



# FCC SAR TEST REPORT

**Report No.:** SET2020-05992

**Product:** 5G NR Multi model smart phone

**Trade Name:** ZTE

**Model No.:** ZTG01

**FCC ID:** SRQ-ZTG01

**Applicant:** ZTE CORPORATION

**Address:** ZTE Plaza, Keji Road South, Shenzhen, China.

**Issued by:** CCIC Southern Testing Co., Ltd.

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

**Tel:** 86 755 26627338      **Fax:** 86 755 26627238

**Mail:** manager@ccic-set.com      **Website:** <http://www.ccic-set.com>

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# Test Report

**Product** .....: 5G NR Multi model smart phone  
**Model No.** .....: ZTG01  
**Brand Name**.....: ZTE  
**FCC ID**.....: SRQ-ZTG01  
**Applicant**.....: ZTE CORPORATION  
**Applicant Address**.....: ZTE Plaza, Keji Road South, Shenzhen, China.  
**Manufacturer**.....: ZTE CORPORATION  
**Manufacturer Address**: ZTE Plaza, Keji Road South, Shenzhen, China.

**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**.....: 2020.05.13-2020.05.19

**Tested by** .....: Mei Chun 2020-06-15  
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 Mei Chun, Test Engineer

**Reviewed by**.....: Chris You 2020-06-15  
 \_\_\_\_\_  
 Chris You, Senior Engineer

**Approved by**.....: Shuangwen Zhang 2020-06-15  
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 Shuangwen Zhang, Manager



## Contents

Test Report .....	2
1. Administrative Data .....	4
2. Equipment Under Test (EUT) .....	5
3. SAR Summary .....	7
4. Specific Absorption Rate (SAR) .....	8
5. Tissue check and recommend Dielectric Parameters .....	12
6. SAR measurement procedure.....	18
7. Conducted RF Output Power .....	19
8. SAR test Exclusion and estimate SAR calculation:.....	30
9. Scaling Factor calculation.....	32
10. Test Results .....	34
11. Simultaneous Transmissions Analysis .....	45
12. Measurement Uncertainty .....	47
13. Equipment List.....	51
ANNEX A: Appendix A: SAR System performance Check Plots.....	52
ANNEX B: Appendix B: SAR Measurement results Plots.....	52
ANNEX C: Appendix C: Calibration reports .....	52
ANNEX D: Appendix D: SAR Test Setup.....	52



## 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:** Portable  
**Exposure Category:** Population/Uncontrolled  
**Sample Name:** 5G NR Multi model smart phone  
**Brand Name:** ZTE  
**Model Name:** ZTG01

Support Band	GSM850/1900MHz, WCDMA 850MHz LTE Band 5,17 WIFI 2.4G/5G, BT,GPS
Test Band	GSM850MHz/1900MHz, WCDMA 850MHz LTE Band 5,17,WIFI 2.4G/5G, BT,GPS
IMEI	865839040005212
Device Class	Class B

Multi Class GPRS: Class 12; EGPRS: Class 12

### General description:

Development Stage	Identical Prototype
Accessories	Power Supply
Hotspot	2.4GHz WLAN support Hotspot mode
Antenna type	Internal Antenna
Operation mode	GSM /WCDMA / LTE /WIFI
Modulation mode	GSM(GMSK),UMTS(QPSK),LTE(QPSK,16QAM,64QAM), WIFI(OFDM/DSSS),BT( GFSK/ $\pi$ /4-DQPSK/8-DPSK)
DTM mode	Not support
Hardware Version	ZTG01HW1.1
Software Version	0.4.0
Battery options :	Model No.: Li3939T44P8h756547 Manufacture:Zhuhai CosMX Battery CO.,Ltd.
Max. SAR Value	Head: 1.006 W/Kg Body: 0.431 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 V:	824-849 MHz	869-894 MHz
LTE Band5:	824-849 MHz	869-894 MHz
LTE Band17:	704-716 MHz	734-746 MHz
WIFI(tested):	2412-2462 MHz	
	5150-5250 MHz	
	5250-5350 MHz	
	5470-5725 MHz	
Bluetooth:	2402-2480 MHz	
Test channels(low-mid-high):	128-190-251(GSM850)	
	512-661-810(GSM1900)	
	4132-4183-4233(UMTS Band V)	
	20450-20525-20600( LTE Band 5 Bandwidth 10M)	
	23780-23790-23800( LTE Band 17 Bandwidth 10M)	
	1-6-11(Wi-Fi 2.4G 802.11b)	
	5190-5270-5500-5725( Wi-Fi 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)
Head	GSM850	0.722	1.006
	GSM1900	0.053	
	WCDMA Band V	0.937	
	LTE Band 5	0.977	
	LTE Band 17	1.006	
	2.4G WIFI	0.530	
	5G WIFI	0.453	
	BT	0.317	

Exposure Position	Frequency Band	Scaled 1g-SAR(W/kg)	Highest Scaled 1g-SAR(W/kg)
Body-worn (10mm Gap)	GSM850	0.381	0.431
	GSM1900	0.431	
	WCDMA Band V	0.405	
	LTE Band 5	0.406	
	LTE Band 17	0.421	
	2.4G WIFI	0.090	
	5G WIFI	0.321	
	BT	0.100	

Exposure Position	Frequency Band	Scaled 1g-SAR(W/kg)	Highest Scaled 1g-SAR(W/kg)
Hotspot (10mm Gap)	GSM850	0.381	0.431
	GSM1900	0.431	
	WCDMA Band V	0.405	
	LTE Band 5	0.406	
	LTE Band 17	0.421	
	2.4G WIFI	0.090	

#### Highest Simultaneous SAR Summary

Exposure Position	Frequency Band	Highest Scaled 1g-SAR(W/kg)
Hotspot (10mmGap)	WWAN(GSM1900)&WIFI 2.4G	0.752

## 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 ( $\rho$ ). 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,  $\delta T$  is the temperature rise and  $\delta t$  the exposure duration, or related to the electrical field in the tissue by

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

where  $\sigma$  is the conductivity of the tissue,  $\rho$  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
<b>Spatial Peak SAR*</b> (Brain/Body)	<b>1.60 mW/g</b>
<b>Spatial Average SAR**</b> (Whole Body)	0.08 mW/g
<b>Spatial Peak SAR***</b> (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.

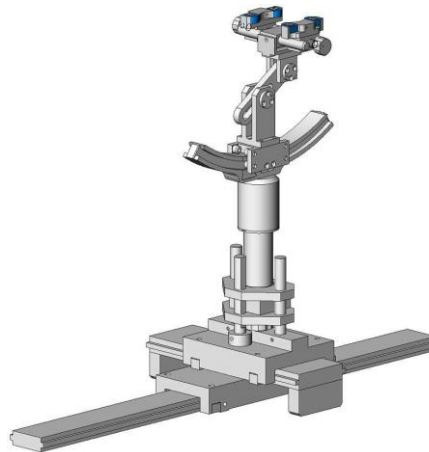


SAM Twin Phantom

### 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

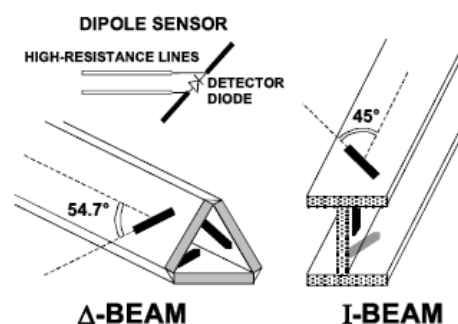


Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	700 MHz to 3 GHz; Linearity: $\pm 0.5$ dB (700 MHz to 3 GHz)
Directivity	$\pm 0.25$ dB in HSL (rotation around probe axis) $\pm 0.5$ dB in tissue material (rotation normal to probe axis)
Dynamic Range	1.5 $\mu$ W/g to 100 mW/g; Linearity: $\pm 0.5$ 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 $\epsilon_r$	Head $\sigma$ (S/m)	Body $\epsilon_r$	Body $\sigma$ (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	
	$\epsilon_r$	$\sigma$ (S/m)	$\epsilon_r$	$\sigma$ (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 Head Tissue Simulating Liquid

Temperature: 23.2 °C; Humidity: 64%;			
/	Frequency	Permittivity $\epsilon$	Conductivity $\sigma$ (S/m)
Target value	750MHz	41.9 $\pm$ 5%	0.89 $\pm$ 5%
Validation value (2020-05-13)	750MHz	41.87	0.90
Target value	835MHz	41.5 $\pm$ 5%	0.90 $\pm$ 5%
Validation value (2020-05-14)	835MHz	41.53	0.92
Target value	1900MHz	40.5 $\pm$ 5%	1.40 $\pm$ 5%
Validation value (2020-05-17)	1900MHz	40.46	1.40
Target value	2450MHz	39.2 $\pm$ 5%	1.80 $\pm$ 5%
Validation value (2020-05-18)	2450MHz	39.24	1.83
Target value	5200MHz	36.0 $\pm$ 5%	4.66 $\pm$ 5%
Validation value (2020-05-19)	5200MHz	36.01	4.67
Target value	5400MHz	35.8 $\pm$ 5%	4.86 $\pm$ 5%
Validation value (2020-05-19)	5400MHz	35.78	4.85
Target value	5600MHz	35.5 $\pm$ 5%	5.07 $\pm$ 5%
Validation value (2020-05-19)	5600MHz	35.52	5.08
Target value	5800MHz	35.3 $\pm$ 5%	5.27 $\pm$ 5%
Validation value (2020-05-19)	5800MHz	35.30	5.27



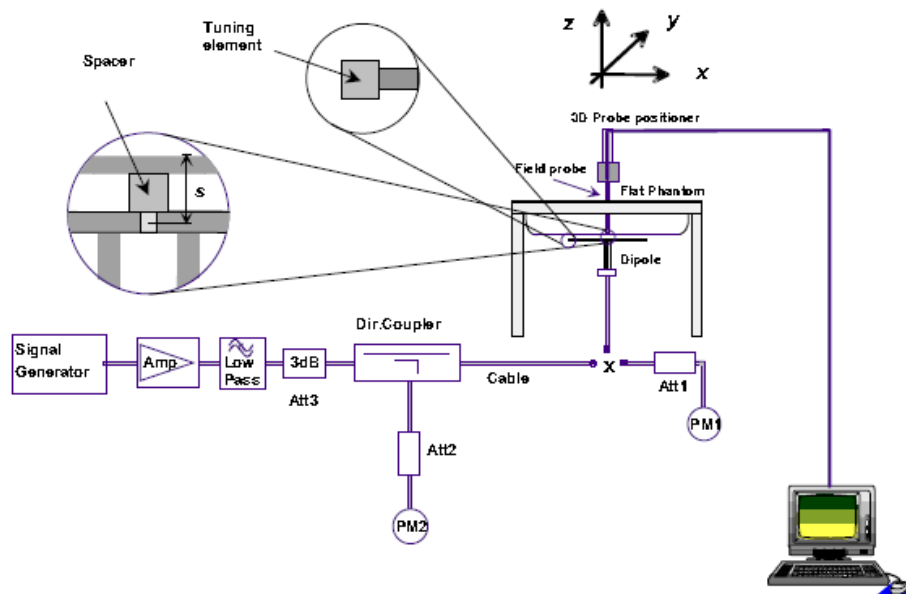
## Dielectric Performance of Body Tissue Simulating Liquid

Temperature: 23.2 °C; Humidity: 64%;			
/	Frequency	Permittivity $\epsilon$	Conductivity $\sigma$ (S/m)
Target value	750MHz	55.5 $\pm$ 5%	0.96 $\pm$ 5%
Validation value (2020-05-13)	750MHz	55.49	0.95
Target value	835MHz	55.2 $\pm$ 5%	0.97 $\pm$ 5%
Validation value (2020-05-14)	835MHz	55.20	0.97
Target value	1900MHz	53.3 $\pm$ 5%	1.52 $\pm$ 5%
Validation value (2020-05-17)	1900MHz	53.27	1.50
Target value	2450MHz	52.7 $\pm$ 5%	1.95 $\pm$ 5%
Validation value (2020-05-18)	2450MHz	52.72	1.97
Target value	5200MHz	49.0 $\pm$ 5%	5.30 $\pm$ 5%
Validation value (2020-05-19)	5200MHz	49.03	5.31
Target value	5400MHz	48.7 $\pm$ 5%	5.53 $\pm$ 5%
Validation value (2020-05-19)	5400MHz	48.74	5.56
Target value	5600MHz	48.5 $\pm$ 5%	5.77 $\pm$ 5%
Validation value (2020-05-19)	5600MHz	48.53	5.78
Target value	5800MHz	48.2 $\pm$ 5%	6.0 $\pm$ 5%
Validation value (2020-05-19)	5800MHz	48.20	6.00

## 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: Head SAR system validation (1g)

Frequency	Duty cycle	Target value (W/kg)	Test value (W/kg)	
			10 mW	1W
750MHz(2020-05-13)	1:1	8.62±10%	0.0804	8.04
835MHz(2020-05-14)	1:1	9.61±10%	0.0987	9.87
1900MHz(2020-05-17)	1:1	39.35±10%	0.3733	37.33
2450MHz(2020-05-18)	1:1	52.67±10%	0.5016	50.16
5200MHz(2020-05-19)	1:1	164.1±10%	1.7267	172.67
5400MHz(2020-05-19)	1:1	171.25±10%	1.8611	186.11
5600MHz(2020-05-19)	1:1	178.98±10%	1.7960	179.60
5800MHz(2020-05-19)	1:1	185.54±10%	1.8463	184.63

Body SAR system validation (1g)

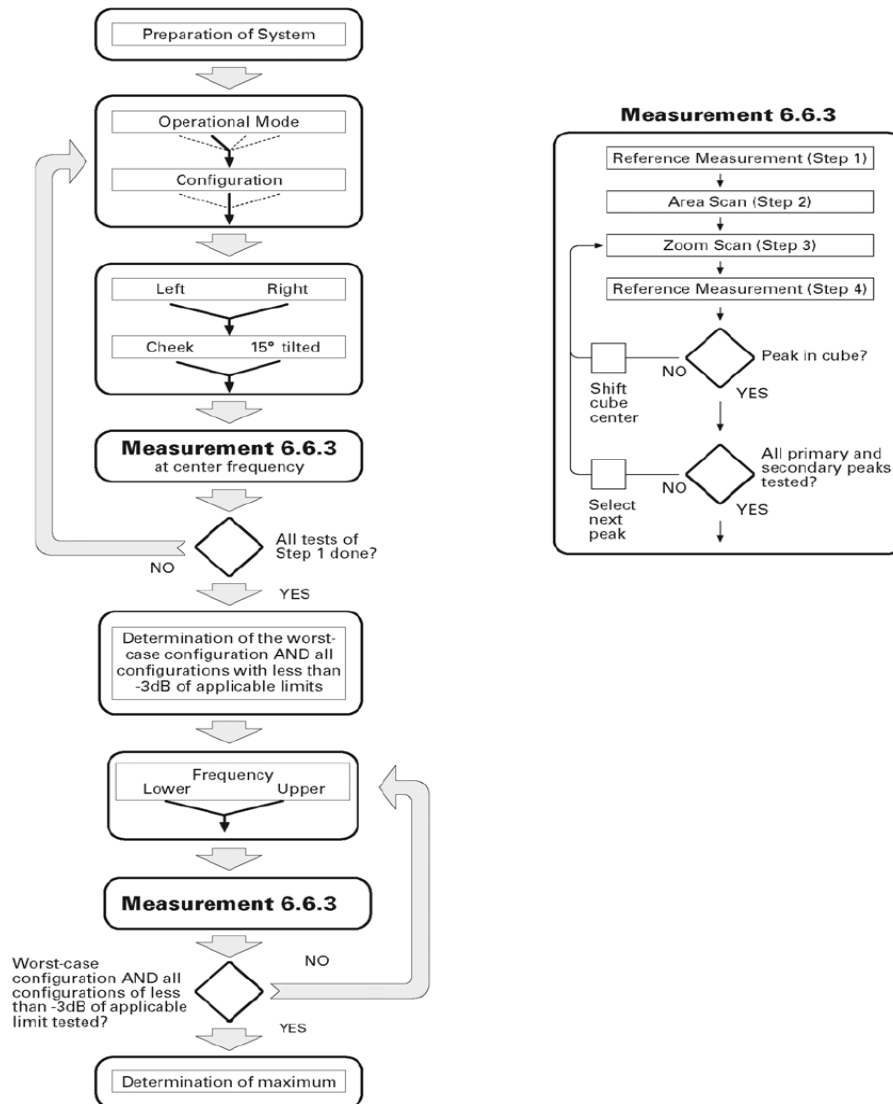
Frequency	Duty cycle	Target value (W/kg)	Test value (W/kg)	
			10 mW	1W
750MHz(2020-05-13)	1:1	8.68±10%	0.0911	9.11
835MHz(2020-05-14)	1:1	9.88±10%	0.1037	10.37
1900MHz(2020-05-17)	1:1	38.84±10%	0.4026	40.26
2450MHz(2020-05-18)	1:1	51.42±10%	0.5466	54.66
5200MHz(2020-05-19)	1:1	155.78±10%	1.7123	171.23
5400MHz(2020-05-19)	1:1	160.24±10%	1.7536	175.36
5600MHz(2020-05-19)	1:1	167.61±10%	1.6871	168.71
5800MHz(2020-05-19)	1:1	170.49±10%	1.7795	177.95

\* 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
GSM (CS)		32.63	32.55	32.67	-9.19	23.44	23.36	23.48
GPRS (GMSK)	1 Tx Slot	32.58	32.57	32.62	-9.19	23.39	23.38	23.43
	2 Tx Slots	31.04	31.07	31.08	-6.13	24.91	24.94	24.95
	3 Tx Slots	28.81	28.6	28.19	-4.42	24.39	24.18	23.77
	4 Tx Slots	28.12	28.16	28.13	-3.18	24.94	24.98	24.95
EDGE (8PSK)	1 Tx Slot	26.55	26.4	26.6	-9.19	17.36	17.21	17.41
	2 Tx Slots	25.27	25.41	25.4	-6.13	19.14	19.28	19.27
	3 Tx Slots	23.27	24	23.78	-4.42	18.85	19.58	19.36
	4 Tx Slots	22.4	22.8	22.41	-3.18	19.22	19.62	19.23
GSM1900		Burst-Averaged output Power (dBm)			Division Factors	Frame-Averaged output Power (dBm)		
		512CH	661CH	810CH		512CH	661CH	810CH
GSM (CS)		29.71	29.68	29.73	-9.19	20.52	20.49	20.54
GPRS (GMSK)	1 Tx Slot	30.12	30.17	30.08	21.05	20.93	20.98	20.89
	2 Tx Slots	28.01	28.19	28.10	-6.13	21.88	22.06	21.97
	3 Tx Slots	26.33	26.57	26.45	-4.42	21.91	22.15	22.03
	4 Tx Slots	25.12	25.37	25.26	-3.18	21.94	22.19	22.08
EDGE (8PSK)	1 Tx Slot	25.43	25.51	25.17	-9.19	16.24	16.32	15.98
	2 Tx Slots	23.33	23.51	23.36	-6.13	17.20	17.38	17.23
	3 Tx Slots	21.67	21.79	21.64	-4.42	17.25	17.37	17.22
	4 Tx Slots	20.46	20.58	20.44	-3.18	17.28	17.40	17.26

**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	-9.19dB	-6.13dB	-4.42dB	-3.18dB



## 7.2 WCDMA Conducted output Power

UMTS850 (Band V)		Average Power (dBm)		
		4132CH	4183CH	4233CH
WCDMA	12.2kbps RMC	24.36	24.19	24.07
HSDPA	Subtest 1	23.37	23.45	23.41
	Subtest 2	23.43	23.36	23.4
	Subtest 3	23.34	23.42	23.43
	Subtest 4	23.35	23.36	23.45
HSUPA	Subtest 1	23.15	23.15	23.21
	Subtest 2	23.18	23.06	23.22
	Subtest 3	23.1	23.16	23.22
	Subtest 4	23.04	23.06	23.23
	Subtest 5	23.05	23.11	23.21

**Note:**

1. 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.
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  $\leq 0.8\text{W/kg}$ , 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.



**The priority Main Antenna:**

1. 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	24.13	24.11	24.02	23.5±1.0
		1	3	23.93	23.93	23.77	
		1	5	24.03	23.97	23.82	
		3	0	23.67	23.82	23.64	23.0±1.0
		3	2	23.63	23.37	23.31	
		3	3	23.54	23.35	23.56	
	6	0	23.09	23.23	23.1	22.5±1.0	
	16QAM	1	0	22.85	22.86	22.75	22.5±1.0
		1	3	22.65	22.68	22.5	
		1	5	22.75	22.72	22.55	
		3	0	22.39	22.57	22.37	22.0±1.0
		3	2	22.35	22.12	22.04	
		3	3	22.26	22.1	22.29	
		6	0	21.81	21.98	21.83	21.5±1.0
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
3MHz	QPSK	1	0	24.26	24.19	24.16	23.5±1.0
		1	7	24.06	24.01	23.91	
		1	14	24.16	24.05	23.96	
		8	0	23.8	23.9	23.78	23.0±1.0
		8	4	23.76	23.45	23.45	
		8	7	23.67	23.43	23.7	
		15	0	23.22	23.31	23.24	22.5±1.0
	16QAM	1	0	22.98	22.94	22.89	22.5±1.0
		1	7	22.78	22.76	22.64	
		1	14	22.88	22.8	22.69	
		8	0	22.52	22.65	22.51	22.0±1.0
		8	4	22.48	22.2	22.18	
		8	7	22.39	22.18	22.43	
		15	0	21.94	22.06	21.97	21.5±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	24.3	24.22	24.22	23.5±1.0
		1	13	24.19	24.25	24	
		1	24	24.18	24.17	24.07	
		12	0	23.84	23.93	23.84	23.0±1.0
		12	6	23.52	23.83	23.49	
		12	13	23.69	23.65	23.59	
	25	0	23.27	23.22	23.31	22.5±1.0	
	16QAM	1	0	23.02	22.97	22.95	22.5±1.0
		1	13	22.91	23	22.73	
		1	24	22.9	22.92	22.8	
		12	0	22.56	22.68	22.57	22.0±1.0
		12	6	22.24	22.58	22.22	
		12	13	22.41	22.4	22.32	
	25	0	21.99	21.97	22.04	21.5±1.0	
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			Tune up
10MHz	QPSK	1	0	24.39	24.27	24.3	23.5±1.0
		1	25	24.25	24.06	24.15	
		1	49	24.29	24.03	24.29	
		25	0	23.88	23.92	23.91	23.0±1.0
		25	13	23.81	23.65	23.56	
		25	25	23.73	23.66	23.62	
	50	0	23.27	23.28	23.32	22.5±1.0	
	16QAM	1	0	23.11	23.02	23.03	22.5±1.0
		1	25	22.82	22.88	22.84	
		1	49	22.99	22.94	22.95	
		25	0	22.65	22.73	22.65	22.0±1.0
		25	13	22.53	22.4	22.29	
		25	25	22.45	22.41	22.35	
	50	0	22.12	22.05	22.08	21.5±1.0	



2. LTE Band 17 Conducted Power Test Verdict:

LTE FDD Band 17				Conducted Power(dBm)			Tune up
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency			
				23755/706.5	23790/710	23825/713.5	
5MHz	QPSK	1	0	24.24	24.35	24.15	23.5±1.0
		1	13	24.14	24.01	23.99	
		1	24	24.13	24.05	24.04	
		12	0	23.84	23.93	23.84	23.0±1.0
		12	6	23.77	23.48	23.63	
		12	13	23.45	23.46	23.61	
	25	0	23.24	23.35	23.28	22.5±1.0	
	16QAM	1	0	22.96	23.1	22.88	22.5±1.0
		1	13	22.76	22.77	22.68	
		1	24	22.85	22.81	22.86	
		12	0	22.56	22.68	22.57	22.0±1.0
		12	6	22.49	22.23	22.36	
		12	13	22.17	22.21	22.34	
		25	0	21.92	22	22.05	21.5±1.0
Bandwidth		Modulation	RB size	RB offset	Channel/Frequency		
	23780/709				23790/710	23800/711	
10MHz	QPSK	1	0	24.33	24.4	24.23	23.5±1.0
		1	25	24.23	24.06	24.07	
		1	49	24.22	24.1	24.12	
		25	0	23.93	23.98	23.92	23.0±1.0
		25	13	23.86	23.53	23.71	
		25	25	23.54	23.51	23.69	
	50	0	23.33	23.4	23.36	22.5±1.0	
	16QAM	1	0	23.05	23.15	22.96	22.5±1.0
		1	25	22.85	22.82	22.76	
		1	49	22.94	22.86	22.94	
		25	0	22.65	22.73	22.65	22.0±1.0
		25	13	22.58	22.28	22.44	
		25	25	22.26	22.26	22.42	
		50	0	22.01	22.05	22.13	21.5±1.0



## 7.4 WIFI Conducted Power

### 802.11b Test mode conducted output power

Channel	Frequency (MHz)	Output Power(dBm)	
		Ant. 0	Ant. 1
1	2412	17.61	16.53
6	2437	17.34	17.48
11	2462	17.46	17.82

### 802.11g Test mode conducted output power

Channel	Frequency (MHz)	Output Power(dBm)	
		Ant. 0	Ant. 1
1	2412	15.25	14.93
6	2437	15.07	14.46
11	2462	15.15	14.75

### 802.11n-20MHz Test mode conducted output power

Channel	Frequency (MHz)	Output Power(dBm)		
		Ant. 0	Ant. 1	Ant. 0+1
1	2412	14.14	12.53	16.42
6	2437	13.88	12.43	16.23
11	2462	12.98	12.69	15.85

### 802.11n-40MHz Test mode conducted output power

Channel	Frequency (MHz)	Output Power(dBm)		
		Ant. 0	Ant. 1	Ant. 0+1
3	2422	12.13	13.10	15.65
6	2437	11.86	11.95	14.92
9	2452	12.54	12.79	15.68

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

Frequency (MHz)	802.11a mode Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	
5180	12.23	12.06	
5220	12.65	11.94	
5240	12.60	11.90	
Test Frequency (MHz)	802.11n-HT20 mode Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	Total
5180	11.09	11.82	14.48
5220	12.30	11.79	15.06
5240	12.22	11.66	14.96
Test Frequency (MHz)	802.11n-HT40 mode Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	Total
5190	12.93	11.99	15.50
5230	13.02	13.93	16.51
Test Frequency (MHz)	802.11ac-VHT20 mode Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	Total
5180	11.73	11.58	14.67
5220	12.04	11.66	14.86
5240	12.04	11.64	14.85

802.11ac-VHT40 mode			
Test Frequency (MHz)	Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	Total
5190	13.04	11.87	15.50
5230	13.02	11.75	15.44

802.11ac-VHT80 mode			
Test Frequency (MHz)	Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	Total
5210	12.62	10.67	14.76



**Conducted Power Test results of band U-NII-2A (5250 ~ 5350 MHz)**

Frequency (MHz)	802.11a mode Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	
5260	12.29	12.63	
5300	12.03	12.48	
5320	12.24	12.33	
Test Frequency (MHz)	802.11n-HT20 mode Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	Total
5260	11.75	10.25	14.07
5300	11.84	10.23	14.12
5320	11.92	10.15	14.13
Test Frequency (MHz)	802.11n-HT40 mode Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	Total
5270	11.91	11.16	14.56
5310	11.56	10.98	14.29
Test Frequency (MHz)	802.11ac-VHT20 mode Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	Total
5260	10.96	11.24	14.11
5300	11.25	11.17	14.22
5320	11.25	10.21	13.77
Test Frequency (MHz)	802.11ac-VHT40 mode Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	Total
5270	12.42	11.19	14.86
5310	12.09	10.96	14.57

802.11ac-VHT80 mode			
Test Frequency (MHz)	Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	Total
5290	11.79	10.66	14.27



**Conducted Power Test results of band U-NII-2C (5470 ~ 5725 MHz)**

Frequency (MHz)	802.11a mode Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	
5500	12.56	12.72	
5600	12.42	11.59	
5700	12.46	12.44	
Test Frequency (MHz)	802.11n-HT20 mode Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	Total
5500	11.23	10.48	13.88
5600	12.52	11.35	14.98
5700	12.53	12.06	15.31
Test Frequency (MHz)	802.11n-HT40 mode Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	Total
5510	10.47	11.19	13.86
5590	11.39	10.64	14.04
5670	11.24	11.85	14.57
Test Frequency (MHz)	802.11ac-VHT20 mode Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	Total
5500	11.25	10.42	13.87
5600	12.50	11.42	15.00
5700	12.55	11.16	14.92
Test Frequency (MHz)	802.11ac-VHT40 mode Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	Total
5510	11.13	10.18	13.69
5590	12.33	11.15	14.79
5670	11.21	11.90	14.58
Test Frequency (MHz)	802.11ac-VHT80 mode Conducted Output Power (dBm)		
	Antenna 0	Antenna 1	Total
5530	10.10	11.00	13.58

### 7.5 Bluetooth Output Power

Channel	Frequency (MHz)	BT3.0 Output Power(dBm)		
		GFSK	$\pi/4$ -DQPSK	8-DPSK
CH 0	2402	6.17	5.76	6.15
CH 39	2441	6.71	6.39	6.72
CH 78	2480	5.42	5.71	6.04
Channel	Frequency (MHz)	BT4.0 Output Power(dBm)		
		GFSK		
CH 0	2402	9.993		
CH 20	2442	9.194		
CH 39	2480	8.832		

#### 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.

## 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  $\leq 50\text{mm}$  are determined by:  $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] [\sqrt{f} \text{ (GHz)}] \leq 3.0$  for 1-g SAR and  $\leq 7.5$  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  $< 5\text{mm}$ , 5mm is used for excluded SAR calculation
  - (5)

BT3.0 Max Power (dBm)	mW	Test Distance (mm)	Frequency(GHz)	Exclusion Thresholds
7.0	5.012	5	2.45	1.569

Per KDB 447498 D01v06 exclusion thresholds is  $1.569 < 3$ , RF exposure evaluation is not required.

BT estimated SAR value =  $\text{Exclusion Thresholds} / 7.5 = 1.569 / 7.5 = \mathbf{0.209\text{W/Kg}}$

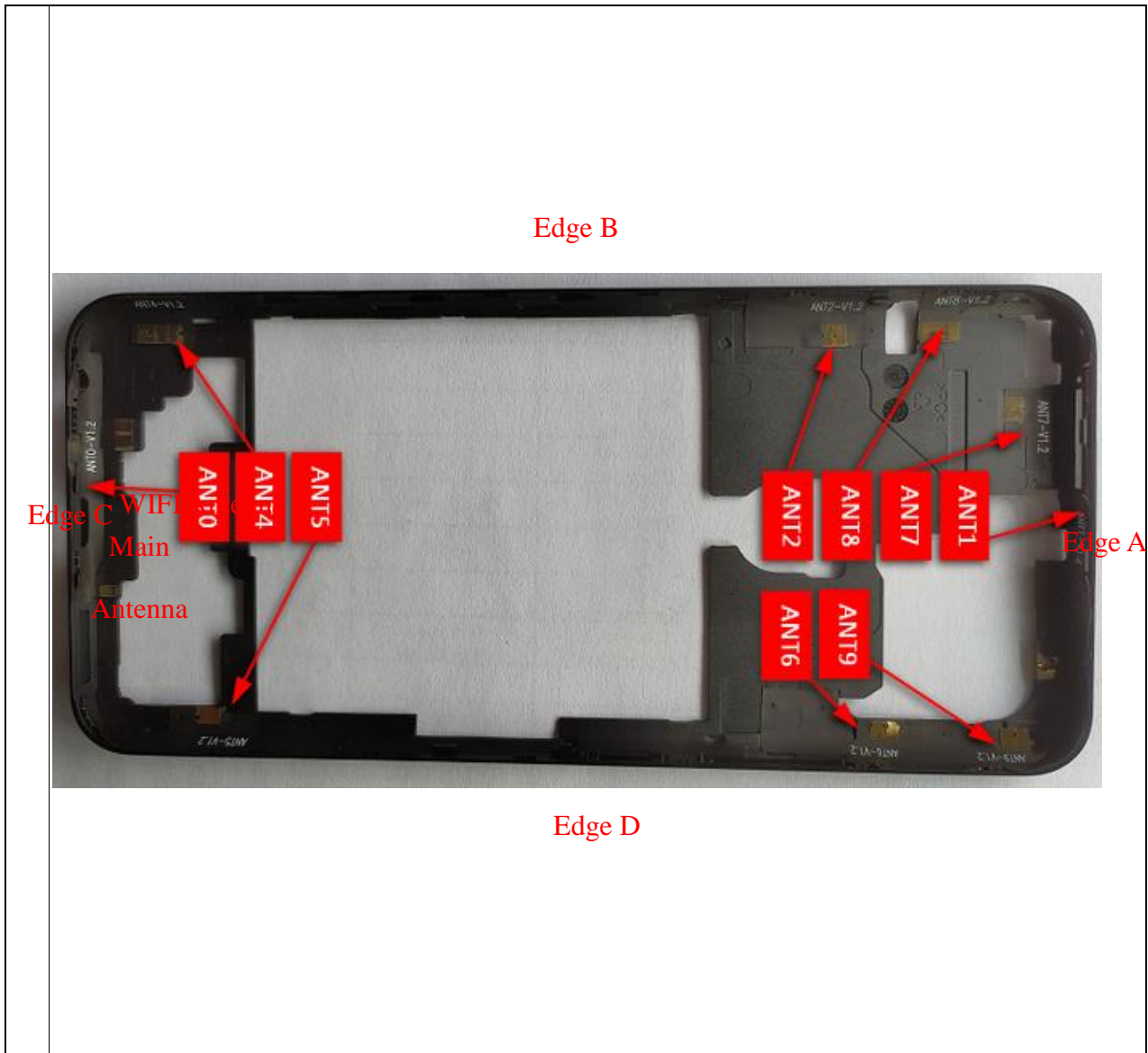
BT3.0 Max Power (dBm)	mW	Test Distance (mm)	Frequency(GHz)	Exclusion Thresholds
7.0	5.012	10	2.45	0.784

Per KDB 447498 D01v06 exclusion thresholds is  $0.784 < 3$ , RF exposure evaluation is not required.

BT estimated SAR value =  $\text{Exclusion Thresholds} / 7.5 = 0.784 / 7.5 = \mathbf{0.105\text{W/Kg}}$

The estimated SAR value is used for simultaneous transmission analysis.

**Antenna Location:**



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-worn	Yes	Yes	No	No	No	No
WWAN Antenna hotspot	Yes	Yes	No	Yes	Yes	Yes
WIFI Antenna Body-worn	Yes	Yes	No	No	No	No
WIFI 2.4G Antenna hotspot	Yes	Yes	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
GSM850	128/824.2	32.63	31.7 ±1.0	32.70	1.016
	190/836.6	32.55	31.7 ±1.0	32.70	1.035
	251/848.8	32.67	31.7 ±1.0	32.70	1.007
GPRS850 (GPRS 4Tx)	128/824.2	28.12	27.2±1.0	28.20	1.019
	190/836.6	28.16	27.2±1.0	28.20	1.009
	251/848.8	28.13	27.2±1.0	28.20	1.016
GSM1900	512/1850.2	29.71	29.0 ±1.0	30.00	1.069
	661/1880.0	29.68	29.0 ±1.0	30.00	1.076
	810/1909.8	29.73	29.0 ±1.0	30.00	1.064
GPRS1900 (GPRS 4Tx)	512/1850.2	25.12	24.5±1.0	25.50	1.091
	661/1880.0	25.37	24.5±1.0	25.50	1.030
	810/1909.8	25.26	24.5±1.0	25.50	1.057
WCDMA850	4132/826.4	24.36	23.5 ±1.0	24.50	1.033
	4183/836.6	24.19	23.5 ±1.0	24.50	1.074
	4233/846.6	24.07	23.5 ±1.0	24.50	1.104
LTE B5 10MHz 1RB#0	20450/829	24.39	23.5 ±1.0	24.50	1.026
	20525/836.5	24.27	23.5 ±1.0	24.50	1.054
	20600/844	24.30	23.5 ±1.0	24.50	1.047
LTE B5 10MHz 25RB#0	20450/829	23.88	23.0 ±1.0	24.00	1.028
	20525/836.5	23.92	23.0 ±1.0	24.00	1.019
	20600/844	23.91	23.0 ±1.0	24.00	1.021
LTE B17 10MHz 1RB#0	23780/709	24.33	23.5 ±1.0	24.50	1.040
	23790/710	24.40	23.5 ±1.0	24.50	1.023
	23800/711	24.23	23.5 ±1.0	24.50	1.064
LTE B17 10MHz 25RB#0	23780/709	23.93	23.0 ±1.0	24.00	1.016
	23790/710	23.98	23.0 ±1.0	24.00	1.005
	23800/711	23.92	23.0 ±1.0	24.00	1.019
WIFI 2.4G 802.11b Ant.0	1/2412	17.61	16.7±1.0	17.70	1.021
	6/2437	17.34	16.7±1.0	17.70	1.086
	11/2462	17.46	16.7±1.0	17.70	1.057
WIFI 2.4G 802.11b Ant.1	1/2412	16.53	17.0±1.0	18.00	1.403
	6/2437	17.48	17.0±1.0	18.80	1.355
	11/2462	17.82	17.0±1.0	18.00	1.042
WIFI 2.4G 802.11n-20 Ant. 0+1	3/2422	16.42	15.5 ±1.0	16.50	1.019
	6/2437	16.23	15.5 ±1.0	16.50	1.064
	9/2452	15.85	15.5 ±1.0	16.50	1.161





WIFI 5G Ant 0	38/5190	13.04	12.1 ±1.0	13.10	1.014
WIFI 5G Ant 0	54/5270	12.42	11.5±1.0	12.50	1.019
WIFI 5G Ant 0	100/5500	12.56	11.6±1.0	12.60	1.009
WIFI 5G Ant 1	36/5180	12.06	11.1 ±1.0	12.10	1.009
WIFI 5G Ant 1	52/5260	12.63	12.0±1.0	13.00	1.089
WIFI 5G Ant 1	140/5700	12.06	11.1 ±1.0	12.10	1.009
WIFI 5G Ant 0+1	46/5230	16.51	15.6 ±1.0	16.60	1.021
WIFI 5G Ant 0+1	54/5270	14.86	14.0 ±1.0	15.00	1.033
WIFI 5G Ant 0+1	140/5700	15.31	14.5±1.0	15.50	1.045
BLE	0/2402	9.993	9.0 ±1.0	10.00	1.002
BLE	39/2441	9.194	9.0 ±1.0	10.00	1.204
BLE	78/2480	8.832	9.0 ±1.0	10.00	1.309

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

**Test Results****Results overview of GSM850**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	190/836.6	Voice	0.553	0.01	1.035	0.572	/
Right Tilt 15 °	190/836.6	Voice	0.442	0.89	1.035	0.457	/
Left Cheek	190/836.6	Voice	<b>0.698</b>	-0.66	1.035	<b>0.722</b>	Yes
Left Cheek	190/836.6	Voice	0.694	-2.97	1.035	0.718	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	190/836.6	GPRS 4Tx	<b>0.215</b>	-1.48	1.009	<b>0.381</b>	Yes
Face Upward	190/836.6	GPRS 4Tx	0.156	-1.11	1.009	0.256	/
Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	190/836.6	GPRS 4Tx	<b>0.378</b>	-1.48	1.009	<b>0.381</b>	Yes
Face Upward	190/836.6	GPRS 4Tx	0.254	-1.11	1.009	0.256	/
Edge B	190/836.6	GPRS 4Tx	0.100	-4.24	1.009	0.101	/
Edge A	190/836.6	GPRS 4Tx	0.215	-0.89	1.009	0.217	/
Edge D	190/836.6	GPRS 4Tx	0.313	-1.52	1.009	0.316	/

**Results overview of GSM1900**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	661/1880.0	Voice	0.034	-2.67	1.076	0.037	/
Right Tilt 15 °	661/1880.0	Voice	0.027	-0.43	1.076	0.029	/
Left Cheek	661/1880.0	Voice	<b>0.049</b>	-3.33	1.076	<b>0.053</b>	Yes
Left Tilt 15 °	661/1880.0	Voice	0.033	1.09	1.076	0.036	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	661/1880.0	GPRS 4Tx	<b>0.418</b>	-2.85	1.030	<b>0.431</b>	Yes
Face Upward	661/1880.0	GPRS 4Tx	0.095	-3.78	1.030	0.098	/
Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	661/1880.0	GPRS 4Tx	<b>0.418</b>	-2.85	1.030	<b>0.431</b>	Yes
Face Upward	661/1880.0	GPRS 4Tx	0.095	-3.78	1.030	0.098	/
Edge B	661/1880.0	GPRS 4Tx	0.020	-1.50	1.030	0.021	/
Edge C	661/1880.0	GPRS 4Tx	0.287	-1.94	1.030	0.296	/
Edge D	661/1880.0	GPRS 4Tx	0.060	4.81	1.030	0.062	/



**Results overview of WCDMA850**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	4183/836.6	RMC	0.660	-0.19	1.074	0.709	/
Right Tilt 15 °	4183/836.6	RMC	0.521	-0.99	1.074	0.560	/
Left Cheek	4132/826.4	RMC	0.832	0.33	1.033	0.859	/
Left Cheek	4183/836.6	RMC	0.855	-0.91	1.074	0.918	/
Left Cheek	4233/846.6	RMC	0.827	1.01	1.104	0.913	/
Left Cheek Repeated	4132/826.4	RMC	0.831	0.23	1.033	0.858	/
	4183/836.6	RMC	0.833	-1.19	1.074	0.895	/
	4233/846.6	RMC	0.828	-2.98	1.104	0.914	/
Left Tilt 15 °	4132/826.4	RMC	0.855	0.21	1.033	0.883	/
Left Tilt 15 °	4183/836.6	RMC	<b>0.872</b>	-0.33	1.074	<b>0.937</b>	Yes
Left Tilt 15 °	4233/846.6	RMC	0.847	0.12	1.104	0.935	/
Left Tilt 15 ° Repeated	4132/826.4	RMC	0.849	0.24	1.033	0.877	/
	4183/836.6	RMC	0.870	-1.09	1.074	0.934	/
	4233/846.6	RMC	0.844	-0.18	1.104	0.932	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	4183/836.6	RMC	<b>0.377</b>	-1.18	1.074	<b>0.405</b>	Yes
Face Upward	4183/836.6	RMC	0.248	-1.13	1.074	0.266	/
Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	4183/836.6	RMC	<b>0.377</b>	-1.18	1.074	<b>0.405</b>	Yes
Face Upward	4183/836.6	RMC	0.248	-1.13	1.074	0.266	/
Edge B	4183/836.6	RMC	0.110	-4.56	1.074	0.118	/
Edge A	4183/836.6	RMC	0.281	-0.35	1.074	0.302	/
Edge D	4183/836.6	RMC	0.317	-1.47	1.074	0.340	/



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

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
1RB#0							
Right Cheek	20525/836.5	Data	0.556	-0.95	1.054	0.586	/
Right Tilt 15 °	20525/836.5	Data	0.456	-1.77	1.054	0.481	/
Left Cheek	20450/829	Data	0.927	1.09	1.026	0.951	/
Left Cheek	20525/836.5	Data	<b>0.927</b>	-0.26	1.054	<b>0.977</b>	Yes
Left Cheek	20600/844	Data	0.924	0.11	1.047	0.967	/
Left Cheek Repeated	20450/829	Data	0.923	1.02	1.026	0.947	/
	20525/836.5	Data	0.924	-0.33	1.054	0.974	/
	20600/844	Data	0.921	-1.04	1.047	0.964	/
Left Tilt 15 °	20525/836.5	Data	0.756	-1.09	1.054	0.797	/
50%RB#0							
Right Cheek	20525/836.5	Data	0.345	0.32	1.019	0.352	/
Right Tilt 15 °	20525/836.5	Data	0.317	-1.09	1.019	0.323	/
Left Cheek	20525/836.5	Data	0.755	2.04	1.019	0.769	/
Left Tilt 15 °	20525/836.5	Data	0.726	-1.11	1.019	0.740	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
1RB#0							
Back Upward	20525/836.5	Data	<b>0.385</b>	-1.96	1.054	<b>0.406</b>	Yes
Face Upward	20525/836.5	Data	0.225	-4.35	1.054	0.237	/
50%RB#0							
Back Upward	20525/836.5	Data	0.298	0.34	1.019	0.304	/
Face Upward	20525/836.5	Data	0.199	-1.27	1.019	0.203	/
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#0							
Back Upward	20525/836.5	Data	<b>0.385</b>	-1.96	1.054	<b>0.406</b>	Yes
Face Upward	20525/836.5	Data	0.225	-4.35	1.054	0.237	/
Edge B	20525/836.5	Data	0.109	3.45	1.054	0.115	/
Edge A	20525/836.5	Data	0.249	-0.64	1.054	0.262	/
Edge D	20525/836.5	Data	0.295	-2.56	1.054	0.311	/
50%RB#0							
Back Upward	20525/836.5	Data	0.298	0.34	1.019	0.304	/
Face Upward	20525/836.5	Data	0.199	-1.27	1.019	0.203	/
Edge B	20525/836.5	Data	0.096	0.65	1.019	0.098	/
Edge A	20525/836.5	Data	0.203	1.23	1.019	0.207	/
Edge D	20525/836.5	Data	0.221	0.87	1.019	0.225	/



**Results overview of FDD LTE Band 17, QPSK, 10MHz Bandwidth**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
1RB#0							
Right Cheek	23790/710	Data	0.648	-1.03	1.023	0.663	/
Right Tilt 15 °	23790/710	Data	0.545	-1.18	1.023	0.558	/
Left Cheek	23780/709	Data	0.958	0.32	1.040	0.996	/
Left Cheek	23790/710	Data	<b>0.983</b>	-1.41	1.023	<b>1.006</b>	Yes
Left Cheek	23800/711	Data	0.936	0.87	1.064	0.996	/
Left Cheek Repeated	23780/709	Data	0.943	1.09	1.040	0.981	/
	23790/710	Data	0.967	-2.33	1.023	0.989	/
	23800/711	Data	0.934	1.06	1.064	0.994	/
Left Tilt 15 °	23790/710	Data	0.753	-1.04	1.023	0.770	/
50%RB#0							
Right Cheek	23790/710	Data	0.533	0.34	1.005	0.536	/
Right Tilt 15 °	23790/710	Data	0.487	-1.09	1.005	0.489	/
Left Cheek	23790/710	Data	0.764	1.37	1.005	0.768	/
Left Tilt 15 °	23790/710	Data	0.718	0.23	1.005	0.722	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
1RB#0							
Back Upward	23790/710	Data	<b>0.412</b>	-024	1.023	<b>0.421</b>	Yes
Face Upward	23790/710	Data	0.208	-0.42	1.023	0.213	/
50%RB#0							
Back Upward	23790/710	Data	0.387	0.23	1.005	0.389	/
Face Upward	23790/710	Data	0.193	-1.29	1.005	0.194	/
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#0							
Back Upward	23790/710	Data	<b>0.412</b>	-024	1.023	<b>0.421</b>	Yes
Face Upward	23790/710	Data	0.208	-0.42	1.023	0.213	/
Edge B	23790/710	Data	0.176	-1.39	1.023	0.180	/
Edge A	23790/710	Data	0.187	-0.83	1.023	0.191	/
Edge D	23790/710	Data	0.325	-1.74	1.023	0.332	/
50%RB#0							
Back Upward	23790/710	Data	0.387	0.23	1.005	0.389	/
Face Upward	23790/710	Data	0.193	-1.29	1.005	0.194	/
Edge B	23790/710	Data	0.176	0.43	1.005	0.177	/
Edge A	23790/710	Data	0.187	-2.34	1.005	0.188	/
Edge D	23790/710	Data	0.325	1.09	1.005	0.327	/

**Results overview of WIFI2.4G 802.11b Ant 0**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	6/2437	DSSS	0.263	-2.64	1.086	0.286	/
Right Tilt 15 °	6/2437	DSSS	0.294	-1.31	1.086	0.319	/
Left Cheek	6/2437	DSSS	<b>0.488</b>	-2.07	1.086	<b>0.530</b>	Yes
Left Tilt 15 °	6/2437	DSSS	0.447	-2.51	1.086	0.485	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	6/2437	DSSS	<b>0.083</b>	-2.85	1.086	<b>0.090</b>	Yes
Face Upward	6/2437	DSSS	0.072	-4.05	1.086	0.078	/
Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	6/2437	DSSS	<b>0.083</b>	-2.85	1.086	<b>0.090</b>	Yes
Face Upward	6/2437	DSSS	0.072	-4.05	1.086	0.078	/
Edge A	6/2437	DSSS	0.095	-2.61	1.086	0.103	/
Edge B	6/2437	DSSS	0.046	0.42	1.086	0.050	/
Edge D	6/2437	DSSS	0.051	1.73	1.086	0.055	/

**Results overview of WIFI2.4G 802.11b Ant 1**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	6/2437	DSSS	0.207	0.44	1.355	0.280	/
Right Tilt 15 °	6/2437	DSSS	0.206	-1.89	1.355	0.279	/
Left Cheek	6/2437	DSSS	0.334	2.13	1.355	0.453	/
Left Tilt 15 °	6/2437	DSSS	0.311	1.72	1.355	0.421	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	6/2437	DSSS	0.067	0.98	1.355	0.088	/
Face Upward	6/2437	DSSS	0.054	-2.03	1.355	0.073	/
Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	6/2437	DSSS	0.067	0.98	1.355	0.088	/
Face Upward	6/2437	DSSS	0.054	-2.03	1.355	0.073	/
Edge A	6/2437	DSSS	0.071	0.64	1.355	0.096	/
Edge B	6/2437	DSSS	0.036	1.35	1.355	0.049	/
Edge D	6/2437	DSSS	0.035	-2.30	1.355	0.047	/

**Results overview of WIFI2.4G 802.11N-20 Ant 0+1**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	6/2437	DSSS	0.204	0.92	1.064	0.217	/
Right Tilt 15 °	6/2437	DSSS	0.200	-1.32	1.064	0.213	/
Left Cheek	6/2437	DSSS	0.308	-3.24	1.064	0.328	/
Left Tilt 15 °	6/2437	DSSS	0.301	-1.93	1.064	0.320	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	6/2437	DSSS	0.071	2.07	1.064	0.076	/
Face Upward	6/2437	DSSS	0.057	-1.72	1.064	0.061	/
Hotspot(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	6/2437	DSSS	0.071	2.07	1.064	0.076	/
Face Upward	6/2437	DSSS	0.057	-1.72	1.064	0.061	/
Edge A	6/2437	DSSS	0.067	1.08	1.064	0.071	/
Edge B	6/2437	DSSS	0.051	0.44	1.064	0.054	/
Edge D	6/2437	DSSS	0.059	-0.75	1.064	0.063	/

**Results overview of WIFI5G (5150~5250) An0**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	38/5190	OFDM	0.228	-0.11	1.014	0.231	/
Right Tilt 15 °	38/5190	OFDM	0.211	0.32	1.014	0.214	/
Left Cheek	38/5190	OFDM	<b>0.447</b>	-2.51	1.014	<b>0.453</b>	Yes
Left Tilt 15 °	38/5190	OFDM	0.428	1.34	1.014	0.434	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	38/5190	OFDM	<b>0.317</b>	1.18	1.014	<b>0.321</b>	Yes
Face Upward	38/5190	OFDM	0.288	-1.02	1.014	0.292	/



**Results overview of WIFI5G (5250~5350) An0**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	54/5270	OFDM	0.221	-0.15	1.019	0.225	/
Right Tilt 15 °	54/5270	OFDM	0.202	0.77	1.019	0.206	/
Left Cheek	54/5270	OFDM	0.401	1.21	1.019	0.409	/
Left Tilt 15 °	54/5270	OFDM	0.388	1.06	1.019	0.395	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	54/5270	OFDM	0.302	1.06	1.019	0.308	/
Face Upward	54/5270	OFDM	0.280	-0.34	1.019	0.285	/

**Results overview of WIFI5G (5470~5725) An0**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	100/5500	OFDM	0.223	0.32	1.009	0.225	/
Right Tilt 15 °	100/5500	OFDM	0.200	-1.21	1.009	0.202	/
Left Cheek	100/5500	OFDM	0.397	0.65	1.009	0.401	/
Left Tilt 15 °	100/5500	OFDM	0.384	-1.20	1.009	0.387	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	100/5500	OFDM	0.301	-0.32	1.009	0.304	/
Face Upward	100/5500	OFDM	0.276	0.18	1.009	0.278	/

**Results overview of WIFI5G (5150~5250) An1**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	36/5180	OFDM	0.217	0.43	1.009	0.219	/
Right Tilt 15 °	36/5180	OFDM	0.210	-4.30	1.009	0.212	/
Left Cheek	36/5180	OFDM	0.407	-2.08	1.009	0.411	/
Left Tilt 15 °	36/5180	OFDM	0.392	1.36	1.009	0.396	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	36/5180	OFDM	0.303	0.43	1.009	0.306	/
Face Upward	36/5180	OFDM	0.290	-2.17	1.009	0.293	/

**Results overview of WIFI5G (5250~5350) An1**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	54/5270	OFDM	0.207	0.43	1.089	0.225	/
Right Tilt 15 °	54/5270	OFDM	0.186	-1.20	1.089	0.203	/
Left Cheek	54/5270	OFDM	0.387	-3.29	1.089	0.421	/
Left Tilt 15 °	54/5270	OFDM	0.356	1.04	1.089	0.388	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	54/5270	OFDM	0.300	1.22	1.089	0.327	/
Face Upward	54/5270	OFDM	0.256	3.15	1.089	0.279	/

**Results overview of WIFI5G (5470~5725) An1**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	100/5500	OFDM	0.222	0.43	1.009	0.224	/
Right Tilt 15 °	100/5500	OFDM	0.189	2.32	1.009	0.191	/
Left Cheek	100/5500	OFDM	0.395	4.02	1.009	0.399	/
Left Tilt 15 °	100/5500	OFDM	0.367	-1.98	1.009	0.370	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	100/5500	OFDM	0.304	1.20	1.009	0.307	/
Face Upward	100/5500	OFDM	0.278	0.32	1.009	0.281	/

**Results overview of WIFI5G (5150~5250) An0+1**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	38/5190	OFDM	0.219	0.34	1.021	0.224	/
Right Tilt 15 °	38/5190	OFDM	0.207	-1.02	1.021	0.211	/
Left Cheek	38/5190	OFDM	0.412	3.19	1.021	0.421	/
Left Tilt 15 °	38/5190	OFDM	0.410	0.54	1.021	0.419	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	38/5190	OFDM	0.304	-2.33	1.021	0.310	/
Face Upward	38/5190	OFDM	0.281	-1.08	1.021	0.287	/

**Results overview of WIFI5G (5250~5350) An0+1**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	54/5270	OFDM	0.223	3.02	1.033	0.230	/
Right Tilt 15 °	54/5270	OFDM	0.204	-2.98	1.033	0.211	/
Left Cheek	54/5270	OFDM	0.405	-1.27	1.033	0.418	/
Left Tilt 15 °	54/5270	OFDM	0.383	0.32	1.033	0.396	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	54/5270	OFDM	0.296	0.32	1.033	0.306	/
Face Upward	54/5270	OFDM	0.269	-1.90	1.033	0.278	/

**Results overview of WIFI5G (5470~5725) An0+1**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	100/5500	OFDM	0.220	0.34	1.045	0.230	/
Right Tilt 15 °	100/5500	OFDM	0.197	-0.87	1.045	0.206	/
Left Cheek	100/5500	OFDM	0.393	1.29	1.045	0.411	/
Left Tilt 15 °	100/5500	OFDM	0.366	1.32	1.045	0.382	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	100/5500	OFDM	0.298	0.43	1.045	0.311	/
Face Upward	100/5500	OFDM	0.254	-2.12	1.045	0.265	/

**Results overview of BT3.0**

Test Position of Head	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Right Cheek	39/2441	DH5	<b>0.263</b>	-2.64	1.204	<b>0.317</b>	Yes
Right Tilt 15 °	39/2441	DH5	0.224	0.97	1.204	0.270	/
Left Cheek	39/2441	DH5	0.187	-1.05	1.204	0.225	/
Left Tilt 15 °	39/2441	DH5	0.179	1.22	1.204	0.216	/
Body-worn(10mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	SAR Plot.
Back Upward	39/2441	DH5	<b>0.083</b>	0.76	1.204	<b>0.100</b>	Yes
Face Upward	39/2441	DH5	0.043	-1.04	1.204	0.052	/

**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)

- $\leq 0.8$  W/kg, when the transmission band is  $\leq 100$  MHz
- $\leq 0.6$  W/kg, when the transmission band is between 100 MHz and 200 MHz
- $\leq 0.4$  W/kg, when the transmission band is  $\geq 200$  MHz

The priority (Main) and secondary(upper) antenna cannot transimit 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	GSM + BT	Yes	No
2	GSM + WIFI 2.4G	Yes	Yes
3	WCDMA +BT	Yes	No
4	WCDMA +WIFI 2.4G	Yes	Yes
5	LTE+BT	Yes	No
6	LTE+WIFI 2.4G	Yes	Yes
7	WIFI+BT	No	No

### Simultaneous Tx Combination of GSM/WCDMA/LTE and BT/WIFI (Head)

Test Position/Freq.		Right Cheek	Right Tilt 15 °	Left Cheek	Left Tilt 15 °
Head MAX 1-g SAR(W/Kg)	GSM850	0.572	0.457	0.722	0.718
	GSM1900	0.037	0.029	0.053	0.036
	WCDMA 850	0.709	0.560	0.918	0.937
	LTE Band5	0.586	0.481	0.977	0.797
	LTE Band17	0.663	0.558	1.006	0.770
	WIFI 2.4G	0.286	0.319	0.530	0.485
	WIFI 5G	0.231	0.214	0.453	0.434
	BT	0.317	0.270	0.225	0.216
WIFI Simultaneous $\Sigma$ 1-g SAR(W/Kg)		0.949	0.877	1.536	1.422
BT Simultaneous $\Sigma$ 1-g SAR(W/Kg)		0.98	0.828	1.231	1.153



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

Test Position/Freq.		BACK	FACE	Edge A	Edge B	Edge C	Edge D
Body MAX 1-g SAR(W/Kg) 10mm distance	GSM850	0.381	0.256	/	/	/	/
	GSM1900	0.431	0.098	/	/	/	/
	WCDMA 850	0.405	0.266	/	/	/	/
	LTE Band5	0.406	0.237	/	/	/	/
	LTE Band17	0.421	0.213	/	/	/	/
	WIFI 2.4G	0.090	0.078	/	/	/	/
	WIFI 5G	0.321	0.292	/	/	/	/
	BT	0.100	0.052	/	/	/	/
WIFI Simultaneous $\Sigma$ 1-g SAR(W/Kg)		0.752	0.558	/	/	/	/
BT Simultaneous $\Sigma$ 1-g SAR(W/Kg)		0.531	0.318	/	/	/	/

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

Test Position/Freq.		BACK	FACE	Edge A	Edge B	Edge C	Edge D
Hotspot MAX 1-g SAR(W/Kg) 10mm distance	GSM850	0.381	0.256	0.217	0.101	/	0.316
	GSM1900	0.431	0.098	/	0.021	0.296	0.062
	WCDMA 850	0.405	0.266	0.302	0.118	/	0.340
	LTE Band5	0.406	0.237	0.262	0.115	/	0.311
	LTE Band17	0.421	0.213	0.191	0.180	/	0.332
	WIFI 2.4G	0.090	0.078	0.103	0.050	/	0.055
WIFI 2.4G Simultaneous $\Sigma$ 1-g SAR(W/Kg)		0.752	0.558	0.832	0.665	0.296	0.395

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

## 11.Measurement Uncertainty

No.	Uncertainty Component	Type	Uncertainty Value (%)	Probability Distribution	k	ci	Standard Uncertainty (%) $u_i(\%)$	Degree of freedom $\nu_{eff}$ or $\nu_i$
<b>Measurement System</b>								
1	– Probe Calibration	B	5.8	N	1	1	5.8	$\infty$
2	– Axial isotropy	B	3.5	R	$\sqrt{3}$	0.5	1.43	$\infty$
3	– Hemispherical Isotropy	B	5.9	R	$\sqrt{3}$	0.5	2.41	$\infty$
4	– Boundary Effect	B	1	R	$\sqrt{3}$	1	0.58	$\infty$
5	– Linearity	B	4.7	R	$\sqrt{3}$	1	2.71	$\infty$
6	– System Detection Limits	B	1.0	R	$\sqrt{3}$	1	0.58	$\infty$
7	Modulation response	B	3	N	1	1	3.00	
8	– Readout Electronics	B	0.5	N	1	1	0.50	$\infty$
9	– Response Time	B	1.4	R	$\sqrt{3}$	1	0.81	$\infty$
10	– Integration Time	B	3.0	R	$\sqrt{3}$	1	1.73	$\infty$
11	– RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.73	$\infty$
12	– Probe Position Mechanical tolerance	B	1.4	R	$\sqrt{3}$	1	0.81	$\infty$
13	– Probe Position with respect to Phantom Shell	B	1.4	R	$\sqrt{3}$	1	0.81	$\infty$
14	– Extrapolation, Interpolation and Integration Algorithms for Max. SAR evaluation	B	2.3	R	$\sqrt{3}$	1	1.33	$\infty$
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	$\infty$
<b>Phantom and Tissue Parameters</b>								
18	- Phantom Uncertainty(shape and thickness tolerances)	B	4	R	$\sqrt{3}$	1	2.31	$\infty$
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	$\infty$
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	$\infty$
23	- Liquid Permittivity -measurement uncertainty	B	5	N	$\sqrt{3}$	1	1.15	$\infty$
<b>Combined Standard Uncertainty</b>				RSS			10.63	
<b>Expanded uncertainty</b> (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 $v_i$
<b>Measurement System</b>								
1	- Probe Calibration	B	5.8	N	1	1	5.8	$\infty$
2	- Axial isotropy	B	3.5	R	$\sqrt{3}$	0.5	1.43	$\infty$





3	– Hemispherical Isotropy	B	5.9	R	$\sqrt{3}$	0.5	2.41	$\infty$
4	– Boundary Effect	B	1	R	$\sqrt{3}$	1	0.58	$\infty$
5	– Linearity	B	4.7	R	$\sqrt{3}$	1	2.71	$\infty$
6	– System Detection Limits	B	1	R	$\sqrt{3}$	1	0.58	$\infty$
7	Modulation response	B	0	N	1	1	0.00	
8	– Readout Electronics	B	0.5	N	1	1	0.50	$\infty$
9	– Response Time	B	0.00	R	$\sqrt{3}$	1	0.00	$\infty$
10	– Integration Time	B	1.4	R	$\sqrt{3}$	1	0.81	$\infty$
11	– RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.73	$\infty$
12	– Probe Position Mechanical tolerance	B	1.4	R	$\sqrt{3}$	1	0.81	$\infty$
13	– Probe Position with respect to Phantom Shell	B	1.4	R	$\sqrt{3}$	1	0.81	$\infty$
14	– Extrapolation, Interpolation and Integration Algorithms for Max. SAR evaluation	B	2.3	R	$\sqrt{3}$	1	1.33	$\infty$
<b>Uncertainties of the DUT</b>								
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	$\infty$
<b>Phantom and Tissue Parameters</b>								
18	– Phantom Uncertainty(shape	B	4	R	$\sqrt{3}$	1	2.31	$\infty$



	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	$\infty$
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	$\infty$
23	- Liquid Permittivity -measurement uncertainty	B	5	N	$\sqrt{3}$	1	1.15	$\infty$
<b>Combined Standard Uncertainty</b>				RSS			10.15	
<b>Expanded uncertainty</b> (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	SN41/18 EPGO330	2019/05/21	2020/05/20
<input checked="" type="checkbox"/>	Dipole	SID750	SN 23/15 DIP0G750-378	2017/11/27	2020/11/26
<input checked="" type="checkbox"/>	Dipole	SID835	SN 09/13 DIP0G835-217	2017/11/27	2020/11/26
<input type="checkbox"/>	Dipole	SID900	SN 09/13 DIP0G900-215	2017/11/27	2020/11/26
<input type="checkbox"/>	Dipole	SID1800	SN 09/13 DIP1G800-216	2017/11/27	2020/11/26
<input checked="" type="checkbox"/>	Dipole	SID1900	SN 09/13 DIP2G000-218	2017/11/27	2020/11/26
<input type="checkbox"/>	Dipole	SID2000	SN 09/13 DIP2G000-219	2017/11/27	2020/11/26
<input checked="" type="checkbox"/>	Dipole	SID2450	SN_09/13_DIP2G450-220	2017/11/27	2020/11/26
<input type="checkbox"/>	Dipole	SID2600	SN 32/14_DIP2G600-338	2017/11/27	2020/11/26
<input checked="" type="checkbox"/>	Dipole	SWG5500	SN15/15 WGA39	2017/11/27	2020/11/26
<input checked="" type="checkbox"/>	Multimeter	Keithley-2000	4014020	2019/04/01	2020/04/01
<input checked="" type="checkbox"/>	System Simulator(Agilent 8960)	E5515C	GB 47200710	2017/11/08	2020/11/26
<input checked="" type="checkbox"/>	System Simulator(R&S)	CMW500	130805	2019/07/30	2020/07/29
<input checked="" type="checkbox"/>	KEYSIGHT	E7515A	MY56040357	2019/04/01	2020/04/01
<input checked="" type="checkbox"/>	Vector Network Analyzer(R&S)	ZVB8	A0802530	2019/04/17	2020/04/17
<input checked="" type="checkbox"/>	PC 3.5 Fixed Match Calibration Kit	ZV-Z32	100571	2017/11/29	2020/11/28
<input checked="" type="checkbox"/>	Dielectric Probe Kit	SCLMP	SN 09/13 OCPG51	2017/11/27	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—