FCC SAR TEST REPORT

FCC ID	:	IHDT56XQ2
Equipment	:	Mobile Cellular Phone
Brand Name	:	Motorola
Applicant	:	Motorola Mobility LLC 222 W,Merchandise Mart Plaza, Chicago IL 60654 USA
Manufacturer	:	Motorola Mobility LLC 222 W,Merchandise Mart Plaza, Chicago IL 60654 USA
Standard	:	FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2013

The product was received on Oct. 24, 2018 and testing was started from Oct. 25, 2018 and completed on Nov. 02, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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

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

Cona Huang

Approved by: Cona Huang / Deputy Manager

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History of this test report

Report No.	Version	Description	Issued Date
FA890604-03	01	Initial issue of report	Nov. 09, 2018

1. Statement of Compliance

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

Equipment Class	Frequency Band	Highest SAR Summary				Highest Simultaneous Transmission 1g SAR (W/kg)
		Head (Separation 0mm)	Body-worn (Separation 5mm)	Hotspot (Separation 5mm)	Product Specific (Separation 0mm)	
		1g SAR (W/kg)			10g SAR (W/kg)	
Licensed	GSM850	0.13	0.29	0.29		1.54
	GSM1900	0.05	1.32	1.45	2.91	
	WCDMA II	0.12	1.32	1.44	3.59	
	WCDMA IV	0.07	1.44	1.45	3.45	
	WCDMA V	0.29	0.56	0.56		
	LTE Band 2	0.11	1.44	1.44	3.53	
	LTE Band 4	0.06	1.45	1.44	3.59	
	LTE Band 5	0.35	0.64	0.64		
	LTE Band 7	0.08	1.42	1.42	3.41	
DTS	2.4GHz WLAN	0.56	0.37	0.37		1.45
DSS	Bluetooth	0.11	0.09	0.09		1.54
Date of Testing:		2018/10/25 ~ 2018/11/2				

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

Reviewed by: Jason Wang
Report Producer: Wan Liu

2. Guidance Applied

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

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

3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Cellular Phone
Brand Name	Motorola
FCC ID	IHDT56XQ2
IMEI Code	SIM1: 359506090031272 SIM2: 359506090031280
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+(16QAM uplink is not supported) LTE: QPSK, 16QAM, 64QAM WLAN 2.4GHz : 802.11b/g/n HT20/HT40 Bluetooth BR/EDR/LE
HW Version	DVT2
SW Version	fastboot_ocean_oem_userdebug_9_PPO29.36_b671_intcfg-test-keys_oem.tar
GSM / (E)GPRS Transfer mode	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.
EUT Stage	Identical Prototype

Remark:

1. The device has two SIM slots and supports Dual SIM Dual Standby. The WWAN radio transmission will be enabled by either one SIM at a time (Single active).
2. This device WLAN 2.4GHz supports Hotspot operation and Bluetooth support tethering applications.
3. 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.
4. 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.
5. 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.
6. The device additionally employs proximity sensors that detect the presence of tissue near the currently active transmit antenna (if that antenna may require reduced power relative the Default power table in order to meet extremity SAR limits). The control logic is such that, if the Body-Worn, 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
7. Reduced power for different RF exposure conditions:
   Body worn: The device employs proximity sensors that detect the presence of the user's body at the front or back

faces of the device, when operating in near-body condition by end user, the device will reduced maximum output powers on the GSM1900, WCDMA B2 / B4, LTE B2 / B4 / B7 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 LTE B2 / B4 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 B2 / B4 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.

<Maximum power for each bands and exposure conditions>

TX. freq.	Default	Head		Body Worn		Hotspot		Product Specific	
	max. tune up limit (dBm)	max. tune up limit(dBm)	power reduction (dB)	max. tune up limit(dBm)	power reduction (dB)	max. tune up limit(dBm)	power reduction (dB)	max. tune up limit(dBm)	power reduction (dB)
GSM850 GSM 1 Tx slot	33.50	33.50		33.50		33.50		33.50	
GSM850 GPRS 1 Tx slot	33.50	33.50		33.50		33.50		33.50	
GSM850 GPRS 2 Tx slots	30.50	30.50		30.50		30.50		30.50	
GSM850 GPRS 3 Tx slots	28.75	28.75		28.75		28.75		28.75	
GSM850 GPRS 4 Tx slots	27.50	27.50		27.50		27.50		27.50	
GSM850 EDGE 1 Tx slot	28.00	28.00		28.00		28.00		28.00	
GSM850 EDGE 2 Tx slots	28.00	28.00		28.00		28.00		28.00	
GSM850 EDGE 3 Tx slots	26.25	26.25		26.25		26.25		26.25	
GSM850 EDGE 4 Tx slots	25.00	25.00		25.00		25.00		25.00	
GSM1900 GSM 1 Tx slot	30.50	30.50		28.50	2.00	27.00	3.50	30.50	
GSM1900 GPRS 1 Tx slot	30.50	30.50		28.50	2.00	27.00	3.50	30.50	
GSM1900 GPRS 2 Tx slots	27.50	27.50		25.50	2.00	24.00	3.50	27.50	
GSM1900 GPRS 3 Tx slots	25.75	25.75		23.75	2.00	22.25	3.50	25.75	
GSM1900 GPRS 4 Tx slots	24.50	24.50		22.50	2.00	21.00	3.50	24.50	
GSM1900 EDGE 1 Tx slot	27.00	27.00		27.00	0.00	26.50	0.50	27.00	
GSM1900 EDGE 2 Tx slots	27.00	27.00		25.00	2.00	23.50	3.50	27.00	
GSM1900 EDGE 3 Tx slots	25.25	25.25		23.75	1.50	21.75	3.50	25.25	
GSM1900 EDGE 4 Tx slots	24.00	24.00		22.00	2.00	20.50	3.50	24.00	
WCDMA II	24.00	24.00		18.00	6.00	16.00	8.00	21.50	2.50
WCDMA IV	24.00	24.00		20.00	4.00	18.50	5.50	20.50	3.50
WCDMA V	24.00	24.00		24.00		24.00		24.00	
LTE B2	24.00	24.00		18.50	5.50	16.50	7.50	22.00	2.00
LTE B4	24.00	24.00		21.00	3.00	18.50	5.50	21.00	3.00
LTE B5	24.00	24.00		24.00		24.00		24.00	
LTE B7	24.00	24.00		21.00	3.00	24.00		24.00	
2.4GHz WLAN 802.11b	19.00	19.00		19.00		19.00		19.00	
2.4GHz WLAN 802.11g	13.50	13.50		13.50		13.50		13.50	
2.4GHz WLAN 802.11n-HT20	11.50	11.50		11.50		11.50		11.50	
2.4GHz WLAN 802.11n-HT40	8.50	8.50		8.50		8.50		8.50	
BT	11.00	11.00		11.00		11.00		11.00	

3.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	IHDT56XQ2
Equipment Name	Mobile Cellular Phone
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz
Channel Bandwidth	LTE Band 02:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 04:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 05:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 07: 5MHz, 10MHz, 15MHz, 20MHz
uplink modulations used	QPSK / 16QAM / 64QAM
LTE Voice / Data requirements	Voice / Data only
LTE MPR permanently built-in by design	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

LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.
Power reduction applied to satisfy SAR compliance	Yes, when operating in hotspot mode that LTE B2 / B4 power reduction applied to satisfy SAR compliance.

Transmission (H, M, L) channel numbers and frequencies in each LTE band

LTE Band 2

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900

LTE Band 4

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745

LTE Band 5

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844

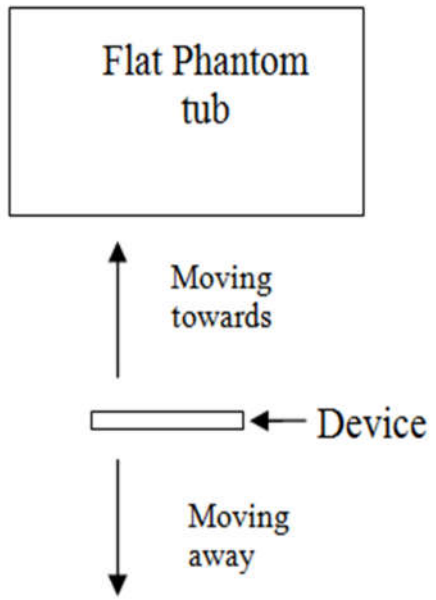
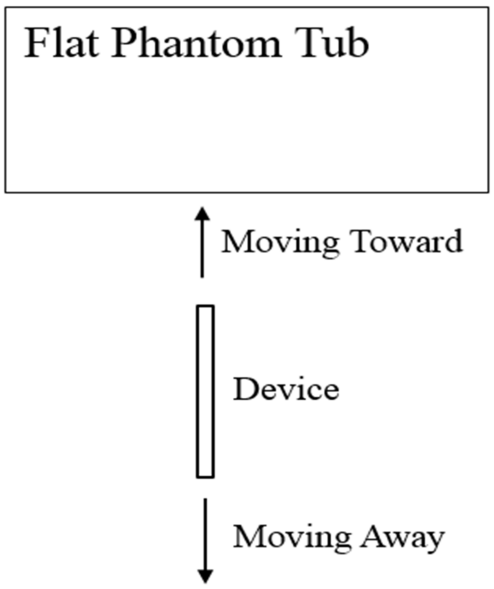
LTE Band 7

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

3.1 Proximity Sensor Triggering Test

<Proximity Sensor Triggering Distance>:

1. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed and the tissue-equivalent medium for highest frequency (2600MHz) and lowest (1750MHz) 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 and LTE B2 / B4 / B7 transmitter at Body-Worn condition; and WCDMA B2 / B4 and LTE B2 / B4 transmitter at Handheld condition.

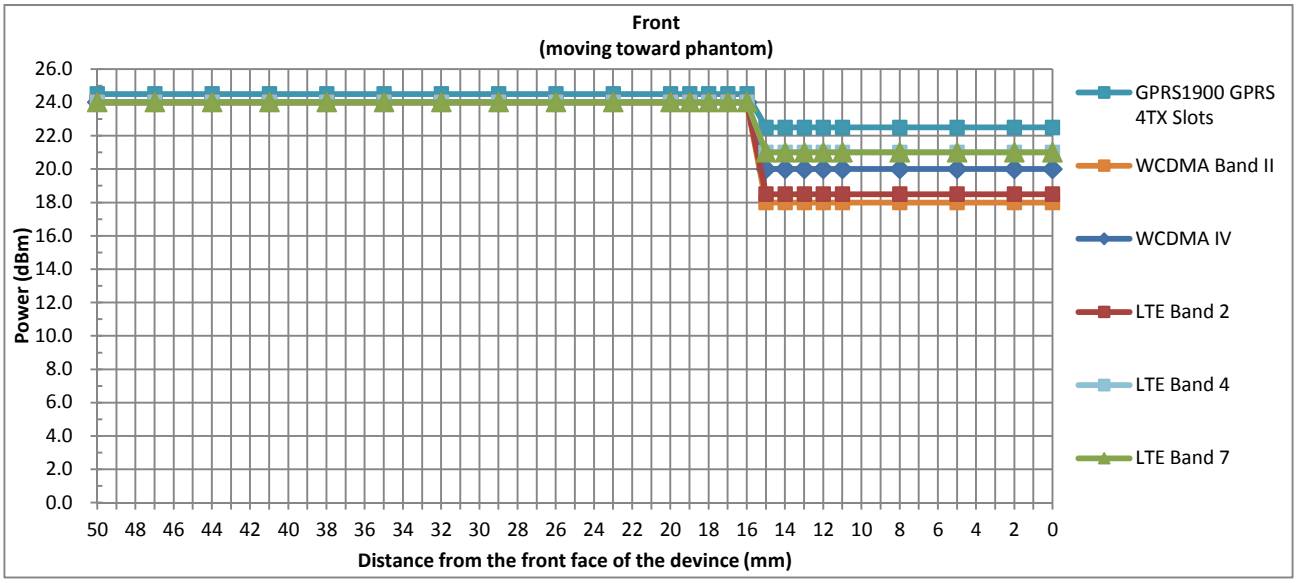
	
Sensor detection test set-up, front and back faces	handheld detection test set-up, bottom face

<P-Sensor>

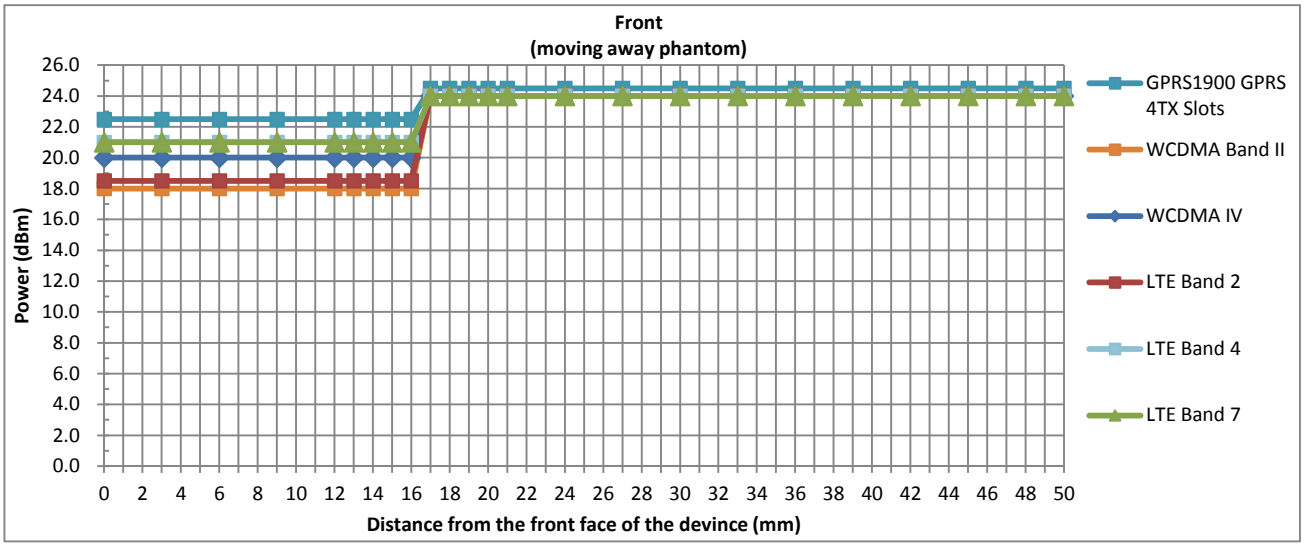
Proximity Sensor Triggering Distance (mm)				
Position	Front		Back	
	Moving towards	Moving away	Moving towards	Moving away
Minimum	15	16	17	19

TX. Band	Proximity Sensor Triggering Power (dBm)		
	Full	Reduced	power reduction (dB)
	max. tune up limit (dBm)	max. tune up limit(dBm)	
GSM1900 GPRS 4Tx slots	24.5	22.5	2
WCDMA Band II	24	18	6
WCDMA Band IV	24	20.0	4
LTE Band2	24	18.5	5.5
LTE Band4	24	21	3
LTE Band7	24	21	3

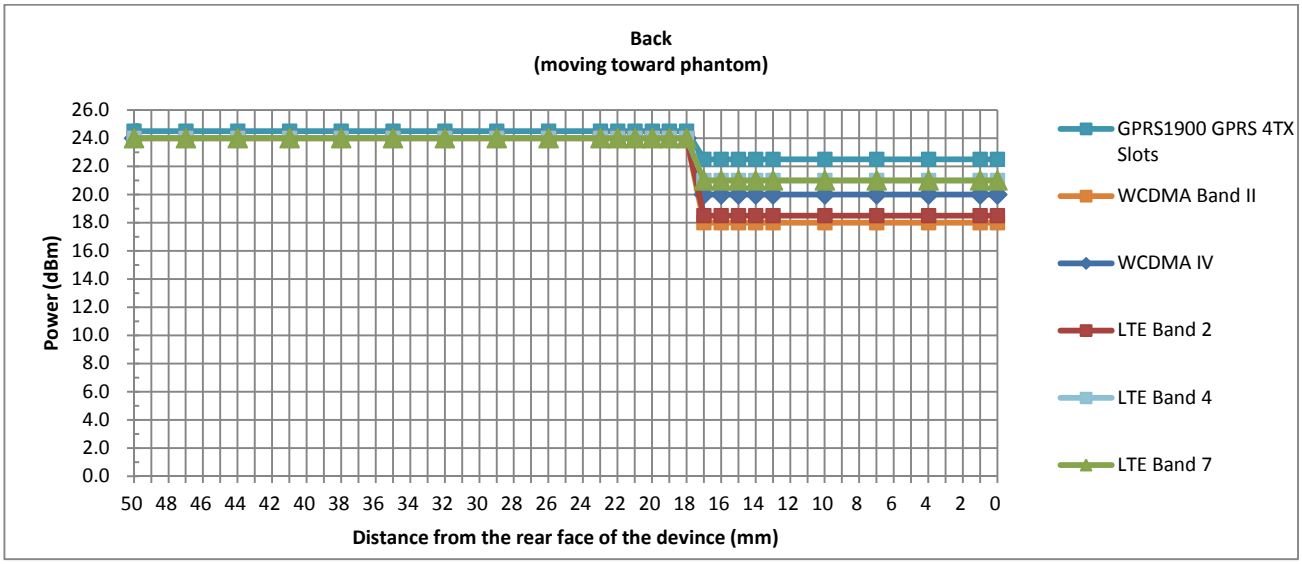
Proximity Sensor Triggering Distance (mm) and Triggering Power (dBm)																									
Front																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
GSM1900 GPRS 4 Tx slots	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21
LTE Band7	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21



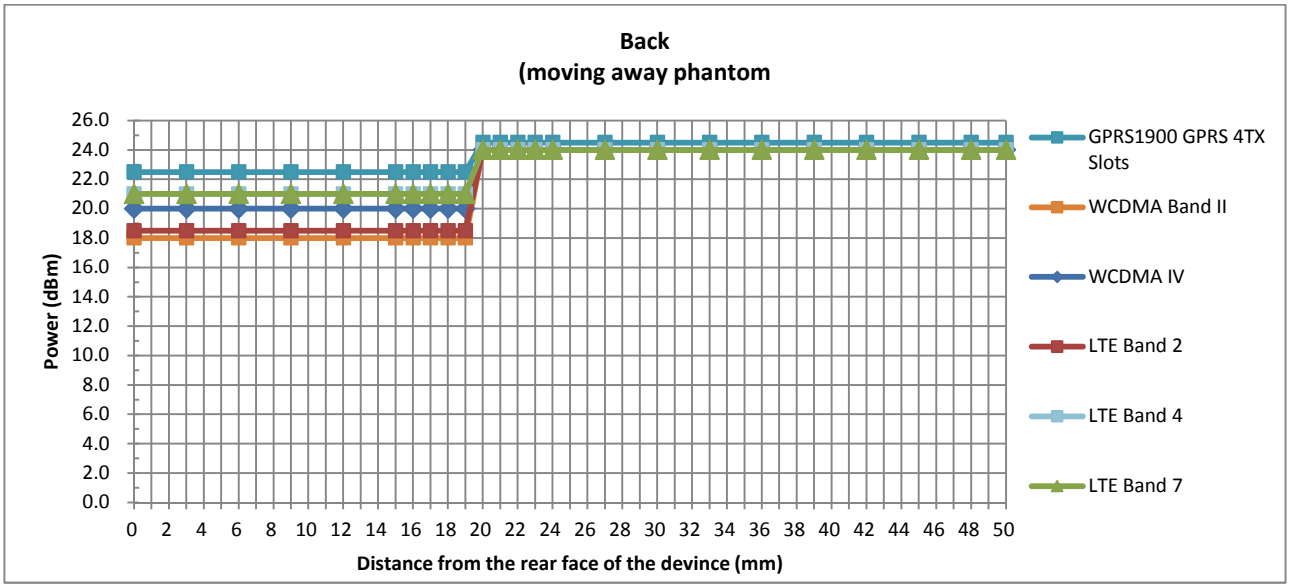
Proximity Sensor Triggering Distance (mm) and Triggering Power (dBm)																									
Front																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
GSM1900 GPRS 4 Tx slots	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21
LTE Band7	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21



Proximity Sensor Triggering Distance (mm) and Triggering Power (dBm)																									
Back																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
GSM1900 GPRS 4 Tx slots	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	24	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	24	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21	21
LTE Band7	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21	21



Proximity Sensor Triggering Distance (mm) and Triggering Power (dBm)																									
Back																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
GSM1900 GPRS 4 Tx slots	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18	18	18
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21	21	21	21
LTE Band7	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21	21	21	21

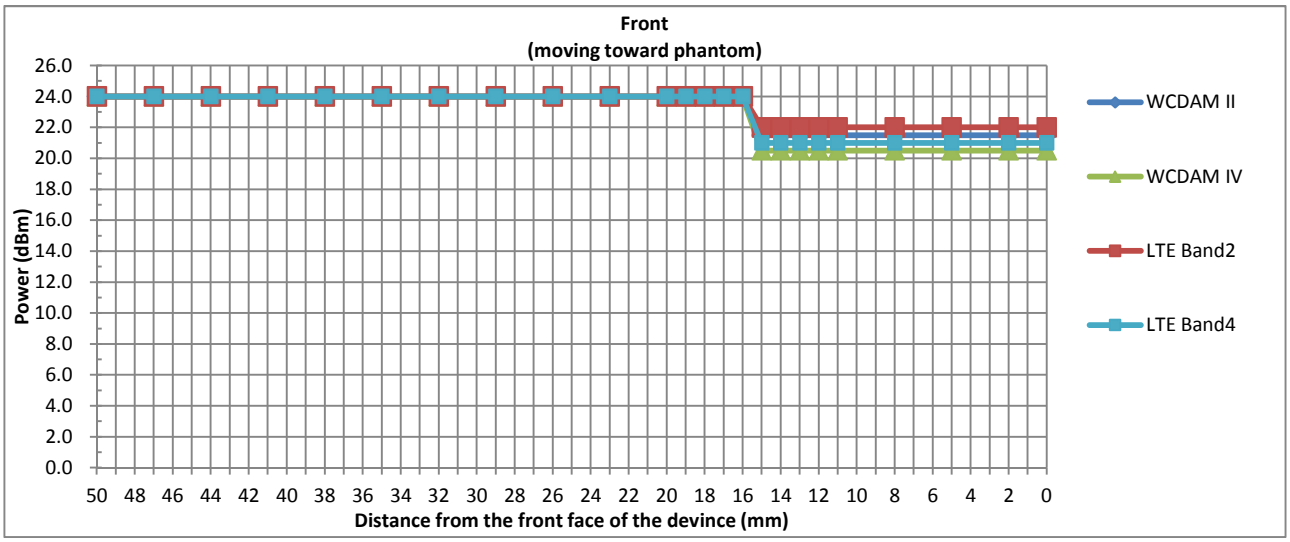


<Handheld>

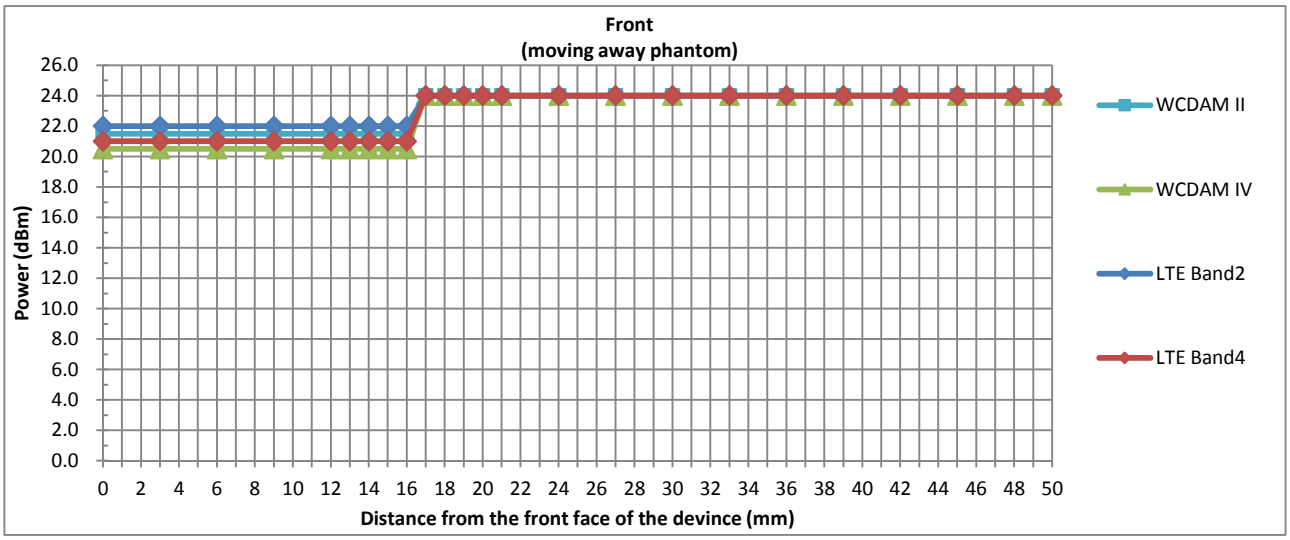
Handheld Triggering Distance (mm)						
Position	Front		Back		Bottom Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	15	16	15	16	18	19

TX. Band	Handheld Triggering Power (dBm)		
	Full	Reduced	power reduction (dB)
	max. tune up limit (dBm)	max. tune up limit(dBm)	
WCDMA Band II	24	21.5	2.5
WCDMA Band IV	24	20.5	3.5
LTE Band2	24	22	2
LTE Band4	24	21	3

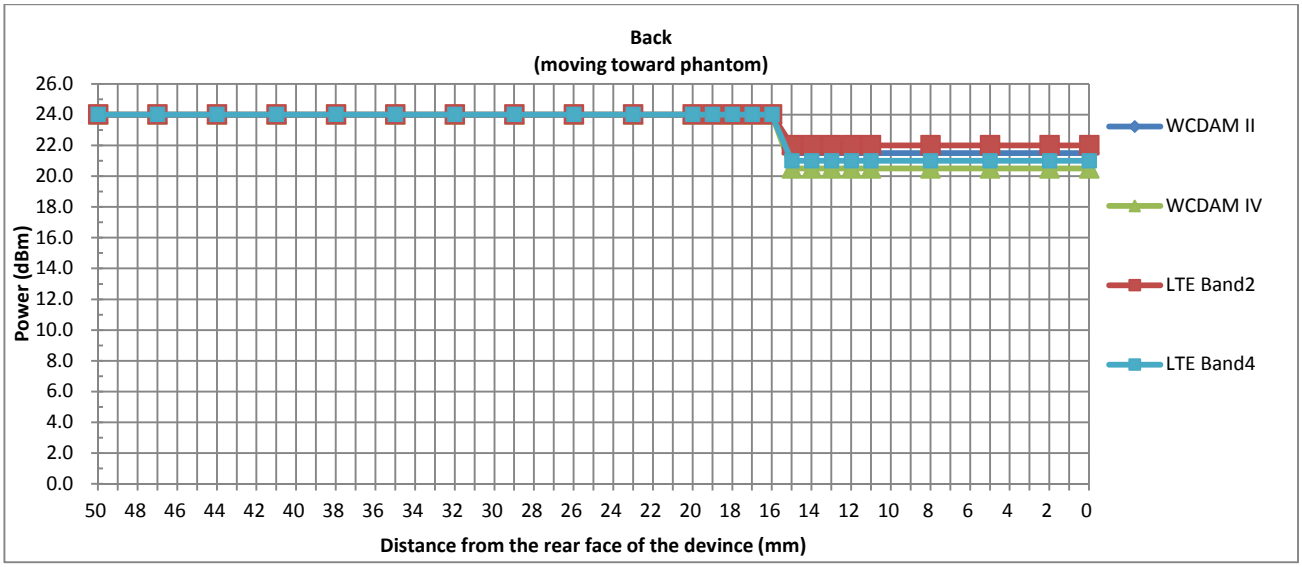
Handheld Triggering Distance (mm) and Triggering Power (dBm)																									
Front																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	22	22	22	22	22	22	22	22	22
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21



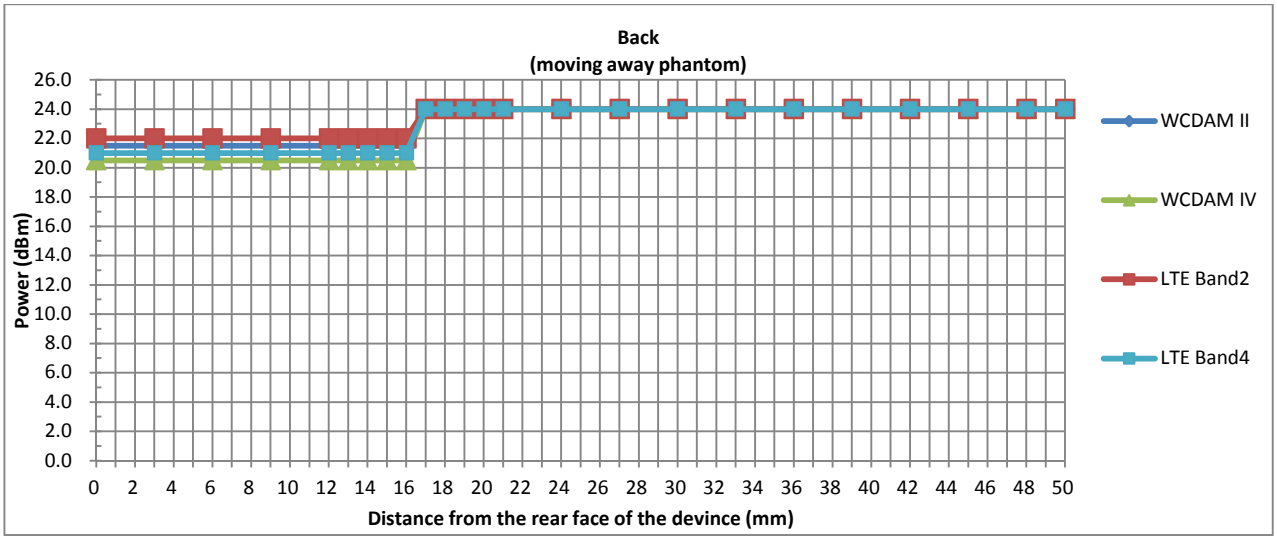
Handheld Triggering Distance (mm) and Triggering Power (dBm)																									
Front																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	22	22	22	22	22	22	22	22	22	22
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21



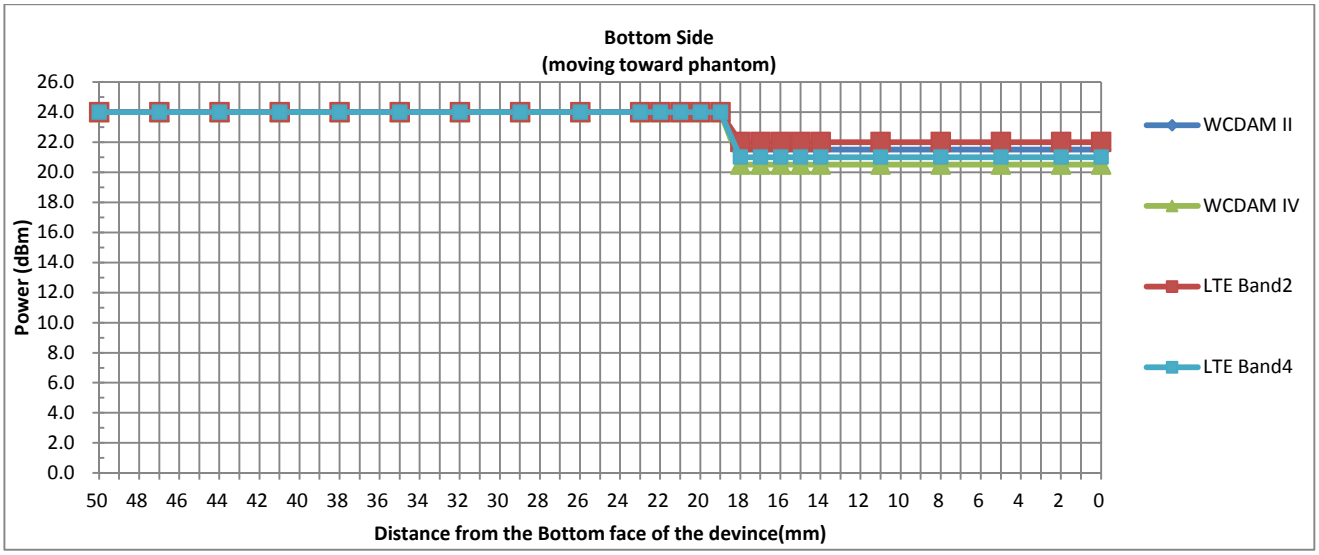
Handheld Triggering Distance (mm) and Triggering Power (dBm)																									
Back																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	22	22	22	22	22	22	22	22	22
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21



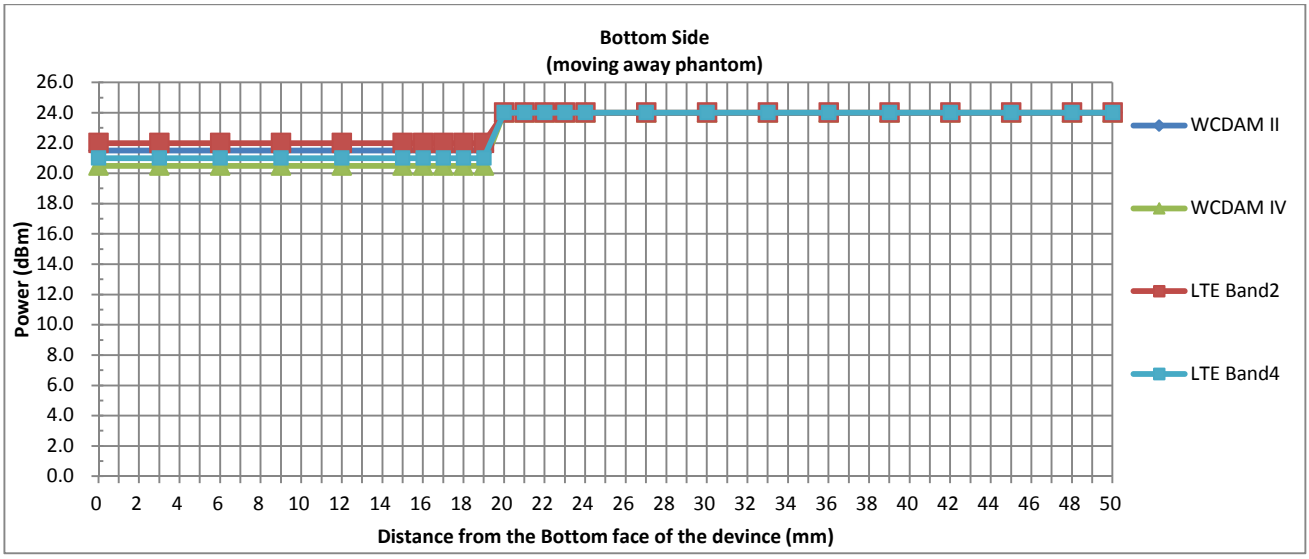
Handheld Triggering Distance (mm) and Triggering Power (dBm)																									
Back																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	24	24	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22	22	22	22	22	22	22	22	22	22	22
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21



Handheld Triggering Distance (mm) and Triggering Power (dBm)																									
Bottom Side																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	24	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	24	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	24	22	22	22	22	22	22	22	22	22	22	22	22	22
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21	21	21



Handheld Triggering Distance (mm) and Triggering Power (dBm)																									
Bottom Side																									
Distance	50	47	44	41	38	35	32	29	26	23	20	19	18	17	16	15	14	13	12	11	10	7	4	1	0
WCDMA Band II	24	24	24	24	24	24	24	24	24	24	24	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
WCDMA Band IV	24	24	24	24	24	24	24	24	24	24	24	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
LTE Band2	24	24	24	24	24	24	24	24	24	24	24	22	22	22	22	22	22	22	22	22	22	22	22	22	22
LTE Band4	24	24	24	24	24	24	24	24	24	24	24	21	21	21	21	21	21	21	21	21	21	21	21	21	21



4. RF Exposure Limits

4.1 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.

4.2 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.

5. Specific Absorption Rate (SAR)

5.1 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.

5.2 SAR Definition

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

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

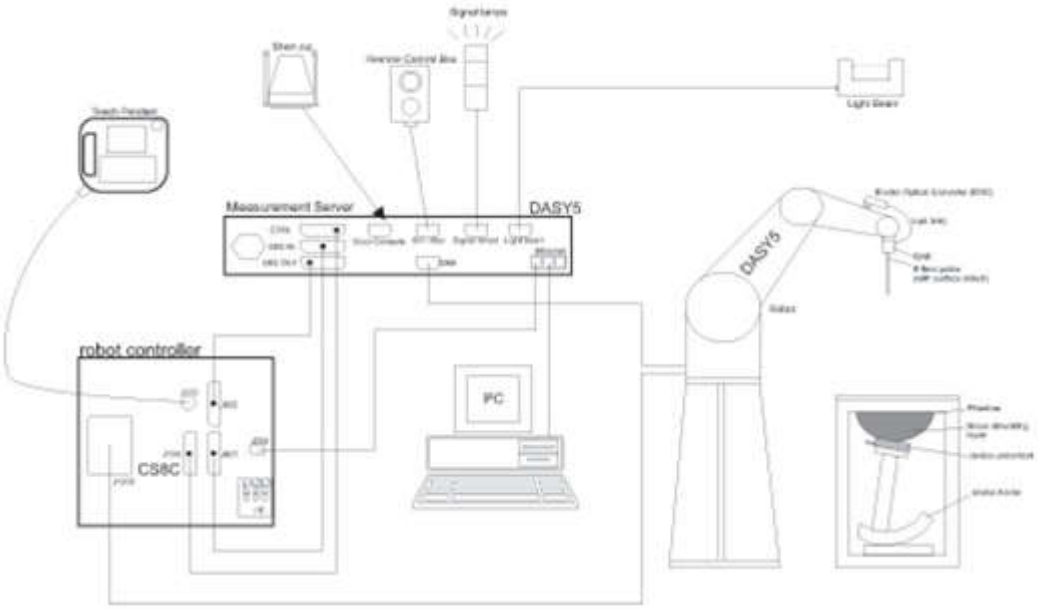
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

6. 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.

6.1 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 μW/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 μW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 μW/g)	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

6.2 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

6.3 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

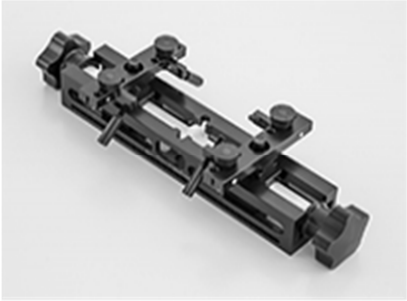
The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

6.4 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

7. 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

7.1 Spatial Peak SAR Evaluation

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

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

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

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

7.2 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.

7.3 Area Scan

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

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

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

7.4 Zoom Scan

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

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

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

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

7.5 Volume Scan Procedures

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

7.6 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.

8. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	835MHz System Validation Kit	D835V2	4d091	2017/12/5	2018/12/4
SPEAG	1750MHz System Validation Kit	D1750V2	1069	2017/12/5	2018/12/4
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	2017/12/6	2018/12/5
SPEAG	2450MHz System Validation Kit	D2450V2	840	2017/12/7	2018/12/6
SPEAG	2600MHz System Validation Kit	D2600V2	1061	2017/12/7	2018/12/6
SPEAG	Data Acquisition Electronics	DAE4	1358	2018/4/19	2019/4/18
SPEAG	Dosimetric E-Field Probe	EX3DV4	3857	2018/5/31	2019/5/30
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1842	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201563900	2018/1/26	2019/1/25
Agilent	Wireless Communication Test Set	E5515C	MY52102706	2018/4/17	2019/4/16
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	2018/4/17	2019/4/16
SPEAG	Dielectric Probe Kit	DAK-3.5	1138	2017/11/28	2018/11/27
Anritsu	Vector Signal Generator	MG3710A	6201682672	2018/2/6	2019/2/5
BONN	POWER AMPLIFIER	BLMA 0830-3	087193A	2018/8/20	2019/8/19
BONN	POWER AMPLIFIER	BLMA 2060-2	087193B	2018/8/20	2019/8/19
Rohde & Schwarz	Power Meter	NRVD	102081	2018/8/20	2019/8/19
Rohde & Schwarz	Power Sensor	NRV-Z5	100538	2018/8/20	2019/8/19
Rohde & Schwarz	Power Sensor	NRV-Z5	100539	2018/8/20	2019/8/19
ARRA	Power Divider	A3200-2	N/A	NA	NA
MCL	Attenuation1	BW-S10W5+	N/A	NA	NA
MCL	Attenuation2	BW-S10W5+	N/A	NA	NA
MCL	Attenuation3	BW-S10W5+	N/A	NA	NA
R&S	CBT BLUETOOTH TESTER	CBT	101246	2018/1/26	2019/1/25
EXA	Spectrum Analyzer	FSV7	101632	2018/1/26	2019/1/25
Agilent	Dual Directional Coupler	778D	20500	2018/8/3	2019/8/2
Agilent	Dual Directional Coupler	11691D	MY48151020	2018/8/3	2019/8/2
Testo	Thermometer	608-H1	1241332126	2018/8/21	2019/8/20
FLUKE	DIGITAC THERMOMETER	51II	97240029	2018/8/8	2019/8/7

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.

9. System Verification

9.1 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.

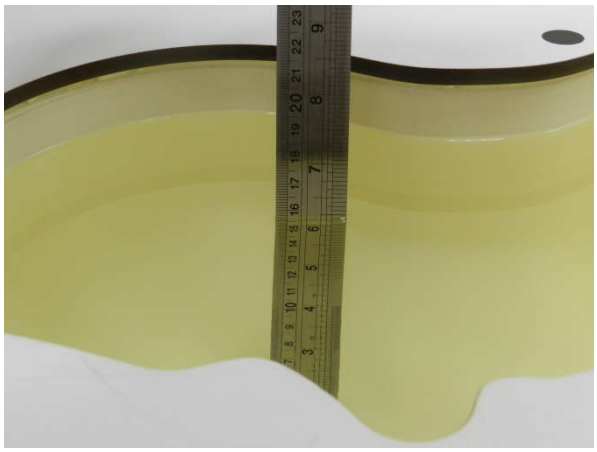


Fig 10.1Photo of Liquid Height for Head SAR

Fig 10.2 Photo of Liquid Height for Body SAR

9.2 Tissue Verification

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

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
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. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
835	HSL	22.6	0.914	42.773	0.90	41.50	1.56	3.07	±5	2018/10/25
1750	HSL	22.7	1.345	41.143	1.37	40.10	-1.82	2.60	±5	2018/10/26
1900	HSL	22.8	1.424	39.918	1.40	40.00	1.71	-0.21	±5	2018/10/27
2450	HSL	22.8	1.863	38.471	1.80	39.20	3.50	-1.86	±5	2018/10/31
2600	HSL	22.7	2.040	37.884	1.96	39.00	4.08	-2.86	±5	2018/10/31
835	MSL	22.8	0.990	55.273	0.97	55.20	2.06	0.13	±5	2018/10/29
1750	MSL	22.6	1.444	54.472	1.49	53.40	-3.09	2.01	±5	2018/10/30
1900	MSL	22.8	1.519	53.914	1.52	53.30	-0.07	1.15	±5	2018/10/31
2450	MSL	22.6	2.021	53.033	1.95	52.70	3.64	0.63	±5	2018/11/2
2600	MSL	22.7	2.217	52.515	2.16	52.50	2.64	0.03	±5	2018/11/2

9.3 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 (%)
2018/10/25	835	HSL	250	D835V2-4d091	3857	1358	2.32	9.48	9.28	-2.11
2018/10/26	1750	HSL	250	D1750V2-1069	3857	1358	9.67	37.00	38.68	4.54
2018/10/27	1900	HSL	250	D1900V2-5d118	3857	1358	10.20	39.70	40.8	2.77
2018/10/31	2450	HSL	250	D2450V2-840	3857	1358	14.10	52.60	56.4	7.22
2018/10/31	2600	HSL	250	D2600V2-1061	3857	1358	14.20	58.20	56.8	-2.41
2018/10/29	835	MSL	250	D835V2-4d091	3857	1358	2.32	9.72	9.28	-4.53
2018/10/30	1750	MSL	250	D1750V2-1069	3857	1358	8.96	38.00	35.84	-5.68
2018/10/31	1900	MSL	250	D1900V2-5d118	3857	1358	9.79	40.40	39.16	-3.07
2018/11/2	2450	MSL	250	D2450V2-840	3857	1358	13.90	51.90	55.6	7.13
2018/11/2	2600	MSL	250	D2600V2-1061	3857	1358	13.80	56.40	55.2	-2.13

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2018/10/29	835	MSL	250	D835V2-4d091	3857	1358	1.53	6.42	6.12	-4.67
2018/10/30	1750	MSL	250	D1750V2-1069	3857	1358	4.86	20.30	19.44	-4.24
2018/10/31	1900	MSL	250	D1900V2-5d118	3857	1358	5.24	21.10	20.96	-0.66
2018/11/2	2600	MSL	250	D2600V2-1061	3857	1358	6.16	25.00	24.64	-1.44

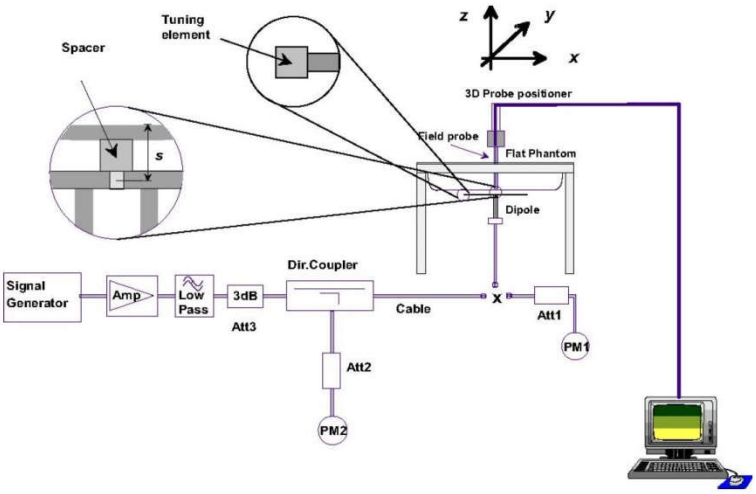


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

10. RF Exposure Positions

10.1 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.

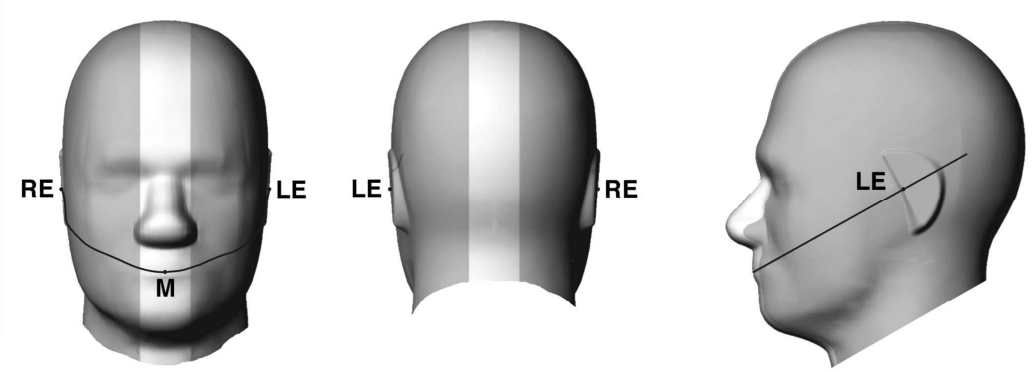


Fig 9.1.1 Front, back, and side views of SAM twin phantom

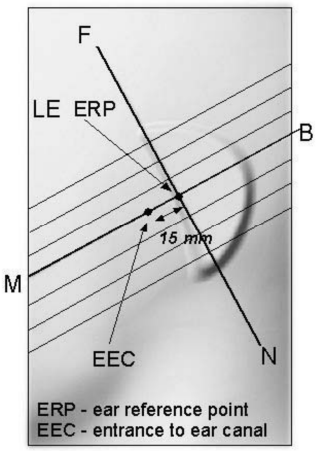


Fig 9.1.2 Close-up side view of phantom showing the ear region.

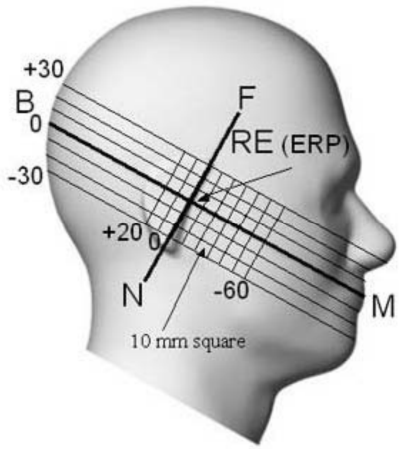


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

10.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width wt of the handset at the level of the acoustic output (point A in Figure 9.2.1 and Figure 9.2.2), and the midpoint of the width wb of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 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.

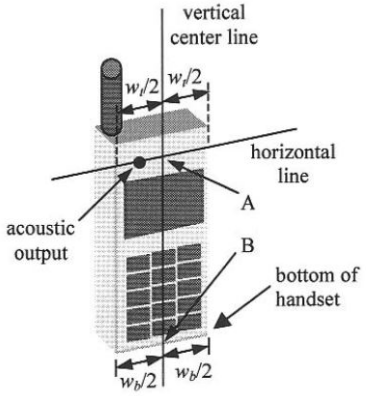


Fig 9.2.1 Handset vertical and horizontal reference lines—"fixed case

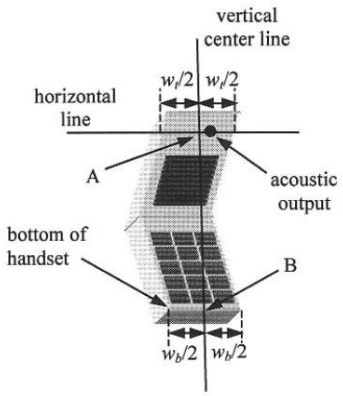


Fig 9.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

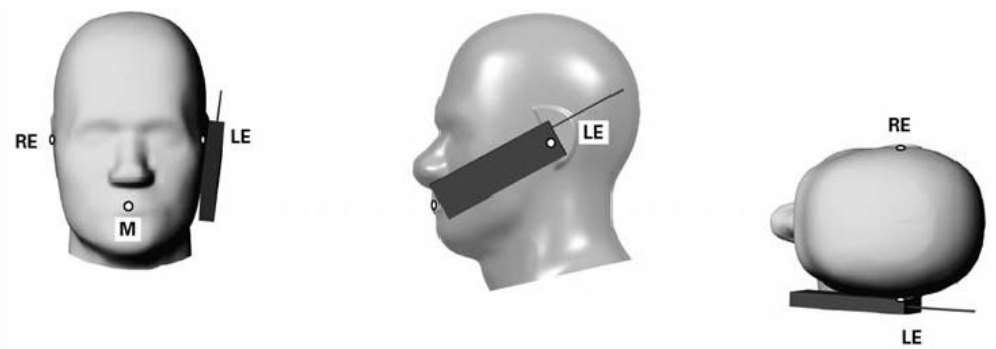


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

10.3 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

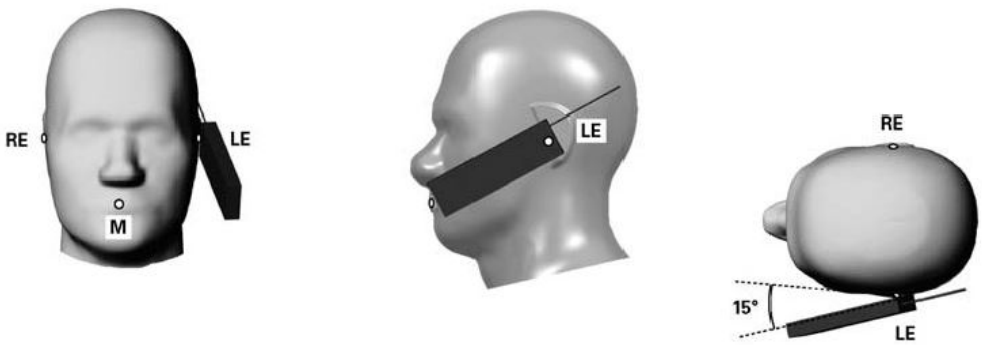


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

10.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 9.4). Per KDB648474 D04v01r03, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a 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 and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are test with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-chip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

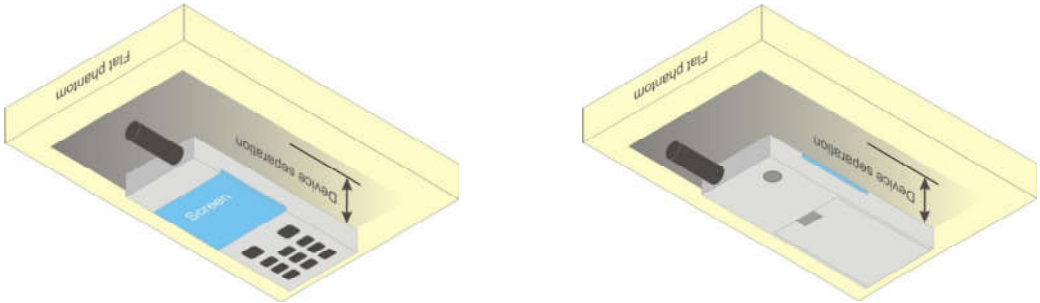


Fig 9.4 Body Worn Position

10.5 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.

10.6 Wireless Router

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

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

11. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

General Note:

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS (4Tx slots) for GSM850/GSM1900 is considered as the primary mode.
2. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode, SAR measurement is not required for the secondary mode
3. Power reduction which is triggered by hotspot mode is implemented in GSM1900 band, for hotspot mode SAR testing EUT was set in reduced power mode and GPRS 4Tx slot due to its highest frame-average power.

<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	33.44	33.46	32.96	33.50	24.44	24.46	23.96	24.50
GPRS 1 Tx slot	33.43	33.44	32.94	33.50	24.43	24.44	23.94	24.50
GPRS 2 Tx slots	30.44	30.34	29.78	30.50	24.44	24.34	23.78	24.50
GPRS 3 Tx slots	28.58	28.49	28.00	28.75	24.32	24.23	23.74	24.49
GPRS 4 Tx slots	27.11	26.95	26.46	27.50	24.11	23.95	23.46	24.50
EDGE 1 Tx slot	27.53	27.33	26.92	28.00	18.53	18.33	17.92	19.00
EDGE 2 Tx slots	27.35	27.23	26.77	28.00	21.35	21.23	20.77	22.00
EDGE 3 Tx slots	25.65	25.45	25.06	26.25	21.39	21.19	20.80	21.99
EDGE 4 Tx slots	24.28	24.00	23.61	25.00	21.28	21.00	20.61	22.00

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	29.54	29.56	30.16	30.50	20.54	20.56	21.16	21.50
GPRS 1 Tx slot	29.53	29.55	30.15	30.50	20.53	20.55	21.15	21.50
GPRS 2 Tx slots	26.32	26.61	26.89	27.50	20.32	20.61	20.89	21.50
GPRS 3 Tx slots	24.60	24.75	25.06	25.75	20.34	20.49	20.80	21.49
GPRS 4 Tx slots	23.22	23.23	23.72	24.50	20.22	20.23	20.72	21.50
EDGE 1 Tx slot	25.74	25.85	26.24	27.00	16.74	16.85	17.24	18.00
EDGE 2 Tx slots	25.74	25.75	26.20	27.00	19.74	19.75	20.20	21.00
EDGE 3 Tx slots	24.04	24.08	24.44	25.25	19.78	19.82	20.18	20.99
EDGE 4 Tx slots	22.72	22.66	23.06	24.00	19.72	19.66	20.06	21.00

<Near-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	28.06	28.15	28.46	28.50	19.06	19.15	19.46	19.50
GPRS 1 Tx slot	28.07	28.17	28.45	28.50	19.07	19.17	19.45	19.50
GPRS 2 Tx slots	25.01	25.05	25.29	25.50	19.01	19.05	19.29	19.50
GPRS 3 Tx slots	23.14	23.13	23.32	23.75	18.88	18.87	19.06	19.49
GPRS 4 Tx slots	21.70	21.79	22.08	22.50	18.70	18.79	19.08	19.50
EDGE 1 Tx slot	25.55	25.93	26.04	27.00	16.55	16.93	17.04	18.00
EDGE 2 Tx slots	24.45	24.56	24.89	25.00	18.45	18.56	18.89	19.00
EDGE 3 Tx slots	22.56	22.54	22.83	23.75	18.30	18.28	18.57	19.49
EDGE 4 Tx slots	21.08	21.18	21.43	22.00	18.08	18.18	18.43	19.00

<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	26.44	26.40	26.87	27.00	17.44	17.40	17.87	18.00
GPRS 1 Tx slot	26.45	26.42	26.90	27.00	17.45	17.42	17.90	18.00
GPRS 2 Tx slots	23.35	23.45	23.64	24.00	17.35	17.45	17.64	18.00
GPRS 3 Tx slots	21.44	21.42	21.85	22.25	17.18	17.16	17.59	17.99
GPRS 4 Tx slots	20.09	20.11	20.54	21.00	17.09	17.11	17.54	18.00
EDGE 1 Tx slot	25.45	25.58	25.91	26.50	16.45	16.58	16.91	17.50
EDGE 2 Tx slots	22.86	22.95	23.30	23.50	16.86	16.95	17.30	17.50
EDGE 3 Tx slots	20.98	21.02	21.29	21.75	16.72	16.76	17.03	17.49
EDGE 4 Tx slots	19.42	19.44	19.90	20.50	16.42	16.44	16.90	17.50

<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} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.

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

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

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

Setup Configuration

HSUPA Setup Configuration:

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

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

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

Note 1: For sub-test 1 to 4, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c.

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

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

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

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

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

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

a. The EUT was connected to Base Station 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: β_c/β_d=2/15
      b). Subtest 2: β_c/β_d=12/15
      c). Subtest 3: β_c/β_d=15/8
      d). Subtest 4: β_c/β_d=15/4
   vi. Set Delta ACK, Delta NACK and Delta CQI = 8
   vii. Set Ack-Nack Repetition Factor to 3
   viii. Set CQI Feedback Cycle (k) to 4 ms
   ix. Set CQI Repetition Factor to 2
   x. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

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

C.8.1.12 Fixed Reference Channel Definition H-Set 12

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

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

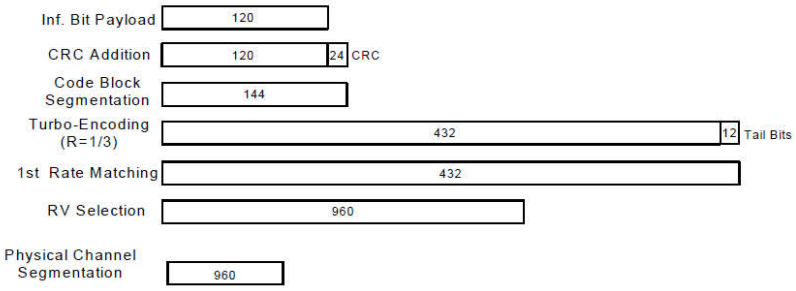


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

General Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

<Default Power Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	23.28	23.26	23.38	24.00	23.40	23.30	23.60	24.00	23.16	23.02	23.00	24.00
3GPP Rel 99	RMC 12.2Kbps	23.30	23.27	23.40	24.00	23.41	23.32	23.62	24.00	23.18	23.03	23.01	24.00
3GPP Rel 6	HSDPA Subtest-1	21.93	22.06	21.97	23.00	22.11	22.19	22.20	23.00	22.35	22.17	22.02	23.00
3GPP Rel 6	HSDPA Subtest-2	21.94	22.03	21.94	23.00	22.15	22.21	22.19	23.00	22.35	22.14	22.03	23.00
3GPP Rel 6	HSDPA Subtest-3	21.44	21.56	21.44	22.50	21.27	21.72	21.74	22.50	21.86	21.66	21.52	22.50
3GPP Rel 6	HSDPA Subtest-4	21.42	21.54	21.44	22.50	21.62	21.70	21.76	22.50	21.85	21.65	21.54	22.50
3GPP Rel 8	DC-HSDPA Subtest-1	21.92	22.02	21.96	23.00	22.12	22.15	22.08	23.00	22.28	22.15	22.01	23.00
3GPP Rel 8	DC-HSDPA Subtest-2	21.98	22.08	21.91	23.00	22.08	22.19	22.01	23.00	22.15	22.14	22.03	23.00
3GPP Rel 8	DC-HSDPA Subtest-3	21.35	21.48	21.45	22.50	21.32	21.78	21.63	22.50	21.81	21.62	21.58	22.50
3GPP Rel 8	DC-HSDPA Subtest-4	21.41	21.51	21.43	22.50	21.28	21.62	21.75	22.50	21.78	21.69	21.48	22.50
3GPP Rel 6	HSUPA Subtest-1	21.92	22.07	21.93	23.00	22.06	22.18	22.19	23.00	22.28	22.20	22.02	23.00
3GPP Rel 6	HSUPA Subtest-2	19.93	20.05	19.92	21.00	20.09	20.16	20.22	21.00	20.28	20.18	19.97	21.00
3GPP Rel 6	HSUPA Subtest-3	20.95	21.00	20.93	22.00	21.06	21.19	21.18	22.00	21.39	21.16	20.98	22.00
3GPP Rel 6	HSUPA Subtest-4	19.90	20.06	19.93	21.00	20.10	20.17	20.14	21.00	20.34	20.17	19.99	21.00
3GPP Rel 6	HSUPA Subtest-5	21.90	22.00	21.90	23.00	22.10	22.20	22.20	23.00	22.40	22.20	22.00	23.00

<Near-body 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	17.80	17.76	17.90	18.00	19.56	19.42	19.73	20.00
3GPP Rel 99	RMC 12.2Kbps	17.82	17.77	17.93	18.00	19.57	19.46	19.74	20.00
3GPP Rel 6	HSDPA Subtest-1	16.61	16.61	16.62	17.00	18.32	18.34	18.46	19.00
3GPP Rel 6	HSDPA Subtest-2	16.62	16.56	16.64	17.00	18.31	18.33	18.43	19.00
3GPP Rel 6	HSDPA Subtest-3	16.10	16.05	16.13	16.50	17.84	17.83	17.98	18.50
3GPP Rel 6	HSDPA Subtest-4	16.12	16.09	16.13	16.50	17.83	17.87	18.01	18.50
3GPP Rel 8	DC-HSDPA Subtest-1	16.58	16.59	16.62	17.00	18.35	18.35	18.45	19.00
3GPP Rel 8	DC-HSDPA Subtest-2	16.51	16.52	16.63	17.00	18.31	18.31	18.41	19.00
3GPP Rel 8	DC-HSDPA Subtest-3	16.23	16.08	16.18	16.50	17.82	17.82	17.88	18.50
3GPP Rel 8	DC-HSDPA Subtest-4	16.11	16.01	16.12	16.50	17.91	17.78	17.91	18.50
3GPP Rel 6	HSUPA Subtest-1	16.52	16.62	16.65	17.00	18.49	18.69	18.82	18.50
3GPP Rel 6	HSUPA Subtest-2	14.55	14.62	14.64	15.00	16.59	16.71	16.82	16.50
3GPP Rel 6	HSUPA Subtest-3	15.55	15.62	15.69	16.00	17.55	17.69	17.79	17.50
3GPP Rel 6	HSUPA Subtest-4	14.56	14.60	14.68	15.00	16.48	16.64	16.83	16.50
3GPP Rel 6	HSUPA Subtest-5	16.60	16.70	16.70	17.00	18.50	18.70	18.90	19.00

<Hotspot 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	15.62	15.60	15.78	16.00	17.82	17.73	18.01	18.50
3GPP Rel 99	RMC 12.2Kbps	15.64	15.62	15.81	16.00	17.84	17.74	18.13	18.50
3GPP Rel 6	HSDPA Subtest-1	14.90	14.83	14.93	15.00	16.93	16.94	17.06	17.50
3GPP Rel 6	HSDPA Subtest-2	14.90	14.83	14.95	15.00	16.98	16.93	17.09	17.50
3GPP Rel 6	HSDPA Subtest-3	14.41	14.34	14.42	14.50	16.42	16.43	16.58	17.00
3GPP Rel 6	HSDPA Subtest-4	14.37	14.31	14.43	14.50	16.43	16.43	16.58	17.00
3GPP Rel 8	DC-HSDPA Subtest-1	14.91	14.90	14.98	15.00	16.91	16.91	17.01	17.50
3GPP Rel 8	DC-HSDPA Subtest-2	14.88	14.91	14.88	15.00	16.98	16.88	17.00	17.50
3GPP Rel 8	DC-HSDPA Subtest-3	14.35	14.36	14.35	14.50	16.42	16.38	16.48	17.00
3GPP Rel 8	DC-HSDPA Subtest-4	14.28	14.28	14.28	14.50	16.41	16.42	16.53	17.00
3GPP Rel 6	HSUPA Subtest-1	13.83	13.80	13.90	15.00	16.96	16.92	17.04	17.50
3GPP Rel 6	HSUPA Subtest-2	12.86	12.84	12.88	13.00	14.90	14.90	15.03	15.50
3GPP Rel 6	HSUPA Subtest-3	13.87	13.83	13.86	14.00	15.89	15.88	16.05	16.50
3GPP Rel 6	HSUPA Subtest-4	12.90	12.84	12.86	13.00	14.93	14.94	15.04	15.50
3GPP Rel 6	HSUPA Subtest-5	14.90	14.84	14.90	15.00	16.90	16.90	17.10	17.50

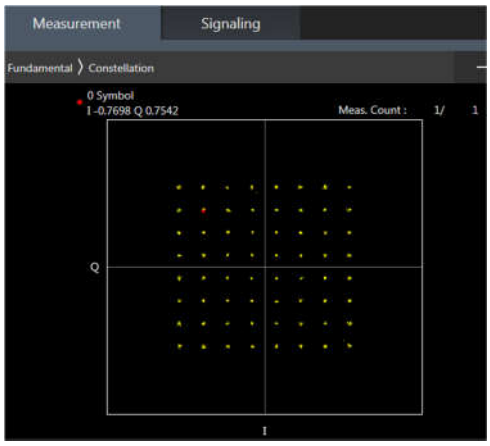
<Product Specific Power Mode>

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	20.97	20.98	21.12	21.50	19.96	19.88	20.10	20.50
3GPP Rel 99	RMC 12.2Kbps	20.98	21.00	21.13	21.50	19.98	19.89	20.11	20.50
3GPP Rel 6	HSDPA Subtest-1	19.94	19.86	19.92	20.50	19.01	18.91	19.07	19.50
3GPP Rel 6	HSDPA Subtest-2	19.37	19.33	19.40	20.50	18.52	18.44	18.61	19.50
3GPP Rel 6	HSDPA Subtest-3	19.88	19.88	19.93	20.00	18.83	18.94	18.98	19.00
3GPP Rel 6	HSDPA Subtest-4	19.88	19.86	19.89	20.00	18.92	18.91	18.92	19.00
3GPP Rel 8	DC-HSDPA Subtest-1	19.78	19.85	19.87	20.50	19.05	18.81	19.01	19.50
3GPP Rel 8	DC-HSDPA Subtest-2	19.85	19.85	19.63	20.50	19.02	18.85	19.12	19.50
3GPP Rel 8	DC-HSDPA Subtest-3	19.83	19.78	19.85	20.00	18.98	18.90	18.98	19.00
3GPP Rel 8	DC-HSDPA Subtest-4	19.78	19.81	19.89	20.00	18.91	18.82	18.78	19.00
3GPP Rel 6	HSUPA Subtest-1	19.88	19.83	19.91	20.50	18.95	18.93	19.04	19.50
3GPP Rel 6	HSUPA Subtest-2	17.85	17.81	17.89	18.50	16.92	16.92	17.03	17.50
3GPP Rel 6	HSUPA Subtest-3	18.82	18.87	18.87	19.50	17.93	17.91	18.00	18.50
3GPP Rel 6	HSUPA Subtest-4	17.86	17.86	17.88	18.50	16.97	16.92	17.02	17.50
3GPP Rel 6	HSUPA Subtest-5	19.80	19.90	19.90	20.50	18.90	18.90	19.00	19.50

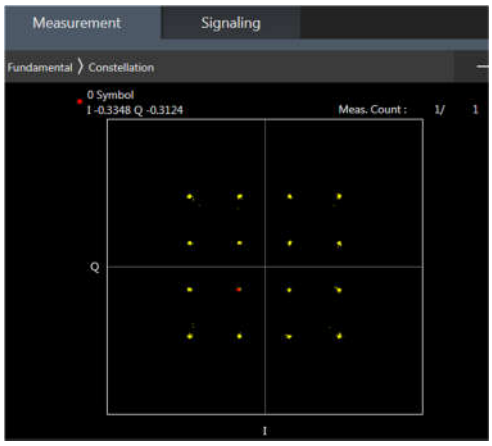
<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B5 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. According to 2017 TCB workshop, for 64 QAM and 16 QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM and 16QAM signal modulation are correct.



64QAM



16QAM

Default Power Mode

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	23.00	22.90	23.38	24	0
20	QPSK	1	49	22.95	22.91	23.17		
20	QPSK	1	99	23.24	22.97	23.05		
20	QPSK	50	0	22.01	22.04	22.23	23	1
20	QPSK	50	24	21.87	21.86	22.07		
20	QPSK	50	50	21.97	22.06	22.13		
20	QPSK	100	0	22.03	21.98	22.32		
20	16QAM	1	0	22.59	22.69	22.85	23	1
20	16QAM	1	49	22.24	22.14	22.25		
20	16QAM	1	99	22.17	22.44	22.24		
20	16QAM	50	0	21.00	20.98	21.16	22	2
20	16QAM	50	24	20.95	20.92	21.03		
20	16QAM	50	50	20.86	21.13	21.24		
20	16QAM	100	0	21.01	20.97	21.23		
20	64QAM	1	0	21.92	22.48	22.56	23	1
20	64QAM	1	49	21.90	21.70	21.95		
20	64QAM	1	99	21.89	22.29	21.90		
20	64QAM	50	0	20.96	21.01	21.06	22	2
20	64QAM	50	24	20.87	20.94	21.05		
20	64QAM	50	50	21.02	21.04	21.25		
20	64QAM	100	0	20.96	21.06	21.22		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.90	22.98	23.20	24	0
15	QPSK	1	37	22.83	22.69	22.90		
15	QPSK	1	74	23.25	23.18	23.30		
15	QPSK	36	0	21.87	21.90	22.02	23	1
15	QPSK	36	20	21.84	21.77	22.01		
15	QPSK	36	39	21.73	21.82	22.10		
15	QPSK	75	0	21.83	21.92	22.08		
15	16QAM	1	0	22.85	22.99	22.71	23	1
15	16QAM	1	37	22.32	22.18	22.05		
15	16QAM	1	74	22.81	22.80	22.73		
15	16QAM	36	0	20.94	20.91	21.04	22	2
15	16QAM	36	20	20.81	20.89	21.04		
15	16QAM	36	39	20.93	21.02	21.10		
15	16QAM	75	0	20.94	21.00	21.17		
15	64QAM	1	0	22.63	22.52	22.55	23	1
15	64QAM	1	37	22.59	22.23	22.25		
15	64QAM	1	74	22.65	22.56	22.64		
15	64QAM	36	0	20.88	20.96	21.00	22	2
15	64QAM	36	20	20.83	20.86	20.98		
15	64QAM	36	39	20.84	21.01	21.06		
15	64QAM	75	0	20.94	20.99	21.17		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	23.20	22.89	23.00	24	0
10	QPSK	1	25	22.80	22.76	23.09		
10	QPSK	1	49	23.24	23.23	23.30		
10	QPSK	25	0	22.00	22.03	22.12	23	1
10	QPSK	25	12	21.98	21.95	22.11		
10	QPSK	25	25	21.93	21.99	22.18		
10	QPSK	50	0	21.99	21.96	22.12		
10	16QAM	1	0	22.48	22.53	22.60	23	1
10	16QAM	1	25	22.21	22.24	22.26		
10	16QAM	1	49	22.59	22.53	22.68		
10	16QAM	25	0	20.98	20.97	21.11	22	2
10	16QAM	25	12	20.91	20.88	21.06		
10	16QAM	25	25	20.94	20.99	21.13		
10	16QAM	50	0	20.97	20.92	21.10		
10	64QAM	1	0	22.40	22.36	22.44	23	1
10	64QAM	1	25	22.05	21.99	22.10		
10	64QAM	1	49	22.45	22.38	22.56		
10	64QAM	25	0	21.01	21.05	21.12	22	2
10	64QAM	25	12	20.98	20.96	21.07		
10	64QAM	25	25	21.00	21.04	21.13		
10	64QAM	50	0	20.96	20.94	21.06		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.92	22.90	22.98	24	0
5	QPSK	1	12	22.81	22.78	23.02		
5	QPSK	1	24	22.94	22.93	23.06		
5	QPSK	12	0	21.96	21.92	22.12	23	1
5	QPSK	12	7	21.90	21.85	22.03		
5	QPSK	12	13	21.89	21.81	22.04		
5	QPSK	25	0	21.92	21.90	22.11		
5	16QAM	1	0	22.31	22.28	22.49	23	1
5	16QAM	1	12	22.12	22.02	22.24		
5	16QAM	1	24	22.22	22.18	22.39		
5	16QAM	12	0	21.03	20.94	21.12	22	2
5	16QAM	12	7	20.99	20.98	21.12		
5	16QAM	12	13	20.96	20.93	21.07		
5	16QAM	25	0	20.92	20.89	21.08		
5	64QAM	1	0	22.14	22.16	22.31	23	1
5	64QAM	1	12	22.03	22.02	22.11		
5	64QAM	1	24	22.11	22.02	22.22		
5	64QAM	12	0	21.02	20.93	21.11	22	2
5	64QAM	12	7	21.00	20.93	21.11		
5	64QAM	12	13	20.98	20.87	21.07		
5	64QAM	25	0	20.99	20.91	21.14		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.54	22.49	22.77	24	0
3	QPSK	1	8	22.58	22.61	22.82		
3	QPSK	1	14	22.44	22.55	22.69		
3	QPSK	8	0	21.52	21.53	21.80	23	1
3	QPSK	8	4	21.50	21.51	21.74		
3	QPSK	8	7	21.49	21.47	21.71		
3	QPSK	15	0	21.47	21.56	21.78		
3	16QAM	1	0	21.71	21.72	22.17	23	1
3	16QAM	1	8	21.54	21.59	21.90		
3	16QAM	1	14	21.69	21.76	22.23		
3	16QAM	8	0	20.63	20.69	20.85	22	2
3	16QAM	8	4	20.63	20.63	20.84		
3	16QAM	8	7	20.64	20.61	20.83		
3	16QAM	15	0	20.47	20.56	20.77		
3	64QAM	1	0	21.93	22.03	22.22	23	1
3	64QAM	1	8	21.74	21.76	22.02		
3	64QAM	1	14	21.82	21.87	22.09		
3	64QAM	8	0	20.64	20.65	20.84	22	2
3	64QAM	8	4	20.59	20.64	20.84		
3	64QAM	8	7	20.58	20.65	20.86		
3	64QAM	15	0	20.52	20.55	20.79		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.54	22.39	22.80	24	0
1.4	QPSK	1	3	22.60	22.47	22.85		
1.4	QPSK	1	5	22.55	22.32	22.67		
1.4	QPSK	3	0	22.47	22.44	22.66		
1.4	QPSK	3	1	22.47	22.51	22.74		
1.4	QPSK	3	3	22.50	22.53	22.76		
1.4	QPSK	6	0	21.51	21.49	21.73	23	1
1.4	16QAM	1	0	21.81	21.64	22.22	23	1
1.4	16QAM	1	3	21.87	21.76	22.22		
1.4	16QAM	1	5	21.78	21.60	22.14		
1.4	16QAM	3	0	21.58	21.60	21.71		
1.4	16QAM	3	1	21.66	21.68	21.80		
1.4	16QAM	3	3	21.62	21.65	21.80		
1.4	16QAM	6	0	20.47	20.51	20.72	22	2
1.4	64QAM	1	0	22.12	22.17	22.23	23	1
1.4	64QAM	1	3	21.85	21.85	21.96		
1.4	64QAM	1	5	22.08	22.19	22.23		
1.4	64QAM	3	0	21.22	21.61	21.74		
1.4	64QAM	3	1	21.25	21.57	21.75		
1.4	64QAM	3	3	21.50	21.60	21.50		
1.4	64QAM	6	0	20.57	20.62	20.82	22	2

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	22.90	23.10	22.95	24	0
20	QPSK	1	49	22.96	22.83	22.92		
20	QPSK	1	99	22.91	23.02	23.06		
20	QPSK	50	0	21.87	21.89	21.90	23	1
20	QPSK	50	24	21.78	21.72	21.84		
20	QPSK	50	50	21.69	21.77	21.80		
20	QPSK	100	0	21.72	21.84	21.97		
20	16QAM	1	0	22.20	22.28	22.33	23	1
20	16QAM	1	49	22.12	22.07	22.17		
20	16QAM	1	99	22.25	22.37	22.38		
20	16QAM	50	0	20.85	20.75	20.89	22	2
20	16QAM	50	24	20.80	20.69	20.86		
20	16QAM	50	50	20.70	20.80	20.82		
20	16QAM	100	0	20.72	20.73	20.83		
20	64QAM	1	0	22.02	22.13	22.08	23	1
20	64QAM	1	49	21.65	21.49	21.62		
20	64QAM	1	99	22.10	22.17	22.19		
20	64QAM	50	0	20.84	20.73	20.86	22	2
20	64QAM	50	24	20.82	20.68	20.82		
20	64QAM	50	50	20.64	20.69	20.77		
20	64QAM	100	0	20.72	20.73	20.80		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	23.02	23.20	23.12	24	0
15	QPSK	1	37	22.61	22.54	22.71		
15	QPSK	1	74	22.77	22.89	22.96		
15	QPSK	36	0	21.86	21.83	21.96	23	1
15	QPSK	36	20	21.79	21.71	21.85		
15	QPSK	36	39	21.74	21.78	21.87		
15	QPSK	75	0	21.75	21.74	21.84		
15	16QAM	1	0	22.29	22.36	22.37	23	1
15	16QAM	1	37	21.88	21.85	21.93		
15	16QAM	1	74	22.19	22.26	22.29		
15	16QAM	36	0	20.91	20.82	20.98	22	2
15	16QAM	36	20	20.80	20.75	20.87		
15	16QAM	36	39	20.72	20.75	20.90		
15	16QAM	75	0	20.80	20.79	20.93		
15	64QAM	1	0	22.10	22.18	22.25	23	1
15	64QAM	1	37	22.09	22.17	22.19		
15	64QAM	1	74	21.98	22.16	22.18		
15	64QAM	36	0	20.89	20.81	20.95	22	2
15	64QAM	36	20	20.82	20.70	20.85		
15	64QAM	36	39	20.70	20.73	20.88		
15	64QAM	75	0	20.80	20.81	20.93		

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	22.77	23.20	23.20	24	0
10	QPSK	1	25	22.84	22.71	22.92		
10	QPSK	1	49	23.36	23.38	23.56		
10	QPSK	25	0	22.02	21.95	22.00	23	1
10	QPSK	25	12	22.00	21.88	21.99		
10	QPSK	25	25	22.05	22.06	22.10		
10	QPSK	50	0	22.03	21.89	22.05		
10	16QAM	1	0	22.56	22.61	22.64	23	1
10	16QAM	1	25	22.23	22.10	22.25		
10	16QAM	1	49	22.65	22.62	22.79		
10	16QAM	25	0	20.97	20.87	20.95	22	2
10	16QAM	25	12	20.98	20.80	20.98		
10	16QAM	25	25	21.02	21.00	21.06		
10	16QAM	50	0	21.06	20.90	21.04		
10	64QAM	1	0	22.44	22.44	22.46	23	1
10	64QAM	1	25	22.11	21.92	22.07		
10	64QAM	1	49	22.55	22.53	22.65		
10	64QAM	25	0	21.03	20.92	21.03	22	2
10	64QAM	25	12	21.00	20.85	21.03		
10	64QAM	25	25	21.09	21.08	21.13		
10	64QAM	50	0	21.05	20.87	21.05		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	23.00	23.05	23.20	24	0
5	QPSK	1	12	22.90	22.76	22.93		
5	QPSK	1	24	22.98	22.90	23.00		
5	QPSK	12	0	22.00	21.88	22.06	23	1
5	QPSK	12	7	21.94	21.82	21.97		
5	QPSK	12	13	21.88	21.85	21.96		
5	QPSK	25	0	21.94	21.90	22.01		
5	16QAM	1	0	22.36	22.37	22.38	23	1
5	16QAM	1	12	22.07	22.00	22.14		
5	16QAM	1	24	22.28	22.18	22.29		
5	16QAM	12	0	21.07	20.96	21.12	22	2
5	16QAM	12	7	21.05	20.90	21.06		
5	16QAM	12	13	21.04	20.95	21.05		
5	16QAM	25	0	20.96	20.84	21.00		
5	64QAM	1	0	22.21	22.16	22.23	23	1
5	64QAM	1	12	22.10	22.00	22.10		
5	64QAM	1	24	22.10	22.08	22.10		
5	64QAM	12	0	21.04	20.90	21.07	22	2
5	64QAM	12	7	21.03	20.92	21.03		
5	64QAM	12	13	20.97	20.95	21.04		
5	64QAM	25	0	21.01	20.91	21.06		

Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	23.22	22.96	22.81	24	0
3	QPSK	1	8	22.93	22.51	22.45		
3	QPSK	1	14	23.39	23.14	23.02		
3	QPSK	8	0	22.04	21.79	21.61	23	1
3	QPSK	8	4	22.04	21.69	21.60		
3	QPSK	8	7	22.11	21.82	21.70		
3	QPSK	15	0	22.06	21.69	21.60		
3	16QAM	1	0	22.55	22.36	22.18	23	1
3	16QAM	1	8	22.28	21.94	21.78		
3	16QAM	1	14	22.65	22.44	22.30		
3	16QAM	8	0	20.94	20.75	20.53	22	2
3	16QAM	8	4	20.93	20.58	20.54		
3	16QAM	8	7	21.03	20.74	20.60		
3	16QAM	15	0	21.05	20.68	20.56		
3	64QAM	1	0	21.90	21.95	21.99	23	1
3	64QAM	1	8	21.89	21.75	21.66		
3	64QAM	1	14	21.88	21.89	21.90		
3	64QAM	8	0	20.89	20.79	20.58	22	2
3	64QAM	8	4	20.90	20.69	20.58		
3	64QAM	8	7	20.92	20.83	20.70		
3	64QAM	15	0	20.91	20.66	20.57		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	22.96	22.42	22.30	24	0
1.4	QPSK	1	3	23.06	22.62	22.49		
1.4	QPSK	1	5	22.95	22.50	22.41		
1.4	QPSK	3	0	22.93	22.61	22.48		
1.4	QPSK	3	1	22.98	22.63	22.57		
1.4	QPSK	3	3	22.95	22.64	22.53		
1.4	QPSK	6	0	21.88	21.55	21.50	23	1
1.4	16QAM	1	0	22.17	21.84	21.76	23	1
1.4	16QAM	1	3	22.20	21.86	21.78		
1.4	16QAM	1	5	22.14	21.72	21.73		
1.4	16QAM	3	0	21.94	21.73	21.60		
1.4	16QAM	3	1	21.98	21.79	21.63		
1.4	16QAM	3	3	21.92	21.73	21.64		
1.4	16QAM	6	0	20.88	20.59	20.49	22	2
1.4	64QAM	1	0	22.09	21.89	21.69	23	1
1.4	64QAM	1	3	22.10	21.87	21.75		
1.4	64QAM	1	5	22.06	21.83	21.62		
1.4	64QAM	3	0	22.12	21.67	21.57		
1.4	64QAM	3	1	22.16	21.74	21.65		
1.4	64QAM	3	3	22.15	21.70	21.63		
1.4	64QAM	6	0	20.92	20.64	20.51	22	2

<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	22.58	22.55	22.42	24	0
10	QPSK	1	25	22.48	22.44	22.46		
10	QPSK	1	49	22.80	22.85	22.93		
10	QPSK	25	0	21.61	21.65	21.47	23	1
10	QPSK	25	12	21.56	21.54	21.54		
10	QPSK	25	25	21.64	21.53	21.50		
10	QPSK	50	0	21.57	21.55	21.57		
10	16QAM	1	0	22.10	22.03	21.98	23	1
10	16QAM	1	25	21.81	21.76	21.80		
10	16QAM	1	49	22.09	22.13	22.13		
10	16QAM	25	0	20.58	20.47	20.48	22	2
10	16QAM	25	12	20.56	20.48	20.51		
10	16QAM	25	25	20.59	20.51	20.56		
10	16QAM	50	0	20.57	20.56	20.53		
10	64QAM	1	0	21.97	21.90	21.88	23	1
10	64QAM	1	25	21.66	21.61	21.62		
10	64QAM	1	49	21.98	22.02	22.09		
10	64QAM	25	0	20.64	20.54	20.48	22	2
10	64QAM	25	12	20.57	20.57	20.55		
10	64QAM	25	25	20.65	20.51	20.63		
10	64QAM	50	0	20.57	20.54	20.55		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.35	22.30	22.45	24	0
5	QPSK	1	12	22.54	22.41	22.47		
5	QPSK	1	24	22.56	22.54	22.52		
5	QPSK	12	0	21.68	21.50	21.51	23	1
5	QPSK	12	7	21.65	21.48	21.51		
5	QPSK	12	13	21.60	21.43	21.52		
5	QPSK	25	0	21.60	21.49	21.53		
5	16QAM	1	0	21.97	21.75	21.78	23	1
5	16QAM	1	12	21.78	21.69	21.68		
5	16QAM	1	24	21.88	21.77	21.76		
5	16QAM	12	0	20.69	20.50	20.58	22	2
5	16QAM	12	7	20.65	20.55	20.58		
5	16QAM	12	13	20.63	20.51	20.58		
5	16QAM	25	0	20.58	20.46	20.50		
5	64QAM	1	0	21.83	21.64	21.62	23	1
5	64QAM	1	12	21.81	21.65	21.69		
5	64QAM	1	24	21.70	21.65	21.64		
5	64QAM	12	0	20.68	20.49	20.56	22	2
5	64QAM	12	7	20.64	20.50	20.60		
5	64QAM	12	13	20.62	20.52	20.56		
5	64QAM	25	0	20.60	20.54	20.52		

Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.72	22.56	22.60	24	0
3	QPSK	1	8	22.73	22.56	22.63		
3	QPSK	1	14	22.63	22.54	22.61		
3	QPSK	8	0	21.77	21.57	21.63	23	1
3	QPSK	8	4	21.75	21.58	21.65		
3	QPSK	8	7	21.74	21.53	21.66		
3	QPSK	15	0	21.71	21.59	21.63		
3	16QAM	1	0	22.12	21.88	21.90	23	1
3	16QAM	1	8	22.05	21.90	21.96		
3	16QAM	1	14	22.01	21.83	21.89		
3	16QAM	8	0	20.84	20.63	20.67	22	2
3	16QAM	8	4	20.82	20.71	20.71		
3	16QAM	8	7	20.81	20.66	20.71		
3	16QAM	15	0	20.74	20.57	20.65		
3	64QAM	1	0	21.87	21.65	21.72	23	1
3	64QAM	1	8	21.95	21.74	21.82		
3	64QAM	1	14	21.83	21.66	21.74		
3	64QAM	8	0	20.73	20.60	20.64	22	2
3	64QAM	8	4	20.71	20.59	20.66		
3	64QAM	8	7	20.69	20.55	20.66		
3	64QAM	15	0	20.72	20.59	20.63		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.68	22.50	22.56	24	0
1.4	QPSK	1	3	22.84	22.53	22.57		
1.4	QPSK	1	5	22.73	22.50	22.52		
1.4	QPSK	3	0	22.79	22.54	22.55		
1.4	QPSK	3	1	22.84	22.57	22.66		
1.4	QPSK	3	3	22.82	22.57	22.65		
1.4	QPSK	6	0	21.71	21.57	21.61	23	1
1.4	16QAM	1	0	22.03	21.82	21.89	23	1
1.4	16QAM	1	3	22.06	21.92	21.93		
1.4	16QAM	1	5	21.97	21.81	21.86		
1.4	16QAM	3	0	21.81	21.61	21.68		
1.4	16QAM	3	1	21.85	21.68	21.68		
1.4	16QAM	3	3	21.81	21.63	21.69		
1.4	16QAM	6	0	20.74	20.61	20.63	22	2
1.4	64QAM	1	0	21.41	21.25	21.32	23	1
1.4	64QAM	1	3	21.44	21.21	21.30		
1.4	64QAM	1	5	21.34	21.18	21.28		
1.4	64QAM	3	0	21.38	21.15	21.19		
1.4	64QAM	3	1	21.32	21.20	21.21		
1.4	64QAM	3	3	21.40	21.20	21.28		
1.4	64QAM	6	0	20.70	20.76	20.69	22	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	23.40	23.38	23.20	24	0
20	QPSK	1	49	23.01	22.98	22.98		
20	QPSK	1	99	23.25	23.18	23.22		
20	QPSK	50	0	22.22	22.09	22.14	23	1
20	QPSK	50	24	22.11	22.03	22.08		
20	QPSK	50	50	22.19	22.17	22.16		
20	QPSK	100	0	22.28	22.24	22.18		
20	16QAM	1	0	22.47	22.44	22.39	23	1
20	16QAM	1	49	22.25	22.20	22.27		
20	16QAM	1	99	22.52	22.38	22.41		
20	16QAM	50	0	21.18	21.10	21.12	22	2
20	16QAM	50	24	21.12	21.09	21.08		
20	16QAM	50	50	21.14	21.15	21.24		
20	16QAM	100	0	21.19	21.11	21.13		
20	64QAM	1	0	22.35	22.28	22.28	23	1
20	64QAM	1	49	22.04	22.11	22.08		
20	64QAM	1	99	22.43	22.31	22.40		
20	64QAM	50	0	21.16	21.06	21.13	22	2
20	64QAM	50	24	21.12	21.06	21.07		
20	64QAM	50	50	21.13	21.14	21.23		
20	64QAM	100	0	21.18	21.10	21.14		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	23.34	23.39	23.30	24	0
15	QPSK	1	37	22.96	22.96	23.06		
15	QPSK	1	74	23.13	23.11	23.13		
15	QPSK	36	0	22.14	22.11	22.16	23	1
15	QPSK	36	20	22.12	22.09	22.15		
15	QPSK	36	39	22.14	22.04	22.18		
15	QPSK	75	0	22.17	22.11	22.17		
15	16QAM	1	0	22.31	22.29	22.39	23	1
15	16QAM	1	37	22.14	22.12	22.22		
15	16QAM	1	74	22.36	22.34	22.37		
15	16QAM	36	0	21.12	21.05	21.10	22	2
15	16QAM	36	20	21.12	21.06	21.19		
15	16QAM	36	39	21.12	21.06	21.20		
15	16QAM	75	0	21.16	21.10	21.22		
15	64QAM	1	0	22.23	22.17	22.25	23	1
15	64QAM	1	37	22.08	22.10	22.22		
15	64QAM	1	74	22.28	22.24	22.27		
15	64QAM	36	0	21.12	21.05	21.07	22	2
15	64QAM	36	20	21.09	21.04	21.18		
15	64QAM	36	39	21.12	21.06	21.17		
15	64QAM	75	0	21.17	21.11	21.22		

Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	23.20	23.20	22.95	24	0
10	QPSK	1	25	22.99	23.03	23.04		
10	QPSK	1	49	23.17	23.15	23.31		
10	QPSK	25	0	22.08	22.10	22.08	23	1
10	QPSK	25	12	21.97	22.02	21.98		
10	QPSK	25	25	22.05	22.04	22.03		
10	QPSK	50	0	22.01	22.07	22.00		
10	16QAM	1	0	22.47	22.47	22.44	23	1
10	16QAM	1	25	22.14	22.17	22.14		
10	16QAM	1	49	22.36	22.37	22.36		
10	16QAM	25	0	21.05	21.07	21.01	22	2
10	16QAM	25	12	20.97	21.01	20.97		
10	16QAM	25	25	21.01	20.99	21.00		
10	16QAM	50	0	21.06	21.08	20.99		
10	64QAM	1	0	22.39	22.36	22.36	23	1
10	64QAM	1	25	22.08	22.09	22.04		
10	64QAM	1	49	22.32	22.30	22.27		
10	64QAM	25	0	21.05	21.06	21.01	22	2
10	64QAM	25	12	20.97	21.01	20.96		
10	64QAM	25	25	20.98	21.06	20.99		
10	64QAM	50	0	21.04	21.04	21.00		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	23.23	23.20	23.26	24	0
5	QPSK	1	12	23.00	22.95	22.94		
5	QPSK	1	24	22.98	22.94	23.00		
5	QPSK	12	0	22.05	22.03	22.01	23	1
5	QPSK	12	7	21.99	22.03	22.02		
5	QPSK	12	13	21.98	21.99	21.98		
5	QPSK	25	0	22.01	22.07	22.05		
5	16QAM	1	0	22.27	22.28	22.23	23	1
5	16QAM	1	12	22.12	22.10	22.11		
5	16QAM	1	24	22.19	22.20	22.22		
5	16QAM	12	0	21.05	21.09	20.99	22	2
5	16QAM	12	7	21.05	21.03	21.03		
5	16QAM	12	13	20.99	21.04	20.98		
5	16QAM	25	0	21.02	21.05	20.97		
5	64QAM	1	0	22.16	22.16	22.14	23	1
5	64QAM	1	12	22.00	22.13	22.05		
5	64QAM	1	24	22.11	22.12	22.11		
5	64QAM	12	0	21.03	21.09	20.98	22	2
5	64QAM	12	7	21.02	21.03	21.01		
5	64QAM	12	13	21.01	21.06	20.96		
5	64QAM	25	0	21.01	21.06	21.04		

Near-body Power Mode

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	17.94	18.11	18.19	18.5	0
20	QPSK	1	49	17.68	17.65	17.79		
20	QPSK	1	99	17.93	18.03	18.15		
20	QPSK	50	0	17.78	17.76	17.94	18.5	0
20	QPSK	50	24	17.64	17.61	17.75		
20	QPSK	50	50	17.74	17.57	17.89		
20	QPSK	100	0	17.97	17.98	18.00		
20	16QAM	1	0	18.49	18.45	18.40	18.5	0
20	16QAM	1	49	17.97	17.96	18.08		
20	16QAM	1	99	18.33	18.44	18.41		
20	16QAM	50	0	17.74	17.71	17.84	18.5	0
20	16QAM	50	24	17.62	17.62	17.79		
20	16QAM	50	50	17.75	17.78	17.95		
20	16QAM	100	0	17.77	17.73	17.83		
20	64QAM	1	0	18.25	18.25	18.39	18.5	0
20	64QAM	1	49	17.46	17.45	17.49		
20	64QAM	1	99	18.17	18.23	18.25		
20	64QAM	50	0	17.71	17.68	17.82	18.5	0
20	64QAM	50	24	17.62	17.60	17.72		
20	64QAM	50	50	17.72	17.76	17.86		
20	64QAM	100	0	17.77	17.73	17.84		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	17.50	17.63	17.58	18.5	0
15	QPSK	1	37	17.91	17.93	18.07		
15	QPSK	1	74	18.00	18.11	18.18		
15	QPSK	36	0	17.69	17.72	17.77	18.5	0
15	QPSK	36	20	17.58	17.59	17.72		
15	QPSK	36	39	17.61	17.73	17.76		
15	QPSK	75	0	17.65	17.64	17.84		
15	16QAM	1	0	18.44	18.43	18.42	18.5	0
15	16QAM	1	37	17.91	17.95	18.00		
15	16QAM	1	74	18.40	18.47	18.40		
15	16QAM	36	0	17.71	17.70	17.78	18.5	0
15	16QAM	36	20	17.62	17.64	17.78		
15	16QAM	36	39	17.63	17.74	17.79		
15	16QAM	75	0	17.67	17.73	17.90		
15	64QAM	1	0	18.24	18.36	18.37	18.5	0
15	64QAM	1	37	17.96	17.90	18.15		
15	64QAM	1	74	18.24	18.38	18.40		
15	64QAM	36	0	17.70	17.69	17.78	18.5	0
15	64QAM	36	20	17.60	17.61	17.71		
15	64QAM	36	39	17.59	17.70	17.76		
15	64QAM	75	0	17.66	17.71	17.89		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	17.40	17.43	17.35	18.5	0
10	QPSK	1	25	18.02	17.95	18.10		
10	QPSK	1	49	17.99	17.88	18.05		
10	QPSK	25	0	17.76	17.79	17.88	18.5	0
10	QPSK	25	12	17.77	17.69	17.82		
10	QPSK	25	25	17.75	17.79	17.84		
10	QPSK	50	0	17.78	17.69	17.85		
10	16QAM	1	0	18.38	18.30	18.40	18.5	0
10	16QAM	1	25	18.10	17.98	18.14		
10	16QAM	1	49	18.36	18.33	18.43		
10	16QAM	25	0	17.74	17.75	17.84	18.5	0
10	16QAM	25	12	17.75	17.61	17.77		
10	16QAM	25	25	17.72	17.69	17.82		
10	16QAM	50	0	17.75	17.68	17.79		
10	64QAM	1	0	18.19	18.14	18.29	18.5	0
10	64QAM	1	25	17.85	17.76	17.94		
10	64QAM	1	49	18.25	18.18	18.34		
10	64QAM	25	0	17.79	17.76	17.87	18.5	0
10	64QAM	25	12	17.76	17.66	17.84		
10	64QAM	25	25	17.76	17.75	17.89		
10	64QAM	50	0	17.78	17.68	17.84		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	17.06	17.11	17.05	18.5	0
5	QPSK	1	12	18.06	17.98	18.12		
5	QPSK	1	24	18.20	18.15	18.30		
5	QPSK	12	0	18.26	18.18	18.35	18.5	0
5	QPSK	12	7	18.22	18.14	18.31		
5	QPSK	12	13	18.21	18.10	18.26		
5	QPSK	25	0	18.26	18.15	18.31		
5	16QAM	1	0	18.01	18.00	18.15	18.5	0
5	16QAM	1	12	17.88	17.91	17.93		
5	16QAM	1	24	17.93	17.86	18.02		
5	16QAM	12	0	17.81	17.76	17.90	18.5	0
5	16QAM	12	7	17.80	17.72	17.85		
5	16QAM	12	13	17.81	17.67	17.84		
5	16QAM	25	0	17.66	17.63	17.78		
5	64QAM	1	0	17.95	17.94	18.03	18.5	0
5	64QAM	1	12	17.85	17.83	17.98		
5	64QAM	1	24	17.90	17.76	17.94		
5	64QAM	12	0	17.79	17.72	17.87	18.5	0
5	64QAM	12	7	17.77	17.70	17.85		
5	64QAM	12	13	17.74	17.64	17.87		
5	64QAM	25	0	17.77	17.70	17.87		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	18.22	18.21	18.27	18.5	0
3	QPSK	1	8	18.10	18.09	18.23		
3	QPSK	1	14	18.14	18.11	18.21		
3	QPSK	8	0	18.19	18.15	18.30	18.5	0
3	QPSK	8	4	18.19	18.10	18.30		
3	QPSK	8	7	18.16	18.11	18.27		
3	QPSK	15	0	18.24	18.09	18.30		
3	16QAM	1	0	18.12	17.70	17.97	18.5	0
3	16QAM	1	8	18.18	17.75	17.93		
3	16QAM	1	14	18.02	17.71	17.86		
3	16QAM	8	0	17.69	17.77	17.94	18.5	0
3	16QAM	8	4	17.75	17.73	17.92		
3	16QAM	8	7	17.68	17.71	17.89		
3	16QAM	15	0	17.74	17.67	17.79		
3	64QAM	1	0	18.08	17.71	17.84	18.5	0
3	64QAM	1	8	18.04	17.75	17.87		
3	64QAM	1	14	18.01	17.75	17.84		
3	64QAM	8	0	17.72	17.61	17.77	18.5	0
3	64QAM	8	4	17.70	17.60	17.80		
3	64QAM	8	7	17.68	17.59	17.74		
3	64QAM	15	0	17.68	17.63	17.81		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	18.19	18.27	18.22	18.5	0
1.4	QPSK	1	3	18.03	18.08	18.16		
1.4	QPSK	1	5	17.93	17.99	18.13		
1.4	QPSK	3	0	18.07	18.07	18.22		
1.4	QPSK	3	1	18.16	18.11	18.27		
1.4	QPSK	3	3	18.08	18.09	18.24		
1.4	QPSK	6	0	18.12	18.07	18.23	18.5	0
1.4	16QAM	1	0	18.08	17.66	17.86	18.5	0
1.4	16QAM	1	3	18.11	17.62	17.93		
1.4	16QAM	1	5	18.02	17.68	17.82		
1.4	16QAM	3	0	17.74	17.73	17.87		
1.4	16QAM	3	1	17.78	17.80	17.89		
1.4	16QAM	3	3	17.67	17.70	17.87		
1.4	16QAM	6	0	17.66	17.60	17.75	18.5	0
1.4	64QAM	1	0	18.00	17.73	17.87	18.5	0
1.4	64QAM	1	3	18.01	17.71	17.86		
1.4	64QAM	1	5	17.91	17.58	17.80		
1.4	64QAM	3	0	17.75	17.65	17.83		
1.4	64QAM	3	1	17.72	17.72	17.85		
1.4	64QAM	3	3	17.71	17.62	17.80		
1.4	64QAM	6	0	17.59	17.60	17.72	18.5	0

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	20.80	20.85	20.79	21	0
20	QPSK	1	49	20.18	20.06	20.15		
20	QPSK	1	99	20.14	20.28	20.25		
20	QPSK	50	0	20.54	20.73	20.52	21	0
20	QPSK	50	24	20.52	20.39	20.49		
20	QPSK	50	50	20.38	20.41	20.40		
20	QPSK	100	0	20.40	20.50	20.41		
20	16QAM	1	0	20.49	20.59	20.53	21	0
20	16QAM	1	49	20.37	20.36	20.38		
20	16QAM	1	99	20.48	20.63	20.55		
20	16QAM	50	0	20.01	19.93	20.05	21	0
20	16QAM	50	24	19.97	19.91	19.99		
20	16QAM	50	50	19.90	19.91	19.96		
20	16QAM	100	0	19.92	19.90	19.92		
20	64QAM	1	0	20.27	20.37	20.31	21	0
20	64QAM	1	49	19.75	19.79	19.78		
20	64QAM	1	99	20.29	20.46	20.38		
20	64QAM	50	0	19.99	19.89	19.99	21	0
20	64QAM	50	24	19.93	19.89	19.93		
20	64QAM	50	50	19.88	19.90	19.92		
20	64QAM	100	0	19.93	19.91	19.92		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	19.56	19.70	19.67	21	0
15	QPSK	1	37	19.76	19.84	19.82		
15	QPSK	1	74	19.99	20.06	20.06		
15	QPSK	36	0	20.00	20.01	20.10	21	0
15	QPSK	36	20	19.94	19.92	19.97		
15	QPSK	36	39	19.87	19.95	19.96		
15	QPSK	75	0	19.93	19.92	19.98		
15	16QAM	1	0	20.62	20.67	20.64	21	0
15	16QAM	1	37	20.14	20.14	20.15		
15	16QAM	1	74	20.47	20.53	20.46		
15	16QAM	36	0	20.06	20.02	20.08	21	0
15	16QAM	36	20	19.94	19.91	20.02		
15	16QAM	36	39	19.95	19.96	19.99		
15	16QAM	75	0	19.96	19.95	20.04		
15	64QAM	1	0	20.42	20.36	20.41	21	0
15	64QAM	1	37	20.33	20.36	20.39		
15	64QAM	1	74	20.23	20.32	20.34		
15	64QAM	36	0	20.04	20.02	20.09	21	0
15	64QAM	36	20	19.96	19.92	19.94		
15	64QAM	36	39	19.90	19.95	19.95		
15	64QAM	75	0	19.95	19.96	20.03		

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	19.84	19.90	19.93	21	0
10	QPSK	1	25	20.04	19.86	19.87		
10	QPSK	1	49	20.52	20.47	20.54		
10	QPSK	25	0	20.22	20.13	20.11	21	0
10	QPSK	25	12	20.22	20.05	20.12		
10	QPSK	25	25	20.23	20.24	20.24		
10	QPSK	50	0	20.25	20.08	20.13		
10	16QAM	1	0	20.85	20.86	20.83	21	0
10	16QAM	1	25	20.50	20.39	20.40		
10	16QAM	1	49	20.91	20.86	20.89		
10	16QAM	25	0	20.16	20.08	20.06	21	0
10	16QAM	25	12	20.18	20.00	20.03		
10	16QAM	25	25	20.21	20.17	20.17		
10	16QAM	50	0	20.21	20.06	20.11		
10	64QAM	1	0	20.61	20.64	20.64	21	0
10	64QAM	1	25	20.26	20.15	20.21		
10	64QAM	1	49	20.81	20.78	20.77		
10	64QAM	25	0	20.22	20.14	20.13	21	0
10	64QAM	25	12	20.23	20.06	20.10		
10	64QAM	25	25	20.24	20.24	20.25		
10	64QAM	50	0	20.21	20.06	20.11		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	19.53	19.50	19.58	21	0
5	QPSK	1	12	20.01	19.92	19.98		
5	QPSK	1	24	20.15	20.11	20.10		
5	QPSK	12	0	20.22	20.07	20.15	21	0
5	QPSK	12	7	20.17	20.06	20.06		
5	QPSK	12	13	20.11	20.06	20.07		
5	QPSK	25	0	20.19	20.06	20.09		
5	16QAM	1	0	20.56	20.40	20.47	21	0
5	16QAM	1	12	20.23	20.17	20.20		
5	16QAM	1	24	20.42	20.34	20.32		
5	16QAM	12	0	20.25	20.14	20.22	21	0
5	16QAM	12	7	20.22	20.15	20.16		
5	16QAM	12	13	20.25	20.18	20.16		
5	16QAM	25	0	20.15	19.98	20.07		
5	64QAM	1	0	20.38	20.35	20.34	21	0
5	64QAM	1	12	20.36	20.23	20.23		
5	64QAM	1	24	20.32	20.24	20.23		
5	64QAM	12	0	20.23	20.10	20.17	21	0
5	64QAM	12	7	20.20	20.09	20.14		
5	64QAM	12	13	20.21	20.11	20.15		
5	64QAM	25	0	20.21	20.12	20.14		

Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	19.42	19.30	19.41	21	0
3	QPSK	1	8	20.10	19.96	20.06		
3	QPSK	1	14	20.09	19.97	20.01		
3	QPSK	8	0	20.10	19.97	20.07	21	0
3	QPSK	8	4	20.11	20.05	20.07		
3	QPSK	8	7	20.07	19.97	20.03		
3	QPSK	15	0	20.09	20.02	20.03		
3	16QAM	1	0	20.26	20.14	20.27	21	0
3	16QAM	1	8	20.30	20.15	20.32		
3	16QAM	1	14	20.23	20.12	20.20		
3	16QAM	8	0	20.27	20.18	20.23	21	0
3	16QAM	8	4	20.27	20.11	20.20		
3	16QAM	8	7	20.25	20.09	20.20		
3	16QAM	15	0	20.11	20.00	20.05		
3	64QAM	1	0	20.15	20.14	20.18	21	0
3	64QAM	1	8	20.20	20.05	20.20		
3	64QAM	1	14	20.13	20.10	20.14		
3	64QAM	8	0	20.13	19.98	20.09	21	0
3	64QAM	8	4	20.13	20.01	20.09		
3	64QAM	8	7	20.06	19.95	20.03		
3	64QAM	15	0	20.10	20.02	20.10		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	19.31	19.20	19.11	21	0
1.4	QPSK	1	3	19.99	19.89	20.01		
1.4	QPSK	1	5	19.83	19.73	19.89		
1.4	QPSK	3	0	20.05	19.94	20.06		
1.4	QPSK	3	1	20.09	19.99	20.09		
1.4	QPSK	3	3	20.04	19.93	20.02		
1.4	QPSK	6	0	20.03	19.93	19.95	21	0
1.4	16QAM	1	0	20.21	20.04	20.18	21	0
1.4	16QAM	1	3	20.30	20.09	20.19		
1.4	16QAM	1	5	20.19	20.07	20.09		
1.4	16QAM	3	0	20.21	20.16	20.21		
1.4	16QAM	3	1	20.26	20.18	20.26		
1.4	16QAM	3	3	20.21	20.08	20.14		
1.4	16QAM	6	0	20.04	19.98	20.02	21	0
1.4	64QAM	1	0	20.16	20.05	20.13	21	0
1.4	64QAM	1	3	20.16	20.10	20.15		
1.4	64QAM	1	5	20.08	20.04	20.09		
1.4	64QAM	3	0	20.16	20.06	20.14		
1.4	64QAM	3	1	20.21	20.13	20.16		
1.4	64QAM	3	3	20.05	20.04	20.08		
1.4	64QAM	6	0	20.07	20.00	20.04	21	0

<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	20.84	20.72	20.78	21	0
20	QPSK	1	49	20.34	20.23	20.26		
20	QPSK	1	99	20.63	20.51	20.59		
20	QPSK	50	0	20.52	20.44	20.46	21	0
20	QPSK	50	24	20.48	20.39	20.39		
20	QPSK	50	50	20.51	20.48	20.44		
20	QPSK	100	0	20.50	20.49	20.45		
20	16QAM	1	0	20.76	20.76	20.77	21	0
20	16QAM	1	49	20.68	20.69	20.64		
20	16QAM	1	99	20.80	20.77	20.78		
20	16QAM	50	0	20.47	20.44	20.41	21	0
20	16QAM	50	24	20.49	20.40	20.34		
20	16QAM	50	50	20.53	20.48	20.49		
20	16QAM	100	0	20.50	20.42	20.44		
20	64QAM	1	0	20.71	20.68	20.65	21	0
20	64QAM	1	49	20.52	20.49	20.41		
20	64QAM	1	99	20.81	20.67	20.78		
20	64QAM	50	0	20.47	20.43	20.44	21	0
20	64QAM	50	24	20.47	20.38	20.35		
20	64QAM	50	50	20.51	20.47	20.49		
20	64QAM	100	0	20.51	20.42	20.43		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	20.64	20.62	20.74	21	0
15	QPSK	1	37	20.34	20.20	20.32		
15	QPSK	1	74	20.48	20.38	20.48		
15	QPSK	36	0	20.46	20.37	20.39	21	0
15	QPSK	36	20	20.46	20.38	20.45		
15	QPSK	36	39	20.51	20.35	20.41		
15	QPSK	75	0	20.51	20.42	20.45		
15	16QAM	1	0	20.79	20.65	20.70	21	0
15	16QAM	1	37	20.55	20.46	20.54		
15	16QAM	1	74	20.77	20.74	20.75		
15	16QAM	36	0	20.50	20.37	20.41	21	0
15	16QAM	36	20	20.48	20.38	20.47		
15	16QAM	36	39	20.49	20.34	20.45		
15	16QAM	75	0	20.52	20.44	20.50		
15	64QAM	1	0	20.70	20.55	20.59	21	0
15	64QAM	1	37	20.56	20.49	20.58		
15	64QAM	1	74	20.64	20.55	20.65		
15	64QAM	36	0	20.50	20.38	20.40	21	0
15	64QAM	36	20	20.47	20.35	20.46		
15	64QAM	36	39	20.51	20.32	20.44		
15	64QAM	75	0	20.50	20.43	20.51		

Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	20.54	20.33	20.59	21	0
10	QPSK	1	25	20.21	20.20	20.14		
10	QPSK	1	49	20.48	20.38	20.43		
10	QPSK	25	0	20.40	20.40	20.34	21	0
10	QPSK	25	12	20.30	20.31	20.27		
10	QPSK	25	25	20.35	20.36	20.26		
10	QPSK	50	0	20.35	20.38	20.24		
10	16QAM	1	0	20.79	20.78	20.79	21	0
10	16QAM	1	25	20.51	20.51	20.43		
10	16QAM	1	49	20.76	20.66	20.68		
10	16QAM	25	0	20.33	20.34	20.28	21	0
10	16QAM	25	12	20.32	20.34	20.21		
10	16QAM	25	25	20.34	20.32	20.26		
10	16QAM	50	0	20.37	20.32	20.23		
10	64QAM	1	0	20.70	20.66	20.62	21	0
10	64QAM	1	25	20.40	20.40	20.31		
10	64QAM	1	49	20.63	20.59	20.59		
10	64QAM	25	0	20.37	20.40	20.36	21	0
10	64QAM	25	12	20.32	20.31	20.20		
10	64QAM	25	25	20.32	20.31	20.31		
10	64QAM	50	0	20.36	20.33	20.24		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	20.50	20.55	20.47	21	0
5	QPSK	1	12	20.21	20.20	20.11		
5	QPSK	1	24	20.29	20.28	20.23		
5	QPSK	12	0	20.34	20.39	20.29	21	0
5	QPSK	12	7	20.32	20.33	20.24		
5	QPSK	12	13	20.31	20.32	20.25		
5	QPSK	25	0	20.34	20.37	20.26		
5	16QAM	1	0	20.63	20.61	20.54	21	0
5	16QAM	1	12	20.49	20.45	20.38		
5	16QAM	1	24	20.51	20.53	20.48		
5	16QAM	12	0	20.36	20.41	20.32	21	0
5	16QAM	12	7	20.35	20.37	20.27		
5	16QAM	12	13	20.34	20.33	20.30		
5	16QAM	25	0	20.35	20.32	20.28		
5	64QAM	1	0	20.51	20.48	20.47	21	0
5	64QAM	1	12	20.46	20.48	20.32		
5	64QAM	1	24	20.41	20.42	20.36		
5	64QAM	12	0	20.34	20.40	20.30	21	0
5	64QAM	12	7	20.33	20.33	20.25		
5	64QAM	12	13	20.32	20.31	20.30		
5	64QAM	25	0	20.36	20.39	20.29		

Hotspot Power Mode

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	16.25	16.09	16.31	16.5	0
20	QPSK	1	49	15.69	15.64	15.78		
20	QPSK	1	99	16.08	16.08	16.29		
20	QPSK	50	0	15.88	15.88	16.10	16.5	0
20	QPSK	50	24	15.72	15.73	15.87		
20	QPSK	50	50	15.84	15.86	15.99		
20	QPSK	100	0	15.89	15.93	16.25		
20	16QAM	1	0	16.08	16.47	16.08	16.5	0
20	16QAM	1	49	16.08	16.04	16.24		
20	16QAM	1	99	16.38	16.15	16.08		
20	16QAM	50	0	15.84	15.82	15.93	16.5	0
20	16QAM	50	24	15.77	15.73	15.85		
20	16QAM	50	50	15.86	15.89	16.03		
20	16QAM	100	0	15.88	15.83	15.94		
20	64QAM	1	0	16.31	16.34	16.40	16.5	0
20	64QAM	1	49	15.68	15.82	15.95		
20	64QAM	1	99	16.28	16.39	16.08		
20	64QAM	50	0	15.81	15.79	15.90	16.5	0
20	64QAM	50	24	15.72	15.72	15.85		
20	64QAM	50	50	15.84	15.84	15.99		
20	64QAM	100	0	15.90	15.81	15.94		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	16.09	16.13	16.19	16.5	0
15	QPSK	1	37	15.84	15.86	15.70		
15	QPSK	1	74	16.07	16.22	16.07		
15	QPSK	36	0	15.80	15.79	15.87	16.5	0
15	QPSK	36	20	15.67	15.73	15.85		
15	QPSK	36	39	15.73	15.81	15.91		
15	QPSK	75	0	15.72	15.80	15.91		
15	16QAM	1	0	16.08	15.91	15.91	16.5	0
15	16QAM	1	37	16.02	16.10	16.19		
15	16QAM	1	74	16.49	16.08	15.91		
15	16QAM	36	0	15.78	15.81	15.89	16.5	0
15	16QAM	36	20	15.69	15.71	15.88		
15	16QAM	36	39	15.75	15.85	15.92		
15	16QAM	75	0	15.73	15.85	15.99		
15	64QAM	1	0	16.30	16.48	16.46	16.5	0
15	64QAM	1	37	15.86	15.92	16.07		
15	64QAM	1	74	16.32	16.46	16.07		
15	64QAM	36	0	15.78	15.80	15.87	16.5	0
15	64QAM	36	20	15.69	15.71	15.82		
15	64QAM	36	39	15.72	15.83	15.91		
15	64QAM	75	0	15.72	15.85	15.98		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	15.19	15.14	15.31	16.5	0
10	QPSK	1	25	15.62	15.55	15.68		
10	QPSK	1	49	16.10	16.04	16.17		
10	QPSK	25	0	15.87	15.88	15.94	16.5	0
10	QPSK	25	12	15.88	15.76	15.93		
10	QPSK	25	25	15.83	15.83	15.95		
10	QPSK	50	0	15.88	15.82	15.95		
10	16QAM	1	0	16.49	16.42	16.41	16.5	0
10	16QAM	1	25	16.13	16.09	16.21		
10	16QAM	1	49	16.33	16.41	16.41		
10	16QAM	25	0	15.88	15.87	15.92	16.5	0
10	16QAM	25	12	15.84	15.74	15.87		
10	16QAM	25	25	15.82	15.83	15.90		
10	16QAM	50	0	15.86	15.77	15.89		
10	64QAM	1	0	16.25	16.21	16.33	16.5	0
10	64QAM	1	25	15.96	15.85	16.05		
10	64QAM	1	49	16.31	16.26	16.40		
10	64QAM	25	0	15.88	15.87	15.95	16.5	0
10	64QAM	25	12	15.85	15.79	15.92		
10	64QAM	25	25	15.84	15.89	15.95		
10	64QAM	50	0	15.89	15.79	15.92		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	15.78	15.74	15.88	16.5	0
5	QPSK	1	12	15.66	15.62	15.76		
5	QPSK	1	24	15.78	15.72	15.90		
5	QPSK	12	0	15.85	15.80	15.95	16.5	0
5	QPSK	12	7	15.82	15.75	15.91		
5	QPSK	12	13	15.80	15.74	15.87		
5	QPSK	25	0	15.85	15.79	15.92		
5	16QAM	1	0	16.19	16.14	16.19	16.5	0
5	16QAM	1	12	16.06	15.98	16.16		
5	16QAM	1	24	15.99	16.02	16.12		
5	16QAM	12	0	15.89	15.87	15.96	16.5	0
5	16QAM	12	7	15.90	15.83	15.95		
5	16QAM	12	13	15.87	15.81	15.95		
5	16QAM	25	0	15.81	15.75	15.88		
5	64QAM	1	0	16.08	16.07	16.13	16.5	0
5	64QAM	1	12	15.91	15.89	16.01		
5	64QAM	1	24	15.94	15.91	16.04		
5	64QAM	12	0	15.86	15.81	15.93	16.5	0
5	64QAM	12	7	15.87	15.81	15.91		
5	64QAM	12	13	15.86	15.73	15.94		
5	64QAM	25	0	15.82	15.77	15.95		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	15.60	15.70	15.70	16.5	0
3	QPSK	1	8	15.85	15.80	15.86		
3	QPSK	1	14	15.73	15.70	15.83		
3	QPSK	8	0	15.77	15.72	15.87	16.5	0
3	QPSK	8	4	15.78	15.77	15.93		
3	QPSK	8	7	15.76	15.67	15.88		
3	QPSK	15	0	15.79	15.73	15.89		
3	16QAM	1	0	16.16	16.13	16.08	16.5	0
3	16QAM	1	8	16.18	16.14	16.08		
3	16QAM	1	14	16.11	16.09	16.05		
3	16QAM	8	0	15.84	15.78	16.02	16.5	0
3	16QAM	8	4	15.82	15.79	15.96		
3	16QAM	8	7	15.81	15.75	15.99		
3	16QAM	15	0	15.84	15.78	15.89		
3	64QAM	1	0	16.08	16.01	16.00	16.5	0
3	64QAM	1	8	16.06	15.94	16.06		
3	64QAM	1	14	16.01	16.01	15.99		
3	64QAM	8	0	15.75	15.73	15.87	16.5	0
3	64QAM	8	4	15.80	15.73	15.91		
3	64QAM	8	7	15.73	15.70	15.84		
3	64QAM	15	0	15.78	15.75	15.87		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	15.78	15.50	15.56	16.5	0
1.4	QPSK	1	3	15.89	15.67	15.81		
1.4	QPSK	1	5	15.74	15.59	15.71		
1.4	QPSK	3	0	15.72	15.69	15.83		
1.4	QPSK	3	1	15.80	15.71	15.88		
1.4	QPSK	3	3	15.74	15.66	15.81		
1.4	QPSK	6	0	15.74	15.69	15.80	16.5	0
1.4	16QAM	1	0	16.07	15.84	15.92	16.5	0
1.4	16QAM	1	3	16.14	15.87	15.97		
1.4	16QAM	1	5	16.06	15.77	15.94		
1.4	16QAM	3	0	15.90	15.75	15.93		
1.4	16QAM	3	1	15.92	15.82	15.98		
1.4	16QAM	3	3	15.84	15.72	15.93		
1.4	16QAM	6	0	15.83	15.72	15.85	16.5	0
1.4	64QAM	1	0	15.76	15.77	16.02	16.5	0
1.4	64QAM	1	3	15.74	15.87	16.01		
1.4	64QAM	1	5	15.69	15.82	15.95		
1.4	64QAM	3	0	15.89	15.76	15.91		
1.4	64QAM	3	1	15.91	15.81	15.91		
1.4	64QAM	3	3	15.84	15.73	15.87		
1.4	64QAM	6	0	15.78	15.72	15.82	16.5	0

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	18.20	18.35	18.29	18.5	0
20	QPSK	1	49	17.71	17.50	17.71		
20	QPSK	1	99	17.75	17.88	17.86		
20	QPSK	50	0	17.63	17.69	17.65	18.5	0
20	QPSK	50	24	17.60	17.49	17.59		
20	QPSK	50	50	17.46	17.51	17.57		
20	QPSK	100	0	17.49	17.88	17.68		
20	16QAM	1	0	18.06	18.12	18.12	18.5	0
20	16QAM	1	49	18.03	17.93	17.95		
20	16QAM	1	99	18.08	18.24	18.20		
20	16QAM	50	0	17.58	17.53	17.63	18.5	0
20	16QAM	50	24	17.57	17.48	17.38		
20	16QAM	50	50	17.46	17.54	17.59		
20	16QAM	100	0	17.52	17.51	17.56		
20	64QAM	1	0	17.90	17.95	17.94	18.5	0
20	64QAM	1	49	17.44	17.59	17.47		
20	64QAM	1	99	17.91	18.04	18.00		
20	64QAM	50	0	17.57	17.52	17.62	18.5	0
20	64QAM	50	24	17.56	17.47	17.54		
20	64QAM	50	50	17.42	17.49	17.51		
20	64QAM	100	0	17.51	17.53	17.56		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	17.22	17.27	17.23	18.5	0
15	QPSK	1	37	17.44	17.38	17.51		
15	QPSK	1	74	17.57	17.64	17.68		
15	QPSK	36	0	17.59	17.57	17.70	18.5	0
15	QPSK	36	20	17.55	17.50	17.63		
15	QPSK	36	39	17.48	17.56	17.57		
15	QPSK	75	0	17.56	17.52	17.63		
15	16QAM	1	0	18.21	18.19	18.21	18.5	0
15	16QAM	1	37	17.85	17.79	17.89		
15	16QAM	1	74	18.03	18.10	18.16		
15	16QAM	36	0	17.66	17.61	17.74	18.5	0
15	16QAM	36	20	17.58	17.53	17.65		
15	16QAM	36	39	17.53	17.58	17.65		
15	16QAM	75	0	17.58	17.53	17.69		
15	64QAM	1	0	17.98	17.99	18.03	18.5	0
15	64QAM	1	37	17.94	17.83	18.00		
15	64QAM	1	74	17.85	17.96	17.95		
15	64QAM	36	0	17.67	17.64	17.71	18.5	0
15	64QAM	36	20	17.55	17.51	17.58		
15	64QAM	36	39	17.51	17.58	17.63		
15	64QAM	75	0	17.57	17.54	17.67		

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	17.96	17.98	17.98	18.5	0
10	QPSK	1	25	17.62	17.41	17.54		
10	QPSK	1	49	18.12	18.11	18.14		
10	QPSK	25	0	17.77	17.75	17.77	18.5	0
10	QPSK	25	12	17.81	17.64	17.75		
10	QPSK	25	25	17.90	17.86	17.88		
10	QPSK	50	0	17.82	17.66	17.81		
10	16QAM	1	0	18.47	18.46	18.50	18.5	0
10	16QAM	1	25	18.17	18.02	18.10		
10	16QAM	1	49	18.55	18.47	18.61		
10	16QAM	25	0	17.76	17.69	17.75	18.5	0
10	16QAM	25	12	17.72	17.56	17.68		
10	16QAM	25	25	17.78	17.78	17.78		
10	16QAM	50	0	17.85	17.67	17.76		
10	64QAM	1	0	18.27	18.27	18.27	18.5	0
10	64QAM	1	25	17.87	17.75	17.88		
10	64QAM	1	49	18.44	18.36	18.47		
10	64QAM	25	0	17.81	17.75	17.79	18.5	0
10	64QAM	25	12	17.82	17.66	17.78		
10	64QAM	25	25	17.85	17.87	17.87		
10	64QAM	50	0	17.81	17.65	17.76		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	17.16	17.09	17.12	18.5	0
5	QPSK	1	12	17.61	17.49	17.60		
5	QPSK	1	24	17.75	17.70	17.74		
5	QPSK	12	0	17.84	17.67	17.82	18.5	0
5	QPSK	12	7	17.75	17.64	17.73		
5	QPSK	12	13	17.73	17.66	17.73		
5	QPSK	25	0	17.77	17.67	17.74		
5	16QAM	1	0	18.05	18.04	18.06	18.5	0
5	16QAM	1	12	17.91	17.82	17.80		
5	16QAM	1	24	17.92	17.86	17.92		
5	16QAM	12	0	17.88	17.72	17.88	18.5	0
5	16QAM	12	7	17.83	17.73	17.85		
5	16QAM	12	13	17.85	17.73	17.79		
5	16QAM	25	0	17.72	17.61	17.70		
5	64QAM	1	0	17.99	17.96	17.99	18.5	0
5	64QAM	1	12	17.96	17.82	17.88		
5	64QAM	1	24	17.95	17.81	17.84		
5	64QAM	12	0	17.84	17.69	17.86	18.5	0
5	64QAM	12	7	17.79	17.69	17.81		
5	64QAM	12	13	17.82	17.73	17.77		
5	64QAM	25	0	17.81	17.66	17.77		

Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	17.05	17.25	17.03	18.5	0
3	QPSK	1	8	17.69	17.59	17.72		
3	QPSK	1	14	17.68	17.56	17.68		
3	QPSK	8	0	17.71	17.59	17.72	18.5	0
3	QPSK	8	4	17.70	17.61	17.72		
3	QPSK	8	7	17.67	17.53	17.66		
3	QPSK	15	0	17.72	17.58	17.69		
3	16QAM	1	0	17.82	17.73	17.83	18.5	0
3	16QAM	1	8	17.78	17.69	17.84		
3	16QAM	1	14	17.76	17.60	17.74		
3	16QAM	8	0	17.91	17.80	17.94	18.5	0
3	16QAM	8	4	17.86	17.71	17.83		
3	16QAM	8	7	17.89	17.71	17.88		
3	16QAM	15	0	17.68	17.60	17.75		
3	64QAM	1	0	17.84	17.70	17.75	18.5	0
3	64QAM	1	8	17.78	17.76	17.83		
3	64QAM	1	14	17.79	17.66	17.73		
3	64QAM	8	0	17.65	17.56	17.69	18.5	0
3	64QAM	8	4	17.69	17.61	17.70		
3	64QAM	8	7	17.67	17.53	17.64		
3	64QAM	15	0	17.71	17.60	17.72		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	17.80	17.87	17.89	18.5	0
1.4	QPSK	1	3	17.55	17.51	17.58		
1.4	QPSK	1	5	17.49	17.43	17.53		
1.4	QPSK	3	0	17.63	17.57	17.70		
1.4	QPSK	3	1	17.68	17.60	17.74		
1.4	QPSK	3	3	17.64	17.52	17.67		
1.4	QPSK	6	0	17.59	17.52	17.60	18.5	0
1.4	16QAM	1	0	17.70	17.63	17.76	18.5	0
1.4	16QAM	1	3	17.79	17.71	17.77		
1.4	16QAM	1	5	17.67	17.57	17.71		
1.4	16QAM	3	0	17.81	17.70	17.84		
1.4	16QAM	3	1	17.88	17.77	17.91		
1.4	16QAM	3	3	17.81	17.68	17.83		
1.4	16QAM	6	0	17.67	17.57	17.68	18.5	0
1.4	64QAM	1	0	17.76	17.66	17.80	18.5	0
1.4	64QAM	1	3	17.83	17.69	17.82		
1.4	64QAM	1	5	17.67	17.59	17.70		
1.4	64QAM	3	0	17.73	17.65	17.71		
1.4	64QAM	3	1	17.84	17.71	17.78		
1.4	64QAM	3	3	17.74	17.58	17.68		
1.4	64QAM	6	0	17.72	17.58	17.73	18.5	0

<Product Specific Power Mode>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	21.88	21.70	21.93	22	0
20	QPSK	1	49	21.34	21.35	21.35		
20	QPSK	1	99	21.55	21.70	21.75		
20	QPSK	50	0	21.36	21.30	21.50	22	0
20	QPSK	50	24	21.21	21.18	21.33		
20	QPSK	50	50	21.32	21.25	21.45		
20	QPSK	100	0	21.39	21.44	21.55		
20	16QAM	1	0	21.99	22.00	21.99	22	0
20	16QAM	1	49	21.55	21.48	21.54		
20	16QAM	1	99	21.94	21.99	21.98		
20	16QAM	50	0	21.31	21.33	21.40	22	0
20	16QAM	50	24	21.22	21.23	21.39		
20	16QAM	50	50	21.32	21.35	21.52		
20	16QAM	100	0	21.32	21.31	21.42		
20	64QAM	1	0	21.80	21.83	21.89	22	0
20	64QAM	1	49	21.08	21.13	21.11		
20	64QAM	1	99	21.77	21.85	21.81		
20	64QAM	50	0	21.29	21.30	21.39	22	0
20	64QAM	50	24	21.19	21.17	21.32		
20	64QAM	50	50	21.30	21.35	21.45		
20	64QAM	100	0	21.33	21.30	21.41		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	21.66	21.62	21.76	22	0
15	QPSK	1	37	20.96	21.03	21.14		
15	QPSK	1	74	21.55	21.66	21.77		
15	QPSK	36	0	21.24	21.28	21.32	22	0
15	QPSK	36	20	21.15	21.20	21.28		
15	QPSK	36	39	21.16	21.30	21.37		
15	QPSK	75	0	21.21	21.27	21.35		
15	16QAM	1	0	21.51	21.60	21.53	22	0
15	16QAM	1	37	21.38	21.44	21.42		
15	16QAM	1	74	21.95	21.58	21.97		
15	16QAM	36	0	21.24	21.28	21.33	22	0
15	16QAM	36	20	21.15	21.24	21.29		
15	16QAM	36	39	21.18	21.33	21.33		
15	16QAM	75	0	21.18	21.33	21.42		
15	64QAM	1	0	21.82	21.90	21.84	22	0
15	64QAM	1	37	21.54	21.60	21.64		
15	64QAM	1	74	21.85	21.96	21.84		
15	64QAM	36	0	21.23	21.27	21.31	22	0
15	64QAM	36	20	21.14	21.18	21.28		
15	64QAM	36	39	21.16	21.31	21.32		
15	64QAM	75	0	21.22	21.30	21.45		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	21.66	21.44	21.68	22	0
10	QPSK	1	25	21.13	21.07	21.19		
10	QPSK	1	49	21.53	21.48	21.62		
10	QPSK	25	0	21.33	21.37	21.41	22	0
10	QPSK	25	12	21.31	21.23	21.37		
10	QPSK	25	25	21.28	21.31	21.46		
10	QPSK	50	0	21.35	21.29	21.39		
10	16QAM	1	0	21.91	21.83	21.95	22	0
10	16QAM	1	25	21.60	21.54	21.59		
10	16QAM	1	49	21.89	21.83	21.89		
10	16QAM	25	0	21.29	21.32	21.36	22	0
10	16QAM	25	12	21.25	21.19	21.33		
10	16QAM	25	25	21.24	21.23	21.41		
10	16QAM	50	0	21.29	21.23	21.37		
10	64QAM	1	0	21.73	21.65	21.76	22	0
10	64QAM	1	25	21.42	21.34	21.48		
10	64QAM	1	49	21.84	21.77	21.80		
10	64QAM	25	0	21.33	21.38	21.41	22	0
10	64QAM	25	12	21.30	21.26	21.40		
10	64QAM	25	25	21.30	21.29	21.41		
10	64QAM	50	0	21.30	21.23	21.40		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	21.14	21.21	21.29	22	0
5	QPSK	1	12	21.13	21.08	21.19		
5	QPSK	1	24	21.24	21.21	21.33		
5	QPSK	12	0	21.30	21.23	21.39	22	0
5	QPSK	12	7	21.27	21.23	21.34		
5	QPSK	12	13	21.21	21.15	21.31		
5	QPSK	25	0	21.31	21.25	21.37		
5	16QAM	1	0	21.63	21.72	21.79	22	0
5	16QAM	1	12	21.44	21.43	21.58		
5	16QAM	1	24	21.48	21.48	21.65		
5	16QAM	12	0	21.34	21.28	21.45	22	0
5	16QAM	12	7	21.34	21.30	21.41		
5	16QAM	12	13	21.33	21.23	21.39		
5	16QAM	25	0	21.20	21.24	21.36		
5	64QAM	1	0	21.50	21.53	21.60	22	0
5	64QAM	1	12	21.40	21.39	21.47		
5	64QAM	1	24	21.38	21.35	21.45		
5	64QAM	12	0	21.31	21.26	21.43	22	0
5	64QAM	12	7	21.26	21.29	21.39		
5	64QAM	12	13	21.29	21.23	21.37		
5	64QAM	25	0	21.28	21.27	21.41		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	21.22	21.19	21.08	22	0
3	QPSK	1	8	21.24	21.19	21.31		
3	QPSK	1	14	21.18	21.17	21.24		
3	QPSK	8	0	21.25	21.19	21.33	22	0
3	QPSK	8	4	21.28	21.22	21.32		
3	QPSK	8	7	21.20	21.11	21.32		
3	QPSK	15	0	21.22	21.20	21.32		
3	16QAM	1	0	21.60	21.37	21.62	22	0
3	16QAM	1	8	21.55	21.39	21.60		
3	16QAM	1	14	21.51	21.39	21.59		
3	16QAM	8	0	21.38	21.29	21.44	22	0
3	16QAM	8	4	21.33	21.30	21.45		
3	16QAM	8	7	21.32	21.29	21.38		
3	16QAM	15	0	21.24	21.23	21.33		
3	64QAM	1	0	21.28	21.27	21.46	22	0
3	64QAM	1	8	21.26	21.26	21.46		
3	64QAM	1	14	21.19	21.26	21.45		
3	64QAM	8	0	21.27	21.13	21.31	22	0
3	64QAM	8	4	21.28	21.17	21.34		
3	64QAM	8	7	21.23	21.15	21.27		
3	64QAM	15	0	21.19	21.21	21.34		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	21.31	20.93	21.00	22	0
1.4	QPSK	1	3	21.37	21.12	21.31		
1.4	QPSK	1	5	21.33	21.05	21.19		
1.4	QPSK	3	0	21.24	21.11	21.26		
1.4	QPSK	3	1	21.23	21.22	21.30		
1.4	QPSK	3	3	21.24	21.12	21.28		
1.4	QPSK	6	0	21.22	21.12	21.26	22	0
1.4	16QAM	1	0	21.43	21.24	21.48	22	0
1.4	16QAM	1	3	21.46	21.38	21.56		
1.4	16QAM	1	5	21.39	21.21	21.48		
1.4	16QAM	3	0	21.17	21.26	21.35		
1.4	16QAM	3	1	21.22	21.29	21.44		
1.4	16QAM	3	3	21.16	21.21	21.32		
1.4	16QAM	6	0	21.19	21.18	21.28	22	0
1.4	64QAM	1	0	21.38	21.30	21.38	22	0
1.4	64QAM	1	3	21.40	21.30	21.42		
1.4	64QAM	1	5	21.28	21.22	21.33		
1.4	64QAM	3	0	21.35	21.21	21.38		
1.4	64QAM	3	1	21.33	21.26	21.38		
1.4	64QAM	3	3	21.27	21.17	21.34		
1.4	64QAM	6	0	21.21	21.15	21.25	22	0

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	20.71	20.84	20.78	21	0
20	QPSK	1	49	20.20	20.12	20.17		
20	QPSK	1	99	20.23	20.35	20.29		
20	QPSK	50	0	20.52	20.63	20.49	21	0
20	QPSK	50	24	20.04	20.15	20.05		
20	QPSK	50	50	19.95	19.97	19.96		
20	QPSK	100	0	20.38	20.69	20.47		
20	16QAM	1	0	20.54	20.62	20.57	21	0
20	16QAM	1	49	20.47	20.41	20.37		
20	16QAM	1	99	20.57	20.64	20.57		
20	16QAM	50	0	20.07	19.96	20.10	21	0
20	16QAM	50	24	20.05	19.95	20.05		
20	16QAM	50	50	19.91	19.99	19.99		
20	16QAM	100	0	19.95	19.98	19.97		
20	64QAM	1	0	20.33	20.42	20.40	21	0
20	64QAM	1	49	19.94	19.76	19.78		
20	64QAM	1	99	20.32	20.50	20.45		
20	64QAM	50	0	20.06	19.96	20.02	21	0
20	64QAM	50	24	19.99	19.94	20.00		
20	64QAM	50	50	19.89	19.97	19.96		
20	64QAM	100	0	19.97	19.98	19.98		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	19.63	19.68	19.77	21	0
15	QPSK	1	37	19.80	19.82	19.86		
15	QPSK	1	74	20.00	20.12	20.13		
15	QPSK	36	0	20.08	20.07	20.13	21	0
15	QPSK	36	20	20.00	19.99	20.04		
15	QPSK	36	39	19.98	20.04	19.98		
15	QPSK	75	0	19.99	19.96	20.06		
15	16QAM	1	0	20.63	20.69	20.67	21	0
15	16QAM	1	37	20.24	20.18	20.21		
15	16QAM	1	74	20.48	20.52	20.52		
15	16QAM	36	0	20.09	20.07	20.17	21	0
15	16QAM	36	20	20.00	19.99	20.08		
15	16QAM	36	39	19.97	20.04	20.04		
15	16QAM	75	0	20.00	20.01	20.11		
15	64QAM	1	0	20.45	20.45	20.47	21	0
15	64QAM	1	37	20.37	20.39	20.50		
15	64QAM	1	74	20.28	20.37	20.40		
15	64QAM	36	0	20.15	20.08	20.16	21	0
15	64QAM	36	20	20.03	20.01	20.01		
15	64QAM	36	39	19.97	20.03	20.04		
15	64QAM	75	0	20.01	20.01	20.10		

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	19.99	19.94	19.88	21	0
10	QPSK	1	25	20.06	19.93	20.03		
10	QPSK	1	49	20.57	20.59	20.66		
10	QPSK	25	0	20.28	20.19	20.18	21	0
10	QPSK	25	12	20.26	20.10	20.16		
10	QPSK	25	25	20.33	20.29	20.27		
10	QPSK	50	0	20.31	20.16	20.19		
10	16QAM	1	0	20.92	20.89	20.90	21	0
10	16QAM	1	25	20.56	20.43	20.45		
10	16QAM	1	49	20.99	20.92	20.99		
10	16QAM	25	0	20.23	20.13	20.12	21	0
10	16QAM	25	12	20.20	20.09	20.13		
10	16QAM	25	25	20.23	20.27	20.28		
10	16QAM	50	0	20.32	20.14	20.17		
10	64QAM	1	0	20.71	20.73	20.72	21	0
10	64QAM	1	25	20.35	20.27	20.24		
10	64QAM	1	49	20.89	20.81	20.88		
10	64QAM	25	0	20.30	20.20	20.19	21	0
10	64QAM	25	12	20.27	20.11	20.18		
10	64QAM	25	25	20.36	20.33	20.30		
10	64QAM	50	0	20.27	20.15	20.19		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	20.63	20.51	20.65	21	0
5	QPSK	1	12	20.10	19.94	20.05		
5	QPSK	1	24	20.24	20.18	20.17		
5	QPSK	12	0	20.28	20.17	20.24	21	0
5	QPSK	12	7	20.22	20.11	20.16		
5	QPSK	12	13	20.21	20.13	20.15		
5	QPSK	25	0	20.27	20.13	20.16		
5	16QAM	1	0	20.53	20.53	20.61	21	0
5	16QAM	1	12	20.28	20.24	20.30		
5	16QAM	1	24	20.45	20.38	20.43		
5	16QAM	12	0	20.37	20.20	20.25	21	0
5	16QAM	12	7	20.32	20.17	20.24		
5	16QAM	12	13	20.30	20.23	20.23		
5	16QAM	25	0	20.20	20.07	20.14		
5	64QAM	1	0	20.46	20.39	20.37	21	0
5	64QAM	1	12	20.34	20.27	20.35		
5	64QAM	1	24	20.38	20.27	20.31		
5	64QAM	12	0	20.33	20.18	20.22	21	0
5	64QAM	12	7	20.30	20.17	20.21		
5	64QAM	12	13	20.23	20.22	20.22		
5	64QAM	25	0	20.26	20.17	20.24		

Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	20.48	20.36	20.54	21	0
3	QPSK	1	8	20.20	20.08	20.17		
3	QPSK	1	14	20.12	20.07	20.12		
3	QPSK	8	0	20.22	20.09	20.18	21	0
3	QPSK	8	4	20.23	20.11	20.17		
3	QPSK	8	7	20.19	20.03	20.11		
3	QPSK	15	0	20.18	20.07	20.13		
3	16QAM	1	0	20.36	20.26	20.32	21	0
3	16QAM	1	8	20.45	20.25	20.29		
3	16QAM	1	14	20.31	20.21	20.26		
3	16QAM	8	0	20.33	20.23	20.33	21	0
3	16QAM	8	4	20.33	20.24	20.28		
3	16QAM	8	7	20.34	20.18	20.25		
3	16QAM	15	0	20.18	20.08	20.14		
3	64QAM	1	0	20.28	20.16	20.23	21	0
3	64QAM	1	8	20.23	20.17	20.22		
3	64QAM	1	14	20.26	20.11	20.21		
3	64QAM	8	0	20.19	20.06	20.12	21	0
3	64QAM	8	4	20.21	20.11	20.17		
3	64QAM	8	7	20.16	20.03	20.15		
3	64QAM	15	0	20.22	20.09	20.21		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	20.43	20.23	20.38	21	0
1.4	QPSK	1	3	20.08	19.98	20.05		
1.4	QPSK	1	5	20.02	19.90	20.00		
1.4	QPSK	3	0	20.11	20.07	20.10		
1.4	QPSK	3	1	20.21	20.10	20.22		
1.4	QPSK	3	3	20.09	20.04	20.13		
1.4	QPSK	6	0	20.11	20.03	20.09	21	0
1.4	16QAM	1	0	20.33	20.18	20.27	21	0
1.4	16QAM	1	3	20.40	20.25	20.34		
1.4	16QAM	1	5	20.26	20.12	20.26		
1.4	16QAM	3	0	20.28	20.21	20.32		
1.4	16QAM	3	1	20.38	20.25	20.35		
1.4	16QAM	3	3	20.27	20.18	20.28		
1.4	16QAM	6	0	20.16	20.07	20.15	21	0
1.4	64QAM	1	0	20.22	20.11	20.21	21	0
1.4	64QAM	1	3	20.30	20.24	20.26		
1.4	64QAM	1	5	20.20	20.13	20.19		
1.4	64QAM	3	0	20.25	20.17	20.25		
1.4	64QAM	3	1	20.30	20.21	20.28		
1.4	64QAM	3	3	20.21	20.11	20.22		
1.4	64QAM	6	0	20.19	20.10	20.17	21	0

<WLAN Conducted Power>

General Note:

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

<2.4GHz WLAN>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	18.46	19.00	97.59
		6	2437	17.62	18.00	
		11	2462	17.64	18.00	
	802.11g 6Mbps	1	2412	13.06	13.50	87.04
		6	2437	12.66	13.00	
		11	2462	12.19	12.50	
	802.11n-HT20 MCS0	1	2412	11.08	11.50	86.70
		6	2437	11.18	11.50	
		11	2462	11.25	11.50	
	802.11n-HT40 MCS0	3	2422	8.22	8.50	85.79
		6	2437	7.71	8.00	
		9	2452	7.39	8.00	

<2.4GHz Bluetooth>

Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
BR / EDR	CH 00	2402	10.75	9.21	9.14
	CH 39	2441	10.66	8.87	9.17
	CH 78	2480	10.09	8.51	8.52
Tune-up Limit			11	11	11

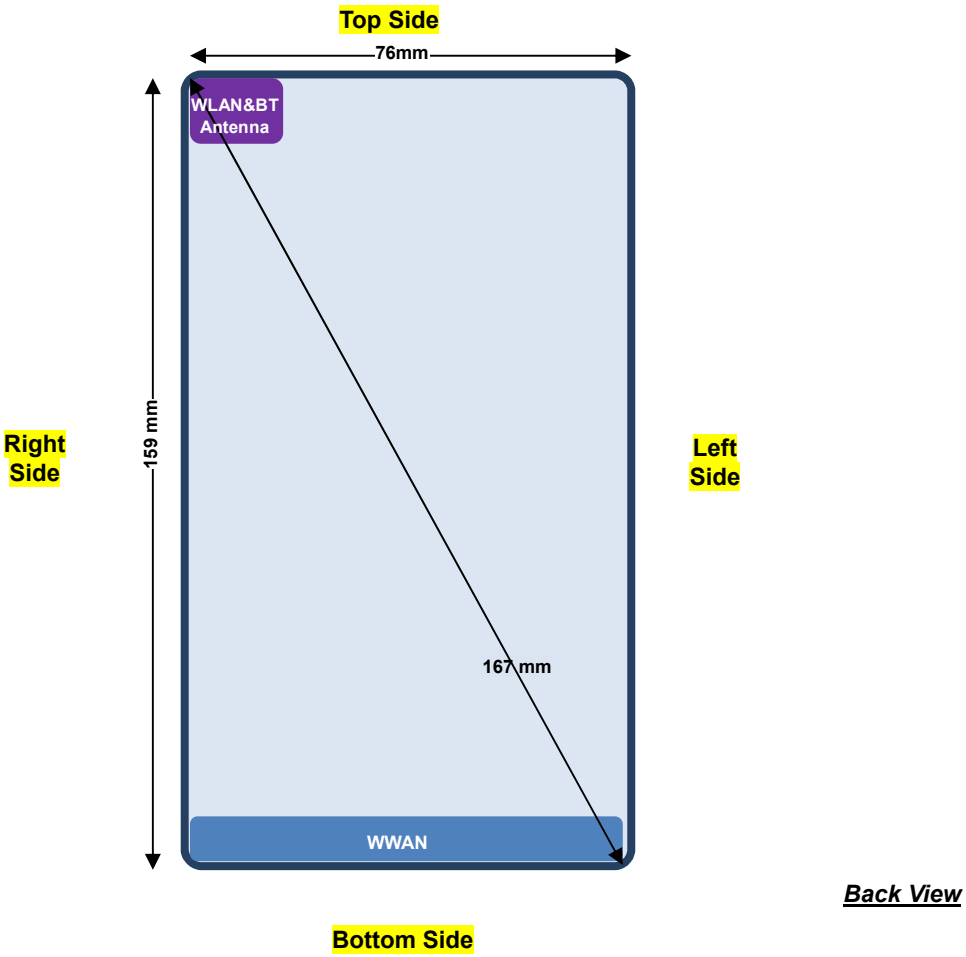
Mode	Channel	Frequency (MHz)	Average power (dBm)
			GFSK
LE	CH 00	2402	1.33
	CH 19	2440	1.03
	CH 39	2480	0.61
Tune-up Limit			2

General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps due to its highest average power and duty cycle is 76.97% considered in SAR testing, and the duty cycle would be scaled to theoretical 83.3% in reported SAR calculation.

12. Antenna Location

<Mobile Phone>



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

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

General Note:

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

13. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 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 ≥0.8W/kg.
4. Pre KDB648474 D04v01r03, when the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.
5. While the device operating in near-body condition by end user, the device will limit different maximum output powers on the GSM1900, WCDMA B2 / B4, LTE B2 / B4 / B7 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.
6. While the device operating in mobile hotspot session, the device will reduce output powers on the GSM1900, WCDMA B2 / B4 and LTE B2 / B4 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.
7. While the device operating in handheld condition, the device will limit different maximum output powers on the WCDMA B2 / B4 and LTE B2 / B4 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.
8. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, when hotspot mode applies, 10-g product specific SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold, for this device only for WWAN transmitter scaled to maximum output power is higher than 1.2W/kg of GSM1900, WCDMA B2 / B4, LTE B2 / B4 / B7, therefore product specific SAR is necessary.

GSM Note:

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS (4Tx slots) for GSM850/GSM1900 is considered as the primary mode.
2. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ 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 ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B5 / B4 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.

WLAN Note:

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

13.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS 4 Tx slots	Right Cheek	0mm	128	824.2	27.11	27.50	1.094	-0.09	0.104	0.114
	GSM850	GPRS 4 Tx slots	Right Tilted	0mm	128	824.2	27.11	27.50	1.094	0.03	0.063	0.069
01	GSM850	GPRS 4 Tx slots	Left Cheek	0mm	128	824.2	27.11	27.50	1.094	-0.01	0.115	0.126
	GSM850	GPRS 4 Tx slots	Left Tilted	0mm	128	824.2	27.11	27.50	1.094	0.03	0.062	0.068
02	GSM1900	GPRS 4 Tx slots	Right Cheek	0mm	810	1909.8	23.72	24.50	1.197	-0.03	0.038	0.045
	GSM1900	GPRS 4 Tx slots	Right Tilted	0mm	810	1909.8	23.72	24.50	1.197	0.06	0.016	0.019
	GSM1900	GPRS 4 Tx slots	Left Cheek	0mm	810	1909.8	23.72	24.50	1.197	0.02	0.031	0.037
	GSM1900	GPRS 4 Tx slots	Left Tilted	0mm	810	1909.8	23.72	24.50	1.197	0.05	0.015	0.018

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
03	WCDMA II	RMC 12.2Kbps	Right Cheek	0mm	9538	1907.6	23.40	24.00	1.148	-0.08	0.100	0.115
	WCDMA II	RMC 12.2Kbps	Right Tilted	0mm	9538	1907.6	23.40	24.00	1.148	0.03	0.049	0.056
	WCDMA II	RMC 12.2Kbps	Left Cheek	0mm	9538	1907.6	23.40	24.00	1.148	-0.03	0.074	0.085
	WCDMA II	RMC 12.2Kbps	Left Tilted	0mm	9538	1907.6	23.40	24.00	1.148	0.03	0.055	0.063
04	WCDMA IV	RMC 12.2Kbps	Right Cheek	0mm	1513	1752.6	23.62	24.00	1.091	-0.17	0.066	0.072
	WCDMA IV	RMC 12.2Kbps	Right Tilted	0mm	1513	1752.6	23.62	24.00	1.091	0.03	0.043	0.047
	WCDMA IV	RMC 12.2Kbps	Left Cheek	0mm	1513	1752.6	23.62	24.00	1.091	-0.03	0.062	0.067
	WCDMA IV	RMC 12.2Kbps	Left Tilted	0mm	1513	1752.6	23.62	24.00	1.091	0.05	0.035	0.039
	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	4132	826.4	23.18	24.00	1.208	0.02	0.228	0.275
	WCDMA V	RMC 12.2Kbps	Right Tilted	0mm	4132	826.4	23.18	24.00	1.208	0.06	0.132	0.159
05	WCDMA V	RMC 12.2Kbps	Left Cheek	0mm	4132	826.4	23.18	24.00	1.208	-0.07	0.239	0.289
	WCDMA V	RMC 12.2Kbps	Left Tilted	0mm	4132	826.4	23.18	24.00	1.208	0.06	0.133	0.161

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
06	LTE Band 2	20M	QPSK	1	0	Right Cheek	0mm	19100	1900	23.38	24.00	1.153	-0.18	0.095	0.109
	LTE Band 2	20M	QPSK	50	0	Right Cheek	0mm	19100	1900	22.23	23.00	1.194	-0.01	0.053	0.063
	LTE Band 2	20M	QPSK	1	0	Right Tilted	0mm	19100	1900	23.38	24.00	1.153	-0.09	0.043	0.050
	LTE Band 2	20M	QPSK	50	0	Right Tilted	0mm	19100	1900	22.23	23.00	1.194	0.14	0.024	0.028
	LTE Band 2	20M	QPSK	1	0	Left Cheek	0mm	19100	1900	23.38	24.00	1.153	-0.07	0.067	0.077
	LTE Band 2	20M	QPSK	50	0	Left Cheek	0mm	19100	1900	22.23	23.00	1.194	-0.17	0.039	0.046
	LTE Band 2	20M	QPSK	1	0	Left Tilted	0mm	19100	1900	23.38	24.00	1.153	-0.11	0.042	0.048
	LTE Band 2	20M	QPSK	50	0	Left Tilted	0mm	19100	1900	22.23	23.00	1.194	0.03	0.024	0.029
07	LTE Band 4	20M	QPSK	1	0	Right Cheek	0mm	20175	1732.5	23.10	24.00	1.230	0.08	0.052	0.064
	LTE Band 4	20M	QPSK	50	0	Right Cheek	0mm	20175	1732.5	21.89	23.00	1.291	-0.02	0.035	0.045
	LTE Band 4	20M	QPSK	1	0	Right Tilted	0mm	20175	1732.5	23.10	24.00	1.230	0.04	0.027	0.033
	LTE Band 4	20M	QPSK	50	0	Right Tilted	0mm	20175	1732.5	21.89	23.00	1.291	0.05	0.017	0.022
	LTE Band 4	20M	QPSK	1	0	Left Cheek	0mm	20175	1732.5	23.10	24.00	1.230	-0.04	0.050	0.062
	LTE Band 4	20M	QPSK	50	0	Left Cheek	0mm	20175	1732.5	21.89	23.00	1.291	0.05	0.034	0.044
	LTE Band 4	20M	QPSK	1	0	Left Tilted	0mm	20175	1732.5	23.10	24.00	1.230	-0.03	0.024	0.030
	LTE Band 4	20M	QPSK	50	0	Left Tilted	0mm	20175	1732.5	21.89	23.00	1.291	0.06	0.017	0.021
	LTE Band 5	10M	QPSK	1	49	Right Cheek	0mm	20525	836.5	22.85	24.00	1.303	-0.02	0.257	0.335
	LTE Band 5	10M	QPSK	25	0	Right Cheek	0mm	20525	836.5	21.65	23.00	1.365	-0.03	0.127	0.173
	LTE Band 5	10M	QPSK	1	49	Right Tilted	0mm	20525	836.5	22.85	24.00	1.303	0.07	0.170	0.222
	LTE Band 5	10M	QPSK	25	0	Right Tilted	0mm	20525	836.5	21.65	23.00	1.365	0.05	0.086	0.117
08	LTE Band 5	10M	QPSK	1	49	Left Cheek	0mm	20525	836.5	22.85	24.00	1.303	-0.03	0.265	0.345
	LTE Band 5	10M	QPSK	25	0	Left Cheek	0mm	20525	836.5	21.65	23.00	1.365	0.03	0.123	0.168
	LTE Band 5	10M	QPSK	1	49	Left Tilted	0mm	20525	836.5	22.85	24.00	1.303	0.03	0.116	0.151
	LTE Band 5	10M	QPSK	25	0	Left Tilted	0mm	20525	836.5	21.65	23.00	1.365	0.03	0.059	0.081
	LTE Band 7	20M	QPSK	1	0	Right Cheek	0mm	20850	2510	23.40	24.00	1.148	0.03	0.061	0.070
	LTE Band 7	20M	QPSK	50	0	Right Cheek	0mm	20850	2510	22.22	23.00	1.197	0.01	0.042	0.050
	LTE Band 7	20M	QPSK	1	0	Right Tilted	0mm	20850	2510	23.40	24.00	1.148	0.07	0.068	0.078
	LTE Band 7	20M	QPSK	50	0	Right Tilted	0mm	20850	2510	22.22	23.00	1.197	-0.03	0.046	0.056
	LTE Band 7	20M	QPSK	1	0	Left Cheek	0mm	20850	2510	23.40	24.00	1.148	-0.03	0.063	0.073
	LTE Band 7	20M	QPSK	50	0	Left Cheek	0mm	20850	2510	22.22	23.00	1.197	0.06	0.041	0.049
09	LTE Band 7	20M	QPSK	1	0	Left Tilted	0mm	20850	2510	23.40	24.00	1.148	-0.05	0.068	0.078
	LTE Band 7	20M	QPSK	50	0	Left Tilted	0mm	20850	2510	22.22	23.00	1.197	-0.05	0.047	0.056

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	1	2412	18.46	19.00	1.133	97.59	1.025	0.03	0.236	0.274
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	1	2412	18.46	19.00	1.133	97.59	1.025	0.05	0.364	0.423
10	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	1	2412	18.46	19.00	1.133	97.59	1.025	0.01	0.478	0.555
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	1	2412	18.46	19.00	1.133	97.59	1.025	-0.18	0.474	0.551

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	DH51Mbps	Right Cheek	0mm	0	2402	10.75	11.00	1.060	76.97	1.082	0.01	0.051	0.059
	Bluetooth	DH51Mbps	Right Tilted	0mm	0	2402	10.75	11.00	1.060	76.97	1.082	-0.1	0.068	0.078
11	Bluetooth	DH51Mbps	Left Cheek	0mm	0	2402	10.75	11.00	1.060	76.97	1.082	-0.08	0.098	0.112
	Bluetooth	DH51Mbps	Left Tilted	0mm	0	2402	10.75	11.00	1.060	76.97	1.082	0.16	0.086	0.099

13.2 Hotspot SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS 4 Tx slots	Front	5mm	128	824.2	27.11	27.50	1.094	-0.03	0.190	0.208
12	GSM850	GPRS 4 Tx slots	Back	5mm	128	824.2	27.11	27.50	1.094	-0.07	0.263	0.288
	GSM850	GPRS 4 Tx slots	Left Side	5mm	128	824.2	27.11	27.50	1.094	-0.06	0.245	0.268
	GSM850	GPRS 4 Tx slots	Right Side	5mm	128	824.2	27.11	27.50	1.094	-0.03	0.193	0.211
	GSM850	GPRS 4 Tx slots	Bottom Side	5mm	128	824.2	27.11	27.50	1.094	0.06	0.108	0.118
	GSM1900	GPRS 4 Tx slots	Front	5mm	810	1909.8	20.54	21.00	1.112	0.04	0.565	0.628
	GSM1900	GPRS 4 Tx slots	Back	5mm	810	1909.8	20.54	21.00	1.112	0.13	0.838	0.932
	GSM1900	GPRS 4 Tx slots	Back	5mm	512	1850.2	20.09	21.00	1.233	-0.07	0.664	0.819
	GSM1900	GPRS 4 Tx slots	Back	5mm	661	1880	20.11	21.00	1.227	0.05	0.693	0.851
	GSM1900	GPRS 4 Tx slots	Left Side	5mm	810	1909.8	20.54	21.00	1.112	-0.03	0.038	0.042
	GSM1900	GPRS 4 Tx slots	Right Side	5mm	810	1909.8	20.54	21.00	1.112	-0.03	0.039	0.044
13	GSM1900	GPRS 4 Tx slots	Bottom Side	5mm	810	1909.8	20.54	21.00	1.112	-0.07	1.300	1.445
	GSM1900	GPRS 4 Tx slots	Bottom Side	5mm	512	1850.2	20.09	21.00	1.233	-0.1	1.050	1.295
	GSM1900	GPRS 4 Tx slots	Bottom Side	5mm	661	1880	20.11	21.00	1.227	0.04	1.090	1.338

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	5mm	9538	1907.6	15.81	16.00	1.045	0.08	0.703	0.734
	WCDMA II	RMC 12.2Kbps	Back	5mm	9538	1907.6	15.81	16.00	1.045	-0.05	0.910	0.951
	WCDMA II	RMC 12.2Kbps	Back	5mm	9262	1852.4	15.64	16.00	1.086	-0.05	0.735	0.799
	WCDMA II	RMC 12.2Kbps	Back	5mm	9400	1880	15.62	16.00	1.091	-0.02	0.851	0.929
	WCDMA II	RMC 12.2Kbps	Left Side	5mm	9538	1907.6	15.81	16.00	1.045	-0.03	0.040	0.042
	WCDMA II	RMC 12.2Kbps	Right Side	5mm	9538	1907.6	15.81	16.00	1.045	-0.03	0.035	0.037
14	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	9538	1907.6	15.81	16.00	1.045	0.01	1.380	1.442
	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	9262	1852.4	15.64	16.00	1.086	-0.01	1.110	1.206
	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	9400	1880	15.62	16.00	1.091	-0.01	1.280	1.397
	WCDMA IV	RMC 12.2Kbps	Front	5mm	1513	1752.6	18.13	18.50	1.089	0.03	0.752	0.819
	WCDMA IV	RMC 12.2Kbps	Front	5mm	1312	1712.4	17.84	18.50	1.164	0.06	0.645	0.751
	WCDMA IV	RMC 12.2Kbps	Front	5mm	1413	1732.6	17.74	18.50	1.191	0.03	0.702	0.836
	WCDMA IV	RMC 12.2Kbps	Back	5mm	1513	1752.6	18.13	18.50	1.089	-0.03	0.931	1.014
	WCDMA IV	RMC 12.2Kbps	Back	5mm	1312	1712.4	17.84	18.50	1.164	0.01	0.781	0.909
	WCDMA IV	RMC 12.2Kbps	Back	5mm	1413	1732.6	17.74	18.50	1.191	-0.05	0.859	1.023
	WCDMA IV	RMC 12.2Kbps	Left Side	5mm	1513	1752.6	18.13	18.50	1.089	0.06	0.058	0.063
	WCDMA IV	RMC 12.2Kbps	Right Side	5mm	1513	1752.6	18.13	18.50	1.089	-0.04	0.034	0.037
15	WCDMA IV	RMC 12.2Kbps	Bottom Side	5mm	1513	1752.6	18.13	18.50	1.089	-0.16	1.330	1.448
	WCDMA IV	RMC 12.2Kbps	Bottom Side	5mm	1312	1712.4	17.84	18.50	1.164	-0.03	1.110	1.292
	WCDMA IV	RMC 12.2Kbps	Bottom Side	5mm	1413	1732.6	17.74	18.50	1.191	-0.02	1.200	1.429
	WCDMA V	RMC 12.2Kbps	Front	5mm	4132	826.4	23.18	24.00	1.208	-0.07	0.339	0.409
16	WCDMA V	RMC 12.2Kbps	Back	5mm	4132	826.4	23.18	24.00	1.208	0.04	0.461	0.557
	WCDMA V	RMC 12.2Kbps	Left Side	5mm	4132	826.4	23.18	24.00	1.208	-0.05	0.439	0.530
	WCDMA V	RMC 12.2Kbps	Right Side	5mm	4132	826.4	23.18	24.00	1.208	-0.03	0.185	0.223
	WCDMA V	RMC 12.2Kbps	Bottom Side	5mm	4132	826.4	23.18	24.00	1.208	0.05	0.198	0.239

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	5mm	19100	1900	16.31	16.50	1.045	0.1	0.700	0.731
	LTE Band 2	20M	QPSK	50	0	Front	5mm	19100	1900	16.10	16.50	1.096	0.05	0.703	0.771
	LTE Band 2	20M	QPSK	100	0	Front	5mm	19100	1900	16.25	16.50	1.059	0.04	0.729	0.772
	LTE Band 2	20M	QPSK	1	0	Back	5mm	19100	1900	16.31	16.50	1.045	-0.03	0.982	1.026
	LTE Band 2	20M	QPSK	1	0	Back	5mm	18700	1860	16.25	16.50	1.059	-0.02	0.808	0.856
	LTE Band 2	20M	QPSK	1	0	Back	5mm	18900	1880	16.09	16.50	1.099	-0.01	0.892	0.980
	LTE Band 2	20M	QPSK	50	0	Back	5mm	19100	1900	16.10	16.50	1.096	-0.05	0.966	1.059
	LTE Band 2	20M	QPSK	50	0	Back	5mm	18700	1860	15.88	16.50	1.153	-0.02	0.803	0.926
	LTE Band 2	20M	QPSK	50	0	Back	5mm	18900	1880	15.88	16.50	1.153	-0.01	0.850	0.980
	LTE Band 2	20M	QPSK	100	0	Back	5mm	19100	1900	16.25	16.50	1.059	-0.06	1.010	1.070
	LTE Band 2	20M	QPSK	1	0	Left Side	5mm	19100	1900	16.31	16.50	1.045	-0.03	0.045	0.047
	LTE Band 2	20M	QPSK	50	0	Left Side	5mm	19100	1900	16.10	16.50	1.096	-0.01	0.044	0.048
	LTE Band 2	20M	QPSK	1	0	Right Side	5mm	19100	1900	16.31	16.50	1.045	-0.06	0.037	0.039
	LTE Band 2	20M	QPSK	50	0	Right Side	5mm	19100	1900	16.10	16.50	1.096	0.02	0.039	0.042
	LTE Band 2	20M	QPSK	1	0	Bottom Side	5mm	19100	1900	16.31	16.50	1.045	-0.01	1.340	1.400
	LTE Band 2	20M	QPSK	1	0	Bottom Side	5mm	18700	1860	16.25	16.50	1.059	-0.02	1.090	1.155
	LTE Band 2	20M	QPSK	1	0	Bottom Side	5mm	18900	1880	16.09	16.50	1.099	-0.19	1.170	1.286
	LTE Band 2	20M	QPSK	50	0	Bottom Side	5mm	19100	1900	16.10	16.50	1.096	-0.04	1.300	1.425
	LTE Band 2	20M	QPSK	50	0	Bottom Side	5mm	18700	1860	15.88	16.50	1.153	-0.04	1.100	1.269
	LTE Band 2	20M	QPSK	50	0	Bottom Side	5mm	18900	1880	15.88	16.50	1.153	-0.04	1.150	1.326
17	LTE Band 2	20M	QPSK	100	0	Bottom Side	5mm	19100	1900	16.25	16.50	1.059	-0.02	1.360	1.441
	LTE Band 4	20M	QPSK	1	0	Front	5mm	20175	1732.5	18.35	18.50	1.035	-0.03	0.815	0.844
	LTE Band 4	20M	QPSK	50	0	Front	5mm	20175	1732.5	17.69	18.50	1.205	-0.18	0.688	0.829
	LTE Band 4	20M	QPSK	100	0	Front	5mm	20175	1732.5	17.88	18.50	1.153	-0.14	0.655	0.756
	LTE Band 4	20M	QPSK	1	0	Back	5mm	20175	1732.5	18.35	18.50	1.035	-0.06	0.846	0.876
	LTE Band 4	20M	QPSK	50	0	Back	5mm	20175	1732.5	17.69	18.50	1.205	0.06	0.888	1.070
	LTE Band 4	20M	QPSK	100	0	Back	5mm	20175	1732.5	17.88	18.50	1.153	-0.09	0.911	1.051
	LTE Band 4	20M	QPSK	1	0	Left Side	5mm	20175	1732.5	18.35	18.50	1.035	-0.01	0.063	0.065
	LTE Band 4	20M	QPSK	50	0	Left Side	5mm	20175	1732.5	17.69	18.50	1.205	-0.03	0.064	0.077
	LTE Band 4	20M	QPSK	1	0	Right Side	5mm	20175	1732.5	18.35	18.50	1.035	-0.01	0.033	0.034
	LTE Band 4	20M	QPSK	50	0	Right Side	5mm	20175	1732.5	17.69	18.50	1.205	-0.02	0.034	0.041
	LTE Band 4	20M	QPSK	1	0	Bottom Side	5mm	20175	1732.5	18.35	18.50	1.035	0.06	1.130	1.170
	LTE Band 4	20M	QPSK	50	0	Bottom Side	5mm	20175	1732.5	17.69	18.50	1.205	-0.19	1.190	1.434
18	LTE Band 4	20M	QPSK	100	0	Bottom Side	5mm	20175	1732.5	17.88	18.50	1.153	-0.15	1.250	1.442
	LTE Band 5	10M	QPSK	1	49	Front	5mm	20525	836.5	22.85	24.00	1.303	-0.04	0.375	0.489
	LTE Band 5	10M	QPSK	25	0	Front	5mm	20525	836.5	21.65	23.00	1.365	-0.04	0.194	0.265
19	LTE Band 5	10M	QPSK	1	49	Back	5mm	20525	836.5	22.85	24.00	1.303	-0.04	0.490	0.639
	LTE Band 5	10M	QPSK	25	0	Back	5mm	20525	836.5	21.65	23.00	1.365	-0.03	0.254	0.347
	LTE Band 5	10M	QPSK	1	49	Left Side	5mm	20525	836.5	22.85	24.00	1.303	-0.04	0.455	0.593
	LTE Band 5	10M	QPSK	25	0	Left Side	5mm	20525	836.5	21.65	23.00	1.365	-0.04	0.242	0.330
	LTE Band 5	10M	QPSK	1	49	Right Side	5mm	20525	836.5	22.85	24.00	1.303	-0.03	0.322	0.420
	LTE Band 5	10M	QPSK	25	0	Right Side	5mm	20525	836.5	21.65	23.00	1.365	-0.02	0.173	0.236
	LTE Band 5	10M	QPSK	1	49	Bottom Side	5mm	20525	836.5	22.85	24.00	1.303	-0.05	0.224	0.292
	LTE Band 5	10M	QPSK	25	0	Bottom Side	5mm	20525	836.5	21.65	23.00	1.365	-0.03	0.107	0.146

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 7	20M	QPSK	1	0	Front	5mm	20850	2510	20.84	21.00	1.038	-0.02	0.785	0.814
	LTE Band 7	20M	QPSK	1	0	Front	5mm	21100	2535	20.72	21.00	1.067	-0.17	0.806	0.860
	LTE Band 7	20M	QPSK	1	0	Front	5mm	21350	2560	20.78	21.00	1.052	-0.04	0.829	0.872
	LTE Band 7	20M	QPSK	50	0	Front	5mm	20850	2510	20.52	21.00	1.117	-0.02	0.802	0.896
	LTE Band 7	20M	QPSK	50	0	Front	5mm	21100	2535	20.44	21.00	1.138	-0.03	0.823	0.936
	LTE Band 7	20M	QPSK	50	0	Front	5mm	21350	2560	20.46	21.00	1.132	-0.01	0.876	0.992
	LTE Band 7	20M	QPSK	100	0	Front	5mm	20850	2510	20.50	21.00	1.122	-0.03	0.827	0.928
	LTE Band 7	20M	QPSK	1	0	Back	5mm	20850	2510	20.84	21.00	1.038	-0.08	1.100	1.141
	LTE Band 7	20M	QPSK	1	0	Back	5mm	21100	2535	20.72	21.00	1.067	-0.06	1.190	1.269
	LTE Band 7	20M	QPSK	1	0	Back	5mm	21350	2560	20.78	21.00	1.052	-0.12	1.220	1.283
	LTE Band 7	20M	QPSK	50	0	Back	5mm	20850	2510	20.52	21.00	1.117	-0.06	1.150	1.284
	LTE Band 7	20M	QPSK	50	0	Back	5mm	21100	2535	20.44	21.00	1.138	-0.02	1.200	1.365
20	LTE Band 7	20M	QPSK	50	0	Back	5mm	21350	2560	20.46	21.00	1.132	-0.06	1.250	1.416
	LTE Band 7	20M	QPSK	100	0	Back	5mm	20850	2510	20.50	21.00	1.122	-0.09	1.150	1.290
	LTE Band 7	20M	QPSK	1	0	Left Side	5mm	20850	2510	20.84	21.00	1.038	-0.03	0.203	0.211
	LTE Band 7	20M	QPSK	50	0	Left Side	5mm	20850	2510	20.52	21.00	1.117	0.02	0.214	0.239
	LTE Band 7	20M	QPSK	1	0	Right Side	5mm	20850	2510	20.84	21.00	1.038	0.06	0.269	0.279
	LTE Band 7	20M	QPSK	50	0	Right Side	5mm	20850	2510	20.52	21.00	1.117	0.03	0.279	0.312
	LTE Band 7	20M	QPSK	1	0	Bottom Side	5mm	20850	2510	20.84	21.00	1.038	-0.15	0.801	0.831
	LTE Band 7	20M	QPSK	1	0	Bottom Side	5mm	21100	2535	20.72	21.00	1.067	-0.16	0.759	0.810
	LTE Band 7	20M	QPSK	1	0	Bottom Side	5mm	21350	2560	20.78	21.00	1.052	-0.02	0.711	0.748
	LTE Band 7	20M	QPSK	50	0	Bottom Side	5mm	20850	2510	20.52	21.00	1.117	-0.02	0.792	0.885
	LTE Band 7	20M	QPSK	50	0	Bottom Side	5mm	21100	2535	20.44	21.00	1.138	-0.09	0.722	0.821
	LTE Band 7	20M	QPSK	50	0	Bottom Side	5mm	21350	2560	20.46	21.00	1.132	-0.05	0.703	0.796
	LTE Band 7	20M	QPSK	100	0	Bottom Side	5mm	20850	2510	20.50	21.00	1.122	-0.05	0.786	0.882

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	1	2412	18.46	19.00	1.133	97.59	1.025	-0.04	0.219	0.254
21	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	1	2412	18.46	19.00	1.133	97.59	1.025	0.03	0.319	0.371
	WLAN2.4GHz	802.11b 1Mbps	Right Side	5mm	1	2412	18.46	19.00	1.133	97.59	1.025	0.08	0.260	0.302
	WLAN2.4GHz	802.11b 1Mbps	Top Side	5mm	1	2412	18.46	19.00	1.133	97.59	1.025	0.11	0.286	0.332

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	DH5 1Mbps	Front	5mm	0	2402	10.75	11.00	1.060	76.97	1.082	-0.05	0.050	0.057
22	Bluetooth	DH5 1Mbps	Back	5mm	0	2402	10.75	11.00	1.060	76.97	1.082	0.03	0.076	0.088
	Bluetooth	DH5 1Mbps	Right Side	5mm	0	2402	10.75	11.00	1.060	76.97	1.082	-0.05	0.066	0.076
	Bluetooth	DH5 1Mbps	Top Side	5mm	0	2402	10.75	11.00	1.060	76.97	1.082	-0.06	0.067	0.077

13.3 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS 4 Tx slots	Front	5mm	-	128	824.2	27.11	27.50	1.094	-0.03	0.190	0.208
23	GSM850	GPRS 4 Tx slots	Back	5mm	-	128	824.2	27.11	27.50	1.094	-0.07	0.263	0.288
	GSM1900	GPRS 4 Tx slots	Front	5mm	-	810	1909.8	22.08	22.50	1.102	-0.06	0.760	0.837
	GSM1900	GPRS 4 Tx slots	Front	5mm	-	512	1850.2	21.7	22.50	1.202	0.03	0.704	0.846
	GSM1900	GPRS 4 Tx slots	Front	5mm	-	661	1880	21.79	22.50	1.178	-0.05	0.770	0.907
	GSM1900	GPRS 4 Tx slots	Back	5mm	-	810	1909.8	22.08	22.50	1.102	-0.03	1.150	1.267
	GSM1900	GPRS 4 Tx slots	Back	5mm	-	512	1850.2	21.7	22.50	1.202	-0.03	0.830	0.998
	GSM1900	GPRS 4 Tx slots	Back	5mm	-	661	1880	21.79	22.50	1.178	-0.01	0.911	1.073
24	GSM1900	GPRS 4 Tx slots	Back	5mm	Headset	810	1909.8	22.08	22.50	1.102	-0.01	1.200	1.322
	GSM1900	GPRS 4 Tx slots	Back	5mm	Headset	512	1850.2	21.7	22.50	1.202	-0.05	0.864	1.039
	GSM1900	GPRS 4 Tx slots	Back	5mm	Headset	661	1880	21.79	22.50	1.178	-0.06	0.955	1.125

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	5mm	-	9538	1907.6	17.93	18.00	1.016	-0.03	0.749	0.761
	WCDMA II	RMC 12.2Kbps	Back	5mm	-	9538	1907.6	17.93	18.00	1.016	-0.01	1.280	1.301
	WCDMA II	RMC 12.2Kbps	Back	5mm	-	9400	1880	17.77	18.00	1.054	0.05	1.210	1.276
	WCDMA II	RMC 12.2Kbps	Back	5mm	-	9262	1852.4	17.82	18.00	1.042	0.08	1.040	1.084
25	WCDMA II	RMC 12.2Kbps	Back	5mm	Headset	9538	1907.6	17.93	18.00	1.016	-0.06	1.300	1.321
	WCDMA II	RMC 12.2Kbps	Back	5mm	Headset	9400	1880	17.77	18.00	1.054	-0.09	1.210	1.276
	WCDMA II	RMC 12.2Kbps	Back	5mm	Headset	9262	1852.4	17.82	18.00	1.042	-0.02	1.060	1.105
	WCDMA IV	RMC 12.2Kbps	Front	5mm	-	1513	1752.6	19.74	20.00	1.062	-0.18	1.030	1.094
	WCDMA IV	RMC 12.2Kbps	Front	5mm	-	1312	1712.4	19.57	20.00	1.104	-0.16	0.887	0.979
	WCDMA IV	RMC 12.2Kbps	Front	5mm	-	1413	1732.6	19.46	20.00	1.132	-0.15	1.000	1.132
	WCDMA IV	RMC 12.2Kbps	Back	5mm	-	1513	1752.6	19.74	20.00	1.062	-0.03	1.270	1.348
	WCDMA IV	RMC 12.2Kbps	Back	5mm	-	1312	1712.4	19.57	20.00	1.104	-0.05	1.060	1.170
	WCDMA IV	RMC 12.2Kbps	Back	5mm	-	1413	1732.6	19.46	20.00	1.132	-0.01	1.180	1.336
26	WCDMA IV	RMC 12.2Kbps	Back	5mm	Headset	1513	1752.6	19.74	20.00	1.062	-0.05	1.360	1.444
	WCDMA IV	RMC 12.2Kbps	Back	5mm	Headset	1312	1712.4	19.57	20.00	1.104	-0.02	1.130	1.248
	WCDMA IV	RMC 12.2Kbps	Back	5mm	Headset	1413	1732.6	19.46	20.00	1.132	-0.01	1.240	1.404
	WCDMA V	RMC 12.2Kbps	Front	5mm	-	4132	826.4	23.18	24.00	1.208	-0.07	0.339	0.409
27	WCDMA V	RMC 12.2Kbps	Back	5mm	-	4132	826.4	23.18	24.00	1.208	0.04	0.461	0.557

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	5mm	-	19100	1900	18.19	18.50	1.074	-0.07	0.894	0.960
	LTE Band 2	20M	QPSK	1	0	Front	5mm	-	18700	1860	17.94	18.50	1.138	-0.01	0.751	0.854
	LTE Band 2	20M	QPSK	1	0	Front	5mm	-	18900	1880	18.11	18.50	1.094	-0.05	0.807	0.883
	LTE Band 2	20M	QPSK	50	0	Front	5mm	-	19100	1900	17.94	18.50	1.138	-0.03	0.881	1.002
	LTE Band 2	20M	QPSK	50	0	Front	5mm	-	18700	1860	17.78	18.50	1.180	0.05	0.738	0.871
	LTE Band 2	20M	QPSK	50	0	Front	5mm	-	18900	1880	17.76	18.50	1.186	-0.03	0.787	0.933
	LTE Band 2	20M	QPSK	100	0	Front	5mm	-	19100	1900	18.00	18.50	1.122	-0.02	1.050	1.178
	LTE Band 2	20M	QPSK	1	0	Back	5mm	-	19100	1900	18.19	18.50	1.074	-0.07	1.210	1.300
	LTE Band 2	20M	QPSK	1	0	Back	5mm	-	18700	1860	17.94	18.50	1.138	-0.01	1.020	1.160
	LTE Band 2	20M	QPSK	1	0	Back	5mm	-	18900	1880	18.11	18.50	1.094	-0.05	1.090	1.192
	LTE Band 2	20M	QPSK	50	0	Back	5mm	-	19100	1900	17.94	18.50	1.138	-0.03	1.200	1.365
	LTE Band 2	20M	QPSK	50	0	Back	5mm	-	18700	1860	17.78	18.50	1.180	-0.05	0.988	1.166
	LTE Band 2	20M	QPSK	50	0	Back	5mm	-	18900	1880	17.76	18.50	1.186	-0.03	1.050	1.245
	LTE Band 2	20M	QPSK	100	0	Back	5mm	-	19100	1900	18.00	18.50	1.122	0.01	1.250	1.403
	LTE Band 2	20M	QPSK	100	0	Back	5mm	Headset	19100	1900	18.00	18.50	1.122	-0.05	1.260	1.414
	LTE Band 2	20M	QPSK	100	0	Back	5mm	Headset	18700	1860	17.97	18.50	1.130	0.06	1.240	1.401
28	LTE Band 2	20M	QPSK	100	0	Back	5mm	Headset	18900	1880	17.98	18.50	1.127	-0.01	1.280	1.443
	LTE Band 4	20M	QPSK	1	0	Front	5mm	-	20175	1732.5	20.85	21.00	1.035	-0.07	0.878	0.909
	LTE Band 4	20M	QPSK	50	0	Front	5mm	-	20175	1732.5	20.73	21.00	1.064	0.05	0.881	0.938
	LTE Band 4	20M	QPSK	100	0	Front	5mm	-	20175	1732.5	20.50	21.00	1.122	0.01	0.891	1.000
	LTE Band 4	20M	QPSK	1	0	Back	5mm	-	20175	1732.5	20.85	21.00	1.035	0.03	1.270	1.315
	LTE Band 4	20M	QPSK	50	0	Back	5mm	-	20175	1732.5	20.73	21.00	1.064	-0.07	1.280	1.362
29	LTE Band 4	20M	QPSK	100	0	Back	5mm	-	20175	1732.5	20.50	21.00	1.122	-0.05	1.290	1.447
	LTE Band 4	20M	QPSK	100	0	Back	5mm	Headset	20175	1732.5	20.50	21.00	1.122	-0.08	1.270	1.425
	LTE Band 5	10M	QPSK	1	49	Front	5mm	-	20525	836.5	22.85	24.00	1.303	-0.04	0.375	0.489
	LTE Band 5	10M	QPSK	25	0	Front	5mm	-	20525	836.5	21.65	23.00	1.365	-0.04	0.194	0.265
30	LTE Band 5	10M	QPSK	1	49	Back	5mm	-	20525	836.5	22.85	24.00	1.303	-0.04	0.490	0.639
	LTE Band 5	10M	QPSK	25	0	Back	5mm	-	20525	836.5	21.65	23.00	1.365	-0.03	0.254	0.347
	LTE Band 7	20M	QPSK	1	0	Front	5mm	-	20850	2510	20.84	21.00	1.038	-0.02	0.785	0.814
	LTE Band 7	20M	QPSK	1	0	Front	5mm	-	21100	2535	20.72	21.00	1.067	-0.17	0.806	0.860
	LTE Band 7	20M	QPSK	1	0	Front	5mm	-	21350	2560	20.78	21.00	1.052	-0.04	0.829	0.872
	LTE Band 7	20M	QPSK	50	0	Front	5mm	-	20850	2510	20.52	21.00	1.117	-0.02	0.802	0.896
	LTE Band 7	20M	QPSK	50	0	Front	5mm	-	21100	2535	20.44	21.00	1.138	-0.03	0.823	0.936
	LTE Band 7	20M	QPSK	50	0	Front	5mm	-	21350	2560	20.46	21.00	1.132	-0.01	0.876	0.992
	LTE Band 7	20M	QPSK	100	0	Front	5mm	-	20850	2510	20.50	21.00	1.122	-0.03	0.827	0.928
	LTE Band 7	20M	QPSK	1	0	Back	5mm	-	20850	2510	20.84	21.00	1.038	-0.08	1.100	1.141
	LTE Band 7	20M	QPSK	1	0	Back	5mm	-	21100	2535	20.72	21.00	1.067	-0.06	1.190	1.269
	LTE Band 7	20M	QPSK	1	0	Back	5mm	-	21350	2560	20.78	21.00	1.052	-0.12	1.220	1.283
	LTE Band 7	20M	QPSK	50	0	Back	5mm	-	20850	2510	20.52	21.00	1.117	-0.06	1.150	1.284
	LTE Band 7	20M	QPSK	50	0	Back	5mm	-	21100	2535	20.44	21.00	1.138	-0.02	1.200	1.365
31	LTE Band 7	20M	QPSK	50	0	Back	5mm	-	21350	2560	20.46	21.00	1.132	-0.06	1.250	1.416
	LTE Band 7	20M	QPSK	100	0	Back	5mm	-	20850	2510	20.50	21.00	1.122	-0.09	1.150	1.290
	LTE Band 7	20M	QPSK	50	0	Back	5mm	Headset	20850	2510	20.52	21.00	1.117	0.02	1.120	1.251
	LTE Band 7	20M	QPSK	50	0	Back	5mm	Headset	21100	2535	20.44	21.00	1.138	-0.01	1.180	1.342
	LTE Band 7	20M	QPSK	50	0	Back	5mm	Headset	21350	2560	20.46	21.00	1.132	-0.14	1.220	1.382

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	-	1	2412	18.46	19.00	1.133	97.59	1.025	-0.04	0.219	0.254
32	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	-	1	2412	18.46	19.00	1.133	97.59	1.025	0.03	0.319	0.371

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	DH5 1Mbps	Front	5mm	-	0	2402	10.75	11.00	1.060	76.97	1.082	-0.05	0.050	0.057
33	Bluetooth	DH5 1Mbps	Back	5mm	-	0	2402	10.75	11.00	1.060	76.97	1.082	0.03	0.076	0.088

13.4 Product Specific SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	GSM1900	GPRS 4 Tx slots	Front	0mm	810	1909.8	23.72	24.50	1.197	0.07	1.970	2.358
	GSM1900	GPRS 4 Tx slots	Front	0mm	512	1850.2	23.22	24.50	1.343	0.13	1.670	2.242
	GSM1900	GPRS 4 Tx slots	Front	0mm	661	1880	23.23	24.50	1.340	0.06	1.730	2.318
	GSM1900	GPRS 4 Tx slots	Back	0mm	810	1909.8	23.72	24.50	1.197	-0.07	2.130	2.549
	GSM1900	GPRS 4 Tx slots	Back	0mm	512	1850.2	23.22	24.50	1.343	-0.03	2.010	2.699
34	GSM1900	GPRS 4 Tx slots	Back	0mm	661	1880	23.23	24.50	1.340	-0.03	2.170	2.907
	GSM1900	GPRS 4 Tx slots	Bottom Side	0mm	810	1909.8	23.72	24.50	1.197	-0.09	1.620	1.939

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	0mm	9538	1907.6	21.13	21.50	1.089	0.11	2.730	2.973
	WCDMA II	RMC 12.2Kbps	Front	0mm	9262	1852.4	20.98	21.50	1.127	0.11	2.550	2.874
	WCDMA II	RMC 12.2Kbps	Front	0mm	9400	1880	21.00	21.50	1.122	0.09	2.780	3.119
	WCDMA II	RMC 12.2Kbps	Back	0mm	9538	1907.6	21.13	21.50	1.089	-0.09	2.950	3.212
	WCDMA II	RMC 12.2Kbps	Back	0mm	9262	1852.4	20.98	21.50	1.127	-0.09	3.150	3.551
35	WCDMA II	RMC 12.2Kbps	Back	0mm	9400	1880	21.00	21.50	1.122	-0.01	3.200	3.590
	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	9538	1907.6	21.13	21.50	1.089	-0.02	2.240	2.439
	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	9262	1852.4	20.98	21.50	1.127	0.06	3.090	3.483
	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	9400	1880	21.00	21.50	1.122	0.03	2.690	3.018
	WCDMA IV	RMC 12.2Kbps	Front	0mm	1513	1752.6	20.11	20.50	1.094	0.06	1.740	1.903
	WCDMA IV	RMC 12.2Kbps	Back	0mm	1513	1752.6	20.11	20.50	1.094	-0.11	2.150	2.352
	WCDMA IV	RMC 12.2Kbps	Back	0mm	1312	1712.4	19.98	20.50	1.127	-0.1	1.820	2.051
	WCDMA IV	RMC 12.2Kbps	Back	0mm	1413	1732.6	19.89	20.50	1.151	-0.12	1.960	2.256
36	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	1513	1752.6	20.11	20.50	1.094	-0.04	3.150	3.446
	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	1312	1712.4	19.98	20.50	1.127	0.09	2.880	3.246
	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	1413	1732.6	19.89	20.50	1.151	0.03	2.970	3.418

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	0mm	19100	1900	21.93	22.00	1.016	0.06	2.740	2.785
	LTE Band 2	20M	QPSK	1	0	Front	0mm	18700	1860	21.88	22.00	1.028	-0.01	2.590	2.663
	LTE Band 2	20M	QPSK	1	0	Front	0mm	18900	1880	21.70	22.00	1.072	-0.02	2.640	2.829
	LTE Band 2	20M	QPSK	50	0	Front	0mm	19100	1900	21.50	22.00	1.122	0.03	2.430	2.727
	LTE Band 2	20M	QPSK	50	0	Front	0mm	18700	1860	21.36	22.00	1.159	0.02	2.270	2.630
	LTE Band 2	20M	QPSK	50	0	Front	0mm	18900	1880	21.30	22.00	1.175	0.08	2.270	2.667
	LTE Band 2	20M	QPSK	100	0	Front	0mm	19100	1900	21.55	22.00	1.109	0.03	2.480	2.751
	LTE Band 2	20M	QPSK	1	0	Back	0mm	19100	1900	21.93	22.00	1.016	-0.03	3.260	3.313
	LTE Band 2	20M	QPSK	1	0	Back	0mm	18700	1860	21.88	22.00	1.028	-0.09	3.290	3.382
37	LTE Band 2	20M	QPSK	1	0	Back	0mm	18900	1880	21.70	22.00	1.072	-0.07	3.290	3.525
	LTE Band 2	20M	QPSK	50	0	Back	0mm	19100	1900	21.50	22.00	1.122	-0.06	2.840	3.187
	LTE Band 2	20M	QPSK	50	0	Back	0mm	18700	1860	21.36	22.00	1.159	-0.08	2.890	3.349
	LTE Band 2	20M	QPSK	50	0	Back	0mm	18900	1880	21.30	22.00	1.175	-0.06	2.790	3.278
	LTE Band 2	20M	QPSK	100	0	Back	0mm	19100	1900	21.55	22.00	1.109	-0.08	2.830	3.139
	LTE Band 2	20M	QPSK	1	0	Bottom Side	0mm	19100	1900	21.93	22.00	1.016	-0.06	2.590	2.632
	LTE Band 2	20M	QPSK	1	0	Bottom Side	0mm	18700	1860	21.88	22.00	1.028	-0.15	3.140	3.228
	LTE Band 2	20M	QPSK	1	0	Bottom Side	0mm	18900	1880	21.70	22.00	1.072	-0.01	2.800	3.000
	LTE Band 2	20M	QPSK	50	0	Bottom Side	0mm	19100	1900	21.50	22.00	1.122	-0.05	2.230	2.502
	LTE Band 2	20M	QPSK	50	0	Bottom Side	0mm	18700	1860	21.36	22.00	1.159	-0.15	2.740	3.175
	LTE Band 2	20M	QPSK	50	0	Bottom Side	0mm	18900	1880	21.30	22.00	1.175	-0.05	2.380	2.796
	LTE Band 2	20M	QPSK	100	0	Bottom Side	0mm	19100	1900	21.55	22.00	1.109	-0.02	2.170	2.407
	LTE Band 4	20M	QPSK	1	0	Front	0mm	20175	1732.5	20.84	21.00	1.038	-0.19	1.710	1.774
	LTE Band 4	20M	QPSK	1	0	Back	0mm	20175	1732.5	20.84	21.00	1.038	-0.17	1.930	2.002
	LTE Band 4	20M	QPSK	50	0	Back	0mm	20175	1732.5	20.63	21.00	1.089	-0.08	2.020	2.200
	LTE Band 4	20M	QPSK	100	0	Back	0mm	20175	1732.5	20.69	21.00	1.074	-0.06	2.080	2.234
	LTE Band 4	20M	QPSK	1	0	Bottom Side	0mm	20175	1732.5	20.84	21.00	1.038	-0.03	3.010	3.123
	LTE Band 4	20M	QPSK	50	0	Bottom Side	0mm	20175	1732.5	20.63	21.00	1.089	-0.01	3.280	3.572
38	LTE Band 4	20M	QPSK	100	0	Bottom Side	0mm	20175	1732.5	20.69	21.00	1.074	-0.08	3.340	3.587
	LTE Band 7	20M	QPSK	1	0	Front	0mm	20850	2510	23.40	24.00	1.148	-0.17	1.900	2.181
	LTE Band 7	20M	QPSK	1	0	Front	0mm	21100	2535	23.38	24.00	1.153	-0.09	1.910	2.203
	LTE Band 7	20M	QPSK	1	0	Front	0mm	21350	2560	23.20	24.00	1.202	-0.13	1.910	2.296
	LTE Band 7	20M	QPSK	50	0	Front	0mm	20850	2510	22.22	23.00	1.197	-0.04	1.230	1.472
	LTE Band 7	20M	QPSK	100	0	Front	0mm	20850	2510	22.28	23.00	1.180	0.06	1.180	1.393
39	LTE Band 7	20M	QPSK	1	0	Back	0mm	20850	2510	23.40	24.00	1.148	0.05	2.970	3.410
	LTE Band 7	20M	QPSK	1	0	Back	0mm	21100	2535	23.38	24.00	1.153	0.05	2.560	2.953
	LTE Band 7	20M	QPSK	1	0	Back	0mm	21350	2560	23.20	24.00	1.202	0.05	2.560	3.078
	LTE Band 7	20M	QPSK	50	0	Back	0mm	20850	2510	22.22	23.00	1.197	0.03	1.730	2.070
	LTE Band 7	20M	QPSK	50	0	Back	0mm	21100	2535	22.09	23.00	1.233	0.06	1.640	2.022
	LTE Band 7	20M	QPSK	50	0	Back	0mm	21350	2560	22.14	23.00	1.219	0.06	1.640	1.999
	LTE Band 7	20M	QPSK	100	0	Back	0mm	20850	2510	22.28	23.00	1.180	0.02	1.710	2.018
	LTE Band 7	20M	QPSK	1	0	Bottom Side	0mm	20850	2510	23.40	24.00	1.148	-0.07	1.780	2.044
	LTE Band 7	20M	QPSK	1	0	Bottom Side	0mm	21100	2535	23.38	24.00	1.153	-0.04	1.670	1.926
	LTE Band 7	20M	QPSK	1	0	Bottom Side	0mm	21350	2560	23.20	24.00	1.202	-0.07	1.630	1.960
	LTE Band 7	20M	QPSK	50	0	Bottom Side	0mm	20850	2510	22.22	23.00	1.197	-0.03	1.140	1.364
	LTE Band 7	20M	QPSK	50	0	Bottom Side	0mm	21100	2535	22.09	23.00	1.233	-0.03	1.060	1.307
	LTE Band 7	20M	QPSK	50	0	Bottom Side	0mm	21350	2560	22.14	23.00	1.219	-0.04	1.040	1.268
	LTE Band 7	20M	QPSK	100	0	Bottom Side	0mm	20850	2510	22.28	23.00	1.180	-0.06	1.100	1.298

13.5 Repeated SAR Measurement

No.	Band	Mode	Test Position	Gap (mm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	-	9538	1907.6	15.81	16.00	1.045	0.01	1.380	-	1.442
2nd	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	-	9538	1907.6	15.81	16.00	1.045	0.03	1.360	1.01	1.421
1st	WCDMA IV	RMC 12.2Kbps	Back	5mm	Headset	1513	1752.6	19.74	20.00	1.062	-0.05	1.360	-	1.444
2nd	WCDMA IV	RMC 12.2Kbps	Back	5mm	Headset	1513	1752.6	19.74	20.00	1.062	0.01	1.350	1.01	1.433
1st	LTE Band 7	20M_QPSK_50_0	Back	5mm	-	21350	2560	20.46	21.00	1.132	-0.06	1.250	-	1.416
2nd	LTE Band 7	20M_QPSK_50_0	Back	5mm	-	21350	2560	20.46	21.00	1.132	0.01	1.240	1.01	1.404

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Ratio	Reported 10g SAR (W/kg)
1st	LTE Band 2	20M	QPSK	1	0	Back	0mm	18900	1880	21.70	22.00	1.072	-0.07	3.290	-	3.525
2nd	LTE Band 2	20M	QPSK	1	0	Back	0mm	18900	1880	21.70	22.00	1.072	0.08	3.260	1.01	3.493
1st	LTE Band 4	20M	QPSK	100	0	Bottom Side	0mm	20175	1732.5	20.69	21.00	1.074	-0.08	3.340	-	3.587
2nd	LTE Band 4	20M	QPSK	100	0	Bottom Side	0mm	20175	1732.5	20.69	21.00	1.074	0.06	3.330	1.00	3.576
1st	LTE Band 7	20M	QPSK	1	0	Back	0mm	20850	2510	23.40	24.00	1.148	0.05	2.970	-	3.410
2nd	LTE Band 7	20M	QPSK	1	0	Back	0mm	20850	2510	23.40	24.00	1.148	-0.01	2.950	1.01	3.387

General Note:

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

14. 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

General Note:

1. This device WLAN 2.4GHz supports Hotspot operation and Bluetooth support tethering applications.
2. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
3. The Scaled SAR summation is calculated based on the same configuration and test position.
4. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.
   v) The SPLSR calculated results please refer to section 14.4.

14.1 Head Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 Bluetooth 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)
GSM	GSM850	Right Cheek	0.114	0.274	0.059	**0.388**	**0.173**
		Right Tilted	0.069	0.423	0.078	**0.492**	**0.147**
		Left Cheek	0.126	0.555	0.112	**0.681**	**0.238**
		Left Tilted	0.068	0.551	0.099	**0.619**	**0.167**
	GSM1900	Right Cheek	0.045	0.274	0.059	**0.319**	**0.104**
		Right Tilted	0.019	0.423	0.078	**0.442**	**0.097**
		Left Cheek	0.037	0.555	0.112	**0.592**	**0.149**
		Left Tilted	0.018	0.551	0.099	**0.569**	**0.117**
WCDMA	WCDMA II	Right Cheek	0.115	0.274	0.059	**0.389**	**0.174**
		Right Tilted	0.056	0.423	0.078	**0.479**	**0.134**
		Left Cheek	0.085	0.555	0.112	**0.640**	**0.197**
		Left Tilted	0.063	0.551	0.099	**0.614**	**0.162**
	WCDMA IV	Right Cheek	0.072	0.274	0.059	**0.346**	**0.131**
		Right Tilted	0.047	0.423	0.078	**0.470**	**0.125**
		Left Cheek	0.067	0.555	0.112	**0.622**	**0.179**
		Left Tilted	0.039	0.551	0.099	**0.590**	**0.138**
	WCDMA V	Right Cheek	0.275	0.274	0.059	**0.549**	**0.334**
		Right Tilted	0.159	0.423	0.078	**0.582**	**0.237**
		Left Cheek	0.289	0.555	0.112	**0.844**	**0.401**
		Left Tilted	0.161	0.551	0.099	**0.712**	**0.260**
LTE	LTE Band 2	Right Cheek	0.109	0.274	0.059	**0.383**	**0.168**
		Right Tilted	0.050	0.423	0.078	**0.473**	**0.128**
		Left Cheek	0.077	0.555	0.112	**0.632**	**0.189**
		Left Tilted	0.048	0.551	0.099	**0.599**	**0.147**
	LTE Band 4	Right Cheek	0.064	0.274	0.059	**0.338**	**0.123**
		Right Tilted	0.033	0.423	0.078	**0.456**	**0.111**
		Left Cheek	0.062	0.555	0.112	**0.617**	**0.174**
		Left Tilted	0.030	0.551	0.099	**0.581**	**0.129**
	LTE Band 5	Right Cheek	0.335	0.274	0.059	**0.609**	**0.394**
		Right Tilted	0.222	0.423	0.078	**0.645**	**0.300**
		Left Cheek	0.345	0.555	0.112	**0.900**	**0.457**
		Left Tilted	0.151	0.551	0.099	**0.702**	**0.250**
	LTE Band 7	Right Cheek	0.070	0.274	0.059	**0.344**	**0.129**
		Right Tilted	0.078	0.423	0.078	**0.501**	**0.156**
		Left Cheek	0.073	0.555	0.112	**0.628**	**0.185**
		Left Tilted	0.078	0.551	0.099	**0.629**	**0.177**

14.2 Hotspot Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 Bluetooth 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	SPLSR	Case No
GSM	GSM850	Front	0.208	0.254	0.057	**0.462**	**0.265**		
		Back	0.288	0.371	0.088	**0.659**	**0.376**		
		Left side	0.268			**0.268**	**0.268**		
		Right side	0.211	0.302	0.076	**0.513**	**0.287**		
		Top side		0.332	0.077	**0.332**	**0.077**		
		Bottom side	0.118			**0.118**	**0.118**		
	GSM1900	Front	0.628	0.254	0.057	**0.882**	**0.685**		
		Back	0.932	0.371	0.088	**1.303**	**1.020**		
		Left side	0.042			**0.042**	**0.042**		
		Right side	0.044	0.302	0.076	**0.346**	**0.120**		
		Top side		0.332	0.077	**0.332**	**0.077**		
		Bottom side	1.445			**1.445**	**1.445**		
WCDMA	WCDMA II	Front	0.734	0.254	0.057	**0.988**	**0.791**		
		Back	0.951	0.371	0.088	**1.322**	**1.039**		
		Left side	0.042			**0.042**	**0.042**		
		Right side	0.037	0.302	0.076	**0.339**	**0.113**		
		Top side		0.332	0.077	**0.332**	**0.077**		
		Bottom side	1.442			**1.442**	**1.442**		
	WCDMA IV	Front	0.836	0.254	0.057	**1.090**	**0.893**		
		Back	1.023	0.371	0.088	**1.394**	**1.111**		
		Left side	0.063			**0.063**	**0.063**		
		Right side	0.037	0.302	0.076	**0.339**	**0.113**		
		Top side		0.332	0.077	**0.332**	**0.077**		
		Bottom side	1.448			**1.448**	**1.448**		
	WCDMA V	Front	0.409	0.254	0.057	**0.663**	**0.466**		
		Back	0.557	0.371	0.088	**0.928**	**0.645**		
		Left side	0.530			**0.530**	**0.530**		
		Right side	0.223	0.302	0.076	**0.525**	**0.299**		
		Top side		0.332	0.077	**0.332**	**0.077**		
		Bottom side	0.239			**0.239**	**0.239**		
LTE	LTE Band 2	Front	0.772	0.254	0.057	**1.026**	**0.829**		
		Back	1.070	0.371	0.088	**1.441**	**1.158**		
		Left side	0.048			**0.048**	**0.048**		
		Right side	0.042	0.302	0.076	**0.344**	**0.118**		
		Top side		0.332	0.077	**0.332**	**0.077**		
		Bottom side	1.441			**1.441**	**1.441**		
	LTE Band 4	Front	0.844	0.254	0.057	**1.098**	**0.901**		
		Back	1.070	0.371	0.088	**1.441**	**1.158**		
		Left side	0.077			**0.077**	**0.077**		
		Right side	0.041	0.302	0.076	**0.343**	**0.117**		
		Top side		0.332	0.077	**0.332**	**0.077**		
		Bottom side	1.442			**1.442**	**1.442**		
	LTE Band 5	Front	0.489	0.254	0.057	**0.743**	**0.546**		
		Back	0.639	0.371	0.088	**1.010**	**0.727**		
		Left side	0.593			**0.593**	**0.593**		
		Right side	0.420	0.302	0.076	**0.722**	**0.496**		
		Top side		0.332	0.077	**0.332**	**0.077**		
		Bottom side	0.292			**0.292**	**0.292**		
	LTE Band 7	Front	0.992	0.254	0.057	**1.246**	**1.049**		
		Back	1.416	0.371	0.088	**1.787**	**1.504**	0.02	Case 11
		Left side	0.239			**0.239**	**0.239**		
		Right side	0.312	0.302	0.076	**0.614**	**0.388**		
		Top side		0.332	0.077	**0.332**	**0.077**		
		Bottom side	0.885			**0.885**	**0.885**		

14.3 Body-Worn Accessory Exposure Conditions

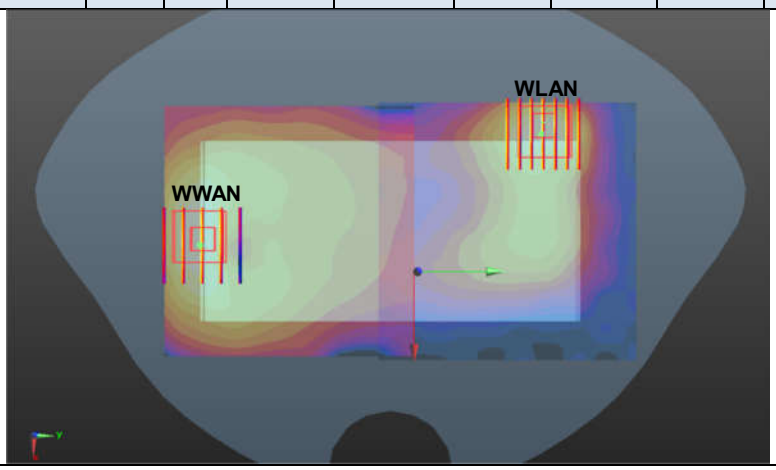
WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 Bluetooth 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	SPLSR	Case No
GSM	GSM850	Front	0.208	0.254	0.057	**0.462**	**0.265**		
		Back	0.288	0.371	0.088	**0.659**	**0.376**		
	GSM1900	Front	0.907	0.254	0.057	**1.161**	**0.964**		
		Back	1.267	0.371	0.088	**1.638**	**1.355**	0.02	Case 1
		Back with Headset	1.322	0.371	0.088	**1.693**	**1.410**	0.02	Case 2
WCDMA	WCDMA II	Front	0.761	0.254	0.057	**1.015**	**0.818**		
		Back	1.301	0.371	0.088	**1.672**	**1.389**	0.02	Case 3
		Back with Headset	1.321	0.371	0.088	**1.692**	**1.409**	0.02	Case 4
	WCDMA IV	Front	1.132	0.254	0.057	**1.386**	**1.189**		
		Back	1.348	0.371	0.088	**1.719**	**1.436**	0.01	Case 5
		Back with Headset	1.444	0.371	0.088	**1.815**	**1.532**	0.02	Case 6
	WCDMA V	Front	0.409	0.254	0.057	**0.663**	**0.466**		
		Back	0.557	0.371	0.088	**0.928**	**0.645**		
LTE	LTE Band 2	Front	1.178	0.254	0.057	**1.432**	**1.235**		
		Back	1.403	0.371	0.088	**1.774**	**1.491**	0.02	Case 7
		Back with Headset	1.443	0.371	0.088	**1.814**	**1.531**	0.02	Case 8
	LTE Band 4	Front	1.000	0.254	0.057	**1.254**	**1.057**		
		Back	1.447	0.371	0.088	**1.818**	**1.535**	0.02	Case 9
		Back with Headset	1.425	0.371	0.088	**1.796**	**1.513**	0.02	Case 10
	LTE Band 5	Front	0.489	0.254	0.057	**0.743**	**0.546**		
		Back	0.639	0.371	0.088	**1.010**	**0.727**		
	LTE Band 7	Front	0.992	0.254	0.057	**1.246**	**1.049**		
		Back	1.416	0.371	0.088	**1.787**	**1.504**	0.02	Case 11
		Back with Headset	1.382	0.371	0.088	**1.753**	**1.470**	0.02	Case 12

14.4 SPLSR Evaluation and Analysis

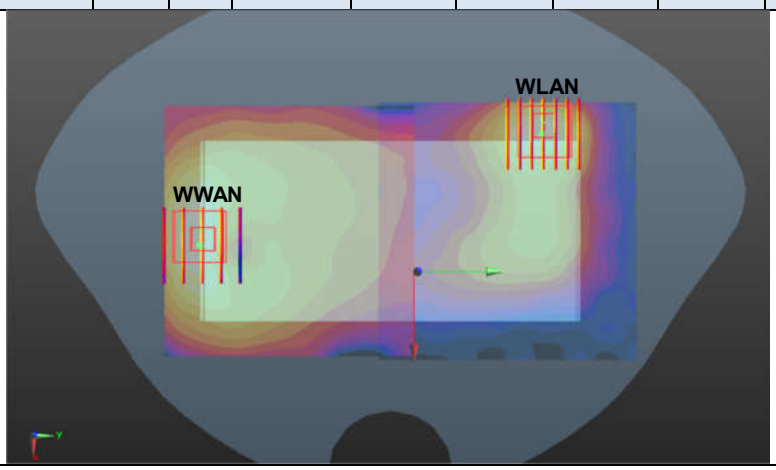
General Note:

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

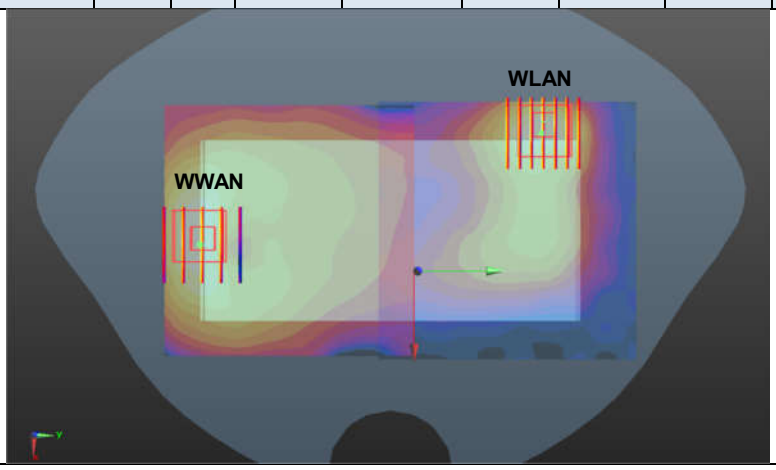
Case 1	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	GSM1900	Back	1.267	5mm	73.4	10.8	3.89	129.0	1.64	0.02	Not required
	WLAN2.4GHz		0.371	5mm	-43.8	64.4	-1.35				



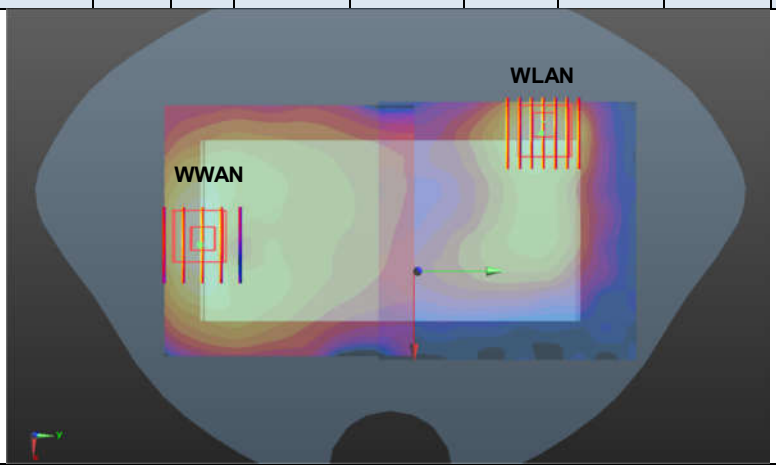
Case 2	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	GSM1900	Back with Headset	1.322	5mm	75.3	11.3	4.03	130.5	1.69	0.02	Not required
	WLAN2.4GHz		0.371	5mm	-43.8	64.4	-1.35				



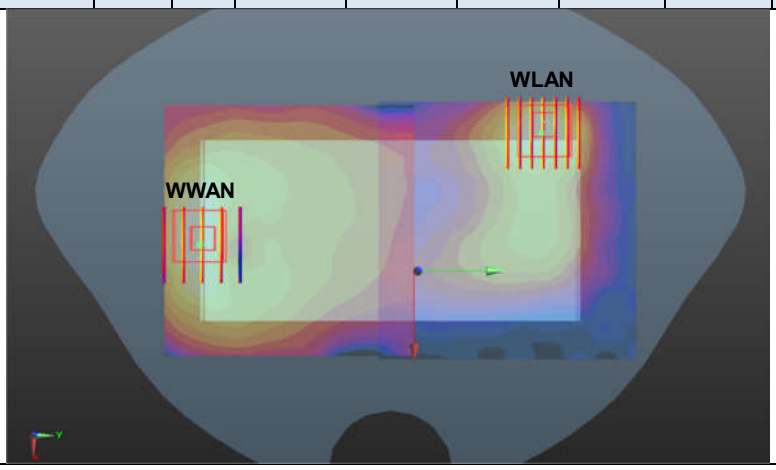
Case 3	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA II	Back	1.301	5mm	75	12.3	3.89	129.8	1.67	0.02	Not required
	WLAN2.4GHz		0.371	5mm	-43.8	64.4	-1.35				



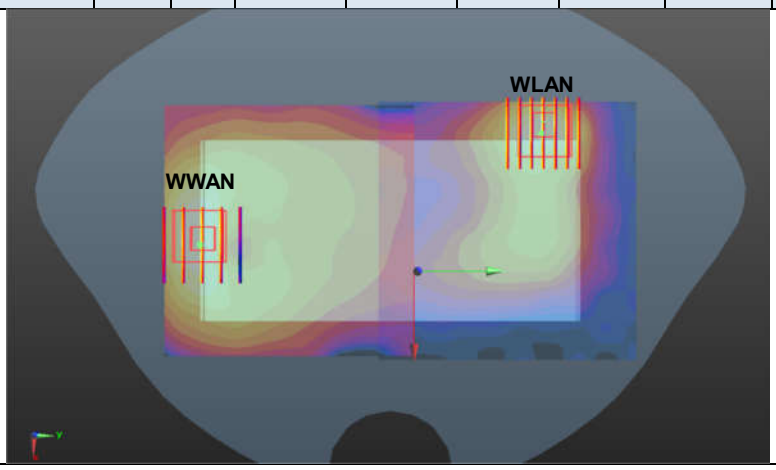
Case 4	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA II	Back with Headset	1.321	5mm	74.22	13.4	3.92	128.7	1.69	0.02	Not required
	WLAN2.4GHz		0.371	5mm	-43.8	64.4	-1.35				



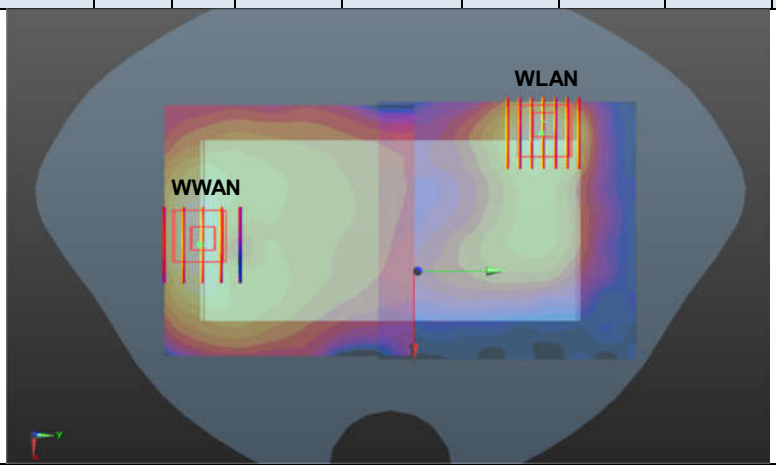
Case 5	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA IV	Back	1.348	5mm	3.1	-85.2	-1.25	156.8	1.72	0.01	Not required
	WLAN2.4GHz		0.371	5mm	-43.8	64.4	-1.35				



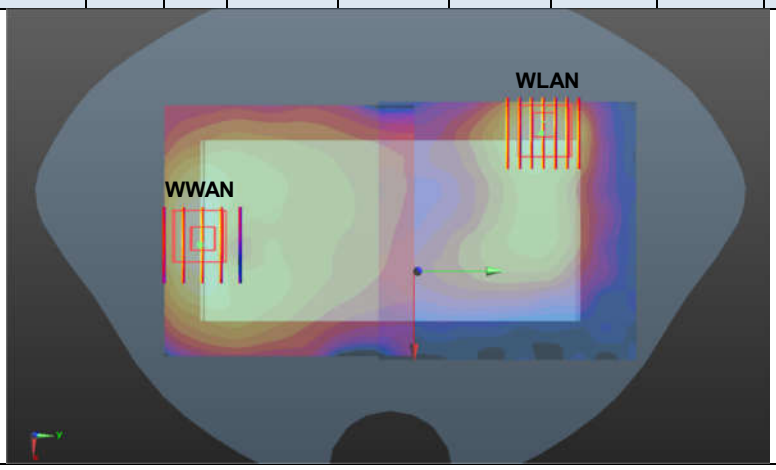
Case 6	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA IV	Back with Headset	1.444	5mm	4.21	-83.2	-2.21	155.2	1.82	0.02	Not required
	WLAN2.4GHz		0.371	5mm	-43.8	64.4	-1.35				



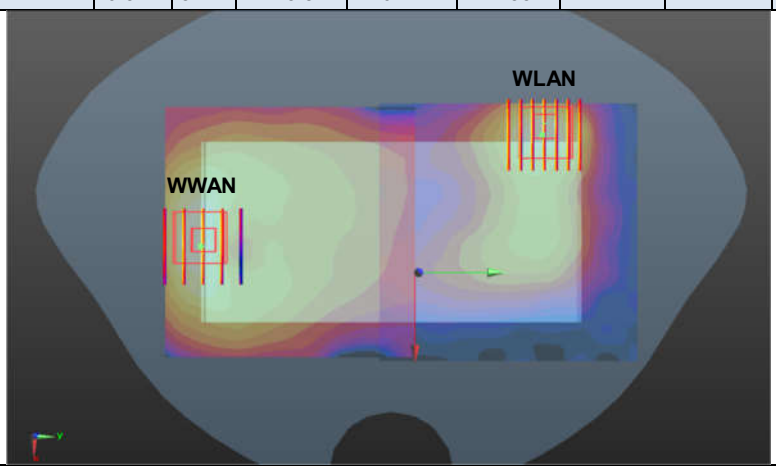
Case 7	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 2	Back	1.403	5mm	73.4	10.8	3.84	129.0	1.77	0.02	Not required
	WLAN2.4GHz		0.371	5mm	-43.8	64.4	-1.35				



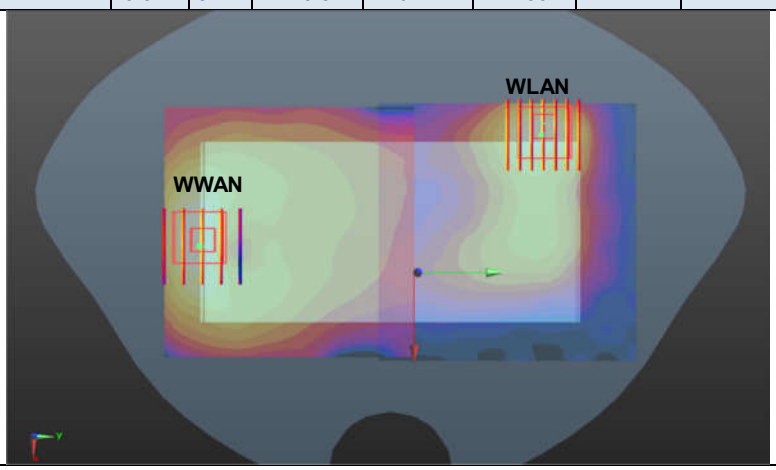
Case 8	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 2	Back with Headset	1.443	5mm	74.42	10.2	3.96	130.2	1.81	0.02	Not required
	WLAN2.4GHz		0.371	5mm	-43.8	64.4	-1.35				



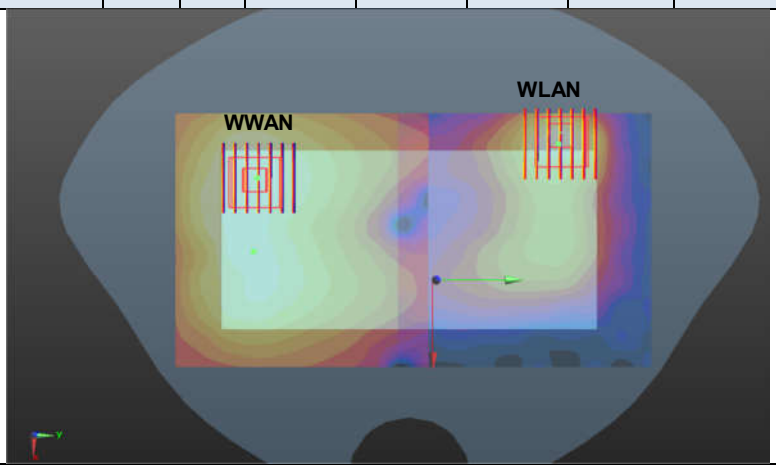
Case 9	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 4	Back	1.447	5mm	76.6	10.7	3.92	131.9	1.82	0.02	Not required
	WLAN2.4GHz		0.371	5mm	-43.8	64.4	-1.35				



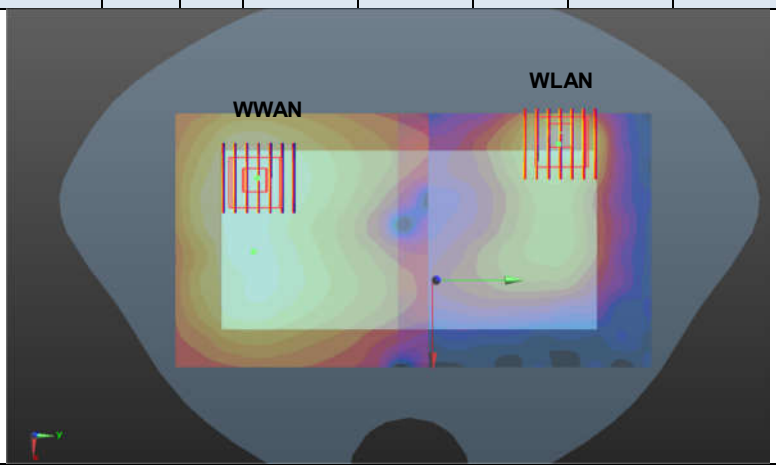
Case 10	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 4	Back with Headset	1.425	5mm	75.1	11.2	3.77	130.4	1.80	0.02	Not required
	WLAN2.4GHz		0.371	5mm	-43.8	64.4	-1.35				



Case 11	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 7	Back	1.416	5mm	-25.4	-67.2	-1.32	132.9	1.79	0.02	Not required
	WLAN2.4GHz		0.371	5mm	-43.8	64.4	-1.35				



Case 12	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 7	Back with Headset	1.382	5mm	-26.3	-68	-1.32	133.6	1.75	0.02	Not required
	WLAN2.4GHz		0.371	5mm	-43.8	64.4	-1.35				



Test Engineer： Mood Huang, Ted Hsieh, Kurt Liu, Randy Lin, Iran Wang, Galen Chang, Willy Yu, Andy Jiang and Bevis Chang

15. Uncertainty Assessment

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

16. 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 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.

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

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

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Appendix B. Plots of SAR Measurement

The plots are shown as follows.

Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.