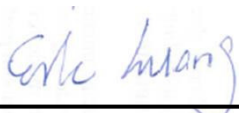


FCC SAR Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : XT1929-8
FCC ID : IHDT56XE3
STANDARD : FCC 47 CFR Part 2 (2.1093)
ANSI/IEEE C95.1-1992
IEEE 1528-2013

We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.



Reviewed by: Eric Huang / Manager



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.)



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[illegible]

**1. Statement of Compliance**

The maximum results of Specific Absorption Rate (SAR) found during testing for Motorola Mobility LLC, Mobile Cellular Phone, XT1929-8, are as follows.

Equipment Class	Frequency Band	Highest SAR Summary				Highest Simultaneous Transmission 1g SAR (W/kg)
		Head (Separation 0mm)	Body-worn (Separation 5mm)	Hotspot (Separation 5mm)	Product Specific (Separation 0mm)	
		1g SAR (W/kg)			10g SAR (W/kg)	
Licensed	GSM850	0.22	0.51	0.51		1.59
	GSM1900	0.17	1.09	1.17	0.96	
	WCDMA II	0.25	1.06	1.03	2.15	
	WCDMA IV	0.31	1.06	1.11	3.20	
	WCDMA V	0.35	0.97	0.97		
	LTE Band 4	0.30	1.10	1.16	3.16	
	LTE Band 7	0.78	1.02	1.02	3.02	
	LTE Band 12 / 17	0.29	1.08	1.08		
	LTE Band 5 / 26	0.39	1.17	1.17		
	LTE Band 38 / 41	0.75	0.97	0.97	2.79	
DTS	2.4GHz WLAN	1.12	0.80	0.84		1.58
NII	5GHz WLAN	1.14	0.74	0.94	0.97	1.59
DSS	Bluetooth	0.26	0.12	0.16		1.29
Date of Testing:		2018/2/21 ~ 2018/3/8				

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

2. Administration Data

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test.

Testing Laboratory	
Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978

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 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01



4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT1929-8
FCC ID	IHDT56XE3
IMEI Code	351885090010389
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 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 26: 814.7 MHz ~ 848.3 MHz LTE Band 38: 2572.5 MHz ~ 2617.5 MHz LTE Band 41: 2498.5 MHz ~ 2687.5 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC: 13.56 MHz
Mode	GSM/GPRS/EGPRS AMR / RMC 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM, 64QAM 2.4GHz WLAN: 802.11b/g/n HT20 5GHz WLAN: 802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC:ASK
HW Version	DVT2
SW Version	OPW28.22
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: 1. The IHDT56XE3 has the identical design as IHDT56XE2 on 2.4GHz WLAN / Bluetooth and 5GHz WLAN. Therefore, these transmitters test result is used in this report to be performed simultaneous transmission analysis and spot checks these transmitters were performed on FCC ID: IHDT56XE3 to ensure that the SAR measurements for both devices are the same, the spot check result refer to section 14.6 2. This device implements antenna tuning techniques for several WWAN (cellular) operating modes and frequencies for the purpose of improving antenna efficiency over a broad range of frequencies. Specifically, this technique is employed in the GSM, WCDMA and LTE modes but not supports LTE B7 / B38 / B41. In this report SAR was measured according to the normally required SAR configurations with the tuner active and worst tune state (auto tune) was used for SAR testing. The detail descriptions of the antenna tuner are included in the operational description and supplemental data for additional information on section16. 3. This device 2.4GHz / 5.8GHz WLAN supports Hotspot operation. 4. When operating in a call in talk position at the head, the device utilizes the At-Head power table. When operating in a body-worn condition, with proximity of the user's body at the front or back of the device, the device operates in the Body-Worn power table. If neither the At-Head or Body-Worn condition is detected, but the device is operating in WiFi Hotspot mode, the device utilizes the Hotspot power table. When operating in any other radiated condition, the device uses the Default power table. 5. The device employs proximity sensors that detect the presence of the user's body at the front or back faces of the device. The control logic is such that, when this front or back body-worn condition is detected and the device is operating in a mode where on-body operation may be expected, the conducted power is applied in the Body-Worn power table. In this condition (user's body detected at front or back face of the device), the Body-Worn power table is applied regardless whether or not the Wi-Fi hotspot mode is active. 6. Note that the Body-Worn Reduced power tables and detection schemes described above are sufficient to assure that body-worn SAR limits are met, regardless whether the Wi-Fi hotspot feature is active or not. However, because FCC has an additional specific test definition and limit for Wi-Fi hotspot mode operation, the additional Hotspot power table is applied if hand-held operation is	

indicated (i.e., not At-Head or Body-Worn) when the Wi-Fi hotspot feature is active. This ensures the 4 edges of the device comply with the letter of the Wi-Fi Hotspot requirement.

7. The device additionally employs proximity sensors that detect the presence of tissue near the currently active transmit antenna (if that antenna may require reduced power relative the Default power table in order to meet extremity SAR limits). The control logic is such that, if the Body-Worn, At-Head or WiFi Hotspot conditions are not detected, but tissue (as a finger or hand, for example) is detected near the transmitting antenna, the Handheld Reduced power table will be applied
8. Reduced power for different RF exposure conditions:
Head: If audio is present at the earpiece, the device will reduce output powers on the WLAN transmitter for held-to-ear and detail descriptions of the power reduction mechanism are included in the operational description.
Body worn: The device employs proximity sensors that detect the presence of the user's body at the front or back faces of the device, when operating in near-body condition by end user, the device will reduced maximum output powers on the GSM1900, WCDMA B2 / B4 / B5, and LTE B4 / B5 / B7 / B26 / B38 / B41 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.
Hotspot: When the mobile hotspot session is turn on by end user, the device will reduced output powers on the GSM1900, WCDMA B2 / B4 / B5, and LTE B4 / B5 / B7 / B26 / B38 / B41 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.
Handheld: The device additionally employs proximity sensors that detect the presence of tissue near the currently active transmit antenna, the device will reduced output powers on the WCDMA B2 / B4, and LTE B4 / B7 / B38 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.

4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05																																																																										
FCC ID		IHDT56XE3																																																																								
Equipment Name		Mobile Cellular Phone																																																																								
Operating Frequency Range of each LTE transmission band		LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 26: 814.7 MHz ~ 848.3 MHz LTE Band 38: 2572.5 MHz ~ 2617.5 MHz LTE Band 41: 2498.5 MHz ~ 2687.5 MHz																																																																								
Channel Bandwidth		LTE Band 04:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 05:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 07: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 17: 5MHz, 10MHz LTE Band 26:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz																																																																								
uplink modulations used		QPSK / 16QAM / 64QAM																																																																								
LTE Voice / Data requirements		Voice and Data																																																																								
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
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3																																																																										
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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, power reduction mechanisms applied to satisfy SAR compliance for LTE B4 / B5 / B7 / B26 / B38 / B41																																																																								
LTE Carrier Aggregation Combinations		Inter-Band and Intra-Band possible combinations as below page and the detail power verification please referred to section 12.																																																																								
LTE Carrier Aggregation Additional Information		This device supports maximum of 3 carriers in the downlink. Additional following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.																																																																								

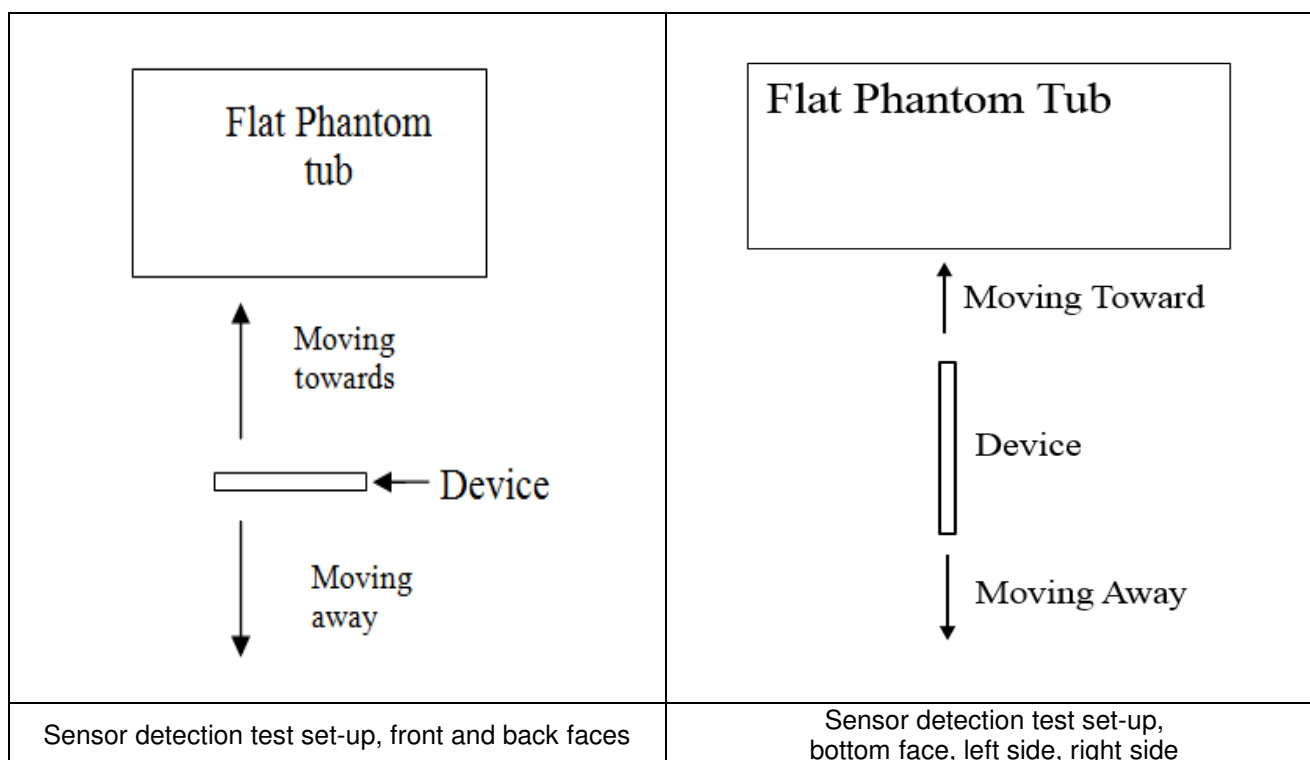


Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)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

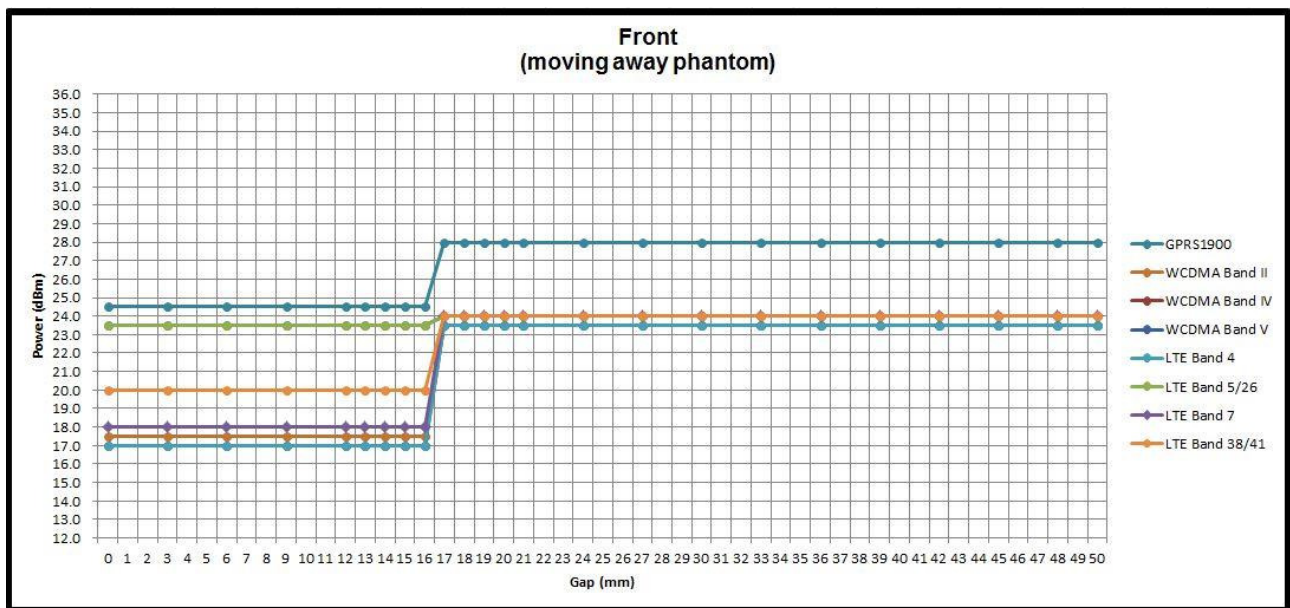
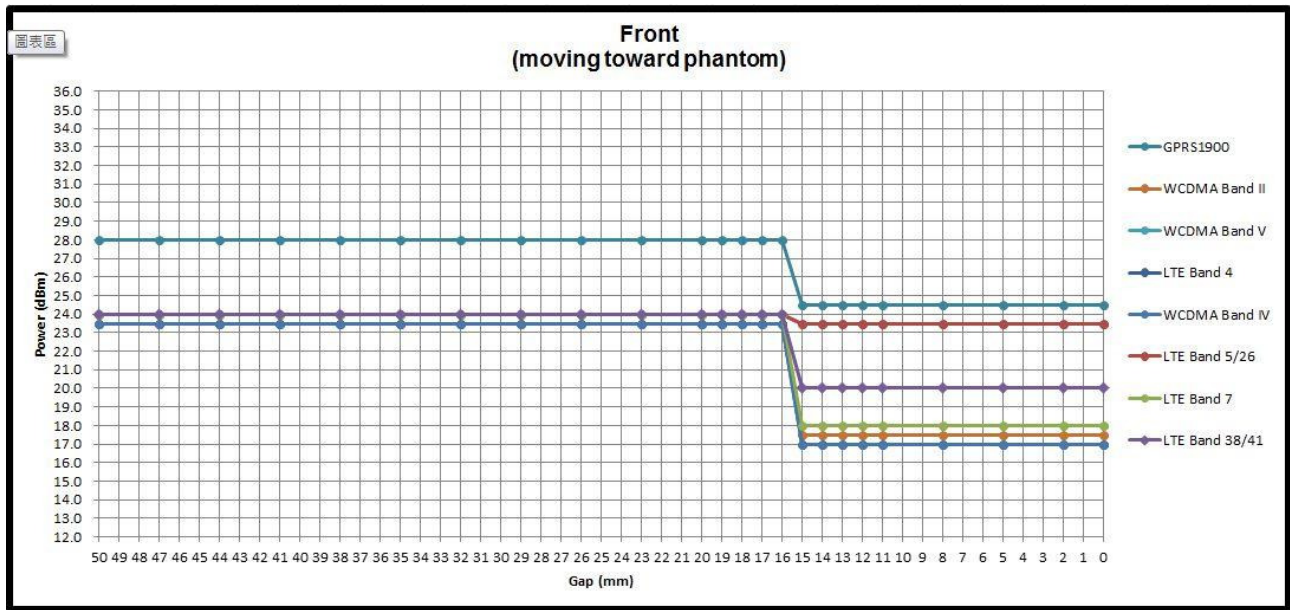
4.3 Proximity Sensor Triggering Test

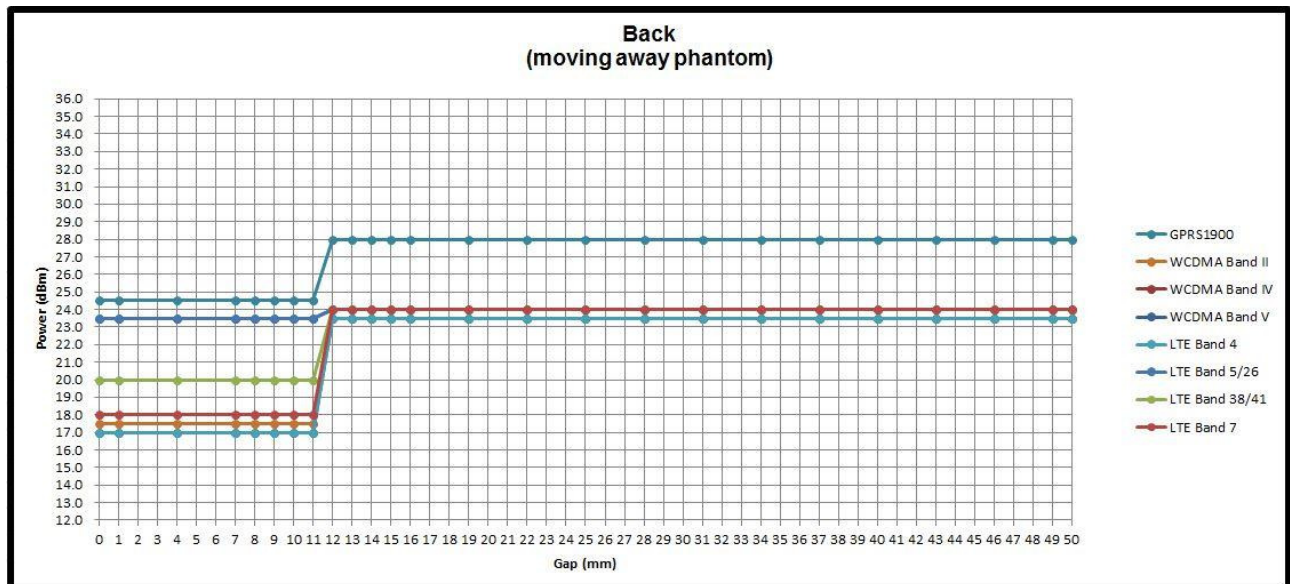
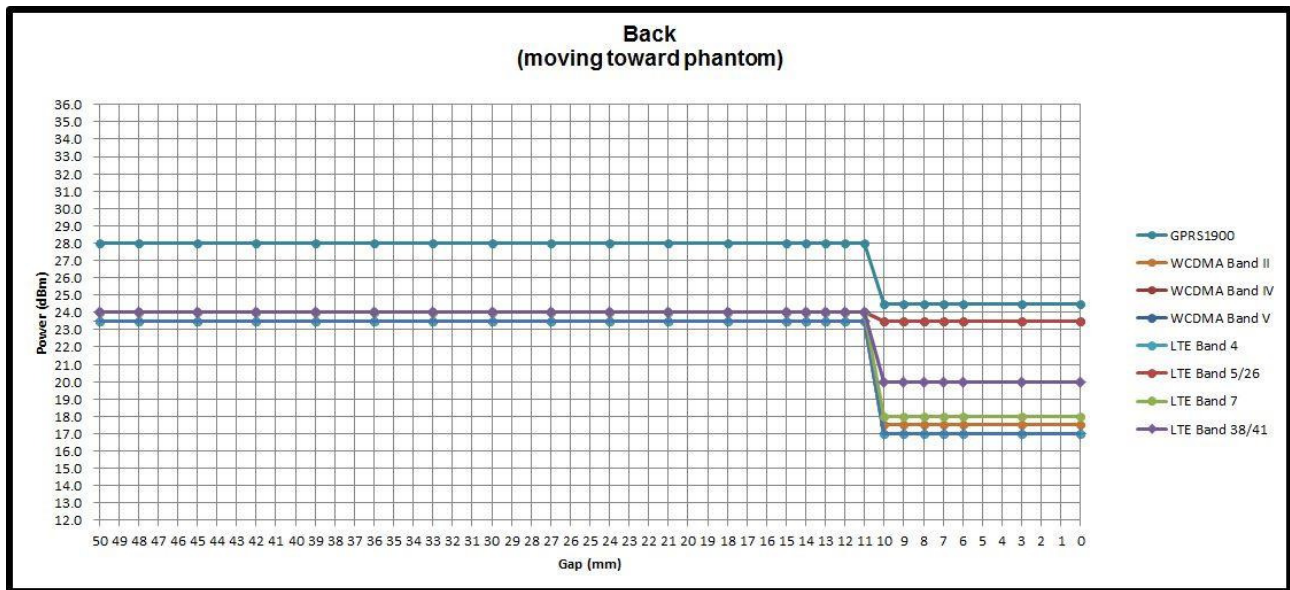
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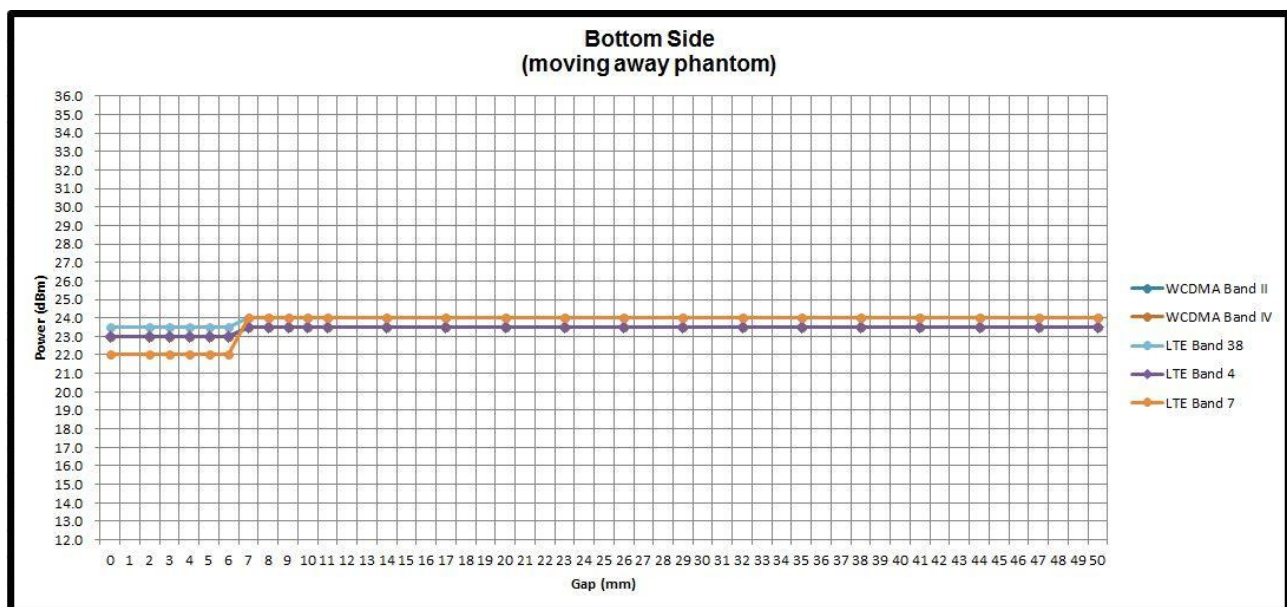
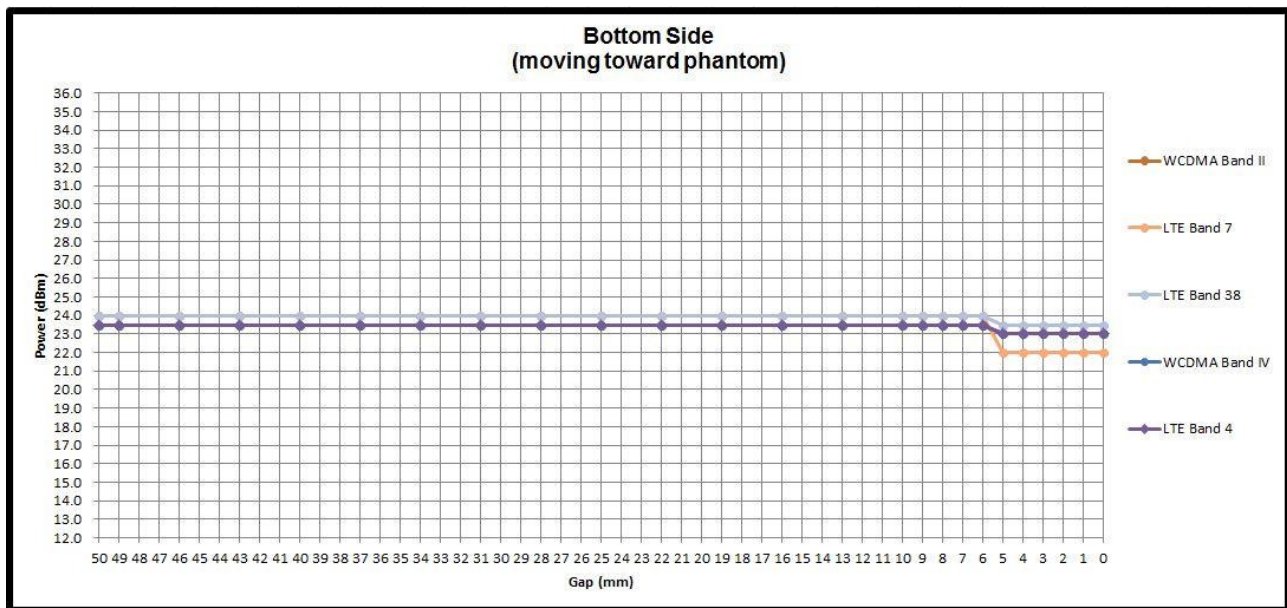
1. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed and the tissue-equivalent medium for highest frequency (2600MHz) and lowest (750MHz) frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensors placed coincident with antenna elements at the top and bottom ends of the phone are utilized to determine when the device comes in proximity of the user's body at the front or back of the device.
3. The output power will reduce to body worn power level when top and bottom sensor pad be detected.
4. The sensors used to detect the proximity of the user's body (Body-Worn condition) at the front or back surface of the device use a detection threshold distance. The data shown in the sections below shows the distance(s).
5. The device additionally employs proximity sensors that detect the presence of tissue near the currently active transmit antenna (if that antenna may require reduced power relative the Default power table in order to meet extremity SAR limits). The control logic is such that, if the Body-Worn, At-Head or WiFi Hotspot conditions are not detected, but tissue (as a finger or hand, for example) is detected near the transmitting antenna, the Handheld Reduced power table will be applied
6. When the sensor is active, the device will reduced maximum output powers on the GSM1900, WCDMA B2 / B4 / B5, and LTE B4 / B5 / B7 / B26 / B38 / B41 transmitter.

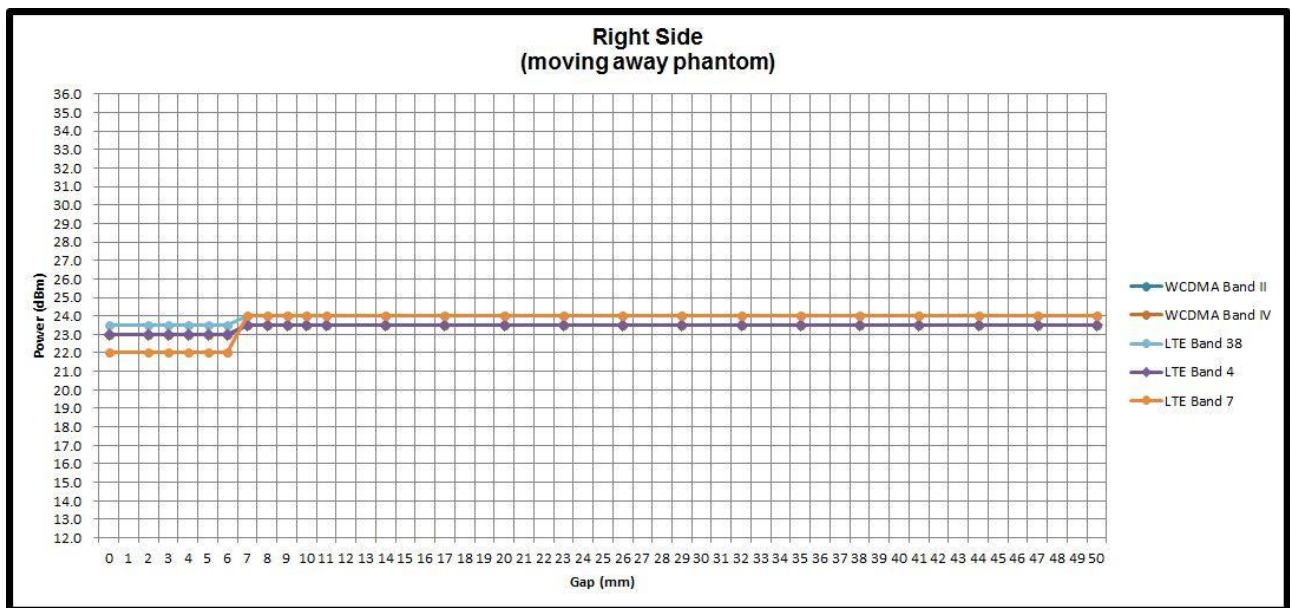
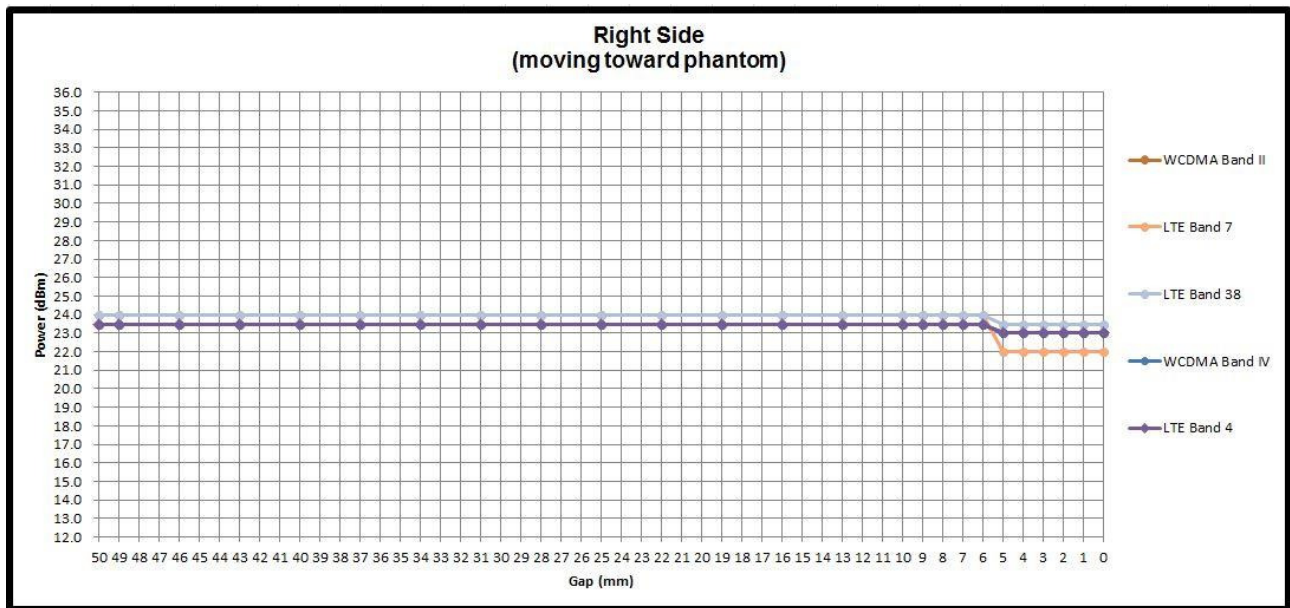


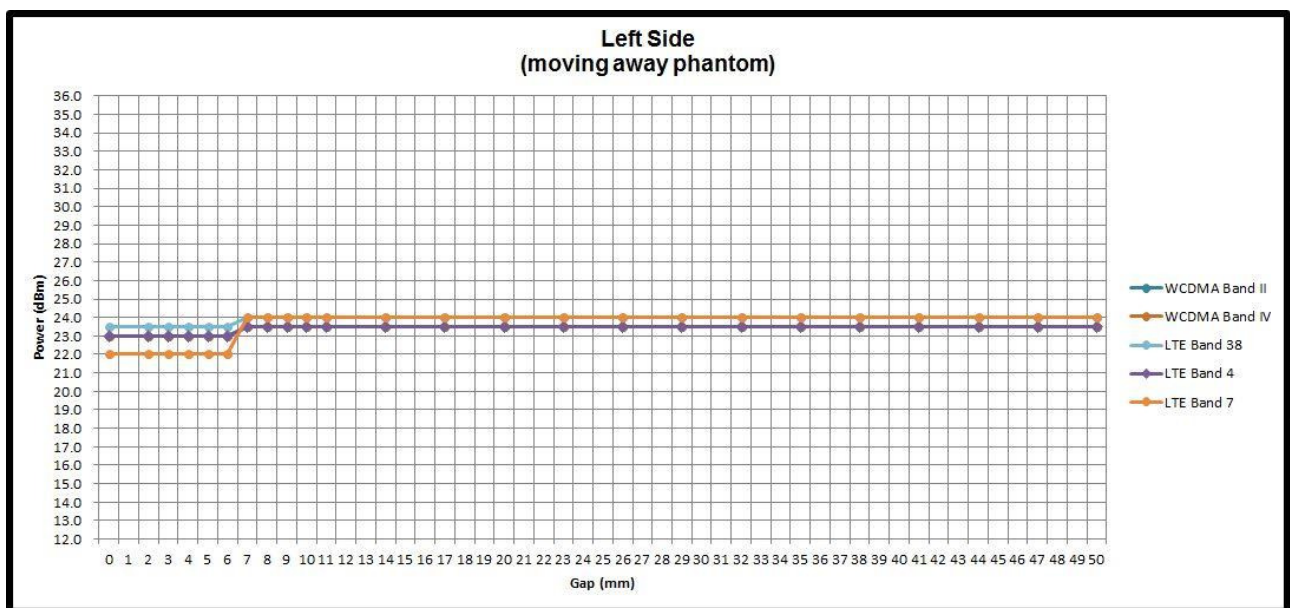
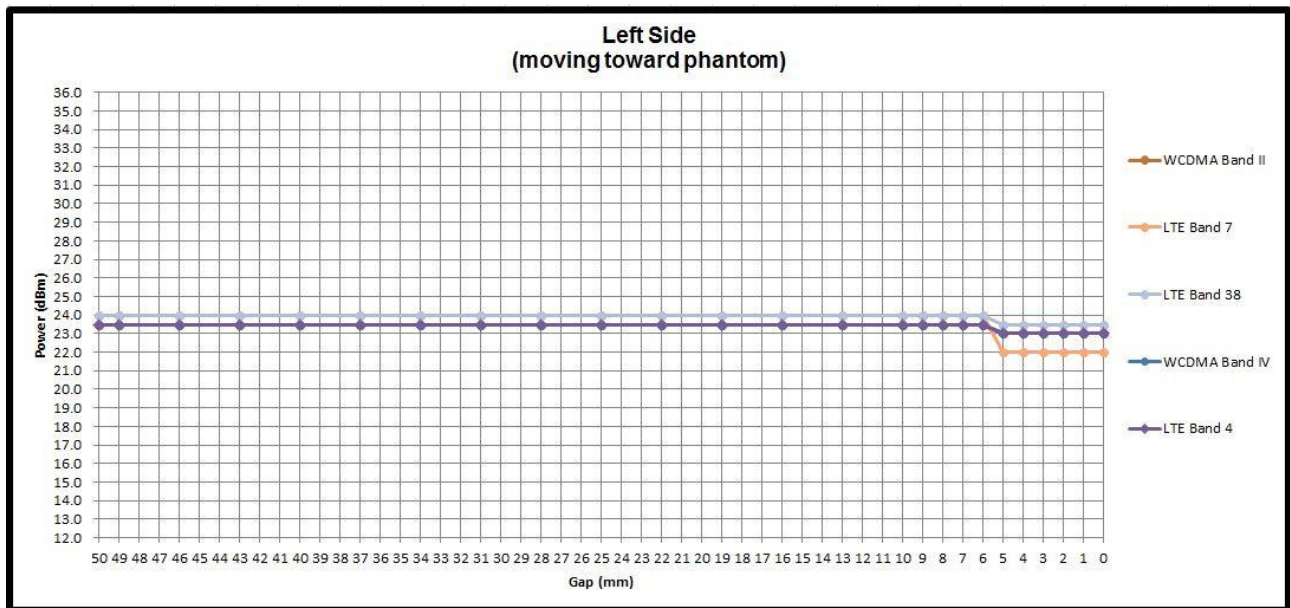
Proximity Sensor Trigger Distance (mm)										
Position	Front		Back		Bottom Side		Right Side		Left Side	
Position	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	15	16	10	11	5	6	5	6	5	6











5. RF Exposure Limits

5.1 Uncontrolled Environment

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

5.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

6. Specific Absorption Rate (SAR)

6.1 Introduction

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

6.2 SAR Definition

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

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

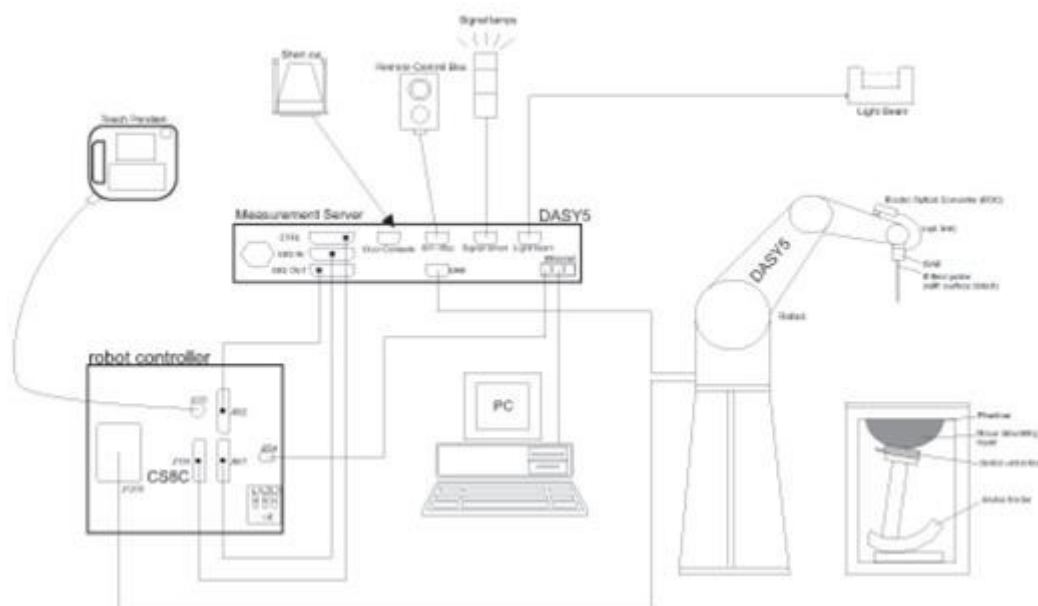
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

7. System Description and Setup

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



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

7.1 E-Field Probe

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

<ES3DV3 Probe>

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	

7.2 Data Acquisition Electronics (DAE)

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

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



Fig 5.1 Photo of DAE

7.3 Phantom

<SAM Twin Phantom>

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.

7.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

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



Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

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

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



Mounting Device for Laptops

8. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

8.1 Spatial Peak SAR Evaluation

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

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

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

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

8.2 Power Reference Measurement

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

8.3 Area Scan

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

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

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
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.	

8.4 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.				

8.5 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.

8.6 Power Drift Monitoring

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



9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1012	May. 22, 2017	May. 21, 2018
SPEAG	835MHz System Validation Kit	D835V2	499	Mar. 21, 2017	Mar. 20, 2018
SPEAG	1750MHz System Validation Kit	D1750V2	1068	Nov. 15, 2017	Nov. 14, 2018
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Sep. 28, 2017	Sep. 27, 2018
SPEAG	2600MHz System Validation Kit	D2600V2	1008	Sep. 18, 2017	Sep. 17, 2018
SPEAG	Data Acquisition Electronics	DAE3	495	May. 22, 2017	May. 21, 2018
SPEAG	Data Acquisition Electronics	DAE4	1399	Nov. 16, 2017	Nov. 15, 2018
SPEAG	Data Acquisition Electronics	DAE4	778	May. 22, 2017	May. 21, 2018
SPEAG	Data Acquisition Electronics	DAE4	853	Jul. 19, 2017	Jul. 18, 2018
SPEAG	Dosimetric E-Field Probe	EX3DV4	3976	Jan. 23, 2018	Jan. 22, 2019
SPEAG	Dosimetric E-Field Probe	EX3DV4	3925	May. 24, 2017	May. 23, 2018
SPEAG	Dosimetric E-Field Probe	ES3DV3	3270	Sep. 25, 2017	Sep. 24, 2018
SPEAG	Dosimetric E-Field Probe	EX3DV4	3931	Sep. 29, 2017	Sep. 28, 2018
SPEAG	Dosimetric E-Field Probe	ES3DV3	3169	May. 11, 2017	May. 10, 2018
WonDer	Thermometer	WD-5016	TM642-1	Mar. 17, 2017	Mar. 16, 2018
WonDer	Thermometer	WD-5016	TM642-2	Mar. 17, 2017	Mar. 16, 2018
WonDer	Thermometer	WD-5016	TM281-1	Mar. 17, 2017	Mar. 16, 2018
WonDer	Thermometer	WD-5016	TM281-2	Mar. 17, 2017	Mar. 16, 2018
WonDer	Thermometer	WD-5016	TM560-1	Mar. 17, 2017	Mar. 16, 2018
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Apr. 20, 2017	Apr. 19, 2018
Agilent	Wireless Communication Test Set	E5515C	MY50266977	May. 30, 2017	May. 29, 2018
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Dec. 07, 2017	Dec. 06, 2018
Agilent	ENA Network Analyzer	E5071C	MY46316648	Jan. 17, 2018	Jan. 16, 2019
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 26, 2017	Sep. 25, 2018
LINE SEIKI	Digital Thermometer	LKMelectronic	DTM3000SPEZIAL	Sep. 06, 2017	Sep. 05, 2018
Anritsu	Power Meter	ML2495A	1419002	May. 15, 2017	May. 14, 2018
Anritsu	Power Sensor	MA2411B	1339124	May. 15, 2017	May. 14, 2018
Anritsu	Power Meter	ML2495A	1218006	Oct. 06, 2017	Oct. 05, 2018
Anritsu	Power Sensor	MA2411B	1207363	Oct. 06, 2017	Oct. 05, 2018
Agilent	Spectrum Analyzer	E4408B	MY44211028	Aug. 23, 2017	Aug. 22, 2018
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jun. 26, 2017	Jun. 25, 2018
Mini-Circuits	Power Amplifier	ZVE-8G+	D120604	Mar. 09, 2017	Mar. 08, 2018
Mini-Circuits	Power Amplifier	ZHL-42W+	QA1344002	Mar. 09, 2017	Mar. 08, 2018
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

General Note:

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

10. System Verification

10.1 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.1. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.2.

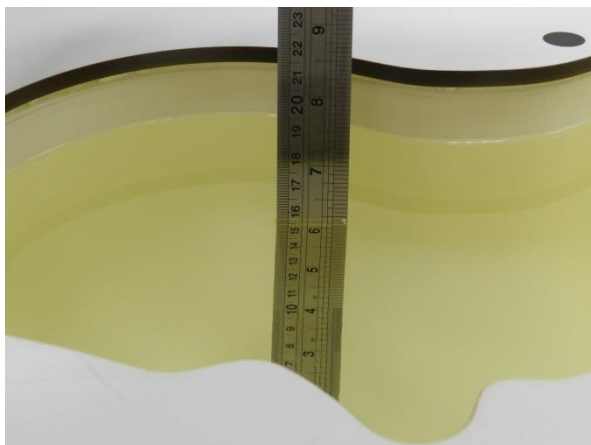


Fig 10.1Photo of Liquid Height for Head SAR



Fig 10.2 Photo of Liquid Height for Body SAR

10.2 Tissue Verification

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

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (ϵ_r)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
900	40.3	57.9	0.2	1.4	0.2	0	0.97	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0
For Body								
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
900	50.8	48.2	0	0.9	0.1	0	1.05	55.0
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

Simulating Liquid for 5GHz, Manufactured by SPEAG

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

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ϵ_r)	Conductivity Target (σ)	Permittivity Target (ϵ_r)	Delta (σ) (%)	Delta (ϵ_r) (%)	Limit (%)	Date
750	HSL	22.4	0.900	42.790	0.89	41.90	1.12	2.12	±5	2018/2/22
750	MSL	22.2	0.974	53.911	0.96	55.50	1.46	-2.86	±5	2018/2/27
835	HSL	22.3	0.886	41.678	0.90	41.50	-1.56	0.43	±5	2018/2/21
835	HSL	22.3	0.886	41.678	0.90	41.50	-1.56	0.43	±5	2018/2/21
835	MSL	22.2	0.964	56.848	0.97	55.20	-0.62	2.99	±5	2018/2/27
1750	HSL	22.3	1.402	40.688	1.37	40.10	2.34	1.47	±5	2018/3/2
1750	MSL	22.5	1.460	55.233	1.49	53.40	-2.01	3.43	±5	2018/3/1
1750	MSL	22.4	1.488	54.987	1.49	53.40	-0.13	2.97	±5	2018/3/6
1750	MSL	22.5	1.508	54.719	1.49	53.40	1.21	2.47	±5	2018/3/8
1900	HSL	22.3	1.442	39.497	1.40	40.00	3.00	-1.26	±5	2018/3/2
1900	MSL	22.5	1.557	51.870	1.52	53.30	2.43	-2.68	±5	2018/3/1
1900	MSL	22.5	1.557	51.870	1.52	53.30	2.43	-2.68	±5	2018/3/1
1900	MSL	22.3	1.555	54.164	1.52	53.30	2.30	1.62	±5	2018/3/7
1900	MSL	22.5	1.552	54.953	1.52	53.30	2.11	3.10	±5	2018/3/8
2600	HSL	22.3	2.003	39.579	1.96	39.00	2.19	1.48	±5	2018/3/3
2600	HSL	22.4	1.973	39.844	1.96	39.00	0.66	2.16	±5	2018/3/5
2600	MSL	22.2	2.197	53.248	2.16	52.50	1.71	1.42	±5	2018/3/2
2600	MSL	22.6	2.175	52.060	2.16	52.50	0.69	-0.84	±5	2018/3/7
2600	MSL	22.5	2.206	53.322	2.16	52.50	2.13	1.57	±5	2018/3/8

10.3 System Performance Check Results

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

Date	Frequency (MHz)	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 (%)
2018/2/22	750	HSL	250	D750V3-1012	ES3DV3 - SN3270	DAE4 Sn778	2.09	8.22	8.36	1.70
2018/2/27	750	MSL	250	D750V3-1012	EX3DV4 - SN3931	DAE4 Sn1399	2.06	8.71	8.24	-5.40
2018/2/21	835	HSL	250	D835V2-499	EX3DV4 - SN3925	DAE4 Sn853	2.42	9.45	9.68	2.43
2018/2/21	835	HSL	250	D835V2-499	ES3DV3 - SN3270	DAE4 Sn778	2.29	9.45	9.16	-3.07
2018/2/27	835	MSL	250	D835V2-499	EX3DV4 - SN3931	DAE4 Sn1399	2.53	9.67	10.12	4.65
2018/3/2	1750	HSL	250	D1750V2-1068	ES3DV3 - SN3270	DAE4 Sn778	9.38	36.70	37.52	2.23
2018/3/1	1750	MSL	250	D1750V2-1068	ES3DV3 - SN3169	DAE4 Sn1399	9.36	37.20	37.44	0.65
2018/3/6	1750	MSL	250	D1750V2-1068	ES3DV3 - SN3270	DAE4 Sn778	9.39	37.20	37.56	0.97
2018/3/8	1750	MSL	250	D1750V2-1068	EX3DV4 - SN3976	DAE3 Sn495	9.34	37.20	37.36	0.43
2018/3/2	1900	HSL	250	D1900V2-5d041	ES3DV3 - SN3270	DAE4 Sn778	9.92	40.50	39.68	-2.02
2018/3/1	1900	MSL	250	D1900V2-5d041	EX3DV4 - SN3931	DAE4 Sn1399	10.50	40.70	42	3.19
2018/3/1	1900	MSL	250	D1900V2-5d041	ES3DV3 - SN3169	DAE4 Sn1399	9.93	40.70	39.72	-2.41
2018/3/7	1900	MSL	250	D1900V2-5d041	ES3DV3 - SN3270	DAE4 Sn778	9.68	40.70	38.72	-4.86
2018/3/8	1900	MSL	250	D1900V2-5d041	EX3DV4 - SN3976	DAE3 Sn495	10.40	40.70	41.6	2.21
2018/3/3	2600	HSL	250	D2600V2-1008	ES3DV3 - SN3270	DAE4 Sn778	14.60	56.80	58.4	2.82
2018/3/5	2600	HSL	250	D2600V2-1008	ES3DV3 - SN3270	DAE4 Sn778	14.30	56.80	57.2	0.70
2018/3/2	2600	MSL	250	D2600V2-1008	ES3DV3 - SN3169	DAE4 Sn1399	13.90	55.00	55.6	1.09
2018/3/7	2600	MSL	250	D2600V2-1008	ES3DV3 - SN3270	DAE4 Sn778	13.90	55.00	55.6	1.09
2018/3/8	2600	MSL	250	D2600V2-1008	EX3DV4 - SN3976	DAE3 Sn495	14.40	55.00	57.6	4.73

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 (%)
2018/3/8	1750	MSL	250	D1750V2-1068	EX3DV4 - SN3976	DAE3 Sn495	5.07	19.70	20.28	2.94
2018/3/8	1900	MSL	250	D1900V2-5d041	EX3DV4 - SN3976	DAE3 Sn495	5.41	21.40	21.64	1.12
2018/3/8	2600	MSL	250	D2600V2-1008	EX3DV4 - SN3976	DAE3 Sn495	6.63	24.50	26.52	8.24

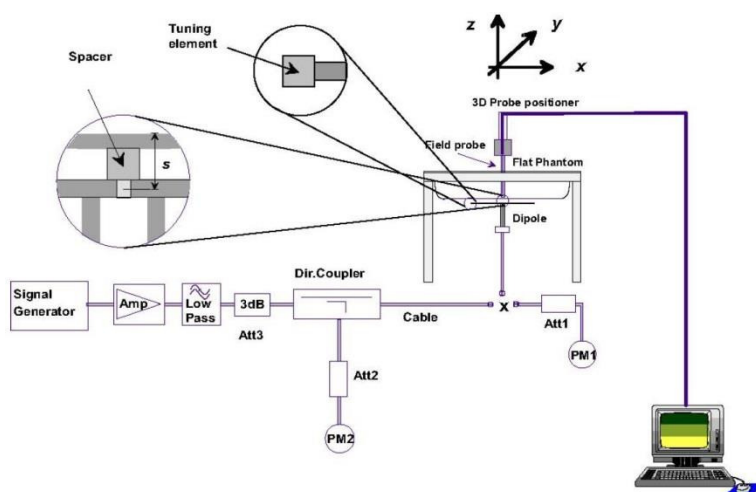

Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

11. RF Exposure Positions

11.1 Ear and handset reference point

Figure 9.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled "M," the left ear reference point (ERP) is marked "LE," and the right ERP is marked "RE." Each ERP is 15 mm along the B-M (back-mouth) line behind the entrance-to-ear-canal (EEC) point, as shown in Figure 9.1.2 The Reference Plane is defined as passing through the two ear reference points and point M. The line N-F (neck-front), also called the reference pivoting line, is normal to the Reference Plane and perpendicular to both a line passing through RE and LE and the B-M line (see Figure 9.1.3). Both N-F and B-M lines should be marked on the exterior of the phantom shell to facilitate handset positioning. Posterior to the N-F line the ear shape is a flat surface with 6 mm thickness at each ERP, and forward of the N-F line the ear is truncated, as illustrated in Figure 9.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

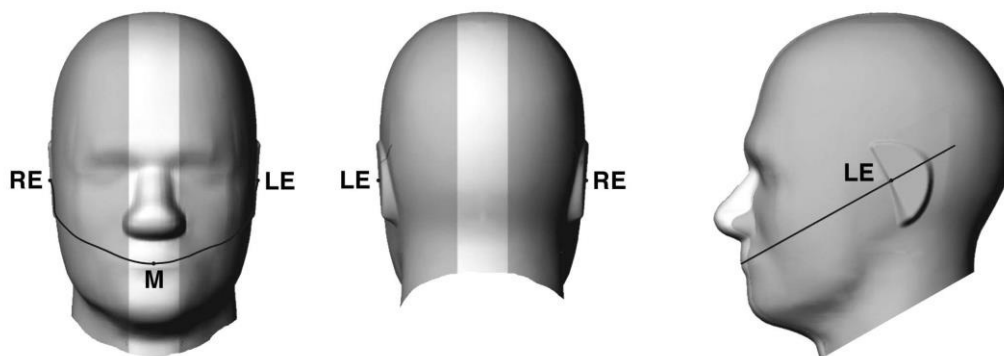


Fig 9.1.1 Front, back, and side views of SAM twin phantom

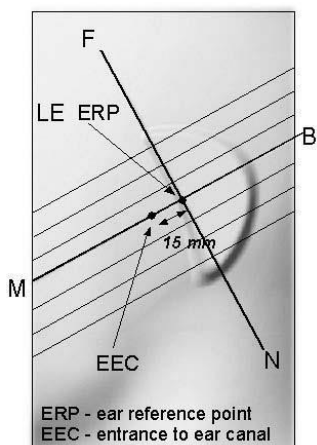


Fig 9.1.2 Close-up side view of phantom showing the ear region.

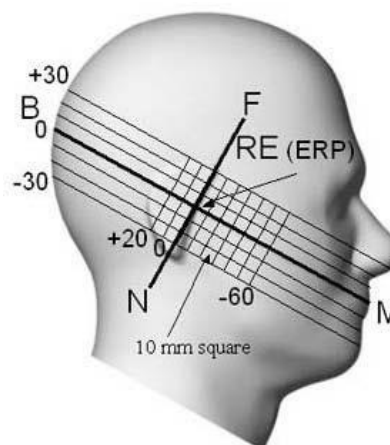


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

11.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width w_t of the handset at the level of the acoustic output (point A in Figure 9.2.1 and Figure 9.2.2), and the midpoint of the width w_b of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 9.2.1). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Figure 9.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
3. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 9.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
4. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP.
5. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
6. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.
7. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 9.2.3. The actual rotation angles should be documented in the test report.

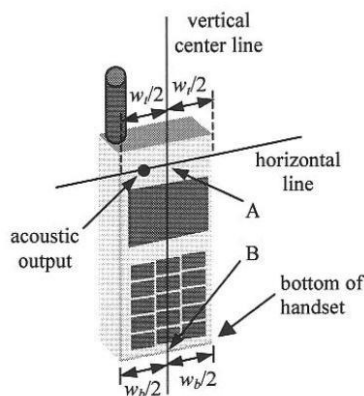


Fig 9.2.1 Handset vertical and horizontal reference lines—“fixed case”

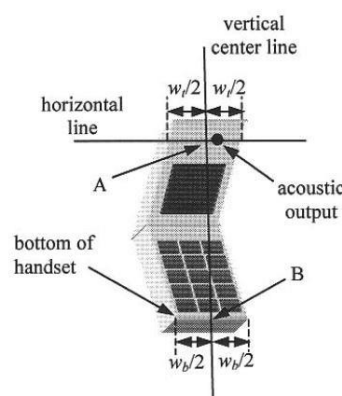


Fig 9.2.2 Handset vertical and horizontal reference lines—“clam-shell case”

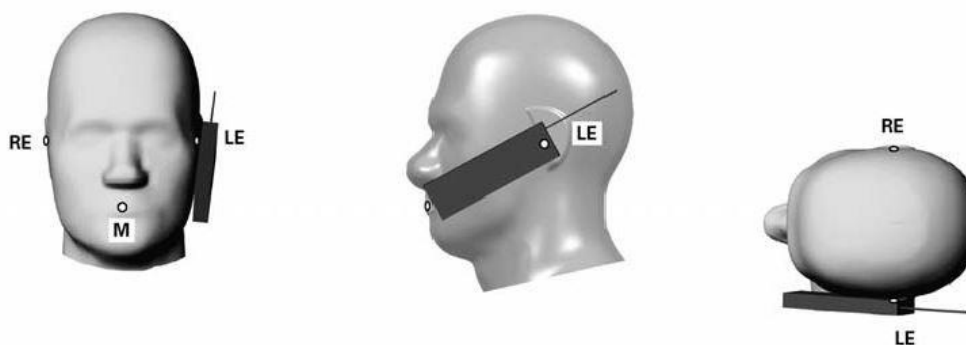


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

11.3 Definition of the tilt position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. While maintaining the orientation of the handset, move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15°.
3. Rotate the handset around the horizontal line by 15°.
4. While maintaining the orientation of the handset, move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact point is on the pinna. See Figure 9.3.1. If contact occurs at any location other than the pinna, e.g., the antenna at the back of the phantom head, the angle of the handset should be reduced. In this case, the tilt position is obtained if any point on the handset is in contact with the pinna and a second point

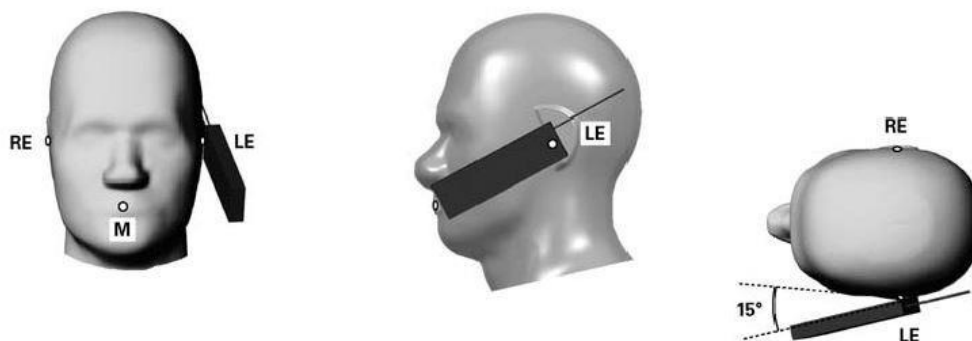


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

11.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 9.4). Per KDB648474 D04v01r03, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is $> 1.2 \text{ W/kg}$, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.

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

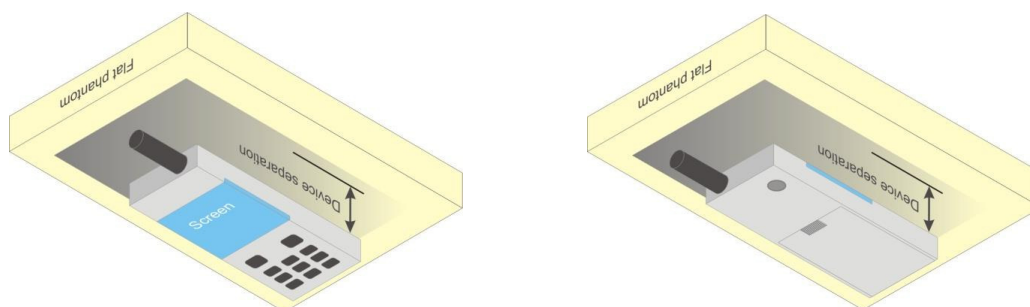


Fig 9.4 Body Worn Position



11.5 Product Specific

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.

11.6 Wireless Router

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

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

12. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

1. Per KDB 447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS (2Tx slots) for GSM850 and GPRS (3Tx slots) for 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

<Default 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	32.10	32.70	32.33	33.50	23.10	23.70	23.33	24.50
GPRS 1 Tx slot	32.18	32.85	32.45	33.50	23.18	23.85	23.45	24.50
GPRS 2 Tx slots	30.59	31.20	31.67	32.00	24.59	25.20	25.67	26.00
GPRS 3 Tx slots	29.00	29.10	29.60	30.00	24.74	24.84	25.34	25.74
GPRS 4 Tx slots	27.51	27.50	27.88	28.00	24.51	24.50	24.88	25.00
EDGE 1 Tx slot	26.03	26.17	26.27	27.00	17.03	17.17	17.27	18.00
EDGE 2 Tx slots	24.90	25.06	25.04	26.00	18.90	19.06	19.04	20.00
EDGE 3 Tx slots	23.07	23.25	23.34	24.50	18.81	18.99	19.08	20.24
EDGE 4 Tx slots	21.47	21.59	21.65	22.50	18.47	18.59	18.65	19.50

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	29.77	29.66	29.61	30.50	20.77	20.66	20.61	21.50
GPRS 1 Tx slot	29.78	29.68	29.62	30.50	20.78	20.68	20.62	21.50
GPRS 2 Tx slots	28.49	28.45	28.59	29.50	22.49	22.45	22.59	23.50
GPRS 3 Tx slots	26.67	26.64	26.80	28.00	22.41	22.38	22.54	23.74
GPRS 4 Tx slots	24.78	24.78	25.06	26.50	21.78	21.78	22.06	23.50
EDGE 1 Tx slot	25.63	25.51	25.66	26.00	16.63	16.51	16.66	17.00
EDGE 2 Tx slots	24.48	24.39	24.59	25.00	18.48	18.39	18.59	19.00
EDGE 3 Tx slots	22.91	22.74	22.90	23.00	18.65	18.48	18.64	18.74
EDGE 4 Tx slots	21.26	21.14	21.33	22.00	18.26	18.14	18.33	19.00

<Near to Body Power Mode>

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	26.55	26.58	26.65	27.00	17.55	17.58	17.65	18.00
GPRS 1 Tx slot	26.57	26.59	26.67	27.00	17.57	17.59	17.67	18.00
GPRS 2 Tx slots	25.53	25.58	25.60	26.00	19.53	19.58	19.60	20.00
GPRS 3 Tx slots	24.01	24.21	24.24	24.50	19.75	19.95	19.98	20.24
GPRS 4 Tx slots	22.47	22.55	22.58	23.00	19.47	19.55	19.58	20.00
EDGE 1 Tx slot	23.07	23.19	23.24	24.00	14.07	14.19	14.24	15.00
EDGE 2 Tx slots	22.05	22.11	22.20	23.00	16.05	16.11	16.20	17.00
EDGE 3 Tx slots	20.77	20.79	20.82	21.00	16.51	16.53	16.56	16.74
EDGE 4 Tx slots	18.97	19.00	19.04	20.00	15.97	16.00	16.04	17.00

<Hotspot Power Mode>

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	24.96	25.08	25.15	26.00	15.96	16.08	16.15	17.00
GPRS 1 Tx slot	24.96	25.10	25.16	26.00	15.96	16.10	16.16	17.00
GPRS 2 Tx slots	23.08	23.22	23.25	24.00	17.08	17.22	17.25	18.00
GPRS 3 Tx slots	22.04	22.17	22.21	23.00	17.78	17.91	17.95	18.74
GPRS 4 Tx slots	20.48	20.60	20.63	21.00	17.48	17.60	17.63	18.00
EDGE 1 Tx slot	23.07	23.19	23.24	24.00	14.07	14.19	14.24	15.00
EDGE 2 Tx slots	22.05	22.11	22.20	23.00	16.05	16.11	16.20	17.00
EDGE 3 Tx slots	20.77	20.79	20.82	21.00	16.51	16.53	16.56	16.74
EDGE 4 Tx slots	18.97	19.00	19.04	20.00	15.97	16.00	16.04	17.00

<WCDMA Conducted Power>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
 - i. Set Gain Factors (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 DPCCH, DPCH 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_d (SF)	β_c/β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	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 $\beta_d/\beta_c = 12/15$, $\beta_{hs}/\beta_c = 24/15$. 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

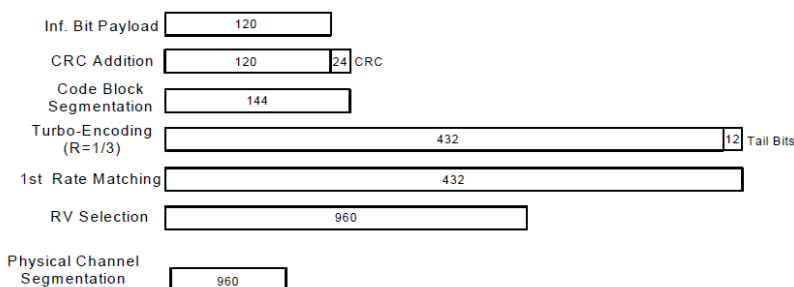
DC-HSDPA 3GPP release 8 Setup Configuration:

- 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 Cycle 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 (HSUPA, HSDPA, DC-HSDPA) are less than $\frac{1}{4}$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

<Default Power Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	22.78	22.86	22.94	23.50	22.62	22.63	22.76	23.50	22.70	22.79	22.69	24.00
3GPP Rel 99	RMC 12.2Kbps	22.82	22.92	23.01	23.50	22.67	22.68	22.82	23.50	22.74	22.85	22.76	24.00
3GPP Rel 6	HSDPA Subtest-1	21.60	21.73	21.91	22.50	21.33	21.36	21.54	22.50	21.70	21.80	21.74	23.00
3GPP Rel 6	HSDPA Subtest-2	21.62	21.77	21.93	22.50	21.35	21.39	21.55	22.50	21.74	21.87	21.76	23.00
3GPP Rel 6	HSDPA Subtest-3	21.13	21.25	21.39	22.00	20.84	20.89	21.04	22.00	21.22	21.38	21.27	22.50
3GPP Rel 6	HSDPA Subtest-4	21.14	21.27	21.41	22.00	20.82	20.86	21.01	22.00	21.23	21.37	21.25	22.50
3GPP Rel 8	DC-HSDPA Subtest-1	21.58	21.72	21.89	22.50	21.31	21.35	21.52	22.50	21.68	21.79	21.72	23.00
3GPP Rel 8	DC-HSDPA Subtest-2	21.60	21.75	21.91	22.50	21.33	21.38	21.54	22.50	21.72	21.85	21.73	23.00
3GPP Rel 8	DC-HSDPA Subtest-3	21.11	21.22	21.36	22.00	20.81	20.86	21.02	22.00	21.19	21.36	21.26	22.50
3GPP Rel 8	DC-HSDPA Subtest-4	21.11	21.24	21.38	22.00	20.79	20.83	20.99	22.00	21.21	21.35	21.23	22.50
3GPP Rel 6	HSUPA Subtest-1	21.79	21.88	21.99	22.50	21.55	21.62	21.32	22.50	21.47	21.60	21.53	23.00
3GPP Rel 6	HSUPA Subtest-2	19.80	19.92	19.96	20.50	19.56	19.64	19.31	20.50	19.68	19.50	19.62	21.00
3GPP Rel 6	HSUPA Subtest-3	20.78	20.88	20.94	21.50	20.62	20.60	20.56	21.50	20.71	20.81	20.75	22.00
3GPP Rel 6	HSUPA Subtest-4	19.82	19.90	19.95	20.50	19.56	19.61	19.48	20.50	19.68	19.84	19.72	21.00
3GPP Rel 6	HSUPA Subtest-5	21.80	21.90	22.00	22.50	21.60	21.60	21.52	22.50	21.69	21.78	21.76	23.00

<Near to Body Power Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	16.74	16.65	16.70	17.50	15.53	15.40	15.61	17.00	22.11	22.17	22.14	23.50
3GPP Rel 99	RMC 12.2Kbps	16.75	16.67	16.72	17.50	15.54	15.41	15.62	17.00	22.13	22.18	22.15	23.50
3GPP Rel 6	HSDPA Subtest-1	15.11	15.20	15.40	16.50	15.18	15.01	15.18	16.00	21.23	21.33	21.27	22.50
3GPP Rel 6	HSDPA Subtest-2	15.24	15.33	15.40	16.50	15.11	15.04	15.12	16.00	21.27	21.40	21.29	22.50
3GPP Rel 6	HSDPA Subtest-3	14.74	14.75	14.91	16.00	14.52	14.47	14.62	15.50	20.75	20.91	20.80	22.00
3GPP Rel 6	HSDPA Subtest-4	14.70	14.83	14.89	16.00	14.52	14.54	14.63	15.50	20.76	20.90	20.78	22.00
3GPP Rel 8	DC-HSDPA Subtest-1	15.10	15.19	15.39	16.50	15.16	14.99	15.16	16.00	21.21	21.32	21.25	22.50
3GPP Rel 8	DC-HSDPA Subtest-2	15.23	15.32	15.39	16.50	15.09	15.02	15.10	16.00	21.25	21.38	21.26	22.50
3GPP Rel 8	DC-HSDPA Subtest-3	14.73	14.74	14.90	16.00	14.50	14.45	14.60	15.50	20.72	20.89	20.79	22.00
3GPP Rel 8	DC-HSDPA Subtest-4	14.69	14.82	14.88	16.00	14.50	14.52	14.61	15.50	20.74	20.88	20.76	22.00
3GPP Rel 6	HSUPA Subtest-1	15.23	15.32	15.43	16.50	15.04	15.08	15.29	16.00	21.00	21.13	21.06	22.50
3GPP Rel 6	HSUPA Subtest-2	13.23	13.37	13.43	14.50	13.06	13.10	13.31	14.00	19.21	19.03	19.15	20.50
3GPP Rel 6	HSUPA Subtest-3	14.26	14.33	14.47	15.50	14.07	14.14	14.35	15.00	20.24	20.34	20.28	21.50
3GPP Rel 6	HSUPA Subtest-4	13.25	13.42	13.48	14.50	13.07	13.07	13.28	14.00	19.21	19.37	19.25	20.50
3GPP Rel 6	HSUPA Subtest-5	15.29	15.29	15.49	16.50	15.10	15.10	15.31	16.00	21.22	21.31	21.29	22.50



<Hotspot Power Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	14.14	14.13	14.20	15.50	15.53	15.40	15.61	16.50	22.11	22.17	22.14	23.50
3GPP Rel 99	RMC 12.2Kbps	14.16	14.12	14.21	15.50	15.54	15.41	15.62	16.50	22.13	22.18	22.15	23.50
3GPP Rel 6	HSDPA Subtest-1	12.60	12.69	12.89	14.50	15.18	15.01	15.18	15.50	21.23	21.33	21.27	22.50
3GPP Rel 6	HSDPA Subtest-2	12.73	12.82	12.89	14.50	15.11	15.04	15.12	15.50	21.27	21.40	21.29	22.50
3GPP Rel 6	HSDPA Subtest-3	12.23	12.24	12.40	14.00	14.52	14.47	14.62	15.00	20.75	20.91	20.80	22.00
3GPP Rel 6	HSDPA Subtest-4	12.19	12.32	12.38	14.00	14.52	14.54	14.63	15.00	20.76	20.90	20.78	22.00
3GPP Rel 8	DC-HSDPA Subtest-1	12.59	12.68	12.88	14.50	15.16	14.99	15.16	15.50	21.21	21.32	21.25	22.50
3GPP Rel 8	DC-HSDPA Subtest-2	12.72	12.81	12.88	14.50	15.09	15.02	15.10	15.50	21.25	21.38	21.26	22.50
3GPP Rel 8	DC-HSDPA Subtest-3	12.22	12.23	12.39	14.00	14.50	14.45	14.60	15.00	20.72	20.89	20.79	22.00
3GPP Rel 8	DC-HSDPA Subtest-4	12.18	12.31	12.37	14.00	14.50	14.52	14.61	15.00	20.74	20.88	20.76	22.00
3GPP Rel 6	HSUPA Subtest-1	12.72	12.81	12.92	14.50	15.04	15.08	15.29	15.50	21.00	21.13	21.06	22.50
3GPP Rel 6	HSUPA Subtest-2	10.72	10.86	10.92	12.50	13.06	13.10	13.31	13.50	19.21	19.03	19.15	20.50
3GPP Rel 6	HSUPA Subtest-3	11.75	11.82	11.96	13.50	14.07	14.14	14.35	14.50	20.24	20.34	20.28	21.50
3GPP Rel 6	HSUPA Subtest-4	10.74	10.91	10.97	12.50	13.07	13.07	13.28	13.50	19.21	19.37	19.25	20.50
3GPP Rel 6	HSUPA Subtest-5	12.78	12.78	12.98	14.50	15.10	15.10	15.31	15.50	21.22	21.31	21.29	22.50

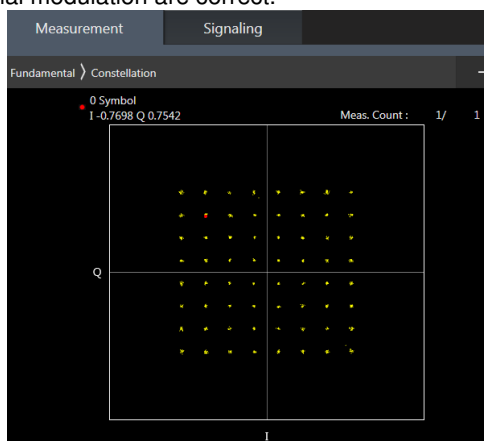
<Product Specific Power Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA 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	22.74	22.65	22.70	23.00	21.80	21.63	21.86	23.00
3GPP Rel 99	RMC 12.2Kbps	22.75	22.66	22.71	23.00	21.85	21.81	21.92	23.00
3GPP Rel 6	HSDPA Subtest-1	21.12	21.21	21.41	22.00	20.72	20.52	20.71	22.00
3GPP Rel 6	HSDPA Subtest-2	21.25	21.34	21.41	22.00	20.61	20.60	20.64	22.00
3GPP Rel 6	HSDPA Subtest-3	20.75	20.76	20.92	21.50	20.01	20.00	20.12	21.50
3GPP Rel 6	HSDPA Subtest-4	20.71	20.84	20.90	21.50	20.05	20.04	20.17	21.50
3GPP Rel 8	DC-HSDPA Subtest-1	21.11	21.20	21.40	22.00	20.67	20.50	20.72	22.00
3GPP Rel 8	DC-HSDPA Subtest-2	21.24	21.33	21.40	22.00	20.62	20.57	20.61	22.00
3GPP Rel 8	DC-HSDPA Subtest-3	20.74	20.75	20.91	21.50	20.04	20.00	20.14	21.50
3GPP Rel 8	DC-HSDPA Subtest-4	20.70	20.83	20.89	21.50	20.00	20.09	20.14	21.50
3GPP Rel 6	HSUPA Subtest-1	21.24	21.33	21.44	22.00	20.59	20.55	20.76	22.00
3GPP Rel 6	HSUPA Subtest-2	19.24	19.38	19.44	20.00	18.59	18.67	18.86	20.00
3GPP Rel 6	HSUPA Subtest-3	20.27	20.34	20.48	21.00	19.60	19.63	19.88	21.00
3GPP Rel 6	HSUPA Subtest-4	19.26	19.43	19.49	20.00	18.60	18.59	18.85	20.00
3GPP Rel 6	HSUPA Subtest-5	21.30	21.30	21.50	22.00	20.62	20.62	20.78	22.00

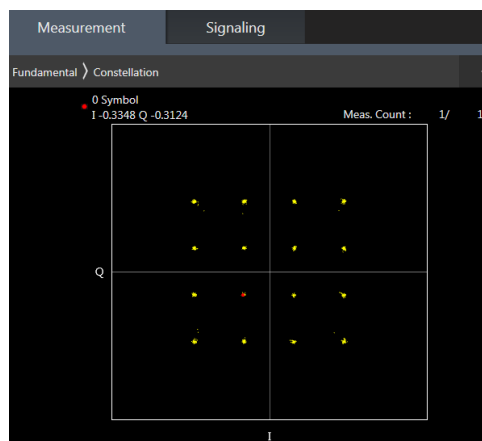
<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4/B12/B26 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 B5/B17/B38 SAR test was covered by Band 26/12/41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. the maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion
 - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to 2017 TCB workshop, for 64 QAM and 16 QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM and 16QAM signal modulation are correct.



64QAM



16QAM

<Default Power Mode>
<LTE Band 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	22.90	22.81	22.82	23.5	0
20	QPSK	1	49	22.73	22.62	22.70		
20	QPSK	1	99	22.63	22.66	22.71		
20	QPSK	50	0	21.87	21.79	21.74	22.5	1
20	QPSK	50	24	21.73	21.71	21.81		
20	QPSK	50	50	21.70	21.67	21.74		
20	QPSK	100	0	21.72	21.73	21.81	22.5	1
20	16QAM	1	0	22.25	22.15	22.17		
20	16QAM	1	49	22.09	22.00	22.03		
20	16QAM	1	99	22.03	22.00	22.07	21.5	2
20	16QAM	50	0	20.95	20.87	20.85		
20	16QAM	50	24	20.81	20.82	20.89		
20	16QAM	50	50	20.77	20.76	20.83	21.5	2
20	16QAM	100	0	20.81	20.77	20.86		
20	64QAM	1	0	21.20	21.09	21.09		
20	64QAM	1	49	21.03	20.91	20.94	21.5	2
20	64QAM	1	99	20.96	20.91	20.98		
20	64QAM	50	0	19.96	19.90	19.86		
20	64QAM	50	24	19.86	19.85	19.91	20.5	3
20	64QAM	50	50	19.81	19.77	19.81		
20	64QAM	100	0	19.85	19.81	19.90		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.85	22.79	22.88	23.5	0
15	QPSK	1	37	22.71	22.64	22.69		
15	QPSK	1	74	22.65	22.70	22.77		
15	QPSK	36	0	21.83	21.74	21.81	22.5	1
15	QPSK	36	20	21.72	21.70	21.80		
15	QPSK	36	39	21.65	21.67	21.71		
15	QPSK	75	0	21.71	21.70	21.77	22.5	1
15	16QAM	1	0	22.24	22.15	22.22		
15	16QAM	1	37	22.07	21.97	21.99		
15	16QAM	1	74	22.04	22.06	22.13	21.5	2
15	16QAM	36	0	20.92	20.84	20.93		
15	16QAM	36	20	20.81	20.82	20.90		
15	16QAM	36	39	20.77	20.75	20.82	21.5	2
15	16QAM	75	0	20.79	20.80	20.86		
15	64QAM	1	0	21.16	21.10	21.15		
15	64QAM	1	37	20.99	20.91	20.91	21.5	2
15	64QAM	1	74	20.95	20.95	21.02		
15	64QAM	36	0	19.97	19.87	19.96		
15	64QAM	36	20	19.82	19.86	19.91	20.5	3
15	64QAM	36	39	19.82	19.81	19.81		
15	64QAM	75	0	19.81	19.81	19.88		



FCC SAR Test Report

Report No. : FA811821-07

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	22.76	22.69	22.75	23.5	0
10	QPSK	1	25	22.68	22.59	22.76		
10	QPSK	1	49	22.65	22.54	22.71		
10	QPSK	25	0	21.77	21.68	21.77	22.5	1
10	QPSK	25	12	21.76	21.68	21.74		
10	QPSK	25	25	21.71	21.63	21.75		
10	QPSK	50	0	21.73	21.65	21.70		
10	16QAM	1	0	22.09	21.97	22.06	22.5	1
10	16QAM	1	25	22.04	21.95	22.05		
10	16QAM	1	49	22.03	21.91	22.08		
10	16QAM	25	0	20.83	20.80	20.87	21.5	2
10	16QAM	25	12	20.84	20.79	20.78		
10	16QAM	25	25	20.80	20.69	20.88		
10	16QAM	50	0	20.84	20.73	20.78		
10	64QAM	1	0	21.04	20.95	21.03	21.5	2
10	64QAM	1	25	20.96	20.89	21.02		
10	64QAM	1	49	20.95	20.85	20.99		
10	64QAM	25	0	19.87	19.79	19.83	20.5	3
10	64QAM	25	12	19.86	19.78	19.85		
10	64QAM	25	25	19.82	19.75	19.87		
10	64QAM	50	0	19.85	19.76	19.84		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	22.70	22.62	22.81	23.5	0
5	QPSK	1	12	22.66	22.59	22.72		
5	QPSK	1	24	22.68	22.60	22.69		
5	QPSK	12	0	21.73	21.65	21.77	22.5	1
5	QPSK	12	7	21.75	21.65	21.77		
5	QPSK	12	13	21.73	21.64	21.75		
5	QPSK	25	0	21.71	21.60	21.75		
5	16QAM	1	0	22.08	21.97	22.06	22.5	1
5	16QAM	1	12	22.04	21.93	22.10		
5	16QAM	1	24	22.05	21.95	21.98		
5	16QAM	12	0	20.85	20.75	20.90	21.5	2
5	16QAM	12	7	20.82	20.75	20.90		
5	16QAM	12	13	20.82	20.74	20.82		
5	16QAM	25	0	20.80	20.74	20.88		
5	64QAM	1	0	21.00	20.88	21.03	21.5	2
5	64QAM	1	12	20.94	20.86	20.97		
5	64QAM	1	24	20.93	20.83	20.91		
5	64QAM	12	0	19.90	19.82	19.94	20.5	3
5	64QAM	12	7	19.90	19.79	19.92		
5	64QAM	12	13	19.86	19.78	19.91		
5	64QAM	25	0	19.82	19.72	19.88		



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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	22.66	22.58	22.74	23.5	0
3	QPSK	1	8	22.65	22.57	22.73		
3	QPSK	1	14	22.65	22.59	22.70		
3	QPSK	8	0	21.69	21.63	21.74	22.5	1
3	QPSK	8	4	21.74	21.65	21.77		
3	QPSK	8	7	21.68	21.60	21.73		
3	QPSK	15	0	21.68	21.62	21.75		
3	16QAM	1	0	21.98	21.92	22.02	22.5	1
3	16QAM	1	8	21.95	21.95	21.99		
3	16QAM	1	14	21.88	21.93	21.95		
3	16QAM	8	0	20.84	20.77	20.91	21.5	2
3	16QAM	8	4	20.86	20.75	20.93		
3	16QAM	8	7	20.81	20.73	20.88		
3	16QAM	15	0	20.79	20.70	20.84		
3	64QAM	1	0	20.88	20.87	20.95	21.5	2
3	64QAM	1	8	20.90	20.86	20.98		
3	64QAM	1	14	20.88	20.84	20.92		
3	64QAM	8	0	19.86	19.76	19.89	20.5	3
3	64QAM	8	4	19.85	19.78	19.93		
3	64QAM	8	7	19.86	19.77	19.87		
3	64QAM	15	0	19.78	19.70	19.88		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	22.59	22.53	22.68	23.5	0
1.4	QPSK	1	3	22.67	22.59	22.71		
1.4	QPSK	1	5	22.57	22.53	22.62		
1.4	QPSK	3	0	22.61	22.56	22.67		
1.4	QPSK	3	1	22.65	22.60	22.70		
1.4	QPSK	3	3	22.62	22.56	22.69		
1.4	QPSK	6	0	21.64	21.56	21.67	22.5	1
1.4	16QAM	1	0	21.89	21.88	22.04	22.5	1
1.4	16QAM	1	3	21.95	21.93	22.07		
1.4	16QAM	1	5	21.86	21.85	21.98		
1.4	16QAM	3	0	21.65	21.65	21.82		
1.4	16QAM	3	1	21.71	21.69	21.84		
1.4	16QAM	3	3	21.65	21.62	21.78		
1.4	16QAM	6	0	20.78	20.71	20.87	21.5	2
1.4	64QAM	1	0	20.81	20.78	20.93	21.5	2
1.4	64QAM	1	3	20.88	20.86	21.02		
1.4	64QAM	1	5	20.84	20.79	20.95		
1.4	64QAM	3	0	20.86	20.79	20.90		
1.4	64QAM	3	1	20.90	20.81	20.99		
1.4	64QAM	3	3	20.84	20.76	20.93		
1.4	64QAM	6	0	19.74	19.66	19.79	20.5	3



<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	22.61	22.65	22.68	24	0
10	QPSK	1	25	22.67	22.71	22.76		
10	QPSK	1	49	22.73	22.64	22.63		
10	QPSK	25	0	21.73	21.75	21.70	23	1
10	QPSK	25	12	21.70	21.75	21.78		
10	QPSK	25	25	21.75	21.68	21.71		
10	QPSK	50	0	21.69	21.70	21.66		
10	16QAM	1	0	21.96	21.97	22.06	23	1
10	16QAM	1	25	22.01	22.06	22.08		
10	16QAM	1	49	22.05	21.98	22.01		
10	16QAM	25	0	20.84	20.86	20.76	22	2
10	16QAM	25	12	20.81	20.82	20.85		
10	16QAM	25	25	20.87	20.79	20.81		
10	16QAM	50	0	20.79	20.81	20.75		
10	64QAM	1	0	20.95	20.95	20.96	22	2
10	64QAM	1	25	20.94	20.99	21.01		
10	64QAM	1	49	20.98	20.94	20.91		
10	64QAM	25	0	19.86	19.85	19.80	21	3
10	64QAM	25	12	19.86	19.85	19.90		
10	64QAM	25	25	19.83	19.76	19.81		
10	64QAM	50	0	19.80	19.84	19.76		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.63	22.75	22.75	24	0
5	QPSK	1	12	22.58	22.70	22.67		
5	QPSK	1	24	22.66	22.67	22.65		
5	QPSK	12	0	21.65	21.72	21.73	23	1
5	QPSK	12	7	21.76	21.75	21.73		
5	QPSK	12	13	21.70	21.69	21.69		
5	QPSK	25	0	21.71	21.71	21.70		
5	16QAM	1	0	22.00	22.06	22.07	23	1
5	16QAM	1	12	21.95	22.06	22.04		
5	16QAM	1	24	22.03	22.03	22.02		
5	16QAM	12	0	20.77	20.81	20.83	22	2
5	16QAM	12	7	20.87	20.83	20.82		
5	16QAM	12	13	20.80	20.81	20.79		
5	16QAM	25	0	20.83	20.81	20.79		
5	64QAM	1	0	20.90	21.03	21.01	22	2
5	64QAM	1	12	20.86	20.98	20.96		
5	64QAM	1	24	20.92	20.95	20.93		
5	64QAM	12	0	19.83	19.85	19.87	21	3
5	64QAM	12	7	19.90	19.89	19.87		
5	64QAM	12	13	19.88	19.82	19.83		
5	64QAM	25	0	19.83	19.79	19.80		



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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	22.62	22.73	22.68	24	0
3	QPSK	1	8	22.61	22.69	22.68		
3	QPSK	1	14	22.59	22.58	22.65		
3	QPSK	8	0	21.65	21.69	21.70	23	1
3	QPSK	8	4	21.68	21.73	21.71		
3	QPSK	8	7	21.62	21.71	21.71		
3	QPSK	15	0	21.62	21.69	21.69		
3	16QAM	1	0	21.97	22.08	22.05	23	1
3	16QAM	1	8	21.95	22.06	22.03		
3	16QAM	1	14	21.94	21.93	21.98		
3	16QAM	8	0	20.77	20.85	20.83	22	2
3	16QAM	8	4	20.82	20.88	20.86		
3	16QAM	8	7	20.78	20.84	20.82		
3	16QAM	15	0	20.75	20.81	20.79		
3	64QAM	1	0	20.89	20.98	20.94	22	2
3	64QAM	1	8	20.89	20.98	20.93		
3	64QAM	1	14	20.87	20.98	20.93		
3	64QAM	8	0	19.78	19.85	19.81	21	3
3	64QAM	8	4	19.80	19.86	19.84		
3	64QAM	8	7	19.77	19.84	19.84		
3	64QAM	15	0	19.74	19.80	19.80		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.55	22.62	22.60	24	0
1.4	QPSK	1	3	22.63	22.71	22.67		
1.4	QPSK	1	5	22.55	22.60	22.59		
1.4	QPSK	3	0	22.60	22.67	22.63		
1.4	QPSK	3	1	22.63	22.71	22.68		
1.4	QPSK	3	3	22.58	22.68	22.63		
1.4	QPSK	6	0	21.57	21.65	21.62	23	1
1.4	16QAM	1	0	21.89	21.96	21.93	23	1
1.4	16QAM	1	3	21.98	22.06	22.02		
1.4	16QAM	1	5	21.91	22.01	21.96		
1.4	16QAM	3	0	21.70	21.78	21.73		
1.4	16QAM	3	1	21.74	21.81	21.78		
1.4	16QAM	3	3	21.69	21.76	21.73		
1.4	16QAM	6	0	20.75	20.82	20.78	22	2
1.4	64QAM	1	0	20.84	20.90	20.89	22	2
1.4	64QAM	1	3	20.91	20.99	20.95		
1.4	64QAM	1	5	20.84	20.92	20.87		
1.4	64QAM	3	0	20.85	20.88	20.85		
1.4	64QAM	3	1	20.86	20.92	20.90		
1.4	64QAM	3	3	20.81	20.89	20.86		
1.4	64QAM	6	0	19.69	19.73	19.72	21	3



<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	22.16	22.32	22.23	24	0
20	QPSK	1	49	22.32	22.48	22.45		
20	QPSK	1	99	22.40	22.54	22.45		
20	QPSK	50	0	21.24	21.38	21.42	23	1
20	QPSK	50	24	21.33	21.52	21.41		
20	QPSK	50	50	21.38	21.56	21.48		
20	QPSK	100	0	21.28	21.49	21.37		
20	16QAM	1	0	21.48	21.66	21.54	23	1
20	16QAM	1	49	21.64	21.80	21.76		
20	16QAM	1	99	21.74	21.84	21.81		
20	16QAM	50	0	20.33	20.46	20.49	22	2
20	16QAM	50	24	20.46	20.63	20.60		
20	16QAM	50	50	20.47	20.68	20.55		
20	16QAM	100	0	20.40	20.57	20.43		
20	64QAM	1	0	20.39	20.56	20.42	22	2
20	64QAM	1	49	20.49	20.71	20.68		
20	64QAM	1	99	20.61	20.73	20.74		
20	64QAM	50	0	19.31	19.46	19.53	21	3
20	64QAM	50	24	19.44	19.62	19.59		
20	64QAM	50	50	19.50	19.67	19.67		
20	64QAM	100	0	19.38	19.56	19.53		
Channel				20825	21100	21375		
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	22.25	22.31	22.30	24	0
15	QPSK	1	37	22.41	22.51	22.44		
15	QPSK	1	74	22.41	22.49	22.42		
15	QPSK	36	0	21.34	21.46	21.43	23	1
15	QPSK	36	20	21.38	21.57	21.50		
15	QPSK	36	39	21.36	21.55	21.54		
15	QPSK	75	0	21.30	21.49	21.43		
15	16QAM	1	0	21.58	21.64	21.65	23	1
15	16QAM	1	37	21.75	21.79	21.76		
15	16QAM	1	74	21.74	21.82	21.75		
15	16QAM	36	0	20.42	20.51	20.52	22	2
15	16QAM	36	20	20.48	20.60	20.58		
15	16QAM	36	39	20.47	20.66	20.59		
15	16QAM	75	0	20.40	20.58	20.52		
15	64QAM	1	0	20.47	20.53	20.53	22	2
15	64QAM	1	37	20.65	20.75	20.66		
15	64QAM	1	74	20.63	20.71	20.64		
15	64QAM	36	0	19.46	19.51	19.53	21	3
15	64QAM	36	20	19.50	19.67	19.63		
15	64QAM	36	39	19.48	19.67	19.64		
15	64QAM	75	0	19.40	19.59	19.52		



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Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	22.27	22.36	22.33	24	0
10	QPSK	1	25	22.41	22.51	22.36		
10	QPSK	1	49	22.36	22.48	22.40		
10	QPSK	25	0	21.36	21.45	21.41	23	1
10	QPSK	25	12	21.44	21.57	21.50		
10	QPSK	25	25	21.38	21.54	21.43		
10	QPSK	50	0	21.33	21.51	21.49	23	1
10	16QAM	1	0	21.64	21.72	21.66		
10	16QAM	1	25	21.75	21.85	21.70		
10	16QAM	1	49	21.67	21.78	21.75	22	2
10	16QAM	25	0	20.49	20.56	20.54		
10	16QAM	25	12	20.57	20.65	20.60		
10	16QAM	25	25	20.43	20.66	20.51	22	2
10	16QAM	50	0	20.42	20.60	20.61		
10	64QAM	1	0	20.39	20.44	20.53		
10	64QAM	1	25	20.59	20.70	20.59	22	2
10	64QAM	1	49	20.56	20.61	20.61		
10	64QAM	25	0	19.38	19.45	19.47		
10	64QAM	25	12	19.50	19.64	19.55	21	3
10	64QAM	25	25	19.40	19.61	19.59		
10	64QAM	50	0	19.33	19.56	19.46		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	22.34	22.46	22.31	24	0
5	QPSK	1	12	22.37	22.50	22.39		
5	QPSK	1	24	22.39	22.53	22.45		
5	QPSK	12	0	21.36	21.47	21.42	23	1
5	QPSK	12	7	21.44	21.54	21.47		
5	QPSK	12	13	21.41	21.56	21.50		
5	QPSK	25	0	21.41	21.49	21.45	23	1
5	16QAM	1	0	21.63	21.74	21.65		
5	16QAM	1	12	21.71	21.83	21.71		
5	16QAM	1	24	21.74	21.87	21.77	22	2
5	16QAM	12	0	20.43	20.59	20.49		
5	16QAM	12	7	20.50	20.64	20.55		
5	16QAM	12	13	20.53	20.61	20.55	22	2
5	16QAM	25	0	20.51	20.59	20.51		
5	64QAM	1	0	20.55	20.66	20.55		
5	64QAM	1	12	20.59	20.73	20.62	22	2
5	64QAM	1	24	20.64	20.74	20.66		
5	64QAM	12	0	19.48	19.62	19.51		
5	64QAM	12	7	19.58	19.68	19.59	21	3
5	64QAM	12	13	19.55	19.65	19.60		
5	64QAM	25	0	19.47	19.61	19.51		



<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	22.49	22.43	22.47	24	0
10	QPSK	1	25	22.57	22.52	22.47		
10	QPSK	1	49	22.57	22.53	22.61		
10	QPSK	25	0	21.65	21.59	21.56	23	1
10	QPSK	25	12	21.65	21.59	21.59		
10	QPSK	25	25	21.60	21.58	21.54		
10	QPSK	50	0	21.61	21.58	21.52	23	1
10	16QAM	1	0	21.83	21.79	21.81		
10	16QAM	1	25	21.91	21.84	21.79		
10	16QAM	1	49	21.87	21.79	21.94	22	2
10	16QAM	25	0	20.72	20.65	20.61		
10	16QAM	25	12	20.74	20.65	20.64		
10	16QAM	25	25	20.71	20.63	20.62	22	2
10	16QAM	50	0	20.72	20.65	20.63		
10	64QAM	1	0	20.77	20.71	20.75		
10	64QAM	1	25	20.84	20.77	20.71	22	2
10	64QAM	1	49	20.82	20.77	20.89		
10	64QAM	25	0	19.71	19.69	19.63		
10	64QAM	25	12	19.73	19.68	19.66	21	3
10	64QAM	25	25	19.70	19.65	19.64		
10	64QAM	50	0	19.72	19.67	19.67		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	22.53	22.51	22.45	24	0
5	QPSK	1	12	22.51	22.52	22.58		
5	QPSK	1	24	22.60	22.51	22.60		
5	QPSK	12	0	21.56	21.58	21.51	23	1
5	QPSK	12	7	21.57	21.60	21.66		
5	QPSK	12	13	21.66	21.59	21.61		
5	QPSK	25	0	21.66	21.57	21.50	23	1
5	16QAM	1	0	21.89	21.83	21.76		
5	16QAM	1	12	21.83	21.84	21.89		
5	16QAM	1	24	21.93	21.78	21.92	22	2
5	16QAM	12	0	20.65	20.69	20.58		
5	16QAM	12	7	20.69	20.70	20.73		
5	16QAM	12	13	20.74	20.68	20.72	22	2
5	16QAM	25	0	20.74	20.63	20.61		
5	64QAM	1	0	20.78	20.80	20.74		
5	64QAM	1	12	20.76	20.75	20.84	22	2
5	64QAM	1	24	20.84	20.73	20.85		
5	64QAM	12	0	19.71	19.74	19.65		
5	64QAM	12	7	19.70	19.73	19.79	21	3
5	64QAM	12	13	19.81	19.70	19.74		
5	64QAM	25	0	19.75	19.67	19.63		



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Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	22.53	22.51	22.55	24	0
3	QPSK	1	8	22.51	22.50	22.55		
3	QPSK	1	14	22.53	22.52	22.55		
3	QPSK	8	0	21.54	21.55	21.60	23	1
3	QPSK	8	4	21.57	21.61	21.62		
3	QPSK	8	7	21.57	21.54	21.61		
3	QPSK	15	0	21.55	21.55	21.59	23	1
3	16QAM	1	0	21.87	21.85	21.91		
3	16QAM	1	8	21.86	21.82	21.90		
3	16QAM	1	14	21.84	21.80	21.89	22	2
3	16QAM	8	0	20.67	20.68	20.70		
3	16QAM	8	4	20.71	20.71	20.74		
3	16QAM	8	7	20.70	20.68	20.72	22	2
3	16QAM	15	0	20.66	20.65	20.69		
3	64QAM	1	0	20.80	20.73	20.80	22	2
3	64QAM	1	8	20.78	20.75	20.79		
3	64QAM	1	14	20.77	20.73	20.84		
3	64QAM	8	0	19.69	19.69	19.71	21	3
3	64QAM	8	4	19.72	19.71	19.75		
3	64QAM	8	7	19.67	19.67	19.75		
3	64QAM	15	0	19.66	19.66	19.68		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	22.46	22.46	22.48	24	0
1.4	QPSK	1	3	22.55	22.51	22.57		
1.4	QPSK	1	5	22.47	22.43	22.48		
1.4	QPSK	3	0	22.51	22.48	22.54		
1.4	QPSK	3	1	22.55	22.52	22.54		
1.4	QPSK	3	3	22.50	22.49	22.53		
1.4	QPSK	6	0	21.49	21.49	21.54	23	1
1.4	16QAM	1	0	21.83	21.76	21.83	23	1
1.4	16QAM	1	3	21.88	21.83	21.92		
1.4	16QAM	1	5	21.82	21.76	21.83		
1.4	16QAM	3	0	21.62	21.57	21.62		
1.4	16QAM	3	1	21.64	21.60	21.66		
1.4	16QAM	3	3	21.62	21.55	21.61		
1.4	16QAM	6	0	20.68	20.66	20.70	22	2
1.4	64QAM	1	0	20.74	20.72	20.77	22	2
1.4	64QAM	1	3	20.81	20.75	20.82		
1.4	64QAM	1	5	20.76	20.68	20.78		
1.4	64QAM	3	0	20.72	20.71	20.74		
1.4	64QAM	3	1	20.79	20.73	20.77		
1.4	64QAM	3	3	20.71	20.68	20.74		
1.4	64QAM	6	0	19.61	19.59	19.64	21	3



<LTE Band 17>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23780	23790	23800		
Frequency (MHz)				709	710	711		
10	QPSK	1	0	22.51	22.48	22.48	24	0
10	QPSK	1	25	22.61	22.51	22.49		
10	QPSK	1	49	22.51	22.50	22.46		
10	QPSK	25	0	21.59	21.65	21.63	23	1
10	QPSK	25	12	21.71	21.68	21.70		
10	QPSK	25	25	21.66	21.56	21.56		
10	QPSK	50	0	21.70	21.67	21.65	23	1
10	16QAM	1	0	21.86	21.85	21.82		
10	16QAM	1	25	21.95	21.82	21.81		
10	16QAM	1	49	21.89	21.86	21.82	22	2
10	16QAM	25	0	20.64	20.77	20.73		
10	16QAM	25	12	20.79	20.77	20.77		
10	16QAM	25	25	20.76	20.67	20.63	22	2
10	16QAM	50	0	20.78	20.74	20.75		
10	64QAM	1	0	20.78	20.75	20.74	22	2
10	64QAM	1	25	20.86	20.72	20.72		
10	64QAM	1	49	20.77	20.74	20.71		
10	64QAM	25	0	19.67	19.73	19.76	21	3
10	64QAM	25	12	19.82	19.78	19.75		
10	64QAM	25	25	19.78	19.66	19.66		
10	64QAM	50	0	19.79	19.77	19.74		
Channel				23755	23790	23825		
Frequency (MHz)				706.5	710	713.5	Tune-up limit (dBm)	MPR (dB)
5	QPSK	1	0	22.54	22.49	22.48	24	0
5	QPSK	1	12	22.51	22.47	22.46		
5	QPSK	1	24	22.54	22.51	22.46		
5	QPSK	12	0	21.61	21.67	21.52	23	1
5	QPSK	12	7	21.61	21.70	21.56		
5	QPSK	12	13	21.58	21.53	21.53		
5	QPSK	25	0	21.61	21.68	21.52	23	1
5	16QAM	1	0	21.88	21.82	21.81		
5	16QAM	1	12	21.87	21.81	21.79		
5	16QAM	1	24	21.86	21.85	21.78	22	2
5	16QAM	12	0	20.65	20.77	20.60		
5	16QAM	12	7	20.68	20.75	20.65		
5	16QAM	12	13	20.66	20.64	20.62	22	2
5	16QAM	25	0	20.66	20.75	20.63		
5	64QAM	1	0	20.81	20.77	20.73		
5	64QAM	1	12	20.78	20.73	20.71	22	2
5	64QAM	1	24	20.76	20.74	20.73		
5	64QAM	12	0	19.72	19.80	19.68		
5	64QAM	12	7	19.77	19.81	19.68	21	3
5	64QAM	12	13	19.72	19.67	19.68		
5	64QAM	25	0	19.68	19.72	19.62		



<LTE Band 26>

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				26765	26865	26965		
Frequency (MHz)				821.5	831.5	841.5		
15	QPSK	1	0	22.73	22.70	22.72	24	0
15	QPSK	1	37	22.74	22.71	22.77		
15	QPSK	1	74	22.63	22.68	22.61		
15	QPSK	36	0	21.85	21.77	21.74	23	1
15	QPSK	36	20	21.83	21.75	21.71		
15	QPSK	36	39	21.73	21.69	21.71		
15	QPSK	75	0	21.78	21.72	21.68	23	1
15	16QAM	1	0	22.07	22.11	22.05		
15	16QAM	1	37	22.07	22.03	22.10		
15	16QAM	1	74	21.98	22.04	21.96	22	2
15	16QAM	36	0	20.93	20.84	20.81		
15	16QAM	36	20	20.89	20.84	20.82		
15	16QAM	36	39	20.83	20.77	20.81	22	2
15	16QAM	75	0	20.88	20.82	20.78		
15	64QAM	1	0	20.97	21.01	20.99		
15	64QAM	1	37	21.00	20.96	21.06	22	2
15	64QAM	1	74	20.91	20.96	20.90		
15	64QAM	36	0	19.91	19.88	19.84	21	3
15	64QAM	36	20	19.91	19.89	19.83		
15	64QAM	36	39	19.86	19.80	19.83		
15	64QAM	75	0	19.86	19.81	19.76		
Channel				26740	26865	26990		
Frequency (MHz)				819	831.5	844	Tune-up limit (dBm)	MPR (dB)
10	QPSK	1	0	22.59	22.66	22.72	24	0
10	QPSK	1	25	22.63	22.67	22.67		
10	QPSK	1	49	22.65	22.61	22.59		
10	QPSK	25	0	21.70	21.76	21.74	23	1
10	QPSK	25	12	21.69	21.76	21.75		
10	QPSK	25	25	21.76	21.67	21.67		
10	QPSK	50	0	21.67	21.70	21.73	23	1
10	16QAM	1	0	21.96	22.03	22.11		
10	16QAM	1	25	21.97	22.02	22.02		
10	16QAM	1	49	22.02	21.98	21.95	22	2
10	16QAM	25	0	20.79	20.86	20.83		
10	16QAM	25	12	20.77	20.86	20.80		
10	16QAM	25	25	20.86	20.81	20.79	22	2
10	16QAM	50	0	20.78	20.81	20.81		
10	64QAM	1	0	20.85	20.91	21.03		
10	64QAM	1	25	20.87	20.95	20.93	22	2
10	64QAM	1	49	20.93	20.90	20.84		
10	64QAM	25	0	19.79	19.87	19.85		
10	64QAM	25	12	19.79	19.85	19.85	21	3
10	64QAM	25	25	19.88	19.81	19.78		
10	64QAM	50	0	19.76	19.84	19.83		



Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	22.58	22.70	22.70	24	0
5	QPSK	1	12	22.53	22.67	22.63		
5	QPSK	1	24	22.65	22.64	22.60		
5	QPSK	12	0	21.62	21.74	21.68	23	1
5	QPSK	12	7	21.73	21.75	21.70		
5	QPSK	12	13	21.69	21.72	21.66		
5	QPSK	25	0	21.69	21.71	21.66	23	1
5	16QAM	1	0	21.95	22.05	22.02		
5	16QAM	1	12	21.88	22.01	21.98		
5	16QAM	1	24	22.01	22.00	21.94	22	2
5	16QAM	12	0	20.72	20.82	20.77		
5	16QAM	12	7	20.82	20.83	20.79		
5	16QAM	12	13	20.77	20.81	20.76	22	2
5	16QAM	25	0	20.80	20.81	20.77		
5	64QAM	1	0	20.89	20.98	20.94	22	2
5	64QAM	1	12	20.80	20.93	20.89		
5	64QAM	1	24	20.91	20.93	20.88		
5	64QAM	12	0	19.77	19.88	19.84	21	3
5	64QAM	12	7	19.87	19.89	19.84		
5	64QAM	12	13	19.82	19.84	19.79		
5	64QAM	25	0	19.81	19.81	19.76	27025	MPR (dB)
Channel				26705	26865	27025		
Frequency (MHz)				815.5	831.5	847.5	Tune-up limit (dBm)	MPR (dB)
3	QPSK	1	0	22.57	22.70	22.64		
3	QPSK	1	8	22.56	22.66	22.53	24	0
3	QPSK	1	14	22.53	22.67	22.59		
3	QPSK	8	0	21.61	21.70	21.66	23	1
3	QPSK	8	4	21.61	21.71	21.68		
3	QPSK	8	7	21.59	21.71	21.64		
3	QPSK	15	0	21.57	21.73	21.65	23	1
3	16QAM	1	0	21.91	22.04	21.98		
3	16QAM	1	8	21.92	22.02	21.96		
3	16QAM	1	14	21.89	21.97	21.94	22	2
3	16QAM	8	0	20.76	20.88	20.79		
3	16QAM	8	4	20.77	20.85	20.80		
3	16QAM	8	7	20.72	20.85	20.79	22	2
3	16QAM	15	0	20.68	20.81	20.76		
3	64QAM	1	0	20.86	20.95	20.92	22	2
3	64QAM	1	8	20.82	20.94	20.91		
3	64QAM	1	14	20.83	20.96	20.90		
3	64QAM	8	0	19.76	19.84	19.79	21	3
3	64QAM	8	4	19.75	19.87	19.82		
3	64QAM	8	7	19.70	19.83	19.80		
3	64QAM	15	0	19.70	19.81	19.76	27025	MPR (dB)
Channel				26705	26865	27025		
Frequency (MHz)				815.5	831.5	847.5	Tune-up limit (dBm)	MPR (dB)



Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	22.51	22.63	22.55	24	0
1.4	QPSK	1	3	22.59	22.67	22.61		
1.4	QPSK	1	5	22.49	22.62	22.53		
1.4	QPSK	3	0	22.58	22.64	22.60		
1.4	QPSK	3	1	22.59	22.69	22.62		
1.4	QPSK	3	3	22.56	22.64	22.58		
1.4	QPSK	6	0	21.55	21.65	21.58	23	1
1.4	16QAM	1	0	21.86	21.96	21.87	23	1
1.4	16QAM	1	3	21.92	22.04	21.97		
1.4	16QAM	1	5	21.83	21.97	21.87		
1.4	16QAM	3	0	21.67	21.76	21.68		
1.4	16QAM	3	1	21.69	21.78	21.74		
1.4	16QAM	3	3	21.65	21.75	21.67		
1.4	16QAM	6	0	20.71	20.82	20.75	22	2
1.4	64QAM	1	0	20.79	20.89	20.83	22	2
1.4	64QAM	1	3	20.85	20.96	20.89		
1.4	64QAM	1	5	20.77	20.87	20.80		
1.4	64QAM	3	0	20.80	20.86	20.83		
1.4	64QAM	3	1	20.82	20.92	20.86		
1.4	64QAM	3	3	20.78	20.87	20.81		
1.4	64QAM	6	0	19.65	19.75	19.69	21	3



<Near to Body Power Mode>

<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	16.03	16.16	15.97	17	0
20	QPSK	1	49	15.72	15.73	15.73		
20	QPSK	1	99	15.90	15.80	15.81		
20	QPSK	50	0	15.69	15.70	15.57	17	0
20	QPSK	50	24	15.54	15.56	15.61		
20	QPSK	50	50	15.49	15.46	15.55		
20	QPSK	100	0	15.52	15.62	15.58	17	0
20	16QAM	1	0	16.06	15.97	16.07		
20	16QAM	1	49	15.85	15.88	15.84		
20	16QAM	1	99	15.91	15.86	15.83	17	0
20	16QAM	50	0	15.75	15.72	15.71		
20	16QAM	50	24	15.63	15.67	15.70		
20	16QAM	50	50	15.60	15.57	15.61	17	0
20	16QAM	100	0	15.63	15.63	15.68		
20	64QAM	1	0	15.97	15.93	15.94		
20	64QAM	1	49	15.81	15.76	15.75	17	0
20	64QAM	1	99	15.76	15.72	15.79		
20	64QAM	50	0	15.76	15.71	15.70		
20	64QAM	50	24	15.64	15.64	15.70	17	0
20	64QAM	50	50	15.60	15.58	15.64		
20	64QAM	100	0	15.63	15.65	15.71		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	15.74	15.59	15.71	17	0
15	QPSK	1	37	15.55	15.43	15.49		
15	QPSK	1	74	15.43	15.52	15.55		
15	QPSK	36	0	15.65	15.56	15.67	17	0
15	QPSK	36	20	15.49	15.53	15.58		
15	QPSK	36	39	15.48	15.51	15.53		
15	QPSK	75	0	15.50	15.55	15.62	17	0
15	16QAM	1	0	16.06	15.99	15.79		
15	16QAM	1	37	15.84	15.82	15.77		
15	16QAM	1	74	15.78	15.88	15.76	17	0
15	16QAM	36	0	15.75	15.69	15.66		
15	16QAM	36	20	15.63	15.66	15.62		
15	16QAM	36	39	15.56	15.57	15.54	17	0
15	16QAM	75	0	15.63	15.66	15.63		
15	64QAM	1	0	15.96	15.92	15.92		
15	64QAM	1	37	15.84	15.74	15.58	17	0
15	64QAM	1	74	15.75	15.80	15.81		
15	64QAM	36	0	15.77	15.71	15.78		
15	64QAM	36	20	15.65	15.66	15.60	17	0
15	64QAM	36	39	15.61	15.59	15.58		
15	64QAM	75	0	15.62	15.62	15.72		



Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	15.65	15.52	15.62	17	0
10	QPSK	1	25	15.54	15.43	15.60		
10	QPSK	1	49	15.54	15.40	15.54		
10	QPSK	25	0	15.66	15.57	15.62	17	0
10	QPSK	25	12	15.64	15.53	15.62		
10	QPSK	25	25	15.57	15.48	15.63		
10	QPSK	50	0	15.63	15.53	15.63	17	0
10	16QAM	1	0	15.99	15.69	15.86		
10	16QAM	1	25	15.86	15.62	15.85		
10	16QAM	1	49	15.80	15.61	15.73	17	0
10	16QAM	25	0	15.70	15.31	15.66		
10	16QAM	25	12	15.71	15.65	15.59		
10	16QAM	25	25	15.68	15.55	15.66	17	0
10	16QAM	50	0	15.69	15.55	15.60		
10	64QAM	1	0	15.88	15.72	15.78		
10	64QAM	1	25	15.83	15.67	15.61	17	0
10	64QAM	1	49	15.80	15.68	15.54		
10	64QAM	25	0	15.75	15.69	15.33		
10	64QAM	25	12	15.70	15.71	15.51	17	0
10	64QAM	25	25	15.66	15.64	15.55		
10	64QAM	50	0	15.69	15.71	15.44		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	15.59	15.50	15.63	17	0
5	QPSK	1	12	15.52	15.43	15.59		
5	QPSK	1	24	15.53	15.45	15.57		
5	QPSK	12	0	15.61	15.49	15.65	17	0
5	QPSK	12	7	15.60	15.52	15.63		
5	QPSK	12	13	15.58	15.47	15.59		
5	QPSK	25	0	15.61	15.50	15.68	17	0
5	16QAM	1	0	15.76	15.72	15.88		
5	16QAM	1	12	15.73	15.40	15.80		
5	16QAM	1	24	15.74	15.52	15.76	17	0
5	16QAM	12	0	15.66	15.61	15.69		
5	16QAM	12	7	15.70	15.64	15.65		
5	16QAM	12	13	15.67	15.70	15.59	17	0
5	16QAM	25	0	15.32	15.29	15.67		
5	64QAM	1	0	15.62	15.85	15.79		
5	64QAM	1	12	15.67	15.76	15.69	17	0
5	64QAM	1	24	15.71	15.68	15.62		
5	64QAM	12	0	15.72	15.71	15.67		
5	64QAM	12	7	15.72	15.73	15.66	17	0
5	64QAM	12	13	15.68	15.68	15.58		
5	64QAM	25	0	15.63	15.65	15.63		



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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	15.56	15.45	15.62	17	0
3	QPSK	1	8	15.54	15.44	15.58		
3	QPSK	1	14	15.49	15.43	15.55		
3	QPSK	8	0	15.56	15.46	15.63	17	0
3	QPSK	8	4	15.61	15.48	15.65		
3	QPSK	8	7	15.55	15.48	15.61		
3	QPSK	15	0	15.60	15.50	15.64		
3	16QAM	1	0	15.59	15.64	15.71	17	0
3	16QAM	1	8	15.53	15.43	15.77		
3	16QAM	1	14	15.58	15.38	15.73		
3	16QAM	8	0	15.41	15.37	15.65	17	0
3	16QAM	8	4	15.48	15.31	15.66		
3	16QAM	8	7	15.51	15.25	15.61		
3	16QAM	15	0	15.22	15.28	15.67		
3	64QAM	1	0	15.38	15.44	15.70	17	0
3	64QAM	1	8	15.28	15.40	15.68		
3	64QAM	1	14	15.26	15.47	15.65		
3	64QAM	8	0	15.22	15.33	15.62	17	0
3	64QAM	8	4	15.29	15.35	15.62		
3	64QAM	8	7	15.23	15.39	15.58		
3	64QAM	15	0	15.24	15.34	15.66		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	15.47	15.37	15.50	17	0
1.4	QPSK	1	3	15.54	15.42	15.60		
1.4	QPSK	1	5	15.47	15.34	15.51		
1.4	QPSK	3	0	15.50	15.40	15.55		
1.4	QPSK	3	1	15.56	15.46	15.60		
1.4	QPSK	3	3	15.50	15.40	15.54		
1.4	QPSK	6	0	15.51	15.41	15.57	17	0
1.4	16QAM	1	0	15.80	15.41	15.69	17	0
1.4	16QAM	1	3	15.87	15.43	15.79		
1.4	16QAM	1	5	15.79	15.44	15.69		
1.4	16QAM	3	0	15.62	15.20	15.55		
1.4	16QAM	3	1	15.65	15.23	15.61		
1.4	16QAM	3	3	15.59	15.15	15.53		
1.4	16QAM	6	0	15.68	15.23	15.63	17	0
1.4	64QAM	1	0	15.72	15.70	15.60	17	0
1.4	64QAM	1	3	15.76	15.70	15.66		
1.4	64QAM	1	5	15.69	15.62	15.58		
1.4	64QAM	3	0	15.70	15.66	15.60		
1.4	64QAM	3	1	15.76	15.69	15.65		
1.4	64QAM	3	3	15.70	15.58	15.59		
1.4	64QAM	6	0	15.60	15.57	15.55	17	0



<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600	23.5	0
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	21.72	21.77	21.81	23.5	0
10	QPSK	1	25	21.97	21.90	21.73		
10	QPSK	1	49	21.81	21.71	21.65		
10	QPSK	25	0	21.81	21.84	21.81	23.5	0
10	QPSK	25	12	21.81	21.84	21.82		
10	QPSK	25	25	21.87	21.82	21.74		
10	QPSK	50	0	21.79	21.84	21.78	23.5	0
10	16QAM	1	0	21.87	21.87	21.91		
10	16QAM	1	25	21.91	21.96	21.87		
10	16QAM	1	49	21.92	21.89	21.80	22.5	1
10	16QAM	25	0	20.96	20.97	20.89		
10	16QAM	25	12	20.90	20.94	20.90		
10	16QAM	25	25	20.94	20.88	20.83	22.5	1
10	16QAM	50	0	20.90	20.91	20.88		
10	64QAM	1	0	21.01	21.07	21.05		
10	64QAM	1	25	21.06	21.06	20.99	22.5	1
10	64QAM	1	49	21.03	20.99	20.91		
10	64QAM	25	0	19.94	19.97	19.92		
10	64QAM	25	12	19.94	19.98	19.89	21.5	2
10	64QAM	25	25	19.98	19.89	19.86		
10	64QAM	50	0	19.94	19.94	19.89		
Channel				20425	20525	20625	23.5	0
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	21.71	21.81	21.73	23.5	0
5	QPSK	1	12	21.69	21.79	21.68		
5	QPSK	1	24	21.77	21.78	21.66		
5	QPSK	12	0	21.77	21.84	21.73	23.5	0
5	QPSK	12	7	21.86	21.84	21.74		
5	QPSK	12	13	21.81	21.83	21.72		
5	QPSK	25	0	21.81	21.82	21.73	23.5	0
5	16QAM	1	0	21.87	21.94	21.86		
5	16QAM	1	12	21.86	21.96	21.85		
5	16QAM	1	24	21.94	21.94	21.80	22.5	1
5	16QAM	12	0	20.83	20.95	20.85		
5	16QAM	12	7	20.96	20.94	20.83		
5	16QAM	12	13	20.93	20.93	20.82	22.5	1
5	16QAM	25	0	20.92	20.93	20.83		
5	64QAM	1	0	21.01	21.08	20.98		
5	64QAM	1	12	20.95	21.06	20.97	22.5	1
5	64QAM	1	24	21.04	21.02	20.92		
5	64QAM	12	0	19.87	20.01	19.91		
5	64QAM	12	7	19.99	20.02	19.91	21.5	2
5	64QAM	12	13	19.95	19.97	19.85		
5	64QAM	25	0	19.94	19.91	19.82		



Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	21.72	21.78	21.71	23.5	0
3	QPSK	1	8	21.68	21.79	21.67		
3	QPSK	1	14	21.67	21.77	21.67		
3	QPSK	8	0	21.75	21.84	21.72	23.5	0
3	QPSK	8	4	21.74	21.85	21.75		
3	QPSK	8	7	21.72	21.80	21.72		
3	QPSK	15	0	21.73	21.83	21.73		
3	16QAM	1	0	21.84	21.92	21.85	23.5	0
3	16QAM	1	8	21.85	21.95	21.83		
3	16QAM	1	14	21.82	21.95	21.80		
3	16QAM	8	0	20.86	20.94	20.85	22.5	1
3	16QAM	8	4	20.89	20.97	20.87		
3	16QAM	8	7	20.89	20.97	20.85		
3	16QAM	15	0	20.84	20.93	20.81		
3	64QAM	1	0	20.99	21.06	20.95	22.5	1
3	64QAM	1	8	20.95	21.05	20.94		
3	64QAM	1	14	20.97	21.05	20.94		
3	64QAM	8	0	19.89	19.96	19.87	21.5	2
3	64QAM	8	4	19.89	19.97	19.87		
3	64QAM	8	7	19.88	19.95	19.86		
3	64QAM	15	0	19.83	19.93	19.83		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	21.65	21.74	21.63	23.5	0
1.4	QPSK	1	3	21.73	21.79	21.68		
1.4	QPSK	1	5	21.63	21.73	21.60		
1.4	QPSK	3	0	21.69	21.75	21.65		
1.4	QPSK	3	1	21.73	21.78	21.67		
1.4	QPSK	3	3	21.67	21.77	21.64		
1.4	QPSK	6	0	21.67	21.75	21.65	23.5	0
1.4	16QAM	1	0	21.90	21.85	21.90	23.5	0
1.4	16QAM	1	3	21.86	21.95	21.82		
1.4	16QAM	1	5	21.80	21.85	21.91		
1.4	16QAM	3	0	21.79	21.86	21.74		
1.4	16QAM	3	1	21.84	21.90	21.77		
1.4	16QAM	3	3	21.80	21.84	21.73		
1.4	16QAM	6	0	20.83	20.92	20.81	22.5	1
1.4	64QAM	1	0	20.93	21.01	20.86	22.5	1
1.4	64QAM	1	3	21.01	21.09	20.95		
1.4	64QAM	1	5	20.89	20.96	20.87		
1.4	64QAM	3	0	20.90	20.99	20.87		
1.4	64QAM	3	1	20.97	21.03	20.90		
1.4	64QAM	3	3	20.90	20.98	20.85		
1.4	64QAM	6	0	19.77	19.84	19.73	21.5	2



<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	17.16	17.24	17.19	18	0
20	QPSK	1	49	17.15	17.17	17.14		
20	QPSK	1	99	17.14	17.20	17.16		
20	QPSK	50	0	17.33	17.37	17.33	18	0
20	QPSK	50	24	17.20	17.33	17.29		
20	QPSK	50	50	17.26	17.22	17.29		
20	QPSK	100	0	17.29	17.32	17.31	18	0
20	16QAM	1	0	16.96	16.98	16.91		
20	16QAM	1	49	17.11	17.10	17.14		
20	16QAM	1	99	17.12	17.14	17.20	18	0
20	16QAM	50	0	16.80	16.79	16.91		
20	16QAM	50	24	16.92	16.91	16.97		
20	16QAM	50	50	16.88	16.98	17.06	18	0
20	16QAM	100	0	16.88	16.89	16.90		
20	64QAM	1	0	16.88	16.84	16.88	18	0
20	64QAM	1	49	17.04	17.03	17.07		
20	64QAM	1	99	16.97	17.02	17.16		
20	64QAM	50	0	16.82	16.80	16.93	18	0
20	64QAM	50	24	16.93	16.94	17.01		
20	64QAM	50	50	16.90	17.02	17.10		
20	64QAM	100	0	16.88	16.92	16.95		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	17.10	17.11	17.07	18	0
15	QPSK	1	37	17.17	17.19	17.04		
15	QPSK	1	74	17.08	17.12	17.14		
15	QPSK	36	0	17.05	17.10	17.14	18	0
15	QPSK	36	20	17.18	17.18	17.19		
15	QPSK	36	39	17.12	17.20	17.13		
15	QPSK	75	0	17.14	17.15	17.22	18	0
15	16QAM	1	0	17.06	17.04	16.98		
15	16QAM	1	37	17.10	17.07	17.09		
15	16QAM	1	74	17.20	17.13	17.18	18	0
15	16QAM	36	0	16.82	16.84	16.88		
15	16QAM	36	20	16.91	16.95	17.04		
15	16QAM	36	39	16.93	16.98	16.99	18	0
15	16QAM	75	0	16.88	16.88	16.96		
15	64QAM	1	0	16.97	16.96	16.92		
15	64QAM	1	37	17.04	17.08	17.05	18	0
15	64QAM	1	74	17.09	17.05	17.14		
15	64QAM	36	0	16.89	16.88	16.93	18	0
15	64QAM	36	20	16.98	17.00	17.08		
15	64QAM	36	39	16.97	17.01	17.03		
15	64QAM	75	0	16.91	16.92	16.99		



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Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	17.15	17.11	17.18	18	0
10	QPSK	1	25	17.21	17.21	17.24		
10	QPSK	1	49	17.23	17.16	17.22		
10	QPSK	25	0	17.16	17.18	17.19	18	0
10	QPSK	25	12	17.14	17.20	17.16		
10	QPSK	25	25	17.18	17.18	17.15		
10	QPSK	50	0	17.10	17.15	17.16	18	0
10	16QAM	1	0	17.05	17.02	17.07		
10	16QAM	1	25	17.20	17.12	17.14		
10	16QAM	1	49	17.15	17.10	17.19	18	0
10	16QAM	25	0	16.94	16.87	16.97		
10	16QAM	25	12	16.90	16.98	16.99		
10	16QAM	25	25	16.93	16.97	16.99	18	0
10	16QAM	50	0	16.88	16.92	17.04		
10	64QAM	1	0	17.01	16.94	17.08		
10	64QAM	1	25	17.14	17.09	17.09	18	0
10	64QAM	1	49	17.10	17.01	17.16		
10	64QAM	25	0	16.95	16.90	17.04		
10	64QAM	25	12	16.94	17.00	17.01	18	0
10	64QAM	25	25	16.97	16.99	17.01		
10	64QAM	50	0	16.93	16.98	17.10		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	17.13	17.06	17.09	18	0
5	QPSK	1	12	17.17	17.13	17.19		
5	QPSK	1	24	17.18	17.16	17.22		
5	QPSK	12	0	17.18	17.13	17.17	18	0
5	QPSK	12	7	17.14	17.22	17.22		
5	QPSK	12	13	17.16	17.18	17.15		
5	QPSK	25	0	17.19	17.18	17.19	18	0
5	16QAM	1	0	17.06	17.00	17.04		
5	16QAM	1	12	17.09	17.06	17.09		
5	16QAM	1	24	17.09	17.05	17.14	18	0
5	16QAM	12	0	16.87	16.84	16.87		
5	16QAM	12	7	16.95	16.91	16.95		
5	16QAM	12	13	16.95	16.92	16.96	18	0
5	16QAM	25	0	16.92	16.86	16.91		
5	64QAM	1	0	17.00	16.93	16.99		
5	64QAM	1	12	17.03	17.01	17.05	18	0
5	64QAM	1	24	17.06	17.02	17.07		
5	64QAM	12	0	16.92	16.89	16.94		
5	64QAM	12	7	17.00	16.96	16.99	18	0
5	64QAM	12	13	17.02	16.99	17.02		
5	64QAM	25	0	16.93	16.89	16.92		



<LTE Band 26>

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				26765	26865	26965	23.5	0
Frequency (MHz)				821.5	831.5	841.5		
15	QPSK	1	0	21.59	21.70	21.79		
15	QPSK	1	37	21.72	21.90	21.97	23.5	0
15	QPSK	1	74	21.70	21.69	21.65		
15	QPSK	36	0	21.69	21.82	21.79		
15	QPSK	36	20	21.79	21.81	21.75	23.5	0
15	QPSK	36	39	21.80	21.78	21.77		
15	QPSK	75	0	21.74	21.79	21.75		
15	16QAM	1	0	21.87	21.82	21.94	23.5	0
15	16QAM	1	37	21.83	21.95	21.87		
15	16QAM	1	74	21.82	21.86	21.86		
15	16QAM	36	0	20.78	20.95	20.88	22.5	1
15	16QAM	36	20	20.88	20.96	20.89		
15	16QAM	36	39	20.88	20.89	20.86		
15	16QAM	75	0	20.85	20.94	20.84	22.5	1
15	64QAM	1	0	20.88	20.98	21.06		
15	64QAM	1	37	21.00	21.08	21.14		
15	64QAM	1	74	20.94	20.97	20.93	21.5	2
15	64QAM	36	0	19.80	20.01	19.91		
15	64QAM	36	20	19.92	19.98	19.88		
15	64QAM	36	39	19.93	19.91	19.90	21.5	2
15	64QAM	75	0	19.83	19.91	19.85		
Channel				26740	26865	26990	23.5	0
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	21.58	21.71	21.81		
10	QPSK	1	25	21.63	21.77	21.76	23.5	0
10	QPSK	1	49	21.65	21.70	21.68		
10	QPSK	25	0	21.71	21.86	21.85		
10	QPSK	25	12	21.80	21.84	21.82	23.5	0
10	QPSK	25	25	21.76	21.76	21.77		
10	QPSK	50	0	21.78	21.84	21.81		
10	16QAM	1	0	21.96	21.87	21.87	23.5	0
10	16QAM	1	25	21.87	21.92	21.93		
10	16QAM	1	49	21.81	21.87	21.82		
10	16QAM	25	0	20.79	20.96	20.94	22.5	1
10	16QAM	25	12	20.87	20.92	20.93		
10	16QAM	25	25	20.85	20.85	20.85		
10	16QAM	50	0	20.86	20.93	20.91	22.5	1
10	64QAM	1	0	20.89	21.00	21.11		
10	64QAM	1	25	20.89	21.04	21.05		
10	64QAM	1	49	20.95	20.97	20.97	21.5	2
10	64QAM	25	0	19.80	19.92	19.92		
10	64QAM	25	12	19.90	19.96	19.92		
10	64QAM	25	25	19.81	19.85	19.85	21.5	2
10	64QAM	50	0	19.87	19.88	19.92		



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Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	21.57	21.82	21.76	23.5	0
5	QPSK	1	12	21.66	21.77	21.72		
5	QPSK	1	24	21.61	21.73	21.69		
5	QPSK	12	0	21.71	21.81	21.76	23.5	0
5	QPSK	12	7	21.70	21.82	21.78		
5	QPSK	12	13	21.68	21.78	21.73		
5	QPSK	25	0	21.69	21.77	21.75		
5	16QAM	1	0	21.96	21.95	21.94	23.5	0
5	16QAM	1	12	21.81	21.94	21.89		
5	16QAM	1	24	21.88	21.90	21.83		
5	16QAM	12	0	20.81	20.94	20.87	22.5	1
5	16QAM	12	7	20.80	20.93	20.88		
5	16QAM	12	13	20.77	20.88	20.81		
5	16QAM	25	0	20.78	20.91	20.83		
5	64QAM	1	0	20.89	21.07	21.03	22.5	1
5	64QAM	1	12	20.92	21.03	21.02		
5	64QAM	1	24	20.89	21.01	20.97		
5	64QAM	12	0	19.86	19.98	19.92	21.5	2
5	64QAM	12	7	19.86	19.95	19.90		
5	64QAM	12	13	19.81	19.91	19.86		
5	64QAM	25	0	19.78	19.89	19.87		
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	21.57	21.77	21.74	23.5	0
3	QPSK	1	8	21.55	21.75	21.70		
3	QPSK	1	14	21.65	21.74	21.70		
3	QPSK	8	0	21.61	21.80	21.75	23.5	0
3	QPSK	8	4	21.71	21.83	21.77		
3	QPSK	8	7	21.69	21.78	21.75		
3	QPSK	15	0	21.69	21.81	21.74		
3	16QAM	1	0	21.93	21.95	21.90	23.5	0
3	16QAM	1	8	21.89	21.92	21.87		
3	16QAM	1	14	21.80	21.89	21.82		
3	16QAM	8	0	20.74	20.93	20.87	22.5	1
3	16QAM	8	4	20.83	20.97	20.91		
3	16QAM	8	7	20.82	20.91	20.87		
3	16QAM	15	0	20.80	20.91	20.85		
3	64QAM	1	0	20.88	21.05	21.02	22.5	1
3	64QAM	1	8	20.82	21.03	20.99		
3	64QAM	1	14	20.95	21.02	20.96		
3	64QAM	8	0	19.74	19.95	19.89	21.5	2
3	64QAM	8	4	19.85	19.95	19.92		
3	64QAM	8	7	19.83	19.93	19.87		
3	64QAM	15	0	19.80	19.90	19.85		



Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	21.51	21.72	21.66	23.5	0
1.4	QPSK	1	3	21.57	21.77	21.70		
1.4	QPSK	1	5	21.58	21.66	21.63		
1.4	QPSK	3	0	21.54	21.75	21.69		
1.4	QPSK	3	1	21.58	21.76	21.70		
1.4	QPSK	3	3	21.53	21.75	21.67		
1.4	QPSK	6	0	21.54	21.74	21.68	23.5	0
1.4	16QAM	1	0	21.86	21.86	21.88	23.5	0
1.4	16QAM	1	3	21.92	21.93	21.86		
1.4	16QAM	1	5	21.84	21.85	21.87		
1.4	16QAM	3	0	21.67	21.85	21.79		
1.4	16QAM	3	1	21.69	21.88	21.82		
1.4	16QAM	3	3	21.63	21.83	21.80		
1.4	16QAM	6	0	20.69	20.88	20.82	22.5	1
1.4	64QAM	1	0	20.79	20.99	20.95	22.5	1
1.4	64QAM	1	3	20.85	21.05	20.99		
1.4	64QAM	1	5	20.78	20.98	20.90		
1.4	64QAM	3	0	20.80	20.97	20.90		
1.4	64QAM	3	1	20.81	21.03	20.98		
1.4	64QAM	3	3	20.76	20.96	20.90		
1.4	64QAM	6	0	19.64	19.83	19.78	21.5	2



<Hotspot Power Mode>

<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	16.03	16.16	15.97	16.5	0
20	QPSK	1	49	15.72	15.73	15.73		
20	QPSK	1	99	15.90	15.80	15.81		
20	QPSK	50	0	15.69	15.70	15.57	16.5	0
20	QPSK	50	24	15.54	15.56	15.61		
20	QPSK	50	50	15.49	15.46	15.55		
20	QPSK	100	0	15.52	15.62	15.58	16.5	0
20	16QAM	1	0	16.06	15.97	16.07		
20	16QAM	1	49	15.85	15.88	15.84		
20	16QAM	1	99	15.91	15.86	15.83	16.5	0
20	16QAM	50	0	15.75	15.72	15.71		
20	16QAM	50	24	15.63	15.67	15.70		
20	16QAM	50	50	15.60	15.57	15.61	16.5	0
20	16QAM	100	0	15.63	15.63	15.68		
20	64QAM	1	0	15.97	15.93	15.94		
20	64QAM	1	49	15.81	15.76	15.75	16.5	0
20	64QAM	1	99	15.76	15.72	15.79		
20	64QAM	50	0	15.76	15.71	15.70		
20	64QAM	50	24	15.64	15.64	15.70	16.5	0
20	64QAM	50	50	15.60	15.58	15.64		
20	64QAM	100	0	15.63	15.65	15.71		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	15.74	15.59	15.71	16.5	0
15	QPSK	1	37	15.55	15.43	15.49		
15	QPSK	1	74	15.43	15.52	15.55		
15	QPSK	36	0	15.65	15.56	15.67	16.5	0
15	QPSK	36	20	15.49	15.53	15.58		
15	QPSK	36	39	15.48	15.51	15.53		
15	QPSK	75	0	15.50	15.55	15.62	16.5	0
15	16QAM	1	0	16.06	15.99	15.79		
15	16QAM	1	37	15.84	15.82	15.77		
15	16QAM	1	74	15.78	15.88	15.76	16.5	0
15	16QAM	36	0	15.75	15.69	15.66		
15	16QAM	36	20	15.63	15.66	15.62		
15	16QAM	36	39	15.56	15.57	15.54	16.5	0
15	16QAM	75	0	15.63	15.66	15.63		
15	64QAM	1	0	15.96	15.92	15.92		
15	64QAM	1	37	15.84	15.74	15.58	16.5	0
15	64QAM	1	74	15.75	15.80	15.81		
15	64QAM	36	0	15.77	15.71	15.78		
15	64QAM	36	20	15.65	15.66	15.60	16.5	0
15	64QAM	36	39	15.61	15.59	15.58		
15	64QAM	75	0	15.62	15.62	15.72		

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	15.65	15.52	15.62	16.5	0
10	QPSK	1	25	15.54	15.43	15.60		
10	QPSK	1	49	15.54	15.40	15.54		
10	QPSK	25	0	15.66	15.57	15.62	16.5	0
10	QPSK	25	12	15.64	15.53	15.62		
10	QPSK	25	25	15.57	15.48	15.63		
10	QPSK	50	0	15.63	15.53	15.63		
10	16QAM	1	0	15.99	15.69	15.86	16.5	0
10	16QAM	1	25	15.86	15.62	15.85		
10	16QAM	1	49	15.80	15.61	15.73		
10	16QAM	25	0	15.70	15.31	15.66	16.5	0
10	16QAM	25	12	15.71	15.65	15.59		
10	16QAM	25	25	15.68	15.55	15.66		
10	16QAM	50	0	15.69	15.55	15.60		
10	64QAM	1	0	15.88	15.72	15.78	16.5	0
10	64QAM	1	25	15.83	15.67	15.61		
10	64QAM	1	49	15.80	15.68	15.54		
10	64QAM	25	0	15.75	15.69	15.33	16.5	0
10	64QAM	25	12	15.70	15.71	15.51		
10	64QAM	25	25	15.66	15.64	15.55		
10	64QAM	50	0	15.69	15.71	15.44		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	15.59	15.50	15.63	16.5	0
5	QPSK	1	12	15.52	15.43	15.59		
5	QPSK	1	24	15.53	15.45	15.57		
5	QPSK	12	0	15.61	15.49	15.65	16.5	0
5	QPSK	12	7	15.60	15.52	15.63		
5	QPSK	12	13	15.58	15.47	15.59		
5	QPSK	25	0	15.61	15.50	15.68		
5	16QAM	1	0	15.76	15.72	15.88	16.5	0
5	16QAM	1	12	15.73	15.40	15.80		
5	16QAM	1	24	15.74	15.52	15.76		
5	16QAM	12	0	15.66	15.61	15.69	16.5	0
5	16QAM	12	7	15.70	15.64	15.65		
5	16QAM	12	13	15.67	15.70	15.59		
5	16QAM	25	0	15.32	15.29	15.67		
5	64QAM	1	0	15.62	15.85	15.79	16.5	0
5	64QAM	1	12	15.67	15.76	15.69		
5	64QAM	1	24	15.71	15.68	15.62		
5	64QAM	12	0	15.72	15.71	15.67	16.5	0
5	64QAM	12	7	15.72	15.73	15.66		
5	64QAM	12	13	15.68	15.68	15.58		
5	64QAM	25	0	15.63	15.65	15.63		



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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	15.56	15.45	15.62	16.5	0
3	QPSK	1	8	15.54	15.44	15.58		
3	QPSK	1	14	15.49	15.43	15.55		
3	QPSK	8	0	15.56	15.46	15.63	16.5	0
3	QPSK	8	4	15.61	15.48	15.65		
3	QPSK	8	7	15.55	15.48	15.61		
3	QPSK	15	0	15.60	15.50	15.64		
3	16QAM	1	0	15.59	15.64	15.71	16.5	0
3	16QAM	1	8	15.53	15.43	15.77		
3	16QAM	1	14	15.58	15.38	15.73		
3	16QAM	8	0	15.41	15.37	15.65	16.5	0
3	16QAM	8	4	15.48	15.31	15.66		
3	16QAM	8	7	15.51	15.25	15.61		
3	16QAM	15	0	15.22	15.28	15.67		
3	64QAM	1	0	15.38	15.44	15.70	16.5	0
3	64QAM	1	8	15.28	15.40	15.68		
3	64QAM	1	14	15.26	15.47	15.65		
3	64QAM	8	0	15.22	15.33	15.62	16.5	0
3	64QAM	8	4	15.29	15.35	15.62		
3	64QAM	8	7	15.23	15.39	15.58		
3	64QAM	15	0	15.24	15.34	15.66		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	15.47	15.37	15.50	16.5	0
1.4	QPSK	1	3	15.54	15.42	15.60		
1.4	QPSK	1	5	15.47	15.34	15.51		
1.4	QPSK	3	0	15.50	15.40	15.55		
1.4	QPSK	3	1	15.56	15.46	15.60		
1.4	QPSK	3	3	15.50	15.40	15.54		
1.4	QPSK	6	0	15.51	15.41	15.57	16.5	0
1.4	16QAM	1	0	15.80	15.41	15.69	16.5	0
1.4	16QAM	1	3	15.87	15.43	15.79		
1.4	16QAM	1	5	15.79	15.44	15.69		
1.4	16QAM	3	0	15.62	15.20	15.55		
1.4	16QAM	3	1	15.65	15.23	15.61		
1.4	16QAM	3	3	15.59	15.15	15.53		
1.4	16QAM	6	0	15.68	15.23	15.63	16.5	0
1.4	64QAM	1	0	15.72	15.70	15.60	16.5	0
1.4	64QAM	1	3	15.76	15.70	15.66		
1.4	64QAM	1	5	15.69	15.62	15.58		
1.4	64QAM	3	0	15.70	15.66	15.60		
1.4	64QAM	3	1	15.76	15.69	15.65		
1.4	64QAM	3	3	15.70	15.58	15.59		
1.4	64QAM	6	0	15.60	15.57	15.55	16.5	0



<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	21.72	21.77	21.81	23.5	0
10	QPSK	1	25	21.97	21.90	21.73		
10	QPSK	1	49	21.81	21.71	21.65		
10	QPSK	25	0	21.81	21.84	21.81	23.5	0
10	QPSK	25	12	21.81	21.84	21.82		
10	QPSK	25	25	21.87	21.82	21.74		
10	QPSK	50	0	21.79	21.84	21.78		
10	16QAM	1	0	21.87	21.87	21.91	23.5	0
10	16QAM	1	25	21.91	21.96	21.87		
10	16QAM	1	49	21.92	21.89	21.80		
10	16QAM	25	0	20.96	20.97	20.89	22.5	1
10	16QAM	25	12	20.90	20.94	20.90		
10	16QAM	25	25	20.94	20.88	20.83		
10	16QAM	50	0	20.90	20.91	20.88		
10	64QAM	1	0	21.01	21.07	21.05	22.5	1
10	64QAM	1	25	21.06	21.06	20.99		
10	64QAM	1	49	21.03	20.99	20.91		
10	64QAM	25	0	19.94	19.97	19.92	21.5	2
10	64QAM	25	12	19.94	19.98	19.89		
10	64QAM	25	25	19.98	19.89	19.86		
10	64QAM	50	0	19.94	19.94	19.89		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	21.71	21.81	21.73	23.5	0
5	QPSK	1	12	21.69	21.79	21.68		
5	QPSK	1	24	21.77	21.78	21.66		
5	QPSK	12	0	21.77	21.84	21.73	23.5	0
5	QPSK	12	7	21.86	21.84	21.74		
5	QPSK	12	13	21.81	21.83	21.72		
5	QPSK	25	0	21.81	21.82	21.73		
5	16QAM	1	0	21.87	21.94	21.86	23.5	0
5	16QAM	1	12	21.86	21.96	21.85		
5	16QAM	1	24	21.94	21.94	21.80		
5	16QAM	12	0	20.83	20.95	20.85	22.5	1
5	16QAM	12	7	20.96	20.94	20.83		
5	16QAM	12	13	20.93	20.93	20.82		
5	16QAM	25	0	20.92	20.93	20.83		
5	64QAM	1	0	21.01	21.08	20.98	22.5	1
5	64QAM	1	12	20.95	21.06	20.97		
5	64QAM	1	24	21.04	21.02	20.92		
5	64QAM	12	0	19.87	20.01	19.91	21.5	2
5	64QAM	12	7	19.99	20.02	19.91		
5	64QAM	12	13	19.95	19.97	19.85		
5	64QAM	25	0	19.94	19.91	19.82		



Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	21.72	21.78	21.71	23.5	0
3	QPSK	1	8	21.68	21.79	21.67		
3	QPSK	1	14	21.67	21.77	21.67		
3	QPSK	8	0	21.75	21.84	21.72	23.5	0
3	QPSK	8	4	21.74	21.85	21.75		
3	QPSK	8	7	21.72	21.80	21.72		
3	QPSK	15	0	21.73	21.83	21.73		
3	16QAM	1	0	21.84	21.92	21.85	23.5	0
3	16QAM	1	8	21.85	21.95	21.83		
3	16QAM	1	14	21.82	21.95	21.80		
3	16QAM	8	0	20.86	20.94	20.85	22.5	1
3	16QAM	8	4	20.89	20.97	20.87		
3	16QAM	8	7	20.89	20.97	20.85		
3	16QAM	15	0	20.84	20.93	20.81		
3	64QAM	1	0	20.99	21.06	20.95	22.5	1
3	64QAM	1	8	20.95	21.05	20.94		
3	64QAM	1	14	20.97	21.05	20.94		
3	64QAM	8	0	19.89	19.96	19.87	21.5	2
3	64QAM	8	4	19.89	19.97	19.87		
3	64QAM	8	7	19.88	19.95	19.86		
3	64QAM	15	0	19.83	19.93	19.83		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	21.65	21.74	21.63	23.5	0
1.4	QPSK	1	3	21.73	21.79	21.68		
1.4	QPSK	1	5	21.63	21.73	21.60		
1.4	QPSK	3	0	21.69	21.75	21.65		
1.4	QPSK	3	1	21.73	21.78	21.67		
1.4	QPSK	3	3	21.67	21.77	21.64		
1.4	QPSK	6	0	21.67	21.75	21.65	23.5	0
1.4	16QAM	1	0	21.90	21.85	21.90	23.5	0
1.4	16QAM	1	3	21.86	21.95	21.82		
1.4	16QAM	1	5	21.80	21.85	21.91		
1.4	16QAM	3	0	21.79	21.86	21.74		
1.4	16QAM	3	1	21.84	21.90	21.77		
1.4	16QAM	3	3	21.80	21.84	21.73		
1.4	16QAM	6	0	20.83	20.92	20.81	22.5	1
1.4	64QAM	1	0	20.93	21.01	20.86	22.5	1
1.4	64QAM	1	3	21.01	21.09	20.95		
1.4	64QAM	1	5	20.89	20.96	20.87		
1.4	64QAM	3	0	20.90	20.99	20.87		
1.4	64QAM	3	1	20.97	21.03	20.90		
1.4	64QAM	3	3	20.90	20.98	20.85		
1.4	64QAM	6	0	19.77	19.84	19.73	21.5	2



<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	17.16	17.24	17.19	18	0
20	QPSK	1	49	17.15	17.17	17.14		
20	QPSK	1	99	17.14	17.20	17.16		
20	QPSK	50	0	17.33	17.37	17.33	18	0
20	QPSK	50	24	17.20	17.33	17.29		
20	QPSK	50	50	17.26	17.22	17.29		
20	QPSK	100	0	17.29	17.32	17.31	18	0
20	16QAM	1	0	16.96	16.98	16.91		
20	16QAM	1	49	17.11	17.10	17.14		
20	16QAM	1	99	17.12	17.14	17.20	18	0
20	16QAM	50	0	16.80	16.79	16.91		
20	16QAM	50	24	16.92	16.91	16.97		
20	16QAM	50	50	16.88	16.98	17.06	18	0
20	16QAM	100	0	16.88	16.89	16.90		
20	64QAM	1	0	16.88	16.84	16.88	18	0
20	64QAM	1	49	17.04	17.03	17.07		
20	64QAM	1	99	16.97	17.02	17.16		
20	64QAM	50	0	16.82	16.80	16.93	18	0
20	64QAM	50	24	16.93	16.94	17.01		
20	64QAM	50	50	16.90	17.02	17.10		
20	64QAM	100	0	16.88	16.92	16.95		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	17.10	17.11	17.07	18	0
15	QPSK	1	37	17.17	17.19	17.04		
15	QPSK	1	74	17.08	17.12	17.14		
15	QPSK	36	0	17.05	17.10	17.14	18	0
15	QPSK	36	20	17.18	17.18	17.19		
15	QPSK	36	39	17.12	17.20	17.13		
15	QPSK	75	0	17.14	17.15	17.22	18	0
15	16QAM	1	0	17.06	17.04	16.98		
15	16QAM	1	37	17.10	17.07	17.09		
15	16QAM	1	74	17.20	17.13	17.18	18	0
15	16QAM	36	0	16.82	16.84	16.88		
15	16QAM	36	20	16.91	16.95	17.04		
15	16QAM	36	39	16.93	16.98	16.99	18	0
15	16QAM	75	0	16.88	16.88	16.96		
15	64QAM	1	0	16.97	16.96	16.92		
15	64QAM	1	37	17.04	17.08	17.05	18	0
15	64QAM	1	74	17.09	17.05	17.14		
15	64QAM	36	0	16.89	16.88	16.93	18	0
15	64QAM	36	20	16.98	17.00	17.08		
15	64QAM	36	39	16.97	17.01	17.03		
15	64QAM	75	0	16.91	16.92	16.99		



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Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	17.15	17.11	17.18	18	0
10	QPSK	1	25	17.21	17.21	17.24		
10	QPSK	1	49	17.23	17.16	17.22		
10	QPSK	25	0	17.16	17.18	17.19	18	0
10	QPSK	25	12	17.14	17.20	17.16		
10	QPSK	25	25	17.18	17.18	17.15		
10	QPSK	50	0	17.10	17.15	17.16	18	0
10	16QAM	1	0	17.05	17.02	17.07		
10	16QAM	1	25	17.20	17.12	17.14		
10	16QAM	1	49	17.15	17.10	17.19	18	0
10	16QAM	25	0	16.94	16.87	16.97		
10	16QAM	25	12	16.90	16.98	16.99		
10	16QAM	25	25	16.93	16.97	16.99	18	0
10	16QAM	50	0	16.88	16.92	17.04		
10	64QAM	1	0	17.01	16.94	17.08		
10	64QAM	1	25	17.14	17.09	17.09	18	0
10	64QAM	1	49	17.10	17.01	17.16		
10	64QAM	25	0	16.95	16.90	17.04		
10	64QAM	25	12	16.94	17.00	17.01	18	0
10	64QAM	25	25	16.97	16.99	17.01		
10	64QAM	50	0	16.93	16.98	17.10		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	17.13	17.06	17.09	18	0
5	QPSK	1	12	17.17	17.13	17.19		
5	QPSK	1	24	17.18	17.16	17.22		
5	QPSK	12	0	17.18	17.13	17.17	18	0
5	QPSK	12	7	17.14	17.22	17.22		
5	QPSK	12	13	17.16	17.18	17.15		
5	QPSK	25	0	17.19	17.18	17.19	18	0
5	16QAM	1	0	17.06	17.00	17.04		
5	16QAM	1	12	17.09	17.06	17.09		
5	16QAM	1	24	17.09	17.05	17.14	18	0
5	16QAM	12	0	16.87	16.84	16.87		
5	16QAM	12	7	16.95	16.91	16.95		
5	16QAM	12	13	16.95	16.92	16.96	18	0
5	16QAM	25	0	16.92	16.86	16.91		
5	64QAM	1	0	17.00	16.93	16.99		
5	64QAM	1	12	17.03	17.01	17.05	18	0
5	64QAM	1	24	17.06	17.02	17.07		
5	64QAM	12	0	16.92	16.89	16.94		
5	64QAM	12	7	17.00	16.96	16.99	18	0
5	64QAM	12	13	17.02	16.99	17.02		
5	64QAM	25	0	16.93	16.89	16.92		



<LTE Band 26>

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				26765	26865	26965	23.5	0
Frequency (MHz)				821.5	831.5	841.5		
15	QPSK	1	0	21.59	21.70	21.79		
15	QPSK	1	37	21.72	21.90	21.97	23.5	0
15	QPSK	1	74	21.70	21.69	21.65		
15	QPSK	36	0	21.69	21.82	21.79		
15	QPSK	36	20	21.79	21.81	21.75	23.5	0
15	QPSK	36	39	21.80	21.78	21.77		
15	QPSK	75	0	21.74	21.79	21.75		
15	16QAM	1	0	21.87	21.82	21.94	23.5	0
15	16QAM	1	37	21.83	21.95	21.87		
15	16QAM	1	74	21.82	21.86	21.86		
15	16QAM	36	0	20.78	20.95	20.88	22.5	1
15	16QAM	36	20	20.88	20.96	20.89		
15	16QAM	36	39	20.88	20.89	20.86		
15	16QAM	75	0	20.85	20.94	20.84	22.5	1
15	64QAM	1	0	20.88	20.98	21.06		
15	64QAM	1	37	21.00	21.08	21.14		
15	64QAM	1	74	20.94	20.97	20.93	21.5	2
15	64QAM	36	0	19.80	20.01	19.91		
15	64QAM	36	20	19.92	19.98	19.88		
15	64QAM	36	39	19.93	19.91	19.90	21.5	2
15	64QAM	75	0	19.83	19.91	19.85		
Channel				26740	26865	26990	23.5	0
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	21.58	21.71	21.81		
10	QPSK	1	25	21.63	21.77	21.76	23.5	0
10	QPSK	1	49	21.65	21.70	21.68		
10	QPSK	25	0	21.71	21.86	21.85	23.5	0
10	QPSK	25	12	21.80	21.84	21.82		
10	QPSK	25	25	21.76	21.76	21.77		
10	QPSK	50	0	21.78	21.84	21.81	23.5	0
10	16QAM	1	0	21.96	21.87	21.87		
10	16QAM	1	25	21.87	21.92	21.93		
10	16QAM	1	49	21.81	21.87	21.82	22.5	1
10	16QAM	25	0	20.79	20.96	20.94		
10	16QAM	25	12	20.87	20.92	20.93		
10	16QAM	25	25	20.85	20.85	20.85	22.5	1
10	16QAM	50	0	20.86	20.93	20.91		
10	64QAM	1	0	20.89	21.00	21.11		
10	64QAM	1	25	20.89	21.04	21.05	22.5	1
10	64QAM	1	49	20.95	20.97	20.97		
10	64QAM	25	0	19.80	19.92	19.92	21.5	2
10	64QAM	25	12	19.90	19.96	19.92		
10	64QAM	25	25	19.81	19.85	19.85		
10	64QAM	50	0	19.87	19.88	19.92	21.5	2



Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	21.57	21.82	21.76	23.5	0
5	QPSK	1	12	21.66	21.77	21.72		
5	QPSK	1	24	21.61	21.73	21.69		
5	QPSK	12	0	21.71	21.81	21.76	23.5	0
5	QPSK	12	7	21.70	21.82	21.78		
5	QPSK	12	13	21.68	21.78	21.73		
5	QPSK	25	0	21.69	21.77	21.75		
5	16QAM	1	0	21.96	21.95	21.94	23.5	0
5	16QAM	1	12	21.81	21.94	21.89		
5	16QAM	1	24	21.88	21.90	21.83		
5	16QAM	12	0	20.81	20.94	20.87	22.5	1
5	16QAM	12	7	20.80	20.93	20.88		
5	16QAM	12	13	20.77	20.88	20.81		
5	16QAM	25	0	20.78	20.91	20.83		
5	64QAM	1	0	20.89	21.07	21.03	22.5	1
5	64QAM	1	12	20.92	21.03	21.02		
5	64QAM	1	24	20.89	21.01	20.97		
5	64QAM	12	0	19.86	19.98	19.92	21.5	2
5	64QAM	12	7	19.86	19.95	19.90		
5	64QAM	12	13	19.81	19.91	19.86		
5	64QAM	25	0	19.78	19.89	19.87		
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	21.57	21.77	21.74	23.5	0
3	QPSK	1	8	21.55	21.75	21.70		
3	QPSK	1	14	21.65	21.74	21.70		
3	QPSK	8	0	21.61	21.80	21.75	23.5	0
3	QPSK	8	4	21.71	21.83	21.77		
3	QPSK	8	7	21.69	21.78	21.75		
3	QPSK	15	0	21.69	21.81	21.74		
3	16QAM	1	0	21.93	21.95	21.90	23.5	0
3	16QAM	1	8	21.89	21.92	21.87		
3	16QAM	1	14	21.80	21.89	21.82		
3	16QAM	8	0	20.74	20.93	20.87	22.5	1
3	16QAM	8	4	20.83	20.97	20.91		
3	16QAM	8	7	20.82	20.91	20.87		
3	16QAM	15	0	20.80	20.91	20.85		
3	64QAM	1	0	20.88	21.05	21.02	22.5	1
3	64QAM	1	8	20.82	21.03	20.99		
3	64QAM	1	14	20.95	21.02	20.96		
3	64QAM	8	0	19.74	19.95	19.89	21.5	2
3	64QAM	8	4	19.85	19.95	19.92		
3	64QAM	8	7	19.83	19.93	19.87		
3	64QAM	15	0	19.80	19.90	19.85		



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Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	21.51	21.72	21.66	23.5	0
1.4	QPSK	1	3	21.57	21.77	21.70		
1.4	QPSK	1	5	21.58	21.66	21.63		
1.4	QPSK	3	0	21.54	21.75	21.69		
1.4	QPSK	3	1	21.58	21.76	21.70		
1.4	QPSK	3	3	21.53	21.75	21.67		
1.4	QPSK	6	0	21.54	21.74	21.68	23.5	0
1.4	16QAM	1	0	21.86	21.86	21.88	23.5	0
1.4	16QAM	1	3	21.92	21.93	21.86		
1.4	16QAM	1	5	21.84	21.85	21.87		
1.4	16QAM	3	0	21.67	21.85	21.79		
1.4	16QAM	3	1	21.69	21.88	21.82		
1.4	16QAM	3	3	21.63	21.83	21.80		
1.4	16QAM	6	0	20.69	20.88	20.82	22.5	1
1.4	64QAM	1	0	20.79	20.99	20.95	22.5	1
1.4	64QAM	1	3	20.85	21.05	20.99		
1.4	64QAM	1	5	20.78	20.98	20.90		
1.4	64QAM	3	0	20.80	20.97	20.90		
1.4	64QAM	3	1	20.81	21.03	20.98		
1.4	64QAM	3	3	20.76	20.96	20.90		
1.4	64QAM	6	0	19.64	19.83	19.78	21.5	2



<Product Specific Power Mode>

<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	21.53	21.50	21.50	23	0
20	QPSK	1	49	21.32	21.32	21.36		
20	QPSK	1	99	21.32	21.32	21.33		
20	QPSK	50	0	21.18	21.14	21.09	22	1
20	QPSK	50	24	21.02	21.04	21.15		
20	QPSK	50	50	21.08	20.97	21.04		
20	QPSK	100	0	21.04	21.04	21.11	22	1
20	16QAM	1	0	21.22	21.15	21.15		
20	16QAM	1	49	21.04	20.97	21.03		
20	16QAM	1	99	20.90	20.99	21.04	21	2
20	16QAM	50	0	20.77	20.70	20.69		
20	16QAM	50	24	20.64	20.65	20.69		
20	16QAM	50	50	20.58	20.57	20.62	21	2
20	16QAM	100	0	20.61	20.62	20.67		
20	64QAM	1	0	20.94	20.93	20.93		
20	64QAM	1	49	20.84	20.76	20.79	21	2
20	64QAM	1	99	20.74	20.74	20.83		
20	64QAM	50	0	19.79	19.72	19.71		
20	64QAM	50	24	19.66	19.67	19.74	20	3
20	64QAM	50	50	19.60	19.61	19.63		
20	64QAM	100	0	19.65	19.63	19.71		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	21.44	21.46	21.47	23	0
15	QPSK	1	37	21.33	21.32	21.35		
15	QPSK	1	74	21.30	21.37	21.40		
15	QPSK	36	0	21.15	21.10	21.15	22	1
15	QPSK	36	20	21.00	21.06	21.13		
15	QPSK	36	39	20.95	20.97	21.05		
15	QPSK	75	0	21.02	21.03	21.11	22	1
15	16QAM	1	0	21.21	21.13	21.21		
15	16QAM	1	37	21.03	20.96	21.02		
15	16QAM	1	74	20.94	21.02	21.07	21	2
15	16QAM	36	0	20.73	20.69	20.77		
15	16QAM	36	20	20.64	20.64	20.69		
15	16QAM	36	39	20.58	20.58	20.61	21	2
15	16QAM	75	0	20.60	20.62	20.68		
15	64QAM	1	0	20.96	20.90	21.00		
15	64QAM	1	37	20.84	20.74	20.80	21	2
15	64QAM	1	74	20.77	20.82	20.88		
15	64QAM	36	0	19.78	19.72	19.79		
15	64QAM	36	20	19.66	19.67	19.73	20	3
15	64QAM	36	39	19.63	19.62	19.66		
15	64QAM	75	0	19.62	19.63	19.70		



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Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	21.50	21.40	21.49	23	0
10	QPSK	1	25	21.36	21.35	21.45		
10	QPSK	1	49	21.31	21.20	21.38		
10	QPSK	25	0	21.15	21.05	21.12	22	1
10	QPSK	25	12	21.09	21.04	21.05		
10	QPSK	25	25	21.10	20.95	21.13		
10	QPSK	50	0	21.10	21.03	21.04	22	1
10	16QAM	1	0	21.12	21.05	21.11		
10	16QAM	1	25	21.06	20.98	21.11		
10	16QAM	1	49	21.02	20.90	21.05	21	2
10	16QAM	25	0	20.71	20.64	20.68		
10	16QAM	25	12	20.70	20.62	20.64		
10	16QAM	25	25	20.67	20.56	20.72	21	2
10	16QAM	50	0	20.70	20.64	20.64		
10	64QAM	1	0	20.87	20.83	20.85		
10	64QAM	1	25	20.84	20.75	20.85	21	2
10	64QAM	1	49	20.81	20.69	20.83		
10	64QAM	25	0	19.72	19.67	19.73		
10	64QAM	25	12	19.74	19.64	19.69	20	3
10	64QAM	25	25	19.69	19.62	19.75		
10	64QAM	50	0	19.73	19.65	19.67		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	21.43	21.36	21.44	23	0
5	QPSK	1	12	21.37	21.32	21.44		
5	QPSK	1	24	21.37	21.31	21.41		
5	QPSK	12	0	21.11	21.03	21.13	22	1
5	QPSK	12	7	21.10	21.03	21.14		
5	QPSK	12	13	21.09	20.96	21.10		
5	QPSK	25	0	21.08	21.00	21.10	22	1
5	16QAM	1	0	21.11	21.01	21.14		
5	16QAM	1	12	21.05	20.95	21.07		
5	16QAM	1	24	21.03	20.94	21.09	21	2
5	16QAM	12	0	20.70	20.62	20.73		
5	16QAM	12	7	20.72	20.63	20.75		
5	16QAM	12	13	20.67	20.58	20.70	21	2
5	16QAM	25	0	20.65	20.58	20.70		
5	64QAM	1	0	20.85	20.78	20.93		
5	64QAM	1	12	20.82	20.74	20.90	21	2
5	64QAM	1	24	20.81	20.74	20.83		
5	64QAM	12	0	19.75	19.67	19.80		
5	64QAM	12	7	19.76	19.68	19.79	20	3
5	64QAM	12	13	19.72	19.64	19.78		
5	64QAM	25	0	19.68	19.59	19.75		



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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	21.39	21.34	21.43	23	0
3	QPSK	1	8	21.37	21.34	21.43		
3	QPSK	1	14	21.32	21.30	21.38		
3	QPSK	8	0	21.12	21.03	21.12	22	1
3	QPSK	8	4	21.09	21.01	21.12		
3	QPSK	8	7	21.05	21.00	21.13		
3	QPSK	15	0	21.05	20.98	21.10		
3	16QAM	1	0	21.03	20.99	21.11	22	1
3	16QAM	1	8	21.03	20.95	21.05		
3	16QAM	1	14	21.02	20.94	21.07		
3	16QAM	8	0	20.72	20.63	20.74	21	2
3	16QAM	8	4	20.73	20.66	20.76		
3	16QAM	8	7	20.69	20.62	20.73		
3	16QAM	15	0	20.70	20.59	20.71		
3	64QAM	1	0	20.78	20.76	20.86	21	2
3	64QAM	1	8	20.78	20.75	20.81		
3	64QAM	1	14	20.75	20.72	20.80		
3	64QAM	8	0	19.74	19.64	19.76	20	3
3	64QAM	8	4	19.75	19.66	19.79		
3	64QAM	8	7	19.72	19.64	19.73		
3	64QAM	15	0	19.68	19.60	19.75		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	21.31	21.24	21.35	23	0
1.4	QPSK	1	3	21.37	21.33	21.40		
1.4	QPSK	1	5	21.28	21.24	21.31		
1.4	QPSK	3	0	21.00	21.03	21.06		
1.4	QPSK	3	1	21.04	21.06	21.09		
1.4	QPSK	3	3	21.00	21.01	21.05		
1.4	QPSK	6	0	20.99	20.91	21.06	22	1
1.4	16QAM	1	0	20.98	20.89	20.99	22	1
1.4	16QAM	1	3	21.04	20.97	21.09		
1.4	16QAM	1	5	20.96	20.85	21.00		
1.4	16QAM	3	0	21.09	21.04	21.16		
1.4	16QAM	3	1	21.15	21.07	21.19		
1.4	16QAM	3	3	21.08	21.02	21.11		
1.4	16QAM	6	0	20.65	20.58	20.71	21	2
1.4	64QAM	1	0	20.72	20.69	20.74	21	2
1.4	64QAM	1	3	20.79	20.73	20.86		
1.4	64QAM	1	5	20.73	20.67	20.75		
1.4	64QAM	3	0	20.72	20.65	20.75		
1.4	64QAM	3	1	20.76	20.70	20.79		
1.4	64QAM	3	3	20.72	20.65	20.76		
1.4	64QAM	6	0	19.60	19.54	19.65	20	3



<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	21.02	21.15	21.09	22	0
20	QPSK	1	49	21.14	21.33	21.28		
20	QPSK	1	99	21.28	21.37	21.33		
20	QPSK	50	0	20.78	20.92	20.95	22	0
20	QPSK	50	24	20.90	21.03	21.00		
20	QPSK	50	50	20.96	21.11	21.08		
20	QPSK	100	0	20.89	21.03	20.99	22	0
20	16QAM	1	0	20.71	20.85	20.74		
20	16QAM	1	49	20.88	20.99	20.95		
20	16QAM	1	99	20.93	21.03	21.02	22	0
20	16QAM	50	0	20.29	20.40	20.45		
20	16QAM	50	24	20.39	20.55	20.49		
20	16QAM	50	50	20.41	20.58	20.55	22	0
20	16QAM	100	0	20.35	20.50	20.41		
20	64QAM	1	0	20.37	20.49	20.35		
20	64QAM	1	49	20.51	20.62	20.61	22	0
20	64QAM	1	99	20.60	20.63	20.64		
20	64QAM	50	0	19.29	19.40	19.45		
20	64QAM	50	24	19.38	19.54	19.49	21	1
20	64QAM	50	50	19.45	19.59	19.58		
20	64QAM	100	0	19.34	19.49	19.43		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	21.13	21.26	21.18	22	0
15	QPSK	1	37	21.18	21.31	21.26		
15	QPSK	1	74	21.21	21.34	21.26		
15	QPSK	36	0	20.88	20.97	20.95	22	0
15	QPSK	36	20	20.94	21.02	21.04		
15	QPSK	36	39	20.92	21.04	21.04		
15	QPSK	75	0	20.90	21.02	21.02	22	0
15	16QAM	1	0	20.83	20.90	20.89		
15	16QAM	1	37	20.87	20.96	20.96		
15	16QAM	1	74	20.91	21.00	20.99	22	0
15	16QAM	36	0	20.35	20.44	20.43		
15	16QAM	36	20	20.41	20.54	20.50		
15	16QAM	36	39	20.43	20.48	20.50	22	0
15	16QAM	75	0	20.34	20.46	20.45		
15	64QAM	1	0	20.47	20.58	20.50		
15	64QAM	1	37	20.51	20.60	20.57	22	0
15	64QAM	1	74	20.52	20.65	20.61		
15	64QAM	36	0	19.36	19.47	19.44		
15	64QAM	36	20	19.44	19.55	19.52	21	1
15	64QAM	36	39	19.45	19.52	19.53		
15	64QAM	75	0	19.36	19.48	19.46		



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Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	21.14	21.27	21.19	22	0
10	QPSK	1	25	21.19	21.32	21.27		
10	QPSK	1	49	21.22	21.35	21.27		
10	QPSK	25	0	20.89	20.98	20.96	22	0
10	QPSK	25	12	20.95	21.03	21.05		
10	QPSK	25	25	20.93	21.05	21.05		
10	QPSK	50	0	20.91	21.03	21.03		
10	16QAM	1	0	20.84	20.91	20.90	22	0
10	16QAM	1	25	20.88	20.97	20.97		
10	16QAM	1	49	20.92	21.01	21.00		
10	16QAM	25	0	20.36	20.45	20.44	22	0
10	16QAM	25	12	20.42	20.55	20.51		
10	16QAM	25	25	20.44	20.49	20.51		
10	16QAM	50	0	20.35	20.47	20.46		
10	64QAM	1	0	20.48	20.59	20.51	22	0
10	64QAM	1	25	20.52	20.61	20.58		
10	64QAM	1	49	20.53	20.66	20.62		
10	64QAM	25	0	19.37	19.48	19.45	21	1
10	64QAM	25	12	19.45	19.56	19.53		
10	64QAM	25	25	19.46	19.53	19.54		
10	64QAM	50	0	19.37	19.49	19.47		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	21.15	21.28	21.20	22	0
5	QPSK	1	12	21.20	21.33	21.28		
5	QPSK	1	24	21.23	21.36	21.28		
5	QPSK	12	0	20.90	20.99	20.97	22	0
5	QPSK	12	7	20.96	21.04	21.06		
5	QPSK	12	13	20.94	21.06	21.06		
5	QPSK	25	0	20.92	21.04	21.04		
5	16QAM	1	0	20.85	20.92	20.91	22	0
5	16QAM	1	12	20.89	20.98	20.98		
5	16QAM	1	24	20.93	21.02	21.01		
5	16QAM	12	0	20.37	20.46	20.45	22	0
5	16QAM	12	7	20.43	20.56	20.52		
5	16QAM	12	13	20.45	20.50	20.52		
5	16QAM	25	0	20.36	20.48	20.47		
5	64QAM	1	0	20.49	20.60	20.52	22	0
5	64QAM	1	12	20.53	20.62	20.59		
5	64QAM	1	24	20.54	20.67	20.63		
5	64QAM	12	0	19.38	19.49	19.46	21	1
5	64QAM	12	7	19.46	19.57	19.54		
5	64QAM	12	13	19.47	19.54	19.55		
5	64QAM	25	0	19.38	19.50	19.48		

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

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

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

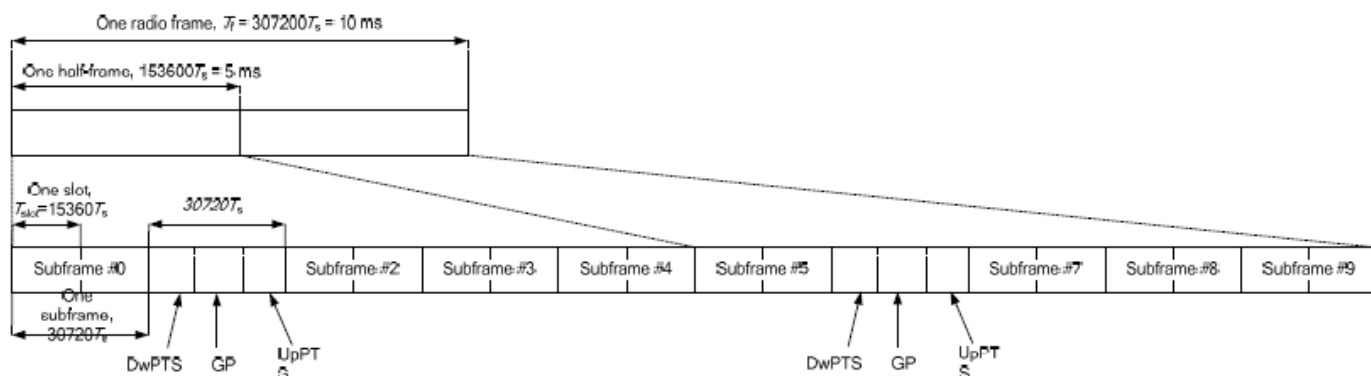


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

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

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

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

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

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

The highest duty factor is resulted from:

- Uplink-downlink configuration: 0. In a half-frame consisted of 5 subframes, uplink operation is in 3 uplink subframes and 1 special subframe.
- special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink
- for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(3+0.167)/5 = 63.3\%$
- for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(3+0.143)/5 = 62.9\%$
- For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix $63.3\%/62.9\% = 1.006$ is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
- The device supports Power Class 2 uplink-downlink configurations 0 and 6, and Power Class 3 uplink-downlink configurations 1 to 5 operations for LTE Band 41.
- The highest available duty cycle for Power Class 2 operation is 43.3% using UL-DL configuration 1, for Power Class 3 operation is 63.3% using UL-DL configuration 0. Per FCC Guidance, all SAR tests were performed using Power Class 3. SAR with Power Class 2 at the available duty factor was additionally performed for the Power Class 3 configuration with the highest SAR among all exposure condition. Please see Section 14.6 for linearity results.



<Default Power Mode>

<LTE Band 38>

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				37850	38000	38150		
Frequency (MHz)				2580	2595	2610		
20	QPSK	1	0	22.81	22.86	22.87	24	0
20	QPSK	1	49	22.86	22.90	23.10		
20	QPSK	1	99	22.79	22.89	23.05		
20	QPSK	50	0	21.83	21.88	21.98	23	1
20	QPSK	50	24	21.90	21.93	22.01		
20	QPSK	50	50	21.84	21.92	22.07		
20	QPSK	100	0	21.85	21.90	21.99	23	1
20	16QAM	1	0	21.90	21.96	22.00		
20	16QAM	1	49	21.96	21.98	22.15		
20	16QAM	1	99	21.89	21.96	22.19	22	2
20	16QAM	50	0	20.92	20.99	21.07		
20	16QAM	50	24	20.99	21.03	21.15		
20	16QAM	50	50	20.92	21.03	21.22	22	2
20	16QAM	100	0	20.94	21.00	21.09		
20	64QAM	1	0	20.68	20.73	20.75		
20	64QAM	1	49	20.72	20.75	20.93	22	2
20	64QAM	1	99	20.64	20.73	20.95		
20	64QAM	50	0	19.92	19.98	20.08		
20	64QAM	50	24	19.99	20.03	20.12	21	3
20	64QAM	50	50	19.93	20.03	20.20		
20	64QAM	100	0	19.95	20.00	20.10		
Channel				37825	38000	38175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2577.5	2595	2612.5		
15	QPSK	1	0	22.82	22.80	22.91	24	0
15	QPSK	1	37	22.86	22.88	23.09		
15	QPSK	1	74	22.87	22.90	23.08		
15	QPSK	36	0	21.80	21.88	21.97	23	1
15	QPSK	36	20	21.90	21.94	22.14		
15	QPSK	36	39	21.86	21.88	22.09		
15	QPSK	75	0	21.84	21.88	21.99	23	1
15	16QAM	1	0	21.91	21.89	22.06		
15	16QAM	1	37	21.94	21.97	22.23		
15	16QAM	1	74	21.97	21.98	22.23	22	2
15	16QAM	36	0	20.87	20.91	21.06		
15	16QAM	36	20	20.92	21.02	21.20		
15	16QAM	36	39	20.89	20.98	21.17	22	2
15	16QAM	75	0	20.92	20.98	21.13		
15	64QAM	1	0	20.67	20.66	20.79		
15	64QAM	1	37	20.71	20.75	21.00	22	2
15	64QAM	1	74	20.72	20.76	21.00		
15	64QAM	36	0	19.91	19.96	20.09		
15	64QAM	36	20	19.96	20.04	20.24	21	3
15	64QAM	36	39	19.94	20.00	20.21		
15	64QAM	75	0	19.91	20.01	20.12		



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Channel				37800	38000	38200	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2575	2595	2615		
10	QPSK	1	0	22.80	22.79	23.00	24	0
10	QPSK	1	25	22.87	22.85	23.06		
10	QPSK	1	49	22.82	22.88	23.08		
10	QPSK	25	0	21.86	21.86	22.05	23	1
10	QPSK	25	12	21.79	21.91	22.10		
10	QPSK	25	25	21.83	21.88	22.08		
10	QPSK	50	0	21.80	21.89	22.11	23	1
10	16QAM	1	0	21.88	21.88	22.17		
10	16QAM	1	25	21.96	21.96	22.21		
10	16QAM	1	49	21.88	21.95	22.19	22	2
10	16QAM	25	0	20.99	20.98	21.21		
10	16QAM	25	12	20.94	21.02	21.24		
10	16QAM	25	25	20.92	20.98	21.22	22	2
10	16QAM	50	0	20.90	20.98	21.23		
10	64QAM	1	0	20.66	20.67	20.94		
10	64QAM	1	25	20.73	20.72	20.99	22	2
10	64QAM	1	49	20.65	20.71	20.97		
10	64QAM	25	0	20.00	20.03	20.27		
10	64QAM	25	12	19.96	20.05	20.30	21	3
10	64QAM	25	25	19.95	20.04	20.27		
10	64QAM	50	0	19.90	19.98	20.22		
Channel				37775	38000	38225	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2572.5	2595	2617.5		
5	QPSK	1	0	22.82	22.82	23.08	24	0
5	QPSK	1	12	22.83	22.83	23.08		
5	QPSK	1	24	22.81	22.82	23.05		
5	QPSK	12	0	21.84	21.88	22.11	23	1
5	QPSK	12	7	21.90	21.92	22.13		
5	QPSK	12	13	21.88	21.91	22.12		
5	QPSK	25	0	21.87	21.86	22.10	23	1
5	16QAM	1	0	21.86	21.89	22.20		
5	16QAM	1	12	21.94	21.95	22.24		
5	16QAM	1	24	21.94	21.97	22.23	22	2
5	16QAM	12	0	20.90	20.92	21.19		
5	16QAM	12	7	20.94	20.94	21.20		
5	16QAM	12	13	20.93	20.97	21.19	22	2
5	16QAM	25	0	20.98	21.01	21.24		
5	64QAM	1	0	20.66	20.70	21.00		
5	64QAM	1	12	20.70	20.71	21.01	22	2
5	64QAM	1	24	20.73	20.73	21.03		
5	64QAM	12	0	19.97	19.98	20.25		
5	64QAM	12	7	19.98	20.03	20.25	21	3
5	64QAM	12	13	19.97	20.02	20.25		
5	64QAM	25	0	20.03	20.03	20.28		



<LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Low Ch. / Freq.	Power Middle High Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				40140	40400	40670	41140		
Frequency (MHz)				2545	2571	2598	2645		
20	QPSK	1	0	22.55	22.69	22.64	22.58	24	0
20	QPSK	1	49	22.77	22.83	22.78	22.73		
20	QPSK	1	99	22.90	22.77	22.73	22.70		
20	QPSK	50	0	21.62	21.72	21.79	21.75	23	1
20	QPSK	50	24	21.76	21.86	21.81	21.75		
20	QPSK	50	50	21.83	21.89	21.82	21.79		
20	QPSK	100	0	21.69	21.81	21.77	21.73		
20	16QAM	1	0	21.64	21.84	21.78	21.75	23	1
20	16QAM	1	49	21.87	21.92	21.87	21.88		
20	16QAM	1	99	21.95	21.86	21.88	21.81		
20	16QAM	50	0	20.70	20.83	20.90	20.87	22	2
20	16QAM	50	24	20.84	20.94	20.91	20.87		
20	16QAM	50	50	20.90	20.99	20.96	20.90		
20	16QAM	100	0	20.82	20.91	20.89	20.81		
20	64QAM	1	0	20.40	20.58	20.53	20.49	22	2
20	64QAM	1	49	20.63	20.68	20.64	20.63		
20	64QAM	1	99	20.72	20.63	20.63	20.60		
20	64QAM	50	0	19.73	19.80	19.89	19.86	21	3
20	64QAM	50	24	19.82	19.96	19.89	19.86		
20	64QAM	50	50	19.91	20.00	19.95	19.92		
20	64QAM	100	0	19.81	19.92	19.89	19.83		
Channel				40115	40395	40685	41165		
Frequency (MHz)				2542.5	2570.5	2599.5	2647.5		
15	QPSK	1	0	22.61	22.78	22.64	22.59	24	0
15	QPSK	1	37	22.76	22.81	22.78	22.76		
15	QPSK	1	74	22.83	22.85	22.74	22.73		
15	QPSK	36	0	21.61	21.73	21.70	21.66	23	1
15	QPSK	36	20	21.71	21.87	21.83	21.78		
15	QPSK	36	39	21.74	21.87	21.82	21.80		
15	QPSK	75	0	21.66	21.79	21.77	21.77		
15	16QAM	1	0	21.69	21.84	21.71	21.73	23	1
15	16QAM	1	37	21.83	21.92	21.88	21.92		
15	16QAM	1	74	21.92	21.94	21.88	21.84		
15	16QAM	36	0	20.62	20.79	20.77	20.75	22	2
15	16QAM	36	20	20.80	20.89	20.89	20.85		
15	16QAM	36	39	20.80	20.90	20.91	20.88		
15	16QAM	75	0	20.78	20.88	20.88	20.86		
15	64QAM	1	0	20.46	20.62	20.48	20.49	22	2
15	64QAM	1	37	20.60	20.69	20.66	20.68		
15	64QAM	1	74	20.68	20.72	20.65	20.61		
15	64QAM	36	0	19.68	19.81	19.78	19.78	21	3
15	64QAM	36	20	19.81	19.93	19.90	19.90		
15	64QAM	36	39	19.84	19.94	19.94	19.91		
15	64QAM	75	0	19.76	19.91	19.89	19.85		



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Channel				40090	40390	40690	41190	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2540	2570	2600	2650		
10	QPSK	1	0	22.61	22.78	22.66	22.63	24	0
10	QPSK	1	25	22.78	22.78	22.78	22.67		
10	QPSK	1	49	22.72	22.86	22.71	22.72		
10	QPSK	25	0	21.65	21.76	21.74	21.75	23	1
10	QPSK	25	12	21.68	21.83	21.78	21.78		
10	QPSK	25	25	21.71	21.84	21.79	21.71		
10	QPSK	50	0	21.65	21.81	21.79	21.79	23	1
10	16QAM	1	0	21.70	21.89	21.78	21.80		
10	16QAM	1	25	21.85	21.88	21.88	21.82		
10	16QAM	1	49	21.77	21.90	21.81	21.83	22	2
10	16QAM	25	0	20.77	20.86	20.87	20.87		
10	16QAM	25	12	20.77	20.96	20.92	20.94		
10	16QAM	25	25	20.81	20.94	20.92	20.84	22	2
10	16QAM	50	0	20.73	20.90	20.90	20.89		
10	64QAM	1	0	20.46	20.66	20.53	20.54		
10	64QAM	1	25	20.62	20.67	20.65	20.58	22	2
10	64QAM	1	49	20.58	20.68	20.56	20.60		
10	64QAM	25	0	19.81	19.88	19.87	19.89		
10	64QAM	25	12	19.80	19.98	19.95	19.97	21	3
10	64QAM	25	25	19.81	20.00	19.96	19.89		
10	64QAM	50	0	19.76	19.91	19.92	19.90		
Channel				40065	40385	40705	41215	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2537.5	2569.5	2601.5	2652.5		
5	QPSK	1	0	22.66	22.72	22.74	22.64	24	0
5	QPSK	1	12	22.73	22.78	22.78	22.69		
5	QPSK	1	24	22.70	22.74	22.75	22.69		
5	QPSK	12	0	21.72	21.81	21.79	21.74	23	1
5	QPSK	12	7	21.77	21.84	21.83	21.75		
5	QPSK	12	13	21.74	21.83	21.82	21.78		
5	QPSK	25	0	21.69	21.78	21.78	21.74	23	1
5	16QAM	1	0	21.72	21.80	21.81	21.77		
5	16QAM	1	12	21.82	21.88	21.94	21.84		
5	16QAM	1	24	21.83	21.89	21.94	21.86	22	2
5	16QAM	12	0	20.77	20.83	20.79	20.78		
5	16QAM	12	7	20.81	20.87	20.90	20.82		
5	16QAM	12	13	20.81	20.90	20.89	20.85	22	2
5	16QAM	25	0	20.80	20.90	20.91	20.85		
5	64QAM	1	0	20.49	20.59	20.57	20.53		
5	64QAM	1	12	20.59	20.65	20.66	20.60	22	2
5	64QAM	1	24	20.62	20.67	20.72	20.63		
5	64QAM	12	0	19.79	19.91	19.87	19.83		
5	64QAM	12	7	19.85	19.94	19.91	19.87	21	3
5	64QAM	12	13	19.88	19.92	19.93	19.89		
5	64QAM	25	0	19.83	19.95	19.93	19.87		



<Near to Body & Hotspot Power Mode>

<LTE Band 38>

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				37850	38000	38150		
Frequency (MHz)				2580	2595	2610		
20	QPSK	1	0	19.99	19.94	19.86	20	0
20	QPSK	1	49	19.88	19.77	19.85		
20	QPSK	1	99	19.80	19.77	19.86		
20	QPSK	50	0	19.97	19.76	19.87	20	0
20	QPSK	50	24	19.93	19.83	19.90		
20	QPSK	50	50	19.80	19.80	19.86		
20	QPSK	100	0	19.89	19.78	19.85	20	0
20	16QAM	1	0	19.92	19.94	19.91		
20	16QAM	1	49	19.91	19.91	19.95		
20	16QAM	1	99	19.94	19.91	19.97	20	0
20	16QAM	50	0	19.96	19.86	19.94		
20	16QAM	50	24	19.91	19.92	19.97		
20	16QAM	50	50	19.92	19.90	19.98	20	0
20	16QAM	100	0	19.94	19.87	19.95		
20	64QAM	1	0	19.82	19.68	19.66		
20	64QAM	1	49	19.74	19.66	19.74	20	0
20	64QAM	1	99	19.67	19.65	19.73		
20	64QAM	50	0	19.57	19.39	19.46		
20	64QAM	50	24	19.54	19.42	19.50	20	0
20	64QAM	50	50	19.42	19.40	19.48		
20	64QAM	100	0	19.50	19.38	19.49		
Channel				37825	38000	38175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2577.5	2595	2612.5		
15	QPSK	1	0	19.96	19.79	19.78	20	0
15	QPSK	1	37	19.94	19.76	19.83		
15	QPSK	1	74	19.87	19.75	19.83		
15	QPSK	36	0	19.89	19.73	19.85	20	0
15	QPSK	36	20	19.86	19.80	19.89		
15	QPSK	36	39	19.83	19.76	19.88		
15	QPSK	75	0	19.82	19.73	19.82	20	0
15	16QAM	1	0	19.95	19.93	19.92		
15	16QAM	1	37	19.95	19.88	19.98		
15	16QAM	1	74	19.94	19.90	19.97	20	0
15	16QAM	36	0	19.97	19.79	19.90		
15	16QAM	36	20	19.95	19.85	19.92		
15	16QAM	36	39	19.92	19.82	19.91	20	0
15	16QAM	75	0	19.92	19.83	19.95		
15	64QAM	1	0	19.81	19.65	19.66		
15	64QAM	1	37	19.83	19.65	19.72	20	0
15	64QAM	1	74	19.71	19.63	19.72		
15	64QAM	36	0	19.47	19.34	19.45		
15	64QAM	36	20	19.48	19.41	19.48	20	0
15	64QAM	36	39	19.45	19.39	19.48		
15	64QAM	75	0	19.43	19.35	19.43		



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Channel				37800	38000	38200	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2575	2595	2615		
10	QPSK	1	0	19.90	19.67	19.77	20	0
10	QPSK	1	25	19.87	19.71	19.82		
10	QPSK	1	49	19.82	19.73	19.84		
10	QPSK	25	0	19.89	19.73	19.82	20	0
10	QPSK	25	12	19.88	19.76	19.86		
10	QPSK	25	25	19.77	19.75	19.82		
10	QPSK	50	0	19.88	19.72	19.86	20	0
10	16QAM	1	0	19.96	19.81	19.92		
10	16QAM	1	25	19.90	19.85	19.94		
10	16QAM	1	49	19.90	19.83	19.93	20	0
10	16QAM	25	0	19.96	19.80	19.90		
10	16QAM	25	12	19.95	19.85	19.95		
10	16QAM	25	25	19.92	19.83	19.92	20	0
10	16QAM	50	0	19.98	19.85	19.94		
10	64QAM	1	0	19.77	19.57	19.65		
10	64QAM	1	25	19.74	19.59	19.70	20	0
10	64QAM	1	49	19.63	19.60	19.68		
10	64QAM	25	0	19.51	19.39	19.46		
10	64QAM	25	12	19.55	19.43	19.50	20	0
10	64QAM	25	25	19.43	19.38	19.47		
10	64QAM	50	0	19.49	19.36	19.43		
Channel				37775	38000	38225	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2572.5	2595	2617.5		
5	QPSK	1	0	19.94	19.70	19.82	20	0
5	QPSK	1	12	19.98	19.73	19.82		
5	QPSK	1	24	19.84	19.70	19.81		
5	QPSK	12	0	19.98	19.74	19.87	20	0
5	QPSK	12	7	19.90	19.78	19.89		
5	QPSK	12	13	19.90	19.75	19.88		
5	QPSK	25	0	19.85	19.71	19.84	20	0
5	16QAM	1	0	19.95	19.82	19.95		
5	16QAM	1	12	19.90	19.86	19.96		
5	16QAM	1	24	19.97	19.88	19.97	20	0
5	16QAM	12	0	19.93	19.77	19.89		
5	16QAM	12	7	19.94	19.79	19.91		
5	16QAM	12	13	19.91	19.78	19.92	20	0
5	16QAM	25	0	19.96	19.85	19.98		
5	64QAM	1	0	19.79	19.60	19.71		
5	64QAM	1	12	19.83	19.62	19.72	20	0
5	64QAM	1	24	19.75	19.63	19.75		
5	64QAM	12	0	19.57	19.38	19.46		
5	64QAM	12	7	19.51	19.39	19.50	20	0
5	64QAM	12	13	19.48	19.39	19.50		
5	64QAM	25	0	19.50	19.40	19.51		



<LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Low Ch. / Freq.	Power Middle High Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				40140	40400	40670	41140		
Frequency (MHz)				2545	2571	2598	2645		
20	QPSK	1	0	19.06	19.32	19.37	19.33	20	0
20	QPSK	1	49	19.26	19.51	19.47	19.36		
20	QPSK	1	99	19.40	19.52	19.50	19.39		
20	QPSK	50	0	19.14	19.41	19.40	19.39	20	0
20	QPSK	50	24	19.27	19.43	19.42	19.41		
20	QPSK	50	50	19.36	19.50	19.46	19.43		
20	QPSK	100	0	19.25	19.42	19.40	19.36		
20	16QAM	1	0	18.90	19.16	19.23	19.15	20	0
20	16QAM	1	49	19.21	19.45	19.44	19.29		
20	16QAM	1	99	19.32	19.42	19.39	19.22		
20	16QAM	50	0	19.03	19.29	19.30	19.25	20	0
20	16QAM	50	24	19.18	19.30	19.40	19.28		
20	16QAM	50	50	19.24	19.38	19.46	19.33		
20	16QAM	100	0	19.13	19.27	19.36	19.24		
20	64QAM	1	0	18.59	18.89	18.94	18.92	20	0
20	64QAM	1	49	18.91	19.20	19.18	19.05		
20	64QAM	1	99	19.04	19.15	19.11	19.02		
20	64QAM	50	0	18.53	18.80	18.82	18.80	20	0
20	64QAM	50	24	18.67	18.81	18.94	18.79		
20	64QAM	50	50	18.75	18.85	18.97	18.83		
20	64QAM	100	0	18.63	18.76	18.91	18.76		
Channel				40115	40395	40685	41165		
Frequency (MHz)				2542.5	2570.5	2599.5	2647.5		
15	QPSK	1	0	19.00	19.30	19.36	19.24	20	0
15	QPSK	1	37	19.20	19.50	19.40	19.41		
15	QPSK	1	74	19.31	19.48	19.46	19.37		
15	QPSK	36	0	19.11	19.41	19.44	19.31	20	0
15	QPSK	36	20	19.23	19.43	19.43	19.47		
15	QPSK	36	39	19.27	19.45	19.46	19.45		
15	QPSK	75	0	18.95	19.14	19.25	19.19		
15	16QAM	1	0	18.91	19.22	19.30	19.14	20	0
15	16QAM	1	37	19.15	19.44	19.34	19.32		
15	16QAM	1	74	19.27	19.39	19.40	19.26		
15	16QAM	36	0	18.94	19.25	19.28	19.18	20	0
15	16QAM	36	20	19.10	19.37	19.40	19.30		
15	16QAM	36	39	19.10	19.27	19.29	19.31		
15	16QAM	75	0	19.07	19.26	19.37	19.29		
15	64QAM	1	0	18.61	18.94	19.01	18.91	20	0
15	64QAM	1	37	18.85	19.17	19.07	19.10		
15	64QAM	1	74	18.96	19.14	19.12	19.06		
15	64QAM	36	0	18.49	18.78	18.87	18.74	20	0
15	64QAM	36	20	18.64	18.93	18.95	18.85		
15	64QAM	36	39	18.66	18.86	18.85	18.87		
15	64QAM	75	0	18.59	18.75	18.92	18.79		



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Channel				40090	40390	40690	41190	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2540	2570	2600	2650		
10	QPSK	1	0	19.00	19.33	19.37	19.28	20	0
10	QPSK	1	25	19.16	19.50	19.41	19.32		
10	QPSK	1	49	19.24	19.46	19.45	19.38		
10	QPSK	25	0	19.09	19.41	19.45	19.35	20	0
10	QPSK	25	12	19.19	19.43	19.42	19.44		
10	QPSK	25	25	19.19	19.44	19.44	19.35		
10	QPSK	50	0	19.17	19.38	19.51	19.43	20	0
10	16QAM	1	0	18.94	19.27	19.35	19.20		
10	16QAM	1	25	19.09	19.41	19.34	19.21		
10	16QAM	1	49	19.12	19.34	19.33	19.20	20	0
10	16QAM	25	0	18.98	19.32	19.36	19.28		
10	16QAM	25	12	19.06	19.40	19.42	19.35		
10	16QAM	25	25	19.09	19.31	19.31	19.26	20	0
10	16QAM	50	0	19.05	19.24	19.40	19.31		
10	64QAM	1	0	18.62	18.99	19.05	18.98		
10	64QAM	1	25	18.80	19.13	19.08	19.01	20	0
10	64QAM	1	49	18.85	19.07	19.08	19.02		
10	64QAM	25	0	18.56	18.86	18.91	18.83		
10	64QAM	25	12	18.64	18.95	18.99	18.88	20	0
10	64QAM	25	25	18.65	18.86	18.88	18.81		
10	64QAM	50	0	18.57	18.78	18.91	18.84		
Channel				40065	40385	40705	41215	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2537.5	2569.5	2601.5	2652.5		
5	QPSK	1	0	19.04	19.42	19.37	19.27	20	0
5	QPSK	1	12	19.12	19.49	19.40	19.32		
5	QPSK	1	24	19.13	19.47	19.40	19.32		
5	QPSK	12	0	19.11	19.46	19.43	19.35	20	0
5	QPSK	12	7	19.17	19.45	19.45	19.35		
5	QPSK	12	13	19.16	19.43	19.48	19.40		
5	QPSK	25	0	19.12	19.47	19.39	19.36	20	0
5	16QAM	1	0	18.93	19.32	19.24	19.15		
5	16QAM	1	12	19.04	19.43	19.34	19.23		
5	16QAM	1	24	19.06	19.45	19.35	19.24	20	0
5	16QAM	12	0	18.94	19.30	19.25	19.19		
5	16QAM	12	7	18.99	19.36	19.29	19.24		
5	16QAM	12	13	19.01	19.35	19.28	19.26	20	0
5	16QAM	25	0	19.03	19.41	19.29	19.26		
5	64QAM	1	0	18.67	19.07	19.01	18.95		
5	64QAM	1	12	18.77	19.15	19.08	19.02	20	0
5	64QAM	1	24	18.78	19.18	19.10	19.06		
5	64QAM	12	0	18.29	18.67	18.59	18.56		
5	64QAM	12	7	18.36	18.71	18.64	18.59	20	0
5	64QAM	12	13	18.36	18.72	18.66	18.60		
5	64QAM	25	0	18.35	18.73	18.64	18.58		

<Product Specific Power Mode>
<LTE Band 38>

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				37850	38000	38150		
Frequency (MHz)				2580	2595	2610		
20	QPSK	1	0	22.26	22.28	22.42	23.5	0
20	QPSK	1	49	22.25	22.26	22.32		
20	QPSK	1	99	22.17	22.24	22.39		
20	QPSK	50	0	21.68	21.73	21.79	22.5	1
20	QPSK	50	24	21.72	21.76	21.83		
20	QPSK	50	50	21.73	21.78	21.91		
20	QPSK	100	0	21.72	21.72	21.82	22.5	1
20	16QAM	1	0	21.81	21.84	21.86		
20	16QAM	1	49	21.86	21.86	22.07		
20	16QAM	1	99	21.75	21.81	22.05	21.5	2
20	16QAM	50	0	20.80	20.83	20.93		
20	16QAM	50	24	20.84	20.88	20.96		
20	16QAM	50	50	20.80	20.88	21.04	21.5	2
20	16QAM	100	0	20.82	20.85	20.92		
20	64QAM	1	0	20.56	20.61	20.62	21.5	2
20	64QAM	1	49	20.62	20.63	20.82		
20	64QAM	1	99	20.50	20.58	20.80		
20	64QAM	50	0	19.81	19.86	19.93	20.5	3
20	64QAM	50	24	19.87	19.89	19.99		
20	64QAM	50	50	19.79	19.86	20.04		
20	64QAM	100	0	19.84	19.87	19.94		
Channel				37825	38000	38175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2577.5	2595	2612.5		
15	QPSK	1	0	22.22	22.19	22.27	23.5	0
15	QPSK	1	37	22.22	22.24	22.33		
15	QPSK	1	74	22.24	22.24	22.32		
15	QPSK	36	0	21.68	21.70	21.79	22.5	1
15	QPSK	36	20	21.73	21.77	21.96		
15	QPSK	36	39	21.70	21.72	21.89		
15	QPSK	75	0	21.67	21.74	21.83	22.5	1
15	16QAM	1	0	21.79	21.78	21.84		
15	16QAM	1	37	21.83	21.84	22.11		
15	16QAM	1	74	21.85	21.85	22.09	21.5	2
15	16QAM	36	0	20.75	20.79	20.90		
15	16QAM	36	20	20.83	20.88	21.05		
15	16QAM	36	39	20.80	20.85	21.01	21.5	2
15	16QAM	75	0	20.80	20.87	20.95		
15	64QAM	1	0	20.56	20.53	20.62		
15	64QAM	1	37	20.60	20.63	20.82	21.5	2
15	64QAM	1	74	20.61	20.63	20.84		
15	64QAM	36	0	19.79	19.84	19.94		
15	64QAM	36	20	19.86	19.90	20.09	20.5	3
15	64QAM	36	39	19.83	19.87	20.07		
15	64QAM	75	0	19.80	19.85	19.98		



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Channel				37800	38000	38200	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2575	2595	2615		
10	QPSK	1	0	22.17	22.16	22.35	23.5	0
10	QPSK	1	25	22.26	22.20	22.28		
10	QPSK	1	49	22.18	22.21	22.32		
10	QPSK	25	0	21.70	21.69	21.87	22.5	1
10	QPSK	25	12	21.67	21.74	21.94		
10	QPSK	25	25	21.64	21.73	21.90		
10	QPSK	50	0	21.66	21.72	21.90	22.5	1
10	16QAM	1	0	21.77	21.77	22.02		
10	16QAM	1	25	21.86	21.83	22.06		
10	16QAM	1	49	21.74	21.79	22.04	21.5	2
10	16QAM	25	0	20.84	20.84	21.04		
10	16QAM	25	12	20.78	20.87	21.09		
10	16QAM	25	25	20.77	20.85	21.06	21.5	2
10	16QAM	50	0	20.77	20.84	21.05		
10	64QAM	1	0	20.54	20.53	20.78		
10	64QAM	1	25	20.61	20.59	20.82	21.5	2
10	64QAM	1	49	20.52	20.57	20.80		
10	64QAM	25	0	19.88	19.88	20.08		
10	64QAM	25	12	19.82	19.91	20.12	20.5	3
10	64QAM	25	25	19.83	19.91	20.09		
10	64QAM	50	0	19.78	19.85	20.05		
Channel				37775	38000	38225	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2572.5	2595	2617.5		
5	QPSK	1	0	22.22	22.20	22.39	23.5	0
5	QPSK	1	12	22.24	22.20	22.39		
5	QPSK	1	24	22.23	22.19	22.38		
5	QPSK	12	0	21.73	21.73	21.92	22.5	1
5	QPSK	12	7	21.75	21.73	21.93		
5	QPSK	12	13	21.74	21.73	21.92		
5	QPSK	25	0	21.73	21.73	21.89	22.5	1
5	16QAM	1	0	21.77	21.77	22.03		
5	16QAM	1	12	21.84	21.80	22.07		
5	16QAM	1	24	21.82	21.82	22.04	21.5	2
5	16QAM	12	0	20.81	20.81	21.01		
5	16QAM	12	7	20.84	20.82	21.02		
5	16QAM	12	13	20.81	20.83	21.02	21.5	2
5	16QAM	25	0	20.83	20.84	21.06		
5	64QAM	1	0	20.57	20.56	20.84		
5	64QAM	1	12	20.61	20.56	20.83	21.5	2
5	64QAM	1	24	20.63	20.60	20.85		
5	64QAM	12	0	19.86	19.86	20.07		
5	64QAM	12	7	19.89	19.89	20.08	20.5	3
5	64QAM	12	13	19.88	19.87	20.05		
5	64QAM	25	0	19.88	19.90	20.09		



<LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Low Ch. / Freq.	Power Middle High Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				40140	40400	40670	41140		
Frequency (MHz)				2545	2571	2598	2645		
20	QPSK	1	0	23.32	23.60	23.62	23.57	24	0
20	QPSK	1	49	23.76	23.91	23.87	23.74		
20	QPSK	1	99	23.69	23.88	23.78	23.73		
20	QPSK	50	0	21.31	21.57	21.58	21.55	23	1
20	QPSK	50	24	21.54	21.78	21.73	21.65		
20	QPSK	50	50	21.50	21.66	21.72	21.60		
20	QPSK	100	0	21.40	21.67	21.57	21.50		
20	16QAM	1	0	21.33	21.55	21.57	21.57	23	1
20	16QAM	1	49	21.62	21.85	21.82	21.72		
20	16QAM	1	99	21.74	21.84	21.73	21.63		
20	16QAM	50	0	20.43	20.69	20.72	20.66	22	2
20	16QAM	50	24	20.57	20.71	20.82	20.68		
20	16QAM	50	50	20.65	20.75	20.86	20.72		
20	16QAM	100	0	20.52	20.66	20.77	20.62		
20	64QAM	1	0	20.05	20.30	20.34	20.32	22	2
20	64QAM	1	49	20.38	20.61	20.59	20.48		
20	64QAM	1	99	20.49	20.58	20.50	20.41		
20	64QAM	50	0	19.41	19.67	19.71	19.67	21	3
20	64QAM	50	24	19.56	19.72	19.84	19.68		
20	64QAM	50	50	19.65	19.78	19.86	19.72		
20	64QAM	100	0	19.50	19.68	19.79	19.64		
Channel				40115	40395	40685	41165		
Frequency (MHz)				2542.5	2570.5	2599.5	2647.5		
15	QPSK	1	0	23.36	23.67	23.71	23.58	24	0
15	QPSK	1	37	23.62	23.90	23.77	23.76		
15	QPSK	1	74	23.72	23.85	23.81	23.73		
15	QPSK	36	0	21.29	21.58	21.62	21.47	23	1
15	QPSK	36	20	21.41	21.69	21.73	21.62		
15	QPSK	36	39	21.47	21.62	21.63	21.61		
15	QPSK	75	0	21.38	21.54	21.67	21.54		
15	16QAM	1	0	21.38	21.64	21.64	21.56	23	1
15	16QAM	1	37	21.61	21.84	21.71	21.73		
15	16QAM	1	74	21.69	21.81	21.74	21.72		
15	16QAM	36	0	20.38	20.63	20.69	20.56	22	2
15	16QAM	36	20	20.50	20.79	20.79	20.68		
15	16QAM	36	39	20.55	20.72	20.69	20.69		
15	16QAM	75	0	20.51	20.65	20.79	20.67		
15	64QAM	1	0	20.12	20.38	20.41	20.32	22	2
15	64QAM	1	37	20.35	20.60	20.48	20.50		
15	64QAM	1	74	20.45	20.57	20.51	20.46		
15	64QAM	36	0	19.38	19.65	19.74	19.60	21	3
15	64QAM	36	20	19.52	19.82	19.85	19.72		
15	64QAM	36	39	19.57	19.73	19.74	19.74		
15	64QAM	75	0	19.49	19.64	19.78	19.68		



FCC SAR Test Report

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Channel				40090	40390	40690	41190	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2540	2570	2600	2650		
10	QPSK	1	0	23.35	23.69	23.72	23.63	24	0
10	QPSK	1	25	23.53	23.84	23.73	23.69		
10	QPSK	1	49	23.61	23.79	23.76	23.73		
10	QPSK	25	0	21.24	21.56	21.64	21.50	23	1
10	QPSK	25	12	21.32	21.64	21.70	21.58		
10	QPSK	25	25	21.36	21.56	21.59	21.54		
10	QPSK	50	0	21.31	21.55	21.67	21.57		
10	16QAM	1	0	21.35	21.65	21.66	21.61	23	1
10	16QAM	1	25	21.51	21.80	21.69	21.64		
10	16QAM	1	49	21.55	21.70	21.67	21.66		
10	16QAM	25	0	20.41	20.70	20.77	20.67	22	2
10	16QAM	25	12	20.47	20.77	20.84	20.74		
10	16QAM	25	25	20.50	20.69	20.71	20.65		
10	16QAM	50	0	20.45	20.64	20.80	20.73		
10	64QAM	1	0	20.12	20.42	20.43	20.35	22	2
10	64QAM	1	25	20.27	20.58	20.48	20.38		
10	64QAM	1	49	20.32	20.49	20.45	20.42		
10	64QAM	25	0	19.42	19.73	19.80	19.69	21	3
10	64QAM	25	12	19.52	19.83	19.87	19.77		
10	64QAM	25	25	19.53	19.74	19.77	19.69		
10	64QAM	50	0	19.44	19.65	19.81	19.70		
Channel				40065	40385	40705	41215	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2537.5	2569.5	2601.5	2652.5		
5	QPSK	1	0	23.39	23.76	23.68	23.63	24	0
5	QPSK	1	12	23.47	23.85	23.75	23.70		
5	QPSK	1	24	23.49	23.84	23.73	23.68		
5	QPSK	12	0	21.24	21.65	21.58	21.51	23	1
5	QPSK	12	7	21.31	21.70	21.62	21.53		
5	QPSK	12	13	21.35	21.71	21.65	21.55		
5	QPSK	25	0	21.27	21.61	21.60	21.52		
5	16QAM	1	0	21.37	21.68	21.62	21.59	23	1
5	16QAM	1	12	21.48	21.78	21.68	21.63		
5	16QAM	1	24	21.49	21.80	21.70	21.69		
5	16QAM	12	0	20.34	20.69	20.65	20.60	22	2
5	16QAM	12	7	20.40	20.74	20.71	20.63		
5	16QAM	12	13	20.42	20.77	20.69	20.64		
5	16QAM	25	0	20.43	20.78	20.70	20.66		
5	64QAM	1	0	20.14	20.46	20.41	20.35	22	2
5	64QAM	1	12	20.22	20.56	20.48	20.40		
5	64QAM	1	24	20.26	20.59	20.49	20.43		
5	64QAM	12	0	19.39	19.76	19.70	19.64	21	3
5	64QAM	12	7	19.46	19.81	19.76	19.68		
5	64QAM	12	13	19.47	19.80	19.75	19.71		
5	64QAM	25	0	19.44	19.80	19.74	19.70		

<LTE Carrier Aggregation combinations>

General Note:

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

	Intra-Band Contiguous	Intra-Band non-Contiguous
Band 7	CA_7C	CA_7A_7A
Band 41	CA_41D	CA_41A_41A
Band 41		CA_41C_41A

<Power verification when LTE Carrier Aggregation Active>

General Note:

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

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

<Two Carrier power verification>

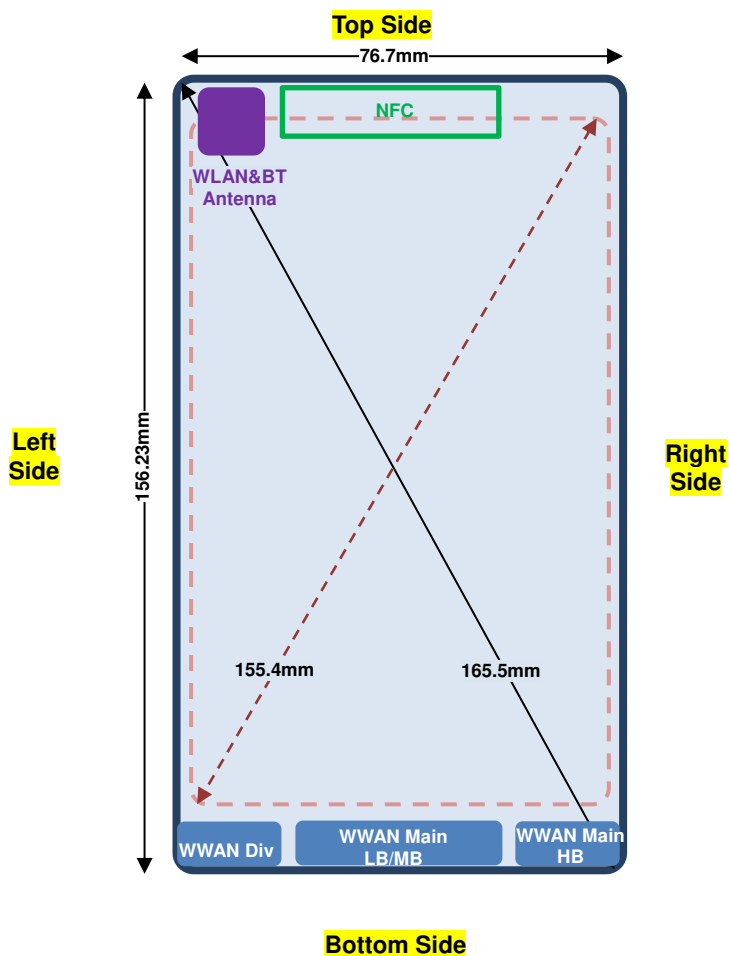
Configure		CA Configuration (BCS)	PCC						SCC				Power		
			LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Intra-Band	Non-Contiguous	CA_7A_7A	7	20M	2535	21100	QPSK	1	99	7	20	2680	3350	22.53	22.54
		CA_41A_41A	41	20	2545	40140	QPSK	1	99	41	20	2636.5	41055	22.89	22.90
	Contiguous	CA_7C	7	20M	2535	21100	QPSK	1	99	7	20	2674.8	3298	22.53	22.54

<Three Carrier power verification>

Configure		CA Configuration (BCS)	PCC							SCC				SCC2				Power	
			LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Intra-Band	Non-Contiguous	CA_41C_41A	41	20	2545	40140	QPSK	1	99	41	20	2564.8	40338	41	20	2598	40670	22.89	22.90
	Contiguous	CA_41D	41	20	2545	40140	QPSK	1	99	41	20	2564.8	40338	41	20	2584.6	40536	22.89	22.90

13. Antenna Location

<Mobile Phone>



Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main_LB/MB	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm	≤ 25mm
WWAN Main_HB	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	>25mm	≤ 25mm
WWAN Div	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm	>25mm

Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main_LB/MB	Yes	Yes	No	Yes	Yes	Yes
WWAN Main_HB	Yes	Yes	No	Yes	No	Yes
WWAN Div	Yes	Yes	No	Yes	Yes	No

General Note:

- Referring to KDB 941225 D06 v02r01, when the overall device length and width are < 9cm*5cm, the test distance is 5 mm. SAR must be measured for all sides and surfaces.
- The WWAN Div antenna only supports LTE B7/B38/B41.
- LB: Low Band as 1GHz below, MB: middle band as 2GHz below, HB: high band as 2GHz above.



14. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
 - b. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 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 only when the measured SAR is ≥ 0.8 W/kg.
4. While the device operating in near-body condition by end user, the device will reduce output powers on the GSM1900, WCDMA B2 / B4 / B5, and LTE B4 / B5 / B7 / B38 / B41 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.
5. While the device operating in mobile hotspot session, the device will reduced output powers on the GSM1900, WCDMA B2 / B4 / B5, and LTE B4 / B5 / B7 / B38 / B41 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.
6. While the device operating in handheld condition, the device will limit different maximum output powers on the GSM1900, WCDMA B2 / B4, and LTE B4 / B7 / B38 / B41 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.
7. While the device operating in Held to head session, the device will limit different maximum output powers on the WLAN transmitter and detail descriptions of the power reduction mechanism are included in the operational description.
8. Per KDB 648474 D04v01r03, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.
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 product specific SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.
10. For 5.3GHz / 5.5GHz WLAN product specific SAR is necessary too, due to an overall diagonal dimension is > 16 cm.

GSM Note:

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS (2Tx slots) for GSM850 and GPRS (3Tx slots) for 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.

UMTS Note:

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

LTE Note:

- 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.
- Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
- 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.
- Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
- 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.
- For LTE B4/B12/B26 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.
- LTE Band 5/17/38 SAR test was covered by Band 26/12/41; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - The maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion.
 - The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

14.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS (2 Tx slots)	Right Cheek	0mm	OFF	251	848.8	31.67	32.00	1.079	-0.15	0.090	0.097
	GSM850	GPRS (2 Tx slots)	Right Tilted	0mm	OFF	251	848.8	31.67	32.00	1.079	-0.07	0.055	0.059
01	GSM850	GPRS (2 Tx slots)	Left Cheek	0mm	OFF	251	848.8	31.67	32.00	1.079	-0.02	0.200	0.216
	GSM850	GPRS (2 Tx slots)	Left Tilted	0mm	OFF	251	848.8	31.67	32.00	1.079	-0.01	0.061	0.066
02	GSM1900	GPRS (3 Tx slots)	Right Cheek	0mm	OFF	810	1909.8	26.80	28.00	1.318	-0.01	0.129	0.170
	GSM1900	GPRS (3 Tx slots)	Right Tilted	0mm	OFF	810	1909.8	26.80	28.00	1.318	-0.08	0.036	0.047
	GSM1900	GPRS (3 Tx slots)	Left Cheek	0mm	OFF	810	1909.8	26.80	28.00	1.318	-0.05	0.076	0.100
	GSM1900	GPRS (3 Tx slots)	Left Tilted	0mm	OFF	810	1909.8	26.80	28.00	1.318	0.04	0.064	0.084

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	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)
03	WCDMA II	RMC 12.2Kbps	Right Cheek	0mm	OFF	9538	1907.6	23.01	23.50	1.119	0.01	0.224	0.251
	WCDMA II	RMC 12.2Kbps	Right Tilted	0mm	OFF	9538	1907.6	23.01	23.50	1.119	0.12	0.078	0.087
	WCDMA II	RMC 12.2Kbps	Left Cheek	0mm	OFF	9538	1907.6	23.01	23.50	1.119	0.12	0.129	0.144
	WCDMA II	RMC 12.2Kbps	Left Tilted	0mm	OFF	9538	1907.6	23.01	23.50	1.119	0.01	0.110	0.123
04	WCDMA IV	RMC 12.2Kbps	Right Cheek	0mm	OFF	1513	1752.6	22.82	23.50	1.169	0.1	0.267	0.312
	WCDMA IV	RMC 12.2Kbps	Right Tilted	0mm	OFF	1513	1752.6	22.82	23.50	1.169	0.09	0.091	0.106
	WCDMA IV	RMC 12.2Kbps	Left Cheek	0mm	OFF	1513	1752.6	22.82	23.50	1.169	0.12	0.148	0.173
	WCDMA IV	RMC 12.2Kbps	Left Tilted	0mm	OFF	1513	1752.6	22.82	23.50	1.169	0.19	0.095	0.111
	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	OFF	4182	836.4	22.85	24.00	1.303	0.01	0.193	0.252
	WCDMA V	RMC 12.2Kbps	Right Tilted	0mm	OFF	4182	836.4	22.85	24.00	1.303	0.02	0.114	0.149
05	WCDMA V	RMC 12.2Kbps	Left Cheek	0mm	OFF	4182	836.4	22.85	24.00	1.303	0.01	0.272	0.354
	WCDMA V	RMC 12.2Kbps	Left Tilted	0mm	OFF	4182	836.4	22.85	24.00	1.303	0.03	0.123	0.160



<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	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 4	20M	QPSK	1	0	Right Cheek	0mm	OFF	20175	1732.5	22.81	23.50	1.172	0.07	0.253	0.297
	LTE Band 4	20M	QPSK	50	0	Right Cheek	0mm	OFF	20175	1732.5	21.79	22.50	1.178	0.07	0.176	0.207
	LTE Band 4	20M	QPSK	1	0	Right Tilted	0mm	OFF	20175	1732.5	22.81	23.50	1.172	0.06	0.084	0.098
	LTE Band 4	20M	QPSK	50	0	Right Tilted	0mm	OFF	20175	1732.5	21.79	22.50	1.178	0.09	0.057	0.067
	LTE Band 4	20M	QPSK	1	0	Left Cheek	0mm	OFF	20175	1732.5	22.81	23.50	1.172	0.06	0.140	0.164
	LTE Band 4	20M	QPSK	50	0	Left Cheek	0mm	OFF	20175	1732.5	21.79	22.50	1.178	0.13	0.097	0.114
	LTE Band 4	20M	QPSK	1	0	Left Tilted	0mm	OFF	20175	1732.5	22.81	23.50	1.172	-0.01	0.056	0.066
	LTE Band 4	20M	QPSK	50	0	Left Tilted	0mm	OFF	20175	1732.5	21.79	22.50	1.178	0.02	0.041	0.048
07	LTE Band 7_Main	20M	QPSK	1	99	Right Cheek	0mm	OFF	21100	2535	22.54	24.00	1.400	-0.19	0.554	0.775
	LTE Band 7_Main	20M	QPSK	50	50	Right Cheek	0mm	OFF	21100	2535	21.56	23.00	1.393	-0.08	0.439	0.612
	LTE Band 7_Main	20M	QPSK	1	99	Right Tilted	0mm	OFF	21100	2535	22.54	24.00	1.400	0.06	0.239	0.335
	LTE Band 7_Main	20M	QPSK	50	50	Right Tilted	0mm	OFF	21100	2535	21.56	23.00	1.393	0.12	0.136	0.189
	LTE Band 7_Main	20M	QPSK	1	99	Left Cheek	0mm	OFF	21100	2535	22.54	24.00	1.400	0.09	0.303	0.424
	LTE Band 7_Main	20M	QPSK	50	50	Left Cheek	0mm	OFF	21100	2535	21.56	23.00	1.393	0.15	0.167	0.233
	LTE Band 7_Main	20M	QPSK	1	99	Left Tilted	0mm	OFF	21100	2535	22.54	24.00	1.400	-0.01	0.319	0.446
	LTE Band 7_Main	20M	QPSK	50	50	Left Tilted	0mm	OFF	21100	2535	21.56	23.00	1.393	0.04	0.180	0.251
	LTE Band 7_Aux	20M	QPSK	1	99	Right Cheek	0mm	OFF	21100	2535	22.54	24.00	1.400	0.12	0.160	0.224
	LTE Band 7_Aux	20M	QPSK	50	50	Right Cheek	0mm	OFF	21100	2535	21.56	23.00	1.393	0.12	0.090	0.125
	LTE Band 7_Aux	20M	QPSK	1	99	Right Tilted	0mm	OFF	21100	2535	22.54	24.00	1.400	0.04	0.269	0.376
	LTE Band 7_Aux	20M	QPSK	50	50	Right Tilted	0mm	OFF	21100	2535	21.56	23.00	1.393	0.03	0.156	0.217
	LTE Band 7_Aux	20M	QPSK	1	99	Left Cheek	0mm	OFF	21100	2535	22.54	24.00	1.400	0.08	0.374	0.523
	LTE Band 7_Aux	20M	QPSK	50	50	Left Cheek	0mm	OFF	21100	2535	21.56	23.00	1.393	0.13	0.204	0.284
	LTE Band 7_Aux	20M	QPSK	1	99	Left Tilted	0mm	OFF	21100	2535	22.54	24.00	1.400	0.1	0.153	0.214
	LTE Band 7_Aux	20M	QPSK	50	50	Left Tilted	0mm	OFF	21100	2535	21.56	23.00	1.393	-0.09	0.055	0.077
	LTE Band 12	10M	QPSK	1	49	Right Cheek	0mm	OFF	23095	707.5	22.53	24.00	1.403	0.02	0.182	0.255
	LTE Band 12	10M	QPSK	25	0	Right Cheek	0mm	OFF	23095	707.5	21.59	23.00	1.384	0.09	0.102	0.141
	LTE Band 12	10M	QPSK	1	49	Right Tilted	0mm	OFF	23095	707.5	22.53	24.00	1.403	0.02	0.102	0.143
	LTE Band 12	10M	QPSK	25	0	Right Tilted	0mm	OFF	23095	707.5	21.59	23.00	1.384	0.06	0.059	0.082
08	LTE Band 12	10M	QPSK	1	49	Left Cheek	0mm	OFF	23095	707.5	22.53	24.00	1.403	0.05	0.207	0.290
	LTE Band 12	10M	QPSK	25	0	Left Cheek	0mm	OFF	23095	707.5	21.59	23.00	1.384	0.13	0.115	0.159
	LTE Band 12	10M	QPSK	1	49	Left Tilted	0mm	OFF	23095	707.5	22.53	24.00	1.403	0.11	0.082	0.115
	LTE Band 12	10M	QPSK	25	0	Left Tilted	0mm	OFF	23095	707.5	21.59	23.00	1.384	0.08	0.055	0.076
	LTE Band 26	15M	QPSK	1	37	Right Cheek	0mm	OFF	26865	831.5	22.71	24.00	1.346	0.01	0.223	0.300
	LTE Band 26	15M	QPSK	36	0	Right Cheek	0mm	OFF	26865	831.5	21.77	23.00	1.327	0.01	0.117	0.155
	LTE Band 26	15M	QPSK	1	37	Right Tilted	0mm	OFF	26865	831.5	22.71	24.00	1.346	0.01	0.095	0.128
	LTE Band 26	15M	QPSK	36	0	Right Tilted	0mm	OFF	26865	831.5	21.77	23.00	1.327	-0.03	0.052	0.069
09	LTE Band 26	15M	QPSK	1	37	Left Cheek	0mm	OFF	26865	831.5	22.71	24.00	1.346	-0.05	0.286	0.385
	LTE Band 26	15M	QPSK	36	0	Left Cheek	0mm	OFF	26865	831.5	21.77	23.00	1.327	0.01	0.147	0.195
	LTE Band 26	15M	QPSK	1	37	Left Tilted	0mm	OFF	26865	831.5	22.71	24.00	1.346	-0.01	0.128	0.172
	LTE Band 26	15M	QPSK	36	0	Left Tilted	0mm	OFF	26865	831.5	21.77	23.00	1.327	0.09	0.066	0.088



<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 41_Main	20M	QPSK	1	99	Right Cheek	0mm	OFF	40140	2545	22.90	24.00	1.288	62.9	1.006	0.12	0.541	0.701
	LTE Band 41_Main	20M	QPSK	1	49	Right Cheek	0mm	OFF	40400	2571	22.83	24.00	1.309	62.9	1.006	0.12	0.564	0.743
	LTE Band 41_Main	20M	QPSK	1	49	Right Cheek	0mm	OFF	40670	2598	22.78	24.00	1.324	62.9	1.006	0.01	0.540	0.719
10	LTE Band 41_Main	20M	QPSK	1	49	Right Cheek	0mm	OFF	41140	2645	22.73	24.00	1.340	62.9	1.006	0.13	0.555	0.748
	LTE Band 41_Main	20M	QPSK	50	50	Right Cheek	0mm	OFF	40400	2571	21.89	23.00	1.291	62.9	1.006	0.11	0.297	0.386
	LTE Band 41_Main	20M	QPSK	1	99	Right Tilted	0mm	OFF	40140	2545	22.90	24.00	1.288	62.9	1.006	0.06	0.238	0.308
	LTE Band 41_Main	20M	QPSK	50	50	Right Tilted	0mm	OFF	40400	2571	21.89	23.00	1.291	62.9	1.006	0.12	0.116	0.151
	LTE Band 41_Main	20M	QPSK	1	99	Left Cheek	0mm	OFF	40140	2545	22.90	24.00	1.288	62.9	1.006	0.17	0.120	0.156
	LTE Band 41_Main	20M	QPSK	50	50	Left Cheek	0mm	OFF	40400	2571	21.89	23.00	1.291	62.9	1.006	0.08	0.065	0.084
	LTE Band 41_Main	20M	QPSK	1	99	Left Tilted	0mm	OFF	40140	2545	22.90	24.00	1.288	62.9	1.006	-0.04	0.221	0.286
	LTE Band 41_Main	20M	QPSK	50	50	Left Tilted	0mm	OFF	40400	2571	21.89	23.00	1.291	62.9	1.006	0.04	0.083	0.108
	LTE Band 41_Aux	20M	QPSK	1	99	Right Cheek	0mm	OFF	40140	2545	22.90	24.00	1.288	62.9	1.006	0.19	0.104	0.135
	LTE Band 41_Aux	20M	QPSK	50	50	Right Cheek	0mm	OFF	40400	2571	21.89	23.00	1.291	62.9	1.006	0.04	0.066	0.086
	LTE Band 41_Aux	20M	QPSK	1	99	Right Tilted	0mm	OFF	40140	2545	22.90	24.00	1.288	62.9	1.006	0.06	0.150	0.194
	LTE Band 41_Aux	20M	QPSK	50	50	Right Tilted	0mm	OFF	40400	2571	21.89	23.00	1.291	62.9	1.006	0.03	0.085	0.110
	LTE Band 41_Aux	20M	QPSK	1	99	Left Cheek	0mm	OFF	40140	2545	22.90	24.00	1.288	62.9	1.006	0.02	0.246	0.319
	LTE Band 41_Aux	20M	QPSK	50	50	Left Cheek	0mm	OFF	40400	2571	21.89	23.00	1.291	62.9	1.006	0.07	0.133	0.173
	LTE Band 41_Aux	20M	QPSK	1	99	Left Tilted	0mm	OFF	40140	2545	22.90	24.00	1.288	62.9	1.006	0.1	0.155	0.201
	LTE Band 41_Aux	20M	QPSK	50	50	Left Tilted	0mm	OFF	40400	2571	21.89	23.00	1.291	62.9	1.006	-0.09	0.058	0.075

14.2 Hotspot SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS (2 Tx slots)	Front	5mm	OFF	251	848.8	31.67	32.00	1.079	0.01	0.325	0.351
11	GSM850	GPRS (2 Tx slots)	Back	5mm	OFF	251	848.8	31.67	32.00	1.079	-0.05	0.475	0.512
	GSM850	GPRS (2 Tx slots)	Left Side	5mm	OFF	251	848.8	31.67	32.00	1.079	-0.13	0.222	0.240
	GSM850	GPRS (2 Tx slots)	Right Side	5mm	OFF	251	848.8	31.67	32.00	1.079	-0.06	0.049	0.053
	GSM850	GPRS (2 Tx slots)	Bottom Side	5mm	OFF	251	848.8	31.67	32.00	1.079	0.07	0.249	0.269
	GSM1900	GPRS (3 Tx slots)	Front	5mm	ON	810	1909.8	22.21	23.00	1.199	-0.04	0.585	0.702
	GSM1900	GPRS (3 Tx slots)	Back	5mm	ON	810	1909.8	22.21	23.00	1.199	0.09	0.654	0.784
	GSM1900	GPRS (3 Tx slots)	Left Side	5mm	ON	810	1909.8	22.21	23.00	1.199	0.06	0.033	0.040
	GSM1900	GPRS (3 Tx slots)	Right Side	5mm	ON	810	1909.8	22.21	23.00	1.199	0.07	0.265	0.318
12	GSM1900	GPRS (3 Tx slots)	Bottom Side	5mm	ON	810	1909.8	22.21	23.00	1.199	0.07	0.974	1.168
	GSM1900	GPRS (3 Tx slots)	Bottom Side	5mm	ON	512	1850.2	22.04	23.00	1.247	-0.07	0.899	1.121
	GSM1900	GPRS (3 Tx slots)	Bottom Side	5mm	ON	661	1880	22.17	23.00	1.211	-0.07	0.930	1.126

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	5mm	ON	9538	1907.6	14.21	15.50	1.346	0.01	0.468	0.630
	WCDMA II	RMC 12.2Kbps	Back	5mm	ON	9538	1907.6	14.21	15.50	1.346	0.17	0.503	0.677
	WCDMA II	RMC 12.2Kbps	Left Side	5mm	ON	9538	1907.6	14.21	15.50	1.346	-0.06	0.020	0.027
	WCDMA II	RMC 12.2Kbps	Right Side	5mm	ON	9538	1907.6	14.21	15.50	1.346	-0.09	0.061	0.082
13	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	ON	9538	1907.6	14.21	15.50	1.346	0.07	0.767	1.032
	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	ON	9262	1852.4	14.16	15.50	1.361	0.06	0.680	0.926
	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	ON	9400	1880	14.12	15.50	1.374	0.07	0.712	0.978
	WCDMA IV	RMC 12.2Kbps	Front	5mm	ON	1513	1752.6	15.62	16.50	1.225	-0.04	0.737	0.903
	WCDMA IV	RMC 12.2Kbps	Front	5mm	ON	1312	1712.4	15.54	16.50	1.247	-0.09	0.626	0.781
	WCDMA IV	RMC 12.2Kbps	Front	5mm	ON	1413	1732.6	15.41	16.50	1.285	-0.11	0.642	0.825
	WCDMA IV	RMC 12.2Kbps	Back	5mm	ON	1513	1752.6	15.62	16.50	1.225	0.18	0.774	0.948
	WCDMA IV	RMC 12.2Kbps	Back	5mm	ON	1312	1712.4	15.54	16.50	1.247	-0.05	0.611	0.762
	WCDMA IV	RMC 12.2Kbps	Back	5mm	ON	1413	1732.6	15.41	16.50	1.285	0.02	0.646	0.830
	WCDMA IV	RMC 12.2Kbps	Left Side	5mm	ON	1513	1752.6	15.62	16.50	1.225	0.13	0.044	0.054
	WCDMA IV	RMC 12.2Kbps	Right Side	5mm	ON	1513	1752.6	15.62	16.50	1.225	0.16	0.084	0.103
14	WCDMA IV	RMC 12.2Kbps	Bottom Side	5mm	ON	1513	1752.6	15.62	16.50	1.225	0.14	0.905	1.108
	WCDMA IV	RMC 12.2Kbps	Bottom Side	5mm	ON	1312	1712.4	15.54	16.50	1.247	0.12	0.781	0.974
	WCDMA IV	RMC 12.2Kbps	Bottom Side	5mm	ON	1413	1732.6	15.41	16.50	1.285	0.12	0.824	1.059
	WCDMA V	RMC 12.2Kbps	Front	5mm	ON	4182	836.4	22.18	23.50	1.355	-0.09	0.460	0.623
	WCDMA V	RMC 12.2Kbps	Back	5mm	ON	4182	836.4	22.18	23.50	1.355	0.08	0.700	0.949
	WCDMA V	RMC 12.2Kbps	Back	5mm	ON	4132	826.4	22.13	23.50	1.371	0.12	0.691	0.947
15	WCDMA V	RMC 12.2Kbps	Back	5mm	ON	4233	846.6	22.15	23.50	1.365	-0.05	0.710	0.969
	WCDMA V	RMC 12.2Kbps	Left Side	5mm	ON	4182	836.4	22.18	23.50	1.355	-0.1	0.291	0.394
	WCDMA V	RMC 12.2Kbps	Right Side	5mm	ON	4182	836.4	22.18	23.50	1.355	-0.02	0.164	0.222
	WCDMA V	RMC 12.2Kbps	Bottom Side	5mm	ON	4182	836.4	22.18	23.50	1.355	-0.16	0.289	0.392



<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	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 4	20M	QPSK	1	0	Front	5mm	ON	20175	1732.5	16.16	16.50	1.081	0.03	0.696	0.753
	LTE Band 4	20M	QPSK	50	0	Front	5mm	ON	20175	1732.5	15.70	16.50	1.202	0	0.693	0.833
	LTE Band 4	20M	QPSK	100	0	Front	5mm	ON	20175	1732.5	15.62	16.50	1.225	-0.15	0.734	0.899
	LTE Band 4	20M	QPSK	1	0	Back	5mm	ON	20175	1732.5	16.16	16.50	1.081	0.12	0.752	0.813
	LTE Band 4	20M	QPSK	50	0	Back	5mm	ON	20175	1732.5	15.70	16.50	1.202	0	0.755	0.908
	LTE Band 4	20M	QPSK	100	0	Back	5mm	ON	20175	1732.5	15.62	16.50	1.225	0.08	0.798	0.977
	LTE Band 4	20M	QPSK	1	0	Left Side	5mm	ON	20175	1732.5	16.16	16.50	1.081	-0.04	0.045	0.049
	LTE Band 4	20M	QPSK	50	0	Left Side	5mm	ON	20175	1732.5	15.70	16.50	1.202	-0.02	0.044	0.053
	LTE Band 4	20M	QPSK	1	0	Right Side	5mm	ON	20175	1732.5	16.16	16.50	1.081	0.07	0.087	0.094
	LTE Band 4	20M	QPSK	50	0	Right Side	5mm	ON	20175	1732.5	15.70	16.50	1.202	0.09	0.086	0.103
	LTE Band 4	20M	QPSK	1	0	Bottom Side	5mm	ON	20175	1732.5	16.16	16.50	1.081	-0.11	0.944	1.021
16	LTE Band 4	20M	QPSK	50	0	Bottom Side	5mm	ON	20175	1732.5	15.70	16.50	1.202	-0.05	0.963	1.158
	LTE Band 4	20M	QPSK	100	0	Bottom Side	5mm	ON	20175	1732.5	15.62	16.50	1.225	-0.12	0.936	1.146
	LTE Band 7_Main	20M	QPSK	1	0	Front	5mm	ON	21100	2535	17.24	18.00	1.191	-0.04	0.347	0.413
	LTE Band 7_Main	20M	QPSK	50	0	Front	5mm	ON	21100	2535	17.37	18.00	1.156	0.01	0.346	0.400
	LTE Band 7_Main	20M	QPSK	1	0	Back	5mm	ON	21100	2535	17.24	18.00	1.191	0.05	0.811	0.966
17	LTE Band 7_Main	20M	QPSK	1	0	Back	5mm	ON	20850	2510	17.16	18.00	1.213	0.13	0.838	1.017
	LTE Band 7_Main	20M	QPSK	1	0	Back	5mm	ON	21350	2560	17.19	18.00	1.205	0.07	0.816	0.983
	LTE Band 7_Main	20M	QPSK	50	0	Back	5mm	ON	21100	2535	17.37	18.00	1.156	0.07	0.849	0.982
	LTE Band 7_Main	20M	QPSK	50	0	Back	5mm	ON	20850	2510	17.33	18.00	1.167	0.02	0.844	0.985
	LTE Band 7_Main	20M	QPSK	50	0	Back	5mm	ON	21350	2560	17.33	18.00	1.167	0.11	0.851	0.993
	LTE Band 7_Main	20M	QPSK	100	0	Back	5mm	ON	21100	2535	17.32	18.00	1.169	-0.09	0.796	0.931
	LTE Band 7_Main	20M	QPSK	1	0	Right Side	5mm	ON	21100	2535	17.24	18.00	1.191	0.03	0.550	0.655
	LTE Band 7_Main	20M	QPSK	50	0	Right Side	5mm	ON	21100	2535	17.37	18.00	1.156	-0.01	0.546	0.631
	LTE Band 7_Main	20M	QPSK	1	0	Bottom Side	5mm	ON	21100	2535	17.24	18.00	1.191	-0.13	0.143	0.170
	LTE Band 7_Main	20M	QPSK	50	0	Bottom Side	5mm	ON	21100	2535	17.37	18.00	1.156	-0.19	0.138	0.160
	LTE Band 7_Aux	20M	QPSK	1	0	Front	5mm	ON	21100	2535	17.24	18.00	1.191	0.1	0.381	0.454
	LTE Band 7_Aux	20M	QPSK	50	0	Front	5mm	ON	21100	2535	17.37	18.00	1.156	0.15	0.384	0.444
	LTE Band 7_Aux	20M	QPSK	1	0	Back	5mm	ON	21100	2535	17.24	18.00	1.191	0.07	0.458	0.546
	LTE Band 7_Aux	20M	QPSK	50	0	Back	5mm	ON	21100	2535	17.37	18.00	1.156	-0.06	0.458	0.529
	LTE Band 7_Aux	20M	QPSK	1	0	Left Side	5mm	ON	21100	2535	17.24	18.00	1.191	-0.09	0.336	0.400
	LTE Band 7_Aux	20M	QPSK	50	0	Left Side	5mm	ON	21100	2535	17.37	18.00	1.156	-0.12	0.337	0.390
	LTE Band 7_Aux	20M	QPSK	1	0	Bottom Side	5mm	ON	21100	2535	17.24	18.00	1.191	-0.02	0.060	0.071
	LTE Band 7_Aux	20M	QPSK	50	0	Bottom Side	5mm	ON	21100	2535	17.37	18.00	1.156	-0.01	0.067	0.077
	LTE Band 12	10M	QPSK	1	49	Front	5mm	OFF	23095	707.5	22.53	24.00	1.403	-0.15	0.552	0.774
	LTE Band 12	10M	QPSK	25	0	Front	5mm	OFF	23095	707.5	21.59	23.00	1.384	-0.09	0.285	0.394
18	LTE Band 12	10M	QPSK	1	49	Back	5mm	OFF	23095	707.5	22.53	24.00	1.403	0.02	0.773	1.084
	LTE Band 12	10M	QPSK	25	0	Back	5mm	OFF	23095	707.5	21.59	23.00	1.384	0.03	0.398	0.551
	LTE Band 12	10M	QPSK	50	0	Back	5mm	OFF	23095	707.5	21.58	23.00	1.387	0.05	0.414	0.574
	LTE Band 12	10M	QPSK	1	49	Left Side	5mm	OFF	23095	707.5	22.53	24.00	1.403	-0.06	0.383	0.537
	LTE Band 12	10M	QPSK	25	0	Left Side	5mm	OFF	23095	707.5	21.59	23.00	1.384	-0.05	0.220	0.304
	LTE Band 12	10M	QPSK	1	49	Right Side	5mm	OFF	23095	707.5	22.53	24.00	1.403	-0.06	0.294	0.412
	LTE Band 12	10M	QPSK	25	0	Right Side	5mm	OFF	23095	707.5	21.59	23.00	1.384	-0.06	0.167	0.231
	LTE Band 12	10M	QPSK	1	49	Bottom Side	5mm	OFF	23095	707.5	22.53	24.00	1.403	-0.11	0.336	0.471
	LTE Band 12	10M	QPSK	25	0	Bottom Side	5mm	OFF	23095	707.5	21.59	23.00	1.384	-0.11	0.186	0.257



FCC SAR Test Report

Report No. : FA811821-07

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	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 26	15M	QPSK	1	37	Front	5mm	ON	26865	831.5	21.90	23.50	1.445	-0.15	0.560	0.809
	LTE Band 26	15M	QPSK	36	0	Front	5mm	ON	26865	831.5	21.82	23.50	1.472	-0.14	0.562	0.827
	LTE Band 26	15M	QPSK	75	0	Front	5mm	ON	26865	831.5	21.79	23.50	1.483	-0.12	0.561	0.832
	LTE Band 26	15M	QPSK	1	37	Back	5mm	ON	26865	831.5	21.90	23.50	1.445	0.12	0.788	1.139
19	LTE Band 26	15M	QPSK	36	0	Back	5mm	ON	26865	831.5	21.82	23.50	1.472	0.11	0.793	1.168
	LTE Band 26	15M	QPSK	75	0	Back	5mm	ON	26865	831.5	21.79	23.50	1.483	0.16	0.774	1.147
	LTE Band 26	15M	QPSK	1	37	Left Side	5mm	ON	26865	831.5	21.90	23.50	1.445	-0.05	0.284	0.411
	LTE Band 26	15M	QPSK	36	0	Left Side	5mm	ON	26865	831.5	21.82	23.50	1.472	-0.06	0.300	0.442
	LTE Band 26	15M	QPSK	1	37	Right Side	5mm	ON	26865	831.5	21.90	23.50	1.445	-0.03	0.181	0.262
	LTE Band 26	15M	QPSK	36	0	Right Side	5mm	ON	26865	831.5	21.82	23.50	1.472	-0.06	0.192	0.283
	LTE Band 26	15M	QPSK	1	37	Bottom Side	5mm	ON	26865	831.5	21.90	23.50	1.445	-0.18	0.352	0.509
	LTE Band 26	15M	QPSK	36	0	Bottom Side	5mm	ON	26865	831.5	21.82	23.50	1.472	-0.16	0.351	0.517

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 41_Main	20M	QPSK	1	99	Front	5mm	ON	40400	2571	19.52	20.00	1.117	62.9	1.006	0.03	0.478	0.537
	LTE Band 41_Main	20M	QPSK	50	50	Front	5mm	ON	40400	2571	19.50	20.00	1.122	62.9	1.006	0	0.485	0.547
	LTE Band 41_Main	20M	QPSK	1	99	Back	5mm	ON	40400	2571	19.52	20.00	1.117	62.9	1.006	0.11	0.837	0.940
	LTE Band 41_Main	20M	QPSK	1	99	Back	5mm	ON	40140	2545	19.40	20.00	1.148	62.9	1.006	0.12	0.779	0.900
20	LTE Band 41_Main	20M	QPSK	1	99	Back	5mm	ON	40670	2598	19.50	20.00	1.122	62.9	1.006	0.06	0.857	0.967
	LTE Band 41_Main	20M	QPSK	1	99	Back	5mm	ON	41140	2645	19.39	20.00	1.151	62.9	1.006	0.12	0.809	0.937
	LTE Band 41_Main	20M	QPSK	50	50	Back	5mm	ON	40400	2571	19.50	20.00	1.122	62.9	1.006	0.1	0.842	0.950
	LTE Band 41_Main	20M	QPSK	50	50	Back	5mm	ON	40140	2545	19.36	20.00	1.159	62.9	1.006	0.06	0.829	0.966
	LTE Band 41_Main	20M	QPSK	50	50	Back	5mm	ON	40670	2598	19.46	20.00	1.132	62.9	1.006	0.1	0.843	0.960
	LTE Band 41_Main	20M	QPSK	50	50	Back	5mm	ON	41140	2645	19.43	20.00	1.140	62.9	1.006	0.12	0.794	0.911
	LTE Band 41_Main	20M	QPSK	100	0	Back	5mm	ON	40400	2571	19.42	20.00	1.143	62.9	1.006	0.04	0.798	0.917
	LTE Band 41_Main	20M	QPSK	1	99	Right Side	5mm	ON	40400	2571	19.52	20.00	1.117	62.9	1.006	-0.03	0.675	0.758
	LTE Band 41_Main	20M	QPSK	1	99	Right Side	5mm	ON	40140	2545	19.40	20.00	1.148	62.9	1.006	0.02	0.742	0.857
	LTE Band 41_Main	20M	QPSK	1	99	Right Side	5mm	ON	40670	2598	19.50	20.00	1.122	62.9	1.006	-0.05	0.724	0.817
	LTE Band 41_Main	20M	QPSK	1	99	Right Side	5mm	ON	41140	2645	19.39	20.00	1.151	62.9	1.006	-0.04	0.711	0.823
	LTE Band 41_Main	20M	QPSK	50	50	Right Side	5mm	ON	40400	2571	19.50	20.00	1.122	62.9	1.006	-0.03	0.680	0.768
	LTE Band 41_Main	20M	QPSK	50	50	Right Side	5mm	ON	40140	2545	19.36	20.00	1.159	62.9	1.006	0.03	0.737	0.859
	LTE Band 41_Main	20M	QPSK	50	50	Right Side	5mm	ON	40670	2598	19.46	20.00	1.132	62.9	1.006	-0.07	0.748	0.852
	LTE Band 41_Main	20M	QPSK	50	50	Right Side	5mm	ON	41140	2645	19.43	20.00	1.140	62.9	1.006	-0.03	0.735	0.843
	LTE Band 41_Main	20M	QPSK	100	0	Right Side	5mm	ON	40400	2571	19.42	20.00	1.143	62.9	1.006	-0.03	0.701	0.806
	LTE Band 41_Main	20M	QPSK	1	99	Bottom Side	5mm	ON	40400	2571	19.52	20.00	1.117	62.9	1.006	-0.11	0.135	0.152
	LTE Band 41_Main	20M	QPSK	50	50	Bottom Side	5mm	ON	40400	2571	19.50	20.00	1.122	62.9	1.006	-0.01	0.141	0.159
	LTE Band 41_Aux	20M	QPSK	1	99	Front	5mm	ON	40400	2565	19.52	20.00	1.117	62.9	1.006	0.09	0.269	0.302
	LTE Band 41_Aux	20M	QPSK	50	50	Front	5mm	ON	40400	2565	19.50	20.00	1.122	62.9	1.006	0.09	0.272	0.307
	LTE Band 41_Aux	20M	QPSK	1	99	Back	5mm	ON	40400	2565	19.52	20.00	1.117	62.9	1.006	-0.13	0.577	0.648
	LTE Band 41_Aux	20M	QPSK	1	99	Back	5mm	ON	40140	2545	19.40	20.00	1.148	62.9	1.006	-0.17	0.552	0.638
	LTE Band 41_Aux	20M	QPSK	1	99	Back	5mm	ON	40670	2598	19.50	20.00	1.122	62.9	1.006	-0.17	0.586	0.661
	LTE Band 41_Aux	20M	QPSK	1	99	Back	5mm	ON	41140	2645	19.39	20.00	1.151	62.9	1.006	-0.04	0.604	0.699
	LTE Band 41_Aux	20M	QPSK	50	50	Back	5mm	ON	40400	2565	19.50	20.00	1.122	62.9	1.006	-0.14	0.580	0.655
	LTE Band 41_Aux	20M	QPSK	50	50	Back	5mm	ON	40140	2545	19.36	20.00	1.159	62.9	1.006	-0.1	0.560	0.653
	LTE Band 41_Aux	20M	QPSK	50	50	Back	5mm	ON	40670	2598	19.46	20.00	1.132	62.9	1.006	-0.13	0.597	0.680
	LTE Band 41_Aux	20M	QPSK	50	50	Back	5mm	ON	41400	2645	19.43	20.00	1.140	62.9	1.006	-0.09	0.546	0.626
	LTE Band 41_Aux	20M	QPSK	100	0	Back	5mm	ON	40400	2571	19.42	20.00	1.143	62.9	1.006	0	0.646	0.743
	LTE Band 41_Aux	20M	QPSK	1	99	Left Side	5mm	ON	40400	2571	19.52	20.00	1.117	62.9	1.006	-0.17	0.302	0.339
	LTE Band 41_Aux	20M	QPSK	50	50	Left Side	5mm	ON	40400	2571	19.50	20.00	1.122	62.9	1.006	-0.17	0.307	0.347
	LTE Band 41_Aux	20M	QPSK	1	99	Bottom Side	5mm	ON	40400	2571	19.52	20.00	1.117	62.9	1.006	0.18	0.055	0.062
	LTE Band 41_Aux	20M	QPSK	50	50	Bottom Side	5mm	ON	40400	2571	19.50	20.00	1.122	62.9	1.006	0.14	0.063	0.071

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14.3 Product Specific SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	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)
21	GSM1900	GPRS (3 Tx slots)	Bottom Side	0mm	OFF	810	1909.8	26.80	28.00	1.318	-0.04	0.725	0.956

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	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)
22	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	ON	9262	1852.4	22.75	23.00	1.059	-0.01	2.030	2.150
	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	ON	9400	1880	22.66	23.00	1.081	-0.01	1.950	2.109
	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	ON	9538	1907.6	22.71	23.00	1.069	-0.06	1.990	2.127
	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	ON	1513	1752.6	21.92	23.00	1.282	-0.01	2.190	2.808
	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	ON	1312	1712.4	21.85	23.00	1.303	-0.01	2.420	3.154
23	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	ON	1413	1732.6	21.81	23.00	1.315	-0.03	2.430	3.196

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	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)
24	LTE Band 4	20M	QPSK	1	0	Bottom Side	0mm	ON	20175	1732.5	21.50	23.00	1.413	-0.09	2.240	3.164
25	LTE Band 7_Main	20M	QPSK	1	99	Right Side	0mm	ON	21100	2535	21.37	22.00	1.156	-0.1	2.610	3.017
	LTE Band 7_Main	20M	QPSK	1	99	Right Side	0mm	ON	20850	2510	21.28	22.00	1.180	-0.09	2.550	3.010
	LTE Band 7_Main	20M	QPSK	1	99	Right Side	0mm	ON	21350	2560	21.33	22.00	1.167	-0.05	2.350	2.742

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
26	LTE Band 41_Main	20M	QPSK	1	49	Right Side	0mm	ON	40400	2571	23.91	24.00	1.021	62.9	1.006	-0.04	2.720	2.794
	LTE Band 41_Main	20M	QPSK	1	49	Right Side	0mm	ON	40140	2545	23.76	24.00	1.057	62.9	1.006	-0.03	2.580	2.743
	LTE Band 41_Main	20M	QPSK	1	49	Right Side	0mm	ON	40670	2598	23.87	24.00	1.030	62.9	1.006	-0.03	2.690	2.788
	LTE Band 41_Main	20M	QPSK	1	49	Right Side	0mm	ON	41140	2645	23.74	24.00	1.062	62.9	1.006	-0.01	2.560	2.734

14.4 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS (2 Tx slots)	Front	5mm	OFF	251	848.8	31.67	32.00	1.079	0.01	0.325	0.351
27	GSM850	GPRS (2 Tx slots)	Back	5mm	OFF	251	848.8	31.67	32.00	1.079	-0.05	0.475	0.512
	GSM1900	GPRS (3 Tx slots)	Front	5mm	ON	810	1909.8	24.24	24.50	1.062	-0.04	0.922	0.979
	GSM1900	GPRS (3 Tx slots)	Front	5mm	ON	512	1850.2	24.01	24.50	1.119	-0.04	0.864	0.967
	GSM1900	GPRS (3 Tx slots)	Front	5mm	ON	661	1880	24.21	24.50	1.069	-0.04	0.902	0.964
28	GSM1900	GPRS (3 Tx slots)	Back	5mm	ON	810	1909.8	24.24	24.50	1.062	0.09	1.030	1.094
	GSM1900	GPRS (3 Tx slots)	Back	5mm	ON	512	1850.2	24.01	24.50	1.119	0.09	0.974	1.090
	GSM1900	GPRS (3 Tx slots)	Back	5mm	ON	661	1880	24.21	24.50	1.069	0.09	0.992	1.061

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	5mm	ON	9262	1852.4	16.75	17.50	1.189	-0.02	0.773	0.919
	WCDMA II	RMC 12.2Kbps	Front	5mm	ON	9400	1880	16.67	17.50	1.211	-0.12	0.735	0.890
	WCDMA II	RMC 12.2Kbps	Front	5mm	ON	9538	1907.6	16.72	17.50	1.197	-0.17	0.751	0.899
	WCDMA II	RMC 12.2Kbps	Back	5mm	ON	9262	1852.4	16.75	17.50	1.189	-0.13	0.853	1.014
	WCDMA II	RMC 12.2Kbps	Back	5mm	ON	9400	1880	16.67	17.50	1.211	-0.08	0.852	1.031
29	WCDMA II	RMC 12.2Kbps	Back	5mm	ON	9538	1907.6	16.72	17.50	1.197	0.09	0.882	1.056
	WCDMA IV	RMC 12.2Kbps	Front	5mm	ON	1513	1752.6	15.62	17.00	1.374	-0.04	0.737	1.013
	WCDMA IV	RMC 12.2Kbps	Front	5mm	ON	1312	1712.4	15.54	17.00	1.400	-0.09	0.626	0.876
	WCDMA IV	RMC 12.2Kbps	Front	5mm	ON	1413	1732.6	15.41	17.00	1.442	-0.11	0.642	0.926
30	WCDMA IV	RMC 12.2Kbps	Back	5mm	ON	1513	1752.6	15.62	17.00	1.374	0.18	0.774	1.064
	WCDMA IV	RMC 12.2Kbps	Back	5mm	ON	1312	1712.4	15.54	17.00	1.400	-0.05	0.611	0.855
	WCDMA IV	RMC 12.2Kbps	Back	5mm	ON	1413	1732.6	15.41	17.00	1.442	0.02	0.646	0.932
	WCDMA V	RMC 12.2Kbps	Front	5mm	ON	4182	836.4	22.18	23.50	1.355	-0.09	0.460	0.623
	WCDMA V	RMC 12.2Kbps	Back	5mm	ON	4182	836.4	22.18	23.50	1.355	0.08	0.700	0.949
	WCDMA V	RMC 12.2Kbps	Back	5mm	ON	4132	826.4	22.13	23.50	1.371	0.12	0.691	0.947
31	WCDMA V	RMC 12.2Kbps	Back	5mm	ON	4233	846.6	22.15	23.50	1.365	-0.05	0.710	0.969



<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	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 4	20M	QPSK	1	0	Front	5mm	ON	20175	1732.5	16.16	17.00	1.213	0.03	0.696	0.845
	LTE Band 4	20M	QPSK	50	0	Front	5mm	ON	20175	1732.5	15.70	17.00	1.349	0	0.693	0.935
	LTE Band 4	20M	QPSK	100	0	Front	5mm	ON	20175	1732.5	15.62	17.00	1.374	-0.15	0.734	1.009
	LTE Band 4	20M	QPSK	1	0	Back	5mm	ON	20175	1732.5	16.16	17.00	1.213	0.12	0.752	0.912
	LTE Band 4	20M	QPSK	50	0	Back	5mm	ON	20175	1732.5	15.70	17.00	1.349	0	0.755	1.018
32	LTE Band 4	20M	QPSK	100	0	Back	5mm	ON	20175	1732.5	15.62	17.00	1.374	0.08	0.798	1.096
	LTE Band 7_Main	20M	QPSK	1	0	Front	5mm	ON	21100	2535	17.24	18.00	1.191	-0.04	0.347	0.413
	LTE Band 7_Main	20M	QPSK	50	0	Front	5mm	ON	21100	2535	17.37	18.00	1.156	0.01	0.346	0.400
	LTE Band 7_Main	20M	QPSK	1	0	Back	5mm	ON	21100	2535	17.24	18.00	1.191	0.05	0.811	0.966
33	LTE Band 7_Main	20M	QPSK	1	0	Back	5mm	ON	20850	2510	17.16	18.00	1.213	0.13	0.838	1.017
	LTE Band 7_Main	20M	QPSK	1	0	Back	5mm	ON	21350	2560	17.19	18.00	1.205	0.07	0.816	0.983
	LTE Band 7_Main	20M	QPSK	50	0	Back	5mm	ON	21100	2535	17.37	18.00	1.156	0.07	0.849	0.982
	LTE Band 7_Main	20M	QPSK	50	0	Back	5mm	ON	20850	2510	17.33	18.00	1.167	0.02	0.844	0.985
	LTE Band 7_Main	20M	QPSK	50	0	Back	5mm	ON	21350	2560	17.33	18.00	1.167	0.11	0.851	0.993
	LTE Band 7_Main	20M	QPSK	100	0	Back	5mm	ON	21100	2535	17.32	18.00	1.169	-0.09	0.796	0.931
	LTE Band 7_Aux	20M	QPSK	1	0	Front	5mm	ON	21100	2535	17.24	18.00	1.191	0.1	0.381	0.454
	LTE Band 7_Aux	20M	QPSK	50	0	Front	5mm	ON	21100	2535	17.37	18.00	1.156	0.15	0.384	0.444
	LTE Band 7_Aux	20M	QPSK	1	0	Back	5mm	ON	21100	2535	17.24	18.00	1.191	0.07	0.458	0.546
	LTE Band 7_Aux	20M	QPSK	50	0	Back	5mm	ON	21100	2535	17.37	18.00	1.156	-0.06	0.458	0.529
	LTE Band 12	10M	QPSK	1	49	Front	5mm	OFF	23095	707.5	22.53	24.00	1.403	-0.15	0.552	0.774
	LTE Band 12	10M	QPSK	25	0	Front	5mm	OFF	23095	707.5	21.59	23.00	1.384	-0.09	0.285	0.394
34	LTE Band 12	10M	QPSK	1	49	Back	5mm	OFF	23095	707.5	22.53	24.00	1.403	0.02	0.773	1.084
	LTE Band 12	10M	QPSK	25	0	Back	5mm	OFF	23095	707.5	21.59	23.00	1.384	0.03	0.398	0.551
	LTE Band 12	10M	QPSK	50	0	Back	5mm	OFF	23095	707.5	21.58	23.00	1.387	0.05	0.414	0.574
	LTE Band 26	15M	QPSK	1	37	Front	5mm	ON	26865	831.5	21.90	23.50	1.445	-0.15	0.560	0.809
	LTE Band 26	15M	QPSK	36	0	Front	5mm	ON	26865	831.5	21.82	23.50	1.472	-0.14	0.562	0.827
	LTE Band 26	15M	QPSK	1	37	Back	5mm	ON	26865	831.5	21.90	23.50	1.445	0.12	0.788	1.139
35	LTE Band 26	15M	QPSK	36	0	Back	5mm	ON	26865	831.5	21.82	23.50	1.472	0.11	0.793	1.168
	LTE Band 26	15M	QPSK	75	0	Back	5mm	ON	26865	831.5	21.79	23.50	1.483	0.16	0.774	1.147



<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 41_Main	20M	QPSK	1	99	Front	5mm	ON	40400	2571	19.52	20.00	1.117	62.9	1.006	0.03	0.478	0.537
	LTE Band 41_Main	20M	QPSK	50	50	Front	5mm	ON	40400	2571	19.50	20.00	1.122	62.9	1.006	0	0.485	0.547
	LTE Band 41_Main	20M	QPSK	1	99	Back	5mm	ON	40400	2571	19.52	20.00	1.117	62.9	1.006	0.11	0.837	0.940
	LTE Band 41_Main	20M	QPSK	1	99	Back	5mm	ON	40140	2545	19.40	20.00	1.148	62.9	1.006	0.12	0.779	0.900
36	LTE Band 41_Main	20M	QPSK	1	99	Back	5mm	ON	40670	2598	19.50	20.00	1.122	62.9	1.006	0.06	0.857	0.967
	LTE Band 41_Main	20M	QPSK	1	99	Back	5mm	ON	41140	2645	19.39	20.00	1.151	62.9	1.006	0.12	0.809	0.937
	LTE Band 41_Main	20M	QPSK	50	50	Back	5mm	ON	40400	2571	19.50	20.00	1.122	62.9	1.006	0.1	0.842	0.950
	LTE Band 41_Main	20M	QPSK	50	50	Back	5mm	ON	40140	2545	19.36	20.00	1.159	62.9	1.006	0.06	0.829	0.966
	LTE Band 41_Main	20M	QPSK	50	50	Back	5mm	ON	40670	2598	19.46	20.00	1.132	62.9	1.006	0.1	0.843	0.960
	LTE Band 41_Main	20M	QPSK	50	50	Back	5mm	ON	41140	2645	19.43	20.00	1.140	62.9	1.006	0.12	0.794	0.911
	LTE Band 41_Main	20M	QPSK	100	0	Back	5mm	ON	40400	2571	19.42	20.00	1.143	62.9	1.006	0.04	0.798	0.917
	LTE Band 41_Aux	20M	QPSK	1	99	Front	5mm	ON	40400	2565	19.52	20.00	1.117	62.9	1.006	0.09	0.269	0.302
	LTE Band 41_Aux	20M	QPSK	50	50	Front	5mm	ON	40400	2565	19.50	20.00	1.122	62.9	1.006	0.09	0.272	0.307
	LTE Band 41_Aux	20M	QPSK	1	99	Back	5mm	ON	40400	2565	19.52	20.00	1.117	62.9	1.006	-0.13	0.577	0.648
	LTE Band 41_Aux	20M	QPSK	1	99	Back	5mm	ON	40140	2545	19.40	20.00	1.148	62.9	1.006	-0.17	0.552	0.638
	LTE Band 41_Aux	20M	QPSK	1	99	Back	5mm	ON	40670	2598	19.50	20.00	1.122	62.9	1.006	-0.17	0.586	0.661
	LTE Band 41_Aux	20M	QPSK	1	99	Back	5mm	ON	41140	2645	19.39	20.00	1.151	62.9	1.006	-0.04	0.604	0.699
	LTE Band 41_Aux	20M	QPSK	50	50	Back	5mm	ON	40400	2565	19.50	20.00	1.122	62.9	1.006	-0.14	0.580	0.655
	LTE Band 41_Aux	20M	QPSK	50	50	Back	5mm	ON	40140	2545	19.36	20.00	1.159	62.9	1.006	-0.1	0.560	0.653
	LTE Band 41_Aux	20M	QPSK	50	50	Back	5mm	ON	40670	2598	19.46	20.00	1.132	62.9	1.006	-0.13	0.597	0.680
	LTE Band 41_Aux	20M	QPSK	50	50	Back	5mm	ON	41400	2645	19.43	20.00	1.140	62.9	1.006	-0.09	0.546	0.626
	LTE Band 41_Aux	20M	QPSK	100	0	Back	5mm	ON	40400	2571	19.42	20.00	1.143	62.9	1.006	0	0.646	0.743

14.5 Repeated SAR Measurement

No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 4	20M_QPSK_50_0	Bottom Side	5mm	ON	20175	1732.5	15.70	16.50	1.202	-	-	-0.05	0.963	-	1.158
2nd	LTE Band 4	20M_QPSK_50_0	Bottom Side	5mm	ON	20175	1732.5	15.70	16.50	1.202	-	-	-0.03	0.934	1.03	1.123
1st	LTE Band 41_Main	20M_QPSK_1_99	Back	5mm	ON	40670	2598	19.50	20.00	1.122	62.9	1.006	0.06	0.857	-	0.967
2nd	LTE Band 41_Main	20M_QPSK_1_99	Back	5mm	ON	40670	2598	19.50	20.00	1.122	62.9	1.006	0.1	0.852	1.01	0.962
1st	GSM1900	GPRS (3 Tx slots)	Back	5mm	ON	810	1909.8	24.24	24.50	1.062	-	-	0.09	1.030	-	1.094
2nd	GSM1900	GPRS (3 Tx slots)	Back	5mm	ON	810	1909.8	24.24	24.50	1.062	-	-	0.09	0.996	1.04	1.057

No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Ratio	Reported 10g SAR (W/kg)
1st	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	ON	9262	1852.4	22.75	23.00	1.059	-	-	-0.01	2.030	-	2.150
2nd	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	ON	9262	1852.4	22.75	23.00	1.059	-	-	-0.02	2.020	1.00	2.140
1st	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	ON	1413	1732.6	21.81	23.00	1.315	-	-	-0.03	2.430	-	3.196
2nd	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	ON	1413	1732.6	21.81	23.00	1.315	-	-	-0.18	2.320	1.05	3.051
1st	LTE Band 7_Main	20M_QPSK_1_99	Right Side	0mm	ON	21100	2535	21.37	22.00	1.156	-	-	-0.1	2.610	-	3.017
2nd	LTE Band 7_Main	20M_QPSK_1_99	Right Side	0mm	ON	21100	2535	21.37	22.00	1.156	-	-	-0.06	2.550	1.02	2.948
1st	LTE Band 41_Main	20M_QPSK_1_49	Right Side	0mm	ON	40400	2571	23.91	24.00	1.021	62.9	1.006	-0.04	2.720	-	2.794
2nd	LTE Band 41_Main	20M_QPSK_1_49	Right Side	0mm	ON	40400	2571	23.91	24.00	1.021	62.9	1.006	-0.1	2.700	1.01	2.773

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*.



14.6 Spot Check Verification Data

<Head Exposure Condition>

Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Original Model					Spot Check Mode					Deviation
						Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	
WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	11	2462	16.94	18.00	95.05	0.836	1.123	16.41	18.00	98.89	0.745	1.086	-3.2%
WLAN5GHz	802.11a 6Mbps	Right Cheek	0mm	60	5300	16.43	16.50	94.98	0.855	0.914	16.20	16.50	93.58	0.713	0.817	-10.6%
WLAN5GHz	802.11a 6Mbps	Right Cheek	0mm	100	5500	16.48	16.50	94.98	1.080	1.142	16.15	16.50	93.58	0.796	0.923	-19.2%
WLAN5GHz	802.11a 6Mbps	Right Cheek	0mm	165	5825	16.49	16.50	94.98	0.911	0.961	16.35	16.50	93.58	0.778	0.861	-10.3%
Bluetooth	1Mbps	Right Cheek	0mm	0	2402	12.26	13.00		0.220	0.261	12.95	13.00		0.242	0.245	-6.2%

<Hotspot Exposure Condition>

Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Original Model					Spot Check Mode					Deviation
						Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	
WLAN2.4GHz	802.11b 1Mbps	Left Side	5mm	6	2437	18.97	19.00	98.89	0.829	0.844	18.98	19.00	98.89	0.971	0.986	16.9%
WLAN5GHz	802.11a 6Mbps	Left Side	5mm	36	5180	16.95	17.00	94.98	0.621	0.661	16.98	17.00	93.58	0.711	0.752	13.8%
WLAN5GHz	802.11a 6Mbps	Left Side	5mm	149	5745	16.94	17.00	94.98	0.882	0.941	16.96	17.00	93.58	0.698	0.753	-20.0%
Bluetooth	1Mbps	Left Side	5mm	0	2402	12.26	13.00		0.135	0.160	12.95	13.00		0.143	0.145	-9.6%

<Body-worn Exposure Condition>

Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Original Model					Spot Check Mode					Deviation
						Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	
WLAN2.4GHz	802.11b 1Mbps	Back	5mm	6	2437	18.97	19.00	98.89	0.784	0.798	18.98	19.00	98.89	0.747	0.759	-4.9%
WLAN5GHz	802.11a 6Mbps	Back	5mm	52	5260	16.95	17.00	94.98	0.502	0.534	16.98	17.00	93.58	0.596	0.630	18.0%
WLAN5GHz	802.11a 6Mbps	Back	5mm	100	5500	16.71	17.00	94.98	0.657	0.739	16.87	17.00	93.58	0.719	0.792	7.2%
WLAN5GHz	802.11a 6Mbps	Back	5mm	149	5745	16.96	17.00	94.98	0.648	0.688	16.96	17.00	93.58	0.609	0.657	-4.5%
Bluetooth	1Mbps	Back	5mm	0	2402	12.26	13.00		0.103	0.122	12.95	13.00		0.099	0.100	-18.0%

<Product Specific Exposure Condition>

Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Original Model					Spot Check Mode					Deviation
						Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)	Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)	
WLAN5GHz	802.11a 6Mbps	Left Side	0mm	52	5260	16.88	17.00	94.98	0.781	0.845	16.92	17.00	93.58	0.812	0.871	3.0%
WLAN5GHz	802.11a 6Mbps	Left Side	0mm	100	5500	16.71	17.00	94.98	0.860	0.968	16.87	17.00	93.58	0.770	0.848	-12.4%

15. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Portable Handset			
		Head	Body-worn	Hotspot	Product Specific
1.	GSM Voice + WLAN2.4GHz	Yes	Yes		Yes
2.	GPRS/EDGE + WLAN2.4GHz	Yes	Yes	Yes	Yes
3.	WCDMA + WLAN2.4GHz	Yes	Yes	Yes	Yes
4.	LTE + WLAN2.4GHz	Yes	Yes	Yes	Yes
5.	GSM Voice + Bluetooth	Yes	Yes		Yes
6.	GPRS/EDGE + Bluetooth	Yes	Yes	Yes	Yes
7.	WCDMA+ Bluetooth	Yes	Yes	Yes	Yes
8.	LTE + Bluetooth	Yes	Yes	Yes	Yes
9.	GSM Voice + WLAN5GHz	Yes	Yes		Yes
10.	GPRS/EDGE + WLAN5GHz	Yes	Yes	Yes	Yes
11.	WCDMA + WLAN5GHz	Yes	Yes	Yes	Yes
12.	LTE + WLAN5GHz	Yes	Yes	Yes	Yes

General Note:

- The IHDT56XE3 has the identical design as IHDT56XE2 on 2.4GHz WLAN / Bluetooth and 5GHz WLAN. Therefore, these transmitters test result is used in this report to be performed simultaneous transmission analysis.
- This device WLAN 2.4GHz / 5.2GHz / 5.8GHz supports Hotspot operation and Bluetooth support tethering applications.
- WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
- EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
- The Scaled SAR summation is calculated based on the same configuration and test position.
- Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
 - Scalar SAR summation < 1.6W/kg.
 - $SPLSR = (SAR1 + SAR2)^{1.5} / (\min. \text{ separation distance, mm})$, 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.
 - If $SPLSR \leq 0.04$, simultaneously transmission SAR measurement is not necessary.
 - Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.
 - The SPLSR calculated results please refer to section 15.5.



15.1 Head Exposure Conditions

WWAN Band		Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	SPLSR	Case No
			WWAN 1g SAR (W/kg)	2.4GHz WLAN 1g SAR (W/kg)	5GHz WLAN 1g SAR (W/kg)	Bluetooth 1g SAR (W/kg)					
GSM	GSM850	Right Cheek	0.097	1.123	1.142	0.261	1.220	1.239	0.358		
		Right Tilted	0.059	0.627	0.734	0.157	0.686	0.793	0.216		
		Left Cheek	0.216	0.317	0.361	0.077	0.533	0.577	0.293		
		Left Tilted	0.066	0.326	0.203	0.077	0.392	0.269	0.143		
	GSM1900	Right Cheek	0.170	1.123	1.142	0.261	1.293	1.312	0.431		
		Right Tilted	0.047	0.627	0.734	0.157	0.674	0.781	0.204		
		Left Cheek	0.100	0.317	0.361	0.077	0.417	0.461	0.177		
		Left Tilted	0.084	0.326	0.203	0.077	0.410	0.287	0.161		
WCDMA	WCDMA II	Right Cheek	0.251	1.123	1.142	0.261	1.374	1.393	0.512		
		Right Tilted	0.087	0.627	0.734	0.157	0.714	0.821	0.244		
		Left Cheek	0.144	0.317	0.361	0.077	0.461	0.505	0.221		
		Left Tilted	0.123	0.326	0.203	0.077	0.449	0.326	0.200		
	WCDMA IV	Right Cheek	0.312	1.123	1.142	0.261	1.435	1.454	0.573		
		Right Tilted	0.106	0.627	0.734	0.157	0.733	0.840	0.263		
		Left Cheek	0.173	0.317	0.361	0.077	0.490	0.534	0.250		
		Left Tilted	0.111	0.326	0.203	0.077	0.437	0.314	0.188		
	WCDMA V	Right Cheek	0.252	1.123	1.142	0.261	1.375	1.394	0.513		
		Right Tilted	0.149	0.627	0.734	0.157	0.776	0.883	0.306		
		Left Cheek	0.354	0.317	0.361	0.077	0.671	0.715	0.431		
		Left Tilted	0.160	0.326	0.203	0.077	0.486	0.363	0.237		
LTE	LTE Band 4	Right Cheek	0.297	1.123	1.142	0.261	1.420	1.439	0.558		
		Right Tilted	0.098	0.627	0.734	0.157	0.725	0.832	0.255		
		Left Cheek	0.164	0.317	0.361	0.077	0.481	0.525	0.241		
		Left Tilted	0.066	0.326	0.203	0.077	0.392	0.269	0.143		
	LTE Band 7_Main	Right Cheek	0.775	1.123	1.142	0.261	1.898	1.917	1.036	0.02	Case 1
		Right Tilted	0.335	0.627	0.734	0.157	0.962	1.069	0.492		
		Left Cheek	0.424	0.317	0.361	0.077	0.741	0.785	0.501		
		Left Tilted	0.446	0.326	0.203	0.077	0.772	0.649	0.523		
	LTE Band 7_Aux	Right Cheek	0.224	1.123	1.142	0.261	1.347	1.366	0.485		
		Right Tilted	0.376	0.627	0.734	0.157	1.003	1.110	0.533		
		Left Cheek	0.523	0.317	0.361	0.077	0.840	0.884	0.600		
		Left Tilted	0.214	0.326	0.203	0.077	0.540	0.417	0.291		
	LTE Band 12	Right Cheek	0.255	1.123	1.142	0.261	1.378	1.397	0.516		
		Right Tilted	0.143	0.627	0.734	0.157	0.770	0.877	0.300		
		Left Cheek	0.290	0.317	0.361	0.077	0.607	0.651	0.367		
		Left Tilted	0.115	0.326	0.203	0.077	0.441	0.318	0.192		
	LTE Band 26	Right Cheek	0.300	1.123	1.142	0.261	1.423	1.442	0.561		
		Right Tilted	0.128	0.627	0.734	0.157	0.755	0.862	0.285		
		Left Cheek	0.385	0.317	0.361	0.077	0.702	0.746	0.462		
		Left Tilted	0.172	0.326	0.203	0.077	0.498	0.375	0.249		
	LTE Band 41_Main	Right Cheek	0.748	1.123	1.142	0.261	1.871	1.890	1.009	0.02	Case 2
		Right Tilted	0.308	0.627	0.734	0.157	0.935	1.042	0.465		
		Left Cheek	0.156	0.317	0.361	0.077	0.473	0.517	0.233		
		Left Tilted	0.286	0.326	0.203	0.077	0.612	0.489	0.363		
	LTE Band 41_Aux	Right Cheek	0.135	1.123	1.142	0.261	1.258	1.277	0.396		
		Right Tilted	0.194	0.627	0.734	0.157	0.821	0.928	0.351		
		Left Cheek	0.319	0.317	0.361	0.077	0.636	0.680	0.396		
		Left Tilted	0.201	0.326	0.203	0.077	0.527	0.404	0.278		



15.2 Hotspot Exposure Conditions

WWAN Band		Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	SPLSR	Case No
			WWAN 1g SAR (W/kg)	2.4GHz WLAN 1g SAR (W/kg)	5GHz WLAN 1g SAR (W/kg)	Bluetooth 1g SAR (W/kg)					
GSM	GSM850	Front	0.351	0.441	0.670	0.090	0.792	1.021	0.441		
		Back	0.512	0.798	0.688	0.122	1.310	1.200	0.634		
		Left side	0.240	0.844	0.941	0.160	1.084	1.181	0.400		
		Right side	0.053				0.053	0.053	0.053		
		Top side		0.155	0.097	0.034	0.155	0.097	0.034		
		Bottom side	0.269				0.269	0.269	0.269		
	GSM1900	Front	0.702	0.441	0.670	0.090	1.143	1.372	0.792		
		Back	0.784	0.798	0.688	0.122	1.582	1.472	0.906		
		Left side	0.040	0.844	0.941	0.160	0.884	0.981	0.200		
		Right side	0.318				0.318	0.318	0.318		
		Top side		0.155	0.097	0.034	0.155	0.097	0.034		
		Bottom side	1.168				1.168	1.168	1.168		
WCDMA	WCDMA II	Front	0.630	0.441	0.670	0.090	1.071	1.300	0.720		
		Back	0.677	0.798	0.688	0.122	1.475	1.365	0.799		
		Left side	0.027	0.844	0.941	0.160	0.871	0.968	0.187		
		Right side	0.082				0.082	0.082	0.082		
		Top side		0.155	0.097	0.034	0.155	0.097	0.034		
		Bottom side	1.032				1.032	1.032	1.032		
	WCDMA IV	Front	0.903	0.441	0.670	0.090	1.344	1.573	0.993		
		Back	0.948	0.798	0.688	0.122	1.746	1.636	1.070	0.02	Case 3
		Left side	0.054	0.844	0.941	0.160	0.898	0.995	0.214		
		Right side	0.103				0.103	0.103	0.103		
		Top side		0.155	0.097	0.034	0.155	0.097	0.034		
		Bottom side	1.108				1.108	1.108	1.108		
	WCDMA V	Front	0.623	0.441	0.670	0.090	1.064	1.293	0.713		
		Back	0.969	0.798	0.688	0.122	1.767	1.657	1.091	0.02	Case 4
		Left side	0.394	0.844	0.941	0.160	1.238	1.335	0.554		
		Right side	0.222				0.222	0.222	0.222		
		Top side		0.155	0.097	0.034	0.155	0.097	0.034		
		Bottom side	0.392				0.392	0.392	0.392		



WWAN Band		Exposure Position	1	2	3	4	1+2	1+3	1+4	SPLSR	Case No
			WWAN 1g SAR (W/kg)	2.4GHz WLAN 1g SAR (W/kg)	5GHz WLAN 1g SAR (W/kg)	Bluetooth 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)		
LTE	LTE Band 4	Front	0.899	0.441	0.670	0.090	1.340	1.569	0.989		
		Back	0.977	0.798	0.688	0.122	1.775	1.665	1.099	0.02	Case 5
		Left side	0.053	0.844	0.941	0.160	0.897	0.994	0.213		
		Right side	0.103				0.103	0.103	0.103		
		Top side		0.155	0.097	0.034	0.155	0.097	0.034		
		Bottom side	1.158				1.158	1.158	1.158		
	LTE Band 7_Main	Front	0.413	0.441	0.670	0.090	0.854	1.083	0.503		
		Back	1.017	0.798	0.688	0.122	1.815	1.705	1.139	0.02	Case 6
		Left side		0.844	0.941	0.160	0.844	0.941	0.160		
		Right side	0.655				0.655	0.655	0.655		
		Top side		0.155	0.097	0.034	0.155	0.097	0.034		
		Bottom side	0.170				0.170	0.170	0.170		
	LTE Band 7_Aux	Front	0.454	0.441	0.670	0.090	0.895	1.124	0.544		
		Back	0.546	0.798	0.688	0.122	1.344	1.234	0.668		
		Left side	0.400	0.844	0.941	0.160	1.244	1.341	0.560		
		Right side					0.000	0.000	0.000		
		Top side		0.155	0.097	0.034	0.155	0.097	0.034		
		Bottom side	0.077				0.077	0.077	0.077		
	LTE Band 12	Front	0.774	0.441	0.670	0.090	1.215	1.444	0.864		
		Back	1.084	0.798	0.688	0.122	1.882	1.772	1.206	0.02	Case 7
		Left side	0.537	0.844	0.941	0.160	1.381	1.478	0.697		
		Right side	0.412				0.412	0.412	0.412		
		Top side		0.155	0.097	0.034	0.155	0.097	0.034		
		Bottom side	0.471				0.471	0.471	0.471		
	LTE Band 26	Front	0.832	0.441	0.670	0.090	1.273	1.502	0.922		
		Back	1.168	0.798	0.688	0.122	1.966	1.856	1.290	0.02	Case 8
		Left side	0.442	0.844	0.941	0.160	1.286	1.383	0.602		
		Right side	0.283				0.283	0.283	0.283		
		Top side		0.155	0.097	0.034	0.155	0.097	0.034		
		Bottom side	0.517				0.517	0.517	0.517		
	LTE Band 41_Main	Front	0.547	0.441	0.670	0.090	0.988	1.217	0.637		
		Back	0.967	0.798	0.688	0.122	1.765	1.655	1.089	0.02	Case 9
		Left side		0.844	0.941	0.160	0.844	0.941	0.160		
		Right side	0.859				0.859	0.859	0.859		
		Top side		0.155	0.097	0.034	0.155	0.097	0.034		
		Bottom side	0.159				0.159	0.159	0.159		
	LTE Band 41_Aux	Front	0.307	0.441	0.670	0.090	0.748	0.977	0.397		
		Back	0.743	0.798	0.688	0.122	1.541	1.431	0.865		
		Left side	0.347	0.844	0.941	0.160	1.191	1.288	0.507		
		Right side					0.000	0.000	0.000		
		Top side		0.155	0.097	0.034	0.155	0.097	0.034		
		Bottom side	0.071				0.071	0.071	0.071		

15.3 Product Specific Exposure Conditions

Remark:

- According to KDB 941225 D06 v02r01 and KDB 648474 D04v01r03, for WWAN / 2.4GHz WLAN / Bluetooth and 5GHz WLAN SAR was excluded, due to transmitting antenna located larger 25mm from that surface or edge and Hotspot SAR was < 1.2W/Kg.

WWAN Band		Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)
			WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth			
			10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)			
GSM	GSM1900	Front			0.408			0.408	
		Back			0.317			0.317	
		Left side			0.967			0.967	
		Right side							
		Top side			0.141			0.141	
		Bottom side	0.956				0.956	0.956	0.956
WCDMA	WCDMA II	Front			0.408			0.408	
		Back			0.317			0.317	
		Left side			0.967			0.967	
		Right side							
		Top side			0.141			0.141	
		Bottom side	2.150				2.150	2.150	2.150
	WCDMA IV	Front			0.408			0.408	
		Back			0.317			0.317	
		Left side			0.967			0.967	
		Right side							
		Top side			0.141			0.141	
		Bottom side	3.196				3.196	3.196	3.196
LTE	LTE Band 4	Front			0.408			0.408	
		Back			0.317			0.317	
		Left side			0.967			0.967	
		Right side							
		Top side			0.141			0.141	
		Bottom side	3.164				3.164	3.164	3.164
	LTE Band 7_Main	Front			0.408			0.408	
		Back			0.317			0.317	
		Left side			0.967			0.967	
		Right side	3.017				3.017	3.017	3.017
		Top side			0.141			0.141	
		Bottom side							
	LTE Band 41_Main	Front			0.408			0.408	
		Back			0.317			0.317	
		Left side			0.967			0.967	
		Right side	2.794				2.794	2.794	2.794
		Top side			0.141			0.141	
		Bottom side							



15.4 Body-Worn Accessory Exposure Conditions

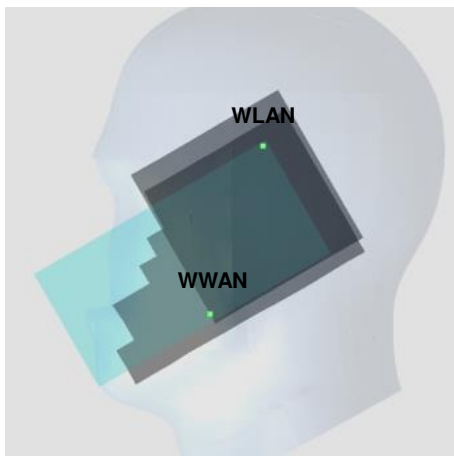
WWAN Band		Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	SPLSR	Case No
			WWAN 1g SAR (W/kg)	2.4GHz WLAN 1g SAR (W/kg)	5GHz WLAN 1g SAR (W/kg)	Bluetooth 1g SAR (W/kg)					
GSM	GSM850	Front	0.351	0.441	0.670	0.090	0.792	1.021	0.441		
		Back	0.512	0.798	0.739	0.122	1.310	1.251	0.634		
	GSM1900	Front	0.979	0.441	0.670	0.090	1.420	1.649	1.069	0.01	Case 10
		Back	1.094	0.798	0.739	0.122	1.892	1.833	1.216	0.02	Case 11
WCDMA	WCDMA II	Front	0.919	0.441	0.670	0.090	1.360	1.589	1.009		
		Back	1.056	0.798	0.739	0.122	1.854	1.795	1.178	0.02	Case 12
	WCDMA IV	Front	1.013	0.441	0.670	0.090	1.454	1.683	1.103	0.01	Case 13
		Back	1.064	0.798	0.739	0.122	1.862	1.803	1.186	0.02	Case 14
	WCDMA V	Front	0.623	0.441	0.670	0.090	1.064	1.293	0.713		
		Back	0.969	0.798	0.739	0.122	1.767	1.708	1.091	0.02	Case 15
LTE	LTE Band 4	Front	1.009	0.441	0.670	0.090	1.450	1.679	1.099	0.01	Case 16
		Back	1.096	0.798	0.739	0.122	1.894	1.835	1.218	0.02	Case 17
	LTE Band 7_Main	Front	0.413	0.441	0.670	0.090	0.854	1.083	0.503		
		Back	1.017	0.798	0.739	0.122	1.815	1.756	1.139	0.02	Case 6
	LTE Band 7_Aux	Front	0.454	0.441	0.670	0.090	0.895	1.124	0.544		
		Back	0.546	0.798	0.739	0.122	1.344	1.285	0.668		
	LTE Band 12	Front	0.774	0.441	0.670	0.090	1.215	1.444	0.864		
		Back	1.084	0.798	0.739	0.122	1.882	1.823	1.206	0.02	Case 7
	LTE Band 26	Front	0.827	0.441	0.670	0.090	1.268	1.497	0.917		
		Back	1.168	0.798	0.739	0.122	1.966	1.907	1.290	0.02	Case 8
	LTE Band 41_Main	Front	0.547	0.441	0.670	0.090	0.988	1.217	0.637		
		Back	0.967	0.798	0.739	0.122	1.765	1.706	1.089	0.02	Case 9
	LTE Band 41_Aux	Front	0.307	0.441	0.670	0.090	0.748	0.977	0.397		
		Back	0.743	0.798	0.739	0.122	1.541	1.482	0.865		

15.5 SPLSR Evaluation and Analysis

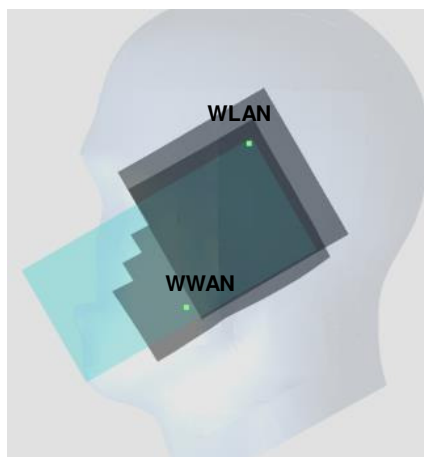
General Note:

1. $SPLSR = (SAR_1 + SAR_2)^{1.5} / (\text{min. separation distance, mm})$. If $SPLSR \leq 0.04$, simultaneously transmission SAR measurement is not necessary.

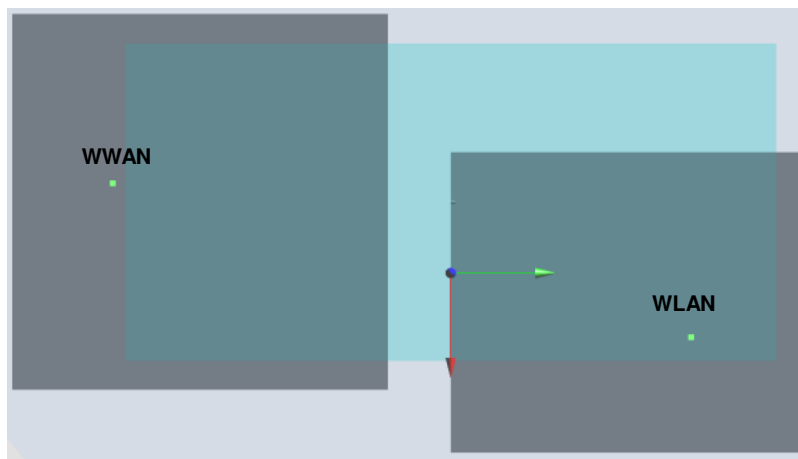
Case 1	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 7	Right Cheek	0.775	0	X	Y	Z	107.3	1.92	0.02	Not required
	WLAN5GHz		1.142	0	15.84	-33.09	-0.26				



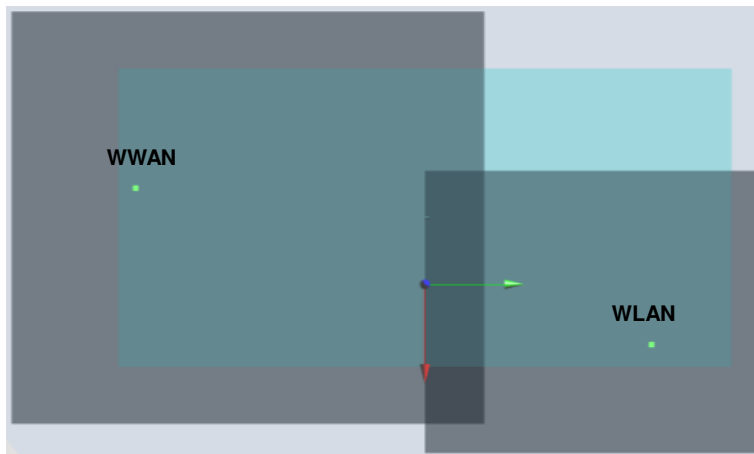
Case 2	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 41	Right Cheek	0.748	0	X	Y	Z	108.7	1.89	0.02	Not required
	WLAN5GHz		1.142	0	15.84	-33.09	-0.26				



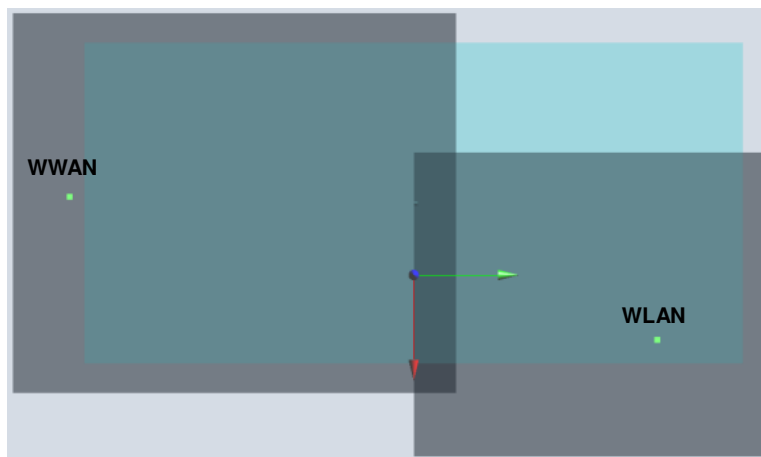
Case 3	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA IV	Back	0.948	5	X	Y	Z	143.8	1.75	0.02	Not required
	WLAN2.4GHz		0.798	5	32.4	59.6	-1.23				



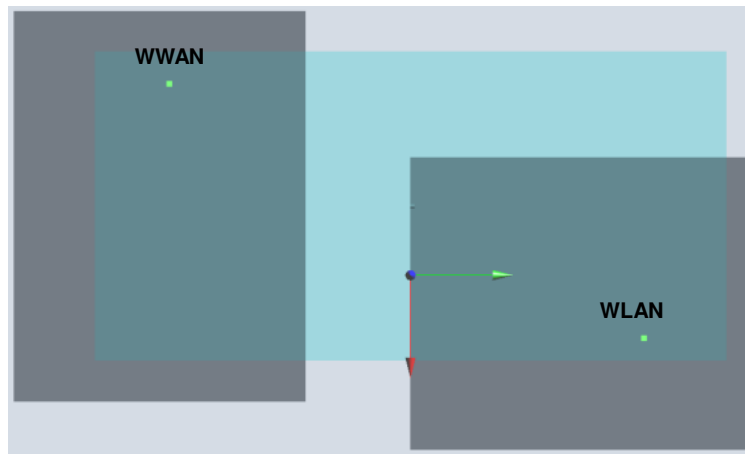
Case 4	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA V	Back	0.969	5	X	Y	Z	144.4	1.77	0.02	Not required
	WLAN2.4GHz		0.798	5	32.4	59.6	-1.23				



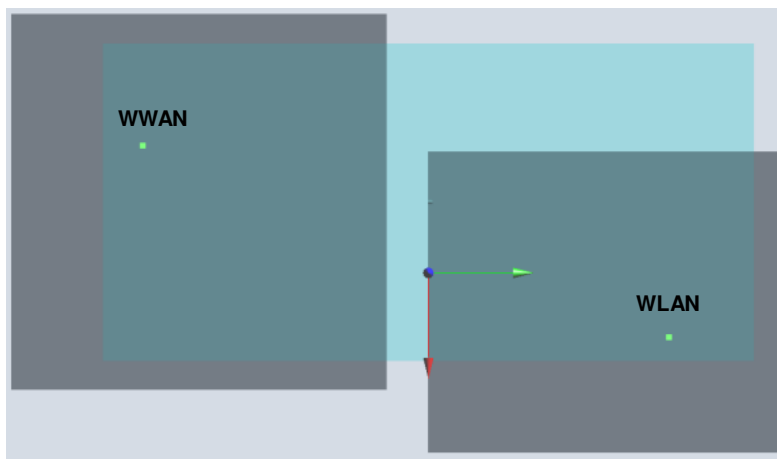
Case 5	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 4	Back	0.977	5	X	Y	Z	142.1	1.78	0.02	Not required
	WLAN2.4GHz		0.798	5	32.4	59.6	-1.23				



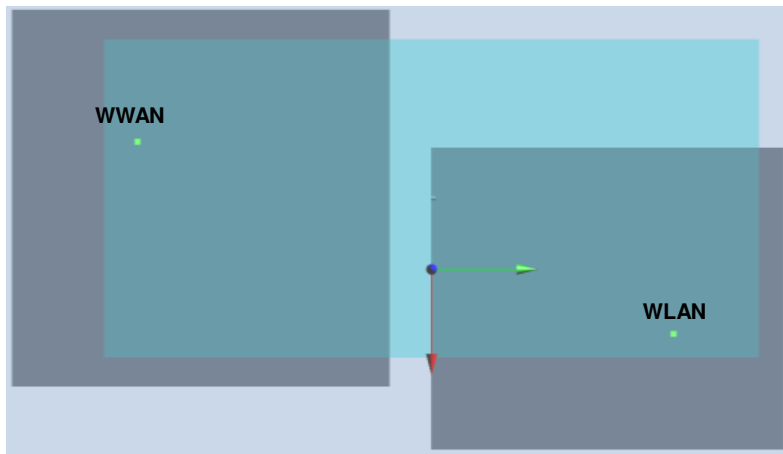
Case 6	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 7	Back	1.017	5	X	Y	Z	122.6	1.82	0.02	Not required
	WLAN2.4GHz		0.798	5	32.4	59.6	-1.23				



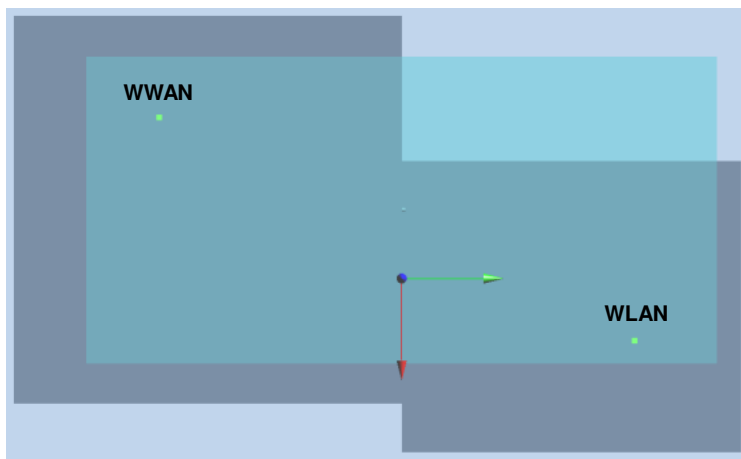
Case 7	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 12	Back	1.084	5	-11.3	-75.5	-0.34	142.0	1.88	0.02	Not required
	WLAN2.4GHz		0.798	5	32.4	59.6	-1.23				



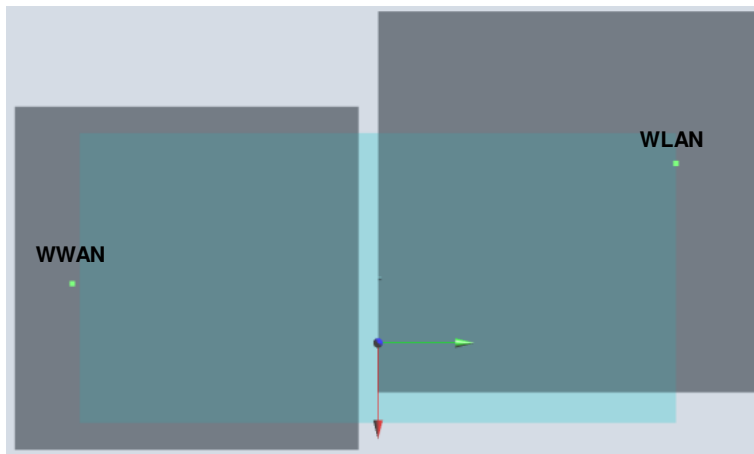
Case 8	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 26	Back	1.168	5	-8.1	-77	-0.32	142.5	1.97	0.02	Not required
	WLAN2.4GHz		0.798	5	32.4	59.6	-1.23				



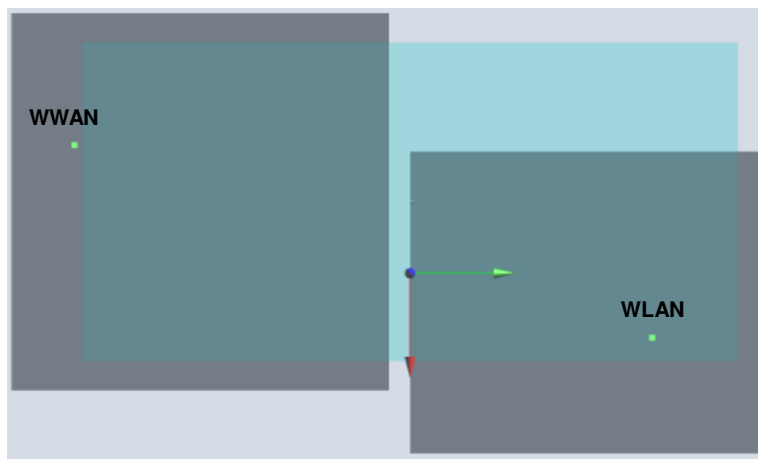
Case 9	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 41	Back	0.967	5	-26.8	-63	-0.31	136.1	1.77	0.02	Not required
	WLAN2.4GHz		0.798	5	32.4	59.6	-1.23				



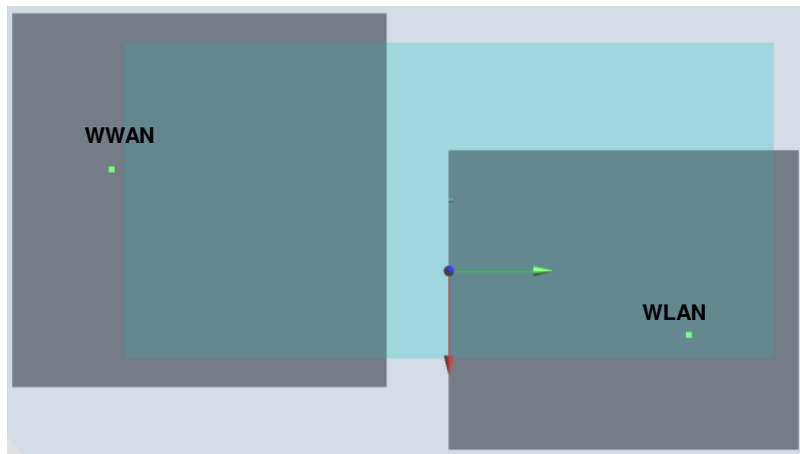
Case 10	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	GSM1900	Front	0.979	5	13.3	-79	-0.74	158.6	1.65	0.01	Not required
	WLAN5GHz		0.67	5	-33.4	72.6	-0.45				



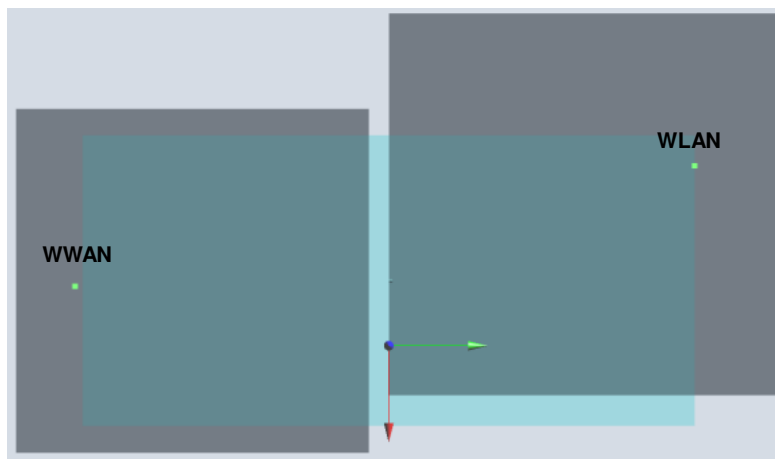
Case	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
11	GSM1900	Back	1.094	5	-6.5	-79	-0.78	144.0	1.89	0.02	Not required
	WLAN2.4GHz		0.798	5	32.4	59.6	-1.23				



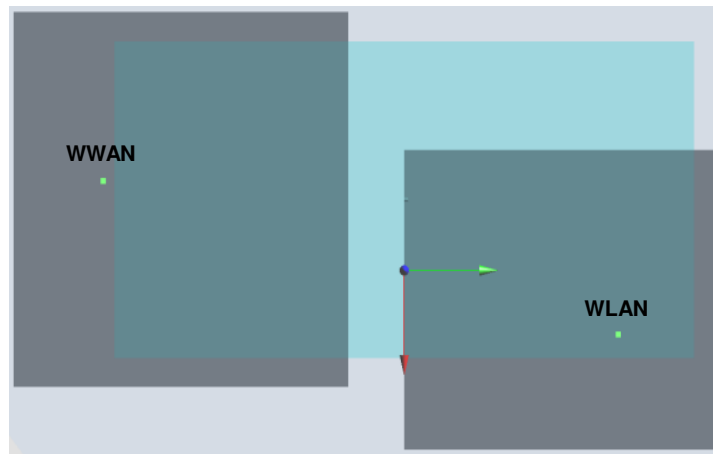
Case	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
12	WCDMA II	Back	1.056	5	-13.3	-80	-1.31	146.9	1.85	0.02	Not required
	WLAN2.4GHz		0.798	5	32.4	59.6	-1.23				



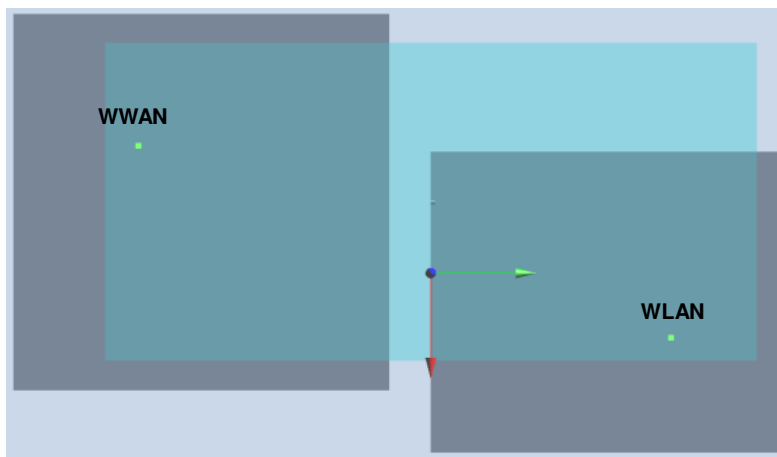
Case	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
13	WCDMA IV	Front	1.013	5	-0.8	-81.4	-1.34	157.4	1.68	0.01	Not required
	WLAN5GHz		0.67	5	-33.4	72.6	-0.45				



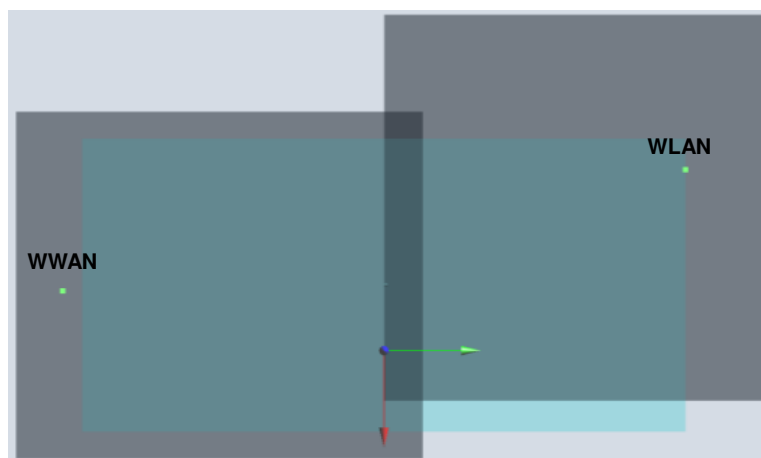
Case	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
14	WCDMA IV	Back	1.064	5	-2.3	-80	-1.36	143.8	1.86	0.02	Not required
	WLAN2.4GHz		0.798	5	32.4	59.6	-1.23				



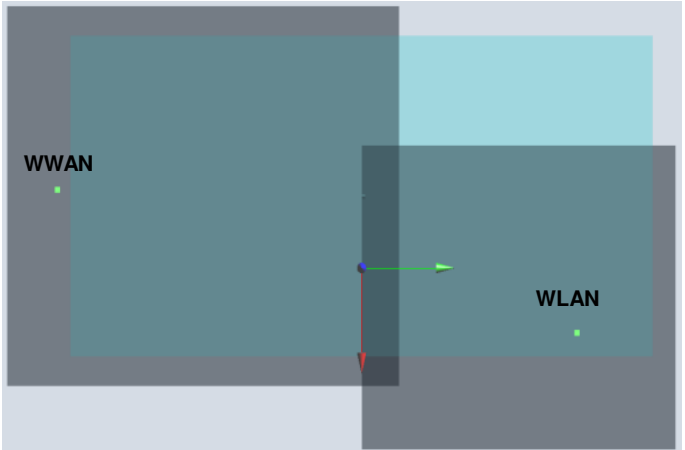
Case	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
15	WCDMA V	Back	0.969	5	-8.1	-77	-0.34	142.5	1.77	0.02	Not required
	WLAN2.4GHz		0.798	5	32.4	59.6	-1.23				



Case	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
16	LTE Band 4	Front	1.009	5	3.7	-80.4	-0.74	157.4	1.68	0.01	Not required
	WLAN5GHz		0.67	5	-33.4	72.6	-0.45				



Case 17	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 4	Back	1.096	5	0.7	-78.9	-0.74	142.1	1.89	0.02	Not required
	WLAN2.4GHz		0.798	5	32.4	59.6	-1.23				





16. Supplemental tuner tests results

General Note:

1. The following test procedure was followed to demonstrate that the SAR results in this report represent the appropriate SAR test conditions. For bands with dynamic tuning implemented, SAR will be measured according to the required FCC SAR test procedures with the dynamic tuner active to allow the device to automatically tune to the antenna state for the respective RF exposure test configurations. Additional single point SAR time-sweep measurements will be evaluated for other tuner states to determine that the other tuner configurations would result in equivalent or lower SAR values. The additional tuner hardware has no influence to the antenna characteristics, other than impedance matching.
2. To evaluate all of the tuner states, the 144 tuner states are divided evenly among band, mode and exposure combinations so that at least one single point SAR measurement is measured in each configuration. Single point time-sweep measurements will be performed at the peak SAR location determined by the zoom scan of the configuration with the highest reported SAR for each combination. The tuner state will be established remotely so that the device is not moved for the entire series of single point SAR for the tuner states in each combination. The SAR probe will remain stationary at the same position throughout the entire series of single point measurements for each combination. The bands which are dynamically tuned are split into two separate antennas, so each antenna system will have its own test plan to cover the corresponding 144 tuner states.
3. The operational decryption contains more information about the design and implementation of the dynamic antenna tuning.



16.1 Supplemental Head SAR results

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 43)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140
GSM850	GPRS (2 Tx slots)	848.8	251			Left Cheek	0mm	0.2	0.255	0.089	0.135	0.113	0.104	0.099	0.108	0.13	0.093	0.22	0.07	0.148	0.07	0.123	0.076	0.106
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 2)	1	11	21	31	41	51	61	71	81	91	101	111	121	131	141
GSM1900	GPRS (3 Tx slots)	1909.8	810			Right Cheek	0mm	0.129	0.142	0.151	0.108	0.114	0.059	0.126	0.101	0.085	0.064	0.106	0.103	0.069	0.116	0.06	0.081	0.047
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 0)	2	12	22	32	42	52	62	72	82	92	102	112	122	132	142
WCDMA B2	RMC 12.2Kbps	1907.6	9538			Right Cheek	0mm	0.224	0.246	0.24	0.187	0.15	0.117	0.189	0.167	0.114	0.239	0.204	0.15	0.12	0.179	0.109	0.111	0.086
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 110)	3	13	23	33	43	53	63	73	83	93	103	113	123	133	143
WCDMA B4	RMC 12.2Kbps	1752.6	1513			Right Cheek	0mm	0.267	0.318	0.284	0.222	0.28	0.247	0.283	0.228	0.25	0.264	0.27	0.286	0.24	0.298	0.191	0.26	0.216
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 118)	4	14	24	34	44	54	64	74	84	94	104	114	124	134	
WCDMA B5	RMC 12.2Kbps	836.4	4182			Left Cheek	0mm	0.272	0.323	0.125	0.137	0.158	0.084	0.231	0.012	0.252	0.035	0.169	0.063	0.146	0.067	0.136	0.14	
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 110)	5	15	25	35	45	55	65	75	85	95	105	115	125	135	
LTE B4	20M	1732.5	20175	1	0	Right Cheek	0mm	0.253	0.307	0.29	0.239	0.319	0.305	0.314	0.318	0.301	0.293	0.252	0.326	0.295	0.326	0.264	0.303	
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 118)	6	16	26	36	46	56	66	76	86	96	106	116	126	136	
LTE B5	10M	836.5	20525	1	25	Left Cheek	0mm	0.306	0.321	0.21	0.151	0.224	0.053	0.296	0.061	0.201	0.111	0.18	0.146	0.149	0.193	0.047	0.299	
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 16)	7	17	27	37	47	57	67	77	87	97	107	117	127	137	
LTE B12	10M	707.5	23095	1	49	Left Cheek	0mm	0.207	0.218	0.053	0.053	0.127	0.019	0.056	0.031	0.081	0.026	0.145	0.055	0.055	0.034	0.021	0.052	
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 16)	8	18	28	38	48	58	68	78	88	98	108	118	128	138	
LTE B17	10M	710	23790	1	25	Left Cheek	0mm	0.186	0.197	0.042	0.019	0.112	0.002	0.057	0.016	0.063	0.011	0.137	0.041	0.001	0.018	0.006	0.036	
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 119)	9	19	29	39	49	59	69	79	89	99	109	119	129	139	
LTE B26	15M	831.5	26865	1	37	Left Cheek	0mm	0.286	0.346	0.243	0.041	0.195	0.043	0.203	0.073	0.165	0.224	0.036	0.283	0.011	0.344	0.021	0.225	

**16.2 Supplemental Body SAR results**

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 43)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140
GSM850	GPRS (2 Tx slots)	848.8	251			Back	5mm	0.475	0.752	0.125	0.282	0.222	0.161	0.175	0.176	0.304	0.115	0.748	0.03	0.308	0.03	0.218	0.05	0.154
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 2)	1	11	21	31	41	51	61	71	81	91	101	111	121	131	141
GSM1900	GPRS (3 Tx slots)	1909.8	810			Bottom Side	5mm	0.974	1.245	1.184	1.081	1.168	0.698	1.189	1.018	0.994	0.785	1.103	1.172	0.915	1.227	0.777	1.046	0.677
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 0)	2	12	22	32	42	52	62	72	82	92	102	112	122	132	142
WCDMA B2	RMC 12.2Kbps	1907.6	9538			Back	5mm	0.767	1.147	1.13	0.73	0.825	0.519	0.927	0.796	0.647	1.137	0.857	0.855	0.536	0.916	0.497	0.638	0.483
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 110)	3	13	23	33	43	53	63	73	83	93	103	113	123	133	143
WCDMA B4	RMC 12.2Kbps	1752.6	1513			Bottom Side	5mm	0.905	1.143	1.135	1.076	1.08	0.99	1.12	1.11	1.024	1.092	1.106	1.11	0.959	1.06	0.898	1.009	0.839
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 118)	4	14	24	34	44	54	64	74	84	94	104	114	124	134	
WCDMA B5	RMC 12.2Kbps	846.6	4233			Back	5mm	0.71	1.07	0.617	0.513	0.657	0.389	1.05	0.062	0.816	0.204	0.596	0.309	0.475	0.408	0.456	0.71	
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 109)	5	15	25	35	45	55	65	75	85	95	105	115	125	135	
LTE B4	20M	1732.5	20175	50	0	Bottom Side	5mm	0.963	1.32	1.245	1.116	1.26	1.132	1.302	1.27	1.115	1.236	1.183	1.255	1.069	1.27	1.184	1.063	
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 45)	6	16	26	36	46	56	66	76	86	96	106	116	126	136	
LTE B5	10M	836.5	20525	1	25	Back	5mm	0.813	1.386	1.078	0.775	1.079	0.355	1.331	0.388	0.921	0.639	0.885	0.784	0.732	1.022	0.316	1.333	
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 16)	7	17	27	37	47	57	67	77	87	97	107	117	127	137	
LTE B12	10M	707.5	23095	1	49	Back	5mm	0.773	1.28	0.277	0.233	0.778	0.024	0.299	0.099	0.489	0.081	0.914	0.269	0.235	0.145	0.04	0.271	
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 16)	8	18	28	38	48	58	68	78	88	98	108	118	128	138	
LTE B17	10M	710	23790	1	25	Back	5mm	0.794	1.284	0.321	0.127	0.805	0.031	0.436	0.118	0.493	0.094	0.987	0.297	0.012	0.152	0.051	0.283	
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)															
									Auto-Tune (State 119)	9	19	29	39	49	59	69	79	89	99	109	119	129	139	
LTE B26	15M	831.5	20525	36	0	Back	5mm	0.793	1.261	0.962	0.173	0.753	0.188	0.776	0.301	0.616	0.901	0.147	1.069	0.055	1.257	0.095	0.802	

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17. Uncertainty Assessment

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

18. References

- [1] FCC 47 CFR Part 2 "Frequency Allocations and Radio Treaty Matters; General Rules and Regulations"
- [2] ANSI/IEEE Std. C95.1-1992, "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz", September 1992
- [3] IEEE Std. 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", Sep 2013
- [4] SPEAG DASY System Handbook
- [5] FCC KDB 248227 D01 v02r02, "SAR Guidance for IEEE 802.11 (WiFi) Transmitters", Oct 2015.
- [6] FCC KDB 447498 D01 v06, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", Oct 2015
- [7] FCC KDB 648474 D04 v01r03, "SAR Evaluation Considerations for Wireless Handsets", Oct 2015.
- [8] FCC KDB 941225 D01 v03r01, "3G SAR MEAUREMENT PROCEDURES", Oct 2015
- [9] FCC KDB 941225 D05 v02r05, "SAR Evaluation Considerations for LTE Devices", Dec 2015
- [10] FCC KDB 941225 D05A v01r02, "Rel. 10 LTE SAR Test Guidance and KDB Inquiries", Oct 2015
- [11] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.
- [12] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.
- [13] FCC KDB 865664 D02 v01r02, "RF Exposure Compliance Reporting and Documentation Considerations" Oct 2015.