FCC SAR TEST REPORT

FCC ID	:	**QYLEM7511F6**
Equipment	:	**WWAN Module**
Brand Name	:	**Getac**
Model Name	:	**EM7511**
Applicant	:	**Getac Technology Corporation. 5F., Building A, No. 209, Sec.1, Nangang Rd.,Nangang Dist., Taipei City 11568, Taiwan, R.O.C.**
Standard	:	**FCC 47 CFR Part 2 (2.1093)**

The product was installed into Tablet (Brand Name Getac, Model Name: F110, F110G6, F110-Ex, F110-621) during test.

The product was received on Jan 26, 2021 and testing was started from Feb 05, 2021 and completed on Feb 09, 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

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History of this test report

Report No.	Version	Description	Issued Date
FA111323	01	Initial issue of report	Mar. 04, 2021

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Getac Technology Corporation., WWAN Module, EM7511, are as follows.

Equipment Class	Frequency Band		Highest SAR Summary Body 1g SAR (W/kg)	Highest Simultaneous Transmission 1g SAR (W/kg)
Licensed	WCDMA	WCDMA II	1.18	1.59
		WCDMA IV	1.18	
		WCDMA V	0.71	
	LTE	LTE Band 2	1.04	
		LTE Band 7	1.14	
		LTE Band 12	0.33	
		LTE Band 13	0.42	
		LTE Band 14	0.47	
		LTE Band 5 / 26	0.65	
		LTE Band 41	1.13	
		LTE Band 48	0.85	
		LTE Band 4 / 66	1.10	
Date of Testing:			2021/2/5 ~ 2021/2/9	

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

Reviewed by: Jason Wang
Report Producer: Carlie Tsai

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 616217 D04 SAR for laptop and tablets v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02

3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	WWAN Module
Brand Name	Getac
Model Name	EM7511
FCC ID	QYLEM7511F6
Integrated WWAN Module	Brand Name: Sierra Model Name: EM7511
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 14: 788 MHz ~ 798 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM, 64QAM
Remark: 1. The Intel AX201NGW WLAN / Bluetooth module is also integrated into this host, for WLAN / Bluetooth power, SAR testing results and simultaneous transmission analysis which can be referred to Sporton FCC SAR Test Report, Report No.: FA111325 (FCC ID: QYLAX201NG). 2. This device has two kinds of SKU; the detail comparison as following table, RF exposure evaluation is selected SKU B as the main tested and SKU C spot check worst case found in SKU B.	

Host Information	
Equipment Name	Tablet
Brand Name	Getac
Model Name	F110, F110G6, F110-Ex, F110-621
EUT Stage	Production Unit

WLAN Module Information	
Equipment Name	Tablet
Brand Name	Getac
Model Name	F110, F110G6, F110-Ex, F110-621, F110-601
Integrated WLAN Module	Brand Name: Intel Model Name: AX201NGW
Integrated RFID Module	Brand Name: Getac Model Name: F110G6 PN7462 NFC
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2400 MHz ~ 2483.5 MHz 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 WLAN U-NII 5: 5925 MHz ~ 6425 MHz WLAN U-NII 6: 6425 MHz ~ 6525 MHz WLAN U-NII 7: 6525 MHz ~ 6875 MHz WLAN U-NII 8: 6875 MHz ~ 7125 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Mode	WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/VHT160/HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE NFC:ASK

Sample List		
SKU	SKU B	SKU C
CPU	i5-1135G7 (Non Vpro)	i7-1165G7 (Vpro)
DDR	Kingston DDR4-3200 16GB	Kingston DDR4-3200 32GB
SSD	512GB	1TB
PANEL	Full HD AUO	Full HD AUO
DIGITIZER	N/A	EMRright Digitizer
OPTION BAY	2D Barcode Reader	RS232 + LAN
Expansion Bay	Smart Card	Smart Card
Right side option	NXP RFID(PN7462)	Finger Print
WLAN/BT	Intel AX201	Intel AX201
WWAN(4G)	EM7511	EM7511
GPS/GNS	EM7511	EM7511
Rear 8M Camera	Support	Support
Webcam FHD	Not Support	Not Support
IR Webcam	Support	Support
USB3.2 Gen2 x 1 Type-A	Support	Support
Type-C (thunder bolt)	Support	Support
Audio/MIC	Support	Support

3.2 General LTE SAR Test and Reporting Considerations

<table>
<tr><th colspan="2">Summarized necessary items addressed in KDB 941225 D05 v02r05</th></tr>
<tr><td>FCC ID</td><td>QYLEM7511F6</td></tr>
<tr><td>Equipment Name</td><td>WWAN Module</td></tr>
<tr><td>Operating Frequency Range of each LTE transmission band</td><td>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 14: 788 MHz ~ 798 MHz
LTE Band 26: 814 MHz ~ 849 MHz
LTE Band 41: 2496 MHz ~ 2690 MHz
LTE Band 48: 3550 MHz ~ 3700 MHz
LTE Band 66: 1710 MHz ~ 1780 MHz</td></tr>
<tr><td>Channel Bandwidth</td><td>LTE Band 2: 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 14: 5MHz, 10MHz
LTE Band 26: 5MHz, 10MHz, 15MHz
LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 48: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 66: 5MHz, 10MHz, 15MHz, 20MHz</td></tr>
<tr><td>uplink modulations used</td><td>QPSK / 16QAM / 64QAM</td></tr>
<tr><td>LTE Voice / Data requirements</td><td>Data only</td></tr>
<tr><td>LTE MPR permanently built-in by design</td><td>
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr>
<tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr>
</table>
</td></tr>
<tr><td>LTE A-MPR</td><td>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)</td></tr>
<tr><td>Spectrum plots for RB configuration</td><td>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.</td></tr>
<tr><td>Power reduction applied to satisfy SAR compliance</td><td>Yes, Proximity Sensor.</td></tr>
<tr><td>LTE Carrier Aggregation Combinations</td><td>Intra-Band possible combinations and the detail power measurement please referred to section 12.</td></tr>
<tr><td>LTE Carrier Aggregation Additional Information</td><td>This device supports maximum of 3 carriers in the downlink and 2 carriers in the uplink. Additional following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.</td></tr>
</table>

Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745
LTE Band 5								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844
LTE Band 7								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510
M	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560
LTE Band 12								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711
LTE Band 13				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	23205	779.5	23230	782
M	23230	782		
H	23255	784.5		
LTE Band 14				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Channel #	Channel #	Freq.(MHz)
L	23305	790.5	23330	793
M	23330	793		
H	23355	795.5		
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)
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 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)
L	39675	2498.5	39700	2501	39725	2503.5	39750	2506
LM	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5
M	40620	2593	40620	2593	40620	2593	40620	2593
HM	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5
H	41565	2687.5	41540	2685	41515	2682.5	41490	2680

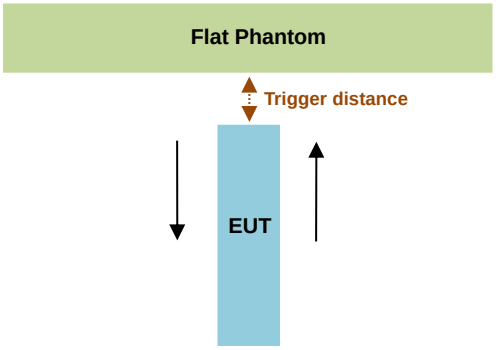
LTE Band 48								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	55265	3552.5	55290	3555	55315	3557.5	55340	3560
LM	55810	3607	55815	3607.5	55820	3608	55830	3609
MH	56170	3643	56165	3642.5	56160	3642	56150	3641
H	56715	3697.5	56690	3695	56665	3692.5	56640	3690

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.



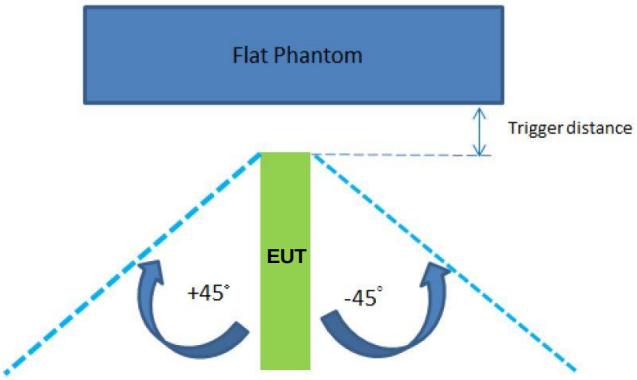
Proximity Sensor Trigger Distance (mm)		
Exposure Position	Edge 1	
	moving toward	moving away
Minimum	21	21

<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, 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 ≤ 10° increments until the tablet is ± 45° from the vertical position at 0°, and the maximum output power remains in the reduced mode.



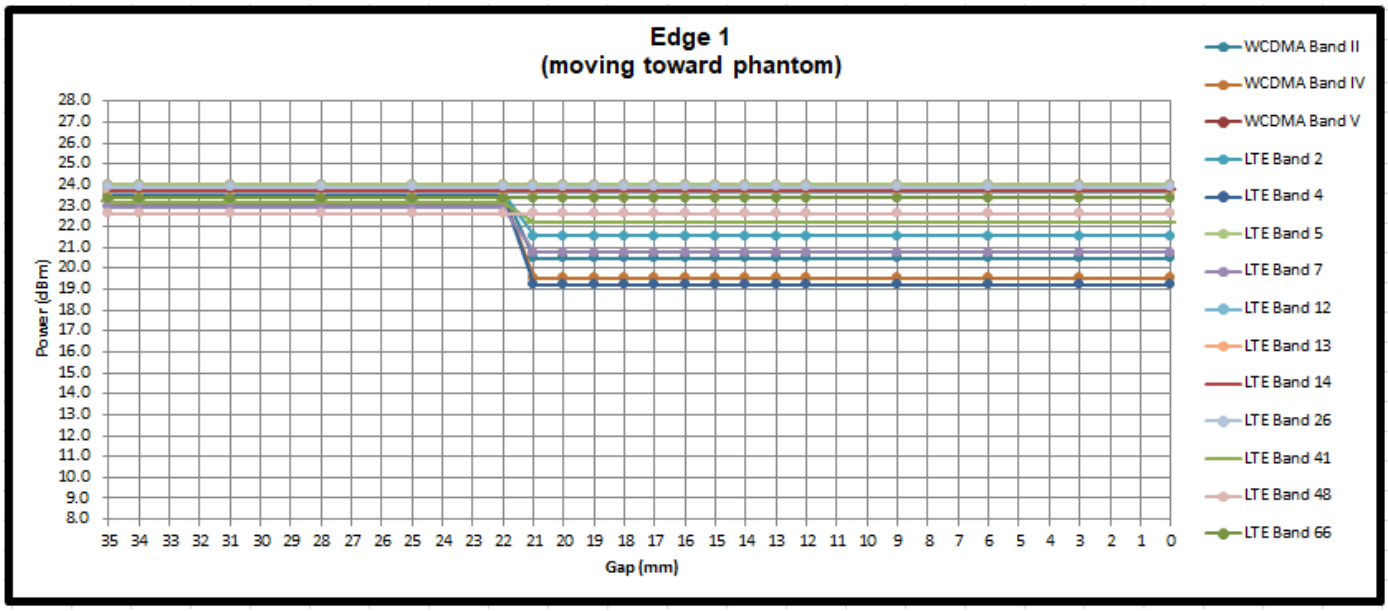
Proximity Sensor Trigger Distance (mm)		
Exposure Position	Edge 1	
	+45	-45
Minimum	22	22

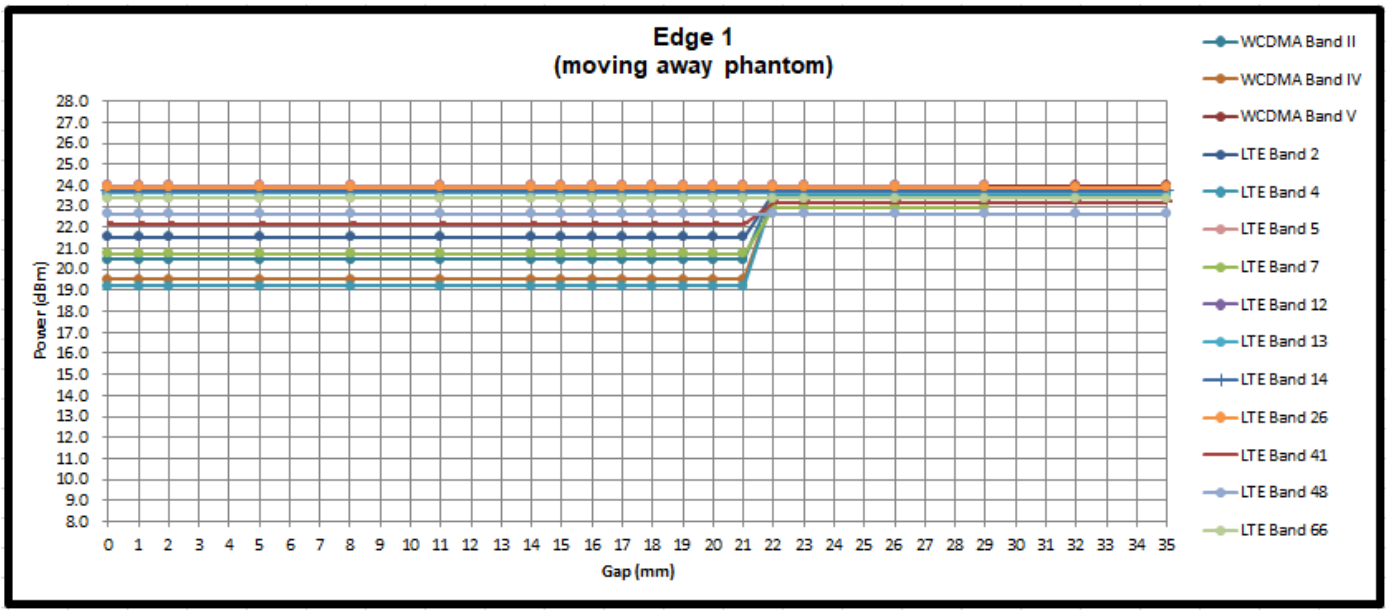
Proximity sensor power reduction

Exposure Position / wireless mode	Edge1 (1)
WCDMA Band II	2 dB
WCDMA Band IV	3 dB
WCDMA Band V	0 dB
LTE Band 2	2 dB
LTE Band 7	2 dB
LTE Band 12	0 dB
LTE Band 13	0 dB
LTE Band 14	0 dB
LTE Band 5/26	0 dB
LTE Band 41	1 dB
LTE Band 48	0 dB
LTE Band 4/66	3 dB

Remark:
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 as below
3. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance was performed:
   - Edge1: 20 mm

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:

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

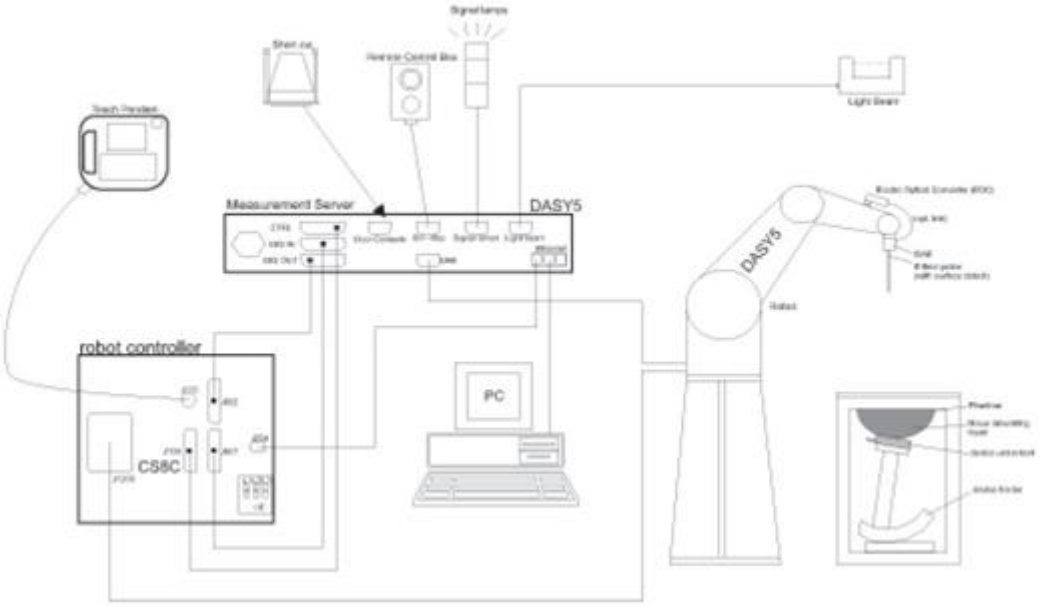
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

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 0007) and the FCC designation No. TW1190 and TW0007 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test.

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory			
Test Site Location	TW1190 No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, CHINESE TAIPEI		TW0007 No. 58, Aly. 75, Ln. 564, Wehnua 3rd, Rd., Guishan Dist., Taoyuan City, CHINESE TAIPEI	
Test Site No.	SAR01-HY	SAR03-HY	SAR08-HY	SAR09-HY
	SAR04-HY	SAR05-HY	SAR11-HY	SAR12-HY
	SAR06-HY	SAR10-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 µW/g – >100 mW/g; Linearity: ±0.2 dB	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 3.9 mm (body: 12 mm) Distance from probe tip to dipole centers: 3.0 mm	

<EX3DV4 Probe>

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

7.3 Data Acquisition Electronics (DAE)

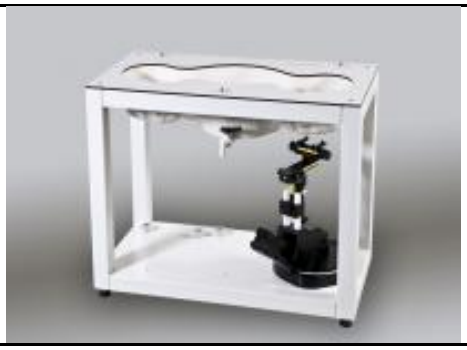
The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an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

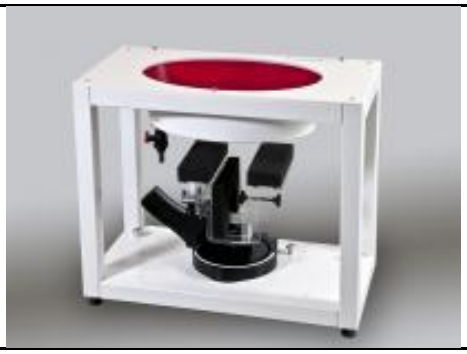
7.4 Phantom

<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 form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

8.2 Power Reference Measurement

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

8.3 Area Scan

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

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

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

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

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

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

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. 06, 2021
SPEAG	835MHz System Validation Kit(2)	D835V2	4d167	Nov. 25, 2019	Nov. 23, 2021
SPEAG	1750MHz System Validation Kit(2)	D1750V2	1112	Mar. 07, 2019	Mar. 05, 2021
SPEAG	1900MHz System Validation Kit(2)	D1900V2	5d185	Mar. 07, 2019	Mar. 05, 2021
SPEAG	2600MHz System Validation Kit(2)	D2600V2	1008	Aug. 31, 2018	Aug. 28, 2021
SPEAG	3500MHz System Validation Kit(2)	D3500V2	1014	Jan. 29, 2019	Jan. 26, 2022
SPEAG	3700MHz System Validation Kit(2)	D3700V2	1006	Mar. 05, 2019	Mar. 03, 2021
SPEAG	Data Acquisition Electronics	DAE4	376	Nov. 23, 2020	Nov. 22, 2021
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. 18, 2020	Mar. 17, 2021
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	Mar. 12, 2020	Mar. 11, 2021
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℃ to 25℃, 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℃ to 25℃ and within ± 2℃ 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. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	22.4	0.899	43.678	0.89	41.90	1.01	4.24	±5	2021/2/6
835	22.4	0.934	43.382	0.90	41.50	3.78	4.53	±5	2021/2/6
1750	22.3	1.341	39.945	1.37	40.10	-2.12	-0.39	±5	2021/2/5
1900	22.3	1.439	39.113	1.40	40.00	2.79	-2.22	±5	2021/2/5
2600	22.6	2.010	37.830	1.96	39.00	2.55	-3.00	±5	2021/2/9
3500	22.6	2.914	37.958	2.91	37.90	0.14	0.15	±5	2021/2/9
3700	22.6	3.119	37.728	3.12	37.70	-0.03	0.07	±5	2021/2/9

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.

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 (%)
2021/2/6	750	50	D750V3-1107	EX3DV4 - SN7590	DAE4 Sn376	0.394	8.32	7.88	-5.29
2021/2/6	835	50	D835V2-4d167	EX3DV4 - SN7590	DAE4 Sn376	0.448	9.55	8.96	-6.18
2021/2/5	1750	250	D1750V2-1112	EX3DV4 - SN7590	DAE4 Sn376	8.47	36.7	33.88	-7.68
2021/2/5	1900	250	D1900V2-5d185	EX3DV4 - SN7590	DAE4 Sn376	10.40	39.40	41.6	5.58
2021/2/9	2600	250	D2600V2-1008	EX3DV4 - SN7590	DAE4 Sn376	15.10	56.40	60.4	7.09
2021/2/9	3500	50	D3500V2-1014	EX3DV4 - SN7590	DAE4 Sn376	3.14	67.90	62.8	-7.51
2021/2/9	3700	50	D3700V2-1006	EX3DV4 - SN7590	DAE4 Sn376	3.16	67.30	63.2	-6.09

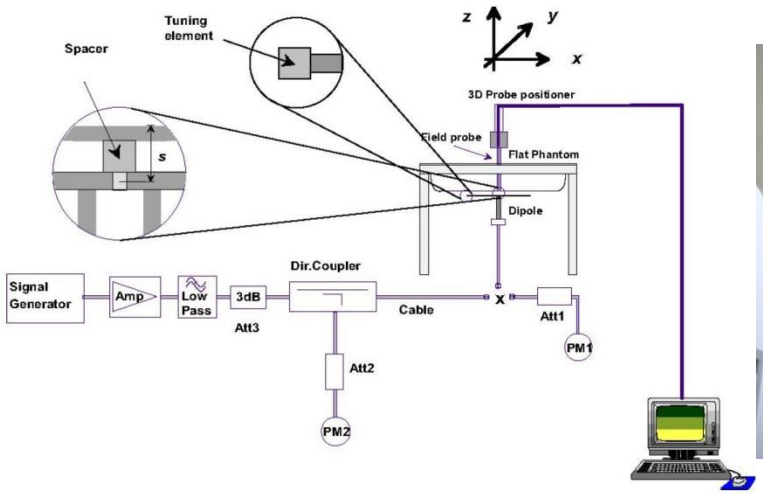


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

11. RF Exposure Positions

11.1 SAR Testing for Tablet

This device can be used also in full sized tablet exposure conditions, due to its size. Per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR exclusion threshold in KDB 447498 D01v06 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

12. 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.
3. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

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

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

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

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

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

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

Setup Configuration

HSUPA Setup Configuration:

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

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

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

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

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

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

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

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

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

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set RMC 12.2Kbps + HSDPA mode.
   ii. Set Cell Power = -25 dBm
   iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
   iv. Select HSDPA Uplink Parameters
   v. Set Gain Factors (β_c and β_d) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
      a). Subtest 1: β_c/β_d=2/15
      b). Subtest 2: β_c/β_d=12/15
      c). Subtest 3: β_c/β_d=15/8
      d). Subtest 4: β_c/β_d=15/4
   vi. Set Delta ACK, Delta NACK and Delta CQI = 8
   vii. Set Ack-Nack Repetition Factor to 3
   viii. Set CQI Feedback Cycle (k) to 4 ms
   ix. Set CQI Repetition Factor to 2
   x. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

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

C.8.1.12 Fixed Reference Channel Definition H-Set 12

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

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

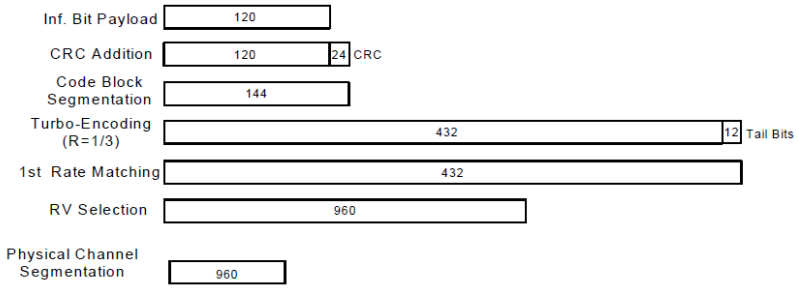


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

General Note:

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

Default Power Mode

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	RMC 12.2Kbps	23.65	23.78	23.73	24.00	23.46	23.56	23.61	24.00	23.86	23.99	23.89	24.00
3GPP Rel 6	HSDPA Subtest-1	22.34	22.42	22.47	23.50	22.39	22.56	22.47	23.50	22.42	22.53	22.30	23.50
3GPP Rel 6	HSDPA Subtest-2	22.38	22.46	22.42	23.50	22.39	22.54	22.45	23.50	22.43	22.51	22.33	23.50
3GPP Rel 6	HSDPA Subtest-3	21.89	21.94	21.99	23.00	21.88	22.05	21.96	23.00	21.94	22.06	21.83	23.00
3GPP Rel 6	HSDPA Subtest-4	21.81	21.95	22.01	23.00	21.88	22.05	21.94	23.00	21.92	21.95	21.84	23.00
3GPP Rel 8	DC-HSDPA Subtest-1	22.31	22.40	22.46	23.50	22.31	22.52	22.45	23.50	22.35	22.51	22.29	23.50
3GPP Rel 8	DC-HSDPA Subtest-2	22.29	22.44	22.42	23.50	22.31	22.52	22.44	23.50	22.42	22.50	22.23	23.50
3GPP Rel 8	DC-HSDPA Subtest-3	21.80	21.91	21.97	23.00	21.88	21.97	21.90	23.00	21.88	22.05	21.81	23.00
3GPP Rel 8	DC-HSDPA Subtest-4	21.79	21.95	21.91	23.00	21.84	22.03	21.92	23.00	21.88	21.86	21.84	23.00
3GPP Rel 6	HSUPA Subtest-1	22.37	22.43	22.48	23.50	22.36	22.56	22.45	23.50	22.43	22.50	22.29	23.50
3GPP Rel 6	HSUPA Subtest-2	20.29	20.43	20.47	21.50	20.38	20.50	20.41	21.50	20.43	20.49	20.29	21.50
3GPP Rel 6	HSUPA Subtest-3	21.29	21.42	21.47	22.50	21.37	21.58	21.46	22.50	21.42	21.48	21.29	22.50
3GPP Rel 6	HSUPA Subtest-4	20.25	20.45	20.49	21.50	20.39	20.52	20.42	21.50	20.48	20.48	20.28	21.50
3GPP Rel 6	HSUPA Subtest-5	22.30	22.40	22.50	23.50	22.40	22.60	22.40	23.50	22.40	22.50	22.30	23.50

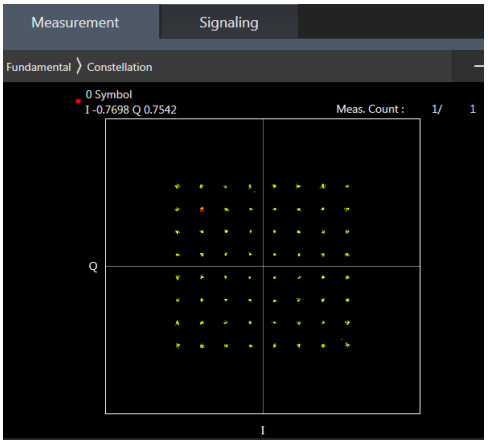
Reduced Power Mode

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513	
Rx Channel		9662	9800	9938		1537	1638	1738	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6	
3GPP Rel 99	RMC 12.2Kbps	20.24	20.49	20.40	22.00	19.38	19.53	19.41	21.00
3GPP Rel 6	HSDPA Subtest-1	19.27	19.43	19.47	21.00	18.37	18.54	18.44	20.00
3GPP Rel 6	HSDPA Subtest-2	19.29	19.46	19.52	21.00	18.38	18.54	18.42	20.00
3GPP Rel 6	HSDPA Subtest-3	18.77	18.98	19.01	20.50	17.85	18.02	17.95	19.50
3GPP Rel 6	HSDPA Subtest-4	18.77	18.94	19.02	20.50	17.86	18.03	17.92	19.50
3GPP Rel 8	DC-HSDPA Subtest-1	19.17	19.35	19.37	21.00	18.34	18.53	18.38	20.00
3GPP Rel 8	DC-HSDPA Subtest-2	19.19	19.39	19.46	21.00	18.29	18.45	18.42	20.00
3GPP Rel 8	DC-HSDPA Subtest-3	18.73	18.91	18.91	20.50	17.76	17.97	17.91	19.50
3GPP Rel 8	DC-HSDPA Subtest-4	18.73	18.93	19.01	20.50	17.80	17.93	17.89	19.50
3GPP Rel 6	HSUPA Subtest-1	19.28	19.43	19.47	20.00	18.34	18.54	18.44	19.00
3GPP Rel 6	HSUPA Subtest-2	17.22	17.40	17.49	18.00	16.32	16.51	16.39	17.00
3GPP Rel 6	HSUPA Subtest-3	18.27	18.44	18.49	19.00	17.35	17.52	17.41	18.00
3GPP Rel 6	HSUPA Subtest-4	17.24	17.42	17.49	18.00	16.34	16.53	16.43	17.00
3GPP Rel 6	HSUPA Subtest-5	19.30	19.50	19.50	20.00	18.40	18.50	18.40	19.00

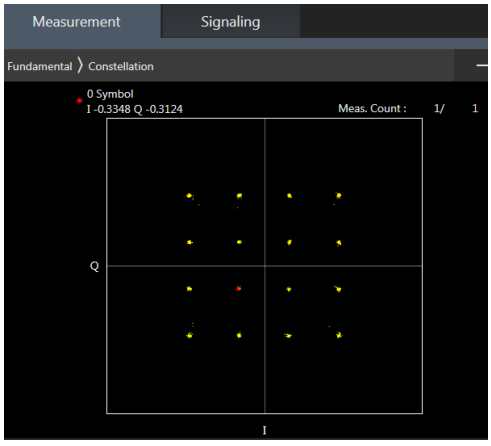
<LTE Conducted Power>

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 ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4/B5/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 25/66; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. the maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion
   b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to 2017 TCB workshop, for 64 QAM and 16 QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM and 16QAM signal modulation are correct.



64QAM



16QAM

Default Power Mode

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	23.31	23.54	23.58	24	0
20	QPSK	1	49	23.19	23.22	23.35		
20	QPSK	1	99	23.27	23.36	23.37		
20	QPSK	50	0	22.34	22.57	22.64	23	1
20	QPSK	50	24	22.35	22.37	22.44		
20	QPSK	50	50	22.19	22.52	22.47		
20	QPSK	100	0	22.40	22.59	22.38		
20	16QAM	1	0	22.89	22.82	22.63	23	1
20	16QAM	1	49	22.40	22.74	22.45		
20	16QAM	1	99	22.26	22.43	22.86		
20	16QAM	50	0	21.53	21.58	21.46	22	2
20	16QAM	50	24	21.33	21.42	21.46		
20	16QAM	50	50	21.24	21.53	21.50		
20	16QAM	100	0	21.28	21.50	21.43		
20	64QAM	1	0	21.59	21.85	21.71	22	2
20	64QAM	1	49	21.44	21.29	21.85		
20	64QAM	1	99	21.20	21.63	21.70		
20	64QAM	50	0	20.50	20.46	20.53	21	3
20	64QAM	50	24	20.40	20.38	20.62		
20	64QAM	50	50	20.29	20.54	20.42		
20	64QAM	100	0	20.22	20.43	20.46		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	23.28	23.57	23.55	24	0
15	QPSK	1	37	23.16	23.12	23.28		
15	QPSK	1	74	23.19	23.28	23.37		
15	QPSK	36	0	22.24	22.54	22.54	23	1
15	QPSK	36	20	22.32	22.30	22.38		
15	QPSK	36	39	22.15	22.44	22.40		
15	QPSK	75	0	22.32	22.57	22.35		
15	16QAM	1	0	22.82	22.73	22.57	23	1
15	16QAM	1	37	22.38	22.72	22.36		
15	16QAM	1	74	22.20	22.37	22.80		
15	16QAM	36	0	21.43	21.56	21.45	22	2
15	16QAM	36	20	21.30	21.33	21.44		
15	16QAM	36	39	21.22	21.48	21.44		
15	16QAM	75	0	21.25	21.49	21.43		
15	64QAM	1	0	21.52	21.75	21.66	22	2
15	64QAM	1	37	21.40	21.19	21.79		
15	64QAM	1	74	21.17	21.61	21.62		
15	64QAM	36	0	20.49	20.41	20.50	21	3
15	64QAM	36	20	20.36	20.31	20.56		
15	64QAM	36	39	20.27	20.52	20.38		
15	64QAM	75	0	20.12	20.39	20.46		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	23.22	23.58	23.49	24	0
10	QPSK	1	25	23.19	23.17	23.26		
10	QPSK	1	49	23.19	23.28	23.28		
10	QPSK	25	0	22.28	22.57	22.59	23	1

10	QPSK	25	12	22.33	22.31	22.34		
10	QPSK	25	25	22.13	22.42	22.46		
10	QPSK	50	0	22.32	22.58	22.34		
10	16QAM	1	0	22.89	22.72	22.63	23	1
10	16QAM	1	25	22.36	22.69	22.38		
10	16QAM	1	49	22.20	22.40	22.78		
10	16QAM	25	0	21.47	21.52	21.40	22	2
10	16QAM	25	12	21.24	21.37	21.41		
10	16QAM	25	25	21.23	21.52	21.44		
10	16QAM	50	0	21.19	21.42	21.40		
10	64QAM	1	0	21.58	21.80	21.70	22	2
10	64QAM	1	25	21.34	21.22	21.79		
10	64QAM	1	49	21.12	21.59	21.70		
10	64QAM	25	0	20.43	20.38	20.51	21	3
10	64QAM	25	12	20.35	20.34	20.60		
10	64QAM	25	25	20.28	20.52	20.39		
10	64QAM	50	0	20.16	20.34	20.44		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	23.31	23.54	23.56	24	0
5	QPSK	1	12	23.19	23.19	23.34		
5	QPSK	1	24	23.17	23.33	23.29		
5	QPSK	12	0	22.29	22.51	22.56	23	1
5	QPSK	12	7	22.31	22.29	22.40		
5	QPSK	12	13	22.15	22.47	22.47		
5	QPSK	25	0	22.33	22.52	22.34		
5	16QAM	1	0	22.80	22.75	22.59	23	1
5	16QAM	1	12	22.37	22.65	22.39		
5	16QAM	1	24	22.25	22.36	22.77		
5	16QAM	12	0	21.47	21.56	21.45	22	2
5	16QAM	12	7	21.30	21.34	21.43		
5	16QAM	12	13	21.20	21.50	21.43		
5	16QAM	25	0	21.21	21.44	21.36		
5	64QAM	1	0	21.50	21.75	21.68	22	2
5	64QAM	1	12	21.34	21.24	21.85		
5	64QAM	1	24	21.12	21.56	21.63		
5	64QAM	12	0	20.50	20.46	20.50	21	3
5	64QAM	12	7	20.30	20.33	20.52		
5	64QAM	12	13	20.23	20.44	20.37		
5	64QAM	25	0	20.22	20.34	20.46		

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	23.38	23.47	23.54	24	0
20	QPSK	1	49	23.25	23.17	23.33		
20	QPSK	1	99	23.37	23.46	23.40		
20	QPSK	50	0	22.39	22.62	22.63	23	1
20	QPSK	50	24	22.27	22.49	22.46		
20	QPSK	50	50	22.37	22.57	22.43		
20	QPSK	100	0	22.40	22.55	22.54		
20	16QAM	1	0	22.78	22.74	22.63	23	1

20	16QAM	1	49	22.34	22.57	22.60		
20	16QAM	1	99	22.16	22.35	22.86		
20	16QAM	50	0	21.48	21.47	21.46		
20	16QAM	50	24	21.22	21.50	21.53	22	2
20	16QAM	50	50	21.33	21.42	21.56		
20	16QAM	100	0	21.15	21.50	21.46		
20	64QAM	1	0	21.54	21.92	21.64		
20	64QAM	1	49	21.48	21.41	22.00	22	2
20	64QAM	1	99	21.20	21.68	21.61		
20	64QAM	50	0	20.49	20.47	20.59		
20	64QAM	50	24	20.29	20.37	20.73	21	3
20	64QAM	50	50	20.28	20.59	20.52		
20	64QAM	100	0	20.30	20.42	20.29		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	23.36	23.43	23.49		
15	QPSK	1	37	23.25	23.09	23.33	24	0
15	QPSK	1	74	23.27	23.45	23.39		
15	QPSK	36	0	22.32	22.55	22.58		
15	QPSK	36	20	22.24	22.40	22.46	23	1
15	QPSK	36	39	22.37	22.51	22.33		
15	QPSK	75	0	22.34	22.49	22.53		
15	16QAM	1	0	22.72	22.69	22.58		
15	16QAM	1	37	22.33	22.56	22.52	23	1
15	16QAM	1	74	22.07	22.28	22.81		
15	16QAM	36	0	21.48	21.39	21.36		
15	16QAM	36	20	21.12	21.50	21.49	22	2
15	16QAM	36	39	21.30	21.36	21.52		
15	16QAM	75	0	21.12	21.45	21.39		
15	64QAM	1	0	21.47	21.88	21.60		
15	64QAM	1	37	21.46	21.33	21.96	22	2
15	64QAM	1	74	21.18	21.65	21.54		
15	64QAM	36	0	20.48	20.47	20.49		
15	64QAM	36	20	20.24	20.31	20.72	21	3
15	64QAM	36	39	20.28	20.49	20.48		
15	64QAM	75	0	20.27	20.38	20.21		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	23.34	23.47	23.48		
10	QPSK	1	25	23.25	23.07	23.30	24	0
10	QPSK	1	49	23.27	23.45	23.33		
10	QPSK	25	0	22.32	22.61	22.55		
10	QPSK	25	12	22.17	22.46	22.41	23	1
10	QPSK	25	25	22.29	22.49	22.41		
10	QPSK	50	0	22.32	22.46	22.48		
10	16QAM	1	0	22.69	22.69	22.62		
10	16QAM	1	25	22.33	22.48	22.58	23	1
10	16QAM	1	49	22.08	22.27	22.83		
10	16QAM	25	0	21.45	21.43	21.45		
10	16QAM	25	12	21.20	21.47	21.50	22	2
10	16QAM	25	25	21.26	21.33	21.54		
10	16QAM	50	0	21.07	21.49	21.36		
10	64QAM	1	0	21.45	21.84	21.56		
10	64QAM	1	25	21.48	21.39	21.94	22	2
10	64QAM	1	49	21.12	21.64	21.53		
10	64QAM	25	0	20.42	20.37	20.57	21	3

10	64QAM	25	12	20.28	20.31	20.65		
10	64QAM	25	25	20.20	20.55	20.46		
10	64QAM	50	0	20.21	20.34	20.27		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	23.36	23.47	23.53	24	0
5	QPSK	1	12	23.25	23.13	23.31		
5	QPSK	1	24	23.35	23.39	23.39		
5	QPSK	12	0	22.31	22.58	22.60	23	1
5	QPSK	12	7	22.19	22.40	22.42		
5	QPSK	12	13	22.35	22.54	22.42		
5	QPSK	25	0	22.31	22.50	22.46		
5	16QAM	1	0	22.74	22.70	22.58	23	1
5	16QAM	1	12	22.32	22.53	22.55		
5	16QAM	1	24	22.15	22.31	22.79		
5	16QAM	12	0	21.44	21.37	21.44	22	2
5	16QAM	12	7	21.15	21.45	21.44		
5	16QAM	12	13	21.31	21.37	21.56		
5	16QAM	25	0	21.06	21.46	21.41		
5	64QAM	1	0	21.50	21.92	21.60	22	2
5	64QAM	1	12	21.42	21.41	21.99		
5	64QAM	1	24	21.18	21.66	21.60		
5	64QAM	12	0	20.44	20.45	20.49	21	3
5	64QAM	12	7	20.29	20.36	20.67		
5	64QAM	12	13	20.25	20.57	20.44		
5	64QAM	25	0	20.21	20.41	20.21		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	23.38	23.40	23.52	24	0
3	QPSK	1	8	23.17	23.14	23.33		
3	QPSK	1	14	23.33	23.46	23.34		
3	QPSK	8	0	22.29	22.62	22.58	23	1
3	QPSK	8	4	22.23	22.41	22.46		
3	QPSK	8	7	22.30	22.54	22.37		
3	QPSK	15	0	22.32	22.55	22.49		
3	16QAM	1	0	22.75	22.74	22.62	23	1
3	16QAM	1	8	22.32	22.48	22.60		
3	16QAM	1	14	22.11	22.33	22.78		
3	16QAM	8	0	21.44	21.40	21.39	22	2
3	16QAM	8	4	21.13	21.42	21.52		
3	16QAM	8	7	21.23	21.35	21.52		
3	16QAM	15	0	21.10	21.41	21.38		
3	64QAM	1	0	21.49	21.91	21.61	22	2
3	64QAM	1	8	21.48	21.37	21.90		
3	64QAM	1	14	21.12	21.66	21.52		
3	64QAM	8	0	20.45	20.41	20.56	21	3
3	64QAM	8	4	20.20	20.37	20.64		
3	64QAM	8	7	20.27	20.55	20.44		
3	64QAM	15	0	20.30	20.41	20.24		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	23.31	23.47	23.52	24	0
1.4	QPSK	1	3	23.23	23.15	23.33		
1.4	QPSK	1	5	23.31	23.36	23.40		
1.4	QPSK	3	0	22.38	22.56	22.53		
1.4	QPSK	3	1	22.19	22.45	22.45		

1.4	QPSK	3	3	22.34	22.51	22.35		
1.4	QPSK	6	0	22.39	22.45	22.47	23	1
1.4	16QAM	1	0	22.72	22.71	22.58	23	1
1.4	16QAM	1	3	22.26	22.57	22.58		
1.4	16QAM	1	5	22.14	22.30	22.82		
1.4	16QAM	3	0	21.44	21.38	21.40		
1.4	16QAM	3	1	21.15	21.40	21.52		
1.4	16QAM	3	3	21.28	21.33	21.55		
1.4	16QAM	6	0	21.12	21.46	21.44	22	2
1.4	64QAM	1	0	21.50	21.86	21.54	22	2
1.4	64QAM	1	3	21.41	21.33	21.97		
1.4	64QAM	1	5	21.19	21.68	21.52		
1.4	64QAM	3	0	20.41	20.44	20.57		
1.4	64QAM	3	1	20.28	20.33	20.69		
1.4	64QAM	3	3	20.24	20.58	20.43		
1.4	64QAM	6	0	20.29	20.37	20.25	21	3

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	23.62	23.78	23.99	24	0
10	QPSK	1	25	23.72	23.78	23.98		
10	QPSK	1	49	23.51	23.76	23.60		
10	QPSK	25	0	22.64	22.83	22.83	23	1
10	QPSK	25	12	22.80	22.80	22.82		
10	QPSK	25	25	22.71	22.98	22.81		
10	QPSK	50	0	22.72	22.79	22.85		
10	16QAM	1	0	22.40	22.80	22.07	23	1
10	16QAM	1	25	21.89	22.25	21.92		
10	16QAM	1	49	22.03	21.91	22.03		
10	16QAM	25	0	21.67	21.94	21.91	22	2
10	16QAM	25	12	21.81	21.85	21.89		
10	16QAM	25	25	21.62	21.87	21.81		
10	16QAM	50	0	21.75	21.88	21.82		
10	64QAM	1	0	21.78	21.60	21.82	22	2
10	64QAM	1	25	21.08	21.50	21.70		
10	64QAM	1	49	21.49	21.99	21.32		
10	64QAM	25	0	20.64	20.92	20.86	21	3
10	64QAM	25	12	20.87	20.83	20.86		
10	64QAM	25	25	20.74	20.92	20.86		
10	64QAM	50	0	20.74	20.70	20.87		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	23.52	23.73	23.91	24	0
5	QPSK	1	12	23.65	23.63	23.81		
5	QPSK	1	24	23.42	23.59	23.42		
5	QPSK	12	0	22.53	22.68	22.67	23	1
5	QPSK	12	7	22.67	22.75	22.81		
5	QPSK	12	13	22.58	22.82	22.71		
5	QPSK	25	0	22.68	22.77	22.72		
5	16QAM	1	0	22.28	22.74	22.04	23	1
5	16QAM	1	12	21.85	22.25	21.87		

5	16QAM	1	24	21.86	21.91	22.03		
5	16QAM	12	0	21.58	21.86	21.86	22	2
5	16QAM	12	7	21.76	21.76	21.86		
5	16QAM	12	13	21.49	21.69	21.61		
5	16QAM	25	0	21.71	21.76	21.73		
5	64QAM	1	0	21.77	21.46	21.77	22	2
5	64QAM	1	12	21.03	21.36	21.53		
5	64QAM	1	24	21.32	21.84	21.30		
5	64QAM	12	0	20.62	20.72	20.81	21	3
5	64QAM	12	7	20.85	20.79	20.73		
5	64QAM	12	13	20.67	20.91	20.73		
5	64QAM	25	0	20.68	20.57	20.70		
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	23.45	23.59	23.82	24	0
3	QPSK	1	8	23.55	23.70	23.83		
3	QPSK	1	14	23.50	23.65	23.60		
3	QPSK	8	0	22.48	22.65	22.83	23	1
3	QPSK	8	4	22.62	22.78	22.71		
3	QPSK	8	7	22.61	22.84	22.69		
3	QPSK	15	0	22.64	22.64	22.75		
3	16QAM	1	0	22.27	22.77	21.93	23	1
3	16QAM	1	8	21.74	22.15	21.75		
3	16QAM	1	14	22.00	21.85	21.95		
3	16QAM	8	0	21.57	21.79	21.89	22	2
3	16QAM	8	4	21.75	21.84	21.73		
3	16QAM	8	7	21.45	21.85	21.80		
3	16QAM	15	0	21.55	21.81	21.67		
3	64QAM	1	0	21.75	21.53	21.70	22	2
3	64QAM	1	8	21.06	21.30	21.69		
3	64QAM	1	14	21.44	21.79	21.25		
3	64QAM	8	0	20.51	20.74	20.84	21	3
3	64QAM	8	4	20.74	20.79	20.80		
3	64QAM	8	7	20.70	20.79	20.69		
3	64QAM	15	0	20.63	20.52	20.70		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	23.52	23.66	23.80	24	0
1.4	QPSK	1	3	23.55	23.73	23.94		
1.4	QPSK	1	5	23.51	23.57	23.46		
1.4	QPSK	3	0	22.52	22.77	22.78		
1.4	QPSK	3	1	22.67	22.79	22.79		
1.4	QPSK	3	3	22.65	22.96	22.74		
1.4	QPSK	6	0	22.61	22.78	22.72	23	1
1.4	16QAM	1	0	22.28	22.66	21.92	23	1
1.4	16QAM	1	3	21.81	22.23	21.77		
1.4	16QAM	1	5	21.84	21.75	22.00		
1.4	16QAM	3	0	21.55	21.74	21.75		
1.4	16QAM	3	1	21.73	21.73	21.88		
1.4	16QAM	3	3	21.53	21.73	21.72		
1.4	16QAM	6	0	21.65	21.76	21.65	22	2
1.4	64QAM	1	0	21.72	21.53	21.76	22	2
1.4	64QAM	1	3	20.96	21.42	21.55		
1.4	64QAM	1	5	21.46	21.95	21.19		
1.4	64QAM	3	0	20.47	20.76	20.86		
1.4	64QAM	3	1	20.76	20.77	20.82		

1.4	64QAM	3	3	20.54	20.79	20.72		
1.4	64QAM	6	0	20.55	20.67	20.69	21	3

<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	22.94	22.81	22.78	23.8	0
20	QPSK	1	49	22.68	22.68	22.61		
20	QPSK	1	99	22.56	22.65	22.61		
20	QPSK	50	0	21.94	21.93	21.59	22.8	1
20	QPSK	50	24	21.74	21.78	21.53		
20	QPSK	50	50	21.71	21.84	21.58		
20	QPSK	100	0	21.86	21.85	21.55		
20	16QAM	1	0	22.23	22.23	21.89	22.8	1
20	16QAM	1	49	21.50	22.23	22.15		
20	16QAM	1	99	22.22	21.90	21.61		
20	16QAM	50	0	20.76	20.91	20.60	21.8	2
20	16QAM	50	24	20.70	20.73	20.55		
20	16QAM	50	50	20.61	20.65	20.52		
20	16QAM	100	0	20.71	20.84	20.56		
20	64QAM	1	0	20.95	21.24	21.15	21.8	2
20	64QAM	1	49	20.55	21.21	20.88		
20	64QAM	1	99	20.84	21.05	20.48		
20	64QAM	50	0	19.79	19.85	19.65	20.8	3
20	64QAM	50	24	19.77	19.79	19.62		
20	64QAM	50	50	19.69	19.91	19.50		
20	64QAM	100	0	19.72	19.89	19.64		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	22.84	22.77	22.68	23.8	0
15	QPSK	1	37	22.64	22.61	22.52		
15	QPSK	1	74	22.55	22.62	22.55		
15	QPSK	36	0	21.85	21.92	21.53	22.8	1
15	QPSK	36	20	21.73	21.76	21.53		
15	QPSK	36	39	21.67	21.82	21.48		
15	QPSK	75	0	21.85	21.83	21.47		
15	16QAM	1	0	22.20	22.18	21.79	22.8	1
15	16QAM	1	37	21.48	22.19	22.07		
15	16QAM	1	74	22.12	21.80	21.54		
15	16QAM	36	0	20.68	20.91	20.53	21.8	2
15	16QAM	36	20	20.64	20.64	20.55		
15	16QAM	36	39	20.55	20.63	20.48		
15	16QAM	75	0	20.62	20.83	20.49		
15	64QAM	1	0	20.85	21.24	21.15	21.8	2
15	64QAM	1	37	20.47	21.17	20.83		
15	64QAM	1	74	20.83	20.96	20.47		
15	64QAM	36	0	19.78	19.79	19.61	20.8	3
15	64QAM	36	20	19.74	19.72	19.55		
15	64QAM	36	39	19.65	19.91	19.45		
15	64QAM	75	0	19.68	19.86	19.64		
Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		

10	QPSK	1	0	22.87	22.73	22.70	23.8	0
10	QPSK	1	25	22.62	22.62	22.59		
10	QPSK	1	49	22.50	22.58	22.51		
10	QPSK	25	0	21.94	21.90	21.54	22.8	1
10	QPSK	25	12	21.65	21.76	21.49		
10	QPSK	25	25	21.67	21.78	21.53		
10	QPSK	50	0	21.84	21.85	21.50		
10	16QAM	1	0	22.15	22.14	21.86	22.8	1
10	16QAM	1	25	21.45	22.18	22.09		
10	16QAM	1	49	22.15	21.85	21.58		
10	16QAM	25	0	20.70	20.85	20.60	21.8	2
10	16QAM	25	12	20.61	20.67	20.45		
10	16QAM	25	25	20.54	20.60	20.51		
10	16QAM	50	0	20.67	20.77	20.47		
10	64QAM	1	0	20.87	21.14	21.13	21.8	2
10	64QAM	1	25	20.51	21.11	20.78		
10	64QAM	1	49	20.80	21.00	20.44		
10	64QAM	25	0	19.75	19.82	19.63	20.8	3
10	64QAM	25	12	19.72	19.73	19.62		
10	64QAM	25	25	19.67	19.87	19.50		
10	64QAM	50	0	19.62	19.87	19.64		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	22.90	22.72	22.75	23.8	0
5	QPSK	1	12	22.62	22.58	22.54		
5	QPSK	1	24	22.51	22.57	22.58		
5	QPSK	12	0	21.84	21.90	21.58	22.8	1
5	QPSK	12	7	21.68	21.68	21.53		
5	QPSK	12	13	21.71	21.83	21.49		
5	QPSK	25	0	21.83	21.80	21.53		
5	16QAM	1	0	22.20	22.20	21.85	22.8	1
5	16QAM	1	12	21.43	22.14	22.07		
5	16QAM	1	24	22.13	21.83	21.55		
5	16QAM	12	0	20.67	20.81	20.54	21.8	2
5	16QAM	12	7	20.68	20.69	20.52		
5	16QAM	12	13	20.53	20.59	20.47		
5	16QAM	25	0	20.63	20.76	20.47		
5	64QAM	1	0	20.88	21.24	21.12	21.8	2
5	64QAM	1	12	20.48	21.21	20.88		
5	64QAM	1	24	20.78	21.05	20.40		
5	64QAM	12	0	19.75	19.81	19.65	20.8	3
5	64QAM	12	7	19.67	19.78	19.58		
5	64QAM	12	13	19.64	19.90	19.44		
5	64QAM	25	0	19.65	19.80	19.61		

<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	23.42	23.63	23.60	24	0
10	QPSK	1	25	23.44	23.40	23.34		
10	QPSK	1	49	23.43	23.37	23.45		
10	QPSK	25	0	22.51	22.56	22.54	23	1

10	QPSK	25	12	22.48	22.50	22.50		
10	QPSK	25	25	22.44	22.44	22.47		
10	QPSK	50	0	22.50	22.51	22.49		
10	16QAM	1	0	22.55	22.96	22.94		
10	16QAM	1	25	22.33	22.52	22.89	23	1
10	16QAM	1	49	22.90	22.17	22.63		
10	16QAM	25	0	21.40	21.51	21.50		
10	16QAM	25	12	21.50	21.44	21.70	22	2
10	16QAM	25	25	21.49	21.55	21.50		
10	16QAM	50	0	21.51	21.48	21.60		
10	64QAM	1	0	21.54	21.34	21.67		
10	64QAM	1	25	21.50	21.85	21.65	22	2
10	64QAM	1	49	21.32	21.54	21.40		
10	64QAM	25	0	20.47	20.49	20.41		
10	64QAM	25	12	20.57	20.52	20.68	21	3
10	64QAM	25	25	20.49	20.53	20.46		
10	64QAM	50	0	20.47	20.50	20.56		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	23.35	23.55	23.54		
5	QPSK	1	12	23.37	23.30	23.27	24	0
5	QPSK	1	24	23.33	23.31	23.38		
5	QPSK	12	0	22.51	22.54	22.54		
5	QPSK	12	7	22.50	22.46	22.48	23	1
5	QPSK	12	13	22.37	22.42	22.40		
5	QPSK	25	0	22.43	22.45	22.52		
5	16QAM	1	0	22.46	22.90	22.86		
5	16QAM	1	12	22.26	22.45	22.79	23	1
5	16QAM	1	24	22.87	22.10	22.58		
5	16QAM	12	0	21.34	21.41	21.50		
5	16QAM	12	7	21.41	21.43	21.63	22	2
5	16QAM	12	13	21.46	21.48	21.47		
5	16QAM	25	0	21.46	21.40	21.52		
5	64QAM	1	0	21.44	21.33	21.65		
5	64QAM	1	12	21.50	21.80	21.61	22	2
5	64QAM	1	24	21.22	21.47	21.30		
5	64QAM	12	0	20.39	20.49	20.41		
5	64QAM	12	7	20.55	20.51	20.58	21	3
5	64QAM	12	13	20.39	20.46	20.40		
5	64QAM	25	0	20.37	20.42	20.55		
Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	23.41	23.56	23.52		
3	QPSK	1	8	23.44	23.33	23.28	24	0
3	QPSK	1	14	23.41	23.28	23.42		
3	QPSK	8	0	22.55	22.47	22.53		
3	QPSK	8	4	22.52	22.41	22.46	23	1
3	QPSK	8	7	22.44	22.35	22.42		
3	QPSK	15	0	22.47	22.50	22.45		
3	16QAM	1	0	22.48	22.86	22.89		
3	16QAM	1	8	22.23	22.47	22.80	23	1
3	16QAM	1	14	22.88	22.13	22.55		
3	16QAM	8	0	21.30	21.50	21.43		
3	16QAM	8	4	21.43	21.35	21.63	22	2
3	16QAM	8	7	21.48	21.51	21.43		
3	16QAM	15	0	21.48	21.39	21.59		

3	64QAM	1	0	21.45	21.28	21.63	22	2
3	64QAM	1	8	21.47	21.81	21.61		
3	64QAM	1	14	21.31	21.52	21.34		
3	64QAM	8	0	20.44	20.39	20.37	21	3
3	64QAM	8	4	20.48	20.51	20.68		
3	64QAM	8	7	20.42	20.48	20.42		
3	64QAM	15	0	20.41	20.50	20.51		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	23.35	23.57	23.53	24	0
1.4	QPSK	1	3	23.36	23.36	23.24		
1.4	QPSK	1	5	23.34	23.29	23.43		
1.4	QPSK	3	0	22.56	22.47	22.49		
1.4	QPSK	3	1	22.48	22.42	22.49		
1.4	QPSK	3	3	22.37	22.37	22.37		
1.4	QPSK	6	0	22.43	22.46	22.52	23	1
1.4	16QAM	1	0	22.47	22.88	22.88	23	1
1.4	16QAM	1	3	22.29	22.51	22.87		
1.4	16QAM	1	5	22.80	22.15	22.54		
1.4	16QAM	3	0	21.36	21.48	21.45		
1.4	16QAM	3	1	21.40	21.39	21.64		
1.4	16QAM	3	3	21.41	21.50	21.50		
1.4	16QAM	6	0	21.51	21.44	21.54	22	2
1.4	64QAM	1	0	21.45	21.32	21.67	22	2
1.4	64QAM	1	3	21.42	21.78	21.61		
1.4	64QAM	1	5	21.31	21.48	21.38		
1.4	64QAM	3	0	20.37	20.40	20.31		
1.4	64QAM	3	1	20.54	20.44	20.58		
1.4	64QAM	3	3	20.46	20.52	20.45		
1.4	64QAM	6	0	20.45	20.49	20.52	21	3

<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		23.68		24	0
10	QPSK	1	25		23.25			
10	QPSK	1	49		23.53			
10	QPSK	25	0		22.61		23	1
10	QPSK	25	12		22.53			
10	QPSK	25	25		22.61			
10	QPSK	50	0		22.52			
10	16QAM	1	0		22.48		23	1
10	16QAM	1	25		22.73			
10	16QAM	1	49		22.36			
10	16QAM	25	0		21.59		22	2
10	16QAM	25	12		21.52			
10	16QAM	25	25		21.66			
10	16QAM	50	0		21.59			
10	64QAM	1	0		21.89		22	2
10	64QAM	1	25		21.55			
10	64QAM	1	49		21.96			
10	64QAM	25	0		20.63		21	3

10	64QAM	25	12		20.57			
10	64QAM	25	25		20.58			
10	64QAM	50	0		20.56			
Channel				23205	23230	23255	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	23.59	23.61	23.62	24	0
5	QPSK	1	12	23.24	23.18	23.23		
5	QPSK	1	24	23.44	23.51	23.52		
5	QPSK	12	0	22.53	22.60	22.57	23	1
5	QPSK	12	7	22.49	22.52	22.48		
5	QPSK	12	13	22.61	22.51	22.59		
5	QPSK	25	0	22.47	22.44	22.47		
5	16QAM	1	0	22.45	22.39	22.41	23	1
5	16QAM	1	12	22.64	22.70	22.68		
5	16QAM	1	24	22.31	22.34	22.29		
5	16QAM	12	0	21.57	21.49	21.54	22	2
5	16QAM	12	7	21.51	21.47	21.42		
5	16QAM	12	13	21.63	21.59	21.64		
5	16QAM	25	0	21.55	21.56	21.58		
5	64QAM	1	0	21.84	21.81	21.89	22	2
5	64QAM	1	12	21.53	21.46	21.53		
5	64QAM	1	24	21.90	21.93	21.86		
5	64QAM	12	0	20.61	20.55	20.57	21	3
5	64QAM	12	7	20.53	20.55	20.55		
5	64QAM	12	13	20.51	20.48	20.56		
5	64QAM	25	0	20.46	20.46	20.48		

<LTE Band 14>

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					23330			
Frequency (MHz)					793			
10	QPSK	1	0		23.74		24	0
10	QPSK	1	25		23.66			
10	QPSK	1	49		23.73			
10	QPSK	25	0		22.74		23	1
10	QPSK	25	12		22.73			
10	QPSK	25	25		22.72			
10	QPSK	50	0		22.71			
10	16QAM	1	0		22.85		23	1
10	16QAM	1	25		22.94			
10	16QAM	1	49		22.78			
10	16QAM	25	0		21.62		22	2
10	16QAM	25	12		21.66			
10	16QAM	25	25		21.73			
10	16QAM	50	0		21.72			
10	64QAM	1	0		21.78		22	2
10	64QAM	1	25		21.68			
10	64QAM	1	49		21.67			
10	64QAM	25	0		20.69		21	3
10	64QAM	25	12		20.83			
10	64QAM	25	25		20.77			
10	64QAM	50	0		20.71			
Channel				23305	23330	23355	Tune-up limit	MPR

Frequency (MHz)				790.5	793	795.5	(dBm)	(dB)
5	QPSK	1	0	23.67	23.71	23.72	24	0
5	QPSK	1	12	23.58	23.60	23.63		
5	QPSK	1	24	23.68	23.65	23.73		
5	QPSK	12	0	22.71	22.73	22.73	23	1
5	QPSK	12	7	22.69	22.70	22.64		
5	QPSK	12	13	22.67	22.70	22.63		
5	QPSK	25	0	22.67	22.67	22.70		
5	16QAM	1	0	22.85	22.81	22.78	23	1
5	16QAM	1	12	22.87	22.94	22.84		
5	16QAM	1	24	22.72	22.76	22.69		
5	16QAM	12	0	21.55	21.57	21.54	22	2
5	16QAM	12	7	21.62	21.65	21.62		
5	16QAM	12	13	21.64	21.71	21.72		
5	16QAM	25	0	21.64	21.68	21.64		
5	64QAM	1	0	21.70	21.72	21.68	22	2
5	64QAM	1	12	21.67	21.63	21.63		
5	64QAM	1	24	21.61	21.66	21.59		
5	64QAM	12	0	20.61	20.62	20.66	21	3
5	64QAM	12	7	20.75	20.80	20.79		
5	64QAM	12	13	20.73	20.69	20.71		
5	64QAM	25	0	20.64	20.67	20.66		

<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	23.75	23.74	23.89	24	0
15	QPSK	1	37	23.47	23.69	23.86		
15	QPSK	1	74	23.59	23.68	23.80		
15	QPSK	36	0	22.73	22.89	22.85	23	1
15	QPSK	36	20	22.62	22.86	22.80		
15	QPSK	36	39	22.52	22.80	22.74		
15	QPSK	75	0	22.65	22.78	22.79		
15	16QAM	1	0	22.94	22.94	22.84	23	1
15	16QAM	1	37	22.88	22.94	22.94		
15	16QAM	1	74	22.40	22.74	22.89		
15	16QAM	36	0	21.76	21.86	21.92	22	2
15	16QAM	36	20	21.62	21.83	21.90		
15	16QAM	36	39	21.60	21.93	21.71		
15	16QAM	75	0	21.70	21.76	21.76		
15	64QAM	1	0	21.84	21.86	21.86	22	2
15	64QAM	1	37	22.00	21.89	21.95		
15	64QAM	1	74	21.99	21.92	21.99		
15	64QAM	36	0	20.80	20.85	20.94	21	3
15	64QAM	36	20	20.71	20.98	20.78		
15	64QAM	36	39	20.57	20.78	20.77		
15	64QAM	75	0	20.69	20.86	20.76		
Channel				26740	26865	26990	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	23.74	23.73	23.84	24	0
10	QPSK	1	25	23.38	23.64	23.86		
10	QPSK	1	49	23.57	23.60	23.70		

10	QPSK	25	0	22.72	22.64	22.78	23	1
10	QPSK	25	12	22.61	22.81	22.76		
10	QPSK	25	25	22.42	22.77	22.72		
10	QPSK	50	0	22.55	22.72	22.77		
10	16QAM	1	0	22.93	22.86	22.75	23	1
10	16QAM	1	25	22.86	22.92	22.84		
10	16QAM	1	49	22.36	22.70	22.82		
10	16QAM	25	0	21.69	21.78	21.84	22	2
10	16QAM	25	12	21.58	21.74	21.83		
10	16QAM	25	25	21.57	21.87	21.63		
10	16QAM	50	0	21.67	21.66	21.67		
10	64QAM	1	0	21.82	21.76	21.84	22	2
10	64QAM	1	25	21.98	21.86	21.87		
10	64QAM	1	49	21.90	21.90	21.96		
10	64QAM	25	0	20.77	20.81	20.92	21	3
10	64QAM	25	12	20.67	20.90	20.76		
10	64QAM	25	25	20.55	20.69	20.71		
10	64QAM	50	0	20.68	20.79	20.75		
Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	23.67	23.69	23.86	24	0
5	QPSK	1	12	23.37	23.68	23.81		
5	QPSK	1	24	23.52	23.59	23.75		
5	QPSK	12	0	22.63	22.69	22.76	23	1
5	QPSK	12	7	22.56	22.84	22.76		
5	QPSK	12	13	22.48	22.80	22.70		
5	QPSK	25	0	22.56	22.71	22.75		
5	16QAM	1	0	22.89	22.84	22.75	23	1
5	16QAM	1	12	22.81	22.87	22.86		
5	16QAM	1	24	22.40	22.68	22.79		
5	16QAM	12	0	21.73	21.77	21.91	22	2
5	16QAM	12	7	21.55	21.82	21.87		
5	16QAM	12	13	21.50	21.93	21.65		
5	16QAM	25	0	21.70	21.70	21.69		
5	64QAM	1	0	21.80	21.81	21.80	22	2
5	64QAM	1	12	21.94	21.80	21.93		
5	64QAM	1	24	21.96	21.86	21.99		
5	64QAM	12	0	20.73	20.83	20.84	21	3
5	64QAM	12	7	20.69	20.92	20.77		
5	64QAM	12	13	20.53	20.73	20.70		
5	64QAM	25	0	20.64	20.77	20.74		

<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	23.25	23.39	23.30	24	0
20	QPSK	1	49	23.10	23.10	23.23		
20	QPSK	1	99	23.19	23.22	23.26		
20	QPSK	50	0	22.25	22.29	22.24	23	1
20	QPSK	50	24	22.16	22.19	22.11		
20	QPSK	50	50	22.17	22.19	22.14		
20	QPSK	100	0	22.15	22.27	22.18		

20	16QAM	1	0	22.73	22.76	22.48	23	1
20	16QAM	1	49	22.57	22.30	22.43		
20	16QAM	1	99	22.27	22.16	22.70		
20	16QAM	50	0	21.45	21.36	21.43	22	2
20	16QAM	50	24	21.35	21.19	21.46		
20	16QAM	50	50	21.41	21.18	21.43		
20	16QAM	100	0	21.34	21.15	21.34		
20	64QAM	1	0	21.85	21.46	21.58	22	2
20	64QAM	1	49	21.25	21.39	21.92		
20	64QAM	1	99	21.55	21.13	21.53		
20	64QAM	50	0	20.34	20.32	20.41	21	3
20	64QAM	50	24	20.31	20.20	20.55		
20	64QAM	50	50	20.40	20.19	20.34		
20	64QAM	100	0	20.33	20.22	20.28		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	23.20	23.24	23.27	24	0
15	QPSK	1	37	23.02	23.03	23.19		
15	QPSK	1	74	23.15	23.22	23.26		
15	QPSK	36	0	22.28	22.35	22.44	23	1
15	QPSK	36	20	22.16	22.22	22.40		
15	QPSK	36	39	22.19	22.35	22.28		
15	QPSK	75	0	22.25	22.39	22.33		
15	16QAM	1	0	22.67	22.72	22.40	23	1
15	16QAM	1	37	22.22	22.50	22.38		
15	16QAM	1	74	22.16	22.21	22.60		
15	16QAM	36	0	21.26	21.40	21.37	22	2
15	16QAM	36	20	21.14	21.26	21.38		
15	16QAM	36	39	21.15	21.40	21.43		
15	16QAM	75	0	21.11	21.31	21.31		
15	64QAM	1	0	21.46	21.84	21.50	22	2
15	64QAM	1	37	21.31	21.16	21.84		
15	64QAM	1	74	21.09	21.53	21.52		
15	64QAM	36	0	20.29	20.25	20.40	21	3
15	64QAM	36	20	20.12	20.22	20.54		
15	64QAM	36	39	20.11	20.39	20.29		
15	64QAM	75	0	20.15	20.32	20.26		
Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	23.18	23.22	23.30	24	0
10	QPSK	1	25	23.02	23.03	23.27		
10	QPSK	1	49	23.19	23.20	23.26		
10	QPSK	25	0	22.24	22.41	22.44	23	1
10	QPSK	25	12	22.11	22.26	22.39		
10	QPSK	25	25	22.09	22.31	22.32		
10	QPSK	50	0	22.23	22.33	22.36		
10	16QAM	1	0	22.71	22.71	22.45	23	1
10	16QAM	1	25	22.26	22.54	22.39		
10	16QAM	1	49	22.06	22.19	22.62		
10	16QAM	25	0	21.35	21.35	21.36	22	2
10	16QAM	25	12	21.14	21.31	21.38		
10	16QAM	25	25	21.13	21.38	21.42		
10	16QAM	50	0	21.09	21.25	21.26		
10	64QAM	1	0	21.39	21.83	21.52	22	2
10	64QAM	1	25	21.30	21.22	21.91		
10	64QAM	1	49	21.09	21.54	21.44		

10	64QAM	25	0	20.29	20.28	20.34	21	3
10	64QAM	25	12	20.20	20.22	20.51		
10	64QAM	25	25	20.19	20.34	20.30		
10	64QAM	50	0	20.19	20.31	20.26		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	23.11	23.27	23.25	24	0
5	QPSK	1	12	23.05	23.06	23.25		
5	QPSK	1	24	23.08	23.20	23.19		
5	QPSK	12	0	22.28	22.43	22.36	23	1
5	QPSK	12	7	22.14	22.27	22.35		
5	QPSK	12	13	22.17	22.37	22.25		
5	QPSK	25	0	22.26	22.33	22.30		
5	16QAM	1	0	22.66	22.63	22.44	23	1
5	16QAM	1	12	22.27	22.48	22.37		
5	16QAM	1	24	22.11	22.25	22.69		
5	16QAM	12	0	21.27	21.41	21.36	22	2
5	16QAM	12	7	21.09	21.29	21.38		
5	16QAM	12	13	21.15	21.37	21.39		
5	16QAM	25	0	21.13	21.29	21.24		
5	64QAM	1	0	21.39	21.83	21.57	22	2
5	64QAM	1	12	21.39	21.18	21.89		
5	64QAM	1	24	21.03	21.46	21.43		
5	64QAM	12	0	20.32	20.29	20.35	21	3
5	64QAM	12	7	20.19	20.21	20.50		
5	64QAM	12	13	20.10	20.36	20.24		
5	64QAM	25	0	20.19	20.24	20.20		

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		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	21.24	21.36	21.55	22	0
20	QPSK	1	49	21.11	21.22	21.47		
20	QPSK	1	99	21.04	21.26	21.49		
20	QPSK	50	0	20.91	21.00	21.27	22	0
20	QPSK	50	24	20.87	20.93	21.24		
20	QPSK	50	50	20.80	20.86	21.18		
20	QPSK	100	0	20.84	20.91	21.23		
20	16QAM	1	0	20.96	20.97	21.32	22	0
20	16QAM	1	49	20.73	20.82	21.15		
20	16QAM	1	99	20.69	20.85	21.16		
20	16QAM	50	0	20.92	21.01	21.29	22	0
20	16QAM	50	24	20.86	20.93	21.22		
20	16QAM	50	50	20.81	20.92	21.18		
20	16QAM	100	0	20.88	20.93	21.25		
20	64QAM	1	0	21.16	21.17	21.52	22	0
20	64QAM	1	49	21.02	21.09	21.27		
20	64QAM	1	99	20.84	21.09	21.37		
20	64QAM	50	0	19.95	20.00	20.32	21	1
20	64QAM	50	24	19.87	19.94	20.24		
20	64QAM	50	50	19.82	19.88	20.22		
20	64QAM	100	0	19.86	19.96	20.27		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	21.20	21.29	21.43	22	0
15	QPSK	1	37	21.10	21.22	21.38		
15	QPSK	1	74	20.97	21.26	21.41		
15	QPSK	36	0	20.81	20.96	21.26	22	0
15	QPSK	36	20	20.80	20.88	21.22		
15	QPSK	36	39	20.80	20.76	21.11		
15	QPSK	75	0	20.75	20.84	21.17		
15	16QAM	1	0	20.87	20.89	21.28	22	0
15	16QAM	1	37	20.66	20.72	21.06		
15	16QAM	1	74	20.63	20.84	21.14		
15	16QAM	36	0	20.85	20.95	21.27	22	0
15	16QAM	36	20	20.85	20.88	21.14		
15	16QAM	36	39	20.79	20.88	21.14		
15	16QAM	75	0	20.88	20.87	21.22		
15	64QAM	1	0	21.06	21.15	21.42	22	0
15	64QAM	1	37	21.02	21.09	21.25		
15	64QAM	1	74	20.80	21.05	21.36		
15	64QAM	36	0	19.91	19.94	20.29	21	1
15	64QAM	36	20	19.77	19.88	20.23		
15	64QAM	36	39	19.78	19.80	20.14		
15	64QAM	75	0	19.84	19.89	20.19		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	21.15	21.28	21.42	22	0
10	QPSK	1	25	21.01	21.16	21.38		
10	QPSK	1	49	20.96	21.22	21.42		
10	QPSK	25	0	20.87	21.00	21.22	22	0

10	QPSK	25	12	20.81	20.85	21.22		
10	QPSK	25	25	20.78	20.79	21.16		
10	QPSK	50	0	20.82	20.87	21.16		
10	16QAM	1	0	20.88	20.87	21.25	22	0
10	16QAM	1	25	20.68	20.79	21.14		
10	16QAM	1	49	20.67	20.79	21.06		
10	16QAM	25	0	20.84	20.97	21.26	22	0
10	16QAM	25	12	20.84	20.86	21.22		
10	16QAM	25	25	20.79	20.91	21.15		
10	16QAM	50	0	20.79	20.83	21.15		
10	64QAM	1	0	21.10	21.14	21.51	22	0
10	64QAM	1	25	21.00	21.04	21.22		
10	64QAM	1	49	20.80	21.03	21.34		
10	64QAM	25	0	19.94	20.00	20.27	21	1
10	64QAM	25	12	19.77	19.90	20.20		
10	64QAM	25	25	19.81	19.87	20.15		
10	64QAM	50	0	19.84	19.91	20.17		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	21.20	21.29	21.52	22	0
5	QPSK	1	12	21.09	21.13	21.39		
5	QPSK	1	24	20.98	21.18	21.48		
5	QPSK	12	0	20.83	20.99	21.20	22	0
5	QPSK	12	7	20.85	20.93	21.22		
5	QPSK	12	13	20.72	20.82	21.14		
5	QPSK	25	0	20.79	20.81	21.23		
5	16QAM	1	0	20.87	20.94	21.27	22	0
5	16QAM	1	12	20.64	20.78	21.13		
5	16QAM	1	24	20.64	20.84	21.12		
5	16QAM	12	0	20.82	20.95	21.23	22	0
5	16QAM	12	7	20.85	20.90	21.20		
5	16QAM	12	13	20.80	20.83	21.18		
5	16QAM	25	0	20.87	20.89	21.24		
5	64QAM	1	0	21.11	21.10	21.42	22	0
5	64QAM	1	12	20.98	21.03	21.23		
5	64QAM	1	24	20.78	21.09	21.37		
5	64QAM	12	0	19.85	19.90	20.26	21	1
5	64QAM	12	7	19.87	19.87	20.17		
5	64QAM	12	13	19.76	19.82	20.18		
5	64QAM	25	0	19.82	19.96	20.24		

<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	20.73	20.75	20.73	21.8	0
20	QPSK	1	49	20.20	20.34	20.31		
20	QPSK	1	99	20.31	20.40	20.27		
20	QPSK	50	0	20.39	20.45	20.41	21.8	0
20	QPSK	50	24	20.33	20.44	20.40		
20	QPSK	50	50	20.30	20.41	20.40		
20	QPSK	100	0	20.32	20.43	20.40		

20	16QAM	1	0	20.41	20.42	20.38	21.8	0
20	16QAM	1	49	20.55	20.71	20.64		
20	16QAM	1	99	20.61	20.74	20.58		
20	16QAM	50	0	20.44	20.47	20.45	21.8	0
20	16QAM	50	24	20.34	20.47	20.44		
20	16QAM	50	50	20.33	20.50	20.45		
20	16QAM	100	0	20.32	20.47	20.45		
20	64QAM	1	0	20.63	20.62	20.62	21.8	0
20	64QAM	1	49	20.47	20.56	20.59		
20	64QAM	1	99	20.52	20.65	20.52		
20	64QAM	50	0	19.43	19.47	19.48	20.8	1
20	64QAM	50	24	19.34	19.46	19.45		
20	64QAM	50	50	19.34	19.49	19.44		
20	64QAM	100	0	19.31	19.46	19.47		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	20.70	20.69	20.63	21.8	0
15	QPSK	1	37	20.14	20.27	20.29		
15	QPSK	1	74	20.30	20.37	20.18		
15	QPSK	36	0	20.33	20.36	20.38	21.8	0
15	QPSK	36	20	20.29	20.36	20.30		
15	QPSK	36	39	20.28	20.39	20.40		
15	QPSK	75	0	20.28	20.33	20.38		
15	16QAM	1	0	20.40	20.37	20.33	21.8	0
15	16QAM	1	37	20.53	20.64	20.58		
15	16QAM	1	74	20.58	20.73	20.52		
15	16QAM	36	0	20.42	20.42	20.35	21.8	0
15	16QAM	36	20	20.25	20.41	20.41		
15	16QAM	36	39	20.33	20.49	20.41		
15	16QAM	75	0	20.30	20.45	20.40		
15	64QAM	1	0	20.54	20.60	20.62	21.8	0
15	64QAM	1	37	20.46	20.51	20.54		
15	64QAM	1	74	20.49	20.60	20.45		
15	64QAM	36	0	19.38	19.45	19.46	20.8	1
15	64QAM	36	20	19.31	19.43	19.45		
15	64QAM	36	39	19.32	19.46	19.34		
15	64QAM	75	0	19.30	19.37	19.43		
Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	20.65	20.67	20.66	21.8	0
10	QPSK	1	25	20.16	20.34	20.25		
10	QPSK	1	49	20.27	20.34	20.23		
10	QPSK	25	0	20.34	20.36	20.33	21.8	0
10	QPSK	25	12	20.30	20.34	20.33		
10	QPSK	25	25	20.21	20.35	20.41		
10	QPSK	50	0	20.30	20.35	20.30		
10	16QAM	1	0	20.41	20.38	20.31	21.8	0
10	16QAM	1	25	20.45	20.66	20.57		
10	16QAM	1	49	20.51	20.67	20.52		
10	16QAM	25	0	20.35	20.47	20.42	21.8	0
10	16QAM	25	12	20.32	20.38	20.40		
10	16QAM	25	25	20.31	20.50	20.43		
10	16QAM	50	0	20.23	20.40	20.42		
10	64QAM	1	0	20.62	20.58	20.52	21.8	0
10	64QAM	1	25	20.44	20.54	20.59		
10	64QAM	1	49	20.47	20.58	20.50		

10	64QAM	25	0	19.36	19.45	19.41	20.8	1
10	64QAM	25	12	19.29	19.39	19.37		
10	64QAM	25	25	19.32	19.48	19.36		
10	64QAM	50	0	19.22	19.37	19.47		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	20.72	20.73	20.65	21.8	0
5	QPSK	1	12	20.19	20.24	20.31		
5	QPSK	1	24	20.26	20.34	20.23		
5	QPSK	12	0	20.37	20.31	20.40	21.8	0
5	QPSK	12	7	20.27	20.35	20.39		
5	QPSK	12	13	20.22	20.39	20.36		
5	QPSK	25	0	20.27	20.33	20.35		
5	16QAM	1	0	20.36	20.40	20.33	21.8	0
5	16QAM	1	12	20.55	20.61	20.63		
5	16QAM	1	24	20.58	20.71	20.48		
5	16QAM	12	0	20.35	20.46	20.37	21.8	0
5	16QAM	12	7	20.25	20.42	20.35		
5	16QAM	12	13	20.23	20.45	20.43		
5	16QAM	25	0	20.27	20.45	20.40		
5	64QAM	1	0	20.54	20.58	20.56	21.8	0
5	64QAM	1	12	20.47	20.54	20.58		
5	64QAM	1	24	20.45	20.58	20.45		
5	64QAM	12	0	19.36	19.41	19.38	20.8	1
5	64QAM	12	7	19.31	19.40	19.37		
5	64QAM	12	13	19.29	19.49	19.40		
5	64QAM	25	0	19.30	19.43	19.47		

<LTE Band 66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	19.07	19.23	19.20	21	0
20	QPSK	1	49	19.03	19.11	19.15		
20	QPSK	1	99	19.02	19.08	19.09		
20	QPSK	50	0	19.18	19.22	19.22	21	0
20	QPSK	50	24	19.19	19.12	19.10		
20	QPSK	50	50	19.13	19.17	19.20		
20	QPSK	100	0	19.18	19.20	19.18		
20	16QAM	1	0	19.15	19.20	19.13	21	0
20	16QAM	1	49	19.15	19.20	19.20		
20	16QAM	1	99	19.16	19.20	19.20		
20	16QAM	50	0	19.18	19.16	19.19	21	0
20	16QAM	50	24	19.15	19.17	19.12		
20	16QAM	50	50	19.09	19.21	19.21		
20	16QAM	100	0	19.17	19.18	19.11		
20	64QAM	1	0	19.13	19.22	19.17	21	0
20	64QAM	1	49	19.19	19.14	19.20		
20	64QAM	1	99	19.20	19.13	19.13		
20	64QAM	50	0	19.17	19.18	19.18	21	0
20	64QAM	50	24	19.13	19.21	19.13		
20	64QAM	50	50	19.22	19.15	19.18		
20	64QAM	100	0	19.22	19.15	19.18		

Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	19.05	19.13	19.10	21	0
15	QPSK	1	37	19.03	19.11	19.15		
15	QPSK	1	74	19.02	19.08	19.09		
15	QPSK	36	0	19.17	19.11	19.21	21	0
15	QPSK	36	20	19.18	19.21	19.21		
15	QPSK	36	39	19.12	19.16	19.19		
15	QPSK	75	0	19.17	19.19	19.19		
15	16QAM	1	0	19.14	19.19	19.12	21	0
15	16QAM	1	37	19.14	19.19	19.19		
15	16QAM	1	74	19.15	19.19	19.19		
15	16QAM	36	0	19.17	19.15	19.18	21	0
15	16QAM	36	20	19.14	19.16	19.11		
15	16QAM	36	39	19.08	19.20	19.20		
15	16QAM	75	0	19.16	19.17	19.10		
15	64QAM	1	0	19.12	19.21	19.16	21	0
15	64QAM	1	37	19.18	19.13	19.19		
15	64QAM	1	74	19.19	19.12	19.12		
15	64QAM	36	0	19.16	19.17	19.17	21	0
15	64QAM	36	20	19.12	19.20	19.12		
15	64QAM	36	39	18.65	18.69	18.78		
15	64QAM	75	0	18.71	18.79	18.74		
Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	19.00	19.21	19.13	21	0
10	QPSK	1	25	19.03	19.11	19.15		
10	QPSK	1	49	19.02	19.08	19.09		
10	QPSK	25	0	19.18	19.12	19.22	21	0
10	QPSK	25	12	19.17	19.11	19.21		
10	QPSK	25	25	19.18	19.21	19.21		
10	QPSK	50	0	19.12	19.16	19.19		
10	16QAM	1	0	19.17	19.19	19.19	21	0
10	16QAM	1	25	19.14	19.19	19.12		
10	16QAM	1	49	19.14	19.19	19.19		
10	16QAM	25	0	19.15	19.19	19.19	21	0
10	16QAM	25	12	19.17	19.15	19.18		
10	16QAM	25	25	19.14	19.16	19.11		
10	16QAM	50	0	19.08	19.20	19.20		
10	64QAM	1	0	19.16	19.17	19.10	21	0
10	64QAM	1	25	19.12	19.21	19.16		
10	64QAM	1	49	19.18	19.13	19.19		
10	64QAM	25	0	19.19	19.12	19.12	21	0
10	64QAM	25	12	19.16	19.17	19.17		
10	64QAM	25	25	19.12	19.20	19.12		
10	64QAM	50	0	18.73	18.80	18.82		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	19.06	19.22	19.12	21	0
5	QPSK	1	12	19.03	19.11	19.15		
5	QPSK	1	24	19.02	19.08	19.09		
5	QPSK	12	0	19.18	19.12	19.22	21	0
5	QPSK	12	7	19.19	19.22	19.22		
5	QPSK	12	13	19.17	19.11	19.21		
5	QPSK	25	0	19.18	19.21	19.21		
5	16QAM	1	0	19.12	19.16	19.19	21	0

5	16QAM	1	12	19.17	19.19	19.19		
5	16QAM	1	24	19.14	19.19	19.12		
5	16QAM	12	0	19.14	19.19	19.19	21	0
5	16QAM	12	7	19.15	19.19	19.19		
5	16QAM	12	13	19.17	19.15	19.18		
5	16QAM	25	0	19.14	19.16	19.11		
5	64QAM	1	0	19.08	19.20	19.20	21	0
5	64QAM	1	12	19.16	19.17	19.10		
5	64QAM	1	24	19.12	19.21	19.16		
5	64QAM	12	0	19.18	19.13	19.19	21	0
5	64QAM	12	7	19.19	19.12	19.12		
5	64QAM	12	13	19.16	19.17	19.17		
5	64QAM	25	0	19.12	19.20	19.12		

<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.

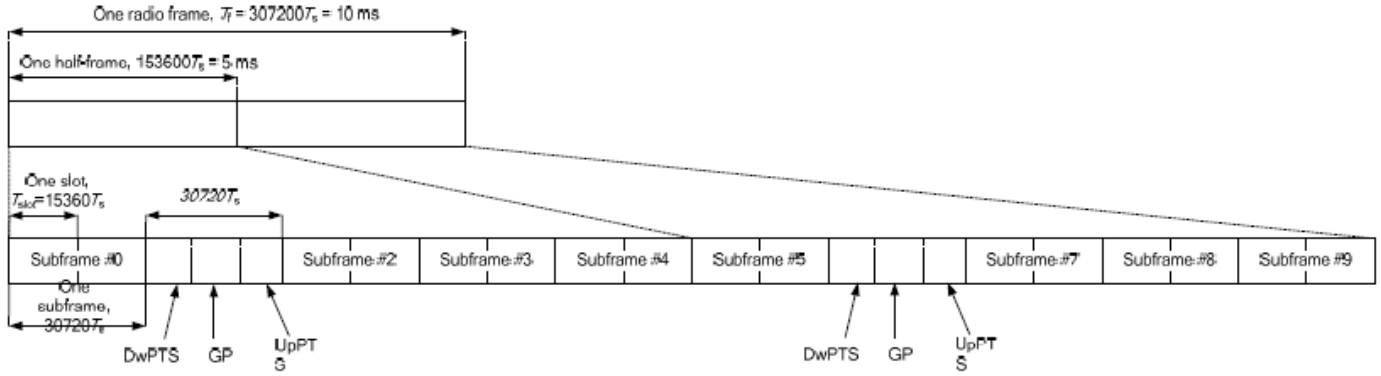


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

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	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

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

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

The highest duty factor is resulted from:

i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subfames, 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	22.77	22.95	23.18	22.85	22.77	23.8	0
20	QPSK	1	49	22.37	22.75	22.95	22.64	22.48		
20	QPSK	1	99	22.75	22.72	22.74	22.65	22.39		
20	QPSK	50	0	21.97	21.88	21.98	21.73	21.78	22.8	1
20	QPSK	50	24	21.59	21.84	21.90	21.82	21.66		
20	QPSK	50	50	21.55	21.52	21.89	21.78	21.61		
20	QPSK	100	0	21.88	21.84	22.01	21.78	21.60		
20	16QAM	1	0	22.32	21.65	21.72	22.06	22.04	22.8	1
20	16QAM	1	49	22.13	21.38	22.38	22.08	21.64		
20	16QAM	1	99	21.76	22.22	21.90	21.37	21.78		
20	16QAM	50	0	21.13	20.80	20.98	20.74	20.59	21.8	2
20	16QAM	50	24	20.65	20.89	21.04	20.75	20.38		
20	16QAM	50	50	20.83	20.59	20.93	20.71	20.52		
20	16QAM	100	0	20.63	20.80	20.94	20.83	20.57		
20	64QAM	1	0	20.60	20.50	20.56	20.47	20.42	21.8	2
20	64QAM	1	49	20.24	20.64	20.79	20.27	20.12		
20	64QAM	1	99	20.24	20.46	20.33	20.06	20.30		
20	64QAM	50	0	19.97	19.89	20.06	19.92	19.88	20.8	3
20	64QAM	50	24	19.84	19.67	19.91	19.73	19.46		
20	64QAM	50	50	19.79	19.82	19.82	19.74	19.57		
20	64QAM	100	0	19.89	19.83	19.96	19.86	19.72		
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	22.76	22.86	23.11	22.75	22.69	23.8	0
15	QPSK	1	37	22.27	22.70	22.93	22.61	22.41		
15	QPSK	1	74	22.75	22.68	22.73	22.62	22.39		
15	QPSK	36	0	21.91	21.81	21.93	21.65	21.78	22.8	1
15	QPSK	36	20	21.57	21.83	21.90	21.73	21.65		
15	QPSK	36	39	21.52	21.52	21.87	21.74	21.55		
15	QPSK	75	0	21.78	21.80	21.99	21.75	21.60		
15	16QAM	1	0	22.24	21.56	21.64	21.99	21.98	22.8	1
15	16QAM	1	37	22.09	21.36	22.36	22.02	21.57		
15	16QAM	1	74	21.70	22.16	21.89	21.37	21.78		
15	16QAM	36	0	21.13	20.71	20.95	20.74	20.53	21.8	2
15	16QAM	36	20	20.56	20.85	20.98	20.72	20.31		
15	16QAM	36	39	20.77	20.53	20.84	20.64	20.50		
15	16QAM	75	0	20.59	20.72	20.85	20.74	20.53		
15	64QAM	1	0	20.52	20.43	20.48	20.37	20.40	21.8	2
15	64QAM	1	37	20.23	20.57	20.77	20.19	20.05		
15	64QAM	1	74	20.19	20.41	20.29	19.99	20.26		
15	64QAM	36	0	19.89	19.84	19.96	19.88	19.78	20.8	3
15	64QAM	36	20	19.83	19.62	19.90	19.72	19.43		
15	64QAM	36	39	19.71	19.74	19.77	19.64	19.50		
15	64QAM	75	0	19.84	19.78	19.86	19.85	19.63		
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2501	2547	2593	2639	2685		
10	QPSK	1	0	22.72	22.87	23.13	22.76	22.77	23.8	0
10	QPSK	1	25	22.32	22.68	22.90	22.54	22.44		
10	QPSK	1	49	22.66	22.66	22.71	22.63	22.31		
10	QPSK	25	0	21.97	21.79	21.93	21.66	21.68	22.8	1

10	QPSK	25	12	21.58	21.77	21.89	21.73	21.63		
10	QPSK	25	25	21.53	21.52	21.88	21.74	21.53		
10	QPSK	50	0	21.84	21.81	21.99	21.71	21.60		
10	16QAM	1	0	22.26	21.58	21.71	22.04	22.04	22.8	1
10	16QAM	1	25	22.05	21.28	22.34	22.02	21.61		
10	16QAM	1	49	21.69	22.15	21.86	21.31	21.68		
10	16QAM	25	0	21.13	20.74	20.90	20.64	20.50	21.8	2
10	16QAM	25	12	20.63	20.84	20.94	20.75	20.35		
10	16QAM	25	25	20.73	20.52	20.88	20.63	20.50		
10	16QAM	50	0	20.62	20.74	20.84	20.80	20.56		
10	64QAM	1	0	20.59	20.44	20.53	20.41	20.37	21.8	2
10	64QAM	1	25	20.18	20.64	20.79	20.26	20.12		
10	64QAM	1	49	20.15	20.39	20.33	19.98	20.20		
10	64QAM	25	0	19.95	19.84	20.01	19.88	19.88	20.8	3
10	64QAM	25	12	19.79	19.65	19.89	19.66	19.44		
10	64QAM	25	25	19.76	19.79	19.76	19.69	19.54		
10	64QAM	50	0	19.89	19.75	19.86	19.78	19.70		
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	22.67	22.86	23.10	22.80	22.70	23.8	0
5	QPSK	1	12	22.35	22.70	22.89	22.57	22.44		
5	QPSK	1	24	22.69	22.71	22.72	22.60	22.35		
5	QPSK	12	0	21.90	21.81	21.95	21.69	21.75	22.8	1
5	QPSK	12	7	21.56	21.81	21.84	21.74	21.58		
5	QPSK	12	13	21.55	21.44	21.84	21.77	21.56		
5	QPSK	25	0	21.81	21.84	21.91	21.70	21.52		
5	16QAM	1	0	22.27	21.60	21.69	22.00	22.04	22.8	1
5	16QAM	1	12	22.13	21.32	22.37	22.06	21.54		
5	16QAM	1	24	21.70	22.17	21.86	21.32	21.75		
5	16QAM	12	0	21.04	20.74	20.97	20.71	20.52	21.8	2
5	16QAM	12	7	20.59	20.82	20.95	20.72	20.29		
5	16QAM	12	13	20.80	20.53	20.91	20.61	20.43		
5	16QAM	25	0	20.60	20.79	20.84	20.79	20.47		
5	64QAM	1	0	20.57	20.43	20.50	20.46	20.36	21.8	2
5	64QAM	1	12	20.23	20.55	20.71	20.18	20.08		
5	64QAM	1	24	20.24	20.44	20.27	20.01	20.20		
5	64QAM	12	0	19.95	19.89	19.97	19.86	19.82	20.8	3
5	64QAM	12	7	19.78	19.59	19.91	19.73	19.41		
5	64QAM	12	13	19.69	19.72	19.72	19.66	19.57		
5	64QAM	25	0	19.86	19.78	19.93	19.76	19.65		

<LTE Band 48>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				55340	55830	56150	56640		
Frequency (MHz)				3560	3609	3641	3690		
20	QPSK	1	0	22.64	22.49	22.59	22.54	23	0
20	QPSK	1	49	22.25	22.21	22.35	22.60		
20	QPSK	1	99	22.61	22.33	22.43	22.61		
20	QPSK	50	0	21.22	21.14	21.18	21.15	22	1
20	QPSK	50	24	21.00	20.61	20.66	21.01		
20	QPSK	50	50	20.49	21.02	20.72	20.49		
20	QPSK	100	0	21.07	21.00	21.06	21.05		

20	16QAM	1	0	20.82	20.92	21.27	21.54	22	1
20	16QAM	1	49	20.64	20.64	21.00	20.62		
20	16QAM	1	99	20.63	21.00	20.75	20.92		
20	16QAM	50	0	19.72	19.74	19.82	19.70	21	2
20	16QAM	50	24	20.01	19.73	19.75	20.10		
20	16QAM	50	50	19.51	20.13	19.71	20.00		
20	16QAM	100	0	19.57	20.19	19.71	19.53		
20	64QAM	1	0	20.02	19.97	19.61	19.43	21	2
20	64QAM	1	49	19.23	19.72	19.97	19.78		
20	64QAM	1	99	19.14	19.11	19.23	19.06		
20	64QAM	50	0	18.73	18.64	18.90	18.67	20	3
20	64QAM	50	24	19.12	18.62	18.73	18.56		
20	64QAM	50	50	18.53	18.63	18.70	18.97		
20	64QAM	100	0	19.10	18.70	18.71	19.16		
Channel				55315	55820	56160	56665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				3557.5	3608	3642	3692.5		
15	QPSK	1	0	22.55	22.39	22.53	22.49	23	0
15	QPSK	1	37	22.17	22.16	22.29	22.50		
15	QPSK	1	74	22.55	22.25	22.41	22.54		
15	QPSK	36	0	21.17	21.10	21.09	21.05	22	1
15	QPSK	36	20	20.97	20.53	20.58	21.00		
15	QPSK	36	39	20.39	20.92	20.71	20.46		
15	QPSK	75	0	21.06	20.90	20.99	20.98		
15	16QAM	1	0	20.79	20.91	21.21	21.45	22	1
15	16QAM	1	37	20.56	20.54	20.91	20.58		
15	16QAM	1	74	20.62	20.98	20.67	20.89		
15	16QAM	36	0	19.65	19.72	19.82	19.65	21	2
15	16QAM	36	20	19.99	19.71	19.70	20.10		
15	16QAM	36	39	19.48	20.13	19.68	19.92		
15	16QAM	75	0	19.49	20.15	19.64	19.50		
15	64QAM	1	0	20.02	19.92	19.51	19.38	21	2
15	64QAM	1	37	19.23	19.69	19.93	19.75		
15	64QAM	1	74	19.14	19.08	19.22	19.03		
15	64QAM	36	0	18.73	18.61	18.87	18.58	20	3
15	64QAM	36	20	19.03	18.58	18.65	18.52		
15	64QAM	36	39	18.45	18.61	18.65	18.93		
15	64QAM	75	0	19.00	18.68	18.68	19.09		
Channel				55290	55815	56165	56690	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				3555	3607.5	3642.5	3695		
10	QPSK	1	0	22.59	22.46	22.50	22.51	23	0
10	QPSK	1	25	22.21	22.14	22.32	22.60		
10	QPSK	1	49	22.61	22.25	22.43	22.51		
10	QPSK	25	0	21.17	21.12	21.10	21.11	22	1
10	QPSK	25	12	20.92	20.56	20.60	20.94		
10	QPSK	25	25	20.46	21.00	20.62	20.44		
10	QPSK	50	0	21.05	20.93	21.02	21.05		
10	16QAM	1	0	20.79	20.90	21.19	21.51	22	1
10	16QAM	1	25	20.59	20.62	20.99	20.54		
10	16QAM	1	49	20.53	20.95	20.70	20.86		
10	16QAM	25	0	19.68	19.71	19.75	19.60	21	2
10	16QAM	25	12	20.00	19.63	19.75	20.07		
10	16QAM	25	25	19.43	20.10	19.62	19.92		
10	16QAM	50	0	19.56	20.11	19.69	19.51		
10	64QAM	1	0	19.97	19.90	19.55	19.34	21	2
10	64QAM	1	25	19.22	19.68	19.95	19.73		
10	64QAM	1	49	19.10	19.06	19.19	19.04		

10	64QAM	25	0	18.70	18.63	18.87	18.67	20	3
10	64QAM	25	12	19.12	18.57	18.68	18.54		
10	64QAM	25	25	18.48	18.54	18.63	18.89		
10	64QAM	50	0	19.06	18.64	18.70	19.15		
Channel				55265	55810	56170	56715	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				3552.5	3607	3643	3697.5		
5	QPSK	1	0	22.60	22.48	22.56	22.45	23	0
5	QPSK	1	12	22.21	22.13	22.31	22.50		
5	QPSK	1	24	22.57	22.27	22.38	22.51		
5	QPSK	12	0	21.12	21.08	21.09	21.11	22	1
5	QPSK	12	7	20.94	20.60	20.65	20.91		
5	QPSK	12	13	20.39	20.97	20.63	20.40		
5	QPSK	25	0	21.01	20.91	21.03	21.00		
5	16QAM	1	0	20.74	20.90	21.17	21.48	22	1
5	16QAM	1	12	20.61	20.54	20.95	20.52		
5	16QAM	1	24	20.58	20.94	20.66	20.85		
5	16QAM	12	0	19.67	19.71	19.77	19.64	21	2
5	16QAM	12	7	19.97	19.66	19.71	20.01		
5	16QAM	12	13	19.47	20.10	19.63	19.99		
5	16QAM	25	0	19.51	20.15	19.66	19.53		
5	64QAM	1	0	19.99	19.94	19.59	19.42	21	2
5	64QAM	1	12	19.14	19.68	19.92	19.75		
5	64QAM	1	24	19.04	19.09	19.22	19.03		
5	64QAM	12	0	18.70	18.63	18.87	18.63	20	3
5	64QAM	12	7	19.02	18.61	18.65	18.51		
5	64QAM	12	13	18.43	18.57	18.60	18.90		
5	64QAM	25	0	19.07	18.65	18.64	19.11		

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	21.94	22.12	22.17	21.93	21.88	22.8	0
20	QPSK	1	49	21.65	21.86	21.77	21.69	21.41		
20	QPSK	1	99	21.68	21.86	21.79	21.59	21.37		
20	QPSK	50	0	21.51	21.57	21.59	21.44	21.49	22.8	0
20	QPSK	50	24	21.35	21.51	21.54	21.43	21.10		
20	QPSK	50	50	21.31	21.49	21.46	21.34	21.02		
20	QPSK	100	0	21.35	21.55	21.56	21.39	21.03		
20	16QAM	1	0	21.69	21.67	21.68	21.58	21.48	22.8	0
20	16QAM	1	49	21.51	21.65	21.55	21.45	21.13		
20	16QAM	1	99	21.38	21.65	21.57	21.34	21.10		
20	16QAM	50	0	20.49	20.65	20.56	20.48	20.29	21.8	1
20	16QAM	50	24	20.38	20.67	20.55	20.43	20.14		
20	16QAM	50	50	20.30	20.57	20.48	20.38	20.06		
20	16QAM	100	0	20.38	20.60	20.53	20.39	20.13		
20	64QAM	1	0	20.36	20.44	20.39	20.30	20.16	21.8	1
20	64QAM	1	49	20.07	20.21	20.17	20.13	19.85		
20	64QAM	1	99	20.04	20.27	20.19	19.96	19.82		
20	64QAM	50	0	19.49	19.59	19.56	19.48	19.31	20.8	2
20	64QAM	50	24	19.35	19.58	19.50	19.40	19.16		
20	64QAM	50	50	19.28	19.53	19.43	19.35	19.06		
20	64QAM	100	0	19.40	19.54	19.52	19.42	19.13		
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	21.52	21.70	21.65	21.50	21.40	22.8	0
15	QPSK	1	37	21.22	21.43	21.29	21.23	20.96		
15	QPSK	1	74	21.21	21.36	21.29	21.14	20.92		
15	QPSK	36	0	21.51	21.51	21.48	21.37	21.20	22.8	0
15	QPSK	36	20	21.31	21.47	21.54	21.37	21.03		
15	QPSK	36	39	21.21	21.46	21.45	21.31	20.96		
15	QPSK	75	0	21.26	21.53	21.48	21.36	21.02		
15	16QAM	1	0	21.66	21.58	21.60	21.49	21.45	22.8	0
15	16QAM	1	37	21.51	21.56	21.54	21.40	21.07		
15	16QAM	1	74	21.29	21.62	21.51	21.25	21.03		
15	16QAM	36	0	20.49	20.58	20.54	20.45	20.20	21.8	1
15	16QAM	36	20	20.32	20.58	20.49	20.42	20.05		
15	16QAM	36	39	20.29	20.53	20.41	20.33	20.02		
15	16QAM	75	0	20.29	20.57	20.46	20.33	20.09		
15	64QAM	1	0	20.28	20.39	20.33	20.26	20.09	21.8	1
15	64QAM	1	37	20.03	20.17	20.17	20.12	19.81		
15	64QAM	1	74	20.03	20.22	20.18	19.94	19.81		
15	64QAM	36	0	19.45	19.52	19.47	19.48	19.24	20.8	2
15	64QAM	36	20	19.30	19.50	19.45	19.40	19.15		
15	64QAM	36	39	19.27	19.46	19.38	19.26	19.05		
15	64QAM	75	0	19.34	19.53	19.52	19.38	19.07		
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2501	2547	2593	2639	2685		
10	QPSK	1	0	21.44	21.75	21.64	21.50	21.45	22.8	0
10	QPSK	1	25	21.23	21.40	21.36	21.22	20.91		
10	QPSK	1	49	21.26	21.37	21.36	21.15	20.91		
10	QPSK	25	0	21.47	21.55	21.50	21.32	21.22	22.8	0

10	QPSK	25	12	21.31	21.52	21.44	21.35	21.09		
10	QPSK	25	25	21.28	21.48	21.40	21.34	21.01		
10	QPSK	50	0	21.35	21.53	21.47	21.33	20.99		
10	16QAM	1	0	21.67	21.61	21.62	21.49	21.45	22.8	0
10	16QAM	1	25	21.49	21.63	21.51	21.45	21.03		
10	16QAM	1	49	21.29	21.56	21.50	21.32	21.04		
10	16QAM	25	0	20.49	20.57	20.48	20.41	20.20	21.8	1
10	16QAM	25	12	20.35	20.64	20.46	20.35	20.05		
10	16QAM	25	25	20.23	20.50	20.45	20.32	20.04		
10	16QAM	50	0	20.29	20.60	20.43	20.35	20.06		
10	64QAM	1	0	20.26	20.41	20.35	20.28	20.15	21.8	1
10	64QAM	1	25	20.06	20.14	20.13	20.04	19.80		
10	64QAM	1	49	20.01	20.18	20.13	19.86	19.83		
10	64QAM	25	0	19.40	19.54	19.52	19.40	19.27	20.8	2
10	64QAM	25	12	19.28	19.51	19.49	19.31	19.16		
10	64QAM	25	25	19.20	19.44	19.39	19.35	18.96		
10	64QAM	50	0	19.35	19.53	19.51	19.34	19.11		
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	21.47	21.68	21.62	21.46	21.39	22.8	0
5	QPSK	1	12	21.19	21.38	21.37	21.29	21.01		
5	QPSK	1	24	21.18	21.45	21.32	21.18	20.90		
5	QPSK	12	0	21.43	21.51	21.41	21.34	21.20	22.8	0
5	QPSK	12	7	21.33	21.56	21.49	21.37	21.07		
5	QPSK	12	13	21.21	21.44	21.40	21.30	20.95		
5	QPSK	25	0	21.32	21.50	21.49	21.32	20.94		
5	16QAM	1	0	21.59	21.60	21.60	21.54	21.47	22.8	0
5	16QAM	1	12	21.50	21.57	21.48	21.40	21.03		
5	16QAM	1	24	21.38	21.59	21.48	21.25	21.05		
5	16QAM	12	0	20.42	20.60	20.51	20.41	20.25	21.8	1
5	16QAM	12	7	20.37	20.59	20.54	20.41	20.04		
5	16QAM	12	13	20.29	20.54	20.45	20.35	20.06		
5	16QAM	25	0	20.38	20.53	20.48	20.29	20.13		
5	64QAM	1	0	20.36	20.35	20.32	20.20	20.09	21.8	1
5	64QAM	1	12	19.99	20.15	20.13	20.08	19.85		
5	64QAM	1	24	19.94	20.21	20.16	19.94	19.83		
5	64QAM	12	0	19.49	19.51	19.51	19.38	19.23	20.8	2
5	64QAM	12	7	19.28	19.51	19.43	19.30	19.11		
5	64QAM	12	13	19.28	19.48	19.33	19.35	18.99		
5	64QAM	25	0	19.32	19.50	19.49	19.39	19.07		

<LTE Carrier Aggregation combinations>

General Note:

1. This device supports Carrier Aggregation on downlink only for inter and intra band, Uplink CA is not supported. For the device supports combination bands and configurations are according to 3GPP.
2. In applying the existing power measurement procedure of KDB 941225 D05A for DL CA SAR test exclusion, only the subset with the largest number of combinations of the frequency band and CCs in each row need consideration, and that configurations require power measurement should be highlighted in the below table.
3. All permutations exist. No restrictions on Pcell & Scell combinations. Only LTE Band 29A is limited to Scell.

2CC Downlink Carrier Aggregation			3CC Downlink Carrier Aggregation		
Number	Combination	Covered by Measurement Superset	Number	Combination	Covered by Measurement Superset
1	12A-66A		30	13A-66A-66A	
2	13A-66A	30	31	13A-66B	32
3	29A-66A	B29 RX Only	32	13A-66C	
4	2A-12A	34	33	2A-13A-66A	
5	2A-13A	35	34	2A-2A-12A	
6	2A-29A	39	35	2A-2A13A	
7	2A-2A	34	36	2A-2A-5A	
8	2A-4A	37	37	2A-4A-12A	
9	2A-5A	42	38	2A-4A-13A	
10	2A-66A	43	39	2A-4A-29A	
11	2A-7A	46	40	2A-4A-5A	
12	2C		41	2A-4A-7A	
13	41C	48	42	2A-5A-66A	
14	4A-12A	49	43	2A-66A-66A	
15	4A-13A	50	44	2A-66B	45
16	4A-29A		45	2A-66C	
17	4A-4A	49	46	2A-7A-12A	
18	4A-5A		47	2A-7A-7A	
19	4A-7A	52	48	41D	
20	5A-66A	54	49	4A-4A-12A	
21	5A-7A		50	4A-4A-13A	
22	5B		51	4A-4A-5A	
23	66A-66A	54	52	4A-7A-12A	
24	66B	55	53	4A-7A-7A	
25	66C	56	54	5A-66A-66A	
26	7A-12A	52	55	5A-66B	56
27	7A-7A	53	56	5A-66C	
28	7B		57	66A-66B	58
29	7C		58	66A-66C	

<Power verification when LTE Carrier Aggregation Active>

General Note:

i. According to KDB941225 D05A v01r02, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.

ii. Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.

iii. The device supports downlink two carrier aggregation. For power measurement were control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.

iv. Selected highest measured power when downlink carrier aggregation is inactive for conducted power comparison with downlink carrier aggregation is active, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.

v. For non-contiguous intra-band CA, the SCC selected to provide maximum separation from the PCC and must remain fully within the downlink transmission band.

vi. For Intra-band, contiguous CA, the downlink channels selected to perform the uplink power measurement must satisfy 3GPP channel spacing (5.4.1A of 3GPP TS 36.521 or equivalent) and channel bandwidth (5.4.2A) requirements.

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

<Two Carrier power verification>

Configure		CA Configuration (BCS)	PCC							SCC				Power	
			LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Inter-Band		4A-29A	4	20	1745	20300	QPSK	1	0	29	10	722.5	9715	23.56	23.54
		4A-5A	4	20	1745	20300	QPSK	1	0	5	10	881.5	2525	23.59	23.54
		5A-7A	5	10	844	20600	QPSK	1	0	7	20	2655	3100	23.98	23.99
		12A-66A	12	10	707.5	23095	QPSK	1	0	66	20	2155	66886	23.78	23.63
Intra-Band	Contiguous	2C	2	20	1880	18900	QPSK	1	0	2	20	1960.2	902	23.66	23.64
		5B	5	10	844	20600	QPSK	1	0	5	10	864.1	2351	23.97	23.99
		7B	7	20	2510	20850	QPSK	1	0	7	20	2660.2	3152	22.98	22.94
		7C	7	20	2510	20850	QPSK	1	0	7	20	2660.2	3152	22.96	22.94

<Three Carrier power verification>

Configure		CA Configuration (BCS)	PCC							SCC				SCC2				Power	
			LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Inter-Band		2A-2A-12A	2	20	1880	18900	QPSK	1	0	2	20	1940	700	12.00	10.00	737.5	5095	23.66	23.64
		2A-2A13A	2	20	1880	18900	QPSK	1	0	2	20	1940	700	13.00	10.00	751	5230	23.7	23.64
		2A-2A-5A	2	20	1880	18900	QPSK	1	0	2	20	1940	700	5.00	10.00	881.5	2525	23.67	23.64
		2A-4A-5A	2	20	1880	18900	QPSK	1	0	4	20	2132.5	2175	5.00	10.00	881.5	2525	23.71	23.64
		2A-4A-7A	2	20	1880	18900	QPSK	1	0	4	20	2132.5	2175	7.00	20.00	2655	3100	23.68	23.64
		2A-4A-12A	2	20	1880	18900	QPSK	1	0	4	20	2132.5	2175	12.00	10.00	737.5	5095	23.68	23.64
		2A-66A-66A	2	20	1880	18900	QPSK	1	0	66	20	2155	66886	66.00	20.00	2190	67236	23.66	23.64
		2A-4A-13A	2	20	1880	18900	QPSK	1	0	4	20	2132.5	2175	13.00	10.00	751	5230	23.69	23.64
		2A-4A-29A	2	20	1880	18900	QPSK	1	0	4	20	2132.5	2175	29.00	10.00	722.5	9715	23.68	23.64
		2A-5A-66A	2	20	1880	18900	QPSK	1	0	5	10	881.5	2525	66.00	20.00	2155	66886	23.65	23.64
		2A-7A-7A	2	20	1880	18900	QPSK	1	0	7	20	2655	3100	7.00	20.00	2680	3350	23.65	23.64
		2A-7A-12A	2	20	1880	18900	QPSK	1	0	7	20	2655	3100	12.00	10.00	737.5	5095	23.69	23.64
		2A-13A-66A	2	20	1880	18900	QPSK	1	0	13	10	750	5230	66.00	20.00	2155	66886	23.68	23.64
		4A-4A-5A	4	20	1745	20300	QPSK	1	0	4	20	2145	2300	5.00	10.00	881.5	2525	23.68	23.54
		4A-4A-12A	4	20	1745	20300	QPSK	1	0	4	20	2145	2300	12.00	10.00	737.5	5095	23.55	23.54
		4A-4A-13A	4	20	1745	20300	QPSK	1	0	4	20	2145	2300	13.00	10.00	751	5230	23.63	23.54
		4A-7A-7A	4	20	1745	20300	QPSK	1	0	7	20	2655.0	3100	7.00	20.00	2680	3350	23.71	23.54
		4A-7A-12A	4	20	1745	20300	QPSK	1	0	7	20	2655.0	3100	12.00	10.00	737.5	5095	23.56	23.54
		5A-66A-66A	5	10	844	20600	QPSK	1	0	66	20	2155.0	66886	66.00	20.00	2190	67236	23.96	23.99
		5A-66C	5	10	844	20600	QPSK	1	0	66	20	2155.0	66886	66.00	20.00	2174.8	67084	23.97	23.99
		13A-66A-66A	13	10	782	23230	QPSK	1	0	66	20	2155	66886	66.00	20.00	2190	67236	23.68	23.63
		13A-66C	13	10	782	23230	QPSK	1	0	66	20	2155	66886	66.00	20.00	2174.8	67084	23.65	23.63
Intra-Band	Non-Contiguous	66A-66C	66	20	1720	132072	QPSK	1	0	66	20	2190	67236	66	20	2170.2	67038	23.45	23.39
	Contiguous	41D	41	20	2593	40620	QPSK	1	0	41	20	2525.8	39948	41	20	2545.6	40146	23.23	23.18

<LTE Uplink carrier aggregation>

2CC Uplink Carrier Aggregation	
Number	Combination
1	CA_7C
2	CA_41C

<Intra-band>

General Note:

i. The device supports intra-band uplink carrier aggregation for LTE B7/B41 with a maximum of two 20MHz component carriers. For intra band contiguous carrier aggregation scenarios, 3GPP 36.101 table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when not-contiguous RB allocation is implemented. The conducted power and MPR setting in this device are permanently implemented pre 3GPP requirement.

ii. The device supports uplink carrier aggregation with a maximum of two 20MHz component carriers. For intra band contiguous carrier aggregation scenarios, 3GPP 36.101 table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when not-contiguous RB allocation is implemented. The conducted power and MPR setting in this device are permanently implemented pre the 3GPP requirement.

iii. According TCB workshop, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.

iv. According TCB workshop, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.

v. Additional SAR measurement for LTE UL CA whit other DL CA combinations active were not required since the maximum output power for this configuration was not > 0.25dB higher than the maximum output power for UL CA active.

<Default Power>

CA_7C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20850	21048	QPSK	1	0	0	0	1	0	22.32	23.8
21100	20902	QPSK	1	0	1	99	2	0	22.91	23.8
21350	21152	QPSK	1	0	1	99	2	0	23.2	23.8

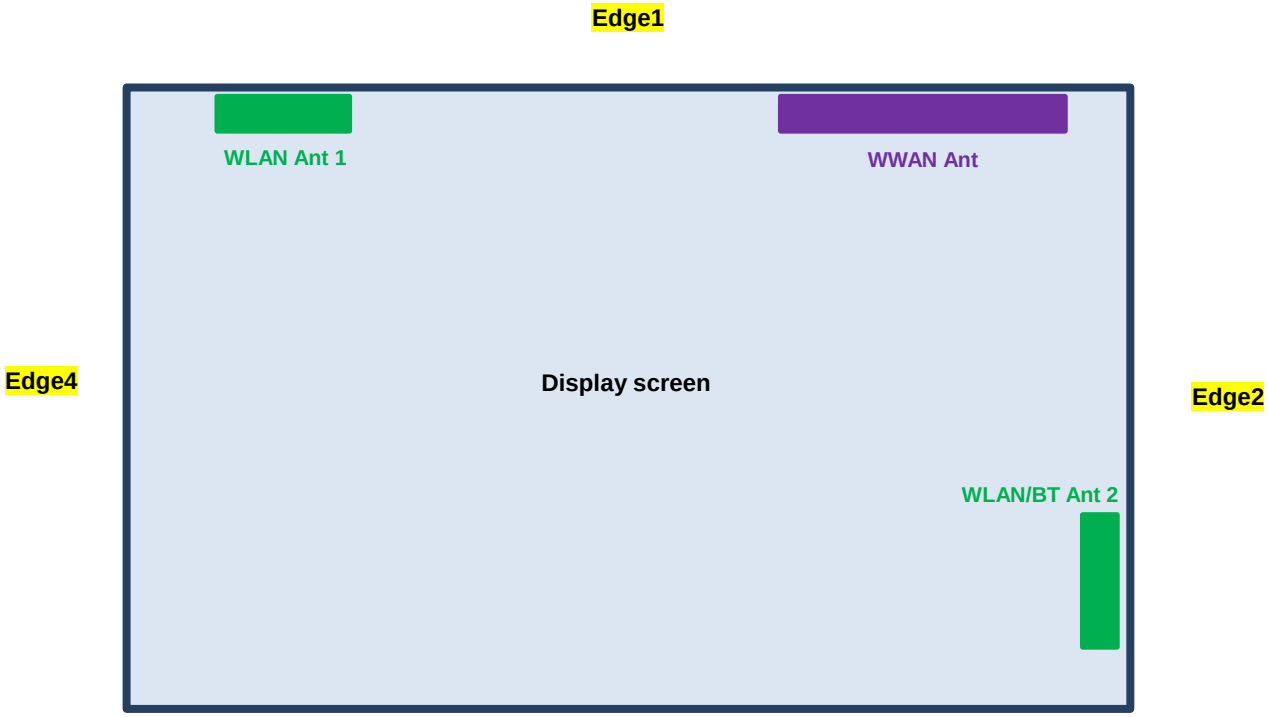
CA_41C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
39750	39948	QPSK	1	0	0	0	1	0	22.49	23.8
40185	39987	QPSK	1	0	1	99	2	0	22.62	23.8
40620	40422	QPSK	1	0	1	99	2	0	22.88	23.8
41055	40857	QPSK	1	0	1	99	2	0	23.08	23.8
41490	41292	QPSK	1	0	1	99	2	0	23.24	23.8

<Reduced Power>

CA_7C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20850	21048	QPSK	1	0	0	0	1	0	20.13	21.8
21100	20902	QPSK	1	0	1	99	2	0	20.56	21.8
21350	21152	QPSK	1	0	1	99	2	0	20.82	21.8

CA_41C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
39750	39948	QPSK	1	0	0	0	1	0	21.02	22.8
40185	39987	QPSK	1	0	1	99	2	0	21.33	22.8
40620	40422	QPSK	1	0	1	99	2	0	21.48	22.8
41055	40857	QPSK	1	0	1	99	2	0	21.52	22.8
41490	41292	QPSK	1	0	1	99	2	0	21.6	22.8

13. Antenna Location



Front View

The separation distance for antenna to edge :

Antenna	To Edge1 (mm)	To Edge2 (mm)	To Edge3 (mm)	To Edge4 (mm)
WWAN Antenna	2.6	35	190	205

<SAR test exclusion table>

General Note:

1. The below table, when the distance is < 50 mm exclusion threshold is "Ratio", when the distance is > 50 mm exclusion threshold is "mW"
2. Maximum power is the source-based time-average power and represents the maximum RF output power among production units
3. Per KDB 447498 D01v06, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
4. Per KDB 447498 D01v06, standalone SAR test exclusion threshold is applied; If the test separation distance is < 5mm, 5mm is used to determine SAR exclusion threshold.
5. Per KDB 447498 D01v06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
   [(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
   - f(GHz) is the RF channel transmit frequency in GHz
   - Power and distance are rounded to the nearest mW and mm before calculation
   - The result is rounded to one decimal place for comparison
6. Per KDB 447498 D01v06, at 100 MHz to 6 GHz and for *test separation distances* > 50 mm, the SAR test exclusion threshold is determined according to the following
   a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz
   b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

Exposure Position	Wireless Interface	WCDMA Band V	WCDMA Band IV	WCDMA Band II	LTE Band 12	LTE Band 14	LTE Band 13	LTE Band 5 / 26	LTE Band 4 / 66	LTE Band 2	LTE Band 7	LTE Band 41	LTE Band 48
	Calculated Frequency	846MHz	1750MHz	1907MHz	715MHz	796MHz	784MHz	848MHz	1779MHz	1909MHz	2567MHz	2687MHz	3698MHz
	Maximum power (dBm)	24	24	24	24	24	24	24	24	24	23.8	23.8	23
	Maximum rated power(mW)	251.0	251.0	251.0	251.0	251.0	251.0	251.0	251.0	251.0	240.0	240.0	200.0
Bottom Face	Separation distance(mm)	5.0											
	exclusion threshold	46.2	66.4	69.3	42.5	44.8	44.5	46.2	67.0	69.4	76.9	78.7	76.9
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edge 1	Separation distance(mm)	2.6											
	exclusion threshold	46.2	66.4	69.3	42.5	44.8	44.5	46.2	67.0	69.4	76.9	78.7	76.9
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edge 2	Separation distance(mm)	35.0											
	exclusion threshold	6.6	9.5	9.9	6.1	6.4	6.4	6.6	9.6	9.9	11.0	11.2	11.0
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edge 3	Separation distance(mm)	190.0											
	exclusion threshold	953.0	1513.0	1509.0	845.0	834.0	901.0	954.0	1512.0	1509.0	1494.0	1492.0	1478.0
	Testing required?	No	No	No	No	No	No	No	No	No	No	No	No
Edge 4	Separation distance(mm)	205.0											
	exclusion threshold	1037.0	1663.0	1659.0	916.0	905.0	980.0	1039.0	1662.0	1659.0	1644.0	1642.0	1628.0
	Testing required?	No	No	No	No	No	No	No	No	No	No	No	No

14. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   c. 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 ≥0.8W/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; 20mm for edge1

UMTS Note:

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

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4/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 25/66; 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 ≤ 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.

14.1 Body SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	SKU	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 Face	0mm	SKU_B	OFF	9400	1880	23.78	24.00	1.052	0.01	0.429	0.451
	WCDMA II	RMC 12.2Kbps	Edge 1	0mm	SKU_B	ON	9400	1880	20.49	22.00	1.416	-0.06	0.774	1.096
01	WCDMA II	RMC 12.2Kbps	Edge 1	0mm	SKU_B	ON	9262	1852.4	20.24	22.00	1.500	-0.11	0.785	1.177
	WCDMA II	RMC 12.2Kbps	Edge 1	0mm	SKU_B	ON	9538	1907.6	20.40	22.00	1.445	0.15	0.730	1.055
	WCDMA II	RMC 12.2Kbps	Edge 2	0mm	SKU_B	OFF	9400	1880	23.78	24.00	1.052	-0.1	0.102	0.107
	WCDMA II	RMC 12.2Kbps	Edge 1	20mm	SKU_B	OFF	9400	1880	23.78	24.00	1.052	-0.14	0.199	0.209
	WCDMA II	RMC 12.2Kbps	Edge 1	0mm	SKU_C	ON	9262	1852.4	20.24	22.00	1.500	-0.16	0.779	1.168
	WCDMA IV	RMC 12.2Kbps	Bottom Face	0mm	SKU_B	OFF	1513	1752.6	23.61	24.00	1.094	0.17	0.515	0.563
	WCDMA IV	RMC 12.2Kbps	Edge 1	0mm	SKU_B	ON	1413	1732.6	19.53	21.00	1.403	-0.14	0.744	1.044
	WCDMA IV	RMC 12.2Kbps	Edge 1	0mm	SKU_B	ON	1513	1752.6	19.41	21.00	1.442	-0.13	0.751	1.083
02	WCDMA IV	RMC 12.2Kbps	Edge 1	0mm	SKU_B	ON	1312	1712.4	19.38	21.00	1.452	-0.03	0.813	1.181
	WCDMA IV	RMC 12.2Kbps	Edge 2	0mm	SKU_B	OFF	1513	1752.6	23.61	24.00	1.094	0.13	0.112	0.123
	WCDMA IV	RMC 12.2Kbps	Edge 1	20mm	SKU_B	OFF	1513	1752.6	23.61	24.00	1.094	-0.12	0.372	0.407
	WCDMA IV	RMC 12.2Kbps	Edge 1	0mm	SKU_C	ON	1312	1712.4	19.38	21.00	1.452	-0.17	0.806	1.170
	WCDMA V	RMC 12.2Kbps	Bottom Face	0mm	SKU_B	OFF	4182	836.4	23.99	24.00	1.002	0.16	0.188	0.188
	WCDMA V	RMC 12.2Kbps	Edge 1	0mm	SKU_B	OFF	4182	836.4	23.99	24.00	1.002	-0.03	0.683	0.684
	WCDMA V	RMC 12.2Kbps	Edge 1	0mm	SKU_B	OFF	4132	826.4	23.86	24.00	1.033	-0.08	0.617	0.637
03	WCDMA V	RMC 12.2Kbps	Edge 1	0mm	SKU_B	OFF	4233	846.6	23.89	24.00	1.026	-0.04	0.689	0.707
	WCDMA V	RMC 12.2Kbps	Edge 2	0mm	SKU_B	OFF	4182	836.4	23.99	24.00	1.002	-0.18	0.119	0.119
	WCDMA V	RMC 12.2Kbps	Edge 3	0mm	SKU_B	OFF	4182	836.4	23.99	24.00	1.002	0.02	0.001	0.001
	WCDMA V	RMC 12.2Kbps	Edge 1	0mm	SKU_C	OFF	4233	846.6	23.89	24.00	1.026	-0.13	0.688	0.706

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	SKU	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 Face	0mm	SKU_B	OFF	19100	1900	23.58	24.00	1.102	-0.12	0.416	0.458
	LTE Band 2	20M	QPSK	50	0	Bottom Face	0mm	SKU_B	OFF	19100	1900	22.64	23.00	1.086	0.05	0.328	0.356
04	LTE Band 2	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	19100	1900	21.55	22.00	1.109	-0.14	0.934	1.036
	LTE Band 2	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	18700	1860	21.24	22.00	1.191	-0.09	0.859	1.023
	LTE Band 2	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	18900	1880	21.36	22.00	1.159	0.14	0.867	1.005
	LTE Band 2	20M	QPSK	50	0	Edge 1	0mm	SKU_B	ON	19100	1900	21.27	22.00	1.183	-0.1	0.861	1.019
	LTE Band 2	20M	QPSK	50	0	Edge 1	0mm	SKU_B	ON	18700	1860	20.91	22.00	1.285	-0.07	0.803	1.032
	LTE Band 2	20M	QPSK	50	0	Edge 1	0mm	SKU_B	ON	18900	1880	21.00	22.00	1.259	-0.09	0.812	1.022
	LTE Band 2	20M	QPSK	100	0	Edge 1	0mm	SKU_B	ON	19100	1900	21.23	22.00	1.194	0.16	0.844	1.008
	LTE Band 2	20M	QPSK	1	0	Edge 2	0mm	SKU_B	OFF	19100	1900	23.58	24.00	1.102	0.13	0.100	0.110
	LTE Band 2	20M	QPSK	50	0	Edge 2	0mm	SKU_B	OFF	19100	1900	22.64	23.00	1.086	0.03	0.077	0.084
	LTE Band 2	20M	QPSK	1	0	Edge 1	20mm	SKU_B	OFF	19100	1900	23.58	24.00	1.102	-0.09	0.189	0.208
	LTE Band 2	20M	QPSK	50	0	Edge 1	20mm	SKU_B	OFF	19100	1900	22.64	23.00	1.086	0.06	0.151	0.164
	LTE Band 2	20M	QPSK	1	0	Edge 1	0mm	SKU_C	ON	19100	1900	21.55	22.00	1.109	-0.1	0.932	1.034
	LTE Band 7	20M	QPSK	1	0	Bottom Face	0mm	SKU_B	OFF	20850	2510	22.94	23.80	1.219	0.12	0.523	0.638
	LTE Band 7	20M	QPSK	50	0	Bottom Face	0mm	SKU_B	OFF	20850	2510	21.94	22.80	1.219	0.12	0.447	0.545
	LTE Band 7	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	21100	2535	20.75	21.80	1.274	-0.16	0.846	1.077
05	LTE Band 7	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	20850	2510	20.73	21.80	1.279	-0.13	0.890	1.139
	LTE Band 7	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	21350	2560	20.73	21.80	1.279	0.13	0.834	1.067
	LTE Band 7	20M	QPSK	50	0	Edge 1	0mm	SKU_B	ON	21100	2535	20.45	21.80	1.365	0.13	0.811	1.107
	LTE Band 7	20M	QPSK	50	0	Edge 1	0mm	SKU_B	ON	20850	2510	20.39	21.80	1.384	-0.16	0.806	1.115
	LTE Band 7	20M	QPSK	50	0	Edge 1	0mm	SKU_B	ON	21350	2560	20.41	21.80	1.377	-0.16	0.801	1.103
	LTE Band 7	20M	QPSK	100	0	Edge 1	0mm	SKU_B	ON	21100	2535	20.43	21.80	1.371	0.13	0.798	1.094
	LTE Band 7	20M	QPSK	1	0	Edge 2	0mm	SKU_B	OFF	20850	2510	22.94	23.80	1.219	0.16	0.123	0.150
	LTE Band 7	20M	QPSK	50	0	Edge 2	0mm	SKU_B	OFF	20850	2510	21.94	22.80	1.219	0.12	0.099	0.121
	LTE Band 7	20M	QPSK	1	0	Edge 1	20mm	SKU_B	OFF	20850	2510	22.94	23.80	1.219	-0.17	0.142	0.173
	LTE Band 7	20M	QPSK	50	0	Edge 1	20mm	SKU_B	OFF	20850	2510	21.94	22.80	1.219	0.12	0.115	0.140
	LTE Band 7	20M	QPSK	1	0	Edge 1	0mm	SKU_C	ON	20850	2510	20.73	21.80	1.279	-0.12	0.877	1.122
	LTE Band 7C	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	21350	2560	20.82	21.80	1.253	-0.1	0.822	1.030
	LTE Band 7C	20M	QPSK	1	0	Edge 1	20mm	SKU_B	OFF	21350	2560	23.20	23.80	1.148	0.06	0.138	0.158
	LTE Band 12	10M	QPSK	1	0	Bottom Face	0mm	SKU_B	OFF	23095	707.5	23.63	24.00	1.089	-0.03	0.074	0.081
	LTE Band 12	10M	QPSK	25	0	Bottom Face	0mm	SKU_B	OFF	23095	707.5	22.56	23.00	1.107	0.05	0.052	0.058
06	LTE Band 12	10M	QPSK	1	0	Edge 1	0mm	SKU_B	OFF	23095	707.5	23.63	24.00	1.089	0.03	0.298	0.325
	LTE Band 12	10M	QPSK	25	0	Edge 1	0mm	SKU_B	OFF	23095	707.5	22.56	23.00	1.107	-0.12	0.227	0.251
	LTE Band 12	10M	QPSK	1	0	Edge 2	0mm	SKU_B	OFF	23095	707.5	23.63	24.00	1.089	0.1	0.001	0.001
	LTE Band 12	10M	QPSK	25	0	Edge 2	0mm	SKU_B	OFF	23095	707.5	22.56	23.00	1.107	0.06	0.001	0.001
	LTE Band 12	10M	QPSK	1	0	Edge 3	0mm	SKU_B	OFF	23095	707.5	23.63	24.00	1.089	0.05	0.001	0.001
	LTE Band 12	10M	QPSK	25	0	Edge 3	0mm	SKU_B	OFF	23095	707.5	22.56	23.00	1.107	-0.01	0.001	0.001
	LTE Band 12	10M	QPSK	1	0	Edge 1	0mm	SKU_C	OFF	23095	707.5	23.63	24.00	1.089	-0.19	0.251	0.273
	LTE Band 13	10M	QPSK	1	0	Bottom Face	0mm	SKU_B	OFF	23230	782	23.68	24.00	1.076	0.15	0.073	0.079
	LTE Band 13	10M	QPSK	25	0	Bottom Face	0mm	SKU_B	OFF	23230	782	22.61	23.00	1.094	0.03	0.055	0.060
07	LTE Band 13	10M	QPSK	1	0	Edge 1	0mm	SKU_B	OFF	23230	782	23.68	24.00	1.076	0.15	0.394	0.424
	LTE Band 13	10M	QPSK	25	0	Edge 1	0mm	SKU_B	OFF	23230	782	22.61	23.00	1.094	-0.11	0.328	0.359
	LTE Band 13	10M	QPSK	1	0	Edge 2	0mm	SKU_B	OFF	23230	782	23.68	24.00	1.076	-0.18	0.001	0.001
	LTE Band 13	10M	QPSK	25	0	Edge 2	0mm	SKU_B	OFF	23230	782	22.61	23.00	1.094	0.01	0.001	0.001
	LTE Band 13	10M	QPSK	1	0	Edge 3	0mm	SKU_B	OFF	23230	782	23.68	24.00	1.076	-0.04	0.001	0.001
	LTE Band 13	10M	QPSK	25	0	Edge 3	0mm	SKU_B	OFF	23230	782	22.61	23.00	1.094	0.09	0.001	0.001
	LTE Band 13	10M	QPSK	1	0	Edge 1	0mm	SKU_C	OFF	23230	782	23.68	24.00	1.076	0.18	0.382	0.411

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	SKU	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 14	10M	QPSK	1	0	Bottom Face	0mm	SKU_B	OFF	23330	793	23.74	24.00	1.062	-0.09	0.087	0.092
	LTE Band 14	10M	QPSK	25	0	Bottom Face	0mm	SKU_B	OFF	23330	793	22.74	23.00	1.062	0.03	0.069	0.073
08	LTE Band 14	10M	QPSK	1	0	Edge 1	0mm	SKU_B	OFF	23330	793	23.74	24.00	1.062	0.1	0.445	0.472
	LTE Band 14	10M	QPSK	25	0	Edge 1	0mm	SKU_B	OFF	23330	793	22.74	23.00	1.062	0.12	0.327	0.347
	LTE Band 14	10M	QPSK	1	0	Edge 2	0mm	SKU_B	OFF	23330	793	23.74	24.00	1.062	-0.04	0.001	0.001
	LTE Band 14	10M	QPSK	25	0	Edge 2	0mm	SKU_B	OFF	23330	793	22.74	23.00	1.062	0.06	0.001	0.001
	LTE Band 14	10M	QPSK	1	0	Edge 3	0mm	SKU_B	OFF	23330	793	23.74	24.00	1.062	0.01	0.001	0.001
	LTE Band 14	10M	QPSK	25	0	Edge 3	0mm	SKU_B	OFF	23330	793	22.74	23.00	1.062	0.06	0.001	0.001
	LTE Band 14	10M	QPSK	1	0	Edge 1	0mm	SKU_C	OFF	23330	793	23.74	24.00	1.062	0.15	0.418	0.444
	LTE Band 26	15M	QPSK	1	0	Bottom Face	0mm	SKU_B	OFF	26865	831.5	23.74	24.00	1.062	0.04	0.128	0.136
	LTE Band 26	15M	QPSK	36	0	Bottom Face	0mm	SKU_B	OFF	26865	831.5	22.89	23.00	1.026	0.07	0.099	0.102
09	LTE Band 26	15M	QPSK	1	0	Edge 1	0mm	SKU_B	OFF	26865	831.5	23.74	24.00	1.062	-0.05	0.609	0.647
	LTE Band 26	15M	QPSK	36	0	Edge 1	0mm	SKU_B	OFF	26865	831.5	22.89	23.00	1.026	0.15	0.458	0.470
	LTE Band 26	15M	QPSK	1	0	Edge 2	0mm	SKU_B	OFF	26865	831.5	23.74	24.00	1.062	0.15	0.101	0.107
	LTE Band 26	15M	QPSK	36	0	Edge 2	0mm	SKU_B	OFF	26865	831.5	22.89	23.00	1.026	0.02	0.081	0.083
	LTE Band 26	15M	QPSK	1	0	Edge 3	0mm	SKU_B	OFF	26865	831.5	23.74	24.00	1.062	0.02	0.001	0.001
	LTE Band 26	15M	QPSK	36	0	Edge 3	0mm	SKU_B	OFF	26865	831.5	22.89	23.00	1.026	0.02	0.001	0.001
	LTE Band 26	15M	QPSK	1	0	Edge 1	0mm	SKU_C	OFF	26865	831.5	23.74	24.00	1.062	-0.05	0.595	0.632
	LTE Band 66	20M	QPSK	1	0	Bottom Face	0mm	SKU_B	OFF	132322	1745	23.39	24.00	1.151	-0.01	0.573	0.659
	LTE Band 66	20M	QPSK	50	0	Bottom Face	0mm	SKU_B	OFF	132322	1745	22.29	23.00	1.178	0.15	0.468	0.551
	LTE Band 66	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	132322	1745	19.23	21.00	1.503	0.19	0.621	0.933
10	LTE Band 66	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	132072	1720	19.07	21.00	1.560	-0.16	0.707	1.103
	LTE Band 66	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	132572	1770	19.20	21.00	1.514	-0.19	0.589	0.891
	LTE Band 66	20M	QPSK	50	0	Edge 1	0mm	SKU_B	ON	132322	1745	19.22	21.00	1.507	0.03	0.661	0.996
	LTE Band 66	20M	QPSK	50	0	Edge 1	0mm	SKU_B	ON	132072	1720	19.18	21.00	1.521	0.12	0.594	0.903
	LTE Band 66	20M	QPSK	50	0	Edge 1	0mm	SKU_B	ON	132572	1770	19.22	21.00	1.507	0.02	0.572	0.862
	LTE Band 66	20M	QPSK	100	0	Edge 1	0mm	SKU_B	ON	132322	1745	19.20	21.00	1.514	-0.05	0.588	0.890
	LTE Band 66	20M	QPSK	1	0	Edge 2	0mm	SKU_B	OFF	132322	1745	23.39	24.00	1.151	-0.06	0.115	0.132
	LTE Band 66	20M	QPSK	50	0	Edge 2	0mm	SKU_B	OFF	132322	1745	22.29	23.00	1.178	0.17	0.086	0.101
	LTE Band 66	20M	QPSK	1	0	Edge 1	20mm	SKU_B	OFF	132322	1745	23.39	24.00	1.151	-0.14	0.364	0.419
	LTE Band 66	20M	QPSK	50	0	Edge 1	20mm	SKU_B	OFF	132322	1745	22.29	23.00	1.178	0.01	0.289	0.340
	LTE Band 66	20M	QPSK	1	0	Edge 1	0mm	SKU_C	ON	132072	1720	19.07	21.00	1.560	-0.14	0.701	1.093

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Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	SKU	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 Face	0mm	SKU_B	OFF	40620	2593	23.18	23.80	1.153	62.9	1.006	-0.16	0.354	0.411
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	SKU_B	OFF	40620	2593	21.98	22.80	1.208	62.9	1.006	-0.16	0.288	0.350
	LTE Band 41	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	40620	2593	22.17	22.80	1.156	62.9	1.006	0.06	0.702	0.816
	LTE Band 41	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	39750	2506	21.94	22.80	1.219	62.9	1.006	0.15	0.719	0.882
	LTE Band 41	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	40185	2549.5	22.12	22.80	1.169	62.9	1.006	0.08	0.692	0.814
	LTE Band 41	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	41055	2636.5	21.93	22.80	1.222	62.9	1.006	0.14	0.805	0.989
11	LTE Band 41	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	41490	2680	21.88	22.80	1.236	62.9	1.006	0.17	0.910	1.131
	LTE Band 41	20M	QPSK	50	0	Edge 1	0mm	SKU_B	ON	40620	2593	21.59	22.80	1.321	62.9	1.006	0.14	0.623	0.828
	LTE Band 41	20M	QPSK	50	0	Edge 1	0mm	SKU_B	ON	39750	2506	21.51	22.80	1.346	62.9	1.006	-0.16	0.641	0.868
	LTE Band 41	20M	QPSK	50	0	Edge 1	0mm	SKU_B	ON	40185	2549.5	21.57	22.80	1.327	62.9	1.006	-0.01	0.602	0.804
	LTE Band 41	20M	QPSK	50	0	Edge 1	0mm	SKU_B	ON	41055	2636.5	21.44	22.80	1.368	62.9	1.006	-0.02	0.734	1.010
	LTE Band 41	20M	QPSK	50	0	Edge 1	0mm	SKU_B	ON	41490	2680	21.49	22.80	1.352	62.9	1.006	-0.06	0.812	1.104
	LTE Band 41	20M	QPSK	100	0	Edge 1	0mm	SKU_B	ON	40620	2593	21.56	22.80	1.330	62.9	1.006	-0.06	0.619	0.828
	LTE Band 41	20M	QPSK	1	0	Edge 2	0mm	SKU_B	OFF	40620	2593	23.18	23.80	1.153	62.9	1.006	0.05	0.060	0.070
	LTE Band 41	20M	QPSK	50	0	Edge 2	0mm	SKU_B	OFF	40620	2593	21.98	22.80	1.208	62.9	1.006	-0.16	0.049	0.060
	LTE Band 41	20M	QPSK	1	0	Edge 1	20mm	SKU_B	OFF	40620	2593	23.18	23.80	1.153	62.9	1.006	-0.19	0.121	0.140
	LTE Band 41	20M	QPSK	50	0	Edge 1	20mm	SKU_B	OFF	40620	2593	21.98	22.80	1.208	62.9	1.006	-0.16	0.086	0.104
	LTE Band 41	20M	QPSK	1	0	Edge 1	0mm	SKU_C	ON	41490	2680	21.88	22.80	1.236	62.9	1.006	-0.16	0.838	1.042
	LTE Band 41C	20M	QPSK	1	0	Edge 1	0mm	SKU_B	ON	41490	2680	21.60	22.80	1.318	62.9	1.006	0.18	0.910	1.060
	LTE Band 41C	20M	QPSK	1	0	Edge 1	20mm	SKU_B	OFF	41490	2680	23.24	23.80	1.138	62.9	1.006	0.02	0.114	0.130
	LTE Band 48	20M	QPSK	1	0	Bottom Face	0mm	SKU_B	OFF	55340	3560	22.64	23.00	1.086	62.9	1.006	0.05	0.400	0.437
	LTE Band 48	20M	QPSK	50	0	Bottom Face	0mm	SKU_B	OFF	55340	3560	21.22	22.00	1.197	62.9	1.006	0.02	0.213	0.256
12	LTE Band 48	20M	QPSK	1	0	Edge 1	0mm	SKU_B	OFF	55340	3560	22.64	23.00	1.086	62.9	1.006	-0.02	0.777	0.849
	LTE Band 48	20M	QPSK	1	0	Edge 1	0mm	SKU_B	OFF	55830	3609	22.49	23.00	1.125	62.9	1.006	0.03	0.583	0.660
	LTE Band 48	20M	QPSK	1	0	Edge 1	0mm	SKU_B	OFF	56150	3641	22.59	23.00	1.099	62.9	1.006	0.14	0.572	0.632
	LTE Band 48	20M	QPSK	1	0	Edge 1	0mm	SKU_B	OFF	56640	3690	22.54	23.00	1.112	62.9	1.006	0.1	0.733	0.820
	LTE Band 48	20M	QPSK	50	0	Edge 1	0mm	SKU_B	OFF	55340	3560	21.22	22.00	1.197	62.9	1.006	0.03	0.440	0.530
	LTE Band 48	20M	QPSK	100	0	Edge 1	0mm	SKU_B	OFF	55340	3560	21.07	22.00	1.239	62.9	1.006	0.11	0.418	0.521
	LTE Band 48	20M	QPSK	1	0	Edge 2	0mm	SKU_B	OFF	55340	3560	22.64	23.00	1.086	62.9	1.006	-0.06	0.001	0.001
	LTE Band 48	20M	QPSK	50	0	Edge 2	0mm	SKU_B	OFF	55340	3560	21.22	22.00	1.197	62.9	1.006	0.08	0.001	0.001
	LTE Band 48	20M	QPSK	1	0	Edge 1	0mm	SKU_C	OFF	55340	3560	22.64	23.00	1.086	62.9	1.006	0.08	0.735	0.803

14.2 Repeated SAR Measurement

No.	Band	Mode	Test Position	Gap (mm)	SKU	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WCDMA IV	RMC 12.2Kbps	Edge 1	0mm	SKU_B	ON	1312	1712.4	19.38	21.00	1.452		1.000	-0.03	0.813		1.181
2nd	WCDMA IV	RMC 12.2Kbps	Edge 1	0mm	SKU_B	ON	1312	1712.4	19.38	21.00	1.452		1.000	-0.11	0.805	1.01	1.169
1st	LTE Band 2	20M_QPSK_1_0	Edge 1	0mm	SKU_B	ON	19100	1900	21.55	22.00	1.109		1.000	-0.14	0.934		1.036
2nd	LTE Band 2	20M_QPSK_1_0	Edge 1	0mm	SKU_B	ON	19100	1900	21.55	22.00	1.109		1.000	0.06	0.918	1.02	1.018
1st	LTE Band 41	20M_QPSK_1_0	Edge 1	0mm	SKU_B	ON	41490	2680	21.88	22.80	1.236	62.9	1.006	0.17	0.910		1.131
2nd	LTE Band 41	20M_QPSK_1_0	Edge 1	0mm	SKU_B	ON	41490	2680	21.88	22.80	1.236	62.9	1.006	0.02	0.906	1.00	1.126
1st	LTE Band 48	20M_QPSK_1_0	Edge 1	0mm	SKU_B	OFF	55340	3560	22.64	23.00	1.086	62.9	1.006	-0.02	0.777		0.849
2nd	LTE Band 48	20M_QPSK_1_0	Edge 1	0mm	SKU_B	OFF	55340	3560	22.64	23.00	1.086	62.9	1.006	-0.11	0.761	1.02	0.832

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. 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.

15. Simultaneous Transmission Analysis

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 Ant 2	Yes

General Note:

1. The Intel AX201NGW WLAN / Bluetooth module is also integrated into this host, for WLAN /Bluetooth power, SAR testing results and simultaneous transmission analysis which can be referred to Sporton FCC SAR Test Report, Report No.: FA111325 (FCC ID: QYLAX201NG).
2. All licensed modes share the same antenna part and cannot transmit simultaneously
3. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
4. The Scaled SAR summation is calculated based on the same configuration and test position.
5. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.

15.1 Body Exposure Conditions

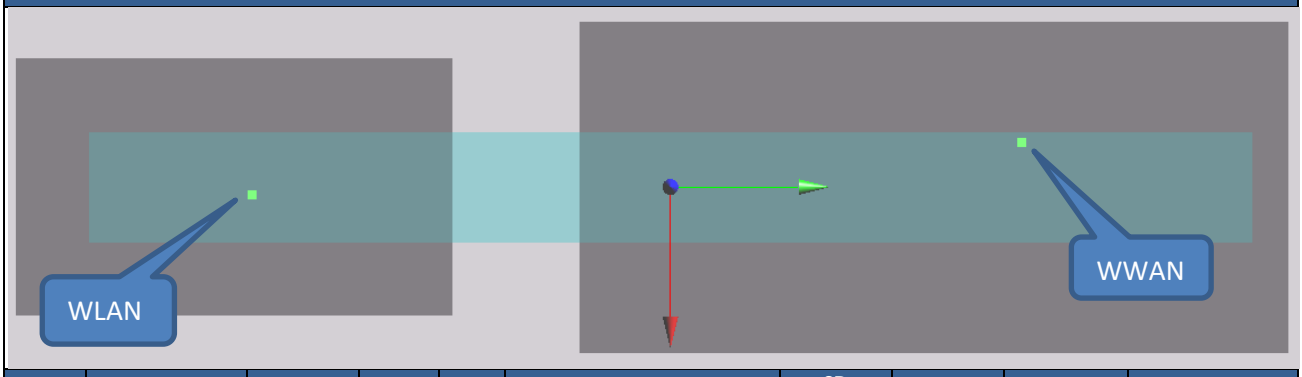
WWAN Band	Exposure Position	0	1	2	3	4	5	0+1+2 Summed 1g SAR (W/kg)	0+1+5 Summed 1g SAR (W/kg)	0+3+4+5 Summed 1g SAR (W/kg)	SPLSR	Case No
		WWAN	2.4GHz WLAN Ant 1	2.4GHz WLAN Ant 2	5GHz WLAN Ant 1	5GHz WLAN Ant 2	Bluetooth Ant 2					
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)					
WCDMA II	Bottom Face at 0mm	0.451	0.063	0.096	0.090	0.109	0.001	**0.610**	**0.515**	**0.651**		
	Edge 1 at 0mm	1.177	0.533		1.169			**1.710**	**1.710**	**2.346**	**0.02**	**Case 1**
	Edge 2 at 0mm	0.107		1.130		0.908	0.127	**1.237**	**0.234**	**1.142**		
WCDMA IV	Bottom Face at 0mm	0.563	0.063	0.096	0.090	0.109	0.001	**0.722**	**0.627**	**0.763**		
	Edge 1 at 0mm	1.181	0.533		1.169			**1.714**	**1.714**	**2.350**	**0.02**	**Case 2**
	Edge 2 at 0mm	0.123		1.130		0.908	0.127	**1.253**	**0.250**	**1.158**		
WCDMA V	Bottom Face at 0mm	0.188	0.063	0.096	0.090	0.109	0.001	**0.347**	**0.252**	**0.388**		
	Edge 1 at 0mm	0.707	0.533		1.169			**1.240**	**1.240**	**1.876**	**0.01**	**Case 3**
	Edge 2 at 0mm	0.119		1.130		0.908	0.127	**1.249**	**0.246**	**1.154**		
	Edge 3 at 0mm	0.001						**0.001**	**0.001**	**0.001**		
LTE Band 2	Bottom Face at 0mm	0.458	0.063	0.096	0.090	0.109	0.001	**0.617**	**0.522**	**0.658**		
	Edge 1 at 0mm	1.036	0.533		1.169			**1.569**	**1.569**	**2.205**	**0.02**	**Case 4**
	Edge 2 at 0mm	0.110		1.130		0.908	0.127	**1.240**	**0.237**	**1.145**		
LTE Band 7	Bottom Face at 0mm	0.638	0.063	0.096	0.090	0.109	0.001	**0.797**	**0.702**	**0.838**		
	Edge 1 at 0mm	1.139	0.533		1.169			**1.672**	**1.672**	**2.308**	**0.02**	**Case 5**
	Edge 2 at 0mm	0.150		1.130		0.908	0.127	**1.280**	**0.277**	**1.185**		
LTE Band 12	Bottom Face at 0mm	0.081	0.063	0.096	0.090	0.109	0.001	**0.240**	**0.145**	**0.281**		
	Edge 1 at 0mm	0.325	0.533		1.169			**0.858**	**0.858**	**1.494**		
	Edge 2 at 0mm	0.001		1.130		0.908	0.127	**1.131**	**0.128**	**1.036**		
	Edge 3 at 0mm	0.001						**0.001**	**0.001**	**0.001**		
LTE Band 13	Bottom Face at 0mm	0.079	0.063	0.096	0.090	0.109	0.001	**0.238**	**0.143**	**0.279**		
	Edge 1 at 0mm	0.424	0.533		1.169			**0.957**	**0.957**	**1.593**		
	Edge 2 at 0mm	0.001		1.130		0.908	0.127	**1.131**	**0.128**	**1.036**		
	Edge 3 at 0mm	0.001						**0.001**	**0.001**	**0.001**		
LTE Band 14	Bottom Face at 0mm	0.092	0.063	0.096	0.090	0.109	0.001	**0.251**	**0.156**	**0.292**		
	Edge 1 at 0mm	0.472	0.533		1.169			**1.005**	**1.005**	**1.641**	**0.01**	**Case 6**
	Edge 2 at 0mm	0.001		1.130		0.908	0.127	**1.131**	**0.128**	**1.036**		
	Edge 3 at 0mm	0.001						**0.001**	**0.001**	**0.001**		
LTE Band 26	Bottom Face at 0mm	0.136	0.063	0.096	0.090	0.109	0.001	**0.295**	**0.200**	**0.336**		
	Edge 1 at 0mm	0.647	0.533		1.169			**1.180**	**1.180**	**1.816**	**0.01**	**Case 7**
	Edge 2 at 0mm	0.107		1.130		0.908	0.127	**1.237**	**0.234**	**1.142**		
	Edge 3 at 0mm	0.001						**0.001**	**0.001**	**0.001**		
LTE Band 41	Bottom Face at 0mm	0.411	0.063	0.096	0.090	0.109	0.001	**0.570**	**0.475**	**0.611**		
	Edge 1 at 0mm	1.131	0.533		1.169			**1.664**	**1.664**	**2.300**	**0.02**	**Case 8**
	Edge 2 at 0mm	0.070		1.130		0.908	0.127	**1.200**	**0.197**	**1.105**		
LTE Band 48	Bottom Face at 0mm	0.437	0.063	0.096	0.090	0.109	0.001	**0.596**	**0.501**	**0.637**		
	Edge 1 at 0mm	0.849	0.533		1.169			**1.382**	**1.382**	**2.018**	**0.01**	**Case 9**
	Edge 2 at 0mm	0.001		1.130		0.908	0.127	**1.131**	**0.128**	**1.036**		
LTE Band 66	Bottom Face at 0mm	0.659	0.063	0.096	0.090	0.109	0.001	**0.818**	**0.723**	**0.859**		
	Edge 1 at 0mm	1.103	0.533		1.169			**1.636**	**1.636**	**2.272**	**0.02**	**Case 10**
	Edge 2 at 0mm	0.132		1.130		0.908	0.127	**1.262**	**0.259**	**1.167**		

15.2 SPLSR Evaluation and Analysis

General Note:

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

Edge1 hotspot point



WLA

	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 1	WCDMA II	Edge 1	1.177	0mm	-10.4	99.2	-3.77	233.7	1.71	0.01	Not required
	WLAN 2.4G_Ant 1		0.533	0mm	-2.4	-134.4	-4.04				
	WCDMA II	Edge 1	1.177	0mm	-10.4	99.2	-3.77	215.4	2.35	0.02	Not required
	WLAN 5G_Ant 1		1.169	0mm	2	-115.8	0.54				
Case 2	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA IV	Edge 1	1.181	0mm	-8.8	98.1	-3.82	232.6	1.71	0.01	Not required
	WLAN 2.4G_Ant 1		0.533	0mm	-2.4	-134.4	-4.04				
	WCDMA IV	Edge 1	1.181	0mm	-8.8	98.1	-3.82	214.2	2.35	0.02	Not required
	WLAN 5G_Ant 1		1.169	0mm	2	-115.8	0.54				
Case 3	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA V	Edge 1	0.707	0mm	-4.5	93.2	-3.87	209.1	1.88	0.01	Not required
	WLAN 5G_Ant 1		1.169	0mm	2	-115.8	0.54				
Case 4	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 2	Edge 1	1.036	0mm	-10.4	99.7	-3.84	215.9	2.21	0.02	Not required
	WLAN 5G_Ant 1		1.169	0mm	2	-115.8	0.54				
Case 5	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 7	Edge 1	1.139	0mm	6.8	88.2	-4.4	222.8	1.67	0.01	Not required
	WLAN 2.4G_Ant 1		0.533	0mm	-2.4	-134.4	-4.04				
	LTE Band 7	Edge 1	1.139	0mm	6.8	88.2	-4.4	204.1	2.31	0.02	Not required
	WLAN 5G_Ant 1		1.169	0mm	2	-115.8	0.54				
Case 6	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 14	Edge 1	0.472	0mm	3.3	95.5	-4.33	211.4	1.64	0.01	Not required
	WLAN 5G_Ant 1		1.169	0mm	2	-115.8	0.54				
Case 7	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 26	Edge 1	0.647	0mm	-2.9	93.2	-3.91	209.1	1.82	0.01	Not required
	WLAN 5G_Ant 1		1.169	0mm	2	-115.8	0.54				

	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 41	Edge 1	1.131	0mm	6.6	79.4	-4.12	214.0	1.66	0.01	Not required
	WLAN 2.4G_Ant 1		0.533	0mm	-2.4	-134.4	-4.04				
	LTE Band 41	Edge 1	1.131	0mm	6.6	79.4	-4.12	195.3	2.30	0.02	Not required
	WLAN 5G_Ant 1		1.169	0mm	2	-115.8	0.54				
	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 9	LTE Band 48	Edge 1	0.849	0mm	-17.6	98.2	0.35	214.9	2.02	0.01	Not required
	WLAN 5G_Ant 1		1.169	0mm	2	-115.8	0.54				
	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 10	LTE Band 66	Edge 1	1.103	0mm	-8.8	98.1	-3.82	232.6	1.64	0.01	Not required
	WLAN 2.4G_Ant 1		0.533	0mm	-2.4	-134.4	-4.04				
	LTE Band 66	Edge 1	1.103	0mm	-8.8	98.1	-3.82	214.2	2.27	0.02	Not required
	WLAN 5G_Ant 1		1.169	0mm	2	-115.8	0.54				

Test Engineer：Mood Huang and Lemon Su

16. 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.

17. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013

[4] SPEAG DASY System Handbook

[5] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[6] FCC KDB 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, 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.