

FCC SAR TEST REPORT

FCC ID : GKR-LN300EG3L
Equipment : Notebook Computer
Brand Name : Lenovo
Model Name : Lenovo 300e Chromebook Gen3***** (*=0~9, A~Z, a~z, "-" or blank, for marketing use only, with no impact on RF compliance of the product)
Applicant : Compal Electronics Inc
No. 581 & 581-1, Ruiguang Rd., Neihu District, Taipei City 11492, Taiwan, R.O.C
Standard : FCC 47 CFR Part 2 (2.1093)

Equipment: Fibocom L850-GL is tested inside of Lenovo Notebook Computer.

The product was received on Apr. 13, 2021 and testing was started from Apr. 27, 2021 and completed on May 04, 2021. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample provide by manufacturer and the test data has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been pass the FCC requirement.

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



Approved by: Cona Huang / Deputy Manager



Sporton International Inc. EMC & Wireless Communications Laboratory
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History of this test report

Report No.	Version	Description	Issued Date
FA140648-02	01	Initial issue of report	May 17, 2021
FA140648-02	02	Update section 1 and remove LTE Band 17	Jul. 06, 2021



1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Compal Electronics Inc, Notebook Computer, Lenovo 300e Chromebook Gen3***** (*=0~9, A~Z, a~z, "-" or blank, for marketing use only, with no impact on RF compliance of the product), are as follows.

Equipment Class	Frequency Band		Highest SAR Summary	Highest Simultaneous Transmission 1g SAR (W/kg)
			Body	
			1g SAR (W/kg)	
Licensed	WCDMA	WCDMA II	1.18	1.59
		WCDMA IV	1.11	
		WCDMA V	0.58	
	LTE	LTE Band 2	1.04	
		LTE Band 7	0.83	
		LTE Band 12	0.56	
		LTE Band 13	0.57	
		LTE Band 5 / 26	0.53	
		LTE Band 30	1.05	
		LTE Band 41	0.72	
		LTE Band 4 / 66	1.08	
DTS	WLAN	2.4GHz WLAN	0.64	1.59
NII		5GHz WLAN	1.20	1.52
DSS	2.4GHz Band	Bluetooth	0.11	1.58
Date of Testing:			2021/4/27 ~ 2021/5/4	

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) 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: Paula Chen

2. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards, the below KDB standard may not including in the TAF code without accreditation.

- 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 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05



3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	Notebook Computer
Brand Name	Lenovo
Model Name	Lenovo 300e Chromebook Gen3***** (*=0~9, A~Z, a~z, "-" or blank, for marketing use only, with no impact on RF compliance of the product)
FCC ID	GKR-LN300EG3L
Integrated WWAN Module	Brand Name: Fibocom Model Name: L850-GL
Wireless Technology and Frequency Range	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA LTE: QPSK, 16QAM
EUT Stage	Engineering sample
Remark:	
<ol style="list-style-type: none"> This device has two antenna vendors, RF exposure evaluation selects South Star as the main test, Pulse will spot check worst case found in South Star. This device is convertible type notebook PC, and there are two mode as usage way, one is laptop mode, another is tablet mode. 	

WWAN Antenna Information				
Main Antenna	Manufacturer	SouthStar	Peak gain(dbi)	2.06
	Part number	N19-0814-R0A DC33002J020	Type	PIFA
	Manufacturer	Pulse	Peak gain(dbi)	2.93
	Part number	SZ18665 DC33002JN20	Type	PIFA



WLAN Module Information	
Integrated WLAN Module 1	Brand Name: Intel® Wi-Fi AX200 Model Name: AX200NGW
Integrated WLAN Module 2	Brand Name: Realtek Model Name: RTL8822CE
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2400 MHz ~ 2483.5 MHz WLAN U-NII 1: 5150 MHz ~ 5250 MHz WLAN U-NII 2: 5250 MHz ~ 5350 MHz WLAN U-NII 3: 5470 MHz ~ 5725 MHz WLAN U-NII 4: 5725 MHz ~ 5825 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz
Mode	WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/VHT160/HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE
Remark:	
1. The AX200NGW is also integrated into this host, the WLAN and Bluetooth SAR results are referenced to FCC ID: O57AX200NGW, Sporton SAR report no.: FA140648 and the results are used to perform simultaneous transmission analysis	
2. The RTL8822CE is also integrated into this host, the WLAN and Bluetooth SAR results are referenced to FCC ID: TX2-RTL8822CE, Sporton SAR report no.: FA140648-01 and the results are used to perform simultaneous transmission analysis	

WLAN Antenna Information			
Antenna Part Number	Manufacture	Antenna Type	Peak Gain(dBi)
Main Antenna Yageo P/N: SZI869W (DC33002JN40)	Pulse Corporation	PIFA	2400-2500MHz: -6.68 dBi
			5150-5350 MHz:-2.65 dBi
			5470-5725MHz:-3.04 dBi
			5725-5875MHz:-2.58 dBi
Aux Antenna Yageo P/N: SZ18701 (DC33002JN50)	Pulse Corporation	PIFA	2400-2500MHz: -2.20 dBi
			5150-5350 MHz:-3.52 dBi
			5470-5725MHz:-4.38 dBi
			5725-5875MHz:-3.81 dBi
Antenna Part Number	Manufacture	Antenna Type	Peak Gain(dBi)
Main Antenna Antenna P/N N12-7352-R0A (DC33002J040)	Shenzhen South Star Technology Co, LTD	PIFA	2400-2500MHz: -4.70 dBi
			5150-5350 MHz:-4.81 dBi
			5470-5725MHz:-3.26 dBi
			5725-5875MHz:-3.49 dBi
Aux Antenna Antenna P/N N12-7353-R0A (DC33002J050)	Shenzhen South Star Technology Co, LTD	PIFA	2400-2500MHz: -3.90 dBi
			5150-5350 MHz:-5.09 dBi
			5470-5725MHz:-6.35 dBi
			5725-5875MHz:-6.14 dBi



3.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05																																																															
FCC ID	GKR-LN300EG3L																																																														
Equipment Name	Notebook Computer																																																														
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 MHz																																																														
Channel Bandwidth	LTE Band 2: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 26: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 30: 5MHz, 10MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz																																																														
uplink modulations used	QPSK / 16QAM																																																														
LTE Voice / Data requirements	Data only																																																														
LTE MPR permanently built-in by design	<p>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</p> <table border="1"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th> <th rowspan="2">MPR (dB)</th> </tr> <tr> <th>1.4 MHz</th> <th>3.0 MHz</th> <th>5 MHz</th> <th>10 MHz</th> <th>15 MHz</th> <th>20 MHz</th> </tr> </thead> <tbody> <tr> <td>QPSK</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 3</td> </tr> <tr> <td>256 QAM</td> <td colspan="6">≥ 1</td> <td>≤ 5</td> </tr> </tbody> </table>	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
Modulation	Channel bandwidth / Transmission bandwidth (N _{RB})						MPR (dB)																																																								
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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	1. Yes, Proximity Sensor.																																																														



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)	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)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510				
M	21100	2535	21100	2535	21100	2535	21100	2535				
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560				
LTE Band 12												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704				
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5				
H	23173	715.3	23165	714.5	23155	713.5	23130	711				
LTE Band 13												
	Bandwidth 5 MHz				Bandwidth 10 MHz							
	Channel #		Freq.(MHz)		Channel #		Freq.(MHz)		Channel #		Freq.(MHz)	
L	23205		779.5		23230		782					
M	23230		782									
H	23255		784.5									
LTE Band 26												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz			
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5		
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5		
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5		



LTE Band 30												
	Bandwidth 5 MHz				Bandwidth 10 MHz							
	Channel #		Freq.(MHz)		Channel #		Freq.(MHz)					
L	27685		2307.5		27710		2310					
M	27710		2310									
H	27735		2312.5									
LTE Band 41												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)		
L	39675	2498.5	39700	2501	39725	2503.5	39750	2506				
L	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5				
M	40620	2593	40620	2593	40620	2593	40620	2593				
H	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5				
H	41565	2687.5	41540	2685	41515	2682.5	41490	2680				
LTE Band 66												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745
H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770

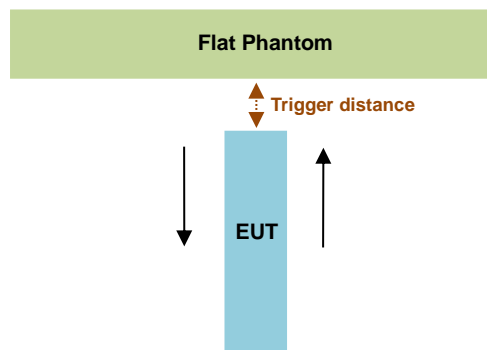
4. Proximity Sensor Triggering Test

<Proximity Sensor Triggering Distance (KDB 616217 D04 section 6.2)>:

For the device is fully integrated, touch sensing capacitive sensor. It uses a charge transfer capacitive acquisition method that is capable of near range proximity detection. In this device offers a state of the art capacitive sensing engine with an embedded sampling capacitor and voltage regulator allowing the overall solution cost to be reduced and improving system immunity in noisy environments.

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. The details are illustrated as following, and the shortest triggering distances were reported and used for SAR assessment.

In the preliminary triggering distance testing, the tissue-equivalent medium for different frequency bands were used for verification; no other frequency bands tissue-equivalent medium was found to result in shortest triggering distance than that for 1900MHz, and the tissue-equivalent medium for 1900MHz was used for formal proximity sensor triggering testing.



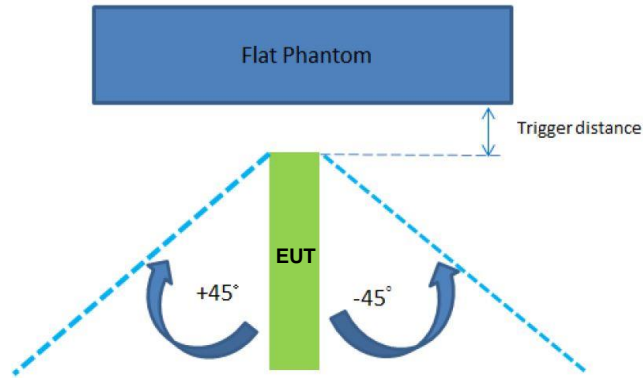
Proximity Sensor Trigger Distance (mm)								
Position	Main antenna							
	Bottom of Laptop		Bottom Face		Edge 1		Edge 2	
	moving toward	moving away	moving toward	moving away	moving toward	moving away	moving toward	moving away
Minimum	17	17	18	17	18	17	10	10

<Proximity Sensor Triggering Coverage (KDB 616217 D04 section 6.3)>:

Since the antenna and sensor are collocated and all of the peak SAR location is overlapping with the sensor pad for this device, therefore, According to KDB 616217 section6.3, these procedures do not apply and are not required for this device. Due to the antenna and sensor are collocated and the peak SAR location is overlapping with the sensor on this device.

<Tablet Tilt angle influences to proximity sensor triggering (KDB 616217 D04 section 6.4)>:

The influence of table tilt angles to proximity sensor triggering was determined by positioning each tablet edge that contains a transmitting antenna, perpendicular to the flat phantom, at above separation distance. Rotating the tablet around the edge next to the phantom in $\leq 10^\circ$ increments until the tablet is $\pm 45^\circ$ from the vertical position at 0° , and the maximum output power remains in the reduced mode.



The Sensor Trigger Distance (mm)		
Position	Edge 1	Edge 2
Minimum	17	10

Proximity sensor power reduction

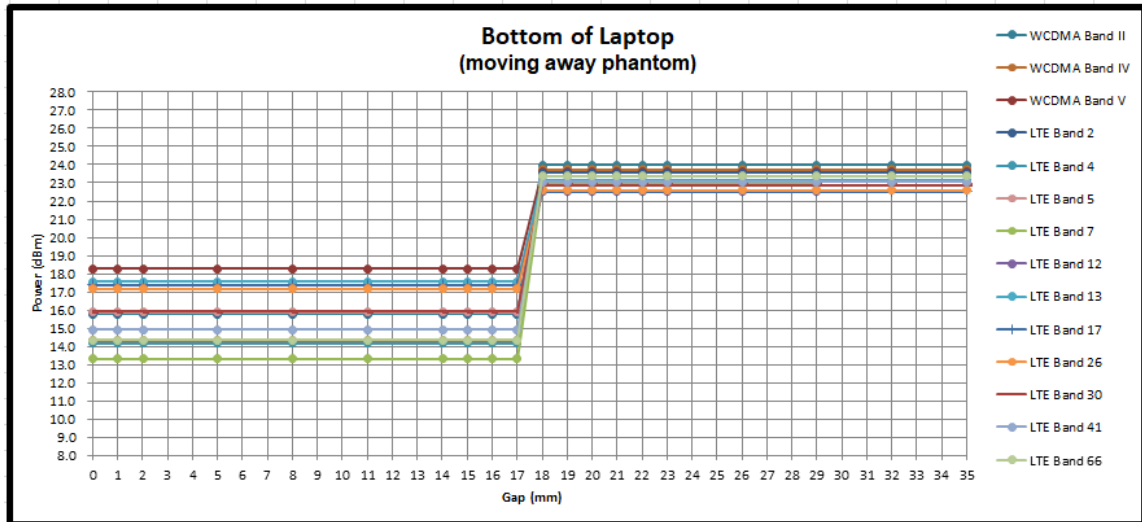
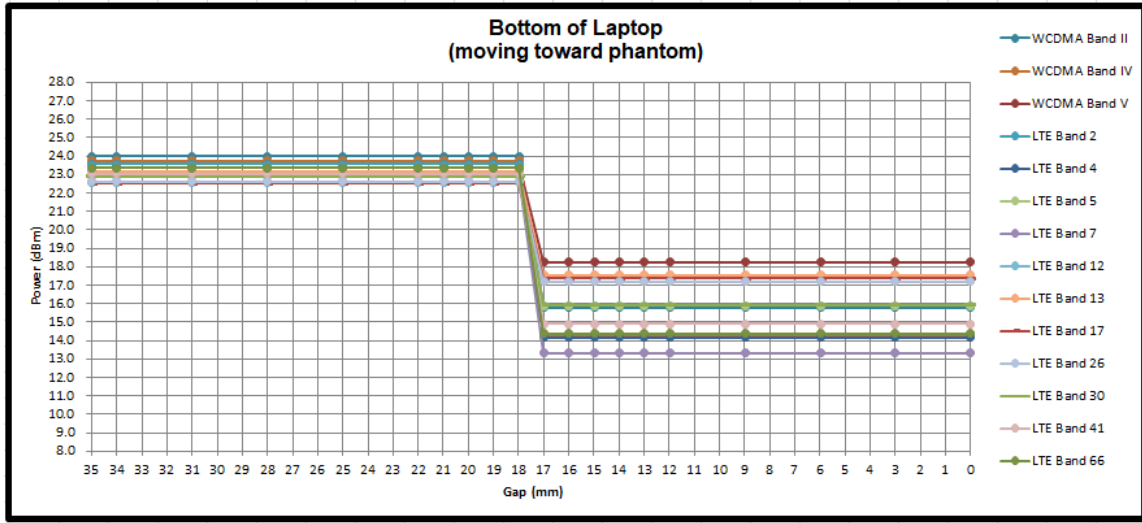
Exposure Position / wireless mode	⁽¹⁾ Bottom Face / Bottom of Laptop / Edge 1 / Edge 2
WCDMA Band II	7.5dB
WCDMA Band IV	9dB
WCDMA Band V	5.5dB
LTE Band 2	7dB
LTE Band 7	9.5dB
LTE Band 12	5.5dB
LTE Band 13	5.5dB
LTE Band 5 / 26	5.5dB
LTE Band 30	7dB
LTE Band 41	8dB
LTE Band 4 / 66	8.5dB

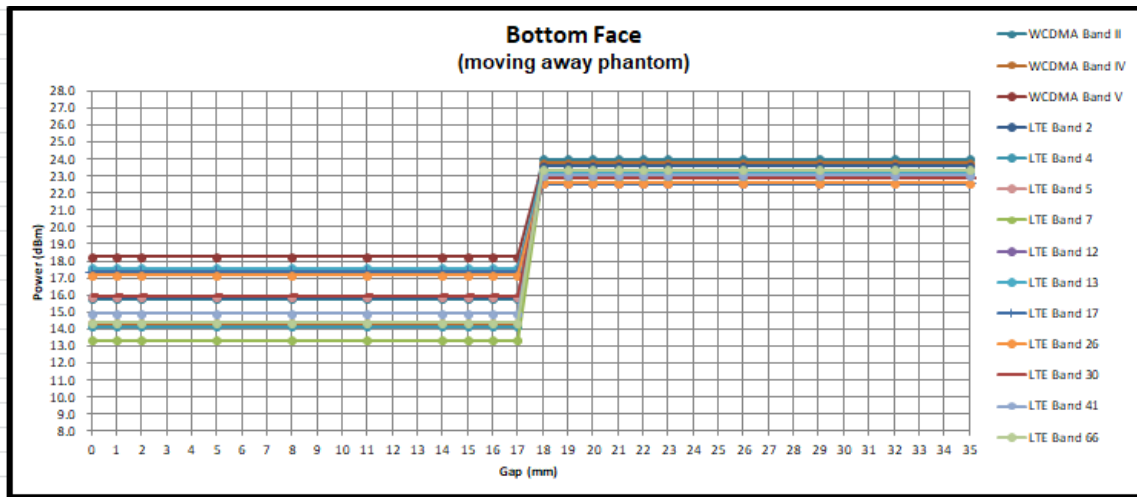
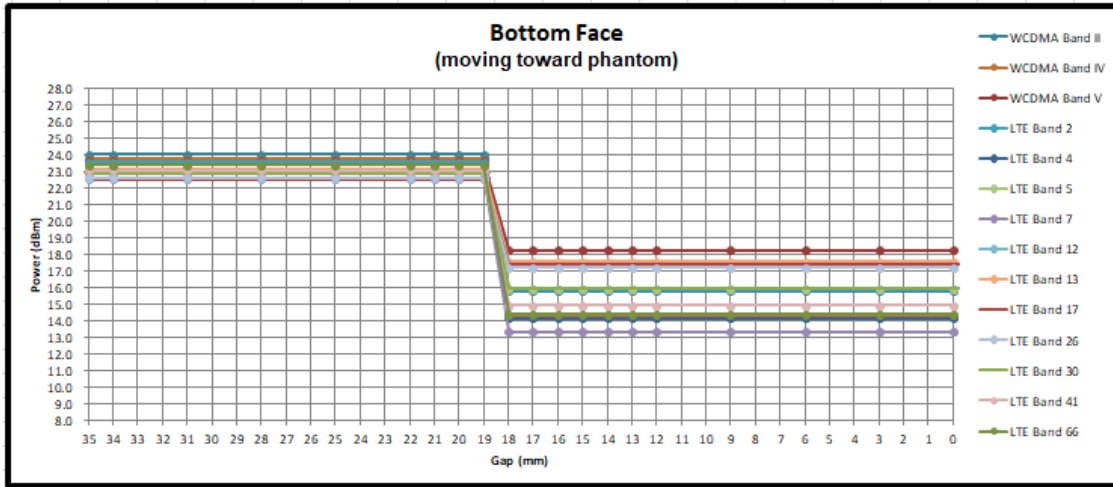
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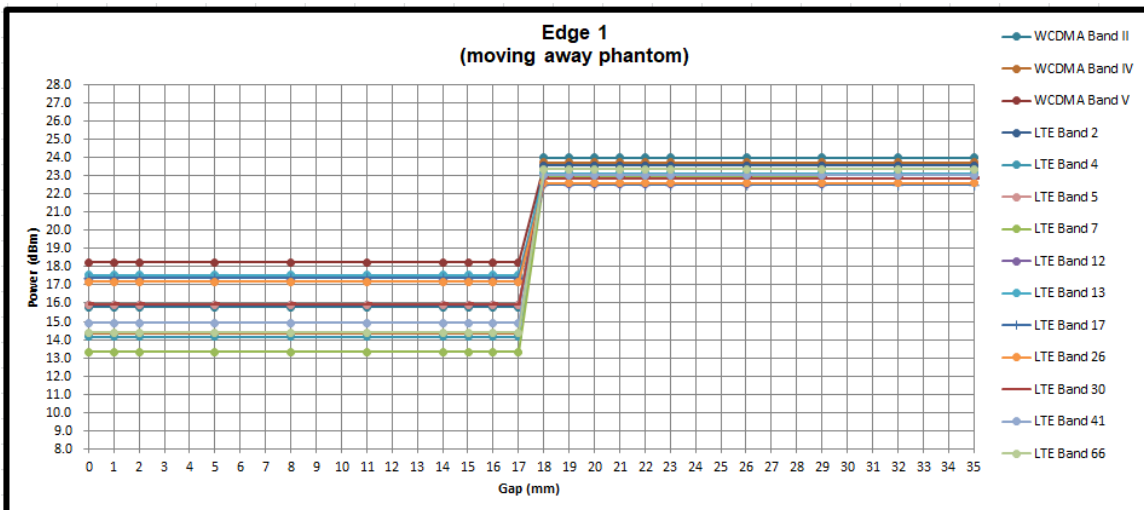
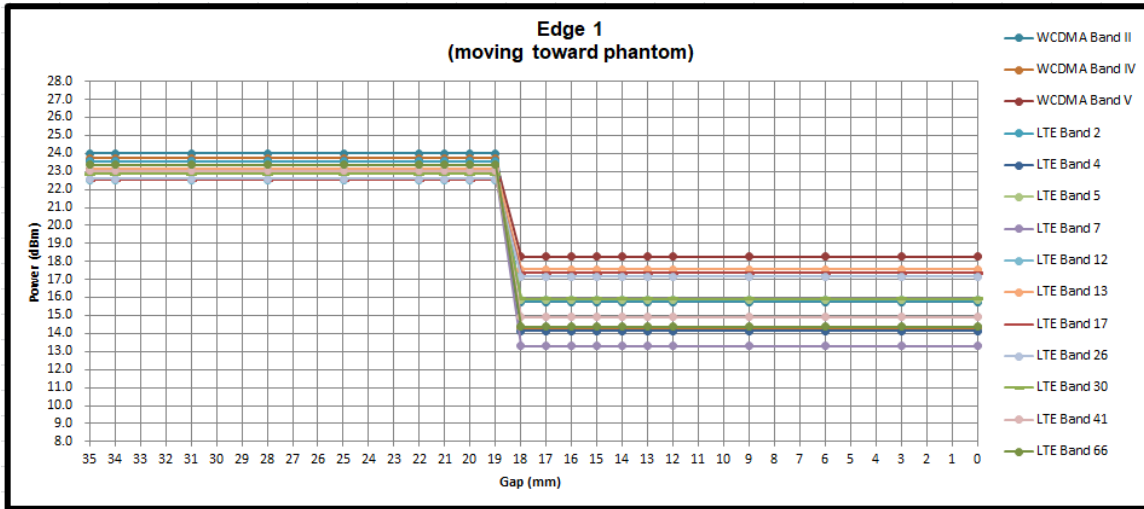
1. ⁽¹⁾: Reduced maximum limit applied by activation of proximity sensor.
2. Tests were performed in accordance with KDB 616217 D04 section 6.1, 6.2, 6.3, 6.4 and 6.5 and compliant results are shown and described in exhibit
3. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance -1 was performed:
 - Bottom Face: [16 mm](#)
 - Bottom of Laptop: [16mm](#)
 - Edge1: [16 mm](#)
 - Edge2: [9mm](#)

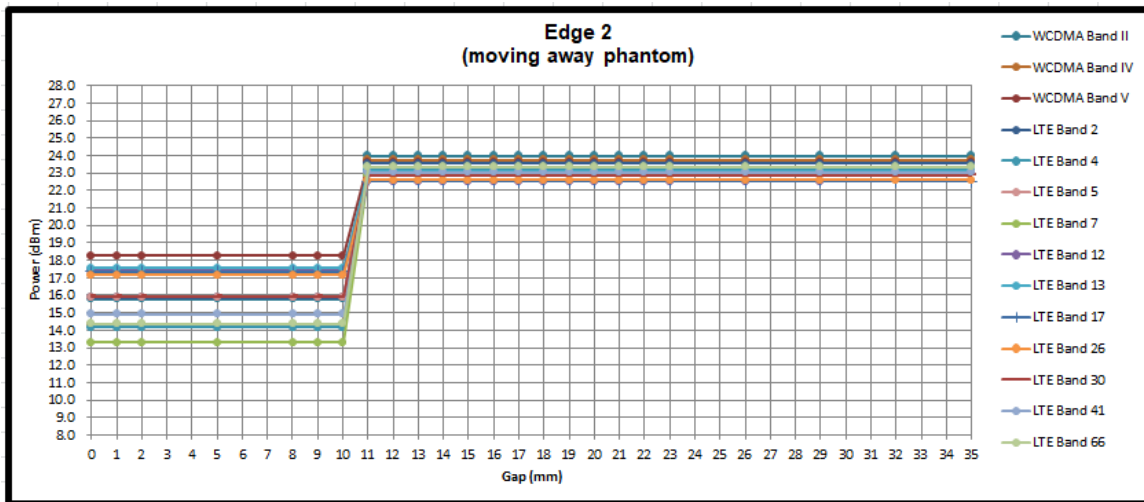
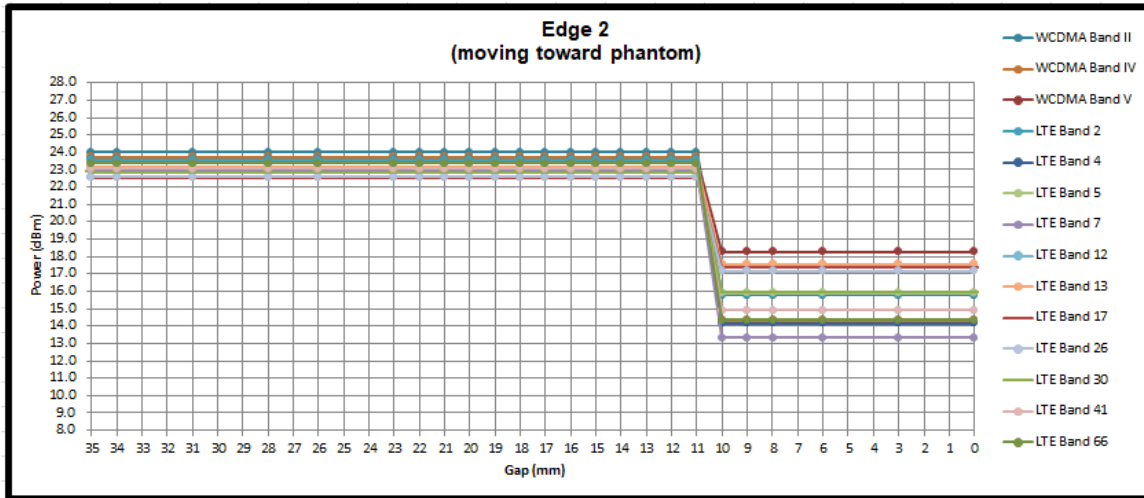


Power Measurement during Sensor Trigger distance testing











5. RF Exposure Limits

5.1 Uncontrolled Environment

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

5.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

6. Specific Absorption Rate (SAR)

6.1 Introduction

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

6.2 SAR Definition

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

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

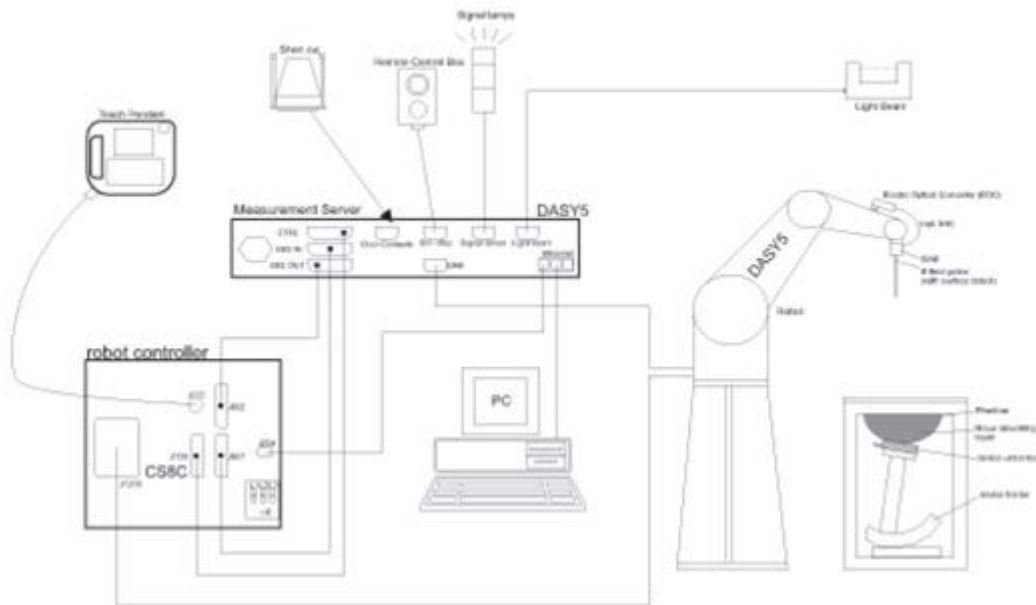
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

7. System Description and Setup

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



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

7.1 Test Site Location


The SAR measurement facilities used to collect data are within both Sporton Lab list below test site location are accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190 and 3786) and the FCC designation No.TW1190 and TW3786 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test.

Test Site	EMC & Wireless Communications Laboratory		Wensan Laboratory		
Test Site Location	TW1190 No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan		TW3786 No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan		
Test Site No.	SAR01-HY	SAR03-HY	SAR08-HY	SAR09-HY	SAR15-HY
	SAR04-HY	SAR05-HY	SAR11-HY	SAR12-HY	
	SAR06-HY	SAR10-HY	SAR13-HY	SAR14-HY	


7.2 E-Field Probe

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

<ES3DV3 Probe>

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

<EX3DV4 Probe>

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

7.3 Data Acquisition Electronics (DAE)

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


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



Fig 5.1 Photo of DAE

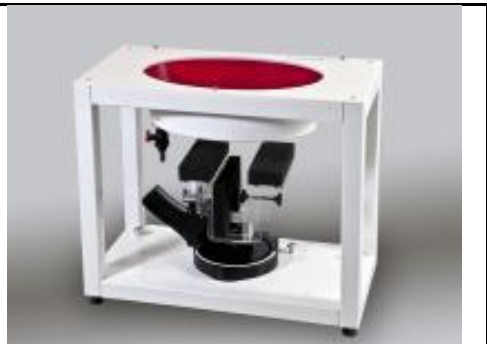
7.4 Phantom

<SAM Twin Phantom>

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

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

<ELI Phantom>

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

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

7.5 Device Holder

<Mounting Device for Hand-Held Transmitter>

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



Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

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

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



Mounting Device for Laptops

8. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

8.1 Spatial Peak SAR Evaluation

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

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

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

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

8.2 Power Reference Measurement

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

8.3 Area Scan

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

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

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

8.4 Zoom Scan

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

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

		≤ 3 GHz	> 3 GHz	
Maximum zoom scan spatial resolution: $\Delta x_{Zoom}, \Delta y_{Zoom}$		≤ 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 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: 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 <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

8.5 Volume Scan Procedures

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

8.6 Power Drift Monitoring

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



9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit ⁽²⁾	D750V3	1107	Mar. 08, 2019	Mar. 05, 2022
SPEAG	835MHz System Validation Kit ⁽²⁾	D835V2	4d167	Nov. 25, 2019	Nov. 23, 2021
SPEAG	1750MHz System Validation Kit ⁽²⁾	D1750V2	1068	Nov. 19, 2018	Nov. 16, 2021
SPEAG	1900MHz System Validation Kit ⁽²⁾	D1900V2	5d041	Sep. 11, 2018	Sep. 08, 2021
SPEAG	2300MHz System Validation Kit ⁽²⁾	D2300V2	1006	Jan. 28, 2019	Jan. 25, 2022
SPEAG	2600MHz System Validation Kit ⁽²⁾	D2600V2	1008	Aug. 31, 2018	Aug. 28, 2021
SPEAG	Data Acquisition Electronics	DAE4	853	Jul. 23, 2020	Jul. 22, 2021
SPEAG	Data Acquisition Electronics	DAE4	1311	Aug. 25, 2020	Aug. 24, 2021
SPEAG	Dosimetric E-Field Probe	EX3DV4	7346	May. 20, 2020	May. 19, 2021
SPEAG	Dosimetric E-Field Probe	EX3DV4	7625	Jan. 19, 2021	Jan. 18, 2022
RCPTWN	Thermometer	HTC-1	TM685-1	Nov. 10, 2020	Nov. 09, 2021
RCPTWN	Thermometer	HTC-1	TM560-2	Nov. 10, 2020	Nov. 09, 2021
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Nov. 10, 2020	Nov. 09, 2021
Keysight	Wireless Communication Test Set	E5515C	MY50267236	Mar. 21, 2021	Mar. 20, 2022
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Nov. 11, 2020	Nov. 10, 2021
Keysight	ENA Network Analyzer	E5071C	MY46101588	Jun. 10, 2020	Jun. 09, 2021
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 16, 2020	Sep. 15, 2021
LINE SEIKI	Digital Thermometer	DTM3000-spezial	2942	Nov. 06, 2020	Nov. 05, 2021
Anritsu	Power Meter	ML2495A	1419002	Aug. 19, 2020	Aug. 18, 2021
Anritsu	Power Sensor	MA2411B	1911176	Aug. 18, 2020	Aug. 17, 2021
Anritsu	Power Meter	ML2495A	1804003	Oct. 21, 2020	Oct. 20, 2021
Anritsu	Power Sensor	MA2411B	1726150	Oct. 21, 2020	Oct. 20, 2021
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jun. 30, 2020	Jun. 29, 2021
Anritsu	Spectrum Analyzer	N9010A	MY53470118	Jan. 15, 2021	Jan. 14, 2022
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 21, 2020	Oct. 20, 2021
Mini-Circuits	Power Amplifier	ZVE-8G+	479102029	Aug. 26, 2020	Aug. 25, 2021
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

General Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.
2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.

10. System Verification

10.1 Tissue Verification

The tissue dielectric parameters of tissue-equivalent media used for SAR measurements must be characterized within a temperature range of 18°C to 25°C, measured with calibrated instruments and apparatuses, such as network analyzers and temperature probes. The temperature of the tissue-equivalent medium during SAR measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized. The tissue dielectric measurement system must be calibrated before use. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements.

The liquid tissue depth was at least 15cm in the phantom for all SAR testing

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ε _r)	Conductivity Target (σ)	Permittivity Target (ε _r)	Delta (σ) (%)	Delta (ε _r) (%)	Limit (%)	Date
750	22.6	0.876	42.696	0.89	41.90	-1.57	1.90	±5	2021/4/27
750	22.4	0.898	43.686	0.89	41.90	0.90	4.26	±5	2021/4/27
835	22.6	0.908	42.400	0.90	41.50	0.89	2.17	±5	2021/4/27
835	22.6	0.912	42.480	0.90	41.50	1.33	2.36	±5	2021/5/4
1750	22.6	1.343	40.308	1.37	40.10	-1.97	0.52	±5	2021/4/28
1750	22.6	1.358	40.611	1.37	40.10	-0.88	1.27	±5	2021/5/4
1900	22.6	1.418	38.760	1.40	40.00	1.29	-3.10	±5	2021/4/28
1900	22.6	1.434	39.063	1.40	40.00	2.43	-2.34	±5	2021/5/4
2300	22.6	1.686	39.136	1.67	39.50	0.96	-0.92	±5	2021/4/29
2300	22.6	1.661	39.583	1.67	39.50	-0.54	0.21	±5	2021/5/3
2600	22.6	2.011	38.024	1.96	39.00	2.60	-2.50	±5	2021/4/29
2600	22.6	2.008	38.398	1.96	39.00	2.45	-1.54	±5	2021/5/3

10.2 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.

Test Site	Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
SAR10	2021/4/27	750	250	D750V3-1107	EX3DV4 - SN7346	DAE4 Sn853	2.07	8.32	8.28	-0.48
SAR05	2021/4/27	750	50	D750V3-1107	EX3DV4 - SN7625	DAE4 Sn1311	0.441	8.32	8.82	6.01
SAR10	2021/4/27	835	50	D835V2-4d167	EX3DV4 - SN7346	DAE4 Sn853	0.458	9.55	9.16	-4.08
SAR10	2021/5/4	835	50	D835V2-4d167	EX3DV4 - SN7346	DAE4 Sn853	0.460	9.55	9.2	-3.66
SAR10	2021/4/28	1750	50	D1750V2-1068	EX3DV4 - SN7346	DAE4 Sn853	1.69	37.10	33.8	-8.89
SAR10	2021/5/4	1750	50	D1750V2-1068	EX3DV4 - SN7346	DAE4 Sn853	1.70	37.10	34	-8.36
SAR10	2021/4/28	1900	250	D1900V2-5d041	EX3DV4 - SN7346	DAE4 Sn853	9.45	40.20	37.8	-5.97
SAR10	2021/5/4	1900	250	D1900V2-5d041	EX3DV4 - SN7346	DAE4 Sn853	9.56	40.20	38.24	-4.88
SAR10	2021/4/29	2300	50	D2300V2-1006	EX3DV4 - SN7346	DAE4 Sn853	2.27	48.70	45.4	-6.78
SAR10	2021/5/3	2300	50	D2300V2-1006	EX3DV4 - SN7346	DAE4 Sn853	2.23	48.70	44.6	-8.42
SAR10	2021/4/29	2600	50	D2600V2-1008	EX3DV4 - SN7346	DAE4 Sn853	2.85	56.40	57	1.06
SAR10	2021/5/3	2600	50	D2600V2-1008	EX3DV4 - SN7346	DAE4 Sn853	2.85	56.40	57	1.06

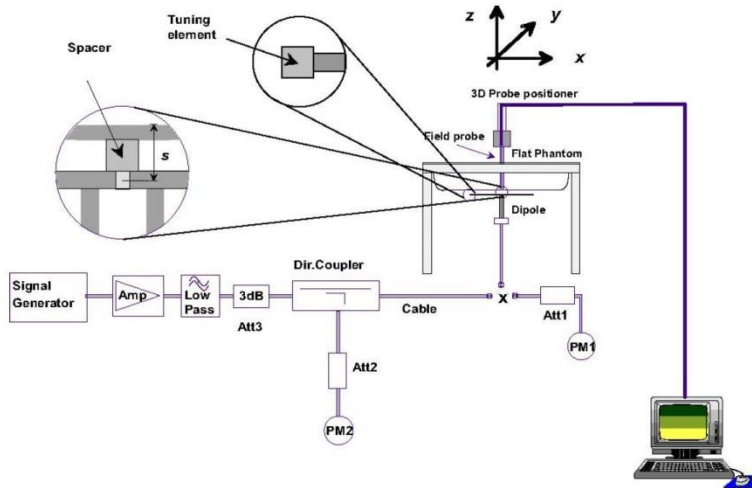


Fig 8.3.1 System Performance Check Setup



Fig 8.3.2 Setup Photo

11. UMTS/LTE Output Power (Unit: dBm)

<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.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
 - i. Set Gain Factors (β_c and β_d) and parameters were set according to each
 - ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
 - iii. Set RMC 12.2Kbps + HSDPA mode.
 - iv. Set Cell Power = -86 dBm
 - v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
 - vi. Select HSDPA Uplink Parameters
 - vii. Set Delta ACK, Delta NACK and Delta CQI = 8
 - viii. Set Ack-Nack Repetition Factor to 3
 - ix. Set CQI Feedback Cycle (k) to 4 ms
 - x. Set CQI Repetition Factor to 2
 - xi. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

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

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

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

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

Setup Configuration

HSUPA Setup Configuration:

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

Table C.11.1.3: 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-TFCl
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

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

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

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

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

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

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

Setup Configuration



<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 is $\leq \frac{1}{4}$ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA) are less than $\frac{1}{4}$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA .

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	RMC 12.2Kbps	23.50	23.67	24.00	24.50	23.36	23.55	23.74	24.50	23.55	23.49	23.58	24.50
3GPP Rel 6	HSDPA Subtest-1	22.52	22.63	23.05	24.00	22.30	22.51	22.49	24.00	22.53	22.96	22.49	24.00
3GPP Rel 6	HSDPA Subtest-2	22.54	22.70	23.08	24.00	22.36	22.56	22.54	24.00	22.55	23.00	22.54	24.00
3GPP Rel 6	HSDPA Subtest-3	22.08	22.23	22.51	23.50	21.88	22.09	22.07	23.50	22.09	22.50	22.07	23.50
3GPP Rel 6	HSDPA Subtest-4	22.00	22.01	22.27	23.50	21.63	21.85	21.83	23.50	21.82	22.26	21.84	23.50
3GPP Rel 6	HSUPA Subtest-1	22.59	22.65	22.98	23.00	22.44	22.59	22.47	23.00	22.41	22.85	22.35	23.00
3GPP Rel 6	HSUPA Subtest-2	20.36	20.44	20.86	21.00	20.22	20.31	20.26	21.00	20.26	20.66	20.18	21.00
3GPP Rel 6	HSUPA Subtest-3	21.13	21.21	21.57	22.00	20.97	21.07	20.98	22.00	20.97	21.39	20.91	22.00
3GPP Rel 6	HSUPA Subtest-4	20.61	20.76	21.00	21.00	20.50	20.62	20.53	21.00	20.48	20.98	20.44	21.00
3GPP Rel 6	HSUPA Subtest-5	22.60	22.80	23.00	23.00	22.40	22.60	22.50	23.00	22.40	22.90	22.50	23.00

Reduced 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	RMC 12.2Kbps	15.77	15.72	15.41	17.00	14.02	14.14	14.31	15.50	18.23	18.26	18.21	19.00
3GPP Rel 6	HSDPA Subtest-1	15.03	14.98	14.67	16.00	13.21	13.33	13.50	14.50	17.46	17.49	17.44	18.00
3GPP Rel 6	HSDPA Subtest-2	15.00	14.87	14.52	16.00	13.12	13.21	13.46	14.50	17.39	17.29	17.33	18.00
3GPP Rel 6	HSDPA Subtest-3	14.39	14.19	13.91	15.50	12.48	12.56	12.76	14.00	17.04	17.07	17.02	17.50
3GPP Rel 6	HSDPA Subtest-4	14.27	14.39	14.13	15.50	12.41	12.63	12.74	14.00	16.94	16.98	17.01	17.50
3GPP Rel 6	HSUPA Subtest-1	14.93	14.93	14.51	16.00	13.01	13.15	13.50	14.50	17.29	17.31	17.34	18.00
3GPP Rel 6	HSUPA Subtest-2	12.48	12.33	12.40	14.00	10.88	10.93	11.02	12.50	15.51	15.38	15.55	16.00
3GPP Rel 6	HSUPA Subtest-3	13.78	13.67	13.25	15.00	11.91	12.03	12.31	13.50	16.51	16.55	16.58	17.00
3GPP Rel 6	HSUPA Subtest-4	12.64	12.42	12.19	14.00	10.71	10.79	10.84	12.50	15.47	15.35	15.43	16.00
3GPP Rel 6	HSUPA Subtest-5	15.00	14.86	14.48	16.00	13.10	13.22	13.43	14.50	17.31	17.39	17.27	18.00

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

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B5/B12/B26 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE band 4/5 SAR test was covered by Band 66/26; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. the maximum output power, including tolerance, for the smaller band is \leq the larger band to qualify for the SAR test exclusion
 - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band



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	23.56	23.43	23.13	24	0
20	QPSK	1	49	23.34	23.43	23.09		
20	QPSK	1	99	23.48	23.30	23.01		
20	QPSK	50	0	22.19	22.26	21.82	23	1
20	QPSK	50	24	22.13	22.37	21.70		
20	QPSK	50	50	22.12	22.29	21.80		
20	QPSK	100	0	22.29	22.40	22.02	23	1
20	16QAM	1	0	22.57	22.46	22.61		
20	16QAM	1	49	22.31	22.49	21.65		
20	16QAM	1	99	22.48	22.54	21.93	22	2
20	16QAM	50	0	21.22	21.34	20.84		
20	16QAM	50	24	21.14	21.43	21.11		
20	16QAM	50	50	21.14	21.35	21.07	22	2
20	16QAM	50	50	21.14	21.35	21.07		
20	16QAM	100	0	21.27	21.48	21.02		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	23.47	23.41	22.99	24	0
15	QPSK	1	37	23.20	23.30	23.04		
15	QPSK	1	74	23.40	23.25	22.92		
15	QPSK	36	0	22.00	22.06	21.81	23	1
15	QPSK	36	20	22.13	22.21	21.62		
15	QPSK	36	39	21.94	22.29	21.71		
15	QPSK	75	0	22.17	22.20	21.93	23	1
15	16QAM	1	0	22.50	22.34	22.44		
15	16QAM	1	37	22.26	22.43	21.49		
15	16QAM	1	74	22.32	22.39	21.88	22	2
15	16QAM	36	0	21.08	21.28	20.71		
15	16QAM	36	20	21.08	21.36	20.99		
15	16QAM	36	39	21.07	21.15	20.95	22	2
15	16QAM	36	39	21.07	21.15	20.95		
15	16QAM	75	0	21.20	21.33	20.83		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	23.38	23.35	23.08	24	0
10	QPSK	1	25	23.29	23.28	23.09		
10	QPSK	1	49	23.36	23.22	22.82		
10	QPSK	25	0	22.13	22.07	21.81	23	1
10	QPSK	25	12	22.02	22.25	21.61		
10	QPSK	25	25	22.10	22.27	21.60		
10	QPSK	50	0	22.26	22.22	21.88	23	1
10	16QAM	1	0	22.52	22.31	22.59		
10	16QAM	1	25	22.16	22.30	21.49		
10	16QAM	1	49	22.46	22.51	21.82	22	2
10	16QAM	25	0	21.05	21.25	20.70		
10	16QAM	25	12	20.97	21.33	21.01		
10	16QAM	25	25	20.99	21.35	20.88	22	2
10	16QAM	25	25	20.99	21.35	20.88		
10	16QAM	50	0	21.13	21.47	20.92		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	23.39	23.26	22.94	24	0
5	QPSK	1	12	23.18	23.32	23.02		



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5	QPSK	1	24	23.47	23.12	23.00		
5	QPSK	12	0	22.03	22.08	21.79	23	1
5	QPSK	12	7	21.98	22.36	21.69		
5	QPSK	12	13	21.94	22.16	21.69		
5	QPSK	25	0	22.21	22.38	21.85		
5	16QAM	1	0	22.46	22.29	22.56	23	1
5	16QAM	1	12	22.21	22.36	21.54		
5	16QAM	1	24	22.44	22.52	21.77		
5	16QAM	12	0	21.08	21.21	20.79	22	2
5	16QAM	12	7	21.08	21.43	21.09		
5	16QAM	12	13	20.94	21.26	21.00		
5	16QAM	25	0	21.08	21.29	20.85		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	23.53	23.34	23.10	24	0
3	QPSK	1	8	23.15	23.35	23.03		
3	QPSK	1	14	23.29	23.15	23.00		
3	QPSK	8	0	22.11	22.16	21.75	23	1
3	QPSK	8	4	22.09	22.19	21.52		
3	QPSK	8	7	22.06	22.14	21.73		
3	QPSK	15	0	22.14	22.29	21.83		
3	16QAM	1	0	22.55	22.36	22.49	23	1
3	16QAM	1	8	22.13	22.42	21.62		
3	16QAM	1	14	22.44	22.39	21.78		
3	16QAM	8	0	21.07	21.32	20.64	22	2
3	16QAM	8	4	20.98	21.43	20.95		
3	16QAM	8	7	20.99	21.25	21.06		
3	16QAM	15	0	21.07	21.42	20.89		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	23.38	23.28	23.05	24	0
1.4	QPSK	1	3	23.31	23.25	23.06		
1.4	QPSK	1	5	23.47	23.10	22.99		
1.4	QPSK	3	0	23.50	23.28	23.10		
1.4	QPSK	3	1	23.18	23.39	23.02		
1.4	QPSK	3	3	23.42	23.17	22.96		
1.4	QPSK	6	0	22.10	22.35	21.90	23	1
1.4	16QAM	1	0	22.39	22.45	22.56	23	1
1.4	16QAM	1	3	22.19	22.40	21.62		
1.4	16QAM	1	5	22.28	22.46	21.79		
1.4	16QAM	3	0	22.48	22.37	22.52		
1.4	16QAM	3	1	22.15	22.44	21.54		
1.4	16QAM	3	3	22.47	22.49	21.86		
1.4	16QAM	6	0	21.10	21.34	20.90		



<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		0
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	22.76	23.14	22.78		
20	QPSK	1	49	22.88	22.63	23.06	24	0
20	QPSK	1	99	22.83	22.90	23.01		
20	QPSK	50	0	21.88	21.87	21.80		
20	QPSK	50	24	21.86	21.73	21.93	23	1
20	QPSK	50	50	21.86	21.79	21.85		
20	QPSK	100	0	21.79	21.83	22.03		
20	16QAM	1	0	22.18	22.25	22.00	23	1
20	16QAM	1	49	22.15	21.74	22.01		
20	16QAM	1	99	21.65	21.90	22.22		
20	16QAM	50	0	20.84	20.87	20.88	22	2
20	16QAM	50	24	20.83	20.71	21.02		
20	16QAM	50	50	20.92	20.75	20.96		
20	16QAM	100	0	21.00	20.76	21.03		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.60	22.94	22.78		
15	QPSK	1	37	22.70	22.52	23.04	24	0
15	QPSK	1	74	22.81	22.89	22.86		
15	QPSK	36	0	21.83	21.67	21.80		
15	QPSK	36	20	21.84	21.67	21.73	23	1
15	QPSK	36	39	21.73	21.69	21.70		
15	QPSK	75	0	21.73	21.65	21.97		
15	16QAM	1	0	22.17	22.19	21.80	23	1
15	16QAM	1	37	22.00	21.55	21.95		
15	16QAM	1	74	21.52	21.88	22.02		
15	16QAM	36	0	20.74	20.84	20.77	22	2
15	16QAM	36	20	20.71	20.55	20.93		
15	16QAM	36	39	20.92	20.63	20.92		
15	16QAM	75	0	20.95	20.59	20.96		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	22.66	22.99	22.72		
10	QPSK	1	25	22.78	22.55	22.97	24	0
10	QPSK	1	49	22.66	22.70	22.94		
10	QPSK	25	0	21.74	21.69	21.72		
10	QPSK	25	12	21.74	21.63	21.82	23	1
10	QPSK	25	25	21.69	21.74	21.70		
10	QPSK	50	0	21.68	21.81	21.87		
10	16QAM	1	0	22.09	22.11	21.94	23	1
10	16QAM	1	25	22.14	21.66	21.98		
10	16QAM	1	49	21.49	21.81	22.02		
10	16QAM	25	0	20.72	20.71	20.87	22	2
10	16QAM	25	12	20.74	20.53	20.86		
10	16QAM	25	25	20.72	20.74	20.93		
10	16QAM	50	0	20.91	20.67	21.02		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	22.58	23.01	22.77		
5	QPSK	1	12	22.72	22.43	22.89	24	0
5	QPSK	1	24	22.71	22.81	22.97		



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5	QPSK	12	0	21.87	21.81	21.76	23	1
5	QPSK	12	7	21.85	21.73	21.73		
5	QPSK	12	13	21.80	21.73	21.84		
5	QPSK	25	0	21.62	21.76	21.92	23	1
5	16QAM	1	0	22.02	22.25	21.89		
5	16QAM	1	12	22.04	21.56	22.01		
5	16QAM	1	24	21.57	21.73	22.11	22	2
5	16QAM	12	0	20.72	20.67	20.71		
5	16QAM	12	7	20.65	20.51	20.84		
5	16QAM	12	13	20.79	20.67	20.89		
5	16QAM	25	0	20.99	20.66	21.02	Tune-up limit (dBm)	MPR (dB)
Channel				19965	20175	20385		
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	22.64	23.07	22.73	24	0
3	QPSK	1	8	22.82	22.63	22.96		
3	QPSK	1	14	22.67	22.80	22.81		
3	QPSK	8	0	21.74	21.68	21.60	23	1
3	QPSK	8	4	21.79	21.64	21.92		
3	QPSK	8	7	21.81	21.73	21.68		
3	QPSK	15	0	21.67	21.79	21.91	23	1
3	16QAM	1	0	22.14	22.09	21.87		
3	16QAM	1	8	22.04	21.74	21.95		
3	16QAM	1	14	21.56	21.83	22.17		
3	16QAM	8	0	20.77	20.76	20.85		
3	16QAM	8	4	20.64	20.64	20.94		
3	16QAM	8	7	20.88	20.61	20.76	22	2
3	16QAM	15	0	20.89	20.66	20.84		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	22.71	23.01	22.66	24	0
1.4	QPSK	1	3	22.86	22.56	23.03		
1.4	QPSK	1	5	22.73	22.79	22.83		
1.4	QPSK	3	0	22.56	23.06	22.76		
1.4	QPSK	3	1	22.69	22.54	23.03		
1.4	QPSK	3	3	22.67	22.85	22.99		
1.4	QPSK	6	0	21.77	21.67	21.89	23	1
1.4	16QAM	1	0	22.01	22.11	21.95	23	1
1.4	16QAM	1	3	22.12	21.68	21.94		
1.4	16QAM	1	5	21.55	21.81	22.12		
1.4	16QAM	3	0	22.16	22.24	21.90		
1.4	16QAM	3	1	22.00	21.59	21.83		
1.4	16QAM	3	3	21.54	21.79	22.18		
1.4	16QAM	6	0	20.88	20.63	21.03		



<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		0
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	23.08	22.79	22.73		
10	QPSK	1	25	22.58	22.75	22.75	24	0
10	QPSK	1	49	22.74	22.61	22.87		
10	QPSK	25	0	21.76	21.66	21.78		
10	QPSK	25	12	21.72	21.67	21.77	23	1
10	QPSK	25	25	21.74	21.79	21.84		
10	QPSK	50	0	21.69	21.72	21.86		
10	16QAM	1	0	22.27	21.78	21.87	23	1
10	16QAM	1	25	21.54	21.72	21.90		
10	16QAM	1	49	22.14	21.76	21.99		
10	16QAM	25	0	20.81	20.78	20.74	22	2
10	16QAM	25	12	20.79	20.67	20.78		
10	16QAM	25	25	20.71	20.88	21.04		
10	16QAM	50	0	20.79	20.74	20.89		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5	24	0
5	QPSK	1	0	23.07	22.67	22.68		
5	QPSK	1	12	22.42	22.70	22.68		
5	QPSK	1	24	22.61	22.48	22.84	23	1
5	QPSK	12	0	21.70	21.49	21.77		
5	QPSK	12	7	21.72	21.60	21.57		
5	QPSK	12	13	21.73	21.62	21.84	23	1
5	QPSK	25	0	21.50	21.53	21.82		
5	16QAM	1	0	22.16	21.69	21.68		
5	16QAM	1	12	21.37	21.64	21.76	23	1
5	16QAM	1	24	22.02	21.75	21.82		
5	16QAM	12	0	20.66	20.63	20.64		
5	16QAM	12	7	20.63	20.63	20.63	22	2
5	16QAM	12	13	20.66	20.88	20.92		
5	16QAM	25	0	20.76	20.60	20.82		
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5	24	0
3	QPSK	1	0	23.06	22.74	22.57		
3	QPSK	1	8	22.49	22.59	22.58		
3	QPSK	1	14	22.62	22.60	22.71	23	1
3	QPSK	8	0	21.70	21.57	21.68		
3	QPSK	8	4	21.56	21.55	21.68		
3	QPSK	8	7	21.59	21.75	21.82	23	1
3	QPSK	15	0	21.51	21.53	21.73		
3	16QAM	1	0	22.21	21.77	21.78		
3	16QAM	1	8	21.47	21.59	21.77	23	1
3	16QAM	1	14	21.98	21.61	21.94		
3	16QAM	8	0	20.78	20.76	20.68		
3	16QAM	8	4	20.63	20.59	20.63	22	2
3	16QAM	8	7	20.56	20.72	20.96		
3	16QAM	15	0	20.75	20.56	20.84		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3	24	0
1.4	QPSK	1	0	22.97	22.70	22.70		
1.4	QPSK	1	3	22.52	22.74	22.61		
1.4	QPSK	1	5	22.67	22.50	22.85		



1.4	QPSK	3	0	22.99	22.79	22.55		
1.4	QPSK	3	1	22.46	22.62	22.62		
1.4	QPSK	3	3	22.57	22.52	22.84		
1.4	QPSK	6	0	21.62	21.65	21.84	23	1
1.4	16QAM	1	0	22.20	21.74	21.73		
1.4	16QAM	1	3	21.41	21.52	21.72		
1.4	16QAM	1	5	22.08	21.72	21.87		
1.4	16QAM	3	0	22.16	21.59	21.76	23	1
1.4	16QAM	3	1	21.34	21.70	21.86		
1.4	16QAM	3	3	22.09	21.58	21.92		
1.4	16QAM	6	0	20.76	20.71	20.88	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	22.88	22.73	22.93		
20	QPSK	1	49	22.71	22.59	22.86	24	0
20	QPSK	1	99	22.76	22.62	22.79		
20	QPSK	50	0	21.76	21.71	22.12		
20	QPSK	50	24	21.69	21.83	21.92	23	1
20	QPSK	50	50	21.75	22.10	22.01		
20	QPSK	100	0	21.84	21.99	22.08		
20	16QAM	1	0	22.12	21.51	22.06		
20	16QAM	1	49	21.40	21.77	21.86	23	1
20	16QAM	1	99	21.66	21.74	22.09		
20	16QAM	50	0	20.89	20.67	20.97		
20	16QAM	50	24	20.72	20.80	20.95	22	2
20	16QAM	50	50	20.72	20.95	20.98		
20	16QAM	100	0	20.78	20.86	21.03		
Channel				20825	21100	21375		
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	22.84	22.58	22.91		
15	QPSK	1	37	22.56	22.47	22.71	24	0
15	QPSK	1	74	22.74	22.62	22.71		
15	QPSK	36	0	21.73	21.64	21.92		
15	QPSK	36	20	21.65	21.66	21.83	23	1
15	QPSK	36	39	21.68	21.97	21.86		
15	QPSK	75	0	21.78	21.94	21.96		
15	16QAM	1	0	21.99	21.49	22.03		
15	16QAM	1	37	21.22	21.71	21.82	23	1
15	16QAM	1	74	21.58	21.68	21.93		
15	16QAM	36	0	20.84	20.63	20.89		
15	16QAM	36	20	20.63	20.77	20.89	22	2
15	16QAM	36	39	20.60	20.89	20.92		
15	16QAM	75	0	20.70	20.74	20.96		
Channel				20800	21100	21400		
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	22.73	22.68	22.77		
10	QPSK	1	25	22.68	22.44	22.79	24	0
10	QPSK	1	49	22.64	22.51	22.71		
10	QPSK	25	0	21.57	21.61	21.80		
10	QPSK	25	12	21.51	21.78	21.86	23	1
10	QPSK	25	25	21.56	22.00	21.87		
10	QPSK	50	0	21.75	21.94	22.08		



10	16QAM	1	0	22.12	21.47	22.03	23	1
10	16QAM	1	25	21.40	21.72	21.85		
10	16QAM	1	49	21.61	21.62	21.99		
10	16QAM	25	0	20.88	20.67	20.86	22	2
10	16QAM	25	12	20.69	20.74	20.88		
10	16QAM	25	25	20.72	20.90	20.87		
10	16QAM	50	0	20.59	20.75	21.00		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	22.81	22.60	22.88	24	0
5	QPSK	1	12	22.53	22.58	22.70		
5	QPSK	1	24	22.65	22.46	22.76		
5	QPSK	12	0	21.68	21.56	21.94	23	1
5	QPSK	12	7	21.65	21.66	21.84		
5	QPSK	12	13	21.64	21.91	21.81		
5	QPSK	25	0	21.75	21.83	22.06		
5	16QAM	1	0	21.95	21.46	21.91	23	1
5	16QAM	1	12	21.26	21.63	21.77		
5	16QAM	1	24	21.55	21.68	21.98		
5	16QAM	12	0	20.80	20.64	20.90	22	2
5	16QAM	12	7	20.64	20.79	20.94		
5	16QAM	12	13	20.72	20.78	20.96		
5	16QAM	25	0	20.58	20.78	20.92		

<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	22.75	22.54	22.35	24	0
10	QPSK	1	25	22.63	22.27	22.25		
10	QPSK	1	49	22.53	22.45	22.46		
10	QPSK	25	0	21.78	21.47	21.46	23	1
10	QPSK	25	12	21.77	21.46	21.43		
10	QPSK	25	25	21.84	21.48	21.50		
10	QPSK	50	0	21.86	21.62	21.45		
10	16QAM	1	0	21.87	21.80	21.63	23	1
10	16QAM	1	25	21.90	21.57	21.76		
10	16QAM	1	49	21.99	21.66	21.79		
10	16QAM	25	0	20.74	20.42	20.48	22	2
10	16QAM	25	12	20.78	20.72	20.57		
10	16QAM	25	25	21.04	20.48	20.60		
10	16QAM	50	0	20.89	20.64	20.57		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	22.73	22.35	22.20	24	0
5	QPSK	1	12	22.45	22.14	22.06		
5	QPSK	1	24	22.46	22.45	22.29		
5	QPSK	12	0	21.59	21.44	21.36	23	1
5	QPSK	12	7	21.76	21.43	21.33		
5	QPSK	12	13	21.76	21.45	21.42		
5	QPSK	25	0	21.70	21.56	21.29		
5	16QAM	1	0	21.85	21.64	21.51	23	1
5	16QAM	1	12	21.76	21.53	21.73		
5	16QAM	1	24	21.97	21.63	21.62		
5	16QAM	12	0	20.54	20.35	20.40	22	2



5	16QAM	12	7	20.64	20.61	20.37		
5	16QAM	12	13	20.87	20.45	20.56		
5	16QAM	25	0	20.87	20.63	20.54		
Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	22.71	22.42	22.16	24	0
3	QPSK	1	8	22.43	22.20	22.21		
3	QPSK	1	14	22.51	22.39	22.37		
3	QPSK	8	0	21.59	21.41	21.32	23	1
3	QPSK	8	4	21.71	21.33	21.33		
3	QPSK	8	7	21.64	21.35	21.46		
3	QPSK	15	0	21.81	21.48	21.39		
3	16QAM	1	0	21.81	21.77	21.56	23	1
3	16QAM	1	8	21.75	21.49	21.68		
3	16QAM	1	14	21.90	21.55	21.66		
3	16QAM	8	0	20.68	20.35	20.31	22	2
3	16QAM	8	4	20.73	20.52	20.46		
3	16QAM	8	7	20.91	20.39	20.42		
3	16QAM	15	0	20.74	20.56	20.52		
Channel				23017	23095	23173		
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	22.69	22.48	22.16	24	0
1.4	QPSK	1	3	22.60	22.25	22.17		
1.4	QPSK	1	5	22.40	22.36	22.27		
1.4	QPSK	3	0	22.71	22.41	22.28		
1.4	QPSK	3	1	22.55	22.15	22.08		
1.4	QPSK	3	3	22.37	22.34	22.40		
1.4	QPSK	6	0	21.85	21.59	21.38	23	1
1.4	16QAM	1	0	21.82	21.76	21.44	23	1
1.4	16QAM	1	3	21.85	21.53	21.70		
1.4	16QAM	1	5	21.95	21.65	21.59		
1.4	16QAM	3	0	21.75	21.79	21.46		
1.4	16QAM	3	1	21.77	21.39	21.64		
1.4	16QAM	3	3	21.79	21.66	21.75		
1.4	16QAM	6	0	20.89	20.62	20.49		

<LTE Band 13>

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				23230				
Frequency (MHz)				782				
10	QPSK	1	0		23.13		24	0
10	QPSK	1	25		22.92			
10	QPSK	1	49		23.08			
10	QPSK	25	0		22.20		23	1
10	QPSK	25	12		22.14			
10	QPSK	25	25		22.14			
10	QPSK	50	0		22.06			
10	16QAM	1	0		22.51		23	1
10	16QAM	1	25		22.45			
10	16QAM	1	49		22.18			
10	16QAM	25	0		21.44		22	2
10	16QAM	25	12		21.26			
10	16QAM	25	25		21.11			
10	16QAM	50	0		21.23			

Channel				23205	23230	23255	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	22.69	23.07	22.94	24	0
5	QPSK	1	12	22.96	23.02	22.99		
5	QPSK	1	24	23.01	22.99	22.96		
5	QPSK	12	0	22.01	21.92	21.98	23	1
5	QPSK	12	7	22.06	21.87	21.90		
5	QPSK	12	13	21.96	21.99	21.92		
5	QPSK	25	0	22.14	21.82	21.95	23	1
5	16QAM	1	0	22.24	22.43	22.26		
5	16QAM	1	12	22.48	22.27	22.28		
5	16QAM	1	24	22.18	22.51	22.45	22	2
5	16QAM	12	0	21.10	20.95	21.13		
5	16QAM	12	7	21.02	20.92	21.10		
5	16QAM	12	13	21.08	21.06	21.12	22	2
5	16QAM	25	0	21.12	20.84	21.13		

<LTE Band 26>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				26765	26865	26965		
Frequency (MHz)				821.5	831.5	841.5		
15	QPSK	1	0	22.99	22.60	22.72	24	0
15	QPSK	1	37	22.73	22.58	22.67		
15	QPSK	1	74	22.96	22.58	22.62		
15	QPSK	36	0	21.93	21.70	21.68	23	1
15	QPSK	36	20	22.03	21.65	21.71		
15	QPSK	36	39	22.11	21.67	21.76		
15	QPSK	75	0	22.07	21.73	21.74	23	1
15	16QAM	1	0	22.19	22.14	22.06		
15	16QAM	1	37	22.55	21.98	22.17		
15	16QAM	1	74	22.52	21.67	22.31	22	2
15	16QAM	36	0	21.07	20.85	20.78		
15	16QAM	36	20	21.03	20.73	20.83		
15	16QAM	36	39	21.01	20.89	20.85	22	2
15	16QAM	75	0	21.19	20.91	20.74		
Channel				26740	26865	26990	24	0
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	22.87	22.54	22.62	24	0
10	QPSK	1	25	22.62	22.62	22.54		
10	QPSK	1	49	22.82	22.49	22.48		
10	QPSK	25	0	21.74	21.58	21.50	23	1
10	QPSK	25	12	21.89	21.48	21.69		
10	QPSK	25	25	22.08	21.59	21.60		
10	QPSK	50	0	21.94	21.59	21.59	23	1
10	16QAM	1	0	22.08	21.96	21.93		
10	16QAM	1	25	22.54	21.83	22.08		
10	16QAM	1	49	22.32	21.47	22.21	22	2
10	16QAM	25	0	21.04	20.85	20.65		
10	16QAM	25	12	20.93	20.55	20.74		
10	16QAM	25	25	21.01	20.88	20.72	22	2
10	16QAM	50	0	21.13	20.88	20.68		
Channel				26715	26865	27015	24	0
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	22.89	22.49	22.62	24	0



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5	QPSK	1	12	22.70	22.55	22.61		
5	QPSK	1	24	22.94	22.56	22.44		
5	QPSK	12	0	21.82	21.66	21.48	23	1
5	QPSK	12	7	21.89	21.58	21.69		
5	QPSK	12	13	21.92	21.48	21.65		
5	QPSK	25	0	21.96	21.61	21.65		
5	16QAM	1	0	22.18	22.09	21.98	23	1
5	16QAM	1	12	22.38	21.85	22.04		
5	16QAM	1	24	22.32	21.56	22.14		
5	16QAM	12	0	21.00	20.74	20.70	22	2
5	16QAM	12	7	20.94	20.73	20.63		
5	16QAM	12	13	20.93	20.81	20.79		
5	16QAM	25	0	21.09	20.91	20.65		
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	22.91	22.54	22.70	24	0
3	QPSK	1	8	22.65	22.52	22.52		
3	QPSK	1	14	22.89	22.47	22.49		
3	QPSK	8	0	21.76	21.56	21.63	23	1
3	QPSK	8	4	22.01	21.65	21.71		
3	QPSK	8	7	22.01	21.50	21.72		
3	QPSK	15	0	21.91	21.56	21.69		
3	16QAM	1	0	22.02	21.96	21.95	23	1
3	16QAM	1	8	22.44	21.95	22.07		
3	16QAM	1	14	22.45	21.56	22.25		
3	16QAM	8	0	20.91	20.71	20.63	22	2
3	16QAM	8	4	20.88	20.69	20.64		
3	16QAM	8	7	20.93	20.82	20.85		
3	16QAM	15	0	20.99	20.84	20.65		
Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	22.83	22.45	22.69	24	0
1.4	QPSK	1	3	22.62	22.57	22.50		
1.4	QPSK	1	5	22.89	22.41	22.59		
1.4	QPSK	3	0	22.88	22.46	22.60		
1.4	QPSK	3	1	22.68	22.43	22.62		
1.4	QPSK	3	3	22.85	22.42	22.50		
1.4	QPSK	6	0	21.90	21.69	21.71	23	1
1.4	16QAM	1	0	22.19	21.96	21.89	23	1
1.4	16QAM	1	3	22.35	21.87	22.05		
1.4	16QAM	1	5	22.40	21.65	22.25		
1.4	16QAM	3	0	22.18	22.13	21.95		
1.4	16QAM	3	1	22.50	21.86	22.05		
1.4	16QAM	3	3	22.51	21.67	22.12		
1.4	16QAM	6	0	21.08	20.74	20.64		



<LTE Band 30>

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				27710				
Frequency (MHz)				2310				
10	QPSK	1	0	22.88			24	0
10	QPSK	1	25	22.61				
10	QPSK	1	49	22.73				
10	QPSK	25	0	21.53			23	1
10	QPSK	25	12	21.46				
10	QPSK	25	25	21.60				
10	QPSK	50	0	21.54			23	1
10	16QAM	1	0	21.81				
10	16QAM	1	25	21.43				
10	16QAM	1	49	21.43			22	2
10	16QAM	25	0	20.39				
10	16QAM	25	12	20.44				
10	16QAM	25	25	20.59			22	2
10	16QAM	50	0	20.55				
Channel				27685	27710	27735		
Frequency (MHz)				2307.5	2310	2312.5		
5	QPSK	1	0	22.53	22.21	22.45	24	0
5	QPSK	1	12	22.27	22.35	22.30		
5	QPSK	1	24	22.40	22.43	22.31		
5	QPSK	12	0	21.43	21.21	21.27	23	1
5	QPSK	12	7	21.29	21.30	21.35		
5	QPSK	12	13	21.28	21.30	21.29		
5	QPSK	25	0	21.47	21.33	21.29	23	1
5	16QAM	1	0	21.68	21.39	21.66		
5	16QAM	1	12	21.49	21.20	21.62		
5	16QAM	1	24	21.60	21.60	21.48	22	2
5	16QAM	12	0	20.39	20.27	20.33		
5	16QAM	12	7	20.25	20.38	20.18		
5	16QAM	12	13	20.39	20.37	20.29	22	2
5	16QAM	12	13	20.39	20.37	20.29		
5	16QAM	25	0	20.14	20.34	20.37		

<LTE Band 66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	22.91	23.26	23.36	24	0
20	QPSK	1	49	22.90	22.95	23.32		
20	QPSK	1	99	22.84	22.97	22.68		
20	QPSK	50	0	21.99	22.06	22.04	23	1
20	QPSK	50	24	22.16	22.12	21.78		
20	QPSK	50	50	21.96	22.16	21.82		
20	QPSK	100	0	22.20	22.32	22.02	23	1
20	16QAM	1	0	21.93	22.29	22.35		
20	16QAM	1	49	22.39	22.71	22.01		
20	16QAM	1	99	22.22	22.71	22.31	22	2
20	16QAM	50	0	20.90	20.96	20.94		
20	16QAM	50	24	20.94	21.04	20.74		
20	16QAM	50	50	20.85	21.03	20.88	22	2
20	16QAM	50	50	20.85	21.03	20.88		
20	16QAM	100	0	21.14	21.19	21.01		
Channel				132047	132322	132597	Tune-up limit	MPR



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Frequency (MHz)				1717.5	1745	1772.5	(dBm)	(dB)
15	QPSK	1	0	22.84	23.14	23.22	24	0
15	QPSK	1	37	22.89	22.84	23.17		
15	QPSK	1	74	22.83	22.88	22.55		
15	QPSK	36	0	21.80	22.06	22.04	23	1
15	QPSK	36	20	22.15	21.93	21.59		
15	QPSK	36	39	21.87	22.07	21.62		
15	QPSK	75	0	22.01	22.15	21.93	23	1
15	16QAM	1	0	21.90	22.19	22.29		
15	16QAM	1	37	22.35	22.63	21.88		
15	16QAM	1	74	22.06	22.58	22.26	22	2
15	16QAM	36	0	20.78	20.83	20.74		
15	16QAM	36	20	20.81	21.00	20.54		
15	16QAM	36	39	20.78	20.96	20.83	22	2
15	16QAM	75	0	20.96	21.02	20.84		
Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	22.81	23.10	23.20	24	0
10	QPSK	1	25	22.84	22.88	23.23		
10	QPSK	1	49	22.76	22.79	22.63		
10	QPSK	25	0	21.94	21.92	21.87	23	1
10	QPSK	25	12	22.09	21.98	21.67		
10	QPSK	25	25	21.83	22.05	21.68		
10	QPSK	50	0	22.15	22.22	21.86	23	1
10	16QAM	1	0	21.89	22.13	22.23		
10	16QAM	1	25	22.30	22.59	21.95		
10	16QAM	1	49	22.10	22.69	22.24	22	2
10	16QAM	25	0	20.70	20.93	20.74		
10	16QAM	25	12	20.89	20.95	20.70		
10	16QAM	25	25	20.77	20.94	20.74	22	2
10	16QAM	50	0	21.07	21.00	20.81		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	22.73	23.21	23.26	24	0
5	QPSK	1	12	22.81	22.83	23.23		
5	QPSK	1	24	22.82	22.85	22.61		
5	QPSK	12	0	21.87	21.92	21.93	23	1
5	QPSK	12	7	22.00	21.96	21.64		
5	QPSK	12	13	21.83	22.14	21.72		
5	QPSK	25	0	22.16	22.23	22.01	23	1
5	16QAM	1	0	21.80	22.09	22.20		
5	16QAM	1	12	22.28	22.57	21.94		
5	16QAM	1	24	22.02	22.60	22.17	22	2
5	16QAM	12	0	20.81	20.87	20.86		
5	16QAM	12	7	20.92	20.94	20.67		
5	16QAM	12	13	20.72	20.86	20.69	22	2
5	16QAM	25	0	21.13	21.15	20.95		
Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	22.85	23.19	23.28	24	0
3	QPSK	1	8	22.87	22.79	23.27		
3	QPSK	1	14	22.74	22.80	22.58		
3	QPSK	8	0	21.84	22.02	21.90	23	1
3	QPSK	8	4	22.15	21.95	21.75		
3	QPSK	8	7	21.87	21.97	21.72		
3	QPSK	15	0	22.18	22.16	21.82	23	1



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3	16QAM	1	0	21.90	22.28	22.19	23	1
3	16QAM	1	8	22.36	22.69	21.85		
3	16QAM	1	14	22.07	22.57	22.17		
3	16QAM	8	0	20.86	20.92	20.91	22	2
3	16QAM	8	4	20.76	20.94	20.72		
3	16QAM	8	7	20.68	20.99	20.73		
3	16QAM	15	0	21.02	21.02	20.99		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	22.74	23.23	23.25	24	0
1.4	QPSK	1	3	22.80	22.86	23.20		
1.4	QPSK	1	5	22.71	22.82	22.58		
1.4	QPSK	3	0	22.79	23.25	23.20		
1.4	QPSK	3	1	22.70	22.92	23.22		
1.4	QPSK	3	3	22.66	22.86	22.63		
1.4	QPSK	6	0	22.10	22.20	21.90	23	1
1.4	16QAM	1	0	21.83	22.26	22.22	23	1
1.4	16QAM	1	3	22.32	22.67	21.90		
1.4	16QAM	1	5	22.03	22.62	22.26		
1.4	16QAM	3	0	21.78	22.16	22.22		
1.4	16QAM	3	1	22.22	22.54	21.87		
1.4	16QAM	3	3	22.17	22.59	22.31		
1.4	16QAM	6	0	21.11	21.04	20.86	22	2



Reduced 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		0
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	15.87	15.81	15.77		
20	QPSK	1	49	15.69	15.66	15.60	17	0
20	QPSK	1	99	15.66	15.69	15.71		
20	QPSK	50	0	15.75	15.74	15.71		
20	QPSK	50	24	15.62	15.64	15.61	17	0
20	QPSK	50	50	15.56	15.50	15.47		
20	QPSK	100	0	15.70	15.64	15.63		
20	16QAM	1	0	15.58	15.59	15.59	17	0
20	16QAM	1	49	15.57	15.52	15.47		
20	16QAM	1	99	15.49	15.48	15.41		
20	16QAM	50	0	15.65	15.58	15.58	17	0
20	16QAM	50	24	15.48	15.51	15.54		
20	16QAM	50	50	15.44	15.45	15.39		
20	16QAM	100	0	15.35	15.33	15.26		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	15.76	15.63	15.76		
15	QPSK	1	37	15.49	15.65	15.44	17	0
15	QPSK	1	74	15.52	15.68	15.65		
15	QPSK	36	0	15.60	15.59	15.56		
15	QPSK	36	20	15.44	15.51	15.43	17	0
15	QPSK	36	39	15.49	15.36	15.37		
15	QPSK	75	0	15.68	15.52	15.57		
15	16QAM	1	0	15.41	15.48	15.45	17	0
15	16QAM	1	37	15.56	15.37	15.36		
15	16QAM	1	74	15.39	15.42	15.27		
15	16QAM	36	0	15.53	15.49	15.50	17	0
15	16QAM	36	20	15.35	15.37	15.50		
15	16QAM	36	39	15.30	15.29	15.37		
15	16QAM	75	0	15.23	15.21	15.18		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	15.72	15.61	15.67		
10	QPSK	1	25	15.55	15.58	15.40	17	0
10	QPSK	1	49	15.64	15.63	15.65		
10	QPSK	25	0	15.65	15.60	15.64		
10	QPSK	25	12	15.52	15.61	15.55	17	0
10	QPSK	25	25	15.38	15.30	15.46		
10	QPSK	50	0	15.64	15.60	15.56		
10	16QAM	1	0	15.49	15.53	15.44	17	0
10	16QAM	1	25	15.43	15.38	15.46		
10	16QAM	1	49	15.46	15.46	15.36		
10	16QAM	25	0	15.56	15.39	15.47	17	0
10	16QAM	25	12	15.48	15.35	15.38		
10	16QAM	25	25	15.24	15.35	15.29		
10	16QAM	50	0	15.18	15.24	15.13		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	15.73	15.72	15.63		
5	QPSK	1	12	15.51	15.52	15.40	17	0



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5	QPSK	1	24	15.47	15.68	15.56		
5	QPSK	12	0	15.58	15.72	15.64	17	0
5	QPSK	12	7	15.52	15.45	15.55		
5	QPSK	12	13	15.44	15.46	15.37		
5	QPSK	25	0	15.62	15.61	15.55	17	0
5	16QAM	1	0	15.40	15.50	15.40		
5	16QAM	1	12	15.42	15.43	15.30		
5	16QAM	1	24	15.49	15.40	15.36	17	0
5	16QAM	12	0	15.61	15.58	15.38		
5	16QAM	12	7	15.35	15.44	15.50		
5	16QAM	12	13	15.33	15.29	15.35	17	0
5	16QAM	25	0	15.35	15.32	15.13		
Channel				18615	18900	19185		
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	15.84	15.75	15.65	17	0
3	QPSK	1	8	15.63	15.49	15.47		
3	QPSK	1	14	15.46	15.58	15.71		
3	QPSK	8	0	15.61	15.72	15.62	17	0
3	QPSK	8	4	15.47	15.50	15.52		
3	QPSK	8	7	15.42	15.39	15.43		
3	QPSK	15	0	15.66	15.60	15.55	17	0
3	16QAM	1	0	15.46	15.50	15.42		
3	16QAM	1	8	15.55	15.47	15.31		
3	16QAM	1	14	15.36	15.44	15.24	17	0
3	16QAM	8	0	15.56	15.55	15.43		
3	16QAM	8	4	15.46	15.51	15.39		
3	16QAM	8	7	15.32	15.41	15.24	17	0
3	16QAM	15	0	15.31	15.17	15.08		
Channel				18607	18900	19193		
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	15.83	15.63	15.68	17	0
1.4	QPSK	1	3	15.62	15.51	15.44		
1.4	QPSK	1	5	15.46	15.67	15.54		
1.4	QPSK	3	0	15.66	15.71	15.62	17	0
1.4	QPSK	3	1	15.46	15.44	15.55		
1.4	QPSK	3	3	15.54	15.41	15.44		
1.4	QPSK	6	0	15.50	15.63	15.46	17	0
1.4	16QAM	1	0	15.57	15.52	15.56	17	0
1.4	16QAM	1	3	15.48	15.35	15.44		
1.4	16QAM	1	5	15.41	15.31	15.41		
1.4	16QAM	3	0	15.62	15.54	15.56	17	0
1.4	16QAM	3	1	15.38	15.34	15.34		
1.4	16QAM	3	3	15.41	15.39	15.31		
1.4	16QAM	6	0	15.30	15.17	15.07	17	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	15.5	0
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	14.09	14.12	14.16	15.5	0
20	QPSK	1	49	13.99	13.98	14.04		
20	QPSK	1	99	14.05	14.01	14.00		
20	QPSK	50	0	14.02	13.97	14.08	15.5	0
20	QPSK	50	24	14.01	14.04	14.06		
20	QPSK	50	50	14.01	14.05	13.97		
20	QPSK	100	0	14.02	13.97	14.01	15.5	0
20	16QAM	1	0	14.04	14.00	13.97		
20	16QAM	1	49	14.02	13.98	14.00		
20	16QAM	1	99	13.97	14.06	14.07	15.5	0
20	16QAM	50	0	13.98	13.98	14.02		
20	16QAM	50	24	14.05	14.01	14.05		
20	16QAM	50	50	13.97	14.01	14.00	15.5	0
20	16QAM	100	0	13.97	13.97	13.98		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5	15.5	0
15	QPSK	1	0	13.96	14.03	14.11		
15	QPSK	1	37	13.85	13.78	13.99		
15	QPSK	1	74	13.95	13.99	13.86	15.5	0
15	QPSK	36	0	13.90	13.86	13.79		
15	QPSK	36	20	13.92	13.98	14.06		
15	QPSK	36	39	14.00	13.92	13.89	15.5	0
15	QPSK	75	0	13.83	13.86	13.91		
15	16QAM	1	0	14.04	13.94	13.91		
15	16QAM	1	37	13.93	13.80	13.94	15.5	0
15	16QAM	1	74	13.87	13.94	13.89		
15	16QAM	36	0	13.80	13.92	13.98		
15	16QAM	36	20	13.99	13.83	14.02	15.5	0
15	16QAM	36	39	13.81	13.99	13.89		
15	16QAM	75	0	13.91	13.77	13.79		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750	15.5	0
10	QPSK	1	0	13.97	14.01	14.03		
10	QPSK	1	25	13.86	13.81	14.03		
10	QPSK	1	49	14.01	13.85	13.83	15.5	0
10	QPSK	25	0	13.92	13.92	13.79		
10	QPSK	25	12	13.94	13.89	13.93		
10	QPSK	25	25	13.94	14.04	13.95	15.5	0
10	QPSK	50	0	13.97	13.84	13.96		
10	16QAM	1	0	13.91	13.92	13.92		
10	16QAM	1	25	14.01	13.98	13.86	15.5	0
10	16QAM	1	49	13.93	13.97	14.04		
10	16QAM	25	0	13.88	13.82	14.02		
10	16QAM	25	12	13.86	13.92	13.89	15.5	0
10	16QAM	25	25	13.95	13.83	13.86		
10	16QAM	50	0	13.97	13.87	13.82		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5	15.5	0
5	QPSK	1	0	13.95	13.96	14.06		
5	QPSK	1	12	13.99	13.79	13.86		
5	QPSK	1	24	13.87	13.92	13.99	15.5	0



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5	QPSK	12	0	13.82	13.81	13.92	15.5	0
5	QPSK	12	7	13.83	13.97	13.86		
5	QPSK	12	13	13.90	13.93	13.78		
5	QPSK	25	0	13.91	13.87	13.96		
5	16QAM	1	0	13.84	13.92	13.78	15.5	0
5	16QAM	1	12	13.86	13.85	13.88		
5	16QAM	1	24	13.87	13.91	13.97		
5	16QAM	12	0	13.84	13.80	13.86	15.5	0
5	16QAM	12	7	14.00	13.91	13.99		
5	16QAM	12	13	13.93	14.01	13.96		
5	16QAM	25	0	13.86	13.80	13.94		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	13.97	14.08	14.11	15.5	0
3	QPSK	1	8	13.88	13.90	13.95		
3	QPSK	1	14	13.90	14.01	13.87		
3	QPSK	8	0	13.99	13.78	13.80	15.5	0
3	QPSK	8	4	13.86	13.95	13.90		
3	QPSK	8	7	13.93	14.01	13.85		
3	QPSK	15	0	13.88	13.79	13.93		
3	16QAM	1	0	13.99	13.98	13.96	15.5	0
3	16QAM	1	8	13.92	13.79	13.96		
3	16QAM	1	14	13.92	14.06	13.93		
3	16QAM	8	0	13.80	13.89	13.83	15.5	0
3	16QAM	8	4	13.86	13.94	14.02		
3	16QAM	8	7	13.95	13.87	13.89		
3	16QAM	15	0	13.93	13.77	13.80		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	13.92	13.93	13.97	15.5	0
1.4	QPSK	1	3	13.84	13.89	14.04		
1.4	QPSK	1	5	14.05	13.83	13.84		
1.4	QPSK	3	0	13.90	13.94	13.88		
1.4	QPSK	3	1	14.01	13.90	13.97		
1.4	QPSK	3	3	13.92	13.89	13.88		
1.4	QPSK	6	0	14.02	13.97	13.94	15.5	0
1.4	16QAM	1	0	13.99	13.98	13.95	15.5	0
1.4	16QAM	1	3	13.87	13.82	13.98		
1.4	16QAM	1	5	13.97	14.05	13.89		
1.4	16QAM	3	0	13.93	13.85	13.98		
1.4	16QAM	3	1	13.90	13.95	13.96		
1.4	16QAM	3	3	13.88	13.93	13.88		
1.4	16QAM	6	0	13.97	13.87	13.83		



<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	17	0
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	15.82	15.90	15.84		
10	QPSK	1	25	15.37	15.44	15.47	17	0
10	QPSK	1	49	15.41	15.39	15.46		
10	QPSK	25	0	15.42	15.46	15.45		
10	QPSK	25	12	15.43	15.43	15.39	17	0
10	QPSK	25	25	15.38	15.39	15.43		
10	QPSK	50	0	15.37	15.43	15.39		
10	16QAM	1	0	15.42	15.38	15.43	17	0
10	16QAM	1	25	15.39	15.44	15.47		
10	16QAM	1	49	15.40	15.40	15.38		
10	16QAM	25	0	15.45	15.44	15.43	17	0
10	16QAM	25	12	15.37	15.45	15.46		
10	16QAM	25	25	15.38	15.47	15.43		
10	16QAM	50	0	15.40	15.39	15.39		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5	17	0
5	QPSK	1	0	15.64	15.84	15.71		
5	QPSK	1	12	15.19	15.25	15.41		
5	QPSK	1	24	15.25	15.19	15.39	17	0
5	QPSK	12	0	15.24	15.25	15.28		
5	QPSK	12	7	15.44	15.36	15.23		
5	QPSK	12	13	15.20	15.20	15.31	17	0
5	QPSK	25	0	15.22	15.29	15.26		
5	16QAM	1	0	15.39	15.28	15.39		
5	16QAM	1	12	15.33	15.30	15.36	17	0
5	16QAM	1	24	15.27	15.36	15.29		
5	16QAM	12	0	15.38	15.29	15.34		
5	16QAM	12	7	15.36	15.26	15.26	17	0
5	16QAM	12	13	15.19	15.37	15.41		
5	16QAM	25	0	15.40	15.30	15.31		
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5	17	0
3	QPSK	1	0	15.77	15.85	15.79		
3	QPSK	1	8	15.18	15.28	15.36		
3	QPSK	1	14	15.26	15.24	15.43	17	0
3	QPSK	8	0	15.40	15.33	15.31		
3	QPSK	8	4	15.31	15.29	15.23		
3	QPSK	8	7	15.28	15.29	15.39	17	0
3	QPSK	15	0	15.20	15.28	15.31		
3	16QAM	1	0	15.27	15.22	15.33		
3	16QAM	1	8	15.37	15.43	15.33	17	0
3	16QAM	1	14	15.31	15.37	15.27		
3	16QAM	8	0	15.37	15.44	15.25		
3	16QAM	8	4	15.32	15.33	15.39	17	0
3	16QAM	8	7	15.26	15.38	15.42		
3	16QAM	15	0	15.32	15.27	15.26		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3	17	0
1.4	QPSK	1	0	15.73	15.73	15.83		
1.4	QPSK	1	3	15.28	15.37	15.28		
1.4	QPSK	1	5	15.39	15.35	15.39		



1.4	QPSK	3	0	15.32	15.26	15.31		
1.4	QPSK	3	1	15.35	15.42	15.33		
1.4	QPSK	3	3	15.36	15.25	15.28		
1.4	QPSK	6	0	15.18	15.29	15.38	17	0
1.4	16QAM	1	0	15.38	15.34	15.39		
1.4	16QAM	1	3	15.24	15.28	15.40		
1.4	16QAM	1	5	15.31	15.28	15.38		
1.4	16QAM	3	0	15.41	15.33	15.24	17	0
1.4	16QAM	3	1	15.29	15.39	15.39		
1.4	16QAM	3	3	15.32	15.43	15.38		
1.4	16QAM	6	0	15.32	15.33	15.23	17	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	13.26	13.23	13.32	14.5	0
20	QPSK	1	49	13.16	13.19	13.14		
20	QPSK	1	99	13.21	13.16	13.12		
20	QPSK	50	0	13.16	13.21	13.22	14.5	0
20	QPSK	50	24	13.11	13.13	13.14		
20	QPSK	50	50	13.21	13.19	13.15		
20	QPSK	100	0	13.20	13.14	13.21		
20	16QAM	1	0	13.14	13.12	13.14	14.5	0
20	16QAM	1	49	13.17	13.12	13.21		
20	16QAM	1	99	13.19	13.18	13.20		
20	16QAM	50	0	13.12	13.15	13.21	14.5	0
20	16QAM	50	24	13.17	13.20	13.17		
20	16QAM	50	50	13.21	13.13	13.19		
20	16QAM	100	0	13.19	13.11	13.20		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	13.09	13.19	13.13	14.5	0
15	QPSK	1	37	13.00	13.04	13.12		
15	QPSK	1	74	13.01	12.97	12.96		
15	QPSK	36	0	12.97	13.04	13.02	14.5	0
15	QPSK	36	20	12.93	12.95	13.00		
15	QPSK	36	39	13.08	13.09	13.14		
15	QPSK	75	0	13.11	13.11	13.02		
15	16QAM	1	0	13.03	13.07	12.98	14.5	0
15	16QAM	1	37	13.09	13.04	13.02		
15	16QAM	1	74	13.01	13.10	13.10		
15	16QAM	36	0	12.98	13.13	13.07	14.5	0
15	16QAM	36	20	13.02	13.10	13.12		
15	16QAM	36	39	13.08	12.97	13.15		
15	16QAM	75	0	12.99	13.01	13.12		
Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	13.22	13.10	13.21	14.5	0
10	QPSK	1	25	13.02	13.08	13.05		
10	QPSK	1	49	13.01	13.07	12.95		
10	QPSK	25	0	13.01	13.14	13.10	14.5	0
10	QPSK	25	12	13.07	13.12	13.09		
10	QPSK	25	25	13.12	13.17	13.09		



10	QPSK	50	0	13.10	12.97	13.18		
10	16QAM	1	0	13.08	12.94	13.02	14.5	0
10	16QAM	1	25	13.09	13.02	13.07		
10	16QAM	1	49	13.18	12.99	13.20		
10	16QAM	25	0	12.97	12.95	13.04	14.5	0
10	16QAM	25	12	13.16	13.02	13.05		
10	16QAM	25	25	13.01	12.94	13.13		
10	16QAM	50	0	13.06	13.08	13.18		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	13.10	13.03	13.24	14.5	0
5	QPSK	1	12	12.99	13.04	13.04		
5	QPSK	1	24	13.15	13.08	12.94		
5	QPSK	12	0	13.07	13.09	13.07	14.5	0
5	QPSK	12	7	12.96	12.98	12.94		
5	QPSK	12	13	13.15	13.12	13.09		
5	QPSK	25	0	13.10	13.11	13.08		
5	16QAM	1	0	13.05	13.00	13.00	14.5	0
5	16QAM	1	12	13.06	12.94	13.21		
5	16QAM	1	24	13.05	13.12	13.05		
5	16QAM	12	0	12.98	12.99	13.17	14.5	0
5	16QAM	12	7	13.07	13.03	13.03		
5	16QAM	12	13	13.12	13.03	13.09		
5	16QAM	25	0	13.14	12.92	13.06		

<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	17.27	17.38	17.30	18.5	0
10	QPSK	1	25	16.83	16.76	16.81		
10	QPSK	1	49	16.81	16.80	16.81		
10	QPSK	25	0	16.79	16.84	16.79	18.5	0
10	QPSK	25	12	16.78	16.77	16.83		
10	QPSK	25	25	16.76	16.83	16.82		
10	QPSK	50	0	16.75	16.85	16.76		
10	16QAM	1	0	16.83	16.79	16.85	18.5	0
10	16QAM	1	25	16.85	16.79	16.83		
10	16QAM	1	49	16.85	16.83	16.80		
10	16QAM	25	0	16.76	16.78	16.78	18.5	0
10	16QAM	25	12	16.81	16.84	16.79		
10	16QAM	25	25	16.83	16.84	16.84		
10	16QAM	50	0	16.84	16.85	16.84		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	17.24	17.23	17.10	18.5	0
5	QPSK	1	12	16.72	16.76	16.72		
5	QPSK	1	24	16.62	16.65	16.62		
5	QPSK	12	0	16.76	16.77	16.75	18.5	0
5	QPSK	12	7	16.61	16.74	16.81		
5	QPSK	12	13	16.80	16.82	16.81		
5	QPSK	25	0	16.63	16.78	16.63		
5	16QAM	1	0	16.72	16.68	16.74	18.5	0
5	16QAM	1	12	16.84	16.59	16.75		



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5	16QAM	1	24	16.81	16.72	16.64	18.5	0
5	16QAM	12	0	16.57	16.58	16.66		
5	16QAM	12	7	16.66	16.74	16.75		
5	16QAM	12	13	16.70	16.70	16.68		
5	16QAM	25	0	16.66	16.77	16.78		
Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	17.09	17.30	17.11	18.5	0
3	QPSK	1	8	16.73	16.65	16.70		
3	QPSK	1	14	16.74	16.66	16.62		
3	QPSK	8	0	16.68	16.72	16.70	18.5	0
3	QPSK	8	4	16.77	16.63	16.79		
3	QPSK	8	7	16.84	16.64	16.67		
3	QPSK	15	0	16.57	16.70	16.75		
3	16QAM	1	0	16.83	16.64	16.65	18.5	0
3	16QAM	1	8	16.72	16.66	16.68		
3	16QAM	1	14	16.77	16.78	16.69		
3	16QAM	8	0	16.69	16.74	16.60	18.5	0
3	16QAM	8	4	16.79	16.64	16.70		
3	16QAM	8	7	16.68	16.67	16.77		
3	16QAM	15	0	16.84	16.71	16.66		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	17.17	17.22	17.30	18.5	0
1.4	QPSK	1	3	16.80	16.71	16.80		
1.4	QPSK	1	5	16.77	16.76	16.71		
1.4	QPSK	3	0	16.65	16.73	16.72		
1.4	QPSK	3	1	16.73	16.63	16.80		
1.4	QPSK	3	3	16.83	16.66	16.64		
1.4	QPSK	6	0	16.67	16.73	16.66	18.5	0
1.4	16QAM	1	0	16.63	16.68	16.74	18.5	0
1.4	16QAM	1	3	16.72	16.64	16.81		
1.4	16QAM	1	5	16.82	16.76	16.64		
1.4	16QAM	3	0	16.71	16.67	16.63		
1.4	16QAM	3	1	16.65	16.73	16.61		
1.4	16QAM	3	3	16.77	16.71	16.70		
1.4	16QAM	6	0	16.76	16.79	16.76		
1.4	16QAM	6	0	16.76	16.79	16.76	18.5	0



<LTE Band 13>

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				23230			18.5	0
Frequency (MHz)				782				
10	QPSK	1	0	17.56			18.5	0
10	QPSK	1	25	17.50				
10	QPSK	1	49	17.38				
10	QPSK	25	0	17.51			18.5	0
10	QPSK	25	12	17.35				
10	QPSK	25	25	17.33				
10	QPSK	50	0	17.27			18.5	0
10	16QAM	1	0	17.44				
10	16QAM	1	25	17.32				
10	16QAM	1	49	17.28			18.5	0
10	16QAM	25	0	17.40				
10	16QAM	25	12	17.23				
10	16QAM	25	25	17.15			18.5	0
10	16QAM	50	0	17.11				
Channel				23205	23230	23255	18.5	0
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	17.50	17.36	17.39	18.5	0
5	QPSK	1	12	17.49	17.42	17.35		
5	QPSK	1	24	17.20	17.30	17.30		
5	QPSK	12	0	17.31	17.33	17.43	18.5	0
5	QPSK	12	7	17.27	17.25	17.21		
5	QPSK	12	13	17.19	17.27	17.14		
5	QPSK	25	0	17.18	17.23	17.17	18.5	0
5	16QAM	1	0	17.39	17.30	17.32		
5	16QAM	1	12	17.26	17.28	17.25		
5	16QAM	1	24	17.23	17.22	17.23	18.5	0
5	16QAM	12	0	17.37	17.37	17.38		
5	16QAM	12	7	17.23	17.08	17.11		
5	16QAM	12	13	17.05	17.08	17.13	18.5	0
5	16QAM	25	0	16.93	17.02	16.95		



<LTE Band 26>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				26765	26865	26965	18.5	0
Frequency (MHz)				821.5	831.5	841.5		
15	QPSK	1	0	17.13	17.18	17.24		
15	QPSK	1	37	16.77	16.79	16.86	18.5	0
15	QPSK	1	74	16.87	16.80	16.79		
15	QPSK	36	0	16.86	16.88	16.85		
15	QPSK	36	20	16.84	16.87	16.81	18.5	0
15	QPSK	36	39	16.78	16.84	16.84		
15	QPSK	75	0	16.81	16.87	16.78		
15	16QAM	1	0	16.87	16.82	16.80	18.5	0
15	16QAM	1	37	16.77	16.77	16.82		
15	16QAM	1	74	16.77	16.84	16.87		
15	16QAM	36	0	16.84	16.85	16.79	18.5	0
15	16QAM	36	20	16.85	16.78	16.82		
15	16QAM	36	39	16.77	16.87	16.79		
15	16QAM	75	0	16.77	16.83	16.79		
Channel				26740	26865	26990	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				819	831.5	844	18.5	0
10	QPSK	1	0	17.09	17.13	17.14		
10	QPSK	1	25	16.57	16.69	16.76		
10	QPSK	1	49	16.83	16.80	16.76	18.5	0
10	QPSK	25	0	16.85	16.78	16.82		
10	QPSK	25	12	16.81	16.86	16.78		
10	QPSK	25	25	16.69	16.64	16.82	18.5	0
10	QPSK	50	0	16.63	16.77	16.59		
10	16QAM	1	0	16.68	16.78	16.76		
10	16QAM	1	25	16.61	16.73	16.64	18.5	0
10	16QAM	1	49	16.72	16.84	16.85		
10	16QAM	25	0	16.66	16.84	16.76		
10	16QAM	25	12	16.71	16.67	16.64	18.5	0
10	16QAM	25	25	16.61	16.77	16.77		
10	16QAM	50	0	16.59	16.63	16.67		
Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5	18.5	0
5	QPSK	1	0	16.95	17.14	17.21		
5	QPSK	1	12	16.62	16.64	16.86		
5	QPSK	1	24	16.75	16.75	16.70	18.5	0
5	QPSK	12	0	16.68	16.69	16.70		
5	QPSK	12	7	16.67	16.79	16.81		
5	QPSK	12	13	16.59	16.74	16.82	18.5	0
5	QPSK	25	0	16.71	16.73	16.67		
5	16QAM	1	0	16.79	16.78	16.73		
5	16QAM	1	12	16.72	16.75	16.73	18.5	0
5	16QAM	1	24	16.73	16.70	16.78		
5	16QAM	12	0	16.65	16.76	16.69		
5	16QAM	12	7	16.77	16.68	16.67	18.5	0
5	16QAM	12	13	16.72	16.68	16.68		
5	16QAM	25	0	16.59	16.66	16.74		
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5	18.5	0
3	QPSK	1	0	17.02	17.15	17.05		
3	QPSK	1	8	16.74	16.60	16.85		
3	QPSK	1	14	16.84	16.62	16.73		



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3	QPSK	8	0	16.77	16.68	16.76	18.5	0
3	QPSK	8	4	16.72	16.73	16.69		
3	QPSK	8	7	16.61	16.66	16.69		
3	QPSK	15	0	16.65	16.85	16.72	18.5	0
3	16QAM	1	0	16.70	16.72	16.61		
3	16QAM	1	8	16.60	16.76	16.76		
3	16QAM	1	14	16.68	16.76	16.80	18.5	0
3	16QAM	8	0	16.64	16.66	16.79		
3	16QAM	8	4	16.67	16.78	16.68		
3	16QAM	8	7	16.63	16.78	16.76		
3	16QAM	15	0	16.73	16.81	16.74	Tune-up limit (dBm)	MPR (dB)
Channel				26697	26865	27033		
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	17.07	17.16	17.18	18.5	0
1.4	QPSK	1	3	16.66	16.62	16.73		
1.4	QPSK	1	5	16.70	16.71	16.63		
1.4	QPSK	3	0	16.70	16.82	16.80		
1.4	QPSK	3	1	16.82	16.85	16.61		
1.4	QPSK	3	3	16.71	16.76	16.76	18.5	0
1.4	QPSK	6	0	16.77	16.84	16.63		
1.4	16QAM	1	0	16.70	16.62	16.62	18.5	0
1.4	16QAM	1	3	16.70	16.70	16.80		
1.4	16QAM	1	5	16.63	16.83	16.76		
1.4	16QAM	3	0	16.75	16.74	16.78		
1.4	16QAM	3	1	16.84	16.66	16.70		
1.4	16QAM	3	3	16.65	16.81	16.78		
1.4	16QAM	6	0	16.72	16.79	16.63	18.5	0



<LTE Band 30>

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				27710				
Frequency (MHz)				2310				
10	QPSK	1	0	15.94			17	0
10	QPSK	1	25	15.88				
10	QPSK	1	49	15.85				
10	QPSK	25	0	15.84			17	0
10	QPSK	25	12	15.78				
10	QPSK	25	25	15.76				
10	QPSK	50	0	15.70			17	0
10	16QAM	1	0	15.77				
10	16QAM	1	25	15.71				
10	16QAM	1	49	15.65			17	0
10	16QAM	25	0	15.70				
10	16QAM	25	12	15.63				
10	16QAM	25	25	15.58			17	0
10	16QAM	50	0	15.56				
Channel				27685	27710	27735		
Frequency (MHz)				2307.5	2310	2312.5		
5	QPSK	1	0	15.90	15.88	15.77	17	0
5	QPSK	1	12	15.87	15.88	15.74		
5	QPSK	1	24	15.72	15.66	15.65		
5	QPSK	12	0	15.78	15.80	15.71	17	0
5	QPSK	12	7	15.68	15.65	15.69		
5	QPSK	12	13	15.67	15.76	15.63		
5	QPSK	25	0	15.69	15.65	15.69	17	0
5	16QAM	1	0	15.71	15.67	15.75		
5	16QAM	1	12	15.69	15.58	15.60		
5	16QAM	1	24	15.59	15.55	15.52	17	0
5	16QAM	12	0	15.53	15.60	15.54		
5	16QAM	12	7	15.54	15.52	15.54		
5	16QAM	12	13	15.51	15.39	15.40	17	0
5	16QAM	12	13	15.51	15.39	15.40		
5	16QAM	25	0	15.41	15.38	15.37		

<LTE Band 66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	14.27	14.34	14.37	15.5	0
20	QPSK	1	49	14.21	14.26	14.23		
20	QPSK	1	99	14.27	14.24	14.18		
20	QPSK	50	0	14.26	14.21	14.27	15.5	0
20	QPSK	50	24	14.20	14.17	14.19		
20	QPSK	50	50	14.22	14.24	14.20		
20	QPSK	100	0	14.21	14.19	14.23	15.5	0
20	16QAM	1	0	14.17	14.18	14.19		
20	16QAM	1	49	14.25	14.17	14.24		
20	16QAM	1	99	14.23	14.27	14.21	15.5	0
20	16QAM	50	0	14.19	14.22	14.22		
20	16QAM	50	24	14.23	14.18	14.19		
20	16QAM	50	50	14.26	14.19	14.21	15.5	0
20	16QAM	50	50	14.26	14.19	14.21		
20	16QAM	100	0	14.20	14.27	14.27		



Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	14.13	14.21	14.31	15.5	0
15	QPSK	1	37	14.06	14.13	14.14		
15	QPSK	1	74	14.27	14.14	14.04		
15	QPSK	36	0	14.07	14.11	14.14	15.5	0
15	QPSK	36	20	14.18	14.16	13.99		
15	QPSK	36	39	14.21	14.15	14.14		
15	QPSK	75	0	14.08	14.15	14.07		
15	16QAM	1	0	14.16	14.04	14.04	15.5	0
15	16QAM	1	37	14.21	13.99	14.07		
15	16QAM	1	74	14.18	14.14	14.15		
15	16QAM	36	0	14.02	14.14	14.20	15.5	0
15	16QAM	36	20	14.05	14.11	14.17		
15	16QAM	36	39	14.15	14.19	14.07		
15	16QAM	75	0	14.06	14.16	14.24		
Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	14.18	14.22	14.49	15.5	0
10	QPSK	1	25	14.04	14.06	14.09		
10	QPSK	1	49	14.16	14.08	14.07		
10	QPSK	25	0	14.10	14.14	14.27	15.5	0
10	QPSK	25	12	14.15	14.07	14.07		
10	QPSK	25	25	14.07	14.10	14.00		
10	QPSK	50	0	14.13	14.15	14.08		
10	16QAM	1	0	14.02	14.00	14.02	15.5	0
10	16QAM	1	25	14.22	14.09	14.14		
10	16QAM	1	49	14.09	14.13	14.21		
10	16QAM	25	0	14.10	14.02	14.18	15.5	0
10	16QAM	25	12	14.12	14.05	14.05		
10	16QAM	25	25	14.23	14.05	14.13		
10	16QAM	50	0	14.20	14.15	14.16		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	14.19	14.25	14.36	15.5	0
5	QPSK	1	12	14.08	14.13	14.08		
5	QPSK	1	24	14.11	14.09	13.98		
5	QPSK	12	0	14.24	14.01	14.25	15.5	0
5	QPSK	12	7	14.18	14.09	14.08		
5	QPSK	12	13	14.20	14.19	14.18		
5	QPSK	25	0	14.03	14.12	14.11		
5	16QAM	1	0	14.09	14.10	13.99	15.5	0
5	16QAM	1	12	14.25	13.99	14.07		
5	16QAM	1	24	14.21	14.12	14.16		
5	16QAM	12	0	14.09	14.12	14.14	15.5	0
5	16QAM	12	7	14.22	14.13	14.18		
5	16QAM	12	13	14.26	14.01	14.04		
5	16QAM	25	0	14.07	14.23	14.24		
Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	14.22	14.19	14.34	15.5	0
3	QPSK	1	8	14.08	14.14	14.11		
3	QPSK	1	14	14.24	14.23	14.09		
3	QPSK	8	0	14.17	14.05	14.22	15.5	0
3	QPSK	8	4	14.14	14.02	13.99		
3	QPSK	8	7	14.07	14.10	14.05		



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3	QPSK	15	0	14.19	14.09	14.20		
3	16QAM	1	0	14.16	14.08	14.01	15.5	0
3	16QAM	1	8	14.05	13.99	14.18		
3	16QAM	1	14	14.11	14.15	14.11		
3	16QAM	8	0	13.99	14.19	14.22	15.5	0
3	16QAM	8	4	14.03	14.09	14.05		
3	16QAM	8	7	14.23	14.16	14.06		
3	16QAM	15	0	14.05	14.18	14.15		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	14.21	14.29	14.38	15.5	0
1.4	QPSK	1	3	14.12	14.13	14.11		
1.4	QPSK	1	5	14.14	14.11	14.07		
1.4	QPSK	3	0	14.15	14.12	14.23		
1.4	QPSK	3	1	14.12	14.14	14.09		
1.4	QPSK	3	3	14.14	14.04	14.04		
1.4	QPSK	6	0	14.13	14.07	14.13	15.5	0
1.4	16QAM	1	0	14.09	14.15	14.05	15.5	0
1.4	16QAM	1	3	14.14	14.11	14.18		
1.4	16QAM	1	5	14.03	14.18	14.11		
1.4	16QAM	3	0	14.11	14.15	14.16		
1.4	16QAM	3	1	14.17	14.03	14.13		
1.4	16QAM	3	3	14.21	14.10	14.15		
1.4	16QAM	6	0	14.08	14.21	14.25	15.5	0

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

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

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

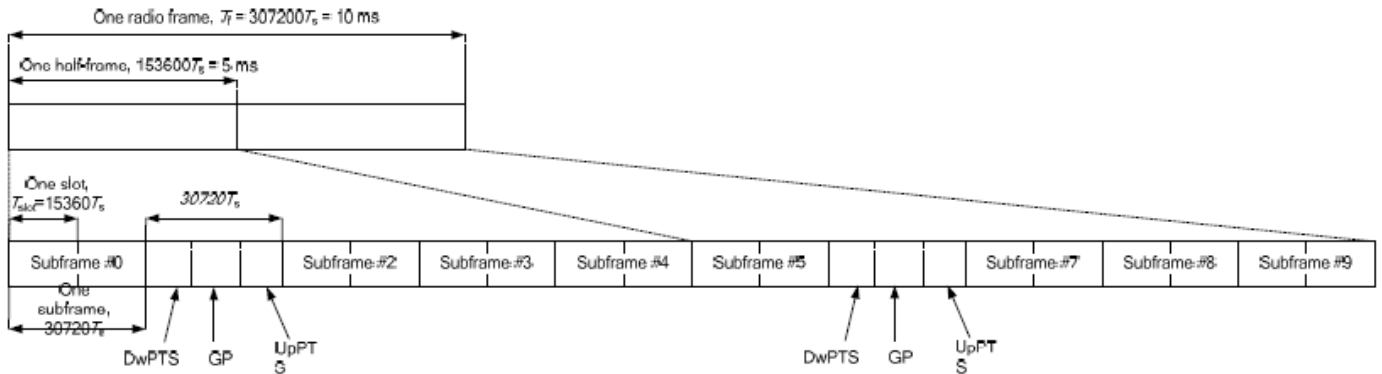


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

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

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

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

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

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

The highest duty factor is resulted from:

- i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subframes, uplink operation is in 3 uplink subframes and 1 special subframe.
- ii. special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink
- iii. for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(3+0.167)/5 = 63.3\%$
- iv. for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(3+0.143)/5 = 62.9\%$
- v. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix $63.3\%/62.9\% = 1.006$ is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.

Default Power Mode
<LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				39750	40185	40620	41055	41490		
Frequency (MHz)				2506	2549.5	2593	2636.5	2680		
20	QPSK	1	0	22.59	22.82	23.04	22.99	22.69	24	0
20	QPSK	1	49	22.34	22.78	22.83	22.80	22.57		
20	QPSK	1	99	22.24	22.72	22.81	22.71	22.63		
20	QPSK	50	0	21.49	21.69	21.73	21.71	21.56	23	1
20	QPSK	50	24	21.32	21.79	21.80	21.79	21.54		
20	QPSK	50	50	21.31	21.80	21.84	21.72	21.63		
20	QPSK	100	0	21.47	21.80	21.78	21.77	21.64	23	1
20	16QAM	1	0	22.03	22.22	22.19	22.45	22.19		
20	16QAM	1	49	21.78	22.33	22.22	22.28	22.05		
20	16QAM	1	99	21.72	22.33	22.41	22.18	22.08	22	2
20	16QAM	50	0	20.61	20.81	20.74	20.94	20.67		
20	16QAM	50	24	20.49	20.92	20.82	20.84	20.63		
20	16QAM	50	50	20.46	20.95	20.90	20.81	20.63	22	2
20	16QAM	50	50	20.46	20.95	20.90	20.81	20.63		
20	16QAM	100	0	20.56	20.92	20.88	20.81	20.68		
Channel				39725	40173	40620	41068	41515	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5		
15	QPSK	1	0	22.40	22.75	22.71	22.82	22.66	24.00	0
15	QPSK	1	37	22.25	22.60	22.67	22.70	22.57		
15	QPSK	1	74	22.17	22.54	22.96	22.59	22.52		
15	QPSK	36	0	21.42	21.54	21.67	21.73	21.48	23	1
15	QPSK	36	20	21.29	21.64	21.80	21.71	21.45		
15	QPSK	36	39	21.25	21.72	21.82	21.62	21.59		
15	QPSK	75	0	21.32	21.72	21.58	21.73	21.48	23	1
15	16QAM	1	0	21.98	22.22	22.06	22.45	22.05		
15	16QAM	1	37	21.66	22.31	22.03	22.25	22.02		
15	16QAM	1	74	21.59	22.21	22.39	22.03	22.01	22	2
15	16QAM	36	0	20.60	20.72	20.58	20.85	20.56		
15	16QAM	36	20	20.48	20.82	20.64	20.66	20.57		
15	16QAM	36	39	20.41	20.75	20.85	20.67	20.59	22	2
15	16QAM	36	39	20.41	20.75	20.85	20.67	20.59		
15	16QAM	75	0	20.47	20.72	20.71	20.63	20.56		
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2501	2547	2593	2639	2685		
10	QPSK	1	0	22.41	22.73	22.84	22.90	22.66	24.00	0
10	QPSK	1	25	22.27	22.76	22.81	22.71	22.50		
10	QPSK	1	49	22.18	22.61	22.80	22.54	22.62		
10	QPSK	25	0	21.37	21.56	21.58	21.82	21.36	23	1
10	QPSK	25	12	21.27	21.71	21.78	21.79	21.42		
10	QPSK	25	25	21.14	21.60	21.76	21.71	21.56		
10	QPSK	50	0	21.38	21.62	21.60	21.62	21.47	23	1
10	16QAM	1	0	21.88	22.21	22.18	22.25	22.07		
10	16QAM	1	25	21.75	22.28	22.05	22.18	22.02		
10	16QAM	1	49	21.57	22.27	22.22	22.09	21.92	22	2
10	16QAM	25	0	20.56	20.63	20.68	20.79	20.47		
10	16QAM	25	12	20.34	20.87	20.68	20.70	20.57		
10	16QAM	25	25	20.43	20.87	20.80	20.64	20.47	22	2
10	16QAM	25	25	20.43	20.87	20.80	20.64	20.47		
10	16QAM	50	0	20.44	20.77	20.73	20.63	20.59		
Channel				39675	40148	40620	41093	41565	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2498.5	2545.8	2593	2640.30	2687.5		
5	QPSK	1	0	22.43	22.74	23.00	22.89	22.60	24.00	0



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5	QPSK	1	12	22.28	22.75	22.79	22.77	22.56	23	1
5	QPSK	1	24	22.18	22.71	22.73	22.59	22.54		
5	QPSK	12	0	21.37	21.49	21.57	21.84	21.48		
5	QPSK	12	7	21.17	21.75	21.80	21.78	21.48		
5	QPSK	12	13	21.27	21.75	21.64	21.61	21.50		
5	QPSK	25	0	21.33	21.69	21.64	21.66	21.50	23	1
5	16QAM	1	0	22.02	22.11	22.05	22.31	22.00		
5	16QAM	1	12	21.62	22.27	22.06	22.17	21.93		
5	16QAM	1	24	21.61	22.14	22.30	22.08	22.05	22	2
5	16QAM	12	0	20.41	20.74	20.65	20.87	20.59		
5	16QAM	12	7	20.31	20.82	20.63	20.72	20.54		
5	16QAM	12	13	20.26	20.77	20.73	20.65	20.48		
5	16QAM	25	0	20.49	20.74	20.79	20.77	20.63		



Reduced Power Mode

<LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				39750	40185	40620	41055	41490		
Frequency (MHz)				2506	2549.5	2593	2636.5	2680		
20	QPSK	1	0	14.92	14.80	14.48	14.78	14.82	16	0
20	QPSK	1	49	14.73	14.80	14.36	14.51	14.60		
20	QPSK	1	99	14.75	14.74	14.32	14.61	14.61		
20	QPSK	50	0	14.81	14.74	14.38	14.55	14.58	16	0
20	QPSK	50	24	14.78	14.76	14.41	14.61	14.57		
20	QPSK	50	50	14.76	14.73	14.39	14.57	14.60		
20	QPSK	100	0	14.71	14.80	14.37	14.53	14.54	16	0
20	16QAM	1	0	14.73	14.75	14.33	14.56	14.56		
20	16QAM	1	49	14.81	14.75	14.39	14.56	14.53		
20	16QAM	1	99	14.77	14.75	14.41	14.61	14.58	16	0
20	16QAM	50	0	14.74	14.75	14.31	14.53	14.57		
20	16QAM	50	24	14.81	14.74	14.33	14.53	14.52		
20	16QAM	50	50	14.72	14.79	14.38	14.58	14.61	16	0
20	16QAM	100	0	14.78	14.81	14.41	14.60	14.54		
Channel				39725	40173	40620	41068	41515		
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5		
15	QPSK	1	0	14.81	14.66	14.41	14.74	14.66	16	0
15	QPSK	1	37	14.56	14.60	14.25	14.35	14.51		
15	QPSK	1	74	14.70	14.54	14.15	14.54	14.51		
15	QPSK	36	0	14.66	14.66	14.25	14.40	14.55	16	0
15	QPSK	36	20	14.64	14.79	14.26	14.46	14.52		
15	QPSK	36	39	14.76	14.66	14.33	14.43	14.54		
15	QPSK	75	0	14.52	14.65	14.32	14.46	14.44	16	0
15	16QAM	1	0	14.72	14.69	14.25	14.46	14.52		
15	16QAM	1	37	14.64	14.70	14.29	14.51	14.49		
15	16QAM	1	74	14.63	14.56	14.24	14.51	14.38	16	0
15	16QAM	36	0	14.66	14.65	14.17	14.50	14.38		
15	16QAM	36	20	14.65	14.62	14.28	14.39	14.43		
15	16QAM	36	39	14.72	14.69	14.27	14.58	14.50	16	0
15	16QAM	75	0	14.67	14.64	14.41	14.53	14.45		
Channel				39700	40160	40620	41080	41540		
Frequency (MHz)				2501	2547	2593	2639	2685		
10	QPSK	1	0	14.91	14.69	14.34	14.72	14.71	16	0
10	QPSK	1	25	14.56	14.70	14.28	14.32	14.57		
10	QPSK	1	49	14.55	14.74	14.16	14.48	14.47		
10	QPSK	25	0	14.65	14.63	14.25	14.40	14.57	16	0
10	QPSK	25	12	14.70	14.75	14.30	14.51	14.46		
10	QPSK	25	25	14.63	14.65	14.39	14.44	14.46		
10	QPSK	50	0	14.61	14.76	14.25	14.42	14.50	16	0
10	16QAM	1	0	14.58	14.55	14.13	14.36	14.53		
10	16QAM	1	25	14.67	14.63	14.29	14.42	14.47		
10	16QAM	1	49	14.68	14.68	14.37	14.41	14.42	16	0
10	16QAM	25	0	14.61	14.62	14.25	14.50	14.44		
10	16QAM	25	12	14.78	14.74	14.16	14.34	14.42		
10	16QAM	25	25	14.72	14.68	14.38	14.43	14.55	16	0
10	16QAM	50	0	14.76	14.80	14.25	14.41	14.45		
Channel				39675	40148	40620	41093	41565		
Frequency (MHz)				2498.5	2545.8	2593	2640.30	2687.5		
5	QPSK	1	0	14.78	14.61	14.31	14.74	14.72	16	0
5	QPSK	1	12	14.70	14.72	14.24	14.44	14.59		



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5	QPSK	1	24	14.71	14.73	14.32	14.48	14.48		
5	QPSK	12	0	14.78	14.72	14.32	14.43	14.38	16	0
5	QPSK	12	7	14.74	14.78	14.24	14.41	14.52		
5	QPSK	12	13	14.73	14.71	14.27	14.47	14.43		
5	QPSK	25	0	14.65	14.71	14.30	14.47	14.45		
5	16QAM	1	0	14.70	14.68	14.19	14.45	14.36	16	0
5	16QAM	1	12	14.79	14.73	14.19	14.48	14.35		
5	16QAM	1	24	14.61	14.61	14.30	14.43	14.54		
5	16QAM	12	0	14.74	14.61	14.13	14.37	14.51	16	0
5	16QAM	12	7	14.70	14.66	14.16	14.35	14.48		
5	16QAM	12	13	14.58	14.71	14.29	14.57	14.56		
5	16QAM	25	0	14.71	14.68	14.26	14.40	14.34		



12. Test exclusion Table

General Note:

- The below table, exemption limits for routine evaluation based on frequency and separation distance was according to SAR-based Exemption – §1.1307(b)(3)(i)(B).

Exposure Position	Wireless Interface	WCDM A Band V	WCDM A Band IV	WCDM A Band II	LTE Band 12	LTE Band 13	LTE Band 5	LTE Band 26	LTE Band 4	LTE Band 66	LTE Band 2	LTE Band 30	LTE Band 7	LTE Band 41
	Calculated Frequency (MHz)	846	1750	1907	715	784	848	848	1754	1779	1909	2312	2567	2687
	Maximum power (dBm)	24.50	24.5	24.5	24	24	24	24	24	24	24	24	24	24
	Maximum rated power(mW)	282.0	282.0	282.0	251.0	251.0	251.0	251.0	251.0	251.0	251.0	251.0	251.0	251.0
Bottom Face	Separation distance(mm)	5.0												
	exclusion threshold	9.1	3.6	3.4	11.5	10.1	9.0	9.0	3.6	3.5	3.4	2.9	2.6	2.5
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edge 1	Separation distance(mm)	6.9												
	exclusion threshold	14.4	6.5	6.1	17.5	15.7	14.3	14.3	6.5	6.4	6.1	5.3	4.9	4.7
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edge 2	Separation distance(mm)	20.3												
	exclusion threshold	66.6	46.6	44.7	72.4	69.2	66.6	66.6	46.6	46.2	44.6	40.6	38.5	37.7
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edge 3	Separation distance(mm)	183.1												
	exclusion threshold	1522.2	2603.7	2599.4	1299.0	1416.8	1525.5	1525.5	2603.6	2602.9	2599.4	2589.8	2584.6	2582.4
	Testing required?	No	No	No	No	No	No	No	No	No	No	No	No	No
Edge 4	Separation distance(mm)	197.5												
	exclusion threshold	1695.2	2990.4	2989.7	1434.7	1572.0	1699.2	1699.2	2990.4	2990.3	2989.7	2988.1	2987.3	2986.9
	Testing required?	No	No	No	No	No	No	No	No	No	No	No	No	No
Bottom of Laptop	Separation distance(mm)	5.0												
	exclusion threshold	9.1	3.6	3.4	11.5	10.1	9.0	9.0	3.6	3.5	3.4	2.9	2.6	2.5
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes



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 TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥ 0.8 W/kg.
4. For the exposure positions that proximity sensor power reduction is applied for SAR compliance, additional SAR testing with EUT transmitting full power in normal mode was performed; 16mm for Bottom of Laptop, 16mm for bottom face, 16cm for edge1 and 9mm for edge2.

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 is $\leq 1/4$ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than $1/4$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA.

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 $1/2$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is $>$ not $1/2$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B5/B12/B26 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE band 4/5 SAR test was covered by Band 66/26; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. The maximum output power, including tolerance, for the smaller band is \leq the larger band to qualify for the SAR test exclusion.
 - b. The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.



13.1 Body SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna Vendor	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	16mm	South Star	OFF	9538	1907.6	24.00	24.50	1.122	-0.06	0.371	0.417
	WCDMA II	RMC 12.2Kbps	Bottom Face	16mm	South Star	OFF	9538	1907.6	24.00	24.50	1.122	0.01	0.549	0.616
	WCDMA II	RMC 12.2Kbps	Edge 1	16mm	South Star	OFF	9538	1907.6	24.00	24.50	1.122	0.09	0.389	0.437
	WCDMA II	RMC 12.2Kbps	Edge 2	9mm	South Star	OFF	9538	1907.6	24.00	24.50	1.122	-0.08	0.023	0.026
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	South Star	ON	9262	1852.4	15.77	17.00	1.327	-0.04	0.854	1.134
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	South Star	ON	9400	1880	15.72	17.00	1.343	0.08	0.751	1.008
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	South Star	ON	9538	1907.6	15.41	17.00	1.442	0.17	0.622	0.897
	WCDMA II	RMC 12.2Kbps	Bottom Face	0mm	South Star	ON	9262	1852.4	15.77	17.00	1.327	-0.09	0.589	0.782
	WCDMA II	RMC 12.2Kbps	Edge 1	0mm	South Star	ON	9262	1852.4	15.77	17.00	1.327	0.02	0.041	0.054
	WCDMA II	RMC 12.2Kbps	Edge 2	0mm	South Star	ON	9262	1852.4	15.77	17.00	1.327	-0.03	0.001	0.001
01	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Pulse	ON	9262	1852.4	15.77	17.00	1.327	-0.01	0.892	1.184
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Pulse	ON	9400	1880	15.72	17.00	1.343	-0.18	0.848	1.139
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Pulse	ON	9538	1907.6	15.41	17.00	1.442	0.01	0.728	1.050
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	16mm	South Star	OFF	1513	1752.6	23.74	24.50	1.191	0.04	0.499	0.594
	WCDMA IV	RMC 12.2Kbps	Bottom Face	16mm	South Star	OFF	1513	1752.6	23.74	24.50	1.191	0.13	0.465	0.554
	WCDMA IV	RMC 12.2Kbps	Edge 1	16mm	South Star	OFF	1513	1752.6	23.74	24.50	1.191	0.13	0.464	0.553
	WCDMA IV	RMC 12.2Kbps	Edge 2	9mm	South Star	OFF	1513	1752.6	23.74	24.50	1.191	0.06	0.049	0.058
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	South Star	ON	1513	1752.6	14.31	15.50	1.315	0	0.710	0.934
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	South Star	ON	1312	1712.4	14.02	15.50	1.406	0.13	0.682	0.959
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	South Star	ON	1413	1732.6	14.14	15.50	1.368	-0.01	0.704	0.963
	WCDMA IV	RMC 12.2Kbps	Bottom Face	0mm	South Star	ON	1513	1752.6	14.31	15.50	1.315	-0.18	0.496	0.652
	WCDMA IV	RMC 12.2Kbps	Bottom Face	0mm	South Star	ON	1312	1712.4	14.02	15.50	1.406	-0.18	0.438	0.616
	WCDMA IV	RMC 12.2Kbps	Bottom Face	0mm	South Star	ON	1413	1732.6	14.14	15.50	1.368	-0.18	0.509	0.696
	WCDMA IV	RMC 12.2Kbps	Edge 1	0mm	South Star	ON	1513	1752.6	14.31	15.50	1.315	-0.04	0.307	0.404
	WCDMA IV	RMC 12.2Kbps	Edge 2	0mm	South Star	ON	1513	1752.6	14.31	15.50	1.315	0.05	0.001	0.001
02	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Pulse	ON	1513	1752.6	14.31	15.50	1.315	-0.02	0.841	1.106
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Pulse	ON	1413	1732.6	14.14	15.50	1.368	-0.05	0.613	0.838
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Pulse	ON	1312	1712.4	14.02	15.50	1.406	0.13	0.602	0.846
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	16mm	South Star	OFF	4233	846.6	23.58	24.50	1.236	0.05	0.192	0.237
	WCDMA V	RMC 12.2Kbps	Bottom Face	16mm	South Star	OFF	4233	846.6	23.58	24.50	1.236	0	0.188	0.232
	WCDMA V	RMC 12.2Kbps	Edge 1	16mm	South Star	OFF	4233	846.6	23.58	24.50	1.236	-0.19	0.099	0.123
	WCDMA V	RMC 12.2Kbps	Edge 2	9mm	South Star	OFF	4233	846.6	23.58	24.50	1.236	0.04	0.096	0.119
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	South Star	ON	4182	836.4	18.26	19.00	1.186	-0.08	0.492	0.583
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	South Star	ON	4132	826.4	18.23	19.00	1.194	-0.08	0.476	0.568
03	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	South Star	ON	4233	846.6	18.21	19.00	1.199	-0.08	0.487	0.584
	WCDMA V	RMC 12.2Kbps	Bottom Face	0mm	South Star	ON	4182	836.4	18.26	19.00	1.186	0.14	0.432	0.512
	WCDMA V	RMC 12.2Kbps	Bottom Face	0mm	South Star	ON	4132	826.4	18.23	19.00	1.194	0.02	0.460	0.549
	WCDMA V	RMC 12.2Kbps	Bottom Face	0mm	South Star	ON	4233	846.6	18.21	19.00	1.199	-0.1	0.415	0.498
	WCDMA V	RMC 12.2Kbps	Edge 1	0mm	South Star	ON	4182	836.4	18.26	19.00	1.186	0.08	0.223	0.264
	WCDMA V	RMC 12.2Kbps	Edge 2	0mm	South Star	ON	4182	836.4	18.26	19.00	1.186	0.14	0.001	0.001
	WCDMA V	RMC 12.2Kbps	Edge 3	0mm	South Star	ON	4182	836.4	18.26	19.00	1.186	0.14	0.001	0.001
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	Pulse	ON	4132	826.4	18.23	19.00	1.194	-0.16	0.294	0.351
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	Pulse	ON	4182	836.4	18.26	19.00	1.186	-0.05	0.221	0.262
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	Pulse	ON	4233	846.6	18.21	19.00	1.199	0.03	0.342	0.410



<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna Vendor	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Bottom of Laptop	16mm	South Star	OFF	18700	1860	23.56	24.00	1.107	0.11	0.331	0.366
	LTE Band 2	20M	QPSK	50	24	Bottom of Laptop	16mm	South Star	OFF	18900	1880	22.37	23.00	1.156	0.04	0.249	0.288
	LTE Band 2	20M	QPSK	1	0	Bottom Face	16mm	South Star	OFF	18700	1860	23.56	24.00	1.107	-0.06	0.489	0.541
	LTE Band 2	20M	QPSK	50	24	Bottom Face	16mm	South Star	OFF	18900	1880	22.37	23.00	1.156	0.04	0.401	0.464
	LTE Band 2	20M	QPSK	1	0	Edge 1	16mm	South Star	OFF	18700	1860	23.56	24.00	1.107	-0.17	0.347	0.384
	LTE Band 2	20M	QPSK	50	24	Edge 1	16mm	South Star	OFF	18900	1880	22.37	23.00	1.156	0.04	0.287	0.332
	LTE Band 2	20M	QPSK	1	0	Edge 2	9mm	South Star	OFF	18700	1860	23.56	24.00	1.107	-0.12	0.021	0.023
	LTE Band 2	20M	QPSK	50	24	Edge 2	9mm	South Star	OFF	18900	1880	22.37	23.00	1.156	-0.04	0.017	0.020
04	LTE Band 2	20M	QPSK	1	0	Bottom of Laptop	0mm	South Star	ON	18700	1860	15.87	17.00	1.297	-0.04	0.804	1.043
	LTE Band 2	20M	QPSK	1	0	Bottom of Laptop	0mm	South Star	ON	18900	1880	15.81	17.00	1.315	-0.19	0.718	0.944
	LTE Band 2	20M	QPSK	1	0	Bottom of Laptop	0mm	South Star	ON	19100	1900	15.77	17.00	1.327	0.08	0.645	0.856
	LTE Band 2	20M	QPSK	50	0	Bottom of Laptop	0mm	South Star	ON	18700	1860	15.75	17.00	1.334	-0.08	0.618	0.824
	LTE Band 2	20M	QPSK	50	0	Bottom of Laptop	0mm	South Star	ON	18900	1880	15.74	17.00	1.337	-0.05	0.552	0.738
	LTE Band 2	20M	QPSK	50	0	Bottom of Laptop	0mm	South Star	ON	19100	1900	15.71	17.00	1.346	-0.04	0.496	0.668
	LTE Band 2	20M	QPSK	100	0	Bottom of Laptop	0mm	South Star	ON	18700	1860	15.70	17.00	1.349	-0.08	0.477	0.643
	LTE Band 2	20M	QPSK	1	0	Bottom Face	0mm	South Star	ON	18700	1860	15.87	17.00	1.297	-0.13	0.562	0.729
	LTE Band 2	20M	QPSK	50	0	Bottom Face	0mm	South Star	ON	18700	1860	15.75	17.00	1.334	-0.18	0.496	0.661
	LTE Band 2	20M	QPSK	1	0	Edge 1	0mm	South Star	ON	18700	1860	15.87	17.00	1.297	-0.1	0.424	0.550
	LTE Band 2	20M	QPSK	50	0	Edge 1	0mm	South Star	ON	18700	1860	15.75	17.00	1.334	-0.1	0.326	0.435
	LTE Band 2	20M	QPSK	1	0	Edge 2	0mm	South Star	ON	18700	1860	15.87	17.00	1.297	-0.13	0.001	0.001
	LTE Band 2	20M	QPSK	50	0	Edge 2	0mm	South Star	ON	18700	1860	15.75	17.00	1.334	-0.13	0.001	0.001
	LTE Band 2	20M	QPSK	1	0	Bottom of Laptop	0mm	Pulse	ON	18700	1860	15.87	17.00	1.297	-0.01	0.765	0.992
	LTE Band 2	20M	QPSK	1	0	Bottom of Laptop	0mm	Pulse	ON	18900	1880	15.81	17.00	1.315	0.17	0.701	0.922
	LTE Band 2	20M	QPSK	1	0	Bottom of Laptop	0mm	Pulse	ON	19100	1900	15.77	17.00	1.327	0.01	0.649	0.861
	LTE Band 2	20M	QPSK	50	0	Bottom of Laptop	0mm	Pulse	ON	18700	1860	15.75	17.00	1.334	-0.05	0.588	0.784
	LTE Band 2	20M	QPSK	100	0	Bottom of Laptop	0mm	Pulse	ON	18700	1860	15.70	17.00	1.349	-0.08	0.465	0.627
	LTE Band 7	20M	QPSK	1	0	Bottom of Laptop	16mm	South Star	OFF	21350	2560	22.93	24.00	1.279	0	0.254	0.325
	LTE Band 7	20M	QPSK	50	0	Bottom of Laptop	16mm	South Star	OFF	21350	2560	22.12	23.00	1.225	0.04	0.211	0.258
	LTE Band 7	20M	QPSK	1	0	Bottom Face	16mm	South Star	OFF	21350	2560	22.93	24.00	1.279	0.1	0.435	0.557
	LTE Band 7	20M	QPSK	50	0	Bottom Face	16mm	South Star	OFF	21350	2560	22.12	23.00	1.225	0.03	0.388	0.475
	LTE Band 7	20M	QPSK	1	0	Edge 1	16mm	South Star	OFF	21350	2560	22.93	24.00	1.279	0.07	0.132	0.169
	LTE Band 7	20M	QPSK	50	0	Edge 1	16mm	South Star	OFF	21350	2560	22.12	23.00	1.225	0.01	0.103	0.126
	LTE Band 7	20M	QPSK	1	0	Edge 2	9mm	South Star	OFF	21350	2560	22.93	24.00	1.279	0.14	0.031	0.039
	LTE Band 7	20M	QPSK	50	0	Edge 2	9mm	South Star	OFF	21350	2560	22.12	23.00	1.225	-0.05	0.024	0.029
	LTE Band 7	20M	QPSK	1	0	Bottom of Laptop	0mm	South Star	ON	21350	2560	13.32	14.50	1.312	-0.07	0.400	0.525
	LTE Band 7	20M	QPSK	50	0	Bottom of Laptop	0mm	South Star	ON	21350	2560	13.22	14.50	1.343	0.13	0.320	0.430
	LTE Band 7	20M	QPSK	1	0	Bottom Face	0mm	South Star	ON	21350	2560	13.32	14.50	1.312	-0.02	0.503	0.660
	LTE Band 7	20M	QPSK	1	0	Bottom Face	0mm	South Star	ON	20850	2510	13.26	14.50	1.330	-0.11	0.412	0.548
	LTE Band 7	20M	QPSK	1	0	Bottom Face	0mm	South Star	ON	21100	2535	13.23	14.50	1.340	-0.04	0.444	0.595
	LTE Band 7	20M	QPSK	50	0	Bottom Face	0mm	South Star	ON	21350	2560	13.22	14.50	1.343	-0.08	0.402	0.540
	LTE Band 7	20M	QPSK	1	0	Edge 1	0mm	South Star	ON	21350	2560	13.32	14.50	1.312	0.1	0.069	0.091
	LTE Band 7	20M	QPSK	50	0	Edge 1	0mm	South Star	ON	21350	2560	13.22	14.50	1.343	0.03	0.052	0.070
	LTE Band 7	20M	QPSK	1	0	Edge 2	0mm	South Star	ON	21350	2560	13.32	14.50	1.312	-0.1	0.001	0.001
	LTE Band 7	20M	QPSK	50	0	Edge 2	0mm	South Star	ON	21350	2560	13.22	14.50	1.343	-0.11	0.001	0.001
05	LTE Band 7	20M	QPSK	1	0	Bottom Face	0mm	Pulse	ON	21350	2560	13.32	14.50	1.312	0.19	0.633	0.831
	LTE Band 7	20M	QPSK	1	0	Bottom Face	0mm	Pulse	ON	20850	2510	13.26	14.50	1.330	0.11	0.573	0.762
	LTE Band 7	20M	QPSK	1	0	Bottom Face	0mm	Pulse	ON	21100	2535	13.23	14.50	1.340	0.16	0.600	0.804
	LTE Band 7	20M	QPSK	50	0	Bottom Face	0mm	Pulse	ON	21350	2560	13.22	14.50	1.343	0.03	0.515	0.692
	LTE Band 7	20M	QPSK	100	0	Bottom Face	0mm	Pulse	ON	21350	2560	13.21	14.50	1.346	0.16	0.443	0.596



FCC SAR TEST REPORT

Report No. : FA140648-02

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna Vendor	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 12	10M	QPSK	1	0	Bottom of Laptop	16mm	South Star	OFF	23095	707.5	22.54	24.00	1.400	0.17	0.059	0.083
	LTE Band 12	10M	QPSK	25	25	Bottom of Laptop	16mm	South Star	OFF	23095	707.5	21.48	23.00	1.419	0.07	0.041	0.058
	LTE Band 12	10M	QPSK	1	0	Bottom Face	16mm	South Star	OFF	23095	707.5	22.54	24.00	1.400	-0.01	0.086	0.120
	LTE Band 12	10M	QPSK	25	25	Bottom Face	16mm	South Star	OFF	23095	707.5	21.48	23.00	1.419	0.04	0.066	0.094
	LTE Band 12	10M	QPSK	1	0	Edge 1	16mm	South Star	OFF	23095	707.5	22.54	24.00	1.400	-0.11	0.031	0.043
	LTE Band 12	10M	QPSK	25	25	Edge 1	16mm	South Star	OFF	23095	707.5	21.48	23.00	1.419	-0.03	0.022	0.031
	LTE Band 12	10M	QPSK	1	0	Edge 2	9mm	South Star	OFF	23095	707.5	22.54	24.00	1.400	-0.15	0.007	0.010
	LTE Band 12	10M	QPSK	25	25	Edge 2	9mm	South Star	OFF	23095	707.5	21.48	23.00	1.419	0.01	0.004	0.006
	LTE Band 12	10M	QPSK	1	0	Bottom of Laptop	0mm	South Star	ON	23095	707.5	17.38	18.50	1.294	-0.14	0.196	0.254
	LTE Band 12	10M	QPSK	25	0	Bottom of Laptop	0mm	South Star	ON	23095	707.5	16.84	18.50	1.466	0.12	0.111	0.163
06	LTE Band 12	10M	QPSK	1	0	Bottom Face	0mm	South Star	ON	23095	707.5	17.38	18.50	1.294	0.12	0.432	0.559
	LTE Band 12	10M	QPSK	25	0	Bottom Face	0mm	South Star	ON	23095	707.5	16.84	18.50	1.466	-0.11	0.345	0.506
	LTE Band 12	10M	QPSK	1	0	Edge 1	0mm	South Star	ON	23095	707.5	17.38	18.50	1.294	-0.17	0.096	0.124
	LTE Band 12	10M	QPSK	25	0	Edge 1	0mm	South Star	ON	23095	707.5	16.84	18.50	1.466	-0.07	0.077	0.113
	LTE Band 12	10M	QPSK	1	0	Edge 2	0mm	South Star	ON	23095	707.5	17.38	18.50	1.294	0.07	0.001	0.001
	LTE Band 12	10M	QPSK	25	0	Edge 2	0mm	South Star	ON	23095	707.5	16.84	18.50	1.466	0.01	0.001	0.001
	LTE Band 12	10M	QPSK	1	0	Bottom Face	0mm	Pulse	ON	23095	707.5	17.38	18.50	1.294	0.19	0.152	0.197
	LTE Band 12	10M	QPSK	25	0	Bottom Face	0mm	Pulse	ON	23095	707.5	16.84	18.50	1.466	0.07	0.121	0.177
	LTE Band 13	10M	QPSK	1	0	Bottom of Laptop	16mm	South Star	OFF	23230	782	23.13	24.00	1.222	-0.11	0.062	0.076
	LTE Band 13	10M	QPSK	25	0	Bottom of Laptop	16mm	South Star	OFF	23230	782	22.20	23.00	1.202	0.06	0.051	0.061
	LTE Band 13	10M	QPSK	1	0	Bottom Face	16mm	South Star	OFF	23230	782	23.13	24.00	1.222	-0.05	0.090	0.110
	LTE Band 13	10M	QPSK	25	0	Bottom Face	16mm	South Star	OFF	23230	782	22.20	23.00	1.202	0.01	0.071	0.085
	LTE Band 13	10M	QPSK	1	0	Edge 1	16mm	South Star	OFF	23230	782	23.13	24.00	1.222	-0.09	0.032	0.039
	LTE Band 13	10M	QPSK	25	0	Edge 1	16mm	South Star	OFF	23230	782	22.20	23.00	1.202	0.04	0.022	0.026
	LTE Band 13	10M	QPSK	1	0	Edge 2	9mm	South Star	OFF	23230	782	23.13	24.00	1.222	-0.13	0.007	0.009
	LTE Band 13	10M	QPSK	25	0	Edge 2	9mm	South Star	OFF	23230	782	22.20	23.00	1.202	-0.02	0.005	0.006
	LTE Band 13	10M	QPSK	1	0	Bottom of Laptop	0mm	South Star	ON	23230	782	17.56	18.50	1.242	-0.05	0.372	0.462
	LTE Band 13	10M	QPSK	25	0	Bottom of Laptop	0mm	South Star	ON	23230	782	17.51	18.50	1.256	-0.04	0.236	0.296
07	LTE Band 13	10M	QPSK	1	0	Bottom Face	0mm	South Star	ON	23230	782	17.56	18.50	1.242	0.15	0.455	0.565
	LTE Band 13	10M	QPSK	25	0	Bottom Face	0mm	South Star	ON	23230	782	17.51	18.50	1.256	-0.1	0.364	0.457
	LTE Band 13	10M	QPSK	1	0	Edge 1	0mm	South Star	ON	23230	782	17.56	18.50	1.242	-0.19	0.156	0.194
	LTE Band 13	10M	QPSK	25	0	Edge 1	0mm	South Star	ON	23230	782	17.51	18.50	1.256	-0.11	0.124	0.156
	LTE Band 13	10M	QPSK	1	0	Edge 2	0mm	South Star	ON	23230	782	17.56	18.50	1.242	-0.13	0.001	0.001
	LTE Band 13	10M	QPSK	25	0	Edge 2	0mm	South Star	ON	23230	782	17.51	18.50	1.256	-0.03	0.001	0.001
	LTE Band 13	10M	QPSK	1	0	Bottom Face	0mm	Pulse	ON	23230	782	17.56	18.50	1.242	0.07	0.238	0.296
	LTE Band 13	10M	QPSK	25	0	Bottom Face	0mm	Pulse	ON	23230	782	17.51	18.50	1.256	0.08	0.119	0.149



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Report No. : FA140648-02

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna Vendor	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 26	15M	QPSK	1	0	Bottom of Laptop	16mm	South Star	OFF	26865	831.5	22.60	24.00	1.380	-0.15	0.155	0.214
	LTE Band 26	15M	QPSK	36	0	Bottom of Laptop	16mm	South Star	OFF	26865	831.5	21.70	23.00	1.349	0.05	0.132	0.178
	LTE Band 26	15M	QPSK	1	0	Bottom Face	16mm	South Star	OFF	26865	831.5	22.60	24.00	1.380	0.01	0.152	0.210
	LTE Band 26	15M	QPSK	36	0	Bottom Face	16mm	South Star	OFF	26865	831.5	21.70	23.00	1.349	0.04	0.129	0.174
	LTE Band 26	15M	QPSK	1	0	Edge 1	16mm	South Star	OFF	26865	831.5	22.60	24.00	1.380	0.12	0.080	0.111
	LTE Band 26	15M	QPSK	36	0	Edge 1	16mm	South Star	OFF	26865	831.5	21.70	23.00	1.349	0.01	0.066	0.089
	LTE Band 26	15M	QPSK	1	0	Edge 2	9mm	South Star	OFF	26865	831.5	22.60	24.00	1.380	0.13	0.078	0.108
	LTE Band 26	15M	QPSK	36	0	Edge 2	9mm	South Star	OFF	26865	831.5	21.70	23.00	1.349	0.02	0.068	0.092
08	LTE Band 26	15M	QPSK	1	0	Bottom of Laptop	0mm	South Star	ON	26865	831.5	17.18	18.50	1.355	-0.06	0.394	0.534
	LTE Band 26	15M	QPSK	36	0	Bottom of Laptop	0mm	South Star	ON	26865	831.5	16.88	18.50	1.452	0.07	0.336	0.488
	LTE Band 26	15M	QPSK	1	0	Bottom Face	0mm	South Star	ON	26865	831.5	17.18	18.50	1.355	-0.02	0.303	0.411
	LTE Band 26	15M	QPSK	36	0	Bottom Face	0mm	South Star	ON	26865	831.5	16.88	18.50	1.452	0.07	0.236	0.343
	LTE Band 26	15M	QPSK	1	0	Edge 1	0mm	South Star	ON	26865	831.5	17.18	18.50	1.355	0.01	0.145	0.197
	LTE Band 26	15M	QPSK	36	0	Edge 1	0mm	South Star	ON	26865	831.5	16.88	18.50	1.452	-0.17	0.124	0.180
	LTE Band 26	15M	QPSK	1	0	Edge 2	0mm	South Star	ON	26865	831.5	17.18	18.50	1.355	-0.17	0.001	0.001
	LTE Band 26	15M	QPSK	36	0	Edge 2	0mm	South Star	ON	26865	831.5	16.88	18.50	1.452	0.01	0.001	0.001
	LTE Band 26	15M	QPSK	1	0	Edge 3	0mm	South Star	ON	26865	831.5	17.18	18.50	1.355	-0.17	0.001	0.001
	LTE Band 26	15M	QPSK	36	0	Edge 3	0mm	South Star	ON	26865	831.5	16.88	18.50	1.452	-0.17	0.001	0.001
	LTE Band 26	15M	QPSK	1	0	Bottom of Laptop	0mm	Pulse	ON	26865	831.5	17.18	18.50	1.355	0.02	0.152	0.206
	LTE Band 26	15M	QPSK	36	0	Bottom of Laptop	0mm	Pulse	ON	26865	831.5	16.88	18.50	1.452	-0.19	0.130	0.189
	LTE Band 30	10M	QPSK	1	0	Bottom of Laptop	16mm	South Star	OFF	27710	2310	22.88	24.00	1.294	-0.12	0.321	0.416
	LTE Band 30	10M	QPSK	25	25	Bottom of Laptop	16mm	South Star	OFF	27710	2310	21.60	23.00	1.380	0.06	0.288	0.398
	LTE Band 30	10M	QPSK	1	0	Bottom Face	16mm	South Star	OFF	27710	2310	22.88	24.00	1.294	0.12	0.550	0.712
	LTE Band 30	10M	QPSK	25	25	Bottom Face	16mm	South Star	OFF	27710	2310	21.60	23.00	1.380	0.01	0.501	0.692
	LTE Band 30	10M	QPSK	1	0	Edge 1	16mm	South Star	OFF	27710	2310	22.88	24.00	1.294	0.03	0.167	0.216
	LTE Band 30	10M	QPSK	25	25	Edge 1	16mm	South Star	OFF	27710	2310	21.60	23.00	1.380	0.11	0.159	0.219
	LTE Band 30	10M	QPSK	1	0	Edge 2	9mm	South Star	OFF	27710	2310	22.88	24.00	1.294	-0.05	0.039	0.050
	LTE Band 30	10M	QPSK	25	25	Edge 2	9mm	South Star	OFF	27710	2310	21.60	23.00	1.380	0.09	0.030	0.041
	LTE Band 30	10M	QPSK	1	0	Bottom of Laptop	0mm	South Star	ON	27710	2310	15.94	17.00	1.276	-0.06	0.464	0.592
	LTE Band 30	10M	QPSK	25	0	Bottom of Laptop	0mm	South Star	ON	27710	2310	15.84	17.00	1.306	-0.14	0.386	0.504
	LTE Band 30	10M	QPSK	1	0	Bottom Face	0mm	South Star	ON	27710	2310	15.94	17.00	1.276	-0.01	0.564	0.720
	LTE Band 30	10M	QPSK	25	0	Bottom Face	0mm	South Star	ON	27710	2310	15.84	17.00	1.306	-0.09	0.459	0.600
	LTE Band 30	10M	QPSK	1	0	Edge 1	0mm	South Star	ON	27710	2310	15.94	17.00	1.276	-0.01	0.128	0.163
	LTE Band 30	10M	QPSK	25	0	Edge 1	0mm	South Star	ON	27710	2310	15.84	17.00	1.306	-0.01	0.102	0.133
	LTE Band 30	10M	QPSK	1	0	Edge 2	0mm	South Star	ON	27710	2310	15.94	17.00	1.276	-0.12	0.001	0.001
	LTE Band 30	10M	QPSK	25	0	Edge 2	0mm	South Star	ON	27710	2310	15.84	17.00	1.306	-0.12	0.001	0.001
09	LTE Band 30	10M	QPSK	1	0	Bottom Face	0mm	Pulse	ON	27710	2310	15.94	17.00	1.276	0.05	0.823	1.051
	LTE Band 30	10M	QPSK	25	0	Bottom Face	0mm	Pulse	ON	27710	2310	15.84	17.00	1.306	0.12	0.661	0.863
	LTE Band 30	10M	QPSK	50	0	Bottom Face	0mm	Pulse	ON	27710	2310	15.70	17.00	1.349	0.01	0.687	0.927



FCC SAR TEST REPORT

Report No. : FA140648-02

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna Vendor	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	16mm	South Star	OFF	132572	1770	23.36	24.00	1.159	-0.06	0.494	0.572
	LTE Band 66	20M	QPSK	50	24	Bottom of Laptop	16mm	South Star	OFF	132072	1720	22.16	23.00	1.213	0.08	0.429	0.521
	LTE Band 66	20M	QPSK	1	0	Bottom Face	16mm	South Star	OFF	132572	1770	23.36	24.00	1.159	-0.17	0.461	0.534
	LTE Band 66	20M	QPSK	50	24	Bottom Face	16mm	South Star	OFF	132072	1720	22.16	23.00	1.213	0.14	0.404	0.490
	LTE Band 66	20M	QPSK	1	0	Edge 1	16mm	South Star	OFF	132572	1770	23.36	24.00	1.159	-0.18	0.460	0.533
	LTE Band 66	20M	QPSK	50	24	Edge 1	16mm	South Star	OFF	132072	1720	22.16	23.00	1.213	0.06	0.409	0.496
	LTE Band 66	20M	QPSK	1	0	Edge 2	9mm	South Star	OFF	132572	1770	23.36	24.00	1.159	0.11	0.048	0.056
	LTE Band 66	20M	QPSK	50	24	Edge 2	9mm	South Star	OFF	132072	1720	22.16	23.00	1.213	0.01	0.033	0.040
	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	0mm	South Star	ON	132572	1770	14.37	15.50	1.297	-0.07	0.732	0.950
	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	0mm	South Star	ON	132072	1720	14.27	15.50	1.327	0.08	0.680	0.903
	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	0mm	South Star	ON	132322	1745	14.34	15.50	1.306	-0.15	0.657	0.858
	LTE Band 66	20M	QPSK	50	0	Bottom of Laptop	0mm	South Star	ON	132572	1770	14.27	15.50	1.327	-0.15	0.590	0.783
	LTE Band 66	20M	QPSK	100	0	Bottom of Laptop	0mm	South Star	ON	132572	1770	14.23	15.50	1.340	0.06	0.524	0.702
	LTE Band 66	20M	QPSK	1	0	Bottom Face	0mm	South Star	ON	132572	1770	14.37	15.50	1.297	-0.03	0.494	0.641
	LTE Band 66	20M	QPSK	50	0	Bottom Face	0mm	South Star	ON	132572	1770	14.27	15.50	1.327	0.02	0.411	0.546
	LTE Band 66	20M	QPSK	1	0	Edge 1	0mm	South Star	ON	132572	1770	14.37	15.50	1.297	0.1	0.326	0.423
	LTE Band 66	20M	QPSK	50	0	Edge 1	0mm	South Star	ON	132572	1770	14.27	15.50	1.327	0.15	0.263	0.349
	LTE Band 66	20M	QPSK	1	0	Edge 2	0mm	South Star	ON	132572	1770	14.37	15.50	1.297	-0.09	0.001	0.001
	LTE Band 66	20M	QPSK	50	0	Edge 2	0mm	South Star	ON	132572	1770	14.27	15.50	1.327	-0.09	0.001	0.001
10	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	0mm	Pulse	ON	132572	1770	14.37	15.50	1.297	-0.08	0.833	1.081
	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	0mm	Pulse	ON	132072	1720	14.27	15.50	1.327	0.14	0.735	0.976
	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	0mm	Pulse	ON	132322	1745	14.34	15.50	1.306	-0.05	0.765	0.999
	LTE Band 66	20M	QPSK	50	0	Bottom of Laptop	0mm	Pulse	ON	132572	1770	14.27	15.50	1.327	-0.02	0.670	0.889
	LTE Band 66	20M	QPSK	50	0	Bottom of Laptop	0mm	Pulse	ON	132072	1720	14.26	15.50	1.330	0.14	0.591	0.786
	LTE Band 66	20M	QPSK	50	0	Bottom of Laptop	0mm	Pulse	ON	132322	1745	14.21	15.50	1.346	-0.05	0.615	0.828
	LTE Band 66	20M	QPSK	100	0	Bottom of Laptop	0mm	Pulse	ON	132572	1770	14.23	15.50	1.340	0.04	0.589	0.789



<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna Vendor	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	16mm	South Star	OFF	40620	2593	23.04	24.00	1.247	62.9	1.006	0.07	0.211	0.265
	LTE Band 41	20M	QPSK	50	50	Bottom of Laptop	16mm	South Star	OFF	40620	2593	21.84	23.00	1.306	62.9	1.006	0.04	0.169	0.222
	LTE Band 41	20M	QPSK	1	0	Bottom Face	16mm	South Star	OFF	40620	2593	23.04	24.00	1.247	62.9	1.006	-0.07	0.362	0.454
	LTE Band 41	20M	QPSK	50	50	Bottom Face	16mm	South Star	OFF	40620	2593	21.84	23.00	1.306	62.9	1.006	0.02	0.322	0.423
	LTE Band 41	20M	QPSK	1	0	Edge 1	16mm	South Star	OFF	40620	2593	23.04	24.00	1.247	62.9	1.006	-0.15	0.110	0.138
	LTE Band 41	20M	QPSK	50	50	Edge 1	16mm	South Star	OFF	40620	2593	21.84	23.00	1.306	62.9	1.006	-0.03	0.094	0.124
	LTE Band 41	20M	QPSK	1	0	Edge 2	9mm	South Star	OFF	40620	2593	23.04	24.00	1.247	62.9	1.006	0.19	0.025	0.032
	LTE Band 41	20M	QPSK	50	50	Edge 2	9mm	South Star	OFF	40620	2593	21.84	23.00	1.306	62.9	1.006	0.12	0.020	0.026
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	0mm	South Star	ON	39750	2506	14.92	16.00	1.282	62.9	1.006	-0.05	0.139	0.179
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	South Star	ON	39750	2506	14.81	16.00	1.315	62.9	1.006	0.1	0.115	0.152
	LTE Band 41	20M	QPSK	1	0	Bottom Face	0mm	South Star	ON	39750	2506	14.92	16.00	1.282	62.9	1.006	-0.15	0.501	0.646
	LTE Band 41	20M	QPSK	1	0	Bottom Face	0mm	South Star	ON	40185	2549.5	14.80	16.00	1.318	62.9	1.006	-0.11	0.489	0.648
	LTE Band 41	20M	QPSK	1	0	Bottom Face	0mm	South Star	ON	40620	2593	14.48	16.00	1.419	62.9	1.006	0.15	0.488	0.697
	LTE Band 41	20M	QPSK	1	0	Bottom Face	0mm	South Star	ON	41055	2636.5	14.78	16.00	1.324	62.9	1.006	-0.13	0.512	0.682
11	LTE Band 41	20M	QPSK	1	0	Bottom Face	0mm	South Star	ON	41490	2680	14.82	16.00	1.312	62.9	1.006	-0.05	0.542	0.715
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	South Star	ON	39750	2506	14.81	16.00	1.315	62.9	1.006	-0.15	0.411	0.544
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	South Star	ON	40185	2549.5	14.74	16.00	1.337	62.9	1.006	-0.11	0.406	0.546
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	South Star	ON	40620	2593	14.38	16.00	1.452	62.9	1.006	0.15	0.399	0.583
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	South Star	ON	41055	2636.5	14.55	16.00	1.396	62.9	1.006	-0.13	0.403	0.566
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	South Star	ON	41490	2680	14.58	16.00	1.387	62.9	1.006	-0.1	0.427	0.596
	LTE Band 41	20M	QPSK	100	0	Bottom Face	0mm	South Star	ON	40185	2549.5	14.80	16.00	1.318	62.9	1.006	-0.05	0.411	0.545
	LTE Band 41	20M	QPSK	1	0	Edge 1	0mm	South Star	ON	39750	2506	14.92	16.00	1.282	62.9	1.006	-0.12	0.066	0.085
	LTE Band 41	20M	QPSK	50	0	Edge 1	0mm	South Star	ON	39750	2506	14.81	16.00	1.315	62.9	1.006	-0.12	0.066	0.087
	LTE Band 41	20M	QPSK	1	0	Edge 2	0mm	South Star	ON	39750	2506	14.92	16.00	1.282	62.9	1.006	-0.19	0.001	0.001
	LTE Band 41	20M	QPSK	50	0	Edge 2	0mm	South Star	ON	39750	2506	14.81	16.00	1.315	62.9	1.006	-0.19	0.001	0.001
	LTE Band 41	20M	QPSK	1	0	Bottom Face	0mm	Pulse	ON	39750	2506	14.92	16.00	1.282	62.9	1.006	-0.01	0.465	0.600
	LTE Band 41	20M	QPSK	1	0	Bottom Face	0mm	Pulse	ON	40620	2593	14.48	16.00	1.419	62.9	1.006	0.09	0.463	0.661
	LTE Band 41	20M	QPSK	1	0	Bottom Face	0mm	Pulse	ON	40185	2549.5	14.80	16.00	1.318	62.9	1.006	0.01	0.490	0.650
	LTE Band 41	20M	QPSK	1	0	Bottom Face	0mm	Pulse	ON	41055	2636.5	14.78	16.00	1.324	62.9	1.006	-0.04	0.503	0.670
	LTE Band 41	20M	QPSK	1	0	Bottom Face	0mm	Pulse	ON	41490	2680	14.82	16.00	1.312	62.9	1.006	0.03	0.517	0.682
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	Pulse	ON	39750	2506	14.81	16.00	1.315	62.9	1.006	-0.01	0.365	0.483
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	Pulse	ON	40620	2593	14.38	16.00	1.452	62.9	1.006	0.09	0.363	0.530
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	Pulse	ON	40185	2549.5	14.74	16.00	1.337	62.9	1.006	0.01	0.384	0.516
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	Pulse	ON	41055	2636.5	14.55	16.00	1.396	62.9	1.006	-0.04	0.395	0.555
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	Pulse	ON	41490	2680	14.58	16.00	1.387	62.9	1.006	-0.02	0.406	0.566
	LTE Band 41	20M	QPSK	100	0	Bottom Face	0mm	Pulse	ON	40185	2549.5	14.80	16.00	1.318	62.9	1.006	0.04	0.401	0.532



13.2 Repeated SAR Measurement

No.	Band	Mode	Test Position	Gap (mm)	Antenna Vendor	Power Reduction	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 of Laptop	0mm	Pulse	ON	9262	1852.4	15.77	17	1.327	-0.01	0.892		1.184
2nd	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Pulse	ON	9262	1852.4	15.77	17	1.327	-0.06	0.867	1.029	1.151
1st	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Pulse	ON	1513	1752.6	14.31	15.5	1.315	-0.02	0.841		1.106
2nd	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Pulse	ON	1513	1752.6	14.31	15.5	1.315	-0.04	0.824	1.021	1.084
1st	LTE Band 30	10M_QPSK_1_0	Bottom Face	0mm	Pulse	ON	27710	2310	15.94	17	1.276	0.05	0.823		1.051
2nd	LTE Band 30	10M_QPSK_1_0	Bottom Face	0mm	Pulse	ON	27710	2310	15.94	17	1.276	0.04	0.807	1.020	1.03

General Note:

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



14. Simultaneous Transmission Analysis

<L850-GL + RTL8822CE>

NO.	Simultaneous Transmission Configurations	Body
1.	WWAN+2.4GHz WLAN Ant 1+ 2.4GHz WLAN Ant 2	Yes
2.	WWAN+2.4GHz WLAN Ant 1+Bluetooth Ant 2	Yes
3.	WWAN+5GHz WLAN Ant 1+5GHz WLAN Ant 2	Yes
4.	WWAN+5GHz WLAN Ant 1+Bluetooth Ant2	Yes

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NO.	Simultaneous Transmission Configurations	Body
1.	WWAN+2.4GHz WLAN Ant 1+ 2.4GHz WLAN Ant 2	Yes
2.	WWAN+2.4GHz WLAN Ant 1+Bluetooth Ant 2	Yes
3.	WWAN+5GHz WLAN Ant 1+5GHz WLAN Ant 2+Bluetooth Ant2	Yes

General Note:

1. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
2. The Scaled SAR summation is calculated based on the same configuration and test position.
3. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
 - i) Scalar SAR summation < 1.6W/kg.
 - ii) $SPLSR = (SAR1 + SAR2)^{1.5} / (\text{min. separation distance, mm})$, 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 $SPLSR \leq 0.04$, 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 13.2.



14.1 Body Exposure Conditions

<L850-GL + RTL8822CE>

WWAN Band	Exposure Position	1	2	3	4	5	6	1+2+3 Summed 1g SAR (W/kg)	1+2+6 Summed 1g SAR (W/kg)	1+4+5 Summed 1g SAR (W/kg)	1+4+6 Summed 1g SAR (W/kg)	SPLSR	Case No
		WWAN	2.4GHz WLAN Ant 1	2.4GHz WLAN Ant 2	5GHz WLAN Ant 1	5GHz WLAN Ant 2	Bluetooth Ant 2						
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)						
WCDMA II	Bottom Face at 0mm	0.782	0.296	0.382	0.156	0.172	0.219	1.460	1.297	1.110	1.157		
	Edge 1 at 0mm	0.054						0.054	0.054	0.054	0.054		
	Edge 2 at 0mm	0.001						0.001	0.001	0.001	0.001		
	Edge 3 at 0mm		0.144	0.136	0.660	0.523	0.078	0.280	0.222	1.183	0.738		
	Bottom of Laptop at 0mm	1.184	0.163	0.241	0.989	1.197	0.173	1.588	1.520	3.370	2.346	0.04	Case 1
WCDMA IV	Bottom Face at 0mm	0.696	0.296	0.382	0.156	0.172	0.219	1.374	1.211	1.024	1.071		
	Edge 1 at 0mm	0.404						0.404	0.404	0.404	0.404		
	Edge 2 at 0mm	0.001						0.001	0.001	0.001	0.001		
	Edge 3 at 0mm		0.144	0.136	0.660	0.523	0.078	0.280	0.222	1.183	0.738		
	Bottom of Laptop at 0mm	1.106	0.163	0.241	0.989	1.197	0.173	1.510	1.442	3.292	2.268	0.04	Case 2
WCDMA V	Bottom Face at 0mm	0.549	0.296	0.382	0.156	0.172	0.219	1.227	1.064	0.877	0.924		
	Edge 1 at 0mm	0.264						0.264	0.264	0.264	0.264		
	Edge 2 at 0mm	0.001						0.001	0.001	0.001	0.001		
	Edge 3 at 0mm	0.001	0.144	0.136	0.660	0.523	0.078	0.281	0.223	1.184	0.739		
	Bottom of Laptop at 0mm	0.584	0.163	0.241	0.989	1.197	0.173	0.988	0.920	2.770	1.746	0.04	Case 3
LTE Band 2	Bottom Face at 0mm	0.729	0.296	0.382	0.156	0.172	0.219	1.407	1.244	1.057	1.104		
	Edge 1 at 0mm	0.550						0.550	0.550	0.550	0.550		
	Edge 2 at 0mm	0.001						0.001	0.001	0.001	0.001		
	Edge 3 at 0mm		0.144	0.136	0.660	0.523	0.078	0.280	0.222	1.183	0.738		
	Bottom of Laptop at 0mm	1.043	0.163	0.241	0.989	1.197	0.173	1.447	1.379	3.229	2.205	0.04	Case 4
LTE Band 7	Bottom Face at 0mm	0.831	0.296	0.382	0.156	0.172	0.219	1.509	1.346	1.159	1.206		
	Edge 1 at 0mm	0.091						0.091	0.091	0.091	0.091		
	Edge 2 at 0mm	0.001						0.001	0.001	0.001	0.001		
	Edge 3 at 0mm		0.144	0.136	0.660	0.523	0.078	0.280	0.222	1.183	0.738		
	Bottom of Laptop at 0mm	0.525	0.163	0.241	0.989	1.197	0.173	0.929	0.861	2.711	1.687	0.04	Case 5
LTE Band 12	Bottom Face at 0mm	0.559	0.296	0.382	0.156	0.172	0.219	1.237	1.074	0.887	0.934		
	Edge 1 at 0mm	0.124						0.124	0.124	0.124	0.124		
	Edge 2 at 0mm	0.001						0.001	0.001	0.001	0.001		
	Edge 3 at 0mm		0.144	0.136	0.660	0.523	0.078	0.280	0.222	1.183	0.738		
	Bottom of Laptop at 0mm	0.254	0.163	0.241	0.989	1.197	0.173	0.658	0.590	2.440	1.416	0.04	Case 6
LTE Band 13	Bottom Face at 0mm	0.565	0.296	0.382	0.156	0.172	0.219	1.243	1.080	0.893	0.940		
	Edge 1 at 0mm	0.194						0.194	0.194	0.194	0.194		
	Edge 2 at 0mm	0.001						0.001	0.001	0.001	0.001		
	Edge 3 at 0mm		0.144	0.136	0.660	0.523	0.078	0.280	0.222	1.183	0.738		
	Bottom of Laptop at 0mm	0.462	0.163	0.241	0.989	1.197	0.173	0.866	0.798	2.648	1.624	0.04	Case 7
LTE Band 26	Bottom Face at 0mm	0.411	0.296	0.382	0.156	0.172	0.219	1.089	0.926	0.739	0.786		
	Edge 1 at 0mm	0.197						0.197	0.197	0.197	0.197		
	Edge 2 at 0mm	0.001						0.001	0.001	0.001	0.001		
	Edge 3 at 0mm	0.001	0.144	0.136	0.660	0.523	0.078	0.281	0.223	1.184	0.739		
	Bottom of Laptop at 0mm	0.534	0.163	0.241	0.989	1.197	0.173	0.938	0.870	2.720	1.696	0.04	Case 8
LTE Band 30	Bottom Face at 0mm	1.051	0.296	0.382	0.156	0.172	0.219	1.729	1.566	1.379	1.426	0.01	Case 9
	Edge 1 at 0mm	0.163						0.163	0.163	0.163	0.163		
	Edge 2 at 0mm	0.001						0.001	0.001	0.001	0.001		
	Edge 3 at 0mm		0.144	0.136	0.660	0.523	0.078	0.280	0.222	1.183	0.738		
	Bottom of Laptop at 0mm	0.592	0.163	0.241	0.989	1.197	0.173	0.996	0.928	2.778	1.754	0.04	Case 10



LTE Band 66	Bottom Face at 0mm	0.641	0.296	0.382	0.156	0.172	0.219	1.319	1.156	0.969	1.016		
	Edge 1 at 0mm	0.423						0.423	0.423	0.423	0.423		
	Edge 2 at 0mm	0.001						0.001	0.001	0.001	0.001		
	Edge 3 at 0mm		0.144	0.136	0.660	0.523	0.078	0.280	0.222	1.183	0.738		
	Bottom of Laptop at 0mm	1.081	0.163	0.241	0.989	1.197	0.173	1.485	1.417	3.267	2.243	0.04	Case 11
LTE Band 41	Bottom Face at 0mm	0.715	0.296	0.382	0.156	0.172	0.219	1.393	1.230	1.043	1.090		
	Edge 1 at 0mm	0.087						0.087	0.087	0.087	0.087		
	Edge 2 at 0mm	0.001						0.001	0.001	0.001	0.001		
	Edge 3 at 0mm		0.144	0.136	0.660	0.523	0.078	0.280	0.222	1.183	0.738		
	Bottom of Laptop at 0mm	0.179	0.163	0.241	0.989	1.197	0.173	0.583	0.515	2.365	1.341	0.04	Case 12

<L850-GL + AX200NGW >

WWAN Band	Exposure Position	1	2	3	4	5	6	1+2+3 Summed 1g SAR (W/kg)	1+2+6 Summed 1g SAR (W/kg)	1+4+5+6 Summed 1g SAR (W/kg)	1+2+3 SPLSR	1+2+3 Case No	1+2+6 SPLSR	1+2+6 Case No	1+4+5+6 SPLSR	1+4+5+6 Case No
		WWAN 1g SAR (W/kg)	2.4GHz WLAN Ant 1 1g SAR (W/kg)	2.4GHz WLAN Ant 2 1g SAR (W/kg)	5GHz WLAN Ant 1 1g SAR (W/kg)	5GHz WLAN Ant 2 1g SAR (W/kg)	Bluetooth Ant 2 1g SAR (W/kg)									
WCDMA II	Bottom Face at 0mm	0.782	0.637	0.556	0.334	0.250	0.109	1.975	1.528	1.475	0.01	Case 13				
	Edge 1 at 0mm	0.054						0.054	0.054	0.054						
	Edge 2 at 0mm	0.001						0.001	0.001	0.001						
	Edge 3 at 0mm		0.313	0.217	0.467	0.317	0.036	0.530	0.349	0.820						
	Bottom of Laptop at 0mm	1.184	0.218	0.481	1.029	0.902	0.051	1.883	1.453	3.166	0.01	Case 14			0.03	Case 15
WCDMA IV	Bottom Face at 0mm	0.696	0.637	0.556	0.334	0.250	0.109	1.889	1.442	1.389	0.01	Case 16				
	Edge 1 at 0mm	0.404						0.404	0.404	0.404						
	Edge 2 at 0mm	0.001						0.001	0.001	0.001						
	Edge 3 at 0mm		0.313	0.217	0.467	0.317	0.036	0.530	0.349	0.820						
	Bottom of Laptop at 0mm	1.106	0.218	0.481	1.029	0.902	0.051	1.805	1.375	3.088	0.01	Case 17			0.03	Case 18
WCDMA V	Bottom Face at 0mm	0.549	0.637	0.556	0.334	0.250	0.109	1.742	1.295	1.242	0.01	Case 19				
	Edge 1 at 0mm	0.264						0.264	0.264	0.264						
	Edge 2 at 0mm	0.001						0.001	0.001	0.001						
	Edge 3 at 0mm	0.001	0.313	0.217	0.467	0.317	0.036	0.531	0.350	0.821						
	Bottom of Laptop at 0mm	0.584	0.218	0.481	1.029	0.902	0.051	1.283	0.853	2.566					0.03	Case 20
LTE Band 2	Bottom Face at 0mm	0.729	0.637	0.556	0.334	0.250	0.109	1.922	1.475	1.422	0.01	Case 21				
	Edge 1 at 0mm	0.550						0.550	0.550	0.550						
	Edge 2 at 0mm	0.001						0.001	0.001	0.001						
	Edge 3 at 0mm		0.313	0.217	0.467	0.317	0.036	0.530	0.349	0.820						
	Bottom of Laptop at 0mm	1.043	0.218	0.481	1.029	0.902	0.051	1.742	1.312	3.025	0.01	Case 22			0.03	Case 23
LTE Band 7	Bottom Face at 0mm	0.831	0.637	0.556	0.334	0.250	0.109	2.024	1.577	1.524	0.01	Case 24				
	Edge 1 at 0mm	0.091						0.091	0.091	0.091						
	Edge 2 at 0mm	0.001						0.001	0.001	0.001						
	Edge 3 at 0mm		0.313	0.217	0.467	0.317	0.036	0.530	0.349	0.820						
	Bottom of Laptop at 0mm	0.525	0.218	0.481	1.029	0.902	0.051	1.224	0.794	2.507					0.03	Case 25
LTE Band 12	Bottom Face at 0mm	0.559	0.637	0.556	0.334	0.250	0.109	1.752	1.305	1.252	0.01	Case 26				
	Edge 1 at 0mm	0.124						0.124	0.124	0.124						
	Edge 2 at 0mm	0.001						0.001	0.001	0.001						
	Edge 3 at 0mm		0.313	0.217	0.467	0.317	0.036	0.530	0.349	0.820						
	Bottom of Laptop at 0mm	0.254	0.218	0.481	1.029	0.902	0.051	0.953	0.523	2.236					0.03	Case 27
LTE Band 13	Bottom Face at 0mm	0.565	0.637	0.556	0.334	0.250	0.109	1.758	1.311	1.258	0.01	Case 28				
	Edge 1 at 0mm	0.194						0.194	0.194	0.194						
	Edge 2 at 0mm	0.001						0.001	0.001	0.001						
	Edge 3 at 0mm		0.313	0.217	0.467	0.317	0.036	0.530	0.349	0.820						
	Bottom of Laptop at 0mm	0.462	0.218	0.481	1.029	0.902	0.051	1.161	0.731	2.444					0.03	Case 29



FCC SAR TEST REPORT

Report No. : FA140648-02

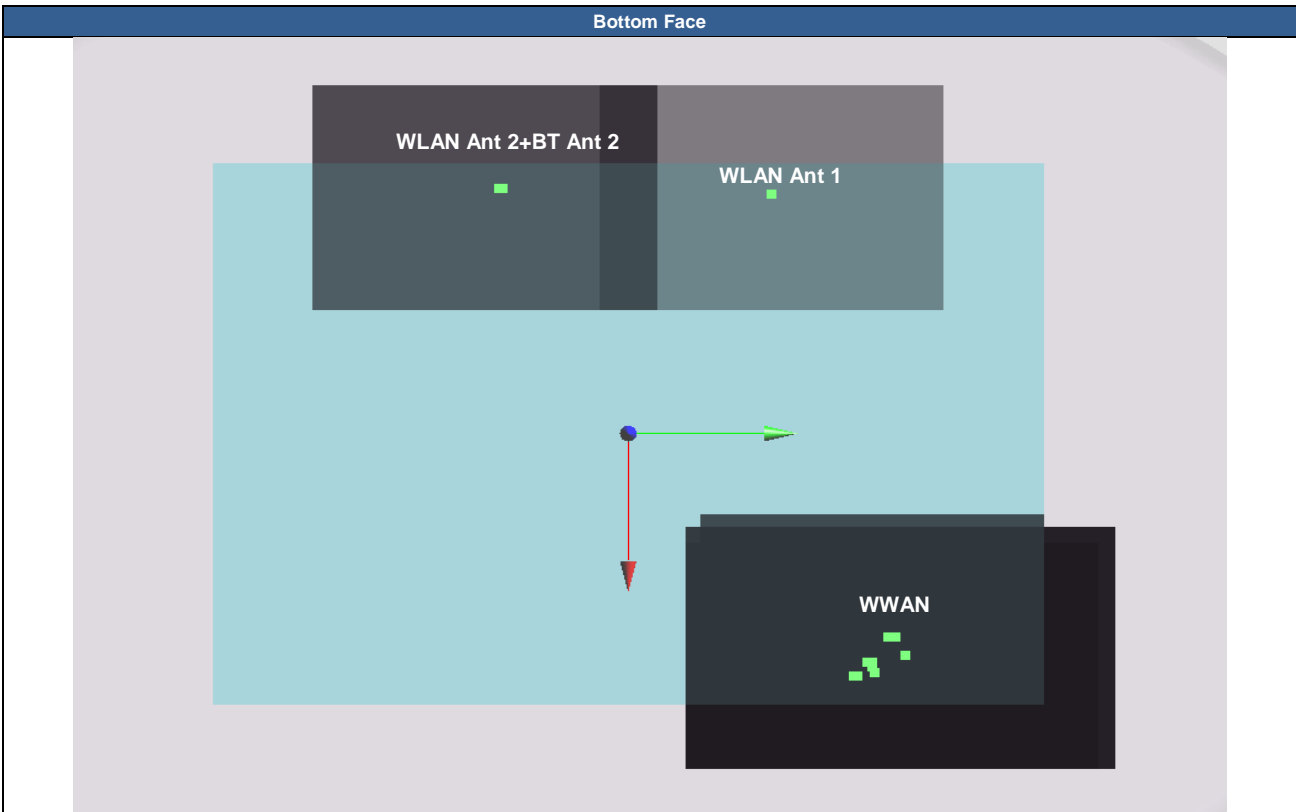
LTE Band 26	Bottom Face at 0mm	0.411	0.637	0.556	0.334	0.250	0.109	1.604	1.157	1.104	0.01	Case 30				
	Edge 1 at 0mm	0.197						0.197	0.197	0.197						
	Edge 2 at 0mm	0.001						0.001	0.001	0.001						
	Edge 3 at 0mm	0.001	0.313	0.217	0.467	0.317	0.036	0.531	0.350	0.821						
	Bottom of Laptop at 0mm	0.534	0.218	0.481	1.029	0.902	0.051	1.233	0.803	2.516					0.03	Case 31
LTE Band 30	Bottom Face at 0mm	1.051	0.637	0.556	0.334	0.250	0.109	2.244	1.797	1.744	0.01	Case 32	0.01	Case 33	0.01	Case 34
	Edge 1 at 0mm	0.163						0.163	0.163	0.163						
	Edge 2 at 0mm	0.001						0.001	0.001	0.001						
	Edge 3 at 0mm		0.313	0.217	0.467	0.317	0.036	0.530	0.349	0.820						
	Bottom of Laptop at 0mm	0.592	0.218	0.481	1.029	0.902	0.051	1.291	0.861	2.574					0.03	Case 35
LTE Band 66	Bottom Face at 0mm	0.641	0.637	0.556	0.334	0.250	0.109	1.834	1.387	1.334	0.01	Case 36				
	Edge 1 at 0mm	0.423						0.423	0.423	0.423						
	Edge 2 at 0mm	0.001						0.001	0.001	0.001						
	Edge 3 at 0mm		0.313	0.217	0.467	0.317	0.036	0.530	0.349	0.820						
	Bottom of Laptop at 0mm	1.081	0.218	0.481	1.029	0.902	0.051	1.780	1.350	3.063	0.01	Case 37			0.03	Case 38
LTE Band 41	Bottom Face at 0mm	0.715	0.637	0.556	0.334	0.250	0.109	1.908	1.461	1.408	0.01	Case 39				
	Edge 1 at 0mm	0.087						0.087	0.087	0.087						
	Edge 2 at 0mm	0.001						0.001	0.001	0.001						
	Edge 3 at 0mm		0.313	0.217	0.467	0.317	0.036	0.530	0.349	0.820						
	Bottom of Laptop at 0mm	0.179	0.218	0.481	1.029	0.902	0.051	0.878	0.448	2.161					0.03	Case 40

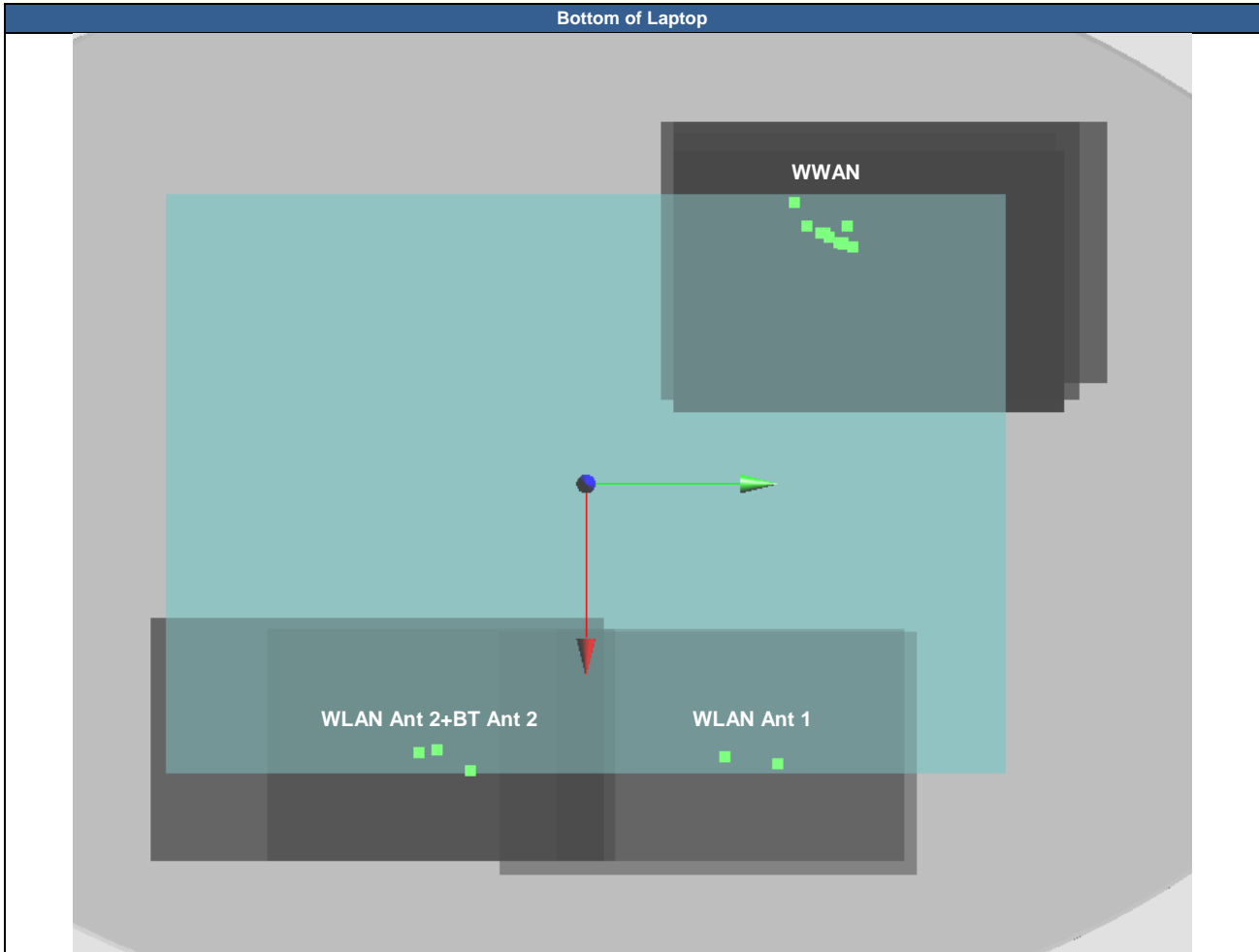
14.2 SPLSR Evaluation and Analysis

General Note:

1. According to antenna location the minimum distance is using for SPLSR analysis
2. Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneously transmitting antenna. When the sum of 1-g or 10-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration. Therefore, the adjacent transmit antennas will be summed first, and then the SPLSR calculation will be evaluated with the farther transmitted antennas.
3. $SPLSR = (SAR_1 + SAR_2)^{1.5} / (min. \text{ separation distance, mm})$. If $SPLSR \leq 0.04$, simultaneously transmission SAR measurement is not necessary

<RTL8822CE>





Case No.	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				
Case 1	WCDMA II	Bottom of Laptop	1.184	0mm	-88.1	79.3	5.68	189.2	2.17	0.02	Not required
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02				
	WCDMA II	Bottom of Laptop	1.184	0mm	-88.1	79.3	5.68	219.6	2.38	0.02	Not required
	WLAN5GHz_Ant 2	Bottom of Laptop	1.197	0mm	97.4	-38.2	4.96				
	WCDMA II	Bottom of Laptop	1.184	0mm	-88.1	79.3	5.68	217.7	1.36	0.01	Not required
	Bluetooth_Ant 2	Bottom of Laptop	0.173	0mm	88.8	-47.6	5.28				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	92.2	2.19	0.04	Not required
	WLAN5GHz_Ant 2	Bottom of Laptop	1.197	0mm	97.4	-38.2	4.96				
WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	102.2	1.16	0.01	Not required	
Bluetooth_Ant 2	Bottom of Laptop	0.173	0mm	88.8	-47.6	5.28					
Case 2	WCDMA IV	Bottom of Laptop	1.106	0mm	-88.1	79.4	5.71	189.2	2.10	0.02	Not required
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02				
	WCDMA IV	Bottom of Laptop	1.106	0mm	-88.1	79.4	5.71	219.6	2.30	0.02	Not required
	WLAN5GHz_Ant 2	Bottom of Laptop	1.197	0mm	97.4	-38.2	4.96				
	WCDMA IV	Bottom of Laptop	1.106	0mm	-88.1	79.4	5.71	217.8	1.28	0.01	Not required
	Bluetooth_Ant 2	Bottom of Laptop	0.173	0mm	88.8	-47.6	5.28				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	92.2	2.19	0.04	Not required
	WLAN5GHz_Ant 2	Bottom of Laptop	1.197	0mm	97.4	-38.2	4.96				
WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	102.2	1.16	0.01	Not required	
Bluetooth_Ant 2	Bottom of Laptop	0.173	0mm	88.8	-47.6	5.28					

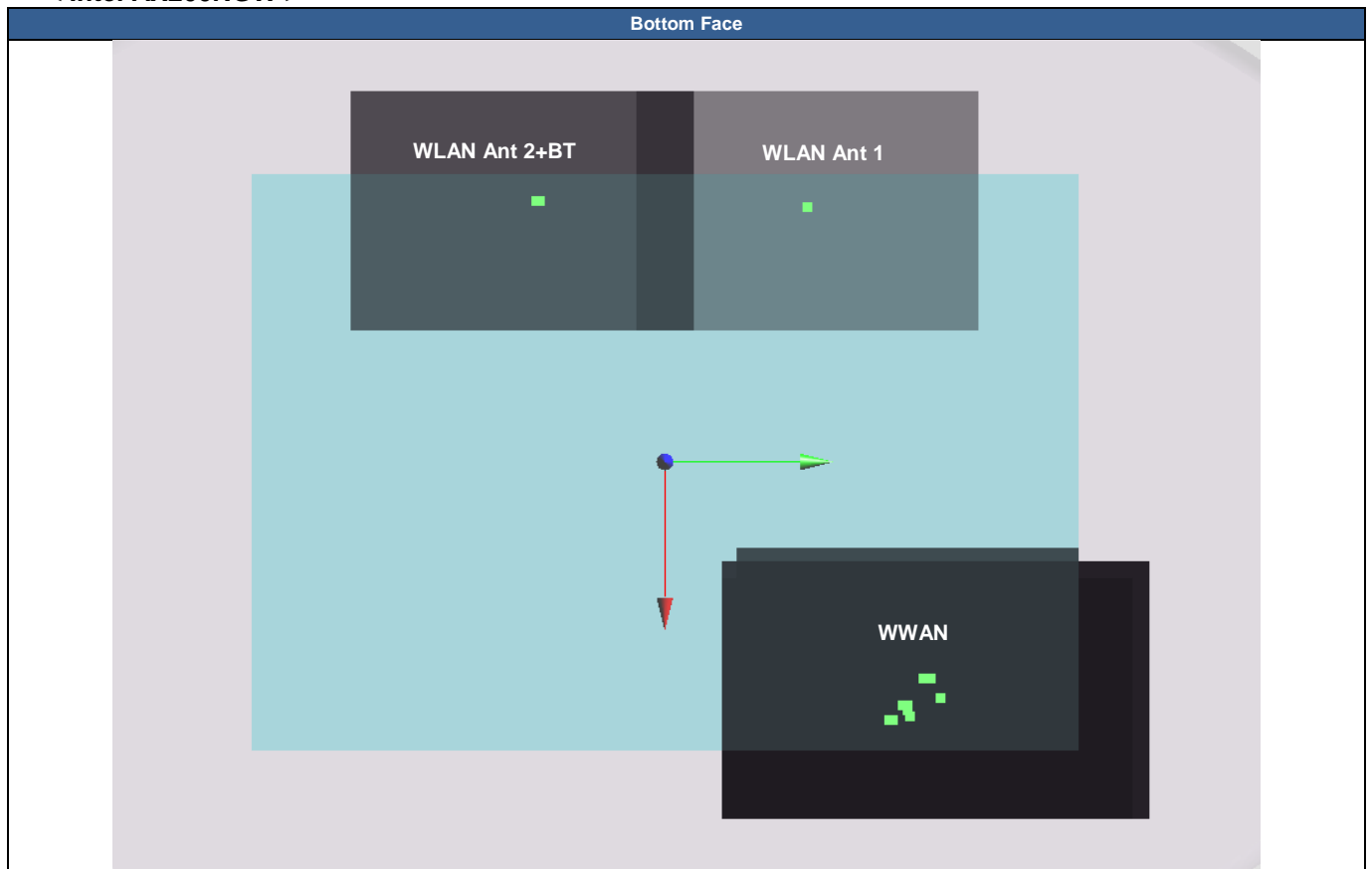


	Band	Position	SAR (W/kg)	Gap	SAR peak location (cm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 3	WCDMA V	Bottom of Laptop	0.584	0mm	-89.3	85.3	6.02	191.3	1.57	0.01	Not required
	WLAN5GHz_Ant 1		0.989	0mm	99.4	54	6.02				
	WCDMA V	Bottom of Laptop	0.584	0mm	-89.3	85.3	6.02	223.9	1.78	0.01	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	WCDMA V	Bottom of Laptop	0.584	0mm	-89.3	85.3	6.02	222.2	0.76	0.00	Not required
	Bluetooth_Ant 2		0.173	0mm	88.8	-47.6	5.28				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	92.2	2.19	0.04	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	102.2	1.16	0.01	Not required
Bluetooth_Ant 2	0.173		0mm	88.8	-47.6	5.28					
Case 4	LTE Band 2	Bottom of Laptop	1.043	0mm	-89.8	77.6	3.75	190.7	2.03	0.02	Not required
	WLAN5GHz_Ant 1		0.989	0mm	99.4	54	6.02				
	LTE Band 2	Bottom of Laptop	1.043	0mm	-89.8	77.6	3.75	220.1	2.24	0.02	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	LTE Band 2	Bottom of Laptop	1.043	0mm	-89.8	77.6	3.75	218.1	1.22	0.01	Not required
	Bluetooth_Ant 2		0.173	0mm	88.8	-47.6	5.28				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	92.2	2.19	0.04	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	102.2	1.16	0.01	Not required
Bluetooth_Ant 2	0.173		0mm	88.8	-47.6	5.28					
Case 5	LTE Band 7	Bottom of Laptop	0.525	0mm	-89	77.4	4.79	189.9	1.51	0.01	Not required
	WLAN5GHz_Ant 1		0.989	0mm	99.4	54	6.02				
	LTE Band 7	Bottom of Laptop	0.525	0mm	-89	77.4	4.79	219.3	1.72	0.01	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	LTE Band 7	Bottom of Laptop	0.525	0mm	-89	77.4	4.79	217.3	0.70	0.00	Not required
	Bluetooth_Ant 2		0.173	0mm	88.8	-47.6	5.28				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	92.2	2.19	0.04	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	102.2	1.16	0.01	Not required
Bluetooth_Ant 2	0.173		0mm	88.8	-47.6	5.28					
Case 6	LTE Band 12	Bottom of Laptop	0.254	0mm	-89	83.6	4.85	190.7	1.24	0.01	Not required
	WLAN5GHz_Ant 1		0.989	0mm	99.4	54	6.02				
	LTE Band 12	Bottom of Laptop	0.254	0mm	-89	83.6	4.85	222.7	1.45	0.01	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	92.2	2.19	0.04	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
Case 7	LTE Band 13	Bottom of Laptop	0.462	0mm	-87.8	85.3	4.86	189.8	1.45	0.01	Not required
	WLAN5GHz_Ant 1		0.989	0mm	99.4	54	6.02				
	LTE Band 13	Bottom of Laptop	0.462	0mm	-87.8	85.3	4.86	222.6	1.66	0.01	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	LTE Band 13	Bottom of Laptop	0.462	0mm	-87.8	85.3	4.86	221.0	0.64	0.00	Not required
	Bluetooth_Ant 2		0.173	0mm	88.8	-47.6	5.28				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	92.2	2.19	0.04	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	102.2	1.16	0.01	Not required
Bluetooth_Ant 2	0.173		0mm	88.8	-47.6	5.28					



	Band	Position	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 8	LTE Band 26	Bottom of Laptop	0.534	0mm	-86.7	83.8	3.79	188.5	1.52	0.01	Not required
	WLAN5GHz_Ant 1		0.989	0mm	99.4	54	6.02				
	LTE Band 26	Bottom of Laptop	0.534	0mm	-86.7	83.8	3.79	220.9	1.73	0.01	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	LTE Band 26	Bottom of Laptop	0.534	0mm	-86.7	83.8	3.79	219.2	0.71	0.00	Not required
	Bluetooth_Ant 2		0.173	0mm	88.8	-47.6	5.28				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	92.2	2.19	0.04	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	102.2	1.16	0.01	Not required
Bluetooth_Ant 2	0.173		0mm	88.8	-47.6	5.28					
Case 9	LTE Band 30	Bottom Face	1.051	0mm	78.8	91.8	4.27	178.5	1.35	0.01	Not required
	WLAN2.4GHz_Ant 1		0.296	0mm	-92.8	42.8	4.54				
	LTE Band 30	Bottom Face	1.051	0mm	78.8	91.8	4.27	222.4	1.43	0.01	Not required
	WLAN2.4GHz_Ant 2		0.382	0mm	-92.2	-50.4	4				
	WLAN2.4GHz_Ant 1	Bottom Face	0.296	0mm	-92.8	42.8	4.54	93.2	0.68	0.01	Not required
	WLAN2.4GHz_Ant 2		0.382	0mm	-92.2	-50.4	4				
Case 10	LTE Band 30	Bottom of Laptop	0.592	0mm	-80.8	91	4.98	184.0	1.58	0.01	Not required
	WLAN5GHz_Ant 1		0.989	0mm	99.4	54	6.02				
	LTE Band 30	Bottom of Laptop	0.592	0mm	-80.8	91	4.98	220.1	1.79	0.01	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	LTE Band 66	Bottom of Laptop	0.592	0mm	-80.8	91	4.98	219.0	0.77	0.00	Not required
	Bluetooth_Ant 2		0.173	0mm	88.8	-47.6	5.28				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	92.2	2.19	0.04	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	102.2	1.16	0.01	Not required
Bluetooth_Ant 2	0.173		0mm	88.8	-47.6	5.28					
Case 11	LTE Band 66	Bottom of Laptop	1.081	0mm	-88.1	79.4	5.57	189.2	2.07	0.02	Not required
	WLAN5GHz_Ant 1		0.989	0mm	99.4	54	6.02				
	LTE Band 66	Bottom of Laptop	1.081	0mm	-88.1	79.4	5.57	219.6	2.28	0.02	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	LTE Band 66	Bottom of Laptop	1.081	0mm	-88.1	79.4	5.57	217.8	1.25	0.01	Not required
	Bluetooth_Ant 2		0.173	0mm	88.8	-47.6	5.28				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	92.2	2.19	0.04	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	102.2	1.16	0.01	Not required
Bluetooth_Ant 2	0.173		0mm	88.8	-47.6	5.28					
Case 12	LTE Band 41	Bottom of Laptop	0.179	0mm	-95	75	4.97	195.5	1.17	0.01	Not required
	WLAN5GHz_Ant 1		0.989	0mm	99.4	54	6.02				
	LTE Band 41	Bottom of Laptop	0.179	0mm	-95	75	4.97	223.2	1.38	0.01	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	LTE Band 41	Bottom of Laptop	0.179	0mm	-95	75	4.97	220.9	0.35	0.00	Not required
	Bluetooth_Ant 2		0.173	0mm	88.8	-47.6	5.28				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	92.2	2.19	0.04	Not required
	WLAN5GHz_Ant 2		1.197	0mm	97.4	-38.2	4.96				
	WLAN5GHz_Ant 1	Bottom of Laptop	0.989	0mm	99.4	54	6.02	102.2	1.16	0.01	Not required
Bluetooth_Ant 2	0.173		0mm	88.8	-47.6	5.28					

< Intel AX200NGW >





	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (cm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 13	WCDMA II	Bottom Face	0.782	0mm	90.5	81.1	5.43	181.2	1.42	0.01	Not required
	WLAN2.4GHz_Ant 1		0.637	0mm	-88.2	51	2.12				
	WCDMA II	Bottom Face	0.782	0mm	90.5	81.1	5.43	225.1	1.34	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
	WLAN2.4GHz_Ant 1	Bottom Face	0.637	0mm	-88.2	51	2.12	101.5	1.19	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
Case 14	WCDMA II	Bottom of Laptop	1.184	0mm	-88.1	79.3	5.68	187.3	1.52	0.01	Not required
	WLAN2.4GHz_Ant 1		0.334	0mm	98.6	64	3.56				
	WCDMA II	Bottom of Laptop	1.184	0mm	-88.1	79.3	5.68	222.2	1.43	0.01	Not required
	WLAN2.4GHz_Ant 2		0.25	0mm	93.6	-48.6	3.52				
	WLAN2.4GHz_Ant 1	Bottom of Laptop	0.334	0mm	98.6	64	3.56	112.7	0.58	0.00	Not required
	WLAN2.4GHz_Ant 2		0.25	0mm	93.6	-48.6	3.52				
Case 15	WCDMA II	Bottom of Laptop	1.184	0mm	-88.1	79.3	5.68	187.9	2.21	0.02	Not required
	WLAN5GHz_Ant 1		1.029	0mm	98	53.6	4.83				
	WCDMA II	Bottom of Laptop	1.184	0mm	-88.1	79.3	5.68	220.1	2.14	0.01	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
	WLAN5GHz_Ant 1	Bottom of Laptop	1.029	0mm	98	53.6	4.83	92.8	1.98	0.03	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				

Case	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (cm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 16	WCDMA IV	Bottom Face	0.696	0mm	90.5	78.5	4.54	180.8	1.33	0.01	Not required
	WLAN2.4GHz_Ant 1		0.637	0mm	-88.2	51	2.12				
	WCDMA II	Bottom Face	0.696	0mm	90.5	78.5	4.54	223.6	1.25	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
	WLAN2.4GHz_Ant 1	Bottom Face	0.637	0mm	-88.2	51	2.12	101.5	1.19	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
Case 17	WCDMA IV	Bottom of Laptop	1.106	0mm	-88.1	79.4	5.71	187.3	1.44	0.01	Not required
	WLAN2.4GHz_Ant 1		0.334	0mm	98.6	64	3.56				
	WCDMA IV	Bottom of Laptop	1.106	0mm	-88.1	79.4	5.71	222.3	1.36	0.01	Not required
	WLAN2.4GHz_Ant 2		0.25	0mm	93.6	-48.6	3.52				
	WLAN2.4GHz_Ant 1	Bottom of Laptop	0.334	0mm	98.6	64	3.56	112.7	0.58	0.00	Not required
	WLAN2.4GHz_Ant 2		0.25	0mm	93.6	-48.6	3.52				
Case 18	WCDMA IV	Bottom of Laptop	1.106	0mm	-88.1	79.4	5.71	187.9	2.14	0.02	Not required
	WLAN5GHz_Ant 1		1.029	0mm	98	53.6	4.83				
	WCDMA IV	Bottom of Laptop	1.106	0mm	-88.1	79.4	5.71	220.2	2.06	0.01	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
	WLAN5GHz_Ant 1	Bottom of Laptop	1.029	0mm	98	53.6	4.83	92.8	1.98	0.03	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
Case 19	WCDMA V	Bottom Face	0.549	0mm	90.34	85.11	-2.51	181.8	1.19	0.01	Not required
	WLAN2.4GHz_Ant 1		0.637	0mm	-88.2	51	2.12				
	WCDMA V	Bottom Face	0.549	0mm	90.34	85.11	-2.51	227.4	1.11	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
	WLAN2.4GHz_Ant 1	Bottom Face	0.637	0mm	-88.2	51	2.12	101.5	1.19	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
Case 20	WCDMA V	Bottom of Laptop	0.584	0mm	-89.3	85.3	6.02	190.0	1.61	0.01	Not required
	WLAN5GHz_Ant 1		1.029	0mm	98	53.6	4.83				
	WCDMA V	Bottom of Laptop	0.584	0mm	-89.3	85.3	6.02	224.4	1.54	0.01	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
	WLAN5GHz_Ant 1	Bottom of Laptop	1.029	0mm	98	53.6	4.83	92.8	1.98	0.03	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
Case 21	LTE Band 2	Bottom Face	0.729	0mm	90.5	80	5.47	181.1	1.37	0.01	Not required
	WLAN2.4GHz_Ant 1		0.637	0mm	-88.2	51	2.12				
	LTE Band 2	Bottom Face	0.729	0mm	90.5	80	5.47	224.5	1.29	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
	WLAN2.4GHz_Ant 1	Bottom Face	0.637	0mm	-88.2	51	2.12	101.5	1.19	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				



Case	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (cm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 22	LTE Band 2	Bottom of Laptop	1.043	0mm	-89.8	77.6	3.75	188.9	1.38	0.01	Not required
	WLAN2.4GHz_Ant 1		0.334	0mm	98.6	64	3.56				
	LTE Band 2	Bottom of Laptop	1.043	0mm	-89.8	77.6	3.75	222.6	1.29	0.01	Not required
	WLAN2.4GHz_Ant 2		0.25	0mm	93.6	-48.6	3.52				
	WLAN2.4GHz_Ant 1	Bottom of Laptop	0.334	0mm	98.6	64	3.56	112.7	0.58	0.00	Not required
	WLAN2.4GHz_Ant 2		0.25	0mm	93.6	-48.6	3.52				
Case 23	LTE Band 2	Bottom of Laptop	1.043	0mm	-89.8	77.6	3.75	189.3	2.07	0.02	Not required
	WLAN5GHz_Ant 1		1.029	0mm	98	53.6	4.83				
	LTE Band 2	Bottom of Laptop	1.043	0mm	-89.8	77.6	3.75	220.7	2.00	0.01	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
	WLAN5GHz_Ant 1	Bottom of Laptop	1.029	0mm	98	53.6	4.83	92.8	1.98	0.03	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
Case 24	LTE Band 7	Bottom Face	0.831	0mm	79.8	93.2	4.27	173.2	1.47	0.01	Not required
	WLAN2.4GHz_Ant 1		0.637	0mm	-88.2	51	2.12				
	LTE Band 7	Bottom Face	0.831	0mm	79.8	93.2	4.27	224.1	1.39	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
	WLAN2.4GHz_Ant 1	Bottom Face	0.637	0mm	-88.2	51	2.12	101.5	1.19	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
Case 25	LTE Band 7	Bottom of Laptop	0.525	0mm	-89	77.4	4.79	188.5	1.55	0.01	Not required
	WLAN5GHz_Ant 1		1.029	0mm	98	53.6	4.83				
	LTE Band 7	Bottom of Laptop	0.525	0mm	-89	77.4	4.79	219.9	1.48	0.01	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
	WLAN5GHz_Ant 1	Bottom of Laptop	1.029	0mm	98	53.6	4.83	92.8	1.98	0.03	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
Case 26	LTE Band 12	Bottom Face	0.559	0mm	91.82	79.63	-2.26	182.3	1.20	0.01	Not required
	WLAN2.4GHz_Ant 1		0.637	0mm	-88.2	51	2.12				
	LTE Band 12	Bottom Face	0.559	0mm	91.82	79.63	-2.26	225.4	1.12	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
	WLAN2.4GHz_Ant 1	Bottom Face	0.637	0mm	-88.2	51	2.12	101.5	1.19	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
Case 27	LTE Band 12	Bottom of Laptop	0.254	0mm	-89	83.6	4.85	189.4	1.28	0.01	Not required
	WLAN5GHz_Ant 1		1.029	0mm	98	53.6	4.83				
	LTE Band 12	Bottom of Laptop	0.254	0mm	-89	83.6	4.85	223.2	1.21	0.01	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
	WLAN5GHz_Ant 1	Bottom of Laptop	1.029	0mm	98	53.6	4.83	92.8	1.98	0.03	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				

Case	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (cm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 28	LTE Band 13	Bottom Face	0.565	0mm	91.91	78.62	-2.23	182.3	1.20	0.01	Not required
	WLAN2.4GHz_Ant 1		0.637	0mm	-88.2	51	2.12				
	LTE Band 13	Bottom Face	0.565	0mm	91.91	78.62	-2.23	224.9	1.12	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
	WLAN2.4GHz_Ant 1	Bottom Face	0.637	0mm	-88.2	51	2.12	101.5	1.19	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
Case 29	LTE Band 13	Bottom of Laptop	0.462	0mm	-87.8	85.3	4.86	188.5	1.49	0.01	Not required
	WLAN5GHz_Ant 1		1.029	0mm	98	53.6	4.83				
	LTE Band 13	Bottom of Laptop	0.462	0mm	-87.8	85.3	4.86	223.2	1.42	0.01	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
	WLAN5GHz_Ant 1	Bottom of Laptop	1.029	0mm	98	53.6	4.83	92.8	1.98	0.03	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
Case 30	LTE Band 26	Bottom Face	0.411	0mm	87.4	84.4	5.52	178.8	1.05	0.01	Not required
	WLAN2.4GHz_Ant 1		0.637	0mm	-88.2	51	2.12				
	LTE Band 26	Bottom Face	0.411	0mm	87.4	84.4	5.52	224.6	0.97	0.00	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
	WLAN2.4GHz_Ant 1	Bottom Face	0.637	0mm	-88.2	51	2.12	101.5	1.19	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
Case 31	LTE Band 26	Bottom of Laptop	0.534	0mm	-86.7	83.8	3.79	187.2	1.56	0.01	Not required
	WLAN5GHz_Ant 1		1.029	0mm	98	53.6	4.83				
	LTE Band 26	Bottom of Laptop	0.534	0mm	-86.7	83.8	3.79	221.4	1.49	0.01	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
	WLAN5GHz_Ant 1	Bottom of Laptop	1.029	0mm	98	53.6	4.83	92.8	1.98	0.03	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
Case 32	LTE Band 30	Bottom Face	1.051	0mm	78.8	91.8	4.27	171.9	1.69	0.01	Not required
	WLAN2.4GHz_Ant 1		0.637	0mm	-88.2	51	2.12				
	LTE Band 30	Bottom Face	1.051	0mm	78.8	91.8	4.27	222.4	1.61	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
	WLAN2.4GHz_Ant 1	Bottom Face	0.637	0mm	-88.2	51	2.12	101.5	1.19	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
Case 33	LTE Band 30	Bottom Face	1.051	0mm	78.8	91.8	4.27	171.9	1.69	0.01	Not required
	WLAN2.4GHz_Ant 1		0.637	0mm	-88.2	51	2.12				
	LTE Band 30	Bottom Face	1.051	0mm	78.8	91.8	4.27	218.7	1.16	0.01	Not required
	Bluetooth_Ant 2		0.109	0mm	-91.6	-45.2	1.64				
	WLAN2.4GHz_Ant 1	Bottom Face	0.637	0mm	-88.2	51	2.12	96.3	0.75	0.01	Not required
	Bluetooth_Ant 2		0.109	0mm	-91.6	-45.2	1.64				

	Band	Position	SAR (W/kg)	Gap	SAR peak location (cm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 34	LTE Band 30	Bottom Face	1.051	0mm	78.8	91.8	4.27	185.9	1.27	0.01	Not required
	WLAN5GHz_Ant 1		0.218	0mm	-104.2	59	4.95				
	LTE Band 30	Bottom Face	1.051	0mm	78.8	91.8	4.27	220.7	1.41	0.01	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.359	0mm	-94.2	-45.2	5.82				
	WLAN5GHz_Ant 1	Bottom Face	0.218	0mm	-104.2	59	4.95	104.7	0.58	0.00	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.359	0mm	-94.2	-45.2	5.82				
Case 35	LTE Band 30	Bottom of Laptop	0.592	0mm	-80.8	91	4.98	182.7	1.62	0.01	Not required
	WLAN5GHz_Ant 1		1.029	0mm	98	53.6	4.83				
	LTE Band 30	Bottom of Laptop	0.592	0mm	-80.8	91	4.98	220.7	1.55	0.01	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
	WLAN5GHz_Ant 1	Bottom of Laptop	1.029	0mm	98	53.6	4.83	92.8	1.98	0.03	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
Case 36	LTE Band 66	Bottom Face	0.641	0mm	90.5	78.5	5.51	180.8	1.28	0.01	Not required
	WLAN2.4GHz_Ant 1		0.637	0mm	-88.2	51	2.12				
	LTE Band 66	Bottom Face	0.641	0mm	90.5	78.5	5.51	223.6	1.20	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
	WLAN2.4GHz_Ant 1	Bottom Face	0.637	0mm	-88.2	51	2.12	101.5	1.19	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
Case 37	LTE Band 66	Bottom of Laptop	1.081	0mm	-88.1	79.4	5.57	187.3	1.42	0.01	Not required
	WLAN2.4GHz_Ant 1		0.334	0mm	98.6	64	3.56				
	LTE Band 66	Bottom of Laptop	1.081	0mm	-88.1	79.4	5.57	222.3	1.33	0.01	Not required
	WLAN2.4GHz_Ant 2		0.25	0mm	93.6	-48.6	3.52				
	WLAN2.4GHz_Ant 1	Bottom of Laptop	0.334	0mm	98.6	64	3.56	112.7	0.58	0.00	Not required
	WLAN2.4GHz_Ant 2		0.25	0mm	93.6	-48.6	3.52				
Case 38	LTE Band 66	Bottom of Laptop	1.081	0mm	-88.1	79.4	5.57	187.9	2.11	0.02	Not required
	WLAN5GHz_Ant 1		1.029	0mm	98	53.6	4.83				
	LTE Band 66	Bottom of Laptop	1.081	0mm	-88.1	79.4	5.57	220.2	2.03	0.01	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
	WLAN5GHz_Ant 1	Bottom of Laptop	1.029	0mm	98	53.6	4.83	92.8	1.98	0.03	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				

	Band	Position	SAR (W/kg)	Gap	SAR peak location (cm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 39	LTE Band 41	Bottom Face	0.715	0mm	82	92.8	2.8	175.3	1.35	0.01	Not required
	WLAN2.4GHz_Ant 1		0.637	0mm	-88.2	51	2.12				
	LTE Band 41	Bottom Face	0.715	0mm	82	92.8	2.8	225.5	1.27	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
	WLAN2.4GHz_Ant 1	Bottom Face	0.637	0mm	-88.2	51	2.12	101.5	1.19	0.01	Not required
	WLAN2.4GHz_Ant 2		0.556	0mm	-92.2	-50.4	4				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 40	LTE Band 41	Bottom of Laptop	0.179	0mm	-95	75	4.97	194.2	1.21	0.01	Not required
	WLAN5GHz_Ant 1		1.029	0mm	98	53.6	4.83				
	LTE Band 41	Bottom of Laptop	0.179	0mm	-95	75	4.97	223.7	1.13	0.01	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				
	WLAN5GHz_Ant 1	Bottom of Laptop	1.029	0mm	98	53.6	4.83	92.8	1.98	0.03	Not required
	WLAN5GHz_Ant 2 + BT Ant 2		0.953	0mm	97.4	-39.2	4.75				

Test Engineer : Jimmy Lu, Bob Cheng, Hoodie HuZeng and Sing Lim

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. Therefore, the measurement uncertainty table is not required in this report.

Declaration of Conformity:

The test results with all measurement uncertainty excluded is presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.



16. References

- [1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”
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- [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 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015
- [8] FCC KDB 941225 D05A v01r02, “Rel. 10 LTE SAR Test Guidance and KDB Inquiries”, Oct 2015
- [9] FCC KDB 616217 D04 v01r02, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, Oct 2015
- [10] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.
- [11] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.