


# FCC SAR TEST REPORT

**FCC ID** : A4RG6GPR  
**Equipment** : Phone  
**Model Name** : G6GPR  
**Applicant** : Google LLC  
1600 Amphitheatre Parkway,  
Mountain View, California, 94043 USA  
**Standard** : FCC 47 CFR Part 2 (2.1093)

The product was received on Aug. 18, 2023 and testing was started from Aug. 30, 2023 and completed on Nov. 01, 2023. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample provide by manufacturer and the test data has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been pass the FCC requirement.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Laboratory, the test report shall not be reproduced except in full.



Approved by: Cona Huang / Deputy Manager



**Sporton International Inc. Wensan Laboratory**

No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan



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### History of this test report

Report No.	Version	Description	Issued Date
FA380308B	01	Initial issue of report	Nov. 17, 2023
FA380308B	02	Update section3, 4, 16.1	Dec. 26, 2023



**1. Statement of Compliance**

The maximum results of Specific Absorption Rate (SAR) found during testing for Google LLC, Phone, G6GPR, are as follows.

Equipment Class	Frequency Band	Highest SAR Summary				Highest Simultaneous Transmission 1g SAR (W/kg)
		Head (Separation 0mm)	Body-worn (Separation 10mm)	Hotspot (Separation 10mm)	Product Specific (Separation 0mm)	
		1g SAR (W/kg)			10g SAR (W/kg)	
Licensed	GSM850	0.99	0.67	0.75		1.59
	GSM1900	0.68	0.75	0.69		
	WCDMA II	0.67	0.74	0.72		
	WCDMA IV	0.54	0.71	0.59		
	WCDMA V	0.85	0.43	0.47		
	LTE B2	0.73	0.64	0.64		
	LTE B7	0.99	0.78	0.79		
	LTE B12/B17	0.93	0.45	0.60		
	LTE B26/B5	0.87	0.51	0.74		
	LTE B41/B38	0.98	0.96	0.69		
	LTE B66/B4	0.65	0.74	0.50		
	FR1 n2	0.76	0.69	0.68		
	FR1 n5	0.97	0.52	0.67		
	FR1 n7	0.99	0.84	0.81		
	FR1 n12	0.99	0.47	0.51		
	FR1 n26	0.99	0.49	0.65		
FR1 n41/n38	0.82	0.99	0.78			
FR1 n66	0.66	0.79	0.68			
FR1 n77	0.95	0.76	0.61			
DXX	13.56 MHz				0.07	
DTS	2.4GHz WLAN	0.80	0.58	0.48		1.58
NII	5GHz WLAN	1.10	0.39	0.35		1.59
6CD	6GHz WLAN	0.56	0.26			
DSS	Bluetooth	0.29	0.37	0.61		1.59
Equipment Class	Frequency Band	Head Reported APD (mW/cm <sup>2</sup> )		Body Reported APD (mW/cm <sup>2</sup> )		Reported PD (mW/cm <sup>2</sup> )
6CD	6GHz WLAN	0.32		0.17		0.73
Date of Testing:		2023/8/30-2023/11/1				

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation and the FCC designation No. TW3786 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 4.0 W/kg for Product Specific 10g SAR) specified in FCC 47 CFR part 2 (2.1093), Human Exposure to RF Radiation Limits (1.0 mW/cm<sup>2</sup>=10 W/m<sup>2</sup>) specified in FCC 47 CFR part 1.1310 and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

**Reviewed by: Jason Wang**  
**Report Producer: Paula Chen**



## **2. Data Reuse Approach**

FCC ID: A4RG8HHN, A4RGKV4X (reference model) and FCC ID: A4RG6GPR (variant model)

- **PCB:** The PCB layout is identical with parent model.
- **Component Positions:** The position of the components on the PCB is not changed
- **Enclosure, Materials, and From Factor:** the Enclosure, Materials, and From Factor are exactly the same

Due to the same design are identical between parent model and variant model, SAR data reuse is requested and spot check data in this report is used to justify the SAR data reuse.

For variant model 1g SAR and 10g spot check SAR result does not exceed 30% and 1g SAR < 1.2W/kg, 10g SAR < 3.0W/kg of the reference model, the WWAN max SAR summary are identical with parent model.

The applicant should take full responsibility that the test data as referenced in this report represent compliance for this FCC ID: A4RG6GPR

## **3. Model Difference Information**

A4RG8HHN, A4RGKV4X and A4RG6GPR use the identical internal printed circuit board layout, and the major differences which may relate to RF are listed below:

- 5G FR2 related components are depopulated
- Depopulated LTE/NR 13, 14, 25, 30, 71 filter
- Different MHB ENDC module

The details of similarity and difference can be found in the confidential documents.



**4. Reference detail Section**

Rule Part	Equipment Class	Wireless Technology	Frequency Band (MHz)	FCC ID (Reference)	Type Grant/ Permissive Change	Reference Title	FCC ID Filling (Variant)	Test on the variant	
Part 2.1093 SAR	DXX	NFC	13.56	A4RG8HHN	Original Grant	FA380306C	A4RG6GPR	Spot check	
	DSS	Bluetooth	2400~2483.5	A4RGKV4X	Original Grant	FA380307B	A4RG6GPR	Spot check	
	DTS	BLE WiFi	2400~2483.5	A4RGKV4X	Original Grant	FA380307B	A4RG6GPR	Spot check	
	NII	Wi-Fi	5150 ~ 5250 5250 ~ 5350 5470 ~ 5725 5725 ~ 5850 5850 ~ 5895	A4RGKV4X	Original Grant	FA380307B	A4RG6GPR	Spot check	
	6CD	Wi-Fi	5925 ~ 6425 6425 ~ 6525 6525 ~ 6875 6875 ~ 7125	A4RGKV4X	Original Grant	FA380307B	A4RG6GPR	Spot check 6E SAR, Full Test on 6E PD, per KDB 484596.	
	PCB CBE	GSM		850/1900	A4RG8HHN	Original Grant	FA380306C	A4RG6GPR	Spot check GSM850 Full Test on GSM1900
		WCDMA		B2/4/5	A4RG8HHN	Original Grant	FA380306C	A4RG6GPR	Full Test
		LTE		B2/4/5/7/12/17/ 26/38/41/66	A4RG8HHN	Original Grant	FA380306C	A4RG6GPR	Spot check / Full Test on B2/4/66 / Additional spot check UL 7C
		5G FR1		n2/5/7/12/26/38/41/ 66/77	A4RG8HHN	Original Grant	FA380306C	A4RG6GPR	Spot check / Full Test on n2/66/77

**5. Guidance Applied**

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards, the below KDB standard may not including in the TAF code without accreditation.

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r03
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01
- IEC/IEEE 62209-1528:2020
- SPEAG DASY6 System Handbook
- SPEAG DASY6 Application Note (Interim Procedure for Device Operation at 6GHz-10GHz)



## 6. Equipment Under Test (EUT) Information

### 6.1 General Information

Product Feature & Specification	
Equipment Name	Phone
Model Name	G6GPR
FCC ID	A4RG6GPR
S / N	38011JEKB00116, 38011JEKB00144,
Frequency Band	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n12 : 699 MHz ~ 716 MHz 5G NR n26 : 814 MHz ~ 849 MHz 5G NR n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n77: 3700 MHz ~ 3980 MHz, 3450MHz ~ 3550MHz WLAN 2.4 GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2 GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3 GHz Band: 5250 MHz ~ 5350 MHz WLAN 5.6 GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8 GHz Band: 5725 MHz ~ 5850 MHz WLAN 5.9 GHz Band: 5850 MHz ~ 5895 MHz WLAN 6E: 5925 MHz~6425 MHz, 6425 MHz~6525 MHz, 6525MHz~6875MHz, 6875 MHz~7125 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz WPC Rx: 110.1KHz ~ 148.5KHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/HE20/HE40/HE80 Bluetooth BR/EDR/LE/HR/Channel sounding NFC: ASK WPC Rx: ASK
GSM / (E)GPRS Transfer mode	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.



6.2 Maximum Tune-up Limit

General Note:

- 1. In the report PC3 as power class3, PC2 as power class2
2. For each cellular band, the device has several WWAN antennas, the antenna selection is based on the connection quality condition.
3. The following table shows maximum output power configurations for various exposure conditions (output power index) with tune-up tolerance accounted. For TAS enabled bands, the values associate with Plimit plus the total uncertainty, or Pmax plus total uncertainty when the derived Plimit is higher than Pmax. In some frequency bands, for some power indexes which associate with the same power level, conducted power measurement for those only need to perform at once. Detail output power measurement refer to appendix D.
4. The index 1 is for the max power conditions, and the use case were evaluated in appendix E.
5. SAR compliance for the scenario, when device in next-to-ear voice call with hotspot enabled, is justified via head SAR test at Power Index 3.
6. The device implements the sensor detection for SAR compliance and the power verification include in appendix E.
7. The device implements the power management and sensor detection for SAR compliance at different exposure conditions (head, body-worn, hotspot) and the TAS feature will manage to ensure the power level not exceeding the associated power table. And also implement Spatial TAS predefine antenna group to analysis simultaneous transmission include in appendix F.

Table with 2 columns: Transmit switching diversity configuration, Support transmit antenna and band. Rows include TX 0 and TX 1 configurations with antenna details like ANT 0: GSM850, UMTS B5, LTE B5/B12/B17/B26, NR n5/n12/n26.





Maximum Transmit Burst Average Power (dBm)								
Band	Antenna	Duty cycle	Maximum Power Condition	Head	Head	Hotspot	Body-worn	Body-worn
				Standalone	Simultaneous	Simultaneous	Standalone	Simultaneous
				Index 1	Index 2	Index 3	Index 4	Index 5
GSM850 GSM/GPRS 1TX	0	12.50%	33.50	33.50	33.50	33.50	33.50	33.50
GSM850 GPRS 2TX	0	25.00%	32.50	32.50	32.50	32.30	32.50	32.30
GSM850 GPRS 3TX	0	37.50%	31.50	31.50	31.00	30.60	31.50	30.60
GSM850 GPRS 4TX	0	50.00%	30.00	30.00	29.70	29.30	30.00	29.30
GSM850 EDGE 1TX	0	12.50%	28.00	28.00	28.00	28.00	28.00	28.00
GSM850 EDGE 2TX	0	25.00%	27.50	27.50	27.50	27.50	27.50	27.50
GSM850 EDGE 3TX	0	37.50%	27.50	27.50	27.50	27.50	27.50	27.50
GSM850 EDGE 4TX	0	50.00%	25.50	25.50	25.50	25.50	25.50	25.50
GSM850 GSM/GPRS 1TX	1	12.50%	33.00	31.90	29.80	33.00	33.00	33.00
GSM850 GPRS 2TX	1	25.00%	32.50	28.90	26.80	32.50	32.50	32.50
GSM850 GPRS 3TX	1	37.50%	30.50	27.00	24.90	30.50	30.50	30.50
GSM850 GPRS 4TX	1	50.00%	28.00	25.80	23.70	28.00	28.00	28.00
GSM850 EDGE 1TX	1	12.50%	27.50	27.50	27.50	27.50	27.50	27.50
GSM850 EDGE 2TX	1	25.00%	27.00	27.00	26.80	27.00	27.00	27.00
GSM850 EDGE 3TX	1	37.50%	27.00	27.00	24.90	27.00	27.00	27.00
GSM850 EDGE 4TX	1	50.00%	24.00	24.00	23.70	24.00	24.00	24.00
GSM1900 GSM/GPRS 1TX	2	12.50%	30.50	30.50	30.50	30.30	30.50	30.30
GSM1900 GPRS 2TX	2	25.00%	29.50	29.50	29.50	27.30	28.10	27.30
GSM1900 GPRS 3TX	2	37.50%	29.00	29.00	28.70	25.50	26.30	25.50
GSM1900 GPRS 4TX	2	50.00%	28.00	28.00	27.50	24.30	25.10	24.30
GSM1900 EDGE 1TX	2	12.50%	26.00	26.00	26.00	26.00	26.00	26.00
GSM1900 EDGE 2TX	2	25.00%	25.00	25.00	25.00	25.00	25.00	25.00
GSM1900 EDGE 3TX	2	37.50%	25.00	25.00	25.00	25.00	25.00	25.00
GSM1900 EDGE 4TX	2	50.00%	24.00	24.00	24.00	24.00	24.00	24.00
GSM1900 GSM/GPRS 1TX	0	12.50%	30.00	30.00	30.00	30.00	30.00	30.00
GSM1900 GPRS 2TX	0	25.00%	29.50	29.50	29.50	29.50	29.50	29.50
GSM1900 GPRS 3TX	0	37.50%	28.50	28.50	28.50	28.50	28.50	28.50
GSM1900 GPRS 4TX	0	50.00%	27.50	27.50	27.50	27.40	27.50	27.50
GSM1900 EDGE 1TX	0	12.50%	26.00	26.00	26.00	26.00	26.00	26.00
GSM1900 EDGE 2TX	0	25.00%	24.50	24.50	24.50	24.50	24.50	24.50
GSM1900 EDGE 3TX	0	37.50%	24.50	24.50	24.50	24.50	24.50	24.50
GSM1900 EDGE 4TX	0	50.00%	23.50	23.50	23.50	23.50	23.50	23.50



Maximum Transmit Burst Average Power (dBm)								
Band	Antenna	Duty cycle	Maximum Power Condition	Head	Head	Hotspot	Body-worn	Body-worn
				Standalone	Simultaneous	Simultaneous	Standalone	Simultaneous
				Index 1	Index 2	Index 3	Index 4	Index 5
WCDMA B2	2	100.00%	25.00	25.00	25.00	20.50	21.30	20.50
WCDMA B2	0	100.00%	24.50	24.50	23.80	24.50	24.50	24.50
WCDMA B4	2	100.00%	25.70	25.70	25.10	23.60	24.40	23.60
WCDMA B4	0	100.00%	25.20	25.20	25.20	23.80	25.20	23.80
WCDMA B5	0	100.00%	25.00	25.00	25.00	25.00	25.00	25.00
WCDMA B5	1	100.00%	24.50	22.40	21.60	24.50	24.50	24.50
LTE B2	2	100.00%	25.00	25.00	24.70	20.90	21.70	20.90
LTE B2	0	100.00%	24.50	24.50	24.50	24.10	24.50	24.20
LTE B5	0	100.00%	25.70	25.70	25.70	25.70	25.70	25.70
LTE B5	1	100.00%	25.20	21.10	19.00	25.20	25.20	25.20
LTE B7	2	100.00%	25.70	24.50	22.50	19.20	23.60	22.30
LTE B7	0	100.00%	25.20	25.20	23.80	21.90	23.70	22.00
LTE B12	0	100.00%	25.70	25.70	25.70	25.70	25.70	25.70
LTE B12	1	100.00%	25.30	22.40	20.30	25.30	25.30	25.30
LTE B17	0	100.00%	25.70	25.70	25.70	25.70	25.70	25.70
LTE B17	1	100.00%	25.20	22.40	20.30	25.20	25.20	25.20
LTE B26	0	100.00%	25.70	25.70	25.70	25.70	25.70	25.70
LTE B26	1	100.00%	25.20	21.10	19.00	25.20	25.20	25.20
LTE B38 PC3	2	63.30%	25.00	25.00	23.10	20.90	25.00	24.50
LTE B38 PC3	0	63.30%	24.50	24.50	24.50	23.30	24.50	24.20
LTE B41 PC3	2	63.30%	25.70	25.10	23.10	20.90	25.60	24.50
LTE B41 PC3	0	63.30%	25.20	25.20	25.20	23.30	25.20	24.20
LTE B41/B38 PC2	2	43.30%	27.50	26.70	24.70	22.50	27.20	26.10
LTE B41/B38 PC2	0	43.30%	27.00	27.00	27.00	24.90	27.00	25.80
LTE B66/B4	2	100.00%	25.70	25.70	25.50	23.00	24.10	23.00
LTE B66/B4	0	100.00%	25.20	25.20	25.20	23.60	25.20	23.60



Maximum Transmit Burst Average Power (dBm)								
Band	Antenna	Duty cycle	Maximum Power Condition	Head	Head	Hotspot	Body-worn	Body-worn
				Standalone	Simultaneous	Simultaneous	Standalone	Simultaneous
				Index 1	Index 2	Index 3	Index 4	Index 5
FR1 n2	2	100.00%	25.00	25.00	24.50	20.40	21.20	20.40
FR1 n2	0	100.00%	24.50	24.50	24.50	24.00	24.50	24.00
FR1 n5	0	100.00%	25.70	25.70	25.70	25.50	25.70	25.70
FR1 n5	1	100.00%	25.20	22.20	20.20	25.20	25.20	25.20
FR1 n7	2	100.00%	25.70	25.70	24.00	20.00	23.90	23.00
FR1 n7	0	100.00%	25.20	25.20	23.70	21.30	23.60	21.70
FR1 n12	0	100.00%	25.70	25.70	25.70	25.70	25.70	25.70
FR1 n12	1	100.00%	25.30	23.40	21.30	25.30	25.30	25.30
FR1 n26	0	100.00%	25.70	25.70	25.70	25.50	25.70	25.70
FR1 n26	1	100.00%	25.20	22.20	20.20	25.20	25.20	25.20
FR1 n41/n38 PC3	2	100.00%	25.70	24.30	23.50	20.40	23.50	22.60
FR1 n41/n38 PC3	0	100.00%	25.20	25.20	24.40	21.30	25.20	24.40
FR1 n66	2	100.00%	25.70	25.70	25.70	23.70	24.50	23.70
FR1 n66	0	100.00%	25.20	25.20	25.20	22.70	25.20	22.70
FR1 n77 PC3	6	100.00%	25.20	23.70	22.90	18.80	21.10	20.30
FR1 n77 PC3	2	100.00%	24.70	24.70	23.00	19.50	21.60	20.30
FR1 n77 PC3	1	100.00%	25.00	19.20	18.40	24.30	25.00	25.00
FR1 n77 PC3	5	100.00%	25.00	16.50	12.30	19.70	24.00	21.60
FR1 n77 PC2	6	50.00%	27.30	26.70	25.90	21.80	24.10	23.30
FR1 n77 PC2	2	50.00%	26.70	26.70	26.00	22.50	24.60	23.30



6.3 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05																																																																										
FCC ID	A4RG6GPR																																																																									
Equipment Name	Phone																																																																									
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 MHz																																																																									
Channel Bandwidth	LTE Band 2: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 17: 5MHz, 10MHz LTE Band 26: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz																																																																									
uplink modulations used	QPSK / 16QAM / 64QAM / 256QAM																																																																									
LTE Voice / Data requirements	Voice and Data																																																																									
LTE MPR permanently built-in by design	<p align="center"><b>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</b></p> <table border="1"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth / Transmission bandwidth (N<sub>RB</sub>)</th> <th rowspan="2">MPR (dB)</th> </tr> <tr> <th>1.4 MHz</th> <th>3.0 MHz</th> <th>5 MHz</th> <th>10 MHz</th> <th>15 MHz</th> <th>20 MHz</th> </tr> </thead> <tbody> <tr> <td>QPSK</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 3</td> </tr> <tr> <td>256 QAM</td> <td colspan="6">≥ 1</td> <td>≤ 5</td> </tr> </tbody> </table>												Modulation	Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> )						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	64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3	256 QAM	≥ 1						≤ 5
Modulation	Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> )						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																																																																			
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2																																																																			
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3																																																																			
256 QAM	≥ 1						≤ 5																																																																			
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)																																																																									
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																																																									
Power reduction applied to satisfy SAR compliance	The device has several different power modes for each exposure conditions SAR compliance; power selection is determined by the device's positioning and usage scenarios. Detail refer to operational description.																																																																									
LTE Carrier Aggregation Combinations	Inter-Band and Intra-Band possible combinations and the detail power measurement please referred to reference model FCC ID: A4RG8HHN, Part1 SAR report section 13.																																																																									
LTE Carrier Aggregation Additional Information	This device supports maximum of 6 carriers in the downlink and 2 carriers in the uplink. Additional following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.																																																																									
Transmission (H, M, L) channel numbers and frequencies in each LTE band																																																																										
LTE Band 2																																																																										
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz																																																															
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)																																																														
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860																																																														
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880																																																														
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900																																																														



LTE Band 4																
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720				
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5				
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745				
LTE Band 5																
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	20407	824.7	20415	825.5	20425	826.5	20450	829	20450	829	20450	829				
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5				
H	20643	848.3	20635	847.5	20625	846.5	20600	844	20600	844	20600	844				
LTE Band 7																
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510	20850	2510	20850	2510				
M	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535				
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560	21350	2560	21350	2560				
LTE Band 12																
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	23017	699.7	23025	700.5	23035	701.5	23060	704	23060	704	23060	704				
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5	23095	707.5	23095	707.5				
H	23173	715.3	23165	714.5	23155	713.5	23130	711	23130	711	23130	711				
LTE Band 17																
	Bandwidth 5 MHz				Bandwidth 10 MHz				Bandwidth 15 MHz				Bandwidth 20 MHz			
	Channel #		Freq.(MHz)		Channel #		Freq. (MHz)		Channel #		Freq. (MHz)		Channel #		Freq. (MHz)	
L	23755		706.5		23780		709		23780		709		23780		709	
M	23790		710		23790		710		23790		710		23790		710	
H	23825		713.5		23800		711		23800		711		23800		711	
LTE Band 26																
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26740	819	26765	821.5				
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5				
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26990	844	26965	841.5				
LTE Band 38																
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	37775	2572.5	37800	2575	37825	2577.5	37850	2580	37850	2580	37850	2580				
M	38000	2595	38000	2595	38000	2595	38000	2595	38000	2595	38000	2595				
H	38225	2617.5	38200	2615	38175	2612.5	38150	2610	38150	2610	38150	2610				
LTE Band 41																
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	39675	2498.5	39700	2501	39725	2503.5	39750	2506	39750	2506	39750	2506				
L	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5	40185	2549.5	40185	2549.5				
M	40620	2593	40620	2593	40620	2593	40620	2593	40620	2593	40620	2593				
H	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5	41055	2636.5	41055	2636.5				
H	41565	2687.5	41540	2685	41515	2682.5	41490	2680	41490	2680	41490	2680				
LTE Band 66																
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720				
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745				
H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770				



6.4 General 5G NR SAR Test and Reporting Considerations

5G NR Information																
FCC	A4RG6GPR															
Equipment Name	Phone															
Operating Frequency Range of each 5G NR transmission band	5G NR n2: 1850 MHz ~ 1910 MHz 5G NR n5: 824 MHz ~ 849 MHz 5G NR n7: 2500 MHz ~ 2570 MHz 5G NR n12: 699 MHz ~ 716 MHz 5G NR n26 : 814 MHz ~ 849 MHz 5G NR n38: 2570 MHz ~ 2620 MHz 5G NR n41: 2496 MHz ~ 2690 MHz 5G NR n66: 1710 MHz ~ 1780 MHz 5G NR n77: 3700 MHz ~ 3980 MHz, 3450MHz ~ 3550MHz															
Channel Bandwidth	5G NR n2: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n5: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n7: 5MHz, 10MHz, 15MHz, 20MHz, 25 MHz, 30MHz, 40MHz, 50MHz 5G NR n12: 5MHz, 10MHz, 15MHz 5G NR n26: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n38: 10MHz, 15MHz, 20MHz 5G NR n41: 10MHz, 15MHz, 20MHz, 30MHz, 40MHz, 50MHz, 60MHz, 70MHz, 80MHz, 90MHz, 100MHz 5G NR n66: 5MHz, 10MHz, 15MHz, 20MHz, 25 MHz, 30MHz, 40MHz 5G NR n77: 10MHz, 15MHz, 20MHz, 25 MHz, 30MHz, 40MHz, 50MHz, 60MHz, 70MHz, 80MHz, 90MHz, 100MHz															
SCS	FDD: SCS15KHz, TDD: SCS30KHz															
uplink modulations used	DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM CP-OFDM QPSK / 16QAM / 64QAM / 256QAM															
A-MPR (Additional MPR) disabled for SAR Testing?	Yes															
LTE Anchor Bands for n2	LTE B5/12															
LTE Anchor Bands for n5	LTE B2/7/66															
LTE Anchor Bands for n7	LTE B5/12															
LTE Anchor Bands for n12	LTE B2/7/66															
LTE Anchor Bands for n26	LTE B7															
LTE Anchor Bands for n38	LTE B2/5/12/66															
LTE Anchor Bands for n41	LTE B2/5/12/26/66															
LTE Anchor Bands for n66	LTE B5/12															
LTE Anchor Bands for n77	LTE B2/5/7/12/26/41/66															
NR Band 2																
Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz										
Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)									
L	370500	1852.5	371000	1855	371500	1857.5	372000	1860								
M	376000	1880	376000	1880	376000	1880	376000	1880								
H	381500	1907.5	381000	1905	380500	1902.5	380000	1900								
NR Band 5																
Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz										
Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)									
L	165300	826.5	165800	829	166300	831.5	166800	834								
M	167300	836.5	167300	836.5	167300	836.5	167300	836.5								
H	169300	846.5	168800	844	168300	841.5	167800	839								
NR Band 7																
Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz		
Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	
L	500500	2502.5	501000	2505	501500	2507.5	502000	2510	502500	2512.5	503000	2515	504000	2520	505000	2525
M	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535
H	513500	2567.5	513000	2565	512500	2562.5	512000	2560	511500	2557.5	511000	2555	510000	2550	509000	2545
NR Band 12																
Bandwidth 5MHz				Bandwidth 10MHz				Bandwidth 15MHz								
Ch. #	Freq. (MHz)			Ch. #	Freq. (MHz)			Ch. #	Freq. (MHz)							
L	140300	701.5			140800	704			141300	706.5						
M	141500	707.5			141500	707.5			141500	707.5						
H	142700	713.5			142200	711			141700	708.5						



NR Band 26																					
Bandwidth 5MHz				Bandwidth 10MHz				Bandwidth 15MHz				Bandwidth 20MHz									
Ch. #	Freq. (MHz)			Ch. #	Freq. (MHz)			Ch. #	Freq. (MHz)			Ch. #	Freq. (MHz)								
L	163300	816.5			163800	819			164300	821.5			164800	824							
M	166300	831.5			166300	831.5			166300	831.5			166300	831.5							
H	169300	846.5			168800	844			168300	841.5			167800	839							

NR Band 38												
Bandwidth 10MHz				Bandwidth 15MHz				Bandwidth 20MHz				
Ch. #	Freq. (MHz)			Ch. #	Freq. (MHz)			Ch. #	Freq. (MHz)			
L	515004	2575.02			515502	2577.51			516000	2580		
M	519000	2595			519000	2595			519000	2595		
H	522996	2614.98			522498	2612.49			522000	2610		

NR Band 41																						
Bandwidth10MHz		Bandwidth15MHz		Bandwidth20MHz		Bandwidth30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth100MHz		
Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	
L	500202	2501.01	500700	2503.5	501204	2506.02	502200	2511	503202	2516.01	504204	2521.02	505200	2526	506202	2531.01	507204	2536.02	508200	2541	509202	2546.01
M	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99
H	537000	2685	536496	2682.48	535998	2679.99	534996	2674.98	534000	2670	532998	2664.99	531996	2659.98	531000	2655	529998	2649.99	528996	2644.98	528000	2640

NR Band 66														
Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz		Bandwidth 40MHz		
Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	
L	342500	1712.5	343000	1715	343500	1717.5	344000	1720	344500	1722.5	345000	1725	346000	1730
M	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745
H	355500	1777.5	355000	1775	354500	1772.5	354000	1770	353500	1767.5	353000	1765	352000	1760

NR Band 77																								
Bandwidth10MHz		Bandwidth15MHz		Bandwidth 20MHz		Bandwidth25MHz		Bandwidth30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth100MHz		
Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	
L	647000	3705	647168	3707.52	647334	3710.01	647500	3712.5	647668	3715.02	648000	3720	648334	3725.01	648668	3730.02	649000	3735	649334	3740.01	649668	3745.02	650000	3750
M	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840
H	665000	3975	664832	3972.48	664666	3969.99	664500	3967.50	664332	3964.98	664000	3960	663666	3954.99	663332	3949.98	663000	3945	662666	3939.99	662332	3934.98	662000	3930

NR Band 77 (3450MHz ~ 3550MHz)																								
Bandwidth10MHz		Bandwidth15MHz		Bandwidth 20MHz		Bandwidth25MHz		Bandwidth30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth100MHz		
Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	
L	630334	3455.01	630500	3457.5	630668	3460.02	630834	3462.51	631000	3465	631334	3470.01	631668	3475.02	632000	3480	632334	3485.01	632668	3490.02	633000	3495		
M	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98
H	636332	3544.98	636166	3542.49	636000	3540	635832	3537.48	635666	3534.99	635332	3529.98	635000	3525	634666	3519.99	634332	3514.98	634000	3510	633666	3504.99		



## 7. TAS feature for RF Exposure compliance

The FCC RF exposure limit is based on time-averaged RF exposure. Both SAR and PD regulatory specifications are defined over certain measurement duration allowing for time-averaging. The Samsung S.LSI proprietary TAS (Time Average SAR) algorithm has been designed to meet the compliance limits over the required duration, while still allowing dynamic control of transmit power for meeting system performance. Under the control of TAS algorithm, the device can transmit at high power up to Pmax for certain interval, but the average power will be maintained not exceeding the pre-defined averaged level (Plimit), and thus maintain the time-averaged RF exposure compliance

The following table shows Plimit and maximum tune up output power Pmax, for all exposure and transmit transmit conditions (output power index).

Pmax	Maximum Tx power that can be transmitted physically from RFIC for a given RAT
SAR_FCC_limit	SAR limit specified by FCC 1.6 W/kg averaged over 1-gram, for head and body exposure, and 4 W/kg averaged over 10-gram, for extremity exposure
Plimit	The time-averaged RF power that corresponds to SAR_target





**7.1 SAR Characterization – Power Table**

**General Note:**

1. The P<sub>limit</sub> values correspond to SAR<sub>design\_target</sub>.
2. GSM and WCDMA don't support time average feature of dynamic power varying, the power will be fixed at the static reduce power level at different exposure conditions for RF exposure compliance. For the GSM (TDD) P<sub>limit</sub> power levels in the table correspond to the burst average power levels which don't account for TX duty cycle.

**<P<sub>limit</sub> for supported technologies and bands (P<sub>limit</sub> corresponding to SAR design target)>**

Wireless technology/ band (No Accounting duty cycle)	Antenna	Duty cycle	Maximum Power Condition	Head		Hotspot	Body-worn		P Max Burst average power (dBm)	
				Standalone	Simultaneous	Simultaneous	Standalone	Simultaneous		
				Index 1	Index 2	Index 3	Index 4	Index 5		Index 6
				P limit						
Burst average power (dBm)										
GSM850 GSM/GPRS 1TX	0	12.50%	32.50	37.10	34.70	34.30	37.50	34.30	32.50	
GSM850 GPRS 2TX	0	25.00%	31.50	34.10	31.70	31.30	34.50	31.30	31.50	
GSM850 GPRS 3TX	0	37.50%	30.50	32.40	30.00	29.60	32.80	29.60	30.50	
GSM850 GPRS 4TX	0	50.00%	29.00	31.10	28.70	28.30	31.50	28.30	29.00	
GSM850 EDGE 1TX	0	12.50%	27.00	37.10	34.70	34.30	37.50	34.30	27.00	
GSM850 EDGE 2TX	0	25.00%	26.50	34.10	31.70	31.30	34.50	31.30	26.50	
GSM850 EDGE 3TX	0	37.50%	26.50	32.40	30.00	29.60	32.80	29.60	26.50	
GSM850 EDGE 4TX	0	50.00%	24.50	31.10	28.70	28.30	31.50	28.30	24.50	
GSM850 GSM/GPRS 1TX	1	12.50%	32.00	30.90	28.80	38.50	39.30	38.50	32.00	
GSM850 GPRS 2TX	1	25.00%	31.50	27.90	25.80	35.50	36.30	35.50	31.50	
GSM850 GPRS 3TX	1	37.50%	29.50	26.00	23.90	33.60	34.40	33.60	29.50	
GSM850 GPRS 4TX	1	50.00%	27.00	24.80	22.70	32.40	33.20	32.40	27.00	
GSM850 EDGE 1TX	1	12.50%	26.50	30.90	28.80	38.50	39.30	38.50	26.50	
GSM850 EDGE 2TX	1	25.00%	26.00	27.90	25.80	35.50	36.30	35.50	26.00	
GSM850 EDGE 3TX	1	37.50%	26.00	26.00	23.90	33.60	34.40	33.60	26.00	
GSM850 EDGE 4TX	1	50.00%	23.00	24.80	22.70	32.40	33.20	32.40	23.00	
GSM1900 GSM/GPRS 1TX	2	12.50%	29.50	34.30	32.50	29.30	30.10	29.30	29.50	
GSM1900 GPRS 2TX	2	25.00%	28.50	31.30	29.50	26.30	27.10	26.30	28.50	
GSM1900 GPRS 3TX	2	37.50%	28.00	29.50	27.70	24.50	25.30	24.50	28.00	
GSM1900 GPRS 4TX	2	50.00%	27.00	28.30	26.50	23.30	24.10	23.30	27.00	
GSM1900 EDGE 1TX	2	12.50%	25.00	34.30	32.50	29.30	30.10	29.30	25.00	
GSM1900 EDGE 2TX	2	25.00%	24.00	31.30	29.50	26.30	27.10	26.30	24.00	
GSM1900 EDGE 3TX	2	37.50%	24.00	29.50	27.70	24.50	25.30	24.50	24.00	
GSM1900 EDGE 4TX	2	50.00%	23.00	28.30	26.50	23.30	24.10	23.30	23.00	
GSM1900 GSM/GPRS 1TX	0	12.50%	29.00	34.60	33.80	32.40	34.60	33.80	29.00	
GSM1900 GPRS 2TX	0	25.00%	28.50	31.60	30.80	29.40	31.60	30.80	28.50	
GSM1900 GPRS 3TX	0	37.50%	27.50	29.80	29.00	27.60	29.80	29.00	27.50	
GSM1900 GPRS 4TX	0	50.00%	26.50	28.60	27.80	26.40	28.60	27.80	26.50	
GSM1900 EDGE 1TX	0	12.50%	25.00	34.60	33.80	32.40	34.60	33.80	25.00	
GSM1900 EDGE 2TX	0	25.00%	23.50	31.60	30.80	29.40	31.60	30.80	23.50	
GSM1900 EDGE 3TX	0	37.50%	23.50	29.80	29.00	27.60	29.80	29.00	23.50	
GSM1900 EDGE 4TX	0	50.00%	22.50	28.60	27.80	26.40	28.60	27.80	22.50	



<P<sub>limit</sub> for supported technologies and bands (P<sub>limit</sub> corresponding to SAR design target)>

Wireless technology/ band (Accounting duty cycle)	Antenna	Duty cycle	Maximum Power Condition	Head		Hotspot	Body-worn		P Max Time-average power (dBm)	
				Standalone	Simultaneous	Simultaneous	Standalone	Simultaneous		
				Index 1	Index 2	Index 3	Index 4	Index 5		Index 6
				P limit						Time-average power (dBm)
WCDMA B2	2	100.00%	24.00	25.90	25.10	19.50	20.30	19.50	24.00	
WCDMA B2	0	100.00%	23.50	25.80	22.80	23.60	25.80	25.00	23.50	
WCDMA B4	2	100.00%	24.70	27.50	24.10	22.60	23.40	22.60	24.70	
WCDMA B4	0	100.00%	24.20	28.40	27.60	22.80	25.80	22.80	24.20	
WCDMA B5	0	100.00%	24.00	28.40	27.60	25.20	28.10	27.30	24.00	
WCDMA B5	1	100.00%	23.50	21.40	20.60	28.20	29.00	28.20	23.50	
LTE B2	2	100.00%	24.00	25.60	23.70	19.90	20.70	19.90	24.00	
LTE B2	0	100.00%	23.50	25.40	24.60	23.10	26.00	23.20	23.50	
LTE B5	0	100.00%	24.70	27.60	26.80	25.10	27.50	26.70	24.70	
LTE B5	1	100.00%	24.20	20.10	18.00	28.00	28.80	28.00	24.20	
LTE B7	2	100.00%	24.70	23.50	21.50	18.20	22.60	21.30	24.70	
LTE B7	0	100.00%	24.20	24.50	22.80	20.90	22.70	21.00	24.20	
LTE B12	0	100.00%	24.80	30.00	29.20	26.30	28.10	27.30	24.80	
LTE B12	1	100.00%	24.30	21.40	19.30	28.20	29.00	28.20	24.30	
LTE B17	0	100.00%	24.70	29.90	29.10	26.20	28.00	27.20	24.70	
LTE B17	1	100.00%	24.20	21.40	19.30	28.20	29.00	28.20	24.20	
LTE B26	0	100.00%	24.70	27.60	26.80	25.10	27.50	26.70	24.70	
LTE B26	1	100.00%	24.20	20.10	18.00	28.00	28.80	28.00	24.20	
LTE B38 PC3	2	63.30%	22.00	22.10	20.10	17.90	22.60	21.50	22.00	
LTE B38 PC3	0	63.30%	21.50	24.40	23.60	20.30	23.90	21.20	21.50	
LTE B41 PC3	2	63.30%	22.70	22.10	20.10	17.90	22.60	21.50	22.70	
LTE B41 PC3	0	63.30%	22.20	24.40	23.60	20.30	23.90	21.20	22.20	
LTE B41/B38 PC2	2	43.30%	22.90	22.10	20.10	17.90	22.60	21.50	22.90	
LTE B41/B38 PC2	0	43.30%	22.40	24.40	23.60	20.30	23.90	21.20	22.40	
LTE B66/B4	2	100.00%	24.70	27.00	24.50	22.00	23.10	22.00	24.70	
LTE B66/B4	0	100.00%	24.20	27.30	26.50	22.60	25.20	22.60	24.20	

1. LTE and 5G NR TDD: P<sub>limit</sub> power levels in the table correspond to the time-averaged power levels which accounts for TX duty cycle.
2. Maximum target power, P<sub>max</sub>, is configured in NV settings in EUT to limit maximum transmitting power. This power is converted into peak power in NV settings for TDD schemes.

**<P<sub>limit</sub> for supported technologies and bands (P<sub>limit</sub> corresponding to SAR design target)>**

Wireless technology/ band (Accounting duty cycle)	Antenna	Duty cycle	Maximum Power Condition	Head		Hotspot	Body-worn		P Max Time-average power (dBm)	
				Standalone	Simultaneous	Simultaneous	Standalone	Simultaneous		
				Index 1	Index 2	Index 3	Index 4	Index 5		Index 6
				P limit						
Time-average power (dBm)										
FR1 n2	2	100.00%	24.00	25.30	23.50	19.40	20.20	19.40	24.00	
FR1 n2	0	100.00%	23.50	27.70	26.90	23.00	25.10	23.00	23.50	
FR1 n5	0	100.00%	24.70	27.70	26.90	24.50	27.40	26.60	24.70	
FR1 n5	1	100.00%	24.20	21.20	19.20	27.60	28.40	27.60	24.20	
FR1 n7	2	100.00%	24.70	25.00	23.00	19.00	22.90	22.00	24.70	
FR1 n7	0	100.00%	24.20	24.20	22.70	20.30	22.60	20.70	24.20	
FR1 n12	0	100.00%	24.80	28.70	27.90	27.00	28.00	27.20	24.80	
FR1 n12	1	100.00%	24.30	22.40	20.30	29.50	30.40	29.60	24.30	
FR1 n26	0	100.00%	24.70	27.70	26.90	24.50	27.40	26.60	24.70	
FR1 n26	1	100.00%	24.20	21.20	19.20	27.60	28.40	27.60	24.20	
FR1 n41/n38 PC3	2	100.00%	24.70	23.30	22.50	19.40	22.50	21.60	24.70	
FR1 n41/n38 PC3	0	100.00%	24.20	24.20	23.40	20.30	24.20	23.40	24.20	
FR1 n66	2	100.00%	24.70	27.00	26.20	22.70	23.50	22.70	24.70	
FR1 n66	0	100.00%	24.20	26.80	26.00	21.70	24.80	21.70	24.20	
FR1 n77 PC3	6	100.00%	24.20	22.70	21.90	17.80	20.10	19.30	24.20	
FR1 n77 PC3	2	100.00%	23.20	23.50	21.50	18.00	20.10	18.80	23.20	
FR1 n77 PC3	1	100.00%	24.00	18.20	17.40	23.30	26.00	25.20	24.00	
FR1 n77 PC3	5	100.00%	24.00	15.50	11.30	18.70	23.00	20.60	24.00	
FR1 n77 PC2	6	50.00%	23.30	22.70	21.90	17.80	20.10	19.30	23.30	
FR1 n77 PC2	2	50.00%	22.20	23.50	21.50	18.00	20.10	18.80	22.20	

1. LTE and 5GNR TDD: P<sub>limit</sub> power levels in the table correspond to the time-averaged power levels which accounts for TX duty cycle.
2. Maximum target power, P<sub>max</sub>, is configured in NV settings in EUT to limit maximum transmitting power. This power is converted into peak power in NV settings for TDD schemes.

**8. RF Exposure Limits**

**8.1 Uncontrolled Environment**

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

**8.2 Controlled Environment**

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

**Limits for Occupational/Controlled Exposure (W/kg)**

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

**Limits for General Population/Uncontrolled Exposure (W/kg)**

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.



According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Peak Spatially Averaged Power Density was evaluated over a circular area of 4cm<sup>2</sup> per interim FCC Guidance for near-field power density evaluations per October 2018 TCB Workshop notes

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

## **9. Specific Absorption Rate (SAR)**

### **9.1 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.

### **9.2 SAR Definition**

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:

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

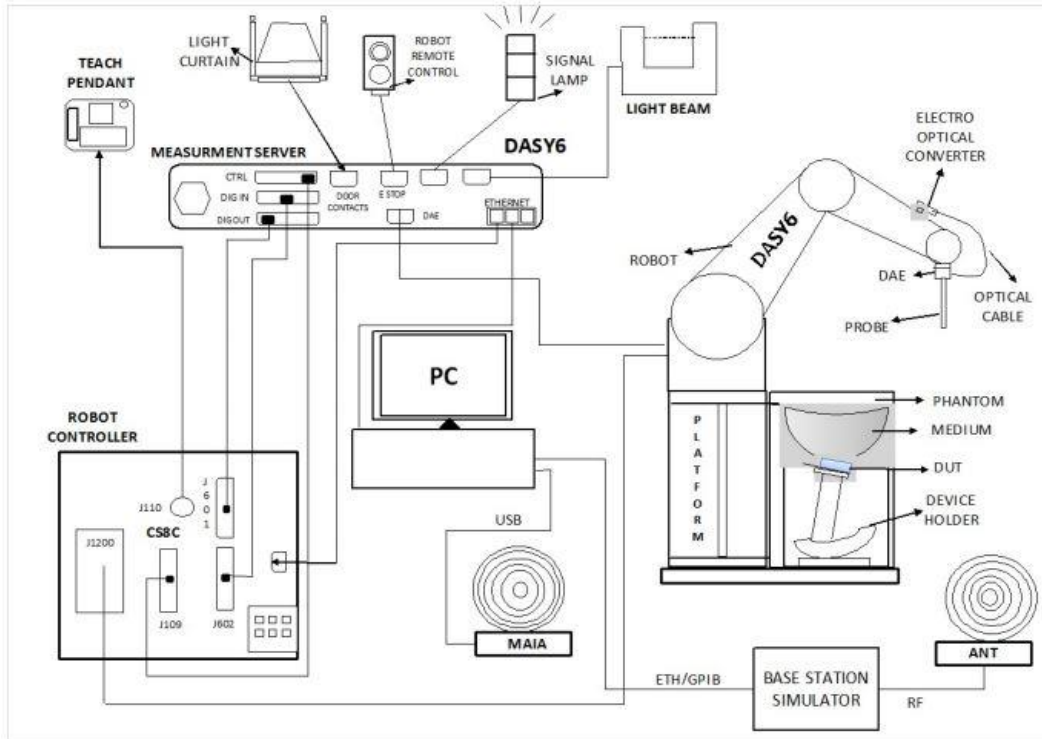
SAR is expressed in units of Watts per kilogram (W/kg)

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

Where:  $\sigma$  is the conductivity of the tissue,  $\rho$  is the mass density of the tissue and E is the RMS electrical field strength.

## 10. System Description and Setup

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



- The DASY system in DASY6/DASY5 V5.2 SAR Configuration is shown above
- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running windows software and the DASY5/DASY6 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

### 10.1 Test Site Location


The SAR measurement facilities used to collect data are within both Sporton Lab list below test site location are accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190 and 3786) and the FCC designation No. TW1190 and TW3786 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test.

Test Site	EMC & Wireless Communications Laboratory		Wensan Laboratory		
Test Site Location	TW1190 No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan		TW3786 No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan		
Test Site No.	SAR01-HY	SAR03-HY	SAR08-HY	SAR09-HY	SAR15-HY
	SAR04-HY	SAR05-HY	SAR11-HY	SAR12-HY	SAR16-HY
	SAR06-HY	SAR10-HY	SAR13-HY	SAR14-HY	SAR17-HY
			SAR18-HY	SAR-20HY	


**10.2 E-Field Probe**

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG). The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

**<ES3DV3 Probe>**

Construction	Symmetric design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – 4 GHz; Linearity: $\pm 0.2$ dB (30 MHz – 4 GHz)	
Directivity	$\pm 0.2$ dB in TSL (rotation around probe axis) $\pm 0.3$ dB in TSL (rotation normal to probe axis)	
Dynamic Range	5 $\mu$ W/g – $>100$ mW/g; Linearity: $\pm 0.2$ dB	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 3.9 mm (body: 12 mm) Distance from probe tip to dipole centers: 3.0 mm	

**<EX3DV4 Probe>**

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

**10.3 Data Acquisition Electronics (DAE)**

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.



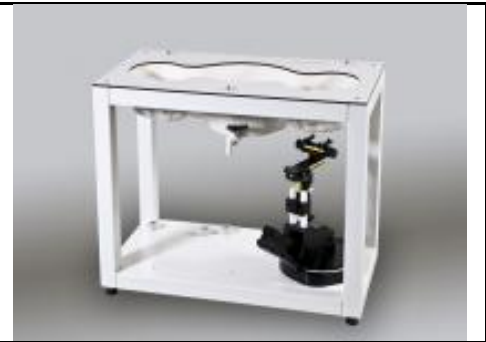
**Fig 5.1** Photo of DAE



**10.4 Phantom**

**<SAM Twin Phantom>**

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

**<ELI Phantom>**

Shell Thickness	2 ± 0.2 mm (sagging: <1%)
Filling Volume	Approx. 30 liters
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm



The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

### **10.5 Device Holder**

#### **<Mounting Device for Hand-Held Transmitter>**

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.



Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

#### **<Mounting Device for Laptops and other Body-Worn Transmitters>**

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.



Mounting Device for Laptops



## 11. Measurement Procedures

The measurement procedures are as follows:

### <Conducted power measurement>

- (a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
- (b) Read the WWAN RF power level from the base station simulator.
- (c) For WLAN power measurement, use engineering software to configure EUT WLAN continuously transmission, at maximum RF power in each supported wireless interface and frequency band
- (d) Connect EUT RF port through RF cable to the power meter, and measure WLAN output power

### <SAR measurement>

- (a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN continuously transmission, at maximum RF power, in the highest power channel.
- (b) Place the EUT in the positions as Appendix G demonstrates.
- (c) Set scan area, grid size and other setting on the DASY software.
- (d) Measure SAR results for the highest power channel on each testing position.
- (e) Find out the largest SAR result on these testing positions of each band
- (f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- (a) Power reference measurement
- (b) Area scan
- (c) Zoom scan
- (d) Power drift measurement

### 11.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

- (a) Extraction of the measured data (grid and values) from the Zoom Scan
- (b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
- (c) Generation of a high-resolution mesh within the measured volume
- (d) Interpolation of all measured values from the measurement grid to the high-resolution grid
- (e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
- (f) Calculation of the averaged SAR within masses of 1g and 10g

**11.2 Power Reference Measurement**

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

**11.3 Area Scan**

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0 is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: $\Delta x_{Area}$ , $\Delta y_{Area}$	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

**11.4 Zoom Scan**

Zoom scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

		$\leq 3$ GHz	$> 3$ GHz	
Maximum zoom scan spatial resolution: $\Delta x_{Zoom}, \Delta y_{Zoom}$		$\leq 2$ GHz: $\leq 8$ mm 2 – 3 GHz: $\leq 5$ mm*	3 – 4 GHz: $\leq 5$ mm* 4 – 6 GHz: $\leq 4$ mm*	
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$	$\leq 5$ mm	3 – 4 GHz: $\leq 4$ mm 4 – 5 GHz: $\leq 3$ mm 5 – 6 GHz: $\leq 2$ mm	
	graded grid	$\Delta z_{Zoom}(1)$ : between 1 <sup>st</sup> two points closest to phantom surface	$\leq 4$ mm	3 – 4 GHz: $\leq 3$ mm 4 – 5 GHz: $\leq 2.5$ mm 5 – 6 GHz: $\leq 2$ mm
		$\Delta z_{Zoom}(n>1)$ : between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z	$\geq 30$ mm	3 – 4 GHz: $\geq 28$ mm 4 – 5 GHz: $\geq 25$ mm 5 – 6 GHz: $\geq 22$ mm	
<p>Note: <math>\delta</math> is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.</p> <p>* When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is <math>\leq 1.4</math> W/kg, <math>\leq 8</math> mm, <math>\leq 7</math> mm and <math>\leq 5</math> mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</p>				

**11.5 Volume Scan Procedures**

The volume scan is used to assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

**11.6 Power Drift Monitoring**

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASy measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.



## 12. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit <sup>(2)</sup>	D750V3	1107	Jun. 22, 2022	Jun. 20, 2024
SPEAG	835MHz System Validation Kit	D835V2	4d167	Nov. 24, 2022	Nov. 23, 2023
SPEAG	1750MHz System Validation Kit <sup>(2)</sup>	D1750V2	1112	Jun. 22, 2022	Jun. 20, 2024
SPEAG	1900MHz System Validation Kit <sup>(2)</sup>	D1900V2	5d185	Jun. 17, 2022	Jun. 15, 2024
SPEAG	2300MHz System Validation Kit <sup>(2)</sup>	D2300V2	1006	Jan. 18, 2022	Jan. 16, 2024
SPEAG	2450MHz System Validation Kit	D2450V2	929	Nov. 21, 2022	Nov. 20, 2023
SPEAG	2600MHz System Validation Kit <sup>(2)</sup>	D2600V2	1078	Jun. 23, 2022	Jun. 21, 2024
SPEAG	3500MHz System Validation Kit <sup>(2)</sup>	D3500V2	1014	Jan. 17, 2022	Jan. 15, 2024
SPEAG	3500MHz System Validation Kit <sup>(2)</sup>	D3500V2	1036	Mar. 23, 2022	Mar. 21, 2024
SPEAG	3700MHz System Validation Kit <sup>(2)</sup>	D3700V2	1006	Jun. 20, 2022	Jun. 18, 2024
SPEAG	3900MHz System Validation Kit <sup>(2)</sup>	D3900V2	1017	Apr. 22, 2022	Apr. 20, 2024
SPEAG	3900MHz System Validation Kit	D3900V2	1092	May. 15, 2023	May. 14, 2024
SPEAG	5GHz System Validation Kit <sup>(2)</sup>	D5GHzV2	1006	May. 25, 2023	May. 23, 2025
SPEAG	5GHz System Validation Kit <sup>(2)</sup>	D5GHzV2	1171	Apr. 20, 2021	Apr. 17, 2024
SPEAG	6500MHz System Validation Kit	D6.5GHzV2	1003	Mar. 15, 2023	Mar. 14, 2024
SPEAG	13MHz System Validation Kit	CLA13	1022	Sep. 01, 2022	Aug. 30, 2024
SPEAG	5G Verification Source	10GHz	1020	Jan. 20, 2023	Jan. 19, 2024
SPEAG	EUmmWV Probe Tip Protection	EUmmWV4	9441	Nov. 18, 2022	Nov. 17, 2023
SPEAG	Data Acquisition Electronics	DAE4	656	Jan. 23, 2023	Jan. 22, 2024
SPEAG	Data Acquisition Electronics	DAE4	661	May. 23, 2023	May. 22, 2024
SPEAG	Data Acquisition Electronics	DAE4	699	Feb. 22, 2023	Feb. 21, 2024
SPEAG	Data Acquisition Electronics	DAE4	1424	Jan. 19, 2023	Jan. 18, 2024
SPEAG	Data Acquisition Electronics	DAE4	1696	Nov. 09, 2022	Nov. 08, 2023
SPEAG	Data Acquisition Electronics	DAE4	1697	Dec. 15, 2022	Dec. 14, 2023
SPEAG	Data Acquisition Electronics	DAE4	1707	Dec. 15, 2022	Dec. 14, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	3931	Oct. 31, 2022	Oct. 30, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	7625	Jan. 26, 2023	Jan. 25, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7692	Jul. 18, 2023	Jul. 17, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7695	May. 22, 2023	May. 21, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7700	Jan. 24, 2023	Jan. 23, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7785	Jan. 05, 2023	Jan. 04, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7791	Feb. 22, 2023	Feb. 21, 2024
RCPTWN	Thermometer	HTC-1	TM685-1	Mar. 21, 2023	Mar. 20, 2024
RCPTWN	Thermometer	HTC-1	TM560-2	Mar. 21, 2023	Mar. 20, 2024
Anritsu	Radio Communication Analyzer	MT8821C	6201074414	Aug. 23, 2023	Aug. 22, 2024
R&S	Wideband Radio Communication Tester	CMX500	101931	Jul. 20, 2023	Jul. 19, 2024
R&S	BT Base Station	CBT	100815	Mar. 05, 2023	Mar. 04, 2024
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3692A	212506	Nov. 14, 2022	Nov. 13, 2023
Keysight	ENA Network Analyzer	E5071C	MY46104758	Sep. 22, 2022	Sep. 21, 2023
Keysight	ENA Network Analyzer	E5071C	MY46316648	Sep. 07, 2023	Sep. 06, 2024
SPEAG	Dielectric Probe Kit	DAK-3.5	1146	Jul. 11, 2023	Jul. 10, 2024
SPEAG	Dielectric Probe Kit	DAK-12	1156	Jul. 17, 2023	Jul. 16, 2024
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3690	Aug. 09, 2023	Aug. 08, 2024
Anritsu	Power Meter	ML2495A	1419002	Aug. 17, 2023	Aug. 16, 2024
Anritsu	Power Sensor	MA2411B	1911176	Aug. 18, 2023	Aug. 17, 2024
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jul. 10, 2023	Jul. 09, 2024
Mini-Circuits	Power Amplifier	ZHL-42W+	715701915	May. 19, 2023	May. 18, 2024
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	Note 1
Warison	Directional Coupler	WCOU-10-50S-10	WR889BMC4B1	Note 1	Note 1
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	Note 1
PE	Attenuator 2	PE7005-10	N/A	Note 1	Note 1
PE	Attenuator 3	PE7005-3	N/A	Note 1	Note 1

**General Note:**

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.
2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.





13. System Verification

13.1 Tissue Verification

The tissue dielectric parameters of tissue-equivalent media used for SAR measurements must be characterized within a temperature range of 18°C to 25°C, measured with calibrated instruments and apparatuses, such as network analyzers and temperature probes. The temperature of the tissue-equivalent medium during SAR measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized. The tissue dielectric measurement system must be calibrated before use. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements.

The liquid tissue depth was at least 15cm in the phantom for all SAR testing.

<Tissue Dielectric Parameter Check Results>

<Spot Check>

Table with 10 columns: Frequency (MHz), Liquid Temp. (°C), Conductivity (σ), Permittivity (εr), Conductivity Target (σ), Permittivity Target (εr), Delta (σ) (%), Delta (εr) (%), Limit (%), Date. It contains multiple rows of test data for various frequencies and temperatures.



**FCC SAR TEST REPORT**

**Report No. : FA380308B**

2600	22.2	1.980	38.000	1.96	39.00	1.02	-2.56	±5	2023/9/28
2600	22.3	1.970	37.800	1.96	39.00	0.51	-3.08	±5	2023/10/4
2600	22.8	1.920	38.000	1.96	39.00	-2.04	-2.56	±5	2023/10/10
2600	22.5	1.930	38.200	1.96	39.00	-1.53	-2.05	±5	2023/10/12
3500	22.5	2.970	38.400	2.91	37.90	2.06	1.32	±5	2023/9/22
3500	22.6	2.920	37.600	2.91	37.90	0.34	-0.79	±5	2023/9/29
3500	22.7	2.920	37.800	2.91	37.90	0.34	-0.26	±5	2023/10/3
3500	22.5	2.950	38.200	2.91	37.90	1.37	0.79	±5	2023/10/5
3500	22.6	2.960	38.100	2.91	37.90	1.72	0.53	±5	2023/10/5
3500	22.7	2.950	37.400	2.91	37.90	1.37	-1.32	±5	2023/10/7
3500	22.7	2.950	37.900	2.91	37.90	1.37	0.00	±5	2023/10/7
3500	22.8	2.930	37.300	2.91	37.90	0.69	-1.58	±5	2023/10/8
3500	22.6	3.010	37.900	2.91	37.90	3.44	0.00	±5	2023/10/9
3500	22.7	2.950	38.100	2.91	37.90	1.37	0.53	±5	2023/10/12
3500	22.3	2.920	37.600	2.91	37.90	0.34	-0.79	±5	2023/10/31
3500	22.2	2.930	38.200	2.91	37.90	0.69	0.79	±5	2023/11/1
3700	22.5	3.130	38.200	3.12	37.70	0.32	1.33	±5	2023/9/22
3700	22.6	3.080	37.400	3.12	37.70	-1.28	-0.80	±5	2023/9/29
3700	22.7	3.110	37.700	3.12	37.70	-0.32	0.00	±5	2023/10/3
3700	22.5	3.110	38.000	3.12	37.70	-0.32	0.80	±5	2023/10/5
3700	22.6	3.120	37.800	3.12	37.70	0.00	0.27	±5	2023/10/5
3700	22.7	3.140	37.100	3.12	37.70	0.64	-1.59	±5	2023/10/7
3700	22.8	3.120	37.000	3.12	37.70	0.00	-1.86	±5	2023/10/8
3700	22.7	3.160	37.900	3.12	37.70	1.28	0.53	±5	2023/10/12
3700	22.3	3.080	37.400	3.12	37.70	-1.28	-0.80	±5	2023/10/31
3700	22.2	3.140	38.000	3.12	37.70	0.64	0.80	±5	2023/11/1
3900	22.6	3.250	37.100	3.33	37.51	-2.40	-1.09	±5	2023/9/29
3900	22.7	3.250	37.300	3.33	37.51	-2.40	-0.56	±5	2023/10/1
3900	22.7	3.280	37.400	3.33	37.51	-1.50	-0.29	±5	2023/10/3
3900	22.6	3.290	37.600	3.33	37.51	-1.20	0.24	±5	2023/10/5
3900	22.5	3.380	37.000	3.33	37.51	1.50	-1.36	±5	2023/10/6
3900	22.7	3.340	36.900	3.33	37.51	0.30	-1.63	±5	2023/10/7
3900	22.7	3.280	37.300	3.33	37.51	-1.50	-0.56	±5	2023/10/7
3900	22.8	3.320	36.700	3.33	37.51	-0.30	-2.16	±5	2023/10/8
3900	22.3	3.250	37.100	3.33	37.51	-2.40	-1.09	±5	2023/10/31
3900	22.2	3.350	37.800	3.33	37.51	0.60	0.77	±5	2023/11/1
5250	22.3	4.600	35.400	4.71	35.95	-2.34	-1.53	±5	2023/10/7
5250	22.3	4.750	37.000	4.71	35.95	0.85	2.92	±5	2023/10/14
5250	22.3	4.820	36.900	4.71	35.95	2.34	2.64	±5	2023/10/15
5250	22.3	4.680	35.700	4.71	35.95	-0.64	-0.70	±5	2023/10/16
5250	22.6	4.820	36.500	4.71	35.95	2.34	1.53	±5	2023/10/16
5250	22.3	4.680	36.000	4.71	35.95	-0.64	0.14	±5	2023/10/17
5250	22.6	4.700	36.800	4.71	35.95	-0.21	2.36	±5	2023/10/18
5250	22.8	4.570	35.400	4.71	35.95	-2.97	-1.53	±5	2023/10/18
5250	22.5	4.670	37.200	4.71	35.95	-0.85	3.48	±5	2023/10/20
5600	22.3	5.000	34.800	5.07	35.50	-1.38	-1.97	±5	2023/10/7
5600	22.3	5.120	36.500	5.07	35.50	0.99	2.82	±5	2023/10/14
5600	22.3	5.210	36.300	5.07	35.50	2.76	2.25	±5	2023/10/15
5600	22.3	5.080	35.100	5.07	35.50	0.20	-1.13	±5	2023/10/16
5600	22.3	5.080	35.400	5.07	35.50	0.20	-0.28	±5	2023/10/17
5600	22.6	5.060	36.300	5.07	35.50	-0.20	2.25	±5	2023/10/18
5600	22.8	4.960	34.800	5.07	35.50	-2.17	-1.97	±5	2023/10/18
5750	22.3	5.180	34.500	5.22	35.35	-0.77	-2.40	±5	2023/10/7
5750	22.3	5.290	36.300	5.22	35.35	1.34	2.69	±5	2023/10/14
5750	22.3	5.360	36.200	5.22	35.35	2.68	2.40	±5	2023/10/15
5750	22.3	5.260	34.800	5.22	35.35	0.77	-1.56	±5	2023/10/16



5750	22.5	5.360	35.800	5.22	35.35	2.68	1.27	±5	2023/10/16
5750	22.3	5.270	35.100	5.22	35.35	0.96	-0.71	±5	2023/10/17
5750	22.6	5.220	36.100	5.22	35.35	0.00	2.12	±5	2023/10/18
5750	22.8	5.150	34.500	5.22	35.35	-1.34	-2.40	±5	2023/10/18
5850	22.5	5.440	35.500	5.32	35.25	2.26	0.71	±5	2023/10/17
5850	22.6	5.180	36.000	5.32	35.25	-2.63	2.13	±5	2023/10/18
6500	22.5	6.310	35.200	6.07	34.50	3.95	2.03	±5	2023/10/13
6500	22.5	5.970	34.200	6.07	34.50	-1.65	-0.87	±5	2023/10/14

**<Full Test>**

Frequency (MHz)	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ε <sub>r</sub> )	Conductivity Target (σ)	Permittivity Target (ε <sub>r</sub> )	Delta (σ) (%)	Delta (ε <sub>r</sub> ) (%)	Limit (%)	Date
835	22.6	0.909	40.600	0.90	41.50	1.00	-2.17	±5	2023/9/18
835	22.6	0.934	41.800	0.90	41.50	3.78	0.72	±5	2023/10/15
835	22.8	0.922	41.400	0.90	41.50	2.44	-0.24	±5	2023/10/18
1750	22.6	1.360	40.500	1.37	40.10	-0.73	1.00	±5	2023/9/16
1750	22.6	1.360	40.800	1.37	40.10	-0.73	1.75	±5	2023/9/21
1750	22.7	1.360	40.600	1.37	40.10	-0.73	1.25	±5	2023/10/13
1750	22.4	1.370	40.200	1.37	40.10	0.00	0.25	±5	2023/10/14
1750	22.5	1.370	40.700	1.37	40.10	0.00	1.50	±5	2023/10/25
1900	22.4	1.420	40.600	1.40	40.00	1.43	1.50	±5	2023/9/15
1900	22.7	1.420	40.800	1.40	40.00	1.43	2.00	±5	2023/9/20
1900	22.4	1.450	38.700	1.40	40.00	3.57	-3.25	±5	2023/10/14
1900	22.7	1.450	39.300	1.40	40.00	3.57	-1.75	±5	2023/10/16
1900	22.8	1.430	39.000	1.40	40.00	2.14	-2.50	±5	2023/10/18
1900	22.5	1.440	39.200	1.40	40.00	2.86	-2.00	±5	2023/10/25
3500	22.5	2.920	37.200	2.91	37.90	0.34	-1.85	±5	2023/10/16
3500	22.7	2.920	37.100	2.91	37.90	0.34	-2.11	±5	2023/10/17
3700	22.5	3.100	36.900	3.12	37.70	-0.64	-2.12	±5	2023/10/16
3700	22.7	3.100	36.800	3.12	37.70	-0.64	-2.39	±5	2023/10/17
3900	22.5	3.310	36.600	3.33	37.51	-0.60	-2.43	±5	2023/10/16
3900	22.7	3.300	36.600	3.33	37.51	-0.90	-2.43	±5	2023/10/17



**13.2 System Performance Check Results**

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

**<Spot Check>**

Test Site	Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
SAR-15	2023/10/13	13	1000	CLA13-1022	EX3DV4 - SN7695	DAE4 Sn656	0.335	0.349	0.335	-4.29
Test Site	Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
SAR17	2023/9/12	750	50	D750V3-1107	EX3DV4 - SN7700	DAE4 Sn1707	0.403	8.540	8.06	-5.62
SAR17	2023/9/14	750	50	D750V3-1107	EX3DV4 - SN7700	DAE4 Sn1707	0.427	8.540	8.54	0.00
SAR17	2023/9/16	750	50	D750V3-1107	EX3DV4 - SN7700	DAE4 Sn1707	0.426	8.540	8.52	-0.23
SAR17	2023/9/18	750	50	D750V3-1107	EX3DV4 - SN7700	DAE4 Sn1707	0.388	8.540	7.76	-9.13
SAR17	2023/9/23	750	50	D750V3-1107	EX3DV4 - SN7700	DAE4 Sn1707	0.427	8.540	8.54	0.00
SAR16	2023/9/12	750	50	D750V3-1107	EX3DV4 - SN3931	DAE4 Sn1696	0.413	8.540	8.26	-3.28
SAR18	2023/9/25	750	50	D750V3-1107	EX3DV4 - SN3931	DAE4 Sn1696	0.392	8.540	7.84	-8.20
SAR17	2023/10/16	750	50	D750V3-1107	EX3DV4 - SN7700	DAE4 Sn1707	0.392	8.540	7.84	-8.20
SAR17	2023/9/13	835	50	D835V2-4d167	EX3DV4 - SN7700	DAE4 Sn1707	0.461	9.800	9.22	-5.92
SAR17	2023/9/16	835	50	D835V2-4d167	EX3DV4 - SN7700	DAE4 Sn1707	0.446	9.800	8.92	-8.98
SAR17	2023/9/19	835	50	D835V2-4d167	EX3DV4 - SN7700	DAE4 Sn1707	0.471	9.800	9.42	-3.88
SAR18	2023/9/24	850	50	D835V2-4d167	EX3DV4 - SN3931	DAE4 Sn1696	0.468	9.800	9.36	-4.49
SAR17	2023/9/25	835	50	D835V2-4d167	EX3DV4 - SN7700	DAE4 Sn1707	0.446	9.800	8.92	-8.98
SAR16	2023/9/13	835	50	D835V2-4d167	EX3DV4 - SN3931	DAE4 Sn1696	0.523	9.800	10.46	6.73
SAR17	2023/10/13	835	50	D835V2-4d167	EX3DV4 - SN7700	DAE4 Sn1707	0.465	9.800	9.3	-5.10
SAR17	2023/9/15	1750	50	D1750V2-1112	EX3DV4 - SN7700	DAE4 Sn1707	1.860	36.900	37.2	0.81
SAR17	2023/9/20	1750	50	D1750V2-1112	EX3DV4 - SN7700	DAE4 Sn1707	1.810	36.900	36.2	-1.90
SAR18	2023/9/24	1750	50	D1750V2-1112	EX3DV4 - SN3931	DAE4 Sn1696	1.750	36.900	35	-5.15
SAR17	2023/9/29	1750	50	D1750V2-1112	EX3DV4 - SN7700	DAE4 Sn1707	1.870	36.900	37.4	1.36
SAR16	2023/10/13	1750	50	D1750V2-1112	EX3DV4 - SN7692	DAE4 Sn661	1.680	36.900	33.6	-8.94
SAR18	2023/8/30	1900	50	D1900V2-5d185	EX3DV4 - SN3931	DAE4 Sn1696	1.830	39.000	36.6	-6.15
SAR17	2023/9/17	1900	50	D1900V2-5d185	EX3DV4 - SN7700	DAE4 Sn1707	1.830	39.000	36.6	-6.15
SAR18	2023/9/20	1900	50	D1900V2-5d185	EX3DV4 - SN3931	DAE4 Sn1696	1.930	39.000	38.6	-1.03
SAR18	2023/9/21	1900	50	D1900V2-5d185	EX3DV4 - SN3931	DAE4 Sn1696	1.950	39.000	39	0.00
SAR17	2023/9/26	1900	50	D1900V2-5d185	EX3DV4 - SN7700	DAE4 Sn1707	1.870	39.000	37.4	-4.10
SAR17	2023/10/3	1900	50	D1900V2-5d185	EX3DV4 - SN7700	DAE4 Sn1707	1.840	39.000	36.8	-5.64
SAR16	2023/10/11	1900	50	D1900V2-5d185	EX3DV4 - SN7692	DAE4 Sn661	1.840	39.000	36.8	-5.64
SAR17	2023/9/21	2300	50	D2300V2-1006	EX3DV4 - SN7700	DAE4 Sn1707	2.270	48.300	45.4	-6.00
SAR17	2023/9/27	2300	50	D2300V2-1006	EX3DV4 - SN7700	DAE4 Sn1707	2.350	48.300	47	-2.69
SAR-15	2023/10/7	2450	50	D2450V2-929	EX3DV4 - SN7791	DAE4 Sn699	2.780	52.400	55.6	6.11
SAR-13	2023/10/12	2450	50	D2450V2-929	EX3DV4 - SN7791	DAE4 Sn1697	2.620	52.400	52.4	0.00
SAR-15	2023/10/12	2450	50	D2450V2-929	EX3DV4 - SN7785	DAE4 Sn699	2.580	52.400	51.6	-1.53
SAR-17	2023/10/13	2450	50	D2450V2-929	EX3DV4 - SN7700	DAE4 Sn1707	2.370	52.400	47.4	-9.54
SAR-15	2023/10/15	2450	50	D2450V2-929	EX3DV4 - SN7785	DAE4 Sn699	2.510	52.400	50.2	-4.20
SAR-15	2023/10/18	2450	50	D2450V2-929	EX3DV4 - SN7785	DAE4 Sn699	2.540	52.400	50.8	-3.05
SAR-15	2023/10/19	2450	50	D2450V2-929	EX3DV4 - SN7785	DAE4 Sn699	2.460	52.400	49.2	-6.11
SAR17	2023/9/21	2600	50	D2600V2-1078	EX3DV4 - SN7700	DAE4 Sn1707	2.790	55.400	55.8	0.72
SAR17	2023/9/24	2600	50	D2600V2-1078	EX3DV4 - SN7700	DAE4 Sn1707	2.620	55.400	52.4	-5.42
SAR18	2023/9/26	2600	50	D2600V2-1078	EX3DV4 - SN3931	DAE4 Sn1696	2.710	55.400	54.2	-2.17
SAR17	2023/9/27	2600	50	D2600V2-1078	EX3DV4 - SN7700	DAE4 Sn1707	2.590	55.400	51.8	-6.50
SAR17	2023/9/28	2600	50	D2600V2-1078	EX3DV4 - SN7700	DAE4 Sn1707	2.590	55.400	51.8	-6.50
SAR17	2023/10/4	2600	50	D2600V2-1078	EX3DV4 - SN7700	DAE4 Sn1707	2.600	55.400	52	-6.14
SAR17	2023/10/10	2600	50	D2600V2-1078	EX3DV4 - SN7700	DAE4 Sn1707	2.510	55.400	50.2	-9.39
SAR17	2023/10/12	2600	50	D2600V2-1078	EX3DV4 - SN7700	DAE4 Sn1707	2.530	55.400	50.6	-8.66
SAR17	2023/9/22	3500	50	D3500V2-1014	EX3DV4 - SN7700	DAE4 Sn1707	3.230	67.200	64.6	-3.87
SAR18	2023/9/29	3500	50	D3500V2-1014	EX3DV4 - SN3931	DAE4 Sn1696	3.400	67.200	68	1.19
SAR16	2023/10/3	3500	50	D3500V2-1014	EX3DV4 - SN7692	DAE4 Sn661	3.550	67.200	71	5.65
SAR17	2023/10/5	3500	50	D3500V2-1014	EX3DV4 - SN7700	DAE4 Sn1707	3.030	67.200	60.6	-9.82
SAR16	2023/10/5	3500	50	D3500V2-1014	EX3DV4 - SN7692	DAE4 Sn661	3.140	67.200	62.8	-6.55
SAR17	2023/10/7	3500	50	D3500V2-1036	EX3DV4 - SN7700	DAE4 Sn1707	3.180	67.400	63.6	-5.64
SAR16	2023/10/7	3500	50	D3500V2-1036	EX3DV4 - SN7692	DAE4 Sn661	3.270	67.400	65.4	-2.97



**FCC SAR TEST REPORT**

**Report No. : FA380308B**

SAR17	2023/10/8	3500	50	D3500V2-1036	EX3DV4 - SN7700	DAE4 Sn1707	3.080	67.400	61.6	-8.61
SAR16	2023/10/9	3500	50	D3500V2-1036	EX3DV4 - SN7692	DAE4 Sn661	3.160	67.400	63.2	-6.23
SAR16	2023/10/12	3500	50	D3500V2-1036	EX3DV4 - SN7692	DAE4 Sn661	3.150	67.400	63	-6.53
SAR16	2023/10/31	3500	50	D3500V2-1036	EX3DV4 - SN7692	DAE4 Sn661	3.540	67.400	70.8	5.04
SAR16	2023/11/1	3500	50	D3500V2-1036	EX3DV4 - SN7692	DAE4 Sn661	3.580	67.400	71.6	6.23
SAR17	2023/9/22	3700	50	D3700V2-1006	EX3DV4 - SN7700	DAE4 Sn1707	3.250	65.600	65	-0.91
SAR18	2023/9/29	3700	50	D3700V2-1006	EX3DV4 - SN3931	DAE4 Sn1696	3.060	65.600	61.2	-6.71
SAR16	2023/10/3	3700	50	D3700V2-1006	EX3DV4 - SN7692	DAE4 Sn661	3.080	65.600	61.6	-6.10
SAR17	2023/10/5	3700	50	D3700V2-1006	EX3DV4 - SN7700	DAE4 Sn1707	3.100	65.600	62	-5.49
SAR16	2023/10/5	3700	50	D3700V2-1006	EX3DV4 - SN7692	DAE4 Sn661	3.240	65.600	64.8	-1.22
SAR17	2023/10/7	3700	50	D3700V2-1006	EX3DV4 - SN7700	DAE4 Sn1707	3.200	65.600	64	-2.44
SAR17	2023/10/8	3700	50	D3700V2-1006	EX3DV4 - SN7700	DAE4 Sn1707	3.160	65.600	63.2	-3.66
SAR16	2023/10/12	3700	50	D3700V2-1006	EX3DV4 - SN7692	DAE4 Sn661	3.260	65.600	65.2	-0.61
SAR16	2023/10/31	3700	50	D3700V2-1006	EX3DV4 - SN7692	DAE4 Sn661	3.260	65.600	65.2	-0.61
SAR16	2023/11/1	3700	50	D3700V2-1006	EX3DV4 - SN7692	DAE4 Sn661	3.150	65.600	63	-3.96
SAR18	2023/9/29	3900	50	D3900V2-1092	EX3DV4 - SN3931	DAE4 Sn1696	3.060	67.000	61.2	-8.66
SAR18	2023/10/1	3900	50	D3900V2-1092	EX3DV4 - SN3931	DAE4 Sn1696	3.370	67.000	67.4	0.60
SAR16	2023/10/3	3900	50	D3900V2-1017-3900	EX3DV4 - SN7692	DAE4 Sn661	3.310	68.700	66.2	-3.64
SAR16	2023/10/5	3900	50	D3900V2-1017-3900	EX3DV4 - SN7692	DAE4 Sn661	3.220	68.700	64.4	-6.26
SAR17	2023/10/6	3900	50	D3900V2-1092	EX3DV4 - SN7700	DAE4 Sn1707	3.240	67.000	64.8	-3.28
SAR17	2023/10/7	3900	50	D3900V2-1092	EX3DV4 - SN7700	DAE4 Sn1707	3.080	67.000	61.6	-8.06
SAR16	2023/10/7	3900	50	D3900V2-1092	EX3DV4 - SN7692	DAE4 Sn661	3.360	67.000	67.2	0.30
SAR17	2023/10/8	3900	50	D3900V2-1092	EX3DV4 - SN7700	DAE4 Sn1707	3.020	67.000	60.4	-9.85
SAR16	2023/10/31	3900	50	D3900V2-1092	EX3DV4 - SN7692	DAE4 Sn661	3.570	67.000	71.4	6.57
SAR16	2023/11/1	3900	50	D3900V2-1092	EX3DV4 - SN7692	DAE4 Sn661	3.330	67.000	66.6	-0.60
SAR-15	2023/10/7	5250	50	D5GHzV2-1171-5250	EX3DV4 - SN7791	DAE4 Sn699	3.850	80.300	77	-4.11
SAR-15	2023/10/14	5250	100	D5GHzV2-1171-5250	EX3DV4 - SN7785	DAE4 Sn699	7.410	80.300	74.1	-7.72
SAR-15	2023/10/15	5250	100	D5GHzV2-1171-5250	EX3DV4 - SN7785	DAE4 Sn699	7.830	80.300	78.3	-2.49
SAR-15	2023/10/16	5250	100	D5GHzV2-1171-5250	EX3DV4 - SN7785	DAE4 Sn699	7.780	80.300	77.8	-3.11
SAR-13	2023/10/16	5250	50	D5GHzV2-1171-5250	EX3DV4 - SN7791	DAE4 Sn1697	3.870	80.300	77.4	-3.61
SAR-15	2023/10/17	5250	100	D5GHzV2-1171-5250	EX3DV4 - SN7785	DAE4 Sn699	8.340	80.300	83.4	3.86
SAR-16	2023/10/18	5250	50	D5GHzV2-1171-5250	EX3DV4 - SN7692	DAE4 Sn661	3.820	80.300	76.4	-4.86
SAR-17	2023/10/18	5250	50	D5GHzV2-1171-5250	EX3DV4 - SN7700	DAE4 Sn1707	4.160	80.300	83.2	3.61
SAR-13	2023/10/20	5250	50	D5GHzV2-1171-5250	EX3DV4 - SN7695	DAE4 Sn1697	3.770	80.300	75.4	-6.10
SAR-15	2023/10/7	5600	50	D5GHzV2-1171-5600	EX3DV4 - SN7791	DAE4 Sn699	4.120	83.400	82.4	-1.20
SAR-15	2023/10/14	5600	100	D5GHzV2-1171-5600	EX3DV4 - SN7785	DAE4 Sn699	8.160	83.400	81.6	-2.16
SAR-15	2023/10/15	5600	100	D5GHzV2-1171-5600	EX3DV4 - SN7785	DAE4 Sn699	8.040	83.400	80.4	-3.60
SAR-15	2023/10/16	5600	100	D5GHzV2-1171-5600	EX3DV4 - SN7785	DAE4 Sn699	8.160	83.400	81.6	-2.16
SAR-15	2023/10/17	5600	100	D5GHzV2-1171-5600	EX3DV4 - SN7785	DAE4 Sn699	7.960	83.400	79.6	-4.56
SAR-16	2023/10/18	5600	50	D5GHzV2-1171-5600	EX3DV4 - SN7692	DAE4 Sn661	4.340	83.400	86.8	4.08
SAR-17	2023/10/18	5600	50	D5GHzV2-1171-5600	EX3DV4 - SN7700	DAE4 Sn1707	4.250	83.400	85	1.92
SAR-15	2023/10/7	5750	50	D5GHzV2-1171-5750	EX3DV4 - SN7791	DAE4 Sn699	3.790	80.400	75.8	-5.72
SAR-15	2023/10/14	5750	100	D5GHzV2-1171-5750	EX3DV4 - SN7785	DAE4 Sn699	7.360	80.400	73.6	-8.46
SAR-15	2023/10/15	5750	100	D5GHzV2-1171-5750	EX3DV4 - SN7785	DAE4 Sn699	7.670	80.400	76.7	-4.60
SAR-15	2023/10/16	5750	100	D5GHzV2-1171-5750	EX3DV4 - SN7785	DAE4 Sn699	7.350	80.400	73.5	-8.58
SAR-13	2023/10/16	5750	100	D5GHzV2-1171-5750	EX3DV4 - SN7791	DAE4 Sn1697	8.240	80.400	82.4	2.49
SAR-15	2023/10/17	5750	100	D5GHzV2-1171-5750	EX3DV4 - SN7785	DAE4 Sn699	7.320	80.400	73.2	-8.96
SAR-16	2023/10/18	5750	50	D5GHzV2-1171-5750	EX3DV4 - SN7692	DAE4 Sn661	4.130	80.400	82.6	2.74
SAR-17	2023/10/18	5750	50	D5GHzV2-1171-5750	EX3DV4 - SN7700	DAE4 Sn1707	4.040	80.400	80.8	0.50
SAR-13	2023/10/17	5850	50	D5GHzV2-1006-5850	EX3DV4 - SN7625	DAE4 Sn1697	3.930	81.800	78.6	-3.91
SAR-13	2023/10/18	5850	50	D5GHzV2-1171-5850	EX3DV4 - SN7625	DAE4 Sn1697	3.780	82.300	75.6	-8.14
SAR-13	2023/10/13	6500	100	D6.5GHzV2-1003	EX3DV4 - SN7791	DAE4 Sn1697	27.400	297.000	274	-7.74
SAR-13	2023/10/14	6500	100	D6.5GHzV2-1003	EX3DV4 - SN7791	DAE4 Sn1697	32.100	297.000	321	8.08

**<Full Test>**

Test Site	Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
SAR16	2023/9/18	835	50	D835V2-4d167	EX3DV4 - SN3931	DAE4 Sn1696	0.482	9.800	9.64	-1.63
SAR15	2023/10/15	835	50	D835V2-4d167	EX3DV4 - SN7692	DAE4 Sn661	0.515	9.800	10.3	5.10
SAR17	2023/10/18	835	50	D835V2-4d167	EX3DV4 - SN7700	DAE4 Sn1707	0.471	9.800	9.42	-3.88
SAR16	2023/9/16	1750	50	D1750V2-1112	EX3DV4 - SN3931	DAE4 Sn1696	1.720	36.900	34.4	-6.78
SAR16	2023/9/21	1750	50	D1750V2-1112	EX3DV4 - SN3931	DAE4 Sn1696	1.730	36.900	34.6	-6.23
SAR15	2023/10/13	1750	50	D1750V2-1112	EX3DV4 - SN7692	DAE4 Sn661	1.680	36.900	33.6	-8.94
SAR17	2023/10/14	1750	50	D1750V2-1112	EX3DV4 - SN7700	DAE4 Sn1707	1.680	36.900	33.6	-8.94
SAR17	2023/10/25	1750	50	D1750V2-1112	EX3DV4 - SN7700	DAE4 Sn1707	1.700	36.900	34	-7.86
SAR16	2023/9/15	1900	50	D1900V2-5d185	EX3DV4 - SN3931	DAE4 Sn1696	1.920	39.000	38.4	-1.54
SAR16	2023/9/20	1900	50	D1900V2-5d185	EX3DV4 - SN3931	DAE4 Sn1696	1.930	39.000	38.6	-1.03
SAR17	2023/10/14	1900	50	D1900V2-5d185	EX3DV4 - SN7700	DAE4 Sn1707	1.910	39.000	38.2	-2.05
SAR15	2023/10/16	1900	50	D1900V2-5d185	EX3DV4 - SN7692	DAE4 Sn661	1.980	39.000	39.6	1.54
SAR17	2023/10/18	1900	50	D1900V2-5d185	EX3DV4 - SN7700	DAE4 Sn1707	1.960	39.000	39.2	0.51
SAR17	2023/10/25	1900	50	D1900V2-5d185	EX3DV4 - SN7700	DAE4 Sn1707	1.900	39.000	38	-2.56
SAR17	2023/10/16	3500	50	D3500V2-1036	EX3DV4 - SN7700	DAE4 Sn1707	3.140	67.400	62.8	-6.82
SAR17	2023/10/17	3500	50	D3500V2-1036	EX3DV4 - SN7700	DAE4 Sn1707	3.300	67.400	66	-2.08
SAR17	2023/10/16	3700	50	D3700V2-1006	EX3DV4 - SN7700	DAE4 Sn1707	2.960	65.600	59.2	-9.76
SAR17	2023/10/17	3700	50	D3700V2-1006	EX3DV4 - SN7700	DAE4 Sn1707	2.970	65.600	59.4	-9.45
SAR17	2023/10/16	3900	50	D3900V2-1092	EX3DV4 - SN7700	DAE4 Sn1707	3.220	67.000	64.4	-3.88
SAR17	2023/10/17	3900	50	D3900V2-1092	EX3DV4 - SN7700	DAE4 Sn1707	3.440	67.000	68.8	2.69

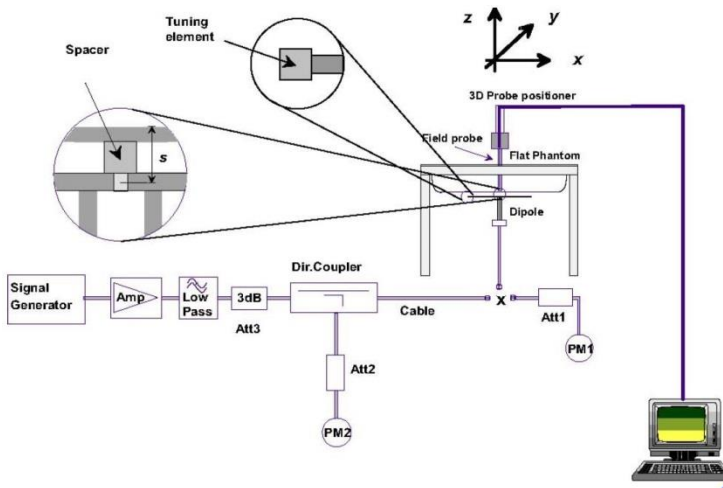


Fig 8.3.1 System Performance Check Setup

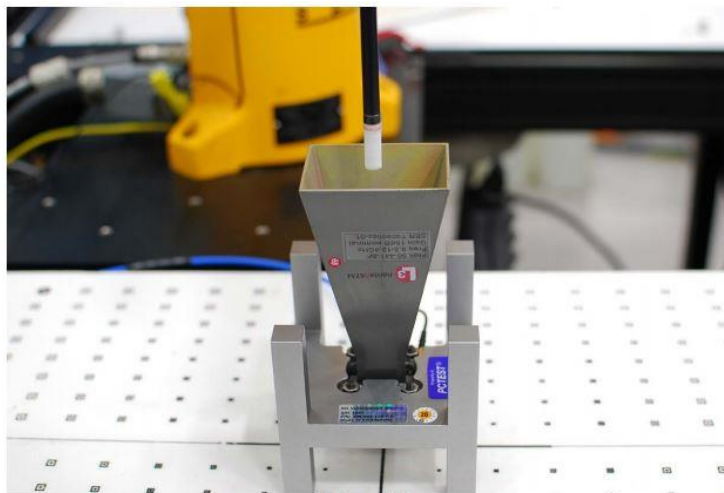


Fig 8.3.2 Setup Photo

**13.3 PD System Performance Check Results**

The system was verified to be within  $\pm 0.66$  dB of the power density targets on the calibration certificate according to the test system specification in the user’s manual and calibration facility recommendation. The 0.66 dB deviation threshold represents the expanded uncertainty for system performance checks using SPEAG’s mmWave verification sources. The same spatial resolution and measurement region used in the source calibration was applied during the system check. The measured power density distribution of verification source was also confirmed through visual inspection to have no noticeable differences, both spatially (shape) and numerically (level) from the distribution provided by the manufacturer, per November 2017 TCBC Workshop Notes

Test Site	Frequency (GHz)	5G Verification Source	Probe S/N	DAE S/N	Distance (mm)	Measured 4 cm <sup>2</sup> (W/m <sup>2</sup> )	Targeted 4 cm <sup>2</sup> (W/m <sup>2</sup> )	Deviation (dB)	Date
SAR13	10G	10GHz_1020	9441	1424	10mm	55.4	54.9	0.04	2023/10/27
SAR13	10G	10GHz_1020	9424	656	10mm	51.3	54.9	-0.29	2023/11/14



**Figure 4-3**  
System Verification Setup Photo

System Performance Check Setup



## **14. Measurement procedure for output power and SAR**

Detail output power measurement data is in the appendix D.

### **<GSM Note>**

1. Per KDB 447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS (4Tx slots) for GSM850/GSM1900 is considered as the primary mode.
3. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is  $\leq \frac{1}{4}$  dB higher than the primary mode, SAR measurement is not required for the secondary mode.

### **<WCDMA Note>**

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
4. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA is  $\leq \frac{1}{4}$  dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA to RMC12.2Kbps and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for HSDPA / HSUPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA) are less than  $\frac{1}{4}$  dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA.

A summary of these settings are illustrated below:



**HSDPA Setup Configuration:**

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
  - i. Set Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters were set according to each
  - ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
  - iii. Set RMC 12.2Kbps + HSDPA mode.
  - iv. Set Cell Power = -86 dBm
  - v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
  - vi. Select HSDPA Uplink Parameters
  - vii. Set Delta ACK, Delta NACK and Delta CQI = 8
  - viii. Set Ack-Nack Repetition Factor to 3
  - ix. Set CQI Feedback Cycle (k) to 4 ms
  - x. Set CQI Repetition Factor to 2
  - xi. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

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

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

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

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

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

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

**Setup Configuration**

**HSUPA Setup Configuration:**

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting \* :
  - i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
  - ii. Set the Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
  - iii. Set Cell Power = -86 dBm
  - iv. Set Channel Type = 12.2k + HSPA
  - v. Set UE Target Power
  - vi. Power Ctrl Mode= Alternating bits
  - vii. Set and observe the E-TFCl
  - viii. Confirm that E-TFCl is equal to the target E-TFCl of 75 for sub-test 1, and other subtest's E-TFCl
- d. The transmitted maximum output power was recorded.

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

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$ (Note1)	$\beta_{ec}$	$\beta_{ed}$ (Note 4) (Note 5)	$\beta_{ed}$ (SF)	$\beta_{ed}$ (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCl
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}$ : 47/15 $\beta_{ed2}$ : 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ . For sub-test 5,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 5/15$  with  $\beta_{hs} = 5/15 * \beta_c$ .

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

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

Note 4: In case of testing by UE using E-DPDCCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCCH power scaling at max power which could results in slightly smaller MPR values.

**Setup Configuration**



**<LTE Note>**

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. LTE band 4 SAR test was covered by Band 66; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
  - a. the maximum output power, including tolerance, for the smaller band is  $\leq$  the larger band to qualify for the SAR test exclusion
  - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

**<5G NR Note>**

1. Referencing the procedure in KDB 941225, the test procedures are outlined as below
  - a. For DFT-OFDM output power measurement, full measurement was done for Pi/2 BPSK and QPSK and for the largest supported bandwidth, repeat test for 16QAM/64QAM/256QAM under 1RB 1Offset configuration. For smaller bandwidth, measure conducted power for Pi/2 BPSK and 1RB 1Offset configuration.
  - b. According to the tune-up, CP-OFDM output power is not ½ dB higher than DFT-OFDM mode, and the reported SAR of DFT-OFDM mode reported SAR is ≤ 1.45 W/kg, SAR test and thus conducted power for CP-OFDM mode is not required.
  - c. To start SAR test for the largest channel bandwidth for PI/2 BPSK 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. Also do SAR test for 50% RB allocation for PI/2 BPSK SAR testing using 1RB PI/2 BPSK allocation procedure
  - d. For PI/2 BPSK with 100% RB allocation, SAR test is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
  - e. For higher modulation QPSK/16QAM/64QAM/256QAM, according to tune-up document the power level is not ½ dB higher than the same configuration in PI/2 BPSK, also reported SAR for the PI/2 BPSK configuration is less than 1.45 W/kg, QPSK/16QAM/64QAM/256QAM SAR testing are not required.
  - f. Smaller bandwidth output power for each RB allocation configuration for this device is not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device
2. Due to test setup limitations, SAR testing for NR TDD Power class 3 was performed using Factory Test Mode software to establish the connection and perform SAR with 100% transmission. For NR TDD power class2 was performed using Factory Test Mode software to establish the connection and perform SAR with 50% transmission.
3. For NR FDD was establishing connections via a base station simulator to use for output power measurement and SAR testing

**<3GPP 38.101 MPR for EN-DC>**

**Table 6.2.2-1 Maximum power reduction (MPR) for power class 3**

Modulation		MPR (dB)		
		Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM	Pi/2 BPSK	≤ 3.5 <sup>1</sup>	≤ 1.2 <sup>1</sup>	≤ 0.2 <sup>1</sup>
		≤ 0.5 <sup>2</sup>	≤ 0.5 <sup>2</sup>	0 <sup>2</sup>
	QPSK	≤ 1		0
	16 QAM	≤ 2		≤ 1
	64 QAM		≤ 2.5	
CP-OFDM	256 QAM		≤ 4.5	
	QPSK	≤ 3		≤ 1.5
	16 QAM	≤ 3		≤ 2
	64 QAM		≤ 3.5	
	256 QAM		≤ 6.5	

NOTE 1: Applicable for UE operating in TDD mode with Pi/2 BPSK modulation and UE indicates support for UE capability *powerBoosting-pi2BPSK* and if the IE *powerBoostPi2BPSK* is set to 1 and 40 % or less slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79. The reference power of 0 dB MPR is 26 dBm.

NOTE 2: Applicable for UE operating in FDD mode, or in TDD mode in bands other than n40, n41, n77, n78 and n79 with Pi/2 BPSK modulation and if the IE *powerBoostPi2BPSK* is set to 0 and if more than 40 % of slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79.

**Table 6.2.2-2 Maximum power reduction (MPR) for power class 2**

Modulation		MPR (dB)		
		Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM	Pi/2 BPSK	≤ 3.5	≤ 0.5	0
	QPSK	≤ 3.5	≤ 1	0
	16 QAM	≤ 3.5	≤ 2	≤ 1
	64 QAM	≤ 3.5		≤ 2.5
	256 QAM		≤ 4.5	
CP-OFDM	QPSK	≤ 3.5	≤ 3	≤ 1.5
	16 QAM	≤ 3.5	≤ 3	≤ 2
	64 QAM		≤ 3.5	
	256 QAM		≤ 6.5	

**15. RF Exposure position consideration**

Distance of the Antenna to the EUT surface/edge						
Antennas	Front	Back	Top Side	Bottom Side	Right Side	Left Side
WWAN Ant 0	≤ 25mm	≤ 25mm	> 25mm	≤ 25mm	≤ 25mm	≤ 25mm
WWAN Ant 1	≤ 25mm	≤ 25mm	≤ 25mm	> 25mm	≤ 25mm	≤ 25mm
WWAN Ant 2	≤ 25mm	≤ 25mm	> 25mm	≤ 25mm	≤ 25mm	≤ 25mm
WWAN Ant 5	≤ 25mm	≤ 25mm	≤ 25mm	> 25mm	≤ 25mm	≤ 25mm
WWAN Ant 6	≤ 25mm	≤ 25mm	> 25mm	≤ 25mm	≤ 25mm	≤ 25mm
WLAN/BT Ant 3 / 4	≤ 25mm	≤ 25mm	≤ 25mm	> 25mm	≤ 25mm	≤ 25mm
NFC	≤ 25mm	≤ 25mm	> 25mm	> 25mm	≤ 25mm	≤ 25mm

Positions for SAR / 6E PD tests						
Antennas	Front	Back	Top Side	Bottom Side	Right Side	Left Side
WWAN Ant 0	Yes	Yes	No	Yes	Yes	Yes
WWAN Ant 1	Yes	Yes	Yes	No	Yes	Yes
WWAN Ant 2	Yes	Yes	No	Yes	Yes	Yes
WWAN Ant 5	Yes	Yes	Yes	No	Yes	Yes
WWAN Ant 6	Yes	Yes	No	Yes	Yes	Yes
WLAN/BT Ant 3 / 4	Yes	Yes	Yes	No	Yes	Yes
NFC	Yes	Yes	No	No	Yes	Yes

**General Note:**

1. Referring to KDB 941225 D06 v02r01, when the overall device length and width are ≥ 9cm\*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge
2. The antenna location is illustrated in the Appendix G.



### 16. Spot Check SAR Results

**General Note:**

- SAR spot check verification on the worst cases from the original model was performed to demonstrate the test data from original model remains representative for the variant model.
- If the 1-g SAR spot check result “does not exceed 30%, but larger than 1.2 W/kg”, more spot check on the next-higher exposure position until the spot check result does not exceed 1.2 W/kg.
- The spot check results don’t show the SAR increase more than 30%, therefore referring to the guidance in the KDB inquiry, SAR data reuse is justified.

1st as parent model

2nd as variant model

#### 16.1 Head SAR

Plot No.	No.	Band	BW (MHz)	Test Position	Gap (mm)	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Deviation (%)
	1st	GSM850_Ant 0	GPRS (3 Tx slots)	Left Cheek	0mm	Index 2	251	848.8	30.00	31.50	1.413			0.05	0.457	0.646	
	2nd	GSM850_Ant 0	GPRS (3 Tx slots)	Left Cheek	0mm	Index 2	251	848.8	29.90	31.50	1.445			-0.06	0.440	0.636	-1.55%
	1st	GSM850_Ant 0	GPRS (3 Tx slots)	Left Cheek	0mm	Index 3	251	848.8	30.00	31.00	1.259			0.05	0.457	0.575	
	2nd	GSM850_Ant 0	GPRS (3 Tx slots)	Left Cheek	0mm	Index 3	251	848.8	29.90	31.00	1.288			-0.06	0.440	0.567	-1.39%
	1st	GSM850_Ant 1	GPRS (2 Tx slots)	Right Cheek	0mm	Index 2	128	824.2	27.99	28.90	1.233			0	0.800	0.986	
01	2nd	GSM850_Ant 1	GPRS (2 Tx slots)	Right Cheek	0mm	Index 2	128	824.2	27.74	28.90	1.306			0.01	0.749	0.978	-0.81%
	1st	GSM850_Ant 1	GPRS (2 Tx slots)	Right Cheek	0mm	Index 3	128	824.2	26.79	26.80	1.002			0	0.635	0.636	
	2nd	GSM850_Ant 1	GPRS (2 Tx slots)	Right Cheek	0mm	Index 3	128	824.2	26.65	26.80	1.035			0.01	0.595	0.616	-3.14%
	1st	LTE Band 7_Ant 2	20M_QPSK_1_0	Right Cheek	0mm	Index 2	21350	2560	22.65	24.50	1.531			0.11	0.649	0.994	
02	2nd	LTE Band 7_Ant 2	20M_QPSK_1_0	Right Cheek	0mm	Index 2	21350	2560	22.50	24.50	1.585			0.18	0.579	0.918	-7.65%
		LTE Band 7C_Ant 2	20M+20M_QPSK_1_99	Right Cheek	0mm	Index 2	20850+21048	2510	20.55	22.50	1.567			0.1	0.158	0.248	
	1st	LTE Band 7_Ant 2	20M_QPSK_1_0	Right Cheek	0mm	Index 3	21100	2535	22.13	22.50	1.089			-0.05	0.555	0.604	
	2nd	LTE Band 7_Ant 2	20M_QPSK_1_0	Right Cheek	0mm	Index 3	21100	2535	22.02	22.50	1.117			0.09	0.516	0.576	-4.64%
		LTE Band 7C_Ant 2	20M+20M_QPSK_1_99	Right Cheek	0mm	Index 3	20850+21048	2510	19.89	20.50	1.151			-0.12	0.149	0.171	
	1st	LTE Band 7_Ant 0	20M_QPSK_1_0	Left Cheek	0mm	Index 2	20850	2510	24.27	25.20	1.239			-0.03	0.741	0.918	
	2nd	LTE Band 7_Ant 0	20M_QPSK_1_0	Left Cheek	0mm	Index 2	20850	2510	23.92	25.20	1.343			-0.08	0.666	0.894	-2.61%
		LTE Band 7C_Ant 0	20M+20M_QPSK_1_0	Left Cheek	0mm	Index 2	21100+20902	2535	23.22	23.70	1.117			-0.06	0.563	0.629	
	1st	LTE Band 7_Ant 0	20M_QPSK_1_0	Left Cheek	0mm	Index 3	20850	2510	23.71	23.80	1.021			-0.09	0.660	0.674	
	2nd	LTE Band 7_Ant 0	20M_QPSK_1_0	Left Cheek	0mm	Index 3	20850	2510	23.44	23.80	1.086			-0.11	0.594	0.645	-4.30%
		LTE Band 7C_Ant 0	20M+20M_QPSK_1_99	Left Cheek	0mm	Index 3	20850+21048	2510	21.82	22.30	1.117			0.09	0.244	0.273	
	1st	LTE Band 12_Ant 0	10M_QPSK_1_0	Left Cheek	0mm	Index 2/3	23095	707.5	24.20	25.70	1.413			-0.03	0.220	0.311	
	2nd	LTE Band 12_Ant 0	10M_QPSK_1_0	Left Cheek	0mm	Index 2/3	23095	707.5	23.95	25.70	1.496			-0.08	0.204	0.305	-1.93%
	1st	LTE Band 12_Ant 1	10M_QPSK_1_0	Right Cheek	0mm	Index 2	23095	707.5	20.74	22.40	1.466			0.03	0.636	0.932	
03	2nd	LTE Band 12_Ant 1	10M_QPSK_1_0	Right Cheek	0mm	Index 2	23095	707.5	20.75	22.40	1.462			0.01	0.632	0.924	-0.86%
	1st	LTE Band 12_Ant 1	10M_QPSK_1_0	Right Cheek	0mm	Index 3	23095	707.5	19.66	20.30	1.159			-0.04	0.505	0.585	
	2nd	LTE Band 12_Ant 1	10M_QPSK_1_0	Right Cheek	0mm	Index 3	23095	707.5	19.72	20.30	1.143			0.09	0.502	0.574	-1.88%
	1st	LTE Band 26_Ant 0	15M_QPSK_1_0	Left Cheek	0mm	Index 2/3	26865	831.5	24.36	25.70	1.361			0.01	0.339	0.462	
	2nd	LTE Band 26_Ant 0	15M_QPSK_1_0	Left Cheek	0mm	Index 2/3	26865	831.5	24.15	25.70	1.429			-0.08	0.321	0.459	-0.65%
	1st	LTE Band 26_Ant 1	15M_QPSK_1_0	Right Cheek	0mm	Index 2	26865	831.5	19.28	21.10	1.521			-0.01	0.570	0.867	
04	2nd	LTE Band 26_Ant 1	15M_QPSK_1_0	Right Cheek	0mm	Index 2	26865	831.5	19.32	21.10	1.507			-0.03	0.438	0.660	-23.88%
	1st	LTE Band 26_Ant 1	15M_QPSK_1_0	Right Cheek	0mm	Index 3	26865	831.5	18.36	19.00	1.159			-0.04	0.464	0.538	
	2nd	LTE Band 26_Ant 1	15M_QPSK_1_0	Right Cheek	0mm	Index 3	26865	831.5	18.40	19.00	1.148			-0.05	0.356	0.409	-23.98%
	1st	LTE Band 41_Ant 2	20M_QPSK_1_0	Right Cheek	0mm	Index 2	41490	2680	23.21	25.10	1.545	62.9	1.006	-0.06	0.632	0.982	
05	2nd	LTE Band 41_Ant 2	20M_QPSK_1_0	Right Cheek	0mm	Index 2	41490	2680	23.31	25.10	1.510	62.9	1.006	-0.16	0.610	0.927	-5.60%
	1st	LTE Band 41_Ant 2	20M_QPSK_1_0	Right Cheek	0mm	Index 3	40185	2549.5	22.81	23.10	1.069	62.9	1.006	-0.07	0.399	0.429	
	2nd	LTE Band 41_Ant 2	20M_QPSK_1_0	Right Cheek	0mm	Index 3	40185	2549.5	22.86	23.10	1.057	62.9	1.006	-0.1	0.381	0.405	
	1st	LTE Band 41_Ant 0	20M_QPSK_1_0	Left Cheek	0mm	Index 2/3	40185	2549.5	24.16	25.20	1.271	62.9	1.006	-0.13	0.397	0.507	
	2nd	LTE Band 41_Ant 0	20M_QPSK_1_0	Left Cheek	0mm	Index 2/3	40185	2549.5	24.03	25.20	1.309	62.9	1.006	0.12	0.380	0.500	-1.38%
	1st	FR1 n7_Ant 2	50M_BPSK_1_1	Right Cheek	0mm	Index 2	507000	2535	24.15	25.70	1.429			-0.03	0.695	0.993	
06	2nd	FR1 n7_Ant 2	50M_BPSK_1_1	Right Cheek	0mm	Index 2	507000	2535	24.09	25.70	1.449			0.04	0.638	0.924	-6.95%



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	1st	FR1 n7_Ant 2	50M_BPSK_1_1	Right Cheek	0mm	Index 3	507000	2535	23.65	24.00	1.084			-0.03	0.619	0.671	-6.41%
	2nd	FR1 n7_Ant 2	50M_BPSK_1_1	Right Cheek	0mm	Index 3	507000	2535	23.57	24.00	1.104			0.04	0.569	0.628	
	1st	FR1 n7_Ant 0	50M_BPSK_1_1	Left Cheek	0mm	Index 2	507000	2535	23.52	25.20	1.472			0.07	0.596	0.877	-11.63%
	2nd	FR1 n7_Ant 0	50M_BPSK_1_1	Left Cheek	0mm	Index 2	507000	2535	23.40	25.20	1.514			-0.09	0.512	0.775	
	1st	FR1 n7_Ant 0	50M_BPSK_1_1	Left Cheek	0mm	Index 3	507000	2535	23.52	23.70	1.042			0.07	0.596	0.621	-11.59%
	2nd	FR1 n7_Ant 0	50M_BPSK_1_1	Left Cheek	0mm	Index 3	507000	2535	23.40	23.70	1.072			-0.09	0.512	0.549	
	1st	FR1 n12_Ant 0	15M_BPSK_36_22	Left Cheek	0mm	Index 2/3	141500	707.5	24.23	25.70	1.403			0.02	0.258	0.362	-8.29%
	2nd	FR1 n12_Ant 0	15M_BPSK_36_22	Left Cheek	0mm	Index 2/3	141500	707.5	24.22	25.70	1.406			0.14	0.236	0.332	
	1st	FR1 n12_Ant 1	15M_BPSK_1_1	Right Cheek	0mm	Index 2	141500	707.5	21.73	23.40	1.469			-0.02	0.675	0.992	-6.25%
07	2nd	FR1 n12_Ant 1	15M_BPSK_1_1	Right Cheek	0mm	Index 2	141500	707.5	21.66	23.40	1.493			0.01	0.623	0.930	
	1st	FR1 n12_Ant 1	15M_BPSK_1_1	Right Cheek	0mm	Index 3	141500	707.5	20.72	21.30	1.143			0.1	0.536	0.613	-5.38%
	2nd	FR1 n12_Ant 1	15M_BPSK_1_1	Right Cheek	0mm	Index 3	141500	707.5	20.61	21.30	1.172			0.06	0.495	0.580	
	1st	FR1 n26_Ant 0	20M_BPSK_50_28	Left Cheek	0mm	Index 2/3	166300	831.5	24.27	25.70	1.390			0.04	0.361	0.502	-1.00%
	2nd	FR1 n26_Ant 0	20M_BPSK_50_28	Left Cheek	0mm	Index 2/3	166300	831.5	24.20	25.70	1.413			0.12	0.352	0.497	
	1st	FR1 n26_Ant 1	20M_BPSK_1_1	Right Cheek	0mm	Index 2	166300	831.5	20.88	22.20	1.355			-0.01	0.733	0.993	-2.42%
08	2nd	FR1 n26_Ant 1	20M_BPSK_1_1	Right Cheek	0mm	Index 2	166300	831.5	20.86	22.20	1.361			-0.15	0.712	0.969	
	1st	FR1 n26_Ant 1	20M_BPSK_1_1	Right Cheek	0mm	Index 3	166300	831.5	19.85	20.20	1.084			0.04	0.582	0.631	-1.90%
	2nd	FR1 n26_Ant 1	20M_BPSK_1_1	Right Cheek	0mm	Index 3	166300	831.5	19.79	20.20	1.099			0.04	0.563	0.619	
	1st	FR1 n41_Ant 2	100M_BPSK_135_0	Right Cheek	0mm	Index 2	518598	2592.99	22.33	24.30	1.574			-0.16	0.520	0.818	-0.49%
09	2nd	FR1 n41_Ant 2	100M_BPSK_135_0	Right Cheek	0mm	Index 2	518598	2592.99	22.31	24.30	1.581			-0.02	0.515	0.814	
	1st	FR1 n41_Ant 2	100M_BPSK_135_0	Right Cheek	0mm	Index 3	518598	2592.99	22.33	23.50	1.309			-0.16	0.520	0.681	-0.59%
	2nd	FR1 n41_Ant 2	100M_BPSK_135_0	Right Cheek	0mm	Index 3	518598	2592.99	22.31	23.50	1.315			-0.02	0.515	0.677	
	1st	FR1 n41_Ant 0	100M_BPSK_1_1	Left Cheek	0mm	Index 2	518598	2592.99	23.87	25.20	1.358			0.14	0.604	0.820	-6.46%
	2nd	FR1 n41_Ant 0	100M_BPSK_1_1	Left Cheek	0mm	Index 2	518598	2592.99	23.77	25.20	1.390			-0.14	0.552	0.767	
	1st	FR1 n41_Ant 0	100M_BPSK_1_1	Left Cheek	0mm	Index 3	518598	2592.99	23.87	24.40	1.130			0.14	0.604	0.682	-6.45%
	2nd	FR1 n41_Ant 0	100M_BPSK_1_1	Left Cheek	0mm	Index 3	518598	2592.99	23.77	24.40	1.156			-0.14	0.552	0.638	
	1st	FR1 n77_Ant 6	100M_BPSK_1_1	Left Cheek	0mm	Index 2	656000	3840	22.37	23.70	1.358			-0.13	0.491	0.667	-15.74%
	2nd	FR1 n77_Ant 6	100M_BPSK_1_1	Left Cheek	0mm	Index 2	656000	3840	22.31	23.70	1.377			-0.11	0.408	0.562	
	1st	FR1 n77_Ant 6	100M_BPSK_1_1	Left Cheek	0mm	Index 3	656000	3840	22.37	22.90	1.130			-0.13	0.491	0.555	-15.86%
	2nd	FR1 n77_Ant 6	100M_BPSK_1_1	Left Cheek	0mm	Index 3	656000	3840	22.31	22.90	1.146			-0.11	0.408	0.467	
	1st	FR1 n77_Ant 6	100M_BPSK_1_1	Left Cheek	0mm	Index 2	633332	3499.98	22.19	23.70	1.416			-0.06	0.445	0.630	-10.79%
	2nd	FR1 n77_Ant 6	100M_BPSK_1_1	Left Cheek	0mm	Index 2	633332	3499.98	22.19	23.70	1.416			-0.1	0.397	0.562	
	1st	FR1 n77_Ant 6	100M_BPSK_1_1	Left Cheek	0mm	Index 3	633332	3499.98	22.19	22.90	1.178			-0.06	0.445	0.524	-10.69%
	2nd	FR1 n77_Ant 6	100M_BPSK_1_1	Left Cheek	0mm	Index 3	633332	3499.98	22.19	22.90	1.178			-0.1	0.397	0.468	
	1st	FR1 n77_Ant 2	100M_BPSK_1_1	Right Cheek	0mm	Index 2	656000	3840	23.70	24.70	1.259			0.04	0.391	0.492	-1.02%
	2nd	FR1 n77_Ant 2	100M_BPSK_1_1	Right Cheek	0mm	Index 2	656000	3840	23.72	24.70	1.253			-0.11	0.389	0.487	
	1st	FR1 n77_Ant 2	100M_BPSK_1_1	Right Cheek	0mm	Index 3	656000	3840	22.69	23.00	1.074			-0.02	0.311	0.334	-1.20%
	2nd	FR1 n77_Ant 2	100M_BPSK_1_1	Right Cheek	0mm	Index 3	656000	3840	22.71	23.00	1.069			0.04	0.309	0.330	
	1st	FR1 n77_Ant 2	100M_BPSK_1_1	Right Cheek	0mm	Index 2	633332	3499.98	23.55	24.70	1.303			-0.14	0.724	0.943	-3.39%
10	2nd	FR1 n77_Ant 2	100M_BPSK_1_1	Right Cheek	0mm	Index 2	633332	3499.98	23.53	24.70	1.309			-0.12	0.696	0.911	
	1st	FR1 n77_Ant 2	100M_BPSK_1_1	Right Cheek	0mm	Index 3	633332	3499.98	22.53	23.00	1.114			0	0.599	0.667	-8.10%
	2nd	FR1 n77_Ant 2	100M_BPSK_1_1	Right Cheek	0mm	Index 3	633332	3499.98	22.55	23.00	1.109			0.03	0.553	0.613	





# FCC SAR TEST REPORT

Report No. : FA380308B

Plot No.	No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured APD (W/m <sup>2</sup> )	Reported APD (W/m <sup>2</sup> )	Deviation (%)
11	1st	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 4	Index 1	12	2467	12.40	12.50	1.023	98.85	1.012	-0.19	0.768	0.795			-3.52%
	2nd	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 4	Index 1	12	2467	12.40	12.50	1.023	98.85	1.012	-0.08	0.741	0.767			
	1st	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 4	Index 3	12	2467	9.90	10.00	1.023	98.85	1.012	0	0.459	0.475			-4.63%
	2nd	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 4	Index 3	12	2467	9.90	10.00	1.023	98.85	1.012	-0.06	0.437	0.453			
	1st	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 3	Index 1/2	11	2462	12.45	12.50	1.012	98.85	1.012	0.01	0.399	0.408			-19.85%
	2nd	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 3	Index 1/2	11	2462	12.45	12.50	1.012	98.85	1.012	-0.07	0.319	0.327			
	1st	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 3	Index 3/4	11	2462	9.95	10.00	1.012	98.85	1.012	-0.15	0.236	0.242			-0.83%
	2nd	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 3	Index 3/4	11	2462	9.95	10.00	1.012	98.85	1.012	-0.12	0.234	0.240			
	1st	WLAN2.4GHz	802.11g 6Mbps	Left Cheek	0mm	Ant 4+3(4)	Index 1	6	2437	12.40	12.50	1.023	93.46	1.070	-0.06	0.641	0.702			-10.54%
	2nd	WLAN2.4GHz	802.11g 6Mbps	Left Cheek	0mm	Ant 4+3(3)	Index 1	6	2437	12.15	12.50	1.084	93.46	1.070	-0.06	0.134	0.155			
	1st	WLAN2.4GHz	802.11g 6Mbps	Left Cheek	0mm	Ant 4+3(4)	Index 1	6	2437	12.40	12.50	1.023	93.46	1.070	-0.09	0.574	0.628			-12.58%
	2nd	WLAN2.4GHz	802.11g 6Mbps	Left Cheek	0mm	Ant 4+3(3)	Index 1	6	2437	12.15	12.50	1.084	93.46	1.070	-0.09	0.096	0.111			
	1st	WLAN2.4GHz	802.11g 6Mbps	Left Tilted	0mm	Ant 4+3(4)	Index 3	1	2412	9.80	10.00	1.047	93.46	1.070	0.08	0.284	0.318			-12.58%
	2nd	WLAN2.4GHz	802.11g 6Mbps	Left Tilted	0mm	Ant 4+3(3)	Index 3	1	2412	9.45	10.00	1.135	93.46	1.070	0.08	0.007	0.009			
	1st	WLAN2.4GHz	802.11g 6Mbps	Left Tilted	0mm	Ant 4+3(4)	Index 3	1	2412	9.80	10.00	1.047	93.46	1.070	0.16	0.248	0.278			-12.58%
	2nd	WLAN2.4GHz	802.11g 6Mbps	Left Tilted	0mm	Ant 4+3(3)	Index 3	1	2412	9.45	10.00	1.135	93.46	1.070	0.16	0.053	0.064			
	1st	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 4	Index 1/2	56	5280	17.90	18.00	1.023	93.46	1.070	0.16	0.609	0.667			-0.15%
	2nd	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 4	Index 1/2	56	5280	17.90	18.00	1.023	93.46	1.070	0.09	0.608	0.666			
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4	Index 3	58	5290	11.90	12.00	1.023	89.9	1.112	-0.16	0.152	0.173			-8.67%
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4	Index 3	58	5290	11.90	12.00	1.023	89.9	1.112	0.1	0.139	0.158			
	1st	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 4	Index 4	54	5270	15.40	15.50	1.023	86.84	1.152	0.18	0.292	0.344			-0.87%
	2nd	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 4	Index 4	54	5270	15.40	15.50	1.023	86.84	1.152	0.15	0.289	0.341			
12	1st	WLAN5GHz	802.11a 6Mbps	Right Cheek	0mm	Ant 4+3(4)	Index 1	52	5260	17.90	18.00	1.023	93.42	1.070	-0.17	0.158	0.173			-5.39%
	2nd	WLAN5GHz	802.11a 6Mbps	Right Cheek	0mm	Ant 4+3(3)	Index 1	52	5260	17.90	18.00	1.023	93.42	1.070	-0.17	1.000	1.095			
	1st	WLAN5GHz	802.11a 6Mbps	Right Cheek	0mm	Ant 4+3(4)	Index 1	52	5260	17.90	18.00	1.023	93.42	1.070	0.14	0.171	0.187			
	2nd	WLAN5GHz	802.11a 6Mbps	Right Cheek	0mm	Ant 4+3(3)	Index 1	52	5260	17.90	18.00	1.023	93.42	1.070	0.14	0.946	1.036			
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(4)	Index 3	58	5290	11.90	12.00	1.023	89.9	1.112	0.1	0.017	0.019			-28.13%
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(3)	Index 3	58	5290	11.50	12.00	1.122	89.9	1.112	0.1	0.262	0.327			
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(4)	Index 3	58	5290	11.90	12.00	1.023	89.9	1.112	-0.15	0.021	0.024			-23.92%
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(3)	Index 3	58	5290	11.50	12.00	1.122	89.9	1.112	-0.15	0.188	0.235			
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4	Index 1	122	5610	15.40	15.50	1.023	89.9	1.112	-0.15	0.628	0.715			-23.92%
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4	Index 1	122	5610	15.40	15.50	1.023	89.9	1.112	0.11	0.478	0.544			
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4	Index 2	122	5610	15.80	16.00	1.047	89.9	1.112	0.15	0.497	0.579			-9.15%
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4	Index 2	122	5610	15.80	16.00	1.047	89.9	1.112	-0.18	0.452	0.526			
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4	Index 3	122	5610	9.30	9.50	1.047	89.9	1.112	-0.14	0.133	0.155			-1.29%
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4	Index 3	122	5610	9.30	9.50	1.047	89.9	1.112	-0.15	0.131	0.153			
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4	Index 4	106	5530	12.40	12.50	1.023	89.9	1.112	0.05	0.279	0.317			-17.67%
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4	Index 4	106	5530	12.40	12.50	1.023	89.9	1.112	0.04	0.229	0.261			
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(4)	Index 1	122	5610	15.40	15.50	1.023	89.9	1.112	-0.18	0.168	0.191			-22.10%
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(3)	Index 1	122	5610	15.30	15.50	1.047	89.9	1.112	-0.18	0.874	1.018			
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(4)	Index 1	122	5610	15.40	15.50	1.023	89.9	1.112	-0.02	0.124	0.141			-22.80%
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(3)	Index 1	122	5610	15.30	15.50	1.047	89.9	1.112	-0.02	0.681	0.793			
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(4)	Index 3	122	5610	9.40	9.50	1.023	89.9	1.112	-0.17	0.024	0.027			-22.80%
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(3)	Index 3	122	5610	9.20	9.50	1.072	89.9	1.112	-0.17	0.210	0.250			
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(4)	Index 3	122	5610	9.40	9.50	1.023	89.9	1.112	0.01	0.026	0.030			-15.36%
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(3)	Index 3	122	5610	9.20	9.50	1.072	89.9	1.112	0.01	0.162	0.193			
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4	Index 1	155	5775	17.40	17.50	1.023	89.9	1.112	0.06	0.572	0.651			-15.36%
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4	Index 1	155	5775	17.40	17.50	1.023	89.9	1.112	0.05	0.484	0.551			
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4	Index 2	155	5775	16.40	16.50	1.023	89.9	1.112	-0.11	0.406	0.462			-5.63%
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4	Index 2	155	5775	16.40	16.50	1.023	89.9	1.112	0.09	0.383	0.436			





16.2 Hotspot SAR

Plot No.	No.	Band	BW (MHz)	Test Position	Gap (mm)	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Deviation (%)
	1st	GSM850_Ant 0	GPRS (3 Tx slots)	Left Side	10mm	Index 4	251	848.8	30.00	30.60	1.148			0	0.651	0.747	
18	2nd	GSM850_Ant 0	GPRS (3 Tx slots)	Left Side	10mm	Index 4	251	848.8	29.90	30.60	1.175			0	0.632	0.743	-0.54%
	1st	GSM850_Ant 1	GPRS (2 Tx slots)	Back	10mm	Index 4	128	824.2	31.92	32.50	1.143			-0.1	0.377	0.431	
	2nd	GSM850_Ant 1	GPRS (2 Tx slots)	Back	10mm	Index 4	128	824.2	31.85	32.50	1.161			-0.02	0.370	0.430	-0.23%
	1st	LTE Band 7_Ant 2	20M_QPSK_1_0	Right Side	10mm	Index 4	21100	2535	18.53	19.20	1.167			0.01	0.462	0.539	
	2nd	LTE Band 7_Ant 2	20M_QPSK_1_0	Right Side	10mm	Index 4	21100	2535	18.35	19.20	1.216			0.07	0.366	0.445	-17.44%
		LTE Band 7C_Ant 2	20M+20M_QPSK_1_99	Right Side	10mm	Index 4	20850+21048	2510	15.66	17.20	1.426			0.11	0.312	0.445	
	1st	LTE Band 7_Ant 0	20M_QPSK_1_0	Left Side	10mm	Index 4	20850	2510	20.82	21.90	1.282			0	0.619	0.794	
19	2nd	LTE Band 7_Ant 0	20M_QPSK_1_0	Left Side	0mm	Index 4	20850	2510	20.78	21.90	1.294			0.01	0.607	0.786	-1.01%
		LTE Band 7C_Ant 0	20M+20M_QPSK_1_99	Left Side	0mm	Index 4	20850+21048	2510	19.05	20.40	1.365			0.11	0.522	0.712	
	1st	LTE Band 12_Ant 0	10M_QPSK_1_0	Left Side	10mm	Index 4	23095	707.5	24.20	25.70	1.413			0	0.422	0.596	
20	2nd	LTE Band 12_Ant 0	10M_QPSK_1_0	Left Side	10mm	Index 4	23095	707.5	23.95	25.70	1.496			0.03	0.372	0.557	-6.54%
	1st	LTE Band 12_Ant 1	10M_QPSK_1_0	Back	10mm	Index 4	23095	707.5	23.77	25.30	1.422			0.05	0.226	0.321	
	2nd	LTE Band 12_Ant 1	10M_QPSK_1_0	Back	10mm	Index 4	23095	707.5	24.10	25.30	1.318			-0.01	0.220	0.290	-9.66%
	1st	LTE Band 26_Ant 0	15M_QPSK_1_0	Left Side	10mm	Index 4	26865	831.5	24.36	25.70	1.361			-0.01	0.540	0.735	
21	2nd	LTE Band 26_Ant 0	15M_QPSK_1_0	Left Side	10mm	Index 4	26865	831.5	24.30	25.70	1.380			0	0.532	0.734	-0.14%
	1st	LTE Band 26_Ant 1	15M_QPSK_1_0	Back	10mm	Index 4	26865	831.5	24.33	25.20	1.222			0.03	0.267	0.326	
	2nd	LTE Band 26_Ant 1	15M_QPSK_1_0	Back	10mm	Index 4	26865	831.5	24.52	25.20	1.169			0	0.255	0.298	-8.59%
	1st	LTE Band 41_Ant 2	20M_QPSK_1_0	Right Side	10mm	Index 4	40185	2549.5	20.50	20.90	1.096	62.9	1.006	-0.02	0.499	0.550	
22	2nd	LTE Band 41_Ant 2	20M_QPSK_1_0	Right Side	10mm	Index 4	40185	2549.5	20.30	20.90	1.148	62.9	1.006	-0.01	0.474	0.547	-0.55%
	1st	LTE Band 41_Ant 0	20M_QPSK_1_0	Left Side	10mm	Index 4	40185	2549.5	21.89	23.30	1.384	62.9	1.006	0.07	0.495	0.689	
	2nd	LTE Band 41_Ant 0	20M_QPSK_1_0	Left Side	10mm	Index 4	40185	2549.5	21.90	23.30	1.380	62.9	1.006	-0.01	0.361	0.501	-27.29%
	1st	FR1 n7_Ant 2	50M_BPSK_1_1	Right Side	10mm	Index 4	507000	2535	20.00	20.00	1.000			-0.01	0.594	0.594	
	2nd	FR1 n7_Ant 2	50M_BPSK_1_1	Right Side	10mm	Index 4	507000	2535	19.92	20.00	1.019			-0.01	0.532	0.542	-8.75%
	1st	FR1 n7_Ant 0	50M_BPSK_1_1	Left Side	10mm	Index 4	507000	2535	21.11	21.30	1.045			-0.01	0.773	0.808	
23	2nd	FR1 n7_Ant 0	50M_BPSK_1_1	Left Side	10mm	Index 4	507000	2535	20.95	21.30	1.084			0.03	0.738	0.800	-0.99%
	1st	FR1 n12_Ant 0	15M_BPSK_1_1	Left Side	10mm	Index 4	141500	707.5	24.25	25.70	1.396			0.01	0.367	0.512	
24	2nd	FR1 n12_Ant 0	15M_BPSK_1_1	Left Side	10mm	Index 4	141500	707.5	24.22	25.70	1.406			-0.01	0.323	0.454	-11.33%
	1st	FR1 n12_Ant 1	15M_BPSK_36_22	Left Side	10mm	Index 4	141500	707.5	23.86	25.30	1.393			-0.01	0.236	0.329	
	2nd	FR1 n12_Ant 1	15M_BPSK_36_22	Left Side	10mm	Index 4	141500	707.5	23.77	25.30	1.422			0	0.229	0.326	-0.91%
	1st	FR1 n26_Ant 0	20M_BPSK_1_1	Left Side	10mm	Index 4	166300	831.5	24.40	25.50	1.288			-0.02	0.507	0.653	
25	2nd	FR1 n26_Ant 0	20M_BPSK_1_1	Left Side	10mm	Index 4	166300	831.5	24.31	25.50	1.315			-0.13	0.487	0.641	-1.84%
	1st	FR1 n26_Ant 1	20M_BPSK_1_1	Back	10mm	Index 4	166300	831.5	23.84	25.20	1.368			0.03	0.254	0.347	
	2nd	FR1 n26_Ant 1	20M_BPSK_1_1	Back	10mm	Index 4	166300	831.5	23.79	25.20	1.384			-0.01	0.233	0.322	-7.20%
	1st	FR1 n41_Ant 2	100M_BPSK_1_1	Right Side	10mm	Index 4	518598	2592.99	19.51	20.40	1.227			-0.05	0.587	0.721	
	2nd	FR1 n41_Ant 2	100M_BPSK_1_1	Right Side	10mm	Index 4	518598	2592.99	19.53	20.40	1.222			0.02	0.559	0.683	-5.27%
	1st	FR1 n41_Ant 0	100M_BPSK_1_1	Left Side	10mm	Index 4	518598	2592.99	19.62	21.30	1.472			-0.02	0.527	0.776	
26	2nd	FR1 n41_Ant 0	100M_BPSK_1_1	Left Side	10mm	Index 4	518598	2592.99	19.63	21.30	1.469			-0.08	0.518	0.761	-1.93%
	1st	FR1 n77_Ant 6	100M_BPSK_1_1	Left Side	10mm	Index 4	656000	3840	17.73	18.80	1.279			-0.02	0.458	0.586	
27	2nd	FR1 n77_Ant 6	100M_BPSK_1_1	Left Side	10mm	Index 4	656000	3840	17.45	18.80	1.365			0.01	0.406	0.554	-5.46%
	1st	FR1 n77_Ant 6	100M_BPSK_1_1	Left Side	10mm	Index 4	633332	3499.98	17.72	18.80	1.282			-0.01	0.440	0.564	
	2nd	FR1 n77_Ant 6	100M_BPSK_1_1	Left Side	10mm	Index 4	633332	3499.98	17.78	18.80	1.265			-0.02	0.430	0.544	-3.55%
	1st	FR1 n77_Ant 2	100M_BPSK_1_1	Right Side	10mm	Index 4	656000	3840	19.33	19.50	1.040			-0.05	0.442	0.460	
	2nd	FR1 n77_Ant 2	100M_BPSK_1_1	Right Side	10mm	Index 4	656000	3840	19.16	19.50	1.081			-0.03	0.423	0.457	-0.65%
	1st	FR1 n77_Ant 2	100M_BPSK_1_1	Right Side	10mm	Index 4	633332	3499.98	19.08	19.50	1.102			-0.02	0.530	0.584	
	2nd	FR1 n77_Ant 2	100M_BPSK_1_1	Right Side	10mm	Index 4	633332	3499.98	18.91	19.50	1.146			-0.04	0.482	0.552	-5.48%





# FCC SAR TEST REPORT

Report No. : FA380308B

Plot No.	No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Deviation (%)
	1st	WLAN2.4GHz	802.11b 1Mbps	Top Side	10mm	Ant 4	Index 7	12	2467	16.40	16.50	1.023	98.85	1.012	0.02	0.463	0.479	-0.42%
28	2nd	WLAN2.4GHz	802.11b 1Mbps	Top Side	10mm	Ant 4	Index 7	12	2467	16.40	16.50	1.023	98.85	1.012	-0.07	0.461	0.477	
	1st	WLAN2.4GHz	802.11b 1Mbps	Left Side	10mm	Ant 3	Index 7	6	2437	16.45	16.50	1.012	98.85	1.012	-0.01	0.170	0.174	-5.75%
	2nd	WLAN2.4GHz	802.11b 1Mbps	Left Side	10mm	Ant 3	Index 7	6	2437	16.45	16.50	1.012	98.85	1.012	0	0.160	0.164	
	1st	WLAN2.4GHz	802.11b 1Mbps	Left Side	10mm	Ant 3	Index 8	6	2437	16.95	17.00	1.012	98.85	1.012	0.11	0.221	0.226	-17.70%
	2nd	WLAN2.4GHz	802.11b 1Mbps	Left Side	10mm	Ant 3	Index 8	6	2437	16.95	17.00	1.012	98.85	1.012	-0.14	0.182	0.186	
	1st	WLAN2.4GHz	802.11g 6Mbps	Top Side	10mm	Ant 4+3(4)	Index 7	6	2437	16.40	16.50	1.023	93.46	1.070	-0.06	0.375	0.411	
		WLAN2.4GHz	802.11g 6Mbps	Top Side	10mm	Ant 4+3(3)	Index 7	6	2437	16.35	16.50	1.035	93.46	1.070	-0.06	0.001	0.001	
	2nd	WLAN2.4GHz	802.11g 6Mbps	Top Side	10mm	Ant 4+3(4)	Index 7	6	2437	16.40	16.50	1.023	93.46	1.070	-0.11	0.318	0.348	-15.33%
		WLAN2.4GHz	802.11g 6Mbps	Top Side	10mm	Ant 4+3(3)	Index 7	6	2437	16.35	16.50	1.035	93.46	1.070	-0.11	0.001	0.001	
	1st	WLAN5GHz	802.11a 6Mbps	Right Side	10mm	Ant 4	Index 7/9	48	5240	17.90	18.00	1.023	93.46	1.070	-0.18	0.316	0.346	
	2nd	WLAN5GHz	802.11a 6Mbps	Right Side	10mm	Ant 4	Index 7/9	48	5240	17.90	18.00	1.023	93.46	1.070	-0.17	0.229	0.251	-27.46%
	1st	WLAN5GHz	802.11a 6Mbps	Right Side	10mm	Ant 4	Index 8	48	5240	19.00	19.00	1.000	93.46	1.070	-0.18	0.329	0.352	
29	2nd	WLAN5GHz	802.11a 6Mbps	Right Side	10mm	Ant 4	Index 8	48	5240	19.00	19.00	1.000	93.46	1.070	-0.18	0.316	0.338	-3.98%
	1st	WLAN5GHz	802.11a 6Mbps	Right Side	10mm	Ant 4+3(4)	Index 7/9	48	5240	17.90	18.00	1.023	93.46	1.070	-0.11	0.273	0.299	
		WLAN5GHz	802.11a 6Mbps	Right Side	10mm	Ant 4+3(3)	Index 7/9	48	5240	17.90	18.00	1.023	93.46	1.070	0.01	0.001	0.001	
	2nd	WLAN5GHz	802.11a 6Mbps	Right Side	10mm	Ant 4+3(4)	Index 7/9	48	5240	17.90	18.00	1.023	93.46	1.070	-0.11	0.273	0.299	0.00%
		WLAN5GHz	802.11a 6Mbps	Right Side	10mm	Ant 4+3(3)	Index 7/9	48	5240	17.90	18.00	1.023	93.46	1.070	0.08	0.001	0.001	
	1st	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4	Index 7/8	157	5785	19.90	20.00	1.023	93.45	1.070	0.01	0.291	0.319	
30	2nd	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4	Index 7/8	157	5785	19.90	20.00	1.023	93.45	1.070	-0.13	0.229	0.251	-21.32%
	1st	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4	Index 9	157	5785	19.40	19.50	1.023	93.45	1.070	0.09	0.188	0.206	
	2nd	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4	Index 9	157	5785	19.40	19.50	1.023	93.45	1.070	0.15	0.166	0.182	-11.65%
	1st	WLAN5GHz	802.11a 6Mbps	Left Side	10mm	Ant 4+3(4)	Index 7	165	5825	19.90	20.00	1.023	93.42	1.070	-0.09	0.001	0.001	
		WLAN5GHz	802.11a 6Mbps	Left Side	10mm	Ant 4+3(3)	Index 7	165	5825	19.60	20.00	1.096	93.42	1.070	-0.09	0.245	0.287	-13.24%
	2nd	WLAN5GHz	802.11a 6Mbps	Left Side	10mm	Ant 4+3(4)	Index 7	165	5825	19.90	20.00	1.023	93.42	1.070	0.07	0.001	0.001	
		WLAN5GHz	802.11a 6Mbps	Left Side	10mm	Ant 4+3(3)	Index 7	165	5825	19.60	20.00	1.096	93.42	1.070	0.07	0.212	0.249	
	1st	WLAN5GHz	802.11a 6Mbps	Left Side	10mm	Ant 4+3(4)	Index 9	157	5785	19.40	19.50	1.023	93.42	1.070	-0.17	0.001	0.001	
		WLAN5GHz	802.11a 6Mbps	Left Side	10mm	Ant 4+3(3)	Index 9	157	5785	19.20	19.50	1.072	93.42	1.070	0.05	0.226	0.259	-29.34%
	2nd	WLAN5GHz	802.11a 6Mbps	Left Side	10mm	Ant 4+3(4)	Index 9	157	5785	19.40	19.50	1.023	93.42	1.070	0.13	0.001	0.001	
		WLAN5GHz	802.11a 6Mbps	Left Side	10mm	Ant 4+3(3)	Index 9	157	5785	19.20	19.50	1.072	93.42	1.070	0.13	0.160	0.183	
	1st	Bluetooth	1Mbps	Top Side	10mm	Ant 4	BT Index 3/4	78	2480	14.90	15.00	1.023	77.07	1.081	-0.14	0.239	0.264	
	2nd	Bluetooth	1Mbps	Top Side	10mm	Ant 4	BT Index 3/4	78	2480	14.90	15.00	1.023	77.07	1.081	-0.17	0.218	0.241	-8.71%
	1st	Bluetooth	1Mbps	Left Side	10mm	Ant 3	BT Index 3	78	2480	20.50	21.00	1.123	77.07	1.081	0.01	0.503	0.611	
31	2nd	Bluetooth	1Mbps	Left Side	10mm	Ant 3	BT Index 3	78	2480	20.50	21.00	1.123	77.07	1.081	-0.04	0.409	0.497	-18.66%
	1st	Bluetooth	1Mbps	Left Side	10mm	Ant 3	BT Index 4	78	2480	14.65	15.00	1.084	77.07	1.081	-0.12	0.121	0.142	
	2nd	Bluetooth	1Mbps	Left Side	10mm	Ant 3	BT Index 4	78	2480	14.65	15.00	1.084	77.07	1.081	-0.02	0.098	0.115	-19.01%



16.3 Body-Worn SAR

Plot No.	No.	Band	BW (MHz)	Test Position	Gap (mm)	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Deviation (%)
	1st	GSM850_Ant 0	GPRS (3 Tx slots)	Front	10mm	Index 5	251	848.8	30.00	31.50	1.413			0.02	0.477	0.674	
32	2nd	GSM850_Ant 0	GPRS (3 Tx slots)	Front	10mm	Index 5	251	848.8	29.90	31.50	1.445			-0.09	0.456	0.659	-2.23%
	1st	GSM850_Ant 0	GPRS (3 Tx slots)	Front	10mm	Index 6	251	848.8	30.00	30.60	1.148			0.02	0.477	0.548	
	2nd	GSM850_Ant 0	GPRS (3 Tx slots)	Front	10mm	Index 6	251	848.8	29.90	30.60	1.175			-0.09	0.456	0.536	-2.19%
	1st	GSM850_Ant 1	GPRS (2 Tx slots)	Back	10mm	Index 5/6	128	824.2	31.92	32.50	1.143			-0.1	0.377	0.431	
	2nd	GSM850_Ant 1	GPRS (2 Tx slots)	Back	10mm	Index 5/6	128	824.2	31.85	32.50	1.161			-0.02	0.370	0.430	-0.23%
	1st	LTE Band 7_Ant 2	20M_QPSK_1_0	Back	10mm	Index 5	21100	2535	22.91	23.60	1.172			-0.03	0.655	0.768	
33	2nd	LTE Band 7_Ant 2	20M_QPSK_1_0	Back	10mm	Index 5	21100	2535	22.92	23.60	1.169			0.01	0.622	0.727	-5.34%
		LTE Band 7C_Ant 2	20M+20M_QPSK_1_99	Back	10mm	Index 5	20850+21048	2510	20.00	21.60	1.445			0.14	0.405	0.585	
	1st	LTE Band 7_Ant 2	20M_QPSK_1_0	Back	10mm	Index 6	21100	2535	21.89	22.30	1.099			-0.1	0.520	0.571	
	2nd	LTE Band 7_Ant 2	20M_QPSK_1_0	Back	10mm	Index 6	21100	2535	21.81	22.30	1.119			0.03	0.494	0.553	-3.15%
		LTE Band 7C_Ant 2	20M+20M_QPSK_1_99	Back	10mm	Index 6	20850+21048	2510	18.44	20.30	1.535			0.11	0.319	0.490	
	1st	LTE Band 7_Ant 0	20M_QPSK_1_0	Front	10mm	Index 5	20850	2510	23.34	23.70	1.086			0	0.715	0.777	
	2nd	LTE Band 7_Ant 0	20M_QPSK_1_0	Front	10mm	Index 5	20850	2510	23.38	23.70	1.076			0	0.632	0.680	-12.48%
		LTE Band 7C_Ant 0	20M+20M_QPSK_1_99	Front	10mm	Index 5	20850+21048	2510	21.43	22.20	1.194			0.06	0.540	0.645	
	1st	LTE Band 7_Ant 0	20M_QPSK_1_0	Front	10mm	Index 6	20850	2510	21.24	22.00	1.191			0.08	0.441	0.525	
	2nd	LTE Band 7_Ant 0	20M_QPSK_1_0	Front	10mm	Index 6	20850	2510	21.18	22.00	1.208			-0.02	0.390	0.471	-10.29%
		LTE Band 7C_Ant 0	20M+20M_QPSK_1_99	Front	10mm	Index 6	20850+21048	2510	19.33	20.50	1.309			0.12	0.350	0.458	
	1st	LTE Band 12_Ant 0	10M_QPSK_1_0	Back	10mm	Index 5/6	23095	707.5	24.20	25.70	1.413			-0.01	0.321	0.453	
34	2nd	LTE Band 12_Ant 0	10M_QPSK_1_0	Back	10mm	Index 5/6	23095	707.5	23.95	25.70	1.496			0.02	0.297	0.444	-1.99%
	1st	LTE Band 12_Ant 1	10M_QPSK_1_0	Back	10mm	Index 5/6	23095	707.5	23.77	25.30	1.422			0.05	0.226	0.321	
	2nd	LTE Band 12_Ant 1	10M_QPSK_1_0	Back	10mm	Index 5/6	23095	707.5	24.10	25.30	1.318			-0.01	0.220	0.290	-9.66%
	1st	LTE Band 26_Ant 0	15M_QPSK_1_0	Front	10mm	Index 5/6	26865	831.5	24.36	25.70	1.361			-0.01	0.373	0.508	
35	2nd	LTE Band 26_Ant 0	15M_QPSK_1_0	Front	10mm	Index 5/6	26865	831.5	24.30	25.70	1.380			-0.01	0.341	0.471	-7.28%
	1st	LTE Band 26_Ant 1	15M_QPSK_1_0	Back	10mm	Index 5/6	26865	831.5	24.33	25.20	1.222			0.03	0.267	0.326	
	2nd	LTE Band 26_Ant 1	15M_QPSK_1_0	Back	10mm	Index 5/6	26865	831.5	24.52	25.20	1.169			0	0.255	0.298	-8.59%
	1st	LTE Band 41_Ant 2	20M_QPSK_1_0	Back	10mm	Index 5	41490	2680	23.70	25.60	1.549	62.9	1.006	-0.04	0.616	0.960	
36	2nd	LTE Band 41_Ant 2	20M_QPSK_1_0	Back	10mm	Index 5	41490	2680	23.72	25.60	1.542	62.9	1.006	-0.03	0.592	0.918	-4.37%
	1st	LTE Band 41_Ant 2	20M_QPSK_1_0	Back	10mm	Index 6	41490	2680	23.70	24.50	1.202	62.9	1.006	-0.04	0.616	0.745	
	2nd	LTE Band 41_Ant 2	20M_QPSK_1_0	Back	10mm	Index 6	41490	2680	23.72	24.50	1.197	62.9	1.006	-0.03	0.592	0.713	-4.30%
	1st	LTE Band 41_Ant 0	20M_QPSK_1_0	Front	10mm	Index 5	40185	2549.5	24.16	25.20	1.271	62.9	1.006	-0.05	0.557	0.712	-7.02%
	2nd	LTE Band 41_Ant 0	20M_QPSK_1_0	Front	10mm	Index 5	40185	2549.5	24.15	25.20	1.274	62.9	1.006	-0.05	0.517	0.662	
	1st	LTE Band 41_Ant 0	20M_QPSK_1_0	Front	10mm	Index 6	40185	2549.5	24.16	24.20	1.009	62.9	1.006	-0.05	0.557	0.566	-7.07%
	2nd	LTE Band 41_Ant 0	20M_QPSK_1_0	Front	10mm	Index 6	40185	2549.5	24.15	24.20	1.012	62.9	1.006	-0.05	0.517	0.526	
	1st	FR1 n7_Ant 2	50M_BPSK_1_1	Back	10mm	Index 5	507000	2535	23.34	23.90	1.138			-0.13	0.734	0.835	
	2nd	FR1 n7_Ant 2	50M_BPSK_1_1	Back	10mm	Index 5	507000	2535	23.41	23.90	1.119			0.04	0.687	0.769	-7.90%
	1st	FR1 n7_Ant 2	50M_BPSK_1_1	Back	10mm	Index 6	507000	2535	22.79	23.00	1.050			0.01	0.654	0.686	
	2nd	FR1 n7_Ant 2	50M_BPSK_1_1	Back	10mm	Index 6	507000	2535	22.93	23.00	1.016			-0.06	0.612	0.622	-9.33%
	1st	FR1 n7_Ant 0	50M_BPSK_1_1	Front	10mm	Index 5	507000	2535	23.60	23.60	1.000			0.14	0.794	0.794	
37	2nd	FR1 n7_Ant 0	50M_BPSK_1_1	Front	10mm	Index 5	507000	2535	23.38	23.60	1.052			-0.02	0.754	0.793	-0.13%
	1st	FR1 n7_Ant 0	50M_BPSK_1_1	Front	10mm	Index 6	507000	2535	21.02	21.70	1.169			0.14	0.446	0.522	-4.21%
	2nd	FR1 n7_Ant 0	50M_BPSK_1_1	Front	10mm	Index 6	507000	2535	20.98	21.70	1.180			-0.02	0.424	0.500	
	1st	FR1 n12_Ant 0	15M_BPSK_36_22	Back	10mm	Index 5/6	141500	707.5	22.35	25.70	1.403			0.01	0.336	0.471	
38	2nd	FR1 n12_Ant 0	15M_BPSK_36_22	Back	10mm	Index 5/6	141500	707.5	24.22	25.70	1.406			-0.01	0.309	0.434	-7.86%
	1st	FR1 n12_Ant 1	15M_BPSK_36_22	Back	10mm	Index 5/6	141500	707.5	22.35	25.30	1.393			-0.02	0.228	0.318	
	2nd	FR1 n12_Ant 1	15M_BPSK_36_22	Back	10mm	Index 5/6	141500	707.5	23.77	25.30	1.422			-0.11	0.222	0.316	-0.63%
	1st	FR1 n26_Ant 0	20M_BPSK_50_28	Front	10mm	Index 5/6	166300	831.5	24.27	25.70	1.390			-0.02	0.351	0.488	
39	2nd	FR1 n26_Ant 0	20M_BPSK_50_28	Front	10mm	Index 5/6	166300	831.5	24.20	25.70	1.413			0.11	0.344	0.486	-0.41%
	1st	FR1 n26_Ant 1	20M_BPSK_1_1	Back	10mm	Index 5/6	166300	831.5	23.84	25.20	1.368			0.03	0.254	0.347	
	2nd	FR1 n26_Ant 1	20M_BPSK_1_1	Back	10mm	Index 5/6	166300	831.5	23.79	25.20	1.384			-0.01	0.233	0.322	-7.20%
	1st	FR1 n41_Ant 2	100M_BPSK_1_1	Back	10mm	Index 5	518598	2592.99	22.50	23.50	1.259			-0.04	0.704	0.886	
	2nd	FR1 n41_Ant 2	100M_BPSK_1_1	Back	10mm	Index 5	518598	2592.99	22.55	23.50	1.245			-0.04	0.647	0.805	-9.14%







## **17. SAR Test Results**

### **General Note:**

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
  - a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
  - b. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)\*Tune-up Scaling Factor
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
  - $\leq 0.8$  W/kg or  $2.0$  W/kg, for 1-g or 10-g respectively, when the transmission band is  $\leq 100$  MHz
  - $\leq 0.6$  W/kg or  $1.5$  W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
  - $\leq 0.4$  W/kg or  $1.0$  W/kg, for 1-g or 10-g respectively, when the transmission band is  $\geq 200$  MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is  $\geq 0.8$ W/kg.
4. Per KDB 648474 D04v01r03, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is  $\leq 1.2$  W/kg, SAR testing with a headset connected to the handset is not required.

### **GSM Note:**

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS (4Tx slots) for GSM850/GSM1900 is considered as the primary mode.
2. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is  $\leq \frac{1}{4}$  dB higher than the primary mode, SAR measurement is not required for the secondary mode.

### **UMTS Note:**

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA is  $\leq \frac{1}{4}$  dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA to RMC12.2Kbps and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for HSDPA / HSUPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA) are less than  $\frac{1}{4}$  dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA.



**LTE Note:**

1. Per KDB 941225 D05v02r05, 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.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. LTE band 4 SAR test was covered by Band 66; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if:
  - a. The maximum output power, including tolerance, for the smaller band is  $\leq$  the larger band to qualify for the SAR test exclusion.
  - b. The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

**5G NR Note:**

1. Referencing the procedure in KDB 941225, the test procedures are outlined as below:
  - a. To start SAR test for the largest channel bandwidth for PI/2 BPSK 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. Also do SAR test for 50% RB allocation for PI/2 BPSK SAR testing using 1RB PI/2 BPSK allocation procedure
  - b. For PI/2 BPSK with 100% RB allocation, SAR test is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.
  - c. For higher modulation QPSK/16QAM/64QAM/256QAM, according to tune-up document the power level is not  $\frac{1}{2}$  dB higher than the same configuration in PI/2 BPSK, also reported SAR for the PI/2 BPSK configuration is less than 1.45 W/kg, QPSK/16QAM/64QAM/256QAM SAR testing are not required.
  - d. Smaller bandwidth output power for each RB allocation configuration for this device is not  $\frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg, smaller bandwidth SAR testing is not required for this device
  - e. For 5G FR1 n77, the maximum channel bandwidth does not support three non-overlapping channels in the frequency band, the middle channel of the group of overlapping channels were selected for testing.
  - f. Due to test setup limitations, SAR testing for NR TDD Power class 3 was performed using Factory Test Mode software to establish the connection and perform SAR with 100% transmission. For NR TDD power class2 was performed using Factory Test Mode software to establish the connection and perform SAR with 50% transmission.
  - g. For NR FDD was establishing connections via a base station simulator to use for output power measurement and SAR testing



17.1 Head SAR

<GSM SAR>

Table with 14 columns: Plot No., Band, Mode, Test Position, Gap (mm), Power Index, Ch., Freq. (MHz), Average Power (dBm), Tune-Up Limit (dBm), Tune-up Scaling Factor, Power Drift (dB), Measured 1g SAR (W/kg), Reported 1g SAR (W/kg). Rows include GSM1900\_Ant 2 and GSM1900\_Ant 0 configurations.

<WCDMA SAR>

Table with 14 columns: Plot No., Band, Mode, Test Position, Gap (mm), Power Index, Ch., Freq. (MHz), Average Power (dBm), Tune-Up Limit (dBm), Tune-up Scaling Factor, Power Drift (dB), Measured 1g SAR (W/kg), Reported 1g SAR (W/kg). Rows include WCDMA II, IV, and V configurations.



<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
54	LTE Band 2_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	Index 2	18900	1880	23.82	25.00	1.312	0.02	0.557	0.731
	LTE Band 2_Ant 2	20M	QPSK	50	0	Right Cheek	0mm	Index 2	18900	1880	22.78	24.00	1.324	0.06	0.426	0.564
	LTE Band 2_Ant 2	20M	QPSK	1	0	Right Tilted	0mm	Index 2	18900	1880	23.82	25.00	1.312	0.03	0.175	0.230
	LTE Band 2_Ant 2	20M	QPSK	50	0	Right Tilted	0mm	Index 2	18900	1880	22.78	24.00	1.324	0.01	0.134	0.177
	LTE Band 2_Ant 2	20M	QPSK	1	0	Left Cheek	0mm	Index 2	18900	1880	23.82	25.00	1.312	0.17	0.332	0.436
	LTE Band 2_Ant 2	20M	QPSK	50	0	Left Cheek	0mm	Index 2	18900	1880	22.78	24.00	1.324	0.05	0.245	0.324
	LTE Band 2_Ant 2	20M	QPSK	1	0	Left Tilted	0mm	Index 2	18900	1880	23.82	25.00	1.312	-0.08	0.231	0.303
	LTE Band 2_Ant 2	20M	QPSK	50	0	Left Tilted	0mm	Index 2	18900	1880	22.78	24.00	1.324	-0.02	0.173	0.229
	LTE Band 2_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	Index 3	18900	1880	23.82	24.70	1.225	0.02	0.557	0.682
	LTE Band 2_Ant 2	20M	QPSK	50	0	Right Cheek	0mm	Index 3	18900	1880	22.78	24.00	1.324	0.06	0.426	0.564
	LTE Band 2_Ant 2	20M	QPSK	1	0	Right Tilted	0mm	Index 3	18900	1880	23.82	24.70	1.225	0.03	0.175	0.214
	LTE Band 2_Ant 2	20M	QPSK	50	0	Right Tilted	0mm	Index 3	18900	1880	22.78	24.00	1.324	0.01	0.134	0.177
	LTE Band 2_Ant 2	20M	QPSK	1	0	Left Cheek	0mm	Index 3	18900	1880	23.82	24.70	1.225	0.17	0.332	0.407
	LTE Band 2_Ant 2	20M	QPSK	50	0	Left Cheek	0mm	Index 3	18900	1880	22.78	24.00	1.324	0.05	0.245	0.324
	LTE Band 2_Ant 2	20M	QPSK	1	0	Left Tilted	0mm	Index 3	18900	1880	23.82	24.70	1.225	-0.08	0.231	0.283
	LTE Band 2_Ant 2	20M	QPSK	50	0	Left Tilted	0mm	Index 3	18900	1880	22.78	24.00	1.324	-0.02	0.173	0.229
	LTE Band 2_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Index 2/3	18900	1880	23.38	24.50	1.294	-0.06	0.242	0.313
	LTE Band 2_Ant 0	20M	QPSK	50	0	Right Cheek	0mm	Index 2/3	18900	1880	22.30	23.50	1.318	-0.03	0.195	0.257
	LTE Band 2_Ant 0	20M	QPSK	1	0	Right Tilted	0mm	Index 2/3	18900	1880	23.38	24.50	1.294	-0.02	0.223	0.289
	LTE Band 2_Ant 0	20M	QPSK	50	0	Right Tilted	0mm	Index 2/3	18900	1880	22.30	23.50	1.318	-0.04	0.115	0.152
	LTE Band 2_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	Index 2/3	18900	1880	23.38	24.50	1.294	0.04	0.461	0.597
	LTE Band 2_Ant 0	20M	QPSK	50	0	Left Cheek	0mm	Index 2/3	18900	1880	22.30	23.50	1.318	0.05	0.362	0.477
	LTE Band 2_Ant 0	20M	QPSK	1	0	Left Tilted	0mm	Index 2/3	18900	1880	23.38	24.50	1.294	-0.03	0.205	0.265
	LTE Band 2_Ant 0	20M	QPSK	50	0	Left Tilted	0mm	Index 2/3	18900	1880	22.30	23.50	1.318	-0.01	0.167	0.220
55	LTE Band 66_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	Index 2	132322	1745	24.10	25.70	1.445	0.15	0.449	0.649
	LTE Band 66_Ant 2	20M	QPSK	50	0	Right Cheek	0mm	Index 2	132322	1745	23.06	24.70	1.459	0.03	0.358	0.522
	LTE Band 66_Ant 2	20M	QPSK	1	0	Right Tilted	0mm	Index 2	132322	1745	24.10	25.70	1.445	-0.02	0.192	0.278
	LTE Band 66_Ant 2	20M	QPSK	50	0	Right Tilted	0mm	Index 2	132322	1745	23.06	24.70	1.459	0.02	0.151	0.220
	LTE Band 66_Ant 2	20M	QPSK	1	0	Left Cheek	0mm	Index 2	132322	1745	24.10	25.70	1.445	-0.15	0.258	0.373
	LTE Band 66_Ant 2	20M	QPSK	50	0	Left Cheek	0mm	Index 2	132322	1745	23.06	24.70	1.459	-0.11	0.208	0.303
	LTE Band 66_Ant 2	20M	QPSK	1	0	Left Tilted	0mm	Index 2	132322	1745	24.10	25.70	1.445	0.06	0.166	0.240
	LTE Band 66_Ant 2	20M	QPSK	50	0	Left Tilted	0mm	Index 2	132322	1745	23.06	24.70	1.459	0.03	0.132	0.193
	LTE Band 66_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	Index 3	132322	1745	24.10	25.50	1.380	0.15	0.449	0.620
	LTE Band 66_Ant 2	20M	QPSK	50	0	Right Cheek	0mm	Index 3	132322	1745	23.06	24.70	1.459	0.03	0.358	0.522
	LTE Band 66_Ant 2	20M	QPSK	1	0	Right Tilted	0mm	Index 3	132322	1745	24.10	25.50	1.380	-0.02	0.192	0.265
	LTE Band 66_Ant 2	20M	QPSK	50	0	Right Tilted	0mm	Index 3	132322	1745	23.06	24.70	1.459	0.02	0.151	0.220
	LTE Band 66_Ant 2	20M	QPSK	1	0	Left Cheek	0mm	Index 3	132322	1745	24.10	25.50	1.380	-0.15	0.258	0.356
	LTE Band 66_Ant 2	20M	QPSK	50	0	Left Cheek	0mm	Index 3	132322	1745	23.06	24.70	1.459	-0.11	0.208	0.303
	LTE Band 66_Ant 2	20M	QPSK	1	0	Left Tilted	0mm	Index 3	132322	1745	24.10	25.50	1.380	0.06	0.166	0.229
	LTE Band 66_Ant 2	20M	QPSK	50	0	Left Tilted	0mm	Index 3	132322	1745	23.06	24.70	1.459	0.03	0.132	0.193
	LTE Band 66_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Index 2/3	132322	1745	23.60	25.20	1.445	0.05	0.149	0.215
	LTE Band 66_Ant 0	20M	QPSK	50	0	Right Cheek	0mm	Index 2/3	132322	1745	22.55	24.20	1.462	0.03	0.122	0.178
	LTE Band 66_Ant 0	20M	QPSK	1	0	Right Tilted	0mm	Index 2/3	132322	1745	23.60	25.20	1.445	-0.01	0.147	0.212
	LTE Band 66_Ant 0	20M	QPSK	50	0	Right Tilted	0mm	Index 2/3	132322	1745	22.55	24.20	1.462	0.03	0.116	0.170
	LTE Band 66_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	Index 2/3	132322	1745	23.60	25.20	1.445	0.11	0.328	0.474
	LTE Band 66_Ant 0	20M	QPSK	50	0	Left Cheek	0mm	Index 2/3	132322	1745	22.55	24.20	1.462	0.03	0.241	0.352
	LTE Band 66_Ant 0	20M	QPSK	1	0	Left Tilted	0mm	Index 2/3	132322	1745	23.60	25.20	1.445	0.07	0.150	0.217
	LTE Band 66_Ant 0	20M	QPSK	50	0	Left Tilted	0mm	Index 2/3	132322	1745	22.55	24.20	1.462	0.06	0.117	0.171





<5G NR SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
56	FR1 n2_Ant 2	20M	BPSK	1	1	Right Cheek	0mm	Index 2	376000	1880	24.32	25.00	1.169	0.14	0.649	0.759
	FR1 n2_Ant 2	20M	BPSK	50	28	Right Cheek	0mm	Index 2	376000	1880	24.31	25.00	1.172	-0.03	0.599	0.702
	FR1 n2_Ant 2	20M	BPSK	1	1	Right Tilted	0mm	Index 2	376000	1880	24.32	25.00	1.169	-0.06	0.217	0.254
	FR1 n2_Ant 2	20M	BPSK	50	28	Right Tilted	0mm	Index 2	376000	1880	24.31	25.00	1.172	-0.03	0.199	0.233
	FR1 n2_Ant 2	20M	BPSK	1	1	Left Cheek	0mm	Index 2	376000	1880	24.32	25.00	1.169	-0.1	0.312	0.365
	FR1 n2_Ant 2	20M	BPSK	50	28	Left Cheek	0mm	Index 2	376000	1880	24.31	25.00	1.172	0.03	0.302	0.354
	FR1 n2_Ant 2	20M	BPSK	1	1	Left Tilted	0mm	Index 2	376000	1880	24.32	25.00	1.169	-0.04	0.227	0.265
	FR1 n2_Ant 2	20M	BPSK	50	28	Left Tilted	0mm	Index 2	376000	1880	24.31	25.00	1.172	0.03	0.215	0.252
	FR1 n2_Ant 2	20M	BPSK	1	1	Right Cheek	0mm	Index 3	376000	1880	24.32	24.50	1.042	0.14	0.649	0.676
	FR1 n2_Ant 2	20M	BPSK	50	28	Right Cheek	0mm	Index 3	376000	1880	24.31	24.50	1.045	-0.03	0.599	0.626
	FR1 n2_Ant 2	20M	BPSK	1	1	Right Tilted	0mm	Index 3	376000	1880	24.32	24.50	1.042	-0.06	0.217	0.226
	FR1 n2_Ant 2	20M	BPSK	50	28	Right Tilted	0mm	Index 3	376000	1880	24.31	24.50	1.045	-0.03	0.199	0.208
	FR1 n2_Ant 2	20M	BPSK	1	1	Left Cheek	0mm	Index 3	376000	1880	24.32	24.50	1.042	-0.1	0.312	0.325
	FR1 n2_Ant 2	20M	BPSK	50	28	Left Cheek	0mm	Index 3	376000	1880	24.31	24.50	1.045	0.03	0.302	0.316
	FR1 n2_Ant 2	20M	BPSK	1	1	Left Tilted	0mm	Index 3	376000	1880	24.32	24.50	1.042	-0.04	0.227	0.237
	FR1 n2_Ant 2	20M	BPSK	50	28	Left Tilted	0mm	Index 3	376000	1880	24.31	24.50	1.045	0.03	0.215	0.225
	FR1 n2_Ant 0	20M	BPSK	1	1	Right Cheek	0mm	Index 2/3	372000	1860	23.63	24.50	1.222	0.19	0.157	0.192
	FR1 n2_Ant 0	20M	BPSK	50	28	Right Cheek	0mm	Index 2/3	372000	1860	23.64	24.50	1.219	-0.11	0.150	0.183
	FR1 n2_Ant 0	20M	BPSK	1	1	Right Tilted	0mm	Index 2/3	372000	1860	23.63	24.50	1.222	-0.01	0.157	0.192
	FR1 n2_Ant 0	20M	BPSK	50	28	Right Tilted	0mm	Index 2/3	372000	1860	23.64	24.50	1.219	-0.09	0.148	0.180
	FR1 n2_Ant 0	20M	BPSK	1	1	Left Cheek	0mm	Index 2/3	372000	1860	23.63	24.50	1.222	-0.11	0.269	0.329
	FR1 n2_Ant 0	20M	BPSK	50	28	Left Cheek	0mm	Index 2/3	372000	1860	23.64	24.50	1.219	-0.18	0.260	0.317
	FR1 n2_Ant 0	20M	BPSK	1	1	Left Tilted	0mm	Index 2/3	372000	1860	23.63	24.50	1.222	-0.09	0.136	0.166
	FR1 n2_Ant 0	20M	BPSK	50	28	Left Tilted	0mm	Index 2/3	372000	1860	23.64	24.50	1.219	0.03	0.134	0.163
57	FR1 n66_Ant 2	40M	BPSK	1	1	Right Cheek	0mm	Index 2/3	349000	1745	25.56	25.70	1.033	0.13	0.636	0.657
	FR1 n66_Ant 2	40M	BPSK	108	54	Right Cheek	0mm	Index 2/3	349000	1745	25.55	25.70	1.035	0.09	0.634	0.656
	FR1 n66_Ant 2	40M	BPSK	1	1	Right Tilted	0mm	Index 2/3	349000	1745	25.56	25.70	1.033	0	0.239	0.247
	FR1 n66_Ant 2	40M	BPSK	108	54	Right Tilted	0mm	Index 2/3	349000	1745	25.55	25.70	1.035	0.01	0.242	0.251
	FR1 n66_Ant 2	40M	BPSK	1	1	Left Cheek	0mm	Index 2/3	349000	1745	25.56	25.70	1.033	0.14	0.338	0.349
	FR1 n66_Ant 2	40M	BPSK	108	54	Left Cheek	0mm	Index 2/3	349000	1745	25.55	25.70	1.035	0.03	0.325	0.336
	FR1 n66_Ant 2	40M	BPSK	1	1	Left Tilted	0mm	Index 2/3	349000	1745	25.56	25.70	1.033	0.03	0.207	0.214
	FR1 n66_Ant 2	40M	BPSK	108	54	Left Tilted	0mm	Index 2/3	349000	1745	25.55	25.70	1.035	-0.02	0.205	0.212
	FR1 n66_Ant 0	40M	BPSK	1	1	Right Cheek	0mm	Index 2/3	349000	1745	24.35	25.20	1.216	0.07	0.204	0.248
	FR1 n66_Ant 0	40M	BPSK	108	54	Right Cheek	0mm	Index 2/3	349000	1745	24.32	25.20	1.225	0.06	0.184	0.225
	FR1 n66_Ant 0	40M	BPSK	1	1	Right Tilted	0mm	Index 2/3	349000	1745	24.35	25.20	1.216	-0.03	0.215	0.261
	FR1 n66_Ant 0	40M	BPSK	108	54	Right Tilted	0mm	Index 2/3	349000	1745	24.32	25.20	1.225	-0.04	0.208	0.255
	FR1 n66_Ant 0	40M	BPSK	1	1	Left Cheek	0mm	Index 2/3	349000	1745	24.35	25.20	1.216	0.13	0.422	0.513
	FR1 n66_Ant 0	40M	BPSK	108	54	Left Cheek	0mm	Index 2/3	349000	1745	24.32	25.20	1.225	0.08	0.398	0.487
	FR1 n66_Ant 0	40M	BPSK	1	1	Left Tilted	0mm	Index 2/3	349000	1745	24.35	25.20	1.216	0	0.220	0.268
	FR1 n66_Ant 0	40M	BPSK	108	54	Left Tilted	0mm	Index 2/3	349000	1745	24.32	25.20	1.225	0.01	0.207	0.253



**FCC SAR TEST REPORT**

**Report No. : FA380308B**

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FR1 n77_Ant 1	100M	BPSK	1	1	Right Cheek	0mm	Index 2	656000	3840	18.23	19.20	1.250	0.16	0.444	0.555
	FR1 n77_Ant 1	100M	BPSK	135	69	Right Cheek	0mm	Index 2	656000	3840	17.90	19.20	1.349	0.08	0.313	0.422
	FR1 n77_Ant 1	100M	BPSK	1	1	Right Tilted	0mm	Index 2	656000	3840	18.23	19.20	1.250	0.18	0.515	0.644
	FR1 n77_Ant 1	100M	BPSK	135	69	Right Tilted	0mm	Index 2	656000	3840	17.90	19.20	1.349	-0.07	0.349	0.471
	FR1 n77_Ant 1	100M	BPSK	1	1	Left Cheek	0mm	Index 2	656000	3840	18.23	19.20	1.250	0.09	0.211	0.264
	FR1 n77_Ant 1	100M	BPSK	135	69	Left Cheek	0mm	Index 2	656000	3840	17.90	19.20	1.349	-0.02	0.134	0.181
	FR1 n77_Ant 1	100M	BPSK	1	1	Left Tilted	0mm	Index 2	656000	3840	18.23	19.20	1.250	-0.1	0.239	0.299
	FR1 n77_Ant 1	100M	BPSK	135	69	Left Tilted	0mm	Index 2	656000	3840	17.90	19.20	1.349	0.16	0.179	0.241
	FR1 n77_Ant 1	100M	BPSK	1	1	Right Cheek	0mm	Index 3	656000	3840	18.23	18.40	1.040	0.16	0.444	0.462
	FR1 n77_Ant 1	100M	BPSK	135	69	Right Cheek	0mm	Index 3	656000	3840	17.90	18.40	1.122	0.08	0.313	0.351
	FR1 n77_Ant 1	100M	BPSK	1	1	Right Tilted	0mm	Index 3	656000	3840	18.23	18.40	1.040	0.18	0.515	0.536
	FR1 n77_Ant 1	100M	BPSK	135	69	Right Tilted	0mm	Index 3	656000	3840	17.90	18.40	1.122	-0.07	0.349	0.392
	FR1 n77_Ant 1	100M	BPSK	1	1	Left Cheek	0mm	Index 3	656000	3840	18.23	18.40	1.040	0.09	0.211	0.219
	FR1 n77_Ant 1	100M	BPSK	135	69	Left Cheek	0mm	Index 3	656000	3840	17.90	18.40	1.122	-0.02	0.134	0.150
	FR1 n77_Ant 1	100M	BPSK	1	1	Left Tilted	0mm	Index 3	656000	3840	18.23	18.40	1.040	-0.1	0.239	0.249
	FR1 n77_Ant 1	100M	BPSK	135	69	Left Tilted	0mm	Index 3	656000	3840	17.90	18.40	1.122	0.16	0.179	0.201
	FR1 n77_Ant 1	100M	BPSK	1	1	Right Cheek	0mm	Index 2	633332	3499.98	18.22	19.20	1.253	-0.12	0.652	0.817
	FR1 n77_Ant 1	100M	BPSK	135	69	Right Cheek	0mm	Index 2	633332	3499.98	18.05	19.20	1.303	0.15	0.608	0.792
	FR1 n77_Ant 1	100M	BPSK	270	0	Right Cheek	0mm	Index 2	633332	3499.98	18.05	19.20	1.303	0.11	0.585	0.762
58	FR1 n77_Ant 1	100M	BPSK	1	1	Right Tilted	0mm	Index 2	633332	3499.98	18.22	19.20	1.253	0.19	0.757	0.949
	FR1 n77_Ant 1	100M	BPSK	135	69	Right Tilted	0mm	Index 2	633332	3499.98	18.05	19.20	1.303	-0.08	0.722	0.941
	FR1 n77_Ant 1	100M	BPSK	270	0	Right Tilted	0mm	Index 2	633332	3499.98	18.05	19.20	1.303	0.05	0.720	0.938
	FR1 n77_Ant 1	100M	BPSK	1	1	Left Cheek	0mm	Index 2	633332	3499.98	18.22	19.20	1.253	-0.14	0.278	0.348
	FR1 n77_Ant 1	100M	BPSK	135	69	Left Cheek	0mm	Index 2	633332	3499.98	18.05	19.20	1.303	-0.04	0.259	0.338
	FR1 n77_Ant 1	100M	BPSK	1	1	Left Tilted	0mm	Index 2	633332	3499.98	18.22	19.20	1.253	-0.1	0.331	0.415
	FR1 n77_Ant 1	100M	BPSK	135	69	Left Tilted	0mm	Index 2	633332	3499.98	18.05	19.20	1.303	0.06	0.316	0.412
	FR1 n77_Ant 1	100M	BPSK	1	1	Right Cheek	0mm	Index 3	633332	3499.98	18.22	18.40	1.042	-0.12	0.652	0.680
	FR1 n77_Ant 1	100M	BPSK	135	69	Right Cheek	0mm	Index 3	633332	3499.98	18.05	18.40	1.084	0.15	0.608	0.659
	FR1 n77_Ant 1	100M	BPSK	270	0	Right Cheek	0mm	Index 3	633332	3499.98	18.05	18.40	1.084	0.11	0.585	0.634
	FR1 n77_Ant 1	100M	BPSK	1	1	Right Tilted	0mm	Index 3	633332	3499.98	18.22	18.40	1.042	0.19	0.757	0.789
	FR1 n77_Ant 1	100M	BPSK	135	69	Right Tilted	0mm	Index 3	633332	3499.98	18.05	18.40	1.084	-0.08	0.722	0.783
	FR1 n77_Ant 1	100M	BPSK	1	1	Left Cheek	0mm	Index 3	633332	3499.98	18.22	18.40	1.042	-0.14	0.278	0.290
	FR1 n77_Ant 1	100M	BPSK	135	69	Left Cheek	0mm	Index 3	633332	3499.98	18.05	18.40	1.084	-0.04	0.259	0.281
	FR1 n77_Ant 1	100M	BPSK	1	1	Left Tilted	0mm	Index 3	633332	3499.98	18.22	18.40	1.042	-0.1	0.331	0.345
	FR1 n77_Ant 1	100M	BPSK	135	69	Left Tilted	0mm	Index 3	633332	3499.98	18.05	18.40	1.084	0.06	0.316	0.343



**FCC SAR TEST REPORT**

**Report No. : FA380308B**

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FR1 n77_Ant 5	100M	BPSK	1	1	Right Cheek	0mm	Index 2	656000	3840	15.27	16.5	1.327	-0.12	0.239	0.317
	FR1 n77_Ant 5	100M	BPSK	135	69	Right Cheek	0mm	Index 2	656000	3840	14.95	16.5	1.429	0.05	0.192	0.274
	FR1 n77_Ant 5	100M	BPSK	1	1	Right Tilted	0mm	Index 2	656000	3840	15.27	16.5	1.327	0.09	0.086	0.114
	FR1 n77_Ant 5	100M	BPSK	135	69	Right Tilted	0mm	Index 2	656000	3840	14.95	16.5	1.429	-0.01	0.079	0.113
	FR1 n77_Ant 5	100M	BPSK	1	1	Left Cheek	0mm	Index 2	656000	3840	15.27	16.5	1.327	-0.11	0.673	0.893
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Cheek	0mm	Index 2	656000	3840	14.95	16.5	1.429	0.06	0.558	0.797
	FR1 n77_Ant 5	100M	BPSK	270	0	Left Cheek	0mm	Index 2	656000	3840	15	16.5	1.413	0.02	0.556	0.785
	FR1 n77_Ant 5	100M	BPSK	1	1	Left Tilted	0mm	Index 2	656000	3840	15.27	16.5	1.327	-0.13	0.192	0.255
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Tilted	0mm	Index 2	656000	3840	14.95	16.5	1.429	0.04	0.172	0.246
	FR1 n77_Ant 5	100M	BPSK	1	1	Right Cheek	0mm	Index 3	656000	3840	12.25	12.3	1.012	-0.14	0.120	0.121
	FR1 n77_Ant 5	100M	BPSK	135	69	Right Cheek	0mm	Index 3	656000	3840	11.9	12.3	1.096	0.01	0.096	0.105
	FR1 n77_Ant 5	100M	BPSK	1	1	Right Tilted	0mm	Index 3	656000	3840	12.25	12.3	1.012	0.05	0.043	0.043
	FR1 n77_Ant 5	100M	BPSK	135	69	Right Tilted	0mm	Index 3	656000	3840	11.9	12.3	1.096	-0.01	0.040	0.044
	FR1 n77_Ant 5	100M	BPSK	1	1	Left Cheek	0mm	Index 3	656000	3840	12.25	12.3	1.012	-0.05	0.337	0.341
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Cheek	0mm	Index 3	656000	3840	11.9	12.3	1.096	0.06	0.280	0.307
	FR1 n77_Ant 5	100M	BPSK	1	1	Left Tilted	0mm	Index 3	656000	3840	12.25	12.3	1.012	-0.15	0.096	0.097
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Tilted	0mm	Index 3	656000	3840	11.9	12.3	1.096	0.09	0.086	0.094
	FR1 n77_Ant 5	100M	BPSK	1	1	Right Cheek	0mm	Index 2	633332	3499.98	15.33	16.5	1.309	-0.09	0.269	0.352
	FR1 n77_Ant 5	100M	BPSK	135	69	Right Cheek	0mm	Index 2	633332	3499.98	14.96	16.5	1.426	0.05	0.185	0.264
	FR1 n77_Ant 5	100M	BPSK	1	1	Right Tilted	0mm	Index 2	633332	3499.98	15.33	16.5	1.309	-0.02	0.080	0.105
	FR1 n77_Ant 5	100M	BPSK	135	69	Right Tilted	0mm	Index 2	633332	3499.98	14.96	16.5	1.426	0.01	0.053	0.076
	FR1 n77_Ant 5	100M	BPSK	1	1	Left Cheek	0mm	Index 2	633332	3499.98	15.33	16.5	1.309	-0.07	0.545	0.714
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Cheek	0mm	Index 2	633332	3499.98	14.96	16.5	1.426	0.03	0.392	0.559
	FR1 n77_Ant 5	100M	BPSK	1	1	Left Tilted	0mm	Index 2	633332	3499.98	15.33	16.5	1.309	-0.15	0.153	0.200
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Tilted	0mm	Index 2	633332	3499.98	14.96	16.5	1.426	0.04	0.106	0.151
	FR1 n77_Ant 5	100M	BPSK	1	1	Right Cheek	0mm	Index 3	633332	3499.98	12.26	12.3	1.009	-0.16	0.135	0.136
	FR1 n77_Ant 5	100M	BPSK	135	69	Right Cheek	0mm	Index 3	633332	3499.98	11.87	12.3	1.104	0.06	0.093	0.103
	FR1 n77_Ant 5	100M	BPSK	1	1	Right Tilted	0mm	Index 3	633332	3499.98	12.26	12.3	1.009	0.16	0.040	0.040
	FR1 n77_Ant 5	100M	BPSK	135	69	Right Tilted	0mm	Index 3	633332	3499.98	11.87	12.3	1.104	-0.04	0.027	0.030
	FR1 n77_Ant 5	100M	BPSK	1	1	Left Cheek	0mm	Index 3	633332	3499.98	12.26	12.3	1.009	-0.02	0.273	0.276
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Cheek	0mm	Index 3	633332	3499.98	11.87	12.3	1.104	0.12	0.196	0.216
	FR1 n77_Ant 5	100M	BPSK	1	1	Left Tilted	0mm	Index 3	633332	3499.98	12.26	12.3	1.009	-0.1	0.077	0.078
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Tilted	0mm	Index 3	633332	3499.98	11.87	12.3	1.104	0.02	0.053	0.059



17.2 Hotspot SAR

<GSM SAR>

Table with 14 columns: Plot No., Band, Mode, Test Position, Gap (mm), Power Index, Ch., Freq. (MHz), Average Power (dBm), Tune-Up Limit (dBm), Tune-up Scaling Factor, Power Drift (dB), Measured 1g SAR (W/kg), Reported 1g SAR (W/kg). Rows include GSM1900\_Ant 2 and GSM1900\_Ant 0 configurations.

<WCDMA SAR>

Table with 14 columns: Plot No., Band, Mode, Test Position, Gap (mm), Power Index, Ch., Freq. (MHz), Average Power (dBm), Tune-Up Limit (dBm), Tune-up Scaling Factor, Power Drift (dB), Measured 1g SAR (W/kg), Reported 1g SAR (W/kg). Rows include WCDMA II, IV, and V configurations.



<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2_Ant 2	20M	QPSK	1	0	Front	10mm	Index 4	18900	1880	20.22	20.90	1.169	-0.01	0.458	0.536
	LTE Band 2_Ant 2	20M	QPSK	50	0	Front	10mm	Index 4	18900	1880	20.02	20.90	1.225	-0.04	0.423	0.518
	LTE Band 2_Ant 2	20M	QPSK	1	0	Back	10mm	Index 4	18900	1880	20.22	20.90	1.169	0.02	0.445	0.520
	LTE Band 2_Ant 2	20M	QPSK	50	0	Back	10mm	Index 4	18900	1880	20.02	20.90	1.225	-0.09	0.427	0.523
	LTE Band 2_Ant 2	20M	QPSK	1	0	Left Side	10mm	Index 4	18900	1880	20.22	20.90	1.169	0	0.034	0.040
	LTE Band 2_Ant 2	20M	QPSK	50	0	Left Side	10mm	Index 4	18900	1880	20.02	20.90	1.225	0.09	0.027	0.033
	LTE Band 2_Ant 2	20M	QPSK	1	0	Right Side	10mm	Index 4	18900	1880	20.22	20.90	1.169	-0.08	0.426	0.498
	LTE Band 2_Ant 2	20M	QPSK	50	0	Right Side	10mm	Index 4	18900	1880	20.02	20.90	1.225	0.05	0.403	0.494
	LTE Band 2_Ant 2	20M	QPSK	1	0	Bottom Side	10mm	Index 4	18900	1880	20.22	20.90	1.169	-0.09	0.316	0.370
	LTE Band 2_Ant 2	20M	QPSK	50	0	Bottom Side	10mm	Index 4	18900	1880	20.02	20.90	1.225	-0.01	0.287	0.351
	LTE Band 2_Ant 0	20M	QPSK	1	0	Front	10mm	Index 4	18900	1880	23.38	24.10	1.180	-0.02	0.402	0.474
	LTE Band 2_Ant 0	20M	QPSK	50	0	Front	10mm	Index 4	18900	1880	22.30	23.50	1.318	0.04	0.293	0.386
	LTE Band 2_Ant 0	20M	QPSK	1	0	Back	10mm	Index 4	18900	1880	23.38	24.10	1.180	0.01	0.451	0.532
	LTE Band 2_Ant 0	20M	QPSK	50	0	Back	10mm	Index 4	18900	1880	22.30	23.50	1.318	0.05	0.327	0.431
63	LTE Band 2_Ant 0	20M	QPSK	1	0	Left Side	10mm	Index 4	18900	1880	23.38	24.10	1.180	-0.01	0.543	0.641
	LTE Band 2_Ant 0	20M	QPSK	50	0	Left Side	10mm	Index 4	18900	1880	22.30	23.50	1.318	-0.02	0.482	0.635
	LTE Band 2_Ant 0	20M	QPSK	1	0	Right Side	10mm	Index 4	18900	1880	23.38	24.10	1.180	-0.17	0.062	0.073
	LTE Band 2_Ant 0	20M	QPSK	50	0	Right Side	10mm	Index 4	18900	1880	22.30	23.50	1.318	-0.04	0.045	0.059
	LTE Band 2_Ant 0	20M	QPSK	1	0	Bottom Side	10mm	Index 4	18900	1880	23.38	24.10	1.180	-0.03	0.094	0.111
	LTE Band 2_Ant 0	20M	QPSK	50	0	Bottom Side	10mm	Index 4	18900	1880	22.30	23.50	1.318	0.01	0.073	0.096
	LTE Band 66_Ant 2	20M	QPSK	1	0	Front	10mm	Index 4	132322	1745	22.30	23.00	1.175	0.05	0.372	0.437
	LTE Band 66_Ant 2	20M	QPSK	50	0	Front	10mm	Index 4	132322	1745	22.21	23.00	1.199	0.08	0.352	0.422
	LTE Band 66_Ant 2	20M	QPSK	1	0	Back	10mm	Index 4	132322	1745	22.30	23.00	1.175	0.07	0.423	0.497
	LTE Band 66_Ant 2	20M	QPSK	50	0	Back	10mm	Index 4	132322	1745	22.21	23.00	1.199	-0.08	0.412	0.494
	LTE Band 66_Ant 2	20M	QPSK	1	0	Left Side	10mm	Index 4	132322	1745	22.30	23.00	1.175	0.02	0.062	0.073
	LTE Band 66_Ant 2	20M	QPSK	50	0	Left Side	10mm	Index 4	132322	1745	22.21	23.00	1.199	-0.04	0.041	0.049
	LTE Band 66_Ant 2	20M	QPSK	1	0	Right Side	10mm	Index 4	132322	1745	22.30	23.00	1.175	0.02	0.388	0.456
	LTE Band 66_Ant 2	20M	QPSK	50	0	Right Side	10mm	Index 4	132322	1745	22.21	23.00	1.199	-0.06	0.367	0.440
	LTE Band 66_Ant 2	20M	QPSK	1	0	Bottom Side	10mm	Index 4	132322	1745	22.30	23.00	1.175	-0.05	0.176	0.207
	LTE Band 66_Ant 2	20M	QPSK	50	0	Bottom Side	10mm	Index 4	132322	1745	22.21	23.00	1.199	0.1	0.165	0.198
64	LTE Band 66_Ant 0	20M	QPSK	1	0	Front	10mm	Index 4	132322	1745	23.60	23.60	1.000	0.06	0.504	0.504
	LTE Band 66_Ant 0	20M	QPSK	50	0	Front	10mm	Index 4	132322	1745	22.55	23.60	1.274	-0.01	0.370	0.471
	LTE Band 66_Ant 0	20M	QPSK	1	0	Back	10mm	Index 4	132322	1745	23.60	23.60	1.000	-0.07	0.442	0.442
	LTE Band 66_Ant 0	20M	QPSK	50	0	Back	10mm	Index 4	132322	1745	22.55	23.60	1.274	0.05	0.341	0.434
	LTE Band 66_Ant 0	20M	QPSK	1	0	Left Side	10mm	Index 4	132322	1745	23.60	23.60	1.000	-0.04	0.307	0.307
	LTE Band 66_Ant 0	20M	QPSK	50	0	Left Side	10mm	Index 4	132322	1745	22.55	23.60	1.274	-0.03	0.232	0.295
	LTE Band 66_Ant 0	20M	QPSK	1	0	Right Side	10mm	Index 4	132322	1745	23.60	23.60	1.000	-0.03	0.111	0.111
	LTE Band 66_Ant 0	20M	QPSK	50	0	Right Side	10mm	Index 4	132322	1745	22.55	23.60	1.274	0.02	0.086	0.110
	LTE Band 66_Ant 0	20M	QPSK	1	0	Bottom Side	10mm	Index 4	132322	1745	23.60	23.60	1.000	0.05	0.407	0.407
	LTE Band 66_Ant 0	20M	QPSK	50	0	Bottom Side	10mm	Index 4	132322	1745	22.55	23.60	1.274	0.02	0.344	0.438



<5G NR SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FR1 n2_Ant 2	20M	BPSK	1	1	Front	10mm	Index 4	376000	1880	19.72	20.40	1.169	-0.08	0.464	0.543
	FR1 n2_Ant 2	20M	BPSK	50	28	Front	10mm	Index 4	376000	1880	19.58	20.40	1.208	0.01	0.479	0.579
	FR1 n2_Ant 2	20M	BPSK	1	1	Back	10mm	Index 4	376000	1880	19.72	20.40	1.169	-0.1	0.387	0.453
	FR1 n2_Ant 2	20M	BPSK	50	28	Back	10mm	Index 4	376000	1880	19.58	20.40	1.208	-0.05	0.396	0.478
	FR1 n2_Ant 2	20M	BPSK	1	1	Left Side	10mm	Index 4	376000	1880	19.72	20.40	1.169	0.02	0.024	0.028
	FR1 n2_Ant 2	20M	BPSK	50	28	Left Side	10mm	Index 4	376000	1880	19.58	20.40	1.208	0.1	0.027	0.033
	FR1 n2_Ant 2	20M	BPSK	1	1	Right Side	10mm	Index 4	376000	1880	19.72	20.40	1.169	-0.02	0.396	0.463
	FR1 n2_Ant 2	20M	BPSK	50	28	Right Side	10mm	Index 4	376000	1880	19.58	20.40	1.208	0.02	0.413	0.499
	FR1 n2_Ant 2	20M	BPSK	1	1	Bottom Side	10mm	Index 4	376000	1880	19.72	20.40	1.169	0.03	0.294	0.344
	FR1 n2_Ant 2	20M	BPSK	50	28	Bottom Side	10mm	Index 4	376000	1880	19.58	20.40	1.208	-0.08	0.309	0.373
	FR1 n2_Ant 0	20M	BPSK	1	1	Front	10mm	Index 4	372000	1860	23.63	24.00	1.089	0.05	0.436	0.475
	FR1 n2_Ant 0	20M	BPSK	50	28	Front	10mm	Index 4	372000	1860	23.64	24.00	1.086	-0.12	0.458	0.498
	FR1 n2_Ant 0	20M	BPSK	1	1	Back	10mm	Index 4	372000	1860	23.63	24.00	1.089	0.04	0.485	0.528
	FR1 n2_Ant 0	20M	BPSK	50	28	Back	10mm	Index 4	372000	1860	23.64	24.00	1.086	-0.02	0.522	0.567
	FR1 n2_Ant 0	20M	BPSK	1	1	Left Side	10mm	Index 4	372000	1860	23.63	24.00	1.089	0.02	0.294	0.320
	FR1 n2_Ant 0	20M	BPSK	50	28	Left Side	10mm	Index 4	372000	1860	23.64	24.00	1.086	-0.05	0.303	0.329
	FR1 n2_Ant 0	20M	BPSK	1	1	Right Side	10mm	Index 4	372000	1860	23.63	24.00	1.089	0.07	0.104	0.113
	FR1 n2_Ant 0	20M	BPSK	50	28	Right Side	10mm	Index 4	372000	1860	23.64	24.00	1.086	-0.12	0.112	0.122
	FR1 n2_Ant 0	20M	BPSK	1	1	Bottom Side	10mm	Index 4	372000	1860	23.63	24.00	1.089	0.08	0.560	0.610
65	FR1 n2_Ant 0	20M	BPSK	50	28	Bottom Side	10mm	Index 4	372000	1860	23.64	24.00	1.086	-0.1	0.626	0.680
	FR1 n66_Ant 2	40M	BPSK	1	1	Front	10mm	Index 4	349000	1745	23.40	23.70	1.072	0.06	0.529	0.567
	FR1 n66_Ant 2	40M	BPSK	108	54	Front	10mm	Index 4	349000	1745	23.36	23.70	1.081	-0.06	0.548	0.593
	FR1 n66_Ant 2	40M	BPSK	1	1	Back	10mm	Index 4	349000	1745	23.40	23.70	1.072	0.1	0.506	0.542
	FR1 n66_Ant 2	40M	BPSK	108	54	Back	10mm	Index 4	349000	1745	23.36	23.70	1.081	0.03	0.523	0.566
	FR1 n66_Ant 2	40M	BPSK	1	1	Left Side	10mm	Index 4	349000	1745	23.40	23.70	1.072	0.02	0.104	0.111
	FR1 n66_Ant 2	40M	BPSK	108	54	Left Side	10mm	Index 4	349000	1745	23.36	23.70	1.081	-0.02	0.116	0.125
	FR1 n66_Ant 2	40M	BPSK	1	1	Right Side	10mm	Index 4	349000	1745	23.40	23.70	1.072	0.04	0.548	0.587
66	FR1 n66_Ant 2	40M	BPSK	108	54	Right Side	10mm	Index 4	349000	1745	23.36	23.70	1.081	0	0.629	0.680
	FR1 n66_Ant 2	40M	BPSK	1	1	Bottom Side	10mm	Index 4	349000	1745	23.40	23.70	1.072	0.05	0.319	0.342
	FR1 n66_Ant 2	40M	BPSK	108	54	Bottom Side	10mm	Index 4	349000	1745	23.36	23.70	1.081	-0.07	0.338	0.366
	FR1 n66_Ant 0	40M	BPSK	1	1	Front	10mm	Index 4	349000	1745	22.26	22.70	1.107	-0.01	0.440	0.487
	FR1 n66_Ant 0	40M	BPSK	108	54	Front	10mm	Index 4	349000	1745	22.25	22.70	1.109	0.08	0.444	0.492
	FR1 n66_Ant 0	40M	BPSK	1	1	Back	10mm	Index 4	349000	1745	22.26	22.70	1.107	0.01	0.386	0.427
	FR1 n66_Ant 0	40M	BPSK	108	54	Back	10mm	Index 4	349000	1745	22.25	22.70	1.109	0.03	0.392	0.435
	FR1 n66_Ant 0	40M	BPSK	1	1	Left Side	10mm	Index 4	349000	1745	22.26	22.70	1.107	0.09	0.244	0.270
	FR1 n66_Ant 0	40M	BPSK	108	54	Left Side	10mm	Index 4	349000	1745	22.25	22.70	1.109	0.07	0.252	0.280
	FR1 n66_Ant 0	40M	BPSK	1	1	Right Side	10mm	Index 4	349000	1745	22.26	22.70	1.107	0.08	0.083	0.092
	FR1 n66_Ant 0	40M	BPSK	108	54	Right Side	10mm	Index 4	349000	1745	22.25	22.70	1.109	-0.05	0.088	0.098
	FR1 n66_Ant 0	40M	BPSK	1	1	Bottom Side	10mm	Index 4	349000	1745	22.26	22.70	1.107	0.03	0.375	0.415
	FR1 n66_Ant 0	40M	BPSK	108	54	Bottom Side	10mm	Index 4	349000	1745	22.25	22.70	1.109	0.04	0.408	0.453





Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FR1 n77_Ant 1	100M	BPSK	1	1	Front	10mm	Index 4	656000	3840	23.15	24.30	1.303	-0.14	0.197	0.257
	FR1 n77_Ant 1	100M	BPSK	135	69	Front	10mm	Index 4	656000	3840	23.02	24.30	1.343	-0.02	0.116	0.156
	FR1 n77_Ant 1	100M	BPSK	1	1	Back	10mm	Index 4	656000	3840	23.15	24.30	1.303	-0.13	0.255	0.332
	FR1 n77_Ant 1	100M	BPSK	135	69	Back	10mm	Index 4	656000	3840	23.02	24.30	1.343	-0.09	0.146	0.196
	FR1 n77_Ant 1	100M	BPSK	1	1	Left Side	10mm	Index 4	656000	3840	23.15	24.30	1.303	-0.14	0.224	0.292
	FR1 n77_Ant 1	100M	BPSK	135	69	Left Side	10mm	Index 4	656000	3840	23.02	24.30	1.343	-0.02	0.117	0.157
	FR1 n77_Ant 1	100M	BPSK	1	1	Right Side	10mm	Index 4	656000	3840	23.15	24.30	1.303	0	0.001	0.001
	FR1 n77_Ant 1	100M	BPSK	135	69	Right Side	10mm	Index 4	656000	3840	23.02	24.30	1.343	0	0.001	0.001
	FR1 n77_Ant 1	100M	BPSK	1	1	Top Side	10mm	Index 4	656000	3840	23.15	24.30	1.303	-0.11	0.361	0.470
	FR1 n77_Ant 1	100M	BPSK	135	69	Top Side	10mm	Index 4	656000	3840	23.02	24.30	1.343	-0.02	0.198	0.266
	FR1 n77_Ant 1	100M	BPSK	1	1	Front	10mm	Index 4	633332	3499.98	23.11	24.30	1.315	-0.12	0.287	0.377
	FR1 n77_Ant 1	100M	BPSK	135	69	Front	10mm	Index 4	633332	3499.98	23.04	24.30	1.337	-0.02	0.280	0.374
	FR1 n77_Ant 1	100M	BPSK	1	1	Back	10mm	Index 4	633332	3499.98	23.11	24.30	1.315	-0.16	0.353	0.464
	FR1 n77_Ant 1	100M	BPSK	135	69	Back	10mm	Index 4	633332	3499.98	23.04	24.30	1.337	-0.08	0.329	0.440
	FR1 n77_Ant 1	100M	BPSK	1	1	Left Side	10mm	Index 4	633332	3499.98	23.11	24.30	1.315	-0.04	0.194	0.255
	FR1 n77_Ant 1	100M	BPSK	135	69	Left Side	10mm	Index 4	633332	3499.98	23.04	24.30	1.337	0.04	0.173	0.231
	FR1 n77_Ant 1	100M	BPSK	1	1	Right Side	10mm	Index 4	633332	3499.98	23.11	24.30	1.315	0	0.001	0.001
	FR1 n77_Ant 1	100M	BPSK	135	69	Right Side	10mm	Index 4	633332	3499.98	23.04	24.30	1.337	0	0.001	0.001
67	FR1 n77_Ant 1	100M	BPSK	1	1	Top Side	10mm	Index 4	633332	3499.98	23.11	24.30	1.315	-0.13	0.467	0.614
	FR1 n77_Ant 1	100M	BPSK	135	69	Top Side	10mm	Index 4	633332	3499.98	23.04	24.30	1.337	-0.08	0.404	0.540
	FR1 n77_Ant 5	100M	BPSK	1	1	Front	10mm	Index 4	656000	3840	19.16	19.7	1.132	-0.02	0.220	0.249
	FR1 n77_Ant 5	100M	BPSK	135	69	Front	10mm	Index 4	656000	3840	18.86	19.7	1.213	0.02	0.186	0.226
	FR1 n77_Ant 5	100M	BPSK	1	1	Back	10mm	Index 4	656000	3840	19.16	19.7	1.132	0.04	0.208	0.236
	FR1 n77_Ant 5	100M	BPSK	135	69	Back	10mm	Index 4	656000	3840	18.86	19.7	1.213	0.07	0.170	0.206
	FR1 n77_Ant 5	100M	BPSK	1	1	Left Side	10mm	Index 4	656000	3840	19.16	19.7	1.132	0.03	0.001	0.001
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Side	10mm	Index 4	656000	3840	18.86	19.7	1.213	-0.02	0.001	0.001
	FR1 n77_Ant 5	100M	BPSK	1	1	Right Side	10mm	Index 4	656000	3840	19.16	19.7	1.132	-0.03	0.402	0.455
	FR1 n77_Ant 5	100M	BPSK	135	69	Right Side	10mm	Index 4	656000	3840	18.86	19.7	1.213	0.1	0.343	0.416
	FR1 n77_Ant 5	100M	BPSK	1	1	Top Side	10mm	Index 4	656000	3840	19.16	19.7	1.132	-0.1	0.067	0.076
	FR1 n77_Ant 5	100M	BPSK	135	69	Top Side	10mm	Index 4	656000	3840	18.86	19.7	1.213	0.1	0.056	0.068
	FR1 n77_Ant 5	100M	BPSK	1	1	Front	10mm	Index 4	633332	3499.98	19.16	19.7	1.132	-0.09	0.246	0.279
	FR1 n77_Ant 5	100M	BPSK	135	69	Front	10mm	Index 4	633332	3499.98	18.81	19.7	1.227	-0.09	0.194	0.238
	FR1 n77_Ant 5	100M	BPSK	1	1	Back	10mm	Index 4	633332	3499.98	19.16	19.7	1.132	0.04	0.255	0.289
	FR1 n77_Ant 5	100M	BPSK	135	69	Back	10mm	Index 4	633332	3499.98	18.81	19.7	1.227	-0.06	0.201	0.247
	FR1 n77_Ant 5	100M	BPSK	1	1	Left Side	10mm	Index 4	633332	3499.98	19.16	19.7	1.132	0.1	0.003	0.003
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Side	10mm	Index 4	633332	3499.98	18.81	19.7	1.227	-0.04	0.001	0.001
	FR1 n77_Ant 5	100M	BPSK	1	1	Right Side	10mm	Index 4	633332	3499.98	19.16	19.7	1.132	0.01	0.485	0.549
	FR1 n77_Ant 5	100M	BPSK	135	69	Right Side	10mm	Index 4	633332	3499.98	18.81	19.7	1.227	0.03	0.380	0.466
	FR1 n77_Ant 5	100M	BPSK	1	1	Top Side	10mm	Index 4	633332	3499.98	19.16	19.7	1.132	-0.05	0.036	0.041
	FR1 n77_Ant 5	100M	BPSK	135	69	Top Side	10mm	Index 4	633332	3499.98	18.81	19.7	1.227	-0.05	0.019	0.023



**17.3 Body-Worn SAR**

**<GSM SAR>**

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
68	GSM1900_Ant 2	GPRS (4 Tx slots)	Front	10mm	Index 5	810	1909.8	24.49	25.10	1.151	-0.11	0.650	0.748
	GSM1900_Ant 2	GPRS (4 Tx slots)	Back	10mm	Index 5	810	1909.8	24.49	25.10	1.151	0.14	0.568	0.654
	GSM1900_Ant 2	GPRS (4 Tx slots)	Front	10mm	Index 6	810	1909.8	24.18	24.30	1.028	-0.04	0.607	0.624
	GSM1900_Ant 2	GPRS (4 Tx slots)	Back	10mm	Index 6	810	1909.8	24.18	24.30	1.028	-0.07	0.530	0.545
	GSM1900_Ant 0	GPRS (4 Tx slots)	Front	10mm	Index 5/6	661	1880	26.22	27.50	1.343	0	0.333	0.447
	GSM1900_Ant 0	GPRS (4 Tx slots)	Back	10mm	Index 5/6	661	1880	26.22	27.50	1.343	0.05	0.370	0.497

**<WCDMA SAR>**

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
69	WCDMA II_Ant 2	RMC 12.2Kbps	Front	10mm	Index 5	9538	1907.6	19.82	21.30	1.406	-0.1	0.528	0.742
	WCDMA II_Ant 2	RMC 12.2Kbps	Back	10mm	Index 5	9538	1907.6	19.82	21.30	1.406	0.05	0.486	0.683
	WCDMA II_Ant 2	RMC 12.2Kbps	Front	10mm	Index 6	9538	1907.6	19.82	20.50	1.169	-0.1	0.528	0.617
	WCDMA II_Ant 2	RMC 12.2Kbps	Back	10mm	Index 6	9538	1907.6	19.82	20.50	1.169	0.05	0.486	0.568
	WCDMA II_Ant 0	RMC 12.2Kbps	Front	10mm	Index 5/6	9538	1907.6	23.79	24.50	1.178	0.01	0.420	0.495
	WCDMA II_Ant 0	RMC 12.2Kbps	Back	10mm	Index 5/6	9538	1907.6	23.79	24.50	1.178	0.03	0.524	0.617
70	WCDMA IV_Ant 2	RMC 12.2Kbps	Front	10mm	Index 5	1513	1752.6	22.74	24.40	1.466	-0.07	0.483	0.708
	WCDMA IV_Ant 2	RMC 12.2Kbps	Back	10mm	Index 5	1513	1752.6	22.74	24.40	1.466	-0.05	0.415	0.608
	WCDMA IV_Ant 2	RMC 12.2Kbps	Front	10mm	Index 6	1513	1752.6	22.74	23.60	1.219	-0.07	0.483	0.589
	WCDMA IV_Ant 2	RMC 12.2Kbps	Back	10mm	Index 6	1513	1752.6	22.74	23.60	1.219	-0.05	0.415	0.506
	WCDMA IV_Ant 0	RMC 12.2Kbps	Front	10mm	Index 5	1513	1752.6	24.25	25.20	1.245	-0.11	0.555	0.691
	WCDMA IV_Ant 0	RMC 12.2Kbps	Back	10mm	Index 5	1513	1752.6	24.25	25.20	1.245	0.05	0.491	0.611
	WCDMA IV_Ant 0	RMC 12.2Kbps	Front	10mm	Index 6	1513	1752.6	23.56	23.80	1.057	-0.07	0.473	0.500
	WCDMA IV_Ant 0	RMC 12.2Kbps	Back	10mm	Index 6	1513	1752.6	23.56	23.80	1.057	0.11	0.428	0.452
71	WCDMA V_Ant 0	RMC 12.2Kbps	Front	10mm	Index 5/6	4233	846.6	24.05	25.00	1.245	0.02	0.349	0.434
	WCDMA V_Ant 0	RMC 12.2Kbps	Back	10mm	Index 5/6	4233	846.6	24.05	25.00	1.245	0.04	0.282	0.351
	WCDMA V_Ant 1	RMC 12.2Kbps	Front	10mm	Index 5/6	4132	826.4	23.64	24.50	1.219	0.01	0.197	0.240
	WCDMA V_Ant 1	RMC 12.2Kbps	Back	10mm	Index 5/6	4132	826.4	23.64	24.50	1.219	-0.03	0.173	0.211





<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
72	LTE Band 2_Ant 2	20M	QPSK	1	0	Front	10mm	Index 5	18900	1880	20.22	21.70	1.406	-0.01	0.458	0.644
	LTE Band 2_Ant 2	20M	QPSK	50	0	Front	10mm	Index 5	18900	1880	20.02	21.70	1.472	-0.04	0.423	0.623
	LTE Band 2_Ant 2	20M	QPSK	1	0	Back	10mm	Index 5	18900	1880	20.22	21.70	1.406	0.02	0.445	0.626
	LTE Band 2_Ant 2	20M	QPSK	50	0	Back	10mm	Index 5	18900	1880	20.02	21.70	1.472	-0.09	0.427	0.629
	LTE Band 2_Ant 2	20M	QPSK	1	0	Front	10mm	Index 6	18900	1880	20.22	20.90	1.169	-0.01	0.458	0.536
	LTE Band 2_Ant 2	20M	QPSK	50	0	Front	10mm	Index 6	18900	1880	20.02	20.90	1.225	-0.04	0.423	0.518
	LTE Band 2_Ant 2	20M	QPSK	1	0	Back	10mm	Index 6	18900	1880	20.22	20.90	1.169	0.02	0.445	0.520
	LTE Band 2_Ant 2	20M	QPSK	50	0	Back	10mm	Index 6	18900	1880	20.02	20.90	1.225	-0.09	0.427	0.523
	LTE Band 2_Ant 0	20M	QPSK	1	0	Front	10mm	Index 5	18900	1880	23.38	24.50	1.294	-0.02	0.402	0.520
	LTE Band 2_Ant 0	20M	QPSK	50	0	Front	10mm	Index 5	18900	1880	22.30	23.50	1.318	0.04	0.293	0.386
	LTE Band 2_Ant 0	20M	QPSK	1	0	Back	10mm	Index 5	18900	1880	23.38	24.50	1.294	0.01	0.451	0.584
	LTE Band 2_Ant 0	20M	QPSK	50	0	Back	10mm	Index 5	18900	1880	22.30	23.50	1.318	0.05	0.327	0.431
	LTE Band 2_Ant 0	20M	QPSK	1	0	Front	10mm	Index 6	18900	1880	23.38	24.20	1.208	-0.02	0.402	0.486
	LTE Band 2_Ant 0	20M	QPSK	50	0	Front	10mm	Index 6	18900	1880	22.30	23.50	1.318	0.04	0.293	0.386
	LTE Band 2_Ant 0	20M	QPSK	1	0	Back	10mm	Index 6	18900	1880	23.38	24.20	1.208	0.01	0.451	0.545
	LTE Band 2_Ant 0	20M	QPSK	50	0	Back	10mm	Index 6	18900	1880	22.30	23.50	1.318	0.05	0.327	0.431
	LTE Band 66_Ant 2	20M	QPSK	1	0	Front	10mm	Index 5	132322	1745	23.40	24.10	1.175	-0.12	0.468	0.550
	LTE Band 66_Ant 2	20M	QPSK	50	0	Front	10mm	Index 5	132322	1745	23.25	24.10	1.216	-0.13	0.443	0.539
	LTE Band 66_Ant 2	20M	QPSK	1	0	Back	10mm	Index 5	132322	1745	23.40	24.10	1.175	0	0.533	0.626
	LTE Band 66_Ant 2	20M	QPSK	50	0	Back	10mm	Index 5	132322	1745	23.25	24.10	1.216	-0.05	0.512	0.623
	LTE Band 66_Ant 2	20M	QPSK	1	0	Front	10mm	Index 6	132322	1745	22.30	23.00	1.175	0.05	0.372	0.437
	LTE Band 66_Ant 2	20M	QPSK	50	0	Front	10mm	Index 6	132322	1745	22.21	23.00	1.199	0.08	0.352	0.422
	LTE Band 66_Ant 2	20M	QPSK	1	0	Back	10mm	Index 6	132322	1745	22.30	23.00	1.175	0.07	0.423	0.497
	LTE Band 66_Ant 2	20M	QPSK	50	0	Back	10mm	Index 6	132322	1745	22.21	23.00	1.199	-0.08	0.412	0.494
73	LTE Band 66_Ant 0	20M	QPSK	1	0	Front	10mm	Index 5	132322	1745	23.60	25.20	1.445	0.06	0.514	0.743
	LTE Band 66_Ant 0	20M	QPSK	50	0	Front	10mm	Index 5	132322	1745	22.55	24.20	1.462	-0.01	0.370	0.541
	LTE Band 66_Ant 0	20M	QPSK	1	0	Back	10mm	Index 5	132322	1745	23.60	25.20	1.445	-0.07	0.442	0.639
	LTE Band 66_Ant 0	20M	QPSK	50	0	Back	10mm	Index 5	132322	1745	22.55	24.20	1.462	0.05	0.341	0.499
	LTE Band 66_Ant 0	20M	QPSK	1	0	Front	10mm	Index 6	132322	1745	23.60	23.60	1.000	0.06	0.504	0.504
	LTE Band 66_Ant 0	20M	QPSK	50	0	Front	10mm	Index 6	132322	1745	22.55	23.60	1.274	-0.01	0.370	0.471
	LTE Band 66_Ant 0	20M	QPSK	1	0	Back	10mm	Index 6	132322	1745	23.60	23.60	1.000	-0.07	0.442	0.442
	LTE Band 66_Ant 0	20M	QPSK	50	0	Back	10mm	Index 6	132322	1745	22.55	23.60	1.274	0.05	0.341	0.434



<5G NR SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FR1 n2_Ant 2	20M	BPSK	1	1	Front	10mm	Index 5	376000	1880	21.20	21.20	1.000	0.04	0.655	0.655
74	FR1 n2_Ant 2	20M	BPSK	50	28	Front	10mm	Index 5	376000	1880	21.13	21.20	1.016	-0.05	0.677	0.688
	FR1 n2_Ant 2	20M	BPSK	1	1	Back	10mm	Index 5	376000	1880	21.20	21.20	1.000	0.01	0.547	0.547
	FR1 n2_Ant 2	20M	BPSK	50	28	Back	10mm	Index 5	376000	1880	21.13	21.20	1.016	-0.15	0.560	0.569
	FR1 n2_Ant 2	20M	BPSK	1	1	Front	10mm	Index 6	376000	1880	19.72	20.40	1.169	-0.08	0.464	0.543
	FR1 n2_Ant 2	20M	BPSK	50	28	Front	10mm	Index 6	376000	1880	19.58	20.40	1.208	0.01	0.479	0.579
	FR1 n2_Ant 2	20M	BPSK	1	1	Back	10mm	Index 6	376000	1880	19.72	20.40	1.169	-0.1	0.387	0.453
	FR1 n2_Ant 2	20M	BPSK	50	28	Back	10mm	Index 6	376000	1880	19.58	20.40	1.208	-0.05	0.396	0.478
	FR1 n2_Ant 0	20M	BPSK	1	1	Front	10mm	Index 5	372000	1860	23.63	24.50	1.222	0.05	0.436	0.533
	FR1 n2_Ant 0	20M	BPSK	50	28	Front	10mm	Index 5	372000	1860	23.64	24.50	1.219	-0.12	0.458	0.558
	FR1 n2_Ant 0	20M	BPSK	1	1	Back	10mm	Index 5	372000	1860	23.63	24.50	1.222	0.04	0.485	0.593
	FR1 n2_Ant 0	20M	BPSK	50	28	Back	10mm	Index 5	372000	1860	23.64	24.50	1.219	-0.02	0.522	0.636
	FR1 n2_Ant 0	20M	BPSK	1	1	Front	10mm	Index 6	372000	1860	23.63	24.00	1.089	0.05	0.436	0.475
	FR1 n2_Ant 0	20M	BPSK	50	28	Front	10mm	Index 6	372000	1860	23.64	24.00	1.086	-0.12	0.458	0.498
	FR1 n2_Ant 0	20M	BPSK	1	1	Back	10mm	Index 6	372000	1860	23.63	24.00	1.089	0.04	0.485	0.528
	FR1 n2_Ant 0	20M	BPSK	50	28	Back	10mm	Index 6	372000	1860	23.64	24.00	1.086	-0.02	0.522	0.567
	FR1 n66_Ant 2	40M	BPSK	1	1	Front	10mm	Index 5	349000	1745	23.90	24.50	1.148	0.01	0.594	0.682
	FR1 n66_Ant 2	40M	BPSK	108	54	Front	10mm	Index 5	349000	1745	23.89	24.50	1.151	-0.04	0.615	0.708
	FR1 n66_Ant 2	40M	BPSK	1	1	Back	10mm	Index 5	349000	1745	23.90	24.50	1.148	0.06	0.568	0.652
	FR1 n66_Ant 2	40M	BPSK	108	54	Back	10mm	Index 5	349000	1745	23.89	24.50	1.151	-0.02	0.587	0.676
	FR1 n66_Ant 2	40M	BPSK	1	1	Front	10mm	Index 6	349000	1745	23.40	23.70	1.072	0.06	0.529	0.567
	FR1 n66_Ant 2	40M	BPSK	108	54	Front	10mm	Index 6	349000	1745	23.36	23.70	1.081	-0.06	0.548	0.593
	FR1 n66_Ant 2	40M	BPSK	1	1	Back	10mm	Index 6	349000	1745	23.40	23.70	1.072	0.1	0.506	0.542
	FR1 n66_Ant 2	40M	BPSK	108	54	Back	10mm	Index 6	349000	1745	23.36	23.70	1.081	0.03	0.523	0.566
	FR1 n66_Ant 0	40M	BPSK	1	1	Front	10mm	Index 5	349000	1745	24.35	25.20	1.216	-0.18	0.640	0.778
75	FR1 n66_Ant 0	40M	BPSK	108	54	Front	10mm	Index 5	349000	1745	24.32	25.20	1.225	0.05	0.641	0.785
	FR1 n66_Ant 0	40M	BPSK	1	1	Back	10mm	Index 5	349000	1745	24.35	25.20	1.216	0.12	0.612	0.744
	FR1 n66_Ant 0	40M	BPSK	108	54	Back	10mm	Index 5	349000	1745	24.32	25.20	1.225	0	0.622	0.762
	FR1 n66_Ant 0	40M	BPSK	1	1	Front	10mm	Index 6	349000	1745	22.26	22.70	1.107	-0.01	0.440	0.487
	FR1 n66_Ant 0	40M	BPSK	108	54	Front	10mm	Index 6	349000	1745	22.25	22.70	1.109	0.08	0.444	0.492
	FR1 n66_Ant 0	40M	BPSK	1	1	Back	10mm	Index 6	349000	1745	22.26	22.70	1.107	0.01	0.386	0.427
	FR1 n66_Ant 0	40M	BPSK	108	54	Back	10mm	Index 6	349000	1745	22.25	22.70	1.109	0.03	0.392	0.435



Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FR1 n77_Ant 1	100M	BPSK	1	1	Front	10mm	Index 5/6	656000	3840	23.15	25.00	1.531	-0.14	0.197	0.302
	FR1 n77_Ant 1	100M	BPSK	135	69	Front	10mm	Index 5/6	656000	3840	23.02	25.00	1.578	-0.02	0.116	0.183
	FR1 n77_Ant 1	100M	BPSK	1	1	Back	10mm	Index 5/6	656000	3840	23.15	25.00	1.531	-0.13	0.255	0.390
	FR1 n77_Ant 1	100M	BPSK	135	69	Back	10mm	Index 5/6	656000	3840	23.02	25.00	1.578	-0.09	0.146	0.230
	FR1 n77_Ant 1	100M	BPSK	1	1	Front	10mm	Index 5/6	633332	3499.98	23.11	25.00	1.545	-0.12	0.287	0.443
	FR1 n77_Ant 1	100M	BPSK	135	69	Front	10mm	Index 5/6	633332	3499.98	23.04	25.00	1.570	-0.02	0.280	0.440
	FR1 n77_Ant 1	100M	BPSK	1	1	Back	10mm	Index 5/6	633332	3499.98	23.11	25.00	1.545	-0.16	0.353	0.545
	FR1 n77_Ant 1	100M	BPSK	135	69	Back	10mm	Index 5/6	633332	3499.98	23.04	25.00	1.570	-0.08	0.329	0.517
	FR1 n77_Ant 5	100M	BPSK	1	1	Front	10mm	Index 5	656000	3840	22.18	24	1.521	-0.02	0.453	0.689
	FR1 n77_Ant 5	100M	BPSK	135	69	Front	10mm	Index 5	656000	3840	22.05	24	1.567	-0.08	0.386	0.605
	FR1 n77_Ant 5	100M	BPSK	1	1	Back	10mm	Index 5	656000	3840	22.18	24	1.521	-0.15	0.415	0.631
	FR1 n77_Ant 5	100M	BPSK	135	69	Back	10mm	Index 5	656000	3840	22.05	24	1.567	0.11	0.344	0.539
	FR1 n77_Ant 5	100M	BPSK	1	1	Front	10mm	Index 6	656000	3840	21.15	21.6	1.109	0.09	0.360	0.399
	FR1 n77_Ant 5	100M	BPSK	135	69	Front	10mm	Index 6	656000	3840	21.06	21.6	1.132	0.04	0.307	0.348
	FR1 n77_Ant 5	100M	BPSK	1	1	Back	10mm	Index 6	656000	3840	21.15	21.6	1.109	0.05	0.330	0.366
	FR1 n77_Ant 5	100M	BPSK	135	69	Back	10mm	Index 6	656000	3840	21.06	21.6	1.132	0.1	0.273	0.309
	FR1 n77_Ant 5	100M	BPSK	1	1	Front	10mm	Index 5	633332	3499.98	22.16	24	1.528	0.08	0.486	0.742
	FR1 n77_Ant 5	100M	BPSK	135	69	Front	10mm	Index 5	633332	3499.98	22.03	24	1.574	0.02	0.378	0.595
76	FR1 n77_Ant 5	100M	BPSK	1	1	Back	10mm	Index 5	633332	3499.98	22.16	24	1.528	-0.14	0.498	0.761
	FR1 n77_Ant 5	100M	BPSK	135	69	Back	10mm	Index 5	633332	3499.98	22.03	24	1.574	-0.08	0.395	0.622
	FR1 n77_Ant 5	100M	BPSK	1	1	Front	10mm	Index 6	633332	3499.98	21.11	21.6	1.119	-0.04	0.386	0.432
	FR1 n77_Ant 5	100M	BPSK	135	69	Front	10mm	Index 6	633332	3499.98	20.98	21.6	1.153	0.09	0.300	0.346
	FR1 n77_Ant 5	100M	BPSK	1	1	Back	10mm	Index 6	633332	3499.98	21.11	21.6	1.119	0.08	0.396	0.443
	FR1 n77_Ant 5	100M	BPSK	135	69	Back	10mm	Index 6	633332	3499.98	20.98	21.6	1.153	0.1	0.314	0.362



17.4 6GHz PD Test Result

Band	Mode	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Grid Step (λ)	iPDn	iPD ratio (≥ -1)	Normal psPD (W/m <sup>2</sup> )	Total psPD (W/m <sup>2</sup> )
WLAN6GHz	802.11ax-HE80 MCS0	Front	2mm	Ant 4+3(3)	7	5985	13.30	0.0625	1.66	-0.8738795	1.70	1.92
WLAN6GHz	802.11ax-HE80 MCS0	Front	10mm	Ant 4+3(4)	7	5985	14.00	0.25	2.03		0.727	0.775
WLAN6GHz	802.11ax-HE80 MCS0	Front	2mm	Ant 4+3(3)	215	7025	14.10	0.0625	1.15	-0.88521272	0.91	1.22
WLAN6GHz	802.11ax-HE80 MCS0	Front	8.59mm	Ant 4+3(3)	215	7025	14.10	0.25	1.41		0.521	0.554

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Index	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Grid Step (λ)	Scaling Factor for Measurement Uncertainty	Power Drift (dB)	Normal psPD (W/m <sup>2</sup> )	Scaled Normal psPD (W/m <sup>2</sup> )	Total psPD (W/m <sup>2</sup> )	Scaled Total psPD (W/m <sup>2</sup> )
	WLAN6GHz	802.11ax-HE80 MCS0	Front	2mm	Ant 4	1	71	6305	14.00	14.00	1.000	87.06	1.149	0.0625	1.5535	-0.05	1.14	2.03	1.47	2.62
	WLAN6GHz	802.11ax-HE80 MCS0	Front	2mm	Ant 4	1	7	5985	13.90	14.00	1.023	87.06	1.149	0.0625	1.5535	-0.17	1.94	3.54	2.53	4.62
	WLAN6GHz	802.11ax-HE80 MCS0	Front	2mm	Ant 4	1	119	6545	14.30	14.50	1.047	87.06	1.149	0.0625	1.5535	0.09	1.69	3.16	2.27	4.24
	WLAN6GHz	802.11ax-HE80 MCS0	Front	2mm	Ant 4	1	167	6785	13.90	14.00	1.023	87.06	1.149	0.0625	1.5535	-0.12	1.09	1.99	1.77	3.23
	WLAN6GHz	802.11ax-HE80 MCS0	Front	2mm	Ant 4	1	215	7025	14.30	15.00	1.175	87.06	1.149	0.0625	1.5535	0.14	1.23	2.58	1.59	3.33
	WLAN6GHz	802.11a 6Mbps	Front	10mm	Ant 4	5	57	6235	19.90	20.00	1.023	93.46	1.070	0.0625	1.5535	-0.07	1.37	2.33	1.62	2.76
	WLAN6GHz	802.11a 6Mbps	Back	10mm	Ant 4	5	57	6235	19.90	20.00	1.023	93.46	1.070	0.0625	1.5535	-0.10	1.79	3.04	1.95	3.32
	WLAN6GHz	802.11a 6Mbps	Back	10mm	Ant 4	5	1	5955	18.90	19.00	1.023	93.46	1.070	0.0625	1.5535	0.09	1.52	2.59	1.71	2.91
	WLAN6GHz	802.11ax-HE80 MCS0	Back	10mm	Ant 4	5	119	6545	14.30	14.50	1.047	87.06	1.149	0.0625	1.5535	-0.16	0.452	0.845	0.514	0.961
	WLAN6GHz	802.11a 6Mbps	Back	10mm	Ant 4	5	173	6815	19.90	20.00	1.023	93.46	1.070	0.0625	1.5535	-0.18	1.55	2.64	1.79	3.04
	WLAN6GHz	802.11ax-HE80 MCS0	Back	10mm	Ant 4	5	215	7025	14.30	15.00	1.175	87.06	1.149	0.0625	1.5535	0.15	0.417	0.875	0.51	1.07
	WLAN6GHz	802.11ax-HE80 MCS0	Front	2mm	Ant 4+3(3)	1	7	5985	13.30	14.00	1.175	87.06	1.149	0.0625	1.5535	-0.14	1.70	3.57	1.92	4.03
	WLAN6GHz	802.11ax-HE80 MCS0	Front	2mm	Ant 4+3(3)	1	71	6305	13.00	14.00	1.259	87.06	1.149	0.0625	1.5535	0.07	2.15	4.83	2.77	6.22
77	WLAN6GHz	802.11ax-HE80 MCS0	Front	2mm	Ant 4+3(3)	1	119	6545	13.80	14.50	1.175	87.06	1.149	0.0625	1.5535	0.12	3.15	6.61	3.47	7.28
	WLAN6GHz	802.11ax-HE80 MCS0	Front	2mm	Ant 4+3(3)	1	167	6785	12.70	14.00	1.349	87.06	1.149	0.0625	1.5535	0.12	1.98	4.77	2.32	5.59
	WLAN6GHz	802.11ax-HE80 MCS0	Front	2mm	Ant 4+3(3)	1	215	7025	14.10	15.00	1.230	87.06	1.149	0.0625	1.5535	-0.17	0.91	2.00	1.22	2.68
	WLAN6GHz	802.11a 6Mbps	Front	10mm	Ant 4+3(3)	5	57	6235	18.80	20.00	1.318	93.46	1.070	0.0625	1.5535	-0.15	1.59	3.48	1.73	3.79
	WLAN6GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	5	57	6235	18.80	20.00	1.318	93.46	1.070	0.0625	1.5535	-0.10	1.79	3.92	2.45	5.37
	WLAN6GHz	802.11a 6Mbps	Left Side	10mm	Ant 4+3(3)	5	57	6235	18.80	20.00	1.318	93.46	1.070	0.0625	1.5535	-0.06	2.46	5.39	2.68	5.87
	WLAN6GHz	802.11a 6Mbps	Left Side	10mm	Ant 4+3(3)	5	1	5955	18.20	19.00	1.202	93.46	1.070	0.0625	1.5535	-0.02	2.26	4.52	2.62	5.24
	WLAN6GHz	802.11ax-HE80 MCS0	Left Side	10mm	Ant 4+3(3)	5	119	6545	13.80	14.50	1.175	87.06	1.149	0.0625	1.5535	0.04	0.813	1.70	0.850	1.78
	WLAN6GHz	802.11a 6Mbps	Left Side	10mm	Ant 4+3(3)	5	173	6815	18.50	20.00	1.413	93.46	1.070	0.0625	1.5535	-0.05	0.778	1.83	1.08	2.54
	WLAN6GHz	802.11ax-HE80 MCS0	Left Side	10mm	Ant 4+3(3)	5	215	7025	14.10	15.00	1.230	87.06	1.149	0.0625	1.5535	-0.09	0.238	0.52	0.377	0.83
	WLAN6GHz	802.11a 6Mbps	Right Side	10mm	Ant 4+3(4)	5	57	6235	19.80	20.00	1.047	93.46	1.070	0.0625	1.5535	0.17	1.55	2.70	1.65	2.87
	WLAN6GHz	802.11a 6Mbps	Top Side	10mm	Ant 4+3(4)	5	57	6235	19.80	20.00	1.047	93.46	1.070	0.0625	1.5535	-0.03	1.18	2.05	1.20	2.09

Test Engineer : Jocelyn Huang, Putzie Chen, Ben Huang, Jay Chien, Jimmy Lu, Carter Jhuang, Mood Huang, Rain Chiu, Jacky Chen and Hank Chiang

## **18. Uncertainty Assessment**

Declaration of Conformity:

The test results with all measurement uncertainty excluded is presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

The component of uncertainty may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainty by the statistical analysis of a series of observations is termed a Type A evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture’s specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in table below.

<b>Uncertainty Distributions</b>	<b>Normal</b>	<b>Rectangular</b>	<b>Triangular</b>	<b>U-Shape</b>
Multi-plying Factor <sup>(a)</sup>	1/k <sup>(b)</sup>	1/√3	1/√6	1/√2

- (a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity
- (b)  $\kappa$  is the coverage factor

### **Standard Uncertainty for Assumed Distribution**

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual “root-sum-squares” (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

The judgment of conformity in the report is based on the measurement results excluding the measurement uncertainty.



**Applicable for SAR Measurements:**

Uncertainty Budget (4 MHz - 10 GHz range)							
Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
<b>Measurement System</b>							
Probe Calibration	18.60	N	2	1	1	9.3	9.3
Axial Isotropy	4.70	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.60	R	1.732	0.7	0.7	3.9	3.9
Linearity	4.70	R	1.732	1	1	2.7	2.7
Modulation Response	4.68	R	1.732	1	1	2.7	2.7
System Detection Limits	1.00	R	1.732	1	1	0.6	0.6
Boundary Effects	2.00	R	1.732	1	1	1.2	1.2
Readout Electronics	0.30	N	1	1	1	0.3	0.3
Response Time	0.00	R	1.732	1	1	0.0	0.0
Integration Time	2.60	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.00	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.00	R	1.732	1	1	1.7	1.7
Probe Positioner	0.40	R	1.732	1	1	0.2	0.2
Probe Positioning	6.70	R	1.732	1	1	3.9	3.9
Post-processing	4.00	R	1.732	1	1	2.3	2.3
<b>Test Sample Related</b>							
Device Holder	3.60	N	1	1	1	3.6	3.6
Test sample Positioning	3.03	N	1	1	1	3.0	3.0
Power Scaling	0.00	R	1.732	1	1	0.0	0.0
Power Drift	5.00	R	1.732	1	1	2.9	2.9
<b>Phantom and Setup</b>							
Phantom Uncertainty	7.60	R	1.732	1	1	4.4	4.4
SAR correction	0.00	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.03	N	1	0.78	0.77	0.0	0.0
Liquid Conductivity (target)	5.00	R	1.732	0.78	0.77	2.3	2.2
Liquid Conductivity (mea.)	2.50	R	1.732	0.78	0.77	1.1	1.1
Temp. unc. - Conductivity	3.68	R	1.732	0.78	0.77	1.7	1.6
Liquid Permittivity Repeatability	0.02	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.00	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.50	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.84	R	1.732	0.23	0.26	0.1	0.1
<b>Combined Std. Uncertainty</b>						14.5%	14.2%
<b>Coverage Factor for 95 %</b>						K=2	K=2
<b>Expanded STD Uncertainty</b>						29.0%	28.4%



**Applicable for Power Density Measurements:**

Error Description	Uncertainty Value (±dB)	Probability	Divisor	(Ci)	Standard Uncertainty (±dB)
Probe Calibration	0.49	N	1	1	0.49
Probe correction	0.00	R	1.732	1	0.00
Frequency response (BW ≤ 1 GHz)	0.20	R	1.732	1	0.12
Sensor cross coupling	0.00	R	1.732	1	0.00
Isotropy	0.50	R	1.732	1	0.29
Linearity	0.20	R	1.732	1	0.12
Probe scattering	0.00	R	1.732	1	0.00
Probe positioning offset	0.30	R	1.732	1	0.17
Probe positioning repeatability	0.04	R	1.732	1	0.02
Sensor mechanical offset	0.00	R	1.732	1	0.00
Probe spatial resolution	0.00	R	1.732	1	0.00
Field impedance dependence	0.00	R	1.732	1	0.00
Amplitude and phase drift	0.00	R	1.732	1	0.00
Amplitude and phase noise	0.04	R	1.732	1	0.02
Measurement area truncation	0.00	R	1.732	1	0.00
Data acquisition	0.03	N	1	1	0.03
Sampling	0.00	R	1.732	1	0.00
Field reconstruction	2.00	R	1.732	1	1.15
Forward transformation	0.00	R	1.732	1	0.00
Power density scaling	0.00	R	1.732	1	0.00
Spatial averaging	0.10	R	1.732	1	0.06
System detection limit	0.04	R	1.732	1	0.02
<b>Uncertainty terms dependent on the DUT and environmental factors</b>					
Probe coupling with DUT	0.00	R	1.732	1	0.0
Modulation response	0.40	R	1.732	1	0.2
Integration time	0.00	R	1.732	1	0.0
Response time	0.00	R	1.732	1	0.0
Device holder influence	0.10	R	1.732	1	0.1
DUT alignment	0.00	R	1.732	1	0.0
RF ambient conditions	0.04	R	1.732	1	0.0
Ambient reflections	0.04	R	1.732	1	0.0
Immunity / secondary reception	0.00	R	1.732	1	0.0
Drift of the DUT		R	1.732	1	
<b>Combined Std. Uncertainty</b>					<b>1.34</b>
<b>Expanded STD Uncertainty (95%)</b>					<b>2.68</b>



## **19. References**

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