FCC SAR Test Report

APPLICANT	: Guangdong OPPO Mobile Telecommunications Corp., Ltd.
EQUIPMENT	: Mobile Phone
BRAND NAME	: OPPO
MODEL NAME	: CPH2639
FCC ID	: R9C-OP23302
STANDARD	: FCC 47 CFR Part 2 (2.1093)

We, Sporton International Inc. (Shenzhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Shenzhen), the test report shall not be reproduced except in full.

Si Zhang

Approved by: Si Zhang

ACCREDITED Cert #5145.01

Sporton International Inc. (Shenzhen)
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People's Republic of China

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA431509	Rev. 01	Initial issue of report.	May 06, 2024

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Guangdong OPPO Mobile Telecommunications Corp., Ltd., Mobile Phone, CPH2639,** are as follows.

Highest 1g SAR Summary						
Equipment Class	Frequency Band		Head (Separation 0mm)	Hotspot (Separation 10mm)	Body-worn (Separation 15mm)	Highest Simultaneous Transmission 1g SAR (W/kg)
			1g SAR (W/kg)			
Licensed	GSM	GSM850	0.87	0.39	0.21	1.55
		GSM1900	0.86	0.47	0.19	
	WCDMA	WCDMA V	0.83	0.39	0.18	
		WCDMA IV	0.97	0.42	0.26	
		WCDMA II	1.01	0.48	0.36	
	LTE	LTE Band 12/17	0.71	0.15	0.17	
		LTE Band 13	0.73	0.31	0.28	
		LTE Band 26/5	0.65	0.24	0.15	
		LTE Band 66/4	0.92	0.46	0.23	
		LTE Band 2	0.92	0.44	0.28	
		LTE Band 7	0.88	0.57	0.29	
		LTE Band 38/41	0.98	0.55	0.29	
	5G NR	FR1 n26/n5	0.78	0.20	0.16	
		FR1 n7	0.95	0.65	0.34	
		FR1 n66	0.93	0.55	0.26	
		FR1 n38/41	0.90	0.71	0.34	
DTS	WLAN	2.4GHz WLAN	**1.10**	0.29	0.13	1.41
NII		5GHz WLAN	0.60	**0.79**	**0.66**	1.55
DSS	Bluetooth	2.4GHz Bluetooth	0.39	0.13	<0.10	1.55

Highest 10g SAR Summary				
Equipment Class	Frequency Band		Product Specific 10g SAR (W/kg) (Separation 0mm)	Highest Simultaneous Transmission 10g SAR (W/kg)
Licensed	5G NR	FR1 n41/38	1.11	2.78
NII	WLAN	5GHz WLAN	**1.66**	2.78
Date of Testing:			2024/3/27 ~ 2024/4/21	

Remark:
1. This device supports LTE B4 / B5 / B17 / B38 and B66 / B26 / B12 / B41. Since the supported frequency span for LTE B4 / B5 / B17 / B38 falls completely within the supports frequency span for LTE B66 / B26 / B12 / B41, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B66 / B26 / B12 / B41.
2. This device supports 5GNR n5 / n38 and n26 / n41. Since the supported frequency span for 5GNR n5 / n38 falls completely within the supports frequency span for n26 / n41, both 5GNR bands have the same target power, and both 5GNR bands share the same transmission path; therefore, SAR was only assessed for n26 / n41.

Declaration of Conformity:
The test results with all measurement uncertainty excluded are 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.

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) 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.

2. Administration Data

Sporton International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Testing Laboratory			
Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR01-SZ SAR02-SZ	CN1256	421272

Applicant	
Company Name	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address	NO.18 HaiBin Road, Wusha Village, Chang'an Town, DongGuan City, Guangdong Province, P.R. China

Manufacturer	
Company Name	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address	NO.18 HaiBin Road, Wusha Village, Chang'an Town, DongGuan City, Guangdong Province, P.R. China

3. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- 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

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Phone
Brand Name	OPPO
Model Name	CPH2639
FCC ID	R9C-OP23302
IMEI Code	Sample 1: IMEI 1: 860772070026631 IMEI 2: 860772070026623 Sample 2: IMEI 1: 860772070031896 IMEI 2: 860772070031888
Wireless Technology and Frequency Range	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 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 13: 777 MHz ~ 787 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 MHz 5G NR n5: 824 MHz ~ 849 MHz 5G NR n7: 2500 MHz ~ 2570 MHz 5G NR n26: 814 MHz ~ 849 MHz 5G NR n66: 1710 MHz ~ 1780 MHz 5G NR n38: 2570 MHz ~ 2620 MHz 5G NR n41: 2496 MHz ~ 2690 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC: 13.56 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+(16QAM uplink is supported) LTE: QPSK, 16QAM, 64QAM 5G NR : CP-OFDM / DFT-s-OFDM, QPSK, 16QAM, 64QAM, 256QAM WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 2.4GHz 802.11ac VHT20/VHT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC: ASK
HW Version	11
SW Version	ColorOS 14.0.1
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.
EUT Stage	Production Unit
Remark: 1. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation. 2. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.	

3. This device 5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WiFi Direct (GC/GO), and 5.3GHz / 5.5GHz supports WiFi Direct (GC only).
4. This device does not support DTM operation and support GRPS/EGRPS mode up to multi-slot class 12.
5. For dual SIM card mobile has two SIM slots and supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (single active). After pre-scan two SIM cards power, we found test result of the SIM1 was the worse, so we chose SIM1 slot to perform all tests.
6. The device implements receiver detect mechanism trigger reduced power for the power management for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity) and the MediaTek TA-SAR will manage to ensure the power level not exceeding the associated power table. And the device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E.
7. For WLAN when transmit, when transmit simultaneously together with WWAN/BT, the device power will be reduced power at head, body worn and extremity exposure conditions.
8. For 5G NR test, using FTM (Factory Test Mode) to perform SAR with default 100% transmission.
9. For 5GNR EN-DC mode, standalone SAR performed for 5GNR NSA band with the maximum power, EN-DC SAR summed EN-DC mode 5GNR standalone SAR and LTE standalone SAR, the result of EN-DC SAR is more conservatively.
10. This device has NFC function and the NFC SAR report will be separately submitted.
11. This device supports 5GNR FR1 bands as following table, including NSA mode and SA mode. NSA and SA mode performed SAR separately.
12. The device has two batteries. For battery 1/2 only suppliers are different, so only battery 1 was chosen to perform full SAR testing.
13. There are two samples, the different between them are different for LCD supplier. According to the differences, we choose sample 1 to perform full SAR testing and sample 2 to verify the worst case of sample 1.

<5G NR>

Mode	Band	Duplex	SCS(KHz)	Bandwidths(BW)
NSA/SA	n5	FDD	15	5, 10, 15, 20, 25
	n7	FDD	15	5, 10, 15, 20, 25, 30, 40, 50
	n26	FDD	15	5, 10, 15, 20
	n66	FDD	15	5, 10, 15, 20, 30, 40
	n38	TDD	30	10, 15, 20, 30, 40
	n41	TDD	30	20, 30, 40, 50, 60, 70, 80, 90, 100

4.2 General LTE SAR Test and Reporting Considerations

<table>
<tr><th colspan="2">Summarized necessary items addressed in KDB 941225 D05 v02r05</th></tr>
<tr><td>FCC ID</td><td>R9C-OP23302</td></tr>
<tr><td>Equipment Name</td><td>Mobile Phone</td></tr>
<tr><td>Operating Frequency Range of each LTE transmission band</td><td>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 13: 777 MHz ~ 787 MHz
LTE Band 17: 704 MHz ~ 716 MHz
LTE Band 26: 814 MHz ~ 849 MHz
LTE Band 38: 2570 MHz ~ 2620 MHz
LTE Band 41: 2496 MHz ~ 2690 MHz
LTE Band 66: 1710 MHz ~ 1780 MHz</td></tr>
<tr><td>Channel Bandwidth</td><td>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 13: 5MHz, 10MHz
LTE Band 17: 5MHz, 10MHz
LTE Band 26:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz
LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz</td></tr>
<tr><td>uplink modulations used</td><td>QPSK / 16QAM / 64QAM</td></tr>
<tr><td>LTE Voice / Data requirements</td><td>Voice and Data</td></tr>
<tr><td>LTE Release Version</td><td>R15, Cat13</td></tr>
<tr><td>CA Support</td><td>Supported, Uplink and Downlink</td></tr>
<tr><td>LTE MPR permanently built-in by design</td><td>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</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>
<tr><td>QPSK</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>≤ 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>> 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>≤ 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>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr>
<tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr>
</table></td></tr>
<tr><td>LTE A-MPR</td><td>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)</td></tr>
<tr><td>Spectrum plots for RB configuration</td><td>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.</td></tr>
<tr><td>Power reduction applied to satisfy SAR compliance</td><td>Yes, when operating in receiver detect mechanism, head/ body-worn /hotspot/extremity will trigger reduced power for some bands applied to satisfy SAR compliance, the detail please referred to section 13.</td></tr>
<tr><td>LTE Carrier Aggregation Combinations</td><td>Inter-Band and Intra-Band possible combinations and the detail power verification please referred to section 13.</td></tr>
<tr><td>LTE Carrier Aggregation Additional Information</td><td>1. This device supports LTE Carrier Aggregation (CA) in the uplink for intra-band with two component carriers in the uplink. SAR Measurements and conducted powers were evaluated per FCC Guidance.
2. This device supports maximum of 2 carriers in the downlink and 2 carriers in the uplink.</td></tr>
</table>

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	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844

LTE Band 7

	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510
M	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560

LTE Band 12

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 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
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

LTE Band 13

	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	23205	779.5	23230	782
M	23230	782		
H	23255	784.5		

LTE Band 17

	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq. (MHz)
L	23755	706.5	23780	709
M	23790	710	23790	710
H	23825	713.5	23800	711

LTE Band 26

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5

LTE Band 38

	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	37775	2572.5	37800	2575	37825	2577.5	37850	2580
M	38000	2595	38000	2595	38000	2595	38000	2595
H	38225	2617.5	38200	2615	38175	2612.5	38150	2610

LTE Band 41

	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	39675	2498.5	39700	2501	39725	2503.5	39750	2506
LM	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5
M	40620	2593	40620	2593	40620	2593	40620	2593

HM	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5
H	41565	2687.5	41540	2685	41515	2682.5	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

<For LTE Overlap Bands Description>

1) LTE Bands BW

Band	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
LTE Band 4	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 66	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 5	Yes	Yes	Yes	Yes		
LTE Band 26	Yes	Yes	Yes	Yes	Yes	
LTE Band 12	Yes	Yes	Yes	Yes		
LTE Band 17			Yes	Yes		
LTE Band 38			Yes	Yes	Yes	Yes
LTE Band 41			Yes	Yes	Yes	Yes

2) LTE Bands tune up:

Band	Ant	Full	ECI 1	ECI 2	ECI 3	ECI 4
		Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit
LTE Band 4	Ant.0	24.8	22.8	24.8	20.3	24.8
LTE Band 66	Ant.0	24.8	22.8	24.8	20.3	24.8
LTE Band 5	Ant.0	24.8	24.8	24.8	23.8	24.8
LTE Band 26	Ant.0	24.8	24.8	24.8	23.8	24.8
LTE Band 12	Ant.0	24.8	24.8	24.8	23.8	24.8
LTE Band 17	Ant.0	24.8	24.8	24.8	23.8	24.8
LTE Band 38	Ant.0	24.8	23.8	24.8	21.3	24.8
LTE Band 41	Ant.0	24.8	23.8	24.8	21.3	24.8

Band	Ant	Full	ECI 1	ECI 2	ECI 3	ECI 4
		Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit
LTE Band 4	Ant.1	24.8	22.3	18.8	19.8	17.8
LTE Band 66	Ant.1	24.8	22.3	18.8	19.8	17.8
LTE Band 5	Ant.1	24.8	24.8	20.8	24.8	19.8
LTE Band 26	Ant.1	24.8	24.8	20.8	24.8	19.8
LTE Band 12	Ant.1	24.8	24.8	22.8	24.3	21.8
LTE Band 17	Ant.1	24.8	24.8	22.8	24.3	21.8
LTE Band 38	Ant.1	24.8	19.8	16.8	17.3	15.8
LTE Band 41	Ant.1	24.8	19.8	16.8	17.3	15.8

Band	Ant	Full	ECI 1	ECI 2	ECI 3	ECI 4
		Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit
LTE Band 4	Ant.4	24.3	24.3	24.3	24.3	24.3
LTE Band 66	Ant.4	24.3	24.3	24.3	24.3	24.3
LTE Band 38	Ant.4	24.1	23.6	24.1	21.6	23.6
LTE Band 41	Ant.4	24.1	23.6	24.1	21.6	23.6

4.3 General 5G NR SAR Test and Reporting Considerations

5G NR Information	
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 n26: 814 MHz ~ 849 MHz 5G NR n66: 1710 MHz ~ 1780 MHz 5G NR n38: 2570 MHz ~ 2620 MHz 5G NR n41: 2496 MHz ~ 2690 MHz
Channel Bandwidth	The detail please refers to section 4.1 5GNR FR1 bands table.
SCS	FDD: SCS15KHz, TDD: SCS30KHz
uplink modulations used	DFT-s-OFDM: QPSK / 16QAM / 64QAM / 256QAM CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM
A-MPR (Additional MPR) disabled for SAR Testing?	Yes
LTE Anchor Bands for n5	LTE B7/66
LTE Anchor Bands for n7	LTE B66
LTE Anchor Bands for n26	LTE B7
LTE Anchor Bands for n66	LTE B2/5/7/12
LTE Anchor Bands for n38	LTE B4/5
LTE Anchor Bands for n41	LTE B4/66

Transmission (H, M, L) channel numbers and frequencies in each 5G NR band

NR Band 5

	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz	
	Ch. #	Freq. (MHz)	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	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 26

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

NR Band 66

	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz	
	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	345000	1725	346000	1730
M	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745
H	355500	1777.5	355000	1775	354500	1772.5	354000	1770	353000	1765	352000	1760

NR Band 38

	Bandwidth10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	515004	2575.02	515502	2577.51	516000	2580	517002	2585.01	518004	2590.02
M	519000	2595	519000	2595	519000	2595	519000	2595	519000	2595
H	522996	2614.98	522498	2612.49	522000	2610	520998	2604.99	519996	2599.98

NR Band 41

	Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth 100MHz	
	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	501204	2506.02	502200	2511	503202	2516.01	504204	2521.02	505200	2526	500202	2501.01	507204	2536.02	508200	2541	509202	2546.01
M	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99
H	535998	2679.99	534996	2674.98	534000	2670	532998	2664.99	531996	2659.98	537000	2685	529998	2649.99	528996	2644.98	528000	2640

<For NR Overlap Bands Description>

1) NR Bands BW

Mode	Band	Duplex	SCS(KHz)	Bandwidths(BW)
SA	n5	FDD	15	5, 10, 15, 20,25
	n26	FDD	15	5, 10, 15, 20
	n38	TDD	30	10, 15, 20, 30, 40
	n41	TDD	30	20, 30, 40, 50, 60, 70, 80, 90, 100

2) NR Bands Tune up:

Band	Ant	Full	ECI 1	ECI 2	ECI 3	ECI 4
		Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit
FR1 n5	Ant.0	25.2	25.2	25.2	24.7	25.2
FR1 n26	Ant.0	25.2	25.2	25.2	24.7	25.2
FR1 n38	Ant.0	25.2	22.2	25.2	20.2	25.2
FR1 n41	Ant.0	25.2	22.2	25.2	20.2	25.2

Band	Ant	Full	ECI 1	ECI 2	ECI 3	ECI 4
		Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit
FR1 n5	Ant.1	25.2	25.2	21.7	25.2	20.7
FR1 n26	Ant.1	25.2	25.2	21.7	25.2	20.7
FR1 n38	Ant.1	25.2	18.2	14.7	15.7	13.7
FR1 n41	Ant.1	25.2	18.2	14.7	15.7	13.7

Band	Ant	Full	ECI 1	ECI 2	ECI 3	ECI 4
		Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit
FR1 n38	Ant.4	24.5	22	22.5	19.5	21.5
FR1 n41	Ant.4	24.5	22	22.5	19.5	21.5

5. TA-SAR feature for RF Exposure compliance

WWAN bands and mmWave are all enabled with MediaTek TA-SAR feature. This feature performs time averaging algorithm in real time to control and manage transmitting power and ensure the time-averaged RF exposure is in compliance with FCC requirements all the time. Note that WLAN operations are not enabled with TA-SAR feature.

The FCC RF exposure limit is defined based on time-averaged RF exposure. The product implements MediaTek TA-SAR feature which controls the instantaneous transmitting power for WWAN transmitter to ensure the product in compliance with FCC RF exposure limit over a defined time window, for SAR (transmit frequency ≤ 6GHz). To control and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure is compliant to the regulation requirement.

The purpose of this report (Part 1 test) is to demonstrate that the EUT meets FCC SAR limits when transmitting in static transmission scenario at maximum allowable time-averaged power levels.

The Plimit values correspond to SAR_design_target. The power will be fixed at the static reduce power level at different exposure conditions for RF exposure compliance. For the GSM (TDD) Plimit power levels in the table correspond to the burst average power levels which don't account for TX duty cycle.

This report describes the procedures for the SAR char generation, and the parameters obtained from SAR characterization (referred to as SAR char, respectively) will be used as input for TA-SAR algorithm. SAR char will be entered via the MediaTek's NV suggestion to enable the TA-SAR Feature.

<Terminologies in this report>

P_{limit}	The time-averaged RF power which corresponds to SAR_design_target.
P_{max}	Maximum target power level
SAR_design_target:	The design target for SAR compliance. It should be less than regulatory SAR limit to account for all device design related uncertainty.
SAR char	P_{limit} for all the technologies/bands for all applicable ECI

<SAR Characterization>

SAR char must be generated to cover all radio configurations and usage scenarios that the wireless device supports for operating at 6 GHz or below. It will then be used as input for TA-SAR to control and manage RF exposure for f < 6 GHz.

<SAR design target and uncertainty>

Item	Uncertainty dB (k=2)
Total uncertainty	1.2

To account for total uncertainty, SAR_design_target should be determined as:

$$SAR\_design\_target < SAR_{regulatory\_limit} \times 10^{\frac{-total\ uncertainty}{10}}$$

The TA-SAR algorithm maintains the time-averaged transmit power, in turn, time-averaged RF exposure of SAR_design_target, below the predefined time-averaged power limit, for each characterized technology and band.

TA-SAR allows the device to transmit at higher power instantaneously, as high as Pmax, when needed, but enforces power limiting to maintain time-averaged transmit power to Plimit.

<P_{limit} for supported technologies and bands>

Band	Antenna	Head (Standalone)	Head (Simultaneous)	Body Worn (Standalone)	Body Worn (Simultaneous) &Hotspot	Extremity (Standalone)	Extremity (Simultaneous)	Pmax*
		(ECI2)	(ECI4)	(ECI1)	(ECI3)	(ECI1)	(ECI3)	
GSM850	Ant 0	31.80	30.80	23.8	23.8	23.8	23.8	23.8
GSM850	Ant 1	20.80	19.80	23.8	23.8	23.8	23.8	23.8
GSM1900	Ant 0	33.10	32.10	20.8	19.30	20.8	19.30	20.8
GSM1900	Ant 1	16.80	15.80	20.8	18.30	20.8	18.30	20.8
WCDMA II	Ant 0	32.20	31.20	22.10	19.60	22.10	19.60	23.6
WCDMA II	Ant 1	16.60	15.60	21.10	18.60	21.10	18.60	23.6
WCDMA IV	Ant 0	33.80	32.80	21.60	19.10	21.60	19.10	23.6
WCDMA IV	Ant 1	17.60	16.60	20.60	18.10	20.60	18.10	23.6
WCDMA V	Ant 0	31.90	30.90	23.6	23.6	23.6	23.6	23.6
WCDMA V	Ant 1	20.10	19.10	23.6	23.6	23.6	23.6	23.6
LTE Band 2	Ant 0	32.40	31.40	21.60	19.10	21.60	19.10	22.6
LTE Band 2	Ant 1	16.60	15.60	20.60	18.10	20.60	18.10	22.6
LTE Band 2(ENDC Only)	Ant 4	27.30	26.30	22.1	22.1	22.1	22.1	22.1
LTE Band 66/4	Ant 0	34.10	33.10	21.60	19.10	21.60	19.10	23.6
LTE Band 66/4	Ant 1	17.60	16.60	21.10	18.60	21.10	18.60	23.6
LTE Band 66/4	Ant 4	36.20	35.20	23.1	23.1	23.1	23.1	23.1
LTE Band 26/5	Ant 0	32.60	31.60	23.6	22.60	23.6	22.60	23.6
LTE Band 26/5	Ant 1	19.60	18.60	23.6	23.6	23.6	23.6	23.6
LTE Band 7	Ant 0	28.70	27.70	21.10	18.60	21.10	18.60	23.6
LTE Band 7	Ant 1	13.10	12.10	16.60	14.10	16.60	14.10	23.6
LTE Band 7	Ant 4	21.90	20.90	20.40	17.90	20.40	17.90	22.9
LTE Band 12/17	Ant 0	33.80	32.80	23.6	22.60	23.6	22.60	23.6
LTE Band 12/17	Ant 1	21.60	20.60	23.6	23.10	23.6	23.10	23.6
LTE Band 13	Ant 0	32.40	31.40	23.6	23.6	23.6	23.6	23.6
LTE Band 13	Ant 1	21.60	20.60	23.6	23.6	23.6	23.6	23.6
LTE Band 41/38 PC3	Ant 0	28.20	27.20	22.60	20.10	22.60	20.10	23.6
LTE Band 41/38 PC3	Ant 1	13.60	12.60	16.60	14.10	16.60	14.10	21.6
LTE Band 41/38 PC3	Ant 4	23.60	20.40	20.40	18.40	20.40	18.40	20.9
FR1 n26/5	Ant 0	33.60	32.60	24.0	23.50	24.0	23.50	24.0
FR1 n26/5	Ant 1	20.50	19.50	24.0	24.0	24.0	24.0	24.0
FR1 n7	Ant 0	28.40	27.40	21.50	19.00	21.50	19.00	24.0
FR1 n7	Ant 1	13.50	12.50	16.50	14.00	16.50	14.00	24.0
FR1 n7	Ant 4	21.80	20.80	20.80	18.30	20.80	18.30	23.3
FR1 n66	Ant 0	33.20	32.20	22.00	20.00	22.00	20.00	24.0
FR1 n66	Ant 1	18.00	17.00	21.50	19.00	21.50	19.00	24.0
FR1 n66	Ant 4	36.60	35.60	23.3	23.3	23.3	23.3	23.3
FR1 n41/38	Ant 0	27.60	26.60	21.00	19.00	21.00	19.00	24.0
FR1 n41/38	Ant 1	13.50	12.50	17.00	14.50	17.00	14.50	24.0
FR1 n41/38	Ant 4	21.30	20.30	20.80	18.30	20.80	18.30	23.3

Note: 1) *P_{max} is used for RF tune up procedure. The maximum allowed output power is equal to Pmax + total uncertainty.
2) All P_{limit} power levels entered in the Table correspond to average power levels after accounting for duty cycle in the case TDD modulation schemes (for e.g., GSM & LTE TDD & NR TDD).
3) The max allowed output power is the Plimit + total uncertainty, and if Plimit is higher than Pmax, the device output power will be Pmax instead.

6. RF Exposure Limits

6.1 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.

6.2 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

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.

7. Specific Absorption Rate (SAR)

7.1 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.

7.2 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 (ρ). The equation description is as below:

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

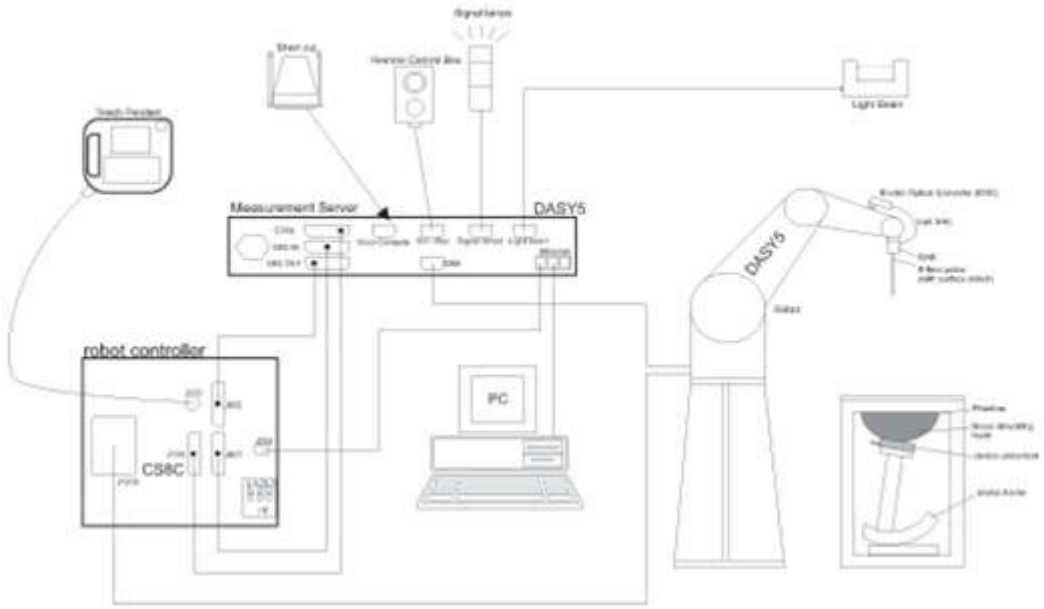
SAR is expressed in units of Watts per kilogram (W/kg)

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

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

8. System Description and Setup

The DASY5 system used for performing compliance tests consists of the following items:



- 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 WinXP or Win7 and the DASY 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.

8.1 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.

<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: ±0.2 dB (30 MHz – 6 GHz)
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/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

8.2 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.

Photo of DAE

8.3 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

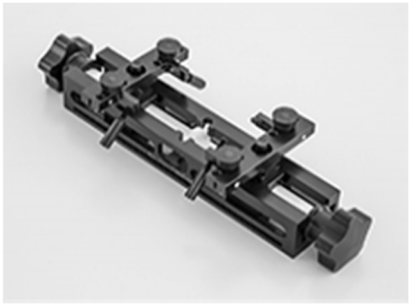
The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices or for evaluating transmitters operating at low frequencies. ELI is fully compatible with standard and all known tissue simulating liquids.

8.4 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

9. 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/BT power measurement, use engineering software to configure EUT WLAN/BT 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/BT output power

<SAR measurement>

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT 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

9.1 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 form 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

9.2 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.

9.3 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	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{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.	

9.4 Zoom Scan

Zoom scans are used 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 shoes 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: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ 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 *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 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.

9.5 Volume Scan Procedures

The volume scan is used for 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.

9.6 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.

10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1099	Dec. 15, 2021	Dec. 13, 2024
SPEAG	835MHz System Validation Kit	D835V2	4d162	Dec. 17, 2021	Dec. 15, 2024
SPEAG	1750MHz System Validation Kit	D1750V2	1137	Oct. 19, 2021	Oct. 17, 2024
SPEAG	1900MHz System Validation Kit	D1900V2	5d182	Dec. 20, 2021	Dec. 18, 2024
SPEAG	2450MHz System Validation Kit	D2450V2	924	Nov. 03, 2023	Nov. 02, 2024
SPEAG	2600MHz System Validation Kit	D2600V2	1070	Dec. 20, 2021	Dec. 18, 2024
SPEAG	5000MHz System Validation Kit	D5GHzV2	1341	Dec. 13, 2021	Dec. 11, 2024
SPEAG	Data Acquisition Electronics	DAE4	1386	Jul. 17, 2023	Jul. 16, 2024
SPEAG	Data Acquisition Electronics	DAE4	715	Jan. 25, 2024	Jan. 24, 2025
SPEAG	Dosimetric E-Field Probe	EX3DV4	3819	Jun. 06, 2023	Jun. 05, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7576	Aug. 23, 2023	Aug. 22, 2024
SPEAG	SAM Twin Phantom	QD 000 P40 CD	1671	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CD	1670	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201300653	Jul. 05, 2023	Jul. 04, 2024
Anritsu	Radio communication analyzer	MT8821C	6262314715	Jul. 05, 2023	Jul. 04, 2024
Anritsu	Radio communication analyzer	MT8821C	6272278319	Jul. 05, 2023	Jul. 04, 2024
Agilent	Wireless Communication Test Set	E5515C	MY50267224	Jul. 05, 2023	Jul. 04, 2024
Keysight	Network Analyzer	E5071C	MY46523671	Oct. 16, 2023	Oct. 15, 2024
Speag	Dielectric Assessment KIT	DAK-3.5	1071	Feb. 19, 2024	Feb. 18, 2025
Agilent	Signal Generator	N5181A	MY50145381	Dec. 28, 2023	Dec. 27, 2024
R&S	Signal Generator	SMB100A	175779	Dec. 28, 2023	Dec. 27, 2024
Anritsu	Power Senor	MA2411B	1306099	Oct. 16, 2023	Oct. 15, 2024
Anritsu	Power Meter	ML2495A	1349001	Oct. 16, 2023	Oct. 15, 2024
Anritsu	Power Sensor	MA2411B	1542004	Dec. 28, 2023	Dec. 27, 2024
Anritsu	Power Meter	ML2495A	1339473	Dec. 28, 2023	Dec. 27, 2024
R&S	CBT BLUETOOTH TESTER	CBT	100963	Dec. 28, 2023	Dec. 27, 2024
R&S	Spectrum Analyzer	FSP7	100818	Jul. 05, 2023	Jul. 04, 2024
TES	Hygrometer	1310	200505600	Jul. 08, 2023	Jul. 07, 2024
Anymetre	Thermo-Hygrometer	JR593	2015030903	Jan. 02, 2024	Jan. 01, 2025
Anymetre	Thermo-Hygrometer	JR593	2015102801	Jan. 02, 2024	Jan. 01, 2025
SPEAG	Device Holder	N/A	N/A	N/A	N/A
AR	Amplifier	5S1G4	0333096	Note 1	
Mini-Circuits	Amplifier	ZVE-3W-83+	599201528	Note 1	
Mini-Circuits	Amplifier	ZVA-183W-S+	726202215	Note 1	
ARRA	Power Divider	A3200-2	N/A	Note 1	
ET Industries	Dual Directional Coupler	C-058-10	N/A	Note 1	
Weinschel	Attenuator 1	3M-10	N/A	Note 1	
Weinschel	Attenuator 2	3M-20	N/A	Note 1	

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
2. Referring to KDB 865664 D01v01r04, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

11. System Verification

11.1 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 11.1. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 11.2.

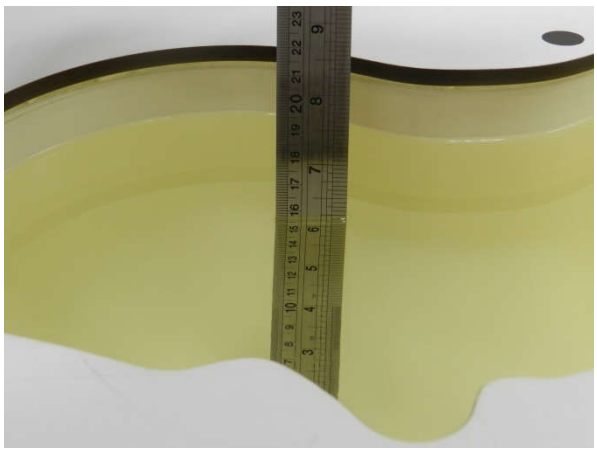


Fig 11.1 Photo of Liquid Height for Head SAR

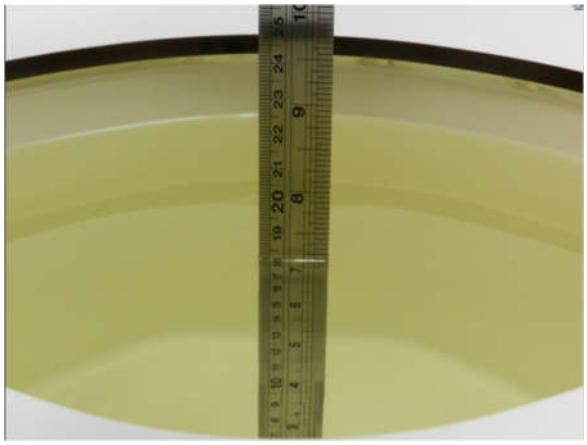


Fig 11.2 Photo of Liquid Height for Body SAR

11.2 Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0

Simulating Liquid for 5GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	Head	22.3	0.885	40.799	0.89	41.90	-0.56	-2.63	±5	2024/4/6
835	Head	22.3	0.917	40.748	0.90	41.50	1.89	-1.81	±5	2024/4/8
1750	Head	22.2	1.345	38.879	1.37	40.10	-1.82	-3.04	±5	2024/4/10
1900	Head	22.1	1.412	38.427	1.40	40.00	0.86	-3.93	±5	2024/4/13
2450	Head	22.2	1.765	38.042	1.80	39.20	-1.94	-2.95	±5	2024/4/14
2600	Head	22.6	1.934	37.625	1.96	39.00	-1.33	-3.53	±5	2024/4/15
5250	Head	22.6	4.660	36.667	4.71	35.95	-1.06	1.99	±5	2024/4/20
5600	Head	22.3	5.030	36.172	5.07	35.50	-0.79	1.89	±5	2024/4/18
5750	Head	22.2	5.193	35.971	5.22	35.35	-0.52	1.76	±5	2024/4/16
750	Head	22.6	0.880	40.789	0.89	41.90	-1.12	-2.65	±5	2024/4/4
835	Head	22.5	0.913	41.025	0.90	41.50	1.44	-1.14	±5	2024/4/11
1750	Head	22.3	1.373	41.355	1.37	40.10	0.22	3.13	±5	2024/3/27
1900	Head	22.6	1.420	40.033	1.40	40.00	1.43	0.08	±5	2024/3/29
2450	Head	22.7	1.738	40.772	1.80	39.20	-3.44	4.01	±5	2024/4/2
2600	Head	22.5	2.055	38.331	1.96	39.00	4.85	-1.72	±5	2024/4/7
5250	Head	22.2	4.583	36.674	4.71	35.95	-2.70	2.01	±5	2024/4/17
5600	Head	22.4	4.989	36.150	5.07	35.50	-1.60	1.83	±5	2024/4/19
5750	Head	22.7	5.168	35.882	5.22	35.35	-1.00	1.50	±5	2024/4/21

11.3 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.

<1g SAR>

Date	Frequency (MHz)	Tissue Type	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 (%)
2024/4/6	750	Head	250	1099	7576	1386	2.240	8.540	8.96	4.92
2024/4/8	835	Head	250	4d162	7576	1386	2.550	9.640	10.2	5.81
2024/4/10	1750	Head	250	1137	7576	1386	9.110	36.500	36.44	-0.16
2024/4/13	1900	Head	250	5d182	7576	1386	9.280	39.600	37.12	-6.26
2024/4/14	2450	Head	250	924	7576	1386	12.700	52.300	50.8	-2.87
2024/4/15	2600	Head	250	1070	7576	1386	13.300	56.200	53.2	-5.34
2024/4/20	5250	Head	100	1341	7576	1386	8.660	80.700	86.6	7.31
2024/4/18	5600	Head	100	1341	7576	1386	8.810	84.500	88.1	4.26
2024/4/16	5750	Head	100	1341	7576	1386	8.670	80.600	86.7	7.57
2024/4/4	750	Head	250	1099	3819	715	2.230	8.540	8.92	4.45
2024/4/11	835	Head	250	4d162	3819	715	2.500	9.640	10	3.73
2024/3/27	1750	Head	250	1137	3819	715	8.810	36.500	35.24	-3.45
2024/3/29	1900	Head	250	5d182	3819	715	9.850	39.600	39.4	-0.51
2024/4/2	2450	Head	250	924	3819	715	12.500	52.300	50	-4.40
2024/4/7	2600	Head	250	1070	3819	715	14.600	56.200	58.4	3.91
2024/4/17	5250	Head	100	1341	3819	715	7.560	80.700	75.6	-6.32
2024/4/19	5600	Head	100	1341	3819	715	7.890	84.500	78.9	-6.63
2024/4/21	5750	Head	100	1341	3819	715	7.530	80.600	75.3	-6.58

<10g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2024/4/6	750	Head	250	1099	7576	1386	1.520	5.650	6.08	7.61
2024/4/8	835	Head	250	4d162	7576	1386	1.670	6.260	6.68	6.71
2024/4/10	1750	Head	250	1137	7576	1386	4.820	19.200	19.28	0.42
2024/4/13	1900	Head	250	5d182	7576	1386	4.820	20.200	19.28	-4.55
2024/4/14	2450	Head	250	924	7576	1386	6.110	24.500	24.44	-0.24
2024/4/15	2600	Head	250	1070	7576	1386	5.700	24.600	22.8	-7.32
2024/4/20	5250	Head	100	1341	7576	1386	2.410	23.100	24.1	4.33
2024/4/18	5600	Head	100	1341	7576	1386	2.570	24.000	25.7	7.08
2024/4/16	5750	Head	100	1341	7576	1386	2.360	22.700	23.6	3.96
2024/4/4	750	Head	250	1099	3819	715	1.450	5.650	5.8	2.65
2024/4/11	835	Head	250	4d162	3819	715	1.610	6.260	6.44	2.88
2024/3/27	1750	Head	250	1137	3819	715	4.720	19.200	18.88	-1.67
2024/3/29	1900	Head	250	5d182	3819	715	5.050	20.200	20.2	0.00
2024/4/2	2450	Head	250	924	3819	715	5.850	24.500	23.4	-4.49
2024/4/7	2600	Head	250	1070	3819	715	6.430	24.600	25.72	4.55
2024/4/17	5250	Head	100	1341	3819	715	2.320	23.100	23.2	0.43
2024/4/19	5600	Head	100	1341	3819	715	2.430	24.000	24.3	1.25
2024/4/21	5750	Head	100	1341	3819	715	2.210	22.700	22.1	-2.64

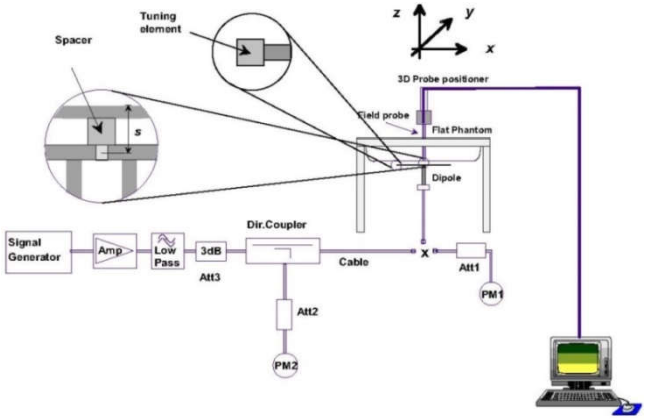


Fig 11.3.1 System Performance Check Setup

Fig 11.3.2 Setup Photo

12. RF Exposure Positions

12.1 Ear and handset reference point

Figure 12.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled “M,” the left ear reference point (ERP) is marked “LE,” and the right ERP is marked “RE.” Each ERP is 15 mm along the B-M (back-mouth) line behind the entrance-to-ear-canal (EEC) point, as shown in Figure 12.1.2 The Reference Plane is defined as passing through the two ear reference points and point M. The line N-F (neck-front), also called the reference pivoting line, is normal to the Reference Plane and perpendicular to both a line passing through RE and LE and the B-M line (see Figure 12.1.3). Both N-F and B-M lines should be marked on the exterior of the phantom shell to facilitate handset positioning. Posterior to the N-F line the ear shape is a flat surface with 6 mm thickness at each ERP, and forward of the N-F line the ear is truncated, as illustrated in Figure 12.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

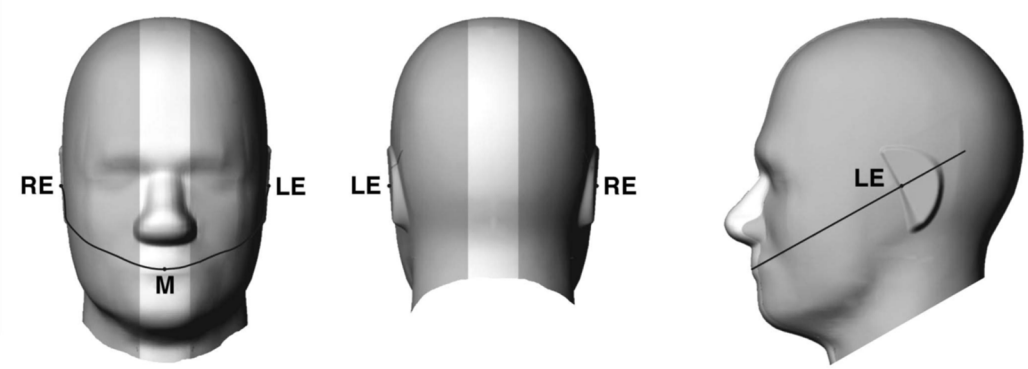


Fig 12.1.1 Front, back, and side views of SAM twin phantom

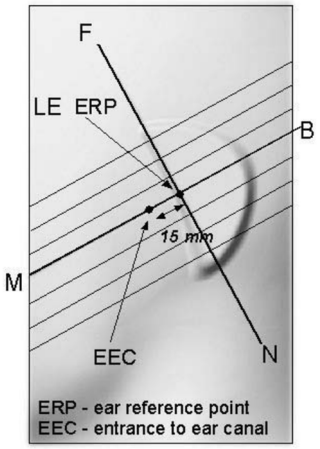


Fig 12.1.2 Close-up side view of phantom showing the ear region.

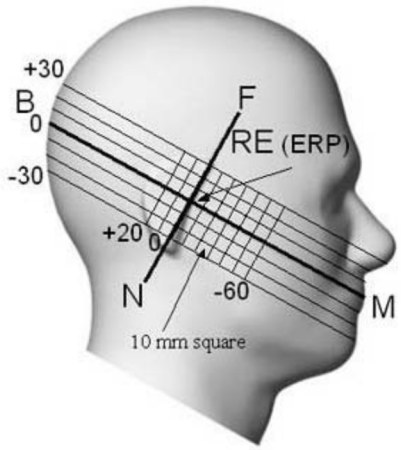


Fig 12.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

12.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width wt of the handset at the level of the acoustic output (point A in Figure 12.2.1 and Figure 12.2.2), and the midpoint of the width wb of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 12.2.1). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Figure 12.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
3. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 12.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
4. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP.
5. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
6. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.
7. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 12.2.3. The actual rotation angles should be documented in the test report.

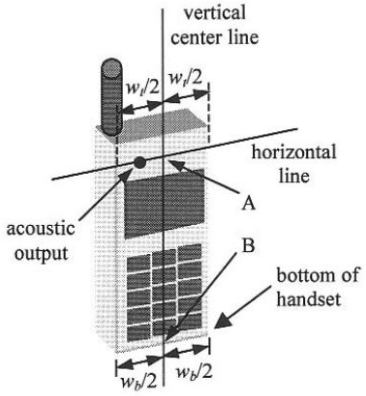


Fig 12.2.1 Handset vertical and horizontal reference lines—"fixed case

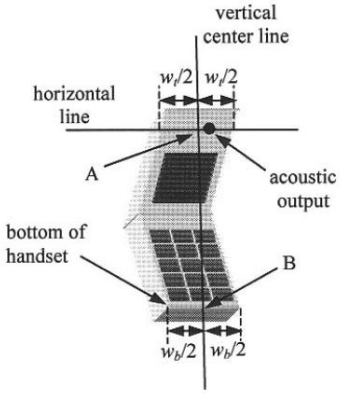


Fig 12.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

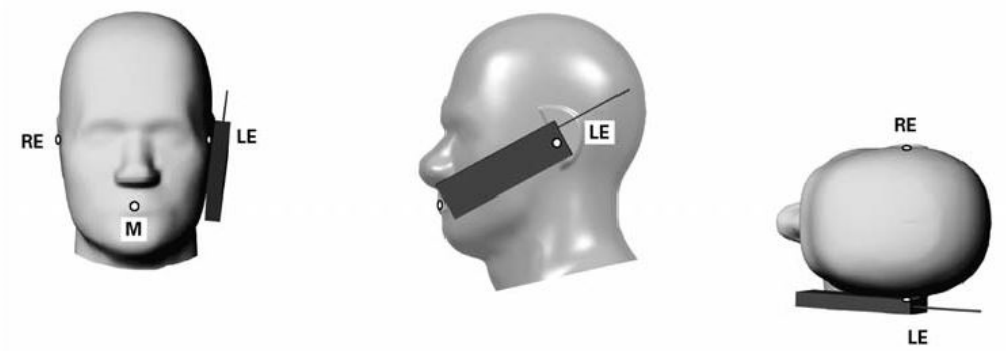


Fig 12.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

12.3 Definition of the tilt position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. While maintaining the orientation of the handset, move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15°.
3. Rotate the handset around the horizontal line by 15°.
4. While maintaining the orientation of the handset, move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact point is on the pinna. See Figure 12.3.1. If contact occurs at any location other than the pinna, e.g., the antenna at the back of the phantom head, the angle of the handset should be reduced. In this case, the tilt position is obtained if any point on the handset is in contact with the pinna and a second point

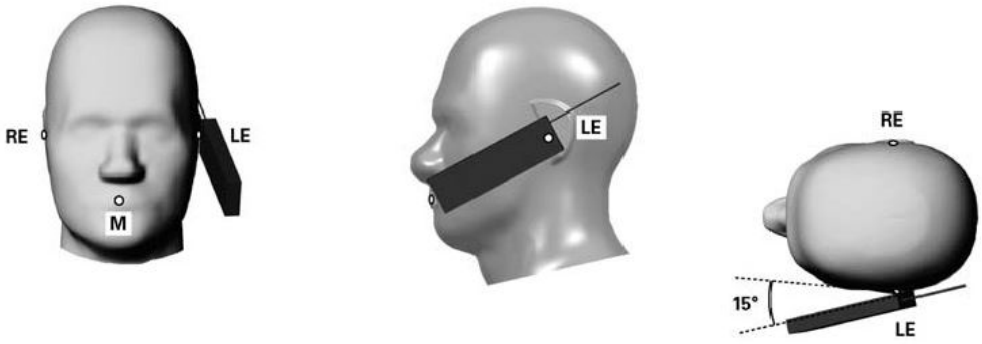


Fig 12.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

12.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 11.4). Per KDB648474 D04v01r03, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.

Accessories for body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are test with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-chip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

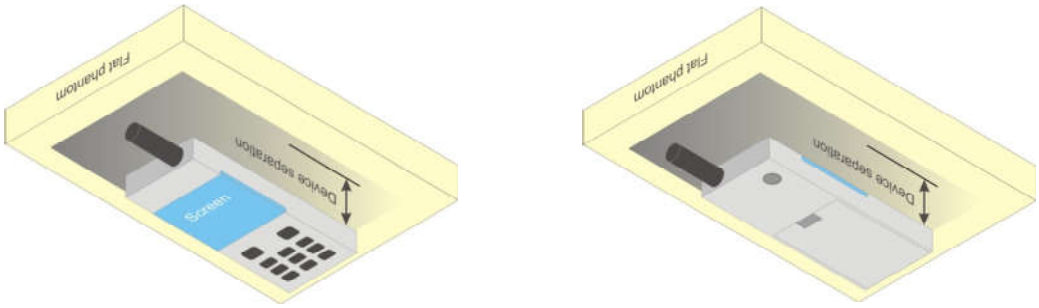


Fig 12.4 Body Worn Position

12.5 Product Specific 10g SAR Exposure

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, that can provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets and support voice calls next to the ear, According to KDB648474 D04v01r03, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.

2. The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions.6 The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

12.6 Wireless Router

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v02r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined form general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v06 publication procedures. The “Portable Hotspot” feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

13. Conducted RF Output Power (Unit: dBm)

The detailed conducted power table can refer to Appendix E.

<GSM Conducted Power>

1. Per KDB 447498 D01, 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.
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 ≤ ¼ dB higher than the primary mode, SAR measurement is not required for the secondary mode.

<WCDMA Conducted Power>

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. For HSPA+ devices supporting 16 QAM in the uplink, power measurements procedure is according to the configurations in Table C.11.1.4 of 3GPP TS 34.121-1.
4. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

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 (β_c and β_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: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, 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: Δ_{ACK}, Δ_{NACK} and Δ_{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, Δ_{ACK} and Δ_{NACK} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$, and Δ_{CQI} = 24/15 with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_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 β_c/β_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 β_c = 11/15 and β_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 (β_c and β_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-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	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	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 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, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c.

Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_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 β_c/β_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 β_c = 10/15 and β_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: β_{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

DC-HSDPA 3GPP release 8 Setup Configuration:

a. The EUT was connected to Base Station referred to the Setup Configuration below
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 RMC 12.2Kbps + HSDPA mode.
   ii. Set Cell Power = -25 dBm
   iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
   iv. Select HSDPA Uplink Parameters
   v. Set Gain Factors (β_c and β_d) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
      a). Subtest 1: β_c/β_d=2/15
      b). Subtest 2: β_c/β_d=12/15
      c). Subtest 3: β_c/β_d=15/8
      d). Subtest 4: β_c/β_d=15/4
   vi. Set Delta ACK, Delta NACK and Delta CQI = 8
   vii. Set Ack-Nack Repetition Factor to 3
   viii. Set CQI Feedback Cycle (k) to 4 ms
   ix. Set CQI Repetition Factor to 2
   x. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification. A summary of these settings are illustrated below:

C.8.1.12 Fixed Reference Channel Definition H-Set 12

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Proces ses	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.		
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

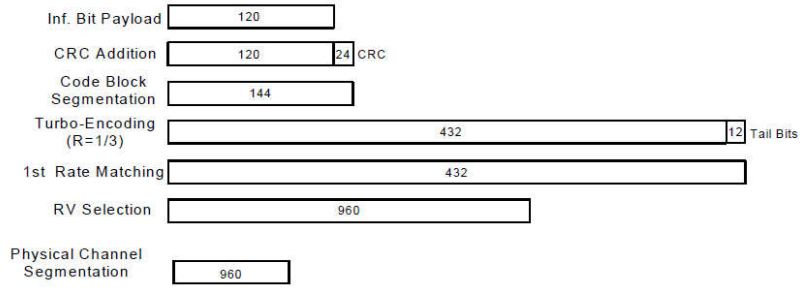


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

HSPA+ 3GPP release 7 (uplink category 7) 16QAM, Setup Configuration:

1. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
2. The RF path losses were compensated into the measurements.
3. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2E:HSPA+:UL with 16QAM
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.4, quoted from the TS 34.121-1 s5.2E
   iii. Set Channel Parms
   iv. Set Cell Power = -86 dBm
   v. Set Channel Type = HSPA
   vi. Set UE Target Power =21 dBm
   vii. Power Ctrl Mode= All Up Bits
   viii. Set Manual Uplink DPCH Bc/Bd = Manual
   ix. Set Manual Uplink DPCH Bc and Bd=15,15(for 34.121-1 v8.10.0 table C11.1.4 sub-test 1)
   x. Set HSPA Conn DL Channel Levels
   xi. Set HS-SCCH Configs
   xii. Set RB Test Mode Setup
   xiii. Set Common HSUPA Parameters
   xiv. Set Serving Grant
   xv. Confirm that E-TFCI is equal to the target E-TFCI of 105 for sub-test 1, and other subtest's E-TFCI
4. The transmitted maximum output power was recorded.

Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signaled to use the extrapolation algorithm.

Setup Configuration

<WCDMA Conducted Power>

General 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 / DC-HSDPA / HSPA+ is ≤ ¼ 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 / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

<LTE Conducted Power>

General 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 ≤ 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/64QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration 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; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B5 / B12 / B17 / B26 / 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 B4 /B5 / B17 SAR test was covered by B66 / B26 / B12; 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 ≤ 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
10. According to May 2017 TCB workshop, for 16QAM and 64QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM and 16QAM signal modulation are correct.

16QAM

64QAM

<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.

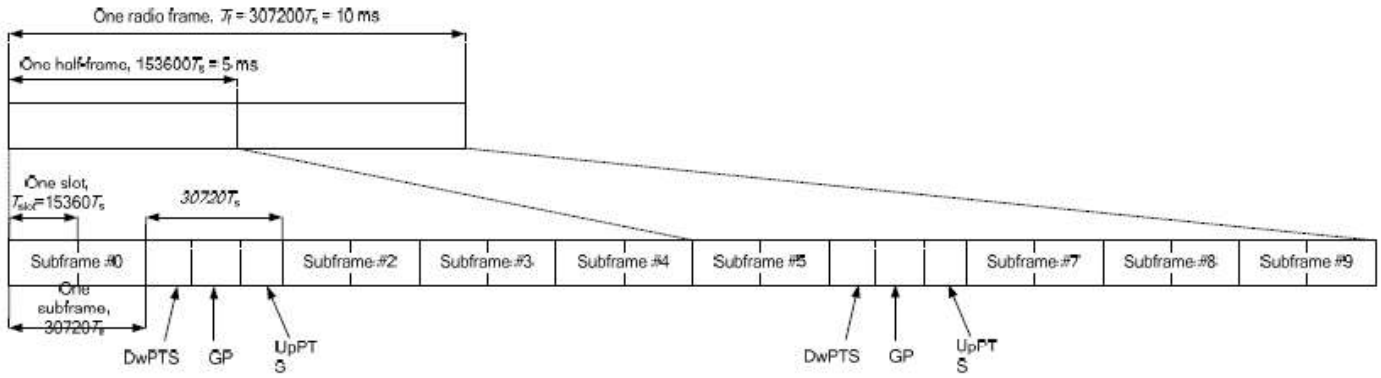


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

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	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Special subframe (30720·T_s): Normal cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	**Normal cyclic prefix in uplink**	**Extended cyclic prefix in uplink**
Uplink duty factor in one special subframe	**0~4**	7.13%	8.33%
	5~9	14.3%	16.7%

Special subframe(30720·T_s): Extended cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	**Normal cyclic prefix in uplink**	**Extended cyclic prefix in uplink**
Uplink duty factor in one special subframe	**0~3**	7.13%	8.33%
	4~7	14.3%	16.7%

The highest duty factor is resulted from:

For LTE TDD Power class 3

i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subfames, 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.

<LTE Carrier Aggregation>

General Note:

1. This device supports Carrier Aggregation on downlink for inter and intra band. For the device supports bands and bandwidths and configurations are provided as follow table was according to 3GPP.
2. In applying the existing power measurement procedures of KDB 941225 D05A for DL CA SAR test exclusion, only the subset with the largest number of combinations of frequency bands and CCs in each row need combination, and for this device that all the configurations were choose to power measurement.
3. All permutations exist. No restrictions on Pcell & Scell combinations.
4. The gray color table is covered by other combinations and no need to verify power.

2CC Downlink Carrier Aggregation			
Number	Combination	Restriction	Covered by Measurement Superset
1	CA_2A-2A		
2	CA_2A-4A		
3	CA_2A-5A		
4	CA_2A-7A		
5	CA_2A-12A		
6	CA_2A-26A		
7	CA_2A-38A		
8	CA_2A-66A		
9	CA_4A-5A		
10	CA_4A-7A		
11	CA_4A-12A		
12	CA_4A-17A		
13	CA_5A-7A		
14	CA_5A-41A		
15	CA_5A-66A		
16	CA_7A-7A		
17	CA_7A-26A		
18	CA_7A-66A		
19	CA_12A-66A		
20	CA_41A-41A		
21	CA_66A-66A		
22	CA_2C		
23	CA_7C		
24	CA_38C		
25	CA_66C		
26	CA_41C		
27			

LTE Carrier Aggregation Conducted Power (Downlink)

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 inter-band CA, the SCC selected highest bandwidth and near the middle of its transmission band. For SCC DL RB size and offset will base on the PCC corresponding RB allocation.

vi. 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.

vii. 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.

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

LTE Carrier Aggregation Conducted Power (Uplink)

LTE Uplink CA	2CC Uplink Carrier Aggregation
Intra-band	Antenna Tx
CA_7C	Ant 0/1/4

<Intra-band>

General Note:

i. The device supports intra-band uplink carrier aggregation for LTE B7 with a maximum of two uplink 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. The device supports uplink carrier aggregation with a maximum of two uplink 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 the 3GPP requirement.

iii. According Nov. 2017 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.

iv. 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.

5G NR Output Power (Unit: dBm)

General Note:

1. 5G NR n5/n7/n26/n66/n38/n41 is SA/NSA mode.
2. For 5G NR test procedure was following step similar FCC KDB 941225 D05:
   a. For DFT-OFDM and CP-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class2 and 3, the CP-OFDM mode will not higher than DFT-OFDM mode, therefore, similar FCC KDB 941225 D05 procedure for other modulation output power for each RB allocation configuration is > not ½ dB higher than the same configuration in DFT-s QPSK and the reported SAR for the DFT-s QPSK configuration is ≤ 1.45 W/kg; CP-OFDM testing is not required.
   b. For DFT-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class2 and 3, for 16QAM/64QAM/256QAM and smaller bandwidth output power will spot check largest channel bandwidth worst RB configuration to ensure the 16QAM/64QAM/256QAM and smaller bandwidth output power will not ½ dB higher than the same configuration in the largest supported bandwidth.
   c. SAR testing 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
   d. 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure
   e. 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 ≤ 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
   f. PI/2 BPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not ½ dB higher than the same configuration in QPSK, also reported SAR for the QPSK configuration is less than 1.45 W/kg, PI/2 BPSK /16QAM/64QAM/256QAM SAR testing are not required.
   g. Smaller bandwidth output power for each RB allocation configuration for this device will 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
3. For 5G NR test, using FTM (Factory Test Mode) to perform SAR with default 100% transmission.
4. NSA and SA mode should perform SAR separately. For the maximum power of NSA mode is the same as SA total power level, so SA SAR can represent NSA mode SAR.
5. 5GNR NSA mode, the power level is the same as 5GNR SA mode, so 5GNR NSA mode and SA mode power table only show one time.
6. 5G NR supports CP-OFDM and DFT-s-OFDM modulation, for DFT-s-OFDM power is higher than CP-OFDM, so only show DFT-s-OFDM power table and chose DFT-s-OFDM to perform SAR testing.
7. For DFT-s-OFDM and CP-OFDM output power measurement reduction, according to 38.101 maximum power reduction for the CP-OFDM mode will not higher than DFT-s-OFDM mode, therefore, CP-OFDM measurement is unnecessary.

<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[1]	≤ 1.2[1]	≤ 0.2[1]
		≤ 0.5[2]	≤ 0.5[2]	0[2]
	QPSK	≤ 1		0
	16 QAM	≤ 2		≤ 1
	64 QAM	≤ 2.5		
	256 QAM	≤ 4.5		
CP-OFDM	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		

<EN-DC combination>

ENDC	NR TX	LTE TX
DC_66A_n7A	Ant 0	Ant 0/1/4
	Ant 1	
	Ant 4	
DC_2A_n66A	Ant 0	Ant 1/4
DC_7A_n66A	Ant 0	Ant 0/1/4
	Ant 1	
	Ant 4	
DC_5A_n66A	Ant 0	Ant 0/1
	Ant 1	
	Ant 4	
DC_12A_n66A	Ant 0	Ant 0/1
	Ant 1	
	Ant 4	
DC_5A_n38A	Ant 0	Ant 0/1
	Ant 1	
	Ant 4	
DC_4A_n38A	Ant 0	Ant 0/1/4
	Ant 1	
	Ant 4	
DC_4A_n41A	Ant 0	Ant 0/1/4
	Ant 1	
	Ant 4	
DC_66A_n41A	Ant 0	Ant 0/1/4
	Ant 1	
	Ant 4	
DC_7A_n5A	Ant 0	Ant 0/1/4
	Ant 1	
DC_66A_n5A	Ant 0	Ant 0/1/4
	Ant 1	
DC_7A_n26A	Ant 0	Ant 0/1/4
	Ant 1	
DC_66A_n38A	Ant 0	Ant 0/1/4
	Ant 1	
	Ant 4	
DC_4A_n7A	Ant 0	Ant 0/1/4
	Ant 1	
	Ant 4	

<WLAN Conducted Power>

General Note:

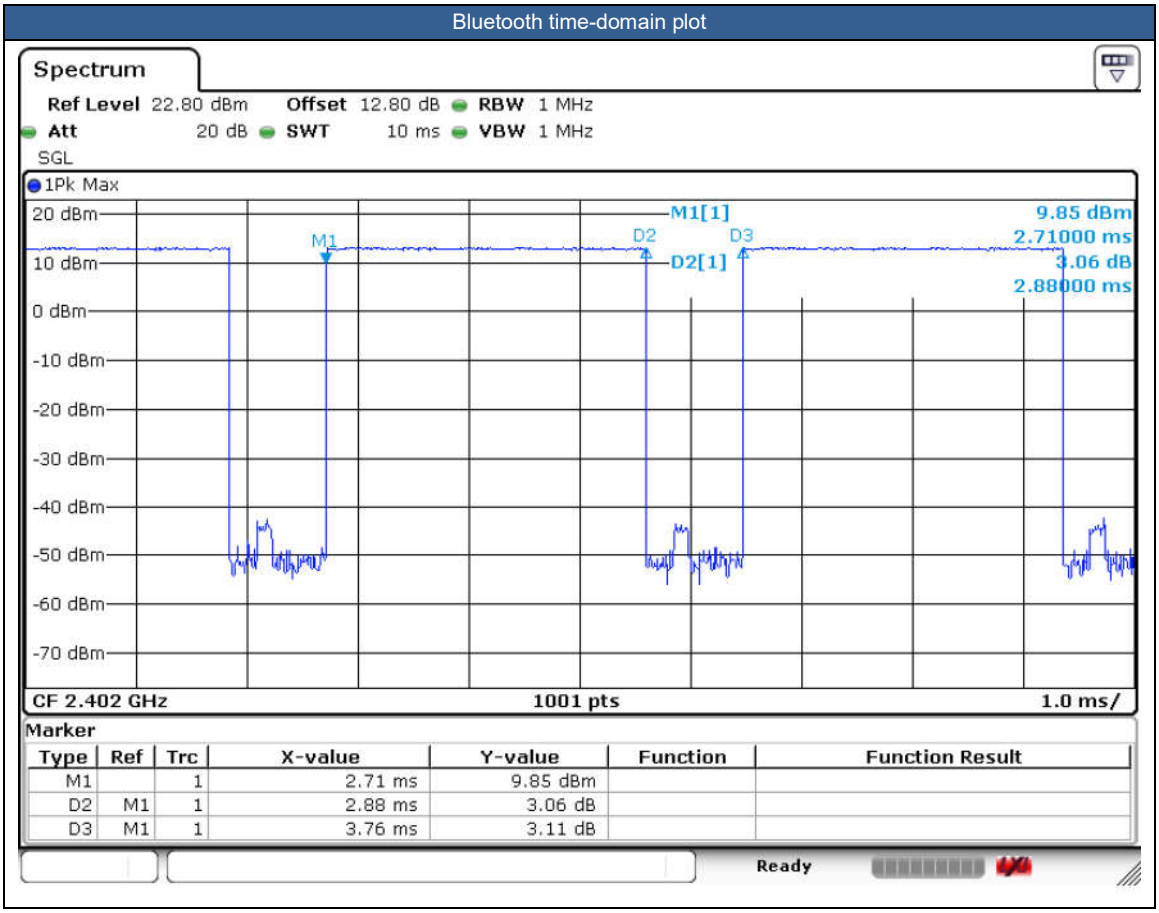
1. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures. For “Not required”, SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration. Additional output power measurements were not necessary.
2. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
3. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
4. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
5. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
   a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
   b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
   c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

<2.4GHz Bluetooth>

General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps, due to its highest average power.
2. The Bluetooth duty cycle are 76.6% as following figure, according to Oct. 2016 TCB workshop for Bluetooth SAR scaling need further consideration and the maximum duty cycle is 100%, therefore the actual duty cycle will be scaled up to100% for Bluetooth reported SAR calculation

Bluetooth time-domain plot



14. Antenna Location

The detailed antenna location information can refer to SAR Test Setup Photos.

15. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN/Bluetooth signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For BT/WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   e. For TDD LTE SAR measurement of power class 3, 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 (W/kg) = Measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 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
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥ 0.8W/kg. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. The device implements receiver detect mechanism trigger reduced power for the power management for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity) and the MediaTek TA-SAR will manage to ensure the power level not exceeding the associated power table. And the device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E.
5. For WLAN when transmit, when transmit simultaneously together with WWAN/BT, the device power will be reduced power at head, body worn and extremity exposure conditions.
6. For 5G NR test, using FTM (Factory Test Mode) to perform SAR with default 100% transmission.
7. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.
   a. For this device SAR for WWAN/WLAN transmitter scaled to maximum output power mode for product specific 10g SAR is higher than 1.2W/kg of 5GNR n38/n41, therefore product specific 10g SAR is necessary.
   b. WLAN 5.3/5.5GHz tested the product specific 10g SAR since it has no hotspot mode.
   c. When 10-g product specific 10g SAR is considered, SAR thresholds is specified in the procedures for SAR test reduction and exclusion should be multiplied by 2.5.
8. According to Nov. 2017 TCB workshop, when the reported 1gSAR for UL CA configuration is <1.2 W/kg, UL CA 1gSAR is not required for all required test channels (PCC based).
9. For head, body worn and extremity exposure conditions with WWAN bands, standalone SAR test pass and simultaneous transmission analysis more conservatively, so Simultaneous SAR additional testing is not required.

GSM Note:

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.
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 ≤ ¼ dB higher than the primary mode, SAR measurement is not required for the secondary mode.

WCDMA 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 / DC-HSDPA / HSPA+ is ≤ ¼ 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 / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+ , and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+ .

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 ≤ 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/64QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration 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; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / B5 / B12 / B17 / B26 / 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 B4 /B5 / B17 SAR test was covered by B66 / B26 / B12; 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 ≤ 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. For 5G NR test procedure was following step similar FCC KDB 941225 D05:
   a. SAR testing 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.
   b. 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure
   c. 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 ≤ 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.
   d. PI/2 BPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not ½ dB higher than the same configuration in QPSK, also reported SAR for the QPSK configuration is less than 1.45 W/kg, PI/2 BPSK /16QAM/64QAM/256QAM SAR testing are not required.
   e. Smaller bandwidth output power for each RB allocation configuration for this device will 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
   f. For 5G FR1 n5/n7 /n38/n41/n66 the maximum bandwidth does not support three non-overlapping channels, 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.

WLAN/Bluetooth Note:

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. Per KDB 248227 D01v02r02, U-NII-1 SAR testing is not required when the U-NII-2A band highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band.
3. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
4. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
5. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

ECI status description：

The device has the following ECI state which used at different exposure condition.

This WWAN bands enabled with MediaTek TA-SAR feature which located at chapter 5. The default power is Pmax power, When Plimit power higher than Pmax power, the output power will be limited at Pmax, and so the SAR will use Pmax power to do the testing.

Exposure Condition	ECI	Trigger conditions
Head SAR-Standalone	ECI 2	Receiver on
Head SAR- Simultaneous	ECI 4	Receiver on+WLAN
Body worn/Extremity SAR-Standalone	ECI 1	Receiver off
Body worn/Hotspot/Extremity SAR- Simultaneous	ECI 3	Receiver off+WLAN

15.1 Head SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	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)
750MHz																					
05	LTE Band 12	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	23095	707.5	1	21.95	22.80	1.216	-	-	-0.03	0.584	**0.710**
	LTE Band 12	10M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	23095	707.5	1	21.95	22.80	1.216	-	-	0.18	0.497	0.604
	LTE Band 12	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI 2	23095	707.5	1	21.95	22.80	1.216	-	-	0.02	0.340	0.414
	LTE Band 12	10M	QPSK	1	0	-	Left Tilted	0mm	Ant 1	ECI 2	23095	707.5	1	21.95	22.80	1.216	-	-	0.07	0.320	0.389
	LTE Band 12	10M	QPSK	25	0	-	Right Cheek	0mm	Ant 1	ECI 2	23095	707.5	1	21.89	22.80	1.233	-	-	0.01	0.507	0.625
	LTE Band 12	10M	QPSK	25	0	-	Right Tilted	0mm	Ant 1	ECI 2	23095	707.5	1	21.89	22.80	1.233	-	-	-0.18	0.480	0.592
	LTE Band 12	10M	QPSK	25	0	-	Left Cheek	0mm	Ant 1	ECI 2	23095	707.5	1	21.89	22.80	1.233	-	-	-0.17	0.326	0.402
	LTE Band 12	10M	QPSK	25	0	-	Left Tilted	0mm	Ant 1	ECI 2	23095	707.5	1	21.89	22.80	1.233	-	-	0.04	0.305	0.376
	LTE Band 12	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI 2	23095	707.5	1	23.90	24.80	1.230	-	-	-0.04	0.072	0.089
	LTE Band 12	10M	QPSK	1	0	-	Right Tilted	0mm	Ant 0	ECI 2	23095	707.5	1	23.90	24.80	1.230	-	-	0.06	0.032	0.039
	LTE Band 12	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	23095	707.5	1	23.90	24.80	1.230	-	-	0.13	0.092	0.113
	LTE Band 12	10M	QPSK	1	0	-	Left Tilted	0mm	Ant 0	ECI 2	23095	707.5	1	23.90	24.80	1.230	-	-	-0.17	0.046	0.057
	LTE Band 12	10M	QPSK	25	0	-	Right Cheek	0mm	Ant 0	ECI 2	23095	707.5	1	22.90	23.80	1.230	-	-	-0.05	0.059	0.073
	LTE Band 12	10M	QPSK	25	0	-	Right Tilted	0mm	Ant 0	ECI 2	23095	707.5	1	22.90	23.80	1.230	-	-	0.03	0.025	0.031
	LTE Band 12	10M	QPSK	25	0	-	Left Cheek	0mm	Ant 0	ECI 2	23095	707.5	1	22.90	23.80	1.230	-	-	-0.01	0.073	0.090
	LTE Band 12	10M	QPSK	25	0	-	Left Tilted	0mm	Ant 0	ECI 2	23095	707.5	1	22.90	23.80	1.230	-	-	-0.16	0.035	0.043
06	LTE Band 13	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	23230	782	1	21.94	22.80	1.219	-	-	-0.05	0.597	**0.728**
	LTE Band 13	10M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	23230	782	1	21.94	22.80	1.219	-	-	-0.05	0.552	0.673
	LTE Band 13	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI 2	23230	782	1	21.94	22.80	1.219	-	-	-0.06	0.423	0.516
	LTE Band 13	10M	QPSK	1	0	-	Left Tilted	0mm	Ant 1	ECI 2	23230	782	1	21.94	22.80	1.219	-	-	0.05	0.383	0.467
	LTE Band 13	10M	QPSK	25	0	-	Right Cheek	0mm	Ant 1	ECI 2	23230	782	1	21.86	22.80	1.242	-	-	-0.08	0.579	0.719
	LTE Band 13	10M	QPSK	25	0	-	Right Tilted	0mm	Ant 1	ECI 2	23230	782	1	21.86	22.80	1.242	-	-	0.13	0.534	0.663
	LTE Band 13	10M	QPSK	25	0	-	Left Cheek	0mm	Ant 1	ECI 2	23230	782	1	21.86	22.80	1.242	-	-	-0.12	0.411	0.510
	LTE Band 13	10M	QPSK	25	0	-	Left Tilted	0mm	Ant 1	ECI 2	23230	782	1	21.86	22.80	1.242	-	-	-0.14	0.373	0.463
	LTE Band 13	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI 2	23230	782	1	23.98	24.80	1.208	-	-	0.13	0.101	0.122
	LTE Band 13	10M	QPSK	1	0	-	Right Tilted	0mm	Ant 0	ECI 2	23230	782	1	23.98	24.80	1.208	-	-	-0.17	0.062	0.075
	LTE Band 13	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	23230	782	1	23.98	24.80	1.208	-	-	-0.15	0.130	0.157
	LTE Band 13	10M	QPSK	1	0	-	Left Tilted	0mm	Ant 0	ECI 2	23230	782	1	23.98	24.80	1.208	-	-	0.08	0.075	0.091
	LTE Band 13	10M	QPSK	25	0	-	Right Cheek	0mm	Ant 0	ECI 2	23230	782	1	22.97	23.80	1.211	-	-	-0.03	0.077	0.093
	LTE Band 13	10M	QPSK	25	0	-	Right Tilted	0mm	Ant 0	ECI 2	23230	782	1	22.97	23.80	1.211	-	-	0.01	0.049	0.059
	LTE Band 13	10M	QPSK	25	0	-	Left Cheek	0mm	Ant 0	ECI 2	23230	782	1	22.97	23.80	1.211	-	-	-0.11	0.098	0.119
	LTE Band 13	10M	QPSK	25	0	-	Left Tilted	0mm	Ant 0	ECI 2	23230	782	1	22.97	23.80	1.211	-	-	-0.16	0.058	0.070
835MHz																					
07	GSM850	-	-	-	-	GPRS(4 Tx slots)	Right Cheek	0mm	Ant 1	ECI 2	189	836.4	1	23.49	25.00	1.416	-	-	0.07	0.612	**0.866**
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Right Tilted	0mm	Ant 1	ECI 2	189	836.4	1	23.49	25.00	1.416	-	-	0.19	0.480	0.680
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Left Cheek	0mm	Ant 1	ECI 2	189	836.4	1	23.49	25.00	1.416	-	-	0.02	0.402	0.569
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Left Tilted	0mm	Ant 1	ECI 2	189	836.4	1	23.49	25.00	1.416	-	-	0.11	0.395	0.559
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Right Cheek	0mm	Ant 1	ECI 2	128	824.2	1	23.39	25.00	1.449	-	-	0.06	0.582	0.843
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Right Cheek	0mm	Ant 1	ECI 2	251	848.8	1	23.48	25.00	1.419	-	-	0.01	0.591	0.839
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Right Cheek	0mm	Ant 0	ECI 2	189	836.4	1	26.74	28.00	1.337	-	-	-0.13	0.113	0.151
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Right Tilted	0mm	Ant 0	ECI 2	189	836.4	1	26.74	28.00	1.337	-	-	0.05	0.064	0.086
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Left Cheek	0mm	Ant 0	ECI 2	189	836.4	1	26.74	28.00	1.337	-	-	-0.04	0.140	0.187
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Left Tilted	0mm	Ant 0	ECI 2	189	836.4	1	26.74	28.00	1.337	-	-	-0.11	0.064	0.086
08	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 1	ECI 2	4182	836.4	1	20.15	21.30	1.303	-	-	0.12	0.640	**0.834**
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 1	ECI 2	4182	836.4	1	20.15	21.30	1.303	-	-	-0.06	0.531	0.692
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 1	ECI 2	4182	836.4	1	20.15	21.30	1.303	-	-	-0.13	0.419	0.546
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 1	ECI 2	4182	836.4	1	20.15	21.30	1.303	-	-	-0.04	0.403	0.525
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 1	ECI 2	4132	826.4	1	20.13	21.30	1.309	-	-	0.05	0.620	0.812
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 1	ECI 2	4233	846.6	1	20.14	21.30	1.306	-	-	0.02	0.615	0.803
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	ECI 2	4182	836.4	1	23.75	24.80	1.274	-	-	-0.1	0.123	0.157
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 0	ECI 2	4182	836.4	1	23.75	24.80	1.274	-	-	-0.09	0.058	0.074

	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI 2	4182	836.4	1	23.75	24.80	1.274	-	-	0.14	0.137	0.174
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 0	ECI 2	4182	836.4	1	23.75	24.80	1.274	-	-	-0.03	0.069	0.088
09	LTE Band 26	15M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	26865	831.5	1	20.10	20.80	1.175	-	-	-0.11	0.555	**0.652**
	LTE Band 26	15M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	26865	831.5	1	20.10	20.80	1.175	-	-	0.09	0.434	0.510
	LTE Band 26	15M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI 2	26865	831.5	1	20.10	20.80	1.175	-	-	-0.16	0.349	0.410
	LTE Band 26	15M	QPSK	1	0	-	Left Tilted	0mm	Ant 1	ECI 2	26865	831.5	1	20.10	20.80	1.175	-	-	0.15	0.322	0.378
	LTE Band 26	15M	QPSK	36	0	-	Right Cheek	0mm	Ant 1	ECI 2	26865	831.5	1	20.02	20.80	1.197	-	-	0.07	0.450	0.539
	LTE Band 26	15M	QPSK	36	0	-	Right Tilted	0mm	Ant 1	ECI 2	26865	831.5	1	20.02	20.80	1.197	-	-	-0.16	0.409	0.489
	LTE Band 26	15M	QPSK	36	0	-	Left Cheek	0mm	Ant 1	ECI 2	26865	831.5	1	20.02	20.80	1.197	-	-	0.15	0.329	0.394
	LTE Band 26	15M	QPSK	36	0	-	Left Tilted	0mm	Ant 1	ECI 2	26865	831.5	1	20.02	20.80	1.197	-	-	-0.17	0.303	0.363
	LTE Band 26	15M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI 2	26865	831.5	1	24.03	24.80	1.194	-	-	-0.12	0.103	0.123
	LTE Band 26	15M	QPSK	1	0	-	Right Tilted	0mm	Ant 0	ECI 2	26865	831.5	1	24.03	24.80	1.194	-	-	0.04	0.050	0.060
	LTE Band 26	15M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	26865	831.5	1	24.03	24.80	1.194	-	-	-0.09	0.126	0.150
	LTE Band 26	15M	QPSK	1	0	-	Left Tilted	0mm	Ant 0	ECI 2	26865	831.5	1	24.03	24.80	1.194	-	-	-0.06	0.062	0.074
	LTE Band 26	15M	QPSK	36	0	-	Right Cheek	0mm	Ant 0	ECI 2	26865	831.5	1	22.95	23.80	1.216	-	-	-0.03	0.086	0.105
	LTE Band 26	15M	QPSK	36	0	-	Right Tilted	0mm	Ant 0	ECI 2	26865	831.5	1	22.95	23.80	1.216	-	-	0.13	0.038	0.046
	LTE Band 26	15M	QPSK	36	0	-	Left Cheek	0mm	Ant 0	ECI 2	26865	831.5	1	22.95	23.80	1.216	-	-	-0.1	0.102	0.124
	LTE Band 26	15M	QPSK	36	0	-	Left Tilted	0mm	Ant 0	ECI 2	26865	831.5	1	22.95	23.80	1.216	-	-	0.07	0.053	0.064
	FR1 n26	20M	QPSK	1	1	DFT-15	Right Cheek	0mm	Ant 1	ECI 2	166300	831.5	1	20.36	21.70	1.361	-	-	0.17	0.355	0.483
	FR1 n26	20M	QPSK	1	1	DFT-15	Right Tilted	0mm	Ant 1	ECI 2	166300	831.5	1	20.36	21.70	1.361	-	-	-0.16	0.279	0.380
	FR1 n26	20M	QPSK	1	1	DFT-15	Left Cheek	0mm	Ant 1	ECI 2	166300	831.5	1	20.36	21.70	1.361	-	-	0.05	0.202	0.275
	FR1 n26	20M	QPSK	1	1	DFT-15	Left Tilted	0mm	Ant 1	ECI 2	166300	831.5	1	20.36	21.70	1.361	-	-	-0.16	0.193	0.263
10	FR1 n26	20M	QPSK	50	28	DFT-15	Right Cheek	0mm	Ant 1	ECI 2	166300	831.5	1	20.28	21.70	1.387	-	-	0.12	0.562	**0.779**
	FR1 n26	20M	QPSK	50	28	DFT-15	Right Tilted	0mm	Ant 1	ECI 2	166300	831.5	1	20.28	21.70	1.387	-	-	-0.16	0.358	0.496
	FR1 n26	20M	QPSK	50	28	DFT-15	Left Cheek	0mm	Ant 1	ECI 2	166300	831.5	1	20.28	21.70	1.387	-	-	0.19	0.273	0.379
	FR1 n26	20M	QPSK	50	28	DFT-15	Left Tilted	0mm	Ant 1	ECI 2	166300	831.5	1	20.28	21.70	1.387	-	-	0.15	0.257	0.356
	FR1 n26	20M	QPSK	1	1	DFT-15	Right Cheek	0mm	Ant 0	ECI 2	166300	831.5	1	23.82	25.20	1.374	-	-	-0.19	0.079	0.109
	FR1 n26	20M	QPSK	1	1	DFT-15	Right Tilted	0mm	Ant 0	ECI 2	166300	831.5	1	23.82	25.20	1.374	-	-	-0.08	0.043	0.059
	FR1 n26	20M	QPSK	1	1	DFT-15	Left Cheek	0mm	Ant 0	ECI 2	166300	831.5	1	23.82	25.20	1.374	-	-	-0.14	0.091	0.125
	FR1 n26	20M	QPSK	1	1	DFT-15	Left Tilted	0mm	Ant 0	ECI 2	166300	831.5	1	23.82	25.20	1.374	-	-	0.15	0.048	0.066
	FR1 n26	20M	QPSK	50	28	DFT-15	Right Cheek	0mm	Ant 0	ECI 2	166300	831.5	1	23.80	25.20	1.380	-	-	0.12	0.083	0.115
	FR1 n26	20M	QPSK	50	28	DFT-15	Right Tilted	0mm	Ant 0	ECI 2	166300	831.5	1	23.80	25.20	1.380	-	-	-0.03	0.044	0.061
	FR1 n26	20M	QPSK	50	28	DFT-15	Left Cheek	0mm	Ant 0	ECI 2	166300	831.5	1	23.80	25.20	1.380	-	-	0.19	0.095	0.131
	FR1 n26	20M	QPSK	50	28	DFT-15	Left Tilted	0mm	Ant 0	ECI 2	166300	831.5	1	23.80	25.20	1.380	-	-	-0.04	0.048	0.066
1750MHz																					
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 1	ECI 2	1413	1732.6	1	18.10	18.80	1.175	-	-	0.12	0.606	0.712
11	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 1	ECI 2	1413	1732.6	1	18.10	18.80	1.175	-	-	0.04	0.828	**0.973**
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 1	ECI 2	1413	1732.6	1	18.10	18.80	1.175	-	-	0.03	0.449	0.528
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 1	ECI 2	1413	1732.6	1	18.10	18.80	1.175	-	-	0.07	0.522	0.613
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 1	ECI 2	1312	1712.4	1	18.08	18.80	1.180	-	-	0.16	0.759	0.896
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 1	ECI 2	1513	1752.6	1	18.04	18.80	1.191	-	-	0.02	0.806	0.960
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	ECI 2	1413	1732.6	1	24.07	24.80	1.183	-	-	0.02	0.063	0.075
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 0	ECI 2	1413	1732.6	1	24.07	24.80	1.183	-	-	0.13	0.054	0.064
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI 2	1413	1732.6	1	24.07	24.80	1.183	-	-	0.14	0.095	0.112
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 0	ECI 2	1413	1732.6	1	24.07	24.80	1.183	-	-	0.03	0.058	0.069
	LTE Band 66	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	132322	1745	1	18.12	18.80	1.169	-	-	0.06	0.595	0.696
12	LTE Band 66	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	132322	1745	1	18.12	18.80	1.169	-	-	0.04	0.786	**0.919**
	LTE Band 66	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI 2	132322	1745	1	18.12	18.80	1.169	-	-	-0.02	0.428	0.501
	LTE Band 66	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 1	ECI 2	132322	1745	1	18.12	18.80	1.169	-	-	-0.11	0.484	0.566
	LTE Band 66	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	132072	1720	1	17.93	18.80	1.222	-	-	0.05	0.725	0.886
	LTE Band 66	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	132572	1770	1	18.06	18.80	1.186	-	-	0.02	0.769	0.912
	LTE Band 66	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 1	ECI 2	132322	1745	1	17.95	18.80	1.216	-	-	0.12	0.578	0.703
	LTE Band 66	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	ECI 2	132322	1745	1	17.95	18.80	1.216	-	-	-0.08	0.660	0.803
	LTE Band 66	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 1	ECI 2	132322	1745	1	17.95	18.80	1.216	-	-	0.18	0.422	0.513
	LTE Band 66	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 1	ECI 2	132322	1745	1	17.95	18.80	1.216	-	-	0.09	0.478	0.581
	LTE Band 66	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	ECI 2	132072	1720	1	17.88	18.80	1.236	-	-	0.06	0.632	0.781
	LTE Band 66	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	ECI 2	132572	1770	1	17.93	18.80	1.222	-	-	0.08	0.629	0.769

	LTE Band 66	20M	QPSK	100	0	-	Right Tilted	0mm	Ant 1	ECI 2	132322	1745	1	17.90	18.80	1.230	-	-	0.09	0.605	0.744
	LTE Band 66	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI 2	132322	1745	1	24.15	24.80	1.161	-	-	-0.03	0.060	0.070
	LTE Band 66	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 0	ECI 2	132322	1745	1	24.15	24.80	1.161	-	-	0.06	0.033	0.038
	LTE Band 66	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	132322	1745	1	24.15	24.80	1.161	-	-	-0.07	0.092	0.107
	LTE Band 66	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 0	ECI 2	132322	1745	1	24.15	24.80	1.161	-	-	0.11	0.053	0.062
	LTE Band 66	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 0	ECI 2	132322	1745	1	23.08	23.80	1.180	-	-	0.17	0.049	0.058
	LTE Band 66	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 0	ECI 2	132322	1745	1	23.08	23.80	1.180	-	-	0.03	0.022	0.026
	LTE Band 66	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 0	ECI 2	132322	1745	1	23.08	23.80	1.180	-	-	-0.11	0.078	0.092
	LTE Band 66	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 0	ECI 2	132322	1745	1	23.08	23.80	1.180	-	-	-0.17	0.044	0.052
	LTE Band 66	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	132322	1745	1	23.65	24.30	1.161	-	-	0.02	0.050	0.058
	LTE Band 66	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI 2	132322	1745	1	23.65	24.30	1.161	-	-	0.05	0.022	0.026
	LTE Band 66	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 4	ECI 2	132322	1745	1	23.65	24.30	1.161	-	-	0.06	0.030	0.035
	LTE Band 66	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 4	ECI 2	132322	1745	1	23.65	24.30	1.161	-	-	0.02	0.019	0.022
	LTE Band 66	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 4	ECI 2	132322	1745	1	22.60	23.30	1.175	-	-	-0.14	0.039	0.046
	LTE Band 66	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 4	ECI 2	132322	1745	1	22.60	23.30	1.175	-	-	0.09	0.019	0.022
	LTE Band 66	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 4	ECI 2	132322	1745	1	22.60	23.30	1.175	-	-	0.03	0.025	0.029
	LTE Band 66	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 4	ECI 2	132322	1745	1	22.60	23.30	1.175	-	-	0.01	0.016	0.019
	FR1 n66	40M	QPSK	1	1	DFT-15	Right Cheek	0mm	Ant 1	ECI 2	349000	1745	1	18.00	19.20	1.318	-	-	0.08	0.479	0.631
	FR1 n66	40M	QPSK	1	1	DFT-15	Right Tilted	0mm	Ant 1	ECI 2	349000	1745	1	18.00	19.20	1.318	-	-	0.11	0.638	0.841
	FR1 n66	40M	QPSK	1	1	DFT-15	Left Cheek	0mm	Ant 1	ECI 2	349000	1745	1	18.00	19.20	1.318	-	-	0.08	0.331	0.436
	FR1 n66	40M	QPSK	1	1	DFT-15	Left Tilted	0mm	Ant 1	ECI 2	349000	1745	1	18.00	19.20	1.318	-	-	-0.14	0.387	0.510
	FR1 n66	40M	QPSK	108	54	DFT-15	Right Cheek	0mm	Ant 1	ECI 2	349000	1745	1	17.96	19.20	1.330	-	-	-0.07	0.508	0.676
13	FR1 n66	40M	QPSK	108	54	DFT-15	Right Tilted	0mm	Ant 1	ECI 2	349000	1745	1	17.96	19.20	1.330	-	-	-0.15	0.696	**0.926**
	FR1 n66	40M	QPSK	108	54	DFT-15	Left Cheek	0mm	Ant 1	ECI 2	349000	1745	1	17.96	19.20	1.330	-	-	-0.13	0.354	0.471
	FR1 n66	40M	QPSK	108	54	DFT-15	Left Tilted	0mm	Ant 1	ECI 2	349000	1745	1	17.96	19.20	1.330	-	-	0.09	0.413	0.549
	FR1 n66	40M	QPSK	216	0	DFT-15	Right Tilted	0mm	Ant 1	ECI 2	349000	1745	1	17.94	19.20	1.337	-	-	0.06	0.658	0.879
	FR1 n66	40M	QPSK	1	1	DFT-15	Right Cheek	0mm	Ant 0	ECI 2	349000	1745	1	23.89	25.20	1.352	-	-	-0.06	0.063	0.085
	FR1 n66	40M	QPSK	1	1	DFT-15	Right Tilted	0mm	Ant 0	ECI 2	349000	1745	1	23.89	25.20	1.352	-	-	-0.1	0.052	0.070
	FR1 n66	40M	QPSK	1	1	DFT-15	Left Cheek	0mm	Ant 0	ECI 2	349000	1745	1	23.89	25.20	1.352	-	-	-0.18	0.098	0.133
	FR1 n66	40M	QPSK	1	1	DFT-15	Left Tilted	0mm	Ant 0	ECI 2	349000	1745	1	23.89	25.20	1.352	-	-	-0.03	0.062	0.084
	FR1 n66	40M	QPSK	108	54	DFT-15	Right Cheek	0mm	Ant 0	ECI 2	349000	1745	1	23.87	25.20	1.358	-	-	0.15	0.067	0.091
	FR1 n66	40M	QPSK	108	54	DFT-15	Right Tilted	0mm	Ant 0	ECI 2	349000	1745	1	23.87	25.20	1.358	-	-	0.11	0.055	0.075
	FR1 n66	40M	QPSK	108	54	DFT-15	Left Cheek	0mm	Ant 0	ECI 2	349000	1745	1	23.87	25.20	1.358	-	-	-0.13	0.104	0.141
	FR1 n66	40M	QPSK	108	54	DFT-15	Left Tilted	0mm	Ant 0	ECI 2	349000	1745	1	23.87	25.20	1.358	-	-	0.09	0.066	0.090
	FR1 n66	40M	QPSK	1	1	DFT-15	Right Cheek	0mm	Ant 4	ECI 2	349000	1745	1	23.66	24.50	1.213	-	-	-0.02	0.046	0.056
	FR1 n66	40M	QPSK	1	1	DFT-15	Right Tilted	0mm	Ant 4	ECI 2	349000	1745	1	23.66	24.50	1.213	-	-	0.06	0.021	0.025
	FR1 n66	40M	QPSK	1	1	DFT-15	Left Cheek	0mm	Ant 4	ECI 2	349000	1745	1	23.66	24.50	1.213	-	-	0.02	0.028	0.034
	FR1 n66	40M	QPSK	1	1	DFT-15	Left Tilted	0mm	Ant 4	ECI 2	349000	1745	1	23.66	24.50	1.213	-	-	-0.06	0.017	0.021
	FR1 n66	40M	QPSK	108	54	DFT-15	Right Cheek	0mm	Ant 4	ECI 2	349000	1745	1	23.63	24.50	1.222	-	-	0.04	0.044	0.054
	FR1 n66	40M	QPSK	108	54	DFT-15	Right Tilted	0mm	Ant 4	ECI 2	349000	1745	1	23.63	24.50	1.222	-	-	0.03	0.017	0.021
	FR1 n66	40M	QPSK	108	54	DFT-15	Left Cheek	0mm	Ant 4	ECI 2	349000	1745	1	23.63	24.50	1.222	-	-	0.08	0.026	0.032
	FR1 n66	40M	QPSK	108	54	DFT-15	Left Tilted	0mm	Ant 4	ECI 2	349000	1745	1	23.63	24.50	1.222	-	-	0.01	0.013	0.016
1900MHz																					
	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Right Cheek	0mm	Ant 1	ECI 2	661	1880	1	20.15	21.00	1.216	-	-	-0.1	0.630	0.766
14	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Right Tilted	0mm	Ant 1	ECI 2	661	1880	1	20.15	21.00	1.216	-	-	-0.03	0.705	**0.857**
	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Left Cheek	0mm	Ant 1	ECI 2	661	1880	1	20.15	21.00	1.216	-	-	-0.12	0.438	0.533
	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Left Tilted	0mm	Ant 1	ECI 2	661	1880	1	20.15	21.00	1.216	-	-	-0.11	0.492	0.598
	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Right Tilted	0mm	Ant 1	ECI 2	512	1850.2	1	19.99	21.00	1.262	-	-	-0.19	0.663	0.837
	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Right Tilted	0mm	Ant 1	ECI 2	810	1909.8	1	20.12	21.00	1.225	-	-	0.09	0.646	0.791
	GSM1900	-	-	-	-	GPRS(2 Tx slots)	Right Cheek	0mm	Ant 0	ECI 2	661	1880	1	26.64	28.00	1.368	-	-	0.06	0.032	0.044
	GSM1900	-	-	-	-	GPRS(2 Tx slots)	Right Tilted	0mm	Ant 0	ECI 2	661	1880	1	26.64	28.00	1.368	-	-	0.03	0.022	0.030
	GSM1900	-	-	-	-	GPRS(2 Tx slots)	Left Cheek	0mm	Ant 0	ECI 2	661	1880	1	26.64	28.00	1.368	-	-	0	0.051	0.070
	GSM1900	-	-	-	-	GPRS(2 Tx slots)	Left Tilted	0mm	Ant 0	ECI 2	661	1880	1	26.64	28.00	1.368	-	-	0.04	0.025	0.034
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 1	ECI 2	9400	1880	1	16.82	17.80	1.253	-	-	0.14	0.565	0.708
15	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 1	ECI 2	9400	1880	1	16.82	17.80	1.253	-	-	-0.05	0.806	**1.010**
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 1	ECI 2	9400	1880	1	16.82	17.80	1.253	-	-	0.05	0.410	0.514
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 1	ECI 2	9400	1880	1	16.82	17.80	1.253	-	-	0.16	0.463	0.580

	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 1	ECI 2	9262	1852.4	1	16.81	17.80	1.256	-	-	-0.06	0.791	0.994
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 1	ECI 2	9538	1907.6	1	16.69	17.80	1.291	-	-	0.01	0.762	0.984
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	ECI 2	9400	1880	1	23.90	24.80	1.230	-	-	-0.03	0.108	0.133
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 0	ECI 2	9400	1880	1	23.90	24.80	1.230	-	-	-0.08	0.090	0.111
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI 2	9400	1880	1	23.90	24.80	1.230	-	-	0.18	0.133	0.164
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 0	ECI 2	9400	1880	1	23.90	24.80	1.230	-	-	0.18	0.072	0.089
	LTE Band 2	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	18900	1880	1	17.16	17.80	1.159	-	-	-0.1	0.576	0.667
16	LTE Band 2	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	18900	1880	1	17.16	17.80	1.159	-	-	0.03	0.792	**0.918**
	LTE Band 2	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI 2	18900	1880	1	17.16	17.80	1.159	-	-	0.02	0.418	0.484
	LTE Band 2	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 1	ECI 2	18900	1880	1	17.16	17.80	1.159	-	-	-0.04	0.462	0.535
	LTE Band 2	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	18700	1860	1	17.14	17.80	1.164	-	-	0.01	0.780	0.908
	LTE Band 2	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	19100	1900	1	17.04	17.80	1.191	-	-	0.08	0.765	0.911
	LTE Band 2	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 1	ECI 2	18900	1880	1	17.14	17.80	1.164	-	-	0.01	0.562	0.654
	LTE Band 2	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	ECI 2	18900	1880	1	17.14	17.80	1.164	-	-	0.01	0.632	0.736
	LTE Band 2	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 1	ECI 2	18900	1880	1	17.14	17.80	1.164	-	-	0.02	0.404	0.470
	LTE Band 2	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 1	ECI 2	18900	1880	1	17.14	17.80	1.164	-	-	0.06	0.446	0.519
	LTE Band 2	20M	QPSK	100	0	-	Right Tilted	0mm	Ant 1	ECI 2	18900	1880	1	17.10	17.80	1.175	-	-	0.12	0.621	0.730
	LTE Band 2	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI 2	18900	1880	1	23.05	23.80	1.189	-	-	0.14	0.088	0.105
	LTE Band 2	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 0	ECI 2	18900	1880	1	23.05	23.80	1.189	-	-	0.15	0.070	0.083
	LTE Band 2	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	18900	1880	1	23.05	23.80	1.189	-	-	-0.19	0.104	0.124
	LTE Band 2	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 0	ECI 2	18900	1880	1	23.05	23.80	1.189	-	-	-0.07	0.053	0.063
	LTE Band 2	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 0	ECI 2	18900	1880	1	22.08	22.80	1.180	-	-	-0.14	0.071	0.084
	LTE Band 2	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 0	ECI 2	18900	1880	1	22.08	22.80	1.180	-	-	-0.05	0.056	0.066
	LTE Band 2	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 0	ECI 2	18900	1880	1	22.08	22.80	1.180	-	-	0.09	0.084	0.099
	LTE Band 2	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 0	ECI 2	18900	1880	1	22.08	22.80	1.180	-	-	0.14	0.047	0.055
	LTE Band 2	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	18900	1880	1	22.02	23.30	1.343	-	-	0.04	0.298	0.400
	LTE Band 2	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI 2	18900	1880	1	22.02	23.30	1.343	-	-	-0.11	0.122	0.164
	LTE Band 2	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 4	ECI 2	18900	1880	1	22.02	23.30	1.343	-	-	-0.16	0.111	0.149
	LTE Band 2	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 4	ECI 2	18900	1880	1	22.02	23.30	1.343	-	-	0.08	0.127	0.171
	LTE Band 2	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 4	ECI 2	18900	1880	1	20.98	22.30	1.355	-	-	-0.08	0.245	0.332
	LTE Band 2	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 4	ECI 2	18900	1880	1	20.98	22.30	1.355	-	-	0.11	0.109	0.148
	LTE Band 2	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 4	ECI 2	18900	1880	1	20.98	22.30	1.355	-	-	0.16	0.095	0.129
	LTE Band 2	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 4	ECI 2	18900	1880	1	20.98	22.30	1.355	-	-	-0.09	0.104	0.141
2600MHz																					
	LTE Band 7	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	21100	2535	1	13.62	14.30	1.169	-	-	-0.12	0.638	0.746
	LTE Band 7	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	21100	2535	1	13.62	14.30	1.169	-	-	0.03	0.742	0.868
	LTE Band 7	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI 2	21100	2535	1	13.62	14.30	1.169	-	-	0.08	0.254	0.297
	LTE Band 7	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 1	ECI 2	21100	2535	1	13.62	14.30	1.169	-	-	0.11	0.317	0.371
	LTE Band 7	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	20850	2510	1	13.52	14.30	1.197	-	-	-0.19	0.694	0.831
17	LTE Band 7	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	21350	2560	1	13.52	14.30	1.197	-	-	0.01	0.732	**0.876**
	LTE Band 7C	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	21350+ 21152	2560+ 2540.2	1	13.60	14.30	1.175	-	-	0.01	0.689	0.810
	LTE Band 7	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 1	ECI 2	21100	2535	1	13.60	14.30	1.175	-	-	-0.12	0.630	0.740
	LTE Band 7	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	ECI 2	21100	2535	1	13.60	14.30	1.175	-	-	0.03	0.739	0.868
	LTE Band 7	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 1	ECI 2	21100	2535	1	13.60	14.30	1.175	-	-	0.01	0.253	0.297
	LTE Band 7	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 1	ECI 2	21100	2535	1	13.60	14.30	1.175	-	-	0.03	0.320	0.376
	LTE Band 7	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	ECI 2	20850	2510	1	13.50	14.30	1.202	-	-	-0.05	0.700	0.842
	LTE Band 7	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	ECI 2	21350	2560	1	13.51	14.30	1.199	-	-	0.15	0.727	0.872
	LTE Band 7	20M	QPSK	100	0	-	Right Tilted	0mm	Ant 1	ECI 2	21100	2535	1	13.54	14.30	1.191	-	-	0.14	0.720	0.858
	LTE Band 7	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI 2	21100	2535	1	24.50	24.80	1.072	-	-	0.08	0.343	0.368
	LTE Band 7C	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI 2	21100+ 20902	2535+ 2515.2	1	23.78	24.80	1.265	-	-	-0.16	0.281	0.355
	LTE Band 7	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 0	ECI 2	21100	2535	1	24.50	24.80	1.072	-	-	-0.09	0.135	0.145
	LTE Band 7	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	21100	2535	1	24.50	24.80	1.072	-	-	0.08	0.174	0.186
	LTE Band 7	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 0	ECI 2	21100	2535	1	24.50	24.80	1.072	-	-	-0.17	0.113	0.121
	LTE Band 7	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 0	ECI 2	21100	2535	1	23.45	24.80	1.365	-	-	-0.16	0.269	0.367
	LTE Band 7	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 0	ECI 2	21100	2535	1	23.45	24.80	1.365	-	-	-0.17	0.112	0.153
	LTE Band 7	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 0	ECI 2	21100	2535	1	23.45	24.80	1.365	-	-	-0.14	0.136	0.186
	LTE Band 7	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 0	ECI 2	21100	2535	1	23.45	24.80	1.365	-	-	0.13	0.087	0.119

	LTE Band 7	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	21100	2535	1	22.20	23.10	1.230	-	-	0.15	0.539	0.663
	LTE Band 7	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI 2	21100	2535	1	22.20	23.10	1.230	-	-	0.19	0.217	0.267
	LTE Band 7	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 4	ECI 2	21100	2535	1	22.20	23.10	1.230	-	-	-0.08	0.233	0.287
	LTE Band 7	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 4	ECI 2	21100	2535	1	22.20	23.10	1.230	-	-	0.17	0.156	0.192
	LTE Band 7	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 4	ECI 2	21100	2535	1	22.15	23.10	1.245	-	-	-0.09	0.620	0.772
	LTE Band 7C	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	21100+ 20902	2535+ +2515.2	1	22.13	23.10	1.250	-	-	0.11	0.542	0.678
	LTE Band 7	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 4	ECI 2	21100	2535	1	22.15	23.10	1.245	-	-	-0.15	0.253	0.315
	LTE Band 7	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 4	ECI 2	21100	2535	1	22.15	23.10	1.245	-	-	0.19	0.267	0.332
	LTE Band 7	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 4	ECI 2	21100	2535	1	22.15	23.10	1.245	-	-	-0.16	0.183	0.228
	LTE Band 41	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	40620	2593	1	16.03	16.80	1.194	62.9	1.006	-0.08	0.592	0.711
	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	40620	2593	1	16.03	16.80	1.194	62.9	1.006	0.11	0.732	0.879
	LTE Band 41	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI 2	40620	2593	1	16.03	16.80	1.194	62.9	1.006	-0.13	0.221	0.265
	LTE Band 41	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 1	ECI 2	40620	2593	1	16.03	16.80	1.194	62.9	1.006	0.11	0.282	0.339
	LTE Band 41	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	39750	2506	1	15.98	16.80	1.208	62.9	1.006	-0.06	0.676	0.821
	LTE Band 41	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	40185	2549.5	1	15.87	16.80	1.239	62.9	1.006	-0.07	0.640	0.798
	LTE Band 41	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	41055	2636.5	1	15.85	16.80	1.245	62.9	1.006	-0.1	0.465	0.582
	LTE Band 41	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	41490	2680	1	15.88	16.80	1.236	62.9	1.006	-0.06	0.351	0.436
18	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	39750	2506	1	15.98	16.80	1.208	62.9	1.006	-0.15	0.804	**0.977**
	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	40185	2549.5	1	15.87	16.80	1.239	62.9	1.006	0.09	0.769	0.958
	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	41055	2636.5	1	15.85	16.80	1.245	62.9	1.006	0.12	0.552	0.691
	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	41490	2680	1	15.88	16.80	1.236	62.9	1.006	-0.15	0.411	0.511
	LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 1	ECI 2	40620	2593	1	15.96	16.80	1.213	62.9	1.006	0.16	0.572	0.698
	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	ECI 2	40620	2593	1	15.96	16.80	1.213	62.9	1.006	-0.14	0.694	0.847
	LTE Band 41	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 1	ECI 2	40620	2593	1	15.96	16.80	1.213	62.9	1.006	-0.06	0.213	0.260
	LTE Band 41	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 1	ECI 2	40620	2593	1	15.96	16.80	1.213	62.9	1.006	0.11	0.268	0.327
	LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 1	ECI 2	39750	2506	1	15.95	16.80	1.216	62.9	1.006	0.05	0.680	0.832
	LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 1	ECI 2	40185	2549.5	1	15.78	16.80	1.265	62.9	1.006	0.17	0.620	0.789
	LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 1	ECI 2	41055	2636.5	1	15.80	16.80	1.259	62.9	1.006	-0.09	0.451	0.571
	LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 1	ECI 2	41490	2680	1	15.68	16.80	1.294	62.9	1.006	-0.07	0.371	0.483
	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	ECI 2	39750	2506	1	15.95	16.80	1.216	62.9	1.006	-0.05	0.795	0.973
	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	ECI 2	40185	2549.5	1	15.78	16.80	1.265	62.9	1.006	0.04	0.760	0.967
	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	ECI 2	41055	2636.5	1	15.80	16.80	1.259	62.9	1.006	-0.08	0.545	0.690
	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	ECI 2	41490	2680	1	15.68	16.80	1.294	62.9	1.006	-0.15	0.378	0.492
	LTE Band 41	20M	QPSK	100	0	-	Right Cheek	0mm	Ant 1	ECI 2	40620	2593	1	15.89	16.80	1.233	62.9	1.006	-0.05	0.562	0.697
	LTE Band 41	20M	QPSK	100	0	-	Right Tilted	0mm	Ant 1	ECI 2	40620	2593	1	15.89	16.80	1.233	62.9	1.006	0.02	0.687	0.852
	LTE Band 41	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI 2	40620	2593	1	24.45	24.80	1.084	62.9	1.006	0.15	0.238	0.260
	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 0	ECI 2	40620	2593	1	24.45	24.80	1.084	62.9	1.006	0.03	0.102	0.111
	LTE Band 41	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	40620	2593	1	24.45	24.80	1.084	62.9	1.006	-0.19	0.112	0.122
	LTE Band 41	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 0	ECI 2	40620	2593	1	24.45	24.80	1.084	62.9	1.006	0.15	0.073	0.080
	LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 0	ECI 2	40620	2593	1	23.40	23.80	1.096	62.9	1.006	0.02	0.186	0.205
	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 0	ECI 2	40620	2593	1	23.40	23.80	1.096	62.9	1.006	-0.12	0.085	0.094
	LTE Band 41	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 0	ECI 2	40620	2593	1	23.40	23.80	1.096	62.9	1.006	0.16	0.087	0.096
	LTE Band 41	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 0	ECI 2	40620	2593	1	23.40	23.80	1.096	62.9	1.006	0.18	0.058	0.064
	LTE Band 41	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	40620	2593	1	23.35	24.10	1.189	62.9	1.006	0.18	0.533	0.637
	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI 2	40620	2593	1	23.35	24.10	1.189	62.9	1.006	0.05	0.229	0.274
	LTE Band 41	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 4	ECI 2	40620	2593	1	23.35	24.10	1.189	62.9	1.006	-0.04	0.220	0.263
	LTE Band 41	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 4	ECI 2	40620	2593	1	23.35	24.10	1.189	62.9	1.006	-0.14	0.168	0.201
	LTE Band 41	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	39750	2506	1	23.33	24.10	1.194	62.9	1.006	0.16	0.409	0.491
	LTE Band 41	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	40185	2549.5	1	23.22	24.10	1.225	62.9	1.006	0.12	0.513	0.632
	LTE Band 41	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	41055	2636.5	1	23.22	24.10	1.225	62.9	1.006	-0.11	0.574	0.707
	LTE Band 41	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	41490	2680	1	23.20	24.10	1.230	62.9	1.006	-0.06	0.498	0.616
	LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 4	ECI 2	40620	2593	1	22.28	23.10	1.208	62.9	1.006	-0.12	0.441	0.536
	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 4	ECI 2	40620	2593	1	22.28	23.10	1.208	62.9	1.006	-0.07	0.189	0.230
	LTE Band 41	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 4	ECI 2	40620	2593	1	22.28	23.10	1.208	62.9	1.006	-0.08	0.186	0.226
	LTE Band 41	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 4	ECI 2	40620	2593	1	22.28	23.10	1.208	62.9	1.006	-0.1	0.128	0.156
	LTE Band 41	20M	QPSK	100	0	-	Right Cheek	0mm	Ant 4	ECI 2	40620	2593	1	22.25	23.10	1.216	62.9	1.006	-0.19	0.447	0.547
	FR1 n7	50M	QPSK	1	1	DFT-15	Right Cheek	0mm	Ant 1	ECI 2	507000	2535	1	13.78	14.70	1.236	-	-	-0.18	0.530	0.655

	FR1 n7	50M	QPSK	1	1	DFT-15	Right Tilted	0mm	Ant 1	ECI 2	507000	2535	1	13.78	14.70	1.236	-	-	-0.16	0.725	0.896
	FR1 n7	50M	QPSK	1	1	DFT-15	Left Cheek	0mm	Ant 1	ECI 2	507000	2535	1	13.78	14.70	1.236	-	-	-0.11	0.210	0.260
	FR1 n7	50M	QPSK	1	1	DFT-15	Left Tilted	0mm	Ant 1	ECI 2	507000	2535	1	13.78	14.70	1.236	-	-	-0.06	0.273	0.337
	FR1 n7	50M	QPSK	135	68	DFT-15	Right Cheek	0mm	Ant 1	ECI 2	507000	2535	1	13.73	14.70	1.250	-	-	0.14	0.580	0.725
19	FR1 n7	50M	QPSK	135	68	DFT-15	Right Tilted	0mm	Ant 1	ECI 2	507000	2535	1	13.73	14.70	1.250	-	-	0.16	0.762	**0.953**
	FR1 n7	50M	QPSK	135	68	DFT-15	Left Cheek	0mm	Ant 1	ECI 2	507000	2535	1	13.73	14.70	1.250	-	-	0.1	0.224	0.280
	FR1 n7	50M	QPSK	135	68	DFT-15	Left Tilted	0mm	Ant 1	ECI 2	507000	2535	1	13.73	14.70	1.250	-	-	-0.19	0.295	0.369
	FR1 n7	50M	QPSK	270	0	DFT-15	Right Tilted	0mm	Ant 1	ECI 2	507000	2535	1	13.70	14.70	1.259	-	-	-0.03	0.711	0.895
	FR1 n7	50M	QPSK	1	1	DFT-15	Right Cheek	0mm	Ant 0	ECI 2	507000	2535	1	24.05	25.20	1.303	-	-	0.04	0.311	0.405
	FR1 n7	50M	QPSK	1	1	DFT-15	Right Tilted	0mm	Ant 0	ECI 2	507000	2535	1	24.05	25.20	1.303	-	-	0.12	0.122	0.159
	FR1 n7	50M	QPSK	1	1	DFT-15	Left Cheek	0mm	Ant 0	ECI 2	507000	2535	1	24.05	25.20	1.303	-	-	-0.06	0.158	0.206
	FR1 n7	50M	QPSK	1	1	DFT-15	Left Tilted	0mm	Ant 0	ECI 2	507000	2535	1	24.05	25.20	1.303	-	-	0	0.098	0.128
	FR1 n7	50M	QPSK	135	68	DFT-15	Right Cheek	0mm	Ant 0	ECI 2	507000	2535	1	24.03	25.20	1.309	-	-	-0.17	0.326	0.427
	FR1 n7	50M	QPSK	135	68	DFT-15	Right Tilted	0mm	Ant 0	ECI 2	507000	2535	1	24.03	25.20	1.309	-	-	-0.19	0.136	0.178
	FR1 n7	50M	QPSK	135	68	DFT-15	Left Cheek	0mm	Ant 0	ECI 2	507000	2535	1	24.03	25.20	1.309	-	-	0.14	0.172	0.225
	FR1 n7	50M	QPSK	135	68	DFT-15	Left Tilted	0mm	Ant 0	ECI 2	507000	2535	1	24.03	25.20	1.309	-	-	0.01	0.112	0.147
	FR1 n7	50M	QPSK	1	1	DFT-15	Right Cheek	0mm	Ant 4	ECI 2	507000	2535	1	21.81	23.00	1.315	-	-	0.06	0.614	0.808
	FR1 n7	50M	QPSK	1	1	DFT-15	Right Tilted	0mm	Ant 4	ECI 2	507000	2535	1	21.81	23.00	1.315	-	-	-0.06	0.255	0.335
	FR1 n7	50M	QPSK	1	1	DFT-15	Left Cheek	0mm	Ant 4	ECI 2	507000	2535	1	21.81	23.00	1.315	-	-	0.1	0.233	0.306
	FR1 n7	50M	QPSK	1	1	DFT-15	Left Tilted	0mm	Ant 4	ECI 2	507000	2535	1	21.81	23.00	1.315	-	-	-0.14	0.155	0.204
	FR1 n7	50M	QPSK	135	68	DFT-15	Right Cheek	0mm	Ant 4	ECI 2	507000	2535	1	21.72	23.00	1.343	-	-	-0.15	0.632	0.849
	FR1 n7	50M	QPSK	135	68	DFT-15	Right Tilted	0mm	Ant 4	ECI 2	507000	2535	1	21.72	23.00	1.343	-	-	0.15	0.265	0.356
	FR1 n7	50M	QPSK	135	68	DFT-15	Left Cheek	0mm	Ant 4	ECI 2	507000	2535	1	21.72	23.00	1.343	-	-	0.15	0.287	0.385
	FR1 n7	50M	QPSK	135	68	DFT-15	Left Tilted	0mm	Ant 4	ECI 2	507000	2535	1	21.72	23.00	1.343	-	-	0	0.174	0.234
	FR1 n7	50M	QPSK	270	0	DFT-15	Right Cheek	0mm	Ant 4	ECI 2	507000	2535	1	21.66	23.00	1.361	-	-	-0.07	0.622	0.847
	FR1 n41	100M	QPSK	1	1	DFT-30	Right Cheek	0mm	Ant 1	ECI 2	518598	2592.99	1	13.86	14.70	1.213	-	-	0.16	0.568	0.689
	FR1 n41	100M	QPSK	1	1	DFT-30	Right Tilted	0mm	Ant 1	ECI 2	518598	2592.99	1	13.86	14.70	1.213	-	-	-0.05	0.698	0.847
	FR1 n41	100M	QPSK	1	1	DFT-30	Left Cheek	0mm	Ant 1	ECI 2	518598	2592.99	1	13.86	14.70	1.213	-	-	0.12	0.222	0.269
	FR1 n41	100M	QPSK	1	1	DFT-30	Left Tilted	0mm	Ant 1	ECI 2	518598	2592.99	1	13.86	14.70	1.213	-	-	0.09	0.288	0.349
	FR1 n41	100M	QPSK	135	69	DFT-30	Right Cheek	0mm	Ant 1	ECI 2	518598	2592.99	1	13.82	14.70	1.225	-	-	-0.14	0.526	0.644
	FR1 n41	100M	QPSK	135	69	DFT-30	Right Tilted	0mm	Ant 1	ECI 2	518598	2592.99	1	13.82	14.70	1.225	-	-	-0.01	0.642	0.786
	FR1 n41	100M	QPSK	135	69	DFT-30	Left Cheek	0mm	Ant 1	ECI 2	518598	2592.99	1	13.82	14.70	1.225	-	-	-0.08	0.191	0.234
	FR1 n41	100M	QPSK	135	69	DFT-30	Left Tilted	0mm	Ant 1	ECI 2	518598	2592.99	1	13.82	14.70	1.225	-	-	0.14	0.236	0.289
	FR1 n41	100M	QPSK	270	0	DFT-30	Right Cheek	0mm	Ant 1	ECI 2	518598	2592.99	1	13.76	14.70	1.242	-	-	0.08	0.521	0.647
	FR1 n41	100M	QPSK	270	0	DFT-30	Right Tilted	0mm	Ant 1	ECI 2	518598	2592.99	1	13.76	14.70	1.242	-	-	-0.18	0.628	0.780
	FR1 n41	100M	QPSK	1	1	DFT-30	Right Cheek	0mm	Ant 0	ECI 2	518598	2592.99	1	24.02	25.20	1.312	-	-	-0.08	0.322	0.423
	FR1 n41	100M	QPSK	1	1	DFT-30	Right Tilted	0mm	Ant 0	ECI 2	518598	2592.99	1	24.02	25.20	1.312	-	-	-0.19	0.132	0.173
	FR1 n41	100M	QPSK	1	1	DFT-30	Left Cheek	0mm	Ant 0	ECI 2	518598	2592.99	1	24.02	25.20	1.312	-	-	-0.04	0.165	0.217
	FR1 n41	100M	QPSK	1	1	DFT-30	Left Tilted	0mm	Ant 0	ECI 2	518598	2592.99	1	24.02	25.20	1.312	-	-	0.14	0.114	0.150
	FR1 n41	100M	QPSK	135	69	DFT-30	Right Cheek	0mm	Ant 0	ECI 2	518598	2592.99	1	23.99	25.20	1.321	-	-	0.07	0.390	0.515
	FR1 n41	100M	QPSK	135	69	DFT-30	Right Tilted	0mm	Ant 0	ECI 2	518598	2592.99	1	23.99	25.20	1.321	-	-	0.02	0.152	0.201
	FR1 n41	100M	QPSK	135	69	DFT-30	Left Cheek	0mm	Ant 0	ECI 2	518598	2592.99	1	23.99	25.20	1.321	-	-	-0.17	0.194	0.256
	FR1 n41	100M	QPSK	135	69	DFT-30	Left Tilted	0mm	Ant 0	ECI 2	518598	2592.99	1	23.99	25.20	1.321	-	-	0.03	0.131	0.173
	FR1 n41	100M	QPSK	1	1	DFT-30	Right Cheek	0mm	Ant 4	ECI 2	518598	2592.99	1	21.31	22.50	1.315	-	-	0.18	0.652	0.858
	FR1 n41	100M	QPSK	1	1	DFT-30	Right Tilted	0mm	Ant 4	ECI 2	518598	2592.99	1	21.31	22.50	1.315	-	-	-0.08	0.226	0.297
	FR1 n41	100M	QPSK	1	1	DFT-30	Left Cheek	0mm	Ant 4	ECI 2	518598	2592.99	1	21.31	22.50	1.315	-	-	-0.02	0.240	0.316
	FR1 n41	100M	QPSK	1	1	DFT-30	Left Tilted	0mm	Ant 4	ECI 2	518598	2592.99	1	21.31	22.50	1.315	-	-	0	0.153	0.201
20	FR1 n41	100M	QPSK	135	69	DFT-30	Right Cheek	0mm	Ant 4	ECI 2	518598	2592.99	1	21.26	22.50	1.330	-	-	0.06	0.674	**0.897**
	FR1 n41	100M	QPSK	135	69	DFT-30	Right Tilted	0mm	Ant 4	ECI 2	518598	2592.99	1	21.26	22.50	1.330	-	-	0.02	0.296	0.394
	FR1 n41	100M	QPSK	135	69	DFT-30	Left Cheek	0mm	Ant 4	ECI 2	518598	2592.99	1	21.26	22.50	1.330	-	-	0	0.328	0.436
	FR1 n41	100M	QPSK	135	69	DFT-30	Left Tilted	0mm	Ant 4	ECI 2	518598	2592.99	1	21.26	22.50	1.330	-	-	-0.18	0.143	0.190
	FR1 n41	100M	QPSK	270	0	DFT-30	Right Cheek	0mm	Ant 4	ECI 2	518598	2592.99	1	21.17	22.50	1.358	-	-	-0.04	0.659	0.895

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	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)
2450MHz																	
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 7	Standalone	11	2462	1	17.07	17.50	1.104	100	1.000	-0.03	0.342	0.378
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Ant 7	Standalone	11	2462	1	17.07	17.50	1.104	100	1.000	-0.04	0.365	0.403
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 7	Standalone	11	2462	1	17.07	17.50	1.104	100	1.000	0.09	0.725	0.800
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 7	Standalone	11	2462	1	17.07	17.50	1.104	100	1.000	0.19	0.576	0.636
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 7	Standalone	1	2412	1	13.50	14.00	1.122	100	1.000	0.1	0.748	0.839
21	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 7	Standalone	6	2437	1	17.05	17.50	1.109	100	1.000	0.04	0.991	**1.099**
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 7	Standalone	6	2437	2	17.05	17.50	1.109	100	1.000	0.09	0.920	1.020
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 7	Simultaneous	6	2437	1	13.08	13.50	1.102	100	1.000	0.1	0.395	0.435
	Bluetooth	DH5 1Mbps	Right Cheek	0mm	Ant 7	Standalone	39	2441	1	12.20	14.00	1.514	76.6	1.305	0	0.098	0.194
	Bluetooth	DH5 1Mbps	Right Tilted	0mm	Ant 7	Standalone	39	2441	1	12.20	14.00	1.514	76.6	1.305	0.1	0.098	0.194
22	Bluetooth	DH5 1Mbps	Left Cheek	0mm	Ant 7	Standalone	39	2441	1	12.20	14.00	1.514	76.6	1.305	-0.08	0.198	**0.391**
	Bluetooth	DH5 1Mbps	Left Tilted	0mm	Ant 7	Standalone	39	2441	1	12.20	14.00	1.514	76.6	1.305	-0.06	0.150	0.296
5000MHz																	
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 7	Standalone	54	5270	1	11.56	13.50	1.563	94.74	1.056	-0.02	0.113	0.187
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Tilted	0mm	Ant 7	Standalone	54	5270	1	11.56	13.50	1.563	94.74	1.056	-0.12	0.125	0.206
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 7	Standalone	54	5270	1	11.56	13.50	1.563	94.74	1.056	0.01	0.299	0.494
23	WLAN5.3GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Ant 7	Standalone	54	5270	1	11.56	13.50	1.563	94.74	1.056	-0.19	0.354	**0.584**
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 7	Standalone	122	5610	1	11.63	13.50	1.538	90.56	1.104	0.02	0.110	0.187
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 7	Standalone	122	5610	1	11.63	13.50	1.538	90.56	1.104	-0.13	0.159	0.270
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 7	Standalone	122	5610	1	11.63	13.50	1.538	90.56	1.104	-0.19	0.147	0.250
24	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 7	Standalone	122	5610	1	11.63	13.50	1.538	90.56	1.104	-0.06	0.312	**0.530**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 7	Standalone	155	5775	1	11.55	13.50	1.567	90.56	1.104	-0.17	0.180	0.311
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 7	Standalone	155	5775	1	11.55	13.50	1.567	90.56	1.104	-0.18	0.201	0.348
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 7	Standalone	155	5775	1	11.55	13.50	1.567	90.56	1.104	0.12	0.179	0.310
25	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 7	Standalone	155	5775	1	11.55	13.50	1.567	90.56	1.104	-0.15	0.348	**0.602**

15.2 Hotspot SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	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)
750MHz																					
	LTE Band 12	10M	QPSK	1	0	-	Front	10mm	Ant 1	ECI 3	23095	707.5	1	23.56	24.30	1.186	-	-	0.16	0.125	0.148
30	LTE Band 12	10M	QPSK	1	0	-	Back	10mm	Ant 1	ECI 3	23095	707.5	1	23.56	24.30	1.186	-	-	-0.06	0.127	**0.151**
	LTE Band 12	10M	QPSK	1	0	-	Left Side	10mm	Ant 1	ECI 3	23095	707.5	1	23.56	24.30	1.186	-	-	0.02	0.104	0.123
	LTE Band 12	10M	QPSK	1	0	-	Top Side	10mm	Ant 1	ECI 3	23095	707.5	1	23.56	24.30	1.186	-	-	0.01	0.097	0.115
	LTE Band 12	10M	QPSK	25	0	-	Front	10mm	Ant 1	ECI 3	23095	707.5	1	22.99	23.80	1.205	-	-	0.13	0.111	0.134
	LTE Band 12	10M	QPSK	25	0	-	Back	10mm	Ant 1	ECI 3	23095	707.5	1	22.99	23.80	1.205	-	-	-0.08	0.120	0.145
	LTE Band 12	10M	QPSK	25	0	-	Left Side	10mm	Ant 1	ECI 3	23095	707.5	1	22.99	23.80	1.205	-	-	-0.08	0.084	0.101
	LTE Band 12	10M	QPSK	25	0	-	Top Side	10mm	Ant 1	ECI 3	23095	707.5	1	22.99	23.80	1.205	-	-	-0.13	0.080	0.096
	LTE Band 12	10M	QPSK	1	0	-	Front	10mm	Ant 0	ECI 3	23095	707.5	1	22.92	23.80	1.225	-	-	-0.11	0.101	0.124
	LTE Band 12	10M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 3	23095	707.5	1	22.92	23.80	1.225	-	-	0.11	0.122	0.149
	LTE Band 12	10M	QPSK	1	0	-	Left Side	10mm	Ant 0	ECI 3	23095	707.5	1	22.92	23.80	1.225	-	-	0.16	0.118	0.145
	LTE Band 12	10M	QPSK	1	0	-	Right Side	10mm	Ant 0	ECI 3	23095	707.5	1	22.92	23.80	1.225	-	-	0.19	0.102	0.125
	LTE Band 12	10M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	ECI 3	23095	707.5	1	22.92	23.80	1.225	-	-	-0.14	0.067	0.082
	LTE Band 12	10M	QPSK	25	0	-	Front	10mm	Ant 0	ECI 3	23095	707.5	1	22.87	23.80	1.239	-	-	-0.06	0.083	0.103
	LTE Band 12	10M	QPSK	25	0	-	Back	10mm	Ant 0	ECI 3	23095	707.5	1	22.87	23.80	1.239	-	-	0.17	0.117	0.145
	LTE Band 12	10M	QPSK	25	0	-	Left Side	10mm	Ant 0	ECI 3	23095	707.5	1	22.87	23.80	1.239	-	-	0.09	0.098	0.121
	LTE Band 12	10M	QPSK	25	0	-	Right Side	10mm	Ant 0	ECI 3	23095	707.5	1	22.87	23.80	1.239	-	-	-0.1	0.083	0.103
	LTE Band 12	10M	QPSK	25	0	-	Bottom Side	10mm	Ant 0	ECI 3	23095	707.5	1	22.87	23.80	1.239	-	-	0.1	0.053	0.066
	LTE Band 13	10M	QPSK	1	0	-	Front	10mm	Ant 1	ECI 3	23230	782	1	23.97	24.80	1.211	-	-	0.1	0.234	0.283
31	LTE Band 13	10M	QPSK	1	0	-	Back	10mm	Ant 1	ECI 3	23230	782	1	23.97	24.80	1.211	-	-	0.04	0.253	**0.306**
	LTE Band 13	10M	QPSK	1	0	-	Left Side	10mm	Ant 1	ECI 3	23230	782	1	23.97	24.80	1.211	-	-	-0.19	0.155	0.188
	LTE Band 13	10M	QPSK	1	0	-	Top Side	10mm	Ant 1	ECI 3	23230	782	1	23.97	24.80	1.211	-	-	0.04	0.181	0.219
	LTE Band 13	10M	QPSK	25	0	-	Front	10mm	Ant 1	ECI 3	23230	782	1	22.91	23.80	1.227	-	-	-0.13	0.179	0.220
	LTE Band 13	10M	QPSK	25	0	-	Back	10mm	Ant 1	ECI 3	23230	782	1	22.91	23.80	1.227	-	-	-0.16	0.206	0.253
	LTE Band 13	10M	QPSK	25	0	-	Left Side	10mm	Ant 1	ECI 3	23230	782	1	22.91	23.80	1.227	-	-	-0.12	0.121	0.149
	LTE Band 13	10M	QPSK	25	0	-	Top Side	10mm	Ant 1	ECI 3	23230	782	1	22.91	23.80	1.227	-	-	-0.17	0.145	0.178
	LTE Band 13	10M	QPSK	1	0	-	Front	10mm	Ant 0	ECI 3	23230	782	1	23.98	24.80	1.208	-	-	0.11	0.116	0.140
	LTE Band 13	10M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 3	23230	782	1	23.98	24.80	1.208	-	-	-0.15	0.167	0.202
	LTE Band 13	10M	QPSK	1	0	-	Left Side	10mm	Ant 0	ECI 3	23230	782	1	23.98	24.80	1.208	-	-	-0.04	0.160	0.193
	LTE Band 13	10M	QPSK	1	0	-	Right Side	10mm	Ant 0	ECI 3	23230	782	1	23.98	24.80	1.208	-	-	-0.18	0.094	0.114
	LTE Band 13	10M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	ECI 3	23230	782	1	23.98	24.80	1.208	-	-	0	0.161	0.194
	LTE Band 13	10M	QPSK	25	0	-	Front	10mm	Ant 0	ECI 3	23230	782	1	22.97	23.80	1.211	-	-	0.03	0.091	0.110
	LTE Band 13	10M	QPSK	25	0	-	Back	10mm	Ant 0	ECI 3	23230	782	1	22.97	23.80	1.211	-	-	-0.16	0.143	0.173
	LTE Band 13	10M	QPSK	25	0	-	Left Side	10mm	Ant 0	ECI 3	23230	782	1	22.97	23.80	1.211	-	-	0.03	0.136	0.165
	LTE Band 13	10M	QPSK	25	0	-	Right Side	10mm	Ant 0	ECI 3	23230	782	1	22.97	23.80	1.211	-	-	0.18	0.073	0.088
	LTE Band 13	10M	QPSK	25	0	-	Bottom Side	10mm	Ant 0	ECI 3	23230	782	1	22.97	23.80	1.211	-	-	-0.14	0.129	0.156
835MHz																					
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Front	10mm	Ant 1	ECI 3	189	836.4	1	26.73	28.00	1.340	-	-	0.05	0.161	0.216
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Back	10mm	Ant 1	ECI 3	189	836.4	1	26.73	28.00	1.340	-	-	0.05	0.218	0.292
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Left Side	10mm	Ant 1	ECI 3	189	836.4	1	26.73	28.00	1.340	-	-	-0.07	0.050	0.067
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Top Side	10mm	Ant 1	ECI 3	189	836.4	1	26.73	28.00	1.340	-	-	-0.17	0.204	0.273
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Front	10mm	Ant 0	ECI 3	189	836.4	1	26.74	28.00	1.337	-	-	-0.03	0.123	0.164
32	GSM850	-	-	-	-	GPRS(4 Tx slots)	Back	10mm	Ant 0	ECI 3	189	836.4	1	26.74	28.00	1.337	-	-	0.14	0.294	**0.393**
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Left Side	10mm	Ant 0	ECI 3	189	836.4	1	26.74	28.00	1.337	-	-	0.09	0.091	0.122
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Right Side	10mm	Ant 0	ECI 3	189	836.4	1	26.74	28.00	1.337	-	-	0	0.081	0.108
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Bottom Side	10mm	Ant 0	ECI 3	189	836.4	1	26.74	28.00	1.337	-	-	0.02	0.156	0.209
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 1	ECI 3	4182	836.4	1	23.77	24.80	1.268	-	-	0.09	0.188	0.238
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 1	ECI 3	4182	836.4	1	23.77	24.80	1.268	-	-	-0.15	0.225	0.285
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 1	ECI 3	4182	836.4	1	23.77	24.80	1.268	-	-	0.13	0.076	0.096
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 1	ECI 3	4182	836.4	1	23.77	24.80	1.268	-	-	0.11	0.196	0.248

	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 0	ECI 3	4182	836.4	1	23.75	24.80	1.274	-	-	-0.01	0.138	0.176
33	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	ECI 3	4182	836.4	1	23.75	24.80	1.274	-	-	-0.05	0.305	**0.388**
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 0	ECI 3	4182	836.4	1	23.75	24.80	1.274	-	-	0.04	0.082	0.104
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 0	ECI 3	4182	836.4	1	23.75	24.80	1.274	-	-	0.05	0.081	0.103
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 0	ECI 3	4182	836.4	1	23.75	24.80	1.274	-	-	0.08	0.176	0.224
	LTE Band 26	15M	QPSK	1	0	-	Front	10mm	Ant 1	ECI 3	26865	831.5	1	23.95	24.80	1.216	-	-	-0.19	0.148	0.180
	LTE Band 26	15M	QPSK	1	0	-	Back	10mm	Ant 1	ECI 3	26865	831.5	1	23.95	24.80	1.216	-	-	-0.12	0.180	0.219
	LTE Band 26	15M	QPSK	1	0	-	Left Side	10mm	Ant 1	ECI 3	26865	831.5	1	23.95	24.80	1.216	-	-	-0.01	0.060	0.073
	LTE Band 26	15M	QPSK	1	0	-	Top Side	10mm	Ant 1	ECI 3	26865	831.5	1	23.95	24.80	1.216	-	-	0.02	0.170	0.207
	LTE Band 26	15M	QPSK	36	0	-	Front	10mm	Ant 1	ECI 3	26865	831.5	1	22.88	23.80	1.236	-	-	0.01	0.125	0.154
	LTE Band 26	15M	QPSK	36	0	-	Back	10mm	Ant 1	ECI 3	26865	831.5	1	22.88	23.80	1.236	-	-	0.01	0.160	0.198
	LTE Band 26	15M	QPSK	36	0	-	Left Side	10mm	Ant 1	ECI 3	26865	831.5	1	22.88	23.80	1.236	-	-	-0.12	0.049	0.061
	LTE Band 26	15M	QPSK	36	0	-	Top Side	10mm	Ant 1	ECI 3	26865	831.5	1	22.88	23.80	1.236	-	-	0.14	0.153	0.189
	LTE Band 26	15M	QPSK	1	0	-	Front	10mm	Ant 0	ECI 3	26865	831.5	1	22.92	23.80	1.225	-	-	0.17	0.123	0.151
34	LTE Band 26	15M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 3	26865	831.5	1	22.92	23.80	1.225	-	-	0.03	0.192	**0.235**
	LTE Band 26	15M	QPSK	1	0	-	Left Side	10mm	Ant 0	ECI 3	26865	831.5	1	22.92	23.80	1.225	-	-	-0.09	0.093	0.114
	LTE Band 26	15M	QPSK	1	0	-	Right Side	10mm	Ant 0	ECI 3	26865	831.5	1	22.92	23.80	1.225	-	-	0.05	0.074	0.091
	LTE Band 26	15M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	ECI 3	26865	831.5	1	22.92	23.80	1.225	-	-	-0.02	0.141	0.173
	LTE Band 26	15M	QPSK	36	0	-	Front	10mm	Ant 0	ECI 3	26865	831.5	1	22.89	23.80	1.233	-	-	-0.13	0.096	0.118
	LTE Band 26	15M	QPSK	36	0	-	Back	10mm	Ant 0	ECI 3	26865	831.5	1	22.89	23.80	1.233	-	-	0.13	0.190	0.234
	LTE Band 26	15M	QPSK	36	0	-	Left Side	10mm	Ant 0	ECI 3	26865	831.5	1	22.89	23.80	1.233	-	-	0.13	0.073	0.090
	LTE Band 26	15M	QPSK	36	0	-	Right Side	10mm	Ant 0	ECI 3	26865	831.5	1	22.89	23.80	1.233	-	-	0.16	0.060	0.074
	LTE Band 26	15M	QPSK	36	0	-	Bottom Side	10mm	Ant 0	ECI 3	26865	831.5	1	22.89	23.80	1.233	-	-	-0.19	0.119	0.147
	FR1 n26	20M	QPSK	1	1	DFT-15	Front	10mm	Ant 1	ECI 3	166300	831.5	1	23.85	25.20	1.365	-	-	-0.14	0.099	0.135
	FR1 n26	20M	QPSK	1	1	DFT-15	Back	10mm	Ant 1	ECI 3	166300	831.5	1	23.85	25.20	1.365	-	-	0.1	0.123	0.168
	FR1 n26	20M	QPSK	1	1	DFT-15	Left Side	10mm	Ant 1	ECI 3	166300	831.5	1	23.85	25.20	1.365	-	-	-0.11	0.050	0.068
	FR1 n26	20M	QPSK	1	1	DFT-15	Top Side	10mm	Ant 1	ECI 3	166300	831.5	1	23.85	25.20	1.365	-	-	0.03	0.108	0.147
	FR1 n26	20M	QPSK	50	28	DFT-15	Front	10mm	Ant 1	ECI 3	166300	831.5	1	23.83	25.20	1.371	-	-	-0.1	0.140	0.192
35	FR1 n26	20M	QPSK	50	28	DFT-15	Back	10mm	Ant 1	ECI 3	166300	831.5	1	23.83	25.20	1.371	-	-	0.14	0.149	**0.204**
	FR1 n26	20M	QPSK	50	28	DFT-15	Left Side	10mm	Ant 1	ECI 3	166300	831.5	1	23.83	25.20	1.371	-	-	-0.1	0.065	0.089
	FR1 n26	20M	QPSK	50	28	DFT-15	Top Side	10mm	Ant 1	ECI 3	166300	831.5	1	23.83	25.20	1.371	-	-	0.13	0.144	0.197
	FR1 n26	20M	QPSK	1	1	DFT-15	Front	10mm	Ant 0	ECI 3	166300	831.5	1	23.29	24.70	1.384	-	-	0.01	0.067	0.093
	FR1 n26	20M	QPSK	1	1	DFT-15	Back	10mm	Ant 0	ECI 3	166300	831.5	1	23.29	24.70	1.384	-	-	-0.08	0.133	0.184
	FR1 n26	20M	QPSK	1	1	DFT-15	Left Side	10mm	Ant 0	ECI 3	166300	831.5	1	23.29	24.70	1.384	-	-	-0.12	0.056	0.077
	FR1 n26	20M	QPSK	1	1	DFT-15	Right Side	10mm	Ant 0	ECI 3	166300	831.5	1	23.29	24.70	1.384	-	-	-0.07	0.050	0.069
	FR1 n26	20M	QPSK	1	1	DFT-15	Bottom Side	10mm	Ant 0	ECI 3	166300	831.5	1	23.29	24.70	1.384	-	-	0.19	0.091	0.126
	FR1 n26	20M	QPSK	50	28	DFT-15	Front	10mm	Ant 0	ECI 3	166300	831.5	1	23.26	24.70	1.393	-	-	0.01	0.089	0.124
	FR1 n26	20M	QPSK	50	28	DFT-15	Back	10mm	Ant 0	ECI 3	166300	831.5	1	23.26	24.70	1.393	-	-	0.01	0.141	0.196
	FR1 n26	20M	QPSK	50	28	DFT-15	Left Side	10mm	Ant 0	ECI 3	166300	831.5	1	23.26	24.70	1.393	-	-	0	0.071	0.099
	FR1 n26	20M	QPSK	50	28	DFT-15	Right Side	10mm	Ant 0	ECI 3	166300	831.5	1	23.26	24.70	1.393	-	-	0.13	0.061	0.085
	FR1 n26	20M	QPSK	50	28	DFT-15	Bottom Side	10mm	Ant 0	ECI 3	166300	831.5	1	23.26	24.70	1.393	-	-	-0.01	0.105	0.146
1750MHz																				
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 1	ECI 3	1413	1732.6	1	18.65	19.30	1.161	-	-	0.05	0.193	0.224
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 1	ECI 3	1413	1732.6	1	18.65	19.30	1.161	-	-	0.1	0.209	0.243
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 1	ECI 3	1413	1732.6	1	18.65	19.30	1.161	-	-	0.13	0.053	0.062
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 1	ECI 3	1413	1732.6	1	18.65	19.30	1.161	-	-	0.19	0.268	0.311
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 0	ECI 3	1413	1732.6	1	19.50	20.30	1.202	-	-	0.11	0.120	0.144
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	ECI 3	1413	1732.6	1	19.50	20.30	1.202	-	-	-0.13	0.257	0.309
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 0	ECI 3	1413	1732.6	1	19.50	20.30	1.202	-	-	0.08	0.032	0.038
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 0	ECI 3	1413	1732.6	1	19.50	20.30	1.202	-	-	0.13	0.071	0.085
36	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 0	ECI 3	1413	1732.6	1	19.50	20.30	1.202	-	-	-0.12	0.353	**0.424**
	LTE Band 66	20M	QPSK	1	0	-	Front	10mm	Ant 1	ECI 3	132322	1745	1	19.10	19.80	1.175	-	-	0.16	0.213	0.250
	LTE Band 66	20M	QPSK	1	0	-	Back	10mm	Ant 1	ECI 3	132322	1745	1	19.10	19.80	1.175	-	-	0.08	0.229	0.269
	LTE Band 66	20M	QPSK	1	0	-	Left Side	10mm	Ant 1	ECI 3	132322	1745	1	19.10	19.80	1.175	-	-	0.18	0.054	0.063
	LTE Band 66	20M	QPSK	1	0	-	Top Side	10mm	Ant 1	ECI 3	132322	1745	1	19.10	19.80	1.175	-	-	0.19	0.285	0.335
	LTE Band 66	20M	QPSK	50	0	-	Front	10mm	Ant 1	ECI 3	132322	1745	1	19.06	19.80	1.186	-	-	-0.16	0.213	0.253

	LTE Band 66	20M	QPSK	50	0	-	Back	10mm	Ant 1	ECI 3	132322	1745	1	19.06	19.80	1.186	-	-	-0.11	0.231	0.274
	LTE Band 66	20M	QPSK	50	0	-	Left Side	10mm	Ant 1	ECI 3	132322	1745	1	19.06	19.80	1.186	-	-	0.11	0.054	0.064
	LTE Band 66	20M	QPSK	50	0	-	Top Side	10mm	Ant 1	ECI 3	132322	1745	1	19.06	19.80	1.186	-	-	0.05	0.291	0.345
	LTE Band 66	20M	QPSK	1	0	-	Front	10mm	Ant 0	ECI 3	132322	1745	1	19.55	20.30	1.189	-	-	0.17	0.117	0.139
	LTE Band 66	20M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 3	132322	1745	1	19.55	20.30	1.189	-	-	-0.12	0.247	0.294
	LTE Band 66	20M	QPSK	1	0	-	Left Side	10mm	Ant 0	ECI 3	132322	1745	1	19.55	20.30	1.189	-	-	0.05	0.025	0.030
	LTE Band 66	20M	QPSK	1	0	-	Right Side	10mm	Ant 0	ECI 3	132322	1745	1	19.55	20.30	1.189	-	-	-0.01	0.067	0.080
37	LTE Band 66	20M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	ECI 3	132322	1745	1	19.55	20.30	1.189	-	-	-0.14	0.383	**0.455**
	LTE Band 66	20M	QPSK	50	0	-	Front	10mm	Ant 0	ECI 3	132322	1745	1	19.51	20.30	1.199	-	-	-0.12	0.120	0.144
	LTE Band 66	20M	QPSK	50	0	-	Back	10mm	Ant 0	ECI 3	132322	1745	1	19.51	20.30	1.199	-	-	-0.12	0.246	0.295
	LTE Band 66	20M	QPSK	50	0	-	Left Side	10mm	Ant 0	ECI 3	132322	1745	1	19.51	20.30	1.199	-	-	0.02	0.024	0.029
	LTE Band 66	20M	QPSK	50	0	-	Right Side	10mm	Ant 0	ECI 3	132322	1745	1	19.51	20.30	1.199	-	-	-0.02	0.065	0.078
	LTE Band 66	20M	QPSK	50	0	-	Bottom Side	10mm	Ant 0	ECI 3	132322	1745	1	19.51	20.30	1.199	-	-	0.01	0.318	0.381
	LTE Band 66	20M	QPSK	1	0	-	Front	10mm	Ant 4	ECI 3	132322	1745	1	23.65	24.30	1.161	-	-	0.06	0.012	0.014
	LTE Band 66	20M	QPSK	1	0	-	Back	10mm	Ant 4	ECI 3	132322	1745	1	23.65	24.30	1.161	-	-	0.03	0.046	0.053
	LTE Band 66	20M	QPSK	1	0	-	Left Side	10mm	Ant 4	ECI 3	132322	1745	1	23.65	24.30	1.161	-	-	0.08	0.020	0.023
	LTE Band 66	20M	QPSK	1	0	-	Top Side	10mm	Ant 4	ECI 3	132322	1745	1	23.65	24.30	1.161	-	-	0.07	0.008	0.009
	LTE Band 66	20M	QPSK	50	0	-	Front	10mm	Ant 4	ECI 3	132322	1745	1	22.60	23.30	1.175	-	-	0.06	0.010	0.012
	LTE Band 66	20M	QPSK	50	0	-	Back	10mm	Ant 4	ECI 3	132322	1745	1	22.60	23.30	1.175	-	-	0.16	0.040	0.047
	LTE Band 66	20M	QPSK	50	0	-	Left Side	10mm	Ant 4	ECI 3	132322	1745	1	22.60	23.30	1.175	-	-	0.08	0.018	0.021
	LTE Band 66	20M	QPSK	50	0	-	Top Side	10mm	Ant 4	ECI 3	132322	1745	1	22.60	23.30	1.175	-	-	0.03	0.006	0.007
	FR1 n66	40M	QPSK	1	1	DFT-15	Front	10mm	Ant 1	ECI 3	349000	1745	1	19.10	20.20	1.288	-	-	-0.02	0.166	0.214
	FR1 n66	40M	QPSK	1	1	DFT-15	Back	10mm	Ant 1	ECI 3	349000	1745	1	19.10	20.20	1.288	-	-	0.15	0.206	0.265
	FR1 n66	40M	QPSK	1	1	DFT-15	Left Side	10mm	Ant 1	ECI 3	349000	1745	1	19.10	20.20	1.288	-	-	-0.11	0.048	0.062
	FR1 n66	40M	QPSK	1	1	DFT-15	Top Side	10mm	Ant 1	ECI 3	349000	1745	1	19.10	20.20	1.288	-	-	0.09	0.257	0.331
	FR1 n66	40M	QPSK	108	54	DFT-15	Front	10mm	Ant 1	ECI 3	349000	1745	1	19.08	20.20	1.294	-	-	0.01	0.178	0.230
	FR1 n66	40M	QPSK	108	54	DFT-15	Back	10mm	Ant 1	ECI 3	349000	1745	1	19.08	20.20	1.294	-	-	0.17	0.224	0.290
	FR1 n66	40M	QPSK	108	54	DFT-15	Left Side	10mm	Ant 1	ECI 3	349000	1745	1	19.08	20.20	1.294	-	-	0.03	0.053	0.069
	FR1 n66	40M	QPSK	108	54	DFT-15	Top Side	10mm	Ant 1	ECI 3	349000	1745	1	19.08	20.20	1.294	-	-	-0.13	0.275	0.356
	FR1 n66	40M	QPSK	1	1	DFT-15	Front	10mm	Ant 0	ECI 3	349000	1745	1	19.99	21.20	1.321	-	-	-0.07	0.123	0.163
	FR1 n66	40M	QPSK	1	1	DFT-15	Back	10mm	Ant 0	ECI 3	349000	1745	1	19.99	21.20	1.321	-	-	-0.12	0.262	0.346
	FR1 n66	40M	QPSK	1	1	DFT-15	Left Side	10mm	Ant 0	ECI 3	349000	1745	1	19.99	21.20	1.321	-	-	0.14	0.037	0.049
	FR1 n66	40M	QPSK	1	1	DFT-15	Right Side	10mm	Ant 0	ECI 3	349000	1745	1	19.99	21.20	1.321	-	-	0.02	0.075	0.099
	FR1 n66	40M	QPSK	1	1	DFT-15	Bottom Side	10mm	Ant 0	ECI 3	349000	1745	1	19.99	21.20	1.321	-	-	-0.02	0.367	0.485
	FR1 n66	40M	QPSK	108	54	DFT-15	Front	10mm	Ant 0	ECI 3	349000	1745	1	19.88	21.20	1.355	-	-	0.1	0.138	0.187
	FR1 n66	40M	QPSK	108	54	DFT-15	Back	10mm	Ant 0	ECI 3	349000	1745	1	19.88	21.20	1.355	-	-	0.02	0.283	0.384
	FR1 n66	40M	QPSK	108	54	DFT-15	Left Side	10mm	Ant 0	ECI 3	349000	1745	1	19.88	21.20	1.355	-	-	0.18	0.045	0.061
	FR1 n66	40M	QPSK	108	54	DFT-15	Right Side	10mm	Ant 0	ECI 3	349000	1745	1	19.88	21.20	1.355	-	-	0.18	0.082	0.111
38	FR1 n66	40M	QPSK	108	54	DFT-15	Bottom Side	10mm	Ant 0	ECI 3	349000	1745	1	19.88	21.20	1.355	-	-	-0.12	0.405	**0.549**
	FR1 n66	40M	QPSK	1	1	DFT-15	Front	10mm	Ant 4	ECI 3	349000	1745	1	23.66	24.50	1.213	-	-	0.05	0.013	0.016
	FR1 n66	40M	QPSK	1	1	DFT-15	Back	10mm	Ant 4	ECI 3	349000	1745	1	23.66	24.50	1.213	-	-	-0.18	0.042	0.051
	FR1 n66	40M	QPSK	1	1	DFT-15	Left Side	10mm	Ant 4	ECI 3	349000	1745	1	23.66	24.50	1.213	-	-	0.01	0.021	0.025
	FR1 n66	40M	QPSK	1	1	DFT-15	Top Side	10mm	Ant 4	ECI 3	349000	1745	1	23.66	24.50	1.213	-	-	0.02	0.009	0.011
	FR1 n66	40M	QPSK	108	54	DFT-15	Front	10mm	Ant 4	ECI 3	349000	1745	1	23.63	24.50	1.222	-	-	0.03	0.014	0.017
	FR1 n66	40M	QPSK	108	54	DFT-15	Back	10mm	Ant 4	ECI 3	349000	1745	1	23.63	24.50	1.222	-	-	-0.08	0.046	0.056
	FR1 n66	40M	QPSK	108	54	DFT-15	Left Side	10mm	Ant 4	ECI 3	349000	1745	1	23.63	24.50	1.222	-	-	0.09	0.023	0.028
	FR1 n66	40M	QPSK	108	54	DFT-15	Top Side	10mm	Ant 4	ECI 3	349000	1745	1	23.63	24.50	1.222	-	-	-0.05	0.010	0.012
1900MHz																					
	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Front	10mm	Ant 1	ECI 3	661	1880	1	21.74	22.50	1.191	-	-	0.01	0.232	0.276
	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Back	10mm	Ant 1	ECI 3	661	1880	1	21.74	22.50	1.191	-	-	-0.08	0.269	0.320
	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Left Side	10mm	Ant 1	ECI 3	661	1880	1	21.74	22.50	1.191	-	-	0.09	0.070	0.083
39	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Top Side	10mm	Ant 1	ECI 3	661	1880	1	21.74	22.50	1.191	-	-	-0.15	0.393	**0.468**
	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Front	10mm	Ant 0	ECI 3	661	1880	1	22.74	23.50	1.191	-	-	0.16	0.152	0.181
	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Back	10mm	Ant 0	ECI 3	661	1880	1	22.74	23.50	1.191	-	-	0.15	0.299	0.356
	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Left Side	10mm	Ant 0	ECI 3	661	1880	1	22.74	23.50	1.191	-	-	0.17	0.048	0.057
	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Right Side	10mm	Ant 0	ECI 3	661	1880	1	22.74	23.50	1.191	-	-	-0.19	0.109	0.130

	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Bottom Side	10mm	Ant 0	ECI 3	661	1880	1	22.74	23.50	1.191	-	-	-0.1	0.291	0.347
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 1	ECI 3	9400	1880	1	18.82	19.80	1.253	-	-	0.18	0.267	0.335
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 1	ECI 3	9400	1880	1	18.82	19.80	1.253	-	-	0.08	0.266	0.333
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 1	ECI 3	9400	1880	1	18.82	19.80	1.253	-	-	-0.14	0.067	0.084
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 1	ECI 3	9400	1880	1	18.82	19.80	1.253	-	-	-0.12	0.372	0.466
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 0	ECI 3	9400	1880	1	19.88	20.80	1.236	-	-	0.09	0.153	0.189
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	ECI 3	9400	1880	1	19.88	20.80	1.236	-	-	0.14	0.306	0.378
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 0	ECI 3	9400	1880	1	19.88	20.80	1.236	-	-	-0.1	0.054	0.067
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 0	ECI 3	9400	1880	1	19.88	20.80	1.236	-	-	-0.06	0.116	0.143
40	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 0	ECI 3	9400	1880	1	19.88	20.80	1.236	-	-	-0.17	0.387	**0.478**
	LTE Band 2	20M	QPSK	1	0	-	Front	10mm	Ant 1	ECI 3	18900	1880	1	18.44	19.30	1.219	-	-	-0.18	0.243	0.296
	LTE Band 2	20M	QPSK	1	0	-	Back	10mm	Ant 1	ECI 3	18900	1880	1	18.44	19.30	1.219	-	-	0.14	0.246	0.300
	LTE Band 2	20M	QPSK	1	0	-	Left Side	10mm	Ant 1	ECI 3	18900	1880	1	18.44	19.30	1.219	-	-	-0.06	0.055	0.067
41	LTE Band 2	20M	QPSK	1	0	-	Top Side	10mm	Ant 1	ECI 3	18900	1880	1	18.44	19.30	1.219	-	-	0.16	0.361	**0.440**
	LTE Band 2	20M	QPSK	50	0	-	Front	10mm	Ant 1	ECI 3	18900	1880	1	18.32	19.30	1.253	-	-	0.07	0.236	0.296
	LTE Band 2	20M	QPSK	50	0	-	Back	10mm	Ant 1	ECI 3	18900	1880	1	18.32	19.30	1.253	-	-	0.03	0.238	0.298
	LTE Band 2	20M	QPSK	50	0	-	Left Side	10mm	Ant 1	ECI 3	18900	1880	1	18.32	19.30	1.253	-	-	0.18	0.056	0.070
	LTE Band 2	20M	QPSK	50	0	-	Top Side	10mm	Ant 1	ECI 3	18900	1880	1	18.32	19.30	1.253	-	-	0.12	0.334	0.419
	LTE Band 2	20M	QPSK	1	0	-	Front	10mm	Ant 0	ECI 3	18900	1880	1	19.23	20.30	1.279	-	-	0.05	0.137	0.175
	LTE Band 2	20M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 3	18900	1880	1	19.23	20.30	1.279	-	-	0.14	0.267	0.342
	LTE Band 2	20M	QPSK	1	0	-	Left Side	10mm	Ant 0	ECI 3	18900	1880	1	19.23	20.30	1.279	-	-	0.06	0.036	0.046
	LTE Band 2	20M	QPSK	1	0	-	Right Side	10mm	Ant 0	ECI 3	18900	1880	1	19.23	20.30	1.279	-	-	0.11	0.099	0.127
	LTE Band 2	20M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	ECI 3	18900	1880	1	19.23	20.30	1.279	-	-	0.16	0.324	0.415
	LTE Band 2	20M	QPSK	50	0	-	Front	10mm	Ant 0	ECI 3	18900	1880	1	19.20	20.30	1.288	-	-	0.07	0.141	0.182
	LTE Band 2	20M	QPSK	50	0	-	Back	10mm	Ant 0	ECI 3	18900	1880	1	19.20	20.30	1.288	-	-	-0.05	0.265	0.341
	LTE Band 2	20M	QPSK	50	0	-	Left Side	10mm	Ant 0	ECI 3	18900	1880	1	19.20	20.30	1.288	-	-	0.02	0.035	0.045
	LTE Band 2	20M	QPSK	50	0	-	Right Side	10mm	Ant 0	ECI 3	18900	1880	1	19.20	20.30	1.288	-	-	-0.1	0.100	0.129
	LTE Band 2	20M	QPSK	50	0	-	Bottom Side	10mm	Ant 0	ECI 3	18900	1880	1	19.20	20.30	1.288	-	-	-0.09	0.324	0.417
	LTE Band 2	20M	QPSK	1	0	-	Front	10mm	Ant 4	ECI 3	18900	1880	1	22.02	23.30	1.343	-	-	-0.11	0.105	0.141
	LTE Band 2	20M	QPSK	1	0	-	Back	10mm	Ant 4	ECI 3	18900	1880	1	22.02	23.30	1.343	-	-	0.02	0.326	0.438
	LTE Band 2	20M	QPSK	1	0	-	Left Side	10mm	Ant 4	ECI 3	18900	1880	1	22.02	23.30	1.343	-	-	0.16	0.176	0.236
	LTE Band 2	20M	QPSK	1	0	-	Top Side	10mm	Ant 4	ECI 3	18900	1880	1	22.02	23.30	1.343	-	-	-0.17	0.077	0.103
	LTE Band 2	20M	QPSK	50	0	-	Front	10mm	Ant 4	ECI 3	18900	1880	1	20.98	22.30	1.355	-	-	-0.05	0.085	0.115
	LTE Band 2	20M	QPSK	50	0	-	Back	10mm	Ant 4	ECI 3	18900	1880	1	20.98	22.30	1.355	-	-	0.18	0.283	0.384
	LTE Band 2	20M	QPSK	50	0	-	Left Side	10mm	Ant 4	ECI 3	18900	1880	1	20.98	22.30	1.355	-	-	0.01	0.151	0.205
	LTE Band 2	20M	QPSK	50	0	-	Top Side	10mm	Ant 4	ECI 3	18900	1880	1	20.98	22.30	1.355	-	-	0.16	0.060	0.081
	LTE Band 7	20M	QPSK	1	0	-	Front	10mm	Ant 1	ECI 3	21100	2535	1	14.44	15.30	1.219	-	-	0.12	0.169	0.206
	LTE Band 7	20M	QPSK	1	0	-	Back	10mm	Ant 1	ECI 3	21100	2535	1	14.44	15.30	1.219	-	-	-0.01	0.314	0.383
	LTE Band 7	20M	QPSK	1	0	-	Left Side	10mm	Ant 1	ECI 3	21100	2535	1	14.44	15.30	1.219	-	-	0.16	0.080	0.098
42	LTE Band 7	20M	QPSK	1	0	-	Top Side	10mm	Ant 1	ECI 3	21100	2535	1	14.44	15.30	1.219	-	-	0.02	0.467	**0.569**
	LTE Band 7C	20M	QPSK	1	0	-	Top Side	10mm	Ant 1	ECI 3	21100+ 20902	2535 +2515.2	1	14.31	15.30	1.256	-	-	0.01	0.428	0.538
	LTE Band 7	20M	QPSK	50	0	-	Front	10mm	Ant 1	ECI 3	21100	2535	1	14.31	15.30	1.256	-	-	0.18	0.171	0.215
	LTE Band 7	20M	QPSK	50	0	-	Back	10mm	Ant 1	ECI 3	21100	2535	1	14.31	15.30	1.256	-	-	-0.19	0.310	0.389
	LTE Band 7	20M	QPSK	50	0	-	Left Side	10mm	Ant 1	ECI 3	21100	2535	1	14.31	15.30	1.256	-	-	-0.19	0.076	0.095
	LTE Band 7	20M	QPSK	50	0	-	Top Side	10mm	Ant 1	ECI 3	21100	2535	1	14.31	15.30	1.256	-	-	0.09	0.450	0.565
	LTE Band 7	20M	QPSK	1	0	-	Front	10mm	Ant 0	ECI 3	21100	2535	1	19.27	19.80	1.130	-	-	-0.19	0.117	0.132
	LTE Band 7	20M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 3	21100	2535	1	19.27	19.80	1.130	-	-	0.06	0.182	0.206
	LTE Band 7C	20M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 3	21100+ 20902	2535+ 2515.2	1	18.75	19.80	1.274	-	-	0.01	0.151	0.192
	LTE Band 7	20M	QPSK	1	0	-	Left Side	10mm	Ant 0	ECI 3	21100	2535	1	19.27	19.80	1.130	-	-	0.01	0.035	0.040
	LTE Band 7	20M	QPSK	1	0	-	Right Side	10mm	Ant 0	ECI 3	21100	2535	1	19.27	19.80	1.130	-	-	-0.05	0.099	0.112
	LTE Band 7	20M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	ECI 3	21100	2535	1	19.27	19.80	1.130	-	-	-0.01	0.142	0.160
	LTE Band 7	20M	QPSK	50	0	-	Front	10mm	Ant 0	ECI 3	21100	2535	1	19.18	19.80	1.153	-	-	0.01	0.122	0.141
	LTE Band 7	20M	QPSK	50	0	-	Back	10mm	Ant 0	ECI 3	21100	2535	1	19.18	19.80	1.153	-	-	-0.05	0.179	0.206
	LTE Band 7	20M	QPSK	50	0	-	Left Side	10mm	Ant 0	ECI 3	21100	2535	1	19.18	19.80	1.153	-	-	0.07	0.033	0.038
	LTE Band 7	20M	QPSK	50	0	-	Right Side	10mm	Ant 0	ECI 3	21100	2535	1	19.18	19.80	1.153	-	-	0.03	0.097	0.112

	LTE Band 7	20M	QPSK	50	0	-	Bottom Side	10mm	Ant 0	ECI 3	21100	2535	1	19.18	19.80	1.153	-	-	0.15	0.142	0.164
	LTE Band 7	20M	QPSK	1	0	-	Front	10mm	Ant 4	ECI 3	21100	2535	1	18.28	19.10	1.208	-	-	0.09	0.073	0.088
	LTE Band 7	20M	QPSK	1	0	-	Back	10mm	Ant 4	ECI 3	21100	2535	1	18.28	19.10	1.208	-	-	0.03	0.291	0.351
	LTE Band 7C	20M	QPSK	1	0	-	Back	10mm	Ant 4	ECI 3	21100+ 20902	2535+ 2515.2	1	18.23	19.10	1.222	-	-	0.09	0.274	0.335
	LTE Band 7	20M	QPSK	1	0	-	Left Side	10mm	Ant 4	ECI 3	21100	2535	1	18.28	19.10	1.208	-	-	-0.07	0.171	0.207
	LTE Band 7	20M	QPSK	1	0	-	Top Side	10mm	Ant 4	ECI 3	21100	2535	1	18.28	19.10	1.208	-	-	-0.09	0.055	0.066
	LTE Band 7	20M	QPSK	50	0	-	Front	10mm	Ant 4	ECI 3	21100	2535	1	18.16	19.10	1.242	-	-	0.07	0.071	0.088
	LTE Band 7	20M	QPSK	50	0	-	Back	10mm	Ant 4	ECI 3	21100	2535	1	18.16	19.10	1.242	-	-	-0.03	0.281	0.349
	LTE Band 7	20M	QPSK	50	0	-	Left Side	10mm	Ant 4	ECI 3	21100	2535	1	18.16	19.10	1.242	-	-	0.09	0.179	0.222
	LTE Band 7	20M	QPSK	50	0	-	Top Side	10mm	Ant 4	ECI 3	21100	2535	1	18.16	19.10	1.242	-	-	-0.02	0.061	0.076
	LTE Band 41	20M	QPSK	1	0	-	Front	10mm	Ant 1	ECI 3	40620	2593	1	16.44	17.30	1.219	62.9	1.006	0	0.144	0.177
	LTE Band 41	20M	QPSK	1	0	-	Back	10mm	Ant 1	ECI 3	40620	2593	1	16.44	17.30	1.219	62.9	1.006	-0.04	0.293	0.359
	LTE Band 41	20M	QPSK	1	0	-	Left Side	10mm	Ant 1	ECI 3	40620	2593	1	16.44	17.30	1.219	62.9	1.006	-0.05	0.109	0.134
43	LTE Band 41	20M	QPSK	1	0	-	Top Side	10mm	Ant 1	ECI 3	40620	2593	1	16.44	17.30	1.219	62.9	1.006	-0.19	0.450	**0.552**
	LTE Band 41	20M	QPSK	50	0	-	Front	10mm	Ant 1	ECI 3	40620	2593	1	16.39	17.30	1.233	62.9	1.006	0.05	0.136	0.169
	LTE Band 41	20M	QPSK	50	0	-	Back	10mm	Ant 1	ECI 3	40620	2593	1	16.39	17.30	1.233	62.9	1.006	0.04	0.280	0.347
	LTE Band 41	20M	QPSK	50	0	-	Left Side	10mm	Ant 1	ECI 3	40620	2593	1	16.39	17.30	1.233	62.9	1.006	0.02	0.108	0.134
	LTE Band 41	20M	QPSK	50	0	-	Top Side	10mm	Ant 1	ECI 3	40620	2593	1	16.39	17.30	1.233	62.9	1.006	0.18	0.360	0.447
	LTE Band 41	20M	QPSK	1	0	-	Front	10mm	Ant 0	ECI 3	40620	2593	1	20.49	21.30	1.205	62.9	1.006	0.18	0.108	0.131
	LTE Band 41	20M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 3	40620	2593	1	20.49	21.30	1.205	62.9	1.006	0.02	0.161	0.195
	LTE Band 41	20M	QPSK	1	0	-	Left Side	10mm	Ant 0	ECI 3	40620	2593	1	20.49	21.30	1.205	62.9	1.006	0.06	0.041	0.050
	LTE Band 41	20M	QPSK	1	0	-	Right Side	10mm	Ant 0	ECI 3	40620	2593	1	20.49	21.30	1.205	62.9	1.006	-0.17	0.087	0.105
	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	ECI 3	40620	2593	1	20.49	21.30	1.205	62.9	1.006	-0.18	0.133	0.161
	LTE Band 41	20M	QPSK	50	0	-	Front	10mm	Ant 0	ECI 3	40620	2593	1	20.45	21.30	1.216	62.9	1.006	-0.07	0.115	0.141
	LTE Band 41	20M	QPSK	50	0	-	Back	10mm	Ant 0	ECI 3	40620	2593	1	20.45	21.30	1.216	62.9	1.006	-0.1	0.162	0.198
	LTE Band 41	20M	QPSK	50	0	-	Left Side	10mm	Ant 0	ECI 3	40620	2593	1	20.45	21.30	1.216	62.9	1.006	0.09	0.042	0.051
	LTE Band 41	20M	QPSK	50	0	-	Right Side	10mm	Ant 0	ECI 3	40620	2593	1	20.45	21.30	1.216	62.9	1.006	0.13	0.088	0.108
	LTE Band 41	20M	QPSK	50	0	-	Bottom Side	10mm	Ant 0	ECI 3	40620	2593	1	20.45	21.30	1.216	62.9	1.006	-0.03	0.135	0.165
	LTE Band 41	20M	QPSK	1	0	-	Front	10mm	Ant 4	ECI 3	40620	2593	1	20.49	21.60	1.291	62.9	1.006	-0.01	0.088	0.114
	LTE Band 41	20M	QPSK	1	0	-	Back	10mm	Ant 4	ECI 3	40620	2593	1	20.49	21.60	1.291	62.9	1.006	0.11	0.284	0.369
	LTE Band 41	20M	QPSK	1	0	-	Left Side	10mm	Ant 4	ECI 3	40620	2593	1	20.49	21.60	1.291	62.9	1.006	0.03	0.171	0.222
	LTE Band 41	20M	QPSK	1	0	-	Top Side	10mm	Ant 4	ECI 3	40620	2593	1	20.49	21.60	1.291	62.9	1.006	-0.16	0.055	0.071
	LTE Band 41	20M	QPSK	50	0	-	Front	10mm	Ant 4	ECI 3	40620	2593	1	20.36	21.60	1.330	62.9	1.006	-0.12	0.087	0.116
	LTE Band 41	20M	QPSK	50	0	-	Back	10mm	Ant 4	ECI 3	40620	2593	1	20.36	21.60	1.330	62.9	1.006	-0.05	0.286	0.383
	LTE Band 41	20M	QPSK	50	0	-	Left Side	10mm	Ant 4	ECI 3	40620	2593	1	20.36	21.60	1.330	62.9	1.006	0.03	0.181	0.242
	LTE Band 41	20M	QPSK	50	0	-	Top Side	10mm	Ant 4	ECI 3	40620	2593	1	20.36	21.60	1.330	62.9	1.006	-0.13	0.056	0.075
	FR1 n7	50M	QPSK	1	1	DFT-15	Front	10mm	Ant 1	ECI 3	507000	2535	1	14.49	15.20	1.178	-	-	0.09	0.122	0.144
	FR1 n7	50M	QPSK	1	1	DFT-15	Back	10mm	Ant 1	ECI 3	507000	2535	1	14.49	15.20	1.178	-	-	-0.17	0.232	0.273
	FR1 n7	50M	QPSK	1	1	DFT-15	Left Side	10mm	Ant 1	ECI 3	507000	2535	1	14.49	15.20	1.178	-	-	0.18	0.061	0.072
	FR1 n7	50M	QPSK	1	1	DFT-15	Top Side	10mm	Ant 1	ECI 3	507000	2535	1	14.49	15.20	1.178	-	-	0.11	0.373	0.439
	FR1 n7	50M	QPSK	135	68	DFT-15	Front	10mm	Ant 1	ECI 3	507000	2535	1	14.44	15.20	1.191	-	-	-0.11	0.139	0.166
	FR1 n7	50M	QPSK	135	68	DFT-15	Back	10mm	Ant 1	ECI 3	507000	2535	1	14.44	15.20	1.191	-	-	0.14	0.270	0.322
	FR1 n7	50M	QPSK	135	68	DFT-15	Left Side	10mm	Ant 1	ECI 3	507000	2535	1	14.44	15.20	1.191	-	-	0.13	0.085	0.101
44	FR1 n7	50M	QPSK	135	68	DFT-15	Top Side	10mm	Ant 1	ECI 3	507000	2535	1	14.44	15.20	1.191	-	-	-0.15	0.546	**0.650**
	FR1 n7	50M	QPSK	1	1	DFT-15	Front	10mm	Ant 0	ECI 3	507000	2535	1	18.93	20.20	1.340	-	-	0.09	0.137	0.184
	FR1 n7	50M	QPSK	1	1	DFT-15	Back	10mm	Ant 0	ECI 3	507000	2535	1	18.93	20.20	1.340	-	-	0.05	0.187	0.251
	FR1 n7	50M	QPSK	1	1	DFT-15	Left Side	10mm	Ant 0	ECI 3	507000	2535	1	18.93	20.20	1.340	-	-	0.06	0.052	0.070
	FR1 n7	50M	QPSK	1	1	DFT-15	Right Side	10mm	Ant 0	ECI 3	507000	2535	1	18.93	20.20	1.340	-	-	0.11	0.108	0.145
	FR1 n7	50M	QPSK	1	1	DFT-15	Bottom Side	10mm	Ant 0	ECI 3	507000	2535	1	18.93	20.20	1.340	-	-	0.07	0.150	0.201
	FR1 n7	50M	QPSK	135	68	DFT-15	Front	10mm	Ant 0	ECI 3	507000	2535	1	18.90	20.20	1.349	-	-	-0.12	0.135	0.182
	FR1 n7	50M	QPSK	135	68	DFT-15	Back	10mm	Ant 0	ECI 3	507000	2535	1	18.90	20.20	1.349	-	-	0	0.183	0.247
	FR1 n7	50M	QPSK	135	68	DFT-15	Left Side	10mm	Ant 0	ECI 3	507000	2535	1	18.90	20.20	1.349	-	-	-0.08	0.050	0.067
	FR1 n7	50M	QPSK	135	68	DFT-15	Right Side	10mm	Ant 0	ECI 3	507000	2535	1	18.90	20.20	1.349	-	-	-0.03	0.105	0.142
	FR1 n7	50M	QPSK	135	68	DFT-15	Bottom Side	10mm	Ant 0	ECI 3	507000	2535	1	18.90	20.20	1.349	-	-	-0.12	0.149	0.201
	FR1 n7	50M	QPSK	1	1	DFT-15	Front	10mm	Ant 4	ECI 3	507000	2535	1	18.20	19.50	1.349	-	-	0.11	0.086	0.116
	FR1 n7	50M	QPSK	1	1	DFT-15	Back	10mm	Ant 4	ECI 3	507000	2535	1	18.20	19.50	1.349	-	-	0.17	0.351	0.473

	FR1 n7	50M	QPSK	1	1	DFT-15	Left Side	10mm	Ant 4	ECI 3	507000	2535	1	18.20	19.50	1.349	-	-	-0.01	0.163	0.220
	FR1 n7	50M	QPSK	1	1	DFT-15	Top Side	10mm	Ant 4	ECI 3	507000	2535	1	18.20	19.50	1.349	-	-	-0.02	0.053	0.071
	FR1 n7	50M	QPSK	135	68	DFT-15	Front	10mm	Ant 4	ECI 3	507000	2535	1	18.13	19.50	1.371	-	-	-0.04	0.086	0.118
	FR1 n7	50M	QPSK	135	68	DFT-15	Back	10mm	Ant 4	ECI 3	507000	2535	1	18.13	19.50	1.371	-	-	0.03	0.299	0.410
	FR1 n7	50M	QPSK	135	68	DFT-15	Left Side	10mm	Ant 4	ECI 3	507000	2535	1	18.13	19.50	1.371	-	-	0.18	0.193	0.265
	FR1 n7	50M	QPSK	135	68	DFT-15	Top Side	10mm	Ant 4	ECI 3	507000	2535	1	18.13	19.50	1.371	-	-	-0.01	0.073	0.100
	FR1 n41	100M	QPSK	1	1	DFT-30	Front	10mm	Ant 1	ECI 3	518598	2592.99	1	14.89	15.70	1.205	-	-	0.1	0.149	0.180
	FR1 n41	100M	QPSK	1	1	DFT-30	Back	10mm	Ant 1	ECI 3	518598	2592.99	1	14.89	15.70	1.205	-	-	-0.16	0.305	0.368
	FR1 n41	100M	QPSK	1	1	DFT-30	Left Side	10mm	Ant 1	ECI 3	518598	2592.99	1	14.89	15.70	1.205	-	-	-0.1	0.103	0.124
45	FR1 n41	100M	QPSK	1	1	DFT-30	Top Side	10mm	Ant 1	ECI 3	518598	2592.99	1	14.89	15.70	1.205	-	-	0.09	0.585	**0.705**
	FR1 n41	100M	QPSK	135	69	DFT-30	Front	10mm	Ant 1	ECI 3	518598	2592.99	1	14.52	15.70	1.312	-	-	0.13	0.149	0.196
	FR1 n41	100M	QPSK	135	69	DFT-30	Back	10mm	Ant 1	ECI 3	518598	2592.99	1	14.52	15.70	1.312	-	-	0.15	0.279	0.366
	FR1 n41	100M	QPSK	135	69	DFT-30	Left Side	10mm	Ant 1	ECI 3	518598	2592.99	1	14.52	15.70	1.312	-	-	-0.01	0.133	0.175
	FR1 n41	100M	QPSK	135	69	DFT-30	Top Side	10mm	Ant 1	ECI 3	518598	2592.99	1	14.52	15.70	1.312	-	-	0.16	0.512	0.672
	FR1 n41	100M	QPSK	270	0	DFT-30	Top Side	10mm	Ant 1	ECI 3	518598	2592.99	1	14.45	15.70	1.334	-	-	0.17	0.509	0.679
	FR1 n41	100M	QPSK	1	1	DFT-30	Front	10mm	Ant 0	ECI 3	518598	2592.99	1	19.20	20.20	1.259	-	-	0.19	0.128	0.161
	FR1 n41	100M	QPSK	1	1	DFT-30	Back	10mm	Ant 0	ECI 3	518598	2592.99	1	19.20	20.20	1.259	-	-	0.08	0.173	0.218
	FR1 n41	100M	QPSK	1	1	DFT-30	Left Side	10mm	Ant 0	ECI 3	518598	2592.99	1	19.20	20.20	1.259	-	-	0.11	0.044	0.055
	FR1 n41	100M	QPSK	1	1	DFT-30	Right Side	10mm	Ant 0	ECI 3	518598	2592.99	1	19.20	20.20	1.259	-	-	0.12	0.101	0.127
	FR1 n41	100M	QPSK	1	1	DFT-30	Bottom Side	10mm	Ant 0	ECI 3	518598	2592.99	1	19.20	20.20	1.259	-	-	0.13	0.125	0.157
	FR1 n41	100M	QPSK	135	69	DFT-30	Front	10mm	Ant 0	ECI 3	518598	2592.99	1	19.18	20.20	1.265	-	-	0.01	0.153	0.194
	FR1 n41	100M	QPSK	135	69	DFT-30	Back	10mm	Ant 0	ECI 3	518598	2592.99	1	19.18	20.20	1.265	-	-	0.05	0.209	0.264
	FR1 n41	100M	QPSK	135	69	DFT-30	Left Side	10mm	Ant 0	ECI 3	518598	2592.99	1	19.18	20.20	1.265	-	-	0.05	0.046	0.058
	FR1 n41	100M	QPSK	135	69	DFT-30	Right Side	10mm	Ant 0	ECI 3	518598	2592.99	1	19.18	20.20	1.265	-	-	0.01	0.130	0.164
	FR1 n41	100M	QPSK	135	69	DFT-30	Bottom Side	10mm	Ant 0	ECI 3	518598	2592.99	1	19.18	20.20	1.265	-	-	0.03	0.177	0.224
	FR1 n41	100M	QPSK	1	1	DFT-30	Front	10mm	Ant 4	ECI 3	518598	2592.99	1	18.20	19.50	1.349	-	-	0.05	0.072	0.097
	FR1 n41	100M	QPSK	1	1	DFT-30	Back	10mm	Ant 4	ECI 3	518598	2592.99	1	18.20	19.50	1.349	-	-	-0.05	0.308	0.415
	FR1 n41	100M	QPSK	1	1	DFT-30	Left Side	10mm	Ant 4	ECI 3	518598	2592.99	1	18.20	19.50	1.349	-	-	-0.07	0.182	0.246
	FR1 n41	100M	QPSK	1	1	DFT-30	Top Side	10mm	Ant 4	ECI 3	518598	2592.99	1	18.20	19.50	1.349	-	-	0.06	0.080	0.108
	FR1 n41	100M	QPSK	135	69	DFT-30	Front	10mm	Ant 4	ECI 3	518598	2592.99	1	18.17	19.50	1.358	-	-	-0.01	0.093	0.126
	FR1 n41	100M	QPSK	135	69	DFT-30	Back	10mm	Ant 4	ECI 3	518598	2592.99	1	18.17	19.50	1.358	-	-	0.14	0.361	0.490
	FR1 n41	100M	QPSK	135	69	DFT-30	Left Side	10mm	Ant 4	ECI 3	518598	2592.99	1	18.17	19.50	1.358	-	-	-0.01	0.247	0.336
	FR1 n41	100M	QPSK	135	69	DFT-30	Top Side	10mm	Ant 4	ECI 3	518598	2592.99	1	18.17	19.50	1.358	-	-	-0.19	0.083	0.113

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	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)
2450MHz																	
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Ant 7	Full	11	2462	1	17.60	18.00	1.096	100	1.000	0.13	0.204	0.224
46	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Ant 7	Full	11	2462	1	17.60	18.00	1.096	100	1.000	-0.13	0.264	**0.289**
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Ant 7	Full	11	2462	1	17.60	18.00	1.096	100	1.000	0.17	0.088	0.096
	WLAN2.4GHz	802.11b 1Mbps	Top Side	10mm	Ant 7	Full	11	2462	1	17.60	18.00	1.096	100	1.000	0.18	0.228	0.250
	Bluetooth	DH5 1Mbps	Front	10mm	Ant 7	Full	39	2441	1	12.20	14.00	1.514	76.6	1.305	-0.1	0.042	0.083
47	Bluetooth	DH5 1Mbps	Back	10mm	Ant 7	Full	39	2441	1	12.20	14.00	1.514	76.6	1.305	0.17	0.064	**0.127**
	Bluetooth	DH5 1Mbps	Right Side	10mm	Ant 7	Full	39	2441	1	12.20	14.00	1.514	76.6	1.305	0.03	0.021	0.041
	Bluetooth	DH5 1Mbps	Top Side	10mm	Ant 7	Full	39	2441	1	12.20	14.00	1.514	76.6	1.305	0.02	0.060	0.119
5000MHz																	
	WLAN5.2GHz	802.11n-HT40 MCS0	Front	10mm	Ant 7	Hotspot on	46	5230	1	14.28	16.00	1.486	94.74	1.056	-0.06	0.148	0.232
48	WLAN5.2GHz	802.11n-HT40 MCS0	Back	10mm	Ant 7	Hotspot on	46	5230	2	14.28	16.00	1.486	94.74	1.056	-0.08	0.504	**0.791**
	WLAN5.2GHz	802.11n-HT40 MCS0	Back	10mm	Ant 7	Hotspot on	46	5230	1	14.28	16.00	1.486	94.74	1.056	-0.02	0.493	0.774
	WLAN5.2GHz	802.11n-HT40 MCS0	Right Side	10mm	Ant 7	Hotspot on	46	5230	1	14.28	16.00	1.486	94.74	1.056	0.16	0.270	0.424
	WLAN5.2GHz	802.11n-HT40 MCS0	Top Side	10mm	Ant 7	Hotspot on	46	5230	1	14.28	16.00	1.486	94.74	1.056	0.1	0.325	0.510
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	10mm	Ant 7	Hotspot on	155	5775	1	14.56	16.00	1.393	90.56	1.104	-0.04	0.098	0.151
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	10mm	Ant 7	Hotspot on	155	5775	1	14.56	16.00	1.393	90.56	1.104	0.04	0.289	0.444
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	10mm	Ant 7	Hotspot on	155	5775	1	14.56	16.00	1.393	90.56	1.104	-0.08	0.129	0.198
49	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	10mm	Ant 7	Hotspot on	155	5775	1	14.56	16.00	1.393	90.56	1.104	0.05	0.476	**0.732**

15.3 Body Worn Accessory SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Headset	Power State	Ch.	Freq. (MHz)	Sample	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)
750MHz																						
	LTE Band 12	10M	QPSK	1	0	-	Front	15mm	Ant 1		ECI 1	23095	707.5	1	24.06	24.80	1.186	-	-	-0.19	0.120	0.142
	LTE Band 12	10M	QPSK	1	0	-	Back	15mm	Ant 1		ECI 1	23095	707.5	1	24.06	24.80	1.186	-	-	0	0.135	0.160
	LTE Band 12	10M	QPSK	25	0	-	Front	15mm	Ant 1		ECI 1	23095	707.5	1	22.99	23.80	1.205	-	-	0.13	0.095	0.114
	LTE Band 12	10M	QPSK	25	0	-	Back	15mm	Ant 1		ECI 1	23095	707.5	1	22.99	23.80	1.205	-	-	0	0.107	0.129
	LTE Band 12	10M	QPSK	1	0	-	Front	15mm	Ant 0		ECI 1	23095	707.5	1	23.90	24.80	1.230	-	-	0.11	0.131	0.161
54	LTE Band 12	10M	QPSK	1	0	-	Back	15mm	Ant 0		ECI 1	23095	707.5	1	23.90	24.80	1.230	-	-	0.08	0.137	**0.169**
	LTE Band 12	10M	QPSK	25	0	-	Front	15mm	Ant 0		ECI 1	23095	707.5	1	22.90	23.80	1.230	-	-	-0.01	0.106	0.130
	LTE Band 12	10M	QPSK	25	0	-	Back	15mm	Ant 0		ECI 1	23095	707.5	1	22.90	23.80	1.230	-	-	-0.16	0.130	0.160
	LTE Band 13	10M	QPSK	1	0	-	Front	15mm	Ant 1		ECI 1	23230	782	1	23.97	24.80	1.211	-	-	-0.11	0.177	0.214
55	LTE Band 13	10M	QPSK	1	0	-	Back	15mm	Ant 1		ECI 1	23230	782	1	23.97	24.80	1.211	-	-	0.04	0.229	**0.277**
	LTE Band 13	10M	QPSK	25	0	-	Front	15mm	Ant 1		ECI 1	23230	782	1	22.91	23.80	1.227	-	-	0.07	0.144	0.177
	LTE Band 13	10M	QPSK	25	0	-	Back	15mm	Ant 1		ECI 1	23230	782	1	22.91	23.80	1.227	-	-	0.07	0.129	0.158
	LTE Band 13	10M	QPSK	1	0	-	Front	15mm	Ant 0		ECI 1	23230	782	1	23.98	24.80	1.208	-	-	-0.13	0.140	0.169
	LTE Band 13	10M	QPSK	1	0	-	Back	15mm	Ant 0		ECI 1	23230	782	1	23.98	24.80	1.208	-	-	0.14	0.181	0.219
	LTE Band 13	10M	QPSK	25	0	-	Front	15mm	Ant 0		ECI 1	23230	782	1	22.97	23.80	1.211	-	-	0.11	0.108	0.131
	LTE Band 13	10M	QPSK	25	0	-	Back	15mm	Ant 0		ECI 1	23230	782	1	22.97	23.80	1.211	-	-	0.08	0.139	0.168
835MHz																						
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Front	15mm	Ant 1		ECI 1	189	836.4	1	26.73	28.00	1.340	-	-	-0.08	0.093	0.125
56	GSM850	-	-	-	-	GPRS(4 Tx slots)	Back	15mm	Ant 1		ECI 1	189	836.4	1	26.73	28.00	1.340	-	-	0.02	0.153	**0.205**
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Front	15mm	Ant 0		ECI 1	189	836.4	1	26.74	28.00	1.337	-	-	0.02	0.102	0.136
	GSM850	-	-	-	-	GPRS(4 Tx slots)	Back	15mm	Ant 0		ECI 1	189	836.4	1	26.74	28.00	1.337	-	-	0.18	0.119	0.159
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 1		ECI 1	4182	836.4	1	23.77	24.80	1.268	-	-	0.15	0.107	0.136
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 1		ECI 1	4182	836.4	1	23.77	24.80	1.268	-	-	0.17	0.132	0.167
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 0		ECI 1	4182	836.4	1	23.75	24.80	1.274	-	-	0.18	0.107	0.136
57	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 0		ECI 1	4182	836.4	1	23.75	24.80	1.274	-	-	0.08	0.139	**0.177**
	LTE Band 26	15M	QPSK	1	0	-	Front	15mm	Ant 1		ECI 1	26865	831.5	1	23.95	24.80	1.216	-	-	-0.1	0.091	0.111
58	LTE Band 26	15M	QPSK	1	0	-	Back	15mm	Ant 1		ECI 1	26865	831.5	1	23.95	24.80	1.216	-	-	-0.02	0.121	**0.147**
	LTE Band 26	15M	QPSK	36	0	-	Front	15mm	Ant 1		ECI 1	26865	831.5	1	22.88	23.80	1.236	-	-	-0.08	0.075	0.093
	LTE Band 26	15M	QPSK	36	0	-	Back	15mm	Ant 1		ECI 1	26865	831.5	1	22.88	23.80	1.236	-	-	0.14	0.092	0.114
	LTE Band 26	15M	QPSK	1	0	-	Front	15mm	Ant 0		ECI 1	26865	831.5	1	24.03	24.80	1.194	-	-	-0.05	0.094	0.112
	LTE Band 26	15M	QPSK	1	0	-	Back	15mm	Ant 0		ECI 1	26865	831.5	1	24.03	24.80	1.194	-	-	0.03	0.111	0.133
	LTE Band 26	15M	QPSK	36	0	-	Front	15mm	Ant 0		ECI 1	26865	831.5	1	22.95	23.80	1.216	-	-	-0.01	0.076	0.092
	LTE Band 26	15M	QPSK	36	0	-	Back	15mm	Ant 0		ECI 1	26865	831.5	1	22.95	23.80	1.216	-	-	0.07	0.088	0.107
	FR1 n26	20M	QPSK	1	1	DFT-15	Front	15mm	Ant 1		ECI 1	166300	831.5	1	23.85	25.20	1.365	-	-	0.03	0.062	0.085
	FR1 n26	20M	QPSK	1	1	DFT-15	Back	15mm	Ant 1		ECI 1	166300	831.5	1	23.85	25.20	1.365	-	-	0.18	0.066	0.090
	FR1 n26	20M	QPSK	50	28	DFT-15	Front	15mm	Ant 1		ECI 1	166300	831.5	1	23.83	25.20	1.371	-	-	-0.02	0.089	0.122
	FR1 n26	20M	QPSK	50	28	DFT-15	Back	15mm	Ant 1		ECI 1	166300	831.5	1	23.83	25.20	1.371	-	-	-0.1	0.094	0.129
	FR1 n26	20M	QPSK	1	1	DFT-15	Front	15mm	Ant 0		ECI 1	166300	831.5	1	23.82	25.20	1.374	-	-	0.14	0.062	0.085
	FR1 n26	20M	QPSK	1	1	DFT-15	Back	15mm	Ant 0		ECI 1	166300	831.5	1	23.82	25.20	1.374	-	-	0.01	0.089	0.122
	FR1 n26	20M	QPSK	50	28	DFT-15	Front	15mm	Ant 0		ECI 1	166300	831.5	1	23.80	25.20	1.380	-	-	-0.08	0.076	0.105
59	FR1 n26	20M	QPSK	50	28	DFT-15	Back	15mm	Ant 0		ECI 1	166300	831.5	1	23.80	25.20	1.380	-	-	-0.07	0.116	**0.160**
1750MHz																						
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 1		ECI 1	1413	1732.6	1	21.14	21.80	1.164	-	-	0.14	0.175	0.204
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 1		ECI 1	1413	1732.6	1	21.14	21.80	1.164	-	-	-0.05	0.189	0.220
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 0		ECI 1	1413	1732.6	1	21.95	22.80	1.216	-	-	0.06	0.123	0.150
60	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 0		ECI 1	1413	1732.6	1	21.95	22.80	1.216	-	-	0.15	0.212	**0.258**
	LTE Band 66	20M	QPSK	1	0	-	Front	15mm	Ant 1		ECI 1	132322	1745	1	21.89	22.30	1.099	-	-	-0.14	0.195	0.214
	LTE Band 66	20M	QPSK	1	0	-	Back	15mm	Ant 1		ECI 1	132322	1745	1	21.89	22.30	1.099	-	-	-0.17	0.206	0.226
	LTE Band 66	20M	QPSK	50	0	-	Front	15mm	Ant 1		ECI 1	132322	1745	1	21.85	22.30	1.109	-	-	-0.01	0.193	0.214
	LTE Band 66	20M	QPSK	50	0	-	Back	15mm	Ant 1		ECI 1	132322	1745	1	21.85	22.30	1.109	-	-	-0.15	0.200	0.222

	LTE Band 66	20M	QPSK	1	0	-	Front	15mm	Ant 0		ECI 1	132322	1745	1	22.16	22.80	1.159	-	-	0.14	0.119	0.138
61	LTE Band 66	20M	QPSK	1	0	-	Back	15mm	Ant 0		ECI 1	132322	1745	1	22.16	22.80	1.159	-	-	0.08	0.197	**0.228**
	LTE Band 66	20M	QPSK	50	0	-	Front	15mm	Ant 0		ECI 1	132322	1745	1	22.14	22.80	1.164	-	-	-0.05	0.118	0.137
	LTE Band 66	20M	QPSK	50	0	-	Back	15mm	Ant 0		ECI 1	132322	1745	1	22.14	22.80	1.164	-	-	0.08	0.190	0.221
	LTE Band 66	20M	QPSK	1	0	-	Front	15mm	Ant 4		ECI 1	132322	1745	1	23.65	24.30	1.161	-	-	0.08	0.013	0.015
	LTE Band 66	20M	QPSK	1	0	-	Back	15mm	Ant 4		ECI 1	132322	1745	1	23.65	24.30	1.161	-	-	0.05	0.050	0.058
	LTE Band 66	20M	QPSK	50	0	-	Front	15mm	Ant 4		ECI 1	132322	1745	1	22.60	23.30	1.175	-	-	-0.07	0.010	0.012
	LTE Band 66	20M	QPSK	50	0	-	Back	15mm	Ant 4		ECI 1	132322	1745	1	22.60	23.30	1.175	-	-	-0.06	0.047	0.055
	FR1 n66	40M	QPSK	1	1	DFT-15	Front	15mm	Ant 1		ECI 1	349000	1745	1	21.69	22.70	1.262	-	-	-0.04	0.152	0.192
	FR1 n66	40M	QPSK	1	1	DFT-15	Back	15mm	Ant 1		ECI 1	349000	1745	1	21.69	22.70	1.262	-	-	0	0.178	0.225
	FR1 n66	40M	QPSK	108	54	DFT-15	Front	15mm	Ant 1		ECI 1	349000	1745	1	21.65	22.70	1.274	-	-	0.1	0.162	0.206
	FR1 n66	40M	QPSK	108	54	DFT-15	Back	15mm	Ant 1		ECI 1	349000	1745	1	21.65	22.70	1.274	-	-	0.03	0.197	0.251
	FR1 n66	40M	QPSK	1	1	DFT-15	Front	15mm	Ant 0		ECI 1	349000	1745	1	21.98	23.20	1.324	-	-	-0.01	0.122	0.162
	FR1 n66	40M	QPSK	1	1	DFT-15	Back	15mm	Ant 0		ECI 1	349000	1745	1	21.98	23.20	1.324	-	-	-0.1	0.195	0.258
	FR1 n66	40M	QPSK	108	54	DFT-15	Front	15mm	Ant 0		ECI 1	349000	1745	1	21.86	23.20	1.361	-	-	-0.01	0.134	0.182
62	FR1 n66	40M	QPSK	108	54	DFT-15	Back	15mm	Ant 0		ECI 1	349000	1745	1	21.86	23.20	1.361	-	-	0.15	0.192	**0.261**
	FR1 n66	40M	QPSK	1	1	DFT-15	Front	15mm	Ant 4		ECI 1	349000	1745	1	23.66	24.50	1.213	-	-	0.06	0.014	0.017
	FR1 n66	40M	QPSK	1	1	DFT-15	Back	15mm	Ant 4		ECI 1	349000	1745	1	23.66	24.50	1.213	-	-	0.11	0.045	0.055
	FR1 n66	40M	QPSK	108	54	DFT-15	Front	15mm	Ant 4		ECI 1	349000	1745	1	23.63	24.50	1.222	-	-	-0.08	0.010	0.012
	FR1 n66	40M	QPSK	108	54	DFT-15	Back	15mm	Ant 4		ECI 1	349000	1745	1	23.63	24.50	1.222	-	-	-0.02	0.042	0.051
1900MHz																						
	GSM1900	-	-	-	-	GPRS(2 Tx slots)	Front	15mm	Ant 1		ECI 1	661	1880	1	26.54	28.00	1.400	-	-	-0.14	0.122	0.171
63	GSM1900	-	-	-	-	GPRS(2 Tx slots)	Back	15mm	Ant 1		ECI 1	661	1880	1	26.54	28.00	1.400	-	-	0.13	0.137	**0.192**
	GSM1900	-	-	-	-	GPRS(2 Tx slots)	Front	15mm	Ant 0		ECI 1	661	1880	1	26.64	28.00	1.368	-	-	-0.15	0.086	0.118
	GSM1900	-	-	-	-	GPRS(2 Tx slots)	Back	15mm	Ant 0		ECI 1	661	1880	1	26.64	28.00	1.368	-	-	0.16	0.134	0.183
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 1		ECI 1	9400	1880	1	21.30	22.30	1.259	-	-	0.06	0.256	0.322
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 1		ECI 1	9400	1880	1	21.30	22.30	1.259	-	-	0.04	0.259	0.326
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 0		ECI 1	9400	1880	1	22.24	23.30	1.276	-	-	0.08	0.148	0.189
64	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 0		ECI 1	9400	1880	1	22.24	23.30	1.276	-	-	-0.19	0.283	**0.361**
	LTE Band 2	20M	QPSK	1	0	-	Front	15mm	Ant 1		ECI 1	18900	1880	1	21.18	21.80	1.153	-	-	-0.16	0.222	0.256
	LTE Band 2	20M	QPSK	1	0	-	Back	15mm	Ant 1		ECI 1	18900	1880	1	21.18	21.80	1.153	-	-	0.04	0.227	0.262
	LTE Band 2	20M	QPSK	50	0	-	Front	15mm	Ant 1		ECI 1	18900	1880	1	21.13	21.80	1.167	-	-	0.12	0.226	0.264
	LTE Band 2	20M	QPSK	50	0	-	Back	15mm	Ant 1		ECI 1	18900	1880	1	21.13	21.80	1.167	-	-	-0.13	0.233	0.272
	LTE Band 2	20M	QPSK	1	0	-	Front	15mm	Ant 0		ECI 1	18900	1880	1	22.06	22.80	1.186	-	-	-0.1	0.130	0.154
65	LTE Band 2	20M	QPSK	1	0	-	Back	15mm	Ant 0		ECI 1	18900	1880	1	22.06	22.80	1.186	-	-	-0.13	0.236	**0.280**
	LTE Band 2	20M	QPSK	50	0	-	Front	15mm	Ant 0		ECI 1	18900	1880	1	22.05	22.80	1.189	-	-	-0.1	0.128	0.152
	LTE Band 2	20M	QPSK	50	0	-	Back	15mm	Ant 0		ECI 1	18900	1880	1	22.05	22.80	1.189	-	-	-0.19	0.230	0.273
	LTE Band 2	20M	QPSK	1	0	-	Front	15mm	Ant 4		ECI 1	18900	1880	1	22.02	23.30	1.343	-	-	0.07	0.077	0.103
	LTE Band 2	20M	QPSK	1	0	-	Back	15mm	Ant 4		ECI 1	18900	1880	1	22.02	23.30	1.343	-	-	0.01	0.125	0.168
	LTE Band 2	20M	QPSK	50	0	-	Front	15mm	Ant 4		ECI 1	18900	1880	1	20.98	22.30	1.355	-	-	-0.03	0.053	0.072
	LTE Band 2	20M	QPSK	50	0	-	Back	15mm	Ant 4		ECI 1	18900	1880	1	20.98	22.30	1.355	-	-	0.06	0.100	0.136
2600MHz																						
	LTE Band 7	20M	QPSK	1	0	-	Front	15mm	Ant 1		ECI 1	21100	2535	1	17.29	17.80	1.125	-	-	-0.13	0.140	0.157
66	LTE Band 7	20M	QPSK	1	0	-	Back	15mm	Ant 1		ECI 1	21100	2535	1	17.29	17.80	1.125	-	-	0.09	0.255	**0.287**
	LTE Band 7C	20M	QPSK	1	0	-	Back	15mm	Ant 1		ECI 1	21100+ 20902	2535+ 2515.2	1	16.83	17.80	1.250	-	-	0.16	0.215	0.269
	LTE Band 7	20M	QPSK	50	0	-	Front	15mm	Ant 1		ECI 1	21100	2535	1	17.22	17.80	1.143	-	-	0.19	0.136	0.155
	LTE Band 7	20M	QPSK	50	0	-	Back	15mm	Ant 1		ECI 1	21100	2535	1	17.22	17.80	1.143	-	-	0.05	0.235	0.269
	LTE Band 7	20M	QPSK	1	0	-	Front	15mm	Ant 0		ECI 1	21100	2535	1	21.90	22.30	1.096	-	-	0.07	0.114	0.125
	LTE Band 7	20M	QPSK	1	0	-	Back	15mm	Ant 0		ECI 1	21100	2535	1	21.90	22.30	1.096	-	-	-0.04	0.169	0.185
	LTE Band 7C	20M	QPSK	1	0	-	Back	15mm	Ant 0		ECI 1	21100+ 20902	2535+ 2515.2	1	21.25	22.30	1.274	-	-	0.07	0.143	0.182
	LTE Band 7	20M	QPSK	50	0	-	Front	15mm	Ant 0		ECI 1	21100	2535	1	21.82	22.30	1.117	-	-	-0.12	0.112	0.125
	LTE Band 7	20M	QPSK	50	0	-	Back	15mm	Ant 0		ECI 1	21100	2535	1	21.82	22.30	1.117	-	-	-0.01	0.165	0.184
	LTE Band 7	20M	QPSK	1	0	-	Front	15mm	Ant 4		ECI 1	21100	2535	1	20.48	21.60	1.294	-	-	0.02	0.062	0.080
	LTE Band 7	20M	QPSK	1	0	-	Back	15mm	Ant 4		ECI 1	21100	2535	1	20.48	21.60	1.294	-	-	0.13	0.177	0.229
	LTE Band 7	20M	QPSK	50	0	-	Front	15mm	Ant 4		ECI 1	21100	2535	1	20.47	21.60	1.297	-	-	0.18	0.066	0.086
	LTE Band 7	20M	QPSK	50	0	-	Back	15mm	Ant 4		ECI 1	21100	2535	1	20.47	21.60	1.297	-	-	-0.06	0.193	0.250
	LTE Band 7C	20M	QPSK	1	0	-	Back	15mm	Ant 4		ECI 1	21100+	2535+	1	20.41	21.60	1.315	-	-	-0.19	0.182	0.239

												20902	2515.2									
	LTE Band 41	20M	QPSK	1	0	-	Front	15mm	Ant 1		ECI 1	40620	2593	1	19.03	19.80	1.194	62.9	1.006	0.07	0.119	0.143
67	LTE Band 41	20M	QPSK	1	0	-	Back	15mm	Ant 1		ECI 1	40620	2593	1	19.03	19.80	1.194	62.9	1.006	-0.19	0.239	**0.287**
	LTE Band 41	20M	QPSK	50	0	-	Front	15mm	Ant 1		ECI 1	40620	2593	1	18.96	19.80	1.213	62.9	1.006	-0.04	0.115	0.140
	LTE Band 41	20M	QPSK	50	0	-	Back	15mm	Ant 1		ECI 1	40620	2593	1	18.96	19.80	1.213	62.9	1.006	-0.17	0.206	0.251
	LTE Band 41	20M	QPSK	1	0	-	Front	15mm	Ant 0		ECI 1	40620	2593	1	23.44	23.80	1.086	62.9	1.006	-0.1	0.102	0.111
	LTE Band 41	20M	QPSK	1	0	-	Back	15mm	Ant 0		ECI 1	40620	2593	1	23.44	23.80	1.086	62.9	1.006	-0.19	0.145	0.158
	LTE Band 41	20M	QPSK	50	0	-	Front	15mm	Ant 0		ECI 1	40620	2593	1	23.40	23.80	1.096	62.9	1.006	0.04	0.101	0.111
	LTE Band 41	20M	QPSK	50	0	-	Back	15mm	Ant 0		ECI 1	40620	2593	1	23.40	23.80	1.096	62.9	1.006	0.11	0.143	0.158
	LTE Band 41	20M	QPSK	1	0	-	Front	15mm	Ant 4		ECI 1	40620	2593	1	22.80	23.60	1.202	62.9	1.006	0.16	0.068	0.082
	LTE Band 41	20M	QPSK	1	0	-	Back	15mm	Ant 4		ECI 1	40620	2593	1	22.80	23.60	1.202	62.9	1.006	0.11	0.182	0.220
	LTE Band 41	20M	QPSK	50	0	-	Front	15mm	Ant 4		ECI 1	40620	2593	1	22.28	23.10	1.208	62.9	1.006	-0.03	0.065	0.079
	LTE Band 41	20M	QPSK	50	0	-	Back	15mm	Ant 4		ECI 1	40620	2593	1	22.28	23.10	1.208	62.9	1.006	-0.1	0.179	0.217
	FR1 n7	50M	QPSK	1	1	DFT-15	Front	15mm	Ant 1		ECI 1	507000	2535	1	16.93	17.70	1.194	-	-	0.06	0.108	0.129
	FR1 n7	50M	QPSK	1	1	DFT-15	Back	15mm	Ant 1		ECI 1	507000	2535	1	16.93	17.70	1.194	-	-	-0.11	0.188	0.224
	FR1 n7	50M	QPSK	135	68	DFT-15	Front	15mm	Ant 1		ECI 1	507000	2535	1	16.91	17.70	1.199	-	-	-0.17	0.116	0.139
	FR1 n7	50M	QPSK	135	68	DFT-15	Back	15mm	Ant 1		ECI 1	507000	2535	1	16.91	17.70	1.199	-	-	0.16	0.207	0.248
	FR1 n7	50M	QPSK	1	1	DFT-15	Front	15mm	Ant 0		ECI 1	507000	2535	1	21.22	22.70	1.406	-	-	0.06	0.120	0.169
	FR1 n7	50M	QPSK	1	1	DFT-15	Back	15mm	Ant 0		ECI 1	507000	2535	1	21.22	22.70	1.406	-	-	-0.03	0.153	0.215
	FR1 n7	50M	QPSK	135	68	DFT-15	Front	15mm	Ant 0		ECI 1	507000	2535	1	20.99	22.70	1.483	-	-	-0.16	0.122	0.181
	FR1 n7	50M	QPSK	135	68	DFT-15	Back	15mm	Ant 0		ECI 1	507000	2535	1	20.99	22.70	1.483	-	-	-0.01	0.157	0.233
	FR1 n7	50M	QPSK	1	1	DFT-15	Front	15mm	Ant 4		ECI 1	507000	2535	1	20.59	22.00	1.384	-	-	-0.13	0.094	0.130
68	FR1 n7	50M	QPSK	1	1	DFT-15	Back	15mm	Ant 4		ECI 1	507000	2535	1	20.59	22.00	1.384	-	-	0.12	0.247	**0.342**
	FR1 n7	50M	QPSK	135	68	DFT-15	Front	15mm	Ant 4		ECI 1	507000	2535	1	20.57	22.00	1.390	-	-	-0.1	0.093	0.129
	FR1 n7	50M	QPSK	135	68	DFT-15	Back	15mm	Ant 4		ECI 1	507000	2535	1	20.57	22.00	1.390	-	-	-0.12	0.211	0.293
	FR1 n41	100M	QPSK	1	1	DFT-30	Front	15mm	Ant 1		ECI 1	518598	2592.99	1	17.15	18.20	1.274	-	-	0.17	0.151	0.192
	FR1 n41	100M	QPSK	1	1	DFT-30	Back	15mm	Ant 1		ECI 1	518598	2592.99	1	17.15	18.20	1.274	-	-	-0.02	0.254	0.323
	FR1 n41	100M	QPSK	135	69	DFT-30	Front	15mm	Ant 1		ECI 1	518598	2592.99	1	17.05	18.20	1.303	-	-	0.13	0.148	0.193
	FR1 n41	100M	QPSK	135	69	DFT-30	Back	15mm	Ant 1		ECI 1	518598	2592.99	1	17.05	18.20	1.303	-	-	-0.16	0.217	0.283
	FR1 n41	100M	QPSK	1	1	DFT-30	Front	15mm	Ant 0		ECI 1	518598	2592.99	1	21.20	22.20	1.259	-	-	-0.15	0.121	0.152
	FR1 n41	100M	QPSK	1	1	DFT-30	Back	15mm	Ant 0		ECI 1	518598	2592.99	1	21.20	22.20	1.259	-	-	0.09	0.152	0.191
	FR1 n41	100M	QPSK	135	69	DFT-30	Front	15mm	Ant 0		ECI 1	518598	2592.99	1	21.15	22.20	1.274	-	-	0.07	0.130	0.166
	FR1 n41	100M	QPSK	135	69	DFT-30	Back	15mm	Ant 0		ECI 1	518598	2592.99	1	21.15	22.20	1.274	-	-	-0.1	0.164	0.209
	FR1 n41	100M	QPSK	1	1	DFT-30	Front	15mm	Ant 4		ECI 1	518598	2592.99	1	20.66	22.00	1.361	-	-	-0.02	0.089	0.121
	FR1 n41	100M	QPSK	1	1	DFT-30	Back	15mm	Ant 4		ECI 1	518598	2592.99	1	20.66	22.00	1.361	-	-	0.08	0.212	0.289
	FR1 n41	100M	QPSK	135	69	DFT-30	Front	15mm	Ant 4		ECI 1	518598	2592.99	1	20.64	22.00	1.368	-	-	-0.17	0.111	0.152
69	FR1 n41	100M	QPSK	135	69	DFT-30	Back	15mm	Ant 4		ECI 1	518598	2592.99	1	20.64	22.00	1.368	-	-	-0.15	0.250	**0.342**

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Headset	Power State	Ch.	Freq. (MHz)	Sample	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)
2450MHz																		
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Ant 7		Standalone	11	2462	1	17.60	18.00	1.096	100	1.000	-0.09	0.109	0.120
70	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 7		Standalone	11	2462	1	17.60	18.00	1.096	100	1.000	0.08	0.120	**0.132**
	Bluetooth	DH5 1Mbps	Front	15mm	Ant 7		Full	39	2441	1	12.20	14.00	1.514	76.6	1.305	0.13	0.021	0.041
71	Bluetooth	DH5 1Mbps	Back	15mm	Ant 7		Full	39	2441	1	12.20	14.00	1.514	76.6	1.305	-0.06	0.033	**0.064**
5000MHz																		
	WLAN5.3GHz	802.11n-HT40 MCS0	Front	15mm	Ant 7		Standalone	54	5270	1	15.52	17.50	1.578	94.74	1.056	-0.13	0.114	0.190
72	WLAN5.3GHz	802.11n-HT40 MCS0	Back	15mm	Ant 7		Standalone	54	5270	1	15.52	17.50	1.578	94.74	1.056	-0.18	0.378	**0.630**
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Front	15mm	Ant 7		Standalone	122	5610	1	15.65	17.50	1.531	90.56	1.104	-0.05	0.087	0.147
73	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 7		Standalone	122	5610	1	15.65	17.50	1.531	90.56	1.104	-0.08	0.387	**0.654**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	15mm	Ant 7		Standalone	155	5775	1	15.53	17.50	1.574	90.56	1.104	0.06	0.092	0.160
74	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 7		Standalone	155	5775	1	15.53	17.50	1.574	90.56	1.104	-0.02	0.382	**0.664**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 7		Standalone	155	5775	2	15.53	17.50	1.574	90.56	1.104	0.09	0.371	0.645

15.4 Product specific 10g SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	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)
75	FR1 n41	100M	QPSK	1	1	DFT-30	Top Side	0mm	Ant 1	ECI 1	518598	2592.99	1	17.15	18.20	1.274	-	-	0.08	0.870	**1.108**
	FR1 n41	100M	QPSK	135	69	DFT-30	Top Side	0mm	Ant 1	ECI 1	518598	2592.99	1	17.05	18.20	1.303	-	-	-0.08	0.863	1.125

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	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)
	WLAN5.3GHz	802.11n-HT40 MCS0	Front	0mm	Ant 7	Standalone	54	5270	1	15.52	17.50	1.578	94.74	1.056	0.18	0.619	1.031
	WLAN5.3GHz	802.11n-HT40 MCS0	Back	0mm	Ant 7	Standalone	54	5270	1	15.52	17.50	1.578	94.74	1.056	0.05	0.770	1.283
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 7	Standalone	54	5270	1	15.52	17.50	1.578	94.74	1.056	-0.02	0.616	1.026
76	WLAN5.3GHz	802.11n-HT40 MCS0	Top Side	0mm	Ant 7	Standalone	54	5270	1	15.52	17.50	1.578	94.74	1.056	0.07	0.989	**1.648**
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Front	0mm	Ant 7	Standalone	122	5610	1	15.65	17.50	1.531	90.56	1.104	0.02	0.377	0.637
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 7	Standalone	122	5610	1	15.65	17.50	1.531	90.56	1.104	0.06	0.624	1.055
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 7	Standalone	122	5610	1	15.65	17.50	1.531	90.56	1.104	0.04	0.447	0.755
77	WLAN5.5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Ant 7	Standalone	122	5610	1	15.65	17.50	1.531	90.56	1.104	-0.19	0.980	**1.656**
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Ant 7	Standalone	122	5610	2	15.65	17.50	1.531	90.56	1.104	0.08	0.926	1.565

15.5 Repeated SAR Measurement

<1g>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	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)	Ratio	Reported 1g SAR (W/kg)
1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 1	ECI 2	1413	1732.6	1	18.10	18.80	1.175	-	-	0.04	0.828	1	0.973
2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 1	ECI 2	1413	1732.6	1	18.10	18.80	1.175	-	-	0.05	0.815	1.016	0.958
1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 1	ECI 2	9400	1880	1	16.82	17.80	1.253	-	-	-0.05	0.806	1.000	1.010
2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 1	ECI 2	9400	1880	1	16.82	17.80	1.253	-	-	0.03	0.801	1.006	1.004
1st	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	39750	2506	1	15.98	16.80	1.208	62.9	1.006	-0.15	0.804	1.000	0.977
2nd	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	39750	2506	1	15.98	16.80	1.208	62.9	1.006	0.09	0.796	1.010	0.967
1st	WLAN2.4GHz	-	-	-	-	802.11b 1Mbps	Left Cheek	0mm	Ant 7	Standalone	6	2437	1	17.05	17.50	1.109	100	1.000	0.04	0.991	1.000	1.099
2nd	WLAN2.4GHz	-	-	-	-	802.11b 1Mbps	Left Cheek	0mm	Ant 7	Standalone	6	2437	1	17.05	17.50	1.109	100	1.000	0.02	0.980	1.011	1.087
1st	WLAN5.3GHz	-	-	-	-	802.11n-HT40 MCS0	Back	10mm	Ant 7	Hotspot on	46	5230	1	14.28	16.00	1.486	94.74	1.056	-0.08	0.504	1.000	0.791
2nd	WLAN5.3GHz	-	-	-	-	802.11n-HT40 MCS0	Back	10mm	Ant 7	Hotspot on	46	5230	1	14.28	16.00	1.486	94.74	1.056	-0.02	0.493	1.022	0.774

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. The ratio is the difference in percentage between original and repeated *measured SAR*.
5. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

16. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	Portable Handset			
		Head	Body-worn	Hotspot	Product specific 10g SAR
1.	WWAN + WLAN2.4GHz	Yes	Yes	Yes	Yes
2.	WWAN + WLAN5GHz	Yes	Yes	Yes	Yes
3.	WWAN + Bluetooth	Yes	Yes	Yes	Yes
4.	WLAN 5GHz + Bluetooth	Yes	Yes	Yes	Yes
5.	WWAN + WLAN 5GHz + Bluetooth	Yes	Yes	Yes	Yes
6.	WWAN + WLAN2.4GHz+NFC				Yes
7.	WWAN + WLAN5GHz+NFC				Yes
8.	WWAN + Bluetooth+NFC				Yes
9.	WLAN 5GHz + Bluetooth+NFC				Yes
10.	WWAN + WLAN 5GHz + Bluetooth+NFC				Yes

General Note:

1. This device supports VoIP in GPRS, EGPRS, WCDMA, LTE and 5GNR (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
2. WWAN above includes 5G NR bands and EN-DC combination.
3. EUT will choose each GSM, WCDMA, LTE and 5GNR according to the network signal condition; therefore, they will not operate simultaneously at any moment.
4. For EN-DC mode, MediaTek TA-SAR algorithm in WWAN adds directly the time-averaged RF exposure from 4G(LTE) and time-averaged RF exposure from 5G NR. TA-SAR algorithm controls the total RF exposure from both 4G and 5G NR to not exceed SAR exposure limit. Therefore, simultaneous transmission compliance between 4G+5G NR operation is demonstrated in the Part 2 Report during algorithm validation. In this Report, simultaneous transmission compliance was evaluated individually with other Radios (WLAN or BT) using one of 4G or 5G NR.
5. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
6. This device 5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WLAN Direct (GC/GO), and 5.3GHz / 5.5GHz supports WLAN Direct (GC only).
7. The worst case 5 GHz WLAN SAR for each configuration was used for SAR summation.
8. According to the EUT characteristic, WLAN 2.4GHz and Bluetooth cannot transmit simultaneously.
9. According to the EUT characteristic, WLAN 5GHz and Bluetooth can transmit simultaneously.
10. According to the EUT characteristic, WLAN 5GHz and WLAN 2.4GHz cannot transmit simultaneously.
11. NFC can transmit simultaneously with other Radios in extremity exposure condition.
12. When stand-alone SAR is not required for a transmitter or antenna, its SAR is considered zero in the SAR summing process to assess Multi-band transmission SAR compliance.
13. The maximum SAR summation is calculated based on the same configuration and test position.
14. For standalone WWAN, always choose the highest SAR among all the selected WWAN bands within the selected antenna for each exposure position to perform simultaneous transmission analysis with WLAN/BT. This is the worst co-located analysis and can represent each band.
15. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
    i) 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/kg.
    ii) SPLSR = (SAR1 + SAR2)^1.5 / (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.
    iii) If SPLSR ≤ 0.04 for 1g SAR and SPLSR≤ 0.10 for 10g SAR, simultaneously transmission SAR measurement is not necessary.
    iv) Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg and 10g SAR < 4.0W/kg.

16.1 5G NR + LTE + WLAN + BT Sim-Tx analysis

In 5G NR + LTE + WLAN + BT simultaneous transmission, 5G NR and LTE transmission are managed and controlled by MediaTek TA-SAR, while the RF exposure from WLAN and BT radios is managed using legacy approach, i.e., through a fixed power back-off if needed.

Since WLAN and BT do not employ time-averaging, 1gSAR and 10gSAR measurement for WLAN and BT need to be conducted at their corresponding rated power following current FCC test procedures to determine reported SAR values.

TA-SAR current implementation assumes hotspots from 5G NR and LTE are collocated. Therefore, for a total of 100% exposure margin, if LTE uses x, then the exposure margin left for 5G NR is capped to y. Thus, the compliance equation for LTE + 5G NR is

$$x*A + y*B + m \le 1$$
$$x + y = g \le 1$$
$$g + m \le 1$$

Where, A is normalized reported time-averaged SAR exposure ratio from LTE, and A ≤ 1.0; B is normalized reported time-averaged exposure ratio from 5G NR (i.e., PD exposure for 5G FR2 or SAR exposure for 5G FR1), and B ≤1.0.

Let m = normalized reported SAR exposure ratio from WLAN+BT, then for compliance,

$$x * A + y * B + m \le 1.0 \quad (1)$$

$$x * A + y * B \le x * \max(A, B) + (g-x) * \max(A, B) \le \max(A, B)$$

$$x * A + (g-x) * B + m \le \max(A, B) + m \le 1.0 \quad (2)$$

If A + m ≤ 1.0 and B + m ≤ 1.0 can be proven, then “x * A + y * B + m ≤ 1.0”. Therefore simultaneous transmission analysis for 5G NR + LTE + WLAN + BT can be performed in two steps

Step 1: Prove total exposure ratio (TER) of LTE + WLAN + BT < 1
Step 2: Prove total exposure ratio (TER) of 5G NR + WLAN + BT < 1

Else, if A + m > 1.0 and/or B + m > 1.0, then the followings need to hold true for compliance:
i. A and m are decoupled based on the SPLSR criteria, and
ii. y * B + m ≤ 1.0, and
iii. x% * A + y * B ≤ 1.0
Note iii. is covered in Part 2 report; i. and ii. should be addressed in Part 2 report.

16.2 Head Exposure Conditions

WWAN Bands	Exposure Position	1	3	4	5	1+3	1+4+5
		WWAN	WLAN2.4GHz Ant 7	WLAN5GHz Ant 7	Bluetooth Ant 7	Summed	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
Ant 0	Right Cheek	0.515	0.378	0.311	0.194	0.89	1.02
	Right Tilted	0.201	0.403	0.348	0.194	0.60	0.74
	Left Cheek	0.256	0.435	0.494	0.391	0.69	1.14
	Left Tilted	0.173	0.636	0.602	0.296	0.81	1.07
Ant 1	Right Cheek	0.866	0.378	0.311	0.194	1.24	1.37
	Right Tilted	1.010	0.403	0.348	0.194	**1.41**	**1.55**
	Left Cheek	0.569	0.435	0.494	0.391	1.00	1.45
	Left Tilted	0.613	0.636	0.602	0.296	1.25	1.51
Ant 4	Right Cheek	0.897	0.378	0.311	0.194	1.28	1.40
	Right Tilted	0.394	0.403	0.348	0.194	0.80	0.94
	Left Cheek	0.436	0.435	0.494	0.391	0.87	1.32
	Left Tilted	0.234	0.636	0.602	0.296	0.87	1.13

16.3 Hotspot Exposure Conditions

WWAN Bands	Exposure Position	1	3	4	5	1+3	1+4+5
		WWAN	WLAN2.4GHz Ant 7	WLAN5GHz Ant 7	Bluetooth Ant 7	Summed	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
Ant 0	Front	0.194	0.224	0.232	0.083	0.42	0.51
	Back	0.393	0.289	0.791	0.127	0.68	1.31
	Left side	0.193				0.19	0.19
	Right side	0.164	0.096	0.424	0.041	0.26	0.63
	Top side		0.250	0.732	0.119	0.25	0.85
	Bottom side	0.549				0.55	0.55
Ant 1	Front	0.335	0.224	0.232	0.083	0.56	0.65
	Back	0.389	0.289	0.791	0.127	0.68	1.31
	Left side	0.188				0.19	0.19
	Right side		0.096	0.424	0.041	0.10	0.47
	Top side	0.705	0.250	0.732	0.119	0.96	1.56
	Bottom side					0.00	0.00
Ant 4	Front	0.141	0.224	0.232	0.083	0.37	0.46
	Back	0.490	0.289	0.791	0.127	0.78	1.41
	Left side	0.336				0.34	0.34
	Right side		0.096	0.424	0.041	0.10	0.47
	Top side	0.113	0.250	0.732	0.119	0.36	0.96
	Bottom side					0.00	0.00

16.4 Body-Worn Accessory Exposure Conditions

WWAN Bands	Exposure Position	1	3	4	5	1+3	1+4+5
		WWAN	WLAN2.4GHz Ant 7	WLAN5GHz Ant 7	Bluetooth Ant 7	Summed	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
Ant 0	Front	0.189	0.120	0.190	0.041	0.31	0.42
	Back	0.361	0.132	0.664	0.064	0.49	1.09
Ant 1	Front	0.322	0.120	0.190	0.041	0.44	0.55
	Back	0.326	0.132	0.664	0.064	0.46	1.05
Ant 4	Front	0.152	0.120	0.190	0.041	0.27	0.38
	Back	0.342	0.132	0.664	0.064	0.47	1.07

16.5 Product specific 10g SAR Exposure Conditions

Remark:

1. For WLAN2.4G/Bluetooth Product specific 10g stand-alone SAR is not required for a transmitter or antenna, due to 1g hotspot SAR is <1.2W/kg.
2. The unit of SAR evaluation is W/kg.

WWAN Bands	Exposure Position	1	4	5	1+4+5
		WWAN	WLAN5GHz Ant 7	NFC	Summed
		10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)
Ant 0	Front		1.031		1.03
	Back		1.283	0.003	1.29
	Left side				0.00
	Right side		1.026		1.03
	Top side		1.656		1.66
	Bottom side				0.00
Ant 1	Front		1.031		1.03
	Back		1.283	0.003	1.29
	Left side				0.00
	Right side		1.026		1.03
	Top side	1.125	1.656		**2.78**
	Bottom side				0.00
Ant 4	Front		1.031		1.03
	Back		1.283	0.003	1.29
	Left side				0.00
	Right side		1.026		1.03
	Top side		1.656		1.66
	Bottom side				0.00

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17. Uncertainty Assessment

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg and highest measured 10-g SAR is less 3.75W/kg. Therefore, the measurement uncertainty table is not required in this report.

18. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013

[4] SPEAG DASY System Handbook

[5] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[6] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.

[7] FCC KDB 648474 D04 v01r03, “SAR Evaluation Considerations for Wireless Handsets”, Oct 2015.

[8] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.

[9] FCC KDB 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, Oct 2015

[10] FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015

[11] FCC KDB 941225 D05A v01r02, “Rel. 10 LTE SAR Test Guidance and KDB Inquiries”, Oct 2015

[12] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.

[13] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

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