



# FCC SAR TEST REPORT

**FCC ID** : IHDT56YG2  
**Equipment** : Mobile Cellular Phone  
**Brand Name** : Motorola  
**Applicant** : Motorola Mobility LLC  
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA  
**Manufacturer** : Motorola Mobility LLC  
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA  
**Standard** : FCC 47 CFR Part 2 (2.1093)  
ANSI/IEEE C95.1-1992  
IEEE 1528-2013

The product was received on Jul. 29, 2019 and testing was started from Jul. 31, 2019 and completed on Aug. 14, 2019. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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



Approved by: Cona Huang / Deputy Manager

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Table of Contents

1. Statement of Compliance ..... 4
2. Guidance Applied..... 4
3. Equipment Under Test (EUT) Information ..... 5
3.1 General Information ..... 5
3.2 Maximum Tune-up Limit..... 7
3.3 General LTE SAR Test and Reporting Considerations ..... 8
4. Proximity Sensor Triggering Test.....10
5. RF Exposure Limits.....15
5.1 Uncontrolled Environment.....15
5.2 Controlled Environment.....15
6. Specific Absorption Rate (SAR).....16
6.1 Introduction .....16
6.2 SAR Definition.....16
7. System Description and Setup .....17
7.1 E-Field Probe .....18
7.2 Data Acquisition Electronics (DAE) .....18
7.3 Phantom.....19
7.4 Device Holder.....20
8. Measurement Procedures .....21
8.1 Spatial Peak SAR Evaluation .....21
8.2 Power Reference Measurement.....22
8.3 Area Scan .....22
8.4 Zoom Scan.....23
8.5 Volume Scan Procedures .....23
8.6 Power Drift Monitoring.....23
9. Test Equipment List .....24
10. System Verification .....25
10.1 Tissue Simulating Liquids.....25
10.2 Tissue Verification .....26
10.3 System Performance Check Results.....27
11. RF Exposure Positions .....29
11.1 Ear and handset reference point .....29
11.2 Definition of the cheek position.....30
11.3 Definition of the tilt position.....31
11.4 Body Worn Accessory .....31
11.5 Product Specific Exposure .....32
11.6 Wireless Router.....32
12. Conducted RF Output Power (Unit: dBm).....33
13. Antenna Location .....114
14. SAR Test Results .....115
14.1 Head SAR .....117
14.2 Hotspot SAR .....120
14.3 Body Worn Accessory SAR .....124
14.4 Product Specific SAR .....128
14.5 Repeated SAR Measurement .....130
15. Simultaneous Transmission Analysis .....131
15.1 Head Exposure Conditions .....132
15.2 Hotspot Exposure Conditions.....133
15.3 Body-Worn Accessory Exposure Conditions .....134
15.4 Product Specific Exposure Conditions .....135
15.5 SPLSR Evaluation and Analysis.....136
16. Supplemental tuner tests results.....141
16.1 Supplemental Head SAR results.....142
16.2 Supplemental Body SAR results .....142
17. Uncertainty Assessment .....145
18. References .....145
Appendix A. Plots of System Performance Check
Appendix B. Plots of High SAR Measurement
Appendix C. DASYS Calibration Certificate
Appendix D. Test Setup Photos





### 1. Statement of Compliance

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

Equipment Class	Frequency Band	Highest SAR Summary				Highest Simultaneous Transmission 1g SAR (W/kg)
		Head (Separation 0mm)	Body-worn (Separation 5mm)	Hotspot (Separation 5mm)	Product Specific (Separation 0mm)	
		1g SAR (W/kg)			10g SAR (W/kg)	
Licensed	GSM850	0.11	0.69	0.69		1.59
	GSM1900	0.17	1.29	1.34	2.35	
	WCDMA II	0.34	1.30	1.32	3.24	
	WCDMA IV	0.25	1.34	1.38	3.58	
	WCDMA V	0.31	1.36	1.36	2.57	
	LTE Band 2	0.20	1.34	1.34	3.48	
	LTE Band 5	0.28	1.35	1.35	1.92	
	LTE Band 7	0.54	1.33	1.33	3.23	
	LTE Band 12/17	0.08	0.89	0.89		
	LTE Band 4/66	0.27	1.31	1.31	2.89	
DTS	2.4GHz WLAN	1.31	1.12	1.12		1.59
NII	5GHz WLAN	0.25	1.38	0.91	2.03	1.38
DSS	Bluetooth	0.15	0.15	0.15		1.51
Date of Testing:		2019/7/31 ~ 2019/8/14				

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test.. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 4.0 W/kg for Product Specific 10g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications

Reviewed by: Jason Wang  
Report Producer: Wan Liu

### 2. 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
- FCC KDB 941225 D07 UMPC Mini Tablet v01r02



### 3. Equipment Under Test (EUT) Information

#### 3.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Cellular Phone
Brand Name	Motorola
FCC ID	IHDT56YG2
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 66: 1710.7 MHz ~ 1779.3 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 ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	GSM/GPRS/EGPRS AMR/RMC 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM, 64QAM WLAN: 802.11a/b/g/n/ac HT20 / HT40 / VHT20 / VHT40 / VHT80 Bluetooth BR/EDR/LE
HW Version	DVT2
SW Version	PPI29.35
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	Identical Prototype
<b>Remark:</b>	
<ol style="list-style-type: none"> <li>This device WLAN 2.4GHz / 5.2GHz / 5.8GHz supports Hotspot operation and Bluetooth support tethering applications.</li> <li>This device implements antenna tuning techniques for WCDMA B2/B4/B5 and LTE B2/B4/B5/B12/B17/B66. Specifically, this technique is employed in the WCDMA and LTE modes. In this report SAR was measured according to the normally required SAR configurations with the tuner active and worst tune state (auto tune) was used for SAR testing. The detail descriptions of the antenna tuner are included in the operational description and supplemental data for additional information on section16.</li> <li>When operating in a body-worn condition, with proximity of the user's body at the front or back of the device, the device operates in the Body-Worn power table. If neither the Body-Worn condition is detected, but the device is operating in WiFi Hotspot mode, the device utilizes the Hotspot power table. When operating in any other radiated condition, the device uses the Default power table.</li> <li>The device employs proximity sensors that detect the presence of the user's body at the front or back faces of the device. The control logic is such that, when this front or back body-worn condition is detected and the device is operating in a mode where on-body operation may be expected, the conducted power is applied in the Body-Worn power table. In this condition (user's body detected at front or back face of the device), the Body-Worn power table is applied regardless whether or not the Wi-Fi hotspot mode is active.</li> <li>Note that the Body-Worn Reduced power tables and detection schemes described above are sufficient to assure that body-worn SAR limits are met, regardless whether the Wi-Fi hotspot feature is active or not. However, because FCC has an additional specific test definition and limit for Wi-Fi hotspot mode operation, the additional Hotspot power table is applied if hand-held operation is indicated (i.e., not At-Head or Body-Worn) when the Wi-Fi hotspot feature is active. This ensures the 4 edges of the device comply with the letter of the Wi-Fi Hotspot requirement.</li> </ol>	



6. The device additionally employs proximity sensors that detect the presence of tissue near the currently active transmit antenna (if that antenna may require reduced power relative the Default power table in order to meet extremity SAR limits). The control logic is such that, if the Body-Worn or WiFi Hotspot conditions are not detected, but tissue (as a finger or hand, for example) is detected near the transmitting antenna, the Handheld power table will be applied

Reduced power for different RF exposure conditions:

Body worn: The device employs proximity sensors that detect the presence of the user’s body at the front or back faces of the device, when operating in near-body condition by end user, the device will reduced maximum output powers on the WCDMA B2 / B4 / B5 and LTE B2 / B4 / B7 / B66 and 5GHz WLAN transmitter and detail descriptions of the power reduction mechanism are included in the operational description.

Hotspot: When the mobile hotspot session is turn on by end user, the device will reduced output powers on the GSM1900, WCDMA B2 / B4 / B5 and LTE B2 / B4 / B7 / B66 and 5GHz WLAN transmitter and detail descriptions of the power reduction mechanism are included in the operational description.

Handheld: The device additionally employs proximity sensors that detect the presence of tissue near the currently active transmit antenna, the device will reduced output powers on the WCDMA B2 / B4, LTE B2 / B4 / B7 / B66 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.

Accessories Information				
Earphone 1	Brand Name	Motorola(Lianyun)	Model Name	SH38C37773
Earphone 2	Brand Name	Motorola(Cosonic)	Model Name	SH38C44959
Earphone 3	Brand Name	Motorola(NEW LEADER)	Model Name	NLD-EM303H-10SF



**3.2 Maximum Tune-up Limit**

<Maximum power for each bands and exposure conditions>

TX. freq.	Default	Head		Body Worn		Hotspot		Product Specific	
	max. tune up limit (dBm)	max. tune up limit(dBm)	power reduction (dB)	max. tune up limit(dBm)	power reduction (dB)	max. tune up limit(dBm)	power reduction (dB)	max. tune up limit(dBm)	power reduction (dB)
GSM850 GSM 1 Tx slot	33.50	33.50	0	33.50	0	33.50	0	33.50	0
GSM850 GPRS 1 Tx slot	33.50	33.50	0	33.50	0	33.50	0	33.50	0
GSM850 GPRS 2 Tx slots	31.50	31.50	0	31.50	0	31.50	0	31.50	0
GSM850 GPRS 3 Tx slots	29.00	29.00	0	29.00	0	29.00	0	29.00	0
GSM850 GPRS 4 Tx slots	27.50	27.50	0	27.50	0	27.50	0	27.50	0
GSM850 EDGE 1 Tx slot	27.50	27.50	0	27.50	0	27.50	0	27.50	0
GSM850 EDGE 2 Tx slots	25.50	25.50	0	25.50	0	25.50	0	25.50	0
GSM850 EDGE 3 Tx slots	23.50	23.50	0	23.50	0	23.50	0	23.50	0
GSM850 EDGE 4 Tx slots	22.00	22.00	0	22.00	0	22.00	0	22.00	0
GSM1900 GSM 1 Tx slot	30.50	30.50	0	30.50	0	28.50	2	30.50	0
GSM1900 GPRS 1 Tx slot	30.50	30.50	0	30.50	0	28.50	2	30.50	0
GSM1900 GPRS 2 Tx slots	28.50	28.50	0	28.50	0	26.00	2.5	28.50	0
GSM1900 GPRS 3 Tx slots	26.50	26.50	0	26.50	0	24.00	2.5	26.50	0
GSM1900 GPRS 4 Tx slots	24.50	24.50	0	24.50	0	22.50	2	24.50	0
GSM1900 EDGE 1 Tx slot	27.00	27.00	0	27.00	0	27.00	0	27.00	0
GSM1900 EDGE 2 Tx slots	25.00	25.00	0	25.00	0	25.00	0	25.00	0
GSM1900 EDGE 3 Tx slots	23.00	23.00	0	23.00	0	23.00	0	23.00	0
GSM1900 EDGE 4 Tx slots	21.00	21.00	0	21.00	0	21.00	0	21.00	0
WCDMA II	24.00	24.00	0	21.00	3	18.00	6	22.00	2
WCDMA VI	24.00	24.00	0	20.00	4	18.00	6	22.00	2
WCDMA V	24.00	24.00	0	23.00	1	23.00	1	23.00	1
LTE B2	24.00	24.00	0	21.50	2.5	18.50	5.5	22.00	2
LTE B5	24.00	24.00	0	24.00	0	24.00	0	24.00	0
LTE B7	24.00	24.00	0	22.00	2	22.00	2	22.50	1.5
LTE B12/17	24.00	24.00	0	24.00	0	24.00	0	24.00	0
LTE B4/B66	24.00	24.00	0	20.50	3.5	18.50	5.5	22.50	1.5

TX. freq.	Default	Head		Body Worn		Hotspot		Product Specific	
	max. tune up limit (dBm)	max. tune up limit(dBm)	power reduction (dB)	max. tune up limit(dBm)	power reduction (dB)	max. tune up limit(dBm)	power reduction (dB)	max. tune up limit(dBm)	power reduction (dB)
WLAN2.4G	19.00	19.00	0	19.00	0	19.00	0	19.00	0
WLAN5.2G	17.00	17.00	0	15.00	2	15.00	2	17.00	0
WLAN5.3G	17.00	17.00	0	17.00	0			17.00	0
WLAN5.5G	16.50	16.50	0	14.00	2.5			16.50	0
WLAN5.8G	16.00	16.00	0	13.00	3	13.00	3	16.00	0
BT	13.00	13.00	0	13.00	0	13.00	0	13.00	0



3.3 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05																																																																										
FCC ID	IHDT56YG2																																																																									
Equipment Name	Mobile Cellular Phone																																																																									
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 66: 1710.7 MHz ~ 1779.3 MHz																																																																									
Channel Bandwidth	LTE Band 02: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 04: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 05: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 07: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 17: 5MHz, 10MHz LTE Band 66: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz																																																																									
uplink modulations used	QPSK / 16QAM / 64QAM																																																																									
LTE Voice / Data requirements	Voice and Data																																																																									
LTE MPR permanently built-in by design	<p align="center"><b>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</b></p> <table border="1"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth / Transmission bandwidth (N<sub>RB</sub>)</th> <th rowspan="2">MPR (dB)</th> </tr> <tr> <th>1.4 MHz</th> <th>3.0 MHz</th> <th>5 MHz</th> <th>10 MHz</th> <th>15 MHz</th> <th>20 MHz</th> </tr> </thead> <tbody> <tr> <td>QPSK</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 3</td> </tr> <tr> <td>256 QAM</td> <td colspan="6" style="text-align: center;">≥ 1</td> <td>≤ 5</td> </tr> </tbody> </table>												Modulation	Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> )						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2	64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3	256 QAM	≥ 1						≤ 5
Modulation	Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> )						MPR (dB)																																																																			
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz																																																																				
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1																																																																			
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1																																																																			
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																																																			
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2																																																																			
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3																																																																			
256 QAM	≥ 1						≤ 5																																																																			
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)																																																																									
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																																																									
Power reduction applied to satisfy SAR compliance	Yes, when operating in hotspot / Body-wron and extremity mode that LTE B2 / B4 / B7 / B66 power reduction applied to satisfy SAR compliance.																																																																									
LTE Carrier Aggregation Combinations	Inter-Band and Intra-Band possible combinations and the detail power measurement please referred to section 12.																																																																									
LTE Carrier Aggregation Additional Information	2This device supports maximum of 2 carriers in the downlink. Additional following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.																																																																									
Transmission (H, M, L) channel numbers and frequencies in each LTE band																																																																										
LTE Band 2																																																																										
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz																																																															
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)																																																														
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860																																																														
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880																																																														
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900																																																														
LTE Band 4																																																																										
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz																																																															
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)																																																														
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720																																																														
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5																																																														
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745																																																														

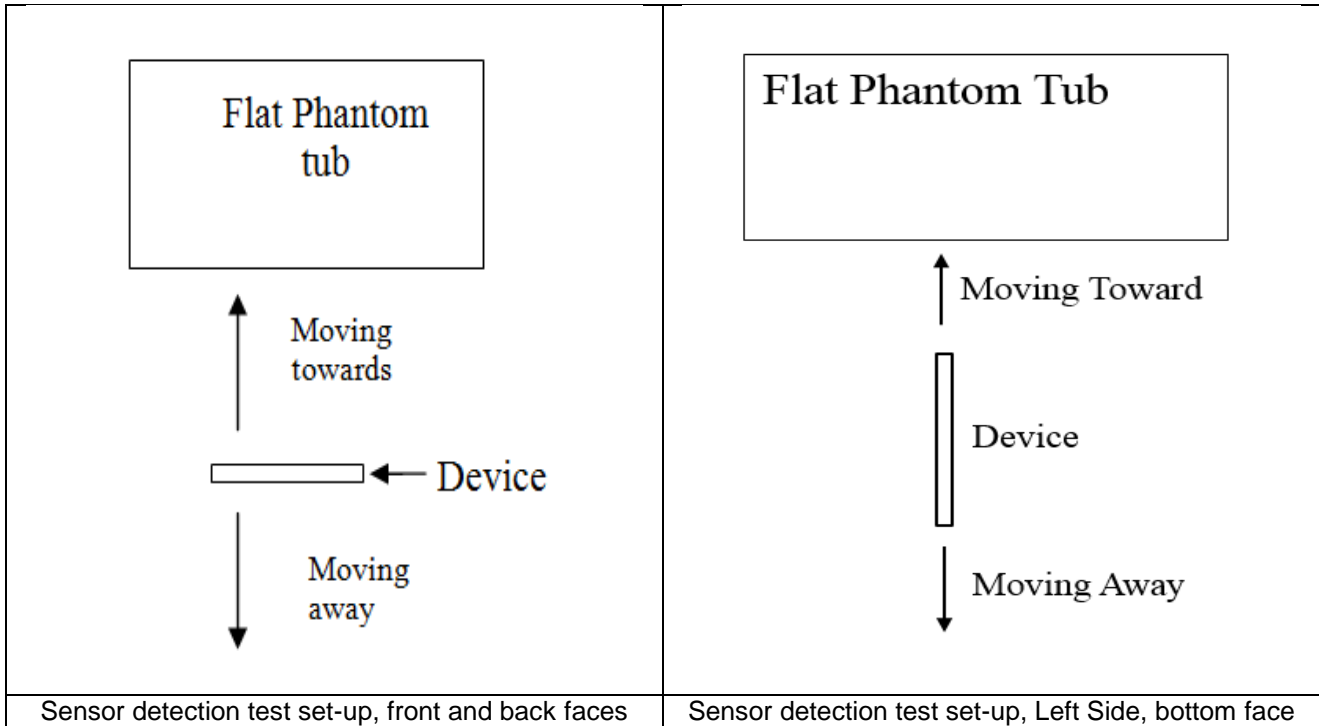


LTE Band 5												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	20407	824.7	20415	825.5	20425	826.5	20450	829				
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5				
H	20643	848.3	20635	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 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 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

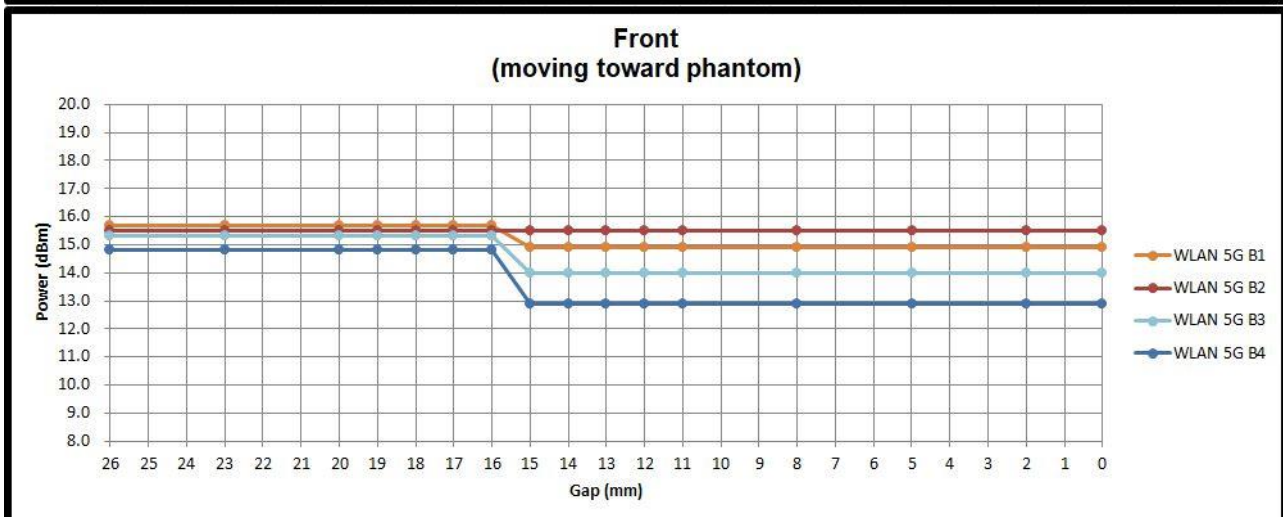
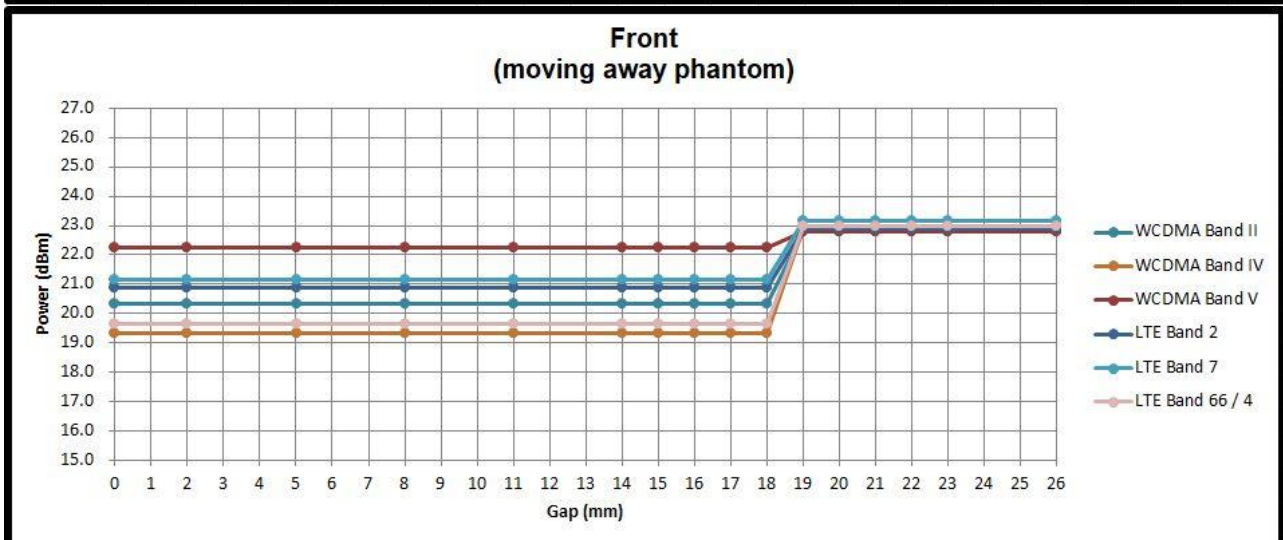
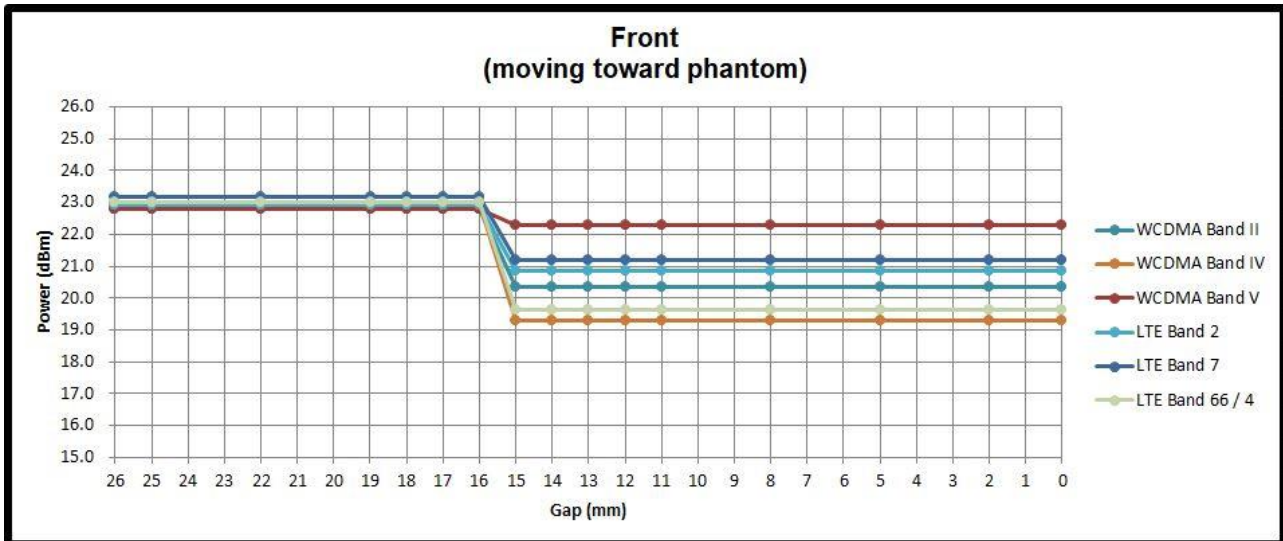
### 4. Proximity Sensor Triggering Test

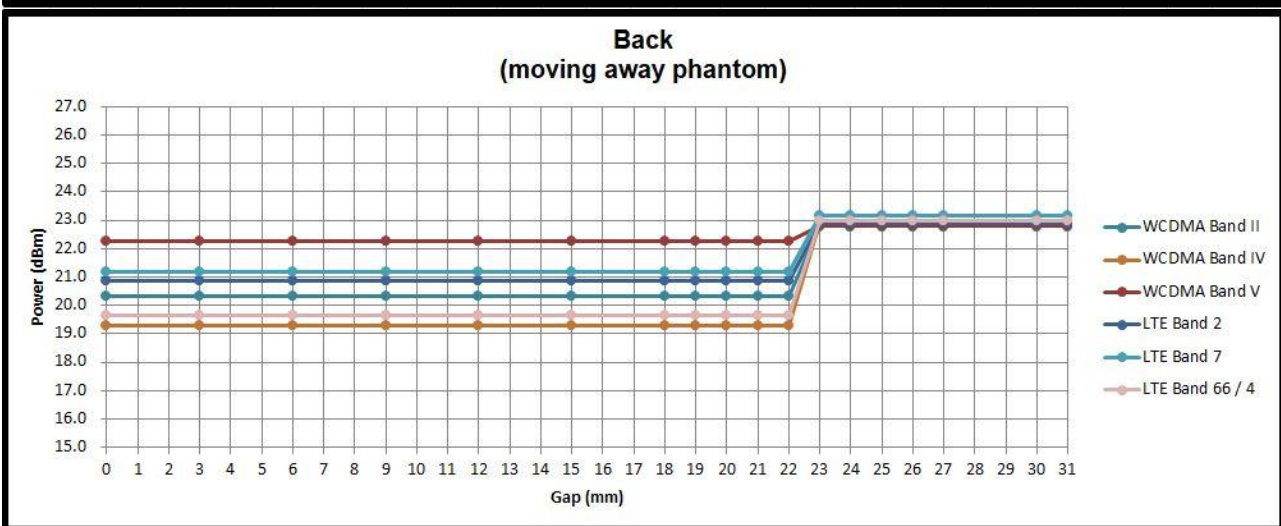
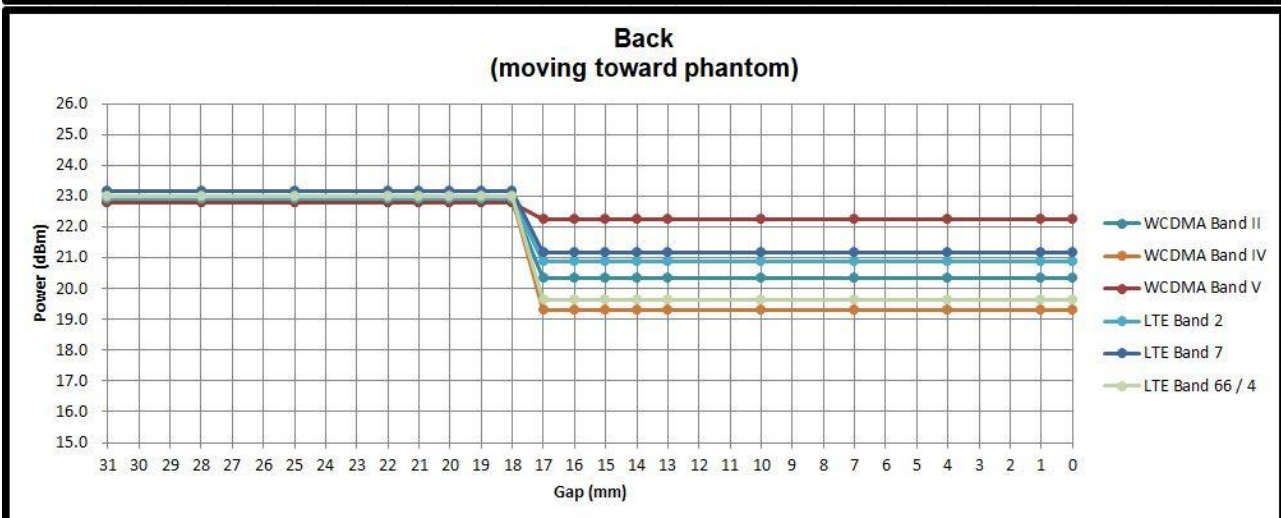
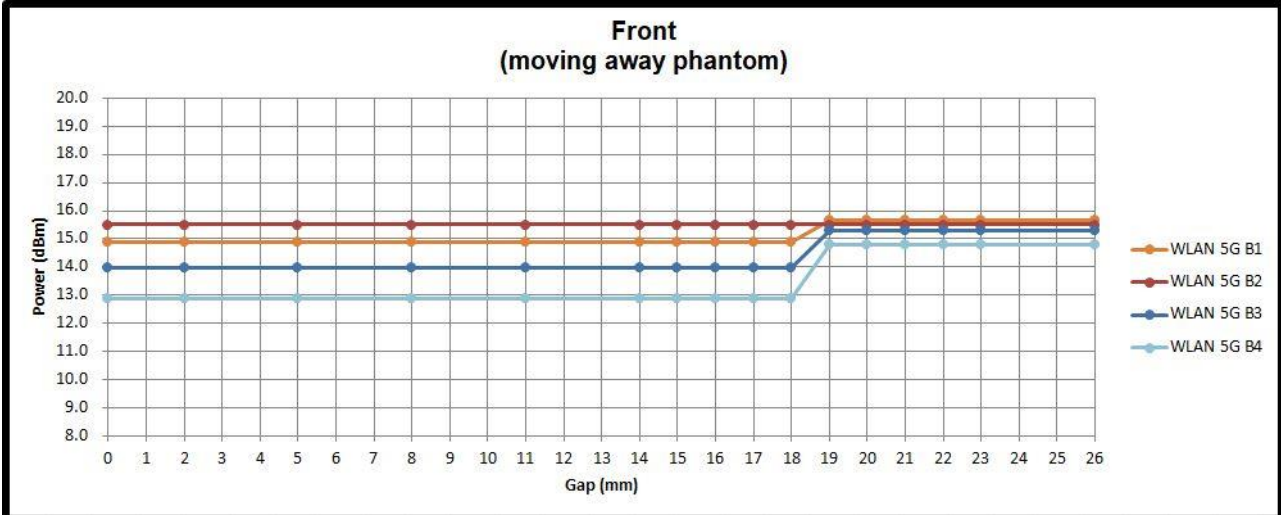
**<Proximity Sensor Triggering Distance>:**

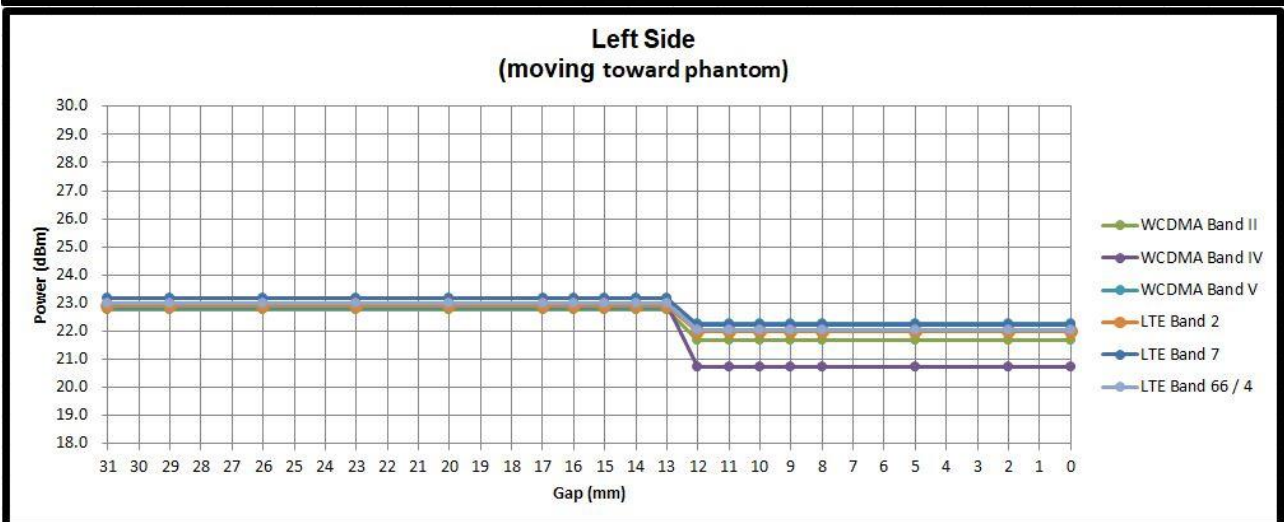
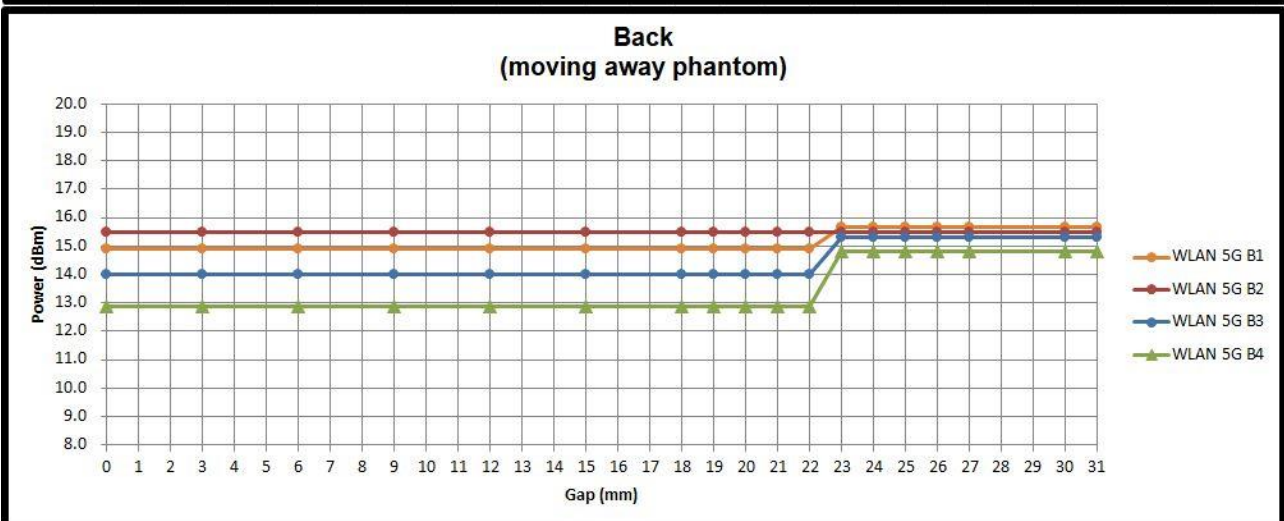
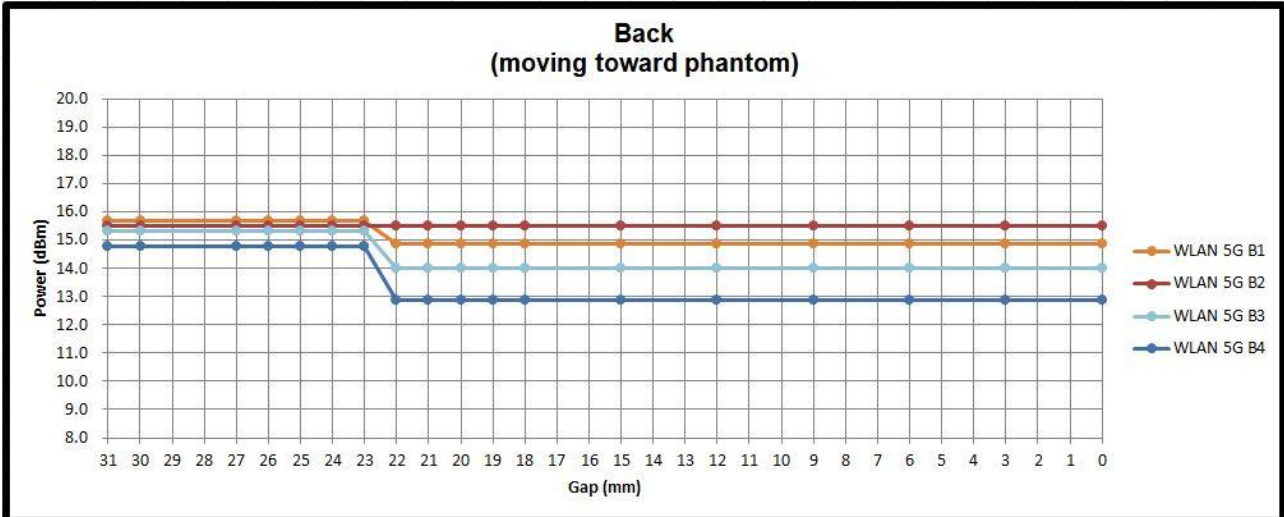
1. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed and the tissue-equivalent medium for highest frequency (2600MHz) and lowest (750MHz) frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensors placed coincident with antenna elements at the top and bottom ends of the phone are utilized to determine when the device comes in proximity of the user's body at the front or back of the device.
3. The output power will reduce to body worn power level when top and bottom sensor pad be detected.
4. The sensors used to detect the proximity of the user's body (Body-Worn condition) at the front or back surface of the device use a detection threshold distance. The data shown in the sections below shows the distance(s).
5. The device additionally employs proximity sensors that detect the presence of tissue near the currently active transmit antenna (if that antenna may require reduced power relative the Default power table in order to meet extremity SAR limits). The control logic is such that, if the Body-Worn, At-Head or WiFi Hotspot conditions are not detected, but tissue (as a finger or hand, for example) is detected near the transmitting antenna, the Handheld Reduced power table will be applied
6. When the sensor is active, the device will reduced maximum output powers on the GSM1900, WCDMA B2 / B4 / B5 and LTE B2 / B4 / B7 / B66 transmitter.

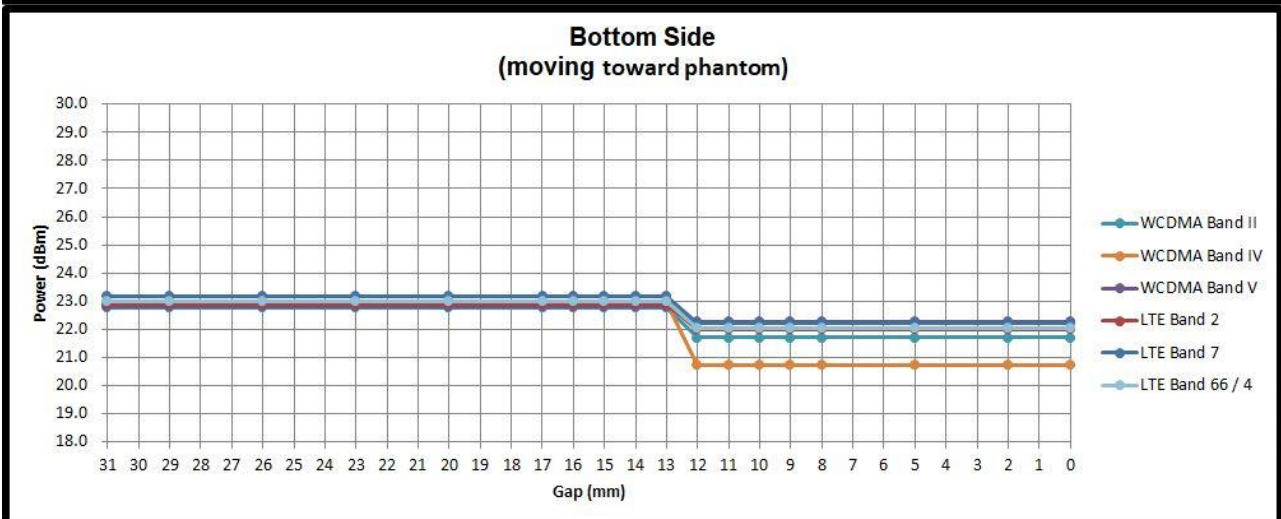


Proximity Sensor Trigger Distance (mm)								
Position	Front		Back		Bottom Side		Left Side	
Position	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	15	18	17	22	12	15	12	15











**5. RF Exposure Limits**

**5.1 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.

**5.2 Controlled Environment**

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

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

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

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

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

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



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

### **6.1 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.

### **6.2 SAR Definition**

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density ( $\rho$ ). The equation description is as below:

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

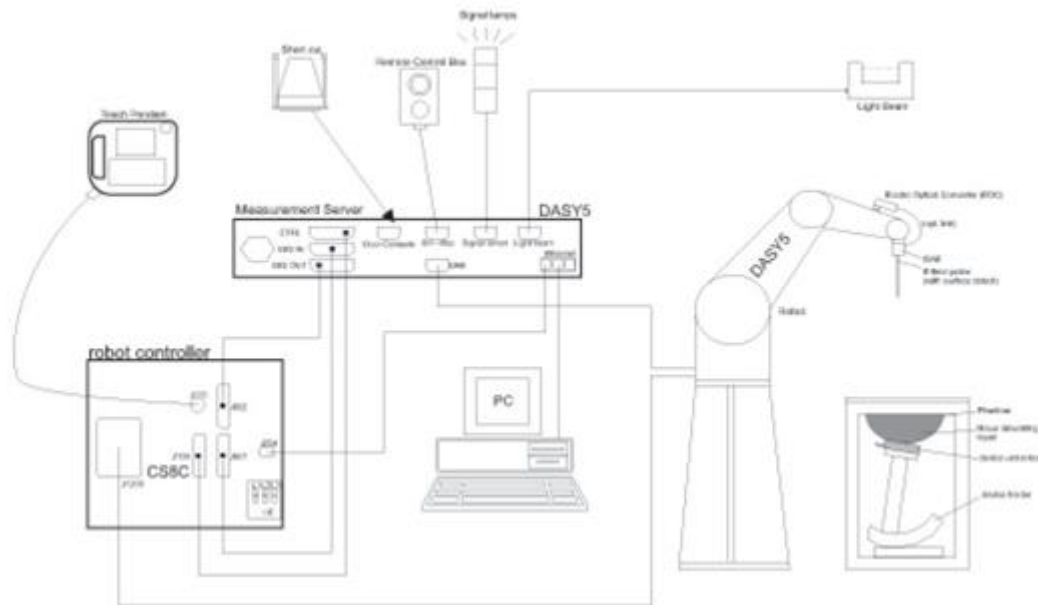
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

## 7. System Description and Setup

The DASY 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 DASY5 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.


**7.1 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.

**<ES3DV3 Probe>**

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

**<EX3DV4 Probe>**

<b>Construction</b>	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
<b>Frequency</b>	10 MHz – >6 GHz Linearity: $\pm 0.2$ dB (30 MHz – 6 GHz)	
<b>Directivity</b>	$\pm 0.3$ dB in TSL (rotation around probe axis) $\pm 0.5$ dB in TSL (rotation normal to probe axis)	
<b>Dynamic Range</b>	10 $\mu$ W/g – >100 mW/g Linearity: $\pm 0.2$ dB (noise: typically <1 $\mu$ W/g)	
<b>Dimensions</b>	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	

**7.2 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.



**Fig 5.1 Photo of DAE**


**7.3 Phantom**

**<SAM Twin Phantom>**

<b>Shell Thickness</b>	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	
<b>Filling Volume</b>	Approx. 25 liters	
<b>Dimensions</b>	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
<b>Measurement Areas</b>	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>**

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

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

## **7.4 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



## **8. 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

### **8.1 Spatial Peak SAR Evaluation**

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

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

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

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

**8.2 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.

**8.3 Area Scan**

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

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

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

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

**8.5 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.

**8.6 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.



**9. Test Equipment List**

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1107	Mar. 08, 2019	Mar. 07, 2020
SPEAG	835MHz System Validation Kit	D835V2	4d167	Mar. 08, 2019	Mar. 07, 2020
SPEAG	1750MHz System Validation Kit	D1750V2	1112	Mar. 07, 2019	Mar. 06, 2020
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Sep. 11, 2018	Sep. 10, 2019
SPEAG	2450MHz System Validation Kit	D2450V2	736	Aug. 31, 2018	Aug. 30, 2019
SPEAG	2600MHz System Validation Kit	D2600V2	1078	Mar. 06, 2019	Mar. 05, 2020
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Sep. 27, 2018	Sep. 26, 2019
SPEAG	Data Acquisition Electronics	DAE3	360	Oct. 29, 2018	Oct. 28, 2019
SPEAG	Data Acquisition Electronics	DAE4	1399	Nov. 16, 2018	Nov. 15, 2019
SPEAG	Dosimetric E-Field Probe	ES3DV3	3169	May. 24, 2019	May. 23, 2020
SPEAG	Dosimetric E-Field Probe	EX3DV4	3642	Apr. 29, 2019	Apr. 28, 2020
SPEAG	Dosimetric E-Field Probe	EX3DV4	3931	Sep. 27, 2018	Sep. 26, 2019
TESTO	Hygro meter	608-H1	34913631	Aug. 27, 2018	Aug. 26, 2019
TESTO	Hygro meter	608-H1	34852481	Sep. 27, 2018	Sep. 26, 2019
RCPTWN	Thermometer	HTC-1	TM685-1	Nov. 12, 2018	Nov. 11, 2019
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Apr. 21, 2019	Apr. 20, 2020
Agilent	Wireless Communication Test Set	E5515C	MY50266977	May. 27, 2019	May. 26, 2020
R&S	BT Base Station	CBT32	100522	Mar. 18, 2019	Mar. 17, 2020
SPEAG	Device Holder	N/A	N/A	N/A	N/A
R&S	Signal Generator	SMA100A	101091	Jul. 03, 2019	Jul. 02, 2020
Agilent	ENA Network Analyzer	E5071C	MY46104758	Sep. 19, 2018	Sep. 18, 2019
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 19, 2018	Sep. 18, 2019
LINE SEIKI	Digital Thermometer	DTM3000-spezial	2942	Dec. 07, 2018	Dec. 06, 2019
Anritsu	Power Meter	ML2495A	1218006	Oct. 08, 2018	Oct. 07, 2019
Anritsu	Power Sensor	MA2411B	1207363	Oct. 08, 2018	Oct. 07, 2019
Anritsu	Power Meter	ML2495A	1419002	May. 29, 2019	May. 28, 2020
Anritsu	Power Sensor	MA2411B	1339124	May. 29, 2019	May. 28, 2020
Agilent	Spectrum Analyzer	E4408B	MY44211028	Aug. 28, 2018	Aug. 27, 2019
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jun. 27, 2019	Jun. 26, 2020
Mini-Circuits	Power Amplifier	ZVE-8G+	070501814	Oct. 08, 2018	Oct. 07, 2019
Mini-Circuits	Power Amplifier	ZHL-42W+	715701915	May. 10, 2019	May. 09, 2020
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

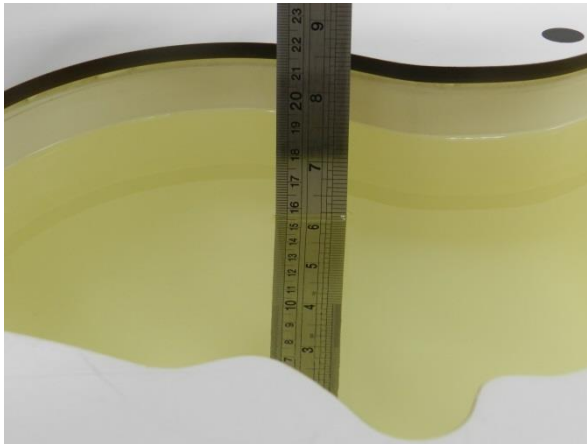
**General Note:**

Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.

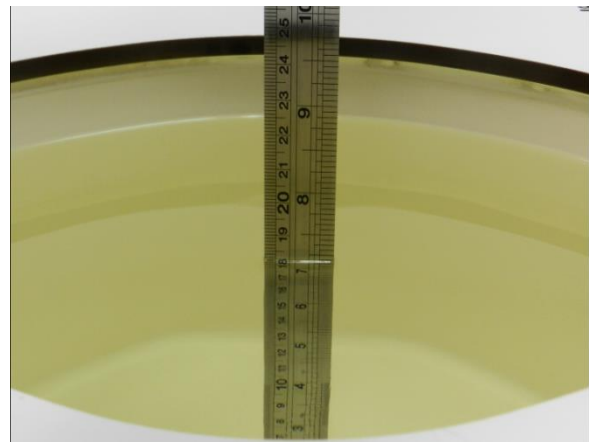
## **10. System Verification**

### **10.1 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. 10.1. 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. 10.2.



**Fig 10.1** Photo of Liquid Height for Head SAR



**Fig 10.2** Photo of Liquid Height for Body SAR



**10.2 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 ( $\sigma$ )	Permittivity ( $\epsilon_r$ )
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
900	40.3	57.9	0.2	1.4	0.2	0	0.97	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)	Liquid Temp. (°C)	Conductivity ( $\sigma$ )	Permittivity ( $\epsilon_r$ )	Conductivity Target ( $\sigma$ )	Permittivity Target ( $\epsilon_r$ )	Delta ( $\sigma$ ) (%)	Delta ( $\epsilon_r$ ) (%)	Limit (%)	Date
750	22.6	0.893	40.490	0.89	41.90	0.34	-3.37	±5	2019/7/31
750	22.6	0.892	43.159	0.89	41.90	0.22	3.00	±5	2019/8/11
835	22.3	0.894	41.840	0.90	41.50	-0.67	0.82	±5	2019/8/1
835	22.4	0.894	41.616	0.90	41.50	-0.67	0.28	±5	2019/8/11
1750	22.7	1.388	40.086	1.37	40.10	1.31	-0.03	±5	2019/8/2
1750	22.3	1.347	40.840	1.37	40.10	-1.68	1.85	±5	2019/8/9
1750	22.3	1.371	41.630	1.37	40.10	0.07	3.82	±5	2019/8/10
1900	22.6	1.414	38.501	1.40	40.00	1.00	-3.75	±5	2019/8/3
1900	22.6	1.418	38.831	1.40	40.00	1.29	-2.92	±5	2019/8/4
1900	22.3	1.385	40.383	1.40	40.00	-1.07	0.96	±5	2019/8/9
1900	22.5	1.427	40.973	1.40	40.00	1.93	2.43	±5	2019/8/10
2450	22.5	1.803	39.649	1.80	39.20	0.17	1.15	±5	2019/7/31
2450	22.8	1.794	39.865	1.80	39.20	-0.33	1.70	±5	2019/8/6
2600	22.6	1.967	38.722	1.96	39.00	0.36	-0.71	±5	2019/8/5
2600	22.3	1.973	38.349	1.96	39.00	0.66	-1.67	±5	2019/8/10
5250	22.5	4.711	36.053	4.71	35.95	0.02	0.29	±5	2019/8/7
5250	22.4	4.721	36.625	4.71	35.95	0.23	1.88	±5	2019/8/8
5250	22.3	4.573	37.298	4.71	35.95	-2.91	3.75	±5	2019/8/14
5600	22.5	5.071	35.607	5.07	35.50	0.02	0.30	±5	2019/8/7
5600	22.4	5.083	36.149	5.07	35.50	0.26	1.83	±5	2019/8/8
5600	22.3	4.924	36.825	5.07	35.50	-2.88	3.73	±5	2019/8/14
5750	22.5	5.220	35.456	5.22	35.35	0.00	0.30	±5	2019/8/7
5750	22.4	5.246	35.932	5.22	35.35	0.50	1.65	±5	2019/8/8
5750	22.3	5.071	36.577	5.22	35.35	-2.85	3.47	±5	2019/8/14

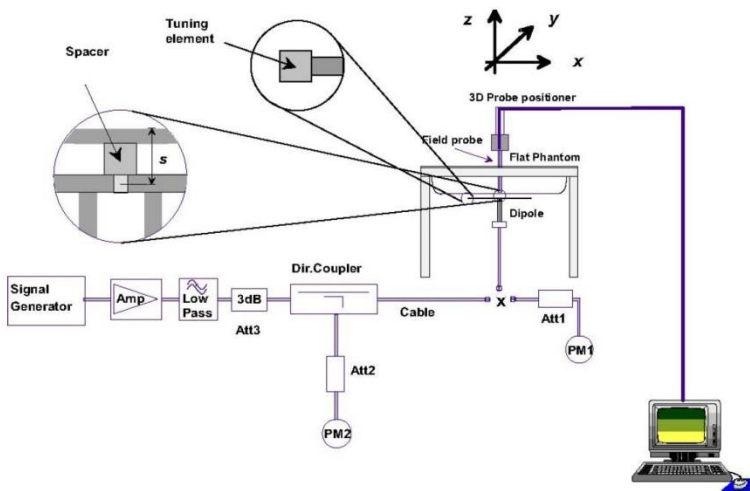


**10.3 System Performance Check Results**

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.

Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2019/7/31	750	250	D750V3-1107	ES3DV3 - SN3169	DAE4 Sn1399	2.00	8.32	8	-3.85
2019/8/11	750	250	D750V3-1107	EX3DV4 - SN3931	DAE4 Sn1399	2.15	8.32	8.6	3.37
2019/8/1	835	250	D835V2-4d167	ES3DV3 - SN3169	DAE4 Sn1399	2.29	9.50	9.16	-3.58
2019/8/11	835	250	D835V2-4d167	EX3DV4 - SN3931	DAE4 Sn1399	2.43	9.50	9.72	2.32
2019/8/2	1750	250	D1750V2-1112	ES3DV3 - SN3169	DAE4 Sn1399	9.34	36.70	37.36	1.80
2019/8/9	1750	250	D1750V2-1112	EX3DV4 - SN3931	DAE4 Sn1399	9.42	36.70	37.68	2.67
2019/8/10	1750	250	D1750V2-1112	EX3DV4 - SN3931	DAE4 Sn1399	9.60	36.70	38.4	4.63
2019/8/3	1900	250	D1900V2-5d041	ES3DV3 - SN3169	DAE4 Sn1399	9.98	40.20	39.92	-0.70
2019/8/4	1900	250	D1900V2-5d041	ES3DV3 - SN3169	DAE4 Sn1399	10.10	40.20	40.4	0.50
2019/8/9	1900	250	D1900V2-5d041	EX3DV4 - SN3931	DAE4 Sn1399	10.50	40.20	42	4.48
2019/8/10	1900	250	D1900V2-5d041	EX3DV4 - SN3931	DAE4 Sn1399	11.00	40.20	44	9.45
2019/7/31	2450	250	D2450V2-736	EX3DV4 - SN3642	DAE3 Sn360	13.50	52.70	54	2.47
2019/8/6	2450	250	D2450V2-736	EX3DV4 - SN3931	DAE4 Sn1399	13.80	52.70	55.2	4.74
2019/8/5	2600	250	D2600V2-1078	ES3DV3 - SN3169	DAE4 Sn1399	13.60	57.60	54.4	-5.56
2019/8/10	2600	250	D2600V2-1078	EX3DV4 - SN3931	DAE4 Sn1399	14.50	57.60	58	0.69
2019/8/7	5250	100	D5GHzV2-1006-5250	EX3DV4 - SN3931	DAE4 Sn1399	8.13	80.70	81.3	0.74
2019/8/8	5250	100	D5GHzV2-1006-5250	EX3DV4 - SN3931	DAE4 Sn1399	7.95	80.70	79.5	-1.49
2019/8/14	5250	100	D5GHzV2-1006-5250	EX3DV4 - SN3931	DAE4 Sn1399	7.89	80.70	78.9	-2.23
2019/8/7	5600	100	D5GHzV2-1006-5600	EX3DV4 - SN3931	DAE4 Sn1399	8.40	83.30	84	0.84
2019/8/8	5600	100	D5GHzV2-1006-5600	EX3DV4 - SN3931	DAE4 Sn1399	8.75	83.30	87.5	5.04
2019/8/14	5600	100	D5GHzV2-1006-5600	EX3DV4 - SN3931	DAE4 Sn1399	8.83	83.30	88.3	6.00
2019/8/7	5750	100	D5GHzV2-1006-5750	EX3DV4 - SN3931	DAE4 Sn1399	8.38	80.40	83.8	4.23
2019/8/8	5750	100	D5GHzV2-1006-5750	EX3DV4 - SN3931	DAE4 Sn1399	8.55	80.40	85.5	6.34
2019/8/14	5750	100	D5GHzV2-1006-5750	EX3DV4 - SN3931	DAE4 Sn1399	8.15	80.40	81.5	1.37

Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2019/8/1	835	250	D835V2-4d167	ES3DV3 - SN3169	DAE4 Sn1399	1.51	6.25	6.04	-3.36
2019/8/2	1750	250	D1750V2-1112	ES3DV3 - SN3169	DAE4 Sn1399	4.99	19.40	19.96	2.89
2019/8/4	1900	250	D1900V2-5d041	ES3DV3 - SN3169	DAE4 Sn1399	5.29	21.20	21.16	-0.19
2019/8/10	1900	250	D1900V2-5d041	EX3DV4 - SN3931	DAE4 Sn1399	5.73	21.20	22.92	8.11
2019/8/5	2600	250	D2600V2-1078	ES3DV3 - SN3169	DAE4 Sn1399	6.14	25.50	24.56	-3.69
2019/8/8	5250	100	D5GHzV2-1006-5250	EX3DV4 - SN3931	DAE4 Sn1399	2.24	23.20	22.4	-3.45
2019/8/8	5600	100	D5GHzV2-1006-5600	EX3DV4 - SN3931	DAE4 Sn1399	2.47	23.80	24.7	3.78
2019/8/8	5750	100	D5GHzV2-1006-5750	EX3DV4 - SN3931	DAE4 Sn1399	2.38	22.90	23.8	3.93



**Fig 8.3.1 System Performance Check Setup**



**Fig 8.3.2 Setup Photo**

## 11. RF Exposure Positions

### 11.1 Ear and handset reference point

Figure 9.1.1 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 9.1.2 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 9.1.3). 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 9.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

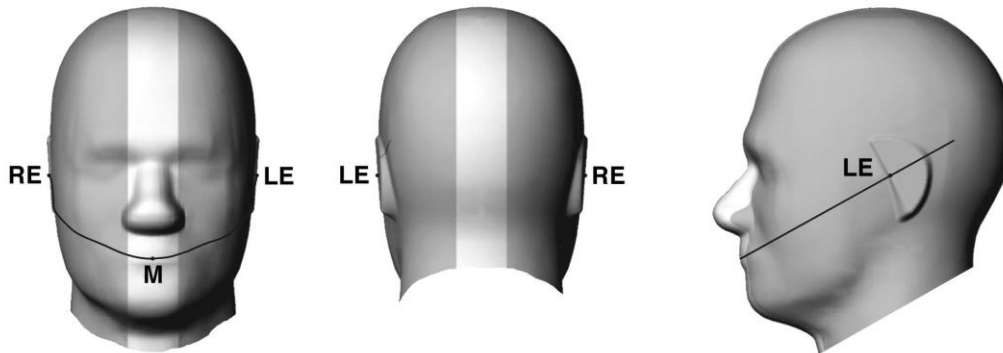


Fig 9.1.1 Front, back, and side views of SAM twin phantom

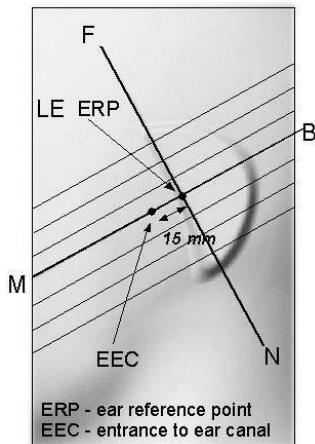


Fig 9.1.2 Close-up side view of phantom showing the ear region.

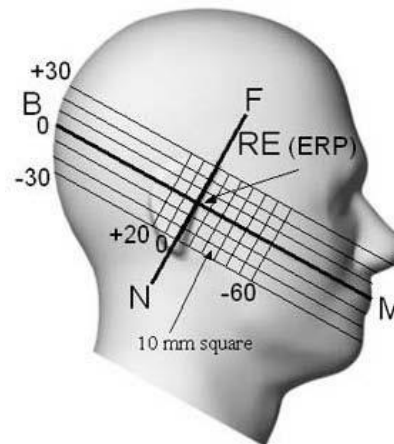
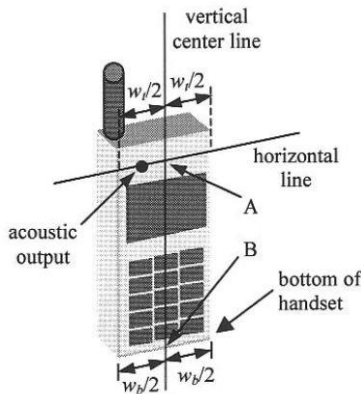


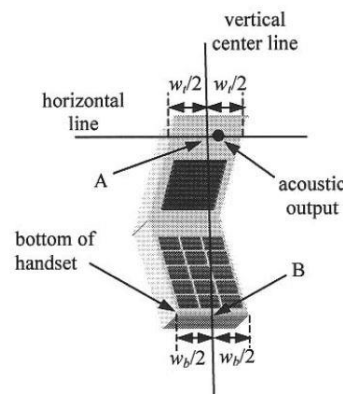
Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

**11.2 Definition of the cheek position**

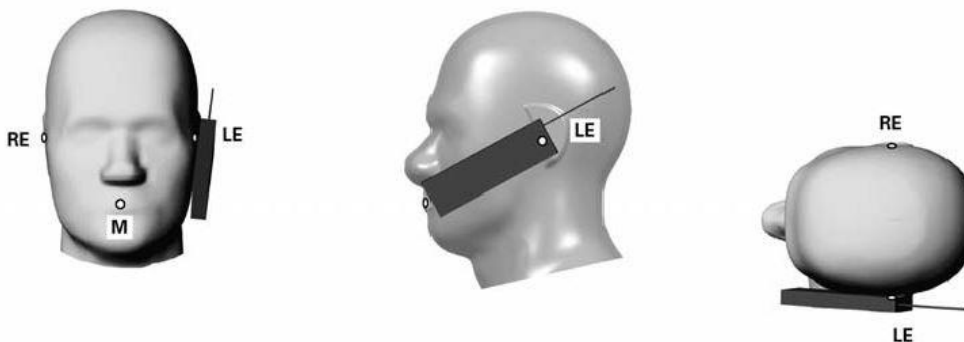
1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width  $w_t$  of the handset at the level of the acoustic output (point A in Figure 9.2.1 and Figure 9.2.2), and the midpoint of the width  $w_b$  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 9.2.1). 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 9.2.2), 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 9.2.3), 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 9.2.3. The actual rotation angles should be documented in the test report.



**Fig 9.2.1 Handset vertical and horizontal reference lines—“fixed case”**



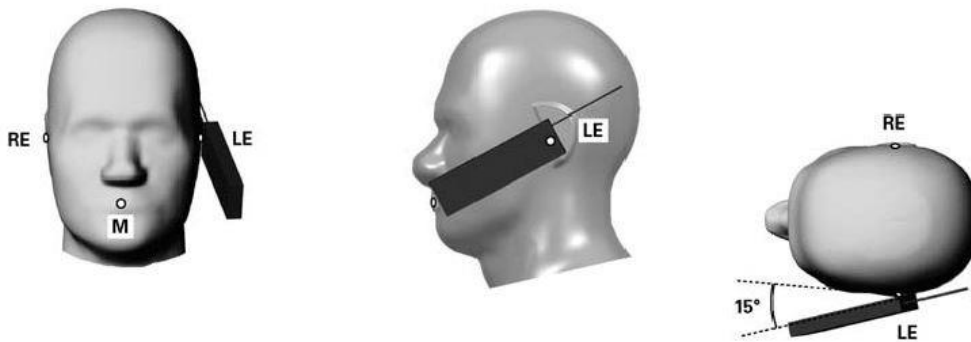
**Fig 9.2.2 Handset vertical and horizontal reference lines—“clam-shell case”**



**Fig 9.2.3 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.**

**11.3 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 9.3.1. 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

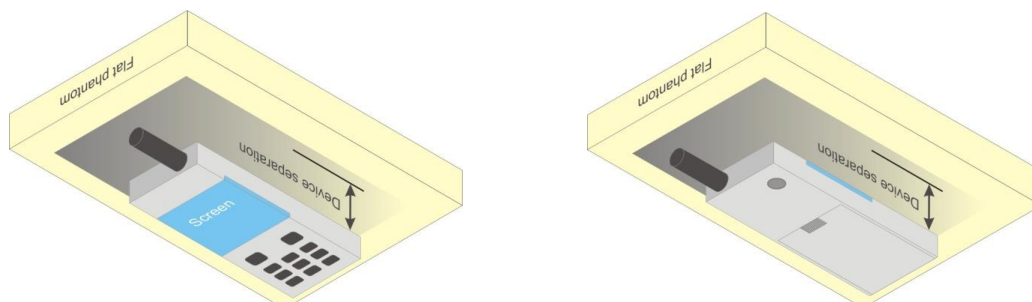


**Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.**

**11.4 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 9.4). 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 headset 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 9.4 Body Worn Position**



### **11.5 Product Specific Exposure**

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that 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  $\leq 25$  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.

### **11.6 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 ( $L \times W \geq 9$  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 from 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.



## 12. Conducted RF Output Power (Unit: dBm)

### <GSM Conducted Power>

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

### <Default / Near-Body / Product Specific Power Mode>

GSM850 TX Channel	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
	128	189	251		128	189	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GSM 1 Tx slot	33.02	32.76	32.79	33.50	24.02	23.76	23.79	24.50
GPRS 1 Tx slot	33.01	32.75	32.78	33.50	24.01	23.75	23.78	24.50
GPRS 2 Tx slots	31.02	30.67	30.72	31.50	25.02	24.67	24.72	25.50
GPRS 3 Tx slots	28.57	28.55	28.32	29.00	24.31	24.29	24.06	24.74
GPRS 4 Tx slots	26.20	26.24	26.32	27.50	23.20	23.24	23.32	24.50
EDGE 1 Tx slot	26.58	26.38	26.20	27.50	17.58	17.38	17.20	18.50
EDGE 2 Tx slots	24.45	24.30	24.24	25.50	18.45	18.30	18.24	19.50
EDGE 3 Tx slots	22.32	22.18	22.12	23.50	18.06	17.92	17.86	19.24
EDGE 4 Tx slots	21.01	21.02	20.80	22.00	18.01	18.02	17.80	19.00

GSM1900 TX Channel	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	29.96	29.85	29.81	30.50	20.96	20.85	20.81	21.50
GPRS 1 Tx slot	29.95	29.83	29.80	30.50	20.95	20.83	20.80	21.50
GPRS 2 Tx slots	28.05	27.91	27.88	28.50	22.05	21.91	21.88	22.50
GPRS 3 Tx slots	25.81	25.73	25.66	26.50	21.55	21.47	21.40	22.24
GPRS 4 Tx slots	23.59	23.54	23.43	24.50	20.59	20.54	20.43	21.50
EDGE 1 Tx slot	26.36	26.44	26.33	27.00	17.36	17.44	17.33	18.00
EDGE 2 Tx slots	24.39	24.40	24.25	25.00	18.39	18.40	18.25	19.00
EDGE 3 Tx slots	22.15	22.20	22.12	23.00	17.89	17.94	17.86	18.74
EDGE 4 Tx slots	19.68	19.72	19.59	21.00	16.68	16.72	16.59	18.00



**<Hotspot Power Mode>**

GSM850 TX Channel	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
	128	189	251		128	189	251	
	Frequency (MHz)	824.2	836.4		848.8	824.2	836.4	
GSM 1 Tx slot	33.02	32.76	32.79	33.50	24.02	23.76	23.79	24.50
GPRS 1 Tx slot	33.01	32.75	32.78	33.50	24.01	23.75	23.78	24.50
GPRS 2 Tx slots	31.02	30.67	30.72	31.50	25.02	24.67	24.72	25.50
GPRS 3 Tx slots	28.57	28.55	28.32	29.00	24.31	24.29	24.06	24.74
GPRS 4 Tx slots	26.20	26.24	26.32	27.50	23.20	23.24	23.32	24.50
EDGE 1 Tx slot	26.58	26.38	26.20	27.50	17.58	17.38	17.20	18.50
EDGE 2 Tx slots	24.45	24.30	24.24	25.50	18.45	18.30	18.24	19.50
EDGE 3 Tx slots	22.32	22.18	22.12	23.50	18.06	17.92	17.86	19.24
EDGE 4 Tx slots	21.01	21.02	20.80	22.00	18.01	18.02	17.80	19.00

GSM1900 TX Channel	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
	512	661	810		512	661	810	
	Frequency (MHz)	1850.2	1880		1909.8	1850.2	1880	
GSM 1 Tx slot	28.23	28.03	28.00	28.50	19.23	19.03	19.00	19.50
GPRS 1 Tx slot	28.38	28.17	28.03	28.50	19.38	19.17	19.03	19.50
GPRS 2 Tx slots	25.49	25.18	25.13	26.00	19.49	19.18	19.13	20.00
GPRS 3 Tx slots	23.41	23.44	23.26	24.00	19.15	19.18	19.00	19.74
GPRS 4 Tx slots	22.44	22.12	22.08	22.50	19.44	19.12	19.08	19.50
EDGE 1 Tx slot	26.36	26.44	26.33	27.00	17.36	17.44	17.33	18.00
EDGE 2 Tx slots	24.39	24.40	24.25	25.00	18.39	18.40	18.25	19.00
EDGE 3 Tx slots	22.15	22.20	22.12	23.00	17.89	17.94	17.86	18.74
EDGE 4 Tx slots	19.68	19.72	19.59	21.00	16.68	16.72	16.59	18.00

**<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 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 ( $\beta_c$  and  $\beta_d$ ) and parameters were set according to each
  - ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
  - iii. Set RMC 12.2Kbps + HSDPA mode.
  - iv. Set Cell Power = -86 dBm
  - v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
  - vi. Select HSDPA Uplink Parameters
  - vii. Set Delta ACK, Delta NACK and Delta CQI = 8
  - viii. Set Ack-Nack Repetition Factor to 3
  - ix. Set CQI Feedback Cycle (k) to 4 ms
  - x. Set CQI Repetition Factor to 2
  - xi. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

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

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

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

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

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

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

**Setup Configuration**

**HSUPA Setup Configuration:**

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

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

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

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

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

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

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

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

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

**Setup Configuration**

**DC-HSDPA 3GPP release 8 Setup Configuration:**

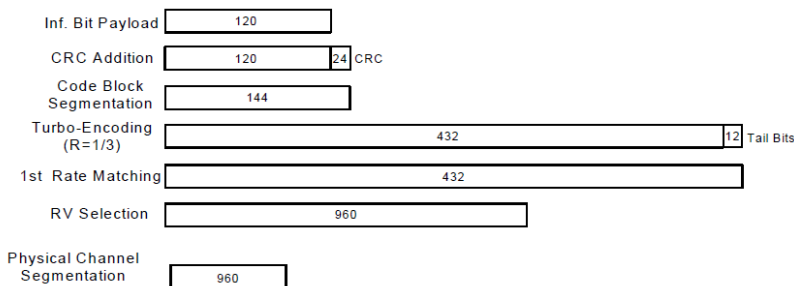
- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
  - i. Set RMC 12.2Kbps + HSDPA mode.
  - ii. Set Cell Power = -25 dBm
  - iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
  - iv. Select HSDPA Uplink Parameters
  - v. Set Gain Factors ( $\beta_c$  and  $\beta_d$ ) 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:  $\beta_c/\beta_d=2/15$
    - b). Subtest 2:  $\beta_c/\beta_d=12/15$
    - c). Subtest 3:  $\beta_c/\beta_d=15/8$
    - d). Subtest 4:  $\beta_c/\beta_d=15/4$
  - 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	Processes	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**



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

<Default Power Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel	Rx Channel	9262	9400	9538		1312	1413	1513		4132	4182	4233	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	22.76	22.74	22.56	24.00	22.76	22.94	22.92	24.00	22.80	22.78	22.73	24.00
3GPP Rel 99	RMC 12.2Kbps	22.78	22.75	22.58	24.00	22.77	22.95	22.93	24.00	22.81	22.81	22.75	24.00
3GPP Rel 6	HSDPA Subtest-1	22.11	22.13	21.97	23.00	21.86	21.91	22.01	23.00	21.70	21.72	21.73	23.00
3GPP Rel 6	HSDPA Subtest-2	22.13	22.17	21.99	23.00	21.84	21.87	22.00	23.00	21.73	21.74	21.76	23.00
3GPP Rel 6	HSDPA Subtest-3	21.62	21.68	21.47	22.50	21.35	21.38	21.50	22.50	21.23	21.26	21.27	22.50
3GPP Rel 6	HSDPA Subtest-4	21.60	21.67	21.47	22.50	21.33	21.37	21.49	22.50	21.23	21.25	21.25	22.50
3GPP Rel 8	DC-HSDPA Subtest-1	22.10	22.16	22.00	23.00	21.85	21.90	22.02	23.00	21.72	21.73	21.74	23.00
3GPP Rel 8	DC-HSDPA Subtest-2	22.13	22.13	22.02	23.00	21.83	21.88	22.00	23.00	21.73	21.73	21.77	23.00
3GPP Rel 8	DC-HSDPA Subtest-3	21.63	21.68	21.46	22.50	21.35	21.38	21.49	22.50	21.22	21.26	21.28	22.50
3GPP Rel 8	DC-HSDPA Subtest-4	21.63	21.65	21.47	22.50	21.34	21.36	21.47	22.50	21.23	21.24	21.24	22.50
3GPP Rel 6	HSUPA Subtest-1	22.22	22.19	22.05	23.00	21.89	22.00	22.01	23.00	21.91	21.94	21.75	23.00
3GPP Rel 6	HSUPA Subtest-2	20.21	20.13	20.09	21.00	19.62	19.82	19.80	21.00	20.01	20.05	19.98	21.00
3GPP Rel 6	HSUPA Subtest-3	21.05	21.10	20.98	22.00	20.09	20.15	20.13	22.00	21.03	21.01	20.91	22.00
3GPP Rel 6	HSUPA Subtest-4	20.15	20.13	20.05	21.00	19.78	19.92	19.91	21.00	20.01	20.01	19.83	21.00
3GPP Rel 6	HSUPA Subtest-5	22.19	22.17	22.06	23.00	21.85	22.01	22.00	23.00	21.98	22.00	21.96	23.00

<Near-Body Power Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel	Rx Channel	9262	9400	9538		1312	1413	1513		4132	4182	4233	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	20.23	20.18	20.18	21.00	19.26	19.28	19.26	20.00	22.19	22.05	21.91	23.00
3GPP Rel 99	RMC 12.2Kbps	20.33	20.25	20.23	21.00	19.30	19.31	19.29	20.00	22.27	22.15	22.03	23.00
3GPP Rel 6	HSDPA Subtest-1	19.21	18.96	19.08	20.00	18.19	18.19	18.13	19.00	21.25	21.16	21.10	22.00
3GPP Rel 6	HSDPA Subtest-2	19.29	18.87	19.08	20.00	18.16	18.22	18.17	19.00	21.22	21.16	21.14	22.00
3GPP Rel 6	HSDPA Subtest-3	18.77	18.54	18.57	19.50	18.11	17.73	17.74	18.50	20.76	20.67	20.62	21.50
3GPP Rel 6	HSDPA Subtest-4	18.77	18.54	18.59	19.50	18.11	17.74	17.73	18.50	20.84	20.69	20.60	21.50
3GPP Rel 8	DC-HSDPA Subtest-1	19.17	18.79	18.95	20.00	18.22	18.23	18.16	19.00	21.12	21.11	21.00	22.00
3GPP Rel 8	DC-HSDPA Subtest-2	19.16	18.81	19.03	20.00	18.24	18.23	18.13	19.00	21.18	21.02	21.10	22.00
3GPP Rel 8	DC-HSDPA Subtest-3	18.71	18.53	18.49	19.50	17.76	17.71	17.65	18.50	20.56	20.56	20.62	21.50
3GPP Rel 8	DC-HSDPA Subtest-4	18.60	18.44	18.44	19.50	17.65	17.66	17.66	18.50	20.78	20.63	20.50	21.50
3GPP Rel 6	HSUPA Subtest-1	19.24	18.99	19.05	20.00	18.16	18.22	18.11	19.00	21.22	21.14	21.03	22.00
3GPP Rel 6	HSUPA Subtest-2	17.28	17.05	17.03	18.00	16.21	16.27	16.13	17.00	19.30	19.16	19.09	20.00
3GPP Rel 6	HSUPA Subtest-3	18.21	18.00	18.07	19.00	17.22	17.21	17.19	18.00	20.25	20.20	20.07	21.00
3GPP Rel 6	HSUPA Subtest-4	17.22	17.00	17.05	18.00	16.22	16.25	16.12	17.00	19.23	19.21	19.09	20.00
3GPP Rel 6	HSUPA Subtest-5	19.30	19.10	19.00	20.00	18.18	18.25	18.17	19.00	21.30	21.10	21.10	22.00



**<Hotspot Power Mode>**

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938	1537	1638	1738	4357	4407	4458			
Frequency (MHz)		1852.4	1880	1907.6	1712.4	1732.6	1752.6	826.4	836.4	846.6			
3GPP Rel 99	AMR 12.2Kbps	17.53	17.32	17.36	18.00	17.13	17.24	17.14	18.00	22.19	22.05	21.91	23.00
3GPP Rel 99	RMC 12.2Kbps	17.55	17.36	17.38	18.00	17.26	17.28	17.22	18.00	22.27	22.15	22.03	23.00
3GPP Rel 6	HSDPA Subtest-1	16.63	16.42	16.41	17.00	16.21	16.25	16.11	17.00	21.25	21.16	21.10	22.00
3GPP Rel 6	HSDPA Subtest-2	16.65	16.45	16.45	17.00	16.22	16.23	16.10	17.00	21.22	21.16	21.14	22.00
3GPP Rel 6	HSDPA Subtest-3	16.14	15.92	15.96	16.50	15.71	15.77	15.63	16.50	20.76	20.67	20.62	21.50
3GPP Rel 6	HSDPA Subtest-4	16.14	15.95	15.97	16.50	15.70	15.76	15.66	16.50	20.84	20.69	20.60	21.50
3GPP Rel 8	DC-HSDPA Subtest-1	16.45	16.40	16.28	17.00	16.23	16.34	16.15	17.00	21.12	21.11	21.00	22.00
3GPP Rel 8	DC-HSDPA Subtest-2	16.49	16.31	16.25	17.00	16.26	16.33	16.10	17.00	21.18	21.02	21.10	22.00
3GPP Rel 8	DC-HSDPA Subtest-3	15.99	15.72	15.95	16.50	15.77	15.81	15.59	16.50	20.56	20.56	20.62	21.50
3GPP Rel 8	DC-HSDPA Subtest-4	15.98	15.92	15.95	16.50	15.78	15.80	15.49	16.50	20.78	20.63	20.50	21.50
3GPP Rel 6	HSUPA Subtest-1	16.62	16.51	16.55	17.00	16.22	16.38	16.21	17.00	21.22	21.14	21.03	22.00
3GPP Rel 6	HSUPA Subtest-2	14.60	14.23	14.45	15.00	14.21	14.32	14.28	15.00	19.30	19.16	19.09	20.00
3GPP Rel 6	HSUPA Subtest-3	15.54	15.46	15.49	16.00	15.23	15.36	15.21	16.00	20.25	20.20	20.07	21.00
3GPP Rel 6	HSUPA Subtest-4	14.63	14.34	14.41	15.00	14.22	14.33	14.29	15.00	19.23	19.21	19.09	20.00
3GPP Rel 6	HSUPA Subtest-5	16.60	16.40	16.50	17.00	16.23	16.41	16.19	17.00	21.30	21.10	21.10	22.00

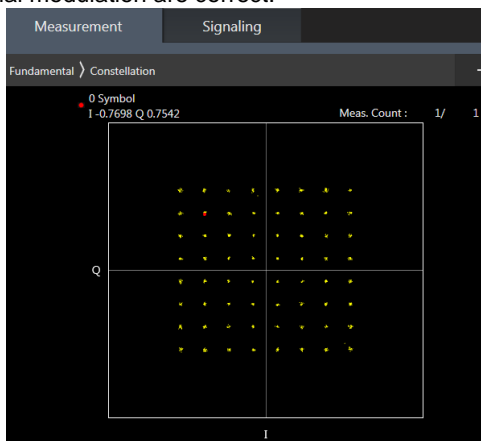
**<Product Specific Power Mode>**

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938	1537	1638	1738	4357	4407	4458			
Frequency (MHz)		1852.4	1880	1907.6	1712.4	1732.6	1752.6	826.4	836.4	846.6			
3GPP Rel 99	AMR 12.2Kbps	21.63	21.43	21.46	22.00	20.70	20.71	20.61	22.00	22.19	22.05	21.91	23.00
3GPP Rel 99	RMC 12.2Kbps	21.70	21.46	21.49	22.00	20.72	20.74	20.68	22.00	22.27	22.15	22.03	23.00
3GPP Rel 6	HSDPA Subtest-1	20.69	20.48	20.53	21.00	20.21	20.22	20.16	21.00	21.25	21.16	21.10	22.00
3GPP Rel 6	HSDPA Subtest-2	20.73	20.49	20.50	21.00	20.23	20.28	20.15	21.00	21.22	21.16	21.14	22.00
3GPP Rel 6	HSDPA Subtest-3	20.26	20.03	20.01	20.50	19.74	19.76	19.63	20.50	20.76	20.67	20.62	21.50
3GPP Rel 6	HSDPA Subtest-4	20.19	19.96	20.06	20.50	19.74	19.78	19.66	20.50	20.84	20.69	20.60	21.50
3GPP Rel 8	DC-HSDPA Subtest-1	20.57	20.29	20.50	21.00	20.19	20.26	20.11	21.00	21.12	21.11	21.00	22.00
3GPP Rel 8	DC-HSDPA Subtest-2	20.71	20.36	20.50	21.00	20.21	20.26	20.17	21.00	21.18	21.02	21.10	22.00
3GPP Rel 8	DC-HSDPA Subtest-3	20.24	19.95	20.00	20.50	19.78	19.83	19.64	20.50	20.56	20.56	20.62	21.50
3GPP Rel 8	DC-HSDPA Subtest-4	20.10	19.91	19.95	20.50	19.77	19.79	19.62	20.50	20.78	20.63	20.50	21.50
3GPP Rel 6	HSUPA Subtest-1	20.70	20.50	20.55	21.00	20.23	20.30	20.11	21.00	21.22	21.14	21.03	22.00
3GPP Rel 6	HSUPA Subtest-2	18.72	18.49	18.55	19.00	18.26	18.29	18.15	19.00	19.30	19.16	19.09	20.00
3GPP Rel 6	HSUPA Subtest-3	19.70	19.54	19.54	20.00	19.24	19.27	19.16	20.00	20.25	20.20	20.07	21.00
3GPP Rel 6	HSUPA Subtest-4	18.72	18.53	18.57	19.00	18.23	18.31	18.14	19.00	19.23	19.21	19.09	20.00
3GPP Rel 6	HSUPA Subtest-5	20.80	20.50	20.60	21.00	20.26	20.31	20.15	21.00	21.30	21.10	21.10	22.00

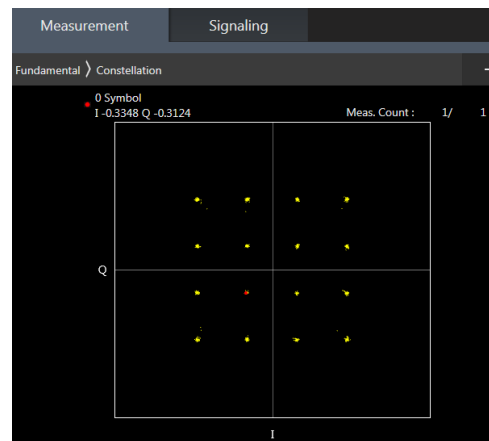
**<LTE Conducted Power>**

**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  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B5 / B12 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE band 4 / 17 SAR test was covered by Band 66 / 12; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
  - a. the maximum output power, including tolerance, for the smaller band is  $\leq$  the larger band to qualify for the SAR test exclusion
  - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to 2017 TCB workshop, for 64 QAM and 16 QAM 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.



**64QAM**



**16QAM**



<Default Power Mode>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	22.53	22.90	22.78	24	0
20	QPSK	1	49	22.48	22.69	22.79		
20	QPSK	1	99	22.44	22.55	22.75		
20	QPSK	50	0	21.55	21.71	21.84	23	1
20	QPSK	50	24	21.52	21.68	21.81		
20	QPSK	50	50	21.54	21.63	21.79		
20	QPSK	100	0	21.62	21.69	21.78	23	1
20	16QAM	1	0	21.94	22.13	22.22		
20	16QAM	1	49	21.93	22.06	22.20		
20	16QAM	1	99	21.91	22.00	22.15	22	2
20	16QAM	50	0	20.69	20.86	20.93		
20	16QAM	50	24	20.67	20.82	20.98		
20	16QAM	50	50	20.68	20.76	20.92	22	2
20	16QAM	100	0	20.77	20.82	20.91		
20	64QAM	1	0	20.97	21.16	21.22		
20	64QAM	1	49	20.94	21.08	21.20	22	2
20	64QAM	1	99	20.88	21.01	21.10		
20	64QAM	50	0	19.78	19.96	20.04		
20	64QAM	50	24	19.76	19.94	20.05	21	3
20	64QAM	50	50	19.75	19.85	20.01		
20	64QAM	100	0	19.88	19.92	20.04		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.66	22.71	22.82	24	0
15	QPSK	1	37	22.57	22.66	22.79		
15	QPSK	1	74	22.47	22.59	22.72		
15	QPSK	36	0	21.69	21.72	21.83	23	1
15	QPSK	36	20	21.63	21.68	21.85		
15	QPSK	36	39	21.57	21.62	21.81		
15	QPSK	75	0	21.57	21.64	21.80	23	1
15	16QAM	1	0	22.08	22.20	22.26		
15	16QAM	1	37	22.02	22.05	22.21		
15	16QAM	1	74	21.92	22.05	22.06	22	2
15	16QAM	36	0	20.79	20.86	20.97		
15	16QAM	36	20	20.80	20.88	21.00		
15	16QAM	36	39	20.71	20.79	20.91	22	2
15	16QAM	75	0	20.77	20.80	20.94		
15	64QAM	1	0	21.01	21.02	21.11		
15	64QAM	1	37	20.91	20.92	21.10	22	2
15	64QAM	1	74	20.81	20.91	20.99		
15	64QAM	36	0	19.83	19.88	19.97		
15	64QAM	36	20	19.81	19.86	19.99	21	3
15	64QAM	36	39	19.71	19.79	19.92		
15	64QAM	75	0	19.75	19.82	19.95		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.57	22.67	22.80	24	0
10	QPSK	1	25	22.57	22.61	22.81		
10	QPSK	1	49	22.50	22.58	22.82		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

10	QPSK	25	0	21.60	21.67	21.95	23	1
10	QPSK	25	12	21.61	21.66	21.97		
10	QPSK	25	25	21.58	21.64	21.96		
10	QPSK	50	0	21.56	21.66	21.94	23	1
10	16QAM	1	0	21.98	22.07	22.30		
10	16QAM	1	25	22.03	22.07	22.29		
10	16QAM	1	49	21.97	22.00	22.16	22	2
10	16QAM	25	0	20.79	20.78	21.12		
10	16QAM	25	12	20.79	20.83	21.11		
10	16QAM	25	25	20.73	20.78	21.07	22	2
10	16QAM	50	0	20.73	20.79	21.08		
10	64QAM	1	0	20.87	20.96	21.22		
10	64QAM	1	25	20.88	20.99	21.16	21	3
10	64QAM	1	49	20.83	20.90	21.11		
10	64QAM	25	0	19.76	19.81	20.10		
10	64QAM	25	12	19.79	19.81	20.14	21	3
10	64QAM	25	25	19.70	19.76	20.08		
10	64QAM	50	0	19.73	19.78	20.08		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.57	22.64	22.89	24	0
5	QPSK	1	12	22.58	22.62	22.89		
5	QPSK	1	24	22.57	22.60	22.83		
5	QPSK	12	0	21.61	21.65	21.96	23	1
5	QPSK	12	7	21.66	21.67	22.01		
5	QPSK	12	13	21.57	21.67	21.96		
5	QPSK	25	0	21.57	21.62	21.95	23	1
5	16QAM	1	0	22.00	22.00	22.21		
5	16QAM	1	12	22.00	22.05	22.27		
5	16QAM	1	24	21.95	22.07	22.21	22	2
5	16QAM	12	0	20.78	20.84	21.13		
5	16QAM	12	7	20.80	20.84	21.15		
5	16QAM	12	13	20.76	20.80	21.07	22	2
5	16QAM	25	0	20.74	20.77	21.04		
5	64QAM	1	0	20.94	20.97	21.14		
5	64QAM	1	12	20.92	20.98	21.18	22	2
5	64QAM	1	24	20.90	20.94	21.10		
5	64QAM	12	0	19.75	19.83	20.11		
5	64QAM	12	7	19.81	19.82	20.13	21	3
5	64QAM	12	13	19.74	19.80	20.06		
5	64QAM	25	0	19.75	19.78	20.06		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.57	22.58	22.84	24	0
3	QPSK	1	8	22.58	22.64	22.87		
3	QPSK	1	14	22.53	22.60	22.82		
3	QPSK	8	0	21.58	21.66	21.96	23	1
3	QPSK	8	4	21.63	21.66	21.99		
3	QPSK	8	7	21.57	21.62	21.94		
3	QPSK	15	0	21.61	21.64	21.95	23	1
3	16QAM	1	0	21.93	21.97	22.23		
3	16QAM	1	8	22.00	22.05	22.25		
3	16QAM	1	14	21.91	21.97	22.19	22	2
3	16QAM	8	0	20.81	20.84	21.11		
3	16QAM	8	4	20.82	20.87	21.16		
3	16QAM	8	7	20.80	20.84	21.12	22	2



**FCC SAR TEST REPORT**

**Report No. : FA962518**

3	16QAM	15	0	20.72	20.76	21.10		
3	64QAM	1	0	20.85	20.92	21.11	22	2
3	64QAM	1	8	20.86	20.96	21.09		
3	64QAM	1	14	20.88	20.95	21.07		
3	64QAM	8	0	19.77	19.81	20.10	21	3
3	64QAM	8	4	19.79	19.84	20.11		
3	64QAM	8	7	19.75	19.81	20.08		
3	64QAM	15	0	19.72	19.74	20.09		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.43	22.58	22.79	24	0
1.4	QPSK	1	3	22.45	22.64	22.87		
1.4	QPSK	1	5	22.40	22.54	22.77		
1.4	QPSK	3	0	22.42	22.58	22.85		
1.4	QPSK	3	1	22.45	22.63	22.87		
1.4	QPSK	3	3	22.42	22.57	22.87		
1.4	QPSK	6	0	21.40	21.53	21.88	23	1
1.4	16QAM	1	0	21.81	21.99	22.17	23	1
1.4	16QAM	1	3	21.88	22.08	22.21		
1.4	16QAM	1	5	21.84	21.95	22.16		
1.4	16QAM	3	0	21.57	21.74	21.96		
1.4	16QAM	3	1	21.61	21.80	21.94		
1.4	16QAM	3	3	21.60	21.68	21.91		
1.4	16QAM	6	0	20.58	20.73	21.06	22	2
1.4	64QAM	1	0	20.74	20.86	21.09	22	2
1.4	64QAM	1	3	20.78	20.91	21.17		
1.4	64QAM	1	5	20.75	20.84	21.01		
1.4	64QAM	3	0	20.60	20.77	21.00		
1.4	64QAM	3	1	20.65	20.84	21.04		
1.4	64QAM	3	3	20.61	20.75	20.99		
1.4	64QAM	6	0	19.58	19.70	20.02		



<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	22.67	22.52	22.62	24	0
20	QPSK	1	49	22.45	22.61	22.72		
20	QPSK	1	99	22.29	22.64	22.57		
20	QPSK	50	0	21.55	21.60	21.62	23	1
20	QPSK	50	24	21.58	21.64	21.68		
20	QPSK	50	50	21.48	21.56	21.63		
20	QPSK	100	0	21.52	21.58	21.57		
20	16QAM	1	0	22.08	21.97	22.10	23	1
20	16QAM	1	49	21.80	22.06	22.23		
20	16QAM	1	99	21.83	22.04	22.02		
20	16QAM	50	0	20.70	20.77	20.75	22	2
20	16QAM	50	24	20.71	20.76	20.82		
20	16QAM	50	50	20.66	20.70	20.75		
20	16QAM	100	0	20.67	20.74	20.67		
20	64QAM	1	0	20.95	20.86	20.98	22	2
20	64QAM	1	49	20.72	20.91	21.03		
20	64QAM	1	99	20.64	20.94	20.87		
20	64QAM	50	0	19.70	19.77	19.75	21	3
20	64QAM	50	24	19.69	19.75	19.81		
20	64QAM	50	50	19.64	19.68	19.76		
20	64QAM	100	0	19.72	19.78	19.71		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.68	22.51	22.64	24	0
15	QPSK	1	37	22.41	22.59	22.68		
15	QPSK	1	74	22.26	22.57	22.62		
15	QPSK	36	0	21.56	21.65	21.72	23	1
15	QPSK	36	20	21.59	21.64	21.72		
15	QPSK	36	39	21.49	21.56	21.64		
15	QPSK	75	0	21.57	21.57	21.65		
15	16QAM	1	0	22.03	21.99	22.20	23	1
15	16QAM	1	37	21.78	22.02	22.08		
15	16QAM	1	74	21.75	22.06	22.01		
15	16QAM	36	0	20.72	20.76	20.85	22	2
15	16QAM	36	20	20.72	20.80	20.86		
15	16QAM	36	39	20.67	20.74	20.79		
15	16QAM	75	0	20.67	20.76	20.81		
15	64QAM	1	0	20.95	20.93	21.09	22	2
15	64QAM	1	37	20.70	20.92	20.96		
15	64QAM	1	74	20.71	20.94	20.93		
15	64QAM	36	0	19.72	19.79	19.86	21	3
15	64QAM	36	20	19.72	19.80	19.84		
15	64QAM	36	39	19.68	19.74	19.79		
15	64QAM	75	0	19.67	19.74	19.79		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	22.53	22.51	22.69	24	0
10	QPSK	1	25	22.39	22.59	22.68		
10	QPSK	1	49	22.24	22.51	22.61		
10	QPSK	25	0	21.43	21.61	21.68	23	1
10	QPSK	25	12	21.43	21.59	21.68		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

10	QPSK	25	25	21.37	21.55	21.62		
10	QPSK	50	0	21.40	21.59	21.66		
10	16QAM	1	0	21.95	21.92	22.12	23	1
10	16QAM	1	25	21.82	22.02	22.11		
10	16QAM	1	49	21.69	21.99	22.03		
10	16QAM	25	0	20.60	20.76	20.82	22	2
10	16QAM	25	12	20.56	20.74	20.81		
10	16QAM	25	25	20.50	20.70	20.76		
10	16QAM	50	0	20.56	20.71	20.77		
10	64QAM	1	0	20.81	20.80	20.99	22	2
10	64QAM	1	25	20.71	20.91	20.99		
10	64QAM	1	49	20.55	20.86	20.88		
10	64QAM	25	0	19.56	19.77	19.82	21	3
10	64QAM	25	12	19.56	19.76	19.82		
10	64QAM	25	25	19.52	19.71	19.75		
10	64QAM	50	0	19.55	19.72	19.78		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	22.33	22.38	22.49	24	0
5	QPSK	1	12	22.22	22.37	22.46		
5	QPSK	1	24	22.18	22.35	22.44		
5	QPSK	12	0	21.27	21.43	21.53	23	1
5	QPSK	12	7	21.31	21.45	21.55		
5	QPSK	12	13	21.23	21.41	21.49		
5	QPSK	25	0	21.23	21.40	21.47		
5	16QAM	1	0	21.74	21.87	21.93	23	1
5	16QAM	1	12	21.67	21.88	21.89		
5	16QAM	1	24	21.60	21.72	21.83		
5	16QAM	12	0	20.41	20.61	20.64	22	2
5	16QAM	12	7	20.45	20.63	20.68		
5	16QAM	12	13	20.39	20.60	20.64		
5	16QAM	25	0	20.40	20.54	20.63		
5	64QAM	1	0	20.63	20.69	20.80	22	2
5	64QAM	1	12	20.52	20.74	20.78		
5	64QAM	1	24	20.48	20.64	20.74		
5	64QAM	12	0	19.41	19.57	19.63	21	3
5	64QAM	12	7	19.44	19.61	19.68		
5	64QAM	12	13	19.39	19.56	19.60		
5	64QAM	25	0	19.39	19.54	19.61		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	22.29	22.36	22.48	24	0
3	QPSK	1	8	22.23	22.37	22.48		
3	QPSK	1	14	22.17	22.35	22.45		
3	QPSK	8	0	21.25	21.40	21.53	23	1
3	QPSK	8	4	21.28	21.43	21.53		
3	QPSK	8	7	21.24	21.41	21.52		
3	QPSK	15	0	21.25	21.37	21.51		
3	16QAM	1	0	21.71	21.77	21.88	23	1
3	16QAM	1	8	21.66	21.85	21.87		
3	16QAM	1	14	21.54	21.79	21.87		
3	16QAM	8	0	20.44	20.62	20.67	22	2
3	16QAM	8	4	20.47	20.64	20.70		
3	16QAM	8	7	20.45	20.62	20.66		
3	16QAM	15	0	20.36	20.56	20.63		
3	64QAM	1	0	20.59	20.69	20.80	22	2



**FCC SAR TEST REPORT**

**Report No. : FA962518**

3	64QAM	1	8	20.46	20.72	20.77	21	3
3	64QAM	1	14	20.42	20.68	20.76		
3	64QAM	8	0	19.41	19.59	19.64		
3	64QAM	8	4	19.44	19.64	19.67		
3	64QAM	8	7	19.43	19.58	19.63		
3	64QAM	15	0	19.38	19.55	19.61		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	22.24	22.33	22.42	24	0
1.4	QPSK	1	3	22.30	22.39	22.49		
1.4	QPSK	1	5	22.24	22.32	22.41		
1.4	QPSK	3	0	22.30	22.36	22.45		
1.4	QPSK	3	1	22.32	22.37	22.50		
1.4	QPSK	3	3	22.29	22.36	22.49		
1.4	QPSK	6	0	21.31	21.35	21.46	23	1
1.4	16QAM	1	0	21.61	21.80	21.85	23	1
1.4	16QAM	1	3	21.77	21.83	21.91		
1.4	16QAM	1	5	21.67	21.75	21.83		
1.4	16QAM	3	0	21.42	21.55	21.62		
1.4	16QAM	3	1	21.50	21.53	21.64		
1.4	16QAM	3	3	21.41	21.56	21.59		
1.4	16QAM	6	0	20.49	20.55	20.62	22	2
1.4	64QAM	1	0	20.58	20.68	20.71	22	2
1.4	64QAM	1	3	20.60	20.71	20.79		
1.4	64QAM	1	5	20.53	20.63	20.70		
1.4	64QAM	3	0	20.49	20.59	20.67		
1.4	64QAM	3	1	20.51	20.59	20.71		
1.4	64QAM	3	3	20.48	20.56	20.67		
1.4	64QAM	6	0	19.41	19.50	19.58	21	3



<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	22.65	22.59	22.81	24	0
10	QPSK	1	25	22.64	22.87	22.78		
10	QPSK	1	49	22.54	22.54	22.79		
10	QPSK	25	0	21.67	21.67	21.85	23	1
10	QPSK	25	12	21.71	21.73	21.85		
10	QPSK	25	25	21.60	21.61	21.77		
10	QPSK	50	0	21.64	21.68	21.83		
10	16QAM	1	0	22.02	21.96	22.22	23	1
10	16QAM	1	25	22.01	22.04	22.12		
10	16QAM	1	49	21.95	21.92	22.17		
10	16QAM	25	0	20.76	20.83	20.95	22	2
10	16QAM	25	12	20.76	20.84	20.96		
10	16QAM	25	25	20.73	20.71	20.86		
10	16QAM	50	0	20.76	20.79	20.95		
10	64QAM	1	0	20.88	20.86	21.10	22	2
10	64QAM	1	25	20.88	20.92	21.04		
10	64QAM	1	49	20.80	20.83	21.07		
10	64QAM	25	0	19.79	19.82	19.96	21	3
10	64QAM	25	12	19.77	19.84	19.97		
10	64QAM	25	25	19.75	19.74	19.88		
10	64QAM	50	0	19.76	19.79	19.94		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.63	22.56	22.84	24	0
5	QPSK	1	12	22.66	22.63	22.83		
5	QPSK	1	24	22.60	22.57	22.81		
5	QPSK	12	0	21.69	21.68	21.85	23	1
5	QPSK	12	7	21.72	21.68	21.88		
5	QPSK	12	13	21.65	21.67	21.82		
5	QPSK	25	0	21.65	21.68	21.85		
5	16QAM	1	0	22.02	21.94	22.18	23	1
5	16QAM	1	12	22.03	22.00	22.16		
5	16QAM	1	24	21.93	21.99	22.23		
5	16QAM	12	0	20.80	20.80	20.99	22	2
5	16QAM	12	7	20.82	20.83	21.03		
5	16QAM	12	13	20.77	20.78	20.94		
5	16QAM	25	0	20.77	20.79	20.97		
5	64QAM	1	0	20.92	20.79	21.09	22	2
5	64QAM	1	12	20.91	20.91	21.07		
5	64QAM	1	24	20.86	20.88	21.12		
5	64QAM	12	0	19.80	19.81	19.96	21	3
5	64QAM	12	7	19.83	19.83	20.00		
5	64QAM	12	13	19.77	19.76	19.93		
5	64QAM	25	0	19.79	19.80	19.98		
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.64	22.61	22.80	24	0
3	QPSK	1	8	22.60	22.57	22.84		
3	QPSK	1	14	22.58	22.55	22.85		
3	QPSK	8	0	21.65	21.63	21.85	23	1
3	QPSK	8	4	21.66	21.67	21.85		



3	QPSK	8	7	21.65	21.64	21.93		
3	QPSK	15	0	21.64	21.62	21.84		
3	16QAM	1	0	22.00	21.98	22.14	23	1
3	16QAM	1	8	21.95	22.01	22.20		
3	16QAM	1	14	21.95	21.97	22.18		
3	16QAM	8	0	20.81	20.81	21.00	22	2
3	16QAM	8	4	20.84	20.84	21.02		
3	16QAM	8	7	20.81	20.80	21.09		
3	16QAM	15	0	20.76	20.75	20.95		
3	64QAM	1	0	20.87	20.87	21.06	22	2
3	64QAM	1	8	20.88	20.87	21.12		
3	64QAM	1	14	20.87	20.87	21.11		
3	64QAM	8	0	19.78	19.78	19.96	21	3
3	64QAM	8	4	19.80	19.80	19.96		
3	64QAM	8	7	19.78	19.78	20.05		
3	64QAM	15	0	19.74	19.73	19.94		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.62	22.55	22.84	24	0
1.4	QPSK	1	3	22.65	22.63	22.81		
1.4	QPSK	1	5	22.58	22.55	22.83		
1.4	QPSK	3	0	22.63	22.60	22.86		
1.4	QPSK	3	1	22.67	22.64	22.81		
1.4	QPSK	3	3	22.61	22.61	22.84		
1.4	QPSK	6	0	21.63	21.61	21.91	23	1
1.4	16QAM	1	0	21.95	21.93	22.21	23	1
1.4	16QAM	1	3	21.97	22.05	22.32		
1.4	16QAM	1	5	21.94	21.93	22.22		
1.4	16QAM	3	0	21.74	21.75	21.99		
1.4	16QAM	3	1	21.80	21.76	22.00		
1.4	16QAM	3	3	21.71	21.72	21.94		
1.4	16QAM	6	0	20.80	20.76	21.04	22	2
1.4	64QAM	1	0	20.85	20.85	21.11	22	2
1.4	64QAM	1	3	20.94	20.93	21.19		
1.4	64QAM	1	5	20.84	20.79	21.08		
1.4	64QAM	3	0	20.80	20.79	21.03		
1.4	64QAM	3	1	20.85	20.78	21.03		
1.4	64QAM	3	3	20.77	20.78	21.01		
1.4	64QAM	6	0	19.73	19.75	20.01	21	3



<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	23.11	23.09	23.16	24	0
20	QPSK	1	49	23.08	22.97	23.05		
20	QPSK	1	99	23.09	23.07	23.03		
20	QPSK	50	0	22.08	22.10	22.14	23	1
20	QPSK	50	24	22.06	22.04	22.08		
20	QPSK	50	50	22.04	22.09	22.10		
20	QPSK	100	0	22.05	22.04	22.10		
20	16QAM	1	0	22.43	22.40	22.40	23	1
20	16QAM	1	49	22.50	22.33	22.39		
20	16QAM	1	99	22.57	22.44	22.42		
20	16QAM	50	0	21.16	21.16	21.15	22	2
20	16QAM	50	24	21.19	21.16	21.22		
20	16QAM	50	50	21.27	21.20	21.19		
20	16QAM	100	0	21.19	21.14	21.17		
20	64QAM	1	0	21.35	21.32	21.29	22	2
20	64QAM	1	49	21.40	21.26	21.31		
20	64QAM	1	99	21.44	21.33	21.34		
20	64QAM	50	0	20.18	20.13	20.16	21	3
20	64QAM	50	24	20.18	20.17	20.21		
20	64QAM	50	50	20.28	20.15	20.19		
20	64QAM	100	0	20.21	20.17	20.20		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	23.09	23.06	23.04	24	0
15	QPSK	1	37	23.12	22.99	23.04		
15	QPSK	1	74	23.13	23.10	23.13		
15	QPSK	36	0	22.08	22.06	22.04	23	1
15	QPSK	36	20	22.09	22.10	22.12		
15	QPSK	36	39	22.21	22.03	22.08		
15	QPSK	75	0	22.11	22.08	22.10		
15	16QAM	1	0	22.43	22.43	22.41	23	1
15	16QAM	1	37	22.51	22.34	22.40		
15	16QAM	1	74	22.61	22.46	22.50		
15	16QAM	36	0	21.17	21.09	21.16	22	2
15	16QAM	36	20	21.21	21.15	21.21		
15	16QAM	36	39	21.33	21.17	21.21		
15	16QAM	75	0	21.23	21.13	21.16		
15	64QAM	1	0	21.39	21.37	21.35	22	2
15	64QAM	1	37	21.44	21.23	21.29		
15	64QAM	1	74	21.48	21.34	21.36		
15	64QAM	36	0	20.18	20.10	20.17	21	3
15	64QAM	36	20	20.22	20.14	20.19		
15	64QAM	36	39	20.31	20.18	20.20		
15	64QAM	75	0	20.21	20.12	20.17		
Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	23.11	22.99	22.97	24	0
10	QPSK	1	25	23.02	22.95	23.02		
10	QPSK	1	49	23.15	23.03	23.06		
10	QPSK	25	0	22.02	22.00	22.03	23	1
10	QPSK	25	12	22.10	22.01	22.06		



10	QPSK	25	25	22.09	22.03	22.09		
10	QPSK	50	0	22.08	22.02	22.02		
10	16QAM	1	0	22.44	22.27	22.31	23	1
10	16QAM	1	25	22.40	22.34	22.34		
10	16QAM	1	49	22.54	22.41	22.45		
10	16QAM	25	0	21.15	21.12	21.16	22	2
10	16QAM	25	12	21.19	21.14	21.15		
10	16QAM	25	25	21.15	21.16	21.13		
10	16QAM	50	0	21.20	21.14	21.15		
10	64QAM	1	0	21.36	21.21	21.23	22	2
10	64QAM	1	25	21.27	21.28	21.27		
10	64QAM	1	49	21.43	21.26	21.34		
10	64QAM	25	0	20.14	20.13	20.17	21	3
10	64QAM	25	12	20.18	20.16	20.15		
10	64QAM	25	25	20.15	20.15	20.12		
10	64QAM	50	0	20.19	20.13	20.14		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	23.11	22.96	22.97	24	0
5	QPSK	1	12	23.03	22.96	22.99		
5	QPSK	1	24	23.04	22.99	23.04		
5	QPSK	12	0	22.09	22.00	22.01	23	1
5	QPSK	12	7	22.08	22.03	22.04		
5	QPSK	12	13	22.08	22.04	22.06		
5	QPSK	25	0	22.07	22.01	22.02		
5	16QAM	1	0	22.45	22.32	22.32	23	1
5	16QAM	1	12	22.38	22.31	22.32		
5	16QAM	1	24	22.39	22.36	22.35		
5	16QAM	12	0	21.19	21.13	21.10	22	2
5	16QAM	12	7	21.24	21.16	21.18		
5	16QAM	12	13	21.19	21.15	21.14		
5	16QAM	25	0	21.18	21.08	21.12		
5	64QAM	1	0	21.34	21.18	21.24	22	2
5	64QAM	1	12	21.28	21.22	21.24		
5	64QAM	1	24	21.29	21.25	21.24		
5	64QAM	12	0	20.18	20.10	20.10	21	3
5	64QAM	12	7	20.22	20.15	20.17		
5	64QAM	12	13	20.19	20.14	20.12		
5	64QAM	25	0	20.17	20.11	20.12		



<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	22.53	22.47	22.55	24	0
10	QPSK	1	25	22.73	22.58	22.56		
10	QPSK	1	49	22.58	22.55	22.62		
10	QPSK	25	0	21.62	21.61	21.59	23	1
10	QPSK	25	12	21.64	21.62	21.60		
10	QPSK	25	25	21.66	21.62	21.53		
10	QPSK	50	0	21.65	21.59	21.57	23	1
10	16QAM	1	0	21.87	21.86	21.91		
10	16QAM	1	25	22.03	21.96	21.92		
10	16QAM	1	49	21.98	21.91	21.95	22	2
10	16QAM	25	0	20.75	20.72	20.69		
10	16QAM	25	12	20.77	20.77	20.69		
10	16QAM	25	25	20.75	20.72	20.69	22	2
10	16QAM	50	0	20.79	20.74	20.66		
10	64QAM	1	0	20.72	20.75	20.79		
10	64QAM	1	25	20.90	20.85	20.82	22	2
10	64QAM	1	49	20.87	20.82	20.85		
10	64QAM	25	0	19.73	19.73	19.71		
10	64QAM	25	12	19.78	19.77	19.71	21	3
10	64QAM	25	25	19.76	19.71	19.70		
10	64QAM	50	0	19.76	19.71	19.66		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	22.54	22.56	22.50	24	0
5	QPSK	1	12	22.54	22.55	22.60		
5	QPSK	1	24	22.60	22.57	22.56		
5	QPSK	12	0	21.55	21.59	21.51	23	1
5	QPSK	12	7	21.58	21.61	21.71		
5	QPSK	12	13	21.66	21.59	21.61		
5	QPSK	25	0	21.68	21.60	21.55	23	1
5	16QAM	1	0	21.84	21.95	21.88		
5	16QAM	1	12	21.93	21.94	21.94		
5	16QAM	1	24	21.98	21.93	21.93	22	2
5	16QAM	12	0	20.68	20.71	20.68		
5	16QAM	12	7	20.74	20.76	20.81		
5	16QAM	12	13	20.78	20.72	20.77	22	2
5	16QAM	25	0	20.78	20.71	20.64		
5	64QAM	1	0	20.75	20.83	20.83		
5	64QAM	1	12	20.83	20.85	20.88	22	2
5	64QAM	1	24	20.85	20.81	20.82		
5	64QAM	12	0	19.67	19.69	19.66		
5	64QAM	12	7	19.70	19.72	19.79	21	3
5	64QAM	12	13	19.78	19.69	19.78		
5	64QAM	25	0	19.78	19.72	19.65		
Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	22.53	22.54	22.59	24	0
3	QPSK	1	8	22.52	22.54	22.57		
3	QPSK	1	14	22.53	22.54	22.56		
3	QPSK	8	0	21.58	21.56	21.59	23	1
3	QPSK	8	4	21.58	21.63	21.66		



3	QPSK	8	7	21.52	21.56	21.59		
3	QPSK	15	0	21.55	21.60	21.63		
3	16QAM	1	0	21.88	21.90	21.93	23	1
3	16QAM	1	8	21.88	21.94	21.96		
3	16QAM	1	14	21.86	21.89	21.90		
3	16QAM	8	0	20.71	20.78	20.81	22	2
3	16QAM	8	4	20.74	20.76	20.79		
3	16QAM	8	7	20.73	20.77	20.80		
3	16QAM	15	0	20.65	20.70	20.77		
3	64QAM	1	0	20.76	20.80	20.84	22	2
3	64QAM	1	8	20.76	20.81	20.82		
3	64QAM	1	14	20.79	20.80	20.81		
3	64QAM	8	0	19.69	19.70	19.77	21	3
3	64QAM	8	4	19.69	19.74	19.76		
3	64QAM	8	7	19.71	19.72	19.75		
3	64QAM	15	0	19.65	19.69	19.76		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	22.49	22.51	22.53	24	0
1.4	QPSK	1	3	22.57	22.59	22.60		
1.4	QPSK	1	5	22.49	22.50	22.54		
1.4	QPSK	3	0	22.57	22.57	22.56		
1.4	QPSK	3	1	22.57	22.58	22.62		
1.4	QPSK	3	3	22.55	22.55	22.60		
1.4	QPSK	6	0	21.54	21.55	21.56	23	1
1.4	16QAM	1	0	21.82	21.89	21.86	23	1
1.4	16QAM	1	3	21.91	21.95	21.95		
1.4	16QAM	1	5	21.78	21.89	21.88		
1.4	16QAM	3	0	21.61	21.68	21.66		
1.4	16QAM	3	1	21.68	21.70	21.72		
1.4	16QAM	3	3	21.63	21.65	21.68		
1.4	16QAM	6	0	20.72	20.76	20.79	22	2
1.4	64QAM	1	0	20.72	20.81	20.82	22	2
1.4	64QAM	1	3	20.75	20.85	20.86		
1.4	64QAM	1	5	20.73	20.80	20.77		
1.4	64QAM	3	0	20.63	20.73	20.70		
1.4	64QAM	3	1	20.69	20.73	20.79		
1.4	64QAM	3	3	20.68	20.71	20.75		
1.4	64QAM	6	0	19.64	19.70	19.71	21	3



<LTE Band 17>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23780	23790	23800		
Frequency (MHz)				709	710	711		
10	QPSK	1	0	22.54	22.56	22.62		
10	QPSK	1	25	22.65	22.61	22.62	24	0
10	QPSK	1	49	22.72	22.71	22.71		
10	QPSK	25	0	21.69	21.66	21.65		
10	QPSK	25	12	21.72	21.70	21.70	23	1
10	QPSK	25	25	21.67	21.62	21.62		
10	QPSK	50	0	21.70	21.69	21.66		
10	16QAM	1	0	21.89	21.93	21.97	23	1
10	16QAM	1	25	22.02	22.00	21.96		
10	16QAM	1	49	22.13	22.11	22.05		
10	16QAM	25	0	20.81	20.77	20.78	22	2
10	16QAM	25	12	20.81	20.82	20.77		
10	16QAM	25	25	20.76	20.79	20.77		
10	16QAM	50	0	20.79	20.78	20.76	22	2
10	64QAM	1	0	20.82	20.80	20.90		
10	64QAM	1	25	20.91	20.89	20.87		
10	64QAM	1	49	21.01	20.98	20.98	21	3
10	64QAM	25	0	19.82	19.77	19.80		
10	64QAM	25	12	19.84	19.83	19.79		
10	64QAM	25	25	19.78	19.78	19.75	21	3
10	64QAM	50	0	19.79	19.78	19.75		
Channel				23755	23790	23825		
Frequency (MHz)				706.5	710	713.5		
5	QPSK	1	0	22.55	22.53	22.60		
5	QPSK	1	12	22.67	22.60	22.61	24	0
5	QPSK	1	24	22.65	22.69	22.69		
5	QPSK	12	0	21.72	21.66	21.63		
5	QPSK	12	7	21.73	21.68	21.67	23	1
5	QPSK	12	13	21.69	21.66	21.61		
5	QPSK	25	0	21.68	21.66	21.66		
5	16QAM	1	0	21.95	21.86	21.98	23	1
5	16QAM	1	12	22.07	21.97	22.01		
5	16QAM	1	24	21.98	22.06	22.02		
5	16QAM	12	0	20.82	20.79	20.78	22	2
5	16QAM	12	7	20.85	20.81	20.81		
5	16QAM	12	13	20.85	20.78	20.75		
5	16QAM	25	0	20.80	20.78	20.76	22	2
5	64QAM	1	0	20.82	20.78	20.83		
5	64QAM	1	12	20.95	20.88	20.87		
5	64QAM	1	24	20.90	20.95	20.91	21	3
5	64QAM	12	0	19.82	19.78	19.77		
5	64QAM	12	7	19.85	19.82	19.78		
5	64QAM	12	13	19.84	19.78	19.75	21	3
5	64QAM	25	0	19.79	19.78	19.75		



<LTE Band 66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	22.86	22.87	22.99	24	0
20	QPSK	1	49	22.79	22.84	22.96		
20	QPSK	1	99	22.70	22.79	22.84		
20	QPSK	50	0	21.87	21.91	21.97	23	1
20	QPSK	50	24	21.84	21.89	21.99		
20	QPSK	50	50	21.77	21.82	21.95		
20	QPSK	100	0	21.80	21.87	21.97		
20	16QAM	1	0	22.22	22.36	22.38	23	1
20	16QAM	1	49	22.17	22.34	22.43		
20	16QAM	1	99	22.12	22.19	22.26		
20	16QAM	50	0	20.99	21.08	21.14	22	2
20	16QAM	50	24	20.97	21.05	21.13		
20	16QAM	50	50	20.89	21.01	21.07		
20	16QAM	100	0	20.89	21.01	21.11		
20	64QAM	1	0	21.12	21.29	21.30	22	2
20	64QAM	1	49	21.12	21.20	21.28		
20	64QAM	1	99	20.99	21.08	21.16		
20	64QAM	50	0	19.95	20.05	20.14	21	3
20	64QAM	50	24	19.95	20.03	20.13		
20	64QAM	50	50	19.90	20.00	20.08		
20	64QAM	100	0	19.94	20.08	20.11		
Channel				132047	132322	132597		
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	22.90	22.95	22.91	24	0
15	QPSK	1	37	22.82	22.92	22.96		
15	QPSK	1	74	22.78	22.82	22.90		
15	QPSK	36	0	21.91	21.97	22.06	23	1
15	QPSK	36	20	21.91	22.00	22.05		
15	QPSK	36	39	21.84	21.92	21.97		
15	QPSK	75	0	21.87	21.93	22.02		
15	16QAM	1	0	22.37	22.45	22.43	23	1
15	16QAM	1	37	22.30	22.40	22.39		
15	16QAM	1	74	22.23	22.28	22.33		
15	16QAM	36	0	21.03	21.12	21.18	22	2
15	16QAM	36	20	21.05	21.13	21.19		
15	16QAM	36	39	21.00	21.09	21.15		
15	16QAM	75	0	21.02	21.07	21.12		
15	64QAM	1	0	21.25	21.28	21.32	22	2
15	64QAM	1	37	21.14	21.23	21.28		
15	64QAM	1	74	21.07	21.14	21.20		
15	64QAM	36	0	20.06	20.12	20.17	21	3
15	64QAM	36	20	20.06	20.16	20.18		
15	64QAM	36	39	19.99	20.08	20.12		
15	64QAM	75	0	20.00	20.09	20.17		
Channel				132022	132322	132622		
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	22.88	22.94	22.93	24	0
10	QPSK	1	25	22.64	22.91	22.91		
10	QPSK	1	49	22.84	22.88	22.92		
10	QPSK	25	0	21.90	21.94	22.03	23	1
10	QPSK	25	12	21.89	21.96	22.04		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

10	QPSK	25	25	21.86	21.92	22.01				
10	QPSK	50	0	21.90	21.95	22.00				
10	16QAM	1	0	22.29	22.44	22.46	23	1		
10	16QAM	1	25	22.27	22.34	22.44				
10	16QAM	1	49	22.19	22.30	22.30				
10	16QAM	25	0	21.02	21.10	21.17	22	2		
10	16QAM	25	12	21.04	21.11	21.17				
10	16QAM	25	25	20.99	21.08	21.12				
10	16QAM	50	0	21.02	21.08	21.14				
10	64QAM	1	0	21.22	21.31	21.32	22	2		
10	64QAM	1	25	21.17	21.28	21.27				
10	64QAM	1	49	21.08	21.18	21.17				
10	64QAM	25	0	20.02	20.11	20.18	21	3		
10	64QAM	25	12	20.03	20.13	20.17				
10	64QAM	25	25	19.99	20.07	20.12				
10	64QAM	50	0	20.03	20.07	20.14				
Channel				131997	132322	132647			Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5				
5	QPSK	1	0	22.83	22.93	22.93	24	0		
5	QPSK	1	12	22.85	22.90	22.96				
5	QPSK	1	24	22.86	22.84	22.87				
5	QPSK	12	0	21.89	21.96	21.98	23	1		
5	QPSK	12	7	21.93	21.96	22.00				
5	QPSK	12	13	21.86	21.96	21.95				
5	QPSK	25	0	21.89	21.92	21.94				
5	16QAM	1	0	22.25	22.32	22.33				
5	16QAM	1	12	22.30	22.36	22.36	23	1		
5	16QAM	1	24	22.25	22.28	22.30				
5	16QAM	12	0	21.06	21.15	21.15				
5	16QAM	12	7	21.09	21.19	21.19	22	2		
5	16QAM	12	13	21.03	21.09	21.14				
5	16QAM	25	0	20.99	21.06	21.11				
5	64QAM	1	0	21.14	21.33	21.29				
5	64QAM	1	12	21.19	21.25	21.22	22	2		
5	64QAM	1	24	21.16	21.20	21.12				
5	64QAM	12	0	20.04	20.13	20.15				
5	64QAM	12	7	20.06	20.16	20.15	21	3		
5	64QAM	12	13	19.99	20.06	20.10				
5	64QAM	25	0	20.00	20.08	20.12				
Channel				131987	132322	132657			Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5				
3	QPSK	1	0	22.83	22.86	22.88	24	0		
3	QPSK	1	8	22.85	22.88	22.93				
3	QPSK	1	14	22.79	22.84	22.89				
3	QPSK	8	0	21.90	21.94	21.97	23	1		
3	QPSK	8	4	21.90	21.97	21.98				
3	QPSK	8	7	21.90	21.91	21.94				
3	QPSK	15	0	21.86	21.93	21.95				
3	16QAM	1	0	22.24	22.33	22.32	23	1		
3	16QAM	1	8	22.25	22.31	22.36				
3	16QAM	1	14	22.16	22.23	22.32				
3	16QAM	8	0	21.07	21.13	21.16	22	2		
3	16QAM	8	4	21.11	21.16	21.19				
3	16QAM	8	7	21.05	21.12	21.15				
3	16QAM	15	0	21.02	21.04	21.08				
3	64QAM	1	0	21.12	21.15	21.16				



**FCC SAR TEST REPORT**

**Report No. : FA962518**

3	64QAM	1	8	21.15	21.21	21.26	21	3
3	64QAM	1	14	21.12	21.17	21.17		
3	64QAM	8	0	20.01	20.09	20.14		
3	64QAM	8	4	20.03	20.12	20.16		
3	64QAM	8	7	20.02	20.09	20.11		
3	64QAM	15	0	19.99	20.03	20.08		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	22.76	22.78	22.87	24	0
1.4	QPSK	1	3	22.82	22.86	22.92		
1.4	QPSK	1	5	22.74	22.76	22.87		
1.4	QPSK	3	0	22.77	22.85	22.88		
1.4	QPSK	3	1	22.80	22.87	22.96		
1.4	QPSK	3	3	22.79	22.82	22.90		
1.4	QPSK	6	0	21.76	21.83	21.91	23	1
1.4	16QAM	1	0	22.18	22.26	22.33	23	1
1.4	16QAM	1	3	22.24	22.30	22.33		
1.4	16QAM	1	5	22.13	22.21	22.27		
1.4	16QAM	3	0	22.00	22.00	22.05		
1.4	16QAM	3	1	21.96	21.93	22.11		
1.4	16QAM	3	3	21.99	22.34	22.04		
1.4	16QAM	6	0	21.00	21.06	21.11	22	2
1.4	64QAM	1	0	21.04	21.16	21.17	22	2
1.4	64QAM	1	3	21.13	21.22	21.28		
1.4	64QAM	1	5	21.08	21.14	21.13		
1.4	64QAM	3	0	20.98	21.09	21.11		
1.4	64QAM	3	1	21.03	21.08	21.12		
1.4	64QAM	3	3	20.97	21.02	21.08		
1.4	64QAM	6	0	19.89	20.01	20.06	21	3



<Near-Body Power Mode>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	20.87	20.79	20.85	21.5	0
20	QPSK	1	49	20.31	20.24	20.41		
20	QPSK	1	99	20.08	20.25	20.46		
20	QPSK	50	0	20.77	20.71	20.75	21.5	0
20	QPSK	50	24	20.39	20.32	20.49		
20	QPSK	50	50	20.22	20.21	20.43		
20	QPSK	100	0	20.74	20.68	20.72	21.5	0
20	16QAM	1	0	20.58	20.78	20.48		
20	16QAM	1	49	20.39	20.36	20.64		
20	16QAM	1	99	20.57	20.73	20.61	21.5	0
20	16QAM	50	0	20.57	20.51	20.65		
20	16QAM	50	24	20.56	20.49	20.64		
20	16QAM	50	50	20.37	20.39	20.64	21.5	0
20	16QAM	100	0	20.44	20.44	20.62		
20	64QAM	1	0	20.49	20.74	20.39		
20	64QAM	1	49	20.35	20.29	20.62	21.5	0
20	64QAM	1	99	20.53	20.63	20.59		
20	64QAM	50	0	19.69	19.91	19.99		
20	64QAM	50	24	19.71	19.84	19.99	21	0.5
20	64QAM	50	50	19.70	19.85	19.94		
20	64QAM	100	0	19.85	19.85	20.04		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	20.86	20.69	20.85	21.5	0
15	QPSK	1	37	20.22	20.14	20.32		
15	QPSK	1	74	20.03	20.23	20.37		
15	QPSK	36	0	20.68	20.61	20.65	21.5	0
15	QPSK	36	20	20.30	20.31	20.41		
15	QPSK	36	39	20.22	20.17	20.40		
15	QPSK	75	0	20.64	20.58	20.66	21.5	0
15	16QAM	1	0	20.48	20.68	20.40		
15	16QAM	1	37	20.34	20.31	20.63		
15	16QAM	1	74	20.52	20.71	20.58	21.5	0
15	16QAM	36	0	20.52	20.41	20.60		
15	16QAM	36	20	20.56	20.48	20.60		
15	16QAM	36	39	20.35	20.33	20.54	21.5	0
15	16QAM	75	0	20.41	20.43	20.53		
15	64QAM	1	0	20.44	20.70	20.31		
15	64QAM	1	37	20.31	20.26	20.53	21.5	0
15	64QAM	1	74	20.52	20.58	20.59		
15	64QAM	36	0	19.66	19.91	19.98		
15	64QAM	36	20	19.64	19.77	19.94	21	0.5
15	64QAM	36	39	19.70	19.82	19.89		
15	64QAM	75	0	19.80	19.79	20.03		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	20.83	20.70	20.80	21.5	0
10	QPSK	1	25	20.21	20.14	20.37		
10	QPSK	1	49	20.00	20.20	20.46		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

10	QPSK	25	0	20.67	20.66	20.70	21.5	0
10	QPSK	25	12	20.39	20.24	20.43		
10	QPSK	25	25	20.13	20.13	20.34		
10	QPSK	50	0	20.68	20.59	20.72		
10	16QAM	1	0	20.52	20.78	20.44	21.5	0
10	16QAM	1	25	20.29	20.36	20.55		
10	16QAM	1	49	20.51	20.63	20.60		
10	16QAM	25	0	20.55	20.41	20.58	21.5	0
10	16QAM	25	12	20.54	20.46	20.56		
10	16QAM	25	25	20.30	20.36	20.56		
10	16QAM	50	0	20.41	20.37	20.61		
10	64QAM	1	0	20.43	20.67	20.35	21.5	0
10	64QAM	1	25	20.28	20.28	20.59		
10	64QAM	1	49	20.44	20.58	20.49		
10	64QAM	25	0	19.65	19.81	19.99	21	0.5
10	64QAM	25	12	19.63	19.80	19.91		
10	64QAM	25	25	19.65	19.76	19.90		
10	64QAM	50	0	19.82	19.84	20.00		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	20.82	20.72	20.78	21.5	0
5	QPSK	1	12	20.29	20.15	20.35		
5	QPSK	1	24	20.01	20.15	20.37		
5	QPSK	12	0	20.70	20.66	20.74	21.5	0
5	QPSK	12	7	20.31	20.22	20.47		
5	QPSK	12	13	20.22	20.20	20.42		
5	QPSK	25	0	20.64	20.66	20.62		
5	16QAM	1	0	20.57	20.75	20.38	21.5	0
5	16QAM	1	12	20.29	20.33	20.59		
5	16QAM	1	24	20.55	20.66	20.51		
5	16QAM	12	0	20.49	20.50	20.64	21.5	0
5	16QAM	12	7	20.55	20.44	20.56		
5	16QAM	12	13	20.28	20.39	20.55		
5	16QAM	25	0	20.43	20.38	20.61		
5	64QAM	1	0	20.42	20.67	20.32	21.5	0
5	64QAM	1	12	20.25	20.22	20.60		
5	64QAM	1	24	20.51	20.60	20.56		
5	64QAM	12	0	19.60	19.84	19.96	21	0.5
5	64QAM	12	7	19.62	19.81	19.93		
5	64QAM	12	13	19.65	19.78	19.91		
5	64QAM	25	0	19.75	19.78	20.02		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	20.86	20.70	20.80	21.5	0
3	QPSK	1	8	20.27	20.20	20.35		
3	QPSK	1	14	20.02	20.20	20.39		
3	QPSK	8	0	20.71	20.68	20.70	21.5	0
3	QPSK	8	4	20.35	20.25	20.45		
3	QPSK	8	7	20.12	20.19	20.39		
3	QPSK	15	0	20.65	20.65	20.66		
3	16QAM	1	0	20.58	20.77	20.45	21.5	0
3	16QAM	1	8	20.38	20.32	20.60		
3	16QAM	1	14	20.51	20.69	20.54		
3	16QAM	8	0	20.50	20.51	20.61	21.5	0
3	16QAM	8	4	20.47	20.48	20.55		
3	16QAM	8	7	20.32	20.37	20.55		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

3	16QAM	15	0	20.34	20.41	20.52		
3	64QAM	1	0	20.40	20.67	20.36	21.5	0
3	64QAM	1	8	20.27	20.23	20.56		
3	64QAM	1	14	20.51	20.54	20.53		
3	64QAM	8	0	19.68	19.85	19.94	21	0.5
3	64QAM	8	4	19.71	19.74	19.93		
3	64QAM	8	7	19.63	19.80	19.87		
3	64QAM	15	0	19.82	19.85	19.96		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	20.80	20.78	20.76	21.5	0
1.4	QPSK	1	3	20.31	20.20	20.31		
1.4	QPSK	1	5	20.04	20.19	20.37		
1.4	QPSK	3	0	20.71	20.70	20.68		
1.4	QPSK	3	1	20.33	20.32	20.40		
1.4	QPSK	3	3	20.18	20.20	20.37		
1.4	QPSK	6	0	20.74	20.66	20.68	21.5	0
1.4	16QAM	1	0	20.49	20.70	20.48	21.5	0
1.4	16QAM	1	3	20.32	20.26	20.60		
1.4	16QAM	1	5	20.47	20.73	20.61		
1.4	16QAM	3	0	20.47	20.51	20.57		
1.4	16QAM	3	1	20.47	20.45	20.57		
1.4	16QAM	3	3	20.28	20.29	20.62		
1.4	16QAM	6	0	20.35	20.41	20.53	21.5	0
1.4	64QAM	1	0	20.49	20.70	20.31	21.5	0
1.4	64QAM	1	3	20.27	20.24	20.53		
1.4	64QAM	1	5	20.51	20.59	20.52		
1.4	64QAM	3	0	20.57	20.71	20.48		
1.4	64QAM	3	1	20.36	20.27	20.57		
1.4	64QAM	3	3	20.56	20.72	20.54		
1.4	64QAM	6	0	19.77	19.80	20.04	21	0.5



<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	19.59	19.61	19.58	20.5	0
20	QPSK	1	49	19.53	19.55	19.56		
20	QPSK	1	99	19.45	19.56	19.50		
20	QPSK	50	0	19.28	19.31	19.35	20.5	0
20	QPSK	50	24	19.28	19.41	19.38		
20	QPSK	50	50	19.21	19.35	19.27		
20	QPSK	100	0	19.24	19.37	19.31	20.5	0
20	16QAM	1	0	19.12	19.16	19.13		
20	16QAM	1	49	19.08	19.10	19.17		
20	16QAM	1	99	19.01	19.09	19.08	20.5	0
20	16QAM	50	0	19.15	19.19	19.25		
20	16QAM	50	24	19.12	19.28	19.26		
20	16QAM	50	50	19.10	19.24	19.18	20.5	0
20	16QAM	100	0	19.11	19.24	19.23		
20	64QAM	1	0	19.48	19.51	19.54		
20	64QAM	1	49	19.42	19.49	19.53	20.5	0
20	64QAM	1	99	19.35	19.46	19.45		
20	64QAM	50	0	19.29	19.31	19.40		
20	64QAM	50	24	19.29	19.41	19.36	20.5	0
20	64QAM	50	50	19.23	19.35	19.32		
20	64QAM	100	0	19.26	19.37	19.33		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	19.58	19.51	19.58	20.5	0
15	QPSK	1	37	19.45	19.45	19.46		
15	QPSK	1	74	19.38	19.52	19.48		
15	QPSK	36	0	19.18	19.26	19.35	20.5	0
15	QPSK	36	20	19.19	19.37	19.28		
15	QPSK	36	39	19.18	19.31	19.25		
15	QPSK	75	0	19.17	19.29	19.21	20.5	0
15	16QAM	1	0	19.04	19.10	19.06		
15	16QAM	1	37	19.03	19.09	19.16		
15	16QAM	1	74	18.99	19.08	19.02	20.5	0
15	16QAM	36	0	19.05	19.11	19.20		
15	16QAM	36	20	19.10	19.27	19.18		
15	16QAM	36	39	19.07	19.20	19.17	20.5	0
15	16QAM	75	0	19.06	19.17	19.22		
15	64QAM	1	0	19.38	19.50	19.52		
15	64QAM	1	37	19.34	19.48	19.48	20.5	0
15	64QAM	1	74	19.33	19.37	19.35		
15	64QAM	36	0	19.26	19.26	19.30		
15	64QAM	36	20	19.22	19.36	19.35	20.5	0
15	64QAM	36	39	19.14	19.29	19.31		
15	64QAM	75	0	19.20	19.29	19.32		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	19.58	19.58	19.58	20.5	0
10	QPSK	1	25	19.51	19.54	19.48		
10	QPSK	1	49	19.45	19.53	19.44		
10	QPSK	25	0	19.20	19.31	19.32	20.5	0
10	QPSK	25	12	19.27	19.32	19.35		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

10	QPSK	25	25	19.11	19.29	19.20		
10	QPSK	50	0	19.20	19.34	19.23		
10	16QAM	1	0	19.02	19.15	19.09	20.5	0
10	16QAM	1	25	19.08	19.07	19.16		
10	16QAM	1	49	18.91	19.07	19.03		
10	16QAM	25	0	19.14	19.11	19.20	20.5	0
10	16QAM	25	12	19.07	19.26	19.21		
10	16QAM	25	25	19.08	19.16	19.16		
10	16QAM	50	0	19.06	19.16	19.19		
10	64QAM	1	0	19.38	19.44	19.48	20.5	0
10	64QAM	1	25	19.42	19.44	19.44		
10	64QAM	1	49	19.25	19.45	19.40		
10	64QAM	25	0	19.24	19.28	19.34	20.5	0
10	64QAM	25	12	19.19	19.31	19.28		
10	64QAM	25	25	19.21	19.33	19.22		
10	64QAM	50	0	19.23	19.31	19.29		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	19.56	19.51	19.57	20.5	0
5	QPSK	1	12	19.46	19.46	19.54		
5	QPSK	1	24	19.35	19.55	19.40		
5	QPSK	12	0	19.24	19.25	19.33	20.5	0
5	QPSK	12	7	19.19	19.40	19.29		
5	QPSK	12	13	19.12	19.30	19.20		
5	QPSK	25	0	19.19	19.31	19.23		
5	16QAM	1	0	19.06	19.10	19.12	20.5	0
5	16QAM	1	12	18.99	19.06	19.16		
5	16QAM	1	24	18.93	19.06	18.99		
5	16QAM	12	0	19.12	19.09	19.25	20.5	0
5	16QAM	12	7	19.02	19.25	19.16		
5	16QAM	12	13	19.08	19.24	19.13		
5	16QAM	25	0	19.07	19.16	19.21		
5	64QAM	1	0	19.42	19.42	19.45	20.5	0
5	64QAM	1	12	19.34	19.43	19.49		
5	64QAM	1	24	19.27	19.45	19.42		
5	64QAM	12	0	19.25	19.24	19.34	20.5	0
5	64QAM	12	7	19.28	19.36	19.34		
5	64QAM	12	13	19.20	19.29	19.28		
5	64QAM	25	0	19.23	19.29	19.31		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	19.49	19.59	19.53	20.5	0
3	QPSK	1	8	19.43	19.55	19.53		
3	QPSK	1	14	19.36	19.47	19.49		
3	QPSK	8	0	19.28	19.22	19.33	20.5	0
3	QPSK	8	4	19.21	19.36	19.32		
3	QPSK	8	7	19.15	19.25	19.23		
3	QPSK	15	0	19.15	19.32	19.31		
3	16QAM	1	0	19.11	19.16	19.13	20.5	0
3	16QAM	1	8	19.05	19.06	19.13		
3	16QAM	1	14	18.96	19.03	19.05		
3	16QAM	8	0	19.06	19.14	19.20	20.5	0
3	16QAM	8	4	19.11	19.28	19.24		
3	16QAM	8	7	19.07	19.23	19.13		
3	16QAM	15	0	19.05	19.15	19.18		
3	64QAM	1	0	19.40	19.43	19.47	20.5	0



**FCC SAR TEST REPORT**

**Report No. : FA962518**

3	64QAM	1	8	19.37	19.39	19.45	20.5	0
3	64QAM	1	14	19.31	19.45	19.39		
3	64QAM	8	0	19.26	19.26	19.33		
3	64QAM	8	4	19.25	19.41	19.31		
3	64QAM	8	7	19.23	19.32	19.29		
3	64QAM	15	0	19.19	19.35	19.25		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	19.58	19.57	19.52	20.5	0
1.4	QPSK	1	3	19.43	19.46	19.47		
1.4	QPSK	1	5	19.37	19.55	19.47		
1.4	QPSK	3	0	19.28	19.22	19.27		
1.4	QPSK	3	1	19.24	19.40	19.29		
1.4	QPSK	3	3	19.20	19.33	19.25		
1.4	QPSK	6	0	19.21	19.31	19.22	20.5	0
1.4	16QAM	1	0	19.11	19.09	19.06	20.5	0
1.4	16QAM	1	3	19.05	19.01	19.08		
1.4	16QAM	1	5	18.97	19.04	19.08		
1.4	16QAM	3	0	19.15	19.15	19.21		
1.4	16QAM	3	1	19.03	19.19	19.23		
1.4	16QAM	3	3	19.07	19.18	19.16		
1.4	16QAM	6	0	19.08	19.20	19.19	20.5	0
1.4	64QAM	1	0	19.45	19.46	19.46	20.5	0
1.4	64QAM	1	3	19.41	19.43	19.49		
1.4	64QAM	1	5	19.32	19.40	19.39		
1.4	64QAM	3	0	19.29	19.31	19.31		
1.4	64QAM	3	1	19.28	19.38	19.28		
1.4	64QAM	3	3	19.20	19.35	19.28		
1.4	64QAM	6	0	19.24	19.37	19.24	20.5	0



<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	22.65	22.59	22.81	24	0
10	QPSK	1	25	22.64	22.87	22.78		
10	QPSK	1	49	22.54	22.54	22.79		
10	QPSK	25	0	21.67	21.67	21.85	23	1
10	QPSK	25	12	21.71	21.73	21.85		
10	QPSK	25	25	21.60	21.61	21.77		
10	QPSK	50	0	21.64	21.68	21.83		
10	16QAM	1	0	22.02	21.96	22.22	23	1
10	16QAM	1	25	22.01	22.04	22.12		
10	16QAM	1	49	21.95	21.92	22.17		
10	16QAM	25	0	20.76	20.83	20.95	22	2
10	16QAM	25	12	20.76	20.84	20.96		
10	16QAM	25	25	20.73	20.71	20.86		
10	16QAM	50	0	20.76	20.79	20.95		
10	64QAM	1	0	20.88	20.86	21.10	22	2
10	64QAM	1	25	20.88	20.92	21.04		
10	64QAM	1	49	20.80	20.83	21.07		
10	64QAM	25	0	19.79	19.82	19.96	21	3
10	64QAM	25	12	19.77	19.84	19.97		
10	64QAM	25	25	19.75	19.74	19.88		
10	64QAM	50	0	19.76	19.79	19.94		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.63	22.56	22.84	24	0
5	QPSK	1	12	22.66	22.63	22.83		
5	QPSK	1	24	22.60	22.57	22.81		
5	QPSK	12	0	21.69	21.68	21.85	23	1
5	QPSK	12	7	21.72	21.68	21.88		
5	QPSK	12	13	21.65	21.67	21.82		
5	QPSK	25	0	21.65	21.68	21.85		
5	16QAM	1	0	22.02	21.94	22.18	23	1
5	16QAM	1	12	22.03	22.00	22.16		
5	16QAM	1	24	21.93	21.99	22.23		
5	16QAM	12	0	20.80	20.80	20.99	22	2
5	16QAM	12	7	20.82	20.83	21.03		
5	16QAM	12	13	20.77	20.78	20.94		
5	16QAM	25	0	20.77	20.79	20.97		
5	64QAM	1	0	20.92	20.79	21.09	22	2
5	64QAM	1	12	20.91	20.91	21.07		
5	64QAM	1	24	20.86	20.88	21.12		
5	64QAM	12	0	19.80	19.81	19.96	21	3
5	64QAM	12	7	19.83	19.83	20.00		
5	64QAM	12	13	19.77	19.76	19.93		
5	64QAM	25	0	19.79	19.80	19.98		
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.64	22.61	22.80	24	0
3	QPSK	1	8	22.60	22.57	22.84		
3	QPSK	1	14	22.58	22.55	22.85		
3	QPSK	8	0	21.65	21.63	21.85	23	1
3	QPSK	8	4	21.66	21.67	21.85		



3	QPSK	8	7	21.65	21.64	21.93		
3	QPSK	15	0	21.64	21.62	21.84		
3	16QAM	1	0	22.00	21.98	22.14	23	1
3	16QAM	1	8	21.95	22.01	22.20		
3	16QAM	1	14	21.95	21.97	22.18		
3	16QAM	8	0	20.81	20.81	21.00	22	2
3	16QAM	8	4	20.84	20.84	21.02		
3	16QAM	8	7	20.81	20.80	21.09		
3	16QAM	15	0	20.76	20.75	20.95		
3	64QAM	1	0	20.87	20.87	21.06	22	2
3	64QAM	1	8	20.88	20.87	21.12		
3	64QAM	1	14	20.87	20.87	21.11		
3	64QAM	8	0	19.78	19.78	19.96	21	3
3	64QAM	8	4	19.80	19.80	19.96		
3	64QAM	8	7	19.78	19.78	20.05		
3	64QAM	15	0	19.74	19.73	19.94		
Channel				20407	20525	20643		
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.62	22.55	22.84	24	0
1.4	QPSK	1	3	22.65	22.63	22.81		
1.4	QPSK	1	5	22.58	22.55	22.83		
1.4	QPSK	3	0	22.63	22.60	22.86		
1.4	QPSK	3	1	22.67	22.64	22.81		
1.4	QPSK	3	3	22.61	22.61	22.84		
1.4	QPSK	6	0	21.63	21.61	21.91	23	1
1.4	16QAM	1	0	21.95	21.93	22.21	23	1
1.4	16QAM	1	3	21.97	22.05	22.32		
1.4	16QAM	1	5	21.94	21.93	22.22		
1.4	16QAM	3	0	21.74	21.75	21.99		
1.4	16QAM	3	1	21.80	21.76	22.00		
1.4	16QAM	3	3	21.71	21.72	21.94		
1.4	16QAM	6	0	20.80	20.76	21.04		
1.4	64QAM	1	0	20.85	20.85	21.11	22	2
1.4	64QAM	1	3	20.94	20.93	21.19		
1.4	64QAM	1	5	20.84	20.79	21.08		
1.4	64QAM	3	0	20.80	20.79	21.03		
1.4	64QAM	3	1	20.85	20.78	21.03		
1.4	64QAM	3	3	20.77	20.78	21.01		
1.4	64QAM	6	0	19.73	19.75	20.01		
21							21	3



<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	21.09	21.12	21.17	22	0
20	QPSK	1	49	21.07	21.00	21.15		
20	QPSK	1	99	21.04	21.01	21.12		
20	QPSK	50	0	21.10	21.05	21.13	22	0
20	QPSK	50	24	21.08	21.03	21.03		
20	QPSK	50	50	21.06	21.02	21.04		
20	QPSK	100	0	21.03	21.00	21.09		
20	16QAM	1	0	20.73	20.78	21.11	22	0
20	16QAM	1	49	20.78	20.84	21.05		
20	16QAM	1	99	20.84	20.74	21.07		
20	16QAM	50	0	20.74	20.76	20.96	22	0
20	16QAM	50	24	20.76	20.65	20.87		
20	16QAM	50	50	20.65	20.56	20.93		
20	16QAM	100	0	20.56	20.62	20.90		
20	64QAM	1	0	20.62	20.59	21.09	22	0
20	64QAM	1	49	20.59	20.78	21.10		
20	64QAM	1	99	20.78	20.82	21.06		
20	64QAM	50	0	20.26	20.10	20.28	21	1
20	64QAM	50	24	20.30	20.11	20.19		
20	64QAM	50	50	20.20	20.17	20.21		
20	64QAM	100	0	20.18	20.13	20.21		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	21.09	21.05	21.16	22	0
15	QPSK	1	37	21.07	20.90	21.15		
15	QPSK	1	74	20.97	21.00	21.08		
15	QPSK	36	0	21.03	20.97	21.06	22	0
15	QPSK	36	20	21.04	20.94	20.94		
15	QPSK	36	39	20.99	20.95	20.97		
15	QPSK	75	0	20.98	20.94	21.09		
15	16QAM	1	0	20.69	20.71	21.08	22	0
15	16QAM	1	37	20.76	20.81	21.01		
15	16QAM	1	74	20.82	20.73	21.05		
15	16QAM	36	0	20.73	20.72	20.92	22	0
15	16QAM	36	20	20.74	20.57	20.77		
15	16QAM	36	39	20.57	20.47	20.87		
15	16QAM	75	0	20.55	20.58	20.87		
15	64QAM	1	0	20.52	20.56	21.06	22	0
15	64QAM	1	37	20.59	20.68	21.07		
15	64QAM	1	74	20.68	20.76	20.98		
15	64QAM	36	0	20.17	20.09	20.23	21	1
15	64QAM	36	20	20.20	20.08	20.17		
15	64QAM	36	39	20.10	20.12	20.19		
15	64QAM	75	0	20.09	20.08	20.11		
Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	21.09	21.04	21.15	22	0
10	QPSK	1	25	21.00	20.92	21.13		
10	QPSK	1	49	21.03	20.94	21.06		
10	QPSK	25	0	21.10	21.02	21.06	22	0
10	QPSK	25	12	21.03	20.99	21.01		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

10	QPSK	25	25	21.03	20.97	21.00		
10	QPSK	50	0	20.94	20.90	20.99		
10	16QAM	1	0	20.70	20.71	21.03	22	0
10	16QAM	1	25	20.76	20.79	20.99		
10	16QAM	1	49	20.82	20.67	21.00		
10	16QAM	25	0	20.65	20.74	20.96	22	0
10	16QAM	25	12	20.75	20.57	20.78		
10	16QAM	25	25	20.62	20.51	20.88		
10	16QAM	50	0	20.56	20.62	20.81		
10	64QAM	1	0	20.59	20.52	21.03	22	0
10	64QAM	1	25	20.59	20.74	21.04		
10	64QAM	1	49	20.73	20.73	21.03		
10	64QAM	25	0	20.20	20.06	20.28	21	1
10	64QAM	25	12	20.29	20.07	20.13		
10	64QAM	25	25	20.19	20.16	20.12		
10	64QAM	50	0	20.13	20.07	20.21		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	21.01	21.09	21.14	22	0
5	QPSK	1	12	20.99	20.99	21.13		
5	QPSK	1	24	20.94	21.01	21.03		
5	QPSK	12	0	21.05	20.98	21.10	22	0
5	QPSK	12	7	21.03	21.01	20.94		
5	QPSK	12	13	21.02	20.96	20.94		
5	QPSK	25	0	20.98	20.90	20.99		
5	16QAM	1	0	20.72	20.68	21.09	22	0
5	16QAM	1	12	20.72	20.75	20.98		
5	16QAM	1	24	20.78	20.74	21.02		
5	16QAM	12	0	20.64	20.74	20.95	22	0
5	16QAM	12	7	20.73	20.64	20.81		
5	16QAM	12	13	20.62	20.47	20.86		
5	16QAM	25	0	20.50	20.53	20.86		
5	64QAM	1	0	20.59	20.55	21.08	22	0
5	64QAM	1	12	20.55	20.75	21.10		
5	64QAM	1	24	20.68	20.82	21.01		
5	64QAM	12	0	20.18	20.06	20.20	21	1
5	64QAM	12	7	20.27	20.04	20.13		
5	64QAM	12	13	20.11	20.14	20.21		
5	64QAM	25	0	20.18	20.05	20.20		



<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	22.53	22.47	22.55	24	0
10	QPSK	1	25	22.73	22.58	22.56		
10	QPSK	1	49	22.58	22.55	22.62		
10	QPSK	25	0	21.62	21.61	21.59	23	1
10	QPSK	25	12	21.64	21.62	21.60		
10	QPSK	25	25	21.66	21.62	21.53		
10	QPSK	50	0	21.65	21.59	21.57		
10	16QAM	1	0	21.87	21.86	21.91	23	1
10	16QAM	1	25	22.03	21.96	21.92		
10	16QAM	1	49	21.98	21.91	21.95		
10	16QAM	25	0	20.75	20.72	20.69	22	2
10	16QAM	25	12	20.77	20.77	20.69		
10	16QAM	25	25	20.75	20.72	20.69		
10	16QAM	50	0	20.79	20.74	20.66		
10	64QAM	1	0	20.72	20.75	20.79	22	2
10	64QAM	1	25	20.90	20.85	20.82		
10	64QAM	1	49	20.87	20.82	20.85		
10	64QAM	25	0	19.73	19.73	19.71	21	3
10	64QAM	25	12	19.78	19.77	19.71		
10	64QAM	25	25	19.76	19.71	19.70		
10	64QAM	50	0	19.76	19.71	19.66		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	22.54	22.56	22.50	24	0
5	QPSK	1	12	22.54	22.55	22.60		
5	QPSK	1	24	22.60	22.57	22.56		
5	QPSK	12	0	21.55	21.59	21.51	23	1
5	QPSK	12	7	21.58	21.61	21.71		
5	QPSK	12	13	21.66	21.59	21.61		
5	QPSK	25	0	21.68	21.60	21.55		
5	16QAM	1	0	21.84	21.95	21.88	23	1
5	16QAM	1	12	21.93	21.94	21.94		
5	16QAM	1	24	21.98	21.93	21.93		
5	16QAM	12	0	20.68	20.71	20.68	22	2
5	16QAM	12	7	20.74	20.76	20.81		
5	16QAM	12	13	20.78	20.72	20.77		
5	16QAM	25	0	20.78	20.71	20.64		
5	64QAM	1	0	20.75	20.83	20.83	22	2
5	64QAM	1	12	20.83	20.85	20.88		
5	64QAM	1	24	20.85	20.81	20.82		
5	64QAM	12	0	19.67	19.69	19.66	21	3
5	64QAM	12	7	19.70	19.72	19.79		
5	64QAM	12	13	19.78	19.69	19.78		
5	64QAM	25	0	19.78	19.72	19.65		
Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	22.53	22.54	22.59	24	0
3	QPSK	1	8	22.52	22.54	22.57		
3	QPSK	1	14	22.53	22.54	22.56		
3	QPSK	8	0	21.58	21.56	21.59	23	1
3	QPSK	8	4	21.58	21.63	21.66		



3	QPSK	8	7	21.52	21.56	21.59		
3	QPSK	15	0	21.55	21.60	21.63		
3	16QAM	1	0	21.88	21.90	21.93	23	1
3	16QAM	1	8	21.88	21.94	21.96		
3	16QAM	1	14	21.86	21.89	21.90		
3	16QAM	8	0	20.71	20.78	20.81	22	2
3	16QAM	8	4	20.74	20.76	20.79		
3	16QAM	8	7	20.73	20.77	20.80		
3	16QAM	15	0	20.65	20.70	20.77		
3	64QAM	1	0	20.76	20.80	20.84	22	2
3	64QAM	1	8	20.76	20.81	20.82		
3	64QAM	1	14	20.79	20.80	20.81		
3	64QAM	8	0	19.69	19.70	19.77	21	3
3	64QAM	8	4	19.69	19.74	19.76		
3	64QAM	8	7	19.71	19.72	19.75		
3	64QAM	15	0	19.65	19.69	19.76		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	22.49	22.51	22.53	24	0
1.4	QPSK	1	3	22.57	22.59	22.60		
1.4	QPSK	1	5	22.49	22.50	22.54		
1.4	QPSK	3	0	22.57	22.57	22.56		
1.4	QPSK	3	1	22.57	22.58	22.62		
1.4	QPSK	3	3	22.55	22.55	22.60		
1.4	QPSK	6	0	21.54	21.55	21.56	23	1
1.4	16QAM	1	0	21.82	21.89	21.86	23	1
1.4	16QAM	1	3	21.91	21.95	21.95		
1.4	16QAM	1	5	21.78	21.89	21.88		
1.4	16QAM	3	0	21.61	21.68	21.66		
1.4	16QAM	3	1	21.68	21.70	21.72		
1.4	16QAM	3	3	21.63	21.65	21.68		
1.4	16QAM	6	0	20.72	20.76	20.79	22	2
1.4	64QAM	1	0	20.72	20.81	20.82	22	2
1.4	64QAM	1	3	20.75	20.85	20.86		
1.4	64QAM	1	5	20.73	20.80	20.77		
1.4	64QAM	3	0	20.63	20.73	20.70		
1.4	64QAM	3	1	20.69	20.73	20.79		
1.4	64QAM	3	3	20.68	20.71	20.75		
1.4	64QAM	6	0	19.64	19.70	19.71	21	3



<LTE Band 17>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23780	23790	23800		
Frequency (MHz)				709	710	711		
10	QPSK	1	0	22.54	22.56	22.62		
10	QPSK	1	25	22.65	22.61	22.62	24	0
10	QPSK	1	49	22.72	22.71	22.71		
10	QPSK	25	0	21.69	21.66	21.65		
10	QPSK	25	12	21.72	21.70	21.70	23	1
10	QPSK	25	25	21.67	21.62	21.62		
10	QPSK	50	0	21.70	21.69	21.66		
10	16QAM	1	0	21.89	21.93	21.97	23	1
10	16QAM	1	25	22.02	22.00	21.96		
10	16QAM	1	49	22.13	22.11	22.05		
10	16QAM	25	0	20.81	20.77	20.78	22	2
10	16QAM	25	12	20.81	20.82	20.77		
10	16QAM	25	25	20.76	20.79	20.77		
10	16QAM	50	0	20.79	20.78	20.76	22	2
10	64QAM	1	0	20.82	20.80	20.90		
10	64QAM	1	25	20.91	20.89	20.87		
10	64QAM	1	49	21.01	20.98	20.98	21	3
10	64QAM	25	0	19.82	19.77	19.80		
10	64QAM	25	12	19.84	19.83	19.79		
10	64QAM	25	25	19.78	19.78	19.75	21	3
10	64QAM	50	0	19.79	19.78	19.75		
Channel				23755	23790	23825		
Frequency (MHz)				706.5	710	713.5		
5	QPSK	1	0	22.55	22.53	22.60		
5	QPSK	1	12	22.67	22.60	22.61	24	0
5	QPSK	1	24	22.65	22.69	22.69		
5	QPSK	12	0	21.72	21.66	21.63		
5	QPSK	12	7	21.73	21.68	21.67	23	1
5	QPSK	12	13	21.69	21.66	21.61		
5	QPSK	25	0	21.68	21.66	21.66		
5	16QAM	1	0	21.95	21.86	21.98	23	1
5	16QAM	1	12	22.07	21.97	22.01		
5	16QAM	1	24	21.98	22.06	22.02		
5	16QAM	12	0	20.82	20.79	20.78	22	2
5	16QAM	12	7	20.85	20.81	20.81		
5	16QAM	12	13	20.85	20.78	20.75		
5	16QAM	25	0	20.80	20.78	20.76	22	2
5	64QAM	1	0	20.82	20.78	20.83		
5	64QAM	1	12	20.95	20.88	20.87		
5	64QAM	1	24	20.90	20.95	20.91	21	3
5	64QAM	12	0	19.82	19.78	19.77		
5	64QAM	12	7	19.85	19.82	19.78		
5	64QAM	12	13	19.84	19.78	19.75	21	3
5	64QAM	25	0	19.79	19.78	19.75		



<LTE Band 66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	19.58	19.65	19.58	20.5	0
20	QPSK	1	49	19.56	19.63	19.57		
20	QPSK	1	99	19.57	19.54	19.51		
20	QPSK	50	0	19.52	19.58	19.46	20.5	0
20	QPSK	50	24	19.28	19.37	19.28		
20	QPSK	50	50	19.31	19.32	19.26		
20	QPSK	100	0	19.41	19.46	19.33		
20	16QAM	1	0	19.11	19.11	19.13	20.5	0
20	16QAM	1	49	19.10	19.14	19.11		
20	16QAM	1	99	19.10	19.07	19.03		
20	16QAM	50	0	19.12	19.19	19.15	20.5	0
20	16QAM	50	24	19.22	19.20	19.13		
20	16QAM	50	50	19.15	19.18	19.08		
20	16QAM	100	0	19.22	19.18	19.13		
20	64QAM	1	0	19.48	19.48	19.48	20.5	0
20	64QAM	1	49	19.44	19.54	19.48		
20	64QAM	1	99	19.39	19.44	19.40		
20	64QAM	50	0	19.28	19.40	19.32	20.5	0
20	64QAM	50	24	19.39	19.39	19.31		
20	64QAM	50	50	19.32	19.34	19.27		
20	64QAM	100	0	19.35	19.38	19.32		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	19.57	19.59	19.52	20.5	0
15	QPSK	1	37	19.52	19.55	19.49		
15	QPSK	1	74	19.48	19.45	19.51		
15	QPSK	36	0	19.45	19.48	19.37	20.5	0
15	QPSK	36	20	19.28	19.33	19.23		
15	QPSK	36	39	19.25	19.31	19.26		
15	QPSK	75	0	19.37	19.40	19.28		
15	16QAM	1	0	19.09	19.09	19.13	20.5	0
15	16QAM	1	37	19.10	19.06	19.07		
15	16QAM	1	74	19.03	18.97	18.93		
15	16QAM	36	0	19.03	19.19	19.14	20.5	0
15	16QAM	36	20	19.18	19.19	19.12		
15	16QAM	36	39	19.07	19.16	19.07		
15	16QAM	75	0	19.12	19.12	19.09		
15	64QAM	1	0	19.38	19.38	19.48	20.5	0
15	64QAM	1	37	19.43	19.45	19.38		
15	64QAM	1	74	19.32	19.40	19.34		
15	64QAM	36	0	19.25	19.35	19.23	20.5	0
15	64QAM	36	20	19.35	19.33	19.31		
15	64QAM	36	39	19.29	19.31	19.19		
15	64QAM	75	0	19.30	19.28	19.29		
Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	19.52	19.55	19.54	20.5	0
10	QPSK	1	25	19.56	19.55	19.53		
10	QPSK	1	49	19.56	19.46	19.49		
10	QPSK	25	0	19.48	19.56	19.40	20.5	0
10	QPSK	25	12	19.27	19.27	19.23		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

10	QPSK	25	25	19.22	19.26	19.16		
10	QPSK	50	0	19.33	19.43	19.30		
10	16QAM	1	0	19.08	19.10	19.11	20.5	0
10	16QAM	1	25	19.05	19.14	19.10		
10	16QAM	1	49	19.08	19.06	19.00		
10	16QAM	25	0	19.05	19.17	19.08	20.5	0
10	16QAM	25	12	19.22	19.14	19.06		
10	16QAM	25	25	19.08	19.13	19.01		
10	16QAM	50	0	19.16	19.10	19.10		
10	64QAM	1	0	19.41	19.43	19.38	20.5	0
10	64QAM	1	25	19.44	19.47	19.47		
10	64QAM	1	49	19.31	19.42	19.38		
10	64QAM	25	0	19.18	19.32	19.30	20.5	0
10	64QAM	25	12	19.30	19.33	19.22		
10	64QAM	25	25	19.30	19.31	19.20		
10	64QAM	50	0	19.32	19.34	19.31		
Channel				131997	132322	132647		
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	19.54	19.62	19.56	20.5	0
5	QPSK	1	12	19.54	19.62	19.47		
5	QPSK	1	24	19.54	19.48	19.41		
5	QPSK	12	0	19.50	19.49	19.37	20.5	0
5	QPSK	12	7	19.23	19.29	19.19		
5	QPSK	12	13	19.30	19.31	19.16		
5	QPSK	25	0	19.35	19.43	19.32		
5	16QAM	1	0	19.05	19.04	19.03		
5	16QAM	1	12	19.08	19.07	19.09	20.5	0
5	16QAM	1	24	19.09	18.97	18.93		
5	16QAM	12	0	19.08	19.18	19.08		
5	16QAM	12	7	19.20	19.10	19.13	20.5	0
5	16QAM	12	13	19.13	19.17	19.03		
5	16QAM	25	0	19.21	19.08	19.12		
5	64QAM	1	0	19.48	19.40	19.38		
5	64QAM	1	12	19.34	19.45	19.43		
5	64QAM	1	24	19.32	19.34	19.31	20.5	0
5	64QAM	12	0	19.18	19.31	19.26		
5	64QAM	12	7	19.39	19.31	19.24		
5	64QAM	12	13	19.29	19.29	19.20		
5	64QAM	25	0	19.32	19.29	19.29		
Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	19.51	19.63	19.53	20.5	0
3	QPSK	1	8	19.51	19.63	19.55		
3	QPSK	1	14	19.55	19.44	19.47		
3	QPSK	8	0	19.43	19.57	19.40	20.5	0
3	QPSK	8	4	19.19	19.30	19.25		
3	QPSK	8	7	19.22	19.26	19.18		
3	QPSK	15	0	19.35	19.36	19.25		
3	16QAM	1	0	19.02	19.08	19.07		
3	16QAM	1	8	19.10	19.04	19.06	20.5	0
3	16QAM	1	14	19.00	19.05	18.96		
3	16QAM	8	0	19.07	19.16	19.07		
3	16QAM	8	4	19.13	19.15	19.11	20.5	0
3	16QAM	8	7	19.10	19.13	19.04		
3	16QAM	15	0	19.21	19.10	19.06		
3	64QAM	1	0	19.38	19.45	19.46		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

3	64QAM	1	8	19.36	19.54	19.42	20.5	0
3	64QAM	1	14	19.34	19.42	19.39		
3	64QAM	8	0	19.26	19.37	19.27		
3	64QAM	8	4	19.29	19.31	19.28		
3	64QAM	8	7	19.22	19.25	19.17		
3	64QAM	15	0	19.27	19.31	19.23		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	19.51	19.60	19.55	20.5	0
1.4	QPSK	1	3	19.47	19.61	19.55		
1.4	QPSK	1	5	19.51	19.47	19.45		
1.4	QPSK	3	0	19.46	19.57	19.44		
1.4	QPSK	3	1	19.20	19.33	19.25		
1.4	QPSK	3	3	19.27	19.28	19.17		
1.4	QPSK	6	0	19.35	19.44	19.24	20.5	0
1.4	16QAM	1	0	19.10	19.03	19.03	20.5	0
1.4	16QAM	1	3	19.02	19.10	19.04		
1.4	16QAM	1	5	19.09	19.07	18.99		
1.4	16QAM	3	0	19.09	19.19	19.12		
1.4	16QAM	3	1	19.16	19.20	19.04		
1.4	16QAM	3	3	19.06	19.11	18.98		
1.4	16QAM	6	0	19.20	19.08	19.05	20.5	0
1.4	64QAM	1	0	19.48	19.48	19.47	20.5	0
1.4	64QAM	1	3	19.39	19.49	19.48		
1.4	64QAM	1	5	19.34	19.39	19.36		
1.4	64QAM	3	0	19.27	19.31	19.23		
1.4	64QAM	3	1	19.30	19.35	19.24		
1.4	64QAM	3	3	19.28	19.25	19.25		
1.4	64QAM	6	0	19.31	19.30	19.28	20.5	0



<Hotspot Power Mode>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	18.22	18.17	18.16	18.5	0
20	QPSK	1	49	18.11	18.00	18.02		
20	QPSK	1	99	18.07	18.03	18.01		
20	QPSK	50	0	18.16	18.12	18.13	18.5	0
20	QPSK	50	24	18.09	17.95	18.07		
20	QPSK	50	50	17.88	17.84	18.05		
20	QPSK	100	0	18.15	18.05	18.05	18.5	0
20	16QAM	1	0	17.48	17.82	17.92		
20	16QAM	1	49	17.40	17.76	17.93		
20	16QAM	1	99	17.67	17.71	17.48	18.5	0
20	16QAM	50	0	17.72	18.04	17.72		
20	16QAM	50	24	17.70	18.04	17.71		
20	16QAM	50	50	18.01	17.96	17.93	18.5	0
20	16QAM	100	0	18.03	18.01	17.66		
20	64QAM	1	0	17.47	17.67	17.67		
20	64QAM	1	49	17.42	17.71	17.73	18.5	0
20	64QAM	1	99	17.65	17.71	17.73		
20	64QAM	50	0	17.69	18.06	17.73		
20	64QAM	50	24	17.74	18.06	17.72	18.5	0
20	64QAM	50	50	17.56	17.96	17.69		
20	64QAM	100	0	17.61	18.02	17.72		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	18.16	18.17	18.06	18.5	0
15	QPSK	1	37	18.09	17.95	17.96		
15	QPSK	1	74	18.05	18.02	17.92		
15	QPSK	36	0	18.15	18.04	18.12	18.5	0
15	QPSK	36	20	17.99	17.85	17.97		
15	QPSK	36	39	17.87	17.82	17.96		
15	QPSK	75	0	18.07	18.04	18.03	18.5	0
15	16QAM	1	0	17.43	17.72	17.82		
15	16QAM	1	37	17.32	17.75	17.86		
15	16QAM	1	74	17.61	17.63	17.48	18.5	0
15	16QAM	36	0	17.71	17.96	17.68		
15	16QAM	36	20	17.67	18.02	17.69		
15	16QAM	36	39	17.99	17.94	17.93	18.5	0
15	16QAM	75	0	17.99	17.97	17.59		
15	64QAM	1	0	17.45	17.59	17.62		
15	64QAM	1	37	17.40	17.70	17.72	18.5	0
15	64QAM	1	74	17.57	17.67	17.64		
15	64QAM	36	0	17.66	17.98	17.64		
15	64QAM	36	20	17.66	18.06	17.67	18.5	0
15	64QAM	36	39	17.50	17.90	17.59		
15	64QAM	75	0	17.54	18.00	17.71		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	18.21	18.07	18.15	18.5	0
10	QPSK	1	25	18.02	18.00	17.96		
10	QPSK	1	49	17.98	18.03	17.96		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

10	QPSK	25	0	18.06	18.02	18.12	18.5	0
10	QPSK	25	12	18.05	17.91	18.03		
10	QPSK	25	25	17.79	17.78	17.97		
10	QPSK	50	0	18.09	17.95	18.02		
10	16QAM	1	0	17.40	17.82	17.87	18.5	0
10	16QAM	1	25	17.30	17.67	17.92		
10	16QAM	1	49	17.58	17.71	17.42		
10	16QAM	25	0	17.64	17.94	17.68	18.5	0
10	16QAM	25	12	17.64	17.98	17.62		
10	16QAM	25	25	18.01	17.94	17.88		
10	16QAM	50	0	17.97	17.98	17.57		
10	64QAM	1	0	17.45	17.66	17.57	18.5	0
10	64QAM	1	25	17.33	17.61	17.70		
10	64QAM	1	49	17.62	17.64	17.70		
10	64QAM	25	0	17.69	17.98	17.70	18.5	0
10	64QAM	25	12	17.73	17.99	17.69		
10	64QAM	25	25	17.49	17.91	17.68		
10	64QAM	50	0	17.53	17.96	17.62		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	18.12	18.15	18.12	18.5	0
5	QPSK	1	12	18.07	17.99	17.98		
5	QPSK	1	24	17.99	17.94	17.95		
5	QPSK	12	0	18.14	18.02	18.05	18.5	0
5	QPSK	12	7	18.02	17.94	18.06		
5	QPSK	12	13	17.87	17.84	18.04		
5	QPSK	25	0	18.14	18.03	17.95		
5	16QAM	1	0	17.39	17.82	17.84	18.5	0
5	16QAM	1	12	17.31	17.70	17.83		
5	16QAM	1	24	17.63	17.68	17.47		
5	16QAM	12	0	17.70	17.94	17.71	18.5	0
5	16QAM	12	7	17.67	18.03	17.69		
5	16QAM	12	13	17.92	17.93	17.88		
5	16QAM	25	0	17.95	17.96	17.66		
5	64QAM	1	0	17.47	17.57	17.61	18.5	0
5	64QAM	1	12	17.32	17.71	17.66		
5	64QAM	1	24	17.57	17.61	17.70		
5	64QAM	12	0	17.63	17.97	17.64	18.5	0
5	64QAM	12	7	17.74	18.00	17.65		
5	64QAM	12	13	17.50	17.94	17.60		
5	64QAM	25	0	17.60	17.97	17.72		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	18.17	18.16	18.14	18.5	0
3	QPSK	1	8	18.09	17.99	17.99		
3	QPSK	1	14	17.97	18.03	17.97		
3	QPSK	8	0	18.15	18.09	18.11	18.5	0
3	QPSK	8	4	18.01	17.87	17.98		
3	QPSK	8	7	17.85	17.84	18.01		
3	QPSK	15	0	18.12	18.05	17.97		
3	16QAM	1	0	17.39	17.78	17.87	18.5	0
3	16QAM	1	8	17.38	17.74	17.93		
3	16QAM	1	14	17.65	17.67	17.43		
3	16QAM	8	0	17.65	18.02	17.63	18.5	0
3	16QAM	8	4	17.61	17.98	17.68		
3	16QAM	8	7	17.97	17.90	17.92		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

3	16QAM	15	0	18.02	18.00	17.58		
3	64QAM	1	0	17.41	17.62	17.62	18.5	0
3	64QAM	1	8	17.33	17.69	17.71		
3	64QAM	1	14	17.63	17.67	17.65		
3	64QAM	8	0	17.62	18.01	17.67	18.5	0
3	64QAM	8	4	17.71	17.96	17.62		
3	64QAM	8	7	17.52	17.95	17.59		
3	64QAM	15	0	17.51	18.01	17.69		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	18.19	18.15	18.14	18.5	0
1.4	QPSK	1	3	18.11	17.99	17.94		
1.4	QPSK	1	5	18.01	17.94	17.96		
1.4	QPSK	3	0	18.06	18.06	18.11		
1.4	QPSK	3	1	18.02	17.86	18.02		
1.4	QPSK	3	3	17.81	17.74	17.98		
1.4	QPSK	6	0	18.07	17.95	18.02	18.5	0
1.4	16QAM	1	0	17.45	17.76	17.84	18.5	0
1.4	16QAM	1	3	17.33	17.73	17.87		
1.4	16QAM	1	5	17.58	17.65	17.44		
1.4	16QAM	3	0	17.70	17.97	17.63		
1.4	16QAM	3	1	17.68	17.94	17.68		
1.4	16QAM	3	3	17.99	17.86	17.85		
1.4	16QAM	6	0	18.03	18.01	17.59	18.5	0
1.4	64QAM	1	0	17.42	17.59	17.60	18.5	0
1.4	64QAM	1	3	17.39	17.68	17.71		
1.4	64QAM	1	5	17.59	17.71	17.70		
1.4	64QAM	3	0	17.62	18.03	17.68		
1.4	64QAM	3	1	17.66	17.96	17.67		
1.4	64QAM	3	3	17.54	17.96	17.66		
1.4	64QAM	6	0	17.60	18.02	17.72	18.5	0



<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300	18.5	0
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	17.97	18.04	18.01	18.5	0
20	QPSK	1	49	17.97	17.98	17.96		
20	QPSK	1	99	17.84	18.00	17.93		
20	QPSK	50	0	17.75	17.85	17.85	18.5	0
20	QPSK	50	24	17.72	17.77	17.83		
20	QPSK	50	50	17.69	17.81	17.76		
20	QPSK	100	0	17.70	17.80	17.80		
20	16QAM	1	0	17.65	17.66	17.59	18.5	0
20	16QAM	1	49	17.58	17.59	17.64		
20	16QAM	1	99	17.51	17.58	17.56		
20	16QAM	50	0	17.67	17.66	17.74	18.5	0
20	16QAM	50	24	17.63	17.73	17.69		
20	16QAM	50	50	17.56	17.70	17.64		
20	16QAM	100	0	17.62	17.71	17.67		
20	64QAM	1	0	17.93	17.97	17.92	18.5	0
20	64QAM	1	49	17.87	18.00	17.96		
20	64QAM	1	99	17.78	17.91	17.85		
20	64QAM	50	0	17.75	17.82	17.84	18.5	0
20	64QAM	50	24	17.80	17.91	17.86		
20	64QAM	50	50	17.71	17.80	17.79		
20	64QAM	100	0	17.75	17.86	17.83		
Channel				20025	20175	20325	18.5	0
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	17.92	18.00	18.01	18.5	0
15	QPSK	1	37	17.96	17.88	17.93		
15	QPSK	1	74	17.80	17.93	17.84		
15	QPSK	36	0	17.74	17.77	17.85	18.5	0
15	QPSK	36	20	17.65	17.75	17.77		
15	QPSK	36	39	17.60	17.73	17.70		
15	QPSK	75	0	17.69	17.80	17.78		
15	16QAM	1	0	17.64	17.60	17.51	18.5	0
15	16QAM	1	37	17.58	17.51	17.56		
15	16QAM	1	74	17.45	17.58	17.55		
15	16QAM	36	0	17.58	17.61	17.68	18.5	0
15	16QAM	36	20	17.62	17.65	17.66		
15	16QAM	36	39	17.54	17.66	17.58		
15	16QAM	75	0	17.58	17.61	17.57		
15	64QAM	1	0	17.84	17.89	17.83	18.5	0
15	64QAM	1	37	17.77	17.99	17.93		
15	64QAM	1	74	17.75	17.87	17.82		
15	64QAM	36	0	17.75	17.75	17.76	18.5	0
15	64QAM	36	20	17.76	17.86	17.76		
15	64QAM	36	39	17.65	17.79	17.79		
15	64QAM	75	0	17.65	17.79	17.74		
Channel				20000	20175	20350	18.5	0
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	17.96	17.94	17.91	18.5	0
10	QPSK	1	25	17.93	17.91	17.88		
10	QPSK	1	49	17.82	17.99	17.93		
10	QPSK	25	0	17.71	17.81	17.85	18.5	0
10	QPSK	25	12	17.64	17.70	17.73		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

10	QPSK	25	25	17.59	17.78	17.76		
10	QPSK	50	0	17.70	17.79	17.71		
10	16QAM	1	0	17.58	17.60	17.53	18.5	0
10	16QAM	1	25	17.56	17.54	17.56		
10	16QAM	1	49	17.51	17.56	17.49		
10	16QAM	25	0	17.61	17.65	17.70	18.5	0
10	16QAM	25	12	17.63	17.66	17.65		
10	16QAM	25	25	17.47	17.68	17.57		
10	16QAM	50	0	17.53	17.70	17.60		
10	64QAM	1	0	17.85	17.90	17.88	18.5	0
10	64QAM	1	25	17.82	17.99	17.87		
10	64QAM	1	49	17.78	17.81	17.78		
10	64QAM	25	0	17.69	17.75	17.78	18.5	0
10	64QAM	25	12	17.75	17.81	17.78		
10	64QAM	25	25	17.64	17.77	17.72		
10	64QAM	50	0	17.72	17.81	17.73		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	17.88	17.95	17.93	18.5	0
5	QPSK	1	12	17.91	17.90	17.88		
5	QPSK	1	24	17.79	17.91	17.85		
5	QPSK	12	0	17.68	17.80	17.85	18.5	0
5	QPSK	12	7	17.71	17.75	17.83		
5	QPSK	12	13	17.65	17.76	17.70		
5	QPSK	25	0	17.67	17.80	17.70		
5	16QAM	1	0	17.64	17.63	17.50	18.5	0
5	16QAM	1	12	17.56	17.53	17.63		
5	16QAM	1	24	17.41	17.48	17.50		
5	16QAM	12	0	17.63	17.61	17.70	18.5	0
5	16QAM	12	7	17.63	17.67	17.60		
5	16QAM	12	13	17.47	17.68	17.54		
5	16QAM	25	0	17.55	17.66	17.66		
5	64QAM	1	0	17.88	17.95	17.90	18.5	0
5	64QAM	1	12	17.78	18.00	17.88		
5	64QAM	1	24	17.78	17.91	17.77		
5	64QAM	12	0	17.69	17.75	17.79	18.5	0
5	64QAM	12	7	17.71	17.81	17.81		
5	64QAM	12	13	17.66	17.79	17.72		
5	64QAM	25	0	17.72	17.86	17.75		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	17.96	17.98	17.96	18.5	0
3	QPSK	1	8	17.94	17.94	17.88		
3	QPSK	1	14	17.81	17.91	17.88		
3	QPSK	8	0	17.70	17.84	17.79	18.5	0
3	QPSK	8	4	17.71	17.77	17.82		
3	QPSK	8	7	17.68	17.78	17.66		
3	QPSK	15	0	17.65	17.77	17.74		
3	16QAM	1	0	17.59	17.66	17.58	18.5	0
3	16QAM	1	8	17.55	17.56	17.56		
3	16QAM	1	14	17.42	17.55	17.48		
3	16QAM	8	0	17.66	17.59	17.71	18.5	0
3	16QAM	8	4	17.57	17.65	17.68		
3	16QAM	8	7	17.55	17.62	17.54		
3	16QAM	15	0	17.58	17.65	17.58		
3	64QAM	1	0	17.92	17.97	17.84	18.5	0



**FCC SAR TEST REPORT**

**Report No. : FA962518**

3	64QAM	1	8	17.83	17.98	17.90	18.5	0
3	64QAM	1	14	17.78	17.90	17.81		
3	64QAM	8	0	17.70	17.81	17.77		
3	64QAM	8	4	17.75	17.83	17.85		
3	64QAM	8	7	17.65	17.71	17.69		
3	64QAM	15	0	17.75	17.79	17.77		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	17.95	18.01	18.01	18.5	0
1.4	QPSK	1	3	17.87	17.96	17.93		
1.4	QPSK	1	5	17.80	17.96	17.90		
1.4	QPSK	3	0	17.75	17.79	17.78		
1.4	QPSK	3	1	17.68	17.67	17.77		
1.4	QPSK	3	3	17.61	17.72	17.73		
1.4	QPSK	6	0	17.65	17.77	17.77	18.5	0
1.4	16QAM	1	0	17.62	17.65	17.55	18.5	0
1.4	16QAM	1	3	17.48	17.59	17.58		
1.4	16QAM	1	5	17.42	17.58	17.55		
1.4	16QAM	3	0	17.65	17.57	17.68		
1.4	16QAM	3	1	17.57	17.71	17.66		
1.4	16QAM	3	3	17.46	17.68	17.64		
1.4	16QAM	6	0	17.61	17.64	17.64	18.5	0
1.4	64QAM	1	0	17.92	17.89	17.87	18.5	0
1.4	64QAM	1	3	17.77	17.93	17.86		
1.4	64QAM	1	5	17.77	17.84	17.83		
1.4	64QAM	3	0	17.72	17.75	17.76		
1.4	64QAM	3	1	17.73	17.88	17.77		
1.4	64QAM	3	3	17.62	17.78	17.77		
1.4	64QAM	6	0	17.69	17.81	17.75	18.5	0



<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	22.65	22.59	22.81	24	0
10	QPSK	1	25	22.64	22.87	22.78		
10	QPSK	1	49	22.54	22.54	22.79		
10	QPSK	25	0	21.67	21.67	21.85	23	1
10	QPSK	25	12	21.71	21.73	21.85		
10	QPSK	25	25	21.60	21.61	21.77		
10	QPSK	50	0	21.64	21.68	21.83		
10	16QAM	1	0	22.02	21.96	22.22	23	1
10	16QAM	1	25	22.01	22.04	22.12		
10	16QAM	1	49	21.95	21.92	22.17		
10	16QAM	25	0	20.76	20.83	20.95	22	2
10	16QAM	25	12	20.76	20.84	20.96		
10	16QAM	25	25	20.73	20.71	20.86		
10	16QAM	50	0	20.76	20.79	20.95		
10	64QAM	1	0	20.88	20.86	21.10	22	2
10	64QAM	1	25	20.88	20.92	21.04		
10	64QAM	1	49	20.80	20.83	21.07		
10	64QAM	25	0	19.79	19.82	19.96	21	3
10	64QAM	25	12	19.77	19.84	19.97		
10	64QAM	25	25	19.75	19.74	19.88		
10	64QAM	50	0	19.76	19.79	19.94		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.63	22.56	22.84	24	0
5	QPSK	1	12	22.66	22.63	22.83		
5	QPSK	1	24	22.60	22.57	22.81		
5	QPSK	12	0	21.69	21.68	21.85	23	1
5	QPSK	12	7	21.72	21.68	21.88		
5	QPSK	12	13	21.65	21.67	21.82		
5	QPSK	25	0	21.65	21.68	21.85		
5	16QAM	1	0	22.02	21.94	22.18	23	1
5	16QAM	1	12	22.03	22.00	22.16		
5	16QAM	1	24	21.93	21.99	22.23		
5	16QAM	12	0	20.80	20.80	20.99	22	2
5	16QAM	12	7	20.82	20.83	21.03		
5	16QAM	12	13	20.77	20.78	20.94		
5	16QAM	25	0	20.77	20.79	20.97		
5	64QAM	1	0	20.92	20.79	21.09	22	2
5	64QAM	1	12	20.91	20.91	21.07		
5	64QAM	1	24	20.86	20.88	21.12		
5	64QAM	12	0	19.80	19.81	19.96	21	3
5	64QAM	12	7	19.83	19.83	20.00		
5	64QAM	12	13	19.77	19.76	19.93		
5	64QAM	25	0	19.79	19.80	19.98		
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.64	22.61	22.80	24	0
3	QPSK	1	8	22.60	22.57	22.84		
3	QPSK	1	14	22.58	22.55	22.85		
3	QPSK	8	0	21.65	21.63	21.85	23	1
3	QPSK	8	4	21.66	21.67	21.85		



3	QPSK	8	7	21.65	21.64	21.93		
3	QPSK	15	0	21.64	21.62	21.84		
3	16QAM	1	0	22.00	21.98	22.14	23	1
3	16QAM	1	8	21.95	22.01	22.20		
3	16QAM	1	14	21.95	21.97	22.18		
3	16QAM	8	0	20.81	20.81	21.00	22	2
3	16QAM	8	4	20.84	20.84	21.02		
3	16QAM	8	7	20.81	20.80	21.09		
3	16QAM	15	0	20.76	20.75	20.95		
3	64QAM	1	0	20.87	20.87	21.06	22	2
3	64QAM	1	8	20.88	20.87	21.12		
3	64QAM	1	14	20.87	20.87	21.11		
3	64QAM	8	0	19.78	19.78	19.96	21	3
3	64QAM	8	4	19.80	19.80	19.96		
3	64QAM	8	7	19.78	19.78	20.05		
3	64QAM	15	0	19.74	19.73	19.94		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.62	22.55	22.84	24	0
1.4	QPSK	1	3	22.65	22.63	22.81		
1.4	QPSK	1	5	22.58	22.55	22.83		
1.4	QPSK	3	0	22.63	22.60	22.86		
1.4	QPSK	3	1	22.67	22.64	22.81		
1.4	QPSK	3	3	22.61	22.61	22.84		
1.4	QPSK	6	0	21.63	21.61	21.91	23	1
1.4	16QAM	1	0	21.95	21.93	22.21	23	1
1.4	16QAM	1	3	21.97	22.05	22.32		
1.4	16QAM	1	5	21.94	21.93	22.22		
1.4	16QAM	3	0	21.74	21.75	21.99		
1.4	16QAM	3	1	21.80	21.76	22.00		
1.4	16QAM	3	3	21.71	21.72	21.94		
1.4	16QAM	6	0	20.80	20.76	21.04	22	2
1.4	64QAM	1	0	20.85	20.85	21.11	22	2
1.4	64QAM	1	3	20.94	20.93	21.19		
1.4	64QAM	1	5	20.84	20.79	21.08		
1.4	64QAM	3	0	20.80	20.79	21.03		
1.4	64QAM	3	1	20.85	20.78	21.03		
1.4	64QAM	3	3	20.77	20.78	21.01		
1.4	64QAM	6	0	19.73	19.75	20.01	21	3



<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	21.09	21.12	21.17	22	0
20	QPSK	1	49	21.07	21.00	21.15		
20	QPSK	1	99	21.04	21.01	21.12		
20	QPSK	50	0	21.10	21.05	21.13	22	0
20	QPSK	50	24	21.08	21.03	21.03		
20	QPSK	50	50	21.06	21.02	21.04		
20	QPSK	100	0	21.03	21.00	21.09		
20	16QAM	1	0	20.73	20.78	21.11	22	0
20	16QAM	1	49	20.78	20.84	21.05		
20	16QAM	1	99	20.84	20.74	21.07		
20	16QAM	50	0	20.74	20.76	20.96	22	0
20	16QAM	50	24	20.76	20.65	20.87		
20	16QAM	50	50	20.65	20.56	20.93		
20	16QAM	100	0	20.56	20.62	20.90		
20	64QAM	1	0	20.62	20.59	21.09	22	0
20	64QAM	1	49	20.59	20.78	21.10		
20	64QAM	1	99	20.78	20.82	21.06		
20	64QAM	50	0	20.26	20.10	20.28	21	1
20	64QAM	50	24	20.30	20.11	20.19		
20	64QAM	50	50	20.20	20.17	20.21		
20	64QAM	100	0	20.18	20.13	20.21		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	21.07	21.08	21.13	22	0
15	QPSK	1	37	21.00	20.99	21.08		
15	QPSK	1	74	21.00	20.95	21.02		
15	QPSK	36	0	21.01	20.95	21.08	22	0
15	QPSK	36	20	21.04	21.01	20.93		
15	QPSK	36	39	20.99	20.98	20.95		
15	QPSK	75	0	21.00	20.91	21.02		
15	16QAM	1	0	20.63	20.77	21.10	22	0
15	16QAM	1	37	20.68	20.83	20.97		
15	16QAM	1	74	20.80	20.65	21.03		
15	16QAM	36	0	20.71	20.68	20.88	22	0
15	16QAM	36	20	20.68	20.56	20.80		
15	16QAM	36	39	20.58	20.55	20.86		
15	16QAM	75	0	20.55	20.59	20.86		
15	64QAM	1	0	20.60	20.49	21.07	22	0
15	64QAM	1	37	20.50	20.74	21.03		
15	64QAM	1	74	20.77	20.74	20.97		
15	64QAM	36	0	20.17	20.08	20.25	21	1
15	64QAM	36	20	20.21	20.10	20.09		
15	64QAM	36	39	20.11	20.13	20.18		
15	64QAM	75	0	20.13	20.10	20.15		
Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	21.08	21.10	21.16	22	0
10	QPSK	1	25	20.97	20.97	21.14		
10	QPSK	1	49	21.02	20.96	21.12		
10	QPSK	25	0	21.02	20.97	21.07	22	0
10	QPSK	25	12	21.06	20.94	21.02		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

10	QPSK	25	25	21.05	20.96	20.94		
10	QPSK	50	0	20.95	20.99	21.02		
10	16QAM	1	0	20.69	20.70	21.08	22	0
10	16QAM	1	25	20.74	20.83	21.05		
10	16QAM	1	49	20.78	20.74	21.04		
10	16QAM	25	0	20.71	20.76	20.90	22	0
10	16QAM	25	12	20.66	20.62	20.86		
10	16QAM	25	25	20.58	20.46	20.86		
10	16QAM	50	0	20.47	20.61	20.81		
10	64QAM	1	0	20.52	20.53	21.01	22	0
10	64QAM	1	25	20.50	20.77	21.08		
10	64QAM	1	49	20.68	20.74	21.06		
10	64QAM	25	0	20.18	20.05	20.23	21	1
10	64QAM	25	12	20.30	20.02	20.09		
10	64QAM	25	25	20.19	20.14	20.11		
10	64QAM	50	0	20.12	20.13	20.20		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	21.07	21.12	21.07	22	0
5	QPSK	1	12	21.04	20.93	21.13		
5	QPSK	1	24	21.00	21.00	21.06		
5	QPSK	12	0	21.03	20.99	21.10	22	0
5	QPSK	12	7	21.04	21.01	21.01		
5	QPSK	12	13	21.00	21.02	21.02		
5	QPSK	25	0	21.01	21.00	21.01		
5	16QAM	1	0	20.64	20.68	21.10	22	0
5	16QAM	1	12	20.68	20.77	20.96		
5	16QAM	1	24	20.84	20.70	20.99		
5	16QAM	12	0	20.72	20.73	20.86	22	0
5	16QAM	12	7	20.67	20.64	20.86		
5	16QAM	12	13	20.56	20.52	20.85		
5	16QAM	25	0	20.48	20.52	20.90		
5	64QAM	1	0	20.52	20.57	21.08	22	0
5	64QAM	1	12	20.59	20.75	21.07		
5	64QAM	1	24	20.72	20.73	21.05		
5	64QAM	12	0	20.18	20.00	20.28	21	1
5	64QAM	12	7	20.27	20.10	20.15		
5	64QAM	12	13	20.16	20.15	20.19		
5	64QAM	25	0	20.16	20.07	20.11		



<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	22.53	22.47	22.55	24	0
10	QPSK	1	25	22.73	22.58	22.56		
10	QPSK	1	49	22.58	22.55	22.62		
10	QPSK	25	0	21.62	21.61	21.59	23	1
10	QPSK	25	12	21.64	21.62	21.60		
10	QPSK	25	25	21.66	21.62	21.53		
10	QPSK	50	0	21.65	21.59	21.57		
10	16QAM	1	0	21.87	21.86	21.91	23	1
10	16QAM	1	25	22.03	21.96	21.92		
10	16QAM	1	49	21.98	21.91	21.95		
10	16QAM	25	0	20.75	20.72	20.69	22	2
10	16QAM	25	12	20.77	20.77	20.69		
10	16QAM	25	25	20.75	20.72	20.69		
10	16QAM	50	0	20.79	20.74	20.66		
10	64QAM	1	0	20.72	20.75	20.79	22	2
10	64QAM	1	25	20.90	20.85	20.82		
10	64QAM	1	49	20.87	20.82	20.85		
10	64QAM	25	0	19.73	19.73	19.71	21	3
10	64QAM	25	12	19.78	19.77	19.71		
10	64QAM	25	25	19.76	19.71	19.70		
10	64QAM	50	0	19.76	19.71	19.66		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	22.54	22.56	22.50	24	0
5	QPSK	1	12	22.54	22.55	22.60		
5	QPSK	1	24	22.60	22.57	22.56		
5	QPSK	12	0	21.55	21.59	21.51	23	1
5	QPSK	12	7	21.58	21.61	21.71		
5	QPSK	12	13	21.66	21.59	21.61		
5	QPSK	25	0	21.68	21.60	21.55		
5	16QAM	1	0	21.84	21.95	21.88	23	1
5	16QAM	1	12	21.93	21.94	21.94		
5	16QAM	1	24	21.98	21.93	21.93		
5	16QAM	12	0	20.68	20.71	20.68	22	2
5	16QAM	12	7	20.74	20.76	20.81		
5	16QAM	12	13	20.78	20.72	20.77		
5	16QAM	25	0	20.78	20.71	20.64		
5	64QAM	1	0	20.75	20.83	20.83	22	2
5	64QAM	1	12	20.83	20.85	20.88		
5	64QAM	1	24	20.85	20.81	20.82		
5	64QAM	12	0	19.67	19.69	19.66	21	3
5	64QAM	12	7	19.70	19.72	19.79		
5	64QAM	12	13	19.78	19.69	19.78		
5	64QAM	25	0	19.78	19.72	19.65		
Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	22.53	22.54	22.59	24	0
3	QPSK	1	8	22.52	22.54	22.57		
3	QPSK	1	14	22.53	22.54	22.56		
3	QPSK	8	0	21.58	21.56	21.59	23	1
3	QPSK	8	4	21.58	21.63	21.66		



3	QPSK	8	7	21.52	21.56	21.59		
3	QPSK	15	0	21.55	21.60	21.63		
3	16QAM	1	0	21.88	21.90	21.93	23	1
3	16QAM	1	8	21.88	21.94	21.96		
3	16QAM	1	14	21.86	21.89	21.90		
3	16QAM	8	0	20.71	20.78	20.81	22	2
3	16QAM	8	4	20.74	20.76	20.79		
3	16QAM	8	7	20.73	20.77	20.80		
3	16QAM	15	0	20.65	20.70	20.77		
3	64QAM	1	0	20.76	20.80	20.84	22	2
3	64QAM	1	8	20.76	20.81	20.82		
3	64QAM	1	14	20.79	20.80	20.81		
3	64QAM	8	0	19.69	19.70	19.77	21	3
3	64QAM	8	4	19.69	19.74	19.76		
3	64QAM	8	7	19.71	19.72	19.75		
3	64QAM	15	0	19.65	19.69	19.76		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	22.49	22.51	22.53	24	0
1.4	QPSK	1	3	22.57	22.59	22.60		
1.4	QPSK	1	5	22.49	22.50	22.54		
1.4	QPSK	3	0	22.57	22.57	22.56		
1.4	QPSK	3	1	22.57	22.58	22.62		
1.4	QPSK	3	3	22.55	22.55	22.60		
1.4	QPSK	6	0	21.54	21.55	21.56	23	1
1.4	16QAM	1	0	21.82	21.89	21.86	23	1
1.4	16QAM	1	3	21.91	21.95	21.95		
1.4	16QAM	1	5	21.78	21.89	21.88		
1.4	16QAM	3	0	21.61	21.68	21.66		
1.4	16QAM	3	1	21.68	21.70	21.72		
1.4	16QAM	3	3	21.63	21.65	21.68		
1.4	16QAM	6	0	20.72	20.76	20.79	22	2
1.4	64QAM	1	0	20.72	20.81	20.82	22	2
1.4	64QAM	1	3	20.75	20.85	20.86		
1.4	64QAM	1	5	20.73	20.80	20.77		
1.4	64QAM	3	0	20.63	20.73	20.70		
1.4	64QAM	3	1	20.69	20.73	20.79		
1.4	64QAM	3	3	20.68	20.71	20.75		
1.4	64QAM	6	0	19.64	19.70	19.71	21	3



<LTE Band 17>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23780	23790	23800		
Frequency (MHz)				709	710	711		
10	QPSK	1	0	22.54	22.56	22.62		
10	QPSK	1	25	22.65	22.61	22.62	24	0
10	QPSK	1	49	22.72	22.71	22.71		
10	QPSK	25	0	21.69	21.66	21.65		
10	QPSK	25	12	21.72	21.70	21.70	23	1
10	QPSK	25	25	21.67	21.62	21.62		
10	QPSK	50	0	21.70	21.69	21.66		
10	16QAM	1	0	21.89	21.93	21.97	23	1
10	16QAM	1	25	22.02	22.00	21.96		
10	16QAM	1	49	22.13	22.11	22.05		
10	16QAM	25	0	20.81	20.77	20.78	22	2
10	16QAM	25	12	20.81	20.82	20.77		
10	16QAM	25	25	20.76	20.79	20.77		
10	16QAM	50	0	20.79	20.78	20.76	22	2
10	64QAM	1	0	20.82	20.80	20.90		
10	64QAM	1	25	20.91	20.89	20.87		
10	64QAM	1	49	21.01	20.98	20.98	21	3
10	64QAM	25	0	19.82	19.77	19.80		
10	64QAM	25	12	19.84	19.83	19.79		
10	64QAM	25	25	19.78	19.78	19.75	21	3
10	64QAM	50	0	19.79	19.78	19.75		
Channel				23755	23790	23825		
Frequency (MHz)				706.5	710	713.5		
5	QPSK	1	0	22.55	22.53	22.60	24	0
5	QPSK	1	12	22.67	22.60	22.61		
5	QPSK	1	24	22.65	22.69	22.69		
5	QPSK	12	0	21.72	21.66	21.63	23	1
5	QPSK	12	7	21.73	21.68	21.67		
5	QPSK	12	13	21.69	21.66	21.61		
5	QPSK	25	0	21.68	21.66	21.66	23	1
5	16QAM	1	0	21.95	21.86	21.98		
5	16QAM	1	12	22.07	21.97	22.01		
5	16QAM	1	24	21.98	22.06	22.02	22	2
5	16QAM	12	0	20.82	20.79	20.78		
5	16QAM	12	7	20.85	20.81	20.81		
5	16QAM	12	13	20.85	20.78	20.75	22	2
5	16QAM	25	0	20.80	20.78	20.76		
5	64QAM	1	0	20.82	20.78	20.83		
5	64QAM	1	12	20.95	20.88	20.87	22	2
5	64QAM	1	24	20.90	20.95	20.91		
5	64QAM	12	0	19.82	19.78	19.77		
5	64QAM	12	7	19.85	19.82	19.78	21	3
5	64QAM	12	13	19.84	19.78	19.75		
5	64QAM	25	0	19.79	19.78	19.75		



<LTE Band 66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	18.16	18.18	18.15	18.5	0
20	QPSK	1	49	18.10	18.12	18.17		
20	QPSK	1	99	18.14	18.08	18.04		
20	QPSK	50	0	17.96	18.00	17.92	18.5	0
20	QPSK	50	24	17.78	17.98	17.90		
20	QPSK	50	50	17.95	17.92	17.87		
20	QPSK	100	0	17.94	17.95	17.88		
20	16QAM	1	0	17.77	17.72	17.77	18.5	0
20	16QAM	1	49	17.71	17.80	17.72		
20	16QAM	1	99	17.72	17.70	17.68		
20	16QAM	50	0	17.77	17.87	17.79	18.5	0
20	16QAM	50	24	17.85	17.89	17.81		
20	16QAM	50	50	17.79	17.82	17.75		
20	16QAM	100	0	17.83	17.86	17.74		
20	64QAM	1	0	18.08	18.06	18.06	18.5	0
20	64QAM	1	49	18.00	18.05	18.11		
20	64QAM	1	99	18.08	18.04	18.08		
20	64QAM	50	0	17.86	17.98	17.91	18.5	0
20	64QAM	50	24	17.96	17.99	17.94		
20	64QAM	50	50	17.93	17.92	17.87		
20	64QAM	100	0	17.94	17.94	17.89		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	18.10	18.12	18.13	18.5	0
15	QPSK	1	37	18.04	18.09	18.11		
15	QPSK	1	74	18.11	18.03	17.96		
15	QPSK	36	0	17.86	17.97	17.89	18.5	0
15	QPSK	36	20	17.68	17.91	17.90		
15	QPSK	36	39	17.91	17.92	17.86		
15	QPSK	75	0	17.93	17.86	17.83		
15	16QAM	1	0	17.76	17.72	17.72	18.5	0
15	16QAM	1	37	17.61	17.78	17.64		
15	16QAM	1	74	17.66	17.62	17.66		
15	16QAM	36	0	17.69	17.78	17.78	18.5	0
15	16QAM	36	20	17.79	17.87	17.77		
15	16QAM	36	39	17.69	17.78	17.69		
15	16QAM	75	0	17.78	17.83	17.69		
15	64QAM	1	0	18.06	18.06	18.05	18.5	0
15	64QAM	1	37	17.93	18.03	18.09		
15	64QAM	1	74	17.98	17.96	18.07		
15	64QAM	36	0	17.84	17.95	17.91	18.5	0
15	64QAM	36	20	17.95	17.97	17.94		
15	64QAM	36	39	17.91	17.86	17.86		
15	64QAM	75	0	17.90	17.87	17.84		
Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	18.09	18.15	18.09	18.5	0
10	QPSK	1	25	18.02	18.09	18.10		
10	QPSK	1	49	18.08	18.06	18.04		
10	QPSK	25	0	17.94	17.96	17.85	18.5	0
10	QPSK	25	12	17.71	17.94	17.89		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

10	QPSK	25	25	17.90	17.89	17.85		
10	QPSK	50	0	17.85	17.93	17.80		
10	16QAM	1	0	17.73	17.67	17.73	18.5	0
10	16QAM	1	25	17.61	17.75	17.64		
10	16QAM	1	49	17.69	17.60	17.68		
10	16QAM	25	0	17.67	17.83	17.70	18.5	0
10	16QAM	25	12	17.75	17.87	17.74		
10	16QAM	25	25	17.79	17.82	17.71		
10	16QAM	50	0	17.77	17.82	17.72		
10	64QAM	1	0	17.99	17.98	18.05	18.5	0
10	64QAM	1	25	17.93	17.96	18.05		
10	64QAM	1	49	17.99	17.96	17.98		
10	64QAM	25	0	17.82	17.94	17.89	18.5	0
10	64QAM	25	12	17.90	17.99	17.93		
10	64QAM	25	25	17.86	17.85	17.81		
10	64QAM	50	0	17.86	17.92	17.80		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	18.14	18.11	18.10	18.5	0
5	QPSK	1	12	18.08	18.10	18.12		
5	QPSK	1	24	18.10	18.03	17.97		
5	QPSK	12	0	17.89	17.92	17.82	18.5	0
5	QPSK	12	7	17.75	17.95	17.89		
5	QPSK	12	13	17.85	17.85	17.85		
5	QPSK	25	0	17.85	17.89	17.80		
5	16QAM	1	0	17.69	17.70	17.72	18.5	0
5	16QAM	1	12	17.69	17.76	17.65		
5	16QAM	1	24	17.72	17.67	17.58		
5	16QAM	12	0	17.77	17.77	17.77	18.5	0
5	16QAM	12	7	17.81	17.83	17.79		
5	16QAM	12	13	17.76	17.77	17.65		
5	16QAM	25	0	17.73	17.86	17.72		
5	64QAM	1	0	18.08	18.04	18.02	18.5	0
5	64QAM	1	12	17.96	18.00	18.10		
5	64QAM	1	24	17.98	17.97	18.07		
5	64QAM	12	0	17.82	17.93	17.87	18.5	0
5	64QAM	12	7	17.96	17.93	17.93		
5	64QAM	12	13	17.93	17.92	17.80		
5	64QAM	25	0	17.90	17.90	17.81		
Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	18.06	18.12	18.11	18.5	0
3	QPSK	1	8	18.07	18.06	18.13		
3	QPSK	1	14	18.12	18.01	18.02		
3	QPSK	8	0	17.92	17.99	17.92	18.5	0
3	QPSK	8	4	17.73	17.96	17.87		
3	QPSK	8	7	17.90	17.92	17.85		
3	QPSK	15	0	17.91	17.95	17.87		
3	16QAM	1	0	17.69	17.68	17.76	18.5	0
3	16QAM	1	8	17.65	17.72	17.68		
3	16QAM	1	14	17.64	17.67	17.68		
3	16QAM	8	0	17.76	17.81	17.71	18.5	0
3	16QAM	8	4	17.75	17.89	17.73		
3	16QAM	8	7	17.74	17.77	17.66		
3	16QAM	15	0	17.78	17.77	17.72		
3	64QAM	1	0	17.99	18.05	17.98	18.5	0



**FCC SAR TEST REPORT**

**Report No. : FA962518**

3	64QAM	1	8	17.90	17.99	18.10	18.5	0
3	64QAM	1	14	18.03	18.02	18.07		
3	64QAM	8	0	17.78	17.89	17.81		
3	64QAM	8	4	17.93	17.89	17.84		
3	64QAM	8	7	17.88	17.90	17.82		
3	64QAM	15	0	17.89	17.90	17.85		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	18.14	18.15	18.05	18.5	0
1.4	QPSK	1	3	18.07	18.08	18.16		
1.4	QPSK	1	5	18.14	18.01	17.94		
1.4	QPSK	3	0	17.87	17.92	17.90		
1.4	QPSK	3	1	17.68	17.98	17.83		
1.4	QPSK	3	3	17.93	17.84	17.82		
1.4	QPSK	6	0	17.87	17.91	17.81	18.5	0
1.4	16QAM	1	0	17.70	17.69	17.69	18.5	0
1.4	16QAM	1	3	17.65	17.75	17.68		
1.4	16QAM	1	5	17.72	17.68	17.62		
1.4	16QAM	3	0	17.71	17.87	17.73		
1.4	16QAM	3	1	17.79	17.88	17.71		
1.4	16QAM	3	3	17.76	17.74	17.70		
1.4	16QAM	6	0	17.79	17.79	17.69	18.5	0
1.4	64QAM	1	0	18.01	18.02	18.02	18.5	0
1.4	64QAM	1	3	17.95	17.98	18.01		
1.4	64QAM	1	5	18.01	17.96	18.06		
1.4	64QAM	3	0	17.80	17.88	17.84		
1.4	64QAM	3	1	17.86	17.89	17.84		
1.4	64QAM	3	3	17.84	17.85	17.79		
1.4	64QAM	6	0	17.85	17.84	17.82	18.5	0



<Product Specific Power Mode>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	21.99	21.90	21.92	22	0
20	QPSK	1	49	21.45	21.41	21.52		
20	QPSK	1	99	21.22	21.35	21.54		
20	QPSK	50	0	21.84	21.69	21.73	22	0
20	QPSK	50	24	21.50	21.33	21.52		
20	QPSK	50	50	21.32	21.28	21.49		
20	QPSK	100	0	21.71	21.70	21.69	22	0
20	16QAM	1	0	21.90	21.75	21.92		
20	16QAM	1	49	21.52	21.70	21.92		
20	16QAM	1	99	21.62	21.32	21.43	21	1
20	16QAM	50	0	20.68	20.52	20.62		
20	16QAM	50	24	20.64	20.47	20.63		
20	16QAM	50	50	20.48	20.41	20.58	21	1
20	16QAM	100	0	20.54	20.48	20.62		
20	64QAM	1	0	20.87	20.67	20.82		
20	64QAM	1	49	20.87	20.58	20.84	21	1
20	64QAM	1	99	20.50	20.62	20.75		
20	64QAM	50	0	19.70	19.53	19.66		
20	64QAM	50	24	19.69	19.53	19.66	20	2
20	64QAM	50	50	19.48	19.43	19.61		
20	64QAM	100	0	19.59	19.46	19.63		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	21.91	21.87	21.84	22	0
15	QPSK	1	37	21.44	21.32	21.51		
15	QPSK	1	74	21.20	21.35	21.53		
15	QPSK	36	0	21.84	21.61	21.72	22	0
15	QPSK	36	20	21.45	21.27	21.48		
15	QPSK	36	39	21.32	21.28	21.42		
15	QPSK	75	0	21.63	21.63	21.67	22	0
15	16QAM	1	0	21.82	21.68	21.87		
15	16QAM	1	37	21.50	21.70	21.84		
15	16QAM	1	74	21.57	21.24	21.37	21	1
15	16QAM	36	0	20.61	20.45	20.53		
15	16QAM	36	20	20.60	20.46	20.54		
15	16QAM	36	39	20.38	20.39	20.50	21	1
15	16QAM	75	0	20.52	20.48	20.60		
15	64QAM	1	0	20.84	20.58	20.72		
15	64QAM	1	37	20.78	20.50	20.76	21	1
15	64QAM	1	74	20.44	20.61	20.70		
15	64QAM	36	0	19.66	19.49	19.64		
15	64QAM	36	20	19.61	19.43	19.57	20	2
15	64QAM	36	39	19.42	19.43	19.59		
15	64QAM	75	0	19.55	19.44	19.57		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	21.94	21.86	21.90	22	0
10	QPSK	1	25	21.40	21.32	21.49		
10	QPSK	1	49	21.12	21.25	21.53		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

10	QPSK	25	0	21.84	21.62	21.70	22	0
10	QPSK	25	12	21.48	21.31	21.42		
10	QPSK	25	25	21.30	21.23	21.44		
10	QPSK	50	0	21.65	21.63	21.64		
10	16QAM	1	0	21.82	21.72	21.92	22	0
10	16QAM	1	25	21.42	21.64	21.91		
10	16QAM	1	49	21.52	21.23	21.33		
10	16QAM	25	0	20.68	20.47	20.60	21	1
10	16QAM	25	12	20.63	20.37	20.62		
10	16QAM	25	25	20.41	20.38	20.57		
10	16QAM	50	0	20.46	20.47	20.54		
10	64QAM	1	0	20.84	20.59	20.76	21	1
10	64QAM	1	25	20.80	20.50	20.76		
10	64QAM	1	49	20.41	20.57	20.68		
10	64QAM	25	0	19.70	19.43	19.60	20	2
10	64QAM	25	12	19.65	19.48	19.60		
10	64QAM	25	25	19.44	19.37	19.57		
10	64QAM	50	0	19.54	19.41	19.62		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	21.91	21.82	21.91	22	0
5	QPSK	1	12	21.43	21.36	21.49		
5	QPSK	1	24	21.14	21.27	21.44		
5	QPSK	12	0	21.75	21.66	21.67	22	0
5	QPSK	12	7	21.49	21.27	21.49		
5	QPSK	12	13	21.28	21.24	21.42		
5	QPSK	25	0	21.64	21.60	21.59		
5	16QAM	1	0	21.87	21.65	21.85	22	0
5	16QAM	1	12	21.48	21.67	21.83		
5	16QAM	1	24	21.54	21.27	21.39		
5	16QAM	12	0	20.62	20.46	20.61	21	1
5	16QAM	12	7	20.54	20.40	20.59		
5	16QAM	12	13	20.46	20.31	20.55		
5	16QAM	25	0	20.48	20.42	20.60		
5	64QAM	1	0	20.86	20.66	20.78	21	1
5	64QAM	1	12	20.81	20.57	20.81		
5	64QAM	1	24	20.41	20.57	20.74		
5	64QAM	12	0	19.61	19.44	19.62	20	2
5	64QAM	12	7	19.66	19.48	19.63		
5	64QAM	12	13	19.48	19.43	19.51		
5	64QAM	25	0	19.54	19.38	19.56		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	21.92	21.81	21.82	22	0
3	QPSK	1	8	21.37	21.41	21.43		
3	QPSK	1	14	21.15	21.34	21.53		
3	QPSK	8	0	21.82	21.68	21.70	22	0
3	QPSK	8	4	21.42	21.27	21.48		
3	QPSK	8	7	21.23	21.26	21.45		
3	QPSK	15	0	21.66	21.64	21.62		
3	16QAM	1	0	21.84	21.74	21.87	22	0
3	16QAM	1	8	21.48	21.67	21.84		
3	16QAM	1	14	21.56	21.32	21.36		
3	16QAM	8	0	20.58	20.46	20.61	21	1
3	16QAM	8	4	20.61	20.41	20.60		
3	16QAM	8	7	20.46	20.34	20.49		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

3	16QAM	15	0	20.50	20.46	20.62		
3	64QAM	1	0	20.79	20.58	20.73	21	1
3	64QAM	1	8	20.77	20.52	20.80		
3	64QAM	1	14	20.44	20.62	20.71		
3	64QAM	8	0	19.68	19.44	19.60	20	2
3	64QAM	8	4	19.64	19.51	19.65		
3	64QAM	8	7	19.39	19.33	19.59		
3	64QAM	15	0	19.59	19.36	19.63		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	21.95	21.85	21.85	22	0
1.4	QPSK	1	3	21.43	21.32	21.48		
1.4	QPSK	1	5	21.19	21.30	21.44		
1.4	QPSK	3	0	21.75	21.61	21.63		
1.4	QPSK	3	1	21.46	21.25	21.48		
1.4	QPSK	3	3	21.26	21.27	21.47		
1.4	QPSK	6	0	21.64	21.66	21.66	22	0
1.4	16QAM	1	0	21.88	21.66	21.91	22	0
1.4	16QAM	1	3	21.44	21.62	21.82		
1.4	16QAM	1	5	21.54	21.25	21.35		
1.4	16QAM	3	0	21.56	21.56	21.59		
1.4	16QAM	3	1	21.80	21.68	21.79		
1.4	16QAM	3	3	21.42	21.58	21.75		
1.4	16QAM	6	0	20.48	20.47	20.60	21	1
1.4	64QAM	1	0	20.82	20.62	20.72	21	1
1.4	64QAM	1	3	20.83	20.56	20.83		
1.4	64QAM	1	5	20.48	20.61	20.71		
1.4	64QAM	3	0	20.38	20.26	20.45		
1.4	64QAM	3	1	20.48	20.39	20.57		
1.4	64QAM	3	3	20.70	20.49	20.71		
1.4	64QAM	6	0	19.58	19.37	19.55	20	2



<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	21.57	21.65	21.62	22.5	0
20	QPSK	1	49	21.57	21.60	21.55		
20	QPSK	1	99	21.42	21.53	21.52		
20	QPSK	50	0	20.76	20.89	20.88	21.5	1
20	QPSK	50	24	20.73	20.81	20.85		
20	QPSK	50	50	20.69	20.82	20.82		
20	QPSK	100	0	20.72	20.84	20.83		
20	16QAM	1	0	21.14	21.18	21.14	21.5	1
20	16QAM	1	49	21.13	21.13	21.22		
20	16QAM	1	99	21.03	21.17	21.11		
20	16QAM	50	0	20.47	20.46	20.42	20.5	2
20	16QAM	50	24	20.43	20.44	20.44		
20	16QAM	50	50	20.39	20.41	20.48		
20	16QAM	100	0	20.41	20.44	20.41		
20	64QAM	1	0	20.23	20.25	20.24	20.5	2
20	64QAM	1	49	20.21	20.25	20.32		
20	64QAM	1	99	20.15	20.30	20.23		
20	64QAM	50	0	19.07	19.13	19.18	19.5	3
20	64QAM	50	24	19.08	19.22	19.17		
20	64QAM	50	50	19.01	19.15	19.12		
20	64QAM	100	0	19.02	19.18	19.16		
Channel				20025	20175	20325		
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	21.52	21.62	21.59	22.5	0
15	QPSK	1	37	21.48	21.54	21.51		
15	QPSK	1	74	21.32	21.44	21.42		
15	QPSK	36	0	20.72	20.88	20.79	21.5	1
15	QPSK	36	20	20.68	20.79	20.79		
15	QPSK	36	39	20.60	20.78	20.82		
15	QPSK	75	0	20.62	20.76	20.81		
15	16QAM	1	0	21.14	21.18	21.14	21.5	1
15	16QAM	1	37	21.08	21.12	21.15		
15	16QAM	1	74	20.99	21.13	21.06		
15	16QAM	36	0	20.43	20.38	20.33	20.5	2
15	16QAM	36	20	20.43	20.44	20.43		
15	16QAM	36	39	20.38	20.37	20.47		
15	16QAM	75	0	20.31	20.43	20.37		
15	64QAM	1	0	20.19	20.25	20.20	20.5	2
15	64QAM	1	37	20.21	20.15	20.24		
15	64QAM	1	74	20.05	20.21	20.16		
15	64QAM	36	0	19.00	19.07	19.09	19.5	3
15	64QAM	36	20	19.08	19.18	19.08		
15	64QAM	36	39	18.97	19.12	19.06		
15	64QAM	75	0	19.00	19.14	19.12		
Channel				20000	20175	20350		
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	21.52	21.64	21.53	22.5	0
10	QPSK	1	25	21.52	21.52	21.51		
10	QPSK	1	49	21.37	21.50	21.51		
10	QPSK	25	0	20.73	20.80	20.83	21.5	1
10	QPSK	25	12	20.65	20.78	20.77		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

10	QPSK	25	25	20.59	20.76	20.80		
10	QPSK	50	0	20.64	20.74	20.73		
10	16QAM	1	0	21.09	21.09	21.13	21.5	1
10	16QAM	1	25	21.06	21.05	21.16		
10	16QAM	1	49	20.99	21.17	21.11		
10	16QAM	25	0	20.44	20.46	20.32	20.5	2
10	16QAM	25	12	20.34	20.42	20.38		
10	16QAM	25	25	20.38	20.34	20.41		
10	16QAM	50	0	20.41	20.43	20.37		
10	64QAM	1	0	20.13	20.23	20.21	20.5	2
10	64QAM	1	25	20.14	20.18	20.30		
10	64QAM	1	49	20.08	20.22	20.15		
10	64QAM	25	0	18.97	19.12	19.08	19.5	3
10	64QAM	25	12	19.01	19.18	19.07		
10	64QAM	25	25	18.96	19.08	19.05		
10	64QAM	50	0	18.98	19.08	19.06		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	21.57	21.55	21.54	22.5	0
5	QPSK	1	12	21.51	21.57	21.50		
5	QPSK	1	24	21.36	21.47	21.42		
5	QPSK	12	0	20.68	20.89	20.87	21.5	1
5	QPSK	12	7	20.71	20.75	20.77		
5	QPSK	12	13	20.65	20.79	20.76		
5	QPSK	25	0	20.63	20.74	20.74		
5	16QAM	1	0	21.09	21.08	21.08	21.5	1
5	16QAM	1	12	21.11	21.07	21.13		
5	16QAM	1	24	20.99	21.17	21.01		
5	16QAM	12	0	20.43	20.39	20.36	20.5	2
5	16QAM	12	7	20.36	20.40	20.35		
5	16QAM	12	13	20.32	20.41	20.46		
5	16QAM	25	0	20.32	20.42	20.31		
5	64QAM	1	0	20.18	20.22	20.20	20.5	2
5	64QAM	1	12	20.20	20.24	20.22		
5	64QAM	1	24	20.05	20.22	20.19		
5	64QAM	12	0	18.99	19.08	19.09	19.5	3
5	64QAM	12	7	19.02	19.20	19.07		
5	64QAM	12	13	18.91	19.15	19.07		
5	64QAM	25	0	18.98	19.10	19.10		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	21.56	21.62	21.60	22.5	0
3	QPSK	1	8	21.56	21.52	21.52		
3	QPSK	1	14	21.42	21.44	21.42		
3	QPSK	8	0	20.66	20.88	20.88	21.5	1
3	QPSK	8	4	20.66	20.78	20.75		
3	QPSK	8	7	20.68	20.74	20.76		
3	QPSK	15	0	20.66	20.77	20.78		
3	16QAM	1	0	21.13	21.13	21.05	21.5	1
3	16QAM	1	8	21.08	21.13	21.12		
3	16QAM	1	14	21.03	21.15	21.04		
3	16QAM	8	0	20.39	20.43	20.40	20.5	2
3	16QAM	8	4	20.43	20.38	20.35		
3	16QAM	8	7	20.32	20.35	20.47		
3	16QAM	15	0	20.40	20.37	20.38		
3	64QAM	1	0	20.20	20.18	20.15	20.5	2



**FCC SAR TEST REPORT**

**Report No. : FA962518**

3	64QAM	1	8	20.13	20.15	20.22	19.5	3
3	64QAM	1	14	20.14	20.21	20.16		
3	64QAM	8	0	19.05	19.04	19.08		
3	64QAM	8	4	18.98	19.17	19.09		
3	64QAM	8	7	18.95	19.15	19.12		
3	64QAM	15	0	18.98	19.18	19.16		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	21.51	21.57	21.59	22.5	0
1.4	QPSK	1	3	21.52	21.48	21.44		
1.4	QPSK	1	5	21.38	21.40	21.34		
1.4	QPSK	3	0	21.43	21.43	21.48		
1.4	QPSK	3	1	21.44	21.48	21.45		
1.4	QPSK	3	3	21.42	21.40	21.31		
1.4	QPSK	6	0	21.19	21.12	21.14	21.5	1
1.4	16QAM	1	0	21.04	21.10	21.05	21.5	1
1.4	16QAM	1	3	21.00	21.04	21.07		
1.4	16QAM	1	5	20.95	21.06	20.97		
1.4	16QAM	3	0	21.03	21.11	21.03		
1.4	16QAM	3	1	21.04	21.03	21.02		
1.4	16QAM	3	3	20.96	21.09	20.99		
1.4	16QAM	6	0	20.30	20.27	20.33	20.5	2
1.4	64QAM	1	0	20.19	20.12	20.07	20.5	2
1.4	64QAM	1	3	20.11	20.05	20.15		
1.4	64QAM	1	5	20.04	20.20	20.16		
1.4	64QAM	3	0	20.40	20.37	20.29		
1.4	64QAM	3	1	20.12	20.10	20.05		
1.4	64QAM	3	3	20.03	20.12	20.15		
1.4	64QAM	6	0	18.89	19.11	19.11	19.5	3



<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	22.65	22.59	22.81	24	0
10	QPSK	1	25	22.64	22.87	22.78		
10	QPSK	1	49	22.54	22.54	22.79		
10	QPSK	25	0	21.67	21.67	21.85	23	1
10	QPSK	25	12	21.71	21.73	21.85		
10	QPSK	25	25	21.60	21.61	21.77		
10	QPSK	50	0	21.64	21.68	21.83		
10	16QAM	1	0	22.02	21.96	22.22	23	1
10	16QAM	1	25	22.01	22.04	22.12		
10	16QAM	1	49	21.95	21.92	22.17		
10	16QAM	25	0	20.76	20.83	20.95	22	2
10	16QAM	25	12	20.76	20.84	20.96		
10	16QAM	25	25	20.73	20.71	20.86		
10	16QAM	50	0	20.76	20.79	20.95		
10	64QAM	1	0	20.88	20.86	21.10	22	2
10	64QAM	1	25	20.88	20.92	21.04		
10	64QAM	1	49	20.80	20.83	21.07		
10	64QAM	25	0	19.79	19.82	19.96	21	3
10	64QAM	25	12	19.77	19.84	19.97		
10	64QAM	25	25	19.75	19.74	19.88		
10	64QAM	50	0	19.76	19.79	19.94		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.63	22.56	22.84	24	0
5	QPSK	1	12	22.66	22.63	22.83		
5	QPSK	1	24	22.60	22.57	22.81		
5	QPSK	12	0	21.69	21.68	21.85	23	1
5	QPSK	12	7	21.72	21.68	21.88		
5	QPSK	12	13	21.65	21.67	21.82		
5	QPSK	25	0	21.65	21.68	21.85		
5	16QAM	1	0	22.02	21.94	22.18	23	1
5	16QAM	1	12	22.03	22.00	22.16		
5	16QAM	1	24	21.93	21.99	22.23		
5	16QAM	12	0	20.80	20.80	20.99	22	2
5	16QAM	12	7	20.82	20.83	21.03		
5	16QAM	12	13	20.77	20.78	20.94		
5	16QAM	25	0	20.77	20.79	20.97		
5	64QAM	1	0	20.92	20.79	21.09	22	2
5	64QAM	1	12	20.91	20.91	21.07		
5	64QAM	1	24	20.86	20.88	21.12		
5	64QAM	12	0	19.80	19.81	19.96	21	3
5	64QAM	12	7	19.83	19.83	20.00		
5	64QAM	12	13	19.77	19.76	19.93		
5	64QAM	25	0	19.79	19.80	19.98		
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.64	22.61	22.80	24	0
3	QPSK	1	8	22.60	22.57	22.84		
3	QPSK	1	14	22.58	22.55	22.85		
3	QPSK	8	0	21.65	21.63	21.85	23	1
3	QPSK	8	4	21.66	21.67	21.85		



3	QPSK	8	7	21.65	21.64	21.93		
3	QPSK	15	0	21.64	21.62	21.84		
3	16QAM	1	0	22.00	21.98	22.14	23	1
3	16QAM	1	8	21.95	22.01	22.20		
3	16QAM	1	14	21.95	21.97	22.18		
3	16QAM	8	0	20.81	20.81	21.00	22	2
3	16QAM	8	4	20.84	20.84	21.02		
3	16QAM	8	7	20.81	20.80	21.09		
3	16QAM	15	0	20.76	20.75	20.95		
3	64QAM	1	0	20.87	20.87	21.06	22	2
3	64QAM	1	8	20.88	20.87	21.12		
3	64QAM	1	14	20.87	20.87	21.11		
3	64QAM	8	0	19.78	19.78	19.96	21	3
3	64QAM	8	4	19.80	19.80	19.96		
3	64QAM	8	7	19.78	19.78	20.05		
3	64QAM	15	0	19.74	19.73	19.94		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.62	22.55	22.84	24	0
1.4	QPSK	1	3	22.65	22.63	22.81		
1.4	QPSK	1	5	22.58	22.55	22.83		
1.4	QPSK	3	0	22.63	22.60	22.86		
1.4	QPSK	3	1	22.67	22.64	22.81		
1.4	QPSK	3	3	22.61	22.61	22.84		
1.4	QPSK	6	0	21.63	21.61	21.91	23	1
1.4	16QAM	1	0	21.95	21.93	22.21	23	1
1.4	16QAM	1	3	21.97	22.05	22.32		
1.4	16QAM	1	5	21.94	21.93	22.22		
1.4	16QAM	3	0	21.74	21.75	21.99		
1.4	16QAM	3	1	21.80	21.76	22.00		
1.4	16QAM	3	3	21.71	21.72	21.94		
1.4	16QAM	6	0	20.80	20.76	21.04	22	2
1.4	64QAM	1	0	20.85	20.85	21.11	22	2
1.4	64QAM	1	3	20.94	20.93	21.19		
1.4	64QAM	1	5	20.84	20.79	21.08		
1.4	64QAM	3	0	20.80	20.79	21.03		
1.4	64QAM	3	1	20.85	20.78	21.03		
1.4	64QAM	3	3	20.77	20.78	21.01		
1.4	64QAM	6	0	19.73	19.75	20.01	21	3



<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	22.13	22.03	22.22	22.5	0
20	QPSK	1	49	22.11	21.88	22.15		
20	QPSK	1	99	22.10	22.01	22.11		
20	QPSK	50	0	22.13	22.05	22.20	22.5	0
20	QPSK	50	24	22.12	22.04	22.12		
20	QPSK	50	50	22.12	22.03	22.11		
20	QPSK	100	0	22.08	22.03	22.09		
20	16QAM	1	0	22.02	21.91	22.16	22.5	0
20	16QAM	1	49	22.13	22.09	22.12		
20	16QAM	1	99	21.82	22.13	22.10		
20	16QAM	50	0	20.95	20.79	20.97	21.5	1
20	16QAM	50	24	21.00	20.80	20.92		
20	16QAM	50	50	20.94	20.87	20.92		
20	16QAM	100	0	20.87	20.82	20.87		
20	64QAM	1	0	20.94	20.83	21.11	21.5	1
20	64QAM	1	49	21.20	20.97	21.18		
20	64QAM	1	99	21.10	21.18	21.11		
20	64QAM	50	0	20.27	20.07	20.26	20.5	2
20	64QAM	50	24	20.30	20.14	20.18		
20	64QAM	50	50	20.26	20.19	20.24		
20	64QAM	100	0	20.18	20.09	20.21		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	22.07	22.03	22.19	22.5	0
15	QPSK	1	37	22.07	21.88	22.06		
15	QPSK	1	74	22.07	22.00	22.06		
15	QPSK	36	0	22.04	22.05	22.14	22.5	0
15	QPSK	36	20	22.06	22.01	22.05		
15	QPSK	36	39	22.07	21.94	22.05		
15	QPSK	75	0	22.06	21.98	22.00		
15	16QAM	1	0	21.93	21.84	22.13	22.5	0
15	16QAM	1	37	22.10	22.07	22.06		
15	16QAM	1	74	21.74	22.09	22.09		
15	16QAM	36	0	20.86	20.75	20.91	21.5	1
15	16QAM	36	20	20.99	20.71	20.82		
15	16QAM	36	39	20.91	20.82	20.84		
15	16QAM	75	0	20.80	20.73	20.86		
15	64QAM	1	0	20.87	20.80	21.01	21.5	1
15	64QAM	1	37	21.16	20.95	21.18		
15	64QAM	1	74	21.02	21.13	21.11		
15	64QAM	36	0	20.25	20.02	20.21	20.5	2
15	64QAM	36	20	20.26	20.11	20.15		
15	64QAM	36	39	20.22	20.16	20.21		
15	64QAM	75	0	20.17	20.07	20.16		
Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	22.13	21.98	22.19	22.5	0
10	QPSK	1	25	22.02	21.80	22.07		
10	QPSK	1	49	22.08	21.98	22.11		
10	QPSK	25	0	22.13	22.02	22.20	22.5	0
10	QPSK	25	12	22.12	22.03	22.05		



10	QPSK	25	25	22.02	22.03	22.11		
10	QPSK	50	0	22.07	21.97	22.08		
10	16QAM	1	0	21.98	21.84	22.12	22.5	0
10	16QAM	1	25	22.11	21.99	22.09		
10	16QAM	1	49	21.80	22.13	22.10		
10	16QAM	25	0	20.92	20.74	20.89	21.5	1
10	16QAM	25	12	20.97	20.73	20.87		
10	16QAM	25	25	20.85	20.80	20.85		
10	16QAM	50	0	20.85	20.77	20.87		
10	64QAM	1	0	20.90	20.75	21.07	21.5	1
10	64QAM	1	25	21.17	20.97	21.18		
10	64QAM	1	49	21.10	21.08	21.07		
10	64QAM	25	0	20.26	20.05	20.21	20.5	2
10	64QAM	25	12	20.25	20.10	20.14		
10	64QAM	25	25	20.26	20.09	20.17		
10	64QAM	50	0	20.14	20.02	20.17		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	22.04	22.02	22.13	22.5	0
5	QPSK	1	12	22.07	21.83	22.07		
5	QPSK	1	24	22.10	21.92	22.07		
5	QPSK	12	0	22.05	22.03	22.19	22.5	0
5	QPSK	12	7	22.10	21.99	22.09		
5	QPSK	12	13	22.03	22.01	22.03		
5	QPSK	25	0	22.00	22.02	22.02		
5	16QAM	1	0	21.99	21.91	22.11	22.5	0
5	16QAM	1	12	22.06	21.99	22.04		
5	16QAM	1	24	21.80	22.04	22.08		
5	16QAM	12	0	20.85	20.70	20.97	21.5	1
5	16QAM	12	7	20.94	20.72	20.90		
5	16QAM	12	13	20.93	20.85	20.82		
5	16QAM	25	0	20.78	20.80	20.82		
5	64QAM	1	0	20.85	20.79	21.01	21.5	1
5	64QAM	1	12	21.11	20.95	21.09		
5	64QAM	1	24	21.04	21.15	21.05		
5	64QAM	12	0	20.18	19.97	20.26	20.5	2
5	64QAM	12	7	20.30	20.05	20.09		
5	64QAM	12	13	20.16	20.13	20.23		
5	64QAM	25	0	20.17	20.04	20.20		



<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	22.53	22.47	22.55	24	0
10	QPSK	1	25	22.73	22.58	22.56		
10	QPSK	1	49	22.58	22.55	22.62		
10	QPSK	25	0	21.62	21.61	21.59	23	1
10	QPSK	25	12	21.64	21.62	21.60		
10	QPSK	25	25	21.66	21.62	21.53		
10	QPSK	50	0	21.65	21.59	21.57		
10	16QAM	1	0	21.87	21.86	21.91	23	1
10	16QAM	1	25	22.03	21.96	21.92		
10	16QAM	1	49	21.98	21.91	21.95		
10	16QAM	25	0	20.75	20.72	20.69	22	2
10	16QAM	25	12	20.77	20.77	20.69		
10	16QAM	25	25	20.75	20.72	20.69		
10	16QAM	50	0	20.79	20.74	20.66		
10	64QAM	1	0	20.72	20.75	20.79	22	2
10	64QAM	1	25	20.90	20.85	20.82		
10	64QAM	1	49	20.87	20.82	20.85		
10	64QAM	25	0	19.73	19.73	19.71	21	3
10	64QAM	25	12	19.78	19.77	19.71		
10	64QAM	25	25	19.76	19.71	19.70		
10	64QAM	50	0	19.76	19.71	19.66		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	22.54	22.56	22.50	24	0
5	QPSK	1	12	22.54	22.55	22.60		
5	QPSK	1	24	22.60	22.57	22.56		
5	QPSK	12	0	21.55	21.59	21.51	23	1
5	QPSK	12	7	21.58	21.61	21.71		
5	QPSK	12	13	21.66	21.59	21.61		
5	QPSK	25	0	21.68	21.60	21.55		
5	16QAM	1	0	21.84	21.95	21.88	23	1
5	16QAM	1	12	21.93	21.94	21.94		
5	16QAM	1	24	21.98	21.93	21.93		
5	16QAM	12	0	20.68	20.71	20.68	22	2
5	16QAM	12	7	20.74	20.76	20.81		
5	16QAM	12	13	20.78	20.72	20.77		
5	16QAM	25	0	20.78	20.71	20.64		
5	64QAM	1	0	20.75	20.83	20.83	22	2
5	64QAM	1	12	20.83	20.85	20.88		
5	64QAM	1	24	20.85	20.81	20.82		
5	64QAM	12	0	19.67	19.69	19.66	21	3
5	64QAM	12	7	19.70	19.72	19.79		
5	64QAM	12	13	19.78	19.69	19.78		
5	64QAM	25	0	19.78	19.72	19.65		
Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	22.53	22.54	22.59	24	0
3	QPSK	1	8	22.52	22.54	22.57		
3	QPSK	1	14	22.53	22.54	22.56		
3	QPSK	8	0	21.58	21.56	21.59	23	1
3	QPSK	8	4	21.58	21.63	21.66		



3	QPSK	8	7	21.52	21.56	21.59		
3	QPSK	15	0	21.55	21.60	21.63		
3	16QAM	1	0	21.88	21.90	21.93	23	1
3	16QAM	1	8	21.88	21.94	21.96		
3	16QAM	1	14	21.86	21.89	21.90		
3	16QAM	8	0	20.71	20.78	20.81	22	2
3	16QAM	8	4	20.74	20.76	20.79		
3	16QAM	8	7	20.73	20.77	20.80		
3	16QAM	15	0	20.65	20.70	20.77		
3	64QAM	1	0	20.76	20.80	20.84	22	2
3	64QAM	1	8	20.76	20.81	20.82		
3	64QAM	1	14	20.79	20.80	20.81		
3	64QAM	8	0	19.69	19.70	19.77	21	3
3	64QAM	8	4	19.69	19.74	19.76		
3	64QAM	8	7	19.71	19.72	19.75		
3	64QAM	15	0	19.65	19.69	19.76		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	22.49	22.51	22.53	24	0
1.4	QPSK	1	3	22.57	22.59	22.60		
1.4	QPSK	1	5	22.49	22.50	22.54		
1.4	QPSK	3	0	22.57	22.57	22.56		
1.4	QPSK	3	1	22.57	22.58	22.62		
1.4	QPSK	3	3	22.55	22.55	22.60		
1.4	QPSK	6	0	21.54	21.55	21.56	23	1
1.4	16QAM	1	0	21.82	21.89	21.86	23	1
1.4	16QAM	1	3	21.91	21.95	21.95		
1.4	16QAM	1	5	21.78	21.89	21.88		
1.4	16QAM	3	0	21.61	21.68	21.66		
1.4	16QAM	3	1	21.68	21.70	21.72		
1.4	16QAM	3	3	21.63	21.65	21.68		
1.4	16QAM	6	0	20.72	20.76	20.79	22	2
1.4	64QAM	1	0	20.72	20.81	20.82	22	2
1.4	64QAM	1	3	20.75	20.85	20.86		
1.4	64QAM	1	5	20.73	20.80	20.77		
1.4	64QAM	3	0	20.63	20.73	20.70		
1.4	64QAM	3	1	20.69	20.73	20.79		
1.4	64QAM	3	3	20.68	20.71	20.75		
1.4	64QAM	6	0	19.64	19.70	19.71	21	3



<LTE Band 17>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23780	23790	23800		
Frequency (MHz)				709	710	711		
10	QPSK	1	0	22.54	22.56	22.62		
10	QPSK	1	25	22.65	22.61	22.62	24	0
10	QPSK	1	49	22.72	22.71	22.71		
10	QPSK	25	0	21.69	21.66	21.65		
10	QPSK	25	12	21.72	21.70	21.70	23	1
10	QPSK	25	25	21.67	21.62	21.62		
10	QPSK	50	0	21.70	21.69	21.66		
10	16QAM	1	0	21.89	21.93	21.97	23	1
10	16QAM	1	25	22.02	22.00	21.96		
10	16QAM	1	49	22.13	22.11	22.05		
10	16QAM	25	0	20.81	20.77	20.78	22	2
10	16QAM	25	12	20.81	20.82	20.77		
10	16QAM	25	25	20.76	20.79	20.77		
10	16QAM	50	0	20.79	20.78	20.76	22	2
10	64QAM	1	0	20.82	20.80	20.90		
10	64QAM	1	25	20.91	20.89	20.87		
10	64QAM	1	49	21.01	20.98	20.98	21	3
10	64QAM	25	0	19.82	19.77	19.80		
10	64QAM	25	12	19.84	19.83	19.79		
10	64QAM	25	25	19.78	19.78	19.75	21	3
10	64QAM	50	0	19.79	19.78	19.75		
Channel				23755	23790	23825		
Frequency (MHz)				706.5	710	713.5		
5	QPSK	1	0	22.55	22.53	22.60		
5	QPSK	1	12	22.67	22.60	22.61	24	0
5	QPSK	1	24	22.65	22.69	22.69		
5	QPSK	12	0	21.72	21.66	21.63		
5	QPSK	12	7	21.73	21.68	21.67	23	1
5	QPSK	12	13	21.69	21.66	21.61		
5	QPSK	25	0	21.68	21.66	21.66		
5	16QAM	1	0	21.95	21.86	21.98	23	1
5	16QAM	1	12	22.07	21.97	22.01		
5	16QAM	1	24	21.98	22.06	22.02		
5	16QAM	12	0	20.82	20.79	20.78	22	2
5	16QAM	12	7	20.85	20.81	20.81		
5	16QAM	12	13	20.85	20.78	20.75		
5	16QAM	25	0	20.80	20.78	20.76	22	2
5	64QAM	1	0	20.82	20.78	20.83		
5	64QAM	1	12	20.95	20.88	20.87		
5	64QAM	1	24	20.90	20.95	20.91	21	3
5	64QAM	12	0	19.82	19.78	19.77		
5	64QAM	12	7	19.85	19.82	19.78		
5	64QAM	12	13	19.84	19.78	19.75	21	3
5	64QAM	25	0	19.79	19.78	19.75		



<LTE Band 66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	21.94	22.05	21.94	22.5	0
20	QPSK	1	49	21.89	21.98	21.94		
20	QPSK	1	99	21.99	21.94	21.86		
20	QPSK	50	0	21.29	21.30	21.22	21.5	1
20	QPSK	50	24	21.23	21.28	21.22		
20	QPSK	50	50	21.22	21.23	21.17		
20	QPSK	100	0	21.24	21.24	21.18		
20	16QAM	1	0	21.16	21.16	21.15	21.5	1
20	16QAM	1	49	21.12	21.25	21.15		
20	16QAM	1	99	21.13	21.14	21.09		
20	16QAM	50	0	20.44	20.48	20.50	20.5	2
20	16QAM	50	24	20.48	20.46	20.47		
20	16QAM	50	50	20.47	20.47	20.46		
20	16QAM	100	0	20.48	20.45	20.46		
20	64QAM	1	0	20.24	20.29	20.30	20.5	2
20	64QAM	1	49	20.21	20.34	20.30		
20	64QAM	1	99	20.26	20.26	20.19		
20	64QAM	50	0	19.11	19.24	19.14	19.5	3
20	64QAM	50	24	19.19	19.24	19.15		
20	64QAM	50	50	19.13	19.14	19.10		
20	64QAM	100	0	19.18	19.17	19.09		
Channel				132047	132322	132597		
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	21.90	21.95	21.91	22.5	0
15	QPSK	1	37	21.84	21.94	21.85		
15	QPSK	1	74	21.97	21.84	21.83		
15	QPSK	36	0	21.20	21.21	21.20	21.5	1
15	QPSK	36	20	21.21	21.22	21.12		
15	QPSK	36	39	21.19	21.16	21.08		
15	QPSK	75	0	21.17	21.19	21.18		
15	16QAM	1	0	21.08	21.08	21.08	21.5	1
15	16QAM	1	37	21.09	21.21	21.08		
15	16QAM	1	74	21.09	21.04	21.08		
15	16QAM	36	0	20.35	20.48	20.50	20.5	2
15	16QAM	36	20	20.48	20.48	20.37		
15	16QAM	36	39	20.40	20.43	20.44		
15	16QAM	75	0	20.46	20.50	20.37		
15	64QAM	1	0	20.24	20.27	20.25	20.5	2
15	64QAM	1	37	20.11	20.28	20.24		
15	64QAM	1	74	20.19	20.25	20.15		
15	64QAM	36	0	19.10	19.15	19.14	19.5	3
15	64QAM	36	20	19.09	19.22	19.13		
15	64QAM	36	39	19.10	19.06	19.07		
15	64QAM	75	0	19.13	19.09	19.06		
Channel				132022	132322	132622		
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	21.86	22.04	21.88	22.5	0
10	QPSK	1	25	21.81	21.98	21.91		
10	QPSK	1	49	21.94	21.92	21.76		
10	QPSK	25	0	21.20	21.24	21.16	21.5	1
10	QPSK	25	12	21.17	21.26	21.12		



**FCC SAR TEST REPORT**

**Report No. : FA962518**

10	QPSK	25	25	21.20	21.17	21.08		
10	QPSK	50	0	21.23	21.17	21.13		
10	16QAM	1	0	21.07	21.15	21.06	21.5	1
10	16QAM	1	25	21.04	21.22	21.09		
10	16QAM	1	49	21.03	21.09	21.08		
10	16QAM	25	0	20.35	20.50	20.42	20.5	2
10	16QAM	25	12	20.49	20.50	20.42		
10	16QAM	25	25	20.47	20.44	20.45		
10	16QAM	50	0	20.44	20.48	20.42		
10	64QAM	1	0	20.20	20.20	20.24	20.5	2
10	64QAM	1	25	20.20	20.31	20.22		
10	64QAM	1	49	20.17	20.18	20.13		
10	64QAM	25	0	19.06	19.17	19.05	19.5	3
10	64QAM	25	12	19.13	19.20	19.05		
10	64QAM	25	25	19.09	19.13	19.02		
10	64QAM	50	0	19.10	19.15	19.09		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	21.86	22.04	21.92	22.5	0
5	QPSK	1	12	21.88	21.97	21.89		
5	QPSK	1	24	21.99	21.90	21.81		
5	QPSK	12	0	21.20	21.20	21.19	21.5	1
5	QPSK	12	7	21.17	21.28	21.21		
5	QPSK	12	13	21.13	21.17	21.17		
5	QPSK	25	0	21.17	21.16	21.12		
5	16QAM	1	0	21.09	21.13	21.12	21.5	1
5	16QAM	1	12	21.05	21.21	21.15		
5	16QAM	1	24	21.05	21.04	21.09		
5	16QAM	12	0	20.38	20.50	20.50	20.5	2
5	16QAM	12	7	20.47	20.48	20.46		
5	16QAM	12	13	20.40	20.41	20.39		
5	16QAM	25	0	20.49	20.47	20.40		
5	64QAM	1	0	20.18	20.25	20.21	20.5	2
5	64QAM	1	12	20.14	20.24	20.28		
5	64QAM	1	24	20.22	20.20	20.14		
5	64QAM	12	0	19.01	19.24	19.04	19.5	3
5	64QAM	12	7	19.17	19.24	19.10		
5	64QAM	12	13	19.10	19.07	19.01		
5	64QAM	25	0	19.10	19.08	19.01		
Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	21.87	21.96	21.85	22.5	0
3	QPSK	1	8	21.83	21.97	21.84		
3	QPSK	1	14	21.95	21.88	21.86		
3	QPSK	8	0	21.25	21.24	21.20	21.5	1
3	QPSK	8	4	21.20	21.25	21.12		
3	QPSK	8	7	21.20	21.23	21.09		
3	QPSK	15	0	21.21	21.14	21.14		
3	16QAM	1	0	21.08	21.09	21.11	21.5	1
3	16QAM	1	8	21.10	21.17	21.15		
3	16QAM	1	14	21.07	21.07	20.99		
3	16QAM	8	0	20.40	20.46	20.43	20.5	2
3	16QAM	8	4	20.45	20.47	20.46		
3	16QAM	8	7	20.46	20.45	20.44		
3	16QAM	15	0	20.48	20.50	20.44		
3	64QAM	1	0	20.21	20.23	20.22	20.5	2



**FCC SAR TEST REPORT**

**Report No. : FA962518**

3	64QAM	1	8	20.17	20.29	20.21	19.5	3
3	64QAM	1	14	20.16	20.20	20.11		
3	64QAM	8	0	19.10	19.24	19.11		
3	64QAM	8	4	19.09	19.24	19.11		
3	64QAM	8	7	19.10	19.10	19.04		
3	64QAM	15	0	19.18	19.12	19.08		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	21.94	21.98	21.91	22.5	0
1.4	QPSK	1	3	21.88	21.96	21.85		
1.4	QPSK	1	5	21.95	21.89	21.79		
1.4	QPSK	3	0	21.27	21.26	21.18		
1.4	QPSK	3	1	21.15	21.27	21.16		
1.4	QPSK	3	3	21.13	21.18	21.09		
1.4	QPSK	6	0	21.23	21.19	21.17	21.5	1
1.4	16QAM	1	0	21.15	21.07	21.12	21.5	1
1.4	16QAM	1	3	21.09	21.25	21.05		
1.4	16QAM	1	5	21.04	21.06	21.08		
1.4	16QAM	3	0	20.98	21.07	21.06		
1.4	16QAM	3	1	21.00	21.07	21.08		
1.4	16QAM	3	3	21.05	21.00	20.89		
1.4	16QAM	6	0	20.49	20.50	20.40	20.5	2
1.4	64QAM	1	0	20.20	20.24	20.26	20.5	2
1.4	64QAM	1	3	20.20	20.29	20.21		
1.4	64QAM	1	5	20.25	20.20	20.10		
1.4	64QAM	3	0	20.19	20.22	20.22		
1.4	64QAM	3	1	20.16	20.22	20.15		
1.4	64QAM	3	3	20.12	20.12	20.01		
1.4	64QAM	6	0	19.08	19.10	19.01	19.5	3



<LTE Carrier Aggregation combinations>

General Note:

- 1. This device supports Carrier Aggregation on downlink only for inter and intra band, Uplink CA is not supported. For the device supports combination bands and configurations are according to 3GPP.
- 2. In applying the existing power measurement procedure of KDB 941225 D05A for DL CA SAR test exclusion, only the subset with the largest number of combinations of the frequency band and CCs in each row need consideration, and that configurations require power measurement should be highlighted in the below table.

2CC Downlink Carrier Aggregation		
Number	Combination	Covered by Measurement Superset
1	2A-4A	
2	2A-5A	
3	2A-7A	
4	4A-5A	
5	4A-7A	
6	4A-12A	
7	4A-17A	
8	5A-7A	
9	12A-66A	
10	4A-4A	
11	7A-7A	
12	66A-66A	
13	7B	
14	7C	
15	66B	
16	66C	



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

**General Note:**

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

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

**<Two Carrier power verification>**

Configure	CA Configuration (BCS)	PCC							SCC				Power		
		LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)	
Inter-Band	2A-4A	2	20	1880	18900	QPSK	1	0	4	20	2132.5	2175	22.93	22.90	
	2A-5A	2	20	1880	18900	QPSK	1	0	5	10	881.5	2525	22.79	22.90	
	2A-7A	2	20	1880	18900	QPSK	1	0	7	20	2655	3100	22.81	22.90	
	4A-5A	4	20	1745	20300	QPSK	1	49	5	10	881.5	2525	22.65	22.72	
	4A-7A	4	20	1745	20300	QPSK	1	49	7	20	2655	3100	22.77	22.72	
	4A-12A	4	20	1745	20300	QPSK	1	49	12	10	737.5	5095	22.74	22.72	
	4A-17A	4	10	1745	20300	QPSK	1	0	17	10	740	5790	22.53	22.69	
	5A-7A	5	10	836.5	20525	QPSK	1	25	7	20	2655	3100	22.81	22.87	
	12A-66A	12	10	704	23060	QPSK	1	25	66	20	2155	66886	22.66	22.73	
Intra-Band	Non-Contiguous	4A-4A	4	20	1745	20300	QPSK	1	49	4	20	2120	2050	22.83	22.72
		7A-7A	7	20	2560	21350	QPSK	1	0	7	20	2630	2850	23.01	23.16
		66A-66A	66	20	1770	132572	QPSK	1	0	66	20	2120	66536	23.05	22.99
	Contiguous	7B	7	15	2562.5	21375	QPSK	1	74	7	5	2673.2	3282	23.14	23.16
		7C	7	20	2560	21350	QPSK	1	0	7	20	2660.2	3152	23.28	23.16
		66B	66	15	1777.5	132647	QPSK	1	12	66	5	2168.2	67018	23.05	22.99
		66C	66	20	1770	132572	QPSK	1	0	66	20	2150.2	66838	23.06	22.99



**<WLAN Conducted Power>**

**General Note:**

1. 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.
2. 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).
3. 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.
4. 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  $\leq 0.4$  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  $\leq 0.8$  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  $\leq 1.2$  W/kg or all required channels are tested.

**<Default / Product Specific power mode>**

**<2.4GHz WLAN>**

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	17.55	19.00	100.00
		6	2437	17.10	19.00	
		11	2462	17.41	19.00	
	802.11g 6Mbps	1	2412	15.12	16.50	98.28
		6	2437	14.56	16.50	
		11	2462	14.84	16.50	
	802.11n-HT20 MCS0	1	2412	14.23	15.50	98.16
		6	2437	13.97	15.50	
		11	2462	14.22	15.50	



<5GHz WLAN >

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	15.43	17.00	98.28
		40	5200	15.47	17.00	
		44	5220	15.60	17.00	
		48	5240	15.67	17.00	
	802.11n-HT20 MCS0	36	5180	14.87	16.50	98.16
		40	5200	14.83	16.50	
		44	5220	14.89	16.50	
		48	5240	14.96	16.50	
	802.11n-HT40 MCS0	38	5190	12.93	14.50	96.32
		46	5230	13.06	14.50	
	802.11ac-VHT20 MCS0	36	5180	14.39	16.00	97.79
		40	5200	14.38	16.00	
44		5220	14.47	16.00		
48		5240	14.69	16.00		
802.11ac-VHT40 MCS0	38	5190	12.88	14.50	96.32	
	46	5230	13.50	14.50		
802.11ac-VHT80 MCS0	42	5210	10.18	12.00	93.02	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	15.12	17.00	98.28
		56	5280	15.17	17.00	
		60	5300	15.23	17.00	
		64	5320	15.50	17.00	
	802.11n-HT20 MCS0	52	5260	14.97	16.50	98.16
		56	5280	14.99	16.50	
		60	5300	15.20	16.50	
		64	5320	15.38	16.50	
	802.11n-HT40 MCS0	54	5270	13.03	15.00	96.32
		62	5310	13.27	15.00	
	802.11ac-VHT20 MCS0	52	5260	14.59	16.50	97.79
		56	5280	14.56	16.50	
60		5300	14.77	16.50		
802.11ac-VHT40 MCS0	54	5270	13.49	15.00	96.32	
	62	5310	13.75	15.00		
802.11ac-VHT80 MCS0	58	5290	10.16	12.00	93.02	



	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	15.31	16.50	98.28
		116	5580	15.27	16.50	
		124	5620	14.98	16.50	
		132	5660	15.07	16.50	
		144	5720	15.16	16.50	
	802.11n-HT20 MCS0	100	5500	15.07	16.00	98.16
		116	5580	15.10	16.00	
		124	5620	14.85	16.00	
		132	5660	14.93	16.00	
		144	5720	14.96	16.00	
	802.11n-HT40 MCS0	102	5510	12.62	14.00	96.32
		110	5550	12.90	14.00	
		126	5630	12.65	14.00	
		134	5670	12.32	14.00	
		142	5710	12.48	14.00	
	802.11ac-VHT20 MCS0	100	5500	14.27	15.50	97.79
		116	5580	14.26	15.50	
		124	5620	13.95	15.50	
		132	5660	14.03	15.50	
		144	5720	14.40	15.50	
802.11ac-VHT40 MCS0	102	5510	12.98	14.50	96.32	
	110	5550	13.35	14.50		
	126	5630	13.15	14.50		
	134	5670	12.80	14.50		
	142	5710	12.96	14.50		
802.11ac-VHT80 MCS0	106	5530	10.34	12.00	93.02	
	122	5610	10.00	12.00		
	138	5690	10.19	12.00		

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	14.62	16.00	98.28
		157	5785	14.34	16.00	
		165	5825	14.80	16.00	
	802.11n-HT20 MCS0	149	5745	14.46	16.00	98.16
		157	5785	14.20	16.00	
		165	5825	14.61	16.00	
	802.11n-HT40 MCS0	151	5755	12.88	14.50	96.32
		159	5795	12.69	14.50	
	802.11ac-VHT20 MCS0	149	5745	13.79	15.50	97.79
		157	5785	13.51	15.50	
		165	5825	13.67	15.50	
	802.11ac-VHT40 MCS0	151	5755	13.87	15.50	96.32
		159	5795	13.84	15.50	
	802.11ac-VHT80 MCS0	155	5775	10.19	12.00	93.02



**<Near-Body / Hotspot power mode>**

**<2.4GHz WLAN>**

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	17.55	19.00	100.00
		6	2437	17.10	19.00	
		11	2462	17.41	19.00	
	802.11g 6Mbps	1	2412	15.12	16.50	98.28
		6	2437	14.56	16.50	
		11	2462	14.84	16.50	
	802.11n-HT20 MCS0	1	2412	14.23	15.50	98.16
		6	2437	13.97	15.50	
		11	2462	14.22	15.50	

**<5GHz WLAN >**

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	14.80	15.00	98.28
		40	5200	13.30	15.00	
		44	5220	14.89	15.00	
		48	5240	14.86	15.00	
	802.11n-HT20 MCS0	36	5180	14.87	15.00	98.16
		40	5200	14.83	15.00	
		44	5220	14.89	15.00	
		48	5240	14.96	15.00	
	802.11n-HT40 MCS0	38	5190	12.93	14.50	96.32
		46	5230	13.06	14.50	
	802.11ac-VHT20 MCS0	36	5180	14.39	15.00	97.79
		40	5200	14.38	15.00	
		44	5220	14.47	15.00	
		48	5240	14.69	15.00	
	802.11ac-VHT40 MCS0	38	5190	12.88	14.50	96.32
		46	5230	13.50	14.50	
802.11ac-VHT80 MCS0	42	5210	10.18	12.00	93.02	



	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	15.12	17.00	98.28
		56	5280	15.17	17.00	
		60	5300	15.23	17.00	
		64	5320	15.50	17.00	
	802.11n-HT20 MCS0	52	5260	14.97	16.50	98.16
		56	5280	14.99	16.50	
		60	5300	15.20	16.50	
		64	5320	15.38	16.50	
	802.11n-HT40 MCS0	54	5270	13.03	15.00	96.32
		62	5310	13.27	15.00	
	802.11ac-VHT20 MCS0	52	5260	14.59	16.50	97.79
		56	5280	14.56	16.50	
		60	5300	14.77	16.50	
		64	5320	15.05	16.50	
802.11ac-VHT40 MCS0	54	5270	13.49	15.00	96.32	
	62	5310	13.75	15.00		
802.11ac-VHT80 MCS0	58	5290	10.16	12.00	93.02	



	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	13.98	14.00	98.28
		116	5580	13.99	14.00	
		124	5620	13.93	14.00	
		132	5660	13.99	14.00	
		144	5720	12.10	14.00	
	802.11n-HT20 MCS0	100	5500	13.83	14.00	98.16
		116	5580	14.00	14.00	
		124	5620	13.72	14.00	
		132	5660	13.79	14.00	
		144	5720	13.69	14.00	
	802.11n-HT40 MCS0	102	5510	12.01	13.50	96.32
		110	5550	12.38	13.50	
		126	5630	12.08	13.50	
		134	5670	11.80	13.50	
		142	5710	11.94	13.50	
	802.11ac-VHT20 MCS0	100	5500	12.55	14.00	97.79
		116	5580	12.54	14.00	
		124	5620	12.26	14.00	
		132	5660	12.35	14.00	
		144	5720	12.46	14.00	
802.11ac-VHT40 MCS0	102	5510	11.86	13.50	96.32	
	110	5550	12.23	13.50		
	126	5630	12.05	13.50		
	134	5670	11.70	13.50		
	142	5710	11.96	13.50		
802.11ac-VHT80 MCS0	106	5530	10.34	12.00	93.02	
	122	5610	10.00	12.00		
	138	5690	10.19	12.00		

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	11.32	13.00	98.28
		157	5785	11.07	13.00	
		165	5825	11.09	13.00	
	802.11n-HT20 MCS0	149	5745	11.16	13.00	98.16
		157	5785	11.00	13.00	
		165	5825	11.01	13.00	
	802.11n-HT40 MCS0	151	5755	12.88	13.00	96.32
		159	5795	11.40	13.00	
	802.11ac-VHT20 MCS0	149	5745	12.13	13.00	97.79
		157	5785	11.78	13.00	
		165	5825	11.94	13.00	
	802.11ac-VHT40 MCS0	151	5755	12.82	13.00	96.32
		159	5795	12.74	13.00	
802.11ac-VHT80 MCS0	155	5775	10.19	12.00	93.02	



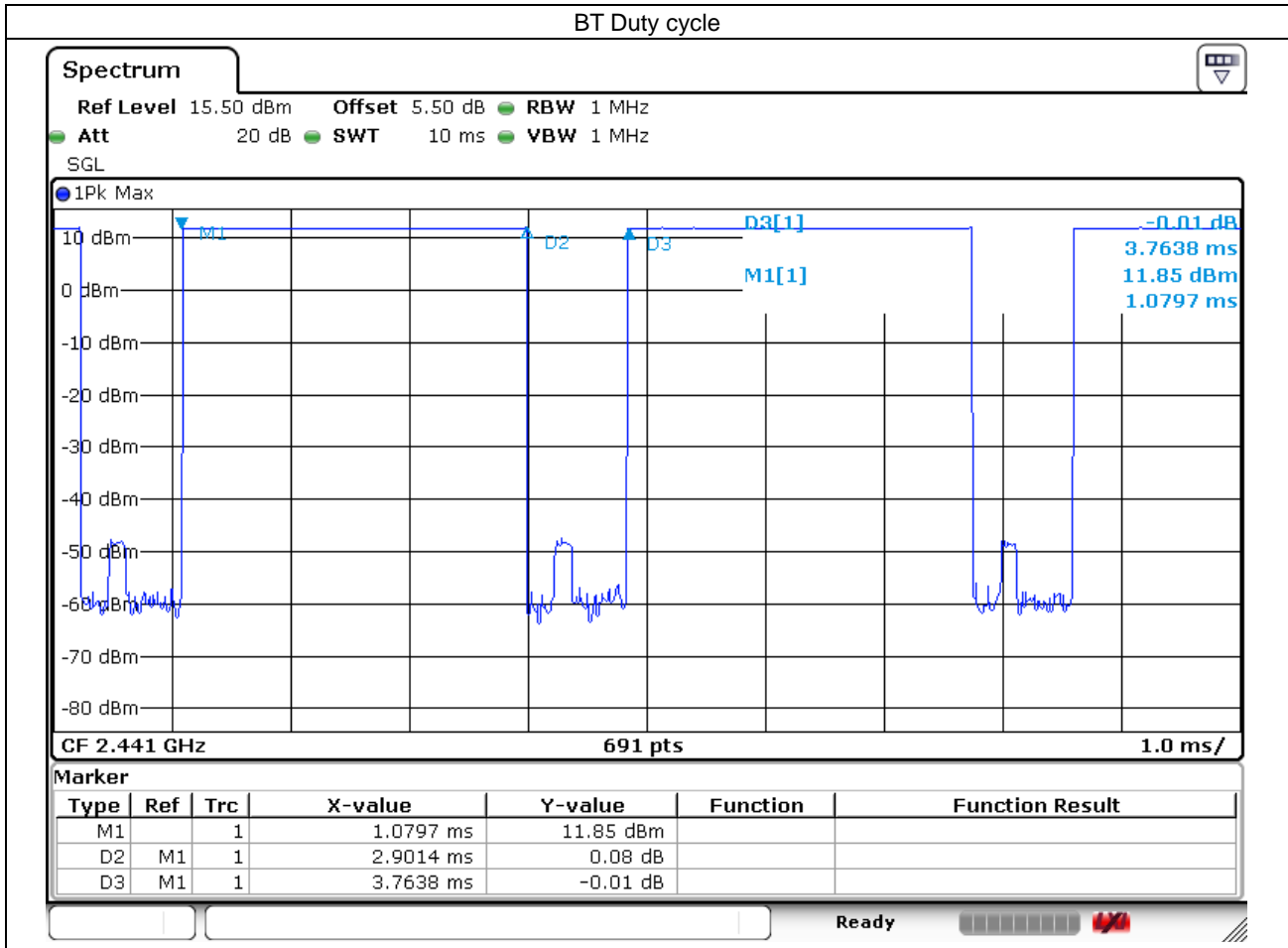
<2.4GHz Bluetooth>

Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
BR / EDR	CH 00	2402	11.07	8.94	8.91
	CH 39	2441	12.01	10.29	10.21
	CH 78	2480	11.30	9.59	9.63
Tune-up Limit			13.00	10.50	10.50

Mode	Channel	Frequency (MHz)	Average power (dBm)
			1Mbps
LE	CH 00	2402	1.53
	CH 19	2440	2.16
	CH 39	2480	1.44
Tune-up Limit			2.50

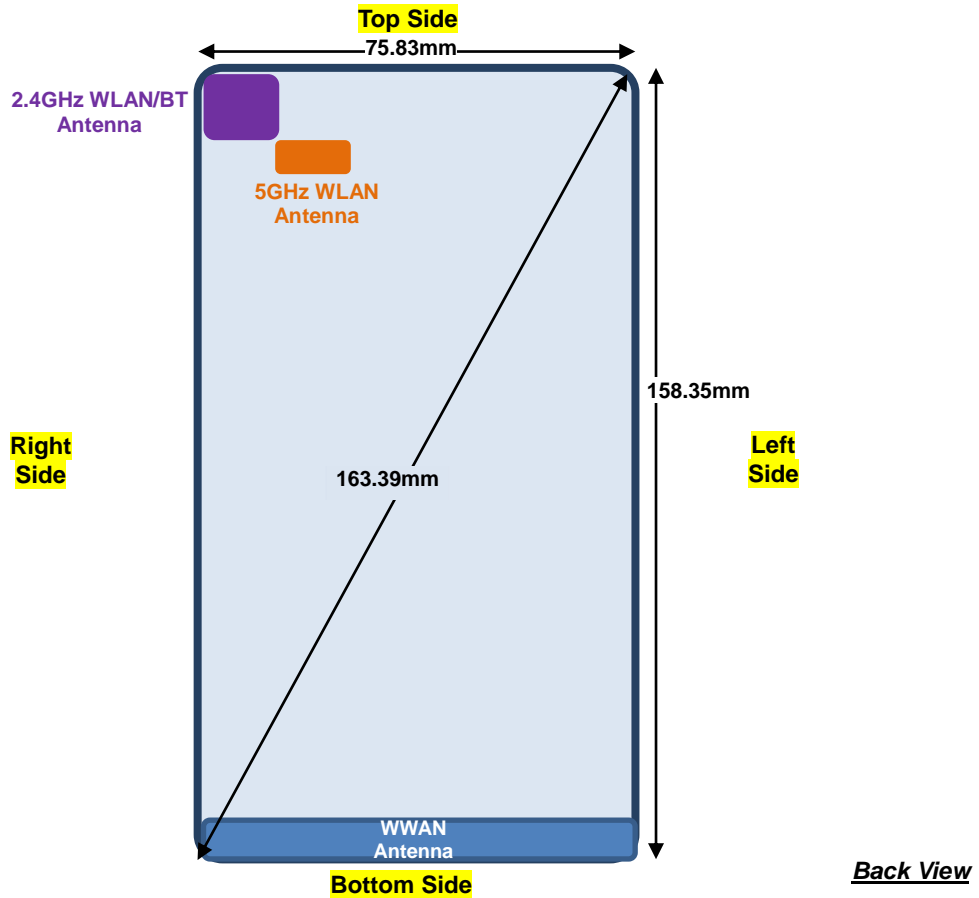
General Note:

- For 2.4GHz Bluetooth SAR testing was selected 1Mbps due to its highest average power and duty cycle is 77.6% considered in SAR testing, and the duty cycle would be scaled to theoretical 83.3% in reported SAR calculation.



### 13. Antenna Location

<Mobile Phone>



Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm	≤ 25mm
2.4GHz WLAN & BT	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	>25mm
5GHz WLAN	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	>25mm

Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN	Yes	Yes	No	Yes	Yes	Yes
2.4GHz WLAN & BT	Yes	Yes	Yes	No	Yes	No
5GHz WLAN	Yes	Yes	Yes	No	Yes	No

**General Note:**

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



## 14. 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 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 WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)\* Duty Cycle scaling factor \* Tune-up scaling factor
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
  - $\leq 0.8$  W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\leq 100$  MHz
  - $\leq 0.6$  W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
  - $\leq 0.4$  W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\geq 200$  MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is  $\geq 0.8$ W/kg.
4. Per KDB648474 D04v01r03, when the reported SAR for a body-worn accessory, measured without a headset connected to the headset, 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 headset attached to the headset.
5. 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 product specific 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, for this device only bottom side SAR for WWAN transmitter scaled to maximum output power is higher than 1.2W/kg of GSM1900, WCDMA B2/B4/B5, LTE B2/B5/B7/B66 and 5.2GHz / 5.8GHz WLAN, therefore product specific SAR is necessary.
6. For 5.3GHz / 5.5GHz WLAN product specific SAR is necessary too, due to an overall diagonal dimension is  $> 16$ cm.
7. For front and back position at hotspot exposure condition was choose higher power level between hotspot power table and body-worn power table for SAR compliance.
8. Reduced power for different RF exposure conditions:
  - a. Body worn: The device employs proximity sensors that detect the presence of the user's body at the front or back faces of the device, when operating in near-body condition by end user, the device will reduced maximum output powers on the WCDMA B2 / B4 / B5 and LTE B2 / B4 / B7 / B66 and detail descriptions of the power reduction mechanism are included in the operational description.
  - b. Hotspot: When the mobile hotspot session is turn on by end user, the device will reduced output powers on the GSM1900, WCDMA B2 / B4 / B5 and LTE B2 / B4 / B7 / B66 and detail descriptions of the power reduction mechanism are included in the operational description.
  - c. Handheld: The device additionally employs proximity sensors that detect the presence of tissue near the currently active transmit antenna, the device will reduced output powers on the WCDMA B2 / B4, LTE B2 / B4 / B7 / B66 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.

### GSM Note:

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

**UMTS Note:**

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

**LTE Note:**

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is  $> \frac{1}{2}$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is  $> \frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B12 / B5 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE band 4 / 17 SAR test was covered by Band 66 / 12; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
  - a. The maximum output power, including tolerance, for the smaller band is  $\leq$  the larger band to qualify for the SAR test exclusion.
  - b. The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

**WLAN 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  $\leq 1.2$  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  $\leq 1.2$  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  $\leq 0.8$  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  $\leq 1.2$  W/kg or all required channels are tested.
5. During SAR testing the WLAN transmission was verified using a spectrum analyzer.



**14.1 Head SAR**

**<GSM SAR>**

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
01	GSM850	GPRS (2 Tx slots)	Right Cheek	0mm	128	824.2	31.02	31.50	1.117	-0.01	0.097	0.108
	GSM850	GPRS (2 Tx slots)	Right Tilted	0mm	128	824.2	31.02	31.50	1.117	0.14	0.048	0.054
	GSM850	GPRS (2 Tx slots)	Left Cheek	0mm	128	824.2	31.02	31.50	1.117	-0.06	0.077	0.086
	GSM850	GPRS (2 Tx slots)	Left Tilted	0mm	128	824.2	31.02	31.50	1.117	0.04	0.048	0.054
	GSM1900	GPRS (2 Tx slots)	Right Cheek	0mm	512	1850.2	28.05	28.50	1.109	0.05	0.069	0.077
	GSM1900	GPRS (2 Tx slots)	Right Tilted	0mm	512	1850.2	28.05	28.50	1.109	0.12	0.038	0.042
02	GSM1900	GPRS (2 Tx slots)	Left Cheek	0mm	512	1850.2	28.05	28.50	1.109	0.05	0.151	0.167
	GSM1900	GPRS (2 Tx slots)	Left Tilted	0mm	512	1850.2	28.05	28.50	1.109	0.01	0.020	0.022

**<WCDMA SAR>**

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Right Cheek	0mm	9262	1852.4	22.78	24.00	1.324	0.04	0.167	0.221
	WCDMA II	RMC 12.2Kbps	Right Tilted	0mm	9262	1852.4	22.78	24.00	1.324	0.06	0.132	0.175
03	WCDMA II	RMC 12.2Kbps	Left Cheek	0mm	9262	1852.4	22.78	24.00	1.324	0.09	0.260	0.344
	WCDMA II	RMC 12.2Kbps	Left Tilted	0mm	9262	1852.4	22.78	24.00	1.324	0	0.085	0.113
	WCDMA IV	RMC 12.2Kbps	Right Cheek	0mm	1413	1732.6	22.95	24.00	1.274	0.01	0.114	0.145
	WCDMA IV	RMC 12.2Kbps	Right Tilted	0mm	1413	1732.6	22.95	24.00	1.274	-0.01	0.071	0.090
04	WCDMA IV	RMC 12.2Kbps	Left Cheek	0mm	1413	1732.6	22.95	24.00	1.274	0.08	0.196	0.250
	WCDMA IV	RMC 12.2Kbps	Left Tilted	0mm	1413	1732.6	22.95	24.00	1.274	0.17	0.067	0.085
05	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	4182	836.4	22.81	24.00	1.315	-0.06	0.238	0.313
	WCDMA V	RMC 12.2Kbps	Right Tilted	0mm	4182	836.4	22.81	24.00	1.315	0	0.118	0.155
	WCDMA V	RMC 12.2Kbps	Left Cheek	0mm	4182	836.4	22.81	24.00	1.315	-0.01	0.192	0.253
	WCDMA V	RMC 12.2Kbps	Left Tilted	0mm	4182	836.4	22.81	24.00	1.315	0.02	0.121	0.159



<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
06	LTE Band 2	20M	QPSK	1	0	Right Cheek	0mm	18900	1880	22.90	24.00	1.288	-0.15	0.155	0.200
	LTE Band 2	20M	QPSK	50	0	Right Cheek	0mm	19100	1900	21.84	23.00	1.306	0.07	0.091	0.119
	LTE Band 2	20M	QPSK	1	0	Right Tilted	0mm	18900	1880	22.90	24.00	1.288	0.04	0.136	0.175
	LTE Band 2	20M	QPSK	50	0	Right Tilted	0mm	19100	1900	21.84	23.00	1.306	0.11	0.100	0.131
	LTE Band 2	20M	QPSK	1	0	Left Cheek	0mm	18900	1880	22.90	24.00	1.288	0.09	0.134	0.173
	LTE Band 2	20M	QPSK	50	0	Left Cheek	0mm	19100	1900	21.84	23.00	1.306	0.15	0.078	0.102
	LTE Band 2	20M	QPSK	1	0	Left Tilted	0mm	18900	1880	22.90	24.00	1.288	0.08	0.074	0.095
	LTE Band 2	20M	QPSK	50	0	Left Tilted	0mm	19100	1900	21.84	23.00	1.306	-0.04	0.049	0.064
07	LTE Band 5	10M	QPSK	1	25	Right Cheek	0mm	20525	836.5	22.87	24.00	1.297	0.02	0.216	0.280
	LTE Band 5	10M	QPSK	25	12	Right Cheek	0mm	20525	836.5	21.73	23.00	1.340	0	0.118	0.158
	LTE Band 5	10M	QPSK	1	25	Right Tilted	0mm	20525	836.5	22.87	24.00	1.297	0.03	0.098	0.127
	LTE Band 5	10M	QPSK	25	12	Right Tilted	0mm	20525	836.5	21.73	23.00	1.340	0.02	0.053	0.071
	LTE Band 5	10M	QPSK	1	25	Left Cheek	0mm	20525	836.5	22.87	24.00	1.297	-0.01	0.173	0.224
	LTE Band 5	10M	QPSK	25	12	Left Cheek	0mm	20525	836.5	21.73	23.00	1.340	0.05	0.092	0.124
	LTE Band 5	10M	QPSK	1	25	Left Tilted	0mm	20525	836.5	22.87	24.00	1.297	0	0.110	0.143
	LTE Band 5	10M	QPSK	25	12	Left Tilted	0mm	20525	836.5	21.73	23.00	1.340	0.04	0.059	0.079
	LTE Band 7	20M	QPSK	1	0	Right Cheek	0mm	21350	2560	23.16	24.00	1.213	0.02	0.350	0.425
	LTE Band 7	20M	QPSK	50	0	Right Cheek	0mm	21350	2560	22.14	23.00	1.219	0.1	0.227	0.277
	LTE Band 7	20M	QPSK	1	0	Right Tilted	0mm	21350	2560	23.16	24.00	1.213	-0.09	0.361	0.438
	LTE Band 7	20M	QPSK	50	0	Right Tilted	0mm	21350	2560	22.14	23.00	1.219	-0.04	0.232	0.283
08	LTE Band 7	20M	QPSK	1	0	Left Cheek	0mm	21350	2560	23.16	24.00	1.213	-0.04	0.446	0.541
	LTE Band 7	20M	QPSK	50	0	Left Cheek	0mm	21350	2560	22.14	23.00	1.219	-0.08	0.281	0.343
	LTE Band 7	20M	QPSK	1	0	Left Tilted	0mm	21350	2560	23.16	24.00	1.213	-0.06	0.179	0.217
	LTE Band 7	20M	QPSK	50	0	Left Tilted	0mm	21350	2560	22.14	23.00	1.219	0.06	0.112	0.137
	LTE Band 12	10M	QPSK	1	25	Right Cheek	0mm	23095	707.5	22.58	24.00	1.387	0.05	0.052	0.072
	LTE Band 12	10M	QPSK	25	25	Right Cheek	0mm	23095	707.5	21.62	23.00	1.374	0.02	0.028	0.038
	LTE Band 12	10M	QPSK	1	25	Right Tilted	0mm	23095	707.5	22.58	24.00	1.387	0.03	0.028	0.039
	LTE Band 12	10M	QPSK	25	25	Right Tilted	0mm	23095	707.5	21.62	23.00	1.374	0.11	0.016	0.022
09	LTE Band 12	10M	QPSK	1	25	Left Cheek	0mm	23095	707.5	22.58	24.00	1.387	0.01	0.057	0.079
	LTE Band 12	10M	QPSK	25	25	Left Cheek	0mm	23095	707.5	21.62	23.00	1.374	0.14	0.031	0.043
	LTE Band 12	10M	QPSK	1	25	Left Tilted	0mm	23095	707.5	22.58	24.00	1.387	-0.12	0.034	0.047
	LTE Band 12	10M	QPSK	25	25	Left Tilted	0mm	23095	707.5	21.62	23.00	1.374	0.04	0.019	0.026
	LTE Band 66	20M	QPSK	1	0	Right Cheek	0mm	132572	1770	22.99	24.00	1.262	0.07	0.093	0.117
	LTE Band 66	20M	QPSK	50	24	Right Cheek	0mm	132572	1770	21.99	23.00	1.262	0.14	0.061	0.077
	LTE Band 66	20M	QPSK	1	0	Right Tilted	0mm	132572	1770	22.99	24.00	1.262	-0.01	0.071	0.090
	LTE Band 66	20M	QPSK	50	24	Right Tilted	0mm	132572	1770	21.99	23.00	1.262	0.15	0.045	0.057
10	LTE Band 66	20M	QPSK	1	0	Left Cheek	0mm	132572	1770	22.99	24.00	1.262	0.03	0.212	0.268
	LTE Band 66	20M	QPSK	50	24	Left Cheek	0mm	132572	1770	21.99	23.00	1.262	0.11	0.132	0.167
	LTE Band 66	20M	QPSK	1	0	Left Tilted	0mm	132572	1770	22.99	24.00	1.262	0.18	0.079	0.100
	LTE Band 66	20M	QPSK	50	24	Left Tilted	0mm	132572	1770	21.99	23.00	1.262	0.18	0.048	0.061



<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	1	2412	17.55	19.00	1.396	100	1.000	-0.05	0.373	0.521
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	1	2412	17.55	19.00	1.396	100	1.000	0.07	0.470	0.656
11	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	1	2412	17.55	19.00	1.396	100	1.000	0.07	0.935	1.306
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	6	2437	17.10	19.00	1.549	100	1.000	-0.03	0.733	1.135
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	11	2462	17.41	19.00	1.442	100	1.000	0	0.711	1.025
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	1	2412	17.55	19.00	1.396	100	1.000	0.09	0.648	0.905
	WLAN5GHz	802.11a 6Mbps	Right Cheek	0mm	64	5320	15.50	17.00	1.413	98.28	1.018	-0.17	0.108	0.155
12	WLAN5GHz	802.11a 6Mbps	Right Tilted	0mm	64	5320	15.50	17.00	1.413	98.28	1.018	-0.11	0.132	0.190
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	64	5320	15.50	17.00	1.413	98.28	1.018	-0.02	0.093	0.134
	WLAN5GHz	802.11a 6Mbps	Left Tilted	0mm	64	5320	15.50	17.00	1.413	98.28	1.018	-0.15	0.115	0.165
	WLAN5GHz	802.11a 6Mbps	Right Tilted	0mm	64	5320	15.50	17.00	1.413	98.28	1.018	-0.09	0.126	0.181
	WLAN5GHz	802.11a 6Mbps	Right Cheek	0mm	100	5500	15.31	16.50	1.317	98.28	1.018	-0.12	0.121	0.162
13	WLAN5GHz	802.11a 6Mbps	Right Tilted	0mm	100	5500	15.31	16.50	1.317	98.28	1.018	-0.12	0.129	0.173
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	100	5500	15.31	16.50	1.317	98.28	1.018	-0.06	0.104	0.139
	WLAN5GHz	802.11a 6Mbps	Left Tilted	0mm	100	5500	15.31	16.50	1.317	98.28	1.018	-0.17	0.128	0.172
	WLAN5GHz	802.11a 6Mbps	Right Tilted	0mm	100	5500	15.31	16.50	1.317	98.28	1.018	-0.14	0.115	0.154
	WLAN5GHz	802.11a 6Mbps	Right Cheek	0mm	165	5825	14.80	16.00	1.320	98.28	1.018	-0.07	0.130	0.175
14	WLAN5GHz	802.11a 6Mbps	Right Tilted	0mm	165	5825	14.80	16.00	1.320	98.28	1.018	0	0.186	0.250
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	165	5825	14.80	16.00	1.320	98.28	1.018	-0.15	0.112	0.150
	WLAN5GHz	802.11a 6Mbps	Left Tilted	0mm	165	5825	14.80	16.00	1.320	98.28	1.018	-0.18	0.139	0.187

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	1Mbps	Right Cheek	0mm	39	2441	12.01	13	1.256	77.6	1.073	0.07	0.060	0.081
	Bluetooth	1Mbps	Right Tilted	0mm	39	2441	12.01	13	1.256	77.6	1.073	-0.12	0.070	0.094
15	Bluetooth	1Mbps	Left Cheek	0mm	39	2441	12.01	13	1.256	77.6	1.073	0.13	0.112	0.151
	Bluetooth	1Mbps	Left Tilted	0mm	39	2441	12.01	13	1.256	77.6	1.073	0.13	0.082	0.111



14.2 Hotspot SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
16	GSM850	GPRS (2 Tx slots)	Front	5mm	128	824.2	31.02	31.50	1.117	-0.04	0.503	0.562
	GSM850	GPRS (2 Tx slots)	Back	5mm	128	824.2	31.02	31.50	1.117	-0.09	0.620	0.692
	GSM850	GPRS (2 Tx slots)	Left Side	5mm	128	824.2	31.02	31.50	1.117	-0.02	0.095	0.106
	GSM850	GPRS (2 Tx slots)	Right Side	5mm	128	824.2	31.02	31.50	1.117	-0.01	0.281	0.314
	GSM850	GPRS (2 Tx slots)	Bottom Side	5mm	128	824.2	31.02	31.50	1.117	-0.08	0.599	0.669
17	GSM1900	GPRS (2 Tx slots)	Front	5mm	512	1850.2	28.05	28.50	1.109	-0.05	0.934	1.036
	GSM1900	GPRS (2 Tx slots)	Front	5mm	661	1880	27.91	28.50	1.146	-0.06	0.783	0.897
	GSM1900	GPRS (2 Tx slots)	Front	5mm	810	1909.8	27.88	28.50	1.153	-0.15	0.814	0.939
	GSM1900	GPRS (2 Tx slots)	Back	5mm	512	1850.2	28.05	28.50	1.109	0.01	1.160	1.287
	GSM1900	GPRS (2 Tx slots)	Back	5mm	661	1880	27.91	28.50	1.146	-0.07	1.110	1.272
	GSM1900	GPRS (2 Tx slots)	Back	5mm	810	1909.8	27.88	28.50	1.153	-0.14	1.050	1.211
	GSM1900	GPRS (2 Tx slots)	Left Side	5mm	512	1850.2	25.49	26.00	1.125	-0.14	0.095	0.107
	GSM1900	GPRS (2 Tx slots)	Right Side	5mm	512	1850.2	25.49	26.00	1.125	-0.11	0.453	0.509
	GSM1900	GPRS (2 Tx slots)	Bottom Side	5mm	512	1850.2	25.49	26.00	1.125	0.04	1.190	1.338
	GSM1900	GPRS (2 Tx slots)	Bottom Side	5mm	661	1880	25.18	26.00	1.208	-0.01	0.942	1.138
	GSM1900	GPRS (2 Tx slots)	Bottom Side	5mm	810	1909.8	25.13	26.00	1.222	-0.03	0.881	1.076

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
18	WCDMA II	RMC 12.2Kbps	Front	5mm	9262	1852.4	20.33	21.00	1.167	0.03	0.869	1.014
	WCDMA II	RMC 12.2Kbps	Front	5mm	9400	1880	20.25	21.00	1.189	0.01	0.845	1.004
	WCDMA II	RMC 12.2Kbps	Front	5mm	9538	1907.6	20.23	21.00	1.194	0.03	0.836	0.998
	WCDMA II	RMC 12.2Kbps	Back	5mm	9262	1852.4	20.33	21.00	1.167	-0.02	1.030	1.202
	WCDMA II	RMC 12.2Kbps	Back	5mm	9400	1880	20.25	21.00	1.189	0.01	1.070	1.272
	WCDMA II	RMC 12.2Kbps	Back	5mm	9538	1907.6	20.23	21.00	1.194	-0.01	1.090	1.301
	WCDMA II	RMC 12.2Kbps	Left Side	5mm	9262	1852.4	17.55	18.00	1.109	-0.06	0.063	0.070
	WCDMA II	RMC 12.2Kbps	Right Side	5mm	9262	1852.4	17.55	18.00	1.109	-0.09	0.425	0.471
	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	9262	1852.4	17.55	18.00	1.109	-0.05	1.190	1.320
	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	9400	1880	17.36	18.00	1.159	-0.04	1.080	1.251
	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	9538	1907.6	17.38	18.00	1.153	-0.07	0.947	1.092
	WCDMA IV	RMC 12.2Kbps	Front	5mm	1413	1732.6	19.31	20.00	1.172	0.04	0.980	1.149
	WCDMA IV	RMC 12.2Kbps	Front	5mm	1312	1712.4	19.30	20.00	1.175	0.03	0.902	1.060
	WCDMA IV	RMC 12.2Kbps	Front	5mm	1513	1752.6	19.29	20.00	1.178	0	0.995	1.172
	WCDMA IV	RMC 12.2Kbps	Back	5mm	1413	1732.6	19.31	20.00	1.172	0.04	1.120	1.313
	WCDMA IV	RMC 12.2Kbps	Back	5mm	1312	1712.4	19.30	20.00	1.175	-0.01	1.010	1.187
	WCDMA IV	RMC 12.2Kbps	Back	5mm	1513	1752.6	19.29	20.00	1.178	-0.03	1.140	1.342
	WCDMA IV	RMC 12.2Kbps	Left Side	5mm	1413	1732.6	17.28	18.00	1.180	0.06	0.039	0.046
WCDMA IV	RMC 12.2Kbps	Right Side	5mm	1413	1732.6	17.28	18.00	1.180	-0.01	0.249	0.294	
WCDMA IV	RMC 12.2Kbps	Bottom Side	5mm	1413	1732.6	17.28	18.00	1.180	-0.04	1.100	1.298	
WCDMA IV	RMC 12.2Kbps	Bottom Side	5mm	1312	1712.4	17.26	18.00	1.186	-0.06	1.030	1.221	
19	WCDMA IV	RMC 12.2Kbps	Bottom Side	5mm	1513	1752.6	17.22	18.00	1.197	-0.02	1.150	1.376



Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA V	RMC 12.2Kbps	Front	5mm	4132	826.4	22.27	23.00	1.183	-0.02	0.813	0.962
	WCDMA V	RMC 12.2Kbps	Front	5mm	4182	836.4	22.15	23.00	1.216	-0.06	0.929	1.130
	WCDMA V	RMC 12.2Kbps	Front	5mm	4233	846.6	22.03	23.00	1.250	0	0.951	1.189
	WCDMA V	RMC 12.2Kbps	Back	5mm	4132	826.4	22.27	23.00	1.183	-0.02	0.893	1.056
	WCDMA V	RMC 12.2Kbps	Back	5mm	4182	836.4	22.15	23.00	1.216	-0.04	1.000	1.216
20	WCDMA V	RMC 12.2Kbps	Back	5mm	4233	846.6	22.03	23.00	1.250	-0.03	1.090	1.363
	WCDMA V	RMC 12.2Kbps	Left Side	5mm	4132	826.4	22.27	23.00	1.183	0.01	0.119	0.141
	WCDMA V	RMC 12.2Kbps	Right Side	5mm	4132	826.4	22.27	23.00	1.183	0	0.385	0.455
	WCDMA V	RMC 12.2Kbps	Bottom Side	5mm	4132	826.4	22.27	23.00	1.183	-0.04	0.687	0.813
	WCDMA V	RMC 12.2Kbps	Bottom Side	5mm	4182	836.4	22.15	23.00	1.216	-0.01	0.779	0.947
	WCDMA V	RMC 12.2Kbps	Bottom Side	5mm	4233	846.6	22.03	23.00	1.250	-0.03	0.844	1.055

**<FDD LTE SAR>**

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	5mm	18700	1860	20.87	21.50	1.156	0.05	0.797	0.921
	LTE Band 2	20M	QPSK	1	0	Front	5mm	18900	1880	20.79	21.50	1.178	-0.02	0.815	0.960
	LTE Band 2	20M	QPSK	1	0	Front	5mm	19100	1900	20.85	21.50	1.161	0	0.823	0.956
	LTE Band 2	20M	QPSK	50	0	Front	5mm	18700	1860	20.77	21.50	1.183	-0.01	0.841	0.995
	LTE Band 2	20M	QPSK	50	0	Front	5mm	18900	1880	20.71	21.50	1.199	0.01	0.823	0.987
	LTE Band 2	20M	QPSK	50	0	Front	5mm	19100	1900	20.75	21.50	1.189	0	0.844	1.003
	LTE Band 2	20M	QPSK	100	0	Front	5mm	18700	1860	20.74	21.50	1.191	0.01	0.861	1.026
	LTE Band 2	20M	QPSK	1	0	Back	5mm	18700	1860	20.87	21.50	1.156	0.11	1.060	1.225
	LTE Band 2	20M	QPSK	1	0	Back	5mm	18900	1880	20.79	21.50	1.178	-0.02	1.090	1.284
	LTE Band 2	20M	QPSK	1	0	Back	5mm	19100	1900	20.85	21.50	1.161	0.01	1.110	1.289
21	LTE Band 2	20M	QPSK	50	0	Back	5mm	18700	1860	20.77	21.50	1.183	-0.04	1.130	1.337
	LTE Band 2	20M	QPSK	50	0	Back	5mm	18900	1880	20.71	21.50	1.199	0	1.080	1.295
	LTE Band 2	20M	QPSK	50	0	Back	5mm	19100	1900	20.75	21.50	1.189	-0.04	1.120	1.331
	LTE Band 2	20M	QPSK	100	0	Back	5mm	18700	1860	20.74	21.50	1.191	0.07	1.090	1.298
	LTE Band 2	20M	QPSK	1	0	Left Side	5mm	18700	1860	18.22	18.50	1.067	-0.01	0.064	0.068
	LTE Band 2	20M	QPSK	50	0	Left Side	5mm	18700	1860	18.16	18.50	1.081	0.08	0.051	0.055
	LTE Band 2	20M	QPSK	1	0	Right Side	5mm	18700	1860	18.22	18.50	1.067	-0.13	0.428	0.457
	LTE Band 2	20M	QPSK	50	0	Right Side	5mm	18700	1860	18.16	18.50	1.081	0.14	0.419	0.453
	LTE Band 2	20M	QPSK	1	0	Bottom Side	5mm	18700	1860	18.22	18.50	1.067	-0.04	1.110	1.184
	LTE Band 2	20M	QPSK	1	0	Bottom Side	5mm	18900	1880	18.17	18.50	1.079	-0.02	1.100	1.187
	LTE Band 2	20M	QPSK	1	0	Bottom Side	5mm	19100	1900	18.16	18.50	1.081	-0.05	1.020	1.103
	LTE Band 2	20M	QPSK	50	0	Bottom Side	5mm	18700	1860	18.16	18.50	1.081	-0.05	1.130	1.222
	LTE Band 2	20M	QPSK	50	0	Bottom Side	5mm	18900	1880	18.12	18.50	1.091	-0.04	1.100	1.201
	LTE Band 2	20M	QPSK	50	0	Bottom Side	5mm	19100	1900	18.13	18.50	1.089	-0.07	1.030	1.122
	LTE Band 2	20M	QPSK	100	0	Bottom Side	5mm	18700	1860	18.15	18.50	1.084	-0.06	1.130	1.225



**FCC SAR TEST REPORT**

**Report No. : FA962518**

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 5	10M	QPSK	1	25	Front	5mm	20525	836.5	22.87	24.00	1.297	0	0.828	1.074
	LTE Band 5	10M	QPSK	25	12	Front	5mm	20525	836.5	21.73	23.00	1.340	-0.02	0.488	0.654
	LTE Band 5	10M	QPSK	50	0	Front	5mm	20525	836.5	21.68	23.00	1.355	-0.02	0.473	0.641
22	LTE Band 5	10M	QPSK	1	25	Back	5mm	20525	836.5	22.87	24.00	1.297	-0.01	1.040	1.349
	LTE Band 5	10M	QPSK	25	12	Back	5mm	20525	836.5	21.73	23.00	1.340	-0.02	0.850	1.139
	LTE Band 5	10M	QPSK	50	0	Back	5mm	20525	836.5	21.68	23.00	1.355	0.07	0.820	1.111
	LTE Band 5	10M	QPSK	1	25	Left Side	5mm	20525	836.5	22.87	24.00	1.297	0.01	0.073	0.095
	LTE Band 5	10M	QPSK	25	12	Left Side	5mm	20525	836.5	21.73	23.00	1.340	0	0.068	0.091
	LTE Band 5	10M	QPSK	1	25	Right Side	5mm	20525	836.5	22.87	24.00	1.297	0	0.234	0.304
	LTE Band 5	10M	QPSK	25	12	Right Side	5mm	20525	836.5	21.73	23.00	1.340	-0.01	0.217	0.291
	LTE Band 5	10M	QPSK	1	25	Bottom Side	5mm	20525	836.5	22.87	24.00	1.297	0	0.870	1.129
	LTE Band 5	10M	QPSK	25	12	Bottom Side	5mm	20525	836.5	21.73	23.00	1.340	0.03	0.488	0.654
	LTE Band 5	10M	QPSK	50	0	Bottom Side	5mm	20525	836.5	21.68	23.00	1.355	0.06	0.468	0.634
	LTE Band 7	20M	QPSK	1	0	Front	5mm	21350	2560	21.17	22.00	1.211	0	0.730	0.884
	LTE Band 7	20M	QPSK	1	0	Front	5mm	20850	2510	21.09	22.00	1.233	0	0.699	0.862
	LTE Band 7	20M	QPSK	1	0	Front	5mm	21100	2535	21.12	22.00	1.225	-0.01	0.720	0.882
	LTE Band 7	20M	QPSK	50	0	Front	5mm	21350	2560	21.13	22.00	1.222	0.01	0.714	0.872
	LTE Band 7	20M	QPSK	50	0	Front	5mm	20850	2510	21.10	22.00	1.230	0.14	0.701	0.862
	LTE Band 7	20M	QPSK	50	0	Front	5mm	21100	2535	21.05	22.00	1.245	-0.05	0.708	0.881
	LTE Band 7	20M	QPSK	100	0	Front	5mm	21350	2560	21.09	22.00	1.233	-0.01	0.714	0.880
23	LTE Band 7	20M	QPSK	1	0	Back	5mm	21350	2560	21.17	22.00	1.211	-0.06	1.100	1.332
	LTE Band 7	20M	QPSK	1	0	Back	5mm	20850	2510	21.09	22.00	1.233	-0.07	0.887	1.094
	LTE Band 7	20M	QPSK	1	0	Back	5mm	21100	2535	21.12	22.00	1.225	-0.02	1.000	1.225
	LTE Band 7	20M	QPSK	50	0	Back	5mm	21350	2560	21.13	22.00	1.222	-0.02	1.080	1.320
	LTE Band 7	20M	QPSK	50	0	Back	5mm	20850	2510	21.10	22.00	1.230	0.01	0.857	1.054
	LTE Band 7	20M	QPSK	50	0	Back	5mm	21100	2535	21.05	22.00	1.245	-0.04	0.962	1.197
	LTE Band 7	20M	QPSK	100	0	Back	5mm	21350	2560	21.09	22.00	1.233	-0.04	0.983	1.212
	LTE Band 7	20M	QPSK	1	0	Left Side	5mm	21350	2560	21.17	22.00	1.211	-0.02	0.736	0.891
	LTE Band 7	20M	QPSK	1	0	Left Side	5mm	20850	2510	21.09	22.00	1.233	-0.02	0.659	0.813
	LTE Band 7	20M	QPSK	1	0	Left Side	5mm	21100	2535	21.12	22.00	1.225	-0.04	0.715	0.876
	LTE Band 7	20M	QPSK	50	0	Left Side	5mm	21350	2560	21.13	22.00	1.222	0.02	0.784	0.958
	LTE Band 7	20M	QPSK	50	0	Left Side	5mm	20850	2510	21.10	22.00	1.230	0.03	0.692	0.851
	LTE Band 7	20M	QPSK	50	0	Left Side	5mm	21100	2535	21.05	22.00	1.245	0.02	0.743	0.925
	LTE Band 7	20M	QPSK	100	0	Left Side	5mm	21350	2560	21.09	22.00	1.233	-0.05	0.779	0.961
	LTE Band 7	20M	QPSK	1	0	Right Side	5mm	21350	2560	21.17	22.00	1.211	0.09	0.069	0.084
	LTE Band 7	20M	QPSK	50	0	Right Side	5mm	21350	2560	21.13	22.00	1.222	0.11	0.068	0.083
	LTE Band 7	20M	QPSK	1	0	Bottom Side	5mm	21350	2560	21.17	22.00	1.211	-0.04	0.858	1.039
	LTE Band 7	20M	QPSK	1	0	Bottom Side	5mm	20850	2510	21.09	22.00	1.233	-0.01	0.577	0.712
	LTE Band 7	20M	QPSK	1	0	Bottom Side	5mm	21100	2535	21.12	22.00	1.225	-0.02	0.690	0.845
	LTE Band 7	20M	QPSK	50	0	Bottom Side	5mm	21350	2560	21.13	22.00	1.222	-0.05	0.863	1.054
	LTE Band 7	20M	QPSK	50	0	Bottom Side	5mm	20850	2510	21.10	22.00	1.230	0.03	0.617	0.759
	LTE Band 7	20M	QPSK	50	0	Bottom Side	5mm	21100	2535	21.05	22.00	1.245	-0.03	0.721	0.897
	LTE Band 7	20M	QPSK	100	0	Bottom Side	5mm	21350	2560	21.09	22.00	1.233	-0.04	0.870	1.073
	LTE Band 12	10M	QPSK	1	25	Front	5mm	23095	707.5	22.58	24.00	1.387	0	0.548	0.760
	LTE Band 12	10M	QPSK	25	25	Front	5mm	23095	707.5	21.62	23.00	1.374	0	0.305	0.419
24	LTE Band 12	10M	QPSK	1	25	Back	5mm	23095	707.5	22.58	24.00	1.387	-0.05	0.644	0.893
	LTE Band 12	10M	QPSK	25	25	Back	5mm	23095	707.5	21.62	23.00	1.374	-0.04	0.360	0.495
	LTE Band 12	10M	QPSK	50	0	Back	5mm	23095	707.5	21.59	23.00	1.384	-0.01	0.351	0.486
	LTE Band 12	10M	QPSK	1	25	Left Side	5mm	23095	707.5	22.58	24.00	1.387	-0.01	0.170	0.236
	LTE Band 12	10M	QPSK	25	25	Left Side	5mm	23095	707.5	21.62	23.00	1.374	0.01	0.096	0.132
	LTE Band 12	10M	QPSK	1	25	Right Side	5mm	23095	707.5	22.58	24.00	1.387	0.02	0.332	0.460
	LTE Band 12	10M	QPSK	25	25	Right Side	5mm	23095	707.5	21.62	23.00	1.374	0.01	0.186	0.256
	LTE Band 12	10M	QPSK	1	25	Bottom Side	5mm	23095	707.5	22.58	24.00	1.387	0.11	0.501	0.695
	LTE Band 12	10M	QPSK	25	25	Bottom Side	5mm	23095	707.5	21.62	23.00	1.374	0.03	0.279	0.383



Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 66	20M	QPSK	1	0	Front	5mm	132322	1745	19.65	20.50	1.216	0.02	0.867	1.054
	LTE Band 66	20M	QPSK	1	0	Front	5mm	132072	1720	19.58	20.50	1.236	0.01	0.811	1.002
	LTE Band 66	20M	QPSK	1	0	Front	5mm	132572	1770	19.58	20.50	1.236	0.03	0.840	1.038
	LTE Band 66	20M	QPSK	50	0	Front	5mm	132322	1745	19.58	20.50	1.236	-0.02	0.848	1.048
	LTE Band 66	20M	QPSK	50	0	Front	5mm	132072	1720	19.52	20.50	1.253	0.03	0.819	1.026
	LTE Band 66	20M	QPSK	50	0	Front	5mm	132572	1770	19.46	20.50	1.271	0	0.828	1.052
	LTE Band 66	20M	QPSK	100	0	Front	5mm	132322	1745	19.46	20.50	1.271	0	0.822	1.044
25	LTE Band 66	20M	QPSK	1	0	Back	5mm	132322	1745	19.65	20.50	1.216	0.11	1.080	1.313
	LTE Band 66	20M	QPSK	1	0	Back	5mm	132072	1720	19.58	20.50	1.236	0.1	0.974	1.204
	LTE Band 66	20M	QPSK	1	0	Back	5mm	132572	1770	19.58	20.50	1.236	0.01	0.999	1.235
	LTE Band 66	20M	QPSK	50	0	Back	5mm	132322	1745	19.58	20.50	1.236	-0.04	1.020	1.261
	LTE Band 66	20M	QPSK	50	0	Back	5mm	132072	1720	19.52	20.50	1.253	-0.03	0.927	1.162
	LTE Band 66	20M	QPSK	50	0	Back	5mm	132572	1770	19.46	20.50	1.271	-0.05	1.000	1.271
	LTE Band 66	20M	QPSK	100	0	Back	5mm	132322	1745	19.46	20.50	1.271	0.01	1.030	1.309
	LTE Band 66	20M	QPSK	1	0	Left Side	5mm	132322	1745	18.18	18.50	1.076	-0.12	0.060	0.065
	LTE Band 66	20M	QPSK	50	0	Left Side	5mm	132322	1745	18.00	18.50	1.122	0.06	0.043	0.048
	LTE Band 66	20M	QPSK	1	0	Right Side	5mm	132322	1745	18.18	18.50	1.076	-0.09	0.281	0.302
	LTE Band 66	20M	QPSK	50	0	Right Side	5mm	132322	1745	18.00	18.50	1.122	-0.08	0.264	0.296
	LTE Band 66	20M	QPSK	1	0	Bottom Side	5mm	132322	1745	18.18	18.50	1.076	0.14	0.947	1.019
	LTE Band 66	20M	QPSK	1	0	Bottom Side	5mm	132072	1720	18.16	18.50	1.081	0.04	1.180	1.276
	LTE Band 66	20M	QPSK	1	0	Bottom Side	5mm	132572	1770	18.15	18.50	1.084	0.05	1.040	1.127
	LTE Band 66	20M	QPSK	50	0	Bottom Side	5mm	132322	1745	18.00	18.50	1.122	-0.11	0.950	1.066
	LTE Band 66	20M	QPSK	50	0	Bottom Side	5mm	132072	1720	17.96	18.50	1.132	-0.16	0.980	1.110
	LTE Band 66	20M	QPSK	50	0	Bottom Side	5mm	132572	1770	17.92	18.50	1.143	0.04	1.020	1.166
	LTE Band 66	20M	QPSK	100	0	Bottom Side	5mm	132322	1745	17.95	18.50	1.135	-0.1	0.929	1.054

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	1	2412	17.55	19.00	1.396	100	1.000	-0.06	0.409	0.571
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	1	2412	17.55	19.00	1.396	100	1.000	0.07	0.731	1.021
26	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	6	2437	17.10	19.00	1.549	100	1.000	-0.01	0.720	1.115
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	11	2462	17.41	19.00	1.442	100	1.000	0	0.689	0.994
	WLAN2.4GHz	802.11b 1Mbps	Right Side	5mm	1	2412	17.55	19.00	1.396	100	1.000	-0.03	0.310	0.433
	WLAN2.4GHz	802.11b 1Mbps	Top Side	5mm	1	2412	17.55	19.00	1.396	100	1.000	-0.04	0.530	0.740
	WLAN5GHz	802.11a 6Mbps	Front	5mm	44	5220	14.89	15.00	1.027	98.28	1.018	-0.11	0.047	0.049
	WLAN5GHz	802.11a 6Mbps	Back	5mm	44	5220	14.89	15.00	1.027	98.28	1.018	-0.1	1.050	1.097
	WLAN5GHz	802.11a 6Mbps	Back	5mm	36	5180	14.80	15.00	1.048	98.28	1.018	0.13	1.170	1.249
27	WLAN5GHz	802.11a 6Mbps	Back	5mm	40	5200	13.30	15.00	1.479	98.28	1.018	0.02	0.908	1.367
	WLAN5GHz	802.11a 6Mbps	Back	5mm	48	5240	14.86	15.00	1.034	98.28	1.018	-0.05	1.090	1.147
	WLAN5GHz	802.11a 6Mbps	Right Side	5mm	44	5220	14.89	15.00	1.027	98.28	1.018	0.14	0.082	0.086
	WLAN5GHz	802.11a 6Mbps	Top Side	5mm	44	5220	14.89	15.00	1.027	98.28	1.018	-0.12	0.236	0.247
	WLAN5GHz	802.11n-HT40 MCS0	Front	5mm	151	5755	12.88	13.00	1.027	96.32	1.038	-0.13	0.028	0.030
	WLAN5GHz	802.11n-HT40 MCS0	Back	5mm	151	5755	12.88	13.00	1.027	96.32	1.038	-0.05	1.130	1.205
28	WLAN5GHz	802.11n-HT40 MCS0	Back	5mm	159	5795	11.40	13.00	1.445	96.32	1.038	0.15	0.868	1.302
	WLAN5GHz	802.11a 6Mbps	Back	5mm	149	5745	11.32	13.00	1.474	98.28	1.018	0	0.780	1.170
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	5mm	151	5755	12.88	13.00	1.027	96.32	1.038	0.08	0.078	0.083
	WLAN5GHz	802.11n-HT40 MCS0	Top Side	5mm	151	5755	12.88	13.00	1.027	96.32	1.038	-0.06	0.160	0.171



**<Bluetooth SAR>**

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	1Mbps	Front	5mm	39	2441	12.01	13.00	1.256	77.6	1.073	0.14	0.074	0.100
29	Bluetooth	1Mbps	Back	5mm	39	2441	12.01	13.00	1.256	77.6	1.073	-0.02	0.112	0.151
	Bluetooth	1Mbps	Right Side	5mm	39	2441	12.01	13.00	1.256	77.6	1.073	-0.05	0.043	0.058
	Bluetooth	1Mbps	Top Side	5mm	39	2441	12.01	13.00	1.256	77.6	1.073	0.13	0.061	0.082

**14.3 Body Worn Accessory SAR**

**<GSM SAR>**

Plot No.	Band	Mode	Test Position	Gap (mm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS (2 Tx slots)	Front	5mm	-	128	824.2	31.02	31.50	1.117	-0.04	0.503	0.562
30	GSM850	GPRS (2 Tx slots)	Back	5mm	-	128	824.2	31.02	31.50	1.117	-0.09	0.620	0.692
	GSM1900	GPRS (2 Tx slots)	Front	5mm	-	512	1850.2	28.05	28.50	1.109	-0.05	0.934	1.036
	GSM1900	GPRS (2 Tx slots)	Front	5mm	-	661	1880	27.91	28.50	1.146	-0.06	0.783	0.897
	GSM1900	GPRS (2 Tx slots)	Front	5mm	-	810	1909.8	27.88	28.50	1.153	-0.15	0.814	0.939
31	GSM1900	GPRS (2 Tx slots)	Back	5mm	-	512	1850.2	28.05	28.50	1.109	0.01	1.160	1.287
	GSM1900	GPRS (2 Tx slots)	Back	5mm	-	661	1880	27.91	28.50	1.146	-0.07	1.110	1.272
	GSM1900	GPRS (2 Tx slots)	Back	5mm	-	810	1909.8	27.88	28.50	1.153	-0.14	1.050	1.211
	GSM1900	GPRS (2 Tx slots)	Back	5mm	Headset 1	512	1850.2	28.05	28.50	1.109	0.01	1.110	1.231
	GSM1900	GPRS (2 Tx slots)	Back	5mm	Headset 2	512	1850.2	28.05	28.50	1.109	0.01	1.050	1.165
	GSM1900	GPRS (2 Tx slots)	Back	5mm	Headset 3	512	1850.2	28.05	28.50	1.109	0.01	1.030	1.142

**<WCDMA SAR>**

Plot No.	Band	Mode	Test Position	Gap (mm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	5mm	-	9262	1852.4	20.33	21.00	1.167	0.03	0.869	1.014
	WCDMA II	RMC 12.2Kbps	Front	5mm	-	9400	1880	20.25	21.00	1.189	0.01	0.845	1.004
	WCDMA II	RMC 12.2Kbps	Front	5mm	-	9538	1907.6	20.23	21.00	1.194	0.03	0.836	0.998
	WCDMA II	RMC 12.2Kbps	Back	5mm	-	9262	1852.4	20.33	21.00	1.167	-0.02	1.030	1.202
	WCDMA II	RMC 12.2Kbps	Back	5mm	-	9400	1880	20.25	21.00	1.189	0.01	1.070	1.272
32	WCDMA II	RMC 12.2Kbps	Back	5mm	-	9538	1907.6	20.23	21.00	1.194	-0.01	1.090	1.301
	WCDMA II	RMC 12.2Kbps	Back	5mm	Headset 1	9538	1907.6	20.23	21.00	1.194	-0.02	1.010	1.206
	WCDMA II	RMC 12.2Kbps	Back	5mm	Headset 2	9538	1907.6	20.23	21.00	1.194	0.18	0.998	1.192
	WCDMA II	RMC 12.2Kbps	Back	5mm	Headset 3	9538	1907.6	20.23	21.00	1.194	-0.07	0.995	1.188
	WCDMA IV	RMC 12.2Kbps	Front	5mm	-	1413	1732.6	19.31	20.00	1.172	0.04	0.980	1.149
	WCDMA IV	RMC 12.2Kbps	Front	5mm	-	1312	1712.4	19.30	20.00	1.175	0.03	0.902	1.060
	WCDMA IV	RMC 12.2Kbps	Front	5mm	-	1513	1752.6	19.29	20.00	1.178	0	0.995	1.172
	WCDMA IV	RMC 12.2Kbps	Back	5mm	-	1413	1732.6	19.31	20.00	1.172	0.04	1.120	1.313
	WCDMA IV	RMC 12.2Kbps	Back	5mm	-	1312	1712.4	19.30	20.00	1.175	-0.01	1.010	1.187
33	WCDMA IV	RMC 12.2Kbps	Back	5mm	-	1513	1752.6	19.29	20.00	1.178	-0.03	1.140	1.342
	WCDMA IV	RMC 12.2Kbps	Back	5mm	Headset 1	1513	1752.6	19.29	20.00	1.178	0.05	1.090	1.284
	WCDMA IV	RMC 12.2Kbps	Back	5mm	Headset 2	1513	1752.6	19.29	20.00	1.178	0.14	1.060	1.248
	WCDMA IV	RMC 12.2Kbps	Back	5mm	Headset 3	1513	1752.6	19.29	20.00	1.178	0.11	1.020	1.201



Plot No.	Band	Mode	Test Position	Gap (mm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA V	RMC 12.2Kbps	Front	5mm	-	4132	826.4	22.27	23.00	1.183	-0.02	0.813	0.962
	WCDMA V	RMC 12.2Kbps	Front	5mm	-	4182	836.4	22.15	23.00	1.216	-0.06	0.929	1.130
	WCDMA V	RMC 12.2Kbps	Front	5mm	-	4233	846.6	22.03	23.00	1.250	0	0.951	1.189
	WCDMA V	RMC 12.2Kbps	Back	5mm	-	4132	826.4	22.27	23.00	1.183	-0.02	0.893	1.056
	WCDMA V	RMC 12.2Kbps	Back	5mm	-	4182	836.4	22.15	23.00	1.216	-0.04	1.000	1.216
34	WCDMA V	RMC 12.2Kbps	Back	5mm	-	4233	846.6	22.03	23.00	1.250	-0.03	1.090	1.363
	WCDMA V	RMC 12.2Kbps	Back	5mm	Headset 1	4233	846.6	22.03	23.00	1.250	-0.05	1.010	1.263
	WCDMA V	RMC 12.2Kbps	Back	5mm	Headset 2	4233	846.6	22.03	23.00	1.250	-0.04	1.010	1.263
	WCDMA V	RMC 12.2Kbps	Back	5mm	Headset 3	4233	846.6	22.03	23.00	1.250	-0.02	0.993	1.242

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	5mm	-	18700	1860	20.87	21.50	1.156	0.05	0.797	0.921
	LTE Band 2	20M	QPSK	1	0	Front	5mm	-	18900	1880	20.79	21.50	1.178	-0.02	0.815	0.960
	LTE Band 2	20M	QPSK	1	0	Front	5mm	-	19100	1900	20.85	21.50	1.161	0	0.823	0.956
	LTE Band 2	20M	QPSK	50	0	Front	5mm	-	18700	1860	20.77	21.50	1.183	-0.01	0.841	0.995
	LTE Band 2	20M	QPSK	50	0	Front	5mm	-	18900	1880	20.71	21.50	1.199	0.01	0.823	0.987
	LTE Band 2	20M	QPSK	50	0	Front	5mm	-	19100	1900	20.75	21.50	1.189	0	0.844	1.003
	LTE Band 2	20M	QPSK	100	0	Front	5mm	-	18700	1860	20.74	21.50	1.191	0.01	0.861	1.026
	LTE Band 2	20M	QPSK	1	0	Back	5mm	-	18700	1860	20.87	21.50	1.156	0.11	1.060	1.225
	LTE Band 2	20M	QPSK	1	0	Back	5mm	-	18900	1880	20.79	21.50	1.178	-0.02	1.090	1.284
	LTE Band 2	20M	QPSK	1	0	Back	5mm	-	19100	1900	20.85	21.50	1.161	0.01	1.110	1.289
35	LTE Band 2	20M	QPSK	50	0	Back	5mm	-	18700	1860	20.77	21.50	1.183	-0.04	1.130	1.337
	LTE Band 2	20M	QPSK	50	0	Back	5mm	-	18900	1880	20.71	21.50	1.199	0	1.080	1.295
	LTE Band 2	20M	QPSK	50	0	Back	5mm	-	19100	1900	20.75	21.50	1.189	-0.04	1.120	1.331
	LTE Band 2	20M	QPSK	100	0	Back	5mm	-	18700	1860	20.74	21.50	1.191	0.07	1.090	1.298
	LTE Band 2	20M	QPSK	50	0	Back	5mm	Headset 1	18700	1860	20.77	21.50	1.183	0.01	1.010	1.195
	LTE Band 2	20M	QPSK	50	0	Back	5mm	Headset 2	18700	1860	20.77	21.50	1.183	0.17	0.988	1.169
	LTE Band 2	20M	QPSK	50	0	Back	5mm	Headset 3	18700	1860	20.77	21.50	1.183	-0.06	1.000	1.183
	LTE Band 5	10M	QPSK	1	25	Front	5mm	-	20525	836.5	22.87	24.00	1.297	0	0.828	1.074
	LTE Band 5	10M	QPSK	25	12	Front	5mm	-	20525	836.5	21.73	23.00	1.340	-0.02	0.488	0.654
	LTE Band 5	10M	QPSK	50	0	Front	5mm	-	20525	836.5	21.68	23.00	1.355	-0.02	0.473	0.641
36	LTE Band 5	10M	QPSK	1	25	Back	5mm	-	20525	836.5	22.87	24.00	1.297	-0.01	1.040	1.349
	LTE Band 5	10M	QPSK	25	12	Back	5mm	-	20525	836.5	21.73	23.00	1.340	-0.02	0.850	1.139
	LTE Band 5	10M	QPSK	50	0	Back	5mm	-	20525	836.5	21.68	23.00	1.355	0.07	0.820	1.111
	LTE Band 5	10M	QPSK	1	25	Back	5mm	Headset 1	20525	836.5	22.87	24.00	1.297	-0.05	1.030	1.336
	LTE Band 5	10M	QPSK	1	25	Back	5mm	Headset 2	20525	836.5	22.87	24.00	1.297	-0.12	1.030	1.336
	LTE Band 5	10M	QPSK	1	25	Back	5mm	Headset 3	20525	836.5	22.87	24.00	1.297	-0.04	1.010	1.310



Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 7	20M	QPSK	1	0	Front	5mm	-	21350	2560	21.17	22.00	1.211	0	0.730	0.884
	LTE Band 7	20M	QPSK	1	0	Front	5mm	-	20850	2510	21.09	22.00	1.233	0	0.699	0.862
	LTE Band 7	20M	QPSK	1	0	Front	5mm	-	21100	2535	21.12	22.00	1.225	-0.01	0.720	0.882
	LTE Band 7	20M	QPSK	50	0	Front	5mm	-	21350	2560	21.13	22.00	1.222	0.01	0.714	0.872
	LTE Band 7	20M	QPSK	50	0	Front	5mm	-	20850	2510	21.10	22.00	1.230	0.14	0.701	0.862
	LTE Band 7	20M	QPSK	50	0	Front	5mm	-	21100	2535	21.05	22.00	1.245	-0.05	0.708	0.881
	LTE Band 7	20M	QPSK	100	0	Front	5mm	-	21350	2560	21.09	22.00	1.233	-0.01	0.714	0.880
37	LTE Band 7	20M	QPSK	1	0	Back	5mm	-	21350	2560	21.17	22.00	1.211	-0.06	1.100	1.332
	LTE Band 7	20M	QPSK	1	0	Back	5mm	-	20850	2510	21.09	22.00	1.233	-0.07	0.887	1.094
	LTE Band 7	20M	QPSK	1	0	Back	5mm	-	21100	2535	21.12	22.00	1.225	-0.02	1.000	1.225
	LTE Band 7	20M	QPSK	50	0	Back	5mm	-	21350	2560	21.13	22.00	1.222	-0.02	1.080	1.320
	LTE Band 7	20M	QPSK	50	0	Back	5mm	-	20850	2510	21.10	22.00	1.230	0.01	0.857	1.054
	LTE Band 7	20M	QPSK	50	0	Back	5mm	-	21100	2535	21.05	22.00	1.245	-0.04	0.962	1.197
	LTE Band 7	20M	QPSK	100	0	Back	5mm	-	21350	2560	21.09	22.00	1.233	-0.04	0.983	1.212
	LTE Band 7	20M	QPSK	1	0	Back	5mm	Headset 1	21350	2560	21.17	22.00	1.211	0.03	1.060	1.283
	LTE Band 7	20M	QPSK	1	0	Back	5mm	Headset 2	21350	2560	21.17	22.00	1.211	-0.05	1.050	1.271
	LTE Band 7	20M	QPSK	1	0	Back	5mm	Headset 3	21350	2560	21.17	22.00	1.211	-0.14	1.020	1.235
	LTE Band 12	10M	QPSK	1	25	Front	5mm	-	23095	707.5	22.58	24.00	1.387	0	0.548	0.760
	LTE Band 12	10M	QPSK	25	25	Front	5mm	-	23095	707.5	21.62	23.00	1.374	0	0.305	0.419
38	LTE Band 12	10M	QPSK	1	25	Back	5mm	-	23095	707.5	22.58	24.00	1.387	-0.05	0.644	0.893
	LTE Band 12	10M	QPSK	25	25	Back	5mm	-	23095	707.5	21.62	23.00	1.374	-0.04	0.360	0.495
	LTE Band 12	10M	QPSK	50	0	Back	5mm	-	23095	707.5	21.59	23.00	1.384	-0.01	0.351	0.486
	LTE Band 66	20M	QPSK	1	0	Front	5mm	-	132322	1745	19.65	20.50	1.216	0.02	0.867	1.054
	LTE Band 66	20M	QPSK	1	0	Front	5mm	-	132072	1720	19.58	20.50	1.236	0.01	0.811	1.002
	LTE Band 66	20M	QPSK	1	0	Front	5mm	-	132572	1770	19.58	20.50	1.236	0.03	0.840	1.038
	LTE Band 66	20M	QPSK	50	0	Front	5mm	-	132322	1745	19.58	20.50	1.236	-0.02	0.848	1.048
	LTE Band 66	20M	QPSK	50	0	Front	5mm	-	132072	1720	19.52	20.50	1.253	0.03	0.819	1.026
	LTE Band 66	20M	QPSK	50	0	Front	5mm	-	132572	1770	19.46	20.50	1.271	0	0.828	1.052
	LTE Band 66	20M	QPSK	100	0	Front	5mm	-	132322	1745	19.46	20.50	1.271	0	0.822	1.044
39	LTE Band 66	20M	QPSK	1	0	Back	5mm	-	132322	1745	19.65	20.50	1.216	0.11	1.080	1.313
	LTE Band 66	20M	QPSK	1	0	Back	5mm	-	132072	1720	19.58	20.50	1.236	0.1	0.974	1.204
	LTE Band 66	20M	QPSK	1	0	Back	5mm	-	132572	1770	19.58	20.50	1.236	0.01	0.999	1.235
	LTE Band 66	20M	QPSK	50	0	Back	5mm	-	132322	1745	19.58	20.50	1.236	-0.04	1.020	1.261
	LTE Band 66	20M	QPSK	50	0	Back	5mm	-	132072	1720	19.52	20.50	1.253	-0.03	0.927	1.162
	LTE Band 66	20M	QPSK	50	0	Back	5mm	-	132572	1770	19.46	20.50	1.271	-0.05	1.000	1.271
	LTE Band 66	20M	QPSK	100	0	Back	5mm	-	132322	1745	19.46	20.50	1.271	0.01	1.030	1.309
	LTE Band 66	20M	QPSK	1	0	Back	5mm	Headset 1	132322	1745	19.46	20.50	1.271	-0.02	1.030	1.309
	LTE Band 66	20M	QPSK	1	0	Back	5mm	Headset 2	132322	1745	19.46	20.50	1.271	0.08	1.020	1.296
	LTE Band 66	20M	QPSK	1	0	Back	5mm	Headset 3	132322	1745	19.46	20.50	1.271	0.06	0.984	1.250



<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	-	1	2412	17.55	19.00	1.396	100	1.000	-0.06	0.409	0.571
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	-	1	2412	17.55	19.00	1.396	100	1.000	0.07	0.731	1.021
40	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	-	6	2437	17.10	19.00	1.549	100	1.000	-0.01	0.720	1.115
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	-	11	2462	17.41	19.00	1.442	100	1.000	0	0.689	0.994
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Headset1	11	2462	17.41	19.00	1.442	100	1.000	0.01	0.465	0.671
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Headset2	11	2462	17.41	19.00	1.442	100	1.000	-0.01	0.488	0.704
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Headset3	11	2462	17.41	19.00	1.442	100	1.000	0.02	0.435	0.627
	WLAN5GHz	802.11a 6Mbps	Front	5mm	-	64	5320	15.50	17.00	1.413	98.28	1.018	-0.03	0.038	0.055
	WLAN5GHz	802.11a 6Mbps	Back	5mm	-	64	5320	15.50	17.00	1.413	98.28	1.018	-0.01	0.858	1.234
	WLAN5GHz	802.11a 6Mbps	Back	5mm	-	52	5260	15.12	17.00	1.543	98.28	1.018	-0.05	0.830	1.304
41	WLAN5GHz	802.11a 6Mbps	Back	5mm	-	56	5280	15.17	17.00	1.526	98.28	1.018	-0.03	0.888	1.379
	WLAN5GHz	802.11a 6Mbps	Back	5mm	-	60	5300	15.23	17.00	1.505	98.28	1.018	-0.07	0.869	1.331
	WLAN5GHz	802.11a 6Mbps	Back	5mm	Headset1	56	5280	15.17	17.00	1.526	98.28	1.018	-0.06	0.826	1.283
	WLAN5GHz	802.11a 6Mbps	Back	5mm	Headset2	56	5280	15.17	17.00	1.526	98.28	1.018	-0.16	0.583	0.905
	WLAN5GHz	802.11a 6Mbps	Back	5mm	Headset3	56	5280	15.17	17.00	1.526	98.28	1.018	-0.16	0.528	0.820
	WLAN5GHz	802.11a 6Mbps	Front	5mm	-	116	5580	13.99	14.00	1.002	98.28	1.018	-0.16	0.034	0.035
	WLAN5GHz	802.11a 6Mbps	Back	5mm	-	116	5580	13.99	14.00	1.002	98.28	1.018	0.13	1.130	1.153
	WLAN5GHz	802.11a 6Mbps	Back	5mm	-	100	5500	13.98	14.00	1.005	98.28	1.018	-0.04	0.907	0.928
	WLAN5GHz	802.11a 6Mbps	Back	5mm	-	124	5620	13.93	14.00	1.017	98.28	1.018	-0.01	1.250	1.295
	WLAN5GHz	802.11a 6Mbps	Back	5mm	-	132	5660	13.99	14.00	1.003	98.28	1.018	-0.1	1.270	1.297
42	WLAN5GHz	802.11a 6Mbps	Back	5mm	-	144	5720	12.10	14.00	1.549	98.28	1.018	0.17	0.853	1.345
	WLAN5GHz	802.11a 6Mbps	Back	5mm	Headset 1	144	5720	12.10	14.00	1.549	98.28	1.018	-0.11	0.843	1.330
	WLAN5GHz	802.11a 6Mbps	Back	5mm	Headset2	144	5720	12.10	14.00	1.549	98.28	1.018	0.04	0.709	1.118
	WLAN5GHz	802.11a 6Mbps	Back	5mm	Headset3	144	5720	12.10	14.00	1.549	98.28	1.018	0.02	0.689	1.086
	WLAN5GHz	802.11n-HT40 MCS0	Front	5mm	-	151	5755	12.88	13.00	1.027	96.32	1.038	-0.13	0.028	0.030
	WLAN5GHz	802.11n-HT40 MCS0	Back	5mm	-	151	5755	12.88	13.00	1.027	96.32	1.038	-0.05	1.130	1.205
43	WLAN5GHz	802.11n-HT40 MCS0	Back	5mm	-	159	5795	11.40	13.00	1.445	96.32	1.038	0.15	0.868	1.302
	WLAN5GHz	802.11a 6Mbps	Back	5mm	-	149	5745	11.32	13.00	1.474	98.28	1.018	0	0.780	1.170
	WLAN5GHz	802.11n-HT40 MCS0	Back	5mm	Headset1	159	5795	11.40	13.00	1.445	96.32	1.038	0.05	0.589	0.884
	WLAN5GHz	802.11n-HT40 MCS0	Back	5mm	Headset2	159	5795	11.40	13.00	1.445	96.32	1.038	-0.06	0.529	0.794
	WLAN5GHz	802.11n-HT40 MCS0	Back	5mm	Headset3	159	5795	11.40	13.00	1.445	96.32	1.038	-0.17	0.523	0.784

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	1Mbps	Front	5mm	-	39	2441	12.01	13.00	1.256	77.6	1.073	0.14	0.074	0.100
44	Bluetooth	1Mbps	Back	5mm	-	39	2441	12.01	13.00	1.256	77.6	1.073	-0.02	0.112	0.151
	Bluetooth	1Mbps	Back	5mm	Headset1	39	2441	12.01	13.00	1.256	77.6	1.073	-0.05	0.073	0.098
	Bluetooth	1Mbps	Back	5mm	Headset2	39	2441	12.01	13.00	1.256	77.6	1.073	0.01	0.069	0.093
	Bluetooth	1Mbps	Back	5mm	Headset3	39	2441	12.01	13.00	1.256	77.6	1.073	-0.05	0.055	0.074



**14.4 Product Specific SAR**

**<GSM SAR>**

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
45	GSM1900	GPRS (2 Tx slots)	Back	0mm	512	1850.2	28.05	28.50	1.109	0.09	2.120	2.351
	GSM1900	GPRS (2 Tx slots)	Back	0mm	661	1880	27.91	28.50	1.146	0.13	1.640	1.879
	GSM1900	GPRS (2 Tx slots)	Back	0mm	810	1909.8	27.88	28.50	1.153	0.1	1.690	1.949
	GSM1900	GPRS (2 Tx slots)	Bottom Side	0mm	512	1850.2	28.05	28.50	1.109	-0.11	1.970	2.185
	GSM1900	GPRS (2 Tx slots)	Bottom Side	0mm	661	1880	27.91	28.50	1.146	-0.07	1.330	1.524
	GSM1900	GPRS (2 Tx slots)	Bottom Side	0mm	810	1909.8	27.88	28.50	1.153	0.03	1.340	1.546

**<WCDMA SAR>**

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	0mm	9262	1852.4	21.70	22.00	1.072	0.02	1.750	1.875
	WCDMA II	RMC 12.2Kbps	Front	0mm	9400	1880	21.46	22.00	1.132	0.01	1.850	2.095
	WCDMA II	RMC 12.2Kbps	Front	0mm	9538	1907.6	21.49	22.00	1.125	0.02	1.710	1.923
	WCDMA II	RMC 12.2Kbps	Back	0mm	9262	1852.4	21.70	22.00	1.072	-0.07	2.350	2.518
	WCDMA II	RMC 12.2Kbps	Back	0mm	9400	1880	21.46	22.00	1.132	-0.01	2.470	2.797
	WCDMA II	RMC 12.2Kbps	Back	0mm	9538	1907.6	21.49	22.00	1.125	-0.03	2.430	2.733
	WCDMA II	RMC 12.2Kbps	Right Side	0mm	9262	1852.4	22.78	24.00	1.324	-0.02	1.230	1.629
46	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	9262	1852.4	21.70	22.00	1.072	-0.07	3.020	3.236
	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	9400	1880	21.46	22.00	1.132	-0.05	2.660	3.012
	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	9538	1907.6	21.49	22.00	1.125	-0.04	2.410	2.710
	WCDMA IV	RMC 12.2Kbps	Front	0mm	1413	1732.6	20.74	22.00	1.337	0.05	1.830	2.446
	WCDMA IV	RMC 12.2Kbps	Front	0mm	1312	1712.4	20.72	22.00	1.343	0.01	1.770	2.377
	WCDMA IV	RMC 12.2Kbps	Front	0mm	1513	1752.6	20.68	22.00	1.355	0.01	1.840	2.494
	WCDMA IV	RMC 12.2Kbps	Back	0mm	1413	1732.6	20.74	22.00	1.337	0	2.510	3.355
	WCDMA IV	RMC 12.2Kbps	Back	0mm	1312	1712.4	20.72	22.00	1.343	-0.03	2.320	3.115
	WCDMA IV	RMC 12.2Kbps	Back	0mm	1513	1752.6	20.68	22.00	1.355	-0.01	2.550	3.456
	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	1413	1732.6	20.74	22.00	1.337	-0.09	2.600	3.475
	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	1312	1712.4	20.72	22.00	1.343	-0.05	2.560	3.437
47	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	1513	1752.6	20.68	22.00	1.355	-0.02	2.640	3.578
	WCDMA V	RMC 12.2Kbps	Front	0mm	4132	826.4	22.81	24.00	1.315	-0.04	1.800	2.367
	WCDMA V	RMC 12.2Kbps	Front	0mm	4182	836.4	22.81	24.00	1.315	0	1.850	2.433
	WCDMA V	RMC 12.2Kbps	Front	0mm	4233	846.6	22.75	24.00	1.334	0.04	1.910	2.547
	WCDMA V	RMC 12.2Kbps	Back	0mm	4132	826.4	22.81	24.00	1.315	-0.09	1.800	2.367
	WCDMA V	RMC 12.2Kbps	Back	0mm	4182	836.4	22.81	24.00	1.315	-0.06	1.870	2.459
48	WCDMA V	RMC 12.2Kbps	Back	0mm	4233	846.6	22.75	24.00	1.334	0.11	1.930	2.574
	WCDMA V	RMC 12.2Kbps	Bottom Side	0mm	4233	846.6	22.75	24.00	1.334	0.05	1.400	1.867



<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 2	20M	QPSK	100	0	Front	0mm	18700	1860	21.71	22.00	1.069	-0.04	2.210	2.363
	LTE Band 2	20M	QPSK	50	0	Back	0mm	18700	1860	21.84	22.00	1.038	0.02	3.030	3.144
	LTE Band 2	20M	QPSK	50	0	Back	0mm	18900	1880	21.69	22.00	1.074	0.1	3.120	3.351
49	LTE Band 2	20M	QPSK	50	0	Back	0mm	19100	1900	21.73	22.00	1.064	0.03	3.270	3.480
	LTE Band 2	20M	QPSK	1	0	Right Side	0mm	18700	1860	22.53	24.00	1.403	-0.03	1.280	1.796
	LTE Band 2	20M	QPSK	100	0	Bottom Side	0mm	18700	1860	21.71	22.00	1.069	-0.02	2.760	2.951
50	LTE Band 5	10M	QPSK	1	25	Back	0mm	20525	836.5	22.87	24.00	1.297	-0.01	1.480	1.920
	LTE Band 7	20M	QPSK	1	0	Front	0mm	21350	2560	22.22	22.50	1.067	0.15	2.120	2.261
	LTE Band 7	20M	QPSK	1	0	Front	0mm	20850	2510	22.13	22.50	1.089	-0.01	2.040	2.221
	LTE Band 7	20M	QPSK	1	0	Front	0mm	21100	2535	22.03	22.50	1.114	0	2.180	2.429
51	LTE Band 7	20M	QPSK	1	0	Back	0mm	21350	2560	22.22	22.50	1.067	-0.14	3.030	3.232
	LTE Band 7	20M	QPSK	1	0	Back	0mm	20850	2510	22.13	22.50	1.089	-0.01	2.520	2.744
	LTE Band 7	20M	QPSK	1	0	Back	0mm	21100	2535	22.03	22.50	1.114	-0.06	2.800	3.120
	LTE Band 7	20M	QPSK	100	0	Left Side	0mm	21350	2560	22.09	22.50	1.099	-0.04	2.170	2.385
	LTE Band 7	20M	QPSK	100	0	Bottom Side	0mm	21350	2560	22.09	22.50	1.099	0.06	1.900	2.088
	LTE Band 66	20M	QPSK	1	0	Front	0mm	132322	1745	22.05	22.50	1.109	0.05	1.730	1.919
	LTE Band 66	20M	QPSK	1	0	Front	0mm	132072	1720	21.94	22.50	1.138	0	1.680	1.911
	LTE Band 66	20M	QPSK	1	0	Front	0mm	132572	1770	21.94	22.50	1.138	0.11	1.690	1.923
	LTE Band 66	20M	QPSK	1	0	Back	0mm	132322	1745	22.05	22.50	1.109	-0.01	2.060	2.285
	LTE Band 66	20M	QPSK	1	0	Back	0mm	132072	1720	21.94	22.50	1.138	-0.15	2.070	2.355
	LTE Band 66	20M	QPSK	1	0	Back	0mm	132572	1770	21.94	22.50	1.138	-0.01	2.270	2.582
	LTE Band 66	20M	QPSK	1	0	Bottom Side	0mm	132322	1745	22.05	22.50	1.109	0.01	2.530	2.806
52	LTE Band 66	20M	QPSK	1	0	Bottom Side	0mm	132072	1720	21.94	22.50	1.138	-0.03	2.540	2.890
	LTE Band 66	20M	QPSK	1	0	Bottom Side	0mm	132572	1770	21.94	22.50	1.138	-0.02	2.440	2.776

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
53	WLAN5GHz	802.11a 6Mbps	Back	0mm	48	5240	15.67	17.00	1.360	98.28	1.018	-0.12	1.060	1.467
	WLAN5GHz	802.11a 6Mbps	Front	0mm	64	5320	15.50	17.00	1.413	98.28	1.018	-0.09	0.042	0.060
54	WLAN5GHz	802.11a 6Mbps	Back	0mm	64	5320	15.50	17.00	1.413	98.28	1.018	-0.04	1.220	1.754
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	64	5320	15.50	17.00	1.413	98.28	1.018	0.06	0.049	0.070
	WLAN5GHz	802.11a 6Mbps	Top Side	0mm	64	5320	15.50	17.00	1.413	98.28	1.018	-0.12	0.105	0.151
	WLAN5GHz	802.11a 6Mbps	Front	0mm	100	5500	15.31	16.50	1.317	98.28	1.018	-0.17	0.047	0.063
55	WLAN5GHz	802.11a 6Mbps	Back	0mm	100	5500	15.31	16.50	1.317	98.28	1.018	0.05	1.320	1.769
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	100	5500	15.31	16.50	1.317	98.28	1.018	0.13	0.055	0.074
	WLAN5GHz	802.11a 6Mbps	Top Side	0mm	100	5500	15.31	16.50	1.317	98.28	1.018	-0.04	0.118	0.158
56	WLAN5GHz	802.11a 6Mbps	Back	0mm	165	5825	14.80	16.00	1.320	98.28	1.018	-0.03	1.510	2.029
	WLAN5GHz	802.11a 6Mbps	Back	0mm	149	5745	14.62	16.00	1.376	98.28	1.018	0.04	1.330	1.862
	WLAN5GHz	802.11a 6Mbps	Back	0mm	157	5785	14.34	16.00	1.467	98.28	1.018	-0.05	1.280	1.912



14.5 Repeated SAR Measurement

No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	9262	1852.4	17.55	18.00	1.109	-	1.000	-0.05	1.190	-	1.320
2nd	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	9262	1852.4	17.55	18.00	1.109	-	1.000	0.13	1.120	1.06	1.242
1st	WCDMA IV	RMC 12.2Kbps	Bottom Side	5mm	1513	1752.6	17.22	18.00	1.197	-	1.000	-0.02	1.150	-	1.376
2nd	WCDMA IV	RMC 12.2Kbps	Bottom Side	5mm	1513	1752.6	17.22	18.00	1.197	-	1.000	-0.17	1.120	1.03	1.340
1st	WCDMA V	RMC 12.2Kbps	Back	5mm	4233	846.6	22.03	23.00	1.250	-	1.000	-0.03	1.090	-	1.363
2nd	WCDMA V	RMC 12.2Kbps	Back	5mm	4233	846.6	22.03	23.00	1.250	-	1.000	0.04	1.040	1.05	1.300
1st	LTE Band 7	20M_QPSK_1_0	Back	5mm	21350	2560	21.17	22.00	1.211	-	1.000	-0.06	1.100	-	1.332
2nd	LTE Band 7	20M_QPSK_1_0	Back	5mm	21350	2560	21.17	22.00	1.211	-	1.000	-0.16	1.020	1.08	1.235
1st	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	1	2412	17.55	19.00	1.396	100	1.000	0.07	0.935	-	1.306
2nd	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	1	2412	17.55	19.00	1.396	100	1.000	0.01	0.896	1.04	1.251
1st	WLAN5GHz	802.11a 6Mbps	Back	5mm	36	5180	14.80	15.00	1.048	98.28	1.018	0.13	1.170	-	1.249
2nd	WLAN5GHz	802.11a 6Mbps	Back	5mm	36	5180	14.80	15.00	1.048	98.28	1.018	-0.02	1.020	1.15	1.088
1st	WLAN5GHz	802.11a 6Mbps	Back	5mm	56	5280	15.17	17.00	1.526	98.28	1.018	-0.03	0.888	-	1.379
2nd	WLAN5GHz	802.11a 6Mbps	Back	5mm	56	5280	15.17	17.00	1.526	98.28	1.018	-0.17	0.849	1.05	1.319
1st	WLAN5GHz	802.11a 6Mbps	Back	5mm	132	5660	13.99	14.00	1.003	98.28	1.018	-0.1	1.270	-	1.297
2nd	WLAN5GHz	802.11a 6Mbps	Back	5mm	132	5660	13.99	14.00	1.003	98.28	1.018	0.13	1.180	1.08	1.205
1st	WLAN5GHz	802.11n-HT40 MCS0	Back	5mm	151	5755	12.88	13.00	1.027	96.32	1.038	-0.05	1.130	-	1.205
2nd	WLAN5GHz	802.11n-HT40 MCS0	Back	5mm	151	5755	12.88	13.00	1.027	96.32	1.038	0	1.050	1.08	1.120

No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Ratio	Reported 10g SAR (W/kg)
1st	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	1513	1752.6	20.68	22.00	1.355	-0.02	2.640	-	3.578
2nd	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	1513	1752.6	20.68	22.00	1.355	-0.13	2.630	1.00	3.564
1st	LTE Band 2	20M_QPSK_50_0	Back	0mm	19100	1900	21.73	22.00	1.064	0.03	3.270	-	3.480
2nd	LTE Band 2	20M_QPSK_50_0	Back	0mm	19100	1900	21.92	22.00	1.019	0.1	3.170	1.08	3.229
1st	LTE Band 7	20M_QPSK_1_0	Back	0mm	21350	2560	22.22	22.50	1.067	-0.14	3.030	-	3.232
2nd	LTE Band 7	20M_QPSK_1_0	Back	0mm	21350	2560	22.22	22.50	1.067	-0.16	2.890	1.05	3.082

General Note:

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



15. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Portable Handset			
		Head	Body-worn	Hotspot	Product Specific
1.	WWAN + WLAN2.4GHz	Yes	Yes	Yes	Yes
2.	WWAN + Bluetooth	Yes	Yes	Yes	Yes
3.	WWAN + WLAN5GHz	Yes	Yes	Yes	Yes

General Note:

1. This device WLAN 2.4GHz / 5.2GHz / 5.8GHz supports Hotspot operation and Bluetooth support tethering applications.
2. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
3. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
4. The Scaled SAR summation is calculated based on the same configuration, test position and test separation distance to show compliance.
5. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
  - i) Scalar SAR summation < 1.6W/kg.
  - ii)  $SPLSR = (SAR1 + SAR2)^{1.5} / (\min. \text{ separation distance, mm})$ , 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  $SPLSR \leq 0.04$  for 1g,  $SPLSR \leq 0.1$  for 10g, simultaneously transmission SAR measurement is not necessary.
  - iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg for 1g, and < 4.0 for 10g.
  - v) The SPLSR calculated results please refer to section 15.5.



15.1 Head Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	1+2	1+3	1+4	SPLSR	Case No	
		WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)			
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)						
GSM	GSM850	Right Cheek	0.108	0.521	0.175	0.081	0.629	0.283	0.189		
		Right Tilted	0.054	0.656	0.250	0.094	0.710	0.304	0.148		
		Left Cheek	0.086	1.306	0.181	0.151	1.392	0.267	0.237		
		Left Tilted	0.054	0.905	0.197	0.111	0.959	0.251	0.165		
	GSM1900	Right Cheek	0.077	0.521	0.175	0.081	0.598	0.252	0.158		
		Right Tilted	0.042	0.656	0.250	0.094	0.698	0.292	0.136		
		Left Cheek	0.167	1.306	0.181	0.151	1.473	0.348	0.318		
		Left Tilted	0.022	0.905	0.197	0.111	0.927	0.219	0.133		
WCDMA	WCDMA II	Right Cheek	0.221	0.521	0.175	0.081	0.742	0.396	0.302		
		Right Tilted	0.175	0.656	0.250	0.094	0.831	0.425	0.269		
		Left Cheek	0.344	1.306	0.181	0.151	1.650	0.525	0.495	0.02	Case 1
		Left Tilted	0.113	0.905	0.197	0.111	1.018	0.310	0.224		
	WCDMA IV	Right Cheek	0.145	0.521	0.175	0.081	0.666	0.320	0.226		
		Right Tilted	0.090	0.656	0.250	0.094	0.746	0.340	0.184		
		Left Cheek	0.250	1.306	0.181	0.151	1.556	0.431	0.401		
		Left Tilted	0.085	0.905	0.197	0.111	0.990	0.282	0.196		
	WCDMA V	Right Cheek	0.313	0.521	0.175	0.081	0.834	0.488	0.394		
		Right Tilted	0.155	0.656	0.250	0.094	0.811	0.405	0.249		
		Left Cheek	0.253	1.306	0.181	0.151	1.559	0.434	0.404		
		Left Tilted	0.159	0.905	0.197	0.111	1.064	0.356	0.270		
LTE	LTE Band 2	Right Cheek	0.200	0.521	0.175	0.081	0.721	0.375	0.281		
		Right Tilted	0.175	0.656	0.250	0.094	0.831	0.425	0.269		
		Left Cheek	0.173	1.306	0.181	0.151	1.479	0.354	0.324		
		Left Tilted	0.095	0.905	0.197	0.111	1.000	0.292	0.206		
	LTE Band 5	Right Cheek	0.280	0.521	0.175	0.081	0.801	0.455	0.361		
		Right Tilted	0.127	0.656	0.250	0.094	0.783	0.377	0.221		
		Left Cheek	0.224	1.306	0.181	0.151	1.530	0.405	0.375		
		Left Tilted	0.143	0.905	0.197	0.111	1.048	0.340	0.254		
	LTE Band 7	Right Cheek	0.425	0.521	0.175	0.081	0.946	0.600	0.506		
		Right Tilted	0.438	0.656	0.250	0.094	1.094	0.688	0.532		
		Left Cheek	0.541	1.306	0.181	0.151	1.847	0.722	0.692	0.03	Case 2
		Left Tilted	0.217	0.905	0.197	0.111	1.122	0.414	0.328		
	LTE Band 12	Right Cheek	0.072	0.521	0.175	0.081	0.593	0.247	0.153		
		Right Tilted	0.039	0.656	0.250	0.094	0.695	0.289	0.133		
		Left Cheek	0.079	1.306	0.181	0.151	1.385	0.260	0.230		
		Left Tilted	0.047	0.905	0.197	0.111	0.952	0.244	0.158		
	LTE Band 66	Right Cheek	0.117	0.521	0.175	0.081	0.638	0.292	0.198		
		Right Tilted	0.090	0.656	0.250	0.094	0.746	0.340	0.184		
		Left Cheek	0.268	1.306	0.181	0.151	1.574	0.449	0.419		
		Left Tilted	0.100	0.905	0.197	0.111	1.005	0.297	0.211		



15.2 Hotspot Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	1+2	1+3	1+4	SPLSR	Case No	SPLSR	
		WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)				
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)							
GSM	GSM850	Front	0.562	0.571	0.055	0.100	1.133	0.617	0.662			
		Back	0.692	1.115	1.379	0.151	1.807	2.071	0.843	0.02	Case 3	
		Left side	0.106				0.106	0.106	0.106			
		Right side	0.314	0.433	0.086	0.058	0.747	0.400	0.372			
		Top side		0.740	0.247	0.082	0.740	0.247	0.082			
	Bottom side	0.669				0.669	0.669	0.669				
	GSM1900	Front	1.036	0.571	0.055	0.100	1.607	1.091	1.136	0.01	Case 4	
		Back	1.287	1.115	1.379	0.151	2.402	2.666	1.438	0.02	Case 4	
		Left side	0.107				0.107	0.107	0.107			
		Right side	0.509	0.433	0.086	0.058	0.942	0.595	0.567			
Top side			0.740	0.247	0.082	0.740	0.247	0.082				
Bottom side	1.338				1.338	1.338	1.338					
WCDMA	WCDMA II	Front	1.014	0.571	0.055	0.100	1.585	1.069	1.114			
		Back	1.301	1.115	1.379	0.151	2.416	2.680	1.452	0.04	Case 5	
		Left side	0.070				0.070	0.070	0.070			
		Right side	0.471	0.433	0.086	0.058	0.904	0.557	0.529			
		Top side		0.740	0.247	0.082	0.740	0.247	0.082			
	Bottom side	1.320				1.320	1.320	1.320				
	WCDMA IV	Front	1.172	0.571	0.055	0.100	1.743	1.227	1.272	0.03	Case 6	
		Back	1.342	1.115	1.379	0.151	2.457	2.721	1.493	0.03	Case 6	
		Left side	0.046				0.046	0.046	0.046			
		Right side	0.294	0.433	0.086	0.058	0.727	0.380	0.352			
		Top side		0.740	0.247	0.082	0.740	0.247	0.082			
	Bottom side	1.376				1.376	1.376	1.376				
	WCDMA V	Front	1.189	0.571	0.055	0.100	1.760	1.244	1.289	0.02	Case 7	
		Back	1.363	1.115	1.379	0.151	2.478	2.742	1.514	0.03	Case 7	
		Left side	0.141				0.141	0.141	0.141			
Right side		0.455	0.433	0.086	0.058	0.888	0.541	0.513				
Top side			0.740	0.247	0.082	0.740	0.247	0.082				
Bottom side	1.055				1.055	1.055	1.055					
LTE	LTE Band 2	Front	1.026	0.571	0.055	0.100	1.597	1.081	1.126	0.01	Case 8	
		Back	1.337	1.115	1.379	0.151	2.452	2.716	1.488	0.04	Case 8	
		Left side	0.068				0.068	0.068	0.068			
		Right side	0.457	0.433	0.086	0.058	0.890	0.543	0.515			
		Top side		0.740	0.247	0.082	0.740	0.247	0.082			
	Bottom side	1.225				1.225	1.225	1.225				
	LTE Band 5	Front	1.074	0.571	0.055	0.100	1.645	1.129	1.174	0.01	Case 9	
		Back	1.349	1.115	1.379	0.151	2.464	2.728	1.500	0.03	Case 9	
		Left side	0.095				0.095	0.095	0.095			
		Right side	0.304	0.433	0.086	0.058	0.737	0.390	0.362			
		Top side		0.740	0.247	0.082	0.740	0.247	0.082			
	Bottom side	1.129				1.129	1.129	1.129				
	LTE Band 7	Front	0.884	0.571	0.055	0.100	1.455	0.939	0.984			
		Back	1.332	1.115	1.379	0.151	2.447	2.711	1.483	0.03	Case 10	
		Left side	0.961				0.961	0.961	0.961			
		Right side	0.084	0.433	0.086	0.058	0.517	0.170	0.142			
		Top side		0.740	0.247	0.082	0.740	0.247	0.082			
	Bottom side	1.073				1.073	1.073	1.073				
LTE Band 12	Front	0.760	0.571	0.055	0.100	1.331	0.815	0.860				
	Back	0.893	1.115	1.379	0.151	2.008	2.272	1.044	0.02	Case 11		
	Left side	0.236				0.236	0.236	0.236				
	Right side	0.460	0.433	0.086	0.058	0.893	0.546	0.518				
	Top side		0.740	0.247	0.082	0.740	0.247	0.082				
Bottom side	0.695				0.695	0.695	0.695					
LTE Band 66	Front	1.054	0.571	0.055	0.100	1.625	1.109	1.154	0.01	Case 12		
	Back	1.313	1.115	1.379	0.151	2.428	2.692	1.464	0.03	Case 12		
	Left side	0.065				0.065	0.065	0.065				
	Right side	0.302	0.433	0.086	0.058	0.735	0.388	0.360				
	Top side		0.740	0.247	0.082	0.740	0.247	0.082				
Bottom side	1.276				1.276	1.276	1.276					



15.3 Body-Worn Accessory Exposure Conditions

WWAN Band		Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	SPLSR	Case No
			WWAN 1g SAR (W/kg)	2.4GHz WLAN 1g SAR (W/kg)	5GHz WLAN 1g SAR (W/kg)	Bluetooth 1g SAR (W/kg)					
GSM	GSM850	Front	0.562	0.571	0.055	0.100	1.133	0.617	0.662		
		Back	0.692	1.115	1.379	0.151	1.807	2.071	0.843	0.02	Case 3
		Back with Headset	0.692	0.704	1.330	0.098	1.396	2.022	0.790	0.02	Case 3
	GSM1900	Front	1.036	0.571	0.055	0.100	1.607	1.091	1.136	0.01	Case 4
		Back	1.287	1.115	1.379	0.151	2.402	2.666	1.438	0.02	Case 4
		Back with Headset	1.231	0.704	1.330	0.098	1.935	2.561	1.329	0.02	Case 4
WCDMA	WCDMA II	Front	1.014	0.571	0.055	0.100	1.585	1.069	1.114		
		Back	1.301	1.115	1.379	0.151	2.416	2.680	1.452	0.04	Case 5
		Back with Headset	1.206	0.704	1.330	0.098	1.910	2.536	1.304	0.03	Case 5
	WCDMA IV	Front	1.172	0.571	0.055	0.100	1.743	1.227	1.272	0.03	Case 6
		Back	1.342	1.115	1.379	0.151	2.457	2.721	1.493	0.03	Case 6
		Back with Headset	1.284	0.704	1.330	0.098	1.988	2.614	1.382	0.03	Case 6
	WCDMA V	Front	1.189	0.571	0.055	0.100	1.760	1.244	1.289	0.02	Case 7
		Back	1.363	1.115	1.379	0.151	2.478	2.742	1.514	0.03	Case 7
		Back with Headset	1.263	0.704	1.330	0.098	1.967	2.593	1.361	0.03	Case 7
LTE	LTE Band 2	Front	1.026	0.571	0.055	0.100	1.597	1.081	1.126	0.01	Case 8
		Back	1.337	1.115	1.379	0.151	2.452	2.716	1.488	0.04	Case 8
		Back with Headset	1.195	0.704	1.330	0.098	1.899	2.525	1.293	0.03	Case 8
	LTE Band 5	Front	1.074	0.571	0.055	0.100	1.645	1.129	1.174	0.01	Case 9
		Back	1.349	1.115	1.379	0.151	2.464	2.728	1.500	0.03	Case 9
		Back with Headset	1.336	0.704	1.330	0.098	2.040	2.666	1.434	0.03	Case 9
	LTE Band 7	Front	0.884	0.571	0.055	0.100	1.455	0.939	0.984		
		Back	1.332	1.115	1.379	0.151	2.447	2.711	1.483	0.03	Case 10
		Back with Headset	1.283	0.704	1.330	0.098	1.987	2.613	1.381	0.03	Case 10
	LTE Band 12	Front	0.760	0.571	0.055	0.100	1.331	0.815	0.860		
		Back	0.893	1.115	1.379	0.151	2.008	2.272	1.044	0.02	Case 11
		Back with Headset	0.893	0.704	1.330	0.098	1.597	2.223	0.991	0.02	Case 11
LTE Band 66	Front	1.054	0.571	0.055	0.100	1.625	1.109	1.154	0.01	Case 12	
	Back	1.313	1.115	1.379	0.151	2.428	2.692	1.464	0.03	Case 12	
	Back with Headset	1.309	0.704	1.330	0.098	2.013	2.639	1.407	0.03	Case 12	



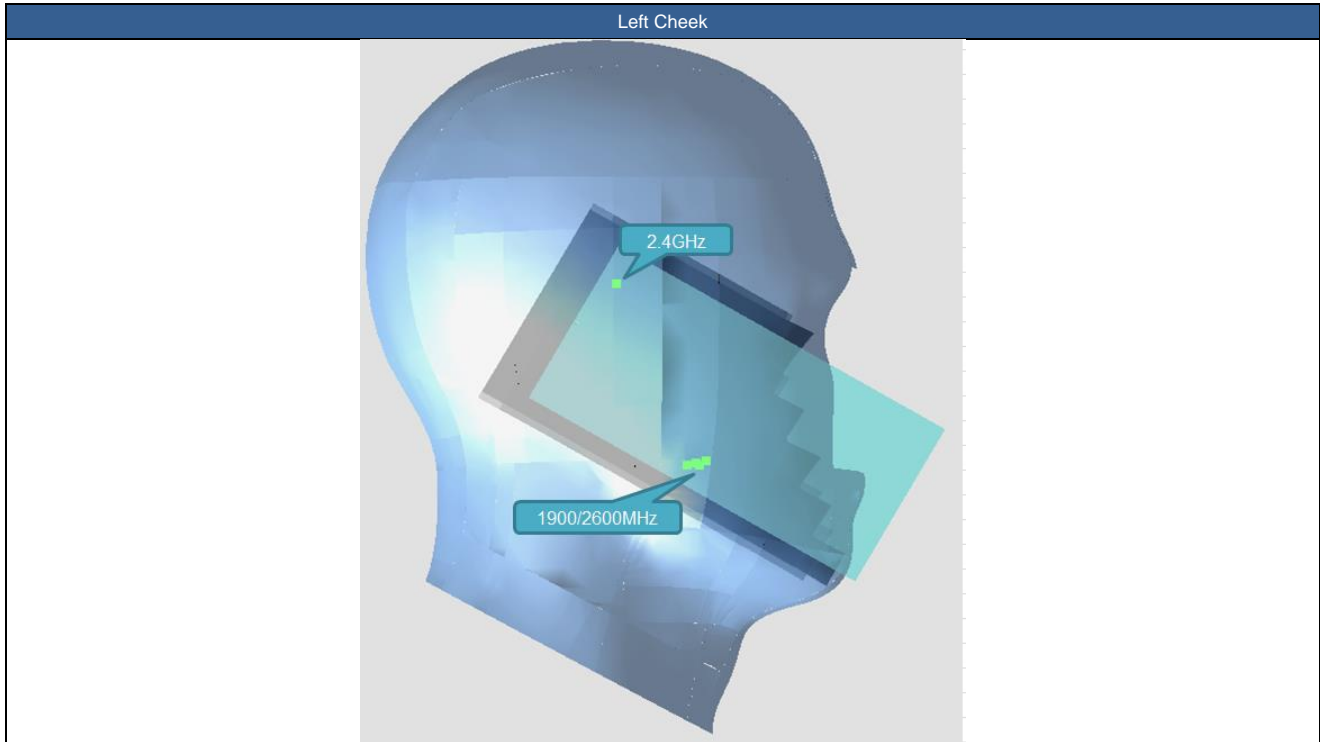
**15.4 Product Specific Exposure Conditions**

WWAN Band		Exposure Position	1	4	1+4 Summed 10g SAR (W/kg)	SPLSR	Case No
			WWAN 10g SAR (W/kg)	5GHz WLAN 10g SAR (W/kg)			
GSM	GSM1900	Front		0.063	<b>0.063</b>		
		Back	2.351	2.029	<b>4.380</b>	0.07	Case 13
		Left side			<b>0.000</b>		
		Right side		0.074	<b>0.074</b>		
		Top side		0.158	<b>0.158</b>		
		Bottom side	2.185		<b>2.185</b>		
WCDMA	WCDMA II	Front	2.095	0.063	<b>2.158</b>		
		Back	2.797	2.029	<b>4.826</b>	0.08	Case 14
		Left side			<b>0.000</b>		
		Right side	1.629	0.074	<b>1.703</b>		
		Top side		0.158	<b>0.158</b>		
		Bottom side	3.236		<b>3.236</b>		
	WCDMA IV	Front	2.494	0.063	<b>2.557</b>		
		Back	3.456	2.029	<b>5.485</b>	0.09	Case 15
		Left side			<b>0.000</b>		
		Right side		0.074	<b>0.074</b>		
		Top side		0.158	<b>0.158</b>		
		Bottom side	3.578		<b>3.578</b>		
	WCDMA V	Front	2.547	0.063	<b>2.610</b>		
		Back	2.574	2.029	<b>4.603</b>	0.07	Case 16
		Left side			<b>0.000</b>		
		Right side		0.074	<b>0.074</b>		
		Top side		0.158	<b>0.158</b>		
		Bottom side	1.867		<b>1.867</b>		
LTE	LTE Band 2	Front	2.363	0.063	<b>2.426</b>		
		Back	3.480	2.029	<b>5.509</b>	0.10	Case 17
		Left side			<b>0.000</b>		
		Right side	1.796	0.074	<b>1.870</b>		
		Top side		0.158	<b>0.158</b>		
		Bottom side	2.951		<b>2.951</b>		
	LTE Band 5	Front		0.063	<b>0.063</b>		
		Back	1.920	2.029	<b>3.949</b>		
		Left side			<b>0.000</b>		
		Right side		0.074	<b>0.074</b>		
		Top side		0.158	<b>0.158</b>		
		Bottom side			<b>0.000</b>		
	LTE Band 7	Front	2.429	0.063	<b>2.492</b>		
		Back	3.232	2.029	<b>5.261</b>	0.09	Case 18
		Left side	2.385		<b>2.385</b>		
		Right side		0.074	<b>0.074</b>		
		Top side		0.158	<b>0.158</b>		
		Bottom side	2.088		<b>2.088</b>		
	LTE Band 66	Front	1.923	0.063	<b>1.986</b>		
		Back	2.582	2.029	<b>4.611</b>	0.07	Case 19
		Left side			<b>0.000</b>		
		Right side		0.074	<b>0.074</b>		
		Top side		0.158	<b>0.158</b>		
		Bottom side	2.890		<b>2.890</b>		

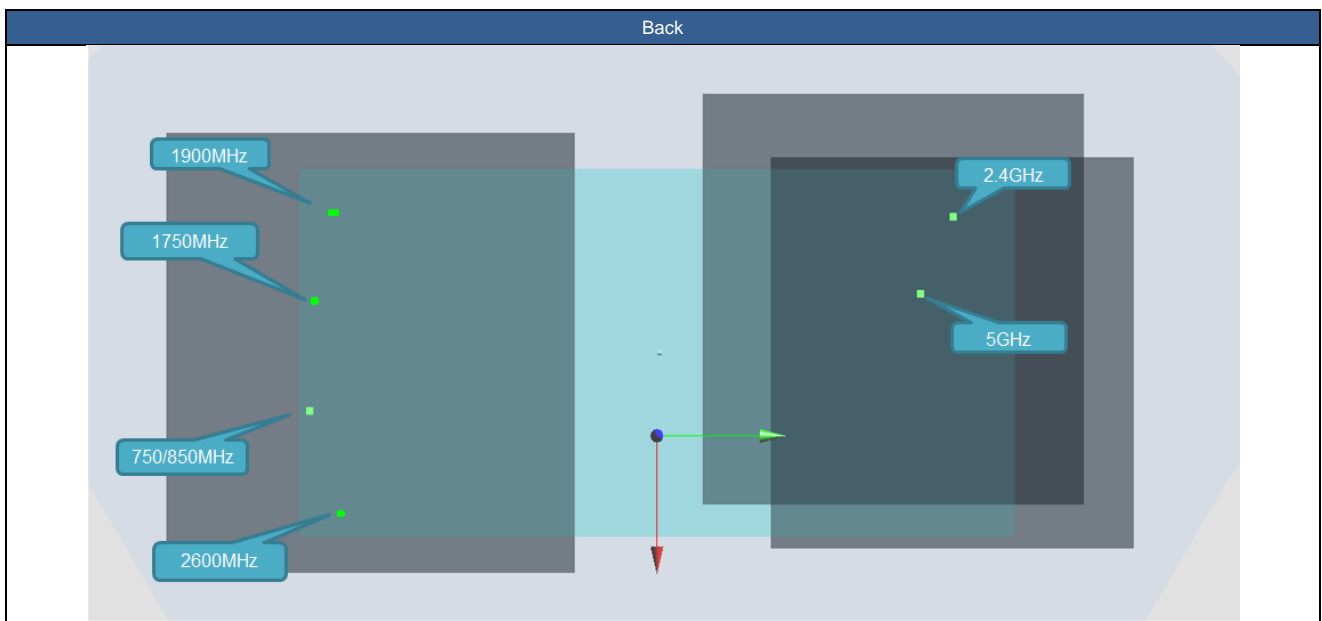
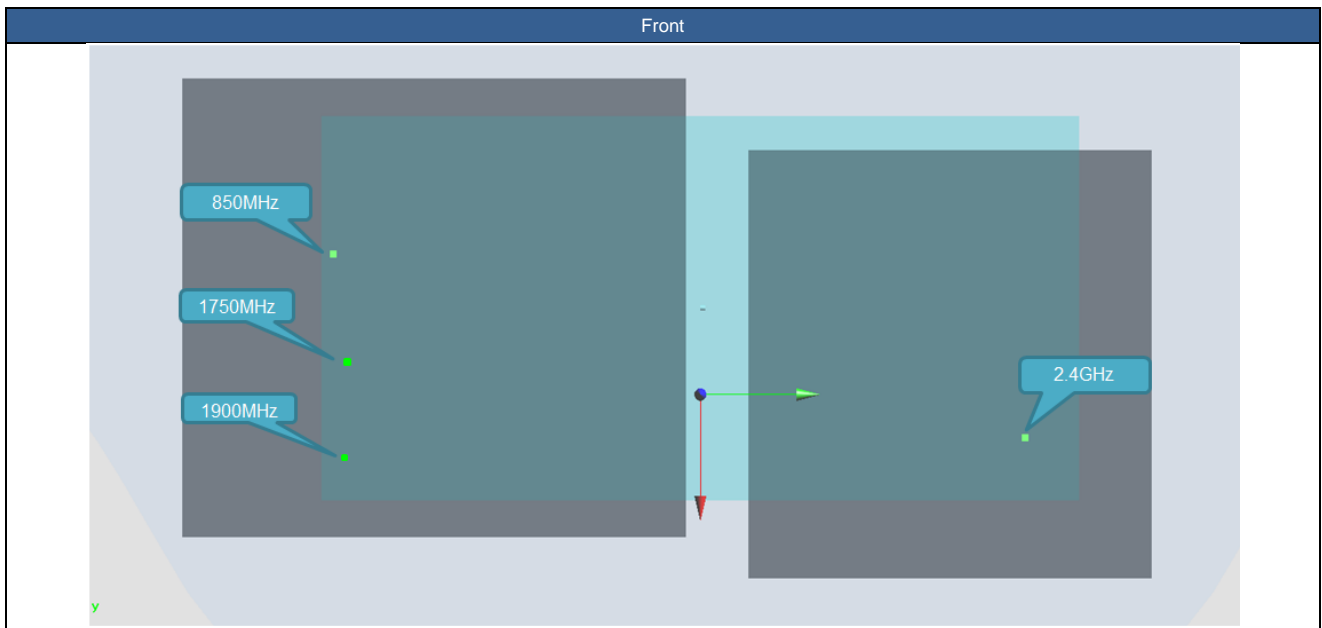
**15.5 SPLSR Evaluation and Analysis**

**General Note:**

1.  $SPLSR = (SAR_1 + SAR_2)^{1.5} / (min. \text{ separation distance, mm})$ . If  $SPLSR \leq 0.04$  for 1g,  $SPLSR \leq 0.1$  for 10g, simultaneously transmission SAR measurement is not necessary
2. The detail hotspot point for each transmitter in each exposure condition are showing as below figure and the minimum 3D distance for each sum combination is used for SPLSR analysis.



Case	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 1	WCDMA II	Left Cheek	0.344	0	51.66	-62.89	-0.26	90.8	1.65	0.02	Not required
	2.4GHz WLAN		1.306	0	14.13	19.76	-1.46				
Case 2	LTE B7	Left Cheek	0.541	0	47.16	-60.89	-2.59	87.2	1.85	0.03	Not required
	2.4GHz WLAN		1.306	0	14.13	19.76	-1.46				



	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 3	GSM850	Back	0.692	5	7.2	-81.3	-1.99	141.0	1.81	0.02	Not required
	2.4GHz WLAN		1.115	5	-23.8	56.2	-2.05				
	GSM850	Back	0.692	5	7.2	-81.3	-1.99	140.1	2.07	0.02	Not required
	5GHz WLAN		1.379	5	-13.6	57.2	-1.21				
	GSM850	Back with headset	0.692	5	7.4	-82.4	-1.99	145.3	1.40	0.01	Not required
	2.4GHz WLAN		0.704	5	-24.4	59.4	-2.05				
	GSM850	Back with headset	0.692	5	7.4	-82.4	-1.99	143.9	2.02	0.02	Not required
	5GHz WLAN		1.33	5	-7.2	60.8	-1.16				



	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 4	GSM1900	Front	1.036	5	9	-76.9	-0.97	149.5	1.61	0.01	Not required
	2.4GHz WLAN		0.571	5	26.6	71.6	-1.8				
	GSM1900	Back	0.692	5	-34.5	-62.31	-1.09	119.0	1.81	0.02	Not required
	2.4GHz WLAN		1.115	5	-23.8	56.2	-2.05				
	GSM1900	Back	0.692	5	-34.5	-62.31	-1.09	121.3	2.07	0.02	Not required
	5GHz WLAN		1.379	5	-13.6	57.2	-1.21				
	GSM1900	Back with headset	0.692	5	-34.5	-62.31	-1.07	122.1	1.40	0.01	Not required
	2.4GHz WLAN		0.704	5	-24.4	59.4	-2.05				
	GSM1900	Back with headset	0.692	5	-34.5	-62.31	-1.07	126.1	2.02	0.02	Not required
5GHz WLAN	1.33		5	-7.2	60.8	-1.16					
Case 5	WCDMA B2	Back	1.301	5	-36.9	-61.51	-1.12	118.4	2.42	0.03	Not required
	2.4GHz WLAN		1.115	5	-23.8	56.2	-2.05				
	WCDMA B2	Back	1.301	5	-36.9	-61.51	-1.12	121.0	2.68	0.04	Not required
	5GHz WLAN		1.379	5	-13.6	57.2	-1.21				
	WCDMA B2	Back with headset	1.206	5	-36.9	-61.51	-1.11	121.6	1.91	0.02	Not required
	2.4GHz WLAN		0.704	5	-24.4	59.4	-2.05				
	WCDMA B2	Back with headset	1.206	5	-36.9	-61.51	-1.11	125.9	2.54	0.03	Not required
	5GHz WLAN		1.33	5	-7.2	60.8	-1.16				
Case 6	WCDMA B4	Front	1.172	5				76.4	1.74	0.03	Not required
	2.4GHz WLAN		0.571	5	26.6	71.6	-1.8				
	WCDMA B4	Back	1.342	5	-11.6	-78.2	-0.93	135.0	2.46	0.03	Not required
	2.4GHz WLAN		1.115	5	-23.8	56.2	-2.05				
	WCDMA B4	Back	1.342	5	-11.6	-78.2	-0.93	135.4	2.72	0.03	Not required
	5GHz WLAN		1.379	5	-13.6	57.2	-1.21				
	WCDMA B4	Back with headset	1.284	5	-11.6	-78.2	-0.92	138.2	1.99	0.02	Not required
	2.4GHz WLAN		0.704	5	-24.4	59.4	-2.05				
	WCDMA B4	Back with headset	1.284	5	-11.6	-78.2	-0.92	139.1	2.61	0.03	Not required
5GHz WLAN	1.33		5	-7.2	60.8	-1.16					
Case 7	WCDMA B5	Front	1.189	5	-4.1	-79.7	-2.03	154.4	1.76	0.02	Not required
	2.4GHz WLAN		0.571	5	26.6	71.6	-1.8				
	WCDMA B5	Back	1.363	5	8.8	-81.3	-1.98	141.3	2.48	0.03	Not required
	2.4GHz WLAN		1.115	5	-23.8	56.2	-2.05				
	WCDMA B5	Back	1.363	5	8.8	-81.3	-1.98	140.3	2.74	0.03	Not required
	5GHz WLAN		1.379	5	-13.6	57.2	-1.21				
	WCDMA B5	Back with headset	1.263	5	8.8	-82.9	-2	146.1	1.97	0.02	Not required
	2.4GHz WLAN		0.704	5	-24.4	59.4	-2.05				
	WCDMA B5	Back with headset	1.263	5	8.8	-82.9	-2	144.6	2.59	0.03	Not required
5GHz WLAN	1.33		5	-7.2	60.8	-1.16					



	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 8	LTE B2	Front	1.026	5	9	-78.4	-0.9	151.0	1.60	0.01	Not required
	2.4GHz WLAN		0.571	5	26.6	71.6	-1.8				
	LTE B2	Back	1.337	5	-37.1	-64.61	-1.11	121.5	2.45	0.03	Not required
	2.4GHz WLAN		1.115	5	-23.8	56.2	-2.05				
	LTE B2	Back	1.337	5	-37.1	-64.61	-1.11	124.1	2.72	0.04	Not required
	5GHz WLAN		1.379	5	-13.6	57.2	-1.21				
	LTE B2	Back with headset	1.195	5	-37.1	-61.21	-1.12	121.3	1.90	0.02	Not required
	2.4GHz WLAN		0.704	5	-24.4	59.4	-2.05				
	LTE B2	Back with headset	1.195	5	-37.1	-61.21	-1.12	125.6	2.53	0.03	Not required
5GHz WLAN	1.33		5	-7.2	60.8	-1.16					
Case 9	LTE B5	Front	1.074	5	-2.4	-82.9	-2.05	157.2	1.65	0.01	Not required
	2.4GHz WLAN		0.571	5	26.6	71.6	-1.8				
	LTE B5	Back	1.349	5	8.8	-82.9	-1.99	142.9	2.46	0.03	Not required
	2.4GHz WLAN		1.115	5	-23.8	56.2	-2.05				
	LTE B5	Back	1.349	5	8.8	-82.9	-1.99	141.9	2.73	0.03	Not required
	5GHz WLAN		1.379	5	-13.6	57.2	-1.21				
	LTE B5	Back with headset	1.336	5	8.8	-82.9	-1.99	146.1	2.04	0.02	Not required
	2.4GHz WLAN		0.704	5	-24.4	59.4	-2.05				
	LTE B5	Back with headset	1.336	5	8.8	-82.9	-1.99	144.6	2.67	0.03	Not required
5GHz WLAN	1.33		5	-7.2	60.8	-1.16					
Case 10	LTE B7	Back	1.332	5	28.4	-72.2	-1.71	138.6	2.45	0.03	Not required
	2.4GHz WLAN		1.115	5	-23.8	56.2	-2.05				
	LTE B7	Back	1.332	5	28.4	-72.2	-1.71	136.0	2.71	0.03	Not required
	5GHz WLAN		1.379	5	-13.6	57.2	-1.21				
	LTE B7	Back with headset	1.283	5	28.4	-72.2	-1.7	141.8	1.99	0.02	Not required
	2.4GHz WLAN		0.704	5	-24.4	59.4	-2.05				
	LTE B7	Back with headset	1.283	5	28.4	-72.2	-1.7	137.7	2.61	0.03	Not required
	5GHz WLAN		1.33	5	-7.2	60.8	-1.16				
Case 11	LTE B12	Back	0.893	5	10.7	-83.5	-1.94	143.9	2.01	0.02	Not required
	2.4GHz WLAN		1.115	5	-23.8	56.2	-2.05				
	LTE B12	Back	0.893	5	10.7	-83.5	-1.94	142.8	2.27	0.02	Not required
	5GHz WLAN		1.379	5	-13.6	57.2	-1.21				
	LTE B12	Back with headset	0.893	5	10.7	-83.5	-1.94	147.1	1.60	0.01	Not required
	2.4GHz WLAN		0.704	5	-24.4	59.4	-2.05				
	LTE B12	Back with headset	0.893	5	10.7	-83.5	-1.94	145.4	2.22	0.02	Not required
5GHz WLAN	1.33		5	-7.2	60.8	-1.16					



Case	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 12	LTE B66	Front	1.054	5	11.3	-79.7	-0.99	152.1	1.63	0.01	Not required
	2.4GHz WLAN		0.571	5	26.6	71.6	-1.8				
	LTE B66	Back	1.313	5	-11.9	-78.1	-1.08	134.8	2.43	0.03	Not required
	2.4GHz WLAN		1.115	5	-23.8	56.2	-2.05				
	LTE B66	Back	1.313	5	-11.9	-78.1	-1.08	135.3	2.69	0.03	Not required
	5GHz WLAN		1.379	5	-13.6	57.2	-1.21				
	LTE B66	Back with headset	1.309	5	-10	-75	-1	135.2	2.01	0.02	Not required
	2.4GHz WLAN		0.704	5	-24.4	59.4	-2.05				
	LTE B66	Back with headset	1.309	5	-10	-75	-1	135.8	2.64	0.03	Not required
5GHz WLAN	1.33		5	-7.2	60.8	-1.16					
Case 13	GSM1900	Back	2.351	0	-34.5	-62.31	-1.09	125.7	4.38	0.07	Not required
	5GHz WLAN		2.029	0	-7.3	60.4	-1.22				
	5GHz WLAN	Back	2.029	0	-7.3	60.4	-1.22	128.5	4.83	0.08	Not required
Case 14	WCDMA B2	Back	2.797	0	-37.1	-64.61	-1.11	128.5	4.83	0.08	Not required
	5GHz WLAN		2.029	0	-7.3	60.4	-1.22				
	5GHz WLAN	Back	2.029	0	-7.3	60.4	-1.22	138.7	5.49	0.09	Not required
Case 15	WCDMA B4	Back	3.456	0	-11.6	-78.2	-0.93	138.7	5.49	0.09	Not required
	5GHz WLAN		2.029	0	-7.3	60.4	-1.22				
	5GHz WLAN	Back	2.029	0	-7.3	60.4	-1.22	142.6	4.60	0.07	Not required
Case 16	WCDMA B5	Back	2.574	0	8.8	-81.3	-1.98	142.6	4.60	0.07	Not required
	5GHz WLAN		2.029	0	-7.3	60.4	-1.22				
	5GHz WLAN	Back	2.029	0	-7.3	60.4	-1.22	128.5	5.51	0.10	Not required
Case 17	LTE B2	Back	3.48	0	-37.1	-64.61	-1.11	128.5	5.51	0.10	Not required
	5GHz WLAN		2.029	0	-7.3	60.4	-1.22				
	5GHz WLAN	Back	2.029	0	-7.3	60.4	-1.22	137.3	5.26	0.09	Not required
Case 18	LTE B7	Back	3.232	0	28.4	-72.2	-1.71	137.3	5.26	0.09	Not required
	5GHz WLAN		2.029	0	-7.3	60.4	-1.22				
	5GHz WLAN	Back	2.029	0	-7.3	60.4	-1.22	138.6	4.61	0.07	Not required
Case 19	LTE B66	Back	2.582	0	-11.9	-78.1	-1.08	138.6	4.61	0.07	Not required
	5GHz WLAN		2.029	0	-7.3	60.4	-1.22				
	5GHz WLAN	Back	2.029	0	-7.3	60.4	-1.22	138.6	4.61	0.07	Not required



## **16. Supplemental tuner tests results**

### **General Note:**

1. The following test procedure was followed to demonstrate that the SAR results in this report represent the appropriate SAR test conditions. For bands with dynamic tuning implemented, SAR will be measured according to the required FCC SAR test procedures with the dynamic tuner active to allow the device to automatically tune to the antenna state for the respective RF exposure test configurations. Additional single point SAR time-sweep measurements will be evaluated for other tuner states to determine that the other tuner configurations would result in equivalent or lower SAR values. The additional tuner hardware has no influence to the antenna characteristics, other than impedance matching.
2. To evaluate all of the tuner states, the 144 tuner states are divided evenly among band, mode and exposure combinations so that at least one single point SAR measurement is measured in each configuration. Single point time-sweep measurements will be performed at the peak SAR location determined by the zoom scan of the configuration with the highest reported SAR for each combination. The tuner state will be established remotely so that the device is not moved for the entire series of single point SAR for the tuner states in each combination. The SAR probe will remain stationary at the same position throughout the entire series of single point measurements for each combination.
3. The device supports LTE B12/B17, B4/B66. Since the supported frequency span for LTE B17/B4 falls completely within the supported frequency span for LTE B12/B66, and both bands have the same target power and both LTE bands share the same transmission path, therefore standalone SAR was only assessed for LTE B12/B66. The single point SAR time-sweep measurements were treated independently for each supported ACL frequency band. For the LTE B17/B4 single point SAR measurement selected the highest measured SAR configuration and exposure condition of LTE B12/B66. And the number of required single point measurements at least 11 applies to the band.
4. The tuner state was established remotely through Wi-Fi so that the device is not moved for the entire series of single point SAR for the tuner states in each combination (band, mode, exposure conditions). The operational decryption contains more information about the design and implementation of the dynamic antenna tuning.



16.1 Supplemental Head SAR results

Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
									Auto-Tune	0	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
WCDMA B2	RMC12.2K	1852.4	92692	N/A	N/A	Left Cheek	0 mm	0.26	0.34	0.046	0.215	0.158	0.241	0.273	0.206	0.321	0.266	0.211	0.312	0.339	0.334	0.268	0.177	0.32	0.332	0.324	0.326	0.321	0.321	0.307
Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
WCDMA B4	RMC12.2K	1732.6	1413	N/A	N/A	Left Cheek	0 mm	0.196	0.261	0.061	0.125	0.128	0.148	0.188	0.223	0.061	0.187	0.157	0.259	0.126	0.109	0.163	0.146	0.254	0.099	0.083	0.153	0.126	0.068	0.058
Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
WCDMA B5	RMC12.2K	836.4	4182	N/A	N/A	Left Cheek	0 mm	0.238	0.275	0.051	0.138	0.155	0.204	0.162	0.069	0.038	0.218	0.168	0.023	0.074	0.091	0.148	0.139	0.044	0.003	0.008	0.125	0.079	0.065	0.061
Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
LTE B2	QPSK	1880	18900	1	0	Left Cheek	0 mm	0.155	0.206	0.091	0.17	0.143	0.189	0.204	0.202	0.089	0.202	0.182	0.163	0.09	0.204	0.2	0.188	0.198	0.122	0.182	0.061	0.204	0.198	0.189
Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
LTE B5	QPSK	836.5	20525	1	25	Right Cheek	0 mm	0.216	0.249	0.066	0.177	0.173	0.021	0.148	0.098	0.118	0.065	0.188	0.144	0.012	0.018	0.193	0.137	0.147	0.022	0.056	0.03	0.076	0.001	
Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
LTE B12/B17	QPSK	707.5	23095	1	25	Left Cheek	0 mm	0.057	0.0616	0.0614	0.002	0.024	0.001	0.003	0.002	0.024	0.002	0.011	0.006	0.001	0.047	0.001	0.008	0.006	0.004	0.005	0.002	0.001	0.001	
Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
LTE B4/B66	QPSK	1770	132572	1	0	Left Cheek	0 mm	0.212	0.274	0.111	0.104	0.152	0.273	0.221	0.207	0.195	0.15	0.229	0.197	0.192	0.17	0.104	0.218	0.163	0.142	0.199	0.159	0.162	0.117	

16.2 Supplemental Body SAR results

Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
									Auto-Tune	0	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
WCDMA B2	RMC12.2K	1852.4	9262	N/A	N/A	Bottom Side	5mm	1.19	1.474	0.199	0.932	0.684	1.044	1.183	0.893	1.391	1.153	0.914	1.352	1.469	1.447	1.161	0.767	1.387	1.439	1.404	1.413	1.391	1.392	1.330
Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
WCDMA B4	RMC12.2K	1752.6	1513	N/A	N/A	Bottom Side	5mm	1.15	1.295	0.302	0.620	0.635	0.734	0.932	1.106	0.302	0.927	0.778	1.285	0.625	0.540	0.808	0.724	1.260	0.491	0.411	0.759	0.625	0.337	0.287
Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
WCDMA B5	RMC12.2K	846.6	4233	N/A	N/A	Back	5mm	1.09	1.287	0.211	0.693	0.555	0.931	0.944	0.524	0.145	1.128	0.705	0.193	0.609	0.699	0.874	0.733	0.308	0.043	0.031	0.884	0.563	0.499	0.461
Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
LTE B2	QPSK	1880	18700	100	0	Bottom Side	5mm	1.13	1.29	0.549	0.941	0.818	1.058	1.235	1.259	0.599	1.217	1.113	1.201	0.852	1.289	1.201	1.149	1.276	1.045	1.134	0.393	1.243	1.144	1.056
Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
LTE B5	QPSK	836.5	20525	1	25	Back	5mm	1.04	1.282	0.341	0.985	0.809	0.065	0.881	0.619	0.623	0.195	1.015	0.824	0.097	0.075	1.088	0.795	0.827	0.162	0.337	0.091	0.515	0.012	
Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
LTE B12/B17	QPSK	707.5	23095	1	25	Back	5mm	0.644	0.815	0.813	0.044	0.351	0.003	0.049	0.031	0.328	0.039	0.143	0.085	0.005	0.587	0.012	0.116	0.085	0.056	0.061	0.034	0.001	0.001	
Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
LTE B4/B66	QPSK	1720	132072	1	0	Bottom Side	5mm	1.09	1.115	0.644	0.667	0.799	1.076	0.585	0.612	0.888	0.766	0.915	0.526	0.528	0.685	0.551	0.744	0.419	0.359	0.569	0.473	0.569	0.326	



<Additional Dynamic antenna tuning test>

According to 201904 TCBC workshop, if any single point SAR measurement result is > 1.2 W/kg for a band/exposure condition combination set, all supported tuner states are evaluated with single point SAR measurements for the combination

Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
									Auto-Tune	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
WCDMA B2	RMC12.2K	1852.4	9262	N/A	N/A	Bottom Side	5mm	1.19	1.474	0.199	1.072	0.872	0.596	1.234	1.310	0.082	0.932	1.253	0.386	1.205	0.148	0.586	0.996	0.684	0.453	0.986	0.291	1.034	0.662	0.405
									21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
									1.044	0.167	0.082	1.472	1.158	0.853	1.396	1.183	0.177	1.053	0.377	0.301	1.072	1.148	0.893	1.082	0.482	0.996	1.253	0.158	0.662	1.391
									43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
									1.396	1.015	1.024	0.805	0.415	1.377	1.153	0.424	0.701	0.243	1.453	1.339	0.539	0.914	0.243	1.301	0.577	1.301	1.015	0.52	1.352	0.434
									65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
									1.329	0.71	1.243	0.996	1.291	1.469	0.434	0.939	1.082	1.424	0.453	1.186	1.447	1.101	0.701	0.967	1.015	0.91	0.358	1.161	1.253	1.196
									87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108
									0.796	0.139	1.32	1.348	0.767	0.834	0.253	1.177	1.205	0.996	1.339	1.387	0.672	1.091	0.215	1.12	0.872	0.758	1.439	0.577	1.196	1.291
									109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130
									1.015	0.548	1.186	1.404	0.958	1.405	1.101	0.186	0.215	0.767	1.413	1.186	1.471	0.882	0.339	0.424	0.186	1.391	1.415	0.701	0.396	1.005
									131	132	133	134	135	136	137	138	139	140	141	142	143									
									0.548	0.377	1.392	1.11	1.262	1.167	0.891	0.901	0.367	1.330	1.177	0.272	0.758									
WCDMA B4	RMC12.2K	1752.6	1513	N/A	N/A	Bottom Side	5mm	1.15	1.295	0.579	0.302	0.883	0.188	1.103	0.245	0.826	0.56	0.620	0.874	0.864	0.579	0.226	0.264	0.531	0.635	0.626	1.026	0.607	0.255	1.045
									21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
									0.131	0.734	0.103	1.207	0.541	1.064	1.289	0.56	0.932	0.874	0.207	0.103	0.341	0.303	0.283	1.106	0.207	0.074	0.826	1.226	0.655	
									43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
									0.302	1.274	0.131	0.112	0.312	0.483	0.807	0.927	0.379	1.236	1.007	1.055	0.731	0.674	0.778	0.131	0.483	0.893	0.769	0.636	0.236	1.285
									65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
									0.998	0.141	0.16	0.874	0.922	0.445	0.625	0.245	0.893	1.16	0.074	0.455	0.141	0.540	0.283	0.293	0.769	1.16	1.007	0.922	0.808	0.312
									87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108
									0.093	1.283	0.703	1.283	0.598	0.724	0.312	0.95	1.198	0.455	1.007	1.036	1.260	0.607	0.712	0.703	1.274	1.207	0.75	0.491	0.312	0.445
									109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130
									0.979	0.636	0.474	0.788	0.411	0.217	0.217	1.188	0.969	0.941	0.264	0.759	0.845	0.817	0.693	1.045	0.55	1.007	0.625	0.76	0.922	0.598
									131	132	133	134	135	136	137	138	139	140	141	142	143									
									0.579	0.836	0.912	0.337	0.798	0.112	0.874	0.569	0.398	0.683	0.287	1.112	0.312									
WCDMA B5	RMC12.2K	846.6	4233	N/A	N/A	Back	5mm	1.09	1.287	0.837	1.037	0.211	0.523	0.609	0.809	1.009	0.761	0.266	0.693	0.904	0.818	0.228	0.552	0.39	1.228	0.555	1.133	0.237	0.466	1.19
									21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
									0.133	0.447	0.931	0.637	0.771	0.075	0.456	0.504	0.723	0.944	0.733	0.904	0.771	0.599	0.085	0.723	0.524	0.171	1.237	0.914	0.504	0.38
									43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
									0.209	0.145	0.237	0.561	0.266	0.104	0.618	0.18	1.128	1.278	0.304	0.399	0.199	1.199	0.361	0.705	0.723	0.114	0.799	0.809	0.828	0.733
									65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
									0.193	0.618	1.095	0.523	0.428	0.79	0.352	0.609	0.685	0.99	0.437	0.066	0.475	1.066	0.699	0.352	0.171	0.561	1.199	0.123	0.742	0.874
									87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108
									0.647	0.209	0.152	0.885	0.437	0.475	0.733	1.18	0.628	0.218	0.428	0.856	0.352	0.308	0.456	0.999	0.837	0.752	1.228	1.19	0.043	0.933
									109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130
									0.066	1.266	0.866	1.066	1.009	0.031	0.304	0.275	0.228	0.447	1.047	1.066	0.884	0.228	0.799	0.656	0.942	0.085	0.704	0.563	1.228	0.818
									131	132	133	134	135	136	137	138	139	140	141	142	143									
									0.856	0.875	0.199	0.447	0.499	1.009	0.618	0.447	1.095	1.209	0.533	0.461	1.161									
LTE B2	QPSK	1860	18700	100	0	Bottom Side	5mm	1.13	1.29	0.355	1.174	1.145	0.549	1.25	0.888	0.288	0.612	1.193	0.555	0.941	0.583	1.269	0.069	0.25	0.812	1.174	0.818	0.555	0.736	0.317
									21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
									0.088	0.888	1.088	1.058	0.098	1.107	0.698	1.221	1.269	1.098	1.235	1.05	0.621	0.631	1.221	1.269	0.698	1.259	0.793	1.183	0.136	1.117
									43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
									0.907	0.126	0.599	0.869	0.755	0.183	0.84	0.078	0.907	1.217	0.555	0.564	0.602	0.317	0.507	1.231	1.113	0.202	0.726	0.393	1.283	1.155
									65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
									0.688	1.201	0.688	0.659	1.126	1.269	0.25	0.488	0.852	0.117	0.088	0.745	0.878	0.917	1.212	1.289	0.145	1.05	0.831	0.821	0.298	1.231
									87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108
									1.201	0.526	1.098	0.288	0.126	0.45	0.612	1.149	0.136	0.269	0.336	1.145	1.155	0.926	1.276	0.107	1.078	1.288	0.488	0.745	0.355	1.045
									109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130
									0.831	0.612	0.983	1.259	0.478	0.374	1.134	0.621	1.155	1.259	0.698	1.031	0.802	0.393	0.25	0.831	0.402	0.326	0.878	0.993	1.243	0.564
									131	132	133	134	135	136	137	138	139	140	141	142	143									
									0.326	1.126	0.917	0.936	0.136	1.144	0.212	0.098	0.859	0.488	1.25	0.107	1.056									



Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																					
									Auto-Tune	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
LTE B5	QPSK	836.5	20525	1	25	Back	5mm	1.04	1.282	1.223	0.394	0.223	0.27	0.341	1.118	1.109	0.08	0.423	0.89	1.109	0.985	0.213	0.347	0.87	0.49	0.832	0.242	0.809	1.223	0.099
									21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
									0.461	0.48	0.728	0.718	0.065	0.909	1.223	0.956	0.223	0.756	0.804	0.881	0.223	0.851	1.156	0.347	0.699	1.251	0.619	0.423	1.232	0.728
									43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
									0.28	0.337	0.328	0.623	0.08	0.756	0.099	0.47	0.499	1.275	0.195	1.109	0.413	1.147	0.547	0.728	0.261	1.015	0.556	0.509	0.451	1.09
									65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
									0.366	1.185	0.824	1.061	0.175	0.88	1.213	0.842	0.451	0.097	0.28	0.67	0.518	0.994	1.004	1.118	0.075	0.899	1.27	1.166	1.242	0.242
									87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108
									0.594	1.088	0.518	0.966	1.042	0.642	1.09	0.518	0.795	0.28	0.109	0.642	1.213	0.556	0.575	0.827	1.166	0.956	0.49	1.032	0.709	0.928
									109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130
									0.162	0.728	1.051	0.899	0.832	0.918	0.47	0.337	0.27	0.585	0.661	0.242	0.947	0.47	0.091	0.29	0.556	0.47	0.432	0.937	0.347	0.515
									131	132	133	134	135	136	137	138	139	140	141	142	143									
0.413	0.137	0.718	0.651	0.623	1.166	0.012	0.585	1.175	0.775	0.604	0.518	0.985																		
LTE B4/B66	QPSK	1720	132072	1	0	Bottom Side	5mm	1.09	1.115	1.065	0.827	0.608	0.799	0.875	0.408	0.644	0.675	0.189	0.865	0.227	0.494	0.246	0.667	0.523	0.38	1.037	0.675	0.361	0.627	0.799
									21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
									0.38	0.237	1.094	1.113	0.57	0.837	1.076	0.123	0.084	0.265	0.199	0.599	0.37	0.585	0.475	0.675	1.065	0.856	0.113	0.103	0.612	0.627
									43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
									0.913	0.589	0.732	0.475	0.732	0.888	0.98	0.256	0.875	0.732	0.999	0.123	0.766	0.123	0.427	0.675	0.218	0.723	0.751	0.915	0.523	0.542
									65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
									0.884	0.389	0.284	0.284	0.526	0.065	0.703	0.094	0.399	0.484	0.094	0.528	0.551	0.837	0.056	0.094	0.399	0.323	0.685	0.275	0.57	1.094
									87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108
									0.961	0.97	0.37	0.551	0.665	0.884	0.189	0.532	0.465	0.056	0.744	0.723	0.799	1.065	0.799	1.084	1.037	0.419	1.037	1.027	0.103	0.884
									109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130
									0.846	0.875	0.359	0.561	0.094	0.818	0.323	0.542	0.751	0.569	0.551	0.37	0.484	0.961	0.351	0.913	0.473	1.094	0.694	0.523	0.399	0.275
									131	132	133	134	135	136	137	138	139	140	141	142	143									
1.101	0.569	0.97	0.77	0.161	1.027	0.732	0.751	0.326	0.627	0.846	0.38	0.932																		

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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  $\leq 30\%$ , 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 248227 D01 v02r02, "SAR Guidance for IEEE 802.11 (WiFi) Transmitters", Oct 2015.
- [6] FCC KDB 447498 D01 v06, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", Oct 2015
- [7] FCC KDB 648474 D04 v01r03, "SAR Evaluation Considerations for Wireless Handsets", Oct 2015.
- [8] FCC KDB 941225 D01 v03r01, "3G SAR MEAUREMENT PROCEDURES", Oct 2015
- [9] FCC KDB 941225 D05 v02r05, "SAR Evaluation Considerations for LTE Devices", Dec 2015
- [10] FCC KDB 941225 D05A v01r02, "Rel. 10 LTE SAR Test Guidance and KDB Inquiries", Oct 2015
- [11] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.
- [12] FCC KDB 941225 D07 v01r02, " SAR Evaluation Procedures for UMPC Mini-Tablet Devices", Oct 2015.
- [13] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.
- [14] FCC KDB 865664 D02 v01r02, "RF Exposure Compliance Reporting and Documentation Considerations" Oct 2015.