

FCC SAR Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : XT1955-2
FCC ID : IHDT56XQ3
STANDARD : FCC 47 CFR Part 2 (2.1093)
ANSI/IEEE C95.1-1992
IEEE 1528-2013

The product was received on Sep. 06, 2018 and testing was started from Oct. 05, 2018 and completed on Oct. 23, 2018. We, Sporton International (Kunshan) Inc, would like to declare that the tested sample has been evaluated in accordance with the procedures and had been in compliance with the applicable technical standards.

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



Approved by: Mark Qu / Manager



Sporton International (Kunshan) Inc.
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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA890604-02	Rev. 01	Initial issue of report	Oct. 30, 2018



1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Motorola Mobility LLC, Mobile Cellular Phone, XT1955-2**, are as follows.

Highest 1g SAR Summary						
Equipment Class	Frequency Band		Head (Separation 0mm)	Hotspot (Separation 5mm)	Body-worn (Separation 5mm)	Highest Simultaneous Transmission 1g SAR (W/kg)
			1g SAR (W/kg)			
Licensed	GSM	GSM850	0.25	0.49	0.49	1.59
		GSM1900	<0.10	1.37	1.34	
	WCDMA	Band V	0.30	0.50	0.49	
		Band IV	<0.10	1.33	1.37	
		Band II	<0.10	1.32	1.31	
	LTE	Band 5	0.34	0.56	0.55	
		Band 66/Band 4	<0.10	1.38	1.34	
		Band 2	0.11	1.39	1.40	
		Band 7	<0.10	1.41	1.41	
DTS	WLAN	2.4GHz WLAN	0.42	0.24	0.24	1.59
DSS	Bluetooth	2.4GHz Bluetooth	<0.10	<0.10	<0.10	1.43

Highest 10g SAR Summary			
Equipment Class	Frequency Band		Product Specific 10g SAR (W/kg) (Separation 0mm)
Licensed	GSM	GSM1900	2.46
	WCDMA	Band IV	3.45
		Band II	3.47
	LTE	Band 66/Band 4	3.49
		Band 2	3.26
		Band 7	3.49
Date of Testing:		2018/10/5~2018/10/23	
Remark: This device supports both LTE B4 and B66. Since the supported frequency span for LTE B4 falls completely within the supports frequency span for LTE B66, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B66.			

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 4.0 W/kg for Product Specific 10g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications

2. Administration Data

Testing Laboratory	
Test Site	Sporton International (Kunshan) Inc.
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone, Jiangsu Province 215335, China TEL : 86-512-57900158 FAX : 86-512-57900958

Applicant	
Company Name	Motorola Mobility LLC
Address	222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

Manufacturer	
Company Name	Motorola Mobility LLC
Address	222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

3. Guidance Applied

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

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r03
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT1955-2
FCC ID	IHDT56XQ3
IMEI Code	359520090010178/ 359520090010186
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 66: 1710.7 MHz ~ 1779.3 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+(16QAM uplink is not supported) LTE: QPSK, 16QAM, 64QAM WLAN 2.4GHz 802.11b/g/n HT20/HT40 Bluetooth BR/EDR/LE
HW Version	DVT2
SW Version	fastboot_ocean_oem_userdebug_9_PPO29.36_b671_intcfg-test-keys_oem.tar
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
Remark: - This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation. - This device 2.4GHz WLAN support hotspot operation and Bluetooth support BT tethering. - This device does not support DTM operation and supports GRPS/EGRPS mode up to multi-slot class 12. - The device employs proximity sensors that detect the presence of the user's body at the front or back faces of the device. When front or back body worn condition is detected, GSM1900, WCDMA band II/IV, LTE band 2/4/7/66 reduced power will be active. (P-sensor can't work at detecting presence of the user's body at the four edges of the device.) - When hotspot mode is enabled, power reduction will be activated to limit the maximum power of GSM1900, WCDMA band II/IV, LTE band 2/4/7/66. - This device hotspot reduced power and P-sensor reduced power level are the same for LTE Band 7. And for other Bands are differences. - P-sensor can detect handheld state, WCDMA Band II/IV, and LTE Band2/4/66 for front/back/bottom sides of product specific 10g SAR condition reduced powers will be active. - There are two different types of EUT. They are single SIM card mobile and dual SIM card mobile. The others are the same including circuit design, PCB board, structure and all components. It is special to declare. After pre-scan two types of EUT, we found test result of the sample that dual SIM was the worst, so we chose dual SIM card mobile to perform all tests. - For dual SIM card mobile has two SIM slots and supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (single active). After pre-scan two SIM cards power, we found test result of the SIM1 was the worse, so we chose SIM1 slot to perform all tests.	

4.2 Specification of Accessory

Specification of Accessory				
AC Adapter 1 (US)	Brand Name	Motorola(Salom)	Model Name	SC-51
	Power Rating	I/P: 100 - 240 Vac, 0.6A, O/P: 5Vdc -3000mA; 9Vdc -2000mA;12Vdc -1500mA		
AC Adapter 1 (EU)	Brand Name	Motorola(Salom)	Model Name	SC-52
	Power Rating	I/P: 100 - 240 Vac, 0.6A, O/P: 5Vdc -3000mA; 9Vdc -2000mA;12Vdc -1500mA		
AC Adapter 1 (AR)	Brand Name	Motorola(Salom)	Model Name	SC-56
	Power Rating	I/P: 100 - 240 Vac, 0.6A, O/P: 5Vdc -3000mA; 9Vdc -2000mA;12Vdc -1500mA		
AC Adapter 2 (US)	Brand Name	Motorola(Chenyang)	Model Name	SC-51
	Power Rating	I/P: 100 - 240 Vac, 0.6A, O/P: 5Vdc -3000mA; 9Vdc -2000mA;12Vdc -1500mA		
AC Adapter 2 (EU)	Brand Name	Motorola(Chenyang)	Model Name	SC-52
	Power Rating	I/P: 100 - 240 Vac, 0.6A, O/P: 5Vdc -3000mA; 9Vdc -2000mA;12Vdc -1500mA		
AC Adapter 2 (AR)	Brand Name	Motorola(Chenyang)	Model Name	SC-56
	Power Rating	I/P: 100 - 240 Vac, 0.6A, O/P: 5Vdc -3000mA; 9Vdc -2000mA;12Vdc -1500mA		
Earphone	Brand Name	Motorola(Lianyun)	Model Name	LYM500B-36C-003
	Signal Line	1.2 meter, non-shielded cable, without ferrite core		
USB Cable	Brand Name	Motorola(Saibao)	Model Name	711310002491
	Signal Line	1.0 meter, shielded cable, without ferrite core		
Battery	Brand Name	Motorola (SCUD)	Model Name	JK50
	Power Rating	3.8Vdc,5000mAh	Type	Li-ion

4.3 General LTE SAR Test and Reporting Considerations

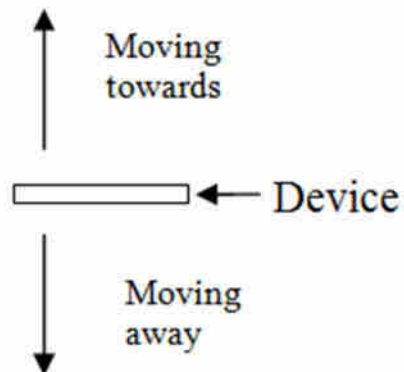
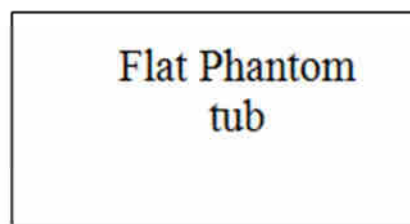
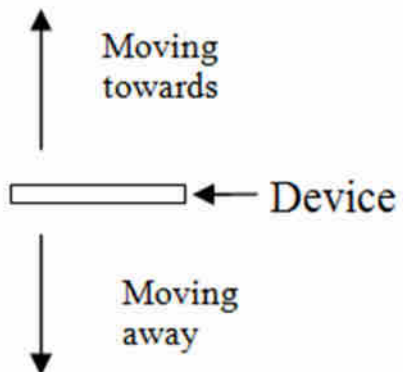
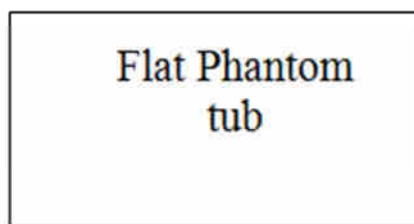
Summarized necessary items addressed in KDB 941225 D05 v02r05																																																																													
FCC ID	IHDT56XQ3																																																																												
Equipment Name	Mobile Cellular Phone																																																																												
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 66: 1710.7 MHz ~ 1779.3 MHz																																																																												
Channel Bandwidth	LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz																																																																												
uplink modulations used	QPSK / 16QAM / 64QAM																																																																												
LTE Voice / Data requirements	Voice and Data																																																																												
LTE Release Version	R10, Cat5																																																																												
CA Support	Not Supported																																																																												
LTE MPR permanently built-in by design	<table><tr><th colspan="8">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</th></tr><tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr><tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr><tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr><tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr><tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr><tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr></table>							Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3								Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2	64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3	256 QAM	≥ 1						≤ 5
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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 1. The device employs proximity sensors that detect the presence of the user's body at the front or back faces of the device. When front or back body worn condition is detected, GSM1900, WCDMA band II/IV, LTE band 2/4/7/66 reduced power will be active. (P-sensor can't work at detecting presence of the user's body at the four edges of the device.) 2. When hotspot mode is enabled, power reduction will be activated to limit the maximum power of GSM1900, WCDMA band II/IV, LTE band 2/4/7/66. 3. P-sensor can detect handheld state, WCDMA Band II/IV, and LTE Band2/4/66 for front/back/bottom sides of product specific 10g SAR condition reduced powers will be active.																																																																												

Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745
LTE Band 5												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829	20475	831.5	20500	834
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844	20575	841.5	20550	838
LTE Band 7												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz		Bandwidth 25 MHz		Bandwidth 30 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510	20875	2512.5	20900	2515
M	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560	21325	2557.5	21300	2555
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

5. Proximity Sensor Triggering Test

5.1 Proximity sensor triggering distances(Per KDB616217§6.2)

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 (1750MHz) frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensor placed coincident with antenna elements at the bottom end of the phone are utilized to determine when the device comes in proximity of the user's body at the front or back side surface of the device. There is no need to do sensor coverage testing for the proximity sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the proximity sensor entirely covers the antenna.
3. The device employs proximity sensors that detect the presence of the user's body at the front or back faces of the device. When front or back body worn condition is detected, GSM1900, WCDMA band II/IV, LTE band 2/4/7/66 reduced power will be active. (P-sensor can't work at detecting presence of the user's body at the four edges of the device.)
4. P-sensor can detect handheld state, WCDMA Band II/IV, and LTE Band2/4/66 for front/back/bottom sides of product specific 10g SAR condition reduced powers will be active.



Sensor/handheld detection test set-up, front and back faces

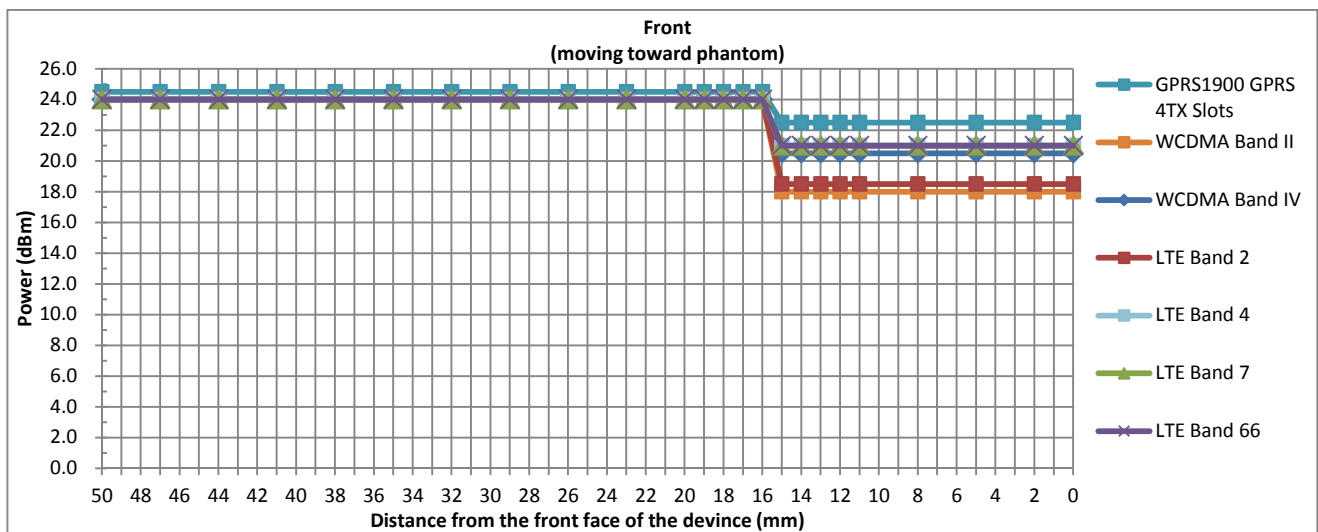
handheld detection test set-up, bottom side

<P-Sensor>

Proximity Sensor Triggering Distance (mm)				
Position	Front		Back	
	Moving towards	Moving away	Moving towards	Moving away
Minimum	15	16	17	19

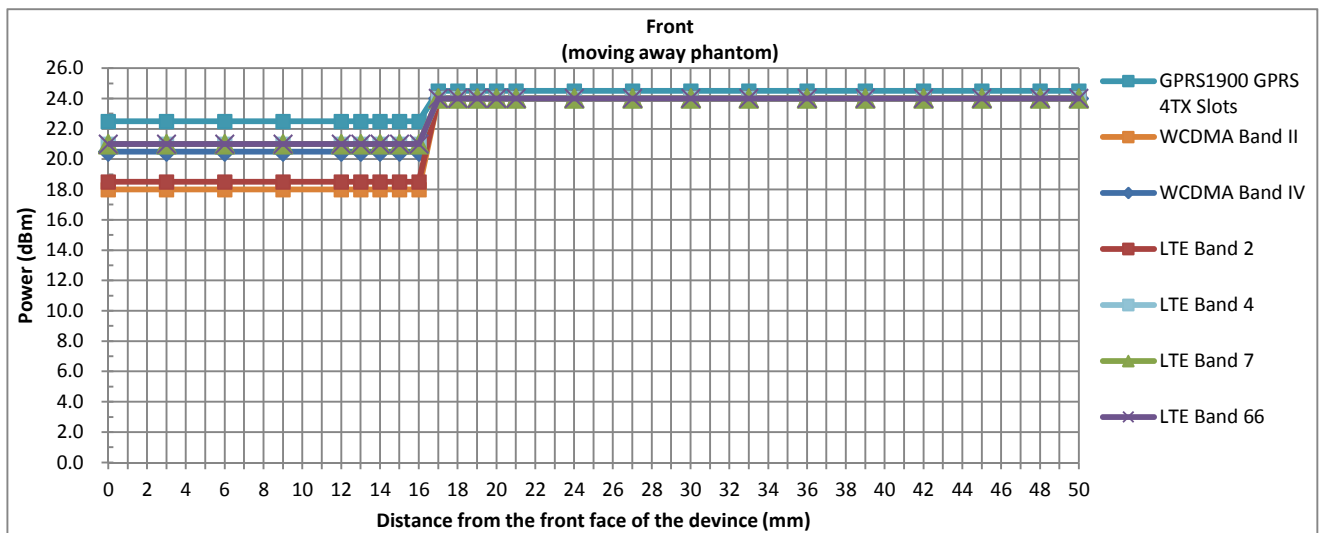
TX. Band	Proximity Sensor Triggering Power (dBm)		
	Full	Reduced	power reduction (dB)
	max. tune up limit (dBm)	max. tune up limit(dBm)	
GSM1900 GPRS 4Tx slots	24.5	22.5	2
WCDMA Band II	24	18	6
WCDMA Band IV	24	20.5	3.5
LTE Band2	24	18.5	6.5
LTE Band4	24	21	3
LTE Band7	24	21	3
LTE Band66	24	21	3

Proximity Sensor Triggering Distance (mm) and Triggering Power (dBm)																									
Front																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
GSM1900 GPRS 4 Tx slots	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21
LTE Band7	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21
LTE Band66	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21

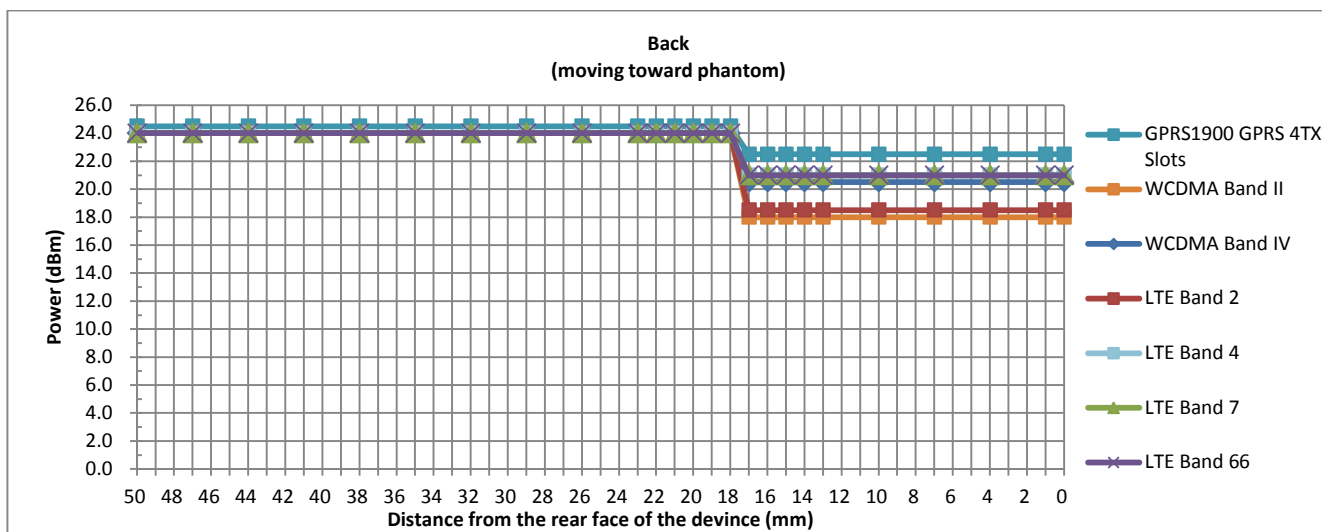




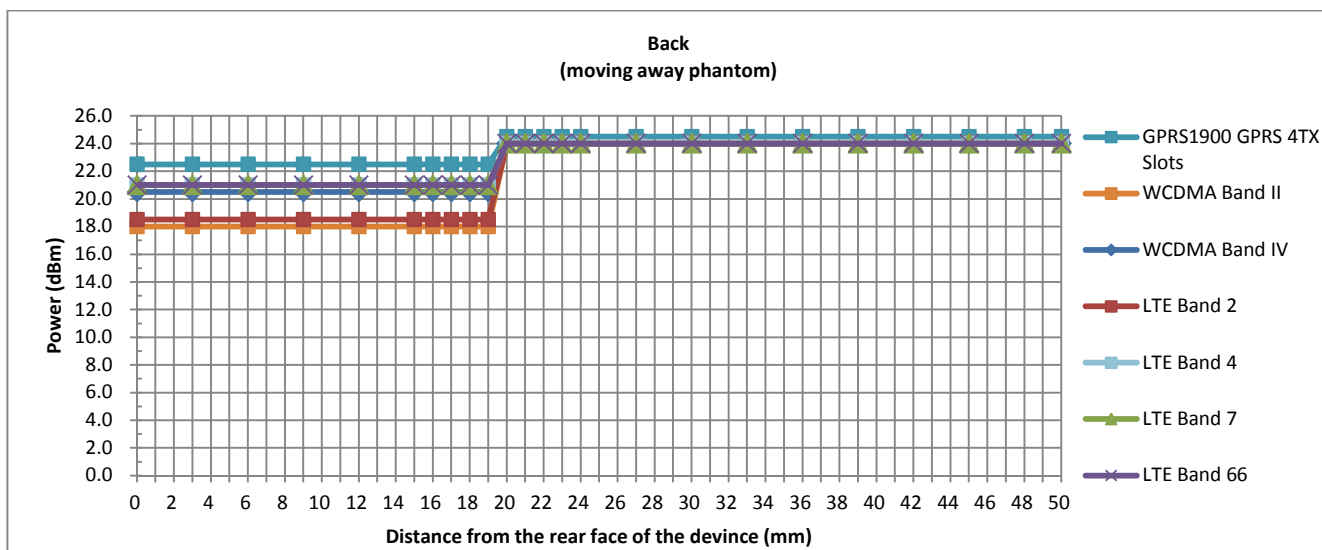
Proximity Sensor Triggering Distance (mm) and Triggering Power (dBm)																									
Front																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
GSM1900 GPRS 4 Tx slots	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21
LTE Band7	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21
LTE Band66	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21



Proximity Sensor Triggering Distance (mm) and Triggering Power (dBm)																									
Back																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
GSM1900 GPRS 4 Tx slots	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	24	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	24	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21	21
LTE Band7	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21	21
LTE Band66	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21	21



Proximity Sensor Triggering Distance (mm) and Triggering Power (dBm)																									
Back																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
GSM1900 GPRS 4 Tx slots	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18	18	18
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21	21	21	21
LTE Band7	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21	21	21	21
LTE Band66	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21	21	21	21

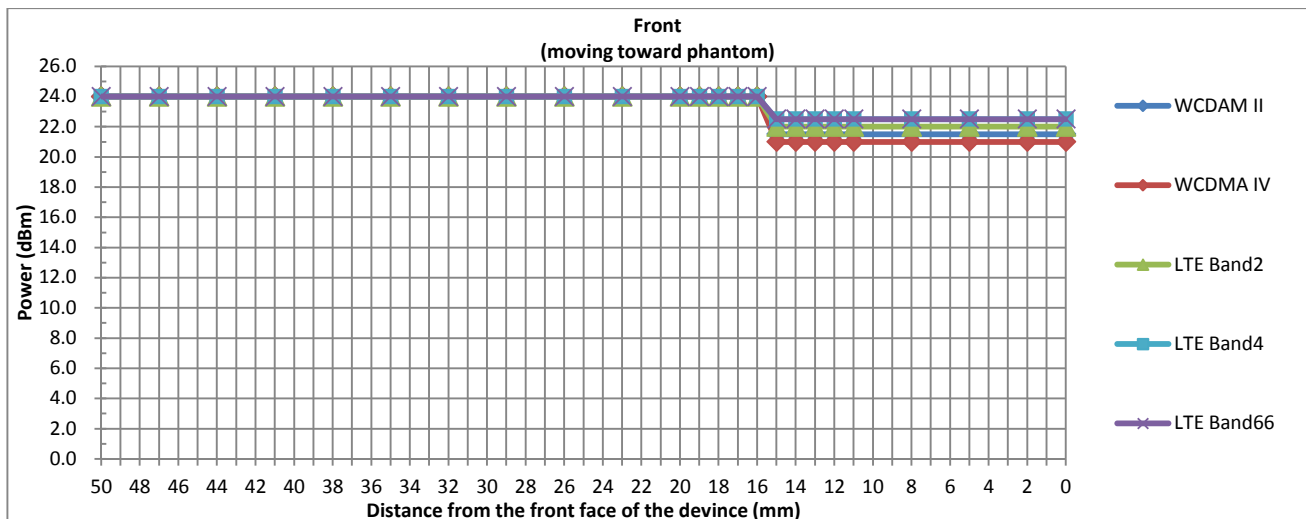


<Handheld>

Handheld Triggering Distance (mm)						
Position	Front		Back		Bottom Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	15	16	15	16	18	19

TX. Band	Handheld Triggering Power (dBm)		
	Full	Reduced	power reduction (dB)
	max. tune up limit (dBm)	max. tune up limit(dBm)	
WCDMA Band II	24	21.5	2.5
WCDMA Band IV	24	21	3
LTE Band2	24	22	2
LTE Band4	24	22.5	1.5
LTE Band66	24	22.5	1.5

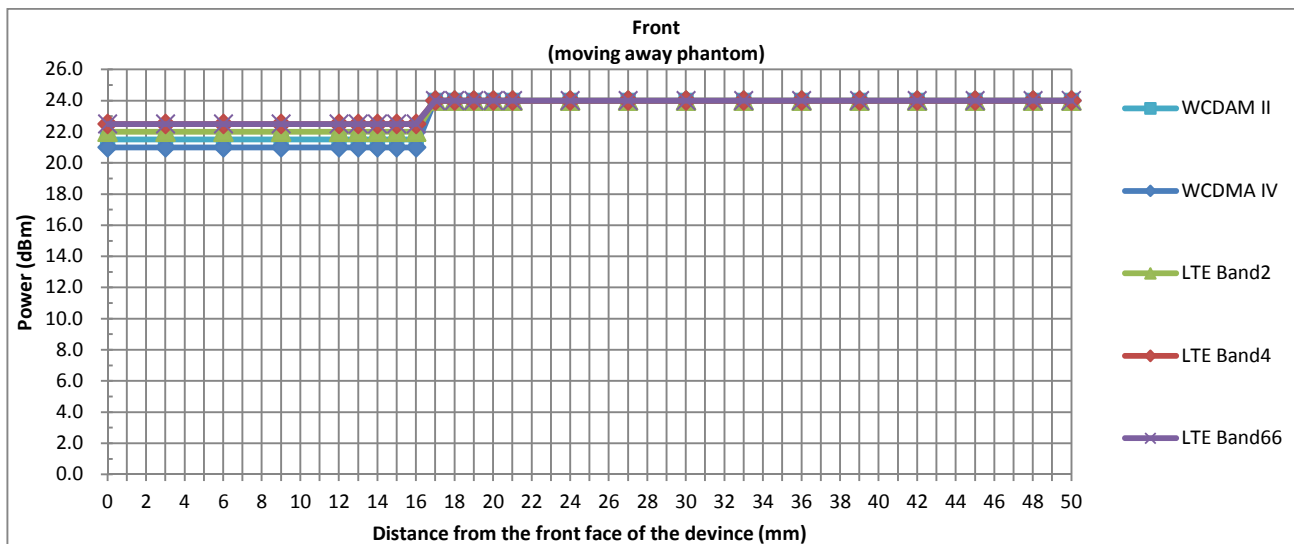
Handheld Triggering Distance (mm) and Triggering Power (dBm)																									
Front																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	22	22	22	22	22	22	22	22	22
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
LTE Band66	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5





Handheld Triggering Distance (mm) and Triggering Power (dBm)

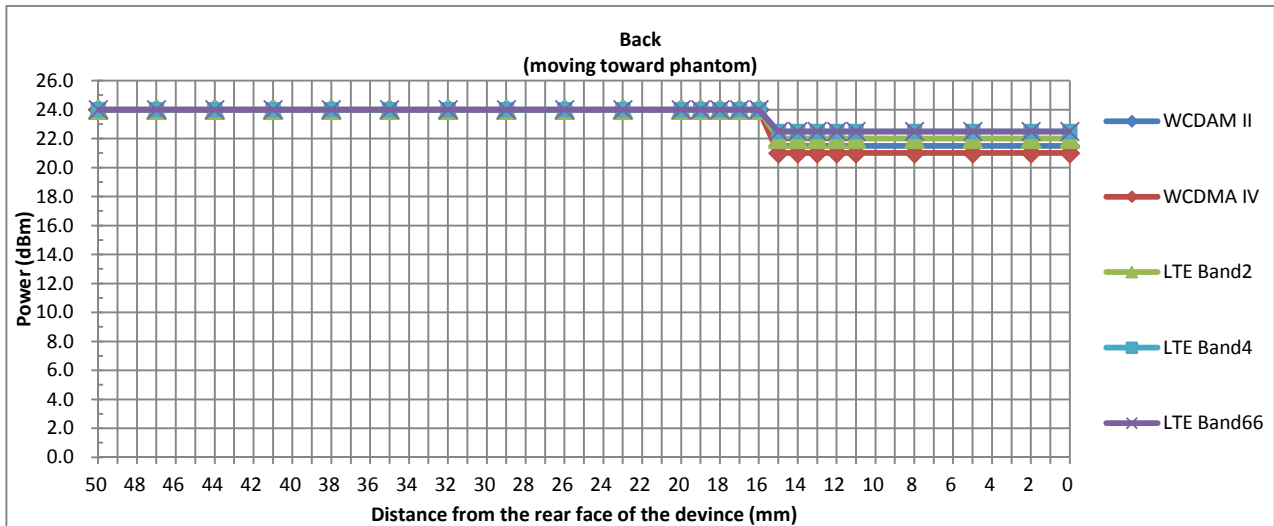
Front																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	22	22	22	22	22	22	22	22	22	22
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
LTE Band66	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5





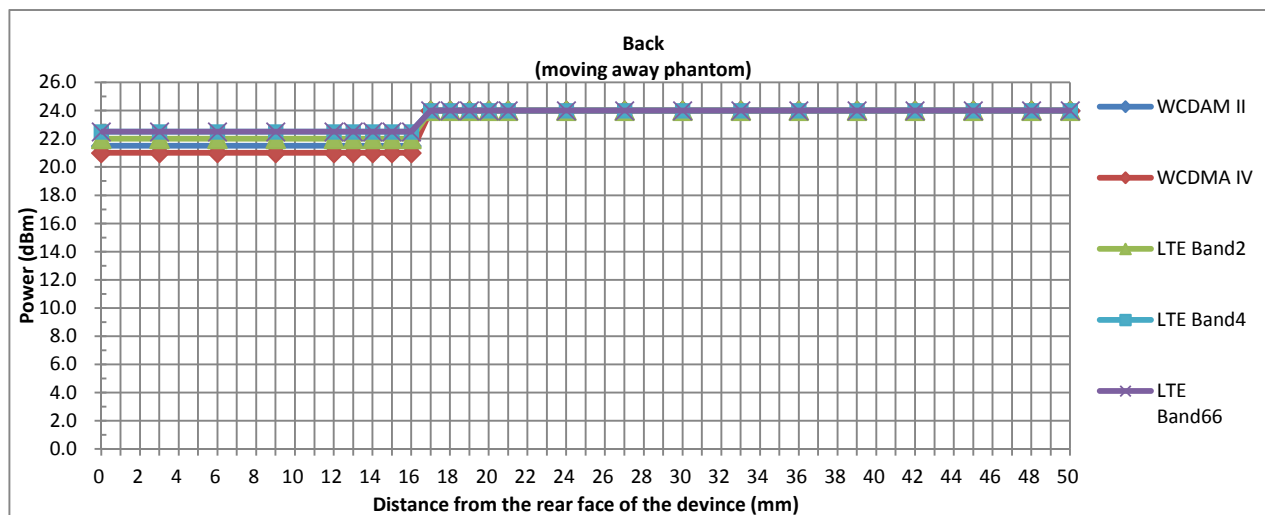
Handheld Triggering Distance (mm) and Triggering Power (dBm)

Back																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	22	22	22	22	22	22	22	22	22
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
LTE Band66	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5





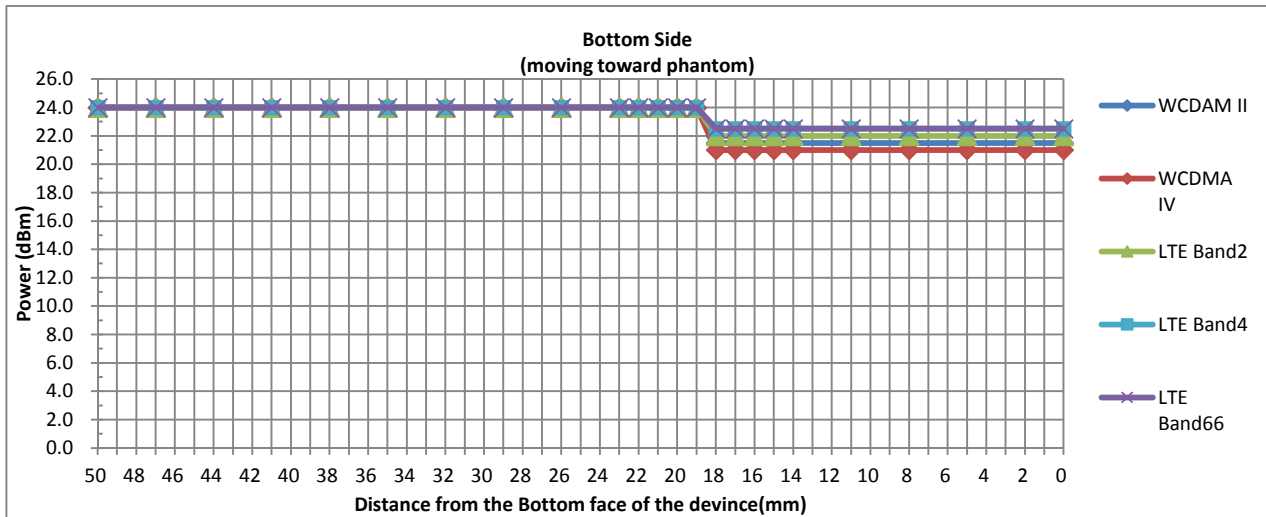
Handheld Triggering Distance (mm) and Triggering Power (dBm)																									
Back																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	22	22	22	22	22	22	22	22	22	22
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
LTE Band66	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5



Handheld Triggering Distance (mm) and Triggering Power (dBm)

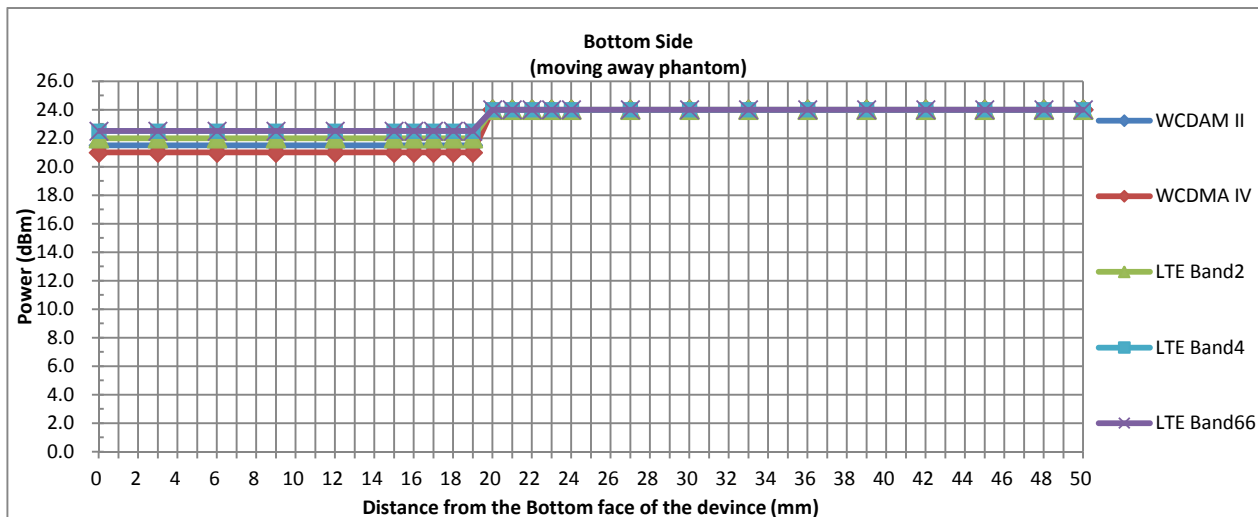
Bottom Side

Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21	21	21
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	22	22	22	22	22	22	22	22	22	22	22	22	22
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
LTE Band66	24	24	24	24	24	24	24	24	24	24	24	24	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5





Handheld Triggering Distance (mm) and Triggering Power (dBm)																									
Bottom Side																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21	21	21	21
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	22	22	22	22	22	22	22	22	22	22	22	22	22	22
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
LTE Band66	24	24	24	24	24	24	24	24	24	24	24	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5



6. RF Exposure Limits

6.1 Uncontrolled Environment

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

6.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

7. Specific Absorption Rate (SAR)

7.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

7.2 SAR Definition

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

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

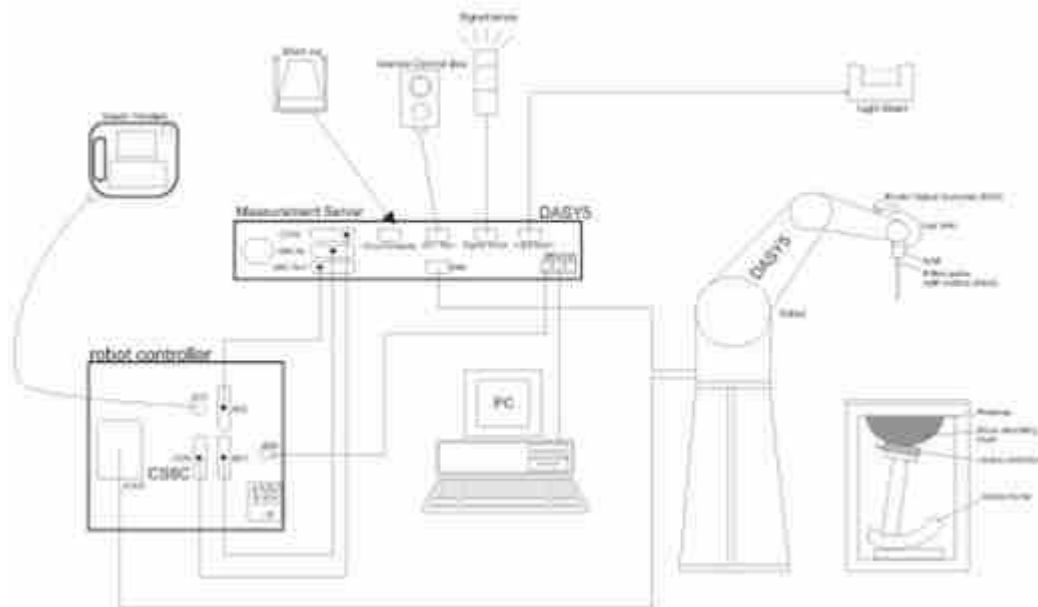
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

8. System Description and Setup

The 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.

8.1 E-Field Probe

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

<ES3DV3 Probe>

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

<EX3DV4 Probe>

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

8.2 Data Acquisition Electronics (DAE)

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

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



Photo of DAE

8.3 Phantom

<SAM Twin Phantom>

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

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

<ELI Phantom>

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

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

8.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

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



Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

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

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



Mounting Device for Laptops

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

9.1 Spatial Peak SAR Evaluation

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

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

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

- (a) Extraction of the measured data (grid and values) from the Zoom Scan
- (b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
- (c) Generation of a high-resolution mesh within the measured volume
- (d) Interpolation of all measured values 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

9.2 Power Reference Measurement

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

9.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB) 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	$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: Δx_{Area} , Δy_{Area}	≤ 2 GHz: ≤ 15 mm $2 - 3$ GHz: ≤ 12 mm	$3 - 4$ GHz: ≤ 12 mm $4 - 6$ GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

9.4 Zoom Scan

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

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

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

9.5 Volume Scan Procedures

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

9.6 Power Drift Monitoring

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

10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	835MHz System Validation Kit	D835V2	4d091	2017/12/5	2018/12/4
SPEAG	1750MHz System Validation Kit	D1750V2	1069	2017/12/5	2018/12/4
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	2017/12/6	2018/12/5
SPEAG	2450MHz System Validation Kit	D2450V2	840	2017/12/7	2018/12/6
SPEAG	2600MHz System Validation Kit	D2600V2	1061	2017/12/7	2018/12/6
SPEAG	Data Acquisition Electronics	DAE4	1358	2018/4/19	2019/4/18
SPEAG	Data Acquisition Electronics	DAE4	1210	2018/5/28	2019/5/27
SPEAG	Dosimetric E-Field Probe	EX3DV4	3857	2018/5/31	2019/5/30
SPEAG	Dosimetric E-Field Probe	EX3DV4	3954	2018/1/31	2019/1/30
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1754	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1503	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1697	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201563900	2018/1/26	2019/1/25
Agilent	Wireless Communication Test Set	E5515C	MY52102706	2018/4/17	2019/4/16
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	2018/4/17	2019/4/16
SPEAG	Dielectric Probe Kit	DAK-3.5	1138	2017/11/28	2018/11/27
Anritsu	Vector Signal Generator	MG3710A	6201682672	2018/2/6	2019/2/5
Rohde & Schwarz	Power Meter	NRVD	102081	2018/8/20	2019/8/19
Rohde & Schwarz	Power Sensor	NRV-Z5	100538	2018/8/20	2019/8/19
Rohde & Schwarz	Power Sensor	NRV-Z5	100539	2018/8/20	2019/8/19
R&S	CBT BLUETOOTH TESTER	CBT	101246	2018/1/26	2019/1/25
EXA	Spectrum Analyzer	FSV7	101632	2018/1/26	2019/1/25
Testo	Thermometer	608-H1	1241332126	2018/8/21	2019/8/20
FLUKE	DIGITAC THERMOMETER	51II	97240029	2018/8/3	2019/8/2
ARRA	Power Divider	A3200-2	N/A	Note	
MCL	Attenuation1	BW-S10W5+	N/A	Note	
MCL	Attenuation2	BW-S10W5+	N/A	Note	
MCL	Attenuation3	BW-S10W5+	N/A	Note	
Agilent	Dual Directional Coupler	778D	20500	Note	
Agilent	Dual Directional Coupler	11691D	MY48151020	Note	
BONN	POWER AMPLIFIER	BLMA 0830-3	087193A	Note	
BONN	POWER AMPLIFIER	BLMA 2060-2	087193B	Note	

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.

11. System Verification

11.1 Tissue Simulating Liquids

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

11.2 Tissue Verification

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

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (ϵ_r)
For Head								
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0
For Body								
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7
2600	68.1	0	0	0.1	0	31.8	2.16	52.5

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ϵ_r)	Conductivity Target (σ)	Permittivity Target (ϵ_r)	Delta (σ) (%)	Delta (ϵ_r) (%)	Limit (%)	Date
835	Head	22.8	0.914	42.773	0.90	41.50	1.56	3.07	±5	2018/10/5
1750	Head	22.8	1.345	41.143	1.37	40.10	-1.82	2.60	±5	2018/10/10
1900	Head	22.7	1.424	39.918	1.40	40.00	1.71	-0.21	±5	2018/10/11
2450	Head	22.7	1.863	38.471	1.80	39.20	3.50	-1.86	±5	2018/10/23
2600	Head	22.6	2.040	37.884	1.96	39.00	4.08	-2.86	±5	2018/10/11
835	Body	22.7	0.990	55.273	0.97	55.20	2.06	0.13	±5	2018/10/6
1750	Body	22.6	1.444	54.472	1.49	53.40	-3.09	2.01	±5	2018/10/16
1900	Body	22.7	1.519	53.914	1.52	53.30	-0.07	1.15	±5	2018/10/17
2450	Body	22.7	2.012	54.301	1.95	52.70	3.18	3.04	±5	2018/10/23
2600	Body	22.7	2.217	52.515	2.16	52.50	2.64	0.03	±5	2018/10/20

11.3 System Performance Check Results

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

<1g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2018/10/5	835	Head	250	4d091	3857	1358	2.45	9.48	9.8	3.38
2018/10/10	1750	Head	250	1069	3954	1210	8.82	37.00	35.28	-4.65
2018/10/11	1900	Head	250	5d118	3954	1210	9.21	39.70	36.84	-7.20
2018/10/23	2450	Head	250	840	3954	1210	13.90	52.60	55.6	5.70
2018/10/11	2600	Head	250	1061	3954	1210	13.80	58.20	55.2	-5.15
2018/10/6	835	Body	250	4d091	3857	1358	2.32	9.72	9.28	-4.53
2018/10/16	1750	Body	250	1069	3954	1210	8.78	38.00	35.12	-7.58
2018/10/17	1900	Body	250	5d118	3954	1210	9.50	40.40	38	-5.94
2018/10/23	2450	Body	250	840	3954	1210	13.90	51.90	55.6	7.13
2018/10/20	2600	Body	250	1061	3954	1210	14.60	56.40	58.4	3.55

<10g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2018/10/16	1750	Body	250	1069	3954	1210	4.77	20.30	19.08	-6.01
2018/10/17	1900	Body	250	5d118	3954	1210	4.94	21.10	19.76	-6.35
2018/10/20	2600	Body	250	1061	3954	1210	6.57	25.00	26.28	5.12

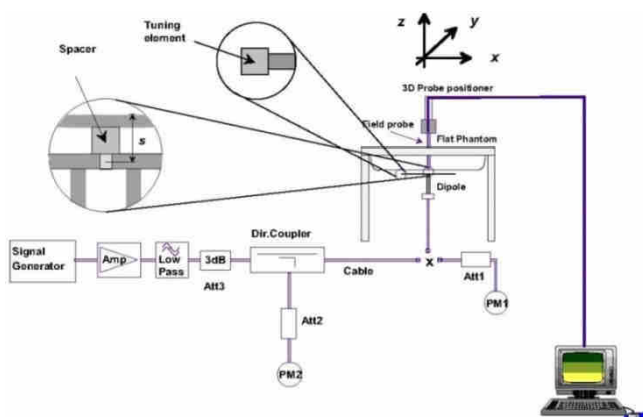


Fig 8.3.1 System Performance Check Setup



Fig 8.3.2 Setup Photo

12. RF Exposure Positions

12.1 Ear and handset reference point

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

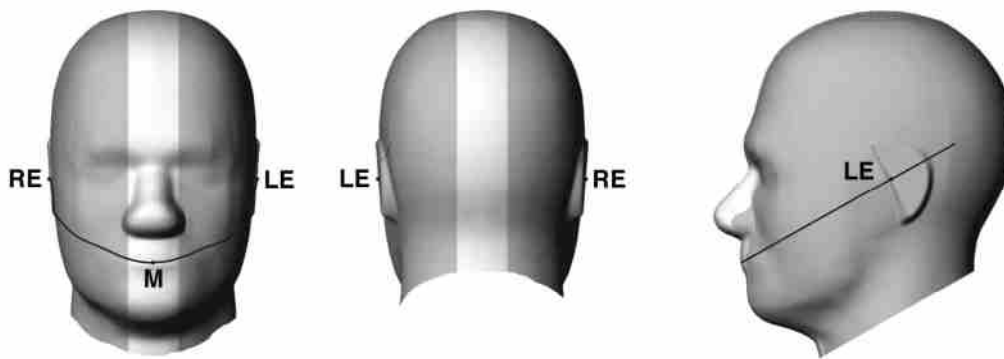


Fig 12.1.1 Front, back, and side views of SAM twin phantom

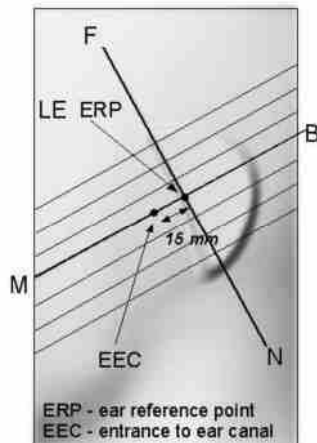


Fig 12.1.2 Close-up side view of phantom showing the ear region.

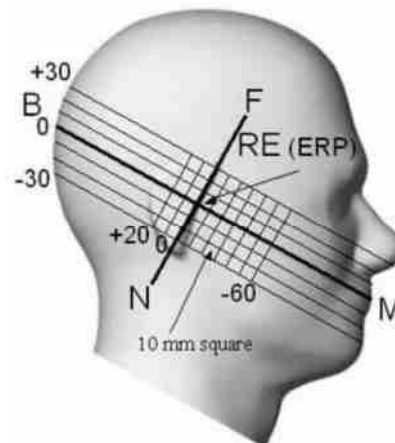


Fig 12.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

12.2 Definition of the cheek position

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

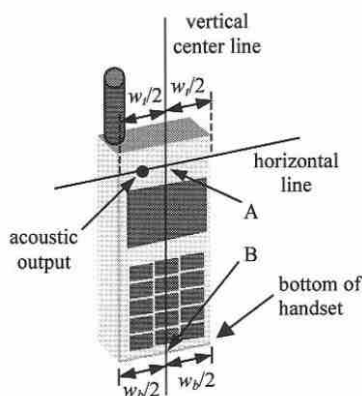


Fig 12.2.1 Handset vertical and horizontal reference lines—"fixed case"

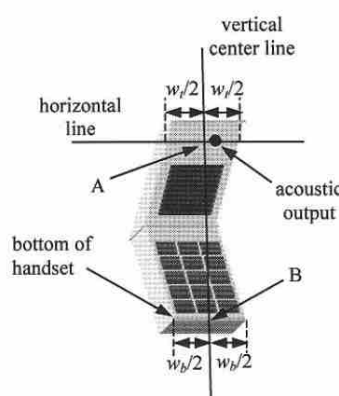


Fig 12.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

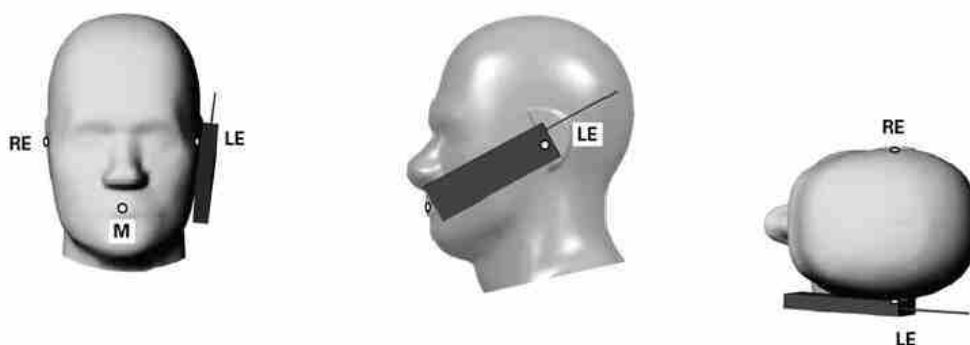


Fig 12.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

12.3 Definition of the tilt position

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

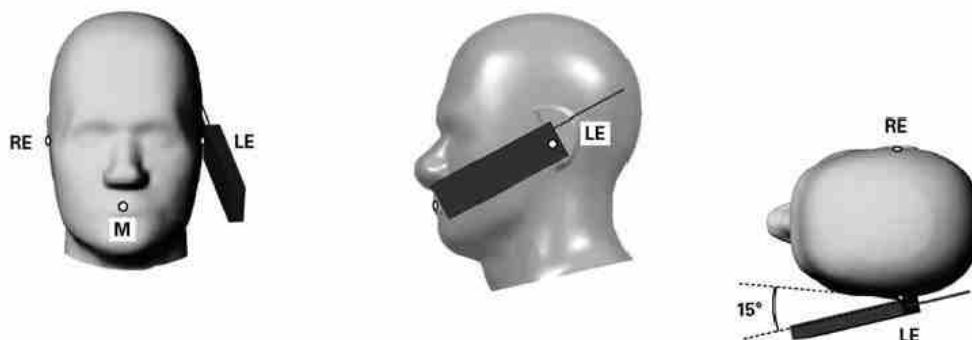


Fig 12.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

12.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 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 $> 1.2 \text{ W/kg}$, 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) only the accessory that dictates the closest spacing to the body is tested.

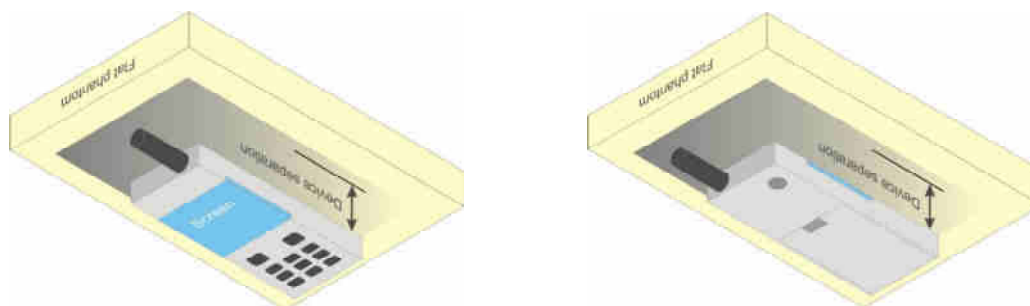


Fig 12.4 Body Worn Position

12.5 Product Specific 10g SAR Exposure

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that 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 ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions.6 The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

12.6 Wireless Router

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v02r01 where SAR test considerations for handsets ($L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$) 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.

13. 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 4Tx slots for GSM850/GSM1900 are 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.
4. Power reduction which is triggered by hotspot mode/p-sensor on are implemented in 1900 band, for SAR testing EUT was set in reduced power mode and GPRS 4 Tx slots due to its highest frame-average power.

<Full Power Mode>

GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
Tx Channel	128	189	251		128	189	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GSM 1 Tx slot	33.30	33.41	33.32	33.50	24.30	24.41	24.32	24.50
GPRS 1 Tx slot	33.32	33.40	33.31	33.50	24.32	24.40	24.31	24.50
GPRS 2 Tx slots	30.18	30.14	30.21	30.50	24.18	24.14	24.21	24.50
GPRS 3 Tx slots	28.37	28.29	28.45	28.75	24.11	24.03	24.19	24.49
GPRS 4 Tx slots	26.72	26.76	26.82	27.50	23.72	23.76	23.82	24.50
EDGE 1 Tx slot	27.19	27.22	27.24	28.00	18.19	18.22	18.24	19.00
EDGE 2 Tx slots	27.05	27.02	27.10	28.00	21.05	21.02	21.10	22.00
EDGE 3 Tx slots	25.34	25.37	25.34	26.25	21.08	21.11	21.08	21.99
EDGE 4 Tx slots	23.90	23.90	23.96	25.00	20.90	20.90	20.96	22.00

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.

The calculated method are shown as below:

Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB

Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB

Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB

Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
Tx Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	29.99	29.96	29.96	30.50	20.99	20.96	20.96	21.50
GPRS 1 Tx slot	29.98	29.94	29.95	30.50	20.98	20.94	20.95	21.50
GPRS 2 Tx slots	26.57	26.54	26.94	27.50	20.57	20.54	20.94	21.50
GPRS 3 Tx slots	24.79	24.71	24.77	25.75	20.53	20.45	20.51	21.49
GPRS 4 Tx slots	23.53	23.51	23.56	24.50	20.53	20.51	20.56	21.50
EDGE 1 Tx slot	26.14	26.03	25.96	27.00	17.14	17.03	16.96	18.00
EDGE 2 Tx slots	25.97	25.97	25.92	27.00	19.97	19.97	19.92	21.00
EDGE 3 Tx slots	24.26	24.18	24.28	25.25	20.00	19.92	20.02	20.99
EDGE 4 Tx slots	22.94	22.85	22.90	24.00	19.94	19.85	19.90	21.00

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.

The calculated method are shown as below:

Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB

Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB

Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB

Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

<Reduced Power Mode for P-Sensor On >

GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
Tx Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	28.32	28.28	28.46	28.50	19.32	19.28	19.46	19.50
GPRS 1 Tx slot	28.31	28.27	28.44	28.50	19.31	19.27	19.44	19.50
GPRS 2 Tx slots	25.12	25.01	25.22	25.50	19.12	19.01	19.22	19.50
GPRS 3 Tx slots	23.24	23.17	23.31	23.75	18.98	18.91	19.05	19.49
GPRS 4 Tx slots	21.84	21.84	21.98	22.50	18.84	18.84	18.98	19.50
EDGE 1 Tx slot	25.77	25.66	25.87	27.00	16.77	16.66	16.87	18.00
EDGE 2 Tx slots	24.44	24.30	24.50	25.50	18.44	18.30	18.50	19.50
EDGE 3 Tx slots	22.58	22.43	22.61	23.75	18.32	18.17	18.35	19.49
EDGE 4 Tx slots	21.15	21.11	21.24	22.50	18.15	18.11	18.24	19.50

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.

The calculated method are shown as below:

Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB

Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB

Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB

Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

<Reduced Power Mode for Hotspot On >

GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
Tx Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	26.58	26.50	26.66	27.00	17.58	17.50	17.66	18.00
GPRS 1 Tx slot	26.56	26.49	26.65	27.00	17.56	17.49	17.65	18.00
GPRS 2 Tx slots	23.59	23.59	23.75	24.00	17.59	17.59	17.75	18.00
GPRS 3 Tx slots	21.74	21.82	21.84	22.25	17.48	17.56	17.58	17.99
GPRS 4 Tx slots	20.35	20.37	20.50	21.00	17.35	17.37	17.50	18.00
EDGE 1 Tx slot	25.46	25.48	25.58	26.50	16.46	16.48	16.58	17.50
EDGE 2 Tx slots	22.84	22.84	23.01	23.50	16.84	16.84	17.01	17.50
EDGE 3 Tx slots	20.97	20.95	21.20	21.75	16.71	16.69	16.94	17.49
EDGE 4 Tx slots	19.52	19.71	19.75	20.50	16.52	16.71	16.75	17.50

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.

The calculated method are shown as below:

Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB

Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB

Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB

Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

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

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

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

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

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ 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 (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
 - iii. Set Cell Power = -86 dBm
 - iv. Set Channel Type = 12.2k + HSPA
 - v. Set UE Target Power
 - vi. Power Ctrl Mode= Alternating bits
 - vii. Set and observe the E-TFCI
 - viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
- d. The transmitted maximum output power was recorded.

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

Sub-test	β_c	β_d	β_{sf} (SF)	β_{sf}/β_d	β_{HS} (Note 1)	β_{bc}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1} : 47/15 β_{ed2} : 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK} , Δ_{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 β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ 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: β_{ed} can not be set directly; it is set by Absolute Grant Value.

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

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

- a. The EUT was connected to Base Station 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 (β_c and β_d) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
 - a). Subtest 1: $\beta_c/\beta_d=2/15$
 - 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.		

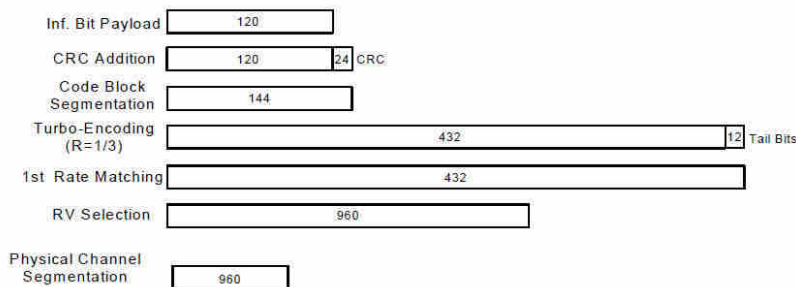


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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 $\leq \frac{1}{4}$ 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 ≤ 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 (HSDPA / HSUPA / 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

<Full Power Mode>

Band		WCDMA Band II			Tune-up Limit (dBm)	WCDMA Band IV			Tune-up Limit (dBm)	WCDMA Band 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	23.12	23.10	23.15	24.00	23.45	23.46	23.57	24.00	23.30	23.08	23.11	24.00
3GPP Rel 99	RMC 12.2Kbps	23.13	23.13	23.16	24.00	23.46	23.48	23.58	24.00	23.31	23.10	23.13	24.00
3GPP Rel 6	HSDPA Subtest-1	22.12	22.02	22.02	23.00	21.85	21.93	22.04	23.00	22.36	22.17	22.16	23.00
3GPP Rel 6	HSDPA Subtest-2	22.10	22.04	22.02	23.00	21.83	21.90	22.03	23.00	22.37	22.19	22.18	23.00
3GPP Rel 6	HSDPA Subtest-3	21.60	21.54	21.55	22.50	21.36	21.32	21.52	22.50	21.87	21.68	21.65	22.50
3GPP Rel 6	HSDPA Subtest-4	21.62	21.54	21.54	22.50	21.38	21.32	21.53	22.50	21.87	21.69	21.67	22.50
3GPP Rel 8	DC-HSDPA Subtest-1	22.10	22.25	22.12	23.00	21.75	21.80	22.10	23.00	22.39	22.12	22.08	23.00
3GPP Rel 8	DC-HSDPA Subtest-2	22.05	22.12	22.08	23.00	21.68	21.85	22.12	23.00	22.31	22.18	22.09	23.00
3GPP Rel 8	DC-HSDPA Subtest-3	21.56	21.54	21.45	22.50	21.31	21.45	21.52	22.50	21.85	21.51	21.47	22.50
3GPP Rel 8	DC-HSDPA Subtest-4	21.71	21.48	21.42	22.50	21.25	21.38	21.61	22.50	21.53	22.43	21.53	22.50
3GPP Rel 6	HSUPA Subtest-1	22.20	22.09	22.07	23.00	21.93	21.88	22.15	23.00	22.37	22.21	22.10	23.00
3GPP Rel 6	HSUPA Subtest-2	20.21	20.14	20.09	21.00	19.91	19.88	20.15	21.00	20.35	20.23	20.14	21.00
3GPP Rel 6	HSUPA Subtest-3	21.21	21.08	21.10	22.00	20.87	20.91	21.14	22.00	21.35	21.22	21.14	22.00
3GPP Rel 6	HSUPA Subtest-4	20.21	20.07	20.09	21.00	19.87	19.88	20.13	21.00	20.37	20.23	20.12	21.00
3GPP Rel 6	HSUPA Subtest-5	22.20	22.10	22.10	23.00	21.90	21.90	22.10	23.00	22.30	22.20	22.20	23.00



<Reduced Power Mode for P-Sensor On>

Band		WCDMA Band II			Tune-up Limit (dBm)	WCDMA Band IV			Tune-up Limit (dBm)
Tx Channel		9262	9400	9538		1312	1413	1513	
Rx Channel		9662	9800	9938		1537	1638	1738	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6	
3GPP Rel 99	AMR 12.2Kbps	17.66	17.72	17.70	18.00	19.88	19.92	20.02	20.50
3GPP Rel 99	RMC 12.2Kbps	17.68	17.74	17.75	18.00	19.90	19.93	20.04	20.50
3GPP Rel 6	HSDPA Subtest-1	16.72	16.82	16.67	17.00	18.86	18.93	18.93	19.50
3GPP Rel 6	HSDPA Subtest-2	16.76	16.83	16.67	17.00	18.81	18.98	18.90	19.50
3GPP Rel 6	HSDPA Subtest-3	16.27	16.31	16.18	16.50	18.32	18.46	18.41	19.00
3GPP Rel 6	HSDPA Subtest-4	16.25	16.31	16.16	16.50	18.34	18.46	18.41	19.00
3GPP Rel 8	DC-HSDPA Subtest-1	16.49	16.85	16.72	17.00	18.78	18.78	18.90	19.50
3GPP Rel 8	DC-HSDPA Subtest-2	16.75	16.78	16.58	17.00	18.68	18.85	18.85	19.50
3GPP Rel 8	DC-HSDPA Subtest-3	16.25	16.35	16.15	16.50	18.31	18.41	18.45	19.00
3GPP Rel 8	DC-HSDPA Subtest-4	16.21	16.29	16.32	16.50	18.32	18.42	18.36	19.00
3GPP Rel 6	HSUPA Subtest-1	16.73	16.78	16.63	17.00	18.91	19.02	18.95	19.50
3GPP Rel 6	HSUPA Subtest-2	14.74	14.72	14.70	15.00	16.85	16.89	16.98	17.50
3GPP Rel 6	HSUPA Subtest-3	15.75	15.73	15.66	16.00	17.88	18.11	18.02	18.50
3GPP Rel 6	HSUPA Subtest-4	14.72	14.80	14.67	15.00	16.85	16.87	17.00	17.50
3GPP Rel 6	HSUPA Subtest-5	16.60	16.60	16.70	17.00	18.80	18.90	19.00	19.50

<Reduced Power Mode for Hotspot On >

Band		WCDMA Band II			Tune-up Limit (dBm)	WCDMA Band IV			Tune-up Limit (dBm)
Tx Channel		9262	9400	9538		1312	1413	1513	
Rx Channel		9662	9800	9938		1537	1638	1738	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6	
3GPP Rel 99	AMR 12.2Kbps	15.68	15.70	15.70	16.00	17.86	17.88	18.00	18.50
3GPP Rel 99	RMC 12.2Kbps	15.69	15.72	15.73	16.00	17.87	17.89	18.02	18.50
3GPP Rel 6	HSDPA Subtest-1	14.66	14.69	14.62	15.00	16.71	16.86	16.97	17.50
3GPP Rel 6	HSDPA Subtest-2	14.68	14.70	14.60	15.00	16.72	16.83	16.94	17.50
3GPP Rel 6	HSDPA Subtest-3	14.15	14.17	14.09	14.50	16.18	16.35	16.43	17.00
3GPP Rel 6	HSDPA Subtest-4	14.16	14.19	14.11	14.50	16.14	16.37	16.43	17.00
3GPP Rel 8	DC-HSDPA Subtest-1	14.62	14.62	14.51	15.00	16.68	16.85	16.91	17.50
3GPP Rel 8	DC-HSDPA Subtest-2	14.61	14.65	14.58	15.00	16.69	16.82	16.95	17.50
3GPP Rel 8	DC-HSDPA Subtest-3	14.08	14.08	14.01	14.50	16.15	16.28	16.41	17.00
3GPP Rel 8	DC-HSDPA Subtest-4	14.09	14.12	14.12	14.50	16.13	16.35	16.48	17.00
3GPP Rel 6	HSUPA Subtest-1	14.58	14.72	14.65	15.00	16.71	16.75	16.61	17.50
3GPP Rel 6	HSUPA Subtest-2	12.55	12.46	12.68	13.00	14.80	14.85	14.75	15.50
3GPP Rel 6	HSUPA Subtest-3	13.58	13.81	13.75	14.00	15.63	15.68	15.61	16.50
3GPP Rel 6	HSUPA Subtest-4	12.55	12.53	12.70	13.00	14.68	14.81	14.82	15.50
3GPP Rel 6	HSUPA Subtest-5	14.56	14.60	14.68	15.00	16.75	16.68	16.54	17.50

<Reduced Power Mode for Handheld>

Band		WCDMA Band II			Tune-up Limit (dBm)	WCDMA Band IV			Tune-up Limit (dBm)
Tx Channel		9262	9400	9538		1312	1413	1513	
Rx Channel		9662	9800	9938		1537	1638	1738	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6	
3GPP Rel 99	AMR 12.2Kbps	20.60	20.70	20.72	21.50	20.85	20.96	20.96	21.00
3GPP Rel 99	RMC 12.2Kbps	20.62	20.72	20.73	21.50	20.86	20.97	20.98	21.00
3GPP Rel 6	HSDPA Subtest-1	19.56	19.66	19.57	20.50	19.80	19.81	19.92	20.50
3GPP Rel 6	HSDPA Subtest-2	19.62	19.65	19.58	20.50	19.74	19.80	19.91	20.50
3GPP Rel 6	HSDPA Subtest-3	19.14	19.16	19.07	20.00	19.27	19.30	19.43	20.00
3GPP Rel 6	HSDPA Subtest-4	19.12	19.14	19.06	20.00	19.27	19.31	19.42	20.00
3GPP Rel 8	DC-HSDPA Subtest-1	19.48	19.58	19.43	20.50	19.82	19.78	19.78	20.50
3GPP Rel 8	DC-HSDPA Subtest-2	19.61	19.61	19.52	20.50	19.78	19.83	19.85	20.50
3GPP Rel 8	DC-HSDPA Subtest-3	19.13	19.18	19.12	20.00	19.23	19.25	19.42	20.00
3GPP Rel 8	DC-HSDPA Subtest-4	19.11	19.12	19.01	20.00	19.21	19.10	19.15	20.00
3GPP Rel 6	HSUPA Subtest-1	19.58	19.69	19.60	20.50	19.74	19.79	19.91	20.50
3GPP Rel 6	HSUPA Subtest-2	17.63	17.67	17.62	18.50	17.74	17.81	17.94	18.50
3GPP Rel 6	HSUPA Subtest-3	18.58	18.69	18.57	19.50	18.78	18.81	18.91	19.50
3GPP Rel 6	HSUPA Subtest-4	17.63	17.67	17.58	18.50	17.74	17.81	17.92	18.50
3GPP Rel 6	HSUPA Subtest-5	19.60	19.70	19.60	20.50	19.80	19.80	19.90	20.50

<LTE Conducted Power>**General Note:**

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM/64QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B5 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 SAR test was covered by Band 66; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. the maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion
 - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

<Full 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	23.43	23.40	23.46	24	0
20	QPSK	1	49	23.09	23.12	23.21		
20	QPSK	1	99	23.21	23.21	23.37		
20	QPSK	50	0	22.12	22.15	22.19	23	1
20	QPSK	50	24	22.04	22.04	22.13		
20	QPSK	50	50	22.10	22.12	22.19		
20	QPSK	100	0	22.10	22.23	22.27		
20	16QAM	1	0	22.64	22.78	22.69	23	1
20	16QAM	1	49	22.30	22.31	22.32		
20	16QAM	1	99	22.52	22.46	22.50		
20	16QAM	50	0	21.08	21.15	21.17	22	2
20	16QAM	50	24	21.01	21.06	21.10		
20	16QAM	50	50	21.05	21.13	21.23		
20	16QAM	100	0	21.05	21.01	21.15		
20	64QAM	1	0	21.36	21.41	21.45	22	2
20	64QAM	1	49	20.99	20.95	21.09		
20	64QAM	1	99	21.34	21.29	21.44		
20	64QAM	50	0	20.08	20.10	20.16	21	3
20	64QAM	50	24	19.99	20.00	20.08		
20	64QAM	50	50	20.06	20.05	20.15		
20	64QAM	100	0	20.02	20.01	20.14		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	23.25	23.33	23.42	24	0
15	QPSK	1	37	22.98	22.98	23.08		
15	QPSK	1	74	23.30	23.29	23.43		
15	QPSK	36	0	22.08	22.14	22.15	23	1
15	QPSK	36	20	22.08	22.02	22.15		
15	QPSK	36	39	22.05	22.09	22.20		
15	QPSK	75	0	22.12	22.07	22.19		
15	16QAM	1	0	22.71	22.76	22.80	23	1
15	16QAM	1	37	22.23	22.17	22.30		
15	16QAM	1	74	22.75	22.66	22.69		
15	16QAM	36	0	21.10	21.10	21.12	22	2
15	16QAM	36	20	21.14	21.05	21.17		
15	16QAM	36	39	21.03	21.08	21.12		
15	16QAM	75	0	21.10	21.08	21.31		
15	64QAM	1	0	21.51	21.53	21.65	22	2
15	64QAM	1	37	21.53	21.48	21.60		
15	64QAM	1	74	21.57	21.51	21.55		
15	64QAM	36	0	20.10	20.09	20.12	21	3
15	64QAM	36	20	20.11	19.99	20.16		
15	64QAM	36	39	20.01	20.02	20.11		



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15	64QAM	75	0	20.11	20.06	20.25		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	23.34	23.36	23.41	24	0
10	QPSK	1	25	23.00	22.91	23.08		
10	QPSK	1	49	23.21	23.31	23.40		
10	QPSK	25	0	22.11	22.13	22.22	23	1
10	QPSK	25	12	22.09	22.07	22.18		
10	QPSK	25	25	22.18	22.09	22.23		
10	QPSK	50	0	22.12	22.09	22.20		
10	16QAM	1	0	22.65	22.69	22.68	23	1
10	16QAM	1	25	22.40	22.34	22.43		
10	16QAM	1	49	22.54	22.66	22.67		
10	16QAM	25	0	21.10	21.04	21.21	22	2
10	16QAM	25	12	21.08	21.01	21.13		
10	16QAM	25	25	21.08	21.03	21.17		
10	16QAM	50	0	21.12	21.03	21.16		
10	64QAM	1	0	21.45	21.54	21.48	22	2
10	64QAM	1	25	21.24	21.12	21.27		
10	64QAM	1	49	21.47	21.48	21.50		
10	64QAM	25	0	20.18	20.09	20.26	21	3
10	64QAM	25	12	20.13	20.09	20.21		
10	64QAM	25	25	20.17	20.09	20.23		
10	64QAM	50	0	20.09	20.08	20.18		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	23.21	23.15	23.25	24	0
5	QPSK	1	12	22.97	22.96	23.08		
5	QPSK	1	24	23.08	22.99	23.19		
5	QPSK	12	0	22.11	22.07	22.19	23	1
5	QPSK	12	7	22.06	22.03	22.12		
5	QPSK	12	13	22.03	22.00	22.15		
5	QPSK	25	0	22.07	22.04	22.20		
5	16QAM	1	0	22.45	22.49	22.59	23	1
5	16QAM	1	12	22.22	22.21	22.40		
5	16QAM	1	24	22.31	22.31	22.49		
5	16QAM	12	0	21.18	21.16	21.30	22	2
5	16QAM	12	7	21.13	21.13	21.25		
5	16QAM	12	13	21.08	21.11	21.20		
5	16QAM	25	0	21.01	21.02	21.19		
5	64QAM	1	0	21.27	21.26	21.41	22	2
5	64QAM	1	12	21.21	21.17	21.28		
5	64QAM	1	24	21.19	21.09	21.29		
5	64QAM	12	0	20.15	20.14	20.23	21	3
5	64QAM	12	7	20.14	20.11	20.24		
5	64QAM	12	13	20.13	20.01	20.17		
5	64QAM	25	0	20.08	20.12	20.24		



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Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.96	23.05	23.12	24	0
3	QPSK	1	8	22.93	23.05	23.17		
3	QPSK	1	14	22.90	22.93	23.06		
3	QPSK	8	0	22.05	22.04	22.14	23	1
3	QPSK	8	4	22.12	22.06	22.17		
3	QPSK	8	7	22.01	21.99	22.15		
3	QPSK	15	0	22.06	22.05	22.17		
3	16QAM	1	0	22.30	22.29	22.50	23	1
3	16QAM	1	8	22.26	22.26	22.50		
3	16QAM	1	14	22.20	22.21	22.44		
3	16QAM	8	0	21.10	21.21	21.29	22	2
3	16QAM	8	4	21.10	21.11	21.25		
3	16QAM	8	7	21.06	21.15	21.23		
3	16QAM	15	0	21.02	21.04	21.19		
3	64QAM	1	0	21.16	21.15	21.30	22	2
3	64QAM	1	8	21.16	21.10	21.36		
3	64QAM	1	14	21.13	21.09	21.31		
3	64QAM	8	0	20.05	19.97	20.17	21	3
3	64QAM	8	4	20.05	19.99	20.15		
3	64QAM	8	7	20.03	19.94	20.14		
3	64QAM	15	0	19.97	20.02	20.17		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.99	22.93	23.11	24	0
1.4	QPSK	1	3	23.00	23.02	23.18		
1.4	QPSK	1	5	22.96	22.87	23.09		
1.4	QPSK	3	0	23.02	23.01	23.05		
1.4	QPSK	3	1	23.12	23.02	23.12		
1.4	QPSK	3	3	23.06	22.99	23.07		
1.4	QPSK	6	0	21.99	21.98	22.16	23	1
1.4	16QAM	1	0	22.35	22.23	22.39	23	1
1.4	16QAM	1	3	22.43	22.30	22.48		
1.4	16QAM	1	5	22.33	22.20	22.45		
1.4	16QAM	3	0	22.08	22.14	22.17		
1.4	16QAM	3	1	22.19	22.15	22.25		
1.4	16QAM	3	3	22.02	22.09	22.19		
1.4	16QAM	6	0	21.07	21.00	21.14	22	2
1.4	64QAM	1	0	21.38	21.08	21.21	22	2
1.4	64QAM	1	3	21.39	21.12	21.30		
1.4	64QAM	1	5	21.26	21.07	21.20		
1.4	64QAM	3	0	21.09	21.08	21.20		
1.4	64QAM	3	1	21.09	21.10	21.22		
1.4	64QAM	3	3	21.06	21.04	21.14		
1.4	64QAM	6	0	19.97	19.96	20.09	21	3



<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	22.71	22.87	22.86	24	0
20	QPSK	1	49	22.77	23.00	23.14		
20	QPSK	1	99	22.71	22.86	22.91		
20	QPSK	50	0	21.89	21.85	21.86	23	1
20	QPSK	50	24	22.00	21.85	21.96		
20	QPSK	50	50	21.85	21.85	21.80		
20	16QAM	100	0	21.89	21.89	21.83	23	1
20	16QAM	1	0	22.12	22.20	22.16		
20	16QAM	1	49	22.28	22.10	22.29		
20	16QAM	1	99	22.10	22.16	22.27	22	2
20	16QAM	50	0	20.93	20.80	20.83		
20	16QAM	50	24	20.94	20.86	20.93		
20	16QAM	50	50	20.81	20.83	20.80	22	2
20	16QAM	100	0	20.83	20.72	20.90		
20	64QAM	1	0	21.62	21.01	20.97		
20	64QAM	1	49	21.58	21.50	20.90	22	2
20	64QAM	1	99	21.35	20.97	21.10		
20	64QAM	50	0	19.89	19.78	19.79		
20	64QAM	50	24	19.94	19.81	19.91	21	3
20	64QAM	50	50	19.80	19.81	19.76		
20	64QAM	100	0	19.83	19.75	19.88		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	23.03	22.91	22.97	24	0
15	QPSK	1	37	22.81	22.76	22.89		
15	QPSK	1	74	22.81	22.81	22.89		
15	QPSK	36	0	22.03	21.88	21.98	23	1
15	QPSK	36	20	21.94	21.90	21.96		
15	QPSK	36	39	21.85	21.82	21.93		
15	QPSK	75	0	21.90	21.79	21.95	23	1
15	16QAM	1	0	22.41	22.34	22.37		
15	16QAM	1	37	21.97	21.89	22.11		
15	16QAM	1	74	22.18	22.24	22.30	22	2
15	16QAM	36	0	21.03	20.95	21.00		
15	16QAM	36	20	20.95	20.91	21.00		
15	16QAM	36	39	20.85	20.86	20.90	22	2
15	16QAM	75	0	20.97	20.84	20.93		
15	64QAM	1	0	21.25	21.14	21.16		
15	64QAM	1	37	21.37	21.20	21.40	22	2
15	64QAM	1	74	21.02	21.01	21.13		
15	64QAM	36	0	20.01	19.91	19.99		
15	64QAM	36	20	19.94	19.87	20.00	21	3
15	64QAM	36	39	19.84	19.85	19.90		
15	64QAM	75	0	19.98	19.84	19.94		



Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	23.25	23.23	23.40	24	0
10	QPSK	1	25	23.01	22.95	22.98		
10	QPSK	1	49	23.49	23.33	23.40		
10	QPSK	25	0	22.06	22.06	22.14	23	1
10	QPSK	25	12	22.05	21.98	22.15		
10	QPSK	25	25	22.14	22.05	22.26		
10	QPSK	50	0	22.01	22.00	22.14		
10	16QAM	1	0	22.45	22.50	22.41	23	1
10	16QAM	1	25	22.32	22.21	22.44		
10	16QAM	1	49	22.44	22.42	22.40		
10	16QAM	25	0	20.99	20.95	21.07	22	2
10	16QAM	25	12	20.97	20.94	21.07		
10	16QAM	25	25	21.05	20.97	21.15		
10	16QAM	50	0	21.11	20.97	21.12		
10	64QAM	1	0	21.39	21.31	21.52	22	2
10	64QAM	1	25	21.21	21.05	21.17		
10	64QAM	1	49	21.62	21.49	21.67		
10	64QAM	25	0	20.04	20.03	20.17	21	3
10	64QAM	25	12	20.03	19.99	20.13		
10	64QAM	25	25	20.10	20.06	20.27		
10	64QAM	50	0	20.05	19.97	20.11		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	23.10	23.04	23.20	24	0
5	QPSK	1	12	22.97	22.93	23.05		
5	QPSK	1	24	23.05	22.95	23.17		
5	QPSK	12	0	22.07	21.93	22.18	23	1
5	QPSK	12	7	22.03	21.95	22.14		
5	QPSK	12	13	22.03	21.91	22.10		
5	QPSK	25	0	22.07	21.96	22.14		
5	16QAM	1	0	22.45	22.40	22.42	23	1
5	16QAM	1	12	22.04	22.00	22.17		
5	16QAM	1	24	22.33	22.24	22.40		
5	16QAM	12	0	21.14	21.01	21.27	22	2
5	16QAM	12	7	21.07	21.03	21.23		
5	16QAM	12	13	21.06	21.06	21.19		
5	16QAM	25	0	20.99	20.90	21.05		
5	64QAM	1	0	21.25	21.25	21.34	22	2
5	64QAM	1	12	21.20	21.07	21.27		
5	64QAM	1	24	21.14	21.01	21.29		
5	64QAM	12	0	20.09	19.99	20.19	21	3
5	64QAM	12	7	20.06	20.04	20.16		
5	64QAM	12	13	20.07	19.99	20.20		
5	64QAM	25	0	20.05	19.97	20.16		



Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	22.96	22.85	23.07	24	0
3	QPSK	1	8	22.89	22.94	23.16		
3	QPSK	1	14	22.84	22.88	23.06		
3	QPSK	8	0	22.06	22.02	22.09	23	1
3	QPSK	8	4	22.07	21.97	22.14		
3	QPSK	8	7	22.01	21.96	22.10		
3	QPSK	15	0	21.99	21.93	22.10		
3	16QAM	1	0	22.26	22.30	22.42	23	1
3	16QAM	1	8	22.30	22.26	22.47		
3	16QAM	1	14	22.19	22.21	22.34		
3	16QAM	8	0	21.11	21.10	21.24	22	2
3	16QAM	8	4	21.09	21.04	21.23		
3	16QAM	8	7	21.04	21.09	21.24		
3	16QAM	15	0	21.05	20.94	21.11		
3	64QAM	1	0	21.06	21.03	21.18	22	2
3	64QAM	1	8	21.09	21.02	21.24		
3	64QAM	1	14	21.03	21.07	21.19		
3	64QAM	8	0	19.99	19.94	20.14	21	3
3	64QAM	8	4	19.99	19.95	20.15		
3	64QAM	8	7	19.96	19.89	20.07		
3	64QAM	15	0	20.01	19.92	20.15		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	22.93	22.79	22.98	24	0
1.4	QPSK	1	3	23.00	22.92	23.12		
1.4	QPSK	1	5	22.95	22.85	23.04		
1.4	QPSK	3	0	23.01	22.86	23.06		
1.4	QPSK	3	1	23.08	22.90	23.08		
1.4	QPSK	3	3	23.00	22.84	23.05		
1.4	QPSK	6	0	21.96	21.85	22.07	23	1
1.4	16QAM	1	0	22.31	22.27	22.34	23	1
1.4	16QAM	1	3	22.36	22.25	22.44		
1.4	16QAM	1	5	22.33	22.13	22.35		
1.4	16QAM	3	0	22.03	22.00	22.21		
1.4	16QAM	3	1	22.11	22.05	22.24		
1.4	16QAM	3	3	21.97	22.00	22.20		
1.4	16QAM	6	0	20.98	20.91	21.12	22	2
1.4	64QAM	1	0	21.31	21.02	21.23	22	2
1.4	64QAM	1	3	21.37	20.99	21.20		
1.4	64QAM	1	5	21.29	20.94	21.20		
1.4	64QAM	3	0	21.10	20.96	21.16		
1.4	64QAM	3	1	21.01	20.99	21.21		
1.4	64QAM	3	3	21.02	20.95	21.10		
1.4	64QAM	6	0	19.97	19.90	20.06	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	22.98	22.73	22.72	24	0
10	QPSK	1	25	22.59	22.59	22.66		
10	QPSK	1	49	23.05	23.00	23.02		
10	QPSK	25	0	21.80	21.54	21.63	23	1
10	QPSK	25	12	21.78	21.62	21.71		
10	QPSK	25	25	21.78	21.69	21.74		
10	QPSK	50	0	21.76	21.58	21.73	23	1
10	16QAM	1	0	22.21	22.01	21.99		
10	16QAM	1	25	22.02	21.83	21.97		
10	16QAM	1	49	22.30	22.23	22.23	22	2
10	16QAM	25	0	20.77	20.53	20.63		
10	16QAM	25	12	20.69	20.57	20.70		
10	16QAM	25	25	20.76	20.68	20.71	22	2
10	16QAM	50	0	20.76	20.54	20.70		
10	64QAM	1	0	21.05	20.90	20.83		
10	64QAM	1	25	20.85	20.67	20.80	22	2
10	64QAM	1	49	21.10	21.11	21.17		
10	64QAM	25	0	19.76	19.52	19.61	21	3
10	64QAM	25	12	19.72	19.55	19.65		
10	64QAM	25	25	19.78	19.69	19.78		
10	64QAM	50	0	19.73	19.55	19.71		
Channel				20425	20525	20625		
Frequency (MHz)				826.5	836.5	846.5	Tune-up limit (dBm)	MPR (dB)
5	QPSK	1	0	22.82	22.66	22.66	24	0
5	QPSK	1	12	22.65	22.46	22.62		
5	QPSK	1	24	22.67	22.55	22.66		
5	QPSK	12	0	21.79	21.55	21.69	23	1
5	QPSK	12	7	21.77	21.55	21.70		
5	QPSK	12	13	21.74	21.49	21.66		
5	QPSK	25	0	21.74	21.59	21.67	23	1
5	16QAM	1	0	22.13	21.89	21.93		
5	16QAM	1	12	21.97	21.70	21.85		
5	16QAM	1	24	21.96	21.83	21.97	22	2
5	16QAM	12	0	20.80	20.57	20.69		
5	16QAM	12	7	20.78	20.59	20.71		
5	16QAM	12	13	20.77	20.58	20.71	22	2
5	16QAM	25	0	20.72	20.53	20.62		
5	64QAM	1	0	21.00	20.77	20.80		
5	64QAM	1	12	20.88	20.71	20.91	22	2
5	64QAM	1	24	20.84	20.72	20.79		
5	64QAM	12	0	19.79	19.55	19.67		
5	64QAM	12	7	19.77	19.55	19.69	21	3
5	64QAM	12	13	19.75	19.57	19.74		
5	64QAM	25	0	19.72	19.59	19.68		



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Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.75	22.46	22.65	24	0
3	QPSK	1	8	22.69	22.54	22.64		
3	QPSK	1	14	22.63	22.51	22.57		
3	QPSK	8	0	21.77	21.48	21.65	23	1
3	QPSK	8	4	21.75	21.55	21.68		
3	QPSK	8	7	21.72	21.52	21.63		
3	QPSK	15	0	21.70	21.56	21.63		
3	16QAM	1	0	22.12	21.75	21.90	23	1
3	16QAM	1	8	22.11	21.88	21.91		
3	16QAM	1	14	21.96	21.88	21.87		
3	16QAM	8	0	20.83	20.58	20.75	22	2
3	16QAM	8	4	20.80	20.64	20.76		
3	16QAM	8	7	20.79	20.60	20.75		
3	16QAM	15	0	20.73	20.48	20.66		
3	64QAM	1	0	20.82	20.62	20.81	22	2
3	64QAM	1	8	20.87	20.67	20.80		
3	64QAM	1	14	20.83	20.70	20.74		
3	64QAM	8	0	19.73	19.50	19.61	21	3
3	64QAM	8	4	19.71	19.53	19.65		
3	64QAM	8	7	19.65	19.46	19.64		
3	64QAM	15	0	19.70	19.53	19.69		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.77	22.46		24	0
1.4	QPSK	1	3	22.85	22.55	22.66		
1.4	QPSK	1	5	22.77	22.45	22.60		
1.4	QPSK	3	0	22.83	22.46	22.61		
1.4	QPSK	3	1	22.86	22.54	22.70		
1.4	QPSK	3	3	22.83	22.50	22.63		
1.4	QPSK	6	0	21.77	21.52	21.65	23	1
1.4	16QAM	1	0	22.02	21.74	21.87	23	1
1.4	16QAM	1	3	22.11	21.78	21.90		
1.4	16QAM	1	5	21.99	21.77	21.86		
1.4	16QAM	3	0	21.82	21.58	21.73		
1.4	16QAM	3	1	21.83	21.66	21.76		
1.4	16QAM	3	3	21.75	21.51	21.71		
1.4	16QAM	6	0	20.83	20.53	20.69	22	2
1.4	64QAM	1	0	20.93	20.65	20.77	22	2
1.4	64QAM	1	3	21.07	20.66	20.83		
1.4	64QAM	1	5	20.96	20.60	20.75		
1.4	64QAM	3	0	20.83	20.57	20.65		
1.4	64QAM	3	1	20.77	20.61	20.79		
1.4	64QAM	3	3	20.78	20.57	20.68		
1.4	64QAM	6	0	19.73	19.52	19.65	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	23.29	23.04	23.04	24	0
20	QPSK	1	49	23.20	23.09	23.14		
20	QPSK	1	99	23.14	22.98	23.09		
20	QPSK	50	0	22.26	22.14	22.12	23	1
20	QPSK	50	24	21.99	22.20	22.20		
20	QPSK	50	50	22.15	22.20	22.22		
20	QPSK	100	0	22.30	22.28	22.21	23	1
20	16QAM	1	0	22.43	22.29	22.30		
20	16QAM	1	49	22.46	22.41	22.45		
20	16QAM	1	99	22.41	22.24	22.29	22	2
20	16QAM	50	0	21.28	21.13	21.16		
20	16QAM	50	24	21.29	21.21	21.26		
20	16QAM	50	50	21.22	21.22	21.26	22	2
20	16QAM	100	0	21.27	21.18	21.24		
20	64QAM	1	0	21.36	21.24	21.22		
20	64QAM	1	49	21.37	21.16	21.28	22	2
20	64QAM	1	99	21.32	21.21	21.23		
20	64QAM	50	0	20.26	20.17	20.13	21	3
20	64QAM	50	24	20.31	20.23	20.23		
20	64QAM	50	50	20.24	20.22	20.23		
20	64QAM	100	0	20.34	20.18	20.23		
Channel				20825	21100	21375		
Frequency (MHz)				2507.5	2535	2562.5	Tune-up limit (dBm)	MPR (dB)
15	QPSK	1	0	23.03	22.93	22.94	24	0
15	QPSK	1	37	23.16	23.04	23.21		
15	QPSK	1	74	23.07	23.03	23.13		
15	QPSK	36	0	22.31	22.15	22.24	23	1
15	QPSK	36	20	22.32	22.22	22.36		
15	QPSK	36	39	22.30	22.26	22.24		
15	QPSK	75	0	22.29	22.16	22.24	23	1
15	16QAM	1	0	22.39	22.21	22.28		
15	16QAM	1	37	22.31	22.24	22.36		
15	16QAM	1	74	22.27	22.29	22.31	22	2
15	16QAM	36	0	21.29	21.20	21.28		
15	16QAM	36	20	21.31	21.22	21.32		
15	16QAM	36	39	21.28	21.26	21.26	22	2
15	16QAM	75	0	21.27	21.24	21.29		
15	64QAM	1	0	21.25	21.14	21.22		
15	64QAM	1	37	21.30	21.27	21.30	22	2
15	64QAM	1	74	21.21	21.25	21.22		
15	64QAM	36	0	20.28	20.16	20.21		
15	64QAM	36	20	20.30	20.22	20.32	21	3
15	64QAM	36	39	20.27	20.27	20.21		
15	64QAM	75	0	20.28	20.24	20.28		



Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	23.28	23.23	23.24	24	0
10	QPSK	1	25	23.19	23.10	23.22		
10	QPSK	1	49	23.27	23.25	22.15		
10	QPSK	25	0	22.21	22.16	22.23	23	1
10	QPSK	25	12	22.14	22.10	22.14		
10	QPSK	25	25	22.19	22.07	22.19		
10	QPSK	50	0	22.11	22.09	22.15		
10	16QAM	1	0	22.42	22.45	22.41	23	1
10	16QAM	1	25	22.29	22.26	22.31		
10	16QAM	1	49	22.49	22.42	22.41		
10	16QAM	25	0	21.21	21.07	21.20	22	2
10	16QAM	25	12	21.20	21.10	21.19		
10	16QAM	25	25	21.19	21.05	21.18		
10	16QAM	50	0	21.24	21.14	21.20		
10	64QAM	1	0	21.49	21.35	21.33	22	2
10	64QAM	1	25	21.27	21.18	21.21		
10	64QAM	1	49	21.43	21.37	21.36		
10	64QAM	25	0	20.22	20.11	20.20	21	3
10	64QAM	25	12	20.20	20.11	20.21		
10	64QAM	25	25	20.20	20.07	20.19		
10	64QAM	50	0	20.20	20.07	20.18		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	23.13	23.09	23.14	24	0
5	QPSK	1	12	23.11	23.01	23.16		
5	QPSK	1	24	23.11	22.99	23.13		
5	QPSK	12	0	22.22	22.15	22.21	23	1
5	QPSK	12	7	22.22	22.13	22.20		
5	QPSK	12	13	22.14	22.10	22.16		
5	QPSK	25	0	22.25	22.14	22.20		
5	16QAM	1	0	22.47	22.31	22.42	23	1
5	16QAM	1	12	22.33	22.21	22.29		
5	16QAM	1	24	22.37	22.32	22.40		
5	16QAM	12	0	21.29	21.15	21.22	22	2
5	16QAM	12	7	21.23	21.14	21.19		
5	16QAM	12	13	21.24	21.09	21.21		
5	16QAM	25	0	21.24	21.13	21.20		
5	64QAM	1	0	21.40	21.25	21.31	22	2
5	64QAM	1	12	21.18	21.16	21.23		
5	64QAM	1	24	21.24	21.16	21.29		
5	64QAM	12	0	20.27	20.13	20.19	21	3
5	64QAM	12	7	20.23	20.13	20.18		
5	64QAM	12	13	20.23	20.08	20.23		
5	64QAM	25	0	20.24	20.14	20.19		



<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	22.89	22.89	22.83		
20	QPSK	1	49	22.82	22.80	22.80	24	0
20	QPSK	1	99	23.04	23.30	23.18		
20	QPSK	50	0	22.06	21.92	21.94		
20	QPSK	50	24	22.10	22.11	21.98	23	1
20	QPSK	50	50	22.03	21.92	21.96		
20	QPSK	100	0	22.07	22.10	21.93		
20	16QAM	1	0	22.46	22.22	22.37	23	1
20	16QAM	1	49	22.29	22.18	22.17		
20	16QAM	1	99	22.45	22.50	22.50		
20	16QAM	50	0	21.06	20.86	20.86	22	2
20	16QAM	50	24	21.07	20.94	20.97		
20	16QAM	50	50	20.95	20.91	20.93		
20	16QAM	100	0	20.94	20.96	20.96	22	2
20	64QAM	1	0	21.29	21.02	21.05		
20	64QAM	1	49	21.24	21.09	21.02		
20	64QAM	1	99	21.48	21.44	21.37	21	3
20	64QAM	50	0	19.99	19.80	19.90		
20	64QAM	50	24	20.04	19.89	19.91		
20	64QAM	50	50	19.91	19.87	19.93	21	3
20	64QAM	100	0	19.96	19.96	19.99		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	23.20	23.24	23.19		
15	QPSK	1	37	22.89	22.89	22.86	24	0
15	QPSK	1	74	23.20	23.06	23.09		
15	QPSK	36	0	22.16	22.02	22.07		
15	QPSK	36	20	22.00	21.91	21.86	23	1
15	QPSK	36	39	22.01	21.84	21.89		
15	QPSK	75	0	22.10	21.96	21.89		
15	16QAM	1	0	22.48	22.45	22.48	23	1
15	16QAM	1	37	22.23	22.28	22.12		
15	16QAM	1	74	22.43	22.50	22.36		
15	16QAM	36	0	21.17	21.00	21.10	22	2
15	16QAM	36	20	21.08	21.01	20.98		
15	16QAM	36	39	21.09	20.91	20.91		
15	16QAM	75	0	21.07	20.95	20.84	22	2
15	64QAM	1	0	21.52	21.52	21.40		
15	64QAM	1	37	21.81	21.79	21.51		
15	64QAM	1	74	21.67	21.82	21.68	21	3
15	64QAM	36	0	20.11	19.97	20.05		
15	64QAM	36	20	20.02	19.98	19.90		
15	64QAM	36	39	19.98	19.92	19.87	21	3
15	64QAM	75	0	20.03	19.95	19.88		



Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	22.59	22.46	22.54	24	0
10	QPSK	1	25	22.96	22.79	22.74		
10	QPSK	1	49	22.94	22.91	22.93		
10	QPSK	25	0	22.14	21.95	21.83	23	1
10	QPSK	25	12	22.27	22.08	22.06		
10	QPSK	25	25	22.16	22.04	21.92		
10	QPSK	50	0	22.17	22.00	21.91		
10	16QAM	1	0	22.01	22.06	22.05	23	1
10	16QAM	1	25	22.40	22.27	22.12		
10	16QAM	1	49	22.40	22.45	22.42		
10	16QAM	25	0	21.12	20.94	20.87	22	2
10	16QAM	25	12	21.29	21.07	21.04		
10	16QAM	25	25	21.25	21.13	21.02		
10	16QAM	50	0	21.23	21.02	20.94		
10	64QAM	1	0	21.31	21.29	21.29	22	2
10	64QAM	1	25	21.61	21.60	21.50		
10	64QAM	1	49	21.71	21.78	21.58		
10	64QAM	25	0	20.12	19.85	19.81	21	3
10	64QAM	25	12	20.26	20.07	20.04		
10	64QAM	25	25	20.13	20.00	19.88		
10	64QAM	50	0	20.17	19.99	19.89		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	23.26	23.01	23.02	24	0
5	QPSK	1	12	23.13	22.93	22.86		
5	QPSK	1	24	23.18	22.94	22.87		
5	QPSK	12	0	22.30	22.03	22.02	23	1
5	QPSK	12	7	22.21	22.05	21.93		
5	QPSK	12	13	22.11	22.01	21.82		
5	QPSK	25	0	22.21	22.04	21.90		
5	16QAM	1	0	22.48	22.45	22.33	23	1
5	16QAM	1	12	22.45	22.44	22.28		
5	16QAM	1	24	22.50	22.30	22.22		
5	16QAM	12	0	21.33	21.06	21.05	22	2
5	16QAM	12	7	21.22	21.07	20.95		
5	16QAM	12	13	21.16	21.03	20.92		
5	16QAM	25	0	21.15	21.03	20.89		
5	64QAM	1	0	21.50	21.19	21.22	22	2
5	64QAM	1	12	21.18	21.12	21.02		
5	64QAM	1	24	21.40	21.12	21.10		
5	64QAM	12	0	20.27	20.04	19.99	21	3
5	64QAM	12	7	20.23	20.07	19.95		
5	64QAM	12	13	20.19	20.00	19.88		
5	64QAM	25	0	20.17	20.04	19.90		



Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	23.09	22.91	22.83	24	0
3	QPSK	1	8	23.04	23.01	22.81		
3	QPSK	1	14	22.94	22.93	22.82		
3	QPSK	8	0	22.22	21.90	21.88	23	1
3	QPSK	8	4	22.18	22.04	21.93		
3	QPSK	8	7	22.15	21.98	21.86		
3	QPSK	15	0	22.13	21.97	21.86		
3	16QAM	1	0	22.37	22.36	22.12	23	1
3	16QAM	1	8	22.34	22.45	22.28		
3	16QAM	1	14	22.29	22.34	22.15		
3	16QAM	8	0	21.31	20.95	20.95	22	2
3	16QAM	8	4	21.22	21.03	20.90		
3	16QAM	8	7	21.14	20.97	20.84		
3	16QAM	15	0	21.17	21.03	20.90		
3	64QAM	1	0	21.27	21.31	21.00	22	2
3	64QAM	1	8	21.26	21.42	20.96		
3	64QAM	1	14	21.11	21.36	20.95		
3	64QAM	8	0	20.17	19.91	19.89	21	3
3	64QAM	8	4	20.16	20.03	19.93		
3	64QAM	8	7	20.09	19.94	19.87		
3	64QAM	15	0	20.14	19.98	19.85		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	23.10	22.78	22.88	24	0
1.4	QPSK	1	3	23.14	22.91	22.93		
1.4	QPSK	1	5	23.08	22.87	22.85		
1.4	QPSK	3	0	23.19	22.86	22.82		
1.4	QPSK	3	1	23.24	23.05	22.86		
1.4	QPSK	3	3	23.15	22.93	22.84		
1.4	QPSK	6	0	22.14	21.94	21.86	23	1
1.4	16QAM	1	0	22.36	22.21	22.12	23	1
1.4	16QAM	1	3	22.48	22.37	22.17		
1.4	16QAM	1	5	22.34	22.29	22.13		
1.4	16QAM	3	0	22.23	21.93	21.85		
1.4	16QAM	3	1	22.28	22.16	21.86		
1.4	16QAM	3	3	22.24	22.01	21.79		
1.4	16QAM	6	0	21.14	20.95	20.87	22	2
1.4	64QAM	1	0	21.22	21.19	20.97	22	2
1.4	64QAM	1	3	21.23	21.35	20.98		
1.4	64QAM	1	5	21.21	21.26	21.00		
1.4	64QAM	3	0	21.35	20.94	20.94		
1.4	64QAM	3	1	21.28	21.00	20.99		
1.4	64QAM	3	3	21.26	21.04	20.92		
1.4	64QAM	6	0	20.22	19.91	19.78	21	3



<Reduced Power Mode for P-Sensor On>

<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	18.19	18.05	18.20	18.5	0
20	QPSK	1	49	17.71	17.46	17.65		
20	QPSK	1	99	17.96	17.97	17.95		
20	QPSK	50	0	17.95	17.78	17.96	18.5	0
20	QPSK	50	24	17.86	17.68	17.81		
20	QPSK	50	50	17.88	17.80	17.81		
20	QPSK	100	0	17.96	17.87	18.03	18.5	0
20	16QAM	1	0	17.53	18.15	18.18		
20	16QAM	1	49	17.84	17.66	17.83		
20	16QAM	1	99	18.13	18.12	18.14	18.5	0
20	16QAM	50	0	17.99	17.75	17.86		
20	16QAM	50	24	17.89	17.69	17.82		
20	16QAM	50	50	17.93	17.81	17.85	18.5	0
20	16QAM	100	0	17.92	17.80	17.87		
20	64QAM	1	0	18.00	17.84	17.96		
20	64QAM	1	49	17.35	17.10	17.18	18.5	0
20	64QAM	1	99	17.80	17.82	17.71		
20	64QAM	50	0	17.47	17.24	17.16		
20	64QAM	50	24	17.37	17.14	17.20	18.5	0
20	64QAM	50	50	17.38	17.26	17.18		
20	64QAM	100	0	17.44	17.30	17.35		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	17.78	17.65	17.86	18.5	0
15	QPSK	1	37	17.44	17.43	17.49		
15	QPSK	1	74	17.79	17.69	17.78		
15	QPSK	36	0	17.53	17.28	17.49	18.5	0
15	QPSK	36	20	17.40	17.20	17.32		
15	QPSK	36	39	17.45	17.24	17.35		
15	QPSK	75	0	17.51	17.24	17.41	18.5	0
15	16QAM	1	0	18.00	17.90	17.96		
15	16QAM	1	37	17.71	17.54	17.60		
15	16QAM	1	74	18.00	17.96	17.94	18.5	0
15	16QAM	36	0	17.60	17.34	17.49		
15	16QAM	36	20	17.43	17.25	17.40		
15	16QAM	36	39	17.49	17.26	17.36	18.5	0
15	16QAM	75	0	17.56	17.28	17.45		
15	64QAM	1	0	17.65	17.10	17.62		
15	64QAM	1	37	17.38	17.45	17.61	18.5	0
15	64QAM	1	74	17.71	17.58	17.01		
15	64QAM	36	0	17.52	17.30	17.63		
15	64QAM	36	20	17.43	17.26	17.65	18.5	0
15	64QAM	36	39	17.51	17.27	17.68		
15	64QAM	75	0	17.55	17.25	17.40		



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Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	17.69	17.59	17.48	18.5	0
10	QPSK	1	25	17.27	17.13	17.31		
10	QPSK	1	49	17.64	17.55	17.69		
10	QPSK	25	0	17.48	17.34	17.48	18.5	0
10	QPSK	25	12	17.42	17.28	17.36		
10	QPSK	25	25	17.43	17.30	17.48		
10	QPSK	50	0	17.47	17.31	17.48		
10	16QAM	1	0	17.94	17.97	17.94	18.5	0
10	16QAM	1	25	17.71	17.62	17.75		
10	16QAM	1	49	17.95	17.94	17.94		
10	16QAM	25	0	17.41	17.31	17.45	18.5	0
10	16QAM	25	12	17.41	17.24	17.33		
10	16QAM	25	25	17.42	17.28	17.45		
10	16QAM	50	0	17.46	17.27	17.45		
10	64QAM	1	0	17.89	17.20	17.80	18.5	0
10	64QAM	1	25	17.58	17.52	17.61		
10	64QAM	1	49	17.97	17.50	17.48		
10	64QAM	25	0	17.46	17.34	17.53	18.5	0
10	64QAM	25	12	17.46	17.26	17.38		
10	64QAM	25	25	17.46	17.36	17.47		
10	64QAM	50	0	17.47	17.33	17.49		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	17.34	17.34	17.32	18.5	0
5	QPSK	1	12	17.32	17.17	17.29		
5	QPSK	1	24	17.39	17.19	17.39		
5	QPSK	12	0	17.49	17.35	17.40	18.5	0
5	QPSK	12	7	17.38	17.25	17.40		
5	QPSK	12	13	17.33	17.22	17.40		
5	QPSK	25	0	17.42	17.26	17.42		
5	16QAM	1	0	17.84	17.71	17.77	18.5	0
5	16QAM	1	12	17.67	17.54	17.67		
5	16QAM	1	24	17.59	17.47	17.66		
5	16QAM	12	0	17.51	17.42	17.46	18.5	0
5	16QAM	12	7	17.48	17.33	17.48		
5	16QAM	12	13	17.42	17.35	17.45		
5	16QAM	25	0	17.36	17.23	17.39		
5	64QAM	1	0	17.66	17.51	17.67	18.5	0
5	64QAM	1	12	17.52	17.48	17.53		
5	64QAM	1	24	17.57	17.37	17.52		
5	64QAM	12	0	17.48	17.34	17.42	18.5	0
5	64QAM	12	7	17.48	17.28	17.44		
5	64QAM	12	13	17.37	17.29	17.45		
5	64QAM	25	0	17.41	17.29	17.45		



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Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	17.18	17.09	17.17	18.5	0
3	QPSK	1	8	17.34	17.20	17.37		
3	QPSK	1	14	17.27	17.17	17.32		
3	QPSK	8	0	17.39	17.22	17.39	18.5	0
3	QPSK	8	4	17.40	17.23	17.39		
3	QPSK	8	7	17.37	17.22	17.36		
3	QPSK	15	0	17.36	17.22	17.37		
3	16QAM	1	0	17.58	17.44	17.56	18.5	0
3	16QAM	1	8	17.58	17.47	17.55		
3	16QAM	1	14	17.46	17.33	17.53		
3	16QAM	8	0	17.52	17.39	17.51	18.5	0
3	16QAM	8	4	17.50	17.31	17.48		
3	16QAM	8	7	17.50	17.30	17.52		
3	16QAM	15	0	17.42	17.23	17.36		
3	64QAM	1	0	17.50	17.38	17.47	18.5	0
3	64QAM	1	8	17.50	17.37	17.51		
3	64QAM	1	14	17.46	17.32	17.47		
3	64QAM	8	0	17.35	17.21	17.36	18.5	0
3	64QAM	8	4	17.39	17.22	17.38		
3	64QAM	8	7	17.36	17.18	17.36		
3	64QAM	15	0	17.39	17.21	17.38		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	17.22	16.98	17.07	18.5	0
1.4	QPSK	1	3	17.26	17.13	17.32		
1.4	QPSK	1	5	17.21	17.08	17.24		
1.4	QPSK	3	0	17.30	17.17	17.33		
1.4	QPSK	3	1	17.35	17.19	17.36		
1.4	QPSK	3	3	17.28	17.18	17.36		
1.4	QPSK	6	0	17.29	17.16	17.32	18.5	0
1.4	16QAM	1	0	17.45	17.36	17.47	18.5	0
1.4	16QAM	1	3	17.51	17.39	17.56		
1.4	16QAM	1	5	17.38	17.32	17.45		
1.4	16QAM	3	0	17.41	17.26	17.40		
1.4	16QAM	3	1	17.45	17.36	17.50		
1.4	16QAM	3	3	17.43	17.27	17.39		
1.4	16QAM	6	0	17.27	17.17	17.31	18.5	0
1.4	64QAM	1	0	17.39	17.35	17.44	18.5	0
1.4	64QAM	1	3	17.49	17.33	17.46		
1.4	64QAM	1	5	17.36	17.22	17.40		
1.4	64QAM	3	0	17.45	17.29	17.39		
1.4	64QAM	3	1	17.47	17.29	17.45		
1.4	64QAM	3	3	17.48	17.22	17.36		
1.4	64QAM	6	0	17.37	17.20	17.32	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		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	20.12	19.89	19.78	21	0
20	QPSK	1	49	19.98	19.29	19.40		
20	QPSK	1	99	19.25	19.40	19.42		
20	QPSK	50	0	19.04	19.13	19.24	21	0
20	QPSK	50	24	19.01	19.12	19.12		
20	QPSK	50	50	19.09	19.08	19.06		
20	QPSK	100	0	19.11	19.15	19.14	21	0
20	16QAM	1	0	19.49	19.47	19.59		
20	16QAM	1	49	19.42	19.32	19.47		
20	16QAM	1	99	19.43	19.36	19.59	21	0
20	16QAM	50	0	19.17	19.13	19.21		
20	16QAM	50	24	19.12	19.16	19.11		
20	16QAM	50	50	19.03	19.11	19.08	21	0
20	16QAM	100	0	19.12	19.03	19.19		
20	64QAM	1	0	19.54	19.30	19.36		
20	64QAM	1	49	19.43	19.12	19.16	21	0
20	64QAM	1	99	19.49	19.26	19.43		
20	64QAM	50	0	19.14	19.11	19.19		
20	64QAM	50	24	19.08	19.10	19.13	21	0
20	64QAM	50	50	19.02	19.08	19.03		
20	64QAM	100	0	19.12	19.03	19.19		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	19.64	19.09	19.63	21	0
15	QPSK	1	37	19.16	19.12	19.01		
15	QPSK	1	74	19.10	19.10	19.13		
15	QPSK	36	0	19.17	19.16	19.23	21	0
15	QPSK	36	20	19.12	19.08	19.19		
15	QPSK	36	39	19.05	19.13	19.05		
15	QPSK	75	0	19.09	19.16	19.09	21	0
15	16QAM	1	0	19.60	19.59	19.70		
15	16QAM	1	37	19.37	19.36	19.41		
15	16QAM	1	74	19.47	19.42	19.57	21	0
15	16QAM	36	0	19.15	19.19	19.22		
15	16QAM	36	20	19.07	19.16	19.20		
15	16QAM	36	39	19.86	19.12	19.07	21	0
15	16QAM	75	0	19.16	19.11	19.09		
15	64QAM	1	0	19.41	19.64	19.45		
15	64QAM	1	37	19.23	19.41	19.45	21	0
15	64QAM	1	74	19.28	19.53	19.41		
15	64QAM	36	0	19.17	19.17	19.21		
15	64QAM	36	20	19.08	19.12	19.18	21	0
15	64QAM	36	39	19.06	19.11	19.05		
15	64QAM	75	0	19.12	19.10	19.09		



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Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	19.03	19.02	19.08	21	0
10	QPSK	1	25	19.12	19.17	19.23		
10	QPSK	1	49	19.68	19.74	19.76		
10	QPSK	25	0	19.21	19.33	19.39	21	0
10	QPSK	25	12	19.21	19.29	19.39		
10	QPSK	25	25	19.39	19.47	19.45		
10	QPSK	50	0	19.24	19.32	19.40		
10	16QAM	1	0	19.83	19.92	20.09	21	0
10	16QAM	1	25	19.58	19.56	19.63		
10	16QAM	1	49	20.03	20.04	20.09		
10	16QAM	25	0	19.19	19.29	19.38	21	0
10	16QAM	25	12	19.18	19.26	19.32		
10	16QAM	25	25	19.30	19.42	19.40		
10	16QAM	50	0	19.35	19.29	19.42		
10	64QAM	1	0	19.59	19.79	19.86	21	0
10	64QAM	1	25	19.30	19.31	19.46		
10	64QAM	1	49	19.92	19.99	20.01		
10	64QAM	25	0	19.24	19.36	19.39	21	0
10	64QAM	25	12	19.24	19.32	20.11		
10	64QAM	25	25	19.34	19.44	19.30		
10	64QAM	50	0	19.25	19.30	19.22		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	19.53	19.52	19.23	21	0
5	QPSK	1	12	19.02	19.16	19.21		
5	QPSK	1	24	19.13	19.30	19.27		
5	QPSK	12	0	19.23	19.34	19.35	21	0
5	QPSK	12	7	19.17	19.21	19.29		
5	QPSK	12	13	19.14	19.21	19.33		
5	QPSK	25	0	19.18	19.25	19.38		
5	16QAM	1	0	19.48	19.71	19.70	21	0
5	16QAM	1	12	19.22	19.41	19.47		
5	16QAM	1	24	19.40	19.56	19.55		
5	16QAM	12	0	19.26	19.40	19.37	21	0
5	16QAM	12	7	19.25	19.33	19.40		
5	16QAM	12	13	19.20	19.30	19.38		
5	16QAM	25	0	19.11	19.17	19.30		
5	64QAM	1	0	19.36	19.47	19.59	21	0
5	64QAM	1	12	19.29	19.35	19.47		
5	64QAM	1	24	19.32	19.39	19.41		
5	64QAM	12	0	19.26	19.38	19.34	21	0
5	64QAM	12	7	19.19	19.29	19.37		
5	64QAM	12	13	19.19	19.30	19.37		
5	64QAM	25	0	19.16	19.26	19.40		



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Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	19.50	19.67	19.65	21	0
3	QPSK	1	8	19.13	19.23	19.26		
3	QPSK	1	14	19.08	19.22	19.24		
3	QPSK	8	0	19.14	19.30	19.35	21	0
3	QPSK	8	4	19.12	19.28	19.27		
3	QPSK	8	7	19.14	19.27	19.27		
3	QPSK	15	0	19.11	19.21	19.34		
3	16QAM	1	0	19.38	19.54	19.62	21	0
3	16QAM	1	8	19.46	19.50	19.53		
3	16QAM	1	14	19.40	19.48	19.48		
3	16QAM	8	0	19.30	19.44	19.49	21	0
3	16QAM	8	4	19.26	19.32	19.38		
3	16QAM	8	7	19.27	19.31	19.42		
3	16QAM	15	0	19.21	19.24	19.38		
3	64QAM	1	0	19.27	19.44	19.49	21	0
3	64QAM	1	8	19.24	19.33	19.43		
3	64QAM	1	14	19.25	19.35	19.38		
3	64QAM	8	0	19.17	19.32	19.38	21	0
3	64QAM	8	4	19.23	19.30	19.35		
3	64QAM	8	7	19.16	19.24	19.29		
3	64QAM	15	0	19.21	19.23	19.39		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	19.20	19.51	19.39	21	0
1.4	QPSK	1	3	19.30	19.20	19.62		
1.4	QPSK	1	5	19.18	19.15	19.52		
1.4	QPSK	3	0	19.17	19.27	19.43		
1.4	QPSK	3	1	19.17	19.25	19.51		
1.4	QPSK	3	3	19.16	19.20	19.43		
1.4	QPSK	6	0	19.15	19.14	19.46	21	0
1.4	16QAM	1	0	19.38	19.55	19.80	21	0
1.4	16QAM	1	3	19.46	19.49	19.87		
1.4	16QAM	1	5	19.38	19.49	19.78		
1.4	16QAM	3	0	19.12	19.41	19.60		
1.4	16QAM	3	1	19.20	19.37	19.65		
1.4	16QAM	3	3	19.14	19.34	19.59		
1.4	16QAM	6	0	19.18	19.23	19.48	21	0
1.4	64QAM	1	0	19.34	19.21	19.49	21	0
1.4	64QAM	1	3	19.34	19.28	19.54		
1.4	64QAM	1	5	19.43	19.41	19.50		
1.4	64QAM	3	0	19.12	19.37	19.57		
1.4	64QAM	3	1	19.14	19.34	19.62		
1.4	64QAM	3	3	19.22	19.28	19.55		
1.4	64QAM	6	0	19.12	19.28	19.47	21	0



<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	20.90	20.68	20.72	21	0
20	QPSK	1	49	20.63	20.51	20.63		
20	QPSK	1	99	20.83	20.61	20.77		
20	QPSK	50	0	20.79	20.71	20.76	21	0
20	QPSK	50	24	20.65	20.67	20.73		
20	QPSK	50	50	20.74	20.65	20.76		
20	QPSK	100	0	20.82	20.80	20.77	21	0
20	16QAM	1	0	20.83	20.56	20.59		
20	16QAM	1	49	20.55	20.64	20.63		
20	16QAM	1	99	20.77	20.90	20.89	21	0
20	16QAM	50	0	20.82	20.74	20.73		
20	16QAM	50	24	20.78	20.77	20.72		
20	16QAM	50	50	20.75	20.67	20.80	21	0
20	16QAM	100	0	20.79	20.70	20.78		
20	64QAM	1	0	20.73	20.39	20.59		
20	64QAM	1	49	20.65	20.53	20.24	21	0
20	64QAM	1	99	20.23	20.58	20.32		
20	64QAM	50	0	20.36	20.30	20.29		
20	64QAM	50	24	20.30	20.25	20.30	21	0
20	64QAM	50	50	20.34	19.96	20.35		
20	64QAM	100	0	20.41	20.08	20.40		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	20.60	20.61	20.16	21	0
15	QPSK	1	37	20.24	20.15	20.18		
15	QPSK	1	74	20.33	20.25	20.37		
15	QPSK	36	0	20.39	20.32	20.36	21	0
15	QPSK	36	20	20.39	20.31	20.37		
15	QPSK	36	39	20.34	20.38	20.34		
15	QPSK	75	0	20.37	20.37	20.36	21	0
15	16QAM	1	0	20.65	20.60	20.60		
15	16QAM	1	37	20.47	20.45	20.44		
15	16QAM	1	74	20.61	20.62	20.66	21	0
15	16QAM	36	0	20.41	20.34	20.34		
15	16QAM	36	20	20.34	20.31	20.36		
15	16QAM	36	39	20.38	20.41	20.36	21	0
15	16QAM	75	0	20.37	20.40	20.36		
15	64QAM	1	0	20.56	20.84	20.51		
15	64QAM	1	37	20.46	20.55	20.56	21	0
15	64QAM	1	74	20.62	20.40	20.40		
15	64QAM	36	0	20.34	20.33	20.34		
15	64QAM	36	20	20.38	20.30	20.31	21	0
15	64QAM	36	39	20.38	20.16	20.37		
15	64QAM	75	0	20.36	20.43	20.33		



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Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	20.34	20.35	20.37	21	0
10	QPSK	1	25	20.17	20.10	20.12		
10	QPSK	1	49	20.34	20.37	20.43		
10	QPSK	25	0	20.33	20.29	20.32	21	0
10	QPSK	25	12	20.31	20.23	20.26		
10	QPSK	25	25	20.30	20.25	20.25		
10	QPSK	50	0	20.29	20.27	20.28		
10	16QAM	1	0	20.76	20.78	20.76	21	0
10	16QAM	1	25	20.50	20.44	20.51		
10	16QAM	1	49	20.63	20.64	20.68		
10	16QAM	25	0	20.34	20.25	20.29	21	0
10	16QAM	25	12	20.27	20.21	20.25		
10	16QAM	25	25	20.26	20.20	20.30		
10	16QAM	50	0	20.32	20.27	20.28		
10	64QAM	1	0	20.67	20.60	20.58	21	0
10	64QAM	1	25	20.37	20.32	20.29		
10	64QAM	1	49	20.61	20.60	20.58		
10	64QAM	25	0	20.34	20.32	20.31	21	0
10	64QAM	25	12	20.28	20.25	20.24		
10	64QAM	25	25	20.31	20.26	20.32		
10	64QAM	50	0	20.31	20.25	20.29		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	20.41	20.42	20.47	21	0
5	QPSK	1	12	20.16	20.11	20.16		
5	QPSK	1	24	20.23	20.10	20.25		
5	QPSK	12	0	20.30	20.25	20.32	21	0
5	QPSK	12	7	20.28	20.25	20.28		
5	QPSK	12	13	20.26	20.18	20.24		
5	QPSK	25	0	20.30	20.29	20.28		
5	16QAM	1	0	20.62	20.50	20.53	21	0
5	16QAM	1	12	20.40	20.38	20.40		
5	16QAM	1	24	20.52	20.37	20.45		
5	16QAM	12	0	20.36	20.32	20.30	21	0
5	16QAM	12	7	20.32	20.31	20.33		
5	16QAM	12	13	20.34	20.24	20.30		
5	16QAM	25	0	20.29	20.25	20.26		
5	64QAM	1	0	20.49	20.40	20.41	21	0
5	64QAM	1	12	20.38	20.34	20.34		
5	64QAM	1	24	20.37	20.35	20.39		
5	64QAM	12	0	20.31	20.31	20.28	21	0
5	64QAM	12	7	20.29	20.30	20.33		
5	64QAM	12	13	20.31	20.22	20.29		
5	64QAM	25	0	20.35	20.24	20.32		



<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	20.02	20.02	20.14		
20	QPSK	1	49	20.06	20.08	20.06	21	0
20	QPSK	1	99	20.23	20.43	20.40		
20	QPSK	50	0	19.52	19.54	19.65		
20	QPSK	50	24	19.51	19.66	19.60	21	0
20	QPSK	50	50	19.48	19.58	19.65		
20	QPSK	100	0	19.61	19.69	19.68		
20	16QAM	1	0	19.66	19.55	19.56	21	0
20	16QAM	1	49	19.64	19.58	19.69		
20	16QAM	1	99	20.09	20.05	20.22		
20	16QAM	50	0	19.47	19.56	19.67	21	0
20	16QAM	50	24	19.51	19.53	19.61		
20	16QAM	50	50	19.57	19.52	19.64		
20	16QAM	100	0	19.51	19.57	19.62	21	0
20	64QAM	1	0	19.69	19.81	19.95		
20	64QAM	1	49	19.54	19.63	19.57		
20	64QAM	1	99	20.06	20.35	20.31	21	0
20	64QAM	50	0	19.46	19.51	19.61		
20	64QAM	50	24	19.48	19.51	19.58		
20	64QAM	50	50	19.50	19.51	19.63	21	0
20	64QAM	100	0	19.50	19.55	19.61		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	19.82	19.35	19.50		
15	QPSK	1	37	19.27	19.72	19.46	21	0
15	QPSK	1	74	19.54	19.80	19.81		
15	QPSK	36	0	19.64	19.72	19.71	21	0
15	QPSK	36	20	19.41	19.54	19.59		
15	QPSK	36	39	19.47	19.46	19.59		
15	QPSK	75	0	19.47	19.53	19.62	21	0
15	16QAM	1	0	20.15	20.37	20.42		
15	16QAM	1	37	19.70	19.96	19.73		
15	16QAM	1	74	20.02	20.21	20.17	21	0
15	16QAM	36	0	19.61	19.62	19.75		
15	16QAM	36	20	19.42	19.48	19.62		
15	16QAM	36	39	19.38	19.46	19.57	21	0
15	16QAM	75	0	19.51	19.54	19.61		
15	64QAM	1	0	20.41	20.23	20.24		
15	64QAM	1	37	20.10	19.78	19.83	21	0
15	64QAM	1	74	19.85	20.03	20.04		
15	64QAM	36	0	19.64	19.63	19.72		
15	64QAM	36	20	19.45	19.51	19.60	21	0
15	64QAM	36	39	19.39	19.43	19.53		
15	64QAM	75	0	19.58	19.52	19.61		



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Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	19.35	20.13	20.18	21	0
10	QPSK	1	25	19.35	19.27	19.38		
10	QPSK	1	49	20.04	19.95	20.07		
10	QPSK	25	0	19.32	19.42	19.60	21	0
10	QPSK	25	12	19.34	19.51	19.63		
10	QPSK	25	25	19.50	19.44	19.59		
10	QPSK	50	0	19.52	19.43	19.58		
10	16QAM	1	0	19.49	19.43	19.50	21	0
10	16QAM	1	25	19.80	19.69	19.80		
10	16QAM	1	49	20.26	20.26	20.40		
10	16QAM	25	0	19.41	19.45	19.58	21	0
10	16QAM	25	12	19.50	19.50	19.66		
10	16QAM	25	25	19.41	19.57	19.69		
10	16QAM	50	0	19.52	19.51	19.63		
10	64QAM	1	0	19.01	19.37	19.55	21	0
10	64QAM	1	25	19.21	19.05	19.09		
10	64QAM	1	49	19.57	19.12	19.35		
10	64QAM	25	0	19.35	20.11	19.57	21	0
10	64QAM	25	12	19.51	19.45	19.69		
10	64QAM	25	25	19.51	19.31	19.15		
10	64QAM	50	0	19.28	19.12	19.27		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	19.45	19.27	19.65	21	0
5	QPSK	1	12	19.30	19.34	19.51		
5	QPSK	1	24	19.42	19.39	19.53		
5	QPSK	12	0	19.42	19.47	19.68	21	0
5	QPSK	12	7	19.38	19.42	19.57		
5	QPSK	12	13	19.35	19.39	19.56		
5	QPSK	25	0	19.45	19.43	19.59		
5	16QAM	1	0	19.79	19.80	20.03	21	0
5	16QAM	1	12	19.73	19.56	19.91		
5	16QAM	1	24	19.82	19.70	19.89		
5	16QAM	12	0	19.41	19.52	19.70	21	0
5	16QAM	12	7	19.37	19.46	19.61		
5	16QAM	12	13	19.35	19.44	19.60		
5	16QAM	25	0	19.42	19.38	19.57		
5	64QAM	1	0	19.95	19.65	19.84	21	0
5	64QAM	1	12	19.72	19.54	19.64		
5	64QAM	1	24	19.77	19.50	19.70		
5	64QAM	12	0	19.46	19.53	19.65	21	0
5	64QAM	12	7	19.40	19.44	19.59		
5	64QAM	12	13	19.36	19.41	19.58		
5	64QAM	25	0	19.44	19.44	19.60		



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Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	19.35	19.12	19.25	21	0
3	QPSK	1	8	19.18	19.41	19.51		
3	QPSK	1	14	19.31	19.45	19.47		
3	QPSK	8	0	19.07	19.16	19.54	21	0
3	QPSK	8	4	19.39	19.46	19.55		
3	QPSK	8	7	19.33	19.40	19.55		
3	QPSK	15	0	19.31	19.38	19.54		
3	16QAM	1	0	19.77	19.77	19.84	21	0
3	16QAM	1	8	19.79	19.75	19.87		
3	16QAM	1	14	19.63	19.74	19.79		
3	16QAM	8	0	19.42	19.45	19.66	21	0
3	16QAM	8	4	19.39	19.44	19.63		
3	16QAM	8	7	19.32	19.38	19.64		
3	16QAM	15	0	19.39	19.41	19.56		
3	64QAM	1	0	19.68	19.15	19.68	21	0
3	64QAM	1	8	19.10	19.32	19.68		
3	64QAM	1	14	19.22	19.46	19.67		
3	64QAM	8	0	19.37	19.45	19.55	21	0
3	64QAM	8	4	19.37	19.43	19.58		
3	64QAM	8	7	19.30	19.36	19.55		
3	64QAM	15	0	19.34	19.40	19.58		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	19.42	19.34	19.09	21	0
1.4	QPSK	1	3	19.46	19.37	19.52		
1.4	QPSK	1	5	19.38	19.25	19.19		
1.4	QPSK	3	0	19.34	19.41	19.58		
1.4	QPSK	3	1	19.41	19.46	19.60		
1.4	QPSK	3	3	19.38	19.35	19.55		
1.4	QPSK	6	0	19.31	19.35	19.53	21	0
1.4	16QAM	1	0	19.65	19.71	19.80	21	0
1.4	16QAM	1	3	19.71	19.81	19.84		
1.4	16QAM	1	5	19.59	19.73	19.76		
1.4	16QAM	3	0	19.40	19.46	19.55		
1.4	16QAM	3	1	19.38	19.51	19.60		
1.4	16QAM	3	3	19.29	19.42	19.49		
1.4	16QAM	6	0	19.39	19.41	19.56	21	0
1.4	64QAM	1	0	19.46	19.70	19.04	21	0
1.4	64QAM	1	3	19.42	19.29	19.00		
1.4	64QAM	1	5	19.65	19.25	19.66		
1.4	64QAM	3	0	19.38	19.13	19.41		
1.4	64QAM	3	1	19.34	19.56	19.35		
1.4	64QAM	3	3	19.45	19.52	19.31		
1.4	64QAM	6	0	19.37	19.40	19.61	21	0



<Reduced Power Mode for Hotspot On>

<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	16.26	16.24	16.41	16.5	0
20	QPSK	1	49	15.99	15.91	15.95		
20	QPSK	1	99	16.18	16.11	16.26		
20	QPSK	50	0	16.24	15.99	16.25	16.5	0
20	QPSK	50	24	16.12	15.88	16.04		
20	QPSK	50	50	16.10	16.00	16.06		
20	QPSK	100	0	16.18	16.07	16.23	16.5	0
20	16QAM	1	0	15.94	15.89	15.87		
20	16QAM	1	49	16.09	15.95	15.98		
20	16QAM	1	99	16.36	16.34	16.36	16.5	0
20	16QAM	50	0	16.17	15.95	16.08		
20	16QAM	50	24	16.12	15.88	16.05		
20	16QAM	50	50	16.15	16.05	16.08	16.5	0
20	16QAM	100	0	16.15	16.05	16.10		
20	64QAM	1	0	16.24	16.11	16.19		
20	64QAM	1	49	15.82	15.88	16.20	16.5	0
20	64QAM	1	99	16.05	15.99	15.87		
20	64QAM	50	0	16.23	15.94	16.06		
20	64QAM	50	24	16.10	15.87	16.00	16.5	0
20	64QAM	50	50	16.15	15.98	16.06		
20	64QAM	100	0	16.14	16.05	16.07		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	15.90	16.24	16.36	16.5	0
15	QPSK	1	37	15.89	15.92	15.97		
15	QPSK	1	74	16.20	16.39	16.24		
15	QPSK	36	0	16.24	15.98	16.10	16.5	0
15	QPSK	36	20	16.08	15.91	16.02		
15	QPSK	36	39	16.13	15.88	16.02		
15	QPSK	75	0	16.15	15.93	16.11	16.5	0
15	16QAM	1	0	16.37	16.13	16.27		
15	16QAM	1	37	15.90	15.91	15.91		
15	16QAM	1	74	16.36	16.23	16.29	16.5	0
15	16QAM	36	0	16.28	15.98	16.13		
15	16QAM	36	20	16.08	15.90	16.06		
15	16QAM	36	39	16.17	15.92	16.02	16.5	0
15	16QAM	75	0	16.21	15.97	16.13		
15	64QAM	1	0	16.23	15.99	16.11		
15	64QAM	1	37	15.81	15.74	15.82	16.5	0
15	64QAM	1	74	16.24	16.13	16.14		
15	64QAM	36	0	16.26	15.96	16.10		
15	64QAM	36	20	16.09	15.87	16.05	16.5	0
15	64QAM	36	39	16.16	15.90	16.01		
15	64QAM	75	0	16.20	15.98	16.13		



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Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	16.33	16.28	16.24	16.5	0
10	QPSK	1	25	15.84	15.86	15.96		
10	QPSK	1	49	16.34	16.23	16.33		
10	QPSK	25	0	16.14	16.04	16.14	16.5	0
10	QPSK	25	12	16.11	15.99	16.06		
10	QPSK	25	25	16.08	16.00	16.16		
10	QPSK	50	0	16.15	15.97	16.13		
10	16QAM	1	0	16.25	16.11	16.08	16.5	0
10	16QAM	1	25	15.89	15.82	15.90		
10	16QAM	1	49	16.26	16.11	16.13		
10	16QAM	25	0	16.12	16.00	16.15	16.5	0
10	16QAM	25	12	16.09	15.97	15.96		
10	16QAM	25	25	16.09	15.97	16.11		
10	16QAM	50	0	16.12	15.99	16.11		
10	64QAM	1	0	16.04	15.92	15.95	16.5	0
10	64QAM	1	25	15.69	15.69	15.73		
10	64QAM	1	49	16.14	15.98	16.06		
10	64QAM	25	0	16.17	16.05	16.17	16.5	0
10	64QAM	25	12	16.12	15.95	16.05		
10	64QAM	25	25	16.13	15.97	16.19		
10	64QAM	50	0	16.13	15.98	16.12		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	15.97	16.07	16.01	16.5	0
5	QPSK	1	12	15.95	15.81	15.93		
5	QPSK	1	24	16.05	15.89	16.06		
5	QPSK	12	0	16.16	15.98	16.06	16.5	0
5	QPSK	12	7	16.09	15.91	16.07		
5	QPSK	12	13	16.01	15.90	16.07		
5	QPSK	25	0	16.12	15.94	16.10		
5	16QAM	1	0	16.20	16.28	16.20	16.5	0
5	16QAM	1	12	16.30	16.14	16.31		
5	16QAM	1	24	16.27	16.14	16.28		
5	16QAM	12	0	16.19	16.01	16.15	16.5	0
5	16QAM	12	7	16.16	15.97	16.14		
5	16QAM	12	13	16.08	15.94	16.15		
5	16QAM	25	0	16.05	15.87	16.08		
5	64QAM	1	0	16.29	16.21	16.32	16.5	0
5	64QAM	1	12	16.21	16.00	16.25		
5	64QAM	1	24	16.17	16.01	16.14		
5	64QAM	12	0	16.16	16.02	16.13	16.5	0
5	64QAM	12	7	16.15	15.95	16.15		
5	64QAM	12	13	16.06	15.93	16.15		
5	64QAM	25	0	16.09	15.96	16.12		



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Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	16.08	15.79	16.22	16.5	0
3	QPSK	1	8	16.02	15.89	16.04		
3	QPSK	1	14	15.97	15.84	16.03		
3	QPSK	8	0	16.07	15.93	16.05	16.5	0
3	QPSK	8	4	16.10	15.92	16.07		
3	QPSK	8	7	16.02	15.83	16.05		
3	QPSK	15	0	16.06	15.89	16.05		
3	16QAM	1	0	16.26	16.08	16.27	16.5	0
3	16QAM	1	8	16.40	16.06	16.28		
3	16QAM	1	14	16.31	15.96	16.18		
3	16QAM	8	0	16.20	16.03	16.17	16.5	0
3	16QAM	8	4	16.20	16.01	16.16		
3	16QAM	8	7	16.13	16.00	16.18		
3	16QAM	15	0	16.05	15.91	16.05		
3	64QAM	1	0	16.11	16.11	16.22	16.5	0
3	64QAM	1	8	16.08	16.03	16.13		
3	64QAM	1	14	15.99	16.02	16.11		
3	64QAM	8	0	16.09	15.90	16.06	16.5	0
3	64QAM	8	4	16.12	15.86	16.09		
3	64QAM	8	7	16.04	15.88	16.03		
3	64QAM	15	0	16.03	15.89	16.03		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	16.09	15.75	15.77	16.5	0
1.4	QPSK	1	3	16.18	15.85	16.00		
1.4	QPSK	1	5	16.10	15.76	15.90		
1.4	QPSK	3	0	16.04	15.90	16.00		
1.4	QPSK	3	1	16.06	15.92	16.07		
1.4	QPSK	3	3	16.07	15.85	16.02		
1.4	QPSK	6	0	16.02	15.84	16.00	16.5	0
1.4	16QAM	1	0	16.24	16.03	16.15	16.5	0
1.4	16QAM	1	3	16.31	16.09	16.23		
1.4	16QAM	1	5	16.24	15.96	16.14		
1.4	16QAM	3	0	16.02	15.97	16.14		
1.4	16QAM	3	1	16.07	16.01	16.20		
1.4	16QAM	3	3	16.00	15.91	16.13		
1.4	16QAM	6	0	16.05	15.89	16.06	16.5	0
1.4	64QAM	1	0	16.19	16.02	16.14	16.5	0
1.4	64QAM	1	3	16.29	16.09	16.18		
1.4	64QAM	1	5	16.16	16.00	16.13		
1.4	64QAM	3	0	16.17	15.95	16.08		
1.4	64QAM	3	1	16.22	15.99	16.16		
1.4	64QAM	3	3	16.13	15.91	16.07		
1.4	64QAM	6	0	16.03	15.91	16.07	16.5	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		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	18.22	18.25	18.35		
20	QPSK	1	49	18.19	18.18	18.25	18.5	0
20	QPSK	1	99	18.26	18.13	18.30		
20	QPSK	50	0	17.83	17.87	17.98		
20	QPSK	50	24	17.84	17.89	17.86	18.5	0
20	QPSK	50	50	17.78	17.85	17.83		
20	QPSK	100	0	17.88	17.94	17.87		
20	16QAM	1	0	17.64	17.69	17.55	18.5	0
20	16QAM	1	49	17.62	17.75	17.93		
20	16QAM	1	99	17.86	17.88	17.98		
20	16QAM	50	0	17.92	17.89	17.96	18.5	0
20	16QAM	50	24	17.88	17.89	17.86		
20	16QAM	50	50	17.74	17.81	17.81		
20	16QAM	100	0	17.83	17.78	17.95	18.5	0
20	64QAM	1	0	18.19	18.03	17.92		
20	64QAM	1	49	18.11	17.72	18.04		
20	64QAM	1	99	18.22	17.80	17.94	18.5	0
20	64QAM	50	0	17.92	17.85	17.95		
20	64QAM	50	24	17.83	17.84	17.88		
20	64QAM	50	50	17.74	17.83	17.84	18.5	0
20	64QAM	100	0	17.85	17.78	17.95		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	17.62	17.53	17.53		
15	QPSK	1	37	17.72	17.65	17.77	18.5	0
15	QPSK	1	74	17.79	17.83	17.83		
15	QPSK	36	0	17.88	17.90	17.93		
15	QPSK	36	20	17.87	17.82	17.91	18.5	0
15	QPSK	36	39	17.73	17.81	17.81		
15	QPSK	75	0	17.84	17.78	17.82		
15	16QAM	1	0	18.31	18.36	18.42	18.5	0
15	16QAM	1	37	18.09	18.05	18.18		
15	16QAM	1	74	18.19	18.25	18.28		
15	16QAM	36	0	17.90	17.89	17.96	18.5	0
15	16QAM	36	20	17.81	17.84	17.92		
15	16QAM	36	39	17.69	17.84	17.82		
15	16QAM	75	0	17.87	17.84	17.85	18.5	0
15	64QAM	1	0	18.15	18.21	18.24		
15	64QAM	1	37	18.04	18.03	18.12		
15	64QAM	1	74	18.03	18.09	18.16	18.5	0
15	64QAM	36	0	17.89	17.86	17.94		
15	64QAM	36	20	17.82	17.80	17.92		
15	64QAM	36	39	17.67	17.83	17.78	18.5	0
15	64QAM	75	0	17.88	17.87	17.86		



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Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	17.85	17.85	17.84	18.5	0
10	QPSK	1	25	17.79	17.81	17.93		
10	QPSK	1	49	18.22	18.26	18.26		
10	QPSK	25	0	17.97	18.07	18.13	18.5	0
10	QPSK	25	12	17.99	18.02	18.08		
10	QPSK	25	25	18.10	18.19	18.15		
10	QPSK	50	0	17.98	18.02	18.13		
10	16QAM	1	0	18.08	18.19	18.00	18.5	0
10	16QAM	1	25	17.76	17.82	17.87		
10	16QAM	1	49	18.17	18.16	18.07		
10	16QAM	25	0	17.43	17.53	17.63	18.5	0
10	16QAM	25	12	17.42	17.48	17.52		
10	16QAM	25	25	17.49	17.62	17.63		
10	16QAM	50	0	17.53	17.54	17.62		
10	64QAM	1	0	17.89	17.98	18.13	18.5	0
10	64QAM	1	25	17.68	17.68	17.67		
10	64QAM	1	49	18.03	18.06	18.06		
10	64QAM	25	0	17.45	17.58	17.64	18.5	0
10	64QAM	25	12	17.42	17.51	17.58		
10	64QAM	25	25	17.56	17.71	17.68		
10	64QAM	50	0	17.49	17.57	17.62		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	17.70	17.71	17.62	18.5	0
5	QPSK	1	12	17.81	17.89	17.99		
5	QPSK	1	24	17.90	18.05	18.05		
5	QPSK	12	0	18.00	18.09	18.09	18.5	0
5	QPSK	12	7	17.96	17.97	18.08		
5	QPSK	12	13	17.92	17.97	18.06		
5	QPSK	25	0	17.99	17.98	18.08		
5	16QAM	1	0	18.28	18.40	18.48	18.5	0
5	16QAM	1	12	18.09	18.14	18.23		
5	16QAM	1	24	18.16	18.27	18.22		
5	16QAM	12	0	18.03	18.16	18.10	18.5	0
5	16QAM	12	7	18.00	18.04	18.15		
5	16QAM	12	13	17.97	18.05	18.15		
5	16QAM	25	0	17.88	17.92	18.02		
5	64QAM	1	0	18.13	18.25	18.35	18.5	0
5	64QAM	1	12	18.11	18.07	18.22		
5	64QAM	1	24	18.03	18.18	18.17		
5	64QAM	12	0	17.99	18.13	18.08	18.5	0
5	64QAM	12	7	17.97	18.00	18.10		
5	64QAM	12	13	17.95	18.05	18.13		
5	64QAM	25	0	17.90	17.99	18.08		



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Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	17.82	17.74	18.04	18.5	0
3	QPSK	1	8	17.73	17.76	17.78		
3	QPSK	1	14	17.81	17.71	17.81		
3	QPSK	8	0	17.94	17.72	18.09	18.5	0
3	QPSK	8	4	17.94	18.00	18.03		
3	QPSK	8	7	17.87	17.99	17.99		
3	QPSK	15	0	17.89	17.94	18.05		
3	16QAM	1	0	18.20	18.36	18.39	18.5	0
3	16QAM	1	8	18.26	18.32	18.33		
3	16QAM	1	14	18.18	18.38	18.32		
3	16QAM	8	0	17.92	18.06	18.22	18.5	0
3	16QAM	8	4	17.93	17.97	18.08		
3	16QAM	8	7	17.90	17.97	18.11		
3	16QAM	15	0	17.91	18.00	18.11		
3	64QAM	1	0	18.27	18.31	18.09	18.5	0
3	64QAM	1	8	18.00	18.06	18.08		
3	64QAM	1	14	17.85	18.25	18.05		
3	64QAM	8	0	17.83	18.04	18.13	18.5	0
3	64QAM	8	4	17.91	18.01	17.72		
3	64QAM	8	7	17.84	17.96	17.85		
3	64QAM	15	0	17.83	18.15	18.04		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	18.00	18.00	18.13	18.5	0
1.4	QPSK	1	3	17.73	18.07	17.93		
1.4	QPSK	1	5	17.69	17.94	17.86		
1.4	QPSK	3	0	17.79	17.97	17.94		
1.4	QPSK	3	1	17.88	17.88	17.98		
1.4	QPSK	3	3	17.80	17.81	17.94		
1.4	QPSK	6	0	17.73	17.94	17.91	18.5	0
1.4	16QAM	1	0	18.00	18.21	18.08	18.5	0
1.4	16QAM	1	3	18.03	18.23	18.14		
1.4	16QAM	1	5	17.94	18.16	18.08		
1.4	16QAM	3	0	17.92	18.11	18.04		
1.4	16QAM	3	1	17.96	18.05	18.12		
1.4	16QAM	3	3	17.88	17.95	18.02		
1.4	16QAM	6	0	17.88	17.91	17.94	18.5	0
1.4	64QAM	1	0	18.35	18.02	18.19	18.5	0
1.4	64QAM	1	3	18.00	18.16	18.12		
1.4	64QAM	1	5	17.98	17.90	17.98		
1.4	64QAM	3	0	17.87	17.61	18.07		
1.4	64QAM	3	1	17.92	18.09	18.08		
1.4	64QAM	3	3	17.83	17.99	18.05		
1.4	64QAM	6	0	17.90	17.89	17.96	18.5	0



<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				100	0	-100		
Frequency (MHz)				10	0	-10		
20	QPSK	1	0	20.90	20.68	20.72		
20	QPSK	1	49	20.63	20.51	20.63	21	0
20	QPSK	1	99	20.83	20.61	20.77		
20	QPSK	50	0	20.79	20.71	20.76		
20	QPSK	50	24	20.65	20.67	20.73	21	0
20	QPSK	50	50	20.74	20.65	20.76		
20	QPSK	100	0	20.82	20.80	20.77		
20	16QAM	1	0	20.83	20.56	20.59	21	0
20	16QAM	1	49	20.55	20.64	20.63		
20	16QAM	1	99	20.77	20.90	20.89		
20	16QAM	50	0	20.82	20.74	20.73	21	0
20	16QAM	50	24	20.78	20.77	20.72		
20	16QAM	50	50	20.75	20.67	20.80		
20	16QAM	100	0	20.79	20.70	20.78	21	0
20	64QAM	1	0	20.73	20.39	20.59		
20	64QAM	1	49	20.65	20.53	20.24		
20	64QAM	1	99	20.23	20.58	20.32	21	0
20	64QAM	50	0	20.36	20.30	20.29		
20	64QAM	50	24	20.30	20.25	20.30		
20	64QAM	50	50	20.34	19.96	20.35	21	0
20	64QAM	100	0	20.41	20.08	20.40		
Channel				75	0	-75	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				7.5	0	-7.5		
15	QPSK	1	0	20.60	20.61	20.16		
15	QPSK	1	37	20.24	20.15	20.18	21	0
15	QPSK	1	74	20.33	20.25	20.37		
15	QPSK	36	0	20.39	20.32	20.36	21	0
15	QPSK	36	20	20.39	20.31	20.37		
15	QPSK	36	39	20.34	20.38	20.34		
15	QPSK	75	0	20.37	20.37	20.36	21	0
15	16QAM	1	0	20.65	20.60	20.60		
15	16QAM	1	37	20.47	20.45	20.44		
15	16QAM	1	74	20.61	20.62	20.66	21	0
15	16QAM	36	0	20.41	20.34	20.34		
15	16QAM	36	20	20.34	20.31	20.36		
15	16QAM	36	39	20.38	20.41	20.36	21	0
15	16QAM	75	0	20.37	20.40	20.36		
15	64QAM	1	0	20.56	20.84	20.51		
15	64QAM	1	37	20.46	20.55	20.56	21	0
15	64QAM	1	74	20.62	20.40	20.40		
15	64QAM	36	0	20.34	20.33	20.34		
15	64QAM	36	20	20.38	20.30	20.31	21	0
15	64QAM	36	39	20.38	20.16	20.37		
15	64QAM	75	0	20.36	20.43	20.33		



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Channel				50	0	-50	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				5	0	-5		
10	QPSK	1	0	20.34	20.35	20.37	21	0
10	QPSK	1	25	20.17	20.10	20.12		
10	QPSK	1	49	20.34	20.37	20.43		
10	QPSK	25	0	20.33	20.29	20.32	21	0
10	QPSK	25	12	20.31	20.23	20.26		
10	QPSK	25	25	20.30	20.25	20.25		
10	QPSK	50	0	20.29	20.27	20.28		
10	16QAM	1	0	20.76	20.78	20.76	21	0
10	16QAM	1	25	20.50	20.44	20.51		
10	16QAM	1	49	20.63	20.64	20.68		
10	16QAM	25	0	20.34	20.25	20.29	21	0
10	16QAM	25	12	20.27	20.21	20.25		
10	16QAM	25	25	20.26	20.20	20.30		
10	16QAM	50	0	20.32	20.27	20.28		
10	64QAM	1	0	20.67	20.60	20.58	21	0
10	64QAM	1	25	20.37	20.32	20.29		
10	64QAM	1	49	20.61	20.60	20.58		
10	64QAM	25	0	20.34	20.32	20.31	21	0
10	64QAM	25	12	20.28	20.25	20.24		
10	64QAM	25	25	20.31	20.26	20.32		
10	64QAM	50	0	20.31	20.25	20.29		
Channel				25	0	-25	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2.5	0	-2.5		
5	QPSK	1	0	20.41	20.42	20.47	21	0
5	QPSK	1	12	20.16	20.11	20.16		
5	QPSK	1	24	20.23	20.10	20.25		
5	QPSK	12	0	20.30	20.25	20.32	21	0
5	QPSK	12	7	20.28	20.25	20.28		
5	QPSK	12	13	20.26	20.18	20.24		
5	QPSK	25	0	20.30	20.29	20.28		
5	16QAM	1	0	20.62	20.50	20.53	21	0
5	16QAM	1	12	20.40	20.38	20.40		
5	16QAM	1	24	20.52	20.37	20.45		
5	16QAM	12	0	20.36	20.32	20.30	21	0
5	16QAM	12	7	20.32	20.31	20.33		
5	16QAM	12	13	20.34	20.24	20.30		
5	16QAM	25	0	20.29	20.25	20.26		
5	64QAM	1	0	20.49	20.40	20.41	21	0
5	64QAM	1	12	20.38	20.34	20.34		
5	64QAM	1	24	20.37	20.35	20.39		
5	64QAM	12	0	20.31	20.31	20.28	21	0
5	64QAM	12	7	20.29	20.30	20.33		
5	64QAM	12	13	20.31	20.22	20.29		
5	64QAM	25	0	20.35	20.24	20.32		



<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	18.05	18.04	18.02		
20	QPSK	1	49	17.86	17.86	17.75	18.5	0
20	QPSK	1	99	17.91	18.14	18.03		
20	QPSK	50	0	17.64	17.64	17.73		
20	QPSK	50	24	17.61	17.74	17.66	18.5	0
20	QPSK	50	50	17.63	17.66	17.74		
20	QPSK	100	0	17.11	17.23	17.17		
20	16QAM	1	0	17.02	17.21	17.20	18.5	0
20	16QAM	1	49	17.02	17.14	17.05		
20	16QAM	1	99	17.12	17.36	17.59		
20	16QAM	50	0	17.13	17.16	17.24	18.5	0
20	16QAM	50	24	17.12	17.15	17.22		
20	16QAM	50	50	17.13	17.16	17.25		
20	16QAM	100	0	17.18	17.20	17.28	18.5	0
20	64QAM	1	0	17.75	17.34	17.79		
20	64QAM	1	49	17.36	17.55	17.65		
20	64QAM	1	99	17.37	17.95	18.09	18.5	0
20	64QAM	50	0	17.08	17.16	17.69		
20	64QAM	50	24	17.10	17.17	17.41		
20	64QAM	50	50	17.20	17.28	17.24	18.5	0
20	64QAM	100	0	17.41	17.29	17.30		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	18.32	18.23	17.73		
15	QPSK	1	37	17.96	17.64	17.77	18.5	0
15	QPSK	1	74	18.10	17.93	18.12		
15	QPSK	36	0	18.18	17.95	18.04		
15	QPSK	36	20	17.85	17.82	17.95	18.5	0
15	QPSK	36	39	17.74	17.84	17.88		
15	QPSK	75	0	17.80	17.86	17.98		
15	16QAM	1	0	18.16	18.14	18.28	18.5	0
15	16QAM	1	37	17.64	17.63	17.67		
15	16QAM	1	74	17.97	17.97	18.03		
15	16QAM	36	0	17.98	18.00	18.08	18.5	0
15	16QAM	36	20	17.81	17.85	17.95		
15	16QAM	36	39	17.78	17.79	17.85		
15	16QAM	75	0	17.90	17.88	17.98	18.5	0
15	64QAM	1	0	18.49	18.41	18.38		
15	64QAM	1	37	18.16	17.91	18.19		
15	64QAM	1	74	18.05	18.27	18.39	18.5	0
15	64QAM	36	0	17.68	18.01	18.09		
15	64QAM	36	20	17.81	17.83	17.95		
15	64QAM	36	39	17.85	17.80	17.87	18.5	0
15	64QAM	75	0	17.87	17.89	17.98		



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Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	17.17	17.25	17.42	18.5	0
10	QPSK	1	25	17.82	17.71	17.87		
10	QPSK	1	49	17.17	17.20	17.89		
10	QPSK	25	0	17.80	17.81	17.79	18.5	0
10	QPSK	25	12	17.90	17.63	17.80		
10	QPSK	25	25	17.79	17.84	17.45		
10	QPSK	50	0	17.79	17.83	17.98		
10	16QAM	1	0	17.47	17.48	17.49	18.5	0
10	16QAM	1	25	17.52	17.55	17.86		
10	16QAM	1	49	18.10	18.18	18.28		
10	16QAM	25	0	17.76	17.80	17.93	18.5	0
10	16QAM	25	12	17.86	17.78	18.02		
10	16QAM	25	25	17.88	17.91	18.01		
10	16QAM	50	0	17.89	17.84	17.95		
10	64QAM	1	0	17.66	17.44	17.62	18.5	0
10	64QAM	1	25	17.92	17.94	18.03		
10	64QAM	1	49	17.93	17.38	18.15		
10	64QAM	25	0	17.72	17.76	18.21	18.5	0
10	64QAM	25	12	17.87	17.88	18.02		
10	64QAM	25	25	17.78	17.89	18.01		
10	64QAM	50	0	17.77	17.81	17.83		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	17.86	17.99	17.99	18.5	0
5	QPSK	1	12	17.56	17.96	17.95		
5	QPSK	1	24	17.74	17.82	17.81		
5	QPSK	12	0	17.84	17.87	18.03	18.5	0
5	QPSK	12	7	17.77	17.83	17.92		
5	QPSK	12	13	17.69	17.78	17.89		
5	QPSK	25	0	17.80	17.82	17.99		
5	16QAM	1	0	18.30	18.20	18.31	18.5	0
5	16QAM	1	12	18.03	18.13	18.26		
5	16QAM	1	24	18.17	18.12	18.32		
5	16QAM	12	0	17.80	17.85	17.98	18.5	0
5	16QAM	12	7	17.79	17.85	17.96		
5	16QAM	12	13	17.75	17.82	17.93		
5	16QAM	25	0	17.84	17.90	17.98		
5	64QAM	1	0	18.36	18.36	18.31	18.5	0
5	64QAM	1	12	18.13	18.15	18.34		
5	64QAM	1	24	18.10	17.95	18.20		
5	64QAM	12	0	17.85	17.88	17.52	18.5	0
5	64QAM	12	7	17.77	17.84	17.92		
5	64QAM	12	13	17.73	17.83	17.92		
5	64QAM	25	0	17.84	17.85	17.80		



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Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	17.75	17.55	18.03	18.5	0
3	QPSK	1	8	17.67	17.78	18.08		
3	QPSK	1	14	17.65	17.62	17.90		
3	QPSK	8	0	17.81	17.82	17.94	18.5	0
3	QPSK	8	4	17.79	17.32	17.95		
3	QPSK	8	7	17.66	17.74	17.87		
3	QPSK	15	0	17.73	17.77	17.91		
3	16QAM	1	0	18.20	18.17	18.24	18.5	0
3	16QAM	1	8	18.22	18.19	18.27		
3	16QAM	1	14	18.04	18.13	18.33		
3	16QAM	8	0	17.83	17.84	17.96	18.5	0
3	16QAM	8	4	17.75	17.81	17.96		
3	16QAM	8	7	17.75	17.81	17.92		
3	16QAM	15	0	17.79	17.81	17.94		
3	64QAM	1	0	18.12	18.13	18.25	18.5	0
3	64QAM	1	8	18.06	18.07	18.18		
3	64QAM	1	14	18.04	18.05	18.20		
3	64QAM	8	0	17.60	17.79	18.30	18.5	0
3	64QAM	8	4	17.73	17.80	18.22		
3	64QAM	8	7	17.67	17.58	18.31		
3	64QAM	15	0	17.69	17.74	17.94		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	17.60	17.74	17.79	18.5	0
1.4	QPSK	1	3	17.67	17.68	17.85		
1.4	QPSK	1	5	17.60	17.62	17.79		
1.4	QPSK	3	0	17.75	17.73	17.92		
1.4	QPSK	3	1	17.75	17.83	17.97		
1.4	QPSK	3	3	17.71	17.70	17.91		
1.4	QPSK	6	0	17.65	17.70	17.83	18.5	0
1.4	16QAM	1	0	17.89	18.18	18.12	18.5	0
1.4	16QAM	1	3	17.98	18.19	18.19		
1.4	16QAM	1	5	17.85	18.07	18.12		
1.4	16QAM	3	0	17.81	17.83	17.99		
1.4	16QAM	3	1	17.90	17.87	18.09		
1.4	16QAM	3	3	17.81	17.78	17.94		
1.4	16QAM	6	0	17.78	17.77	17.85	18.5	0
1.4	64QAM	1	0	17.82	18.14	17.95	18.5	0
1.4	64QAM	1	3	17.87	18.10	18.00		
1.4	64QAM	1	5	17.75	18.00	18.04		
1.4	64QAM	3	0	17.78	17.84	18.03		
1.4	64QAM	3	1	17.87	17.82	18.02		
1.4	64QAM	3	3	17.77	17.82	18.00		
1.4	64QAM	6	0	17.71	17.76	17.95	18.5	0



<Reduced Power Mode for Handheld>

<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	21.86	21.85	21.74	22	0
20	QPSK	1	49	21.36	21.17	21.33		
20	QPSK	1	99	21.62	21.61	21.49		
20	QPSK	50	0	21.28	21.24	21.23	22	0
20	QPSK	50	24	21.05	20.89	21.01		
20	QPSK	50	50	21.08	20.99	21.03		
20	QPSK	100	0	21.16	21.08	21.13		
20	16QAM	1	0	21.74	21.64	21.49	22	0
20	16QAM	1	49	21.22	20.95	21.16		
20	16QAM	1	99	21.35	21.35	21.38		
20	16QAM	50	0	21.17	20.93	21.08	22	0
20	16QAM	50	24	21.09	20.89	21.06		
20	16QAM	50	50	21.14	21.02	21.06		
20	16QAM	100	0	21.13	21.01	21.05		
20	64QAM	1	0	21.68	21.55	21.57	22	0
20	64QAM	1	49	20.95	20.62	20.78		
20	64QAM	1	99	21.47	21.51	21.46		
20	64QAM	50	0	21.19	20.92	21.04	22	0
20	64QAM	50	24	21.08	20.86	21.01		
20	64QAM	50	50	21.12	20.97	21.05		
20	64QAM	100	0	21.14	21.01	21.04		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	21.50	21.23	21.41	22	0
15	QPSK	1	37	20.90	20.72	20.86		
15	QPSK	1	74	21.46	21.37	21.29		
15	QPSK	36	0	21.21	20.94	21.10	22	0
15	QPSK	36	20	21.08	20.89	21.03		
15	QPSK	36	39	21.14	20.91	21.01		
15	QPSK	75	0	21.15	20.89	21.06		
15	16QAM	1	0	21.83	21.67	21.74	22	0
15	16QAM	1	37	21.27	21.10	21.16		
15	16QAM	1	74	21.83	21.72	21.71		
15	16QAM	36	0	21.21	20.96	21.12	22	0
15	16QAM	36	20	21.07	20.88	21.06		
15	16QAM	36	39	21.12	20.90	20.99		
15	16QAM	75	0	21.16	20.96	21.13		
15	64QAM	1	0	21.69	21.47	21.54	22	0
15	64QAM	1	37	21.34	21.21	21.37		
15	64QAM	1	74	21.67	21.60	21.45		
15	64QAM	36	0	21.18	20.95	21.11	22	0
15	64QAM	36	20	21.05	20.87	21.00		
15	64QAM	36	39	21.09	20.87	20.97		



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15	64QAM	75	0	21.16	20.94	21.13		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	21.29	21.28	21.38	22	0
10	QPSK	1	25	20.92	20.71	20.96		
10	QPSK	1	49	21.31	21.21	21.38		
10	QPSK	25	0	21.13	21.00	21.12	22	0
10	QPSK	25	12	21.12	20.92	21.00		
10	QPSK	25	25	21.12	20.97	21.20		
10	QPSK	50	0	21.09	20.95	21.10		
10	16QAM	1	0	21.69	21.59	21.56	22	0
10	16QAM	1	25	21.37	21.23	21.30		
10	16QAM	1	49	21.67	21.56	21.60		
10	16QAM	25	0	21.09	20.96	21.10	22	0
10	16QAM	25	12	21.08	20.88	20.99		
10	16QAM	25	25	21.03	20.96	21.13		
10	16QAM	50	0	21.12	20.93	21.14		
10	64QAM	1	0	21.51	21.42	21.41	22	0
10	64QAM	1	25	21.19	21.02	21.16		
10	64QAM	1	49	21.62	21.45	21.50		
10	64QAM	25	0	21.16	21.02	21.16	22	0
10	64QAM	25	12	21.06	20.94	20.97		
10	64QAM	25	25	21.07	21.09	21.15		
10	64QAM	50	0	21.11	21.15	21.14		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	21.00	20.83	20.94	22	0
5	QPSK	1	12	20.93	20.78	20.94		
5	QPSK	1	24	21.03	20.83	21.04		
5	QPSK	12	0	21.11	21.01	21.06	22	0
5	QPSK	12	7	21.02	20.96	21.03		
5	QPSK	12	13	20.99	20.92	20.99		
5	QPSK	25	0	21.08	20.89	21.07		
5	16QAM	1	0	21.44	21.17	21.50	22	0
5	16QAM	1	12	21.23	21.09	21.25		
5	16QAM	1	24	21.24	21.05	21.34		
5	16QAM	12	0	21.17	21.00	21.05	22	0
5	16QAM	12	7	21.12	20.96	21.12		
5	16QAM	12	13	21.03	20.89	21.12		
5	16QAM	25	0	21.03	20.93	21.06		
5	64QAM	1	0	21.31	21.35	21.31	22	0
5	64QAM	1	12	21.20	21.14	21.18		
5	64QAM	1	24	21.17	21.18	21.23		
5	64QAM	12	0	21.15	20.92	21.03	22	0
5	64QAM	12	7	21.09	20.88	21.11		
5	64QAM	12	13	21.02	20.85	21.11		
5	64QAM	25	0	21.05	20.90	21.12		



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Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	20.84	20.80	20.88	22	0
3	QPSK	1	8	21.04	20.84	21.03		
3	QPSK	1	14	20.94	20.82	20.98		
3	QPSK	8	0	21.07	20.90	21.02	22	0
3	QPSK	8	4	21.05	20.85	21.06		
3	QPSK	8	7	21.01	20.85	20.99		
3	QPSK	15	0	21.01	20.91	21.03		
3	16QAM	1	0	21.31	21.18	21.35	22	0
3	16QAM	1	8	21.31	21.11	21.35		
3	16QAM	1	14	21.19	21.01	21.31		
3	16QAM	8	0	21.17	20.99	21.12	22	0
3	16QAM	8	4	21.15	20.97	21.14		
3	16QAM	8	7	21.15	20.98	21.10		
3	16QAM	15	0	21.06	20.86	21.02		
3	64QAM	1	0	21.17	21.01	21.14	22	0
3	64QAM	1	8	21.13	21.04	21.19		
3	64QAM	1	14	20.84	20.94	21.13		
3	64QAM	8	0	20.76	20.86	21.02	22	0
3	64QAM	8	4	21.07	20.91	21.05		
3	64QAM	8	7	21.03	20.82	21.01		
3	64QAM	15	0	21.03	20.91	21.06		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	20.91	20.62	20.63	22	0
1.4	QPSK	1	3	20.93	20.84	21.01		
1.4	QPSK	1	5	20.89	20.73	20.87		
1.4	QPSK	3	0	21.05	20.82	21.00		
1.4	QPSK	3	1	21.07	20.85	21.01		
1.4	QPSK	3	3	21.00	20.85	20.93		
1.4	QPSK	6	0	21.01	20.80	20.98	22	0
1.4	16QAM	1	0	21.22	21.07	21.31	22	0
1.4	16QAM	1	3	21.25	21.11	21.37		
1.4	16QAM	1	5	21.15	21.04	21.32		
1.4	16QAM	3	0	21.11	20.97	21.06		
1.4	16QAM	3	1	21.12	20.99	21.10		
1.4	16QAM	3	3	21.11	20.90	21.05		
1.4	16QAM	6	0	21.02	20.86	20.98	22	0
1.4	64QAM	1	0	21.11	20.97	21.16	22	0
1.4	64QAM	1	3	21.18	21.05	21.11		
1.4	64QAM	1	5	21.09	20.89	21.06		
1.4	64QAM	3	0	21.10	20.92	21.08		
1.4	64QAM	3	1	21.14	20.95	21.10		
1.4	64QAM	3	3	21.09	20.94	21.00		
1.4	64QAM	6	0	21.04	20.84	20.99	22	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		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	21.25	21.97	21.96		
20	QPSK	1	49	21.13	21.30	21.42	22.5	0
20	QPSK	1	99	21.35	21.41	21.44		
20	QPSK	50	0	21.31	21.35	21.48		
20	QPSK	50	24	21.31	21.37	21.37	22.5	0
20	QPSK	50	50	21.25	21.30	21.30		
20	QPSK	100	0	21.40	21.42	21.39		
20	16QAM	1	0	21.62	21.69	21.72	22.5	0
20	16QAM	1	49	21.61	21.53	21.64		
20	16QAM	1	99	21.57	21.50	21.76		
20	16QAM	50	0	21.46	21.39	21.45	22.5	0
20	16QAM	50	24	21.37	21.39	21.34		
20	16QAM	50	50	21.20	21.33	21.30		
20	16QAM	100	0	21.38	21.28	21.42	22.5	0
20	64QAM	1	0	21.94	21.48	21.54		
20	64QAM	1	49	21.76	21.14	21.19		
20	64QAM	1	99	21.69	21.35	21.59	22.5	0
20	64QAM	50	0	21.36	21.34	21.43		
20	64QAM	50	24	21.33	21.38	21.36		
20	64QAM	50	50	21.24	21.31	21.29	22.5	0
20	64QAM	100	0	21.39	21.30	21.40		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	20.97	21.05	20.92		
15	QPSK	1	37	21.17	21.17	21.21	22.5	0
15	QPSK	1	74	21.26	21.34	21.33		
15	QPSK	36	0	21.42	21.35	21.39		
15	QPSK	36	20	21.37	21.27	21.43	22.5	0
15	QPSK	36	39	21.20	21.28	21.31		
15	QPSK	75	0	21.32	21.28	21.27		
15	16QAM	1	0	21.80	21.80	21.83	22.5	0
15	16QAM	1	37	21.48	21.46	21.53		
15	16QAM	1	74	21.68	21.72	21.71		
15	16QAM	36	0	21.40	21.40	21.46	22.5	0
15	16QAM	36	20	21.35	21.33	21.39		
15	16QAM	36	39	21.23	21.28	21.26		
15	16QAM	75	0	21.37	21.35	21.30	22.5	0
15	64QAM	1	0	21.60	21.66	21.65		
15	64QAM	1	37	21.55	21.58	21.56		
15	64QAM	1	74	21.50	20.96	21.52	22.5	0
15	64QAM	36	0	21.39	21.43	21.46		
15	64QAM	36	20	21.33	21.40	21.38		
15	64QAM	36	39	21.18	21.32	21.25	22.5	0
15	64QAM	75	0	21.36	21.35	21.30		



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Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	21.15	21.25	21.40	22.5	0
10	QPSK	1	25	21.34	21.35	21.48		
10	QPSK	1	49	21.97	21.99	21.99		
10	QPSK	25	0	21.48	21.61	21.62	22.5	0
10	QPSK	25	12	21.45	21.50	21.58		
10	QPSK	25	25	21.60	21.69	21.64		
10	QPSK	50	0	21.45	21.57	21.60		
10	16QAM	1	0	22.02	22.04	22.22	22.5	0
10	16QAM	1	25	21.68	21.73	21.75		
10	16QAM	1	49	22.27	22.20	22.25		
10	16QAM	25	0	21.42	21.63	21.60	22.5	0
10	16QAM	25	12	21.44	21.51	21.54		
10	16QAM	25	25	21.54	21.66	21.60		
10	16QAM	50	0	21.53	21.58	21.65		
10	64QAM	1	0	21.84	22.14	22.04	22.5	0
10	64QAM	1	25	21.56	21.72	21.64		
10	64QAM	1	49	22.18	22.19	22.15		
10	64QAM	25	0	21.49	21.55	21.62	22.5	0
10	64QAM	25	12	21.43	21.49	21.58		
10	64QAM	25	25	21.58	21.66	21.67		
10	64QAM	50	0	21.48	21.55	21.61		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	20.80	20.93	21.04	22.5	0
5	QPSK	1	12	21.37	21.44	21.49		
5	QPSK	1	24	21.41	21.57	21.53		
5	QPSK	12	0	21.47	21.57	21.57	22.5	0
5	QPSK	12	7	21.39	21.49	21.55		
5	QPSK	12	13	21.40	21.46	21.53		
5	QPSK	25	0	21.44	21.51	21.55		
5	16QAM	1	0	21.84	21.93	22.00	22.5	0
5	16QAM	1	12	21.56	21.65	21.71		
5	16QAM	1	24	21.74	21.90	21.79		
5	16QAM	12	0	21.49	21.61	21.63	22.5	0
5	16QAM	12	7	21.48	21.54	21.61		
5	16QAM	12	13	21.47	21.56	21.60		
5	16QAM	25	0	21.35	21.45	21.53		
5	64QAM	1	0	21.66	21.80	21.87	22.5	0
5	64QAM	1	12	21.49	21.62	21.71		
5	64QAM	1	24	21.52	21.69	21.66		
5	64QAM	12	0	21.51	21.59	21.61	22.5	0
5	64QAM	12	7	21.44	21.52	21.48		
5	64QAM	12	13	21.40	21.56	21.49		
5	64QAM	25	0	21.44	21.54	21.58		



FCC SAR Test Report

Report No. : FA890604-02

Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	20.73	20.77	20.75	22.5	0
3	QPSK	1	8	21.40	21.47	21.46		
3	QPSK	1	14	21.32	21.45	21.41		
3	QPSK	8	0	21.41	21.54	21.57	22.5	0
3	QPSK	8	4	21.39	21.48	21.53		
3	QPSK	8	7	21.39	21.49	21.49		
3	QPSK	15	0	21.40	21.46	21.58		
3	16QAM	1	0	21.73	21.88	21.77	22.5	0
3	16QAM	1	8	21.74	21.80	21.74		
3	16QAM	1	14	21.62	21.72	21.68		
3	16QAM	8	0	21.50	21.64	21.61	22.5	0
3	16QAM	8	4	21.50	21.57	21.53		
3	16QAM	8	7	21.44	21.55	21.51		
3	16QAM	15	0	21.40	21.46	21.55		
3	64QAM	1	0	21.48	21.70	21.89	22.5	0
3	64QAM	1	8	21.53	21.59	21.76		
3	64QAM	1	14	21.45	21.57	21.74		
3	64QAM	8	0	21.43	21.59	21.59	22.5	0
3	64QAM	8	4	21.46	21.52	21.50		
3	64QAM	8	7	21.41	21.46	21.48		
3	64QAM	15	0	21.41	21.48	21.55		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	21.33	20.82	21.42	22.5	0
1.4	QPSK	1	3	21.37	21.43	21.51		
1.4	QPSK	1	5	21.28	21.38	21.42		
1.4	QPSK	3	0	21.38	21.47	21.48		
1.4	QPSK	3	1	21.46	21.41	21.49		
1.4	QPSK	3	3	21.37	21.41	21.48		
1.4	QPSK	6	0	21.30	21.38	21.43	22.5	0
1.4	16QAM	1	0	21.69	21.82	21.76	22.5	0
1.4	16QAM	1	3	21.73	21.75	21.74		
1.4	16QAM	1	5	21.64	21.73	21.73		
1.4	16QAM	3	0	21.38	21.60	21.48		
1.4	16QAM	3	1	21.46	21.55	21.51		
1.4	16QAM	3	3	21.36	21.48	21.43		
1.4	16QAM	6	0	21.37	21.47	21.48	22.5	0
1.4	64QAM	1	0	21.62	21.60	21.64	22.5	0
1.4	64QAM	1	3	21.68	21.60	21.72		
1.4	64QAM	1	5	21.59	21.58	21.56		
1.4	64QAM	3	0	21.43	21.45	21.50		
1.4	64QAM	3	1	21.15	21.45	21.58		
1.4	64QAM	3	3	21.47	21.49	21.46		
1.4	64QAM	6	0	21.34	21.44	21.45	22.5	0



<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	21.88	21.93	22.10	22.5	0
20	QPSK	1	49	21.76	21.81	21.78		
20	QPSK	1	99	22.37	22.41	22.38		
20	QPSK	50	0	21.52	21.57	21.68	22.5	0
20	QPSK	50	24	21.52	21.69	21.67		
20	QPSK	50	50	21.52	21.59	21.67		
20	QPSK	100	0	21.53	21.58	21.53	22.5	0
20	16QAM	1	0	22.00	22.19	21.85		
20	16QAM	1	49	21.26	21.58	21.66		
20	16QAM	1	99	21.81	22.14	22.19	22.5	0
20	16QAM	50	0	21.07	21.04	21.23		
20	16QAM	50	24	21.08	21.05	21.15		
20	16QAM	50	50	21.01	21.07	21.20	22.5	0
20	16QAM	100	0	20.99	21.14	21.18		
20	64QAM	1	0	22.07	21.78	21.94		
20	64QAM	1	49	21.92	21.30	21.34	22.5	0
20	64QAM	1	99	22.24	22.24	22.24		
20	64QAM	50	0	21.05	21.04	21.16		
20	64QAM	50	24	21.04	21.01	21.13	22.5	0
20	64QAM	50	50	20.98	21.07	21.19		
20	64QAM	100	0	20.99	21.14	21.18		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	21.85	22.01	21.50	22.5	0
15	QPSK	1	37	21.33	21.40	21.50		
15	QPSK	1	74	21.68	21.75	21.77		
15	QPSK	36	0	21.67	21.72	21.73	22.5	0
15	QPSK	36	20	21.46	21.56	21.65		
15	QPSK	36	39	21.46	21.52	21.59		
15	QPSK	75	0	21.45	21.56	21.63	22.5	0
15	16QAM	1	0	22.19	22.27	22.29		
15	16QAM	1	37	21.60	21.82	21.73		
15	16QAM	1	74	22.02	22.09	22.06	22.5	0
15	16QAM	36	0	21.14	21.18	21.22		
15	16QAM	36	20	20.94	21.05	21.15		
15	16QAM	36	39	20.89	21.00	21.06	22.5	0
15	16QAM	75	0	21.05	21.10	21.17		
15	64QAM	1	0	21.98	22.12	22.18		
15	64QAM	1	37	21.68	21.57	21.75	22.5	0
15	64QAM	1	74	21.83	21.92	21.91		
15	64QAM	36	0	21.13	21.16	21.22		
15	64QAM	36	20	20.92	21.05	21.14	22.5	0
15	64QAM	36	39	20.88	20.99	21.04		
15	64QAM	75	0	21.00	21.10	21.17		



FCC SAR Test Report

Report No. : FA890604-02

Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	21.33	21.94	21.58	22.5	0
10	QPSK	1	25	21.41	21.58	21.57		
10	QPSK	1	49	21.93	21.93	22.09		
10	QPSK	25	0	21.35	21.42	21.61	22.5	0
10	QPSK	25	12	21.51	21.51	21.63		
10	QPSK	25	25	21.52	21.50	21.66		
10	QPSK	50	0	21.46	21.46	21.54		
10	16QAM	1	0	21.39	21.33	21.38	22.5	0
10	16QAM	1	25	21.68	21.67	21.80		
10	16QAM	1	49	22.11	22.29	22.28		
10	16QAM	25	0	20.85	20.93	21.09	22.5	0
10	16QAM	25	12	20.93	21.03	21.09		
10	16QAM	25	25	20.95	21.11	21.10		
10	16QAM	50	0	21.02	20.98	21.16		
10	64QAM	1	0	21.46	21.45	21.42	22.5	0
10	64QAM	1	25	21.51	21.87	21.67		
10	64QAM	1	49	22.04	22.38	22.16		
10	64QAM	25	0	20.88	20.94	21.11	22.5	0
10	64QAM	25	12	20.97	21.03	21.12		
10	64QAM	25	25	21.03	21.01	21.15		
10	64QAM	50	0	20.93	20.94	21.11		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	21.57	21.26	21.79	22.5	0
5	QPSK	1	12	21.64	21.74	21.88		
5	QPSK	1	24	21.57	21.66	21.81		
5	QPSK	12	0	21.69	21.77	21.92	22.5	0
5	QPSK	12	7	21.76	21.80	21.98		
5	QPSK	12	13	21.64	21.77	21.91		
5	QPSK	25	0	21.67	21.68	21.88		
5	16QAM	1	0	22.05	21.92	22.20	22.5	0
5	16QAM	1	12	22.10	21.99	22.29		
5	16QAM	1	24	22.03	21.93	22.21		
5	16QAM	12	0	21.81	21.83	21.99	22.5	0
5	16QAM	12	7	21.88	21.92	22.07		
5	16QAM	12	13	21.68	21.81	21.96		
5	16QAM	25	0	21.68	21.79	21.92		
5	64QAM	1	0	21.96	21.86	22.23	22.5	0
5	64QAM	1	12	22.08	21.91	22.20		
5	64QAM	1	24	21.98	21.85	22.16		
5	64QAM	12	0	21.76	21.91	21.97	22.5	0
5	64QAM	12	7	21.77	21.94	21.94		
5	64QAM	12	13	21.75	21.87	21.96		
5	64QAM	25	0	21.64	21.81	21.90		



FCC SAR Test Report

Report No. : FA890604-02

Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	21.63	21.09	21.55	22.5	0
3	QPSK	1	8	21.55	21.79	21.82		
3	QPSK	1	14	21.52	21.74	21.83		
3	QPSK	8	0	21.79	21.82	21.84	22.5	0
3	QPSK	8	4	21.76	21.83	21.78		
3	QPSK	8	7	21.68	21.78	21.66		
3	QPSK	15	0	21.73	21.78	21.92		
3	16QAM	1	0	21.89	22.02	21.83	22.5	0
3	16QAM	1	8	21.87	21.99	21.86		
3	16QAM	1	14	21.82	21.97	21.88		
3	16QAM	8	0	21.87	21.96	21.88	22.5	0
3	16QAM	8	4	21.83	21.93	22.21		
3	16QAM	8	7	21.76	21.90	21.92		
3	16QAM	15	0	21.79	21.81	22.03		
3	64QAM	1	0	21.84	21.96	21.96	22.5	0
3	64QAM	1	8	21.92	21.92	21.76		
3	64QAM	1	14	21.80	21.84	21.75		
3	64QAM	8	0	21.78	21.82	21.92	22.5	0
3	64QAM	8	4	21.78	21.79	21.79		
3	64QAM	8	7	21.70	21.75	21.94		
3	64QAM	15	0	21.75	21.80	21.45		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	21.57	21.06	21.79	22.5	0
1.4	QPSK	1	3	21.64	21.74	21.88		
1.4	QPSK	1	5	21.67	21.66	21.81		
1.4	QPSK	3	0	21.69	21.77	21.92		
1.4	QPSK	3	1	21.76	21.80	21.98		
1.4	QPSK	3	3	21.64	21.77	21.91		
1.4	QPSK	6	0	21.67	21.68	21.88	22.5	0
1.4	16QAM	1	0	22.05	21.92	22.20	22.5	0
1.4	16QAM	1	3	22.10	21.99	22.29		
1.4	16QAM	1	5	22.03	21.93	22.21		
1.4	16QAM	3	0	21.81	21.83	21.99		
1.4	16QAM	3	1	21.88	21.92	22.07		
1.4	16QAM	3	3	21.68	21.81	21.96		
1.4	16QAM	6	0	21.68	21.79	21.92	22.5	0
1.4	64QAM	1	0	21.96	21.86	22.23	22.5	0
1.4	64QAM	1	3	22.08	21.91	22.20		
1.4	64QAM	1	5	21.98	21.85	22.16		
1.4	64QAM	3	0	21.76	21.91	21.97		
1.4	64QAM	3	1	21.77	21.94	21.94		
1.4	64QAM	3	3	21.75	21.87	21.96		
1.4	64QAM	6	0	21.64	21.81	21.90	22.5	0

<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 ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
 - b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
 - c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

<2.4GHz WLAN>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	18.50	19.00	97.59
		6	2437	17.66	19.00	
		11	2462	17.69	19.00	
	802.11g 6Mbps	1	2412	14.20	14.50	87.44
		6	2437	13.90	14.50	
		11	2462	13.86	14.50	
	802.11n-HT20 MCS0	1	2412	12.59	13.00	86.70
		6	2437	12.21	13.00	
		11	2462	12.63	13.00	
	802.11n-HT40 MCS0	3	2422	8.93	9.00	85.53
		6	2437	8.16	9.00	
		9	2452	8.82	9.00	

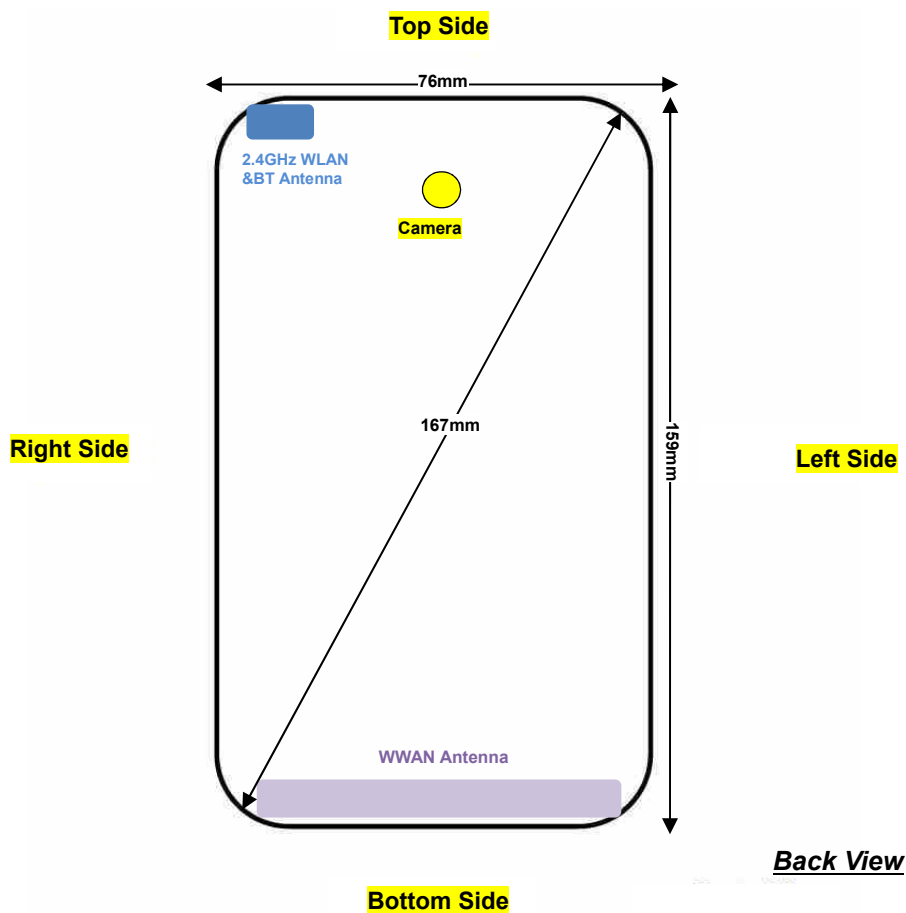
<2.4GHz Bluetooth>
General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps, due to its highest average power.
2. The Bluetooth duty cycle is 76.70 % as following figure, according to 2016 Oct. TCB workshop for Bluetooth SAR scaling need further consideration and the theoretical duty cycle is 83.3%, therefore the actual duty cycle will be scaled up to the theoretical value of Bluetooth reported SAR calculation

Mode	Channel	Frequency (MHz)	Average power (dBm)
			1Mbps
BR/EDR	CH 00	2402	9.66
	CH 39	2441	10.92
	CH 78	2480	9.84
Tune-up limit (dBm)			11.00

Mode	Channel	Frequency (MHz)	Average power (dBm)
			GFSK
LE	CH 00	2402	0.35
	CH 19	2440	1.39
	CH 39	2480	0.70
Tune-up Limit			2.00

14. Antenna Location



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

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

General Note:

Referring to KDB 941225 D06 v02r01, when the overall device length and width are $\geq 9\text{cm} \times 5\text{cm}$, 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.

15. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
 - b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
 - c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
 - d. For BT/WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥ 0.8 W/kg. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. Pre KDB648474 D04v01r03, when the reported SAR for a 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.
5. The device employs proximity sensors that detect the presence of the user's body at the front or back faces of the device. When front or back body worn condition is detected, GSM1900, WCDMA band II/IV, LTE band 2/4/7/66 reduced power will be active. (P-sensor can't work at detecting presence of the user's body at the four edges of the device.)
6. When hotspot mode is enabled, power reduction will be activated to limit the maximum power of GSM1900, WCDMA band II/IV, LTE band 2/4/7/66.
7. This device hotspot reduced power and P-sensor reduced power level are the same for LTE Band 7. And for other Bands are differences.
8. P-sensor can detect handheld state, WCDMA Band II/IV, and LTE Band2/4/66 for front/back/bottom sides of product specific 10g SAR condition reduced powers will be active.
9. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.
 - a. For this device SAR for WWAN transmitter scaled to reduced power mode for product specific 10g SAR is higher than 1.2W/kg of GSM1900, WCDMA Band II/IV, LTE Band 2/4/7/66, therefore product specific 10g SAR is necessary.
 - b. When 10-g product specific 10g SAR is considered, SAR thresholds is specified in the procedures for SAR test reduction and exclusion should be multiplied by 2.5.

GSM Note:

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS 4Tx slots for GSM850/GSM1900 are considered as the primary mode.
2. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode, SAR measurement is not required for the secondary mode.
3. Power reduction which is triggered by hotspot mode/p-sensor on are implemented in 1900 band, for SAR testing EUT was set in reduced power mode and GPRS 4 Tx slots due to its highest frame-average power.

WCDMA Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA 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 ≤ 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 (HSDPA / HSUPA / 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 ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM/64QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / B5 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 SAR test was covered by Band 66; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - c. the maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion
 - d. 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 ≤ 1.2 W/kg.
2. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
3. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
4. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

15.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Power Mode	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 4 Tx slots	Right Cheek	Full	251	848.8	26.82	27.50	1.169	0.13	0.209	0.244
	GSM850	GPRS 4 Tx slots	Right Tilted	Full	251	848.8	26.82	27.50	1.169	0.01	0.171	0.200
01	GSM850	GPRS 4 Tx slots	Left Cheek	Full	251	848.8	26.82	27.50	1.169	0.07	0.210	0.246
	GSM850	GPRS 4 Tx slots	Left Tilted	Full	251	848.8	26.82	27.50	1.169	-0.09	0.123	0.144
	GSM1900	GPRS 4 Tx slots	Right Cheek	Full	810	1909.8	23.56	24.50	1.242	0.01	0.023	0.028
	GSM1900	GPRS 4 Tx slots	Right Tilted	Full	810	1909.8	23.56	24.50	1.242	0.01	0.006	0.007
02	GSM1900	GPRS 4 Tx slots	Left Cheek	Full	810	1909.8	23.56	24.50	1.242	-0.02	0.022	0.028
	GSM1900	GPRS 4 Tx slots	Left Tilted	Full	810	1909.8	23.56	24.50	1.242	0.02	0.007	0.008

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Power Mode	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 Band V	RMC 12.2Kbps	Right Cheek	Full	4132	826.4	23.31	24.00	1.172	-0.02	0.221	0.259
	WCDMA Band V	RMC 12.2Kbps	Right Tilted	Full	4132	826.4	23.31	24.00	1.172	0.03	0.137	0.161
03	WCDMA Band V	RMC 12.2Kbps	Left Cheek	Full	4132	826.4	23.31	24.00	1.172	0.07	0.259	0.304
	WCDMA Band V	RMC 12.2Kbps	Left Tilted	Full	4132	826.4	23.31	24.00	1.172	0.01	0.144	0.169
	WCDMA Band IV	RMC 12.2Kbps	Right Cheek	Full	1513	1752.6	23.58	24.00	1.102	-0.01	0.028	0.031
	WCDMA Band IV	RMC 12.2Kbps	Right Tilted	Full	1513	1752.6	23.58	24.00	1.102	0.01	0.015	0.017
04	WCDMA Band IV	RMC 12.2Kbps	Left Cheek	Full	1513	1752.6	23.58	24.00	1.102	-0.07	0.028	0.031
	WCDMA Band IV	RMC 12.2Kbps	Left Tilted	Full	1513	1752.6	23.58	24.00	1.102	0.02	0.020	0.022
	WCDMA Band II	RMC 12.2Kbps	Right Cheek	Full	9538	1907.6	23.16	24.00	1.213	-0.08	0.067	0.081
	WCDMA Band II	RMC 12.2Kbps	Right Tilted	Full	9538	1907.6	23.16	24.00	1.213	0.01	0.037	0.045
05	WCDMA Band II	RMC 12.2Kbps	Left Cheek	Full	9538	1907.6	23.16	24.00	1.213	-0.04	0.074	0.090
	WCDMA Band II	RMC 12.2Kbps	Left Tilted	Full	9538	1907.6	23.16	24.00	1.213	0.01	0.055	0.067



<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Power Mode	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 5	10M	QPSK	1	49	Right Cheek	Full	20525	836.5	23.00	24.00	1.259	-0.04	0.244	0.307
	LTE Band 5	10M	QPSK	25	0	Right Cheek	Full	20525	836.5	21.54	23.00	1.400	0.06	0.116	0.162
	LTE Band 5	10M	QPSK	1	49	Right Tilted	Full	20525	836.5	23.00	24.00	1.259	-0.02	0.145	0.183
	LTE Band 5	10M	QPSK	25	0	Right Tilted	Full	20525	836.5	21.54	23.00	1.400	0.05	0.076	0.106
	LTE Band 5	10M	QPSK	1	49	Left Cheek	Full	20525	836.5	23.00	24.00	1.259	0.05	0.266	0.335
	LTE Band 5	10M	QPSK	25	0	Left Cheek	Full	20525	836.5	21.54	23.00	1.400	0.07	0.121	0.169
	LTE Band 5	10M	QPSK	1	49	Left Tilted	Full	20525	836.5	23.00	24.00	1.259	-0.12	0.118	0.149
	LTE Band 5	10M	QPSK	25	0	Left Tilted	Full	20525	836.5	21.54	23.00	1.400	0.11	0.041	0.058
07	LTE Band 66	20M	QPSK	1	99	Right Cheek	Full	132322	1745	23.30	24.00	1.175	-0.18	0.046	0.054
	LTE Band 66	20M	QPSK	50	24	Right Cheek	Full	132322	1745	22.11	23.00	1.227	-0.03	0.021	0.026
	LTE Band 66	20M	QPSK	1	99	Right Tilted	Full	132322	1745	23.30	24.00	1.175	-0.04	0.020	0.023
	LTE Band 66	20M	QPSK	50	24	Right Tilted	Full	132322	1745	22.11	23.00	1.227	0.01	0.022	0.026
	LTE Band 66	20M	QPSK	1	99	Left Cheek	Full	132322	1745	23.30	24.00	1.175	-0.12	0.030	0.035
	LTE Band 66	20M	QPSK	50	24	Left Cheek	Full	132322	1745	22.11	23.00	1.227	0.01	0.023	0.028
	LTE Band 66	20M	QPSK	1	99	Left Tilted	Full	132322	1745	23.30	24.00	1.175	0.01	0.024	0.029
	LTE Band 66	20M	QPSK	50	24	Left Tilted	Full	132322	1745	22.11	23.00	1.227	0.01	0.017	0.021
08	LTE Band 2	20M	QPSK	1	0	Right Cheek	Full	19100	1900	23.46	24.00	1.132	-0.05	0.095	0.107
	LTE Band 2	20M	QPSK	50	0	Right Cheek	Full	19100	1900	22.19	23.00	1.205	0.04	0.046	0.056
	LTE Band 2	20M	QPSK	1	0	Right Tilted	Full	19100	1900	23.46	24.00	1.132	0.01	0.041	0.046
	LTE Band 2	20M	QPSK	50	0	Right Tilted	Full	19100	1900	22.19	23.00	1.205	0.01	0.021	0.025
	LTE Band 2	20M	QPSK	1	0	Left Cheek	Full	19100	1900	23.46	24.00	1.132	-0.03	0.064	0.072
	LTE Band 2	20M	QPSK	50	0	Left Cheek	Full	19100	1900	22.19	23.00	1.205	-0.09	0.026	0.031
	LTE Band 2	20M	QPSK	1	0	Left Tilted	Full	19100	1900	23.46	24.00	1.132	0.01	0.058	0.065
	LTE Band 2	20M	QPSK	50	0	Left Tilted	Full	19100	1900	22.19	23.00	1.205	0.02	0.028	0.033
09	LTE Band 7	20M	QPSK	1	0	Right Cheek	Full	20850	2510	23.29	24.00	1.178	0.02	0.061	0.071
	LTE Band 7	20M	QPSK	50	0	Right Cheek	Full	20850	2510	22.26	23.00	1.186	0.02	0.033	0.040
	LTE Band 7	20M	QPSK	1	0	Right Tilted	Full	20850	2510	23.29	24.00	1.178	-0.06	0.068	0.080
	LTE Band 7	20M	QPSK	50	0	Right Tilted	Full	20850	2510	22.26	23.00	1.186	0.06	0.036	0.043
	LTE Band 7	20M	QPSK	1	0	Left Cheek	Full	20850	2510	23.29	24.00	1.178	0.02	0.056	0.066
	LTE Band 7	20M	QPSK	50	0	Left Cheek	Full	20850	2510	22.26	23.00	1.186	0.05	0.035	0.042
	LTE Band 7	20M	QPSK	1	0	Left Tilted	Full	20850	2510	23.29	24.00	1.178	0.02	0.061	0.072
	LTE Band 7	20M	QPSK	50	0	Left Tilted	Full	20850	2510	22.26	23.00	1.186	0.06	0.043	0.051



<WLAN 2.4GHz SAR>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Max Area Scan SAR	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	1	2412	18.50	19.00	1.122	97.59	1.025		0.234		
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	1	2412	18.50	19.00	1.122	97.59	1.025		0.352		
10	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	1	2412	18.50	19.00	1.122	97.59	1.025	-0.03	0.611	0.363	0.417
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	1	2412	18.50	19.00	1.122	97.59	1.025	0.05	0.530	0.330	0.380

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	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	39	2441	10.92	11.00	1.019	76.70	1.086	-0.03	0.012	0.013
	Bluetooth	1Mbps	Right Tilted	39	2441	10.92	11.00	1.019	76.70	1.086	0.03	0.028	0.031
11	Bluetooth	1Mbps	Left Cheek	39	2441	10.92	11.00	1.019	76.70	1.086	-0.14	0.034	0.038
	Bluetooth	1Mbps	Left Tilted	39	2441	10.92	11.00	1.019	76.70	1.086	0.02	0.030	0.034

15.2 Hotspot SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Mode	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)
12	GSM850	GPRS 4 Tx slots	Front	5	Full	251	848.8	26.82	27.50	1.169	-0.02	0.334	0.391
	GSM850	GPRS 4 Tx slots	Back	5	Full	251	848.8	26.82	27.50	1.169	-0.14	0.420	0.491
	GSM850	GPRS 4 Tx slots	Left Side	5	Full	251	848.8	26.82	27.50	1.169	0.01	0.305	0.357
	GSM850	GPRS 4 Tx slots	Right Side	5	Full	251	848.8	26.82	27.50	1.169	0.01	0.272	0.318
	GSM850	GPRS 4 Tx slots	Bottom Side	5	Full	251	848.8	26.82	27.50	1.169	-0.04	0.183	0.214
13	GSM1900	GPRS 4 Tx slots	Front	5	Hotspot On	810	1909.8	20.50	21.00	1.122	-0.04	0.474	0.532
	GSM1900	GPRS 4 Tx slots	Back	5	Hotspot On	810	1909.8	20.50	21.00	1.122	-0.06	0.811	0.910
	GSM1900	GPRS 4 Tx slots	Back	5	Hotspot On	512	1850.2	20.35	21.00	1.161	0.05	0.613	0.712
	GSM1900	GPRS 4 Tx slots	Back	5	Hotspot On	661	1880	20.37	21.00	1.156	-0.02	0.638	0.738
	GSM1900	GPRS 4 Tx slots	Left Side	5	Hotspot On	810	1909.8	20.50	21.00	1.122	-0.06	0.386	0.433
	GSM1900	GPRS 4 Tx slots	Right Side	5	Hotspot On	810	1909.8	20.50	21.00	1.122	-0.06	0.377	0.423
	GSM1900	GPRS 4 Tx slots	Bottom Side	5	Hotspot On	810	1909.8	20.50	21.00	1.122	-0.04	1.220	1.369
	GSM1900	GPRS 4 Tx slots	Bottom Side	5	Hotspot On	512	1850.2	20.35	21.00	1.161	-0.05	1.040	1.208
	GSM1900	GPRS 4 Tx slots	Bottom Side	5	Hotspot On	661	1880	20.37	21.00	1.156	0.01	1.080	1.249



<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Mode	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 Band V	RMC 12.2Kbps	Front	5	Full	4132	826.4	23.31	24.00	1.172	-0.02	0.204	0.239
	WCDMA Band V	RMC 12.2Kbps	Back	5	Full	4132	826.4	23.31	24.00	1.172	0.01	0.417	0.489
14	WCDMA Band V	RMC 12.2Kbps	Left Side	5	Full	4132	826.4	23.31	24.00	1.172	-0.02	0.423	0.496
	WCDMA Band V	RMC 12.2Kbps	Right Side	5	Full	4132	826.4	23.31	24.00	1.172	0.01	0.342	0.401
	WCDMA Band V	RMC 12.2Kbps	Bottom Side	5	Full	4132	826.4	23.31	24.00	1.172	-0.06	0.162	0.190
	WCDMA Band IV	RMC 12.2Kbps	Front	5	Hotspot On	1513	1738	18.02	18.50	1.117	-0.01	0.582	0.650
	WCDMA Band IV	RMC 12.2Kbps	Back	5	Hotspot On	1513	1738	18.02	18.50	1.117	-0.05	0.749	0.837
	WCDMA Band IV	RMC 12.2Kbps	Back	5	Hotspot On	1312	1712.4	17.87	18.50	1.156	-0.07	0.598	0.691
	WCDMA Band IV	RMC 12.2Kbps	Back	5	Hotspot On	1413	1732.6	17.89	18.50	1.151	-0.03	0.697	0.802
	WCDMA Band IV	RMC 12.2Kbps	Left Side	5	Hotspot On	1513	1738	18.02	18.50	1.117	-0.06	0.059	0.065
	WCDMA Band IV	RMC 12.2Kbps	Right Side	5	Hotspot On	1513	1738	18.02	18.50	1.117	-0.06	0.033	0.036
15	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	5	Hotspot On	1513	1738	18.02	18.50	1.117	-0.02	1.190	1.329
	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	5	Hotspot On	1312	1712.4	17.87	18.50	1.156	-0.09	0.826	0.955
	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	5	Hotspot On	1413	1732.6	17.89	18.50	1.151	-0.02	0.963	1.108
	WCDMA Band II	RMC 12.2Kbps	Front	5	Hotspot On	9538	1907.6	15.73	16.00	1.064	-0.05	0.620	0.660
	WCDMA Band II	RMC 12.2Kbps	Back	5	Hotspot On	9538	1907.6	15.73	16.00	1.064	-0.05	0.873	0.929
	WCDMA Band II	RMC 12.2Kbps	Back	5	Hotspot On	9262	1852.4	15.69	16.00	1.074	-0.04	0.700	0.752
	WCDMA Band II	RMC 12.2Kbps	Back	5	Hotspot On	9400	1880	15.72	16.00	1.067	-0.05	0.807	0.861
	WCDMA Band II	RMC 12.2Kbps	Left Side	5	Hotspot On	9538	1907.6	15.73	16.00	1.064	-0.02	0.022	0.023
	WCDMA Band II	RMC 12.2Kbps	Right Side	5	Hotspot On	9538	1907.6	15.73	16.00	1.064	-0.05	0.029	0.031
16	WCDMA Band II	RMC 12.2Kbps	Bottom Side	5	Hotspot On	9538	1907.6	15.73	16.00	1.064	-0.04	1.240	1.320
	WCDMA Band II	RMC 12.2Kbps	Bottom Side	5	Hotspot On	9262	1852.4	15.69	16.00	1.074	-0.04	0.983	1.056
	WCDMA Band II	RMC 12.2Kbps	Bottom Side	5	Hotspot On	9400	1880	15.72	16.00	1.067	-0.05	1.130	1.205



<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	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	49	Front	5	Full	20525	836.5	23.00	24.00	1.259	-0.02	0.340	0.428
	LTE Band 5	10M	QPSK	25	0	Front	5	Full	20525	836.5	21.54	23.00	1.400	-0.07	0.170	0.238
	LTE Band 5	10M	QPSK	1	49	Back	5	Full	20525	836.5	23.00	24.00	1.259	-0.01	0.433	0.545
	LTE Band 5	10M	QPSK	25	0	Back	5	Full	20525	836.5	21.54	23.00	1.400	-0.03	0.217	0.304
17	LTE Band 5	10M	QPSK	1	49	Left Side	5	Full	20525	836.5	23.00	24.00	1.259	-0.07	0.443	0.558
	LTE Band 5	10M	QPSK	25	0	Left Side	5	Full	20525	836.5	21.54	23.00	1.400	-0.01	0.231	0.323
	LTE Band 5	10M	QPSK	1	49	Right Side	5	Full	20525	836.5	23.00	24.00	1.259	-0.11	0.298	0.375
	LTE Band 5	10M	QPSK	25	0	Right Side	5	Full	20525	836.5	21.54	23.00	1.400	0.02	0.154	0.216
	LTE Band 5	10M	QPSK	1	49	Bottom Side	5	Full	20525	836.5	23.00	24.00	1.259	0.01	0.206	0.259
	LTE Band 5	10M	QPSK	25	0	Bottom Side	5	Full	20525	836.5	21.54	23.00	1.400	0.08	0.102	0.143
	LTE Band 66	20M	QPSK	1	99	Front	5	Hotspot On	132322	1745	18.14	18.50	1.086	-0.07	0.382	0.415
	LTE Band 66	20M	QPSK	50	24	Front	5	Hotspot On	132322	1745	17.74	18.50	1.191	-0.04	0.319	0.380
	LTE Band 66	20M	QPSK	1	99	Back	5	Hotspot On	132322	1745	18.14	18.50	1.086	-0.04	0.574	0.624
	LTE Band 66	20M	QPSK	50	24	Back	5	Hotspot On	132322	1745	17.74	18.50	1.191	-0.01	0.629	0.749
	LTE Band 66	20M	QPSK	1	99	Left Side	5	Hotspot On	132322	1745	18.14	18.50	1.086	-0.03	0.047	0.051
	LTE Band 66	20M	QPSK	50	24	Left Side	5	Hotspot On	132322	1745	17.74	18.50	1.191	-0.01	0.039	0.047
	LTE Band 66	20M	QPSK	1	99	Right Side	5	Hotspot On	132322	1745	18.14	18.50	1.086	-0.02	0.017	0.018
	LTE Band 66	20M	QPSK	50	24	Right Side	5	Hotspot On	132322	1745	17.74	18.50	1.191	-0.01	0.013	0.015
	LTE Band 66	20M	QPSK	1	99	Bottom Side	5	Hotspot On	132322	1745	18.14	18.50	1.086	-0.03	0.916	0.995
	LTE Band 66	20M	QPSK	1	99	Bottom Side	5	Hotspot On	132072	1720	17.91	18.50	1.146	-0.08	0.763	0.874
18	LTE Band 66	20M	QPSK	1	99	Bottom Side	5	Hotspot On	132572	1770	18.03	18.50	1.114	-0.03	1.240	1.382
	LTE Band 66	20M	QPSK	50	24	Bottom Side	5	Hotspot On	132322	1745	17.74	18.50	1.191	-0.02	0.775	0.923
	LTE Band 66	20M	QPSK	50	24	Bottom Side	5	Hotspot On	132072	1720	17.61	18.50	1.227	-0.02	0.692	0.849
	LTE Band 66	20M	QPSK	50	24	Bottom Side	5	Hotspot On	132572	1770	17.66	18.50	1.213	-0.02	0.927	1.125
	LTE Band 66	20M	QPSK	100	0	Bottom Side	5	Hotspot On	132322	1745	17.23	18.50	1.340	-0.02	0.813	1.089
	LTE Band 2	20M	QPSK	1	0	Front	5	Hotspot On	19100	1900	16.41	16.50	1.021	-0.01	0.711	0.726
	LTE Band 2	20M	QPSK	50	0	Front	5	Hotspot On	19100	1900	16.25	16.50	1.059	-0.05	0.698	0.739
	LTE Band 2	20M	QPSK	1	0	Back	5	Hotspot On	19100	1900	16.41	16.50	1.021	-0.01	0.962	0.982
	LTE Band 2	20M	QPSK	1	0	Back	5	Hotspot On	18700	1860	16.26	16.50	1.057	-0.06	0.797	0.842
	LTE Band 2	20M	QPSK	1	0	Back	5	Hotspot On	18900	1880	16.24	16.50	1.062	-0.01	0.833	0.884
	LTE Band 2	20M	QPSK	50	0	Back	5	Hotspot On	19100	1900	16.25	16.50	1.059	-0.03	0.928	0.983
	LTE Band 2	20M	QPSK	50	0	Back	5	Hotspot On	18700	1860	16.24	16.50	1.062	-0.03	0.771	0.819
	LTE Band 2	20M	QPSK	50	0	Back	5	Hotspot On	18900	1880	15.99	16.50	1.125	-0.09	0.832	0.936
	LTE Band 2	20M	QPSK	100	0	Back	5	Hotspot On	19100	1900	16.23	16.50	1.064	-0.04	0.966	1.028
	LTE Band 2	20M	QPSK	1	0	Left Side	5	Hotspot On	19100	1900	16.41	16.50	1.021	-0.01	0.051	0.052
	LTE Band 2	20M	QPSK	50	0	Left Side	5	Hotspot On	19100	1900	16.25	16.50	1.059	-0.03	0.050	0.053
	LTE Band 2	20M	QPSK	1	0	Right Side	5	Hotspot On	19100	1900	16.41	16.50	1.021	-0.05	0.044	0.045
	LTE Band 2	20M	QPSK	50	0	Right Side	5	Hotspot On	19100	1900	16.25	16.50	1.059	-0.08	0.049	0.052
	LTE Band 2	20M	QPSK	1	0	Bottom Side	5	Hotspot On	19100	1900	16.41	16.50	1.021	-0.08	1.280	1.307
	LTE Band 2	20M	QPSK	1	0	Bottom Side	5	Hotspot On	18700	1860	16.26	16.50	1.057	-0.01	1.080	1.141
	LTE Band 2	20M	QPSK	1	0	Bottom Side	5	Hotspot On	18900	1880	16.24	16.50	1.062	-0.04	1.130	1.200
	LTE Band 2	20M	QPSK	50	0	Bottom Side	5	Hotspot On	19100	1900	16.25	16.50	1.059	-0.06	1.280	1.356
	LTE Band 2	20M	QPSK	50	0	Bottom Side	5	Hotspot On	18700	1860	16.24	16.50	1.062	-0.05	1.120	1.189
	LTE Band 2	20M	QPSK	50	0	Bottom Side	5	Hotspot On	18900	1880	15.99	16.50	1.125	-0.06	1.190	1.338
19	LTE Band 2	20M	QPSK	100	0	Bottom Side	5	Hotspot On	19100	1900	16.23	16.50	1.064	-0.08	1.310	1.394



Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	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	5	Hotspot On	20850	2510	20.90	21.00	1.023	-0.04	1.130	1.156
	LTE Band 7	20M	QPSK	1	0	Front	5	Hotspot On	21100	2535	20.68	21.00	1.076	-0.04	0.887	0.955
	LTE Band 7	20M	QPSK	1	0	Front	5	Hotspot On	21350	2560	20.72	21.00	1.067	-0.04	0.855	0.912
	LTE Band 7	20M	QPSK	50	0	Front	5	Hotspot On	20850	2510	20.79	21.00	1.050	-0.04	1.030	1.081
	LTE Band 7	20M	QPSK	50	0	Front	5	Hotspot On	21100	2535	20.71	21.00	1.069	-0.04	0.894	0.956
	LTE Band 7	20M	QPSK	50	0	Front	5	Hotspot On	21350	2560	20.76	21.00	1.057	-0.04	0.010	0.919
	LTE Band 7	20M	QPSK	100	0	Front	5	Hotspot On	20850	2510	20.82	21.00	1.042	-0.04	0.871	0.908
	LTE Band 7	20M	QPSK	1	0	Back	5	Hotspot On	20850	2510	20.90	21.00	1.023	-0.01	1.160	1.187
	LTE Band 7	20M	QPSK	1	0	Back	5	Hotspot On	21100	2535	20.68	21.00	1.076	-0.05	1.260	1.356
20	LTE Band 7	20M	QPSK	1	0	Back	5	Hotspot On	21350	2560	20.72	21.00	1.067	-0.09	1.320	1.408
	LTE Band 7	20M	QPSK	50	0	Back	5	Hotspot On	20850	2510	20.79	21.00	1.050	-0.07	1.190	1.249
	LTE Band 7	20M	QPSK	50	0	Back	5	Hotspot On	21100	2535	20.71	21.00	1.069	-0.08	1.290	1.379
	LTE Band 7	20M	QPSK	50	0	Back	5	Hotspot On	21350	2560	20.76	21.00	1.057	-0.06	1.330	1.406
	LTE Band 7	20M	QPSK	100	0	Back	5	Hotspot On	20850	2510	20.82	21.00	1.042	-0.01	1.160	1.209
	LTE Band 7	20M	QPSK	1	0	Left Side	5	Hotspot On	20850	2510	20.90	21.00	1.023	-0.01	0.295	0.302
	LTE Band 7	20M	QPSK	50	0	Left Side	5	Hotspot On	20850	2510	20.79	21.00	1.050	-0.02	0.230	0.241
	LTE Band 7	20M	QPSK	1	0	Right Side	5	Hotspot On	20850	2510	20.90	21.00	1.023	-0.03	0.343	0.351
	LTE Band 7	20M	QPSK	50	0	Right Side	5	Hotspot On	20850	2510	20.79	21.00	1.050	-0.07	0.309	0.324
	LTE Band 7	20M	QPSK	1	0	Bottom Side	5	Hotspot On	20850	2510	20.90	21.00	1.023	-0.02	1.190	1.218
	LTE Band 7	20M	QPSK	1	0	Bottom Side	5	Hotspot On	21100	2535	20.68	21.00	1.076	-0.08	1.170	1.259
	LTE Band 7	20M	QPSK	1	0	Bottom Side	5	Hotspot On	21350	2560	20.72	21.00	1.067	-0.09	1.110	1.184
	LTE Band 7	20M	QPSK	50	0	Bottom Side	5	Hotspot On	20850	2510	20.79	21.00	1.050	-0.08	1.030	1.081
	LTE Band 7	20M	QPSK	50	0	Bottom Side	5	Hotspot On	21350	2560	20.71	21.00	1.069	-0.03	0.857	0.916
	LTE Band 7	20M	QPSK	50	0	Bottom Side	5	Hotspot On	21100	2535	20.76	21.00	1.057	-0.03	0.886	0.936
	LTE Band 7	20M	QPSK	100	0	Bottom Side	5	Hotspot On	20850	2510	20.82	21.00	1.042	-0.01	0.895	0.933



<WLAN 2.4GHz 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)	Max Area Scan SAR	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	5	1	2412	18.50	19.00	1.122	97.59	1.025		0.266		
21	WLAN2.4GHz	802.11b 1Mbps	Back	5	1	2412	18.50	19.00	1.122	97.59	1.025	-0.04	0.377	0.211	0.243
	WLAN2.4GHz	802.11b 1Mbps	Right Side	5	1	2412	18.50	19.00	1.122	97.59	1.025		0.328		
	WLAN2.4GHz	802.11b 1Mbps	Top Side	5	1	2412	18.50	19.00	1.122	97.59	1.025		0.306		

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	5	39	2441	10.92	11.00	1.019	76.70	1.086	0.05	0.015	0.017
22	Bluetooth	1Mbps	Back	5	39	2441	10.92	11.00	1.019	76.70	1.086	-0.05	0.022	0.025
	Bluetooth	1Mbps	Right Side	5	39	2441	10.92	11.00	1.019	76.70	1.086	0.06	0.022	0.024
	Bluetooth	1Mbps	Top Side	5	39	2441	10.92	11.00	1.019	76.70	1.086	0.08	0.021	0.024

15.3 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Headset	Power Mode	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 4 Tx slots	Front	5	-	Full	251	848.8	26.82	27.50	1.169	-0.02	0.334	0.391
23	GSM850	GPRS 4 Tx slots	Back	5	-	Full	251	848.8	26.82	27.50	1.169	-0.14	0.420	0.491
	GSM1900	GPRS 4 Tx slots	Front	5	-	P-Sensor On	810	1909.8	21.98	22.50	1.127	0.02	0.800	0.902
	GSM1900	GPRS 4 Tx slots	Front	5	-	P-Sensor On	512	1850.2	21.84	22.50	1.164	0.03	0.652	0.759
	GSM1900	GPRS 4 Tx slots	Front	5	-	P-Sensor On	661	1880	21.84	22.50	1.164	0.06	0.682	0.794
	GSM1900	GPRS 4 Tx slots	Back	5	-	P-Sensor On	810	1909.8	21.98	22.50	1.127	0.01	1.070	1.206
	GSM1900	GPRS 4 Tx slots	Back	5	-	P-Sensor On	512	1850.2	21.84	22.50	1.164	0.01	0.996	1.159
	GSM1900	GPRS 4 Tx slots	Back	5	-	P-Sensor On	661	1880	21.84	22.50	1.164	-0.05	1.020	1.187
24	GSM1900	GPRS 4 Tx slots	Back	5	Headset	P-Sensor On	810	1909.8	21.98	22.50	1.127	-0.02	1.190	1.341
	GSM1900	GPRS 4 Tx slots	Back	5	Headset	P-Sensor On	512	1850.2	21.84	22.50	1.164	-0.08	0.986	1.148
	GSM1900	GPRS 4 Tx slots	Back	5	Headset	P-Sensor On	661	1880	21.84	22.50	1.164	0.02	0.992	1.155



<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Headset	Power Mode	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 Band V	RMC 12.2Kbps	Front	5	-	Full	4132	826.4	23.31	24.00	1.172	-0.02	0.204	0.239
25	WCDMA Band V	RMC 12.2Kbps	Back	5	-	Full	4132	826.4	23.31	24.00	1.172	-0.01	0.417	0.489
	WCDMA Band IV	RMC 12.2Kbps	Front	5	-	P-Sensor On	1513	1738	20.04	20.50	1.112	0.01	0.839	0.933
	WCDMA Band IV	RMC 12.2Kbps	Front	5	-	P-Sensor On	1312	1712.4	19.90	20.50	1.148	0.02	0.707	0.812
	WCDMA Band IV	RMC 12.2Kbps	Front	5	-	P-Sensor On	1413	1732.6	19.93	20.50	1.140	0.01	0.788	0.899
26	WCDMA Band IV	RMC 12.2Kbps	Back	5	-	P-Sensor On	1513	1738	20.04	20.50	1.112	-0.05	1.230	1.367
	WCDMA Band IV	RMC 12.2Kbps	Back	5	-	P-Sensor On	1312	1712.4	19.90	20.50	1.148	0.01	0.947	1.087
	WCDMA Band IV	RMC 12.2Kbps	Back	5	-	P-Sensor On	1413	1732.6	19.93	20.50	1.140	0.05	1.120	1.277
	WCDMA Band IV	RMC 12.2Kbps	Back	5	Headset	P-Sensor On	1513	1738	20.04	20.50	1.112	0.02	0.170	0.189
	WCDMA Band IV	RMC 12.2Kbps	Back	5	Headset	P-Sensor On	1312	1712.4	19.90	20.50	1.148	0.05	0.982	1.127
	WCDMA Band IV	RMC 12.2Kbps	Back	5	Headset	P-Sensor On	1413	1732.6	19.93	20.50	1.140	0.05	1.110	1.266
	WCDMA Band II	RMC 12.2Kbps	Front	5	-	P-Sensor On	9538	1907.6	17.75	18.00	1.059	0.06	0.941	0.997
	WCDMA Band II	RMC 12.2Kbps	Front	5	-	P-Sensor On	9262	1852.4	17.68	18.00	1.076	0.05	0.775	0.834
	WCDMA Band II	RMC 12.2Kbps	Front	5	-	P-Sensor On	9400	1880	17.74	18.00	1.062	0.01	0.875	0.929
	WCDMA Band II	RMC 12.2Kbps	Back	5	-	P-Sensor On	9538	1907.6	17.75	18.00	1.059	0.03	1.230	1.303
	WCDMA Band II	RMC 12.2Kbps	Back	5	-	P-Sensor On	9262	1852.4	17.68	18.00	1.076	0.02	0.993	1.069
	WCDMA Band II	RMC 12.2Kbps	Back	5	-	P-Sensor On	9400	1880	17.74	18.00	1.062	0.06	1.140	1.210
27	WCDMA Band II	RMC 12.2Kbps	Back	5	Headset	P-Sensor On	9538	1907.6	17.75	18.00	1.059	-0.06	1.240	1.313
	WCDMA Band II	RMC 12.2Kbps	Back	5	Headset	P-Sensor On	9262	1852.4	17.68	18.00	1.076	0.02	0.991	1.067
	WCDMA Band II	RMC 12.2Kbps	Back	5	Headset	P-Sensor On	9400	1880	17.74	18.00	1.062	0.06	1.130	1.200



<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Headset	Power Mode	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	49	Front	5	-	Full	20525	836.5	23.00	24.00	1.259	-0.02	0.340	0.428
	LTE Band 5	10M	QPSK	25	0	Front	5	-	Full	20525	836.5	21.54	23.00	1.400	-0.07	0.170	0.238
28	LTE Band 5	10M	QPSK	1	49	Back	5	-	Full	20525	836.5	23.00	24.00	1.259	-0.01	0.433	0.545
	LTE Band 5	10M	QPSK	25	0	Back	5	-	Full	20525	836.5	21.54	23.00	1.400	-0.03	0.217	0.304
	LTE Band 66	20M	QPSK	1	99	Front	5	-	P-Sensor On	132322	1745	20.43	21.00	1.140	-0.04	0.701	0.799
	LTE Band 66	20M	QPSK	50	24	Front	5	-	P-Sensor On	132322	1745	19.66	21.00	1.361	0.01	0.604	0.822
	LTE Band 66	20M	QPSK	1	99	Back	5	-	P-Sensor On	132322	1745	20.43	21.00	1.140	-0.01	1.060	1.209
	LTE Band 66	20M	QPSK	1	99	Back	5	-	P-Sensor On	132072	1720	20.23	21.00	1.194	-0.07	0.925	1.104
29	LTE Band 66	20M	QPSK	1	99	Back	5	-	P-Sensor On	132572	1770	20.40	21.00	1.148	-0.01	1.170	1.343
	LTE Band 66	20M	QPSK	50	24	Back	5	-	P-Sensor On	132322	1745	19.66	21.00	1.361	0.01	0.922	1.255
	LTE Band 66	20M	QPSK	50	24	Back	5	-	P-Sensor On	132072	1720	19.51	21.00	1.409	0.03	0.808	1.139
	LTE Band 66	20M	QPSK	50	24	Back	5	-	P-Sensor On	132572	1770	19.60	21.00	1.380	0.01	0.971	1.340
	LTE Band 66	20M	QPSK	100	0	Back	5	-	P-Sensor On	132322	1745	19.69	21.00	1.352	-0.09	0.526	0.711
	LTE Band 66	20M	QPSK	1	99	Back	5	Headset	P-Sensor On	132322	1745	20.43	21.00	1.140	-0.01	1.010	1.152
	LTE Band 66	20M	QPSK	1	99	Back	5	Headset	P-Sensor On	132072	1720	20.23	21.00	1.194	-0.07	0.889	1.061
	LTE Band 66	20M	QPSK	1	99	Back	5	Headset	P-Sensor On	132572	1770	20.40	21.00	1.148	0.01	1.070	1.229
	LTE Band 2	20M	QPSK	1	0	Front	5	-	P-Sensor On	19100	1900	18.20	18.50	1.072	0.02	0.737	0.790
	LTE Band 2	20M	QPSK	50	0	Front	5	-	P-Sensor On	19100	1900	17.96	18.50	1.132	0.03	0.694	0.786
	LTE Band 2	20M	QPSK	1	0	Back	5	-	P-Sensor On	19100	1900	18.20	18.50	1.072	0.01	1.250	1.339
	LTE Band 2	20M	QPSK	1	0	Back	5	-	P-Sensor On	18700	1860	18.19	18.50	1.074	0.01	0.993	1.066
	LTE Band 2	20M	QPSK	1	0	Back	5	-	P-Sensor On	18900	1880	18.05	18.50	1.109	0.01	1.080	1.198
	LTE Band 2	20M	QPSK	50	0	Back	5	-	P-Sensor On	19100	1900	17.96	18.50	1.132	0.02	1.140	1.291
	LTE Band 2	20M	QPSK	50	0	Back	5	-	P-Sensor On	18700	1860	17.95	18.50	1.135	-0.06	0.980	1.112
	LTE Band 2	20M	QPSK	50	0	Back	5	-	P-Sensor On	18900	1880	17.78	18.50	1.180	0.01	1.040	1.228
30	LTE Band 2	20M	QPSK	100	0	Back	5	-	P-Sensor On	19100	1900	18.03	18.50	1.114	-0.06	1.260	1.404
	LTE Band 2	20M	QPSK	100	0	Back	5	Headset	P-Sensor On	19100	1900	18.03	18.50	1.114	0.01	1.190	1.326
	LTE Band 7	20M	QPSK	1	0	Front	5	-	P-Sensor On	20850	2510	20.90	21.00	1.023	-0.04	1.130	1.156
	LTE Band 7	20M	QPSK	1	0	Front	5	-	P-Sensor On	21100	2535	20.68	21.00	1.076	-0.04	0.887	0.955
	LTE Band 7	20M	QPSK	1	0	Front	5	-	P-Sensor On	21350	2560	20.72	21.00	1.067	-0.04	0.855	0.912
	LTE Band 7	20M	QPSK	50	0	Front	5	-	P-Sensor On	20850	2510	20.79	21.00	1.050	-0.04	1.030	1.081
	LTE Band 7	20M	QPSK	50	0	Front	5	-	P-Sensor On	21100	2535	20.71	21.00	1.069	-0.04	0.894	0.956
	LTE Band 7	20M	QPSK	50	0	Front	5	-	P-Sensor On	21350	2560	20.76	21.00	1.057	-0.04	0.010	0.919
	LTE Band 7	20M	QPSK	100	0	Front	5	-	P-Sensor On	20850	2510	20.82	21.00	1.042	-0.04	0.871	0.908
	LTE Band 7	20M	QPSK	1	0	Back	5	-	P-Sensor On	20850	2510	20.90	21.00	1.023	-0.01	1.160	1.187
	LTE Band 7	20M	QPSK	1	0	Back	5	-	P-Sensor On	21100	2535	20.68	21.00	1.076	-0.05	1.260	1.356
31	LTE Band 7	20M	QPSK	1	0	Back	5	-	P-Sensor On	21350	2560	20.72	21.00	1.067	-0.09	1.320	1.408
	LTE Band 7	20M	QPSK	50	0	Back	5	-	P-Sensor On	20850	2510	20.79	21.00	1.050	-0.07	1.190	1.249
	LTE Band 7	20M	QPSK	50	0	Back	5	-	P-Sensor On	21100	2535	20.71	21.00	1.069	-0.08	1.290	1.379
	LTE Band 7	20M	QPSK	50	0	Back	5	-	P-Sensor On	21350	2560	20.76	21.00	1.057	-0.06	1.330	1.406
	LTE Band 7	20M	QPSK	100	0	Back	5	-	P-Sensor On	20850	2510	20.82	21.00	1.042	-0.01	1.160	1.209
	LTE Band 7	20M	QPSK	1	0	Back	5	Headset	P-Sensor On	21350	2560	20.72	21.00	1.067	0.01	1.280	1.365
	LTE Band 7	20M	QPSK	1	0	Back	5	Headset	P-Sensor On	20850	2510	20.90	21.00	1.023	-0.05	1.120	1.146
	LTE Band 7	20M	QPSK	1	0	Back	5	Headset	P-Sensor On	21100	2535	20.68	21.00	1.076	-0.04	1.210	1.303



<WLAN 2.4GHz 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)	Max Area Scan SAR	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	5	1	2412	18.50	19.00	1.122	97.59	1.025		0.266		
32	WLAN2.4GHz	802.11b 1Mbps	Back	5	1	2412	18.50	19.00	1.122	97.59	1.025	-0.04	0.377	0.211	0.243

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	5	39	2441	10.92	11.00	1.019	76.70	1.086	0.05	0.015	0.017
33	Bluetooth	1Mbps	Back	5	39	2441	10.92	11.00	1.019	76.70	1.086	-0.05	0.022	0.025



15.4 Product specific 10g SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Mode	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)
	GSM1900	GPRS 4 Tx slots	Back	0	Full	810	1909.8	23.56	24.50	1.242	-0.01	1.970	2.446
	GSM1900	GPRS 4 Tx slots	Back	0	Full	512	1850.2	23.53	24.50	1.250	-0.01	1.770	2.213
34	GSM1900	GPRS 4 Tx slots	Back	0	Full	661	1880	23.51	24.50	1.256	-0.06	1.960	2.462
	GSM1900	GPRS 4 Tx slots	Bottom Side	0	Full	810	1909.8	23.56	24.50	1.242	-0.02	1.500	1.862

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Mode	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 Band IV	RMC 12.2Kbps	Back	0	Handheld On	1513	1738	20.98	21.00	1.005	-0.03	2.220	2.230
	WCDMA Band IV	RMC 12.2Kbps	Back	0	Handheld On	1312	1712.4	20.86	21.00	1.033	-0.03	2.170	2.241
	WCDMA Band IV	RMC 12.2Kbps	Back	0	Handheld On	1413	1732.6	20.97	21.00	1.007	-0.03	2.390	2.407
	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	0	Handheld On	1513	1738	20.98	21.00	1.005	-0.04	3.200	3.215
35	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	0	Handheld On	1312	1712.4	20.86	21.00	1.033	-0.03	3.340	3.449
	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	0	Handheld On	1413	1732.6	20.97	21.00	1.007	-0.04	3.410	3.434
	WCDMA Band II	RMC 12.2Kbps	Front	0	Handheld On	9538	1907.6	20.73	21.50	1.194	0.06	1.940	2.316
	WCDMA Band II	RMC 12.2Kbps	Front	0	Handheld On	9262	1852.4	20.62	21.50	1.225	0.09	1.730	2.119
	WCDMA Band II	RMC 12.2Kbps	Front	0	Handheld On	9400	1880	20.72	21.50	1.197	0.06	1.840	2.202
	WCDMA Band II	RMC 12.2Kbps	Back	0	Handheld On	9538	1907.6	20.73	21.50	1.194	-0.02	2.790	3.331
	WCDMA Band II	RMC 12.2Kbps	Back	0	Handheld On	9262	1852.4	20.62	21.50	1.225	-0.02	2.560	3.135
36	WCDMA Band II	RMC 12.2Kbps	Back	0	Handheld On	9400	1880	20.72	21.50	1.197	-0.06	2.900	3.471
	WCDMA Band II	RMC 12.2Kbps	Bottom Side	0	Handheld On	9538	1907.6	20.73	21.50	1.194	-0.08	2.060	2.460
	WCDMA Band II	RMC 12.2Kbps	Bottom Side	0	Handheld On	9262	1852.4	20.62	21.50	1.225	-0.08	2.570	3.147
	WCDMA Band II	RMC 12.2Kbps	Bottom Side	0	Handheld On	9400	1880	20.72	21.50	1.197	-0.08	2.260	2.705



<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	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 66	20M	QPSK	1	99	Back	0	Handheld On	132322	1745	22.41	22.50	1.021	-0.06	2.450	2.501
	LTE Band 66	20M	QPSK	1	99	Back	0	Handheld On	132072	1720	22.37	22.50	1.030	-0.02	2.420	2.494
	LTE Band 66	20M	QPSK	1	99	Back	0	Handheld On	132572	1770	22.38	22.50	1.028	0.06	2.500	2.570
	LTE Band 66	20M	QPSK	50	24	Back	0	Handheld On	132322	1745	21.69	22.50	1.205	0.04	2.100	2.531
	LTE Band 66	20M	QPSK	50	24	Back	0	Handheld On	132072	1720	21.52	22.50	1.253	0.05	1.940	2.431
	LTE Band 66	20M	QPSK	50	24	Back	0	Handheld On	132572	1770	21.67	22.50	1.211	-0.06	1.970	2.385
	LTE Band 66	20M	QPSK	100	0	Back	0	Handheld On	132322	1745	21.58	22.50	1.236	-0.06	1.920	2.373
37	LTE Band 66	20M	QPSK	1	99	Bottom Side	0	Handheld On	132322	1745	22.41	22.50	1.021	-0.01	3.420	3.492
	LTE Band 66	20M	QPSK	1	99	Bottom Side	0	Handheld On	132072	1720	22.37	22.50	1.030	0.01	3.380	3.483
	LTE Band 66	20M	QPSK	1	99	Bottom Side	0	Handheld On	132572	1770	22.38	22.50	1.028	0.02	3.220	3.310
	LTE Band 66	20M	QPSK	50	24	Bottom Side	0	Handheld On	132322	1745	21.69	22.50	1.205	0.02	2.850	3.434
	LTE Band 66	20M	QPSK	50	24	Bottom Side	0	Handheld On	132072	1720	21.52	22.50	1.253	0.03	2.760	3.459
	LTE Band 66	20M	QPSK	50	24	Bottom Side	0	Handheld On	132572	1770	21.67	22.50	1.211	0.04	2.560	3.099
	LTE Band 66	20M	QPSK	100	0	Bottom Side	0	Handheld On	132322	1745	21.58	22.50	1.236	-0.06	2.630	3.251
	LTE Band 2	20M	QPSK	1	0	Front	0	Handheld On	19100	1900	21.86	22.00	1.033	0.03	1.900	1.962
	LTE Band 2	20M	QPSK	50	0	Front	0	Handheld On	19100	1900	21.28	22.00	1.180	0.03	1.640	1.936
38	LTE Band 2	20M	QPSK	1	0	Back	0	Handheld On	19100	1900	21.86	22.00	1.033	-0.04	3.160	3.264
	LTE Band 2	20M	QPSK	1	0	Back	0	Handheld On	18700	1860	21.85	22.00	1.035	-0.04	2.780	2.878
	LTE Band 2	20M	QPSK	1	0	Back	0	Handheld On	18900	1880	21.74	22.00	1.062	-0.04	2.840	3.015
	LTE Band 2	20M	QPSK	50	0	Back	0	Handheld On	19100	1900	21.28	22.00	1.180	-0.04	2.650	3.128
	LTE Band 2	20M	QPSK	50	0	Back	0	Handheld On	18700	1860	21.24	22.00	1.191	-0.04	2.470	2.942
	LTE Band 2	20M	QPSK	50	0	Back	0	Handheld On	18900	1880	21.23	22.00	1.194	-0.04	2.550	3.045
	LTE Band 2	20M	QPSK	100	0	Back	0	Handheld On	19100	1900	21.16	22.00	1.213	-0.04	2.520	3.058
	LTE Band 2	20M	QPSK	1	0	Bottom Side	0	Handheld On	19100	1900	21.86	22.00	1.033	-0.02	2.470	2.551
	LTE Band 2	20M	QPSK	1	0	Bottom Side	0	Handheld On	18700	1860	21.85	22.00	1.035	-0.02	2.790	2.888
	LTE Band 2	20M	QPSK	1	0	Bottom Side	0	Handheld On	18900	1880	21.74	22.00	1.062	-0.02	2.500	2.654
	LTE Band 2	20M	QPSK	50	0	Bottom Side	0	Handheld On	19100	1900	21.28	22.00	1.180	-0.02	2.160	2.549
	LTE Band 2	20M	QPSK	50	0	Bottom Side	0	Handheld On	18700	1860	21.24	22.00	1.191	-0.02	2.590	3.085
	LTE Band 2	20M	QPSK	50	0	Bottom Side	0	Handheld On	18900	1880	21.23	22.00	1.194	-0.02	2.300	2.746
	LTE Band 2	20M	QPSK	100	0	Bottom Side	0	Handheld On	19100	1900	21.16	22.00	1.213	-0.04	2.380	2.888
	LTE Band 7	20M	QPSK	1	0	Front	0	Full	20850	2510	23.29	24.00	1.178	0.02	2.180	2.567
	LTE Band 7	20M	QPSK	1	0	Front	0	Full	21100	2535	23.04	24.00	1.247	0.03	2.130	2.657
	LTE Band 7	20M	QPSK	1	0	Front	0	Full	21350	2560	23.04	24.00	1.247	0.05	2.180	2.719
	LTE Band 7	20M	QPSK	50	0	Front	0	Full	20850	2510	22.26	23.00	1.186	0.06	1.370	1.625
	LTE Band 7	20M	QPSK	100	0	Front	0	Full	20850	2510	22.30	23.00	1.175	0.02	1.400	1.645
	LTE Band 7	20M	QPSK	1	0	Back	0	Full	20850	2510	23.29	24.00	1.178	-0.03	2.790	3.286
	LTE Band 7	20M	QPSK	1	0	Back	0	Full	21100	2535	23.04	24.00	1.247	0.02	2.790	3.480
39	LTE Band 7	20M	QPSK	1	0	Back	0	Full	21350	2560	23.04	24.00	1.247	-0.04	2.800	3.493
	LTE Band 7	20M	QPSK	50	0	Back	0	Full	20850	2510	22.26	23.00	1.186	0.02	1.720	2.040
	LTE Band 7	20M	QPSK	50	0	Back	0	Full	21100	2535	22.14	23.00	1.219	0.01	1.840	2.243
	LTE Band 7	20M	QPSK	50	0	Back	0	Full	21350	2560	22.12	23.00	1.225	0.02	1.810	2.217
	LTE Band 7	20M	QPSK	100	0	Back	0	Full	20850	2510	22.30	23.00	1.175	0.03	1.720	2.021
	LTE Band 7	20M	QPSK	1	0	Bottom Side	0	Full	20850	2510	23.29	24.00	1.178	0.02	2.350	2.767
	LTE Band 7	20M	QPSK	1	0	Bottom Side	0	Full	21100	2535	23.04	24.00	1.247	0.01	2.250	2.807
	LTE Band 7	20M	QPSK	1	0	Bottom Side	0	Full	21350	2560	23.04	24.00	1.247	0.05	2.260	2.819
	LTE Band 7	20M	QPSK	50	0	Bottom Side	0	Full	20850	2510	22.26	23.00	1.186	0.05	1.530	1.814
	LTE Band 7	20M	QPSK	100	0	Bottom Side	0	Full	20850	2510	22.30	23.00	1.175	0.05	1.560	1.833

15.5 Repeated SAR Measurement

<1g SAR>

No.	Band	Mode	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 66	-	20M	QPSK	1	99	Bottom Side	5	Hotspot On	132572	1770	18.03	18.50	1.114	-0.03	1.240	1	1.382
2nd	LTE Band 66	-	20M	QPSK	1	99	Bottom Side	5	Hotspot On	132572	1770	18.03	18.50	1.114	0.05	1.220	1.016	1.359
1st	LTE Band 2	-	20M	QPSK	100	0	Bottom Side	5	Hotspot On	19100	1900	16.23	16.50	1.064	-0.08	1.310	1	1.394
2nd	LTE Band 2	-	20M	QPSK	100	0	Bottom Side	5	Hotspot On	19100	1900	16.23	16.50	1.064	0.01	1.300	1.008	1.383
1st	LTE Band 7	-	20M	QPSK	50	0	Back	5	Hotspot On	21350	2560	20.76	21.00	1.057	-0.06	1.330	1	1.406
2nd	LTE Band 7	-	20M	QPSK	50	0	Back	5	Hotspot On	21350	2560	20.76	21.00	1.057	0.01	1.320	1.008	1.395
1st	LTE Band 7	-	20M	QPSK	50	0	Back	5	P-Sensor On	21350	2560	20.76	21.00	1.057	-0.06	1.330	1	1.406
2nd	LTE Band 7	-	20M	QPSK	50	0	Back	5	P-Sensor On	21350	2560	20.76	21.00	1.057	0.01	1.320	1.008	1.395

<10g SAR>

No.	Band	Mode	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	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	LTE Band 66	-	20M	QPSK	1	99	Bottom Side	0	Handheld On	132322	1745	22.41	22.50	1.021	-0.01	3.420	1	3.492
2nd	LTE Band 66	-	20M	QPSK	1	99	Bottom Side	0	Handheld On	132322	1745	22.41	22.50	1.021	0.03	3.400	1.006	3.471
1st	LTE Band 2	-	20M	QPSK	1	0	Back	0	Handheld On	19100	1900	21.86	22.00	1.033	-0.04	3.160	1	3.264
2nd	LTE Band 2	-	20M	QPSK	1	0	Back	0	Handheld On	19100	1900	21.86	22.00	1.033	0.02	3.130	1.010	3.233
1st	LTE Band 7	-	20M	QPSK	1	0	Back	0	Full	21350	2560	23.04	24.00	1.247	-0.04	2.800	1	3.493
2nd	LTE Band 7	-	20M	QPSK	1	0	Back	0	Full	21350	2560	23.04	24.00	1.247	0.05	2.780	1.007	3.468

General Note:

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

16. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	Portable Handset		
		Head	Body-worn	Hotspot
1.	GSM Voice + WLAN2.4GHz	Yes	Yes	
2.	GPRS/EDGE + WLAN2.4GHz	Yes	Yes	Yes
3.	WCDMA + WLAN2.4GHz	Yes	Yes	Yes
4.	LTE + WLAN2.4GHz	Yes	Yes	Yes
5.	GSM Voice + Bluetooth	Yes	Yes	
6.	GPRS/EDGE + Bluetooth	Yes	Yes	Yes
7.	WCDMA + Bluetooth	Yes	Yes	Yes
8.	LTE + Bluetooth	Yes	Yes	Yes

General Note:

1. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
2. EUT will choose each GSM, WCDMA and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
3. This device 2.4GHz WLAN support hotspot operation and Bluetooth support BT tethering.
4. WLAN 2.4GHz and Bluetooth share the same antenna so can't transmit simultaneously.
5. Chose the worst zoom scan SAR of WLAN correspondingly for co-located with WWAN analysis.
6. The reported SAR summation is calculated based on the same configuration and test position.
7. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
 - i) 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/kg.
 - ii) $SPLSR = (SAR1 + SAR2)^{1.5} / (\min. \text{ separation distance, mm})$, 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 $SPLSR \leq 0.04$, simultaneously transmission SAR measurement is not necessary.
 - iv) Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg and 10g SAR < 4.0W/kg.
 - v) The SPLSR calculated results please refer to section 16.4.

16.1 Head Exposure Conditions

WWAN Band		Exposure Position	1	2	3	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)
			WWAN	2.4GHz WLAN	Bluetooth		
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
GSM	GSM850	Right Cheek	0.244	0.417	0.013	0.66	0.26
		Right Tilted	0.200	0.417	0.031	0.62	0.23
		Left Cheek	0.246	0.417	0.038	0.66	0.28
		Left Tilted	0.144	0.380	0.034	0.52	0.18
	GSM1900	Right Cheek	0.028	0.417	0.013	0.45	0.04
		Right Tilted	0.007	0.417	0.031	0.42	0.04
		Left Cheek	0.028	0.417	0.038	0.45	0.07
		Left Tilted	0.008	0.380	0.034	0.39	0.04
WCDMA	Band V	Right Cheek	0.259	0.417	0.013	0.68	0.27
		Right Tilted	0.161	0.417	0.031	0.58	0.19
		Left Cheek	0.304	0.417	0.038	0.72	0.34
		Left Tilted	0.169	0.380	0.034	0.55	0.20
	Band IV	Right Cheek	0.031	0.417	0.013	0.45	0.04
		Right Tilted	0.017	0.417	0.031	0.43	0.05
		Left Cheek	0.031	0.417	0.038	0.45	0.07
		Left Tilted	0.022	0.380	0.034	0.40	0.06
	Band II	Right Cheek	0.081	0.417	0.013	0.50	0.09
		Right Tilted	0.045	0.417	0.031	0.46	0.08
		Left Cheek	0.090	0.417	0.038	0.51	0.13
		Left Tilted	0.067	0.380	0.034	0.45	0.10
LTE	Band 5	Right Cheek	0.307	0.417	0.013	0.72	0.32
		Right Tilted	0.183	0.417	0.031	0.60	0.21
		Left Cheek	0.335	0.417	0.038	0.75	0.37
		Left Tilted	0.149	0.380	0.034	0.53	0.18
	Band 66	Right Cheek	0.054	0.417	0.013	0.47	0.07
		Right Tilted	0.026	0.417	0.031	0.44	0.06
		Left Cheek	0.035	0.417	0.038	0.45	0.07
		Left Tilted	0.029	0.380	0.034	0.41	0.06
	Band 2	Right Cheek	0.107	0.417	0.013	0.52	0.12
		Right Tilted	0.046	0.417	0.031	0.46	0.08
		Left Cheek	0.072	0.417	0.038	0.49	0.11
		Left Tilted	0.065	0.380	0.034	0.45	0.10
	Band 7	Right Cheek	0.071	0.417	0.013	0.49	0.08
		Right Tilted	0.080	0.417	0.031	0.50	0.11
		Left Cheek	0.066	0.417	0.038	0.48	0.10
		Left Tilted	0.072	0.380	0.034	0.45	0.11

16.2 Hotspot Exposure Conditions

WWAN Band		Exposure Position	1	2	3	1+2	1+3
			WWAN	2.4GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
GSM	GSM850	Front	0.391	0.243	0.017	0.63	0.41
		Back	0.491	0.243	0.025	0.73	0.52
		Left Side	0.357			0.36	0.36
		Right Side	0.318	0.243	0.024	0.56	0.34
		Top Side		0.243	0.024	0.24	0.02
		Bottom Side	0.214			0.21	0.21
	GSM1900	Front	0.532	0.243	0.017	0.78	0.55
		Back	0.910	0.243	0.025	1.15	0.94
		Left Side	0.433			0.43	0.43
		Right Side	0.423	0.243	0.024	0.67	0.45
		Top Side		0.243	0.024	0.24	0.02
		Bottom Side	1.369			1.37	1.37
WCDMA	Band V	Front	0.239	0.243	0.017	0.48	0.26
		Back	0.489	0.243	0.025	0.73	0.51
		Left Side	0.496			0.50	0.50
		Right Side	0.401	0.243	0.024	0.64	0.43
		Top Side		0.243	0.024	0.24	0.02
		Bottom Side	0.190			0.19	0.19
	Band IV	Front	0.650	0.243	0.017	0.89	0.67
		Back	0.837	0.243	0.025	1.08	0.86
		Left Side	0.065			0.07	0.07
		Right Side	0.036	0.243	0.024	0.28	0.06
		Top Side		0.243	0.024	0.24	0.02
		Bottom Side	1.329			1.33	1.33
	Band II	Front	0.660	0.243	0.017	0.90	0.68
		Back	0.929	0.243	0.025	1.17	0.95
		Left Side	0.023			0.02	0.02
		Right Side	0.031	0.243	0.024	0.27	0.06
		Top Side		0.243	0.024	0.24	0.02
		Bottom Side	1.320			1.32	1.32

WWAN Band		Exposure Position	1	2	3	1+2			1+3
			WWAN	2.4GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	SPLSR	Case No	Summed 1g SAR (W/kg)
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)				
LTE	Band 5	Front	0.428	0.243	0.017	0.67			0.45
		Back	0.545	0.243	0.025	0.79			0.57
		Left Side	0.558			0.56			0.56
		Right Side	0.375	0.243	0.024	0.62			0.40
		Top Side		0.243	0.024	0.24			0.02
		Bottom Side	0.259			0.26			0.26
	Band 66	Front	0.415	0.243	0.017	0.66			0.43
		Back	0.749	0.243	0.025	0.99			0.77
		Left Side	0.051			0.05			0.05
		Right Side	0.018	0.243	0.024	0.26			0.04
		Top Side		0.243	0.024	0.24			0.02
		Bottom Side	1.382			1.38			1.38
	Band 2	Front	0.739	0.243	0.017	0.98			0.76
		Back	1.028	0.243	0.025	1.27			1.05
		Left Side	0.053			0.05			0.05
		Right Side	0.052	0.243	0.024	0.30			0.08
		Top Side		0.243	0.024	0.24			0.02
		Bottom Side	1.394			1.39			1.39
	Band 7	Front	1.156	0.243	0.017	1.40			1.17
		Back	1.408	0.243	0.025	1.65	0.02	01	1.43
		Left Side	0.302			0.30			0.30
		Right Side	0.351	0.243	0.024	0.59			0.38
		Top Side		0.243	0.024	0.24			0.02
		Bottom Side	1.259			1.26			1.26

16.3 Body-Worn Accessory Exposure Conditions

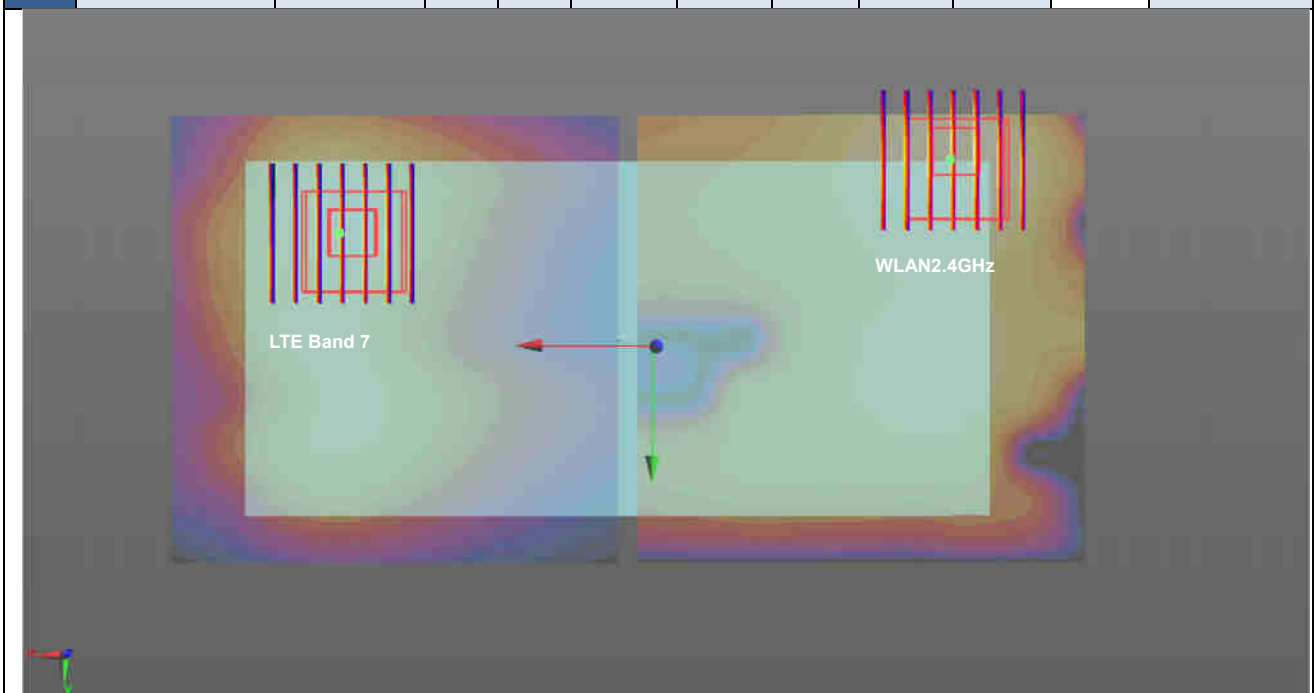
WWAN Band		Exposure Position	1	2	3	1+2			1+3
			WWAN	2.4GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	SPLSR	Case No	Summed 1g SAR (W/kg)
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)				
GSM	GSM850	Front	0.391	0.243	0.017	0.63			0.41
		Back	0.491	0.243	0.025	0.73			0.52
	GSM1900	Front	0.902	0.243	0.017	1.15			0.92
		Back	1.206	0.243	0.025	1.45			1.23
		Back at 5mm Headset	1.341			1.34			1.34
WCDMA	Band V	Front	0.239	0.243	0.017	0.48			0.26
		Back	0.489	0.243	0.025	0.73			0.51
	Band IV	Front	0.933	0.243	0.017	1.18			0.95
		Back	1.367	0.243	0.025	1.61	0.01	02	1.39
		Back at 5mm Headset	1.266			1.27			1.27
	Band II	Front	0.997	0.243	0.017	1.24			1.01
		Back	1.303	0.243	0.025	1.55			1.33
		Back at 5mm Headset	1.313			1.31			1.31
	LTE	Band 5	Front	0.428	0.243	0.67			0.45
			Back	0.545	0.243	0.79			0.57
		Band 66	Front	0.822	0.243	1.07			0.84
			Back	1.343	0.243	1.59			1.37
			Back at 5mm Headset	1.229		1.23			1.23
		Band 2	Front	0.790	0.243	1.03			0.81
			Back	1.404	0.243	1.65	0.01	03	1.43
			Back at 5mm Headset	1.326		1.33			1.33
		Band 7	Front	1.156	0.243	1.40			1.17
			Back	1.408	0.243	1.65	0.02	01	1.43
		Back at 5mm Headset	1.365			1.37			1.37

16.4 SPLSR Evaluation and Analysis

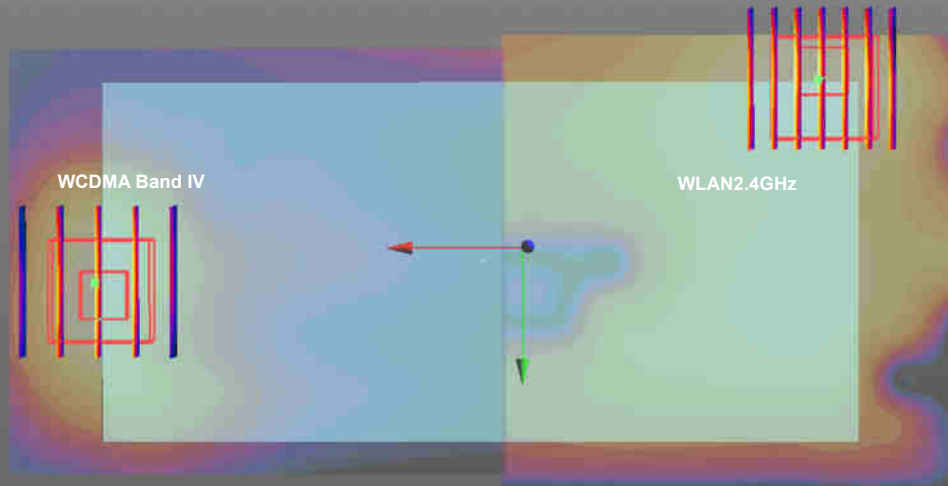
General Note:

- When standalone SAR is measured for both antennas in the pair, the peak location separation distance is computed by the square root of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$, where (x_1, y_1, z_1) and (x_2, y_2, z_2) are the coordinates in the area scans or extrapolated peak SAR locations in the zoom scans, as appropriate.
- $SPLSR = (SAR_1 + SAR_2)1.5 / (\text{min. separation distance, mm})$. If $SPLSR \leq 0.04$, simultaneously transmission SAR measurement is not necessary.

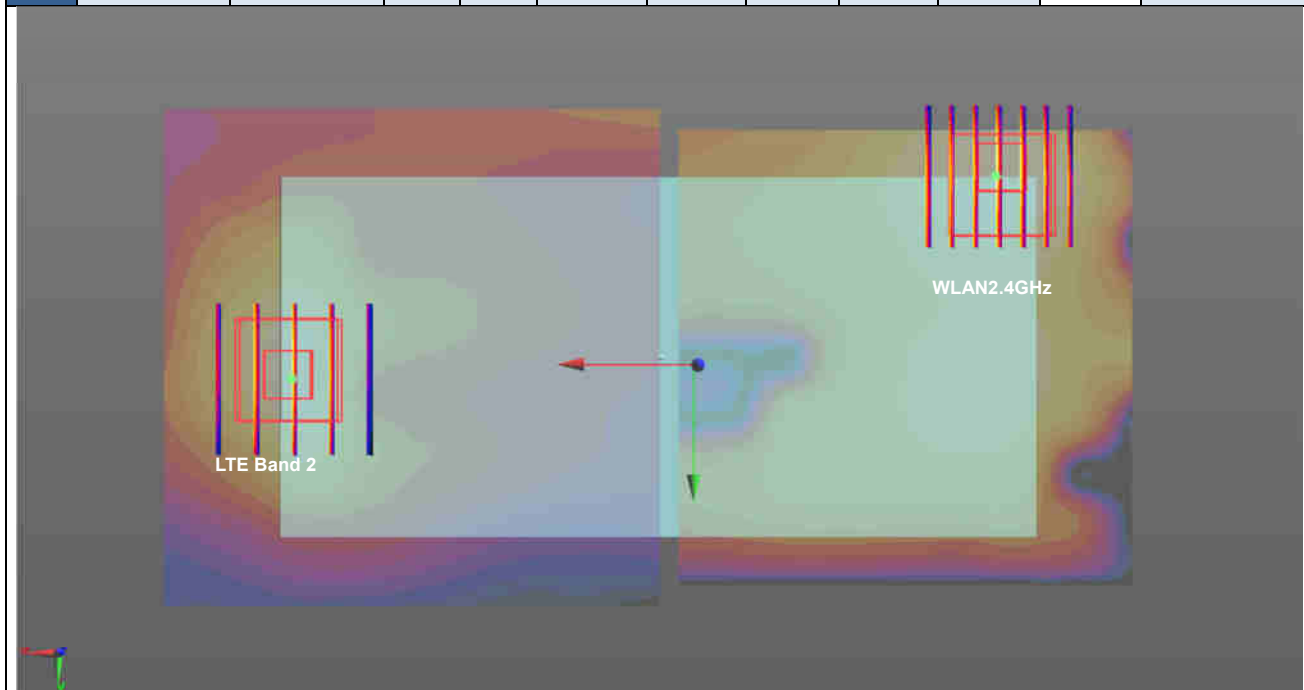
Case #1	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 7	Back	1.408	5	59	-22.8	3.66	133.4	1.65	0.02	Not required
	WLAN2.4GHz		0.243	5	-73.2	-40.4	3.34				



Case #2	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	WCDMA Band IV		1.367	5	80.4	9.3	3.88				
	WLAN2.4GHz	Back	0.243	5	-73.2	-40.4	3.34	161.4	1.61	0.01	Not required



Case #3	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 2	Back	1.404	5	X	Y	Z	158.7	1.65	0.01	Not required
	WLAN2.4GHz		0.243	5	-73.2	-40.4	3.34				



Test Engineer: Nick Hu

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 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.
- [6] FCC KDB 865664 D02 v01r02, "RF Exposure Compliance Reporting and Documentation Considerations" Oct 2015.
- [7] FCC KDB 447498 D01 v06, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", Oct 2015
- [8] FCC KDB 648474 D04 v01r03, "SAR Evaluation Considerations for Wireless Handsets", Oct 2015.
- [9] FCC KDB 248227 D01 v02r02, "SAR Guidance for IEEE 802.11 (WiFi) Transmitters", Oct 2015.
- [10] FCC KDB 616217 D04 v01r02, "SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers", Oct 2015
- [11] FCC KDB 941225 D01 v03r01, "3G SAR MEAUREMENT PROCEDURES", Oct 2015
- [12] FCC KDB 941225 D05 v02r05, "SAR Evaluation Considerations for LTE Devices", Dec 2015
- [13] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.



Appendix A. Plots of System Performance Check

The plots are shown as follows.



Appendix B. Plots of High SAR Measurement

The plots are shown as follows.



Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.