21.41			
		8	7	21.35	21.35	21.34			
		15	0	21.34	21.39	21.34	20.5±1.0		
	16QAM	1	0	20.86	20.88	20.91	20.5±1.0		
		1	7	21.31	20.82	20.94			
		1	14	21.29	20.78	21.04			
		8	0	20.35	20.36	20.46	19.5±1.0		
		8	4	20.45	20.41	20.39			
		8	7	20.39	20.47	20.49			
				15	0	20.20	20.14	20.27	19.5±1.0



LTE FDD Band 12				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				23035/701.5	23095/707.5	23155/713.5	
5MHz	QPSK	1	0	22.04	22.20	21.83	21.5±1.0
		1	13	22.30	22.28	22.31	
		1	24	22.28	22.03	22.10	
		12	0	21.39	21.46	21.32	20.5±1.0
		12	6	21.46	21.41	21.45	
		12	13	21.44	21.43	21.39	
		25	0	21.40	21.46	21.30	20.5±1.0
	16QAM	1	0	21.35	21.13	21.32	20.5±1.0
		1	13	21.33	20.90	21.03	
		1	24	21.17	20.85	21.34	
		12	0	20.44	20.31	20.44	19.5±1.0
		12	6	20.20	20.19	20.45	
		12	13	20.22	20.29	20.44	
		25	0	20.23	20.36	20.46	19.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				23060/704	23095/707.5	23130/711	
10MHz	QPSK	1	0	21.95	22.15	22.19	21.5±1.0
		1	25	22.33	22.17	22.40	
		1	49	22.15	22.04	22.12	
		25	0	21.41	21.33	21.44	20.5±1.0
		25	13	21.40	21.39	21.46	
		25	25	21.50	21.41	21.38	
		50	0	21.39	21.38	21.46	20.5±1.0
	16QAM	1	0	21.09	21.30	21.32	20.5±1.0
		1	25	21.32	21.40	21.36	
		1	49	21.27	21.18	21.07	
		25	0	20.23	20.26	20.41	19.5±1.0
		25	13	20.21	20.36	20.23	
		25	25	20.47	20.29	20.39	
		50	0	20.50	20.30	20.40	19.5±1.0



6. LTE Band 13 Conducted Power Test Verdict:

LTE FDD Band 13				Conducted Power(dBm)			Tune up	
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency				
				23035/779.5	23095/782	23155/784.5		
5MHz	QPSK	1	0	22.14	21.79	21.85	21.5±1.0	
		1	13	22.10	22.16	22.13		
		1	24	21.90	22.00	21.84		
		12	0	21.29	21.29	21.37	20.5±1.0	
		12	6	21.27	21.40	21.29		
		12	13	21.14	21.31	21.24		
		25	0	21.27	21.35	21.32	20.5±1.0	
	16QAM	1	0	21.16	21.13	21.07	20.5±1.0	
		1	13	21.05	21.47	21.25		
		1	24	21.05	21.08	20.99		
		12	0	20.13	20.21	20.42	19.5±1.0	
		12	6	20.29	20.44	20.32		
		12	13	20.39	20.36	20.12		
		25	0	20.26	20.38	20.27	19.5±1.0	
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up	
10MHz	QPSK				23230/782			21.5±1.0
		1	0	22.03				
		1	25	22.18				
		1	49	21.95				
		25	0	21.24			20.5±1.0	
		25	13	21.31				
		25	25	21.25				
	50	0	21.28			20.5±1.0		
	16QAM	1	0	21.09			20.5±1.0	
		1	25	21.31				
		1	49	20.95				
		25	0	20.24			19.5±1.0	
		25	13	20.38				
		25	25	20.45				
50		0	20.20			19.5±1.0		



7. LTE Band 25 Conducted Power Test Verdict:

LTE FDD Band 25				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				26047/1850.7	26365/1882.5	26683/1914.3	
1.4MHz	QPSK	1	0	22.05	22.06	22.20	21.5±1.0
		1	3	22.10	22.25	22.16	
		1	5	22.08	22.15	22.35	
		3	0	22.22	22.23	22.53	22.0±1.0
		3	2	22.32	22.42	22.53	
		3	3	22.29	22.37	22.54	
	6	0	21.18	21.30	21.40	20.5±1.0	
	16QAM	1	0	20.90	20.85	21.21	20.5±1.0
		1	3	20.85	21.03	21.13	
		1	5	21.19	21.34	21.39	
		3	0	21.41	21.26	21.36	20.5±1.0
		3	2	21.29	21.36	21.45	
		3	3	21.18	21.32	21.45	
		6	0	19.92	20.20	20.41	19.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				26055/1851.5	26365/1882.5	26675/1913.5	
3MHz	QPSK	1	0	22.11	21.88	22.30	21.5±1.0
		1	7	22.32	22.23	22.33	
		1	14	22.21	22.22	22.28	
		8	0	21.29	21.28	21.47	21.0±1.0
		8	4	21.28	21.34	21.54	
		8	7	21.27	21.32	21.50	
		15	0	21.23	21.30	21.49	20.5±1.0
	16QAM	1	0	21.29	21.10	21.30	20.5±1.0
		1	7	21.26	21.43	21.43	
		1	14	21.17	21.24	21.22	
		8	0	20.34	20.13	20.13	20.0±1.0
		8	4	20.26	20.52	20.28	
		8	7	20.41	20.37	20.53	
		15	0	20.04	20.25	20.48	19.5±1.0



LTE FDD Band 25				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				26065/1852.5	26365/1882.5	26665/1912.5	
5MHz	QPSK	1	0	22.13	21.89	22.16	21.5±1.0
		1	13	22.17	22.13	22.21	
		1	24	22.07	22.27	21.97	
		12	0	21.22	21.22	21.49	21.0±1.0
		12	6	21.30	21.32	21.52	
		12	13	21.28	21.33	21.54	
		25	0	21.25	21.29	21.46	20.5±1.0
	16QAM	1	0	21.22	21.19	21.11	20.5±1.0
		1	13	21.10	20.82	20.92	
		1	24	21.17	20.93	20.78	
		12	0	20.22	20.26	20.54	20.0±1.0
		12	6	20.21	20.19	20.35	
		12	13	20.20	20.31	20.58	
		25	0	20.33	20.44	20.46	19.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
10MHz	QPSK	1	0	21.95	22.06	22.21	21.5±1.0
		1	25	22.28	22.26	22.40	
		1	49	21.94	22.21	22.13	
		25	0	21.36	21.40	21.58	21.0±1.0
		25	13	21.31	21.30	21.64	
		25	25	21.31	21.26	21.49	
		50	0	21.30	21.35	21.58	21.0±1.0
	16QAM	1	0	21.28	20.84	21.37	20.5±1.0
		1	25	21.29	20.82	21.10	
		1	49	20.95	20.98	21.00	
		25	0	20.20	20.40	20.67	20.0±1.0
		25	13	20.59	20.25	20.48	
		25	25	20.27	20.26	20.42	
		50	0	20.20	20.14	20.52	20.0±1.0
Bandwidth	Modulation	RB size	RB offset	26090/1855	26365/1882.5	26640/1910	Tune up



LTE FDD Band 25				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				26115/1857.5	26365/1882.5	26615/1907.5	
15MHz	QPSK	1	0	22.09	22.07	22.30	21.5±1.0
		1	38	22.42	22.44	22.45	
		1	74	22.31	22.38	22.44	
		36	0	21.38	21.31	21.57	21.0±1.0
		36	18	21.26	21.32	21.57	
		36	39	21.17	21.40	21.52	
		75	0	21.25	21.33	21.62	21.0±1.0
	16QAM	1	0	21.02	20.93	21.08	20.5±1.0
		1	38	21.42	21.35	21.48	
		1	74	20.83	20.95	21.18	
		36	0	20.38	20.22	20.46	20.0±1.0
		36	18	20.35	20.27	20.56	
		36	39	20.17	20.34	20.50	
		75	0	20.30	20.38	20.59	20.0±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
20MHz	QPSK	1	0	22.12	22.13	22.15	22.0±1.0
		1	50	22.19	22.40	22.59	
		1	99	22.10	22.29	22.30	
		50	0	21.35	21.41	21.54	21.0±1.0
		50	25	21.25	21.278	21.55	
		50	50	21.19	21.35	21.53	
		100	0	21.28	21.33	21.47	20.5±1.0
	16QAM	1	0	20.86	20.99	20.90	20.5±1.0
		1	50	21.10	20.89	21.13	
		1	99	20.84	21.20	21.21	
		50	0	20.24	20.44	20.50	20.5±1.0
		50	25	20.24	20.33	20.33	
		50	50	20.24	20.37	20.47	
		100	0	20.27	20.29	20.49	19.5±1.0



8. LTE Band 26 Conducted Power Test Verdict:

LTE FDD Band 26				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				26697/814.7	26865/831.5	27033/848.3	
1.4MHz	QPSK	1	0	22.41	22.41	22.58	22.0±1.0
		1	3	22.49	22.38	22.43	
		1	5	22.45	22.43	22.40	
		3	0	22.51	22.40	22.68	22.0±1.0
		3	2	22.59	22.48	22.76	
		3	3	22.67	22.55	22.65	
	6	0	21.59	21.34	21.62	21.0±1.0	
	16QAM	1	0	21.60	21.26	21.61	21.0±1.0
		1	3	21.16	21.50	21.65	
		1	5	21.17	21.52	21.18	
		3	0	21.61	21.50	21.29	21.0±1.0
		3	2	21.69	21.49	21.49	
		3	3	21.58	21.51	21.37	
		6	0	20.53	20.12	20.25	20.0±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				26705/815.5	26865/831.5	27025/847.5	
3MHz	QPSK	1	0	22.38	22.54	22.36	22.0±1.0
		1	7	22.39	22.48	22.31	
		1	14	22.28	22.36	22.13	
		8	0	21.50	21.60	21.59	21.0±1.0
		8	4	21.71	21.59	21.50	
		8	7	21.46	21.52	21.58	
		15	0	21.48	21.56	21.52	21.0±1.0
	16QAM	1	0	21.10	21.10	21.11	20.5±1.0
		1	7	21.30	21.37	21.49	
		1	14	21.13	21.07	21.16	
		8	0	20.47	20.52	20.59	20.0±1.0
		8	4	20.57	20.46	20.35	
		8	7	20.43	20.47	20.19	
		15	0	20.49	20.31	20.49	19.5±1.0



LTE FDD Band 26				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				26715/816.5	26865/831.5	27015/846.5	
5MHz	QPSK	1	0	22.16	22.23	22.25	22.0±1.0
		1	13	22.13	22.47	22.51	
		1	24	22.26	22.13	22.10	
		12	0	21.52	21.66	21.57	21.0±1.0
		12	6	21.49	21.59	21.53	
		12	13	21.67	21.47	21.48	
		25	0	21.63	21.58	21.48	21.0±1.0
	16QAM	1	0	21.40	21.09	21.04	20.5±1.0
		1	13	21.19	21.40	21.23	
		1	24	21.21	21.34	21.23	
		12	0	20.41	20.49	20.29	20.0±1.0
		12	6	20.44	20.44	20.48	
		12	13	20.41	20.52	20.17	
		25	0	20.54	20.74	20.36	20.0±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				26740/819	26865/831.5	26990/844	
10MHz	QPSK	1	0	22.21	21.98	22.13	21.5±1.0
		1	25	22.44	22.36	22.45	
		1	49	22.23	22.14	22.28	
		25	0	21.62	21.51	21.56	21.5±1.0
		25	13	21.54	21.61	21.67	
		25	25	21.41	21.40	21.57	
		50	0	21.61	21.40	21.55	21.0±1.0
	16QAM	1	0	21.23	21.07	21.26	20.5±1.0
		1	25	21.17	21.10	21.10	
		1	49	21.31	21.40	20.92	
		25	0	20.81	20.66	20.51	20.0±1.0
		25	13	20.67	20.57	20.61	
		25	25	20.31	20.46	20.71	
		50	0	20.52	20.32	20.34	20.0±1.0



LTE FDD Band 26				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				26765/821.5	26865/831.52	26965/841.5	
15MHz	QPSK	1	0	22.29	22.38	22.57	22.0±1.0
		1	38	22.50	22.65	22.77	
		1	74	22.44	22.31	22.33	
		36	0	21.48	21.60	21.50	21.0±1.0
		36	18	21.45	21.39	21.51	
		36	39	21.53	21.51	21.52	
		75	0	21.59	21.46	21.53	21.0±1.0
	16QAM	1	0	21.07	21.07	20.98	20.5±1.0
		1	38	21.17	21.03	21.10	
		1	74	21.08	21.14	21.16	
		36	0	20.41	20.48	20.39	19.5±1.0
		36	18	20.44	20.48	20.44	
		36	39	20.38	20.30	20.43	
		75	0	20.59	20.37	20.40	20.0±1.0



9. LTE Band 66 Conducted Power Test Verdict:

LTE FDD Band 66				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				131979/1710.7	132322/1745	132665/1779.3	
1.4MHz	QPSK	1	0	21.34	21.52	21.51	21.0±1.0
		1	3	21.33	21.60	21.52	
		1	5	21.23	21.64	21.33	
		3	0	21.55	21.65	21.65	21.0±1.0
		3	2	21.62	21.63	21.56	
		3	3	21.50	21.73	21.51	
		6	0	20.42	20.55	20.53	20.0±1.0
	16QAM	1	0	20.55	20.56	20.41	20.0±1.0
		1	3	20.34	20.32	20.25	
		1	5	20.27	20.30	20.09	
		3	0	20.33	20.53	20.48	20.0±1.0
		3	2	20.75	20.63	20.60	
		3	3	20.37	20.59	20.66	
		6	0	19.36	19.49	19.45	18.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				131987/1711.5	12322/1745	132657/1778.5	
3MHz	QPSK	1	0	21.60	21.71	21.53	21.0±1.0
		1	7	21.61	21.60	21.44	
		1	14	21.39	21.40	21.22	
		8	0	20.51	20.91	20.67	20.0±1.0
		8	4	20.51	20.59	20.41	
		8	7	20.45	20.65	20.41	
		15	0	20.48	20.69	20.51	20.0±1.0
	16QAM	1	0	20.51	20.50	20.21	20.0±1.0
		1	7	20.62	20.67	20.19	
		1	14	20.37	20.40	20.29	
		8	0	19.32	19.52	19.61	19.0±1.0
		8	4	19.68	19.60	19.44	
		8	7	19.60	19.55	19.56	
		15	0	19.54	19.78	19.53	19.0±1.0



LTE FDD Band 66				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				131997/1712.5	132322/1745	132647/1777.5	
5MHz	QPSK	1	0	21.34	21.50	21.53	21.0±1.0
		1	13	21.51	21.52	21.44	
		1	24	21.19	21.49	21.14	
		12	0	20.45	20.78	20.54	20.0±1.0
		12	6	20.40	20.60	20.42	
		12	13	20.39	20.70	20.38	
		25	0	20.44	20.74	20.55	20.0±1.0
	16QAM	1	0	19.97	20.10	20.13	19.5±1.0
		1	13	19.99	20.15	20.29	
		1	24	19.84	20.21	19.94	
		12	0	19.61	19.68	19.50	19.0±1.0
		12	6	19.42	19.80	19.43	
		12	13	19.35	19.66	19.37	
		25	0	19.55	19.89	19.45	19.0±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
10MHz	QPSK	1	0	21.33	21.35	21.41	21.0±1.0
		1	25	21.51	21.54	21.56	
		1	49	21.31	21.29	21.32	
		25	0	20.52	20.92	20.61	20.0±1.0
		25	13	20.52	20.78	20.54	
		25	25	20.45	20.65	20.48	
		50	0	20.57	20.75	20.58	20.0±1.0
	16QAM	1	0	20.30	20.31	19.91	19.5±1.0
		1	25	20.05	20.32	19.99	
		1	49	20.15	20.34	19.95	
		25	0	19.59	19.92	19.63	19.0±1.0
		25	13	19.48	19.95	19.72	
		25	25	19.50	19.64	19.55	
		50	0	19.61	19.73	19.63	19.0±1.0
Bandwidth	Modulation	RB size	RB offset	132022/1715	132322/1745	132622/1775	Tune up



LTE FDD Band 66				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				132047/1717.5	132322/1745	132597/1772.5	
15MHz	QPSK	1	0	21.31	21.35	21.45	21.0±1.0
		1	38	21.30	21.55	21.60	
		1	74	21.51	21.50	21.45	
		36	0	20.54	20.87	20.54	20.0±1.0
		36	18	20.49	20.69	20.58	
		36	39	20.49	20.59	20.50	
		75	0	20.55	20.75	20.56	20.0±1.0
	16QAM	1	0	20.25	20.55	20.57	20.0±1.0
		1	38	20.17	20.28	20.10	
		1	74	20.15	20.31	20.19	
		36	0	19.59	19.88	19.71	19.0±1.0
		36	18	19.46	19.75	19.62	
		36	39	19.38	19.58	19.58	
		75	0	19.50	19.68	19.64	19.0±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
20MHz	QPSK	1	0	21.49	21.64	21.30	21.0±1.0
		1	50	21.45	21.74	21.70	
		1	99	21.35	21.36	21.32	
		50	0	20.58	20.86	20.70	20.0±1.0
		50	25	20.51	20.65	20.58	
		50	50	20.49	20.64	20.50	
		100	0	20.56	20.74	20.50	20.0±1.0
	16QAM	1	0	20.42	20.22	20.57	20.0±1.0
		1	50	20.17	20.54	20.56	
		1	99	20.08	20.09	20.10	
		50	0	19.57	19.78	19.79	19.0±1.0
		50	25	19.50	19.80	19.62	
		50	50	19.38	19.61	19.56	
		100	0	19.46	19.71	19.57	19.0±1.0
Bandwidth	Modulation	RB size	RB offset	132072/1720	132322/1745	132572/1770	Tune up



10. LTE Band 71 Conducted Power Test Verdict:

LTE FDD Band 71				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				133147/665.5	133297/680.5	133447/695.5	
5MHz	QPSK	1	0	22.41	22.59	22.67	22.0±1.0
		1	13	22.64	22.69	22.74	
		1	24	22.54	22.60	22.72	
		12	0	21.61	21.67	21.85	21.0±1.0
		12	6	21.69	21.75	21.82	
		12	13	21.63	21.78	21.65	
		25	0	21.77	21.80	21.78	21.0±1.0
	16QAM	1	0	21.05	21.12	21.09	21.0±1.0
		1	13	21.37	21.41	21.46	
		1	24	21.12	21.22	21.01	
		12	0	20.33	20.53	20.56	20.0±1.0
		12	6	20.46	20.51	20.53	
		12	13	20.32	20.60	20.39	
		25	0	20.58	20.66	20.43	20.0±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				133172/668.0	133297/680.5	133422/693.0	
10MHz	QPSK	1	0	22.72	22.70	22.82	22.0±1.0
		1	25	22.84	22.75	22.76	
		1	49	22.53	22.64	22.68	
		25	0	21.74	21.81	21.80	21.0±1.0
		25	13	21.74	21.83	21.89	
		25	25	21.66	21.70	21.73	
		50	0	21.70	21.78	21.74	21.0±1.0
	16QAM	1	0	21.20	21.29	21.42	21.0±1.0
		1	25	21.19	21.39	21.51	
		1	49	21.08	21.13	21.21	
		25	0	20.55	20.70	20.75	20.0±1.0
		25	13	20.71	20.79	20.74	
		25	25	20.72	20.66	20.60	
		50	0	20.63	20.72	20.68	20.0±1.0



LTE FDD Band 71				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
				133197/670.5	133297/680.5	133397/690.5	
15MHz	QPSK	1	0	22.48	22.51	22.78	22.0±1.0
		1	38	22.68	22.70	22.72	
		1	74	22.60	22.64	22.73	
		36	0	21.63	21.74	21.77	21.0±1.0
		36	18	21.65	21.72	21.78	
		36	39	21.59	21.67	21.71	
		75	0	21.64	21.66	21.91	21.0±1.0
	16QAM	1	0	21.47	21.44	21.52	21.0±1.0
		1	38	21.86	21.83	21.74	
		1	74	21.26	21.20	21.43	
		36	0	20.72	20.74	20.63	20.0±1.0
		36	18	20.77	20.75	20.65	
		36	39	20.50	20.61	20.66	
		75	0	20.74	20.68	20.67	20.0±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
20MHz	QPSK	1	0	22.51	22.58	22.60	22.0±1.0
		1	50	22.70	22.66	22.88	
		1	99	22.50	22.64	22.60	
		50	0	21.56	21.67	21.75	21.0±1.0
		50	25	21.66	21.73	21.83	
		50	50	21.62	21.66	21.76	
		100	0	21.66	21.63	21.77	21.0±1.0
	16QAM	1	0	21.31	21.36	21.33	21.0±1.0
		1	50	21.43	21.45	21.49	
		1	99	21.02	21.12	21.05	
		50	0	20.66	20.75	20.73	20.0±1.0
		50	25	20.77	20.64	20.65	
		50	50	20.64	20.68	20.69	
		100	0	20.67	20.56	20.65	20.0±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)	16.49	15.31	12.80
6(2437)	16.25	15.12	12.29
11(2462)	16.92	15.74	13.39
Channel/Freq.(MHz)	Maximum Conducted Out Power (dBm)		
	802.11n(HT40)		
3(2422)	11.72		
6(2437)	11.53		
9(2452)	12.18		

WLAN 5GHz Band Conducted Power

U-NII-1 AVGSA Output Power

Mode	Test Frequency (MHz)	Max Conducted Output Power (dBm)
802.11n (20MHz)	5180	11.16
802.11n (20MHz)	5220	10.65
802.11n (20MHz)	5240	10.32
802.11n (40MHz)	5190	11.53
802.11n (40MHz)	5230	11.28
802.11a (20MHz)	5180	12.45
802.11a (20MHz)	5220	11.66
802.11a (20MHz)	5240	11.57
802.11ac (20MHz)	5180	12.18
802.11ac (20MHz)	5220	11.37
802.11ac (20MHz)	5240	11.05
802.11ac (40MHz)	5190	11.86
802.11ac (40MHz)	5230	11.35
802.11ac (80MHz)	5210	10.96



U-NII-3 AVGSA Output Power

Mode	Test Frequency (MHz)	Max Conducted Output Power (dBm)
802.11a (20MHz)	5745	12.53
802.11a (20MHz)	5785	12.12
802.11a (20MHz)	5825	11.63
802.11n (20MHz)	5745	11.17
802.11n (20MHz)	5785	11.12
802.11n (20MHz)	5825	11.07
802.11n (40MHz)	5755	11.31
802.11n (40MHz)	5795	11.04
802.11ac (20MHz)	5745	11.52
802.11ac (20MHz)	5785	11.37
802.11ac (20MHz)	5825	11.40
802.11ac (40MHz)	5755	10.99
802.11ac (40MHz)	5795	11.04
802.11ac (80MHz)	5775	10.77

7.5 Bluetooth Output Power

Channel	Frequency (MHz)	BT3.0 Output Power(dBm)		
		GFSK	$\pi/4$ -DQPSK	8-DPSK
CH 0	2402	8.59	9.13	9.04
CH 39	2441	8.01	7.51	7.82
CH 78	2480	9.62	9.37	9.74
Channel	Frequency (MHz)	BT4.0 Output Power(dBm)		
		GFSK		
CH 0	2402	-0.094		
CH 20	2442	1.717		
CH 39	2480	0.234		

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 $\leq 1.2\text{W/Kg}$. Thus the SAR can be excluded.

Antenna Location:



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

Antenna	Left Side	Face	Back
WWAN Antenna Body-worn& hotspot	Yes	Yes	Yes
WIFI 2.4G Antenna Body-worn& hotspot	No	Yes	Yes
WIFI 5G Antenna Body-worn	No	Yes	Yes
WIFI 5G Antenna hotspot	No	No	No

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

8. 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	24.55	24.0 ±1.0	25.00	1.109
	190/836.6	24.56	24.0 ±1.0	25.00	1.107
	251/848.8	24.68	24.0 ±1.0	25.00	1.076
GPRS1900 (GPRS 4Tx)	512/1850.2	21.96	21.5 ±1.0	22.50	1.132
	661/1880.0	22.14	21.5 ±1.0	22.50	1.086
	810/1909.8	22.28	21.5 ±1.0	22.50	1.052
WCDMA850	4132/826.4	22.10	21.5 ±1.0	22.50	1.096
	4183/836.6	22.15	21.5 ±1.0	22.50	1.084
	4233/846.6	22.12	21.5 ±1.0	22.50	1.091
WCDMA1900	9262/1852.4	22.35	22.0±1.0	23.00	1.161
	9400/1880.0	22.54	22.0±1.0	23.00	1.112
	9538/1907.6	22.58	22.0±1.0	23.00	1.102
WCDMA1700	1312/1712.4	22.29	21.5 ±1.0	22.50	1.050
	1413/1732.6	22.38	21.5 ±1.0	22.50	1.028
	1513/1752.6	22.32	21.5 ±1.0	22.50	1.042
LTE B2 20MHz 1RB#50	18700/1860	22.55	22.0±1.0	23.00	1.109
	18900/1880	22.34	22.0±1.0	23.00	1.164
	19100/1900	22.63	22.0±1.0	23.00	1.089
LTE B2 20MHz 50RB#0	18700/1860	21.26	20.5 ±1.0	21.50	1.057
	18900/1880	21.33	20.5 ±1.0	21.50	1.040
	19100/1900	21.37	20.5 ±1.0	21.50	1.030
LTE B4 20MHz 1RB#50	20050/1720	22.51	22.0±1.0	23.00	1.119
	20175/1732.5	22.59	22.0±1.0	23.00	1.099
	20300/1745	22.61	22.0±1.0	23.00	1.094
LTE B4 20MHz 50RB#0	20050/1720	21.38	21.0±1.0	22.00	1.153
	20175/1732.5	21.32	21.0±1.0	22.00	1.169
	20300/1745	21.61	21.0±1.0	22.00	1.094
LTE B5 10MHz 1RB#25	20450/829	22.35	21.5 ±1.0	22.50	1.035
	20525/836.5	22.31	21.5 ±1.0	22.50	1.045
	20600/844	22.39	21.5 ±1.0	22.50	1.026
LTE B5 10MHz 25RB#25	20450/829	21.46	20.5 ±1.0	21.50	1.009
	20525/836.5	21.31	20.5 ±1.0	21.50	1.045
	20600/844	21.49	20.5 ±1.0	21.50	1.002



LTE B7 20MHz 1RB#50	20850/2510	22.40	21.5 ± 1.0	22.50	1.023
	21100/2535	22.41	21.5 ± 1.0	22.50	1.021
	21350/2560	22.44	21.5 ± 1.0	22.50	1.014
LTE B7 20MHz 50RB#25	20850/2510	21.44	21.0±1.0	22.00	1.138
	21100/2535	21.54	21.0±1.0	22.00	1.112
	21350/2560	21.70	21.0±1.0	22.00	1.072
LTE B12 10MHz 1RB#25	23060/704	22.33	21.5 ± 1.0	22.50	1.040
	23095/707.5	22.17	21.5 ± 1.0	22.50	1.079
	23130/711	22.40	21.5 ± 1.0	22.50	1.023
LTE B12 10MHz 25RB#25	23060/704	21.50	20.5 ± 1.0	21.50	1.000
	23095/707.5	21.41	20.5 ± 1.0	21.50	1.021
	23130/711	21.38	20.5 ± 1.0	21.50	1.028
LTE B13 10MHz 1RB#25	23230/782	22.18	21.5 ± 1.0	22.50	1.076
LTE B13 10MHz 50RB#13	23230/782	21.31	20.5 ± 1.0	21.50	1.045
LTE B25 20MHz 1RB#50	26140/1860	22.19	22.0±1.0	23.00	1.205
	26365/1882.5	22.40	22.0±1.0	23.00	1.148
	26590/1905	22.59	22.0±1.0	23.00	1.099
LTE B25 20MHz 50RB#0	26140/1860	21.35	21.0±1.0	22.00	1.161
	26365/1882.5	21.41	21.0±1.0	22.00	1.146
	26590/1905	21.54	21.0±1.0	22.00	1.112
LTE B26 15MHz 1RB#38	26765/821.5	22.50	22.0±1.0	23.00	1.122
	26865/831.5	22.65	22.0±1.0	23.00	1.084
	26965/841.5	22.77	22.0±1.0	23.00	1.054
LTE B26 15MHz 36RB#0	26765/821.5	21.48	21.0±1.0	22.00	1.127
	26865/831.5	21.60	21.0±1.0	22.00	1.096
	26965/841.5	21.50	21.0±1.0	22.00	1.122
LTE B66 20MHz 1RB#50	132072/1720	21.45	21.0±1.0	22.00	1.135
	132322/1745	21.74	21.0±1.0	22.00	1.062
	132572/1770	21.70	21.0±1.0	22.00	1.072
LTE B66 20MHz 50RB#0	132072/1720	20.58	20.0 ± 1.0	21.00	1.102
	132322/1745	20.86	20.0 ± 1.0	21.00	1.033
	132572/1770	20.70	20.0 ± 1.0	21.00	1.072



LTE B71 20MHz 1RB#50	133222/673.0	22.70	22.0±1.0	23.00	1.072
	133322/683.0	22.66	22.0±1.0	23.00	1.081
	133372/688.0	22.80	22.0±1.0	23.00	1.047
LTE B71 20MHz 50RB#0	133222/673.0	21.56	21.0±1.0	22.00	1.107
	133322/683.0	21.67	21.0±1.0	22.00	1.079
	133372/688.0	21.75	21.0±1.0	22.00	1.059
WIFI 2.4G 802.11b	1/2412	16.49	16.0 ±1.0	17.00	1.125
	6/2437	16.25	16.0 ±1.0	17.00	1.189
	11/2462	16.92	16.0 ±1.0	17.00	1.019
BT 3.0 GFSK	0/2402	8.59	8.7 ±1.0	9.70	1.291
	39/2441	8.01	8.7 ±1.0	9.70	1.476
	78/2480	9.62	8.7 ±1.0	9.70	1.019
WIFI 5G BAND I	36/5180	12.45	11.5 ±1.0	12.50	1.012
WIFI5G BANDIV	149/5745	12.53	11.6 ±1.0	12.60	1.016

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

9. Test Results

Results overview of GSM850

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Left Side	190/836.6	GPRS 4Tx	0.390	-1.46	1.107	0.432	Yes
Face Upward	190/836.6	GPRS 4Tx	0.264	-3.52	1.107	0.292	/
Back Upward	190/836.6	GPRS 4Tx	0.228	-3.98	1.107	0.252	/

Results overview of GSM1900

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Left Side	661/1880.0	GPRS 4Tx	0.317	-0.80	1.086	0.344	Yes
Face Upward	661/1880.0	GPRS 4Tx	0.182	-4.09	1.086	0.198	/
Back Upward	661/1880.0	GPRS 4Tx	0.137	3.21	1.086	0.149	/

Results overview of WCDMA850

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Left Side	4183/836.6	RMC	0.352	-4.04	1.084	0.382	Yes
Face Upward	4183/836.6	RMC	0.264	-3.20	1.084	0.286	/
Back Upward	4183/836.6	RMC	0.228	0.76	1.084	0.247	/

**Results overview of WCDMA1700**

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Left Side	1312/1712.4	RMC	1.014	4.12	1.050	1.064	/
Left Side	1413/1732.6	RMC	1.090	-2.32	1.028	1.121	Yes
Left Side	1513/1752.6	RMC	1.033	4.89	1.042	1.077	/
Left Side (Repeated)	1312/1712.4	RMC	0.989	-2.32	1.050	1.038	/
	1413/1732.6	RMC	1.026	0.31	1.028	1.055	/
	1513/1752.6	RMC	1.005	-1.65	1.042	1.047	/
Face Upward	1413/1732.6	RMC	0.430	-3.26	1.028	0.442	/
Back Upward	1413/1732.6	RMC	0.622	-3.47	1.028	0.639	/

Results overview of WCDMA1900

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Left Side	9262/1852.4	RMC	0.767	-3.91	1.161	0.891	/
Left Side	9400/1880.0	RMC	0.814	-3.14	1.112	0.905	Yes
Left Side	9538/1907.6	RMC	0.802	-3.90	1.102	0.883	/
Left Side (Repeated)	9262/1852.4	RMC	0.740	-1.98	1.161	0.859	/
	9400/1880.0	RMC	0.782	-2.19	1.112	0.870	/
	9538/1907.6	RMC	0.764	-1.55	1.102	0.842	/
Face Upward	9400/1880.0	RMC	0.408	1.13	1.112	0.454	/
Back Upward	9400/1880.0	RMC	0.356	-3.49	1.112	0.396	/



Results overview of FDD LTE Band 2, QPSK, 20MHz Bandwidth

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)
1RB#50							
Left Side	18700/1860	Data	0.787	2.30	1.109	0.873	/
Left Side	18900/1880	Data	0.805	-0.96	1.164	0.937	Yes
Left Side	19100/1900	Data	0.793	4.43	1.089	0.864	/
Left Side (Repeated)	18700/1860	Data	0.734	-2.38	1.109	0.814	/
	18900/1880	Data	0.766	-1.96	1.164	0.892	/
	19100/1900	Data	0.750	-2.04	1.089	0.817	/
Face Upward	18900/1880	Data	0.412	-3.11	1.164	0.480	/
Back Upward	18900/1880	Data	0.363	-3.08	1.164	0.423	/
50%RB#0							
Left Side	18900/1880	Data	0.762	-3.97	1.040	0.792	/
Face Upward	18900/1880	Data	0.381	-2.92	1.040	0.396	/
Back Upward	18900/1880	Data	0.335	-0.93	1.040	0.348	/

Results overview of FDD LTE Band 4, QPSK, 20MHz Bandwidth

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)
1RB#50							
Left Side	20050/1720	Data	0.972	-3.76	1.119	1.088	/
Left Side	20175/1732.5	Data	1.064	-0.92	1.099	1.169	Yes
Left Side	20300/1745	Data	1.031	-0.20	1.094	1.128	/
Left Side (Repeated)	20050/1720	Data	0.983	-1.67	1.119	1.100	/
	20175/1732.5	Data	1.023	-1.73	1.099	1.124	/
	20300/1745	Data	1.012	-2.68	1.094	1.107	/
Face Upward	20175/1732.5	Data	0.423	4.70	1.099	0.465	/
Back Upward	20175/1732.5	Data	0.617	-4.72	1.099	0.678	/
50%RB#0							
Left Side	20050/1720	Data	0.901	-0.57	1.153	1.039	/
Left Side	20175/1732.5	Data	0.932	1.63	1.169	1.090	/
Left Side	20300/1745	Data	0.926	-1.36	1.094	1.013	/
Left Side (Repeated)	20050/1720	Data	0.822	-2.28	1.153	0.948	/
	20175/1732.5	Data	0.869	-1.97	1.169	1.016	/
	20300/1745	Data	0.848	-3.35	1.094	0.928	/
Face Upward	20175/1732.5	Data	0.387	-0.96	1.169	0.453	/
Back Upward	20175/1732.5	Data	0.579	-0.48	1.169	0.677	/



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

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)
1RB#25							
Left Side	20525/836.5	Data	0.290	3.21	1.045	0.303	Yes
Face Upward	20525/836.5	Data	0.255	-2.27	1.045	0.266	/
Back Upward	20525/836.5	Data	0.257	2.21	1.045	0.268	/
50%RB#25							
Left Side	20525/836.5	Data	0.264	2.31	1.045	0.276	/
Face Upward	20525/836.5	Data	0.203	-1.33	1.045	0.212	/
Back Upward	20525/836.5	Data	0.210	-0.21	1.045	0.219	/

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

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)
1RB#50							
Left Side	20850/2510	Data	1.158	0.04	1.023	1.185	/
Left Side	21100/2535	Data	1.191	-2.26	1.021	1.216	Yes
Left Side	21350/2560	Data	1.173	-3.88	1.014	1.189	/
Left Side (Repeated)	20850/2510	Data	1.086	-1.81	1.023	1.111	/
	21100/2535	Data	1.123	-2.61	1.021	1.147	/
	21350/2560	Data	1.105	4.05	1.014	1.120	/
Face Upward	21100/2535	Data	0.445	0.76	1.021	0.454	/
Back Upward	21100/2535	Data	0.561	-0.68	1.021	0.573	/
50%RB#25							
Left Side	20850/2510	Data	0.999	-2.34	1.138	1.137	/
Left Side	21100/2535	Data	1.034	2.11	1.112	1.150	/
Left Side	21350/2560	Data	1.018	-0.89	1.072	1.091	/
Left Side (Repeated)	20850/2510	Data	0.932	-1.55	1.138	1.061	/
	21100/2535	Data	0.984	-1.69	1.112	1.094	/
	21350/2560	Data	0.967	-4.68	1.072	1.037	/
Face Upward	21100/2535	Data	0.398	4.88	1.112	0.442	/
Back Upward	21100/2535	Data	0.505	2.72	1.112	0.561	/



Results overview of FDD LTE Band 12, QPSK, 10MHz Bandwidth

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)
1RB#25							
Left Side	23095/707.5	Data	0.256	0.34	1.079	0.276	/
Face Upward	23095/707.5	Data	0.429	3.60	1.079	0.463	/
Back Upward	23095/707.5	Data	0.727	-0.82	1.079	0.784	Yes
50%RB#25							
Left Side	23095/707.5	Data	0.216	-2.38	1.021	0.221	/
Face Upward	23095/707.5	Data	0.394	0.30	1.021	0.402	/
Back Upward	23095/707.5	Data	0.701	-0.87	1.021	0.716	/

Results overview of FDD LTE Band 13, QPSK, 10MHz Bandwidth

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)
1RB#25							
Left Side	23230/782	Data	0.368	-4.63	1.076	0.396	/
Face Upward	23230/782	Data	0.565	4.52	1.076	0.608	/
Back Upward	23230/782	Data	0.794	4.39	1.076	0.855	/
Back Upward	23230/782	Data	0.810	-1.59	1.076	0.872	Yes
Back Upward	23230/782	Data	0.782	-1.66	1.076	0.842	/
Back Upward (Repeated)	23230/782	Data	0.761	-0.07	1.076	0.819	/
	23230/782	Data	0.773	2.79	1.076	0.832	/
	23230/782	Data	0.752	-4.81	1.076	0.810	/
50%RB#13							
Left Side	23230/782	Data	0.334	3.60	1.045	0.349	/
Face Upward	23230/782	Data	0.526	2.06	1.045	0.550	/
Back Upward	23230/782	Data	0.751	-3.11	1.045	0.785	/



Results overview of FDD LTE Band 25, QPSK, 20MHz Bandwidth

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)
1RB#50							
Left Side	26140/1860	Data	0.834	2.85	1.205	1.005	/
Left Side	26365/1882.5	Data	0.904	-1.75	1.148	1.038	Yes
Left Side	26590/1905	Data	0.870	2.07	1.099	0.956	/
Left Side (Repeated)	26140/1860	Data	0.783	-1.52	1.205	0.944	/
	26365/1882.5	Data	0.851	-3.64	1.148	0.977	/
	26590/1905	Data	0.822	-4.40	1.099	0.903	/
Face Upward	26365/1882.5	Data	0.469	3.94	1.148	0.538	/
Back Upward	26365/1882.5	Data	0.394	3.30	1.148	0.452	/
50%RB#0							
Left Side	26140/1860	Data	0.706	1.03	1.161	0.820	/
Left Side	26365/1882.5	Data	0.745	-0.91	1.146	0.853	/
Left Side	26590/1905	Data	0.727	-0.33	1.112	0.808	/
Face Upward	26365/1882.5	Data	0.410	-2.48	1.146	0.470	/
Back Upward	26365/1882.5	Data	0.345	-0.76	1.146	0.395	/

Results overview of FDD LTE Band 26, QPSK, 15MHz Bandwidth

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)
1RB#38							
Left Side	26865/831.5	Data	0.321	1.62	1.084	0.348	Yes
Face Upward	26865/831.5	Data	0.287	-2.16	1.084	0.311	/
Back Upward	26865/831.5	Data	0.301	-4.84	1.084	0.326	/
50%RB#0							
Left Side	26865/831.5	Data	0.302	-1.04	1.096	0.331	/
Face Upward	26865/831.5	Data	0.253	0.37	1.096	0.277	/
Back Upward	26865/831.5	Data	0.270	1.01	1.096	0.296	/



Results overview of FDD LTE Band 66, QPSK, 20MHz Bandwidth

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)
1RB#50							
Left Side	132072/1720	Data	0.903	-2.50	1.135	1.025	/
Left Side	132322/1745	Data	0.972	-0.26	1.062	1.032	Yes
Left Side	132572/1770	Data	0.938	2.89	1.072	1.005	/
Left Side (Repeated)	132072/1720	Data	0.834	-0.89	1.135	0.947	/
	132322/1745	Data	0.918	0.39	1.062	0.975	/
	132572/1770	Data	0.880	-1.12	1.072	0.943	/
Face Upward	132322/1745	Data	0.401	-3.70	1.062	0.426	/
Back Upward	132322/1745	Data	0.623	1.34	1.062	0.661	/
50%RB#0							
Left Side	132072/1720	Data	0.723	-2.06	1.102	0.797	/
Left Side	132322/1745	Data	0.793	2.59	1.033	0.819	/
Left Side	132572/1770	Data	0.755	-3.34	1.072	0.809	/
Face Upward	132322/1745	Data	0.343	-2.73	1.033	0.354	/
Back Upward	132322/1745	Data	0.564	1.44	1.033	0.582	/

Results overview of FDD LTE Band 71, QPSK, 20MHz Bandwidth

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)
1RB#50							
Left Side	133322/683.0	Data	0.313	-0.57	1.081	0.338	Yes
Face Upward	133322/683.0	Data	0.226	0.51	1.081	0.244	/
Back Upward	133322/683.0	Data	0.238	-3.53	1.081	0.257	/
50%RB#0							
Left Side	133322/683.0	Data	0.282	-0.46	1.079	0.304	/
Face Upward	133322/683.0	Data	0.187	-1.52	1.079	0.202	/
Back Upward	133322/683.0	Data	0.196	-3.93	1.079	0.211	/

**Results overview of WIFI2.4G 802.11b**

Body-worn& Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Left Side	6/2437	DSSS	0.043	1.48	1.189	0.051	Yes
Face Upward	6/2437	DSSS	0.041	-2.15	1.189	0.049	/

Results overview of WIFI5G 802.11a-5180

Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Left Side	36/5180	OFDM	0.181	2.74	1.012	0.183	Yes
Face Upward	36/5180	OFDM	0.123	-1.37	1.012	0.124	/

**Results overview of WIFI5G 802.11a-5745**

Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Left Side	149/5745	OFDM	0.221	-4.61	1.016	0.225	Yes
Face Upward	149/5745	OFDM	0.178	-1.92	1.016	0.181	/

Results overview of BT

Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Left Side	39/2441	DH5	0.077	-1.30	1.476	0.114	Yes
Face Upward	39/2441	DH5	0.034	-0.01	1.476	0.050	/

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

The priority (Main) and secondary(upper) antenna cannot transmit at the same time.



10. 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+WIFI 2.4G	Yes	Yes
2	WWAN+WIFI 5G	Yes	No
3	WWAN+BT	Yes	No
4	WIFI+BT	No	No

Simultaneous Tx Combination of LTE and WIFI (Body).

Test Position/Freq.		Left Side	Face	Back
Body &Hotspot MAX 1-g SAR(W/Kg) 10mm distance	GSM850	0.432	0.292	0.252
	GSM1900	0.344	0.198	0.149
	WCDMA 1900	0.905	0.454	0.396
	WCDMA 1700	1.121	0.442	0.639
	WCDMA 850	0.382	0.286	0.247
	LTE Band2	0.937	0.480	0.423
	LTE Band4	1.169	0.465	0.678
	LTE Band5	0.303	0.266	0.268
	LTE Band7	1.216	0.454	0.573
	LTE Band12	0.276	0.463	0.784
	LTE Band13	0.396	0.608	0.872
	LTE Band25	1.038	0.538	0.452
	LTE Band26	0.348	0.311	0.326
	LTE Band66	1.032	0.426	0.661
	LTE Band71	0.338	0.244	0.257
	WIFI 2.4G	0.051	0.049	/
	WIFI 5G	0.225	0.181	/
	BT	0.114	0.050	/
	WIFI2.4G Simultaneous \sum 1-g SAR(W/Kg)		1.267	0.657
WIFI5G Simultaneous \sum 1-g SAR(W/Kg)		1.441	0.789	/
BT Simultaneous \sum 1-g SAR(W/Kg)		1.330	0.658	/

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

11. Measurement Uncertainty

No.	Uncertainty Component	Type	Uncertainty Value (%)	Probability Distribution	k	ci	Standard Uncertainty (%) $u_i(\%)$	Degree of freedom ν_{eff} or ν_i
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 (%) $u_i(\%)$	Degree of freedom V_{eff} or v_i
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 numerical 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	B	4	R	$\sqrt{3}$	1	2.31	∞



	and thickness tolerances)							
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	



12. 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
<input checked="" type="checkbox"/>	SAR Probe	SSE2	SN27/15 EPGO261	2020/06/25	2021/06/24
<input checked="" type="checkbox"/>	Dipole	SID750	SN 23/15 DIP0G750-378	2020/06/25	2021/06/24
<input checked="" type="checkbox"/>	Dipole	SID835	SN 09/13 DIP0G835-217	2020/06/25	2021/06/24
<input checked="" type="checkbox"/>	Dipole	SID900	SN 09/13 DIP0G900-215	2020/06/25	2021/06/24
<input checked="" type="checkbox"/>	Dipole	SID1800	SN 09/13 DIP1G800-216	2020/06/25	2021/06/24
<input checked="" type="checkbox"/>	Dipole	SID2000	SN 09/13 DIP2G000-219	2020/06/25	2021/06/24
<input checked="" type="checkbox"/>	Dipole	SID2450	SN_09/13_DIP2G450-220	2020/06/25	2021/06/24
<input checked="" type="checkbox"/>	Dipole	SID2600	SN 32/14_DIP2G600-338	2020/06/25	2021/06/24
<input type="checkbox"/>	Dipole	SWG5500	SN15/15 WGA39	2020/06/25	2021/06/24
<input checked="" type="checkbox"/>	Multimeter	Keithley-2000	4014020	2020/04/03	2021/04/03
<input checked="" type="checkbox"/>	System Simulator(R&S)	CMW500	130805	2020/07/26	2021/07/25
<input checked="" type="checkbox"/>	KEYSIGHT	E7515A	MY56040357	2020/04/03	2021/04/03
<input checked="" type="checkbox"/>	Vector Network Analyzer(R&S)	ZVB8	A0802530	2020/04/03	2021/04/03
<input checked="" type="checkbox"/>	PC 3.5 Fixed Match Calibration Kit	ZV-Z32	100571	2019/11/29	2020/11/28
<input checked="" type="checkbox"/>	Dielectric Probe Kit	SCLMP	SN 09/13 OCPG51	2019/11/27	2020/11/26
<input checked="" type="checkbox"/>	Signal Generator	SMU200A	A140801888	2020/03/16	2021/03/15
<input checked="" type="checkbox"/>	Amplifier	Nucletudes	143060	2020/03/16	2021/03/15
<input checked="" type="checkbox"/>	Directional Coupler	DC6180A	305827	2020/03/16	2021/03/15
<input checked="" type="checkbox"/>	Power Meter	NRP2	A140401673	2020/03/16	2021/03/15
<input checked="" type="checkbox"/>	Power Sensor	NPR-Z11	1138.3004.02-114072-nq	2020/03/16	2021/03/15
<input checked="" type="checkbox"/>	Power Meter	NRVS	A0802531	2020/03/16	2021/03/15
<input checked="" type="checkbox"/>	Power Sensor	NRV-Z4	100069	2020/03/16	2021/03/15



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—