

# FCC SAR TEST REPORT

FCC ID : A4RGHL1X  
Equipment : Phone  
Applicant : Google LLC  
1600 Amphitheatre Parkway,  
Mountain View, California, 94043 USA  
Standard : FCC 47 CFR Part 2 (2.1093)

The product was received on Sep. 20, 2022 and testing was started from Sep. 21, 2022 and completed on Oct. 28, 2022. 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. Wensan Laboratory, the test report shall not be reproduced except in full.



Approved by: Cona Huang / Deputy Manager



**Sporton International Inc. Wensan Laboratory**

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### History of this test report

Report No.	Version	Description	Issued Date
FA241216-02D	01	Initial issue of report	Dec. 01, 2022



# 1. Statement of Compliance

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

Equipment Class	Frequency Band	Highest SAR Summary				Highest Simultaneous Transmission 1g SAR (W/kg)	Highest Simultaneous Transmission 10g 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	1.19	0.67	0.93		1.59	2.24
	GSM1900	0.55	0.93	0.93			
	WCDMA II	0.76	0.75	0.75			
	WCDMA IV	0.62	0.65	0.72			
	WCDMA V	1.17	0.39	0.53			
	LTE Band 5	1.19	0.64	0.93			
	LTE Band 7	0.99	0.66	0.99			
	LTE Band 12/17	1.12	0.54	0.72			
	LTE Band 25/2	0.74	0.95	0.95			
	LTE Band 41/38	0.71	0.56	0.99			
	LTE Band 66/4	0.64	0.76	0.93			
	FR1 n5	1.18	0.53	0.73			
	FR1 n7	1.19	0.67	0.98			
	FR1 n12	1.19	0.44	0.60			
	FR1 n25/2	0.67	0.88	0.88			
	FR1 n41/38	1.18	0.78	0.99			
	FR1 n66	0.66	0.74	0.78			
FR1 n77	1.12	0.56	0.98				
DTS	2.4GHz WLAN	1.20	0.56	0.60		1.58	
NII	5GHz WLAN	1.18	0.55	0.43	2.24	1.59	2.24
6XD	6GHz WLAN	0.19	0.11		0.18		
DSS	Bluetooth	0.47	0.56	0.29		1.59	
Equipment Class	Frequency Band	Head Reported APD (mW/cm <sup>2</sup> )	Body-worn Reported APD (mW/cm <sup>2</sup> )	Product Specific Reported APD (mW/cm <sup>2</sup> )	Reported PD (mW/cm <sup>2</sup> )		
6XD	6GHz WLAN	0.10	0.09	0.42	0.61		
Date of Testing:		2022/9/21 ~ 2022/10/28					

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: Carlie Tsai**



## **2. Data Reuse Approach**

FCC ID: A4RGWKK3 (reference model) and FCC ID: A4RGHL1X (variant model)

- **PCB:** The PCB layout is identical with parent model.
- **Component Positions:** The WiFi/BT HW design are the same. But different LB module and different MHB ENDC module.
- **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: A4RGHL1X

## **3. Model Difference Information**

A4RGWKK3 and A4RGHL1X use the identical internal printed circuit board layout, and the major differences which may relate to RF are listed below:

- Different LB module and 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	DSS	Bluetooth	2400~2483.5	A4RGWKK3	Original Grant	FA280208-01C	A4RGHL1X	Spot check
	DTS	BLE WiFi	2400~2483.5	A4RGWKK3	Original Grant	FA280208-01C	A4RGHL1X	Spot check
	NII	Wi-Fi	5150 ~ 5250 5250 ~ 5350 5470 ~ 5725 5725 ~ 5850 5850 ~ 5895	A4RGWKK3	Original Grant	FA280208-01C	A4RGHL1X	Spot check
	6XD	Wi-Fi	5925 ~ 6425 6425 ~ 6525 6525 ~ 6875 6875 ~ 7125	A4RGWKK3	Original Grant	FA280208-01C	A4RGHL1X	Spot check
	PCB CBE	GSM	850/1900				A4RGHL1X	Full Test
		WCDMA	B2/4/5				A4RGHL1X	Full Test
		LTE	B2/4/5/7/12/17/ 25/38/41/66				A4RGHL1X	Full Test
		5G FR1	n2/5/7/12/25/ 38/41/66/77				A4RGHL1X	Full Test

**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
- FCC KDB 941225 D07 UMPC Mini Tablet v01r02
- 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
FCC ID	A4RGHL1X
S / N	28261FQHN00086 28261FQHN00076 28261FQHN00084 28261FQHN00070
Wireless Technology and Frequency Range	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 25: 1850 MHz ~ 1915 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 n25 : 1850 MHz ~ 1915 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: 3450 MHz ~ 3550 MHz, 3700 MHz ~ 3980 MHz WLAN 2.4GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2G Band: 5150 MHz ~ 5250 MHz WLAN 5.3G Band: 5250 MHz ~ 5350 MHz WLAN 5.5G Band: 5470 MHz ~ 5725 MHz WLAN 5.8G Band: 5725 MHz ~ 5850 MHz WLAN 5.9G UNII4 Band: 5850 MHz ~ 5895 MHz WLAN 6E: 5925 MHz ~ 6425 MHz, 6425 MHz ~ 6525 MHz, 6525 MHz ~ 6875 MHz, 6875 MHz ~ 7125 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz
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 NFC: 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.
<b>Remark:</b> <ol style="list-style-type: none"> <li>Dynamic antenna tuning mechanism is available at Ant. 0 for its &lt; 3GHz LTE band, details are illustrated in the operational description</li> <li>This device WLAN 2.4GHz / 5.2GHz / 5.8GHz supports Hotspot operation and Bluetooth support tethering applications.</li> <li>This device has NFC operations, the NFC antenna is integrated into the device for this model, therefore, all SAR test were performed with the device which already incorporates the NFC antenna. A diagram showing the location of the antenna can be found in the operational description.</li> <li>According to FCC KDB publication 447498 D01v06, transmitters are consider to be operating simultaneously when there is overlapping transmission, with the exception of transmission during network hand-offs with maximum hand-off duration less than 30 seconds.</li> </ol>	



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 device implements the power management and sensor detection for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity) by output power index and the TAS feature will manage to ensure the power level not exceeding the associated power table. Details about the power management decision and sensor detection are provided in the operational description.
4. 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.
5. The index 1 is for the mobile exposure condition, the compliance is demonstrated in Sporton's test report FA241216-02A.
6. 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.
7. Since the device the device support TAS feature and the 5G NR transmitter will operate in the time-averaged transmission power and 5G NR TDD PC3 / PC2 support the same Plimit, therefore, the 5G NR TDD SAR was performed with highest power and 100% duty cycle to be tested.
8. Antenna 1 and 5 for n77 is used as SRS dedicated antennas, i.e., the antenna(s) are used for receive and Sound Reference Signal transmission (SRS) only (not traffic transmission), RF Exposure was performed using Factory Test Mode software to establish the connection and perform SAR with 100% transmission.

Table with 2 columns: Transmit switching diversity configuration, Support transmit antenna and band. Rows include TX 0 and TX 1 configurations with antenna details.



Maximum Transmit Burst Average Power (dBm)								
Band	Antenna	Duty cycle	Mobile Condition	Head	Head	Hotspot	Body-worn/Extremity	Body-worn/Extremity
				Standalone	Simultaneous	Simultaneous	Standalone	Simultaneous
			Index 1	Index 2	Index 3	Index 4	Index 5	Index 6
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	32.50	32.50	32.50
GSM850 GPRS 3TX	0	37.50%	31.50	31.50	31.50	31.20	31.50	30.70
GSM850 GPRS 4TX	0	50.00%	30.50	30.50	30.50	30.00	30.30	29.50
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
GSM1900 GSM/GPRS 1TX	2	12.50%	30.50	30.50	30.50	30.50	30.50	30.50
GSM1900 GPRS 2TX	2	25.00%	29.50	29.50	29.50	29.00	29.00	28.20
GSM1900 GPRS 3TX	2	37.50%	29.00	29.00	29.00	27.20	27.20	26.40
GSM1900 GPRS 4TX	2	50.00%	28.00	28.00	28.00	26.00	26.00	25.20
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
WCDMA B2	2	100.00%	25.70	25.70	25.70	21.50	21.50	21.50
WCDMA B4	2	100.00%	25.70	25.70	25.70	23.70	23.70	23.70
WCDMA B5	0	100.00%	25.00	25.00	25.00	25.00	25.00	25.00
LTE B5	0	100.00%	25.70	25.70	25.70	25.70	25.70	25.60
LTE B7	2	100.00%	25.70	25.70	25.70	21.40	22.20	22.20
LTE B12/B17	0	100.00%	25.70	25.70	25.70	25.70	25.70	25.70
LTE B25/B2	2	100.00%	25.70	25.70	25.70	22.50	22.50	22.50
LTE B41/B38 PC3	2	63.30%	25.70	25.70	25.70	24.00	24.30	24.30
LTE B41/B38 PC2	2	43.30%	27.50	27.50	27.50	25.60	25.90	25.90
LTE B66/B4	2	100.00%	25.70	25.70	25.70	23.80	23.80	23.80
FR1 n5	0	100.00%	25.70	25.70	25.70	25.70	25.70	25.70
FR1 n7	2	100.00%	25.70	25.70	24.90	22.00	22.20	22.20
FR1 n12	0	100.00%	25.70	25.70	25.70	25.70	25.70	25.70
FR1 n25/n2	2	100.00%	25.70	25.70	25.70	22.70	22.70	22.70
FR1 n41/38 PC3	2	100.00%	25.50	25.50	24.70	22.60	22.70	22.70
FR1 n41 PC2	2	50.00%	27.50	27.50	27.50	25.60	25.70	25.70
FR1 n66	2	100.00%	25.70	25.70	25.70	24.10	24.10	24.10
FR1 n77 PC3	6	100.00%	25.70	25.70	25.00	20.60	20.60	20.60
FR1 n77 PC2	6	50.00%	27.20	27.20	27.20	23.60	23.60	23.60
FR1 n77 SRS	1	100.00%	25.80	21.20	20.40	22.80	22.80	22.80



Maximum Transmit Burst Average Power (dBm)								
Band	Antenna	Duty cycle	Mobile Condition	Head	Head	Hotspot	Body-worn/Extremity	Body-worn/Extremity
				Standalone	Simultaneous	Simultaneous	Standalone	Simultaneous
				Index 1	Index 2	Index 3	Index 4	Index 5
GSM850 GSM/GPRS 1TX	1	12.50%	33.00	33.00	32.80	33.00	33.00	33.00
GSM850 GPRS 2TX	1	25.00%	32.50	30.60	29.80	32.50	32.50	32.50
GSM850 GPRS 3TX	1	37.50%	30.50	28.80	28.00	30.50	30.50	30.50
GSM850 GPRS 4TX	1	50.00%	29.00	27.60	26.80	29.00	29.00	29.00
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	27.00	27.00	27.00	27.00
GSM850 EDGE 3TX	1	37.50%	27.00	27.00	27.00	27.00	27.00	27.00
GSM850 EDGE 4TX	1	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	29.10
GSM1900 GPRS 3TX	0	37.50%	28.50	28.50	28.50	28.10	28.10	27.30
GSM1900 GPRS 4TX	0	50.00%	27.70	27.70	27.70	26.90	26.90	26.10
GSM1900 EDGE 1TX	0	12.50%	26.00	26.00	26.00	26.00	26.00	26.00
GSM1900 EDGE 2TX	0	25.00%	24.80	24.80	24.80	24.80	24.80	24.80
GSM1900 EDGE 3TX	0	37.50%	24.80	24.80	24.80	24.80	24.80	24.80
GSM1900 EDGE 4TX	0	50.00%	23.80	23.80	23.80	23.80	23.80	23.80
WCDMA B2	0	100.00%	25.20	25.20	25.20	22.90	22.90	22.90
WCDMA B4	0	100.00%	25.20	25.20	25.20	24.00	24.00	24.00
WCDMA B5	1	100.00%	24.50	23.60	22.80	24.50	24.50	24.50
LTE B5	1	100.00%	25.20	24.20	23.40	25.20	25.20	25.20
LTE B7	0	100.00%	25.20	25.20	25.20	21.90	22.30	22.30
LTE B12/B17	1	100.00%	25.20	23.90	23.10	25.20	25.20	25.20
LTE B25/B2	0	100.00%	25.20	25.20	25.20	23.60	23.60	23.60
LTE B41/B38 PC3	0	63.30%	25.20	25.20	25.20	23.30	24.10	24.10
LTE B41/B38 PC2	0	43.30%	27.00	27.00	27.00	24.90	25.70	25.70
LTE B66/B4	0	100.00%	25.20	25.20	25.20	23.70	23.70	23.70
FR1 n5	1	100.00%	25.20	24.30	23.50	25.20	25.20	25.20
FR1 n7	0	100.00%	25.20	25.20	25.20	22.10	22.80	22.80
FR1 n12	1	100.00%	25.20	24.60	23.80	25.20	25.20	25.20
FR1 n25/n2	0	100.00%	25.20	25.20	25.20	23.60	23.60	23.60
FR1 n41/38 PC3	0	100.00%	25.00	25.00	24.80	21.80	22.70	22.70
FR1 n41 PC2	0	50.00%	27.00	27.00	27.00	24.80	25.70	25.70
FR1 n66	0	100.00%	25.20	25.20	25.20	23.80	23.80	23.80
FR1 n77 PC3	2	100.00%	24.70	24.70	24.70	20.10	20.70	20.70
FR1 n77 PC2	2	50.00%	26.20	26.20	26.20	23.10	23.70	23.70
FR1 n77 SRS	5	100.00%	26.00	20.70	19.90	22.50	22.50	22.50



**6.3 General LTE SAR Test and Reporting Considerations**

Summarized necessary items addressed in KDB 941225 D05 v02r05																																																																										
FCC ID	A4RGHL1X																																																																									
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 25: 1850 MHz ~ 1915 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 25: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz 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 section 15.																																																																									
LTE Carrier Aggregation Additional Information	This device supports maximum of 5 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 25																
	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	26047	1850.7	26055	1851.5	26065	1852.5	26090	1855	26115	1857.5	26140	1860				
M	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880				
H	26683	1914.3	26675	1913.5	26665	1912.5	26640	1910	26615	1907.5	26590	1905				
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	A4RGHL1X															
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 n25: 1850 MHz ~ 1915 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: 3450MHz ~ 3550MHz, 3700 MHz ~ 3980 MHz															
Channel Bandwidth	5G NR n2: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n5: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n7: 5MHz, 10MHz, 15MHz, 20MHz, 25MHz, 30MHz, 40MHz, 50MHz 5G NR n12: 5MHz, 10MHz, 15MHz 5G NR n25: 5MHz, 10MHz, 15MHz, 20MHz, 25MHz, 30MHz, 40MHz 5G NR n38: 10MHz, 15MHz, 20MHz 5G NR n41: 10MHz, 15MHz, 20MHz, 30MHz, 40MHz, 50MHz, 60MHz, 80MHz, 90MHz, 100MHz 5G NR n66: 5MHz, 10MHz, 15MHz, 20MHz, 25MHz, 30MHz, 40MHz 5G NR n77: 10MHz, 15MHz, 20MHz, 25MHz, 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 B12															
LTE Anchor Bands for n12	LTE B2/7/66															
LTE Anchor Bands for n25	LTE B12															
LTE Anchor Bands for n41	LTE B2/5/12/66															
LTE Anchor Bands for n66	LTE B5/12															
LTE Anchor Bands for n77	LTE B2/5/12/41/66															
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 25														
	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	370500	1852.5	371000	1855	371500	1857.5	372000	1860	372500	1862.5	373000	1865	374000	1870
M	376500	1882.5	376500	1882.5	376500	1882.5	376500	1882.5	376500	1882.5	376500	1882.5	376500	1882.5
H	382500	1912.5	382000	1910	381500	1907.5	381000	1905	380500	1902.5	380000	1900	379000	1895

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		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)
L	500202	2501.01	500700	2503.5	501204	2506.02	502200	2511	503202	2516.01	504204	2521.02	505200	2526	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
H	537000	2685	536496	2682.48	535998	2679.99	534996	2674.98	534000	2670	532998	2664.99	531996	2659.98	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 (3700 MHz ~ 3980 MHz)																								
	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	633332	3499.98
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		
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	Mobile condition	Head		Hotspot	Body-worn/Extremity		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						
GSM850 GSM/GPRS 1TX	0	12.50%	32.50	37.10	36.30	35.00	35.30	34.50	32.50
GSM850 GPRS 2TX	0	25.00%	31.50	34.10	33.30	32.00	32.30	31.50	31.50
GSM850 GPRS 3TX	0	37.50%	30.50	32.30	31.50	30.20	30.50	29.70	30.50
GSM850 GPRS 4TX	0	50.00%	29.50	31.10	30.30	29.00	29.30	28.50	29.50
GSM850 EDGE 1TX	0	12.50%	27.00	37.10	36.30	35.00	35.30	34.50	27.00
GSM850 EDGE 2TX	0	25.00%	26.50	34.10	33.30	32.00	32.30	31.50	26.50
GSM850 EDGE 3TX	0	37.50%	26.50	32.30	31.50	30.20	30.50	29.70	26.50
GSM850 EDGE 4TX	0	50.00%	24.50	31.10	30.30	29.00	29.30	28.50	24.50
GSM1900 GSM/GPRS 1TX	2	12.50%	29.50	37.00	36.20	31.00	31.00	30.20	29.50
GSM1900 GPRS 2TX	2	25.00%	28.50	34.00	33.20	28.00	28.00	27.20	28.50
GSM1900 GPRS 3TX	2	37.50%	28.00	32.20	31.40	26.20	26.20	25.40	28.00
GSM1900 GPRS 4TX	2	50.00%	27.00	31.00	30.20	25.00	25.00	24.20	27.00
GSM1900 EDGE 1TX	2	12.50%	25.00	37.00	36.20	31.00	31.00	30.20	25.00
GSM1900 EDGE 2TX	2	25.00%	24.00	34.00	33.20	28.00	28.00	27.20	24.00
GSM1900 EDGE 3TX	2	37.50%	24.00	32.20	31.40	26.20	26.20	25.40	24.00
GSM1900 EDGE 4TX	2	50.00%	23.00	31.00	30.20	25.00	25.00	24.20	23.00
WCDMA B2	2	100.00%	24.70	27.60	26.80	20.50	20.50	20.50	24.70
WCDMA B4	2	100.00%	24.70	27.90	27.10	22.70	22.70	22.70	24.70
WCDMA B5	0	100.00%	24.00	27.70	26.90	25.50	25.50	24.70	24.00

Wireless technology/ band (No Accounting duty cycle)	Antenna	Duty cycle	Mobile condition	Head		Hotspot	Body-worn/Extremity		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						
GSM850 GSM/GPRS 1TX	1	12.50%	32.00	32.60	31.80	37.30	37.30	36.50	32.00
GSM850 GPRS 2TX	1	25.00%	31.50	29.60	28.80	34.30	34.30	33.50	31.50
GSM850 GPRS 3TX	1	37.50%	29.50	27.80	27.00	32.50	32.50	31.70	29.50
GSM850 GPRS 4TX	1	50.00%	28.00	26.60	25.80	31.30	31.30	30.50	28.00
GSM850 EDGE 1TX	1	12.50%	26.50	32.60	31.80	37.30	37.30	36.50	26.50
GSM850 EDGE 2TX	1	25.00%	26.00	29.60	28.80	34.30	34.30	33.50	26.00
GSM850 EDGE 3TX	1	37.50%	26.00	27.80	27.00	32.50	32.50	31.70	26.00
GSM850 EDGE 4TX	1	50.00%	23.00	26.60	25.80	31.30	31.30	30.50	23.00
GSM1900 GSM/GPRS 1TX	0	12.50%	29.00	36.60	35.80	31.90	31.90	31.10	29.00
GSM1900 GPRS 2TX	0	25.00%	28.50	33.60	32.80	28.90	28.90	28.10	28.50
GSM1900 GPRS 3TX	0	37.50%	27.50	31.80	31.00	27.10	27.10	26.30	27.50
GSM1900 GPRS 4TX	0	50.00%	26.70	30.60	29.80	25.90	25.90	25.10	26.70
GSM1900 EDGE 1TX	0	12.50%	25.00	36.60	35.80	31.90	31.90	31.10	25.00
GSM1900 EDGE 2TX	0	25.00%	23.80	33.60	32.80	28.90	28.90	28.10	23.80
GSM1900 EDGE 3TX	0	37.50%	23.80	31.80	31.00	27.10	27.10	26.30	23.80
GSM1900 EDGE 4TX	0	50.00%	22.80	30.60	29.80	25.90	25.90	25.10	22.80
WCDMA B2	0	100.00%	24.20	26.10	25.30	21.90	21.90	21.90	24.20
WCDMA B4	0	100.00%	24.20	27.80	27.00	23.00	23.00	23.00	24.20
WCDMA B5	1	100.00%	23.50	22.60	21.80	26.70	26.70	25.90	23.50



**<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	Mobile condition	Head		Hotspot	Body-worn/Extremity		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)										
LTE B7	2	100.00%	24.70	25.80	25.00	20.40	21.20	21.20	24.70	
LTE B12/B17	0	100.00%	24.70	28.80	28.00	26.00	27.40	26.60	24.70	
LTE B25/B2	2	100.00%	24.70	29.00	28.20	21.50	21.50	21.50	24.70	
LTE B5	0	100.00%	24.70	27.70	26.90	25.30	25.40	24.60	24.70	
LTE B41/B38 PC3	2	63.30%	22.70	25.40	24.60	21.00	21.30	21.30	22.70	
LTE B41/B38 PC2	2	43.30%	22.90	25.40	24.60	21.00	21.30	21.30	22.90	
LTE B66/B4	2	100.00%	24.70	27.40	26.60	22.80	22.80	22.80	24.70	
FR1 n5	0	100.00%	24.70	28.00	27.20	25.60	25.60	24.80	24.70	
FR1 n7	2	100.00%	24.70	24.70	23.90	21.00	21.20	21.20	24.70	
FR1 n12	0	100.00%	24.70	29.40	28.60	26.30	27.10	26.30	24.70	
FR1 n25/n2	2	100.00%	24.70	27.50	26.70	21.70	21.70	21.70	24.70	
FR1 n41/38 PC3	2	100.00%	24.50	24.50	23.70	21.60	21.70	21.70	24.50	
FR1 n41 PC2	2	50.00%	23.50	24.50	23.70	21.60	21.70	21.70	23.50	
FR1 n66	2	100.00%	24.70	27.60	26.80	23.10	23.10	23.10	24.70	
FR1 n77 PC3	6	100.00%	24.70	24.80	24.00	19.60	19.60	19.60	24.70	
FR1 n77 PC2	6	50.00%	23.20	24.80	24.00	19.60	19.60	19.60	23.20	
FR1 n77 SRS	1	100.00%	24.80	20.20	19.40	21.80	21.80	21.80	24.80	

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	Mobile condition	Head		Hotspot	Body-worn/Extremity		P Max Time-average power (dBm)
			Index 1	Standalone	Simultaneous	Index 4	Standalone	Simultaneous	
				Index 2	Index 3		Index 5	Index 6	
			P limit						
LTE B7	0	100.00%	24.20	25.20	24.40	20.90	21.30	21.30	24.20
LTE B12/B17	1	100.00%	24.20	22.90	22.10	28.40	28.40	27.60	24.20
LTE B25/B2	0	100.00%	24.20	26.90	26.10	22.60	22.60	22.60	24.20
LTE B5	1	100.00%	24.20	23.20	22.40	26.80	26.80	26.00	24.20
LTE B41/B38 PC3	0	63.30%	22.20	24.80	24.00	20.30	21.10	21.10	22.20
LTE B41/B38 PC2	0	43.30%	22.40	24.80	24.00	20.30	21.10	21.10	22.40
LTE B66/B4	0	100.00%	24.20	27.30	26.50	22.70	22.70	22.70	24.20
FR1 n5	1	100.00%	24.20	23.30	22.50	28.20	28.20	27.40	24.20
FR1 n7	0	100.00%	24.20	26.70	25.90	21.10	21.80	21.80	24.20
FR1 n12	1	100.00%	24.20	23.60	22.80	28.80	28.80	28.00	24.20
FR1 n25/n2	0	100.00%	24.20	27.20	26.40	22.60	22.60	22.60	24.20
FR1 n41/38 PC3	0	100.00%	24.00	24.60	23.80	20.80	21.70	21.70	24.00
FR1 n41 PC2	0	50.00%	23.00	24.60	23.80	20.80	21.70	21.70	23.00
FR1 n66	0	100.00%	24.20	27.60	26.80	22.80	22.80	22.80	24.20
FR1 n77 PC3	2	100.00%	23.70	25.70	24.90	19.10	19.70	19.70	23.70
FR1 n77 PC2	2	50.00%	22.20	25.70	24.90	19.10	19.70	19.70	22.20
FR1 n77 SRS	5	100.00%	25.00	19.70	18.90	21.50	21.50	21.50	25.00

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:

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

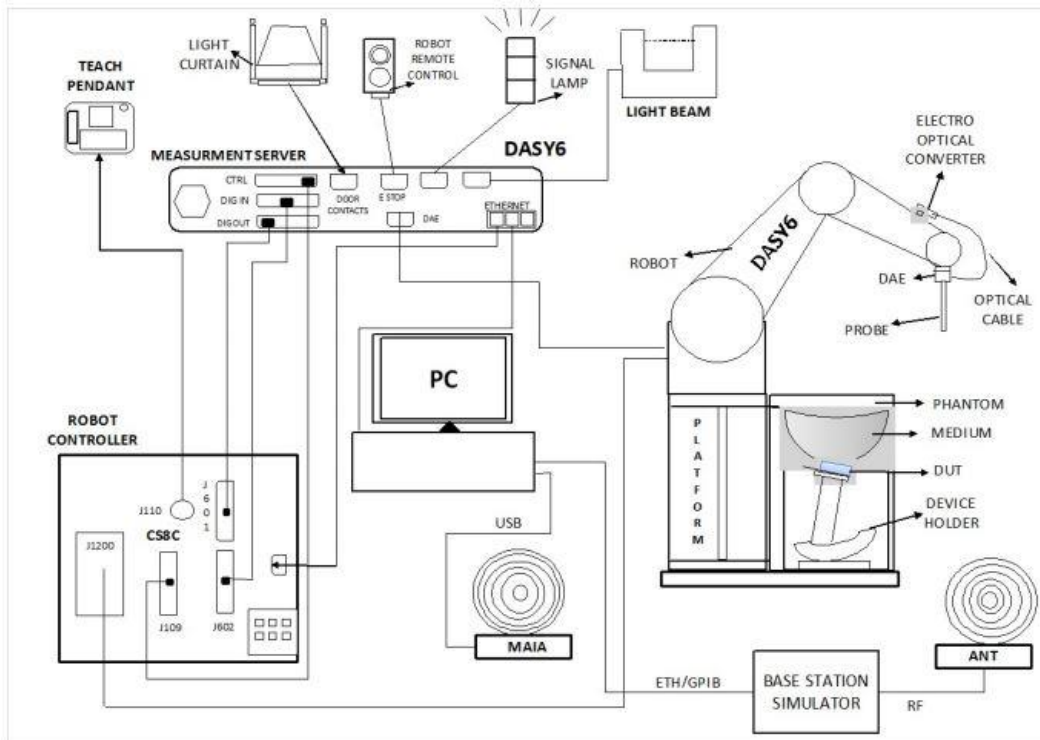
SAR is expressed in units of Watts per kilogram (W/kg)

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

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


**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	

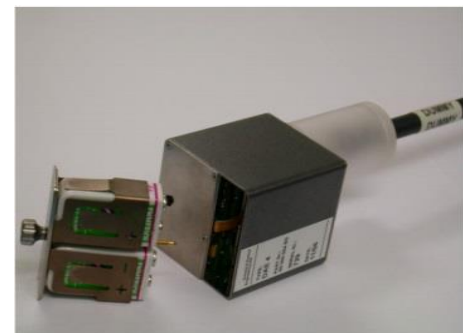
**<EX3DV4 Probe>**

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>**

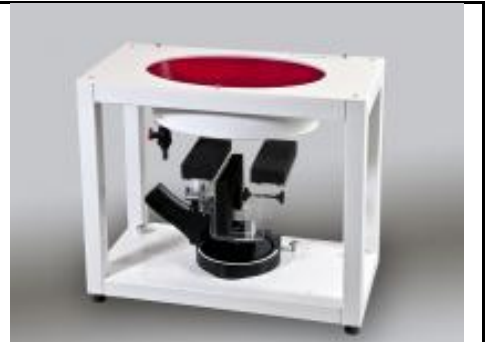
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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 D 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	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5 \text{ mm}$
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.

		≤ 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	
Note: $\delta$ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details. * 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 $\leq 1.4$ W/kg, $\leq 8$ mm, $\leq 7$ mm and $\leq 5$ 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.				

**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	1012	Aug. 18, 2021	Aug. 16, 2023
SPEAG	835MHz System Validation Kit <sup>(2)</sup>	D835V2	499	Aug. 18, 2021	Aug. 16, 2023
SPEAG	1750MHz System Validation Kit	D1750V2	1112	Jun. 22, 2022	Jun. 21, 2023
SPEAG	1900MHz System Validation Kit	D1900V2	5d093	Mar. 25, 2022	Mar. 24, 2023
SPEAG	2450MHz System Validation Kit <sup>(2)</sup>	D2450V2	929	Nov. 21, 2019	Nov. 18, 2022
SPEAG	2600MHz System Validation Kit <sup>(2)</sup>	D2600V2	1008	Aug. 17, 2021	Aug. 15, 2023
SPEAG	3500MHz System Validation Kit	D3500V2	1014	Jan. 17, 2022	Jan. 16, 2023
SPEAG	3900MHz System Validation Kit	D3900V2	1017	Apr. 22, 2022	Apr. 21, 2023
SPEAG	5GHz System Validation Kit <sup>(2)</sup>	D5GHzV2	1128	Dec. 16, 2019	Dec. 13, 2022
SPEAG	5GHz System Validation Kit <sup>(2)</sup>	D5GHzV2	1171	Apr. 20, 2021	Apr. 18, 2023
SPEAG	6500MHz System Validation Kit	D6.5GHzV2	1003	Sep. 24, 2021	Sep. 23, 2022
SPEAG	Data Acquisition Electronics	DAE4	316	Jan. 26, 2022	Jan. 25, 2023
SPEAG	Data Acquisition Electronics	DAE4	699	Feb. 24, 2022	Feb. 23, 2023
SPEAG	Data Acquisition Electronics	DAE4	853	Jul. 20, 2022	Jul. 19, 2023
SPEAG	Data Acquisition Electronics	DAE4	1399	Feb. 28, 2022	Feb. 27, 2023
SPEAG	Data Acquisition Electronics	DAE4	1424	Jan. 20, 2022	Jan. 19, 2023
SPEAG	Data Acquisition Electronics	DAE4	1707	Jan. 12, 2022	Jan. 11, 2023
SPEAG	Dosimetric E-Field Probe	ES3DV3	3184	Sep. 26, 2022	Sep. 25, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	3728	Mar. 02, 2022	Mar. 01, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	3931	Oct. 21, 2021	Oct. 20, 2022
SPEAG	Dosimetric E-Field Probe	EX3DV4	3976	Jan. 27, 2022	Jan. 26, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	7625	Jan. 27, 2022	Jan. 26, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	7700	Jan. 11, 2022	Jan. 10, 2023
Testo	Hygro meter	608-H1	45196600	Oct. 22, 2021	Oct. 21, 2022
Testo	Hygro meter	608-H1	45207528	Oct. 22, 2021	Oct. 21, 2022
RCPTWN	Thermometer	HTC-1	TM685-1	Jun. 27, 2022	Jun. 26, 2023
RCPTWN	Thermometer	HTC-1	TM560-2	Mar. 15, 2022	Mar. 14, 2023
Anritsu	Radio Communication Analyzer	MT8821C	6201074414	Aug. 19, 2022	Aug. 18, 2023
Keysight	Wireless Communication Test Set	E5515C	MY50266977	May. 10, 2022	May. 09, 2023
Keysight	5G Wireless Test Platform	E7515B	MY59321826	Apr. 13, 2022	Apr. 12, 2023
R&S	BT Base Station	CBT32	101136	Oct. 17, 2021	Oct. 16, 2022
R&S	BT Base Station	CBT	100815	Feb. 18, 2022	Feb. 17, 2023
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Oct. 24, 2021	Oct. 23, 2022
R&S	Signal Generator	SMA100A	101091	Oct. 04, 2022	Oct. 03, 2023
Keysight	ENA Network Analyzer	E5071C	MY46316648	Jul. 25, 2022	Jul. 24, 2023
SPEAG	Dielectric Probe Kit	DAK-3.5	1146	Jul. 25, 2022	Jul. 24, 2023
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3252	Jul. 25, 2022	Jul. 24, 2023
Anritsu	Power Meter	ML2495A	1419002	Aug. 16, 2022	Aug. 15, 2023
Anritsu	Power Sensor	MA2411B	1911176	Aug. 16, 2022	Aug. 15, 2023
Anritsu	Power Meter	ML2496A	2119003	Jun. 22, 2022	Jun. 21, 2023
Anritsu	Power Sensor	MA2411B	1911334	Jun. 22, 2022	Jun. 21, 2023
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jul. 21, 2022	Jul. 20, 2023
Agilent	Spectrum Analyzer	E4408B	MY44211028	Aug. 19, 2021	Aug. 17, 2023
Mini-Circuits	Power Amplifier	ZHL-42W+	715701915	May. 12, 2022	May. 11, 2023
Mini-Circuits	Power Amplifier	ZVE-3W-183+	072602118	Mar. 09, 2022	Mar. 08, 2023
ATM	Dual Directional Coupler	C122H-10	P610410z-02		Note 1
Warison	Directional Coupler	WCOU-10-50S-10	WR889BMC4B1		Note 1
Woken	Attenuator 1	WK0602-XX	N/A		Note 1
PE	Attenuator 2	PE7005-10	N/A		Note 1
PE	Attenuator 3	PE7005-3	N/A		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>**

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
750	22.6	0.889	42.169	0.89	41.90	-0.11	0.64	±5	2022/10/2
750	22.7	0.884	42.232	0.89	41.90	-0.67	0.79	±5	2022/10/5
835	22.4	0.899	42.289	0.90	41.50	-0.11	1.90	±5	2022/9/30
835	22.4	0.891	41.458	0.90	41.50	-1.00	-0.10	±5	2022/10/1
835	22.6	0.917	42.596	0.90	41.50	1.89	2.64	±5	2022/10/3
835	22.6	0.893	41.528	0.90	41.50	-0.78	0.07	±5	2022/10/4
835	22.4	0.892	41.396	0.90	41.50	-0.89	-0.25	±5	2022/10/6
835	22.1	0.899	42.539	0.90	41.50	-0.11	2.50	±5	2022/10/13
1750	22.2	1.329	39.408	1.37	40.10	-2.99	-1.73	±5	2022/9/28
1750	22.4	1.427	40.655	1.37	40.10	4.16	1.38	±5	2022/10/2
1750	22.1	1.379	40.979	1.37	40.10	0.66	2.19	±5	2022/10/7
1750	22.3	1.359	40.617	1.37	40.10	-0.80	1.29	±5	2022/10/8
1900	22.2	1.445	40.382	1.40	40.00	3.21	0.95	±5	2022/9/28
1900	22.6	1.398	39.661	1.40	40.00	-0.14	-0.85	±5	2022/10/4
1900	22.4	1.421	40.511	1.40	40.00	1.50	1.28	±5	2022/10/6
1900	22.1	1.388	40.185	1.40	40.00	-0.86	0.46	±5	2022/10/7
1900	22.8	1.409	39.763	1.40	40.00	0.64	-0.59	±5	2022/10/9
2600	22.4	2.039	38.811	1.96	39.00	4.03	-0.48	±5	2022/10/1
2600	22.2	1.948	37.922	1.96	39.00	-0.61	-2.76	±5	2022/10/5
2600	22.8	1.963	38.448	1.96	39.00	0.15	-1.42	±5	2022/10/9
2600	22.4	1.943	38.669	1.96	39.00	-0.87	-0.85	±5	2022/10/11
2600	22.6	1.973	38.037	1.96	39.00	0.66	-2.47	±5	2022/10/12
2600	22.3	1.992	38.739	1.96	39.00	1.63	-0.67	±5	2022/10/14
2600	22.7	1.962	38.368	1.96	39.00	0.10	-1.62	±5	2022/10/23
3500	22.3	2.879	36.938	2.91	37.90	-1.07	-2.54	±5	2022/10/14
3500	22.2	2.889	37.425	2.91	37.90	-0.72	-1.25	±5	2022/10/15
3500	22.5	2.918	38.050	2.91	37.90	0.27	0.40	±5	2022/10/16
3500	22.7	2.829	37.570	2.91	37.90	-2.78	-0.87	±5	2022/10/24
3900	22.2	3.373	36.996	3.33	37.51	1.29	-1.37	±5	2022/10/13
3900	22.3	3.354	36.388	3.33	37.51	0.72	-2.99	±5	2022/10/14
3900	22.2	3.281	36.787	3.33	37.51	-1.47	-1.93	±5	2022/10/15
3900	22.7	3.245	37.480	3.33	37.51	-2.55	-0.08	±5	2022/10/24



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
2450	22.6	1.870	40.961	1.80	39.20	3.89	4.49	±5	2022/9/21
2450	22.5	1.805	39.342	1.80	39.20	0.28	0.36	±5	2022/10/4
2450	22.1	1.803	39.411	1.80	39.20	0.17	0.54	±5	2022/10/18
2450	22.2	1.853	38.580	1.80	39.20	2.94	-1.58	±5	2022/10/23
2450	22.7	1.802	38.967	1.80	39.20	0.11	-0.59	±5	2022/10/23
5250	22.2	4.619	36.467	4.71	35.95	-1.93	1.44	±5	2022/10/15
5250	22.5	4.698	36.130	4.71	35.95	-0.25	0.50	±5	2022/10/16
5250	22.5	4.670	37.234	4.71	35.95	-0.85	3.57	±5	2022/10/17
5250	22.1	4.761	37.366	4.71	35.95	1.08	3.94	±5	2022/10/18
5250	22.2	4.759	37.439	4.71	35.95	1.04	4.14	±5	2022/10/19
5250	22.3	4.780	36.706	4.71	35.95	1.49	2.10	±5	2022/10/21
5250	22.2	4.720	37.307	4.71	35.95	0.21	3.77	±5	2022/10/22
5250	22.3	4.593	36.087	4.71	35.95	-2.48	0.38	±5	2022/10/22
5600	22.2	4.978	35.985	5.07	35.50	-1.81	1.37	±5	2022/10/15
5600	22.5	5.026	35.644	5.07	35.50	-0.87	0.41	±5	2022/10/16
5600	22.5	5.046	36.699	5.07	35.50	-0.47	3.38	±5	2022/10/17
5600	22.2	5.097	36.985	5.07	35.50	0.53	4.18	±5	2022/10/19
5600	22.3	5.155	36.196	5.07	35.50	1.68	1.96	±5	2022/10/21
5600	22.2	5.056	36.853	5.07	35.50	-0.28	3.81	±5	2022/10/22
5600	22.3	4.951	35.605	5.07	35.50	-2.35	0.30	±5	2022/10/22
5750	22.2	5.129	35.710	5.22	35.35	-1.74	1.02	±5	2022/10/15
5750	22.5	5.219	35.584	5.22	35.35	-0.02	0.66	±5	2022/10/16
5750	22.5	5.193	36.523	5.22	35.35	-0.52	3.32	±5	2022/10/17
5750	22.1	5.294	36.655	5.22	35.35	1.42	3.69	±5	2022/10/18
5750	22.2	5.220	36.707	5.22	35.35	0.00	3.84	±5	2022/10/19
5850	22.5	5.306	36.365	5.32	35.25	-0.26	3.16	±5	2022/10/17
6500	22.1	6.120	34.600	6.07	34.50	0.82	0.29	±5	2022/9/23
6500	22.5	6.030	34.280	6.07	34.50	-0.66	-0.64	±5	2022/10/28



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.

Table with 11 columns: Test Site, Date, Frequency (MHz)2, 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 (%). It contains 35 rows of test data.



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 (%)	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
SAR12	2022/9/21	2450	50	D2450V2-929	EX3DV4 - SN3931	DAE4 Sn853	2.660	53.100	53.2	0.19	1.250	24.700	25	1.21
SAR14	2022/10/4	2450	50	D2450V2-929	EX3DV4 - SN3728	DAE4 Sn316	2.470	53.100	49.4	-6.97	1.160	24.700	23.2	-6.07
SAR13	2022/10/18	2450	50	D2450V2-929	EX3DV4 - SN7625	DAE4 Sn1424	2.450	53.100	49	-7.72	1.150	24.700	23	-6.88
SAR11	2022/10/23	2450	250	D2450V2-929	ES3DV3 - SN3184	DAE4 Sn699	12.800	53.100	51.2	-3.58	6.310	24.700	25.24	2.19
SAR09	2022/10/23	2450	50	D2450V2-929	EX3DV4 - SN7700	DAE4 Sn1399	2.460	53.100	49.2	-7.34	1.150	24.700	23	-6.88
SAR13	2022/10/15	5250	100	D5GHzV2-1128	EX3DV4 - SN7625	DAE4 Sn1424	7.970	80.000	79.7	-0.37	2.270	22.900	22.7	-0.87
SAR09	2022/10/16	5250	100	D5GHzV2-1128	EX3DV4 - SN7700	DAE4 Sn1399	8.100	80.000	81	1.25	2.320	22.900	23.2	1.31
SAR13	2022/10/17	5250	100	D5GHzV2-1128	EX3DV4 - SN7625	DAE4 Sn1424	8.050	80.000	80.5	0.63	2.290	22.900	22.9	0.00
SAR14	2022/10/18	5250	50	D5GHzV2-1128	EX3DV4 - SN3728	DAE4 Sn316	3.650	80.000	73	-8.75	1.040	22.900	20.8	-9.17
SAR13	2022/10/19	5250	100	D5GHzV2-1128	EX3DV4 - SN7625	DAE4 Sn1424	8.210	80.000	82.1	2.63	2.340	22.900	23.4	2.18
SAR14	2022/10/21	5250	100	D5GHzV2-1128	EX3DV4 - SN3728	DAE4 Sn316	7.940	80.000	79.4	-0.75	2.260	22.900	22.6	-1.31
SAR14	2022/10/22	5250	100	D5GHzV2-1128	EX3DV4 - SN3728	DAE4 Sn316	7.620	80.000	76.2	-4.75	2.150	22.900	21.5	-6.11
SAR15	2022/10/22	5250	50	D5GHzV2-1128	EX3DV4 - SN3976	DAE4 Sn1707	3.750	80.000	75	-6.25	1.070	22.900	21.4	-6.55
SAR13	2022/10/15	5600	100	D5GHzV2-1128	EX3DV4 - SN7625	DAE4 Sn1424	8.040	82.400	80.4	-2.43	2.270	23.600	22.7	-3.81
SAR09	2022/10/16	5600	100	D5GHzV2-1128	EX3DV4 - SN7700	DAE4 Sn1399	8.260	82.400	82.6	0.24	2.360	23.600	23.6	0.00
SAR13	2022/10/17	5600	100	D5GHzV2-1128	EX3DV4 - SN7625	DAE4 Sn1424	8.150	82.400	81.5	-1.09	2.310	23.600	23.1	-2.12
SAR13	2022/10/19	5600	50	D5GHzV2-1128	EX3DV4 - SN7625	DAE4 Sn1424	4.040	82.400	80.8	-1.94	1.150	23.600	23	-2.54
SAR14	2022/10/21	5600	100	D5GHzV2-1128	EX3DV4 - SN3728	DAE4 Sn316	8.090	82.400	80.9	-1.82	2.350	23.600	23.5	-0.42
SAR14	2022/10/22	5600	100	D5GHzV2-1128	EX3DV4 - SN3728	DAE4 Sn316	7.900	82.400	79	-4.13	2.230	23.600	22.3	-5.51
SAR15	2022/10/22	5600	50	D5GHzV2-1128	EX3DV4 - SN3976	DAE4 Sn1707	3.750	82.400	75	-8.98	1.070	23.600	21.4	-9.32
SAR13	2022/10/15	5750	100	D5GHzV2-1128	EX3DV4 - SN7625	DAE4 Sn1424	7.890	79.100	78.9	-0.25	2.240	22.600	22.4	-0.88
SAR09	2022/10/16	5750	100	D5GHzV2-1128	EX3DV4 - SN7700	DAE4 Sn1399	8.080	79.100	80.8	2.15	2.310	22.600	23.1	2.21
SAR13	2022/10/17	5750	100	D5GHzV2-1128	EX3DV4 - SN7625	DAE4 Sn1424	7.990	79.100	79.9	1.01	2.270	22.600	22.7	0.44
SAR14	2022/10/18	5750	100	D5GHzV2-1128	EX3DV4 - SN3728	DAE4 Sn316	7.550	79.100	75.5	-4.55	2.150	22.600	21.5	-4.87
SAR13	2022/10/19	5750	50	D5GHzV2-1128	EX3DV4 - SN7625	DAE4 Sn1424	3.820	79.100	76.4	-3.41	1.100	22.600	22	-2.65
SAR13	2022/10/17	5850	100	D5GHzV2-1171	EX3DV4 - SN7625	DAE4 Sn1424	8.360	82.300	83.6	1.58	2.340	23.100	23.4	1.30
SAR14	2022/9/23	6500	100	D6.5GHzV2-1003	EX3DV4 - SN3728	DAE4 Sn316	30.500	292.000	305	4.45	5.680	53.800	56.8	5.58
SAR13	2022/10/28	6500	100	D6.5GHzV2-1003	EX3DV4 - SN7625	DAE4 Sn1424	30.900	292.000	309	5.82	5.700	53.800	57	5.95

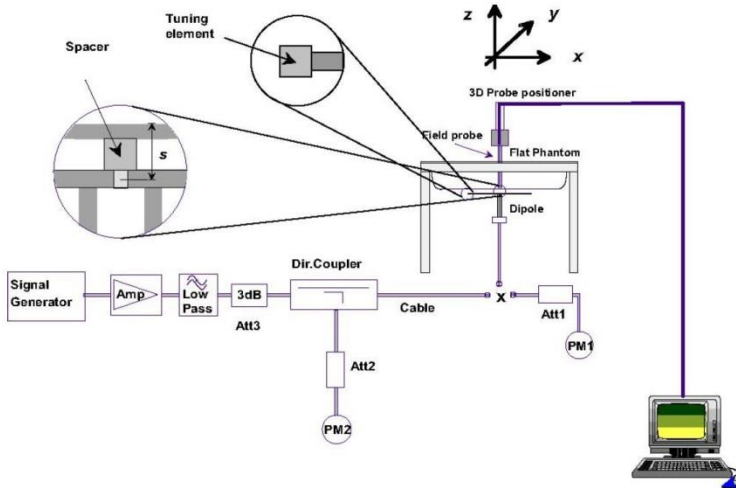


Fig 8.3.1 System Performance Check Setup



Fig 8.3.2 Setup Photo



## **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 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 DPDCH, DPCCH, HS- DPCCH, E-DPDCH 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-DPDCH 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-DPDCH power scaling at max power which could results in slightly smaller MPR values.

**Setup Configuration**

**<LTE Note>**

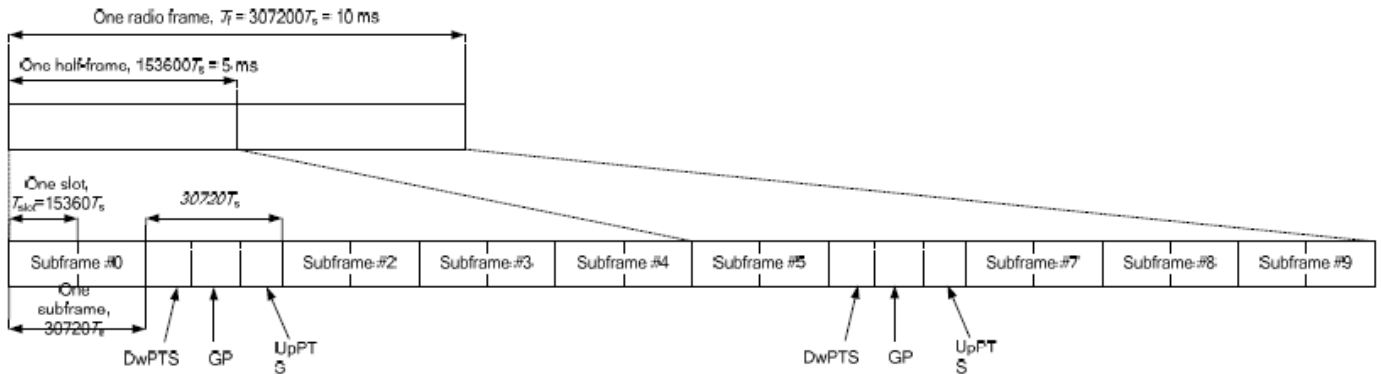
1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested 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. For LTE B4/B5/B12/B17/B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE band 2/4/17/38 SAR test was covered by Band 25/66/12/41; 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

**<TDD LTE SAR Measurement>**

TDD LTE configuration setup for SAR measurement

SAR was tested with a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by 3GPP.

- a. 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations
- b. "special subframe S" contains both uplink and downlink transmissions, it has been taken into consideration to determine the transmission duty factor according to the worst case uplink and downlink cyclic prefix requirements for UpPTS
- c. Establishing connections with base station simulators ensure a consistent means for testing SAR and recommended for evaluating SAR. The Anritsu MT8820C (firmware: #22.52#004) was used for LTE output power measurements and SAR testing.



**Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).**

**Table 4.2-2: Uplink-downlink configurations.**

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

**Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).**

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink				
	DwPTS	UpPTS		DwPTS	UpPTS			
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		
0	6592 · Ts	2192 · Ts	2560 · Ts	7680 · Ts	2192 · Ts	2560 · Ts		
1	19760 · Ts			20480 · Ts				
2	21952 · Ts			23040 · Ts				
3	24144 · Ts			25600 · Ts				
4	26336 · Ts			7680 · Ts				
5	6592 · Ts	4384 · Ts	5120 · Ts	20480 · Ts	4384 · Ts	5120 · Ts		
6	19760 · Ts			23040 · Ts				
7	21952 · Ts			12800 · Ts				
8	24144 · Ts			-			-	-
9	13168 · Ts			-			-	-

<b>Special subframe (30720·T<sub>s</sub>): Normal cyclic prefix in downlink (UpPTS)</b>			
	<b>Special subframe configuration</b>	<b>Normal cyclic prefix in uplink</b>	<b>Extended cyclic prefix in uplink</b>
<b>Uplink duty factor in one special subframe</b>	<b>0~4</b>	7.13%	8.33%
	<b>5~9</b>	14.3%	16.7%

<b>Special subframe(30720·T<sub>s</sub>): Extended cyclic prefix in downlink (UpPTS)</b>			
	<b>Special subframe configuration</b>	<b>Normal cyclic prefix in uplink</b>	<b>Extended cyclic prefix in uplink</b>
<b>Uplink duty factor in one special subframe</b>	<b>0~3</b>	7.13%	8.33%
	<b>4~7</b>	14.3%	16.7%

The highest duty factor is resulted from:

- i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subframes, uplink operation is in 3 uplink subframes and 1 special subframe.
- ii. special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink
- iii. for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is:  $(3+0.167)/5 = 63.3\%$
- iv. for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is:  $(3+0.143)/5 = 62.9\%$
- v. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix  $63.3\%/62.9\% = 1.006$  is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)\* Tune-up Scaling Factor\* scaling factor for extended cyclic prefix.
- vi. The device supports Power Class 3 uplink-downlink configurations 0 and 6, and Power Class 2 uplink-downlink configurations 1 to 5 operations for LTE Band 41.
- vii. The highest available duty cycle for Power Class 2 operation is 43.3% using UL-DL configuration 1, for Power Class 3 operation is 63.3% using UL-DL configuration 0. Per FCC Guidance, all SAR tests were performed using Power Class 3. SAR with Power Class 2 at the available duty factor was additionally performed for the Power Class 3 configuration with the highest SAR among all exposure condition.

**<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 was performed using Factory Test Mode software to establish the connection and perform SAR with 100% transmission.
3. Antenna 1 and 5 for n77 is used as SRS dedicated antennas, i.e., the antenna(s) are used for receive and Sound Reference Signal transmission (SRS) only (not traffic transmission), RF Exposure was performed using Factory Test Mode software to establish the connection and perform SAR with 100% transmission.

**<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. DL/UL carrier aggregation**

**<LTE Carrier Aggregation combinations>**

**General Note:**

1. This device supports Carrier Aggregation on downlink only for inter and intra band. For the device supports combination bands and configurations are according to 3GPP.
2. In applying the existing power measurement procedure of KDB 941225 D05A for DL CA SAR test exclusion, only the subset with the largest number of combinations of the frequency band and CCs in each row need consideration, and that configurations require power measurement should be highlighted in the below table.

2CC Downlink Carrier Aggregation			3CC Downlink Carrier Aggregation		
Number	Combination	Covered by	Number	Combination	Covered by
		Measurement Superset			Measurement Superset
1	CA_2A-12A	3CC-45	45	CA_2A-12A-66A	4CC-127
2	CA_2A-2A	3CC-47	46	CA_2A-12A-12A	4CC-142
3	CA_2A-17A	3CC-54	47	CA_2A-2A-12A	4CC-131
4	CA_2A-4A	3CC-48	48	CA_2A-2A-4A	4CC-133
5	CA_2A-5A	3CC-50	49	CA_2A-12B	4CC-128
6	CA_2A-66A	3CC-51	50	CA_2A-2A-5A	4CC-135
7	CA_2A-7A	3CC-52	51	CA_2A-2A-66A	4CC-137
8	CA_2C	3CC-68	52	CA_2A-2A-7A	4CC-141
9	CA_4A-12A	3CC-53	53	CA_2A-4A-12A	4CC-144
10	CA_4A-17A	3CC-54	54	CA_2A-4A-17A	
11	CA_4A-4A	3CC-55	55	CA_2A-4A-4A	4CC-145
12	CA_4A-5A	3CC-56	56	CA_2A-4A-5A	4CC-145
13	CA_4A-7A	3CC-57	57	CA_2A-4A-7A	4CC-149
14	CA_5A-25A		58	CA_2A-5A-66A	4CC-150
15	CA_5A-38A	3CC-91	59	CA_2A-5A-7A	4CC-198
16	CA_5A-41A		60	CA_2A-5B	4CC-136
17	CA_5A-5A	3CC-84	61	CA_2A-66A-66A	4CC-155
18	CA_5A-66A	3CC-84	62	CA_2A-66B	4CC-138
19	CA_5A-7A	3CC-88	63	CA_2A-66C	4CC-139
20	CA_5B	3CC-92	64	CA_2A-7A-12A	4CC-140
21	CA_5C	2CC-14	65	CA_2A-7A-66A	4CC-141
22	CA_7A-12A	3CC-93	66	CA_2A-7A-7A	4CC-161
23	CA_7A-66A	3CC-95	67	CA_2A-7C	4CC-162
24	CA_7A-7A	3CC-66	68	CA_2C-5A	4CC-209
25	CA_7A-38A		69	CA_2C-66A-66A	4CC-137
26	CA_7B	2CC-25	70	CA_2C-66A	4CC-137
27	CA_7C	2CC-25	71	CA_2C-12A	3CC-64
28	CA_12A-12A	3CC-98	72	CA_4A-12A-12A	4CC-142
29	CA_12A-25A		73	CA_4A-12B	3CC-72
30	CA_12A-66A	3CC-101	74	CA_4A-4A-12A	4CC-144
31	CA_12B	2CC-30	75	CA_4A-4A-5A	4CC-145
32	CA_25A-25A	4CC-184	76	CA_4A-4A-7A	4CC-166
33	CA_25A-41A	4CC-195	77	CA_4A-5B	4CC-165
34	CA_38A-38A	2CC-25	78	CA_4A-7A-12A	4CC-166
35	CA_38C	2CC-34	79	CA_4A-7A-7A	4CC-148
36	CA_41A-41A	4CC-186	80	CA_4A-7C	3CC-79
37	CA_41C	4CC-188	81	CA_4C-12A	3CC-78
38	CA_66A-66A	3CC-109	82	CA_4C-5A	4CC-165
39	CA_66B	2CC-38	83	CA_4C-7A	3CC-76
40	CA_66C	2CC-38	84	CA_5A-5A-66A	4CC-150
41	CA_4A-41A		85	CA_5A-66A-66A	4CC-151
42	CA_25C	2CC-43	86	CA_5A-66B	4CC-152
43	CA_25A-66A	4CC-207	87	CA_5A-66C	4CC-153



44	CA_7A-25A	3CC-124	88	CA_5A-7A-7A	4CC-200
			89	CA_5A-7A-66A	4CC-200
			90	CA_5A-7C	3CC-88
			91	CA_5B-38A	
			92	CA_5B-66A	4CC-154
			93	CA_7A-12A-66A	4CC-179
			94	CA_7A-12B	4CC-180
			95	CA_7A-66A-66A	4CC-181
			96	CA_7A-7A-66A	4CC-181
			97	CA_7C-66A	4CC-162
			98	CA_12A-12A-66A	4CC-179
			99	CA_12A-66A-66A	4CC-196
			100	CA_12A-66C	3CC-99
			101	CA_12B-66A	3CC-99
			102	CA_25A-25A-25A	4CC-184
			103	CA_25A-25A-41A	4CC-184
			104	CA_25A-25C	3CC-102
			105	CA_25A-41C	4CC-195
			106	CA_25D	3CC-102
			107	CA_41A-41C	4CC-186
			108	CA_41D	4CC-187
			109	CA_66A-66A-66A	4CC-196
			110	CA_66A-66B	3CC-109
			111	CA_66A-66C	3CC-109
			112	CA_66D	3CC-109
			113	CA_2A-5A-5A	4CC-134
			114	CA_4A-5A-5A	4CC-146
			115	CA_25C-41A	4CC-195
			116	CA_41A-41A-41A	4CC-186
			117	CA_41C-41A	4CC-188
			118	CA_66B-66A	4CC-190
			119	CA_2A-2A-2A	4CC-192
			120	CA_7A-7A-12A	4CC-199
			121	CA_25A-25A-66A	4CC-203
			122	CA_7A-7A-25A	4CC-202
			123	CA_7A-25A-25A	4CC-201
			124	CA_7A-25A-66A	4CC-202
			125	CA_7C-25A	4CC-206



4CC Downlink Carrier Aggregation			5CC Downlink Carrier Aggregation		
Number	Combination	Covered by	Number	Combination	Covered by
		Measurement Superset			Measurement Superset
126	CA_2A-12A-66A-66A	5CC-210	210	CA_2A-12B-66A-66A	5CC-211
127	CA_2A-12A-66C	5CC-210	211	CA_2A-2A-12A-66A-66A	
128	CA_2A-12B-66A	5CC-210	212	CA_2A-2A-12B-66A	5CC-211
129	CA_2A-2A-12A-66A	5CC-211	213	CA_2A-2A-4A-4A-5A	
130	CA_2A-2A-12B	5CC-212	214	CA_2A-2A-4A-5B	5CC-213
131	CA_2A-2A-4A-12A		215	CA_2A-2A-5A-66A-66A	
132	CA_2A-2A-4A-4A	5CC-213	216	CA_2A-2A-5A-66B	5CC-215
133	CA_2A-2A-4A-5A	5CC-213	217	CA_2A-2A-5A-66C	5CC-215
134	CA_2A-2A-5A-5A	5CC-213	218	CA_2A-2A-5B-66A	5CC-215
135	CA_2A-2A-5A-66A	5CC-215	219	CA_2A-2A-66A-66B	5CC-220
136	CA_2A-2A-5B	5CC-218	220	CA_2A-2A-66A-66C	5CC-215
137	CA_2A-2A-66A-66A	5CC-219	221	CA_2A-4A-4A-5B	5CC-213
138	CA_2A-2A-66B	5CC-219	222	CA_2A-5B-66A-66A	5CC-215
139	CA_2A-2A-66C	5CC-220	223	CA_2A-5B-66B	5CC-215
140	CA_2A-2A-7A-12A		224	CA_2A-5B-66C	5CC-215
141	CA_2A-2A-7A-66A	5CC-235	225	CA_2A-7A-7A-66A-66A	
142	CA_2A-4A-12A-12A	4CC-131	226	CA_5A-7C-66A-66A	
143	CA_2A-4A-12B	4CC-142	227	CA_5B-66A-66B	5CC-222
144	CA_2A-4A-4A-12A	4CC-131	228	CA_25A-25A-41D	
145	CA_2A-4A-4A-5A	5CC-221	229	CA_25C-41D	5CC-228
146	CA_2A-4A-5A-5A	5CC-213	230	CA_41C-41D	5CC-229
147	CA_2A-4A-5B	5CC-214	231	CA_41F	5CC-228
148	CA_2A-4A-7A-7A		232	CA_2A-2A-2A-12A-66A	5CC-211
149	CA_2A-4A-7C	4CC-148	233	CA_2A-2A-2A-5A-66A	5CC-215
150	CA_2A-5A-5A-66A	5CC-234	234	CA_2A-5A-5A-66A-66A	5CC-215
151	CA_2A-5A-66A-66A	5CC-234	235	CA_2A-2A-7A-66A-66A	5CC-225
152	CA_2A-5A-66B	5CC-216	236	CA_7A-7A-25A-25A-66A	
153	CA_2A-5A-66C	5CC-217	237	CA_7C-25A-25A-66A	5CC-236
154	CA_2A-5B-66A	5CC-218	238	CA_2A-7C-66A-66A	5CC-235
155	CA_2A-66A-66A-66A	5CC-225			
156	CA_2A-66A-66B	5CC-219			
157	CA_2A-66A-66C	5CC-220			
158	CA_2A-66D	4CC-156			
159	CA_2A-7A-12B	4CC-140			
160	CA_2A-7A-66A-66A	5CC-235			
161	CA_2A-7A-7A-66A	5CC-225			
162	CA_2A-7C-66A	5CC-238			
163	CA_4A-4A-12B	4CC-131			
164	CA_4A-4A-5A-5A	5CC-213			
165	CA_4A-4A-5B	4CC-164			
166	CA_4A-7A-12B				
167	CA_5A-5A-66A-66A	5CC-234			
168	CA_5A-5A-66B	4CC-167			
169	CA_5A-5A-66C	4CC-167			
170	CA_5A-66A-66A-66A	5CC-215			
171	CA_5A-66A-66B	4CC-170			
172	CA_5A-66A-66C	4CC-170			
173	CA_5A-66D	4CC-170			
174	CA_5A-7A-66A-66A	5CC-226			
175	CA_5A-7C-66A	5CC-226			
176	CA_5B-66A-66A	5CC-222			
177	CA_5B-66B	5CC-223			



178	CA_5B-66C	5CC-224			
179	CA_7A-12A-66A-66A				
180	CA_7A-12B-66A	4CC-179			
181	CA_7A-7A-66A-66A	5CC-225			
182	CA_7C-66A-66A	4CC-181			
183	CA_12B-66A-66A	5CC-210			
184	CA_25A-25A-41C	5CC-228			
185	CA_25A-41D	5CC-228			
186	CA_41A-41A-41C	5CC-228			
187	CA_41A-41D	4CC-186			
188	CA_41C-41C	4CC-186			
189	CA_41E	4CC-186			
190	CA_66B-66C	5CC-227			
191	CA_2A-2A-2A-12A	5CC-232			
192	CA_2A-2A-2A-5A	5CC-233			
193	CA_2A-2A-2A-66A	5CC-233			
194	CA_2C-5B	5CC-223			
195	CA_25C-41C	5CC-228			
196	CA_12A-66A-66A-66A	5CC-212			
197	CA_2A-5A-7A-7A				
198	CA_2A-5A-7C	4CC-197			
199	CA_2A-7A-7A-12A	4CC-140			
200	CA_5A-7A-7A-66A	5CC-226			
201	CA_7A-7A-25A-25A	5CC-236			
202	CA_7A-7A-25A-66A	5CC-236			
203	CA_7A-25A-25A-66A	5CC-236			
204	CA_2A-2A-7A-7A	4CC-197			
205	CA_2A-2A-7C	4CC-204			
206	CA_7C-25A-25A	5CC-237			
207	CA_7C-25A-66A	5CC-237			
208	CA_2A-2A-5A-7A	4CC-197			
209	CA_2C-5A-66A	5CC-215			

**<Power verification when LTE Carrier Aggregation Active>**

**General Note:**

- i. According to KDB941225 D05A v01r02, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.
- ii. Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.
- iii. The device supports downlink two carrier aggregation. For power measurement were control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
- iv. Selected highest measured power when downlink carrier aggregation is inactive for conducted power comparison with downlink carrier aggregation is active, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.
- v. For non-contiguous intra-band CA, the SCC selected to provide maximum separation from the PCC and must remain fully within the downlink transmission band.
- vi. For Intra-band, contiguous CA, the downlink channels selected to perform the uplink power measurement must satisfy 3GPP channel spacing (5.4.1A of 3GPP TS 36.521 or equivalent) and channel bandwidth (5.4.2A) requirements.

$$\text{Nominal channel spacing} = \left\lceil \frac{BW_{\text{Channel}(1)} + BW_{\text{Channel}(2)} - 0.1|BW_{\text{Channel}(1)} - BW_{\text{Channel}(2)}|}{0.6} \right\rceil 0.3 \text{ [MHz]}$$

**<Two Carrier power verification>**

Configure	PCC							SCC				Power		CA Configuration (BCS)
	LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)	
Inter-Band	5	10	836.5	20525	QPSK	1	0	25	20	1960	8340	23.81	23.86	CA_5A-25A
	5	10	836.5	20525	QPSK	1	0	41	20	2593	40620	23.79	23.86	CA_5A-41A
	7	20	2535	21100	QPSK	1	0	38	20	2595	38000	24.62	24.68	CA_7A-38A
	12	10	711	23130	QPSK	1	0	25	20	1960	8340	23.90	23.92	CA_12A-25A
	4	20	1745	20300	QPSK	1	0	41	20	2593	40620	24.40	24.47	CA_4A-41A

**<Three Carrier power verification>**

Configure	PCC							SCC1				SCC2				Power		CA Configuration (BCS)
	LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)	
Inter-Band	2	10	1880	18900	QPSK	1	0	4	10	2132.5	2175	17	10	740	5790	24.43	24.46	CA_2A-4A-17A
	5	10	831.6	20476	QPSK	1	0	5	10	886.5	2575	38	20	2595	38000	23.82	23.86	CA_5B-38A



<Four Carrier power verification>

Configure	PCC								SCC1				SCC2				SCC3				Power		CA Configuration (BCS)
	LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)		
Inter-Band	2	20	1880	18900	QPSK	1	0	2	5	1987.5	1175	4	20	2132.5	2175	12	10	737.5	5095	24.44	24.48	CA_2A-2A-4A-12A	
	2	20	1880	18900	QPSK	1	0	2	5	1987.5	1175	7	20	2655	3100	12	10	737.5	5095	24.40	24.48	CA_2A-2A-7A-12A	
	2	20	1880	18900	QPSK	1	0	4	20	2132.5	2175	7	20	2655	3100	7	5	2687.5	3425	24.38	24.48	CA_2A-4A-7A-7A	
	4	20	1745	20300	QPSK	1	0	7	20	2655	3100	12	10	740	5120	12	5	732.8	5048	24.39	24.47	CA_4A-7A-12B	
	7	20	2535	21100	QPSK	1	0	12	10	737.5	5095	66	20	2155	66886	66	5	2197.5	67311	24.59	24.68	CA_7A-12A-66A-66A	
	2	20	1880	18900	QPSK	1	0	5	10	881.5	2525	7	20	2605	3100	7	5	2687.5	3425	24.41	24.48	CA_2A-5A-7A-7A	

<Five Carrier power verification>

Configure	PCC								SCC1				SCC2				SCC3				SCC4				Power		CA Configuration (BCS)
	LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)		
Inter-Band	2	20	1880	18900	QPSK	1	0	2	5	1987.5	1175	12	10	737.5	5095	66	20	2155	66886	66	5	2197.5	67311	24.37	24.48	CA_2A-2A-12A-66A-66A	
	2	20	1880	18900	QPSK	1	0	2	5	1987.5	1175	4	20	2132.5	2175	4	5	2152.5	2375	5	10	881.5	2525	24.40	24.48	CA_2A-2A-4A-4A-5A	
	2	20	1880	18900	QPSK	1	0	2	5	1987.5	1175	5	10	881.5	2525	66	20	2155	66886	66	5	2197.5	67311	24.36	24.48	CA_2A-2A-5A-66A-66A	
	2	20	1880	18900	QPSK	1	0	7	20	2655	3100	7	5	2687.5	3425	66	20	2155	66886	66	5	2197.5	67311	24.33	24.48	CA_2A-7A-7A-66A-66A	
	5	10	836.5	20525	QPSK	1	0	7	20	2655	3100	7	20	2674.8	3298	66	20	2155	66886	66	5	2197.5	67311	23.77	23.86	CA_5A-7C-66A-66A	
	25	20	1880	26340	QPSK	1	0	25	5	1992.5	8665	41	20	2593	40620	41	20	2612.8	40818	41	20	2632.6	41016	24.13	24.21	CA_25A-25A-41D	
	7	20	2535	21100	QPSK	1	0	7	5	2687.5	3425	25	20	1960	8340	25	5	1992.5	8665	66	20	2155	66886	24.59	24.68	CA_7A-7A-25A-25A-66A	



<LTE Uplink carrier aggregation>

2CC Uplink Carrier Aggregation	
Number	Combination
1	CA_5B
2	CA_7C
3	CA_38C
4	CA_41C

<Intra-band>

General Note:

- i. The device supports intra-band uplink carrier aggregation with a maximum of two 20MHz component carriers. For intra band contiguous carrier aggregation scenarios, 3GPP 36.101 table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when not-contiguous RB allocation is implemented. The conducted power and MPR setting in this device are permanently implemented pre 3GPP requirement.
- ii. According TCB workshop, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.
- iii. Uplink CA is only operating with power class3, and additional SAR measurement for LTE UL CA whit other DL CA combinations active were not required since the maximum output power for this configuration was not > 0.25dB higher than the maximum output power for UL CA active.
- iv. For Intra-band, contiguous CA, the channels selected to perform the uplink power measurement must satisfy 3GPP channel spacing (5.4.1A of 3GPP TS 36.521 or equivalent) and channel bandwidth (5.4.2A) requirements.

**TX 0**

Index 1/2/3/4/5								
CA_5B_Ant 0								
Combination 10MHz+10MHz (50RB+50RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
20450	20549	QPSK	1	49	1	0	22.42	24
20525	20426	QPSK	1	0	1	49	22.39	24
20600	20501	QPSK	1	0	1	49	22.41	24

Index 6								
CA_5B_Ant 0								
Combination 10MHz+10MHz (50RB+50RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
20450	20549	QPSK	1	49	1	0	22.42	23.9
20525	20426	QPSK	1	0	1	49	22.39	23.9
20600	20501	QPSK	1	0	1	49	22.41	23.9



Index 1/2/3								
CA_7C_Ant 2								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
20850	21048	QPSK	1	99	1	0	22.58	24
21100	20902	QPSK	1	0	1	99	22.42	24
21350	21152	QPSK	1	0	1	99	22.6	24

Index 4								
CA_7C_Ant 2								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
20850	21048	QPSK	1	99	1	0	19.6	19.7
21100	20902	QPSK	1	0	1	99	19.69	19.7
21350	21152	QPSK	1	0	1	99	19.63	19.7

Index 5/6								
CA_7C_Ant 2								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
20850	21048	QPSK	1	99	1	0	19.6	20.5
21100	20902	QPSK	1	0	1	99	19.69	20.5
21350	21152	QPSK	1	0	1	99	19.63	20.5

Index 1/2/3/4/5/6								
CA_38C_Ant 2								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
37850	38048	QPSK	1	99	1	0	11.60	12.80
38000	37802	QPSK	1	0	1	99	11.97	12.80
38150	37952	QPSK	1	0	1	99	11.91	12.80

Index 1/2/3/4/5/6								
CA_41C_Ant 2								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
39750	39948	QPSK	1	99	1	0	11.57	12.8
40185	39987	QPSK	1	0	1	99	11.85	12.8
40620	40422	QPSK	1	0	1	99	11.67	12.8
41055	40857	QPSK	1	0	1	99	11.83	12.8
41490	41292	QPSK	1	0	1	99	11.59	12.8





**TX 1**

Index 1/4/5/6								
CA_5B_Ant 1								
Combination 10MHz+10MHz (50RB+50RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
20450	20549	QPSK	1	49	1	0	22.01	23.5
20525	20426	QPSK	1	0	1	49	22.02	23.5
20600	20501	QPSK	1	0	1	49	22	23.5

Index 2								
CA_5B_Ant 1								
Combination 10MHz+10MHz (50RB+50RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
20450	20549	QPSK	1	49	1	0	21.06	22.5
20525	20426	QPSK	1	0	1	49	21.16	22.5
20600	20501	QPSK	1	0	1	49	21.14	22.5

Index 3								
CA_5B_Ant 1								
Combination 10MHz+10MHz (50RB+50RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
20450	20549	QPSK	1	49	1	0	21.06	21.7
20525	20426	QPSK	1	0	1	49	21.16	21.7
20600	20501	QPSK	1	0	1	49	21.14	21.7

Index 1/2/3								
CA_7C_Ant 0								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
20850	21048	QPSK	1	99	1	0	22.48	23.5
21100	20902	QPSK	1	0	1	99	22.38	23.5
21350	21152	QPSK	1	0	1	99	22.47	23.5

Index 4								
CA_7C_Ant 0								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
20850	21048	QPSK	1	99	1	0	19.96	20.2
21100	20902	QPSK	1	0	1	99	20.05	20.2
21350	21152	QPSK	1	0	1	99	19.96	20.2

Index 5/6								
CA_7C_Ant 0								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
20850	21048	QPSK	1	99	1	0	19.96	20.6
21100	20902	QPSK	1	0	1	99	20.05	20.6
21350	21152	QPSK	1	0	1	99	19.96	20.6



Index 1/2/3/4/5/6								
CA_38C_Ant 0								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
37850	38048	QPSK	1	99	1	0	11.04	12.30
38000	37802	QPSK	1	0	1	99	11.38	12.30
38150	37952	QPSK	1	0	1	99	11.28	12.30

Index 1/2/3/4/5/6								
CA_41C_Ant 0								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
39750	39948	QPSK	1	99	1	0	11.09	12.3
40185	39987	QPSK	1	0	1	99	11.34	12.3
40620	40422	QPSK	1	0	1	99	11.18	12.3
41055	40857	QPSK	1	0	1	99	11.13	12.3
41490	41292	QPSK	1	0	1	99	11.15	12.3

**16. 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

Positions for SAR tests; Hotspot mode						
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

**General Note:**

- 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
- The antenna location is illustrated in the Appendix E.



### 17. 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

#### 17.1 Head SAR

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	Right Cheek	0mm	Ant 4+3(4)	1	6	2437	13.40	13.50	1.023	98.24	1.018	0.14	0.166	0.173	-1%
		WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 4+3(3)	1	6	2437	12.90	13.00	1.023	98.24	1.018	0.14	0.515	0.536	
	2nd	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 4+3(4)	1	6	2437	13.30	13.50	1.047	98	1.020	-0.12	0.179	0.191	-1%
		WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 4+3(3)	1	6	2437	12.70	13.00	1.072	98	1.020	-0.12	0.485	0.530	
01	1st	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 4+3(4)	2	6	2437	16.40	16.50	1.023	98.24	1.018	-0.13	1.150	1.198	-2%
		WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 4+3(3)	2	6	2437	15.10	15.50	1.096	98.24	1.018	-0.13	0.131	0.146	
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 4+3(4)	2	6	2437	16.30	16.50	1.047	98	1.020	-0.16	1.100	1.175		
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 4+3(3)	2	6	2437	15.10	15.50	1.096	98	1.020	-0.16	0.152	0.170		
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(4)	1	58	5290	9.70	10.00	1.072	100	1.000	-0.06	0.044	0.047	-9%
		WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(3)	1	58	5290	7.70	8.00	1.072	100	1.000	-0.06	0.140	0.150	
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(4)	1	58	5290	9.70	10.00	1.072	99.3	1.007	-0.02	0.047	0.051	
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 4+3(3)	1	58	5290	7.70	8.00	1.072	99.3	1.007	-0.02	0.126	0.136	
02	1st	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 4+3(4)	2	62	5310	17.60	18.00	1.096	100	1.000	-0.09	0.458	0.502	-9%
		WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 4+3(3)	2	62	5310	16.00	16.50	1.122	100	1.000	-0.09	1.050	1.178	
	2nd	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 4+3(4)	2	62	5310	17.60	18.00	1.096	100	1.000	-0.11	0.477	0.523	
	2nd	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 4+3(3)	2	62	5310	16.50	16.50	1.000	100	1.000	-0.11	1.070	1.070	
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4+3(4)	1	106	5530	6.10	6.50	1.096	100	1.000	0.02	0.109	0.120	-8%
		WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4+3(3)	1	106	5530	8.90	9.00	1.023	100	1.000	0.02	0.035	0.036	
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4+3(4)	1	106	5530	5.70	6.50	1.202	99.3	1.007	-0.03	0.091	0.110	
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4+3(3)	1	106	5530	9.00	9.00	1.000	99.3	1.007	-0.03	0.070	0.070	
03	1st	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 4+3(4)	2	102	5510	14.40	15.50	1.288	100	1.000	-0.05	0.357	0.460	-26%
		WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 4+3(3)	2	102	5510	16.80	17.50	1.175	100	1.000	-0.05	0.867	1.019	
	2nd	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 4+3(4)	2	102	5510	14.40	15.50	1.288	99.6	1.004	0.06	0.547	0.707	
	2nd	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 4+3(3)	2	102	5510	16.80	17.50	1.175	99.6	1.004	0.06	0.640	0.755	
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4+3(4)	1	155	5775	8.40	8.50	1.023	100	1.000	-0.03	0.129	0.132	-21%
		WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4+3(3)	1	155	5775	12.70	13.00	1.072	100	1.000	-0.03	0.069	0.074	
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4+3(4)	1	155	5775	8.30	8.50	1.047	99.3	1.007	0.04	0.099	0.104	
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4+3(3)	1	155	5775	11.90	13.00	1.288	99.3	1.007	0.04	0.041	0.053	
04	1st	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 4+3(4)	2	165	5825	15.60	16.50	1.230	100	1.000	-0.16	0.907	1.116	-3%
		WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 4+3(3)	2	165	5825	18.60	19.00	1.096	100	1.000	-0.16	0.374	0.410	
	2nd	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 4+3(4)	2	165	5825	15.00	16.50	1.413	99.2	1.008	0.02	0.760	1.082	
	2nd	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 4+3(3)	2	165	5825	17.90	19.00	1.288	99.2	1.008	0.02	0.506	0.657	
	1st	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4+3(4)	1	171	5855	8.40	8.50	1.023	100	1.000	0.09	0.142	0.145	-8%
		WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4+3(3)	1	171	5855	11.80	12.00	1.047	100	1.000	0.09	0.069	0.072	
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4+3(4)	1	171	5855	8.20	8.50	1.072	99.3	1.007	0.15	0.123	0.133	
	2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 4+3(3)	1	171	5855	11.10	12.00	1.230	99.3	1.007	0.15	0.070	0.087	
05	1st	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 4+3(4)	2	177	5885	15.60	16.00	1.096	100	1.000	-0.15	1.080	1.184	-6%
		WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 4+3(3)	2	177	5885	16.40	17.00	1.148	100	1.000	-0.15	0.350	0.402	
	2nd	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 4+3(4)	2	177	5885	15.80	16.00	1.047	99.2	1.008	0.11	1.050	1.108	
	2nd	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 4+3(3)	2	177	5885	15.60	17.00	1.380	99.2	1.008	0.11	0.445	0.619	



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^2)	Deviation (%)
	1st	WLAN6GHz	802.11ax-HE80 MCS0	Right Cheek	0mm	Ant 4+3(4)	1/2	167	6785	8.00	9.00	1.259	100	1.000	0.15	0.001	0.001	0.001	-53%
		WLAN6GHz	802.11ax-HE80 MCS0	Right Cheek	0mm	Ant 4+3(3)	1/2	167	6785	8.70	9.00	1.072	100	1.000	0.15	0.181	0.194	0.964	
06	2nd	WLAN6GHz	802.11ax-HE80 MCS0	Right Cheek	0mm	Ant 4+3(4)	1/2	167	6785	7.60	9.00	1.380	95.8	1.044	-0.04	0.001	0.001	0.001	
		WLAN6GHz	802.11ax-HE80 MCS0	Right Cheek	0mm	Ant 4+3(3)	1/2	167	6785	8.40	9.00	1.148	95.8	1.044	-0.04	0.077	0.092	0.311	

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	Bluetooth	1Mbps	Left Tilted	0mm	Ant 4	1	39	2441	11.99	12.00	1.002	77.22	1.079	-0.11	0.434	0.469	0%
07	2nd	Bluetooth	1Mbps	Left Tilted	0mm	Ant 4	1	39	2441	11.80	12.00	1.047	77.22	1.079	-0.12	0.414	0.468	
	1st	Bluetooth	1Mbps	Right Cheek	0mm	Ant 3	1	78	2480	11.88	12.00	1.028	76.83	1.084	-0.13	0.356	0.397	-1%
	2nd	Bluetooth	1Mbps	Right Cheek	0mm	Ant 3	1	78	2480	11.90	12.00	1.023	76.83	1.084	-0.13	0.356	0.395	

17.2 Hotspot SAR

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+3(4)	3	1	2412	19.40	19.50	1.023	98.24	1.018	-0.14	0.572	0.596	0%
		WLAN2.4GHz	802.11b 1Mbps	Top Side	10mm	Ant 4+3(3)	3	1	2412	18.40	18.50	1.023	98.24	1.018	-0.14	0.473	0.493	
08	2nd	WLAN2.4GHz	802.11b 1Mbps	Top Side	10mm	Ant 4+3(4)	3	1	2412	19.40	19.50	1.023	98	1.020	-0.17	0.570	0.595	
		WLAN2.4GHz	802.11b 1Mbps	Top Side	10mm	Ant 4+3(3)	3	1	2412	18.30	18.50	1.047	98	1.020	-0.17	0.459	0.490	
	1st	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	3	44	5220	18.40	19.00	1.148	100	1.000	-0.17	0.166	0.191	-19%
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	3	44	5220	18.10	19.00	1.230	100	1.000	-0.17	0.331	0.407	
09	2nd	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	3	44	5220	18.50	19.00	1.122	99.2	1.008	-0.03	0.130	0.147	
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	3	44	5220	18.40	19.00	1.148	99.2	1.008	-0.03	0.286	0.331	
	1st	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	3	157	5785	18.90	19.00	1.023	100	1.000	-0.1	0.415	0.425	-9%
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	3	157	5785	18.80	19.00	1.047	100	1.000	-0.1	0.095	0.099	
10	2nd	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	3	157	5785	18.60	19.00	1.096	99.2	1.008	-0.11	0.349	0.386	
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	3	157	5785	18.80	19.00	1.047	99.2	1.008	-0.11	0.097	0.102	
	1st	Bluetooth	1Mbps	Top Side	10mm	Ant 4	4	78	2480	14.62	15.00	1.091	77.22	1.079	-0.04	0.242	0.285	-30%
	2nd	Bluetooth	1Mbps	Top Side	10mm	Ant 4	4	78	2480	14.62	15.00	1.091	77.22	1.079	-0.01	0.170	0.200	
	1st	Bluetooth	1Mbps	Left Side	10mm	Ant 3	4	39	2441	14.53	15.00	1.114	76.83	1.084	-0.12	0.196	0.237	-1%
11	2nd	Bluetooth	1Mbps	Left Side	10mm	Ant 3	4	39	2441	14.64	15.00	1.086	76.83	1.000	-0.17	0.199	0.234	



17.3 Body-Worn SAR

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	Front	10mm	Ant 4+3(4)	4/5/6	6	2437	19.80	20.00	1.047	98.24	1.018	-0.17	0.420	0.448	-8%
		WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Ant 4+3(3)	4/5/6	6	2437	19.80	20.00	1.047	98.24	1.018	-0.17	0.522	0.556	
12	2nd	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Ant 4+3(4)	4/5/6	6	2437	19.70	20.00	1.072	98.24	1.018	-0.18	0.350	0.382	-8%
		WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Ant 4+3(3)	4/5/6	6	2437	19.80	20.00	1.047	98.24	1.018	-0.18	0.481	0.513	
	1st	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	4/6	60	5300	18.50	19.00	1.122	100	1.000	-0.13	0.177	0.199	-7%
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	4/6	60	5300	18.10	19.00	1.230	100	1.000	-0.13	0.375	0.461	
13	2nd	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	4/6	60	5300	18.50	19.00	1.122	99.2	1.008	-0.04	0.117	0.132	-7%
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	4/6	60	5300	17.60	19.00	1.380	99.2	1.008	-0.04	0.310	0.431	
	1st	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	5	44	5220	18.40	19.00	1.148	100	1.000	-0.17	0.166	0.191	-19%
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	5	44	5220	18.10	19.00	1.230	100	1.000	-0.17	0.331	0.407	
	2nd	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	5	44	5220	18.50	19.00	1.122	99.2	1.008	-0.03	0.130	0.147	-19%
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	5	44	5220	18.40	19.00	1.148	99.2	1.008	-0.03	0.286	0.331	
	1st	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	4/5/6	144	5720	18.10	19.00	1.230	100	1.000	-0.12	0.339	0.417	-20%
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	4/5/6	144	5720	17.90	19.00	1.288	100	1.000	-0.12	0.062	0.080	
14	2nd	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	4/5/6	144	5720	17.50	19.00	1.413	99.2	1.008	-0.12	0.234	0.333	-20%
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	4/5/6	144	5720	18.00	19.00	1.259	99.2	1.008	-0.12	0.055	0.070	
	1st	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	4/5/6	157	5785	18.90	19.00	1.023	100	1.000	-0.1	0.415	0.425	-9%
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	4/5/6	157	5785	18.80	19.00	1.047	100	1.000	-0.1	0.095	0.099	
15	2nd	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	4/5/6	157	5785	18.60	19.00	1.096	99.2	1.008	-0.11	0.349	0.386	-9%
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	4/5/6	157	5785	18.80	19.00	1.047	99.2	1.008	-0.11	0.097	0.102	
	1st	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	4/6	173	5865	17.10	19.00	1.549	100	1.000	-0.13	0.356	0.551	-35%
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	4/6	173	5865	17.80	19.00	1.318	100	1.000	-0.13	0.128	0.169	
16	2nd	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	4/6	173	5865	17.50	19.00	1.413	99.2	1.008	-0.1	0.253	0.360	-35%
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	4/6	173	5865	17.10	19.00	1.549	99.2	1.008	-0.1	0.124	0.194	
	1st	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	5	173	5865	17.10	18.00	1.230	100	1.000	-0.13	0.356	0.438	-35%
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	5	173	5865	17.80	19.00	1.318	100	1.000	-0.13	0.128	0.169	
	2nd	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(4)	5	173	5865	17.50	18.00	1.122	99.2	1.008	-0.1	0.253	0.286	-35%
		WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 4+3(3)	5	173	5865	17.10	19.00	1.549	99.2	1.008	-0.1	0.124	0.194	

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> )	Deviation (%)
	1st	WLAN6GHz	802.11ax-HE80 MCS0	Back	10mm	Ant 4+3(4)	4/5/6	167	6785	8.00	9.00	1.259	100	1.000	-0.09	0.001	0.001	0.001	-41%
		WLAN6GHz	802.11ax-HE80 MCS0	Back	10mm	Ant 4+3(3)	4/5/6	167	6785	8.70	9.00	1.072	100	1.000	-0.09	0.106	0.114	0.856	
17	2nd	WLAN6GHz	802.11ax-HE80 MCS0	Back	10mm	Ant 4+3(4)	4/5/6	167	6785	7.60	9.00	1.380	95.8	1.044	-0.08	0.001	0.001	0.001	-41%
		WLAN6GHz	802.11ax-HE80 MCS0	Back	10mm	Ant 4+3(3)	4/5/6	167	6785	8.40	9.00	1.148	95.8	1.044	-0.08	0.056	0.067	0.448	

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	Bluetooth	1Mbps	Front	10mm	Ant 4	2/3	0	2402	18.44	20.00	1.434	77.1	1.080	-0.06	0.304	0.471	-2%
	2nd	Bluetooth	1Mbps	Front	10mm	Ant 4	2/3	0	2402	18.11	20.00	1.545	76.83	1.084	-0.07	0.275	0.461	
18	1st	Bluetooth	1Mbps	Front	10mm	Ant 3	2/3	78	2480	18.33	20.00	1.468	77.1	1.080	0	0.353	0.560	-3%
	2nd	Bluetooth	1Mbps	Front	10mm	Ant 3	2/3	78	2480	18.18	20.00	1.521	76.83	1.084	0.08	0.329	0.542	
	1st	Bluetooth	1Mbps	Front	10mm	Ant 4	4	39	2441	14.99	15.00	1.002	77.22	1.079	-0.11	0.122	0.132	-27%
	2nd	Bluetooth	1Mbps	Front	10mm	Ant 4	4	39	2441	14.50	15.00	1.122	77.22	1.079	-0.07	0.080	0.097	
	1st	Bluetooth	1Mbps	Front	10mm	Ant 3	4	78	2480	14.98	15.00	1.005	76.83	1.084	-0.03	0.128	0.139	-4%
	2nd	Bluetooth	1Mbps	Front	10mm	Ant 3	4	78	2480	14.84	15.00	1.038	76.83	1.084	-0.06	0.118	0.133	

**17.4 Product Specific SAR**

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 10g SAR (W/kg)	Reported 10g SAR (W/kg)	Deviation (%)
	1st	WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 4+3(4)	4/6	64	5320	18.50	19.00	1.122	100	1.000	0.13	0.001	0.001	-10%
		WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 4+3(3)	4/6	64	5320	18.10	19.00	1.230	100	1.000	0.13	1.820	2.239	
19	2nd	WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 4+3(4)	4/6	64	5320	18.40	19.00	1.148	99.2	1.008	0.15	0.001	0.001	-10%
		WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 4+3(3)	4/6	64	5320	18.10	19.00	1.230	99.2	1.008	0.15	1.620	2.009	
	1st	WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 4+3(4)	5	60	5300	18.80	19.00	1.047	100	1.000	0.01	0.001	0.001	-24%
		WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 4+3(3)	5	60	5300	17.90	18.00	1.023	100	1.000	0.01	1.700	1.740	
	2nd	WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 4+3(4)	5	60	5300	18.50	19.00	1.122	99.2	1.008	-0.12	0.001	0.001	-24%
		WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 4+3(3)	5	60	5300	17.60	18.00	1.096	99.2	1.008	-0.12	1.200	1.326	
	1st	WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 4+3(4)	4/5/6	100	5500	18.00	19.00	1.259	100	1.000	-0.13	0.001	0.001	-11%
		WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 4+3(3)	4/5/6	100	5500	18.10	19.00	1.230	100	1.000	-0.13	0.861	1.059	
20	2nd	WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 4+3(4)	4/5/6	100	5500	17.00	19.00	1.585	99.2	1.008	0.07	0.001	0.002	-11%
		WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 4+3(3)	4/5/6	100	5500	18.20	19.00	1.202	99.2	1.008	0.07	0.777	0.942	
	1st	WLAN5GHz	802.11a 6Mbps	Front	0mm	Ant 4+3(4)	4/6	173	5865	17.10	19.00	1.549	100	1.000	-0.04	1.120	1.735	-21%
		WLAN5GHz	802.11a 6Mbps	Front	0mm	Ant 4+3(3)	4/6	173	5865	17.80	19.00	1.318	100	1.000	-0.04	0.664	0.875	
21	2nd	WLAN5GHz	802.11a 6Mbps	Front	0mm	Ant 4+3(4)	4/6	173	5865	17.50	19.00	1.413	99.2	1.008	-0.19	0.957	1.363	-21%
		WLAN5GHz	802.11a 6Mbps	Front	0mm	Ant 4+3(3)	4/6	173	5865	17.10	19.00	1.549	99.2	1.008	-0.19	0.569	0.888	
	1st	WLAN5GHz	802.11a 6Mbps	Front	0mm	Ant 4+3(4)	5	173	5865	17.10	18.00	1.230	100	1.000	-0.04	1.120	1.378	-21%
		WLAN5GHz	802.11a 6Mbps	Front	0mm	Ant 4+3(3)	5	173	5865	17.80	19.00	1.318	100	1.000	-0.04	0.664	0.875	
	2nd	WLAN5GHz	802.11a 6Mbps	Front	0mm	Ant 4+3(4)	5	173	5865	17.50	18.00	1.122	99.2	1.008	-0.19	0.957	1.082	-21%
		WLAN5GHz	802.11a 6Mbps	Front	0mm	Ant 4+3(3)	5	173	5865	17.10	19.00	1.549	99.2	1.008	-0.19	0.569	0.888	

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 10g SAR (W/kg)	Reported 10g SAR (W/kg)	Measured APD (W/m^2)	Deviation (%)
	1st	WLAN6GHz	802.11ax-HE80 MCS0	Back	0mm	Ant 4+3(4)	4/5/6	167	6785	8.00	9.00	1.259	100	1.000	0.14	0.033	0.042	0.745	-39%
		WLAN6GHz	802.11ax-HE80 MCS0	Back	0mm	Ant 4+3(3)	4/5/6	167	6785	8.70	9.00	1.072	100	1.000	0.14	0.166	0.178	3.880	
22	2nd	WLAN6GHz	802.11ax-HE80 MCS0	Back	0mm	Ant 4+3(4)	4/5/6	167	6785	7.60	9.00	1.380	95.8	1.044	0.09	0.017	0.024	0.408	-39%
		WLAN6GHz	802.11ax-HE80 MCS0	Back	0mm	Ant 4+3(3)	4/5/6	167	6785	8.40	9.00	1.148	95.8	1.044	0.09	0.091	0.109	2.140	

**Conclusion:**

The spot check results don't show the SAR increase more than 30%, and all below 1.2W/kg for 1-g SAR, below 3W/kg for 10-g SAR. Referring to the guidance in the KDB inquiry, SAR data reuse is justified.



## 18. SAR Test Results

### General Note:

4. 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
  - c. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix  $63.3\%/62.9\% = 1.006$  is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)\* Tune-up Scaling Factor\* scaling factor for extended cyclic prefix.
5. 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
6. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is  $\geq 0.8$ W/kg.
7. 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.
8. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension  $> 15$ cm or an overall diagonal dimension  $> 16$ cm, when hotspot mode applies, 10-g product specific SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR  $> 1.2$  W/kg, in this report all the hotspot mode results are  $< 1.2$ W/kg.

### 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. For LTE B4/B5/B12/B17/B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE band 2/4/17/38 SAR test was covered by Band 25/66/12/41; 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 n5/n12/n41/n71/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 was performed using Factory Test Mode software to establish the connection and perform SAR with 100% transmission.
  - g. Antenna 1 and 5 for n77 is used as SRS dedicated antennas, i.e., the antenna(s) are used for receive and Sound Reference Signal transmission (SRS) only (not traffic transmission), RF Exposure was performed using Factory Test Mode software to establish the connection and perform SAR with 100% transmission.



18.1 Head 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)
	GSM850_Ant 0	GPRS (4 Tx slots)	Right Cheek	0mm	2/3	128	824.2	29.41	30.50	1.285	-0.04	0.401	0.515
	GSM850_Ant 0	GPRS (4 Tx slots)	Right Tilted	0mm	2/3	128	824.2	29.41	30.50	1.285	-0.04	0.204	0.262
	GSM850_Ant 0	GPRS (4 Tx slots)	Left Cheek	0mm	2/3	128	824.2	29.41	30.50	1.285	-0.01	0.503	0.646
	GSM850_Ant 0	GPRS (4 Tx slots)	Left Tilted	0mm	2/3	128	824.2	29.41	30.50	1.285	0.19	0.243	0.312
	GSM850_Ant 1	GPRS (4 Tx slots)	Right Cheek	0mm	2	128	824.2	26.66	27.60	1.242	-0.02	0.953	1.183
23	GSM850_Ant 1	GPRS (4 Tx slots)	Right Cheek	0mm	2	189	836.4	26.52	27.60	1.282	-0.08	0.930	1.193
	GSM850_Ant 1	GPRS (4 Tx slots)	Right Cheek	0mm	2	251	848.8	26.23	27.60	1.371	-0.02	0.849	1.164
	GSM850_Ant 1	GPRS (4 Tx slots)	Right Tilted	0mm	2	128	824.2	26.66	27.60	1.242	-0.03	0.803	0.997
	GSM850_Ant 1	GPRS (4 Tx slots)	Right Tilted	0mm	2	189	836.4	26.52	27.60	1.282	0.06	0.756	0.969
	GSM850_Ant 1	GPRS (4 Tx slots)	Right Tilted	0mm	2	251	848.8	26.23	27.60	1.371	-0.01	0.692	0.949
	GSM850_Ant 1	GPRS (4 Tx slots)	Left Cheek	0mm	2	128	824.2	26.66	27.60	1.242	0.03	0.539	0.669
	GSM850_Ant 1	GPRS (4 Tx slots)	Left Tilted	0mm	2	128	824.2	26.66	27.60	1.242	-0.03	0.456	0.566
	GSM850_Ant 1	GPRS (4 Tx slots)	Right Cheek	0mm	3	128	824.2	26.66	26.80	1.033	-0.02	0.953	0.984
	GSM850_Ant 1	GPRS (4 Tx slots)	Right Cheek	0mm	3	189	836.4	26.52	26.80	1.067	-0.08	0.930	0.992
	GSM850_Ant 1	GPRS (4 Tx slots)	Right Cheek	0mm	3	251	848.8	26.23	26.80	1.140	-0.02	0.849	0.968
	GSM850_Ant 1	GPRS (4 Tx slots)	Right Tilted	0mm	3	128	824.2	26.66	26.80	1.033	-0.03	0.803	0.829
	GSM850_Ant 1	GPRS (4 Tx slots)	Right Tilted	0mm	3	189	836.4	26.52	26.80	1.067	0.06	0.756	0.806
	GSM850_Ant 1	GPRS (4 Tx slots)	Right Tilted	0mm	3	251	848.8	26.23	26.80	1.140	-0.01	0.692	0.789
	GSM850_Ant 1	GPRS (4 Tx slots)	Left Cheek	0mm	3	128	824.2	26.66	26.80	1.033	0.03	0.539	0.557
	GSM850_Ant 1	GPRS (4 Tx slots)	Left Tilted	0mm	3	128	824.2	26.66	26.80	1.033	-0.03	0.456	0.471
	GSM1900_Ant 2	GPRS (4 Tx slots)	Right Cheek	0mm	2/3	810	1909.8	26.84	28.00	1.306	0.08	0.358	0.468
	GSM1900_Ant 2	GPRS (4 Tx slots)	Right Tilted	0mm	2/3	810	1909.8	26.84	28.00	1.306	0	0.127	0.166
	GSM1900_Ant 2	GPRS (4 Tx slots)	Left Cheek	0mm	2/3	810	1909.8	26.84	28.00	1.306	-0.17	0.198	0.259
	GSM1900_Ant 2	GPRS (4 Tx slots)	Left Tilted	0mm	2/3	810	1909.8	26.84	28.00	1.306	0.11	0.139	0.182
	GSM1900_Ant 0	GPRS (4 Tx slots)	Right Cheek	0mm	2/3	810	1909.8	26.10	27.70	1.445	-0.11	0.224	0.324
	GSM1900_Ant 0	GPRS (4 Tx slots)	Right Tilted	0mm	2/3	810	1909.8	26.10	27.70	1.445	0.04	0.172	0.249
24	GSM1900_Ant 0	GPRS (4 Tx slots)	Left Cheek	0mm	2/3	810	1909.8	26.10	27.70	1.445	0.01	0.382	0.552
	GSM1900_Ant 0	GPRS (4 Tx slots)	Left Tilted	0mm	2/3	810	1909.8	26.10	27.70	1.445	-0.03	0.178	0.257

**<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)
	WCDMA II_Ant 2	RMC 12.2Kbps	Right Cheek	0mm	2/3	9538	1907.6	24.42	25.70	1.343	-0.17	0.495	0.665
	WCDMA II_Ant 2	RMC 12.2Kbps	Right Tilted	0mm	2/3	9538	1907.6	24.42	25.70	1.343	-0.09	0.181	0.243
	WCDMA II_Ant 2	RMC 12.2Kbps	Left Cheek	0mm	2/3	9538	1907.6	24.42	25.70	1.343	-0.12	0.238	0.320
	WCDMA II_Ant 2	RMC 12.2Kbps	Left Tilted	0mm	2/3	9538	1907.6	24.42	25.70	1.343	0.01	0.186	0.250
	WCDMA II_Ant 0	RMC 12.2Kbps	Right Cheek	0mm	2/3	9262	1852.4	23.71	25.20	1.409	-0.05	0.334	0.471
	WCDMA II_Ant 0	RMC 12.2Kbps	Right Tilted	0mm	2/3	9262	1852.4	23.71	25.20	1.409	0.1	0.248	0.350
25	WCDMA II_Ant 0	RMC 12.2Kbps	Left Cheek	0mm	2/3	9262	1852.4	23.71	25.20	1.409	-0.18	0.541	0.762
	WCDMA II_Ant 0	RMC 12.2Kbps	Left Tilted	0mm	2/3	9262	1852.4	23.71	25.20	1.409	0.13	0.216	0.304
26	WCDMA IV_Ant 2	RMC 12.2Kbps	Right Cheek	0mm	2/3	1312	1712.4	24.52	25.70	1.312	-0.19	0.471	0.618
	WCDMA IV_Ant 2	RMC 12.2Kbps	Right Tilted	0mm	2/3	1312	1712.4	24.52	25.70	1.312	-0.01	0.229	0.300
	WCDMA IV_Ant 2	RMC 12.2Kbps	Left Cheek	0mm	2/3	1312	1712.4	24.52	25.70	1.312	-0.18	0.250	0.328
	WCDMA IV_Ant 2	RMC 12.2Kbps	Left Tilted	0mm	2/3	1312	1712.4	24.52	25.70	1.312	0.03	0.268	0.352
	WCDMA IV_Ant 0	RMC 12.2Kbps	Right Cheek	0mm	2/3	1312	1712.4	23.90	25.20	1.349	-0.06	0.185	0.250
	WCDMA IV_Ant 0	RMC 12.2Kbps	Right Tilted	0mm	2/3	1312	1712.4	23.90	25.20	1.349	-0.01	0.160	0.216
	WCDMA IV_Ant 0	RMC 12.2Kbps	Left Cheek	0mm	2/3	1312	1712.4	23.90	25.20	1.349	-0.15	0.400	0.540
	WCDMA IV_Ant 0	RMC 12.2Kbps	Left Tilted	0mm	2/3	1312	1712.4	23.90	25.20	1.349	0.11	0.185	0.250
	WCDMA V_Ant 0	RMC 12.2Kbps	Right Cheek	0mm	2/3	4132	826.4	24.20	25.00	1.202	-0.13	0.236	0.284
	WCDMA V_Ant 0	RMC 12.2Kbps	Right Tilted	0mm	2/3	4132	826.4	24.20	25.00	1.202	0.09	0.138	0.166
	WCDMA V_Ant 0	RMC 12.2Kbps	Left Cheek	0mm	2/3	4132	826.4	24.20	25.00	1.202	0.02	0.303	0.364
	WCDMA V_Ant 0	RMC 12.2Kbps	Left Tilted	0mm	2/3	4132	826.4	24.20	25.00	1.202	0.14	0.129	0.155
27	WCDMA V_Ant 1	RMC 12.2Kbps	Right Cheek	0mm	2	4132	826.4	22.60	23.60	1.259	-0.09	0.932	1.173
	WCDMA V_Ant 1	RMC 12.2Kbps	Right Cheek	0mm	2	4182	836.4	22.56	23.60	1.271	-0.07	0.893	1.135
	WCDMA V_Ant 1	RMC 12.2Kbps	Right Cheek	0mm	2	4233	846.6	22.50	23.60	1.288	-0.07	0.820	1.056
	WCDMA V_Ant 1	RMC 12.2Kbps	Right Tilted	0mm	2	4132	826.4	22.60	23.60	1.259	-0.01	0.819	1.031
	WCDMA V_Ant 1	RMC 12.2Kbps	Right Tilted	0mm	2	4182	836.4	22.56	23.60	1.271	-0.07	0.747	0.949
	WCDMA V_Ant 1	RMC 12.2Kbps	Right Tilted	0mm	2	4233	846.6	22.50	23.60	1.288	0.02	0.718	0.925
	WCDMA V_Ant 1	RMC 12.2Kbps	Left Cheek	0mm	2	4132	826.4	22.60	23.60	1.259	-0.03	0.593	0.747
	WCDMA V_Ant 1	RMC 12.2Kbps	Left Tilted	0mm	2	4132	826.4	22.60	23.60	1.259	-0.02	0.582	0.733
	WCDMA V_Ant 1	RMC 12.2Kbps	Right Cheek	0mm	3	4132	826.4	22.60	22.80	1.047	-0.09	0.932	0.976
	WCDMA V_Ant 1	RMC 12.2Kbps	Right Cheek	0mm	3	4182	836.4	22.56	22.80	1.057	-0.07	0.893	0.944
	WCDMA V_Ant 1	RMC 12.2Kbps	Right Cheek	0mm	3	4233	846.6	22.50	22.80	1.072	-0.07	0.820	0.879
	WCDMA V_Ant 1	RMC 12.2Kbps	Right Tilted	0mm	3	4132	826.4	22.60	22.80	1.047	-0.01	0.819	0.858
	WCDMA V_Ant 1	RMC 12.2Kbps	Right Tilted	0mm	3	4182	836.4	22.56	22.80	1.057	-0.07	0.747	0.789
	WCDMA V_Ant 1	RMC 12.2Kbps	Right Tilted	0mm	3	4233	846.6	22.50	22.80	1.072	0.02	0.718	0.769
	WCDMA V_Ant 1	RMC 12.2Kbps	Left Cheek	0mm	3	4132	826.4	22.60	22.80	1.047	-0.03	0.593	0.621
	WCDMA V_Ant 1	RMC 12.2Kbps	Left Tilted	0mm	3	4132	826.4	22.60	22.80	1.047	-0.02	0.582	0.609



<FDD 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 5_Ant 0	10M	QPSK	1	0	Right Cheek	0mm	2/3	20525	836.5	23.86	25.70	1.528	-0.07	0.241	0.368
	LTE Band 5_Ant 0	10M	QPSK	25	0	Right Cheek	0mm	2/3	20525	836.5	22.93	24.70	1.503	-0.14	0.206	0.310
	LTE Band 5_Ant 0	10M	QPSK	1	0	Right Tilted	0mm	2/3	20525	836.5	23.86	25.70	1.528	0.02	0.170	0.260
	LTE Band 5_Ant 0	10M	QPSK	25	0	Right Tilted	0mm	2/3	20525	836.5	22.93	24.70	1.503	0.06	0.141	0.212
	LTE Band 5_Ant 0	10M	QPSK	1	0	Left Cheek	0mm	2/3	20525	836.5	23.86	25.70	1.528	-0.02	0.352	0.538
	LTE Band 5_Ant 0	10M	QPSK	25	0	Left Cheek	0mm	2/3	20525	836.5	22.93	24.70	1.503	0.07	0.259	0.389
	LTE Band 5_Ant 0	10M	QPSK	1	0	Left Tilted	0mm	2/3	20525	836.5	23.86	25.70	1.528	0.08	0.155	0.237
	LTE Band 5_Ant 0	10M	QPSK	25	0	Left Tilted	0mm	2/3	20525	836.5	22.93	24.70	1.503	0.03	0.126	0.189
	LTE Band 5B_Ant 0	10M	QPSK	1	49	Left Cheek	0mm	2/3	20450+20549	829	22.42	24.00	1.439	0.06	0.282	0.406
	LTE Band 5_Ant 1	10M	QPSK	1	0	Right Cheek	0mm	2	20525	836.5	23.00	24.20	1.318	-0.16	0.881	1.161
28	LTE Band 5_Ant 1	10M	QPSK	25	0	Right Cheek	0mm	2	20525	836.5	22.99	24.20	1.321	-0.16	0.904	1.194
	LTE Band 5_Ant 1	10M	QPSK	50	0	Right Cheek	0mm	2	20525	836.5	22.98	24.20	1.324	-0.1	0.900	1.192
	LTE Band 5_Ant 1	10M	QPSK	1	0	Right Tilted	0mm	2	20525	836.5	23.00	24.20	1.318	-0.04	0.767	1.011
	LTE Band 5_Ant 1	10M	QPSK	25	0	Right Tilted	0mm	2	20525	836.5	22.99	24.20	1.321	0	0.787	1.040
	LTE Band 5_Ant 1	10M	QPSK	50	0	Right Tilted	0mm	2	20525	836.5	22.98	24.20	1.324	-0.05	0.804	1.065
	LTE Band 5_Ant 1	10M	QPSK	1	0	Left Cheek	0mm	2	20525	836.5	23.00	24.20	1.318	-0.02	0.488	0.643
	LTE Band 5_Ant 1	10M	QPSK	25	0	Left Cheek	0mm	2	20525	836.5	22.99	24.20	1.321	0.01	0.502	0.663
	LTE Band 5_Ant 1	10M	QPSK	1	0	Left Tilted	0mm	2	20525	836.5	23.00	24.20	1.318	0	0.441	0.581
	LTE Band 5_Ant 1	10M	QPSK	25	0	Left Tilted	0mm	2	20525	836.5	22.99	24.20	1.321	0.04	0.446	0.589
	LTE Band 5B_Ant 1	10M	QPSK	1	0	Right Cheek	0mm	2	20525+20426	836.5	21.16	22.50	1.361	0.15	0.630	0.858
	LTE Band 5_Ant 1	10M	QPSK	1	0	Right Cheek	0mm	3	20525	836.5	23.00	23.40	1.096	-0.16	0.881	0.966
	LTE Band 5_Ant 1	10M	QPSK	25	0	Right Cheek	0mm	3	20525	836.5	22.99	23.40	1.099	-0.16	0.904	0.994
	LTE Band 5_Ant 1	10M	QPSK	50	0	Right Cheek	0mm	3	20525	836.5	22.98	23.40	1.102	-0.1	0.900	0.991
	LTE Band 5_Ant 1	10M	QPSK	1	0	Right Tilted	0mm	3	20525	836.5	23.00	23.40	1.096	-0.04	0.767	0.841
	LTE Band 5_Ant 1	10M	QPSK	25	0	Right Tilted	0mm	3	20525	836.5	22.99	23.40	1.099	0	0.787	0.865
	LTE Band 5_Ant 1	10M	QPSK	50	0	Right Tilted	0mm	3	20525	836.5	22.98	23.40	1.102	-0.05	0.804	0.886
	LTE Band 5_Ant 1	10M	QPSK	1	0	Left Cheek	0mm	3	20525	836.5	23.00	23.40	1.096	-0.02	0.488	0.535
	LTE Band 5_Ant 1	10M	QPSK	25	0	Left Cheek	0mm	3	20525	836.5	22.99	23.40	1.099	0.01	0.502	0.552
	LTE Band 5_Ant 1	10M	QPSK	1	0	Left Tilted	0mm	3	20525	836.5	23.00	23.40	1.096	0	0.441	0.484
	LTE Band 5_Ant 1	10M	QPSK	25	0	Left Tilted	0mm	3	20525	836.5	22.99	23.40	1.099	0.04	0.446	0.490
	LTE Band 5B_Ant 1	10M	QPSK	1	0	Right Cheek	0mm	3	20525+20426	836.5	21.16	21.70	1.132	0.15	0.630	0.713



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 7_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	21100	2535	24.68	25.70	1.265	0.06	0.757	0.957
	LTE Band 7_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	20850	2510	24.67	25.70	1.268	0.03	0.783	0.993
	LTE Band 7_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	21350	2560	24.63	25.70	1.279	0.1	0.775	0.992
	LTE Band 7_Ant 2	20M	QPSK	50	0	Right Cheek	0mm	2/3	21100	2535	23.50	24.70	1.318	-0.07	0.609	0.803
	LTE Band 7_Ant 2	20M	QPSK	50	0	Right Cheek	0mm	2/3	20850	2510	23.39	24.70	1.352	0.06	0.605	0.818
	LTE Band 7_Ant 2	20M	QPSK	50	0	Right Cheek	0mm	2/3	21350	2560	23.45	24.70	1.334	-0.02	0.630	0.840
	LTE Band 7_Ant 2	20M	QPSK	100	0	Right Cheek	0mm	2/3	21100	2535	23.44	24.70	1.337	0.05	0.597	0.798
	LTE Band 7_Ant 2	20M	QPSK	1	0	Right Tilted	0mm	2/3	21100	2535	24.68	25.70	1.265	-0.06	0.229	0.290
	LTE Band 7_Ant 2	20M	QPSK	50	0	Right Tilted	0mm	2/3	21100	2535	23.50	24.70	1.318	-0.04	0.209	0.276
	LTE Band 7_Ant 2	20M	QPSK	1	0	Left Cheek	0mm	2/3	21100	2535	24.68	25.70	1.265	0.1	0.371	0.469
	LTE Band 7_Ant 2	20M	QPSK	50	0	Left Cheek	0mm	2/3	21100	2535	23.50	24.70	1.318	-0.02	0.355	0.468
	LTE Band 7_Ant 2	20M	QPSK	1	0	Left Tilted	0mm	2/3	21100	2535	24.68	25.70	1.265	0.06	0.342	0.433
	LTE Band 7_Ant 2	20M	QPSK	50	0	Left Tilted	0mm	2/3	21100	2535	23.50	24.70	1.318	0.16	0.321	0.423
	LTE Band 7C_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	21350+21152	2560	22.60	24.00	1.380	0.13	0.675	0.932
	LTE Band 7_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	2/3	21100	2535	24.23	25.20	1.250	-0.09	0.325	0.406
	LTE Band 7_Ant 0	20M	QPSK	50	0	Right Cheek	0mm	2/3	21100	2535	23.00	24.20	1.318	0.06	0.271	0.357
	LTE Band 7_Ant 0	20M	QPSK	1	0	Right Tilted	0mm	2/3	21100	2535	24.23	25.20	1.250	-0.03	0.378	0.473
	LTE Band 7_Ant 0	20M	QPSK	50	0	Right Tilted	0mm	2/3	21100	2535	23.00	24.20	1.318	0	0.277	0.365
29	LTE Band 7_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	2/3	21100	2535	24.23	25.20	1.250	-0.06	0.795	0.994
	LTE Band 7_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	2/3	20850	2510	24.11	25.20	1.285	-0.06	0.677	0.870
	LTE Band 7_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	2/3	21350	2560	24.13	25.20	1.279	-0.04	0.776	0.993
	LTE Band 7_Ant 0	20M	QPSK	50	0	Left Cheek	0mm	2/3	21100	2535	23.00	24.20	1.318	-0.08	0.638	0.841
	LTE Band 7_Ant 0	20M	QPSK	50	0	Left Cheek	0mm	2/3	20850	2510	22.91	24.20	1.346	-0.01	0.590	0.794
	LTE Band 7_Ant 0	20M	QPSK	50	0	Left Cheek	0mm	2/3	21350	2560	22.88	24.20	1.355	-0.08	0.625	0.847
	LTE Band 7_Ant 0	20M	QPSK	100	0	Left Cheek	0mm	2/3	21100	2535	22.93	24.20	1.340	-0.02	0.635	0.851
	LTE Band 7_Ant 0	20M	QPSK	1	0	Left Tilted	0mm	2/3	21100	2535	24.23	25.20	1.250	0.06	0.222	0.278
	LTE Band 7_Ant 0	20M	QPSK	50	0	Left Tilted	0mm	2/3	21100	2535	23.00	24.20	1.318	-0.1	0.171	0.225
	LTE Band 7C_Ant 0	20M	QPSK	1	99	Left Cheek	0mm	2/3	20850+21048	2510	22.48	23.50	1.265	0.13	0.477	0.603



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 12_Ant 0	10M	QPSK	1	0	Right Cheek	0mm	2/3	23095	707.5	23.88	25.70	1.521	-0.11	0.224	0.341
	LTE Band 12_Ant 0	10M	QPSK	25	0	Right Cheek	0mm	2/3	23095	707.5	22.95	24.70	1.496	-0.04	0.176	0.263
	LTE Band 12_Ant 0	10M	QPSK	1	0	Right Tilted	0mm	2/3	23095	707.5	23.88	25.70	1.521	-0.11	0.115	0.175
	LTE Band 12_Ant 0	10M	QPSK	25	0	Right Tilted	0mm	2/3	23095	707.5	22.95	24.70	1.496	-0.04	0.089	0.133
	LTE Band 12_Ant 0	10M	QPSK	1	0	Left Cheek	0mm	2/3	23095	707.5	23.88	25.70	1.521	-0.02	0.350	0.532
	LTE Band 12_Ant 0	10M	QPSK	25	0	Left Cheek	0mm	2/3	23095	707.5	22.95	24.70	1.496	0.02	0.254	0.380
	LTE Band 12_Ant 0	10M	QPSK	1	0	Left Tilted	0mm	2/3	23095	707.5	23.88	25.70	1.521	0.03	0.140	0.213
	LTE Band 12_Ant 0	10M	QPSK	25	0	Left Tilted	0mm	2/3	23095	707.5	22.95	24.70	1.496	-0.02	0.112	0.168
30	LTE Band 12_Ant 1	10M	QPSK	1	0	Right Cheek	0mm	2	23095	707.5	22.40	23.90	1.413	-0.06	0.790	1.116
	LTE Band 12_Ant 1	10M	QPSK	25	0	Right Cheek	0mm	2	23095	707.5	22.42	23.90	1.406	-0.02	0.768	1.080
	LTE Band 12_Ant 1	10M	QPSK	50	0	Right Cheek	0mm	2	23095	707.5	22.40	23.90	1.413	-0.05	0.750	1.059
	LTE Band 12_Ant 1	10M	QPSK	1	0	Right Tilted	0mm	2	23095	707.5	22.40	23.90	1.413	-0.1	0.693	0.979
	LTE Band 12_Ant 1	10M	QPSK	25	0	Right Tilted	0mm	2	23095	707.5	22.42	23.90	1.406	0.02	0.693	0.974
	LTE Band 12_Ant 1	10M	QPSK	50	0	Right Tilted	0mm	2	23095	707.5	22.40	23.90	1.413	-0.06	0.682	0.963
	LTE Band 12_Ant 1	10M	QPSK	1	0	Left Cheek	0mm	2	23095	707.5	22.40	23.90	1.413	0.02	0.355	0.501
	LTE Band 12_Ant 1	10M	QPSK	25	0	Left Cheek	0mm	2	23095	707.5	22.42	23.90	1.406	-0.05	0.358	0.503
	LTE Band 12_Ant 1	10M	QPSK	1	0	Left Tilted	0mm	2	23095	707.5	22.40	23.90	1.413	-0.04	0.347	0.490
	LTE Band 12_Ant 1	10M	QPSK	25	0	Left Tilted	0mm	2	23095	707.5	22.42	23.90	1.406	0.02	0.350	0.492
	LTE Band 12_Ant 1	10M	QPSK	1	0	Right Cheek	0mm	3	23095	707.5	22.40	23.10	1.175	-0.06	0.790	0.928
	LTE Band 12_Ant 1	10M	QPSK	25	0	Right Cheek	0mm	3	23095	707.5	22.42	23.10	1.169	-0.02	0.768	0.898
	LTE Band 12_Ant 1	10M	QPSK	50	0	Right Cheek	0mm	3	23095	707.5	22.40	23.10	1.175	-0.05	0.750	0.881
	LTE Band 12_Ant 1	10M	QPSK	1	0	Right Tilted	0mm	3	23095	707.5	22.40	23.10	1.175	-0.1	0.693	0.814
	LTE Band 12_Ant 1	10M	QPSK	25	0	Right Tilted	0mm	3	23095	707.5	22.42	23.10	1.169	0.02	0.693	0.810
	LTE Band 12_Ant 1	10M	QPSK	50	0	Right Tilted	0mm	3	23095	707.5	22.40	23.10	1.175	-0.06	0.682	0.801
	LTE Band 12_Ant 1	10M	QPSK	1	0	Left Cheek	0mm	3	23095	707.5	22.40	23.10	1.175	0.02	0.355	0.417
	LTE Band 12_Ant 1	10M	QPSK	25	0	Left Cheek	0mm	3	23095	707.5	22.42	23.10	1.169	-0.05	0.358	0.419
	LTE Band 12_Ant 1	10M	QPSK	1	0	Left Tilted	0mm	3	23095	707.5	22.40	23.10	1.175	-0.04	0.347	0.408
	LTE Band 12_Ant 1	10M	QPSK	25	0	Left Tilted	0mm	3	23095	707.5	22.42	23.10	1.169	0.02	0.350	0.409
31	LTE Band 25_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	26340	1880	24.21	25.70	1.409	-0.08	0.523	0.737
	LTE Band 25_Ant 2	20M	QPSK	50	0	Right Cheek	0mm	2/3	26340	1880	22.75	24.20	1.396	-0.08	0.345	0.482
	LTE Band 25_Ant 2	20M	QPSK	1	0	Right Tilted	0mm	2/3	26340	1880	24.21	25.70	1.409	-0.01	0.180	0.254
	LTE Band 25_Ant 2	20M	QPSK	50	0	Right Tilted	0mm	2/3	26340	1880	22.75	24.20	1.396	-0.04	0.133	0.186
	LTE Band 25_Ant 2	20M	QPSK	1	0	Left Cheek	0mm	2/3	26340	1880	24.21	25.70	1.409	-0.13	0.260	0.366
	LTE Band 25_Ant 2	20M	QPSK	50	0	Left Cheek	0mm	2/3	26340	1880	22.75	24.20	1.396	-0.01	0.189	0.264
	LTE Band 25_Ant 2	20M	QPSK	1	0	Left Tilted	0mm	2/3	26340	1880	24.21	25.70	1.409	0.02	0.200	0.282
	LTE Band 25_Ant 2	20M	QPSK	50	0	Left Tilted	0mm	2/3	26340	1880	22.75	24.20	1.396	0.1	0.143	0.200
	LTE Band 25_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	2/3	26340	1880	23.60	25.20	1.445	-0.14	0.244	0.353
	LTE Band 25_Ant 0	20M	QPSK	50	0	Right Cheek	0mm	2/3	26340	1880	22.26	23.70	1.393	0.02	0.175	0.244
	LTE Band 25_Ant 0	20M	QPSK	1	0	Right Tilted	0mm	2/3	26340	1880	23.60	25.20	1.445	-0.16	0.187	0.270
	LTE Band 25_Ant 0	20M	QPSK	50	0	Right Tilted	0mm	2/3	26340	1880	22.26	23.70	1.393	-0.13	0.135	0.188
	LTE Band 25_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	2/3	26340	1880	23.60	25.20	1.445	-0.02	0.449	0.649
	LTE Band 25_Ant 0	20M	QPSK	50	0	Left Cheek	0mm	2/3	26340	1880	22.26	23.70	1.393	0.07	0.331	0.461
	LTE Band 25_Ant 0	20M	QPSK	1	0	Left Tilted	0mm	2/3	26340	1880	23.60	25.20	1.445	0.07	0.174	0.252
	LTE Band 25_Ant 0	20M	QPSK	50	0	Left Tilted	0mm	2/3	26340	1880	22.26	23.70	1.393	0.09	0.129	0.180



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)
32	LTE Band 66_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	132322	1745	24.35	25.70	1.365	-0.14	0.470	0.641
	LTE Band 66_Ant 2	20M	QPSK	50	0	Right Cheek	0mm	2/3	132322	1745	23.31	24.70	1.377	-0.06	0.337	0.464
	LTE Band 66_Ant 2	20M	QPSK	1	0	Right Tilted	0mm	2/3	132322	1745	24.35	25.70	1.365	-0.18	0.184	0.251
	LTE Band 66_Ant 2	20M	QPSK	50	0	Right Tilted	0mm	2/3	132322	1745	23.31	24.70	1.377	-0.1	0.140	0.193
	LTE Band 66_Ant 2	20M	QPSK	1	0	Left Cheek	0mm	2/3	132322	1745	24.35	25.70	1.365	0.09	0.284	0.388
	LTE Band 66_Ant 2	20M	QPSK	50	0	Left Cheek	0mm	2/3	132322	1745	23.31	24.70	1.377	0.04	0.221	0.304
	LTE Band 66_Ant 2	20M	QPSK	1	0	Left Tilted	0mm	2/3	132322	1745	24.35	25.70	1.365	-0.08	0.239	0.326
	LTE Band 66_Ant 2	20M	QPSK	50	0	Left Tilted	0mm	2/3	132322	1745	23.31	24.70	1.377	-0.03	0.182	0.251
	LTE Band 66_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	2/3	132322	1745	23.67	25.20	1.422	-0.05	0.186	0.265
	LTE Band 66_Ant 0	20M	QPSK	50	0	Right Cheek	0mm	2/3	132322	1745	22.57	24.20	1.455	-0.15	0.149	0.217
	LTE Band 66_Ant 0	20M	QPSK	1	0	Right Tilted	0mm	2/3	132322	1745	23.67	25.20	1.422	-0.06	0.144	0.205
	LTE Band 66_Ant 0	20M	QPSK	50	0	Right Tilted	0mm	2/3	132322	1745	22.57	24.20	1.455	-0.13	0.113	0.164
	LTE Band 66_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	2/3	132322	1745	23.67	25.20	1.422	-0.08	0.387	0.550
	LTE Band 66_Ant 0	20M	QPSK	50	0	Left Cheek	0mm	2/3	132322	1745	22.57	24.20	1.455	-0.11	0.314	0.457
	LTE Band 66_Ant 0	20M	QPSK	1	0	Left Tilted	0mm	2/3	132322	1745	23.67	25.20	1.422	-0.11	0.167	0.238
	LTE Band 66_Ant 0	20M	QPSK	50	0	Left Tilted	0mm	2/3	132322	1745	22.57	24.20	1.455	-0.14	0.136	0.198

<TDD 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	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 41_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	41490	2680	24.70	25.70	1.259	62.9	1.006	0.16	0.516	0.654
	LTE Band 41_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	39750	2506	24.50	25.70	1.318	62.9	1.006	0	0.438	0.581
	LTE Band 41_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	40185	2549.5	24.58	25.70	1.294	62.9	1.006	0.05	0.480	0.625
33	LTE Band 41_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	40620	2593	24.54	25.70	1.306	62.9	1.006	0.14	0.540	0.710
	LTE Band 41_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	41055	2636.5	24.57	25.70	1.297	62.9	1.006	-0.13	0.400	0.522
	LTE Band 41_Ant 2	20M	QPSK	50	0	Right Cheek	0mm	2/3	41490	2680	22.72	23.70	1.253	62.9	1.006	0.02	0.269	0.339
	LTE Band 41_Ant 2	20M	QPSK	1	0	Right Tilted	0mm	2/3	41490	2680	24.70	25.70	1.259	62.9	1.006	-0.1	0.096	0.122
	LTE Band 41_Ant 2	20M	QPSK	50	0	Right Tilted	0mm	2/3	41490	2680	22.72	23.70	1.253	62.9	1.006	0.01	0.065	0.082
	LTE Band 41_Ant 2	20M	QPSK	1	0	Left Cheek	0mm	2/3	41490	2680	24.70	25.70	1.259	62.9	1.006	-0.12	0.220	0.279
	LTE Band 41_Ant 2	20M	QPSK	50	0	Left Cheek	0mm	2/3	41490	2680	22.72	23.70	1.253	62.9	1.006	-0.15	0.133	0.168
	LTE Band 41_Ant 2	20M	QPSK	1	0	Left Tilted	0mm	2/3	41490	2680	24.70	25.70	1.259	62.9	1.006	-0.14	0.157	0.199
	LTE Band 41_Ant 2	20M	QPSK	50	0	Left Tilted	0mm	2/3	41490	2680	22.72	23.70	1.253	62.9	1.006	-0.17	0.097	0.122
	LTE Band 41_HPUE_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	41490	2680	26.27	27.50	1.327	42.9	1.009	0.03	0.451	0.604
	LTE Band 41_HPUE_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	39750	2506	26.02	27.50	1.406	42.9	1.009	0.01	0.401	0.569
	LTE Band 41_HPUE_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	40185	2549.5	26.12	27.50	1.374	42.9	1.009	0.09	0.421	0.584
	LTE Band 41_HPUE_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	40620	2593	26.12	27.50	1.374	42.9	1.009	-0.11	0.490	0.679
	LTE Band 41_HPUE_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	41055	2636.5	26.17	27.50	1.358	42.9	1.009	-0.13	0.370	0.507
	LTE Band 41C_Ant 2	20M	QPSK	1	0	Right Cheek	0mm	2/3	40185+39987	2549.5	11.85	12.80	1.245	62.9	1.006	-0.14	0.025	0.031
	LTE Band 41_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	2/3	40185	2549.5	24.17	25.20	1.268	62.9	1.006	-0.01	0.055	0.070
	LTE Band 41_Ant 0	20M	QPSK	50	0	Right Cheek	0mm	2/3	40185	2549.5	22.13	23.20	1.279	62.9	1.006	0.15	0.039	0.050
	LTE Band 41_Ant 0	20M	QPSK	1	0	Right Tilted	0mm	2/3	40185	2549.5	24.17	25.20	1.268	62.9	1.006	-0.09	0.083	0.106
	LTE Band 41_Ant 0	20M	QPSK	50	0	Right Tilted	0mm	2/3	40185	2549.5	22.13	23.20	1.279	62.9	1.006	0.04	0.057	0.073
	LTE Band 41_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	2/3	40185	2549.5	24.17	25.20	1.268	62.9	1.006	0.16	0.423	0.539
	LTE Band 41_Ant 0	20M	QPSK	50	0	Left Cheek	0mm	2/3	40185	2549.5	22.13	23.20	1.279	62.9	1.006	0.13	0.230	0.296
	LTE Band 41_Ant 0	20M	QPSK	1	0	Left Tilted	0mm	2/3	40185	2549.5	24.17	25.20	1.268	62.9	1.006	0.17	0.070	0.089
	LTE Band 41_Ant 0	20M	QPSK	50	0	Left Tilted	0mm	2/3	40185	2549.5	22.13	23.20	1.279	62.9	1.006	0.18	0.042	0.054
	LTE Band 41_HPUE_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	2/3	40185	2549.5	25.75	27.00	1.334	42.9	1.009	-0.02	0.379	0.510
	LTE Band 41C_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	2/3	40185+39987	2549.5	11.34	12.30	1.247	62.9	1.006	0.15	0.020	0.025



<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 n5_Ant 0	20M	BPSK	1	1	Right Cheek	0mm	2/3	167300	836.5	24.55	25.70	1.303	-0.07	0.228	0.297
	FR1 n5_Ant 0	20M	BPSK	50	28	Right Cheek	0mm	2/3	167300	836.5	24.43	25.70	1.340	-0.02	0.248	0.332
	FR1 n5_Ant 0	20M	BPSK	1	1	Right Tilted	0mm	2/3	167300	836.5	24.55	25.70	1.303	0.05	0.150	0.195
	FR1 n5_Ant 0	20M	BPSK	50	28	Right Tilted	0mm	2/3	167300	836.5	24.43	25.70	1.340	0.07	0.161	0.216
	FR1 n5_Ant 0	20M	BPSK	1	1	Left Cheek	0mm	2/3	167300	836.5	24.55	25.70	1.303	0.09	0.339	0.442
	FR1 n5_Ant 0	20M	BPSK	50	28	Left Cheek	0mm	2/3	167300	836.5	24.43	25.70	1.340	0.02	0.361	0.484
	FR1 n5_Ant 0	20M	BPSK	1	1	Left Tilted	0mm	2/3	167300	836.5	24.55	25.70	1.303	0.07	0.148	0.193
	FR1 n5_Ant 0	20M	BPSK	50	28	Left Tilted	0mm	2/3	167300	836.5	24.43	25.70	1.340	0.02	0.156	0.209
	FR1 n5_Ant 1	20M	BPSK	1	1	Right Cheek	0mm	2	167300	836.5	23.50	24.30	1.202	-0.08	0.925	1.112
34	FR1 n5_Ant 1	20M	BPSK	50	28	Right Cheek	0mm	2	167300	836.5	23.39	24.30	1.233	-0.02	0.955	1.178
	FR1 n5_Ant 1	20M	BPSK	100	0	Right Cheek	0mm	2	167300	836.5	23.37	24.30	1.239	-0.06	0.935	1.158
	FR1 n5_Ant 1	20M	BPSK	1	1	Right Tilted	0mm	2	167300	836.5	23.50	24.30	1.202	-0.1	0.766	0.921
	FR1 n5_Ant 1	20M	BPSK	50	28	Right Tilted	0mm	2	167300	836.5	23.39	24.30	1.233	0.11	0.850	1.048
	FR1 n5_Ant 1	20M	BPSK	100	0	Right Tilted	0mm	2	167300	836.5	23.37	24.30	1.239	0.19	0.838	1.038
	FR1 n5_Ant 1	20M	BPSK	1	1	Left Cheek	0mm	2	167300	836.5	23.50	24.30	1.202	0.09	0.611	0.735
	FR1 n5_Ant 1	20M	BPSK	50	28	Left Cheek	0mm	2	167300	836.5	23.39	24.30	1.233	-0.14	0.565	0.697
	FR1 n5_Ant 1	20M	BPSK	1	1	Left Tilted	0mm	2	167300	836.5	23.50	24.30	1.202	0.06	0.536	0.644
	FR1 n5_Ant 1	20M	BPSK	50	28	Left Tilted	0mm	2	167300	836.5	23.39	24.30	1.233	0.06	0.470	0.580
	FR1 n5_Ant 1	20M	BPSK	1	1	Right Cheek	0mm	3	167300	836.5	23.50	23.50	1.000	-0.08	0.925	0.925
	FR1 n5_Ant 1	20M	BPSK	50	28	Right Cheek	0mm	3	167300	836.5	23.39	23.50	1.026	-0.02	0.955	0.979
	FR1 n5_Ant 1	20M	BPSK	100	0	Right Cheek	0mm	3	167300	836.5	23.37	23.50	1.030	-0.06	0.935	0.963
	FR1 n5_Ant 1	20M	BPSK	1	1	Right Tilted	0mm	3	167300	836.5	23.50	23.50	1.000	-0.1	0.766	0.766
	FR1 n5_Ant 1	20M	BPSK	50	28	Right Tilted	0mm	3	167300	836.5	23.39	23.50	1.026	0.11	0.850	0.872
	FR1 n5_Ant 1	20M	BPSK	100	0	Right Tilted	0mm	3	167300	836.5	23.37	23.50	1.030	0.19	0.838	0.863
	FR1 n5_Ant 1	20M	BPSK	1	1	Left Cheek	0mm	3	167300	836.5	23.50	23.50	1.000	0.09	0.611	0.611
	FR1 n5_Ant 1	20M	BPSK	50	28	Left Cheek	0mm	3	167300	836.5	23.39	23.50	1.026	-0.14	0.565	0.579
	FR1 n5_Ant 1	20M	BPSK	1	1	Left Tilted	0mm	3	167300	836.5	23.50	23.50	1.000	0.06	0.536	0.536
	FR1 n5_Ant 1	20M	BPSK	50	28	Left Tilted	0mm	3	167300	836.5	23.39	23.50	1.026	0.06	0.470	0.482





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 n7_Ant 2	50M	BPSK	1	1	Right Cheek	0mm	2	507000	2535	24.84	25.70	1.219	-0.04	0.952	1.160
35	FR1 n7_Ant 2	50M	BPSK	135	68	Right Cheek	0mm	2	507000	2535	24.74	25.70	1.247	-0.06	0.954	1.190
	FR1 n7_Ant 2	50M	BPSK	270	0	Right Cheek	0mm	2	507000	2535	24.27	25.20	1.239	-0.05	0.859	1.064
	FR1 n7_Ant 2	50M	BPSK	1	1	Right Tilted	0mm	2	507000	2535	24.84	25.70	1.219	0.06	0.275	0.335
	FR1 n7_Ant 2	50M	BPSK	135	68	Right Tilted	0mm	2	507000	2535	24.74	25.70	1.247	0.03	0.300	0.374
	FR1 n7_Ant 2	50M	BPSK	1	1	Left Cheek	0mm	2	507000	2535	24.84	25.70	1.219	-0.04	0.374	0.456
	FR1 n7_Ant 2	50M	BPSK	135	68	Left Cheek	0mm	2	507000	2535	24.74	25.70	1.247	-0.02	0.421	0.525
	FR1 n7_Ant 2	50M	BPSK	1	1	Left Tilted	0mm	2	507000	2535	24.84	25.70	1.219	-0.17	0.314	0.383
	FR1 n7_Ant 2	50M	BPSK	135	68	Left Tilted	0mm	2	507000	2535	24.74	25.70	1.247	0.05	0.328	0.409
	FR1 n7_Ant 2	50M	BPSK	1	1	Right Cheek	0mm	3	507000	2535	24.84	24.90	1.014	-0.04	0.952	0.965
	FR1 n7_Ant 2	50M	BPSK	135	68	Right Cheek	0mm	3	507000	2535	24.74	24.90	1.038	-0.06	0.954	0.990
	FR1 n7_Ant 2	50M	BPSK	270	0	Right Cheek	0mm	3	507000	2535	24.27	24.90	1.156	-0.05	0.859	0.993
	FR1 n7_Ant 2	50M	BPSK	1	1	Right Tilted	0mm	3	507000	2535	24.84	24.90	1.014	0.06	0.275	0.279
	FR1 n7_Ant 2	50M	BPSK	135	68	Right Tilted	0mm	3	507000	2535	24.74	24.90	1.038	0.03	0.300	0.311
	FR1 n7_Ant 2	50M	BPSK	1	1	Left Cheek	0mm	3	507000	2535	24.84	24.90	1.014	-0.04	0.374	0.379
	FR1 n7_Ant 2	50M	BPSK	135	68	Left Cheek	0mm	3	507000	2535	24.74	24.90	1.038	-0.02	0.421	0.437
	FR1 n7_Ant 2	50M	BPSK	1	1	Left Tilted	0mm	3	507000	2535	24.84	24.90	1.014	-0.17	0.314	0.318
	FR1 n7_Ant 2	50M	BPSK	135	68	Left Tilted	0mm	3	507000	2535	24.74	24.90	1.038	0.05	0.328	0.340
	FR1 n7_Ant 0	50M	BPSK	1	1	Right Cheek	0mm	2/3	507000	2535	24.40	25.20	1.202	-0.04	0.280	0.337
	FR1 n7_Ant 0	50M	BPSK	135	68	Right Cheek	0mm	2/3	507000	2535	24.28	25.20	1.236	0.11	0.276	0.341
	FR1 n7_Ant 0	50M	BPSK	1	1	Right Tilted	0mm	2/3	507000	2535	24.40	25.20	1.202	0.16	0.310	0.373
	FR1 n7_Ant 0	50M	BPSK	135	68	Right Tilted	0mm	2/3	507000	2535	24.28	25.20	1.236	-0.09	0.192	0.237
	FR1 n7_Ant 0	50M	BPSK	1	1	Left Cheek	0mm	2/3	507000	2535	24.40	25.20	1.202	0.04	0.673	0.809
	FR1 n7_Ant 0	50M	BPSK	135	68	Left Cheek	0mm	2/3	507000	2535	24.28	25.20	1.236	-0.18	0.807	0.997
	FR1 n7_Ant 0	50M	BPSK	270	0	Left Cheek	0mm	2/3	507000	2535	23.83	24.70	1.222	-0.07	0.657	0.803
	FR1 n7_Ant 0	50M	BPSK	1	1	Left Tilted	0mm	2/3	507000	2535	24.40	25.20	1.202	0.03	0.230	0.277
	FR1 n7_Ant 0	50M	BPSK	135	68	Left Tilted	0mm	2/3	507000	2535	24.28	25.20	1.236	0.04	0.144	0.178



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 n12_Ant 0	15M	BPSK	1	1	Right Cheek	0mm	2/3	141500	707.5	24.55	25.70	1.303	-0.09	0.187	0.244
	FR1 n12_Ant 0	15M	BPSK	36	22	Right Cheek	0mm	2/3	141500	707.5	24.51	25.70	1.315	-0.12	0.197	0.259
	FR1 n12_Ant 0	15M	BPSK	1	1	Right Tilted	0mm	2/3	141500	707.5	24.55	25.70	1.303	0.07	0.102	0.133
	FR1 n12_Ant 0	15M	BPSK	36	22	Right Tilted	0mm	2/3	141500	707.5	24.51	25.70	1.315	0	0.091	0.120
	FR1 n12_Ant 0	15M	BPSK	1	1	Left Cheek	0mm	2/3	141500	707.5	24.55	25.70	1.303	0.07	0.273	0.356
	FR1 n12_Ant 0	15M	BPSK	36	22	Left Cheek	0mm	2/3	141500	707.5	24.51	25.70	1.315	0	0.280	0.368
	FR1 n12_Ant 0	15M	BPSK	1	1	Left Tilted	0mm	2/3	141500	707.5	24.55	25.70	1.303	-0.06	0.111	0.145
	FR1 n12_Ant 0	15M	BPSK	36	22	Left Tilted	0mm	2/3	141500	707.5	24.51	25.70	1.315	-0.07	0.119	0.157
	FR1 n12_Ant 1	15M	BPSK	1	1	Right Cheek	0mm	2	141500	707.5	23.30	24.60	1.349	-0.17	0.860	1.160
	FR1 n12_Ant 1	15M	BPSK	36	22	Right Cheek	0mm	2	141500	707.5	23.27	24.60	1.358	-0.1	0.850	1.155
36	FR1 n12_Ant 1	15M	BPSK	75	0	Right Cheek	0mm	2	141500	707.5	23.24	24.60	1.368	-0.09	0.870	1.190
	FR1 n12_Ant 1	15M	BPSK	1	1	Right Tilted	0mm	2	141500	707.5	23.30	24.60	1.349	-0.11	0.785	1.059
	FR1 n12_Ant 1	15M	BPSK	36	22	Right Tilted	0mm	2	141500	707.5	23.27	24.60	1.358	-0.05	0.756	1.027
	FR1 n12_Ant 1	15M	BPSK	75	0	Right Tilted	0mm	2	141500	707.5	23.24	24.60	1.368	-0.06	0.774	1.059
	FR1 n12_Ant 1	15M	BPSK	1	1	Left Cheek	0mm	2	141500	707.5	23.30	24.60	1.349	-0.06	0.406	0.548
	FR1 n12_Ant 1	15M	BPSK	36	22	Left Cheek	0mm	2	141500	707.5	23.27	24.60	1.358	-0.07	0.417	0.566
	FR1 n12_Ant 1	15M	BPSK	1	1	Left Tilted	0mm	2	141500	707.5	23.30	24.60	1.349	0	0.393	0.530
	FR1 n12_Ant 1	15M	BPSK	36	22	Left Tilted	0mm	2	141500	707.5	23.27	24.60	1.358	-0.04	0.388	0.527
	FR1 n12_Ant 1	15M	BPSK	1	1	Right Cheek	0mm	3	141500	707.5	23.30	23.80	1.122	-0.17	0.860	0.965
	FR1 n12_Ant 1	15M	BPSK	36	22	Right Cheek	0mm	3	141500	707.5	23.27	23.80	1.130	-0.1	0.850	0.960
	FR1 n12_Ant 1	15M	BPSK	75	0	Right Cheek	0mm	3	141500	707.5	23.24	23.80	1.138	-0.09	0.870	0.990
	FR1 n12_Ant 1	15M	BPSK	1	1	Right Tilted	0mm	3	141500	707.5	23.30	23.80	1.122	-0.11	0.785	0.881
	FR1 n12_Ant 1	15M	BPSK	36	22	Right Tilted	0mm	3	141500	707.5	23.27	23.80	1.130	-0.05	0.756	0.854
	FR1 n12_Ant 1	15M	BPSK	75	0	Right Tilted	0mm	3	141500	707.5	23.24	23.80	1.138	-0.06	0.774	0.881
	FR1 n12_Ant 1	15M	BPSK	1	1	Left Cheek	0mm	3	141500	707.5	23.30	23.80	1.122	-0.06	0.406	0.456
	FR1 n12_Ant 1	15M	BPSK	36	22	Left Cheek	0mm	3	141500	707.5	23.27	23.80	1.130	-0.07	0.417	0.471
	FR1 n12_Ant 1	15M	BPSK	1	1	Left Tilted	0mm	3	141500	707.5	23.30	23.80	1.122	0	0.393	0.441
	FR1 n12_Ant 1	15M	BPSK	36	22	Left Tilted	0mm	3	141500	707.5	23.27	23.80	1.130	-0.04	0.388	0.438
37	FR1 n25_Ant 2	40M	BPSK	1	1	Right Cheek	0mm	2/3	376500	1882.5	24.60	25.70	1.288	-0.04	0.516	0.665
	FR1 n25_Ant 2	40M	BPSK	108	54	Right Cheek	0mm	2/3	376500	1882.5	24.41	25.70	1.346	-0.06	0.486	0.654
	FR1 n25_Ant 2	40M	BPSK	1	1	Right Tilted	0mm	2/3	376500	1882.5	24.60	25.70	1.288	-0.06	0.171	0.220
	FR1 n25_Ant 2	40M	BPSK	108	54	Right Tilted	0mm	2/3	376500	1882.5	24.41	25.70	1.346	-0.01	0.183	0.246
	FR1 n25_Ant 2	40M	BPSK	1	1	Left Cheek	0mm	2/3	376500	1882.5	24.60	25.70	1.288	-0.08	0.282	0.363
	FR1 n25_Ant 2	40M	BPSK	108	54	Left Cheek	0mm	2/3	376500	1882.5	24.41	25.70	1.346	-0.1	0.277	0.373
	FR1 n25_Ant 2	40M	BPSK	1	1	Left Tilted	0mm	2/3	376500	1882.5	24.60	25.70	1.288	0.11	0.206	0.265
	FR1 n25_Ant 2	40M	BPSK	108	54	Left Tilted	0mm	2/3	376500	1882.5	24.41	25.70	1.346	0.15	0.201	0.271
	FR1 n25_Ant 0	40M	BPSK	1	1	Right Cheek	0mm	2/3	376500	1882.5	23.86	25.20	1.361	-0.11	0.210	0.286
	FR1 n25_Ant 0	40M	BPSK	108	54	Right Cheek	0mm	2/3	376500	1882.5	23.66	25.20	1.426	-0.15	0.233	0.332
	FR1 n25_Ant 0	40M	BPSK	1	1	Right Tilted	0mm	2/3	376500	1882.5	23.86	25.20	1.361	-0.12	0.162	0.221
	FR1 n25_Ant 0	40M	BPSK	108	54	Right Tilted	0mm	2/3	376500	1882.5	23.66	25.20	1.426	-0.06	0.181	0.258
	FR1 n25_Ant 0	40M	BPSK	1	1	Left Cheek	0mm	2/3	376500	1882.5	23.86	25.20	1.361	0.04	0.391	0.532
	FR1 n25_Ant 0	40M	BPSK	108	54	Left Cheek	0mm	2/3	376500	1882.5	23.66	25.20	1.426	0.09	0.432	0.616
	FR1 n25_Ant 0	40M	BPSK	1	1	Left Tilted	0mm	2/3	376500	1882.5	23.86	25.20	1.361	0.01	0.152	0.207
	FR1 n25_Ant 0	40M	BPSK	108	54	Left Tilted	0mm	2/3	376500	1882.5	23.66	25.20	1.426	-0.02	0.186	0.265



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)
38	FR1 n41_Ant 2	100M	BPSK	1	1	Right Cheek	0mm	2	518598	2592.99	24.60	25.50	1.230	-0.13	0.726	0.893
	FR1 n41_Ant 2	100M	BPSK	135	69	Right Cheek	0mm	2	518598	2592.99	24.48	25.50	1.265	-0.04	0.930	1.176
	FR1 n41_Ant 2	100M	BPSK	270	0	Right Cheek	0mm	2	518598	2592.99	24.00	25.00	1.259	-0.13	0.670	0.843
	FR1 n41_Ant 2	100M	BPSK	1	1	Right Tilted	0mm	2	518598	2592.99	24.60	25.50	1.230	-0.09	0.186	0.229
	FR1 n41_Ant 2	100M	BPSK	135	69	Right Tilted	0mm	2	518598	2592.99	24.48	25.50	1.265	0.16	0.298	0.377
	FR1 n41_Ant 2	100M	BPSK	1	1	Left Cheek	0mm	2	518598	2592.99	24.60	25.50	1.230	-0.15	0.365	0.449
	FR1 n41_Ant 2	100M	BPSK	135	69	Left Cheek	0mm	2	518598	2592.99	24.48	25.50	1.265	-0.12	0.388	0.491
	FR1 n41_Ant 2	100M	BPSK	1	1	Left Tilted	0mm	2	518598	2592.99	24.60	25.50	1.230	0.1	0.279	0.343
	FR1 n41_Ant 2	100M	BPSK	135	69	Left Tilted	0mm	2	518598	2592.99	24.48	25.50	1.265	0.08	0.207	0.262
	FR1 n41_Ant 2	100M	BPSK	1	1	Right Cheek	0mm	3	518598	2592.99	24.60	24.70	1.023	-0.13	0.726	0.743
	FR1 n41_Ant 2	100M	BPSK	135	69	Right Cheek	0mm	3	518598	2592.99	24.48	24.70	1.052	-0.04	0.930	0.978
	FR1 n41_Ant 2	100M	BPSK	270	0	Right Cheek	0mm	3	518598	2592.99	24.00	24.70	1.175	-0.13	0.670	0.787
	FR1 n41_Ant 2	100M	BPSK	1	1	Right Tilted	0mm	3	518598	2592.99	24.60	24.70	1.023	-0.09	0.186	0.190
	FR1 n41_Ant 2	100M	BPSK	135	69	Right Tilted	0mm	3	518598	2592.99	24.48	24.70	1.052	0.16	0.298	0.313
	FR1 n41_Ant 2	100M	BPSK	1	1	Left Cheek	0mm	3	518598	2592.99	24.60	24.70	1.023	-0.15	0.365	0.374
	FR1 n41_Ant 2	100M	BPSK	135	69	Left Cheek	0mm	3	518598	2592.99	24.48	24.70	1.052	-0.12	0.388	0.408
	FR1 n41_Ant 2	100M	BPSK	1	1	Left Tilted	0mm	3	518598	2592.99	24.60	24.70	1.023	0.1	0.279	0.285
	FR1 n41_Ant 2	100M	BPSK	135	69	Left Tilted	0mm	3	518598	2592.99	24.48	24.70	1.052	0.08	0.207	0.218
FR1 n41_Ant 0	100M	BPSK	1	1	Right Cheek	0mm	2	518598	2592.99	23.69	25.00	1.352	0.02	0.298	0.403	
FR1 n41_Ant 0	100M	BPSK	135	69	Right Cheek	0mm	2	518598	2592.99	23.38	25.00	1.452	0.06	0.261	0.379	
FR1 n41_Ant 0	100M	BPSK	1	1	Right Tilted	0mm	2	518598	2592.99	23.69	25.00	1.352	0	0.189	0.256	
FR1 n41_Ant 0	100M	BPSK	135	69	Right Tilted	0mm	2	518598	2592.99	23.38	25.00	1.452	-0.01	0.200	0.290	
FR1 n41_Ant 0	100M	BPSK	1	1	Left Cheek	0mm	2	518598	2592.99	23.69	25.00	1.352	-0.03	0.764	1.033	
FR1 n41_Ant 0	100M	BPSK	135	69	Left Cheek	0mm	2	518598	2592.99	23.38	25.00	1.452	0.09	0.579	0.841	
FR1 n41_Ant 0	100M	BPSK	270	0	Left Cheek	0mm	2	518598	2592.99	22.93	24.50	1.435	0.16	0.450	0.646	
FR1 n41_Ant 0	100M	BPSK	1	1	Left Tilted	0mm	2	518598	2592.99	23.69	25.00	1.352	0.03	0.143	0.193	
FR1 n41_Ant 0	100M	BPSK	135	69	Left Tilted	0mm	2	518598	2592.99	23.38	25.00	1.452	0.07	0.096	0.139	
FR1 n41_Ant 0	100M	BPSK	1	1	Right Cheek	0mm	3	518598	2592.99	23.69	24.80	1.291	0.02	0.298	0.385	
FR1 n41_Ant 0	100M	BPSK	135	69	Right Cheek	0mm	3	518598	2592.99	23.38	24.80	1.387	0.06	0.261	0.362	
FR1 n41_Ant 0	100M	BPSK	1	1	Right Tilted	0mm	3	518598	2592.99	23.69	24.80	1.291	0	0.189	0.244	
FR1 n41_Ant 0	100M	BPSK	135	69	Right Tilted	0mm	3	518598	2592.99	23.38	24.80	1.387	-0.01	0.200	0.277	
FR1 n41_Ant 0	100M	BPSK	1	1	Left Cheek	0mm	3	518598	2592.99	23.69	24.80	1.291	-0.03	0.764	0.986	
FR1 n41_Ant 0	100M	BPSK	135	69	Left Cheek	0mm	3	518598	2592.99	23.38	24.80	1.387	0.09	0.579	0.803	
FR1 n41_Ant 0	100M	BPSK	270	0	Left Cheek	0mm	3	518598	2592.99	22.93	24.30	1.371	0.16	0.450	0.617	
FR1 n41_Ant 0	100M	BPSK	1	1	Left Tilted	0mm	3	518598	2592.99	23.69	24.80	1.291	0.03	0.143	0.185	
FR1 n41_Ant 0	100M	BPSK	135	69	Left Tilted	0mm	3	518598	2592.99	23.38	24.80	1.387	0.07	0.096	0.133	
39	FR1 n66_Ant 2	40M	BPSK	1	1	Right Cheek	0mm	2/3	349000	1745	24.61	25.70	1.285	0	0.515	0.662
	FR1 n66_Ant 2	40M	BPSK	108	54	Right Cheek	0mm	2/3	349000	1745	24.52	25.70	1.312	-0.19	0.407	0.534
	FR1 n66_Ant 2	40M	BPSK	1	1	Right Tilted	0mm	2/3	349000	1745	24.61	25.70	1.285	-0.04	0.201	0.258
	FR1 n66_Ant 2	40M	BPSK	108	54	Right Tilted	0mm	2/3	349000	1745	24.52	25.70	1.312	-0.09	0.146	0.192
	FR1 n66_Ant 2	40M	BPSK	1	1	Left Cheek	0mm	2/3	349000	1745	24.61	25.70	1.285	0.03	0.305	0.392
	FR1 n66_Ant 2	40M	BPSK	108	54	Left Cheek	0mm	2/3	349000	1745	24.52	25.70	1.312	0.09	0.240	0.315
	FR1 n66_Ant 2	40M	BPSK	1	1	Left Tilted	0mm	2/3	349000	1745	24.61	25.70	1.285	-0.18	0.239	0.307
	FR1 n66_Ant 2	40M	BPSK	108	54	Left Tilted	0mm	2/3	349000	1745	24.52	25.70	1.312	-0.18	0.172	0.226
	FR1 n66_Ant 0	40M	BPSK	1	1	Right Cheek	0mm	2/3	349000	1745	23.91	25.20	1.346	-0.16	0.194	0.261
	FR1 n66_Ant 0	40M	BPSK	108	54	Right Cheek	0mm	2/3	349000	1745	23.90	25.20	1.349	-0.17	0.182	0.246
	FR1 n66_Ant 0	40M	BPSK	1	1	Right Tilted	0mm	2/3	349000	1745	23.91	25.20	1.346	-0.18	0.174	0.234
	FR1 n66_Ant 0	40M	BPSK	108	54	Right Tilted	0mm	2/3	349000	1745	23.90	25.20	1.349	-0.1	0.180	0.243
	FR1 n66_Ant 0	40M	BPSK	1	1	Left Cheek	0mm	2/3	349000	1745	23.91	25.20	1.346	-0.04	0.438	0.589
	FR1 n66_Ant 0	40M	BPSK	108	54	Left Cheek	0mm	2/3	349000	1745	23.90	25.20	1.349	0	0.420	0.567
	FR1 n66_Ant 0	40M	BPSK	1	1	Left Tilted	0mm	2/3	349000	1745	23.91	25.20	1.346	0.04	0.186	0.250
	FR1 n66_Ant 0	40M	BPSK	108	54	Left Tilted	0mm	2/3	349000	1745	23.90	25.20	1.349	-0.16	0.195	0.263



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 6	100M	BPSK	1	1	Right Cheek	0mm	2	656000	3840	24.44	25.70	1.337	0.02	0.397	0.531	
FR1 n77_Ant 6	100M	BPSK	135	69	Right Cheek	0mm	2	656000	3840	24.35	25.70	1.365	0	0.432	0.589	
FR1 n77_Ant 6	100M	BPSK	1	1	Right Tilted	0mm	2	656000	3840	24.44	25.70	1.337	0.05	0.319	0.426	
FR1 n77_Ant 6	100M	BPSK	135	69	Right Tilted	0mm	2	656000	3840	24.35	25.70	1.365	-0.03	0.337	0.460	
FR1 n77_Ant 6	100M	BPSK	1	1	Left Cheek	0mm	2	656000	3840	24.44	25.70	1.337	-0.03	0.743	0.993	
FR1 n77_Ant 6	100M	BPSK	135	69	Left Cheek	0mm	2	656000	3840	24.35	25.70	1.365	0	0.786	1.073	
FR1 n77_Ant 6	100M	BPSK	270	0	Left Cheek	0mm	2	656000	3840	23.89	25.20	1.352	0.01	0.706	0.955	
FR1 n77_Ant 6	100M	BPSK	1	1	Left Tilted	0mm	2	656000	3840	24.44	25.70	1.337	-0.05	0.239	0.319	
FR1 n77_Ant 6	100M	BPSK	135	69	Left Tilted	0mm	2	656000	3840	24.35	25.70	1.365	0.02	0.234	0.319	
FR1 n77_Ant 6	100M	BPSK	1	1	Right Cheek	0mm	3	656000	3840	24.44	25.00	1.138	0.02	0.397	0.452	
FR1 n77_Ant 6	100M	BPSK	135	69	Right Cheek	0mm	3	656000	3840	24.35	25.00	1.161	0	0.432	0.502	
FR1 n77_Ant 6	100M	BPSK	1	1	Right Tilted	0mm	3	656000	3840	24.44	25.00	1.138	0.05	0.319	0.363	
FR1 n77_Ant 6	100M	BPSK	135	69	Right Tilted	0mm	3	656000	3840	24.35	25.00	1.161	-0.03	0.337	0.391	
FR1 n77_Ant 6	100M	BPSK	1	1	Left Cheek	0mm	3	656000	3840	24.44	25.00	1.138	-0.03	0.743	0.845	
FR1 n77_Ant 6	100M	BPSK	135	69	Left Cheek	0mm	3	656000	3840	24.35	25.00	1.161	0	0.786	0.913	
FR1 n77_Ant 6	100M	BPSK	270	0	Left Cheek	0mm	3	656000	3840	23.89	25.00	1.291	0.01	0.706	0.912	
FR1 n77_Ant 6	100M	BPSK	1	1	Left Tilted	0mm	3	656000	3840	24.44	25.00	1.138	-0.05	0.239	0.272	
FR1 n77_Ant 6	100M	BPSK	135	69	Left Tilted	0mm	3	656000	3840	24.35	25.00	1.161	0.02	0.234	0.272	
FR1 n77_Ant 6	100M	BPSK	1	1	Right Cheek	0mm	2	633332	3499.98	24.23	25.70	1.403	0.01	0.281	0.394	
FR1 n77_Ant 6	100M	BPSK	135	69	Right Cheek	0mm	2	633332	3499.98	24.20	25.70	1.413	0.02	0.331	0.468	
FR1 n77_Ant 6	100M	BPSK	1	1	Right Tilted	0mm	2	633332	3499.98	24.23	25.70	1.403	-0.05	0.189	0.265	
FR1 n77_Ant 6	100M	BPSK	135	69	Right Tilted	0mm	2	633332	3499.98	24.20	25.70	1.413	0.03	0.209	0.295	
FR1 n77_Ant 6	100M	BPSK	1	1	Left Cheek	0mm	2	633332	3499.98	24.23	25.70	1.403	0.01	0.512	0.718	
FR1 n77_Ant 6	100M	BPSK	135	69	Left Cheek	0mm	2	633332	3499.98	24.20	25.70	1.413	-0.03	0.543	0.767	
FR1 n77_Ant 6	100M	BPSK	1	1	Left Tilted	0mm	2	633332	3499.98	24.23	25.70	1.403	0	0.139	0.195	
FR1 n77_Ant 6	100M	BPSK	135	69	Left Tilted	0mm	2	633332	3499.98	24.20	25.70	1.413	0.04	0.159	0.225	
FR1 n77_Ant 6	100M	BPSK	1	1	Right Cheek	0mm	3	633332	3499.98	24.23	25.00	1.194	0.01	0.281	0.336	
FR1 n77_Ant 6	100M	BPSK	135	69	Right Cheek	0mm	3	633332	3499.98	24.20	25.00	1.202	0.02	0.331	0.398	
FR1 n77_Ant 6	100M	BPSK	1	1	Right Tilted	0mm	3	633332	3499.98	24.23	25.00	1.194	-0.05	0.189	0.226	
FR1 n77_Ant 6	100M	BPSK	135	69	Right Tilted	0mm	3	633332	3499.98	24.20	25.00	1.202	0.03	0.209	0.251	
FR1 n77_Ant 6	100M	BPSK	1	1	Left Cheek	0mm	3	633332	3499.98	24.23	25.00	1.194	0.01	0.512	0.611	
FR1 n77_Ant 6	100M	BPSK	135	69	Left Cheek	0mm	3	633332	3499.98	24.20	25.00	1.202	-0.03	0.543	0.653	
FR1 n77_Ant 6	100M	BPSK	1	1	Left Tilted	0mm	3	633332	3499.98	24.23	25.00	1.194	0	0.139	0.166	
FR1 n77_Ant 6	100M	BPSK	135	69	Left Tilted	0mm	3	633332	3499.98	24.20	25.00	1.202	0.04	0.159	0.191	
FR1 n77_Ant 2	100M	BPSK	1	1	Right Cheek	0mm	2/3	656000	3840	23.50	24.70	1.318	-0.08	0.571	0.753	
FR1 n77_Ant 2	100M	BPSK	135	69	Right Cheek	0mm	2/3	656000	3840	23.64	24.70	1.276	0	0.561	0.716	
FR1 n77_Ant 2	100M	BPSK	1	1	Right Tilted	0mm	2/3	656000	3840	23.50	24.70	1.318	0.01	0.255	0.336	
FR1 n77_Ant 2	100M	BPSK	135	69	Right Tilted	0mm	2/3	656000	3840	23.64	24.70	1.276	-0.02	0.240	0.306	
FR1 n77_Ant 2	100M	BPSK	1	1	Left Cheek	0mm	2/3	656000	3840	23.50	24.70	1.318	0.05	0.377	0.497	
FR1 n77_Ant 2	100M	BPSK	135	69	Left Cheek	0mm	2/3	656000	3840	23.64	24.70	1.276	-0.03	0.364	0.465	
FR1 n77_Ant 2	100M	BPSK	1	1	Left Tilted	0mm	2/3	656000	3840	23.50	24.70	1.318	0.05	0.425	0.560	
FR1 n77_Ant 2	100M	BPSK	135	69	Left Tilted	0mm	2/3	656000	3840	23.64	24.70	1.276	-0.1	0.395	0.504	
FR1 n77_Ant 2	100M	BPSK	1	1	Right Cheek	0mm	2/3	633332	3499.98	23.11	24.70	1.442	0.01	0.333	0.480	
FR1 n77_Ant 2	100M	BPSK	135	69	Right Cheek	0mm	2/3	633332	3499.98	23.35	24.70	1.365	-0.01	0.361	0.493	
FR1 n77_Ant 2	100M	BPSK	1	1	Right Tilted	0mm	2/3	633332	3499.98	23.11	24.70	1.442	0.02	0.133	0.192	
FR1 n77_Ant 2	100M	BPSK	135	69	Right Tilted	0mm	2/3	633332	3499.98	23.35	24.70	1.365	-0.04	0.131	0.179	
FR1 n77_Ant 2	100M	BPSK	1	1	Left Cheek	0mm	2/3	633332	3499.98	23.11	24.70	1.442	0.05	0.222	0.320	
FR1 n77_Ant 2	100M	BPSK	135	69	Left Cheek	0mm	2/3	633332	3499.98	23.35	24.70	1.365	0.03	0.217	0.296	
FR1 n77_Ant 2	100M	BPSK	1	1	Left Tilted	0mm	2/3	633332	3499.98	23.11	24.70	1.442	-0.06	0.219	0.316	
FR1 n77_Ant 2	100M	BPSK	135	69	Left Tilted	0mm	2/3	633332	3499.98	23.35	24.70	1.365	0.1	0.226	0.308	
FR1 n77_Ant 1	100M	BPSK	1	1	Right Cheek	0mm	2	656000	3840	20.05	21.20	1.303	0.18	0.833	1.086	



**FCC SAR TEST REPORT**

**Report No. : FA241216-02D**

FR1 n77_Ant 1	100M	BPSK	135	69	Right Cheek	0mm	2	656000	3840	20.00	21.20	1.318	0.15	0.811	1.069
FR1 n77_Ant 1	100M	BPSK	270	0	Right Cheek	0mm	2	656000	3840	20.02	21.20	1.312	0.1	0.825	1.083
FR1 n77_Ant 1	100M	BPSK	1	1	Right Tilted	0mm	2	656000	3840	20.05	21.20	1.303	-0.11	0.504	0.657
FR1 n77_Ant 1	100M	BPSK	135	69	Right Tilted	0mm	2	656000	3840	20.00	21.20	1.318	-0.18	0.462	0.609
FR1 n77_Ant 1	100M	BPSK	1	1	Left Cheek	0mm	2	656000	3840	20.05	21.20	1.303	-0.03	0.201	0.262
FR1 n77_Ant 1	100M	BPSK	135	69	Left Cheek	0mm	2	656000	3840	20.00	21.20	1.318	-0.05	0.195	0.257
FR1 n77_Ant 1	100M	BPSK	1	1	Left Tilted	0mm	2	656000	3840	20.05	21.20	1.303	-0.09	0.176	0.229
FR1 n77_Ant 1	100M	BPSK	135	69	Left Tilted	0mm	2	656000	3840	20.00	21.20	1.318	-0.06	0.173	0.228
FR1 n77_Ant 1	100M	BPSK	1	1	Right Cheek	0mm	3	656000	3840	20.05	20.40	1.084	0.18	0.833	0.903
FR1 n77_Ant 1	100M	BPSK	135	69	Right Cheek	0mm	3	656000	3840	20.00	20.40	1.096	0.15	0.811	0.889
FR1 n77_Ant 1	100M	BPSK	270	0	Right Cheek	0mm	3	656000	3840	20.02	20.40	1.091	0.1	0.825	0.900
FR1 n77_Ant 1	100M	BPSK	1	1	Right Tilted	0mm	3	656000	3840	20.05	20.40	1.084	-0.11	0.504	0.546
FR1 n77_Ant 1	100M	BPSK	135	69	Right Tilted	0mm	3	656000	3840	20.00	20.40	1.096	-0.18	0.462	0.507
FR1 n77_Ant 1	100M	BPSK	1	1	Left Cheek	0mm	3	656000	3840	20.05	20.40	1.084	-0.03	0.201	0.218
FR1 n77_Ant 1	100M	BPSK	135	69	Left Cheek	0mm	3	656000	3840	20.00	20.40	1.096	-0.05	0.195	0.214
FR1 n77_Ant 1	100M	BPSK	1	1	Left Tilted	0mm	3	656000	3840	20.05	20.40	1.084	-0.09	0.176	0.191
FR1 n77_Ant 1	100M	BPSK	135	69	Left Tilted	0mm	3	656000	3840	20.00	20.40	1.096	-0.06	0.173	0.190
FR1 n77_Ant 1	100M	BPSK	1	1	Right Cheek	0mm	2	633332	3499.98	19.86	21.20	1.361	0.12	0.603	0.821
FR1 n77_Ant 1	100M	BPSK	135	69	Right Cheek	0mm	2	633332	3499.98	20.20	21.20	1.259	0.17	0.694	0.874
FR1 n77_Ant 1	100M	BPSK	270	0	Right Cheek	0mm	2	633332	3499.98	20.14	21.20	1.276	0.15	0.722	0.922
FR1 n77_Ant 1	100M	BPSK	1	1	Right Tilted	0mm	2	633332	3499.98	19.86	21.20	1.361	0.04	0.492	0.670
FR1 n77_Ant 1	100M	BPSK	135	69	Right Tilted	0mm	2	633332	3499.98	20.20	21.20	1.259	0.05	0.542	0.682
FR1 n77_Ant 1	100M	BPSK	1	1	Left Cheek	0mm	2	633332	3499.98	19.86	21.20	1.361	-0.05	0.168	0.229
FR1 n77_Ant 1	100M	BPSK	135	69	Left Cheek	0mm	2	633332	3499.98	20.20	21.20	1.259	-0.03	0.167	0.210
FR1 n77_Ant 1	100M	BPSK	1	1	Left Tilted	0mm	2	633332	3499.98	19.86	21.20	1.361	0.12	0.196	0.267
FR1 n77_Ant 1	100M	BPSK	135	69	Left Tilted	0mm	2	633332	3499.98	20.20	21.20	1.259	-0.13	0.216	0.272
FR1 n77_Ant 1	100M	BPSK	1	1	Right Cheek	0mm	3	633332	3499.98	19.86	20.40	1.132	0.12	0.603	0.683
FR1 n77_Ant 1	100M	BPSK	135	69	Right Cheek	0mm	3	633332	3499.98	20.20	20.40	1.047	0.17	0.694	0.727
FR1 n77_Ant 1	100M	BPSK	1	1	Right Tilted	0mm	3	633332	3499.98	19.86	20.40	1.132	0.04	0.492	0.557
FR1 n77_Ant 1	100M	BPSK	135	69	Right Tilted	0mm	3	633332	3499.98	20.20	20.40	1.047	0.05	0.542	0.568
FR1 n77_Ant 1	100M	BPSK	1	1	Left Cheek	0mm	3	633332	3499.98	19.86	20.40	1.132	-0.05	0.168	0.190
FR1 n77_Ant 1	100M	BPSK	135	69	Left Cheek	0mm	3	633332	3499.98	20.20	20.40	1.047	-0.03	0.167	0.175
FR1 n77_Ant 1	100M	BPSK	1	1	Left Tilted	0mm	3	633332	3499.98	19.86	20.40	1.132	0.12	0.196	0.222
FR1 n77_Ant 1	100M	BPSK	135	69	Left Tilted	0mm	3	633332	3499.98	20.20	20.40	1.047	-0.13	0.216	0.226
FR1 n77_Ant 5	100M	BPSK	1	1	Right Cheek	0mm	2	656000	3840	19.37	20.70	1.358	0.06	0.192	0.261
FR1 n77_Ant 5	100M	BPSK	135	69	Right Cheek	0mm	2	656000	3840	19.19	20.70	1.416	-0.18	0.171	0.242
FR1 n77_Ant 5	100M	BPSK	1	1	Right Tilted	0mm	2	656000	3840	19.37	20.70	1.358	0.07	0.095	0.129
FR1 n77_Ant 5	100M	BPSK	135	69	Right Tilted	0mm	2	656000	3840	19.19	20.70	1.416	0.01	0.087	0.123
FR1 n77_Ant 5	100M	BPSK	1	1	Left Cheek	0mm	2	656000	3840	19.37	20.70	1.358	-0.19	0.702	0.954
FR1 n77_Ant 5	100M	BPSK	135	69	Left Cheek	0mm	2	656000	3840	19.19	20.70	1.416	-0.08	0.663	0.939
FR1 n77_Ant 5	100M	BPSK	270	0	Left Cheek	0mm	2	656000	3840	19.25	20.70	1.396	-0.17	0.670	0.936
FR1 n77_Ant 5	100M	BPSK	1	1	Left Tilted	0mm	2	656000	3840	19.37	20.70	1.358	-0.08	0.208	0.283
FR1 n77_Ant 5	100M	BPSK	135	69	Left Tilted	0mm	2	656000	3840	19.19	20.70	1.416	-0.09	0.185	0.262
FR1 n77_Ant 5	100M	BPSK	1	1	Right Cheek	0mm	3	656000	3840	19.37	19.90	1.130	0.06	0.192	0.217
FR1 n77_Ant 5	100M	BPSK	135	69	Right Cheek	0mm	3	656000	3840	19.19	19.90	1.178	-0.18	0.171	0.201
FR1 n77_Ant 5	100M	BPSK	1	1	Right Tilted	0mm	3	656000	3840	19.37	19.90	1.130	0.07	0.095	0.107
FR1 n77_Ant 5	100M	BPSK	135	69	Right Tilted	0mm	3	656000	3840	19.19	19.90	1.178	0.01	0.087	0.102
FR1 n77_Ant 5	100M	BPSK	1	1	Left Cheek	0mm	3	656000	3840	19.37	19.90	1.130	-0.19	0.702	0.793
FR1 n77_Ant 5	100M	BPSK	135	69	Left Cheek	0mm	3	656000	3840	19.19	19.90	1.178	-0.08	0.663	0.781
FR1 n77_Ant 5	100M	BPSK	1	1	Left Tilted	0mm	3	656000	3840	19.37	19.90	1.130	-0.08	0.208	0.235
FR1 n77_Ant 5	100M	BPSK	135	69	Left Tilted	0mm	3	656000	3840	19.19	19.90	1.178	-0.09	0.185	0.218
FR1 n77_Ant 5	100M	BPSK	1	1	Right Cheek	0mm	2	633332	3499.98	19.10	20.70	1.445	-0.06	0.252	0.364
FR1 n77_Ant 5	100M	BPSK	135	69	Right Cheek	0mm	2	633332	3499.98	19.55	20.70	1.303	-0.05	0.214	0.279
FR1 n77_Ant 5	100M	BPSK	1	1	Right Tilted	0mm	2	633332	3499.98	19.10	20.70	1.445	0.1	0.084	0.121
FR1 n77_Ant 5	100M	BPSK	135	69	Right Tilted	0mm	2	633332	3499.98	19.55	20.70	1.303	-0.04	0.084	0.109



40	FR1 n77_Ant 5	100M	BPSK	1	1	Left Cheek	0mm	2	633332	3499.98	19.10	20.70	1.445	-0.12	0.775	1.120
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Cheek	0mm	2	633332	3499.98	19.55	20.70	1.303	-0.04	0.797	1.039
	FR1 n77_Ant 5	100M	BPSK	270	0	Left Cheek	0mm	2	633332	3499.98	19.54	20.70	1.306	-0.19	0.764	0.998
	FR1 n77_Ant 5	100M	BPSK	1	1	Left Tilted	0mm	2	633332	3499.98	19.10	20.70	1.445	0.03	0.248	0.358
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Tilted	0mm	2	633332	3499.98	19.55	20.70	1.303	-0.02	0.239	0.311
	FR1 n77_Ant 5	100M	BPSK	1	1	Right Cheek	0mm	3	633332	3499.98	19.10	19.90	1.202	-0.06	0.252	0.303
	FR1 n77_Ant 5	100M	BPSK	135	69	Right Cheek	0mm	3	633332	3499.98	19.55	19.90	1.084	-0.05	0.214	0.232
	FR1 n77_Ant 5	100M	BPSK	1	1	Right Tilted	0mm	3	633332	3499.98	19.10	19.90	1.202	0.1	0.084	0.101
	FR1 n77_Ant 5	100M	BPSK	135	69	Right Tilted	0mm	3	633332	3499.98	19.55	19.90	1.084	-0.04	0.084	0.091
	FR1 n77_Ant 5	100M	BPSK	1	1	Left Cheek	0mm	3	633332	3499.98	19.10	19.90	1.202	-0.12	0.775	0.932
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Cheek	0mm	3	633332	3499.98	19.55	19.90	1.084	-0.04	0.797	0.864
	FR1 n77_Ant 5	100M	BPSK	270	0	Left Cheek	0mm	3	633332	3499.98	19.54	19.90	1.086	-0.19	0.764	0.830
	FR1 n77_Ant 5	100M	BPSK	1	1	Left Tilted	0mm	3	633332	3499.98	19.10	19.90	1.202	0.03	0.248	0.298
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Tilted	0mm	3	633332	3499.98	19.55	19.90	1.084	-0.02	0.239	0.259

**18.2 Hotspot 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)
	GSM850_Ant 0	GPRS (4 Tx slots)	Front	10mm	4	128	824.2	29.41	30.00	1.146	-0.16	0.543	0.622
	GSM850_Ant 0	GPRS (4 Tx slots)	Back	10mm	4	128	824.2	29.41	30.00	1.146	-0.12	0.545	0.624
41	GSM850_Ant 0	GPRS (4 Tx slots)	Left Side	10mm	4	128	824.2	29.41	30.00	1.146	0.02	0.813	0.931
	GSM850_Ant 0	GPRS (4 Tx slots)	Left Side	10mm	4	189	836.4	29.14	30.00	1.219	-0.19	0.738	0.900
	GSM850_Ant 0	GPRS (4 Tx slots)	Left Side	10mm	4	251	848.8	29.31	30.00	1.172	-0.03	0.680	0.797
	GSM850_Ant 0	GPRS (4 Tx slots)	Right Side	10mm	4	128	824.2	29.41	30.00	1.146	-0.18	0.430	0.493
	GSM850_Ant 0	GPRS (4 Tx slots)	Bottom Side	10mm	4	128	824.2	29.41	30.00	1.146	-0.14	0.544	0.623
	GSM850_Ant 1	GPRS (2 Tx slots)	Front	10mm	4	128	824.2	30.84	32.50	1.466	-0.02	0.266	0.390
	GSM850_Ant 1	GPRS (2 Tx slots)	Back	10mm	4	128	824.2	30.84	32.50	1.466	-0.01	0.308	0.451
	GSM850_Ant 1	GPRS (2 Tx slots)	Left Side	10mm	4	128	824.2	30.84	32.50	1.466	-0.19	0.179	0.262
	GSM850_Ant 1	GPRS (2 Tx slots)	Right Side	10mm	4	128	824.2	30.84	32.50	1.466	-0.05	0.180	0.264
	GSM850_Ant 1	GPRS (2 Tx slots)	Top Side	10mm	4	128	824.2	30.84	32.50	1.466	0.03	0.200	0.293
	GSM1900_Ant 2	GPRS (4 Tx slots)	Front	10mm	4	810	1909.8	25.01	26.00	1.256	0.03	0.651	0.818
	GSM1900_Ant 2	GPRS (4 Tx slots)	Front	10mm	4	512	1850.2	24.87	26.00	1.297	-0.09	0.641	0.831
42	GSM1900_Ant 2	GPRS (4 Tx slots)	Front	10mm	4	661	1880	24.97	26.00	1.268	0.07	0.735	0.932
	GSM1900_Ant 2	GPRS (4 Tx slots)	Back	10mm	4	810	1909.8	25.01	26.00	1.256	0.1	0.647	0.813
	GSM1900_Ant 2	GPRS (4 Tx slots)	Back	10mm	4	512	1850.2	24.87	26.00	1.297	0.13	0.581	0.754
	GSM1900_Ant 2	GPRS (4 Tx slots)	Back	10mm	4	661	1880	24.97	26.00	1.268	0.1	0.716	0.908
	GSM1900_Ant 2	GPRS (4 Tx slots)	Left Side	10mm	4	810	1909.8	25.01	26.00	1.256	-0.07	0.024	0.030
	GSM1900_Ant 2	GPRS (4 Tx slots)	Right Side	10mm	4	810	1909.8	25.01	26.00	1.256	-0.16	0.482	0.605
	GSM1900_Ant 2	GPRS (4 Tx slots)	Bottom Side	10mm	4	810	1909.8	25.01	26.00	1.256	0.13	0.466	0.585
	GSM1900_Ant 0	GPRS (4 Tx slots)	Front	10mm	4	810	1909.8	26.10	26.90	1.202	-0.03	0.396	0.476
	GSM1900_Ant 0	GPRS (4 Tx slots)	Back	10mm	4	810	1909.8	26.10	26.90	1.202	-0.07	0.436	0.524
	GSM1900_Ant 0	GPRS (4 Tx slots)	Left Side	10mm	4	810	1909.8	26.10	26.90	1.202	0.09	0.709	0.852
	GSM1900_Ant 0	GPRS (4 Tx slots)	Left Side	10mm	4	512	1850.2	25.86	26.90	1.271	0.01	0.543	0.690
	GSM1900_Ant 0	GPRS (4 Tx slots)	Left Side	10mm	4	661	1880	26.01	26.90	1.227	-0.18	0.625	0.767
	GSM1900_Ant 0	GPRS (4 Tx slots)	Right Side	10mm	4	810	1909.8	26.10	26.90	1.202	-0.14	0.045	0.054
	GSM1900_Ant 0	GPRS (4 Tx slots)	Bottom Side	10mm	4	810	1909.8	26.10	26.90	1.202	0.15	0.166	0.200

**<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)	
43	WCDMA II_Ant 2	RMC 12.2Kbps	Front	10mm	4	9538	1907.6	20.92	21.50	1.143	-0.03	0.653	0.746	
	WCDMA II_Ant 2	RMC 12.2Kbps	Back	10mm	4	9538	1907.6	20.92	21.50	1.143	-0.19	0.546	0.624	
	WCDMA II_Ant 2	RMC 12.2Kbps	Left Side	10mm	4	9538	1907.6	20.92	21.50	1.143	0.01	0.020	0.023	
	WCDMA II_Ant 2	RMC 12.2Kbps	Right Side	10mm	4	9538	1907.6	20.92	21.50	1.143	-0.03	0.492	0.562	
	WCDMA II_Ant 2	RMC 12.2Kbps	Bottom Side	10mm	4	9538	1907.6	20.92	21.50	1.143	-0.02	0.450	0.514	
	WCDMA II_Ant 0	RMC 12.2Kbps	Front	10mm	4	9262	1852.4	21.82	22.90	1.282	-0.02	0.237	0.304	
	WCDMA II_Ant 0	RMC 12.2Kbps	Back	10mm	4	9262	1852.4	21.82	22.90	1.282	0.06	0.298	0.382	
	WCDMA II_Ant 0	RMC 12.2Kbps	Left Side	10mm	4	9262	1852.4	21.82	22.90	1.282	-0.03	0.427	0.548	
	WCDMA II_Ant 0	RMC 12.2Kbps	Right Side	10mm	4	9262	1852.4	21.82	22.90	1.282	-0.15	0.030	0.038	
	WCDMA II_Ant 0	RMC 12.2Kbps	Bottom Side	10mm	4	9262	1852.4	21.82	22.90	1.282	-0.01	0.136	0.174	
	WCDMA IV_Ant 2	RMC 12.2Kbps	Front	10mm	4	1312	1712.4	23.05	23.70	1.161	-0.1	0.560	0.650	
	WCDMA IV_Ant 2	RMC 12.2Kbps	Back	10mm	4	1312	1712.4	23.05	23.70	1.161	0.08	0.504	0.585	
	WCDMA IV_Ant 2	RMC 12.2Kbps	Left Side	10mm	4	1312	1712.4	23.05	23.70	1.161	0.02	0.138	0.160	
	44	WCDMA IV_Ant 2	RMC 12.2Kbps	Right Side	10mm	4	1312	1712.4	23.05	23.70	1.161	-0.06	0.617	0.717
		WCDMA IV_Ant 2	RMC 12.2Kbps	Bottom Side	10mm	4	1312	1712.4	23.05	23.70	1.161	0	0.387	0.449
	WCDMA IV_Ant 0	RMC 12.2Kbps	Front	10mm	4	1312	1712.4	23.90	24.00	1.023	0	0.462	0.473	
	WCDMA IV_Ant 0	RMC 12.2Kbps	Back	10mm	4	1312	1712.4	23.90	24.00	1.023	-0.16	0.446	0.456	
	WCDMA IV_Ant 0	RMC 12.2Kbps	Left Side	10mm	4	1312	1712.4	23.90	24.00	1.023	-0.1	0.376	0.385	
	WCDMA IV_Ant 0	RMC 12.2Kbps	Right Side	10mm	4	1312	1712.4	23.90	24.00	1.023	-0.02	0.061	0.062	
	WCDMA IV_Ant 0	RMC 12.2Kbps	Bottom Side	10mm	4	1312	1712.4	23.90	24.00	1.023	0.04	0.305	0.312	
	WCDMA V_Ant 0	RMC 12.2Kbps	Front	10mm	4	4132	826.4	24.20	25.00	1.202	-0.02	0.317	0.381	
	WCDMA V_Ant 0	RMC 12.2Kbps	Back	10mm	4	4132	826.4	24.20	25.00	1.202	-0.03	0.321	0.386	
	45	WCDMA V_Ant 0	RMC 12.2Kbps	Left Side	10mm	4	4132	826.4	24.20	25.00	1.202	-0.08	0.438	0.527
		WCDMA V_Ant 0	RMC 12.2Kbps	Right Side	10mm	4	4132	826.4	24.20	25.00	1.202	-0.02	0.218	0.262
	WCDMA V_Ant 0	RMC 12.2Kbps	Bottom Side	10mm	4	4132	826.4	24.20	25.00	1.202	-0.06	0.347	0.417	
	WCDMA V_Ant 1	RMC 12.2Kbps	Front	10mm	4	4132	826.4	22.60	24.50	1.549	-0.14	0.189	0.293	
	WCDMA V_Ant 1	RMC 12.2Kbps	Back	10mm	4	4132	826.4	22.60	24.50	1.549	-0.02	0.218	0.338	
	WCDMA V_Ant 1	RMC 12.2Kbps	Left Side	10mm	4	4132	826.4	22.60	24.50	1.549	-0.14	0.077	0.119	
	WCDMA V_Ant 1	RMC 12.2Kbps	Right Side	10mm	4	4132	826.4	22.60	24.50	1.549	0.08	0.097	0.150	
	WCDMA V_Ant 1	RMC 12.2Kbps	Top Side	10mm	4	4132	826.4	22.60	24.50	1.549	0.09	0.155	0.240	



<FDD 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 5_Ant 0	10M	QPSK	1	0	Front	10mm	4	20525	836.5	23.86	25.70	1.528	-0.14	0.418	0.639
	LTE Band 5_Ant 0	10M	QPSK	25	0	Front	10mm	4	20525	836.5	22.93	24.70	1.503	-0.01	0.336	0.505
	LTE Band 5_Ant 0	10M	QPSK	1	0	Back	10mm	4	20525	836.5	23.86	25.70	1.528	-0.11	0.407	0.622
	LTE Band 5_Ant 0	10M	QPSK	25	0	Back	10mm	4	20525	836.5	22.93	24.70	1.503	0.04	0.326	0.490
46	LTE Band 5_Ant 0	10M	QPSK	1	0	Left Side	10mm	4	20525	836.5	23.86	25.70	1.528	-0.08	0.610	0.932
	LTE Band 5_Ant 0	10M	QPSK	25	0	Left Side	10mm	4	20525	836.5	22.93	24.70	1.503	-0.11	0.477	0.717
	LTE Band 5_Ant 0	10M	QPSK	50	0	Left Side	10mm	4	20525	836.5	22.86	24.70	1.528	-0.04	0.473	0.723
	LTE Band 5_Ant 0	10M	QPSK	1	0	Right Side	10mm	4	20525	836.5	23.86	25.70	1.528	-0.07	0.270	0.412
	LTE Band 5_Ant 0	10M	QPSK	25	0	Right Side	10mm	4	20525	836.5	22.93	24.70	1.503	-0.09	0.209	0.314
	LTE Band 5_Ant 0	10M	QPSK	1	0	Bottom Side	10mm	4	20525	836.5	23.86	25.70	1.528	-0.03	0.466	0.712
	LTE Band 5_Ant 0	10M	QPSK	25	0	Bottom Side	10mm	4	20525	836.5	22.93	24.70	1.503	-0.02	0.369	0.555
	LTE Band 5B_Ant 0	10M	QPSK	1	49	Left Side	10mm	4	20450+20549	829	22.42	24.00	1.439	0.07	0.408	0.587
	LTE Band 5_Ant 1	10M	QPSK	1	0	Front	10mm	4	20525	836.5	23.68	25.20	1.419	0.04	0.237	0.336
	LTE Band 5_Ant 1	10M	QPSK	25	0	Front	10mm	4	20525	836.5	22.59	24.20	1.449	-0.05	0.193	0.280
	LTE Band 5_Ant 1	10M	QPSK	1	0	Back	10mm	4	20525	836.5	23.68	25.20	1.419	-0.09	0.262	0.372
	LTE Band 5_Ant 1	10M	QPSK	25	0	Back	10mm	4	20525	836.5	22.59	24.20	1.449	-0.14	0.213	0.309
	LTE Band 5_Ant 1	10M	QPSK	1	0	Left Side	10mm	4	20525	836.5	23.68	25.20	1.419	0.02	0.097	0.138
	LTE Band 5_Ant 1	10M	QPSK	25	0	Left Side	10mm	4	20525	836.5	22.59	24.20	1.449	0.14	0.076	0.110
	LTE Band 5_Ant 1	10M	QPSK	1	0	Right Side	10mm	4	20525	836.5	23.68	25.20	1.419	-0.19	0.135	0.192
	LTE Band 5_Ant 1	10M	QPSK	25	0	Right Side	10mm	4	20525	836.5	22.59	24.20	1.449	-0.13	0.108	0.156
	LTE Band 5_Ant 1	10M	QPSK	1	0	Top Side	10mm	4	20525	836.5	23.68	25.20	1.419	-0.14	0.181	0.257
	LTE Band 5_Ant 1	10M	QPSK	25	0	Top Side	10mm	4	20525	836.5	22.59	24.20	1.449	-0.1	0.149	0.216
	LTE Band 5B_Ant 1	10M	QPSK	1	0	Back	10mm	4	20525+20426	836.5	22.02	23.50	1.406	0.18	0.219	0.308





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 7_Ant 2	20M	QPSK	1	0	Front	10mm	4	21100	2535	20.87	21.40	1.130	0.14	0.465	0.525
	LTE Band 7_Ant 2	20M	QPSK	50	0	Front	10mm	4	21100	2535	20.96	21.40	1.107	-0.03	0.461	0.510
	LTE Band 7_Ant 2	20M	QPSK	1	0	Back	10mm	4	21100	2535	20.87	21.40	1.130	0.09	0.484	0.547
	LTE Band 7_Ant 2	20M	QPSK	50	0	Back	10mm	4	21100	2535	20.96	21.40	1.107	0.17	0.484	0.536
	LTE Band 7_Ant 2	20M	QPSK	1	0	Left Side	10mm	4	21100	2535	20.87	21.40	1.130	-0.11	0.037	0.042
	LTE Band 7_Ant 2	20M	QPSK	50	0	Left Side	10mm	4	21100	2535	20.96	21.40	1.107	0.09	0.038	0.042
47	LTE Band 7_Ant 2	20M	QPSK	1	0	Right Side	10mm	4	21100	2535	20.87	21.40	1.130	-0.06	0.876	0.990
	LTE Band 7_Ant 2	20M	QPSK	1	0	Right Side	10mm	4	20850	2510	20.79	21.40	1.151	-0.06	0.838	0.964
	LTE Band 7_Ant 2	20M	QPSK	1	0	Right Side	10mm	4	21350	2560	20.86	21.40	1.132	-0.01	0.794	0.899
	LTE Band 7_Ant 2	20M	QPSK	50	0	Right Side	10mm	4	21100	2535	20.96	21.40	1.107	-0.05	0.830	0.918
	LTE Band 7_Ant 2	20M	QPSK	50	0	Right Side	10mm	4	20850	2510	20.90	21.40	1.122	-0.06	0.829	0.930
	LTE Band 7_Ant 2	20M	QPSK	50	0	Right Side	10mm	4	21350	2560	20.95	21.40	1.109	-0.08	0.773	0.857
	LTE Band 7_Ant 2	20M	QPSK	100	0	Right Side	10mm	4	21100	2535	20.93	21.40	1.114	-0.15	0.809	0.901
	LTE Band 7_Ant 2	20M	QPSK	1	0	Bottom Side	10mm	4	21100	2535	20.87	21.40	1.130	0.03	0.395	0.446
	LTE Band 7_Ant 2	20M	QPSK	50	0	Bottom Side	10mm	4	21100	2535	20.96	21.40	1.107	-0.01	0.398	0.440
	LTE Band 7C_Ant 2	20M	QPSK	1	0	Right Side	10mm	4	21100+20902	2535	19.69	19.70	1.002	0.05	0.735	0.737
	LTE Band 7_Ant 0	20M	QPSK	1	0	Front	10mm	4	21100	2535	21.01	21.90	1.227	-0.08	0.364	0.447
	LTE Band 7_Ant 0	20M	QPSK	50	0	Front	10mm	4	21100	2535	20.99	21.90	1.233	-0.06	0.379	0.467
	LTE Band 7_Ant 0	20M	QPSK	1	0	Back	10mm	4	21100	2535	21.01	21.90	1.227	-0.16	0.275	0.338
	LTE Band 7_Ant 0	20M	QPSK	50	0	Back	10mm	4	21100	2535	20.99	21.90	1.233	0.07	0.279	0.344
	LTE Band 7_Ant 0	20M	QPSK	1	0	Left Side	10mm	4	21100	2535	21.01	21.90	1.227	-0.1	0.652	0.800
	LTE Band 7_Ant 0	20M	QPSK	1	0	Left Side	10mm	4	20850	2510	20.92	21.90	1.253	-0.1	0.509	0.638
	LTE Band 7_Ant 0	20M	QPSK	1	0	Left Side	10mm	4	21350	2560	20.81	21.90	1.285	-0.17	0.696	0.895
	LTE Band 7_Ant 0	20M	QPSK	50	0	Left Side	10mm	4	21100	2535	20.99	21.90	1.233	-0.16	0.671	0.827
	LTE Band 7_Ant 0	20M	QPSK	50	0	Left Side	10mm	4	20850	2510	20.92	21.90	1.253	-0.1	0.550	0.689
	LTE Band 7_Ant 0	20M	QPSK	50	0	Left Side	10mm	4	21350	2560	20.87	21.90	1.268	-0.15	0.726	0.920
	LTE Band 7_Ant 0	20M	QPSK	100	0	Left Side	10mm	4	21100	2535	20.96	21.90	1.242	-0.15	0.671	0.833
	LTE Band 7_Ant 0	20M	QPSK	1	0	Right Side	10mm	4	21100	2535	21.01	21.90	1.227	0.01	0.028	0.034
	LTE Band 7_Ant 0	20M	QPSK	50	0	Right Side	10mm	4	21100	2535	20.99	21.90	1.233	-0.19	0.026	0.032
	LTE Band 7_Ant 0	20M	QPSK	1	0	Bottom Side	10mm	4	21100	2535	21.01	21.90	1.227	0.09	0.075	0.092
	LTE Band 7_Ant 0	20M	QPSK	50	0	Bottom Side	10mm	4	21100	2535	20.99	21.90	1.233	0.01	0.079	0.097
	LTE Band 7C_Ant 0	20M	QPSK	1	0	Left Side	10mm	4	21100+20902	2535	20.05	20.20	1.035	0.11	0.561	0.581
	LTE Band 12_Ant 0	10M	QPSK	1	0	Front	10mm	4	23095	707.5	23.88	25.70	1.521	-0.07	0.352	0.535
	LTE Band 12_Ant 0	10M	QPSK	25	0	Front	10mm	4	23095	707.5	22.95	24.70	1.496	-0.06	0.272	0.407
	LTE Band 12_Ant 0	10M	QPSK	1	0	Back	10mm	4	23095	707.5	23.88	25.70	1.521	-0.05	0.322	0.490
	LTE Band 12_Ant 0	10M	QPSK	25	0	Back	10mm	4	23095	707.5	22.95	24.70	1.496	0.01	0.254	0.380
48	LTE Band 12_Ant 0	10M	QPSK	1	0	Left Side	10mm	4	23095	707.5	23.88	25.70	1.521	-0.03	0.475	0.722
	LTE Band 12_Ant 0	10M	QPSK	25	0	Left Side	10mm	4	23095	707.5	22.95	24.70	1.496	-0.08	0.367	0.549
	LTE Band 12_Ant 0	10M	QPSK	1	0	Right Side	10mm	4	23095	707.5	23.88	25.70	1.521	-0.13	0.288	0.438
	LTE Band 12_Ant 0	10M	QPSK	25	0	Right Side	10mm	4	23095	707.5	22.95	24.70	1.496	-0.1	0.224	0.335
	LTE Band 12_Ant 0	10M	QPSK	1	0	Bottom Side	10mm	4	23095	707.5	23.88	25.70	1.521	-0.14	0.265	0.403
	LTE Band 12_Ant 0	10M	QPSK	25	0	Bottom Side	10mm	4	23095	707.5	22.95	24.70	1.496	-0.12	0.208	0.311
	LTE Band 12_Ant 1	10M	QPSK	1	0	Front	10mm	4	23095	707.5	23.59	25.20	1.449	0	0.188	0.272
	LTE Band 12_Ant 1	10M	QPSK	25	0	Front	10mm	4	23095	707.5	22.56	24.20	1.459	-0.03	0.156	0.228
	LTE Band 12_Ant 1	10M	QPSK	1	0	Back	10mm	4	23095	707.5	23.59	25.20	1.449	-0.09	0.214	0.310
	LTE Band 12_Ant 1	10M	QPSK	25	0	Back	10mm	4	23095	707.5	22.56	24.20	1.459	-0.06	0.178	0.260
	LTE Band 12_Ant 1	10M	QPSK	1	0	Left Side	10mm	4	23095	707.5	23.59	25.20	1.449	-0.07	0.110	0.159
	LTE Band 12_Ant 1	10M	QPSK	25	0	Left Side	10mm	4	23095	707.5	22.56	24.20	1.459	-0.03	0.092	0.134
	LTE Band 12_Ant 1	10M	QPSK	1	0	Right Side	10mm	4	23095	707.5	23.59	25.20	1.449	-0.08	0.085	0.123
	LTE Band 12_Ant 1	10M	QPSK	25	0	Right Side	10mm	4	23095	707.5	22.56	24.20	1.459	-0.1	0.068	0.099
	LTE Band 12_Ant 1	10M	QPSK	1	0	Top Side	10mm	4	23095	707.5	23.59	25.20	1.449	-0.11	0.126	0.183
	LTE Band 12_Ant 1	10M	QPSK	25	0	Top Side	10mm	4	23095	707.5	22.56	24.20	1.459	-0.1	0.102	0.149



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 25_Ant 2	20M	QPSK	1	0	Front	10mm	4	26340	1880	21.38	22.50	1.294	0.02	0.695	0.899
	LTE Band 25_Ant 2	20M	QPSK	1	0	Front	10mm	4	26140	1860	21.23	22.50	1.340	-0.02	0.618	0.828
	LTE Band 25_Ant 2	20M	QPSK	1	0	Front	10mm	4	26590	1905	21.37	22.50	1.297	-0.12	0.660	0.856
	LTE Band 25_Ant 2	20M	QPSK	50	0	Front	10mm	4	26340	1880	21.42	22.50	1.282	-0.12	0.721	0.925
	LTE Band 25_Ant 2	20M	QPSK	50	0	Front	10mm	4	26140	1860	21.38	22.50	1.294	-0.08	0.657	0.850
	LTE Band 25_Ant 2	20M	QPSK	50	0	Front	10mm	4	26590	1905	21.36	22.50	1.300	-0.06	0.662	0.861
	LTE Band 25_Ant 2	20M	QPSK	100	0	Front	10mm	4	26340	1880	21.38	22.50	1.294	-0.07	0.706	0.914
	LTE Band 25_Ant 2	20M	QPSK	1	0	Back	10mm	4	26340	1880	21.38	22.50	1.294	-0.03	0.708	0.916
	LTE Band 25_Ant 2	20M	QPSK	1	0	Back	10mm	4	26140	1860	21.23	22.50	1.340	-0.06	0.630	0.844
	LTE Band 25_Ant 2	20M	QPSK	1	0	Back	10mm	4	26590	1905	21.37	22.50	1.297	-0.02	0.678	0.879
49	LTE Band 25_Ant 2	20M	QPSK	50	0	Back	10mm	4	26340	1880	21.42	22.50	1.282	-0.04	0.742	0.951
	LTE Band 25_Ant 2	20M	QPSK	50	0	Back	10mm	4	26140	1860	21.38	22.50	1.294	-0.04	0.680	0.880
	LTE Band 25_Ant 2	20M	QPSK	50	0	Back	10mm	4	26590	1905	21.36	22.50	1.300	-0.09	0.669	0.870
	LTE Band 25_Ant 2	20M	QPSK	100	0	Back	10mm	4	26340	1880	21.38	22.50	1.294	-0.17	0.721	0.933
	LTE Band 25_Ant 2	20M	QPSK	1	0	Left Side	10mm	4	26340	1880	21.38	22.50	1.294	0.01	0.030	0.039
	LTE Band 25_Ant 2	20M	QPSK	50	0	Left Side	10mm	4	26340	1880	21.42	22.50	1.282	0.14	0.031	0.040
	LTE Band 25_Ant 2	20M	QPSK	1	0	Right Side	10mm	4	26340	1880	21.38	22.50	1.294	-0.08	0.681	0.881
	LTE Band 25_Ant 2	20M	QPSK	1	0	Right Side	10mm	4	26140	1860	21.23	22.50	1.340	-0.02	0.607	0.813
	LTE Band 25_Ant 2	20M	QPSK	1	0	Right Side	10mm	4	26590	1905	21.37	22.50	1.297	-0.06	0.607	0.787
	LTE Band 25_Ant 2	20M	QPSK	50	0	Right Side	10mm	4	26340	1880	21.42	22.50	1.282	-0.05	0.676	0.867
	LTE Band 25_Ant 2	20M	QPSK	50	0	Right Side	10mm	4	26140	1860	21.38	22.50	1.294	-0.02	0.634	0.821
	LTE Band 25_Ant 2	20M	QPSK	50	0	Right Side	10mm	4	26590	1905	21.36	22.50	1.300	0.13	0.599	0.779
	LTE Band 25_Ant 2	20M	QPSK	100	0	Right Side	10mm	4	26340	1880	21.38	22.50	1.294	0.02	0.665	0.861
	LTE Band 25_Ant 2	20M	QPSK	1	0	Bottom Side	10mm	4	26340	1880	21.38	22.50	1.294	-0.03	0.486	0.629
	LTE Band 25_Ant 2	20M	QPSK	50	0	Bottom Side	10mm	4	26340	1880	21.42	22.50	1.282	-0.08	0.504	0.646
	LTE Band 25_Ant 0	20M	QPSK	1	0	Front	10mm	4	26340	1880	22.36	23.60	1.330	-0.08	0.270	0.359
	LTE Band 25_Ant 0	20M	QPSK	50	0	Front	10mm	4	26340	1880	22.35	23.60	1.334	0.09	0.275	0.367
	LTE Band 25_Ant 0	20M	QPSK	1	0	Back	10mm	4	26340	1880	22.36	23.60	1.330	-0.04	0.322	0.428
	LTE Band 25_Ant 0	20M	QPSK	50	0	Back	10mm	4	26340	1880	22.35	23.60	1.334	-0.07	0.330	0.440
	LTE Band 25_Ant 0	20M	QPSK	1	0	Left Side	10mm	4	26340	1880	22.36	23.60	1.330	0.17	0.509	0.677
	LTE Band 25_Ant 0	20M	QPSK	50	0	Left Side	10mm	4	26340	1880	22.35	23.60	1.334	-0.08	0.513	0.684
	LTE Band 25_Ant 0	20M	QPSK	1	0	Right Side	10mm	4	26340	1880	22.36	23.60	1.330	0.17	0.038	0.051
	LTE Band 25_Ant 0	20M	QPSK	50	0	Right Side	10mm	4	26340	1880	22.35	23.60	1.334	0.07	0.042	0.056
	LTE Band 25_Ant 0	20M	QPSK	1	0	Bottom Side	10mm	4	26340	1880	22.36	23.60	1.330	0.08	0.142	0.189
	LTE Band 25_Ant 0	20M	QPSK	50	0	Bottom Side	10mm	4	26340	1880	22.35	23.60	1.334	-0.02	0.141	0.188



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 66_Ant 2	20M	QPSK	1	0	Front	10mm	4	132322	1745	23.05	23.80	1.189	-0.05	0.643	0.764
	LTE Band 66_Ant 2	20M	QPSK	50	0	Front	10mm	4	132322	1745	22.97	23.80	1.211	-0.08	0.616	0.746
	LTE Band 66_Ant 2	20M	QPSK	1	0	Back	10mm	4	132322	1745	23.05	23.80	1.189	-0.02	0.539	0.641
	LTE Band 66_Ant 2	20M	QPSK	50	0	Back	10mm	4	132322	1745	22.97	23.80	1.211	-0.03	0.535	0.648
	LTE Band 66_Ant 2	20M	QPSK	1	0	Left Side	10mm	4	132322	1745	23.05	23.80	1.189	0.1	0.125	0.149
	LTE Band 66_Ant 2	20M	QPSK	50	0	Left Side	10mm	4	132322	1745	22.97	23.80	1.211	-0.11	0.122	0.148
	LTE Band 66_Ant 2	20M	QPSK	1	0	Right Side	10mm	4	132322	1745	23.05	23.80	1.189	-0.13	0.727	0.864
	LTE Band 66_Ant 2	20M	QPSK	1	0	Right Side	10mm	4	132072	1720	22.92	23.80	1.225	-0.17	0.695	0.851
	LTE Band 66_Ant 2	20M	QPSK	1	0	Right Side	10mm	4	132572	1770	23.04	23.80	1.191	-0.17	0.687	0.818
	LTE Band 66_Ant 2	20M	QPSK	50	0	Right Side	10mm	4	132322	1745	22.97	23.80	1.211	-0.14	0.735	0.890
50	LTE Band 66_Ant 2	20M	QPSK	50	0	Right Side	10mm	4	132072	1720	22.79	23.80	1.262	-0.18	0.735	0.927
	LTE Band 66_Ant 2	20M	QPSK	50	0	Right Side	10mm	4	132572	1770	22.96	23.80	1.213	-0.17	0.702	0.852
	LTE Band 66_Ant 2	20M	QPSK	100	0	Right Side	10mm	4	132322	1745	22.87	23.80	1.239	-0.18	0.710	0.880
	LTE Band 66_Ant 2	20M	QPSK	1	0	Bottom Side	10mm	4	132322	1745	23.05	23.80	1.189	-0.04	0.404	0.480
	LTE Band 66_Ant 2	20M	QPSK	50	0	Bottom Side	10mm	4	132322	1745	22.97	23.80	1.211	-0.11	0.400	0.484
	LTE Band 66_Ant 0	20M	QPSK	1	0	Front	10mm	4	132322	1745	22.45	23.70	1.334	-0.06	0.328	0.437
	LTE Band 66_Ant 0	20M	QPSK	50	0	Front	10mm	4	132322	1745	22.49	23.70	1.321	-0.03	0.329	0.435
	LTE Band 66_Ant 0	20M	QPSK	1	0	Back	10mm	4	132322	1745	22.45	23.70	1.334	-0.1	0.284	0.379
	LTE Band 66_Ant 0	20M	QPSK	50	0	Back	10mm	4	132322	1745	22.49	23.70	1.321	-0.03	0.290	0.383
	LTE Band 66_Ant 0	20M	QPSK	1	0	Left Side	10mm	4	132322	1745	22.45	23.70	1.334	0.05	0.297	0.396
	LTE Band 66_Ant 0	20M	QPSK	50	0	Left Side	10mm	4	132322	1745	22.49	23.70	1.321	0.08	0.302	0.399
	LTE Band 66_Ant 0	20M	QPSK	1	0	Right Side	10mm	4	132322	1745	22.45	23.70	1.334	-0.09	0.054	0.072
	LTE Band 66_Ant 0	20M	QPSK	50	0	Right Side	10mm	4	132322	1745	22.49	23.70	1.321	-0.05	0.052	0.069
	LTE Band 66_Ant 0	20M	QPSK	1	0	Bottom Side	10mm	4	132322	1745	22.45	23.70	1.334	-0.1	0.310	0.413
	LTE Band 66_Ant 0	20M	QPSK	50	0	Bottom Side	10mm	4	132322	1745	22.49	23.70	1.321	-0.08	0.322	0.425



<TDD LTE SAR>

Table with columns: 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, Duty Cycle %, Duty Cycle Scaling Factor, Power Drift (dB), Measured 1g SAR (W/kg), Reported 1g SAR (W/kg). Contains multiple rows of test data.



<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 n5_Ant 0	20M	BPSK	1	1	Front	10mm	4	167300	836.5	24.55	25.70	1.303	-0.03	0.365	0.476
	FR1 n5_Ant 0	20M	BPSK	50	28	Front	10mm	4	167300	836.5	24.43	25.70	1.340	-0.07	0.392	0.525
	FR1 n5_Ant 0	20M	BPSK	1	1	Back	10mm	4	167300	836.5	24.55	25.70	1.303	-0.11	0.376	0.490
	FR1 n5_Ant 0	20M	BPSK	50	28	Back	10mm	4	167300	836.5	24.43	25.70	1.340	0.05	0.396	0.531
	FR1 n5_Ant 0	20M	BPSK	1	1	Left Side	10mm	4	167300	836.5	24.55	25.70	1.303	-0.04	0.512	0.667
52	FR1 n5_Ant 0	20M	BPSK	50	28	Left Side	10mm	4	167300	836.5	24.43	25.70	1.340	-0.19	0.541	0.725
	FR1 n5_Ant 0	20M	BPSK	1	1	Right Side	10mm	4	167300	836.5	24.55	25.70	1.303	0.12	0.229	0.298
	FR1 n5_Ant 0	20M	BPSK	50	28	Right Side	10mm	4	167300	836.5	24.43	25.70	1.340	-0.02	0.229	0.307
	FR1 n5_Ant 0	20M	BPSK	1	1	Bottom Side	10mm	4	167300	836.5	24.55	25.70	1.303	-0.09	0.377	0.491
	FR1 n5_Ant 0	20M	BPSK	50	28	Bottom Side	10mm	4	167300	836.5	24.43	25.70	1.340	-0.07	0.401	0.537
	FR1 n5_Ant 1	20M	BPSK	1	1	Front	10mm	4	167300	836.5	24.15	25.20	1.274	-0.09	0.208	0.265
	FR1 n5_Ant 1	20M	BPSK	50	28	Front	10mm	4	167300	836.5	24.07	25.20	1.297	-0.07	0.229	0.297
	FR1 n5_Ant 1	20M	BPSK	1	1	Back	10mm	4	167300	836.5	24.15	25.20	1.274	-0.17	0.237	0.302
	FR1 n5_Ant 1	20M	BPSK	50	28	Back	10mm	4	167300	836.5	24.07	25.20	1.297	-0.08	0.268	0.348
	FR1 n5_Ant 1	20M	BPSK	1	1	Left Side	10mm	4	167300	836.5	24.15	25.20	1.274	0.02	0.083	0.106
	FR1 n5_Ant 1	20M	BPSK	50	28	Left Side	10mm	4	167300	836.5	24.07	25.20	1.297	0	0.080	0.104
	FR1 n5_Ant 1	20M	BPSK	1	1	Right Side	10mm	4	167300	836.5	24.15	25.20	1.274	-0.01	0.118	0.150
	FR1 n5_Ant 1	20M	BPSK	50	28	Right Side	10mm	4	167300	836.5	24.07	25.20	1.297	-0.07	0.116	0.150
	FR1 n5_Ant 1	20M	BPSK	1	1	Top Side	10mm	4	167300	836.5	24.15	25.20	1.274	0.08	0.170	0.216
	FR1 n5_Ant 1	20M	BPSK	50	28	Top Side	10mm	4	167300	836.5	24.07	25.20	1.297	-0.09	0.181	0.235
	FR1 n7_Ant 2	50M	BPSK	1	1	Front	10mm	4	507000	2535	21.40	22.00	1.148	-0.04	0.466	0.535
	FR1 n7_Ant 2	50M	BPSK	135	68	Front	10mm	4	507000	2535	21.24	22.00	1.191	-0.07	0.442	0.527
	FR1 n7_Ant 2	50M	BPSK	1	1	Back	10mm	4	507000	2535	21.40	22.00	1.148	-0.09	0.554	0.636
	FR1 n7_Ant 2	50M	BPSK	135	68	Back	10mm	4	507000	2535	21.24	22.00	1.191	-0.14	0.491	0.585
	FR1 n7_Ant 2	50M	BPSK	1	1	Left Side	10mm	4	507000	2535	21.40	22.00	1.148	0.06	0.041	0.047
	FR1 n7_Ant 2	50M	BPSK	135	68	Left Side	10mm	4	507000	2535	21.24	22.00	1.191	0.04	0.038	0.045
	FR1 n7_Ant 2	50M	BPSK	1	1	Right Side	10mm	4	507000	2535	21.40	22.00	1.148	-0.08	0.818	0.939
	FR1 n7_Ant 2	50M	BPSK	135	68	Right Side	10mm	4	507000	2535	21.24	22.00	1.191	-0.09	0.778	0.927
	FR1 n7_Ant 2	50M	BPSK	270	0	Right Side	10mm	4	507000	2535	21.26	22.00	1.186	-0.01	0.790	0.937
	FR1 n7_Ant 2	50M	BPSK	1	1	Bottom Side	10mm	4	507000	2535	21.40	22.00	1.148	0.12	0.430	0.494
	FR1 n7_Ant 2	50M	BPSK	135	68	Bottom Side	10mm	4	507000	2535	21.24	22.00	1.191	-0.08	0.405	0.482
	FR1 n7_Ant 0	50M	BPSK	1	1	Front	10mm	4	507000	2535	21.75	22.10	1.084	-0.05	0.460	0.499
	FR1 n7_Ant 0	50M	BPSK	135	68	Front	10mm	4	507000	2535	21.69	22.10	1.099	-0.03	0.493	0.542
	FR1 n7_Ant 0	50M	BPSK	1	1	Back	10mm	4	507000	2535	21.75	22.10	1.084	-0.13	0.387	0.419
	FR1 n7_Ant 0	50M	BPSK	135	68	Back	10mm	4	507000	2535	21.69	22.10	1.099	-0.02	0.366	0.402
	FR1 n7_Ant 0	50M	BPSK	1	1	Left Side	10mm	4	507000	2535	21.75	22.10	1.084	0.02	0.766	0.830
	FR1 n7_Ant 0	50M	BPSK	135	68	Left Side	10mm	4	507000	2535	21.69	22.10	1.099	-0.04	0.833	0.915
53	FR1 n7_Ant 0	50M	BPSK	270	0	Left Side	10mm	4	507000	2535	21.72	22.10	1.091	-0.06	0.902	0.984
	FR1 n7_Ant 0	50M	BPSK	1	1	Right Side	10mm	4	507000	2535	21.75	22.10	1.084	0.09	0.036	0.039
	FR1 n7_Ant 0	50M	BPSK	135	68	Right Side	10mm	4	507000	2535	21.69	22.10	1.099	0.16	0.031	0.034
	FR1 n7_Ant 0	50M	BPSK	1	1	Bottom Side	10mm	4	507000	2535	21.75	22.10	1.084	-0.12	0.084	0.091
	FR1 n7_Ant 0	50M	BPSK	135	68	Bottom Side	10mm	4	507000	2535	21.69	22.10	1.099	-0.09	0.105	0.115



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 n12_Ant 0	15M	BPSK	1	1	Front	10mm	4	141500	707.5	24.55	25.70	1.303	-0.04	0.338	0.440
	FR1 n12_Ant 0	15M	BPSK	36	22	Front	10mm	4	141500	707.5	24.51	25.70	1.315	-0.01	0.330	0.434
	FR1 n12_Ant 0	15M	BPSK	1	1	Back	10mm	4	141500	707.5	24.55	25.70	1.303	0.01	0.302	0.394
	FR1 n12_Ant 0	15M	BPSK	36	22	Back	10mm	4	141500	707.5	24.51	25.70	1.315	-0.07	0.293	0.385
54	FR1 n12_Ant 0	15M	BPSK	1	1	Left Side	10mm	4	141500	707.5	24.55	25.70	1.303	-0.08	0.459	0.598
	FR1 n12_Ant 0	15M	BPSK	36	22	Left Side	10mm	4	141500	707.5	24.51	25.70	1.315	-0.08	0.444	0.584
	FR1 n12_Ant 0	15M	BPSK	1	1	Right Side	10mm	4	141500	707.5	24.55	25.70	1.303	0.02	0.237	0.309
	FR1 n12_Ant 0	15M	BPSK	36	22	Right Side	10mm	4	141500	707.5	24.51	25.70	1.315	-0.02	0.223	0.293
	FR1 n12_Ant 0	15M	BPSK	1	1	Bottom Side	10mm	4	141500	707.5	24.55	25.70	1.303	-0.04	0.251	0.327
	FR1 n12_Ant 0	15M	BPSK	36	22	Bottom Side	10mm	4	141500	707.5	24.51	25.70	1.315	-0.02	0.264	0.347
	FR1 n12_Ant 1	15M	BPSK	1	1	Front	10mm	4	141500	707.5	24.20	25.20	1.259	0.01	0.178	0.224
	FR1 n12_Ant 1	15M	BPSK	36	22	Front	10mm	4	141500	707.5	24.17	25.20	1.268	0.06	0.193	0.245
	FR1 n12_Ant 1	15M	BPSK	1	1	Back	10mm	4	141500	707.5	24.20	25.20	1.259	-0.12	0.193	0.243
	FR1 n12_Ant 1	15M	BPSK	36	22	Back	10mm	4	141500	707.5	24.17	25.20	1.268	-0.12	0.227	0.288
	FR1 n12_Ant 1	15M	BPSK	1	1	Left Side	10mm	4	141500	707.5	24.20	25.20	1.259	0.09	0.104	0.131
	FR1 n12_Ant 1	15M	BPSK	36	22	Left Side	10mm	4	141500	707.5	24.17	25.20	1.268	-0.14	0.129	0.164
	FR1 n12_Ant 1	15M	BPSK	1	1	Right Side	10mm	4	141500	707.5	24.20	25.20	1.259	0.02	0.090	0.113
	FR1 n12_Ant 1	15M	BPSK	36	22	Right Side	10mm	4	141500	707.5	24.17	25.20	1.268	-0.12	0.090	0.114
	FR1 n12_Ant 1	15M	BPSK	1	1	Top Side	10mm	4	141500	707.5	24.20	25.20	1.259	-0.12	0.116	0.146
	FR1 n12_Ant 1	15M	BPSK	36	22	Top Side	10mm	4	141500	707.5	24.17	25.20	1.268	0.13	0.135	0.171
	FR1 n25_Ant 2	40M	BPSK	1	1	Front	10mm	4	376500	1882.5	22.04	22.70	1.164	0.02	0.716	0.834
55	FR1 n25_Ant 2	40M	BPSK	108	54	Front	10mm	4	376500	1882.5	21.93	22.70	1.194	-0.04	0.737	0.880
	FR1 n25_Ant 2	40M	BPSK	216	0	Front	10mm	4	376500	1882.5	21.84	22.70	1.219	-0.07	0.711	0.867
	FR1 n25_Ant 2	40M	BPSK	1	1	Back	10mm	4	376500	1882.5	22.04	22.70	1.164	-0.04	0.698	0.813
	FR1 n25_Ant 2	40M	BPSK	108	54	Back	10mm	4	376500	1882.5	21.93	22.70	1.194	-0.05	0.710	0.848
	FR1 n25_Ant 2	40M	BPSK	216	0	Back	10mm	4	376500	1882.5	21.84	22.70	1.219	-0.07	0.719	0.876
	FR1 n25_Ant 2	40M	BPSK	1	1	Left Side	10mm	4	376500	1882.5	22.04	22.70	1.164	0.13	0.034	0.040
	FR1 n25_Ant 2	40M	BPSK	108	54	Left Side	10mm	4	376500	1882.5	21.93	22.70	1.194	-0.1	0.030	0.036
	FR1 n25_Ant 2	40M	BPSK	1	1	Right Side	10mm	4	376500	1882.5	22.04	22.70	1.164	-0.13	0.652	0.759
	FR1 n25_Ant 2	40M	BPSK	108	54	Right Side	10mm	4	376500	1882.5	21.93	22.70	1.194	-0.01	0.577	0.689
	FR1 n25_Ant 2	40M	BPSK	1	1	Bottom Side	10mm	4	376500	1882.5	22.04	22.70	1.164	-0.01	0.506	0.589
	FR1 n25_Ant 2	40M	BPSK	108	54	Bottom Side	10mm	4	376500	1882.5	21.93	22.70	1.194	-0.03	0.539	0.644
	FR1 n25_Ant 0	40M	BPSK	1	1	Front	10mm	4	376500	1882.5	22.38	23.60	1.324	0.04	0.249	0.330
	FR1 n25_Ant 0	40M	BPSK	108	54	Front	10mm	4	376500	1882.5	22.32	23.60	1.343	-0.03	0.277	0.372
	FR1 n25_Ant 0	40M	BPSK	1	1	Back	10mm	4	376500	1882.5	22.38	23.60	1.324	-0.07	0.282	0.373
	FR1 n25_Ant 0	40M	BPSK	108	54	Back	10mm	4	376500	1882.5	22.32	23.60	1.343	-0.08	0.299	0.401
	FR1 n25_Ant 0	40M	BPSK	1	1	Left Side	10mm	4	376500	1882.5	22.38	23.60	1.324	0.05	0.455	0.603
	FR1 n25_Ant 0	40M	BPSK	108	54	Left Side	10mm	4	376500	1882.5	22.32	23.60	1.343	0.02	0.477	0.640
	FR1 n25_Ant 0	40M	BPSK	1	1	Right Side	10mm	4	376500	1882.5	22.38	23.60	1.324	0.05	0.036	0.048
	FR1 n25_Ant 0	40M	BPSK	108	54	Right Side	10mm	4	376500	1882.5	22.32	23.60	1.343	-0.09	0.041	0.055
	FR1 n25_Ant 0	40M	BPSK	1	1	Bottom Side	10mm	4	376500	1882.5	22.38	23.60	1.324	0.11	0.128	0.170
	FR1 n25_Ant 0	40M	BPSK	108	54	Bottom Side	10mm	4	376500	1882.5	22.32	23.60	1.343	0.11	0.130	0.175



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 n41_Ant 2	100M	BPSK	1	1	Front	10mm	4	518598	2592.99	22.05	22.60	1.135	0.05	0.606	0.688
	FR1 n41_Ant 2	100M	BPSK	135	69	Front	10mm	4	518598	2592.99	22.00	22.60	1.148	-0.03	0.588	0.675
	FR1 n41_Ant 2	100M	BPSK	1	1	Back	10mm	4	518598	2592.99	22.05	22.60	1.135	0	0.647	0.734
	FR1 n41_Ant 2	100M	BPSK	135	69	Back	10mm	4	518598	2592.99	22.00	22.60	1.148	-0.04	0.667	0.766
	FR1 n41_Ant 2	100M	BPSK	1	1	Left Side	10mm	4	518598	2592.99	22.05	22.60	1.135	0.1	0.043	0.049
	FR1 n41_Ant 2	100M	BPSK	135	69	Left Side	10mm	4	518598	2592.99	22.00	22.60	1.148	-0.05	0.041	0.047
	FR1 n41_Ant 2	100M	BPSK	1	1	Right Side	10mm	4	518598	2592.99	22.05	22.60	1.135	0.06	0.824	0.935
56	FR1 n41_Ant 2	100M	BPSK	135	69	Right Side	10mm	4	518598	2592.99	22.00	22.60	1.148	-0.02	0.862	0.990
	FR1 n41_Ant 2	100M	BPSK	270	0	Right Side	10mm	4	518598	2592.99	21.95	22.60	1.161	-0.01	0.841	0.977
	FR1 n41_Ant 2	100M	BPSK	1	1	Bottom Side	10mm	4	518598	2592.99	22.05	22.60	1.135	0.02	0.495	0.562
	FR1 n41_Ant 2	100M	BPSK	135	69	Bottom Side	10mm	4	518598	2592.99	22.00	22.60	1.148	-0.07	0.439	0.504
	FR1 n41_Ant 0	100M	BPSK	1	1	Front	10mm	4	518598	2592.99	21.20	21.80	1.148	0.03	0.469	0.538
	FR1 n41_Ant 0	100M	BPSK	135	69	Front	10mm	4	518598	2592.99	20.91	21.80	1.227	-0.02	0.443	0.544
	FR1 n41_Ant 0	100M	BPSK	1	1	Back	10mm	4	518598	2592.99	21.20	21.80	1.148	-0.01	0.386	0.443
	FR1 n41_Ant 0	100M	BPSK	135	69	Back	10mm	4	518598	2592.99	20.91	21.80	1.227	0.05	0.409	0.502
	FR1 n41_Ant 0	100M	BPSK	1	1	Left Side	10mm	4	518598	2592.99	21.20	21.80	1.148	0.01	0.813	0.933
	FR1 n41_Ant 0	100M	BPSK	135	69	Left Side	10mm	4	518598	2592.99	20.91	21.80	1.227	0.1	0.766	0.940
	FR1 n41_Ant 0	100M	BPSK	270	0	Left Side	10mm	4	518598	2592.99	20.77	21.80	1.268	-0.11	0.776	0.984
	FR1 n41_Ant 0	100M	BPSK	1	1	Right Side	10mm	4	518598	2592.99	21.20	21.80	1.148	-0.08	0.001	0.001
	FR1 n41_Ant 0	100M	BPSK	135	69	Right Side	10mm	4	518598	2592.99	20.91	21.80	1.227	0.05	0.001	0.001
	FR1 n41_Ant 0	100M	BPSK	1	1	Bottom Side	10mm	4	518598	2592.99	21.20	21.80	1.148	0.02	0.108	0.124
	FR1 n41_Ant 0	100M	BPSK	135	69	Bottom Side	10mm	4	518598	2592.99	20.91	21.80	1.227	-0.01	0.109	0.134
	FR1 n66_Ant 2	40M	BPSK	1	1	Front	10mm	4	349000	1745	23.02	24.10	1.282	-0.11	0.416	0.533
	FR1 n66_Ant 2	40M	BPSK	108	54	Front	10mm	4	349000	1745	23.01	24.10	1.285	-0.04	0.576	0.740
	FR1 n66_Ant 2	40M	BPSK	1	1	Back	10mm	4	349000	1745	23.02	24.10	1.282	-0.07	0.448	0.574
	FR1 n66_Ant 2	40M	BPSK	108	54	Back	10mm	4	349000	1745	23.01	24.10	1.285	-0.07	0.508	0.653
	FR1 n66_Ant 2	40M	BPSK	1	1	Left Side	10mm	4	349000	1745	23.02	24.10	1.282	-0.03	0.102	0.131
	FR1 n66_Ant 2	40M	BPSK	108	54	Left Side	10mm	4	349000	1745	23.01	24.10	1.285	-0.12	0.111	0.143
	FR1 n66_Ant 2	40M	BPSK	1	1	Right Side	10mm	4	349000	1745	23.02	24.10	1.282	-0.05	0.445	0.571
57	FR1 n66_Ant 2	40M	BPSK	108	54	Right Side	10mm	4	349000	1745	23.01	24.10	1.285	0.16	0.610	0.784
	FR1 n66_Ant 2	40M	BPSK	1	1	Bottom Side	10mm	4	349000	1745	23.02	24.10	1.282	0.14	0.284	0.364
	FR1 n66_Ant 2	40M	BPSK	108	54	Bottom Side	10mm	4	349000	1745	23.01	24.10	1.285	-0.19	0.322	0.414
	FR1 n66_Ant 0	40M	BPSK	1	1	Front	10mm	4	349000	1745	23.35	23.80	1.109	-0.08	0.374	0.415
	FR1 n66_Ant 0	40M	BPSK	108	54	Front	10mm	4	349000	1745	23.24	23.80	1.138	0.04	0.342	0.389
	FR1 n66_Ant 0	40M	BPSK	1	1	Back	10mm	4	349000	1745	23.35	23.80	1.109	-0.14	0.342	0.379
	FR1 n66_Ant 0	40M	BPSK	108	54	Back	10mm	4	349000	1745	23.24	23.80	1.138	-0.04	0.361	0.411
	FR1 n66_Ant 0	40M	BPSK	1	1	Left Side	10mm	4	349000	1745	23.35	23.80	1.109	0.17	0.304	0.337
	FR1 n66_Ant 0	40M	BPSK	108	54	Left Side	10mm	4	349000	1745	23.24	23.80	1.138	0.03	0.315	0.358
	FR1 n66_Ant 0	40M	BPSK	1	1	Right Side	10mm	4	349000	1745	23.35	23.80	1.109	-0.08	0.064	0.071
	FR1 n66_Ant 0	40M	BPSK	108	54	Right Side	10mm	4	349000	1745	23.24	23.80	1.138	-0.16	0.055	0.063
	FR1 n66_Ant 0	40M	BPSK	1	1	Bottom Side	10mm	4	349000	1745	23.35	23.80	1.109	-0.02	0.345	0.383
	FR1 n66_Ant 0	40M	BPSK	108	54	Bottom Side	10mm	4	349000	1745	23.24	23.80	1.138	-0.06	0.382	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 6	100M	BPSK	1	1	Front	10mm	4	656000	3840	20.23	20.60	1.089	0.01	0.511	0.556
	FR1 n77_Ant 6	100M	BPSK	135	69	Front	10mm	4	656000	3840	20.25	20.60	1.084	-0.15	0.518	0.561
	FR1 n77_Ant 6	100M	BPSK	1	1	Back	10mm	4	656000	3840	20.23	20.60	1.089	-0.09	0.466	0.507
	FR1 n77_Ant 6	100M	BPSK	135	69	Back	10mm	4	656000	3840	20.25	20.60	1.084	-0.03	0.490	0.531
	FR1 n77_Ant 6	100M	BPSK	1	1	Left Side	10mm	4	656000	3840	20.23	20.60	1.089	-0.09	0.732	0.797
	FR1 n77_Ant 6	100M	BPSK	135	69	Left Side	10mm	4	656000	3840	20.25	20.60	1.084	-0.02	0.761	0.825
	FR1 n77_Ant 6	100M	BPSK	270	0	Left Side	10mm	4	656000	3840	20.20	20.60	1.096	-0.11	0.740	0.811
	FR1 n77_Ant 6	100M	BPSK	1	1	Right Side	10mm	4	656000	3840	20.23	20.60	1.089	-0.12	0.030	0.033
	FR1 n77_Ant 6	100M	BPSK	135	69	Right Side	10mm	4	656000	3840	20.25	20.60	1.084	0.03	0.030	0.033
	FR1 n77_Ant 6	100M	BPSK	1	1	Bottom Side	10mm	4	656000	3840	20.23	20.60	1.089	-0.09	0.300	0.327
	FR1 n77_Ant 6	100M	BPSK	135	69	Bottom Side	10mm	4	656000	3840	20.25	20.60	1.084	-0.12	0.280	0.303
	FR1 n77_Ant 6	100M	BPSK	1	1	Front	10mm	4	633332	3499.98	20.00	20.60	1.148	0.02	0.331	0.380
	FR1 n77_Ant 6	100M	BPSK	135	69	Front	10mm	4	633332	3499.98	20.40	20.60	1.047	-0.05	0.368	0.385
	FR1 n77_Ant 6	100M	BPSK	1	1	Back	10mm	4	633332	3499.98	20.00	20.60	1.148	0.06	0.386	0.443
	FR1 n77_Ant 6	100M	BPSK	135	69	Back	10mm	4	633332	3499.98	20.40	20.60	1.047	0	0.408	0.427
	FR1 n77_Ant 6	100M	BPSK	1	1	Left Side	10mm	4	633332	3499.98	20.00	20.60	1.148	0.03	0.585	0.672
	FR1 n77_Ant 6	100M	BPSK	135	69	Left Side	10mm	4	633332	3499.98	20.40	20.60	1.047	0.15	0.696	0.729
	FR1 n77_Ant 6	100M	BPSK	1	1	Right Side	10mm	4	633332	3499.98	20.00	20.60	1.148	-0.04	0.001	0.001
	FR1 n77_Ant 6	100M	BPSK	135	69	Right Side	10mm	4	633332	3499.98	20.40	20.60	1.047	0.08	0.001	0.001
	FR1 n77_Ant 6	100M	BPSK	1	1	Bottom Side	10mm	4	633332	3499.98	20.00	20.60	1.148	0.1	0.083	0.095
	FR1 n77_Ant 6	100M	BPSK	135	69	Bottom Side	10mm	4	633332	3499.98	20.40	20.60	1.047	-0.06	0.106	0.111
	FR1 n77_Ant 2	100M	BPSK	1	1	Front	10mm	4	656000	3840	19.25	20.10	1.216	-0.18	0.360	0.438
	FR1 n77_Ant 2	100M	BPSK	135	69	Front	10mm	4	656000	3840	19.30	20.10	1.202	0.01	0.340	0.409
	FR1 n77_Ant 2	100M	BPSK	1	1	Back	10mm	4	656000	3840	19.25	20.10	1.216	-0.02	0.339	0.412
	FR1 n77_Ant 2	100M	BPSK	135	69	Back	10mm	4	656000	3840	19.30	20.10	1.202	-0.16	0.320	0.385
	FR1 n77_Ant 2	100M	BPSK	1	1	Left Side	10mm	4	656000	3840	19.25	20.10	1.216	-0.19	0.043	0.052
	FR1 n77_Ant 2	100M	BPSK	135	69	Left Side	10mm	4	656000	3840	19.30	20.10	1.202	-0.11	0.036	0.043
58	FR1 n77_Ant 2	100M	BPSK	1	1	Right Side	10mm	4	656000	3840	19.25	20.10	1.216	0.16	0.804	0.978
	FR1 n77_Ant 2	100M	BPSK	135	69	Right Side	10mm	4	656000	3840	19.30	20.10	1.202	-0.12	0.731	0.879
	FR1 n77_Ant 2	100M	BPSK	270	0	Right Side	10mm	4	656000	3840	19.24	20.10	1.219	-0.06	0.749	0.913
	FR1 n77_Ant 2	100M	BPSK	1	1	Bottom Side	10mm	4	656000	3840	19.25	20.10	1.216	-0.11	0.102	0.124
	FR1 n77_Ant 2	100M	BPSK	135	69	Bottom Side	10mm	4	656000	3840	19.30	20.10	1.202	0.03	0.093	0.112
	FR1 n77_Ant 2	100M	BPSK	1	1	Front	10mm	4	633332	3499.98	18.75	20.10	1.365	0.02	0.204	0.278
	FR1 n77_Ant 2	100M	BPSK	135	69	Front	10mm	4	633332	3499.98	19.06	20.10	1.271	0.13	0.222	0.282
	FR1 n77_Ant 2	100M	BPSK	1	1	Back	10mm	4	633332	3499.98	18.75	20.10	1.365	-0.04	0.199	0.272
	FR1 n77_Ant 2	100M	BPSK	135	69	Back	10mm	4	633332	3499.98	19.06	20.10	1.271	0.02	0.220	0.280
	FR1 n77_Ant 2	100M	BPSK	1	1	Left Side	10mm	4	633332	3499.98	18.75	20.10	1.365	-0.03	0.001	0.001
	FR1 n77_Ant 2	100M	BPSK	135	69	Left Side	10mm	4	633332	3499.98	19.06	20.10	1.271	0	0.001	0.001
	FR1 n77_Ant 2	100M	BPSK	1	1	Right Side	10mm	4	633332	3499.98	18.75	20.10	1.365	-0.03	0.455	0.621
	FR1 n77_Ant 2	100M	BPSK	135	69	Right Side	10mm	4	633332	3499.98	19.06	20.10	1.271	0.05	0.469	0.596
	FR1 n77_Ant 2	100M	BPSK	1	1	Bottom Side	10mm	4	633332	3499.98	18.75	20.10	1.365	0.04	0.066	0.090
	FR1 n77_Ant 2	100M	BPSK	135	69	Bottom Side	10mm	4	633332	3499.98	19.06	20.10	1.271	-0.1	0.071	0.090
	FR1 n77_Ant 1	100M	BPSK	1	1	Front	10mm	4	656000	3840	22.00	22.80	1.202	0.12	0.176	0.212
	FR1 n77_Ant 1	100M	BPSK	135	69	Front	10mm	4	656000	3840	22.15	22.80	1.161	0.15	0.174	0.202
	FR1 n77_Ant 1	100M	BPSK	1	1	Back	10mm	4	656000	3840	22.00	22.80	1.202	-0.1	0.161	0.194
	FR1 n77_Ant 1	100M	BPSK	135	69	Back	10mm	4	656000	3840	22.15	22.80	1.161	-0.15	0.161	0.187
	FR1 n77_Ant 1	100M	BPSK	1	1	Left Side	10mm	4	656000	3840	22.00	22.80	1.202	0.15	0.364	0.438
	FR1 n77_Ant 1	100M	BPSK	135	69	Left Side	10mm	4	656000	3840	22.15	22.80	1.161	0	0.315	0.366
	FR1 n77_Ant 1	100M	BPSK	1	1	Right Side	10mm	4	656000	3840	22.00	22.80	1.202	-0.1	0.029	0.035
	FR1 n77_Ant 1	100M	BPSK	135	69	Right Side	10mm	4	656000	3840	22.15	22.80	1.161	-0.15	0.030	0.035
	FR1 n77_Ant 1	100M	BPSK	1	1	Top Side	10mm	4	656000	3840	22.00	22.80	1.202	0.02	0.155	0.186





	FR1 n77_Ant 1	100M	BPSK	135	69	Top Side	10mm	4	656000	3840	22.15	22.80	1.161	0.03	0.136	0.158
	FR1 n77_Ant 1	100M	BPSK	1	1	Front	10mm	4	633332	3499.98	22.01	22.80	1.199	0.01	0.151	0.181
	FR1 n77_Ant 1	100M	BPSK	135	69	Front	10mm	4	633332	3499.98	22.35	22.80	1.109	0	0.172	0.191
	FR1 n77_Ant 1	100M	BPSK	1	1	Back	10mm	4	633332	3499.98	22.01	22.80	1.199	0.02	0.163	0.196
	FR1 n77_Ant 1	100M	BPSK	135	69	Back	10mm	4	633332	3499.98	22.35	22.80	1.109	0.05	0.175	0.194
	FR1 n77_Ant 1	100M	BPSK	1	1	Left Side	10mm	4	633332	3499.98	22.01	22.80	1.199	-0.04	0.292	0.350
	FR1 n77_Ant 1	100M	BPSK	135	69	Left Side	10mm	4	633332	3499.98	22.35	22.80	1.109	-0.07	0.327	0.363
	FR1 n77_Ant 1	100M	BPSK	1	1	Right Side	10mm	4	633332	3499.98	22.01	22.80	1.199	0.03	0.001	0.001
	FR1 n77_Ant 1	100M	BPSK	135	69	Right Side	10mm	4	633332	3499.98	22.35	22.80	1.109	-0.1	0.001	0.001
	FR1 n77_Ant 1	100M	BPSK	1	1	Top Side	10mm	4	633332	3499.98	22.01	22.80	1.199	0.08	0.210	0.252
	FR1 n77_Ant 1	100M	BPSK	135	69	Top Side	10mm	4	633332	3499.98	22.35	22.80	1.109	-0.02	0.218	0.242
	FR1 n77_Ant 5	100M	BPSK	1	1	Front	10mm	4	656000	3840	21.25	22.50	1.334	0.11	0.154	0.205
	FR1 n77_Ant 5	100M	BPSK	135	69	Front	10mm	4	656000	3840	21.47	22.50	1.268	0.01	0.133	0.169
	FR1 n77_Ant 5	100M	BPSK	1	1	Back	10mm	4	656000	3840	21.25	22.50	1.334	0.09	0.145	0.193
	FR1 n77_Ant 5	100M	BPSK	135	69	Back	10mm	4	656000	3840	21.47	22.50	1.268	-0.03	0.124	0.157
	FR1 n77_Ant 5	100M	BPSK	1	1	Left Side	10mm	4	656000	3840	21.25	22.50	1.334	-0.01	0.032	0.043
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Side	10mm	4	656000	3840	21.47	22.50	1.268	0.12	0.032	0.041
	FR1 n77_Ant 5	100M	BPSK	1	1	Right Side	10mm	4	656000	3840	21.25	22.50	1.334	-0.02	0.350	0.467
	FR1 n77_Ant 5	100M	BPSK	135	69	Right Side	10mm	4	656000	3840	21.47	22.50	1.268	0.16	0.312	0.396
	FR1 n77_Ant 5	100M	BPSK	1	1	Top Side	10mm	4	656000	3840	21.25	22.50	1.334	0.03	0.052	0.069
	FR1 n77_Ant 5	100M	BPSK	135	69	Top Side	10mm	4	656000	3840	21.47	22.50	1.268	0.09	0.041	0.052
	FR1 n77_Ant 5	100M	BPSK	1	1	Front	10mm	4	633332	3499.98	21.30	22.50	1.318	0.02	0.183	0.241
	FR1 n77_Ant 5	100M	BPSK	135	69	Front	10mm	4	633332	3499.98	21.75	22.50	1.189	0.01	0.168	0.200
	FR1 n77_Ant 5	100M	BPSK	1	1	Back	10mm	4	633332	3499.98	21.30	22.50	1.318	0.05	0.158	0.208
	FR1 n77_Ant 5	100M	BPSK	135	69	Back	10mm	4	633332	3499.98	21.75	22.50	1.189	-0.04	0.145	0.172
	FR1 n77_Ant 5	100M	BPSK	1	1	Left Side	10mm	4	633332	3499.98	21.30	22.50	1.318	0.07	0.001	0.001
	FR1 n77_Ant 5	100M	BPSK	135	69	Left Side	10mm	4	633332	3499.98	21.75	22.50	1.189	0	0.001	0.001
	FR1 n77_Ant 5	100M	BPSK	1	1	Right Side	10mm	4	633332	3499.98	21.30	22.50	1.318	0.07	0.439	0.579
	FR1 n77_Ant 5	100M	BPSK	135	69	Right Side	10mm	4	633332	3499.98	21.75	22.50	1.189	0.05	0.382	0.454
	FR1 n77_Ant 5	100M	BPSK	1	1	Top Side	10mm	4	633332	3499.98	21.30	22.50	1.318	-0.02	0.055	0.073
	FR1 n77_Ant 5	100M	BPSK	135	69	Top Side	10mm	4	633332	3499.98	21.75	22.50	1.189	0.06	0.047	0.056

**18.3 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)
	GSM850_Ant 0	GPRS (4 Tx slots)	Front	10mm	5	128	824.2	29.41	30.30	1.227	-0.16	0.543	0.666
59	GSM850_Ant 0	GPRS (4 Tx slots)	Back	10mm	5	128	824.2	29.41	30.30	1.227	-0.12	0.545	0.669
	GSM850_Ant 0	GPRS (4 Tx slots)	Front	10mm	6	128	824.2	29.41	29.50	1.021	-0.16	0.543	0.554
	GSM850_Ant 0	GPRS (4 Tx slots)	Back	10mm	6	128	824.2	29.41	29.50	1.021	-0.12	0.545	0.556
	GSM850_Ant 1	GPRS (2 Tx slots)	Front	10mm	5/6	128	824.2	30.84	32.50	1.466	-0.02	0.266	0.390
	GSM850_Ant 1	GPRS (2 Tx slots)	Back	10mm	5/6	128	824.2	30.84	32.50	1.466	-0.01	0.308	0.451
	GSM1900_Ant 2	GPRS (4 Tx slots)	Front	10mm	5	810	1909.8	25.01	26.00	1.256	0.03	0.651	0.818
	GSM1900_Ant 2	GPRS (4 Tx slots)	Front	10mm	5	512	1850.2	24.87	26.00	1.297	-0.09	0.641	0.831
60	GSM1900_Ant 2	GPRS (4 Tx slots)	Front	10mm	5	661	1880	24.97	26.00	1.268	0.07	0.735	0.932
	GSM1900_Ant 2	GPRS (4 Tx slots)	Back	10mm	5	810	1909.8	25.01	26.00	1.256	0.1	0.647	0.813
	GSM1900_Ant 2	GPRS (4 Tx slots)	Back	10mm	5	512	1850.2	24.87	26.00	1.297	0.13	0.581	0.754
	GSM1900_Ant 2	GPRS (4 Tx slots)	Back	10mm	5	661	1880	24.97	26.00	1.268	0.1	0.716	0.908
	GSM1900_Ant 2	GPRS (4 Tx slots)	Front	10mm	6	810	1909.8	25.01	25.20	1.045	0.03	0.651	0.680
	GSM1900_Ant 2	GPRS (4 Tx slots)	Back	10mm	6	810	1909.8	25.01	25.20	1.045	0.1	0.647	0.676
	GSM1900_Ant 0	GPRS (4 Tx slots)	Front	10mm	5	810	1909.8	26.10	26.90	1.202	-0.03	0.396	0.476
	GSM1900_Ant 0	GPRS (4 Tx slots)	Back	10mm	5	810	1909.8	26.10	26.90	1.202	-0.07	0.436	0.524
	GSM1900_Ant 0	GPRS (4 Tx slots)	Front	10mm	6	810	1909.8	26.10	26.10	1.000	-0.03	0.396	0.396
	GSM1900_Ant 0	GPRS (4 Tx slots)	Back	10mm	6	810	1909.8	26.10	26.10	1.000	-0.07	0.436	0.436

**<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)
61	WCDMA II_Ant 2	RMC 12.2Kbps	Front	10mm	5/6	9538	1907.6	20.92	21.50	1.143	-0.03	0.653	0.746
	WCDMA II_Ant 2	RMC 12.2Kbps	Back	10mm	5/6	9538	1907.6	20.92	21.50	1.143	-0.19	0.546	0.624
	WCDMA II_Ant 0	RMC 12.2Kbps	Front	10mm	5/6	9262	1852.4	21.82	22.90	1.282	-0.02	0.237	0.304
	WCDMA II_Ant 0	RMC 12.2Kbps	Back	10mm	5/6	9262	1852.4	21.82	22.90	1.282	0.06	0.298	0.382
62	WCDMA IV_Ant 2	RMC 12.2Kbps	Front	10mm	5/6	1312	1712.4	23.05	23.70	1.161	-0.1	0.560	0.650
	WCDMA IV_Ant 2	RMC 12.2Kbps	Back	10mm	5/6	1312	1712.4	23.05	23.70	1.161	0.08	0.504	0.585
	WCDMA IV_Ant 0	RMC 12.2Kbps	Front	10mm	5/6	1312	1712.4	23.90	24.00	1.023	0	0.462	0.473
	WCDMA IV_Ant 0	RMC 12.2Kbps	Back	10mm	5/6	1312	1712.4	23.90	24.00	1.023	-0.16	0.446	0.456
	WCDMA V_Ant 0	RMC 12.2Kbps	Front	10mm	5/6	4132	826.4	24.20	25.00	1.202	-0.02	0.317	0.381
63	WCDMA V_Ant 0	RMC 12.2Kbps	Back	10mm	5/6	4132	826.4	24.20	25.00	1.202	-0.03	0.321	0.386
	WCDMA V_Ant 1	RMC 12.2Kbps	Front	10mm	5/6	4132	826.4	22.60	24.50	1.549	-0.14	0.189	0.293
	WCDMA V_Ant 1	RMC 12.2Kbps	Back	10mm	5/6	4132	826.4	22.60	24.50	1.549	-0.02	0.218	0.338



<FDD 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)
64	LTE Band 5_Ant 0	10M	QPSK	1	0	Front	10mm	5	20525	836.5	23.86	25.70	1.528	-0.14	0.418	0.639
	LTE Band 5_Ant 0	10M	QPSK	25	0	Front	10mm	5	20525	836.5	22.93	24.70	1.503	-0.01	0.336	0.505
	LTE Band 5_Ant 0	10M	QPSK	1	0	Back	10mm	5	20525	836.5	23.86	25.70	1.528	-0.11	0.407	0.622
	LTE Band 5_Ant 0	10M	QPSK	25	0	Back	10mm	5	20525	836.5	22.93	24.70	1.503	0.04	0.326	0.490
	LTE Band 5B_Ant 0	10M	QPSK	1	49	Front	10mm	5	20450+20549	829	22.42	24.00	1.439	0.13	0.260	0.374
	LTE Band 5_Ant 0	10M	QPSK	1	0	Front	10mm	6	20525	836.5	23.86	25.60	1.493	-0.14	0.418	0.624
	LTE Band 5_Ant 0	10M	QPSK	25	0	Front	10mm	6	20525	836.5	22.93	24.60	1.469	-0.01	0.336	0.494
	LTE Band 5_Ant 0	10M	QPSK	1	0	Back	10mm	6	20525	836.5	23.86	25.60	1.493	-0.11	0.407	0.608
	LTE Band 5_Ant 0	10M	QPSK	25	0	Back	10mm	6	20525	836.5	22.93	24.60	1.469	0.04	0.326	0.479
	LTE Band 5B_Ant 0	10M	QPSK	1	49	Front	10mm	6	20450+20549	829	22.42	23.90	1.406	0.13	0.260	0.366
	LTE Band 5_Ant 1	10M	QPSK	1	0	Front	10mm	5/6	20525	836.5	23.68	25.20	1.419	0.04	0.237	0.336
	LTE Band 5_Ant 1	10M	QPSK	25	0	Front	10mm	5/6	20525	836.5	22.59	24.20	1.449	-0.05	0.193	0.280
	LTE Band 5_Ant 1	10M	QPSK	1	0	Back	10mm	5/6	20525	836.5	23.68	25.20	1.419	-0.09	0.262	0.372
	LTE Band 5_Ant 1	10M	QPSK	25	0	Back	10mm	5/6	20525	836.5	22.59	24.20	1.449	-0.14	0.213	0.309
	LTE Band 5B_Ant 1	10M	QPSK	1	0	Back	10mm	5/6	20525+20426	836.5	22.02	23.50	1.406	0.18	0.261	0.367
	LTE Band 7_Ant 2	20M	QPSK	1	0	Front	10mm	5/6	21100	2535	20.87	22.20	1.358	0.14	0.465	0.632
	LTE Band 7_Ant 2	20M	QPSK	50	0	Front	10mm	5/6	21100	2535	20.96	22.20	1.330	-0.03	0.461	0.613
65	LTE Band 7_Ant 2	20M	QPSK	1	0	Back	10mm	5/6	21100	2535	20.87	22.20	1.358	0.09	0.484	0.657
	LTE Band 7_Ant 2	20M	QPSK	50	0	Back	10mm	5/6	21100	2535	20.96	22.20	1.330	0.17	0.484	0.644
	LTE Band 7C_Ant 2	20M+20M	QPSK	1	0	Back	10mm	5/6	21100+20902	2535	19.69	20.50	1.205	0.11	0.440	0.530
	LTE Band 7_Ant 0	20M	QPSK	1	0	Front	10mm	5/6	21100	2535	21.01	22.30	1.346	-0.08	0.364	0.490
	LTE Band 7_Ant 0	20M	QPSK	50	0	Front	10mm	5/6	21100	2535	20.99	22.30	1.352	-0.06	0.379	0.512
	LTE Band 7_Ant 0	20M	QPSK	1	0	Back	10mm	5/6	21100	2535	21.01	22.30	1.346	-0.16	0.275	0.370
	LTE Band 7_Ant 0	20M	QPSK	50	0	Back	10mm	5/6	21100	2535	20.99	22.30	1.352	0.07	0.279	0.377
	LTE Band 7C_Ant 0	20M+20M	QPSK	1	0	Front	10mm	5/6	21100+20902	2535	20.05	20.60	1.135	0.05	0.331	0.376
66	LTE Band 12_Ant 0	10M	QPSK	1	0	Front	10mm	5/6	23095	707.5	23.88	25.70	1.521	-0.07	0.352	0.535
	LTE Band 12_Ant 0	10M	QPSK	25	0	Front	10mm	5/6	23095	707.5	22.95	24.70	1.496	-0.06	0.272	0.407
	LTE Band 12_Ant 0	10M	QPSK	1	0	Back	10mm	5/6	23095	707.5	23.88	25.70	1.521	-0.05	0.322	0.490
	LTE Band 12_Ant 0	10M	QPSK	25	0	Back	10mm	5/6	23095	707.5	22.95	24.70	1.496	0.01	0.254	0.380
	LTE Band 12_Ant 1	10M	QPSK	1	0	Front	10mm	5/6	23095	707.5	23.59	25.20	1.449	0	0.188	0.272
	LTE Band 12_Ant 1	10M	QPSK	25	0	Front	10mm	5/6	23095	707.5	22.56	24.20	1.459	-0.03	0.156	0.228
	LTE Band 12_Ant 1	10M	QPSK	1	0	Back	10mm	5/6	23095	707.5	23.59	25.20	1.449	-0.09	0.214	0.310
	LTE Band 12_Ant 1	10M	QPSK	25	0	Back	10mm	5/6	23095	707.5	22.56	24.20	1.459	-0.06	0.178	0.260



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 25_Ant 2	20M	QPSK	1	0	Front	10mm	5/6	26340	1880	21.38	22.50	1.294	0.02	0.695	0.899
	LTE Band 25_Ant 2	20M	QPSK	1	0	Front	10mm	5/6	26140	1860	21.23	22.50	1.340	-0.02	0.618	0.828
	LTE Band 25_Ant 2	20M	QPSK	1	0	Front	10mm	5/6	26590	1905	21.37	22.50	1.297	-0.12	0.660	0.856
	LTE Band 25_Ant 2	20M	QPSK	50	0	Front	10mm	5/6	26340	1880	21.42	22.50	1.282	-0.12	0.721	0.925
	LTE Band 25_Ant 2	20M	QPSK	50	0	Front	10mm	5/6	26140	1860	21.38	22.50	1.294	-0.08	0.657	0.850
	LTE Band 25_Ant 2	20M	QPSK	50	0	Front	10mm	5/6	26590	1905	21.36	22.50	1.300	-0.06	0.662	0.861
	LTE Band 25_Ant 2	20M	QPSK	100	0	Front	10mm	5/6	26340	1880	21.38	22.50	1.294	-0.07	0.706	0.914
	LTE Band 25_Ant 2	20M	QPSK	1	0	Back	10mm	5/6	26340	1880	21.38	22.50	1.294	-0.03	0.708	0.916
	LTE Band 25_Ant 2	20M	QPSK	1	0	Back	10mm	5/6	26140	1860	21.23	22.50	1.340	-0.06	0.630	0.844
	LTE Band 25_Ant 2	20M	QPSK	1	0	Back	10mm	5/6	26590	1905	21.37	22.50	1.297	-0.02	0.678	0.879
67	LTE Band 25_Ant 2	20M	QPSK	50	0	Back	10mm	5/6	26340	1880	21.42	22.50	1.282	-0.04	0.742	0.951
	LTE Band 25_Ant 2	20M	QPSK	50	0	Back	10mm	5/6	26140	1860	21.38	22.50	1.294	-0.04	0.680	0.880
	LTE Band 25_Ant 2	20M	QPSK	50	0	Back	10mm	5/6	26590	1905	21.36	22.50	1.300	-0.09	0.669	0.870
	LTE Band 25_Ant 2	20M	QPSK	100	0	Back	10mm	5/6	26340	1880	21.38	22.50	1.294	-0.17	0.721	0.933
	LTE Band 25_Ant 0	20M	QPSK	1	0	Front	10mm	5/6	26340	1880	22.36	23.60	1.330	-0.08	0.270	0.359
	LTE Band 25_Ant 0	20M	QPSK	50	0	Front	10mm	5/6	26340	1880	22.35	23.60	1.334	0.09	0.275	0.367
	LTE Band 25_Ant 0	20M	QPSK	1	0	Back	10mm	5/6	26340	1880	22.36	23.60	1.330	-0.04	0.322	0.428
	LTE Band 25_Ant 0	20M	QPSK	50	0	Back	10mm	5/6	26340	1880	22.35	23.60	1.334	-0.07	0.330	0.440
68	LTE Band 66_Ant 2	20M	QPSK	1	0	Front	10mm	5/6	132322	1745	23.05	23.80	1.189	-0.05	0.643	0.764
	LTE Band 66_Ant 2	20M	QPSK	50	0	Front	10mm	5/6	132322	1745	22.97	23.80	1.211	-0.08	0.616	0.746
	LTE Band 66_Ant 2	20M	QPSK	1	0	Back	10mm	5/6	132322	1745	23.05	23.80	1.189	-0.02	0.539	0.641
	LTE Band 66_Ant 2	20M	QPSK	50	0	Back	10mm	5/6	132322	1745	22.97	23.80	1.211	-0.03	0.535	0.648
	LTE Band 66_Ant 0	20M	QPSK	1	0	Front	10mm	5/6	132322	1745	22.45	23.70	1.334	-0.06	0.328	0.437
	LTE Band 66_Ant 0	20M	QPSK	50	0	Front	10mm	5/6	132322	1745	22.49	23.70	1.321	-0.03	0.329	0.435
	LTE Band 66_Ant 0	20M	QPSK	1	0	Back	10mm	5/6	132322	1745	22.45	23.70	1.334	-0.1	0.284	0.379
	LTE Band 66_Ant 0	20M	QPSK	50	0	Back	10mm	5/6	132322	1745	22.49	23.70	1.321	-0.03	0.290	0.383

<TDD 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	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 41_Ant 2	20M	QPSK	1	0	Front	10mm	5/6	41490	2680	23.50	24.30	1.202	62.9	1.006	-0.08	0.358	0.433
	LTE Band 41_Ant 2	20M	QPSK	50	0	Front	10mm	5/6	41490	2680	22.85	24.30	1.396	62.9	1.006	-0.04	0.307	0.431
	LTE Band 41_Ant 2	20M	QPSK	1	0	Back	10mm	5/6	41490	2680	23.50	24.30	1.202	62.9	1.006	-0.02	0.442	0.535
	LTE Band 41_Ant 2	20M	QPSK	50	0	Back	10mm	5/6	41490	2680	22.85	24.30	1.396	62.9	1.006	-0.19	0.377	0.530
	LTE Band 41_HPUE_Ant 2	20M	QPSK	1	0	Back	10mm	5/6	41490	2680	25.10	25.90	1.202	42.9	1.009	-0.01	0.431	0.523
	LTE Band 41C_Ant 2	20M	QPSK	1	0	Back	10mm	5/6	40185+39987	2549.5	11.85	12.80	1.245	62.9	1.006	0	0.019	0.024
69	LTE Band 41_Ant 0	20M	QPSK	1	0	Front	10mm	5/6	40185	2549.5	23.12	24.10	1.253	62.9	1.006	0.15	0.446	0.562
	LTE Band 41_Ant 0	20M	QPSK	50	0	Front	10mm	5/6	40185	2549.5	22.08	23.10	1.265	62.9	1.006	0.02	0.352	0.448
	LTE Band 41_Ant 0	20M	QPSK	1	0	Back	10mm	5/6	40185	2549.5	23.12	24.10	1.253	62.9	1.006	-0.15	0.305	0.385
	LTE Band 41_Ant 0	20M	QPSK	50	0	Back	10mm	5/6	40185	2549.5	22.08	23.10	1.265	62.9	1.006	-0.16	0.254	0.323
	LTE Band 41_HPUE_Ant 0	20M	QPSK	1	0	Front	10mm	5/6	40185	2549.5	24.24	25.70	1.400	42.9	1.009	-0.19	0.364	0.514
	LTE Band 41C_Ant 0	20M	QPSK	1	0	Front	10mm	5/6	40185+39987	2549.5	11.34	12.30	1.247	62.9	1.006	0.12	0.021	0.026



<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 n5_Ant 0	20M	BPSK	1	1	Front	10mm	5/6	167300	836.5	24.55	25.70	1.303	-0.03	0.365	0.476
	FR1 n5_Ant 0	20M	BPSK	50	28	Front	10mm	5/6	167300	836.5	24.43	25.70	1.340	-0.07	0.392	0.525
	FR1 n5_Ant 0	20M	BPSK	1	1	Back	10mm	5/6	167300	836.5	24.55	25.70	1.303	-0.11	0.376	0.490
70	FR1 n5_Ant 0	20M	BPSK	50	28	Back	10mm	5/6	167300	836.5	24.43	25.70	1.340	0.05	0.396	0.531
	FR1 n5_Ant 1	20M	BPSK	1	1	Front	10mm	5/6	167300	836.5	24.15	25.20	1.274	-0.09	0.208	0.265
	FR1 n5_Ant 1	20M	BPSK	50	28	Front	10mm	5/6	167300	836.5	24.07	25.20	1.297	-0.07	0.229	0.297
	FR1 n5_Ant 1	20M	BPSK	1	1	Back	10mm	5/6	167300	836.5	24.15	25.20	1.274	-0.17	0.237	0.302
	FR1 n5_Ant 1	20M	BPSK	50	28	Back	10mm	5/6	167300	836.5	24.07	25.20	1.297	-0.08	0.268	0.348
	FR1 n7_Ant 2	50M	BPSK	1	1	Front	10mm	5/6	507000	2535	21.40	22.20	1.202	-0.04	0.466	0.560
	FR1 n7_Ant 2	50M	BPSK	135	68	Front	10mm	5/6	507000	2535	21.24	22.20	1.247	-0.07	0.442	0.551
71	FR1 n7_Ant 2	50M	BPSK	1	1	Back	10mm	5/6	507000	2535	21.40	22.20	1.202	-0.09	0.554	0.666
	FR1 n7_Ant 2	50M	BPSK	135	68	Back	10mm	5/6	507000	2535	21.24	22.20	1.247	-0.14	0.491	0.612
	FR1 n7_Ant 0	50M	BPSK	1	1	Front	10mm	5/6	507000	2535	21.75	22.80	1.274	-0.05	0.460	0.586
	FR1 n7_Ant 0	50M	BPSK	135	68	Front	10mm	5/6	507000	2535	21.69	22.80	1.291	-0.03	0.493	0.637
	FR1 n7_Ant 0	50M	BPSK	1	1	Back	10mm	5/6	507000	2535	21.75	22.80	1.274	-0.13	0.387	0.493
	FR1 n7_Ant 0	50M	BPSK	135	68	Back	10mm	5/6	507000	2535	21.69	22.80	1.291	-0.02	0.366	0.473
72	FR1 n12_Ant 0	15M	BPSK	1	1	Front	10mm	5/6	141500	707.5	24.55	25.70	1.303	-0.04	0.338	0.440
	FR1 n12_Ant 0	15M	BPSK	36	22	Front	10mm	5/6	141500	707.5	24.51	25.70	1.315	-0.01	0.330	0.434
	FR1 n12_Ant 0	15M	BPSK	1	1	Back	10mm	5/6	141500	707.5	24.55	25.70	1.303	0.01	0.302	0.394
	FR1 n12_Ant 0	15M	BPSK	36	22	Back	10mm	5/6	141500	707.5	24.51	25.70	1.315	-0.07	0.293	0.385
	FR1 n12_Ant 1	15M	BPSK	1	1	Front	10mm	5/6	141500	707.5	24.20	25.20	1.259	0.01	0.178	0.224
	FR1 n12_Ant 1	15M	BPSK	36	22	Front	10mm	5/6	141500	707.5	24.17	25.20	1.268	0.06	0.193	0.245
	FR1 n12_Ant 1	15M	BPSK	1	1	Back	10mm	5/6	141500	707.5	24.20	25.20	1.259	-0.12	0.193	0.243
	FR1 n12_Ant 1	15M	BPSK	36	22	Back	10mm	5/6	141500	707.5	24.17	25.20	1.268	-0.12	0.227	0.288
	FR1 n25_Ant 2	40M	BPSK	1	1	Front	10mm	5/6	376500	1882.5	22.04	22.70	1.164	0.02	0.716	0.834
73	FR1 n25_Ant 2	40M	BPSK	108	54	Front	10mm	5/6	376500	1882.5	21.93	22.70	1.194	-0.04	0.737	0.880
	FR1 n25_Ant 2	40M	BPSK	216	0	Front	10mm	5/6	376500	1882.5	21.84	22.70	1.219	-0.07	0.711	0.867
	FR1 n25_Ant 2	40M	BPSK	1	1	Back	10mm	5/6	376500	1882.5	22.04	22.70	1.164	-0.04	0.698	0.813
	FR1 n25_Ant 2	40M	BPSK	108	54	Back	10mm	5/6	376500	1882.5	21.93	22.70	1.194	-0.05	0.710	0.848
	FR1 n25_Ant 2	40M	BPSK	216	0	Back	10mm	5/6	376500	1882.5	21.84	22.70	1.219	-0.07	0.719	0.876
	FR1 n25_Ant 0	40M	BPSK	1	1	Front	10mm	5/6	376500	1882.5	22.38	23.60	1.324	0.04	0.249	0.330
	FR1 n25_Ant 0	40M	BPSK	108	54	Front	10mm	5/6	376500	1882.5	22.32	23.60	1.343	-0.03	0.277	0.372
	FR1 n25_Ant 0	40M	BPSK	1	1	Back	10mm	5/6	376500	1882.5	22.38	23.60	1.324	-0.07	0.282	0.373
	FR1 n25_Ant 0	40M	BPSK	108	54	Back	10mm	5/6	376500	1882.5	22.32	23.60	1.343	-0.08	0.299	0.401
	FR1 n41_Ant 2	100M	BPSK	1	1	Front	10mm	5/6	518598	2592.99	22.05	22.70	1.161	0.05	0.606	0.704
	FR1 n41_Ant 2	100M	BPSK	135	69	Front	10mm	5/6	518598	2592.99	22.00	22.70	1.175	-0.03	0.588	0.691
	FR1 n41_Ant 2	100M	BPSK	1	1	Back	10mm	5/6	518598	2592.99	22.05	22.70	1.161	0	0.647	0.751
74	FR1 n41_Ant 2	100M	BPSK	135	69	Back	10mm	5/6	518598	2592.99	22.00	22.70	1.175	-0.04	0.667	0.784
	FR1 n41_Ant 0	100M	BPSK	1	1	Front	10mm	5/6	518598	2592.99	21.20	22.70	1.413	0.03	0.469	0.662
	FR1 n41_Ant 0	100M	BPSK	135	69	Front	10mm	5/6	518598	2592.99	20.91	22.70	1.510	-0.02	0.443	0.669
	FR1 n41_Ant 0	100M	BPSK	1	1	Back	10mm	5/6	518598	2592.99	21.20	22.70	1.413	-0.01	0.386	0.545
	FR1 n41_Ant 0	100M	BPSK	135	69	Back	10mm	5/6	518598	2592.99	20.91	22.70	1.510	0.05	0.409	0.618



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 n66_Ant 2	40M	BPSK	1	1	Front	10mm	5/6	349000	1745	23.02	24.10	1.282	-0.11	0.416	0.533
75	FR1 n66_Ant 2	40M	BPSK	108	54	Front	10mm	5/6	349000	1745	23.01	24.10	1.285	-0.04	0.576	0.740
	FR1 n66_Ant 2	40M	BPSK	1	1	Back	10mm	5/6	349000	1745	23.02	24.10	1.282	-0.07	0.448	0.574
	FR1 n66_Ant 2	40M	BPSK	108	54	Back	10mm	5/6	349000	1745	23.01	24.10	1.285	-0.07	0.508	0.653
	FR1 n66_Ant 0	40M	BPSK	1	1	Front	10mm	5/6	349000	1745	23.35	23.80	1.109	-0.08	0.374	0.415
	FR1 n66_Ant 0	40M	BPSK	108	54	Front	10mm	5/6	349000	1745	23.24	23.80	1.138	0.04	0.342	0.389
	FR1 n66_Ant 0	40M	BPSK	1	1	Back	10mm	5/6	349000	1745	23.35	23.80	1.109	-0.14	0.342	0.379
	FR1 n66_Ant 0	40M	BPSK	108	54	Back	10mm	5/6	349000	1745	23.24	23.80	1.138	-0.04	0.361	0.411
	FR1 n77_Ant 6	100M	BPSK	1	1	Front	10mm	5/6	656000	3840	20.23	20.60	1.089	0.01	0.511	0.556
76	FR1 n77_Ant 6	100M	BPSK	135	69	Front	10mm	5/6	656000	3840	20.25	20.60	1.084	-0.15	0.518	0.561
	FR1 n77_Ant 6	100M	BPSK	1	1	Back	10mm	5/6	656000	3840	20.23	20.60	1.089	-0.09	0.466	0.507
	FR1 n77_Ant 6	100M	BPSK	135	69	Back	10mm	5/6	656000	3840	20.25	20.60	1.084	-0.03	0.490	0.531
	FR1 n77_Ant 6	100M	BPSK	1	1	Front	10mm	5/6	633332	3499.98	20.00	20.60	1.148	0.02	0.331	0.380
	FR1 n77_Ant 6	100M	BPSK	135	69	Front	10mm	5/6	633332	3499.98	20.40	20.60	1.047	-0.05	0.368	0.385
	FR1 n77_Ant 6	100M	BPSK	1	1	Back	10mm	5/6	633332	3499.98	20.00	20.60	1.148	0.06	0.386	0.443
	FR1 n77_Ant 6	100M	BPSK	135	69	Back	10mm	5/6	633332	3499.98	20.40	20.60	1.047	0	0.408	0.427
	FR1 n77_Ant 2	100M	BPSK	1	1	Front	10mm	5/6	656000	3840	19.25	20.70	1.396	-0.18	0.360	0.503
	FR1 n77_Ant 2	100M	BPSK	135	69	Front	10mm	5/6	656000	3840	19.30	20.70	1.380	0.01	0.340	0.469
	FR1 n77_Ant 2	100M	BPSK	1	1	Back	10mm	5/6	656000	3840	19.25	20.70	1.396	-0.02	0.339	0.473
	FR1 n77_Ant 2	100M	BPSK	135	69	Back	10mm	5/6	656000	3840	19.30	20.70	1.380	-0.16	0.320	0.442
	FR1 n77_Ant 2	100M	BPSK	1	1	Front	10mm	5/6	633332	3499.98	18.75	20.70	1.567	0.02	0.204	0.320
	FR1 n77_Ant 2	100M	BPSK	135	69	Front	10mm	5/6	633332	3499.98	19.06	20.70	1.459	0.13	0.222	0.324
	FR1 n77_Ant 2	100M	BPSK	1	1	Back	10mm	5/6	633332	3499.98	18.75	20.70	1.567	-0.04	0.199	0.312
	FR1 n77_Ant 2	100M	BPSK	135	69	Back	10mm	5/6	633332	3499.98	19.06	20.70	1.459	0.02	0.220	0.321
	FR1 n77_Ant 1	100M	BPSK	1	1	Front	10mm	5/6	656000	3840	22.00	22.80	1.202	0.12	0.176	0.212
	FR1 n77_Ant 1	100M	BPSK	135	69	Front	10mm	5/6	656000	3840	22.15	22.80	1.161	0.15	0.174	0.202
	FR1 n77_Ant 1	100M	BPSK	1	1	Back	10mm	5/6	656000	3840	22.00	22.80	1.202	-0.1	0.161	0.194
	FR1 n77_Ant 1	100M	BPSK	135	69	Back	10mm	5/6	656000	3840	22.15	22.80	1.161	-0.15	0.161	0.187
	FR1 n77_Ant 1	100M	BPSK	1	1	Front	10mm	5/6	633332	3499.98	22.01	22.80	1.199	0.01	0.151	0.181
	FR1 n77_Ant 1	100M	BPSK	135	69	Front	10mm	5/6	633332	3499.98	22.35	22.80	1.109	0	0.172	0.191
	FR1 n77_Ant 1	100M	BPSK	1	1	Back	10mm	5/6	633332	3499.98	22.01	22.80	1.199	0.02	0.163	0.196
	FR1 n77_Ant 1	100M	BPSK	135	69	Back	10mm	5/6	633332	3499.98	22.35	22.80	1.109	0.05	0.175	0.194
	FR1 n77_Ant 5	100M	BPSK	1	1	Front	10mm	5/6	656000	3840	21.25	22.50	1.334	0.11	0.154	0.205
	FR1 n77_Ant 5	100M	BPSK	135	69	Front	10mm	5/6	656000	3840	21.47	22.50	1.268	0.01	0.133	0.169
	FR1 n77_Ant 5	100M	BPSK	1	1	Back	10mm	5/6	656000	3840	21.25	22.50	1.334	0.09	0.145	0.193
	FR1 n77_Ant 5	100M	BPSK	135	69	Back	10mm	5/6	656000	3840	21.47	22.50	1.268	-0.03	0.124	0.157
	FR1 n77_Ant 5	100M	BPSK	1	1	Front	10mm	5/6	633332	3499.98	21.30	22.50	1.318	0.02	0.183	0.241
	FR1 n77_Ant 5	100M	BPSK	135	69	Front	10mm	5/6	633332	3499.98	21.75	22.50	1.189	0.01	0.168	0.200
	FR1 n77_Ant 5	100M	BPSK	1	1	Back	10mm	5/6	633332	3499.98	21.30	22.50	1.318	0.05	0.158	0.208
	FR1 n77_Ant 5	100M	BPSK	135	69	Back	10mm	5/6	633332	3499.98	21.75	22.50	1.189	-0.04	0.145	0.172



**18.4 Repeated SAR Measurement**

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)	Ratio	Reported 1g SAR (W/kg)
1st	FR1 n5_Ant 1	20M	BPSK	50	28	Right Cheek	0mm	2	167300	836.5	23.39	24.30	1.233	-0.02	0.955	-	1.178
2nd	FR1 n5_Ant 1	20M	BPSK	50	28	Right Cheek	0mm	2	167300	836.5	23.39	24.30	1.233	-0.06	0.945	1.01	1.165
1st	FR1 n7_Ant 2	50M	BPSK	135	68	Right Cheek	0mm	2	507000	2535	24.74	25.70	1.247	-0.06	0.954	-	1.190
2nd	FR1 n7_Ant 2	50M	BPSK	135	68	Right Cheek	0mm	2	507000	2535	24.74	25.70	1.247	0.02	0.941	1.01	1.174
1st	FR1 n12_Ant 1	15M	BPSK	75	0	Right Cheek	0mm	2	141500	707.5	23.24	24.60	1.368	-0.09	0.870	-	1.190
2nd	FR1 n12_Ant 1	15M	BPSK	75	0	Right Cheek	0mm	2	141500	707.5	23.24	24.60	1.368	-0.06	0.862	1.01	1.179
1st	FR1 n77_Ant 1	100M	BPSK	1	1	Right Cheek	0mm	2	656000	3840	20.05	21.20	1.303	0.18	0.833	-	1.086
2nd	FR1 n77_Ant 1	100M	BPSK	1	1	Right Cheek	0mm	2	656000	3840	20.05	21.20	1.303	0.03	0.821	1.01	1.070

**General Note:**

- Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is  $\geq 0.8W/kg$ .
- Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is  $\leq 1.2$  and the measured SAR  $< 1.45W/kg$ , only one repeated measurement is required.
- The ratio is the difference in percentage between original and repeated *measured SAR*.
- All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

**18.5 LTE Band 41 Power Class 2 and Power Class 3 Linearity**

This device support Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operation is 43.3% using UL-DL configuration 1. Per FCC Guidance based on the device behavior, all SAR tests were performed using Power Class 3. Power Class 2 is tested using the highest SAR test configuration in Power Class 3 for each LTE configuration and exposure condition combination, according to the highest time averaged power for all applicable uplink-downlink configurations in Power Class 2. When the reported SAR vs. output power is linearly scaled with  $< 10\%$  discrepancy between power classes and all reported SAR are  $< 1.4 W/kg$ , Separate SAR testing for Power Class 2 is not required

Use PC3 power level and SAR to estimated PC2 SAR linearly, and check if the deviation from the measured PC2 SAR is  $< 10\%$

**<LTE Band 41 Linearity Data for Head>**

TX0	LTE Band 41_Ant 2	LTE Band 41_Ant 2
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	25.70	27.50
Reported 1g SAR (W/kg)	0.710	0.679
Duty Cycle	63.30%	43.30%
Frame Averaged (mW)	235.18	243.49
Linearity SAR(W/kg)	0.74	
% deviation from expected linearity		-7.63%

TX1	LTE Band 41_Ant 0	LTE Band 41_Ant 0
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	25.20	27.00
Reported 1g SAR (W/kg)	0.539	0.510
Duty Cycle	63.30%	43.30%
Frame Averaged (mW)	209.61	217.01
Linearity SAR(W/kg)	0.56	
% deviation from expected linearity		-8.61%

**<LTE Band 41 Linearity Data for Hotspot>**

TX0	LTE Band 41_Ant 2	LTE Band 41_Ant 2
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	24.00	25.60
Reported 1g SAR (W/kg)	0.994	0.900
Duty Cycle	63.30%	43.30%
Frame Averaged (mW)	159.00	157.21
Linearity SAR(W/kg)	0.98	
% deviation from expected linearity		-8.43%

TX1	LTE Band 41_Ant 0	LTE Band 41_Ant 0
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	23.30	24.90
Reported 1g SAR (W/kg)	0.875	0.850
Duty Cycle	63.30%	43.30%
Frame Averaged (mW)	135.33	133.81
Linearity SAR(W/kg)	0.87	
% deviation from expected linearity		-1.75%

**<LTE Band 41 Linearity Data for Body-worn>**

TX0	LTE Band 41_Ant 2	LTE Band 41_Ant 2
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	24.30	25.90
Reported 1g SAR (W/kg)	0.535	0.523
Duty Cycle	63.30%	43.30%
Frame Averaged (mW)	170.37	168.46
Linearity SAR(W/kg)	0.53	
% deviation from expected linearity		-1.13%

TX1	LTE Band 41_Ant 0	LTE Band 41_Ant 0
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	24.10	25.70
Reported 1g SAR (W/kg)	0.562	0.514
Duty Cycle	63.30%	43.30%
Frame Averaged (mW)	162.71	160.87
Linearity SAR(W/kg)	0.56	
% deviation from expected linearity		-7.50%



### 19. Simultaneous Transmission Analysis

Exposure Condition	Tx mode	Capable TX Configurations	WWAN Power	WiFi Power	BT Power
Head	WWAN standalone	WWAN	Index 2		
	WiFi standalone	WiFi 2.4G MIMO/CDD (Ant4+3)		Index 2	
		WiFi 5G MIMO (Ant4+3)			
		WiFi 6E MIMO (Ant4+3)			
	WiFi +BT	WiFi 5G MIMO (Ant4+3) + Bluetooth (Ant4)		Index 2	Index 1
		WiFi 5G MIMO (Ant4+3) + Bluetooth (Ant3)			
		WiFi 6E MIMO (Ant4+3) + Bluetooth (Ant4)			
		WiFi 6E MIMO (Ant4+3) + Bluetooth (Ant3)			
	WWAN + WiFi	WWAN + WiFi 2.4G MIMO/CDD (Ant4+3)		Index 3	Index 1
		WWAN + WiFi 5G MIMO (Ant4+3)			
		WWAN + WiFi 6E MIMO (Ant4+3)			
	WWAN + BT	WWAN + Bluetooth (Ant4)		Index 3	Index 1
		WWAN + Bluetooth (Ant3)			
	WWAN + WiFi +BT	WWAN + WiFi 5G MIMO (Ant4+3) + Bluetooth (Ant4)		Index 3	Index 1
WWAN + WiFi 5G MIMO (Ant4+3) + Bluetooth (Ant3)					
WWAN + WiFi 6E MIMO (Ant4+3) + Bluetooth (Ant4)					
WWAN + WiFi 6E MIMO (Ant4+3) + Bluetooth (Ant3)					
Body	WWAN standalone	WWAN	Index 5		
	WiFi standalone	WiFi 2.4G MIMO/CDD (Ant4+3)		Index 6	
		WiFi 5G MIMO (Ant4+3)			
		WiFi 6E MIMO (Ant4+3)			
	BT standalone	Bluetooth (Ant4)			Index 2
		Bluetooth (Ant3)			
	WiFi +BT	WiFi 5G MIMO (Ant4+3) + Bluetooth (Ant4)		Index 6	Index 3
		WiFi 5G MIMO (Ant4+3) + Bluetooth (Ant3)			
		WiFi 6E MIMO (Ant4+3) + Bluetooth (Ant4)			
		WiFi 6E MIMO (Ant4+3) + Bluetooth (Ant3)			
	WWAN + WiFi	WWAN + WiFi 2.4G MIMO/CDD (Ant4+3)		Index 6 / Index 4 (Hotspot)	Index 4
		WWAN + WiFi 5G MIMO (Ant4+3)			
		WWAN + WiFi 6E MIMO (Ant4+3)			
	WWAN + BT	WWAN + Bluetooth (Ant4)		Index 6	Index 3
WWAN + Bluetooth (Ant3)					
WWAN + WiFi +BT	WWAN + WiFi 5G MIMO (Ant4+3) + Bluetooth (Ant4)		Index 6 / Index 4 (Hotspot)	Index 5 / Index 3 (Hotspot)	
	WWAN + WiFi 5G MIMO (Ant4+3) + Bluetooth (Ant3)				
	WWAN + WiFi 6E MIMO (Ant4+3) + Bluetooth (Ant4)				
	WWAN + WiFi 6E MIMO (Ant4+3) + Bluetooth (Ant3)				

**General Note:**

- Simultaneous operation at maximum power levels when the device is neither against the body nor the head (i.e. in a mobile RF exposure condition) is addressed in Sporton's RF Exposure report no.: FA241216-02A
- The Sim-Tx configuration combination include in operation description will be match the title in the below Sum-Tx evaluation table.
- This device only WLAN 2.4GHz / 5.2GHz / 5.8GHz supports Hotspot operation and Bluetooth support tethering applications.
- The worst case reported SAR from each transmit antennas were using for SAR summation. Therefore, the following summations represent the absolute worst cases for simultaneous transmission configuration.
- The SAR summation is calculated based on the same exposure configuration and test position from each transmit antenna worst case reported SAR results.
- Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
  - Scalar SAR summation < 1.6W/kg.
  - $SPLSR = (SAR1 + SAR2)^{1.5} / (\text{min. separation distance, mm})$ , and the peak separation distance is determined from the square root of  $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$ , where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
  - If  $SPLSR \leq 0.04$ , simultaneously transmission SAR measurement is not necessary.
  - Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.
- For WWAN power, when the device is in head mode and hotspot function is enabled, the device will select power index 7 which is further lower than power index 3, as described in the operational description. In this report, standalone and simultaneous SAR compliance for the mentioned scenario was justified at power index 3 conservatively.

### **19.1 5G NR + LTE + WLAN + BT Sim-Tx analysis**

Samsung proprietary TAS feature manages transmitting power effectively in real time and ensures that overall average RF exposure from 4G/5G NR WWAN including 5G NR EN-DC, and LTE intra-band/inter-band uplink CA are in compliance with FCC requirements, while the RF exposure from 2G, 3G and WLAN/BT radios is managed using the legacy approach, i.e., through a fixed power back-off if needed. The test device features a TAS function to keep average RF exposure below the given limit for all cases while allowing temporarily high power transmission for better performance.

For the 5G NR EN-DC, the power ratio factors are  $g_1$  and  $g_2$  for LTE and NR respectively. The main purpose of these power ratio factors is to split the available SAR budget among different RATs, so  $g_1 + g_2 \leq 1$ . The value of  $g_1$  is computed based on the need of the anchor (LTE) and can be changed if the anchor changes its power request. Based on the SAR Budget portion allocated to the anchor, the value of  $g_2$  will be computed. At steady state (where all RATs are being on for a while), the allocated power ratio factors will guarantee that the total exposure ratio never exceeds the highest exposure of either one.

$$g_1 * LTE_{exposure} + g_2 * NR_{exposure} \leq 1.0,$$
$$\text{then, } g_1 * LTE_{exposure} + g_2 * NR_{exposure} \leq \max ( LTE_{exposure} , NR_{exposure} )$$

Compliance of simultaneous transmission of LTE+5G NR+WiFi+BT can be justified from the compliance of LTE+WiFi +BT and 5G NR+WiFi+BT

**19.2 Head Exposure Conditions**

**<WWAN Index 3, WLAN Index 1, BT Index 1>**

WWAN Band	Exposure Position	1	2	3	4	5	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)	1+3+5 Summed 1g SAR (W/kg)
		WWAN 1g SAR (W/kg)	WLAN2.4GHz Ant 4+3 1g SAR (W/kg)	WLAN5/6GHz Ant 4+3 1g SAR (W/kg)	Bluetooth Ant 4 1g SAR (W/kg)	Bluetooth Ant 3 1g SAR (W/kg)				
WWAN Ant 0	Right Cheek	0.515	0.536	0.194	0.145	0.397	1.051	0.709	0.854	1.106
	Right Tilted	0.473	0.271	0.048	0.183	0.033	0.744	0.521	0.704	0.554
	Left Cheek	0.997	0.523	0.145	0.408	0.210	1.520	1.142	1.550	1.352
	Left Tilted	0.312	0.532	0.113	0.469	0.021	0.844	0.425	0.894	0.446
WWAN Ant 1	Right Cheek	0.994	0.536	0.194	0.145	0.397	1.530	1.188	1.333	1.585
	Right Tilted	0.886	0.271	0.048	0.183	0.033	1.157	0.934	1.117	0.967
	Left Cheek	0.621	0.523	0.145	0.408	0.210	1.144	0.766	1.174	0.976
	Left Tilted	0.609	0.532	0.113	0.469	0.021	1.141	0.722	1.191	0.743
WWAN Ant 2	Right Cheek	0.993	0.536	0.194	0.145	0.397	1.529	1.187	1.332	1.584
	Right Tilted	0.336	0.271	0.048	0.183	0.033	0.607	0.384	0.567	0.417
	Left Cheek	0.497	0.523	0.145	0.408	0.210	1.020	0.642	1.050	0.852
	Left Tilted	0.560	0.532	0.113	0.469	0.021	1.092	0.673	1.142	0.694
WWAN Ant 5	Right Cheek	0.303	0.536	0.194	0.145	0.397	0.839	0.497	0.642	0.894
	Right Tilted	0.107	0.271	0.048	0.183	0.033	0.378	0.155	0.338	0.188
	Left Cheek	0.932	0.523	0.145	0.408	0.210	1.455	1.077	1.485	1.287
	Left Tilted	0.298	0.532	0.113	0.469	0.021	0.830	0.411	0.880	0.432
WWAN Ant 6	Right Cheek	0.502	0.536	0.194	0.145	0.397	1.038	0.696	0.841	1.093
	Right Tilted	0.391	0.271	0.048	0.183	0.033	0.662	0.439	0.622	0.472
	Left Cheek	0.913	0.523	0.145	0.408	0.210	1.436	1.058	1.466	1.268
	Left Tilted	0.272	0.532	0.113	0.469	0.021	0.804	0.385	0.854	0.406

**<WLAN Index 2, BT Index 1>**

Exposure Position	1	2	3	4	2+3 Summed 1g SAR (W/kg)	2+4 Summed 1g SAR (W/kg)
	WLAN2.4GHz Ant 4+3 1g SAR (W/kg)	WLAN5/6GHz Ant 4+3 1g SAR (W/kg)	Bluetooth Ant 4 1g SAR (W/kg)	Bluetooth Ant 3 1g SAR (W/kg)		
Right Cheek	1.021	1.178	0.145	0.397	1.323	1.575
Right Tilted	0.470	0.425	0.183	0.033	0.608	0.458
Left Cheek	1.146	1.184	0.408	0.210	1.592	1.394
Left Tilted	1.198	0.799	0.469	0.021	1.268	0.820

**19.3 Hotspot Exposure Conditions**

**<WWAN Index 4, WLAN Index 3, BT Index 4>**

WWAN Band	Exposure Position	1	2	3	4	5	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)	1+3+5 Summed 1g SAR (W/kg)
		WWAN 1g SAR (W/kg)	WLAN2.4GHz Ant 4+3 1g SAR (W/kg)	WLAN5GHz Ant 4+3 1g SAR (W/kg)	Bluetooth Ant 4 1g SAR (W/kg)	Bluetooth Ant 3 1g SAR (W/kg)				
WWAN Ant 0	Front	0.639	0.414	0.224	0.132	0.139	1.053	0.863	0.995	1.002
	Back	0.624	0.382	0.425	0.131	0.121	1.006	1.049	1.180	1.170
	Left side	0.984	0.595	0.218	0.002	0.237	1.579	1.202	1.204	1.439
	Right side	0.493	0.529	0.215	0.093	0.001	1.022	0.708	0.801	0.709
	Top side		0.596	0.297	0.285	0.019	0.596	0.297	0.582	0.316
	Bottom side	0.712					0.712	0.712	0.712	0.712
WWAN Ant 1	Front	0.390	0.414	0.224	0.132	0.139	0.804	0.614	0.746	0.753
	Back	0.451	0.382	0.425	0.131	0.121	0.833	0.876	1.007	0.997
	Left side	0.438	0.595	0.218	0.002	0.237	1.033	0.656	0.658	0.893
	Right side	0.264	0.529	0.215	0.093	0.001	0.793	0.479	0.572	0.480
	Top side	0.293	0.596	0.297	0.285	0.019	0.889	0.590	0.875	0.609
	Bottom side						0.000	0.000	0.000	0.000
WWAN Ant 2	Front	0.932	0.414	0.224	0.132	0.139	1.346	1.156	1.288	1.295
	Back	0.951	0.382	0.425	0.131	0.121	1.333	1.376	1.507	1.497
	Left side	0.160	0.595	0.218	0.002	0.237	0.755	0.378	0.380	0.615
	Right side	0.994	0.529	0.215	0.093	0.001	1.523	1.209	1.302	1.210
	Top side		0.596	0.297	0.285	0.019	0.596	0.297	0.582	0.316
	Bottom side	0.646					0.646	0.646	0.646	0.646
WWAN Ant 5	Front	0.241	0.414	0.224	0.132	0.139	0.655	0.465	0.597	0.604
	Back	0.208	0.382	0.425	0.131	0.121	0.590	0.633	0.764	0.754
	Left side	0.043	0.595	0.218	0.002	0.237	0.638	0.261	0.263	0.498
	Right side	0.579	0.529	0.215	0.093	0.001	1.108	0.794	0.887	0.795
	Top side	0.073	0.596	0.297	0.285	0.019	0.669	0.370	0.655	0.389
	Bottom side						0.000	0.000	0.000	0.000
WWAN Ant 6	Front	0.561	0.414	0.224	0.132	0.139	0.975	0.785	0.917	0.924
	Back	0.531	0.382	0.425	0.131	0.121	0.913	0.956	1.087	1.077
	Left side	0.825	0.595	0.218	0.002	0.237	1.420	1.043	1.045	1.280
	Right side	0.033	0.529	0.215	0.093	0.001	0.562	0.248	0.341	0.249
	Top side		0.596	0.297	0.285	0.019	0.596	0.297	0.582	0.316
	Bottom side	0.327					0.327	0.327	0.327	0.327

**19.4 Body-Worn Accessory Exposure Conditions**

**<WWAN Index 6, WLAN Index 5, BT Index 4>**

WWAN Band	Exposure Position	1	2	3	4	5	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)	1+3+5 Summed 1g SAR (W/kg)
		WWAN	WLAN2.4GHz Ant 4+3	WLAN5/6GHz Ant 4+3	Bluetooth Ant 4	Bluetooth Ant 3				
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)				
WWAN Ant 0	Front	0.669	0.556	0.314	0.132	0.139	<b>1.225</b>	<b>0.983</b>	<b>1.115</b>	<b>1.122</b>
	Back	0.618	0.490	0.438	0.131	0.121	<b>1.108</b>	<b>1.056</b>	<b>1.187</b>	<b>1.177</b>
WWAN Ant 1	Front	0.390	0.556	0.314	0.132	0.139	<b>0.946</b>	<b>0.704</b>	<b>0.836</b>	<b>0.843</b>
	Back	0.451	0.490	0.438	0.131	0.121	<b>0.941</b>	<b>0.889</b>	<b>1.020</b>	<b>1.010</b>
WWAN Ant 2	Front	0.925	0.556	0.314	0.132	0.139	<b>1.481</b>	<b>1.239</b>	<b>1.371</b>	<b>1.378</b>
	Back	0.951	0.490	0.438	0.131	0.121	<b>1.441</b>	<b>1.389</b>	<b>1.520</b>	<b>1.510</b>
WWAN Ant 5	Front	0.241	0.556	0.314	0.132	0.139	<b>0.797</b>	<b>0.555</b>	<b>0.687</b>	<b>0.694</b>
	Back	0.208	0.490	0.438	0.131	0.121	<b>0.698</b>	<b>0.646</b>	<b>0.777</b>	<b>0.767</b>
WWAN Ant 6	Front	0.561	0.556	0.314	0.132	0.139	<b>1.117</b>	<b>0.875</b>	<b>1.007</b>	<b>1.014</b>
	Back	0.531	0.490	0.438	0.131	0.121	<b>1.021</b>	<b>0.969</b>	<b>1.100</b>	<b>1.090</b>

**<WLAN Index 6, BT Index 3>**

Exposure Position	1	2	3	4	3+4 Summed 1g SAR (W/kg)	3+5 Summed 1g SAR (W/kg)
	WLAN2.4GHz Ant 4+3	WLAN5/6GHz Ant 4+3	Bluetooth Ant 4	Bluetooth Ant 3		
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
Front	0.556	0.347	0.471	0.560	<b>0.818</b>	<b>0.907</b>
Back	0.490	0.551	0.326	0.443	<b>0.877</b>	<b>0.994</b>

**<WWAN Index 6, WLAN Index 4>**

WWAN Band	Exposure Position	1	2	3	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)
		WWAN	WLAN2.4GHz Ant 4+3	WLAN5/6GHz Ant 4+3		
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
WWAN Ant 0	Front	0.669	0.556	0.347	<b>1.225</b>	<b>1.016</b>
	Back	0.618	0.490	0.551	<b>1.108</b>	<b>1.169</b>
WWAN Ant 1	Front	0.390	0.556	0.347	<b>0.946</b>	<b>0.737</b>
	Back	0.451	0.490	0.551	<b>0.941</b>	<b>1.002</b>
WWAN Ant 2	Front	0.925	0.556	0.347	<b>1.481</b>	<b>1.272</b>
	Back	0.951	0.490	0.551	<b>1.441</b>	<b>1.502</b>
WWAN Ant 5	Front	0.241	0.556	0.347	<b>0.797</b>	<b>0.588</b>
	Back	0.208	0.490	0.551	<b>0.698</b>	<b>0.759</b>
WWAN Ant 6	Front	0.561	0.556	0.347	<b>1.117</b>	<b>0.908</b>
	Back	0.531	0.490	0.551	<b>1.021</b>	<b>1.082</b>

**<WWAN Index 6, BT Index 3>**

WWAN Band	Exposure Position	1	2	3	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)
		WWAN	Bluetooth Ant 4	Bluetooth Ant 3		
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
WWAN Ant 0	Front	0.669	0.471	0.560	<b>1.140</b>	<b>1.229</b>
	Back	0.618	0.326	0.443	<b>0.944</b>	<b>1.061</b>
WWAN Ant 1	Front	0.390	0.471	0.560	<b>0.861</b>	<b>0.950</b>
	Back	0.451	0.326	0.443	<b>0.777</b>	<b>0.894</b>
WWAN Ant 2	Front	0.925	0.471	0.560	<b>1.396</b>	<b>1.485</b>
	Back	0.951	0.326	0.443	<b>1.277</b>	<b>1.394</b>
WWAN Ant 5	Front	0.241	0.471	0.560	<b>0.712</b>	<b>0.801</b>
	Back	0.208	0.326	0.443	<b>0.534</b>	<b>0.651</b>
WWAN Ant 6	Front	0.561	0.471	0.560	<b>1.032</b>	<b>1.121</b>
	Back	0.531	0.326	0.443	<b>0.857</b>	<b>0.974</b>



**19.5 Product Specific Exposure Conditions**

**<WWAN Index 6, WLAN Index 4>**

WWAN Band	Exposure Position	1	2	1+2 Summed 10g SAR (W/kg)
		WWAN 10g SAR (W/kg)	WLAN5/6GHz Ant 4+3 10g SAR (W/kg)	
WWAN Ant 0	Front		1.735	1.735
	Back		0.937	0.937
	Left side		2.239	2.239
	Right side		1.334	1.334
	Top side		1.036	1.036
	Bottom side			0.000
WWAN Ant 1	Front		1.735	1.735
	Back		0.937	0.937
	Left side		2.239	2.239
	Right side		1.334	1.334
	Top side		1.036	1.036
	Bottom side			0.000
WWAN Ant 2	Front		1.735	1.735
	Back		0.937	0.937
	Left side		2.239	2.239
	Right side		1.334	1.334
	Top side		1.036	1.036
	Bottom side			0.000
WWAN Ant 5	Front		1.735	1.735
	Back		0.937	0.937
	Left side		2.239	2.239
	Right side		1.334	1.334
	Top side		1.036	1.036
	Bottom side			0.000
WWAN Ant 6	Front		1.735	1.735
	Back		0.937	0.937
	Left side		2.239	2.239
	Right side		1.334	1.334
	Top side		1.036	1.036
	Bottom side			0.000

## 20. Supplemental Antenna tuner tests results

**General Note:**

1. This device implements antenna tuning techniques in the several frequency band and list as below. SAR test proposal was measured according to the normally required SAR configurations with the tuner active and worst tune state (auto tune) was used for SAR testing and this design will provide the highest power at different user scenarios and would not influence to the antenna characteristics other than impedance matching.
2. The following test procedure was followed to demonstrate that the SAR results in this report represent the appropriate SAR test conditions. For bands with dynamic tuning implemented, SAR will be measured according to the required FCC SAR test procedures with the dynamic tuner active to allow the device to automatically tune to the antenna state for the respective RF exposure test configurations. Additional single point SAR time-sweep measurements will be evaluated for other tuner states to determine that the other tuner configurations would result in equivalent or lower SAR values.
3. The number of supported tune codes is different for each frequency band as shown in the following table.
4. Dynamic antenna tuning mechanism is available at Ant. 0 and for its < 3GHz LTE band, details are illustrated in the operational description. In this section, all supported tuning states for each band are tested and it's verified that auto-tune state results in the highest SAR configuration.
5. The tuner state was established remotely through Wi-Fi so that the device is not moved for the entire series of single point SAR for the tuner states in each combination (band, mode, exposure conditions).

Antenna configuration	
Transmit switching diversity configuration	Support transmit antenna and band
TX0	ANT 0: LTE B5/B12/B17, FR1 n5/12

Antenna	Band	Number of tuning states
Ant0(LB)	LTE B5, FR1 n5	36
	LTE B12/17, FR1 n12	45



20.1 Supplemental Head SAR results

Head (Ant0)	RF exposure position											Average Value of Time Sweep Single Point SAR (W/kg)																																
	Band	Mode	Channel		Setting	Test Position	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Default-Tuner (State)	Default-Tuner Single Point SAR (W/kg)	Auto-Tuner (State)	Auto-Tuner Single Point SAR (W/kg)																																
	LTE Band 5	10M_QPSK_1_0	Middle	20525	230	Left Cheek	0.352	0.538	26	0.439	26	0.447	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21											
													0.429	0.407	0.411	0.380	0.340	0.370	0.114	0.426	0.199	0.259	0.421	0.285	0.216	0.199	0.179	0.273	0.151	0.179	0.225	0.260	0.428											
													0.436	0.381	0.203	0.248	0.439	0.218	0.217	0.351	0.435	0.423	0.227	0.291	0.222	0.203	0.093																	
													0.181	0.313	0.301	0.283	0.048	0.049	0.183	0.120	0.186	0.197	0.120	0.238	0.152	0.243	0.121	0.001	0.001	0.214	0.293	0.001	0.125											
													0.292	0.164	0.001																													
LTE Band 12/17	10M_QPSK_1_0	Middle	23095	230	Left Cheek	0.350	0.532	6	0.330	6	0.331	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21												
													0.235	0.188	0.243	0.232	0.186	0.330	0.279	0.153	0.050	0.082	0.315	0.071	0.054	0.101	0.313	0.282	0.128	0.053	0.001	0.049	0.181											
													0.181	0.313	0.301	0.283	0.048	0.049	0.183	0.120	0.186	0.197	0.120	0.238	0.152	0.243	0.121	0.001	0.001	0.214	0.293	0.001	0.125											
													0.292	0.164	0.001																													

Head (Ant0)	RF exposure position											Average Value of Time Sweep Single Point SAR (W/kg)																																
	Band	Mode	Channel		Setting	Test Position	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Default-Tuner (State)	Default-Tuner Single Point SAR (W/kg)	Auto-Tuner (State)	Auto-Tuner Single Point SAR (W/kg)																																
	FR1 n5_Ant 0	20M_BPSK_50_28	Middle	167300	Left Cheek	0.361	0.484	26	0.330	26	0.335	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21												
													0.328	0.327	0.281	0.249	0.171	0.210	0.081	0.326	0.226	0.269	0.326	0.160	0.157	0.225	0.198	0.264	0.115	0.198	0.219	0.248	0.283											
													0.330	0.212	0.228	0.246	0.335	0.159	0.227	0.171	0.329	0.309	0.241	0.282	0.159	0.225	0.067																	
FR1 n12_Ant 0	15M_BPSK_36_22	Middle	141500	Left Cheek	0.280	0.368	6	0.249	6	0.253	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21													
													0.232	0.197	0.230	0.221	0.195	0.253	0.214	0.129	0.060	0.089	0.245	0.081	0.068	0.011	0.245	0.201	0.112	0.060	0.050	0.057	0.196											
													0.196	0.249	0.251	0.211	0.060	0.058	0.193	0.135	0.195	0.137	0.249	0.252	0.250	0.140	0.039	0.035	0.239	0.252	0.040	0.141	0.069											
													0.251	0.159	0.039																													





**20.2 Supplemental Body SAR results**

RF exposure position												Average Value of Time Sweep Single Point SAR (W/kg)																																	
Band	Mode	Channel	Setting	Test Position	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Default-Tuner (State)	Default-Tuner Single Point SAR (W/kg)	Auto-Tuner (State)	Auto-Tuner Single Point SAR (W/kg)																																			
Body (Ant0) LTE Band 5	10M_QPSK_1_0	Middle	20525	230	Left Side 10mm	0.610	0.932	26	0.582	26	0.583	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21													
												0.500	0.504	0.496	0.450	0.406	0.448	0.132	0.505	0.238	0.305	0.510	0.351	0.275	0.237	0.210	0.316	0.198	0.208	0.247	0.291	0.574													
												22	23	24	25	26	27	28	29	30	31	32	33	34	35	36																			
												0.564	0.516	0.267	0.302	0.582	0.314	0.258	0.475	0.579	0.570	0.291	0.382	0.317	0.271	0.134																			
Body (Ant0) LTE Band 12/17	10M_QPSK_1_0	Middle	23095	230	Left Side 10mm	0.475	0.722	24	0.614	24	0.616	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21													
												0.506	0.411	0.514	0.506	0.415	0.550	0.516	0.335	0.138	0.206	0.524	0.188	0.150	0.229	0.524	0.457	0.288	0.140	0.112	0.123	0.448													
												22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42													
												0.438	0.590	0.614	0.547	0.150	0.137	0.469	0.328	0.472	0.495	0.328	0.535	0.560	0.329	0.101	0.088	0.478	0.605	0.102	0.328	0.153													
	43	44	45																																										
	0.558	0.424	0.097																																										

RF exposure position												Average Value of Time Sweep Single Point SAR (W/kg)																																		
Band	Mode	Channel	Setting	Test Position	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Default-Tuner (State)	Default-Tuner Single Point SAR (W/kg)	Auto-Tuner (State)	Auto-Tuner Single Point SAR (W/kg)																																				
Body (Ant0) FR1 n5_Ant 0	20M_BPSK_50_28	Middle	167300		Left Side 10mm	0.541	0.725	26	0.501	26	0.502	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21														
												0.455	0.456	0.448	0.405	0.354	0.398	0.114	0.455	0.224	0.280	0.455	0.308	0.243	0.223	0.187	0.282	0.175	0.186	0.220	0.259	0.500														
												22	23	24	25	26	27	28	29	30	31	32	33	34	35	36																				
												0.501	0.450	0.243	0.265	0.502	0.270	0.239	0.403	0.500	0.496	0.266	0.333	0.269	0.243	0.116																				
Body (Ant0) FR1 n12_Ant 0	15M_BPSK_1_1	Middle	141500		Left Side 10mm	0.459	0.598	24	0.456	24	0.458	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21														
												0.367	0.291	0.367	0.365	0.291	0.405	0.386	0.242	0.089	0.130	0.381	0.118	0.094	0.150	0.383	0.360	0.214	0.089	0.070	0.079	0.327														
												22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42														
												0.326	0.450	0.458	0.424	0.100	0.091	0.335	0.234	0.337	0.356	0.234	0.380	0.396	0.234	0.067	0.058	0.336	0.431	0.068	0.232	0.102														
	43	44	45																																											
	0.400	0.312	0.065																																											

Test Engineer : Tommy Chen, Ray Sun, Willie Huang, Wilson Lin, Kevin Guo and Charles Shen

## **21. 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>



## **22. References**

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