

FCC SAR TEST REPORT

FCC ID : QYLEM7565E
Equipment : WWAN module
Brand Name : Getac
Model Name : EM7565
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: EX80) during test.

The product was received on Jun. 25, 2021 and testing was started from Jun. 26, 2021 and completed on Jun. 29, 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
FA710507-21	01	Initial issue of report	Jul. 26, 2021

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Getac Technology Corporation., WWAN module, EM7565, are as follows.

Equipment Class	Frequency Band	Highest SAR Summary	Highest Simultaneous Transmission 1g SAR (W/kg)
		Body	
		1g SAR (W/kg)	
Licensed	WCDMA II	1.15	1.57
	WCDMA IV	1.16	
	WCDMA V	1.17	
	LTE Band 2	1.08	
	LTE Band 7	1.15	
	LTE Band 12	1.16	
	LTE Band 13	1.10	
	LTE Band 5 / 26	1.07	
	LTE Band 4 / 66	1.07	
	LTE Band 41	1.18	
	LTE Band 42 / 48	1.02	
Date of Testing:		2021/06/26 ~ 2021/6/29	

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) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

Reviewed by: Jason Wang

Report Producer: Paula Chen

2. Guidance Applied

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

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 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	EM7565
FCC ID	QYLEM7565E
IMEI Code	353431080056922
Wireless Technology and Frequency Range	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 30: 2305 MHz ~ 2315 MHz (Rx only) LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 42: 3550 MHz ~ 3600 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+ (16QAM uplink) LTE: QPSK, 16QAM, 64QAM

Host Information	
Equipment Name	Tablet
Brand Name	Getac
Model Name	EX80
Integrated WLAN Module	Brand Name: AMPAK Model Name: AP6234
Integrated NFC Module	Brand Name: Jogtek Model Name: TRF7970A
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5805 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Mode	802.11a/b/g/n HT20/HT40 Bluetooth BR/EDR/LE NFC:ASK
EUT Stage	Production Unit
Remark: 1. The AMPAK AP6234 WLAN / Bluetooth module is also integrated into this host, WLAN /Bluetooth power and WLAN SAR testing results can refer to Sporton SAR Test Report, FCC ID: QYLAP6234E, Report No.: FA710507-03 and these SAR results are also used to perform simultaneous transmission analysis.	

3.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05								
FCC ID	QYLEM7565E							
Equipment Name	WWAN module							
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 42: 3550 MHz ~ 3600MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz							
Channel Bandwidth	LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 26:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 42: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 48: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz							
uplink modulations used	QPSK / 16QAM / 64QAM							
LTE Voice / Data requirements	Data only							
LTE MPR permanently built-in by design	Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3							
	Modulation	Channel bandwidth / Transmission bandwidth (N _{RB})						MPR (dB)
		1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
	64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
	256 QAM	≥ 1						≤ 5
	LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI).						
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.							
Power reduction applied to satisfy SAR compliance	Yes, Proximity Sensor.							
LTE Carrier Aggregation Combinations	Uplink CA is not supported and downlink CA Inter-Band and Intra-Band possible combinations and the detail power measurement please referred to section 11.							
LTE Carrier Aggregation Additional Information	This device supports maximum of 3 carriers in the downlink. Additional following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.							

Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745
LTE Band 5												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829				
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5				
H	20643	848.3	20635	847.5	20625	846.5	20600	844				
LTE Band 7												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510				
M	21100	2535	21100	2535	21100	2535	21100	2535				
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560				
LTE Band 12												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704				
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5				
H	23173	715.3	23165	714.5	23155	713.5	23130	711				
LTE Band 13												
	Bandwidth 5 MHz				Bandwidth 10 MHz							
	Channel #		Freq.(MHz)		Channel #		Freq.(MHz)					
L	23205		779.5		23230		782					
M	23230		782									
H	23255		784.5									
LTE Band 26												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz			
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5		
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5		
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5		
LTE Band 41												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	39675	2498.5	39700	2501	39725	2503.5	39750	2506				
L M	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5				
M	40620	2593	40620	2593	40620	2593	40620	2593				
H M	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5				
H	41565	2687.5	41540	2685	41515	2682.5	41490	2680				

LTE Band 42												
	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	43315	3552.5	43140	3555	43165	3557.5	43190	3560				
M	43340	3575	43340	3575	43340	3575	43340	3575				
H	43565	3597.5	43540	3595	43515	3592.5	43490	3590				
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				
L M	55810	3607	55815	3607.5	55820	3608	55830	3609				
M H	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

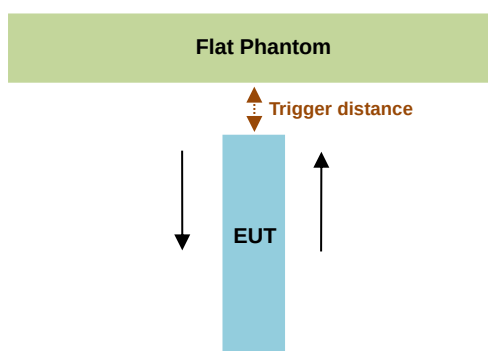
4. Proximity Sensor Triggering Test

<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.



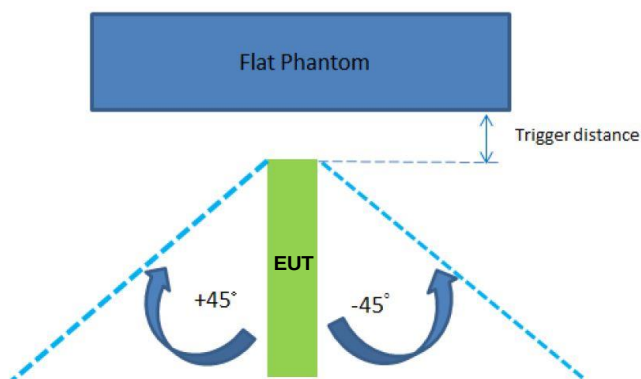
Proximity Sensor Trigger Distance (mm)				
Exposure Position	Bottom Face		Edge 1	
	moving toward	moving away	moving toward	moving away
Minimum	20	22	21	18

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

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

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

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



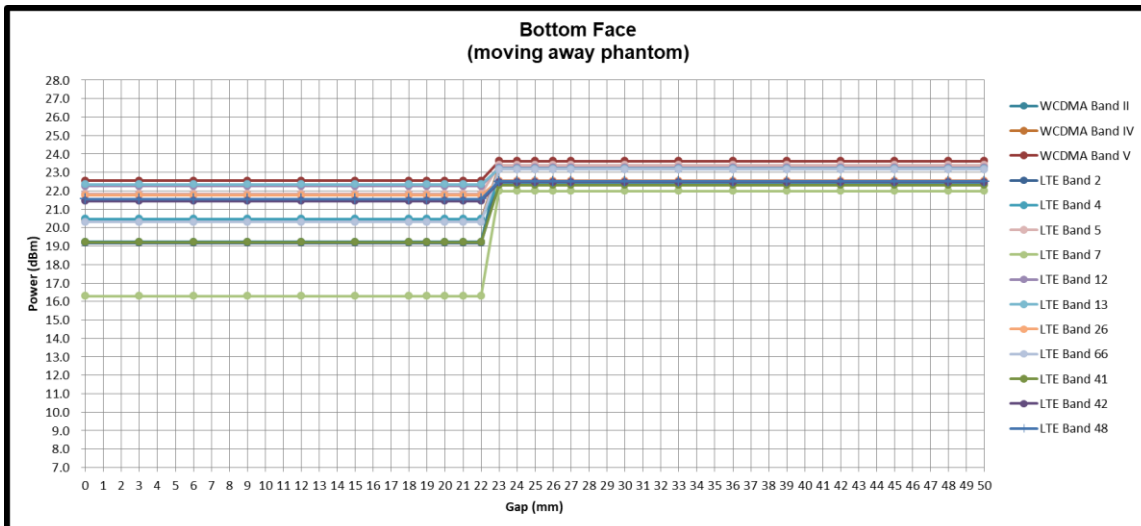
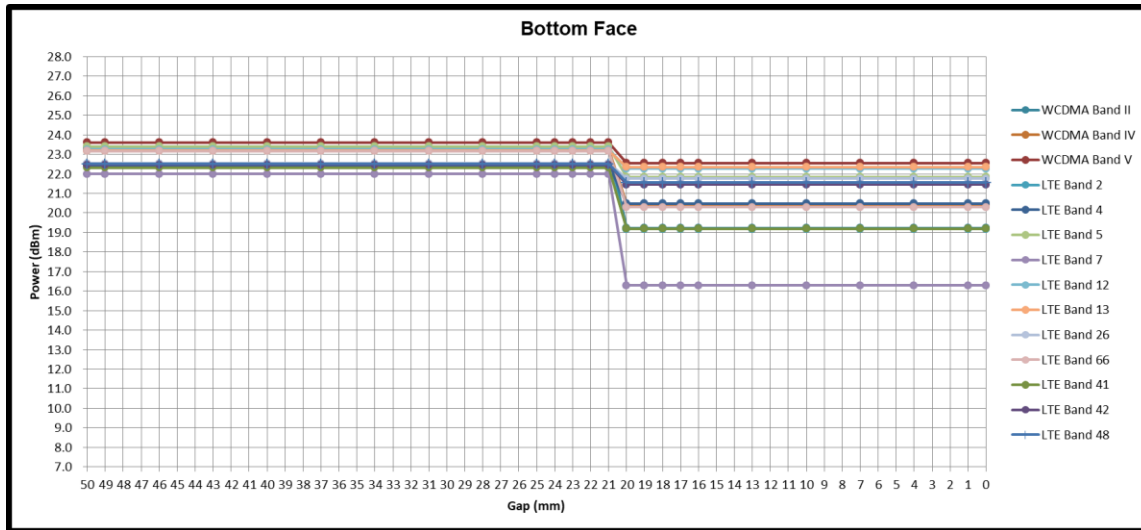
The Sensor Trigger Distance (mm)	
Position	Edge 1
Minimum	18

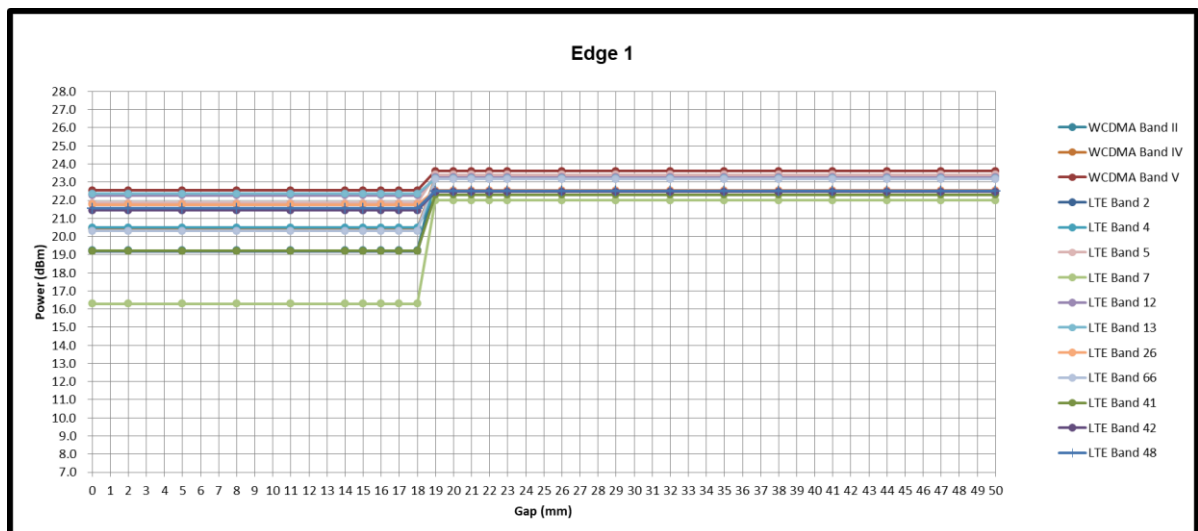
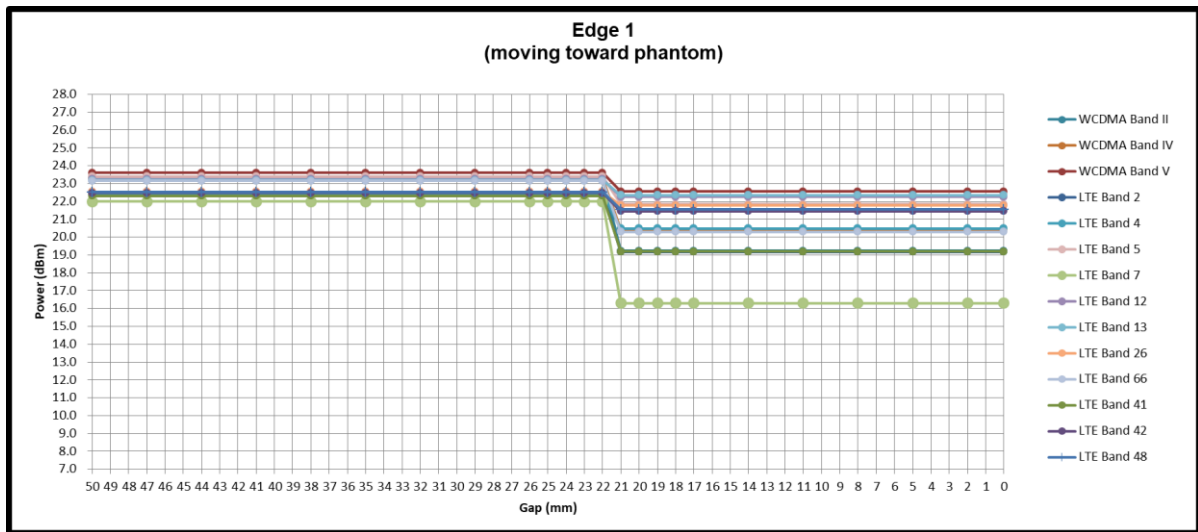
Proximity sensor power reduction

Exposure Position / wireless mode	Bottom Face / Edge 1
WCDMA Band II	4.5dB
WCDMA Band IV	3dB
WCDMA Band V	1dB
LTE Band 2	4.5dB
LTE Band 7	6dB
LTE Band 12	1dB
LTE Band 13	1dB
LTE Band 5 / 26	1.5dB
LTE Band 4 / 66	3.5dB
LTE Band 41	3.5 dB
LTE Band 42 / 48	1.0 dB

Remark:

1. Reduced maximum limit applied by activation of proximity sensor.
2. Power reduction is not applicable for WLAN and Bluetooth.
3. 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
4. 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:
 - Bottom Face: [15 mm](#)
 - Edge1: [15 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:

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

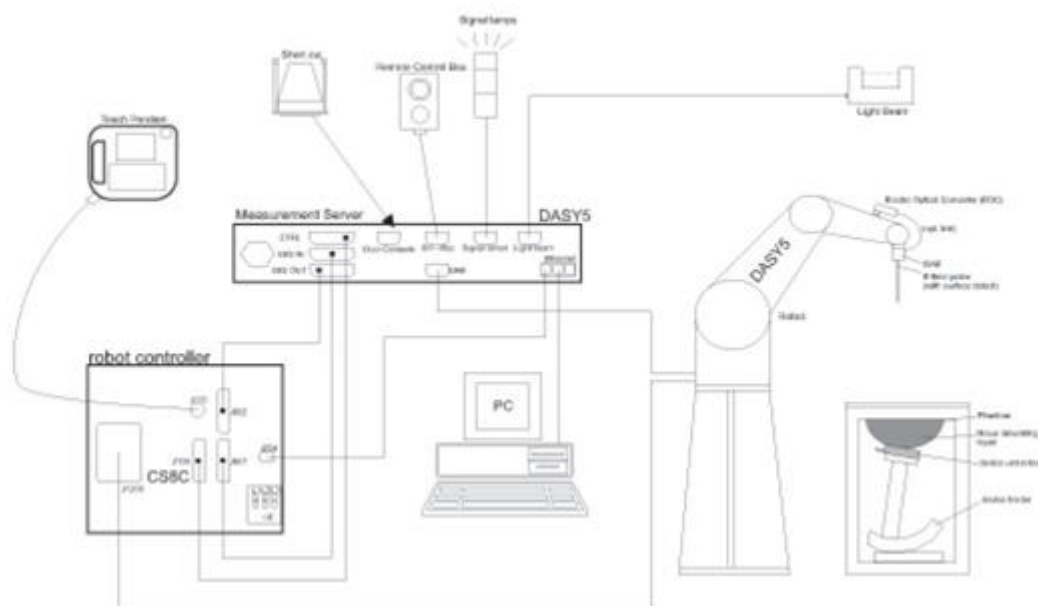
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

7. System Description and Setup

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



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

7.1 Test Site Location

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

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

7.2 E-Field Probe

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

<ES3DV3 Probe>

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

<EX3DV4 Probe>

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

7.3 Data Acquisition Electronics (DAE)

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

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



Fig 5.1 Photo of DAE

7.4 Phantom

<SAM Twin Phantom>

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

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

<ELI Phantom>

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

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

7.5 Device Holder

<Mounting Device for Hand-Held Transmitter>

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



Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

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

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



Mounting Device for Laptops

8. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

8.1 Spatial Peak SAR Evaluation

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

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

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

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

8.2 Power Reference Measurement

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

8.3 Area Scan

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

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

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

8.4 Zoom Scan

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

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

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

8.5 Volume Scan Procedures

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

8.6 Power Drift Monitoring

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

9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit ⁽²⁾	D750V3	1107	Mar. 08, 2019	Mar. 05, 2022
SPEAG	835MHz System Validation Kit ⁽²⁾	D835V2	4d167	Nov. 25, 2019	Nov. 23, 2021
SPEAG	1750MHz System Validation Kit ⁽²⁾	D1750V2	1112	Mar. 07, 2019	Mar. 04, 2022
SPEAG	1900MHz System Validation Kit ⁽²⁾	D1900V2	5d041	Sep. 11, 2018	Sep. 08, 2021
SPEAG	2600MHz System Validation Kit ⁽²⁾	D2600V2	1078	Mar. 06, 2019	Mar. 03, 2022
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. 02, 2022
SPEAG	Data Acquisition Electronics	DAE4	853	Jul. 23, 2020	Jul. 22, 2021
SPEAG	Data Acquisition Electronics	DAE4	1311	Aug. 25, 2020	Aug. 24, 2021
SPEAG	Dosimetric E-Field Probe	ES3DV3	3124	Nov. 23, 2020	Nov. 22, 2021
SPEAG	Dosimetric E-Field Probe	EX3DV4	3642	Apr. 26, 2021	Apr. 25, 2022
Testo	Hygro meter	608-H1	45196600	Nov. 10, 2020	Nov. 09, 2021
Testo	Hygro meter	608-H1	45207528	Nov. 10, 2020	Nov. 09, 2021
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Nov. 10, 2020	Nov. 09, 2021
Keysight	Wireless Communication Test Set	E5515C	MY50266977	May. 12, 2021	May. 11, 2022
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Nov. 11, 2020	Nov. 10, 2021
Keysight	ENA Network Analyzer	E5071C	MY46104758	Sep. 03, 2020	Sep. 02, 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
Agilent	Spectrum Analyzer	E4408B	MY44211028	Aug. 27, 2020	Aug. 26, 2021
Anritsu	Spectrum Analyzer	N9010A	MY53470118	Jan. 15, 2021	Jan. 14, 2022
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 21, 2020	Oct. 20, 2021
Mini-Circuits	Power Amplifier	ZVE-8G+	479102029	Aug. 26, 2020	Aug. 25, 2021
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Warison	Directional Coupler	WCOU-10-50S-10	WR889BMC4B1	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.

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

<WCDMA Conducted Power>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For HSPA+ devices supporting 16 QAM in the uplink, power measurements procedure is according to the configurations in Table C.11.1.4 of 3GPP TS 34.121-1.
4. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

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

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5
Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{hs} = 24/15 * \beta_c$. Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPCCH, DPCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases. Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.							

Setup Configuration

HSUPA Setup Configuration:

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

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1} : 47/15 β_{ed2} : 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

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

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

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

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

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

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

Setup Configuration

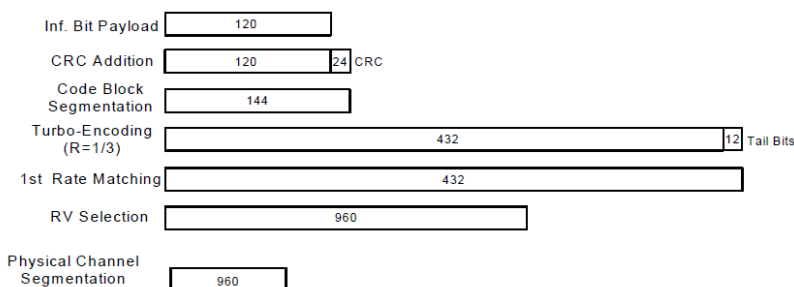
DC-HSDPA 3GPP release 8 Setup Configuration:

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

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

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

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


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

HSPA+ 3GPP release 7 (uplink category 7) 16QAM, 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 = 5.2E:HSPA+:UL with 16QAM
 - 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, C11.1.4, quoted from the TS 34.121-1 s5.2E
 - iii. Set Channel Params
 - iv. Set Cell Power = -86 dBm
 - v. Set Channel Type = HSPA
 - vi. Set UE Target Power =21 dBm
 - vii. Power Ctrl Mode= All Up Bits
 - viii. Set Manual Uplink DPCH Bc/Bd = Manual
 - ix. Set Manual Uplink DPCH Bc and Bd=15,15(for 34.121-1 v8.10.0 table C11.1.4 sub-test 1)
 - x. Set HSPA Conn DL Channel Levels
 - xi. Set HS-SCCH Configs
 - xii. Set RB Test Mode Setup
 - xiii. Set Common HSUPA Parameters
 - xiv. Set Serving Grant
 - xv. Confirm that E-TFCI is equal to the target E-TFCI of 105 for sub-test 1, and other subtest's E-TFCI
- d. The transmitted maximum output power was recorded.

Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	β_c (Note 3)	β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.
 Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
 Note 3: DPDCH is not configured, therefore the β_c is set to 1 and $\beta_d = 0$ by default.
 Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
 Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signaled to use the extrapolation algorithm.

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

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	23.22	23.06	23.29	24.00	23.15	23.26	23.21	24.00	23.46	23.60	23.41	24.00
3GPP Rel 6	HSDPA Subtest-1	22.29	22.33	22.37	23.00	22.19	22.20	22.19	23.00	22.32	22.48	22.42	23.00
3GPP Rel 6	HSDPA Subtest-2	22.28	22.06	22.40	23.00	22.26	22.26	22.16	23.00	22.48	22.39	22.33	23.00
3GPP Rel 6	HSDPA Subtest-3	21.73	21.52	21.78	22.50	21.64	21.67	21.75	22.50	21.98	21.99	21.73	22.50
3GPP Rel 6	HSDPA Subtest-4	21.81	21.60	21.76	22.50	21.73	21.66	21.67	22.50	21.90	22.00	21.94	22.50
3GPP Rel 8	DC-HSDPA Subtest-1	22.22	22.26	22.22	23.00	22.06	22.08	22.12	23.00	22.32	22.38	22.30	23.00
3GPP Rel 8	DC-HSDPA Subtest-2	22.09	21.99	22.27	23.00	22.19	22.06	22.08	23.00	22.31	22.32	22.13	23.00
3GPP Rel 8	DC-HSDPA Subtest-3	21.56	21.47	21.72	22.50	21.59	21.57	21.59	22.50	21.78	21.87	21.56	22.50
3GPP Rel 8	DC-HSDPA Subtest-4	21.76	21.58	21.74	22.50	21.62	21.46	21.62	22.50	21.78	21.91	21.80	22.50
3GPP Rel 6	HSUPA Subtest-1	22.10	22.06	22.20	23.00	21.80	22.00	21.90	23.00	21.48	21.52	21.97	23.00
3GPP Rel 6	HSUPA Subtest-2	19.55	19.68	19.99	21.00	19.82	19.99	19.65	21.00	19.47	19.55	19.52	21.00
3GPP Rel 6	HSUPA Subtest-3	20.80	20.67	20.90	22.00	20.50	20.82	20.48	22.00	20.38	20.61	20.84	22.00
3GPP Rel 6	HSUPA Subtest-4	19.35	19.30	19.66	21.00	19.91	19.48	19.69	21.00	20.09	19.84	19.89	21.00
3GPP Rel 6	HSUPA Subtest-5	21.70	21.50	21.80	23.00	22.00	21.60	21.80	23.00	22.10	21.90	22.10	23.00
3GPP Rel 7	HSPA+ (16QAM) Subtest-1	19.55	19.63	19.60	20.50	19.46	19.51	19.48	20.50	19.44	19.48	19.36	20.50

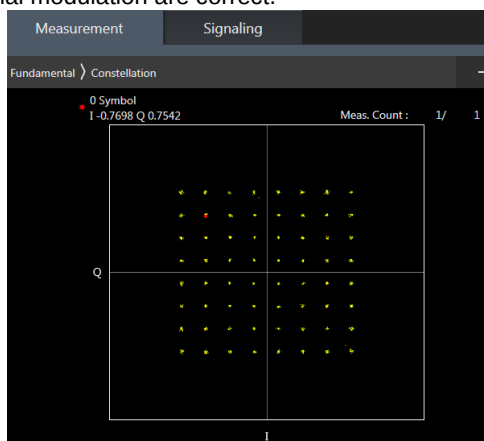
Reduced Power Mode

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	RMC 12.2Kbps	19.20	19.14	19.23	19.50	20.43	20.44	20.34	21.00	22.52	22.55	22.53	23.00
3GPP Rel 6	HSDPA Subtest-1	18.09	17.97	18.02	18.50	19.09	19.18	18.99	20.00	21.41	21.50	21.45	22.00
3GPP Rel 6	HSDPA Subtest-2	18.09	17.93	18.05	18.50	19.00	19.07	18.76	20.00	21.41	21.45	21.40	22.00
3GPP Rel 6	HSDPA Subtest-3	17.61	17.47	17.51	18.00	18.50	18.60	18.45	19.50	20.88	20.91	20.84	21.50
3GPP Rel 6	HSDPA Subtest-4	17.58	17.50	17.50	18.00	18.61	18.58	18.47	19.50	20.95	20.93	20.85	21.50
3GPP Rel 8	DC-HSDPA Subtest-1	17.98	17.92	17.82	18.50	18.90	19.17	18.96	20.00	21.28	21.45	21.28	23.00
3GPP Rel 8	DC-HSDPA Subtest-2	18.02	17.93	17.85	18.50	18.93	19.01	18.70	20.00	21.24	21.40	21.36	23.00
3GPP Rel 8	DC-HSDPA Subtest-3	17.46	17.46	17.36	18.00	18.44	18.59	18.35	19.50	20.75	20.88	20.71	22.50
3GPP Rel 8	DC-HSDPA Subtest-4	17.55	17.48	17.46	18.00	18.48	18.56	18.28	19.50	20.95	20.86	20.70	22.50
3GPP Rel 6	HSUPA Subtest-1	18.04	17.89	18.00	18.50	19.01	19.17	19.10	20.00	21.42	21.46	21.32	22.00
3GPP Rel 6	HSUPA Subtest-2	16.02	15.93	16.01	16.50	16.99	17.03	17.01	18.00	19.30	19.50	19.31	20.00
3GPP Rel 6	HSUPA Subtest-3	17.00	16.92	16.99	17.50	17.87	18.10	17.93	19.00	20.35	20.53	20.31	21.00
3GPP Rel 6	HSUPA Subtest-4	16.06	15.91	16.00	16.50	17.08	17.08	17.03	18.00	19.41	19.41	19.39	20.00
3GPP Rel 6	HSUPA Subtest-5	17.90	17.70	17.90	18.50	18.93	18.99	18.60	20.00	21.20	21.40	21.20	22.00
3GPP Rel 7	HSPA+ (16QAM) Subtest-1	15.65	15.67	15.53	16.00	16.24	16.36	16.30	17.50	18.40	18.45	18.32	19.50

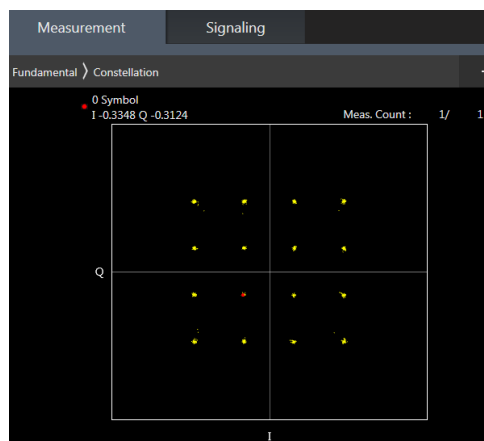
<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4/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 4/5/42 SAR test was covered by Band 66/26/48; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. the maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion
 - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to 2017 TCB workshop, for 64 QAM and 16 QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM and 16QAM signal modulation are correct.



64QAM



16QAM

Default Power Mode
<LTE Band 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	22.38	22.50	22.45	24	0
20	QPSK	1	49	22.37	22.37	22.39		
20	QPSK	1	99	22.18	22.26	22.22		
20	QPSK	50	0	21.40	21.41	21.29	23	1
20	QPSK	50	24	21.35	21.37	21.18		
20	QPSK	50	50	21.27	21.32	21.21		
20	QPSK	100	0	21.30	21.40	21.28	23	1
20	16QAM	1	0	21.73	21.65	21.65		
20	16QAM	1	49	21.75	21.71	21.54		
20	16QAM	1	99	21.47	21.60	21.51	22	2
20	16QAM	50	0	20.51	20.36	20.31		
20	16QAM	50	24	20.24	20.38	20.19		
20	16QAM	50	50	20.07	20.28	20.12	22	2
20	16QAM	100	0	20.53	20.39	20.08		
20	64QAM	1	0	20.84	20.55	20.38		
20	64QAM	1	49	20.55	20.55	20.18	22	2
20	64QAM	1	99	20.38	20.45	20.22		
20	64QAM	50	0	19.39	19.33	19.12		
20	64QAM	50	24	19.31	19.38	19.16	21	3
20	64QAM	50	50	19.05	19.32	19.12		
20	64QAM	100	0	19.33	19.22	19.19		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.25	22.30	22.39	24	0
15	QPSK	1	37	22.24	22.37	22.33		
15	QPSK	1	74	22.09	22.09	22.11		
15	QPSK	36	0	21.46	21.26	21.22	23	1
15	QPSK	36	20	21.21	21.29	21.14		
15	QPSK	36	39	21.24	21.17	21.06		
15	QPSK	75	0	21.15	21.33	21.24	23	1
15	16QAM	1	0	21.62	21.48	21.54		
15	16QAM	1	37	21.64	21.62	21.47		
15	16QAM	1	74	21.32	21.58	21.49	22	2
15	16QAM	36	0	20.43	20.22	20.25		
15	16QAM	36	20	20.14	20.19	20.10		
15	16QAM	36	39	20.03	20.17	20.04	22	2
15	16QAM	75	0	20.40	20.20	20.18		
15	64QAM	1	0	20.71	20.55	20.26		
15	64QAM	1	37	20.53	20.52	20.16	22	2
15	64QAM	1	74	20.33	20.36	20.02		
15	64QAM	36	0	19.26	19.29	19.02		
15	64QAM	36	20	19.14	19.34	19.14	21	3
15	64QAM	36	39	19.01	19.17	19.04		
15	64QAM	75	0	19.28	19.07	19.07		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.23	22.13	22.41	24	0
10	QPSK	1	25	22.37	22.26	22.38		
10	QPSK	1	49	22.18	22.11	22.22		
10	QPSK	25	0	21.30	21.29	21.18	23	1
10	QPSK	25	12	21.22	21.25	21.14		
10	QPSK	25	25	21.24	21.31	21.17		
10	QPSK	50	0	21.30	21.34	21.19	23	1
10	16QAM	1	0	21.60	21.56	21.61		



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10	16QAM	1	25	21.57	21.62	21.39	22	2
10	16QAM	1	49	21.28	21.45	21.33		
10	16QAM	25	0	20.42	20.21	20.16		
10	16QAM	25	12	20.17	20.35	20.08		
10	16QAM	25	25	20.07	20.18	20.03		
10	16QAM	50	0	20.40	20.36	20.06	22	2
10	64QAM	1	0	20.78	20.39	20.27		
10	64QAM	1	25	20.47	20.49	20.03		
10	64QAM	1	49	20.33	20.40	20.14		
10	64QAM	25	0	19.19	19.33	19.11		
10	64QAM	25	12	19.18	19.30	19.16	21	3
10	64QAM	25	25	19.19	19.32	19.10		
10	64QAM	50	0	19.21	19.13	19.15		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.13	22.31	22.49	24	0
5	QPSK	1	12	22.25	22.28	22.30		
5	QPSK	1	24	22.10	22.19	22.17		
5	QPSK	12	0	21.39	21.28	21.18		
5	QPSK	12	7	21.33	21.25	21.26		
5	QPSK	12	13	21.25	21.21	21.18	23	1
5	QPSK	25	0	21.19	21.34	21.26		
5	16QAM	1	0	21.73	21.62	21.64		
5	16QAM	1	12	21.56	21.55	21.45		
5	16QAM	1	24	21.32	21.43	21.43		
5	16QAM	12	0	20.34	20.16	20.29	22	2
5	16QAM	12	7	20.08	20.38	20.02		
5	16QAM	12	13	20.09	20.13	20.03		
5	16QAM	25	0	20.43	20.36	20.14		
5	64QAM	1	0	20.71	20.54	20.28		
5	64QAM	1	12	20.52	20.39	20.02	22	2
5	64QAM	1	24	20.19	20.40	20.21		
5	64QAM	12	0	19.32	19.22	19.08		
5	64QAM	12	7	19.25	19.20	19.00		
5	64QAM	12	13	19.20	19.21	19.15		
5	64QAM	25	0	19.18	19.14	19.20	21	3
Channel				18615	18900	19185		
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.15	22.20	22.43	24	0
3	QPSK	1	8	22.29	22.37	22.34		
3	QPSK	1	14	22.18	22.22	22.17		
3	QPSK	8	0	21.36	21.26	21.20		
3	QPSK	8	4	21.31	21.19	21.03		
3	QPSK	8	7	21.07	21.20	21.07	23	1
3	QPSK	15	0	21.27	21.24	21.17		
3	16QAM	1	0	21.53	21.50	21.61		
3	16QAM	1	8	21.57	21.66	21.37		
3	16QAM	1	14	21.27	21.59	21.44		
3	16QAM	8	0	20.44	20.17	20.22	22	2
3	16QAM	8	4	20.17	20.33	20.13		
3	16QAM	8	7	20.07	20.17	20.02		
3	16QAM	15	0	20.38	20.38	20.03		
3	64QAM	1	0	20.78	20.52	20.20		
3	64QAM	1	8	20.55	20.54	20.07	22	2
3	64QAM	1	14	20.28	20.38	20.14		
3	64QAM	8	0	19.23	19.26	19.00		
3	64QAM	8	4	19.24	19.37	19.14		
3	64QAM	8	7	19.11	19.21	19.05		
3	64QAM	15	0	19.25	19.19	19.03	21	3
Channel				18607	18900	19193		
Frequency (MHz)				1850.7	1880	19185		



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Frequency (MHz)				1850.7	1880	1909.3	(dBm)	(dB)
1.4	QPSK	1	0	22.28	22.30	22.23	24	0
1.4	QPSK	1	3	22.14	22.21	22.16		
1.4	QPSK	1	5	22.23	22.11	22.10		
1.4	QPSK	3	0	22.24	22.25	22.43		
1.4	QPSK	3	1	22.23	22.24	22.39		
1.4	QPSK	3	3	22.18	22.25	22.08	23	1
1.4	QPSK	6	0	21.42	21.12	21.28		
1.4	16QAM	1	0	21.29	21.34	21.08		
1.4	16QAM	1	3	21.10	21.28	21.06		
1.4	16QAM	1	5	21.22	21.27	21.20		
1.4	16QAM	3	0	21.61	21.60	21.45	23	1
1.4	16QAM	3	1	21.58	21.63	21.41		
1.4	16QAM	3	3	21.40	21.53	21.50		
1.4	16QAM	6	0	20.42	20.31	20.23		
1.4	16QAM	6	0	20.42	20.31	20.23		
1.4	64QAM	1	0	20.18	20.24	20.03	22	2
1.4	64QAM	1	3	20.04	20.22	20.07		
1.4	64QAM	1	5	20.73	20.49	20.22		
1.4	64QAM	3	0	20.50	20.42	20.17		
1.4	64QAM	3	1	20.32	20.33	20.03		
1.4	64QAM	3	3	20.16	20.30	20.15	22	2
1.4	64QAM	6	0	19.12	19.32	19.09		
1.4	64QAM	6	0	19.12	19.32	19.09	21	3



<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	22.31	22.46	22.33	24	0
20	QPSK	1	49	22.11	22.14	22.08		
20	QPSK	1	99	22.10	22.09	22.13		
20	QPSK	50	0	21.20	21.24	21.18	23	1
20	QPSK	50	24	21.18	21.14	21.08		
20	QPSK	50	50	21.09	21.20	21.13		
20	QPSK	100	0	21.14	21.40	21.23	23	1
20	16QAM	1	0	21.60	21.54	22.18		
20	16QAM	1	49	21.37	21.31	21.96		
20	16QAM	1	99	21.26	21.28	21.95	22	2
20	16QAM	50	0	20.08	20.16	20.83		
20	16QAM	50	24	20.08	20.03	20.75		
20	16QAM	50	50	20.00	20.02	20.69	22	2
20	16QAM	100	0	20.05	20.05	20.70		
20	64QAM	1	0	20.33	20.35	21.10		
20	64QAM	1	49	20.15	20.13	20.70	22	2
20	64QAM	1	99	20.18	20.07	20.56		
20	64QAM	50	0	19.09	19.13	19.90		
20	64QAM	50	24	19.11	19.30	19.80	21	3
20	64QAM	50	50	19.09	19.24	19.76		
20	64QAM	100	0	19.02	19.01	19.77		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.26	22.43	22.28	24	0
15	QPSK	1	37	22.16	22.05	22.15		
15	QPSK	1	74	22.07	22.08	22.20		
15	QPSK	36	0	21.13	21.24	21.18	23	1
15	QPSK	36	20	21.17	21.22	21.00		
15	QPSK	36	39	21.07	21.29	21.08		
15	QPSK	75	0	21.11	21.44	21.23	23	1
15	16QAM	1	0	21.50	21.47	22.25		
15	16QAM	1	37	21.36	21.24	21.95		
15	16QAM	1	74	21.35	21.31	21.85	22	2
15	16QAM	36	0	20.10	20.23	20.88		
15	16QAM	36	20	20.04	20.30	20.69		
15	16QAM	36	39	20.07	20.04	20.59	22	2
15	16QAM	75	0	20.06	20.02	20.77		
15	64QAM	1	0	20.38	20.36	21.15		
15	64QAM	1	37	20.10	20.16	20.76	22	2
15	64QAM	1	74	20.12	20.05	20.48		
15	64QAM	36	0	19.09	19.12	19.94		
15	64QAM	36	20	19.12	19.34	19.83	21	3
15	64QAM	36	39	19.01	19.24	19.84		
15	64QAM	75	0	19.20	19.30	19.71		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	22.24	22.33	22.13	24	0
10	QPSK	1	25	22.10	22.17	22.08		
10	QPSK	1	49	22.05	22.07	22.13		
10	QPSK	25	0	21.23	21.22	21.25	23	1
10	QPSK	25	12	21.27	21.06	21.10		
10	QPSK	25	25	21.19	21.17	21.15		
10	QPSK	50	0	21.04	21.19	21.71	23	1
10	16QAM	1	0	21.54	21.55	22.25		
10	16QAM	1	25	21.39	21.22	21.97		



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10	16QAM	1	49	21.21	21.27	21.97	22	2
10	16QAM	25	0	20.18	20.20	20.89		
10	16QAM	25	12	20.05	20.10	20.65		
10	16QAM	25	25	20.03	20.11	20.71		
10	16QAM	50	0	20.00	20.08	20.72		
10	64QAM	1	0	20.32	20.30	21.20	22	2
10	64QAM	1	25	20.08	20.20	20.67		
10	64QAM	1	49	20.08	20.01	20.56		
10	64QAM	25	0	19.14	19.09	19.99	21	3
10	64QAM	25	12	19.03	19.35	19.89		
10	64QAM	25	25	19.19	19.26	19.73		
10	64QAM	50	0	19.03	19.09	19.70		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	22.26	22.45	22.33	24	0
5	QPSK	1	12	22.05	22.17	22.00		
5	QPSK	1	24	22.10	22.06	22.10		
5	QPSK	12	0	21.21	21.20	21.15	23	1
5	QPSK	12	7	21.09	21.06	21.02		
5	QPSK	12	13	21.11	21.15	21.10		
5	QPSK	25	0	21.05	21.05	21.63		
5	16QAM	1	0	21.68	21.44	22.13	23	1
5	16QAM	1	12	21.28	21.31	21.95		
5	16QAM	1	24	21.34	21.35	21.85		
5	16QAM	12	0	20.10	20.19	20.82	22	2
5	16QAM	12	7	20.28	20.24	20.82		
5	16QAM	12	13	20.23	20.20	20.65		
5	16QAM	25	0	20.03	20.12	20.70		
5	64QAM	1	0	20.25	20.42	21.19	22	2
5	64QAM	1	12	20.25	20.18	20.68		
5	64QAM	1	24	20.19	20.16	20.58		
5	64QAM	12	0	19.11	19.21	19.87		
5	64QAM	12	7	19.18	19.22	19.90	21	3
5	64QAM	12	13	19.11	19.22	19.71		
5	64QAM	25	0	19.08	19.02	19.74		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	22.22	22.44	22.19	24	0
3	QPSK	1	8	22.04	22.23	22.01		
3	QPSK	1	14	22.20	22.19	22.18		
3	QPSK	8	0	21.13	21.20	21.18	23	1
3	QPSK	8	4	21.08	21.05	21.07		
3	QPSK	8	7	21.05	21.10	21.18		
3	QPSK	15	0	21.23	21.07	21.68		
3	16QAM	1	0	21.52	21.62	22.14	23	1
3	16QAM	1	8	21.46	21.35	21.91		
3	16QAM	1	14	21.18	21.32	22.00		
3	16QAM	8	0	20.06	20.21	20.80	22	2
3	16QAM	8	4	20.06	20.03	20.80		
3	16QAM	8	7	20.01	20.08	20.68		
3	16QAM	15	0	20.12	20.20	20.71		
3	64QAM	1	0	20.26	20.34	21.17	22	2
3	64QAM	1	8	20.18	20.11	20.60		
3	64QAM	1	14	20.13	20.17	20.48		
3	64QAM	8	0	19.15	19.23	19.87		
3	64QAM	8	4	19.02	19.30	19.71	21	3
3	64QAM	8	7	19.02	19.17	19.76		
3	64QAM	15	0	19.10	19.02	19.83		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		



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1.4	QPSK	1	0	22.30	22.38	22.30	24	0
1.4	QPSK	1	3	22.14	22.18	22.07		
1.4	QPSK	1	5	22.08	22.18	22.21		
1.4	QPSK	3	0	22.30	22.36	22.27		
1.4	QPSK	3	1	22.05	22.05	22.13		
1.4	QPSK	3	3	22.18	22.16	22.21		
1.4	QPSK	6	0	21.22	21.28	21.23	23	1
1.4	16QAM	1	0	21.21	21.22	21.17	23	1
1.4	16QAM	1	3	21.18	21.10	21.11		
1.4	16QAM	1	5	21.12	21.08	21.76		
1.4	16QAM	3	0	21.50	21.46	22.22		
1.4	16QAM	3	1	21.27	21.25	21.95		
1.4	16QAM	3	3	21.34	21.23	22.02		
1.4	16QAM	6	0	20.05	20.25	20.77	22	2
1.4	64QAM	1	0	20.01	20.13	20.72	22	2
1.4	64QAM	1	3	20.01	20.11	20.77		
1.4	64QAM	1	5	20.06	20.05	20.72		
1.4	64QAM	3	0	20.34	20.42	21.12		
1.4	64QAM	3	1	20.12	20.11	20.71		
1.4	64QAM	3	3	20.09	20.10	20.56		
1.4	64QAM	6	0	19.14	19.32	19.82	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	23.22	23.40	23.15	24	0
10	QPSK	1	25	23.15	23.23	23.09		
10	QPSK	1	49	23.09	23.08	23.08		
10	QPSK	25	0	22.22	22.32	22.23	23	1
10	QPSK	25	12	22.21	22.30	22.11		
10	QPSK	25	25	22.18	22.14	22.16		
10	QPSK	50	0	22.19	22.28	22.08	23	1
10	16QAM	1	0	22.48	22.52	22.44		
10	16QAM	1	25	22.46	22.54	22.33		
10	16QAM	1	49	22.38	22.41	22.39	22	2
10	16QAM	25	0	21.24	21.31	21.12		
10	16QAM	25	12	21.21	21.32	21.13		
10	16QAM	25	25	21.15	21.16	21.16	22	2
10	16QAM	50	0	21.21	21.29	21.11		
10	64QAM	1	0	21.45	21.38	21.38		
10	64QAM	1	25	21.40	21.39	21.25	22	2
10	64QAM	1	49	21.29	21.27	21.33		
10	64QAM	25	0	20.24	20.32	20.13		
10	64QAM	25	12	20.24	20.31	20.14	21	3
10	64QAM	25	25	20.17	20.18	20.18		
10	64QAM	50	0	20.22	20.33	20.14		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	23.31	23.34	23.24	24	0
5	QPSK	1	12	23.18	23.17	23.10		
5	QPSK	1	24	23.04	23.17	23.02		
5	QPSK	12	0	22.14	22.35	22.29	23	1
5	QPSK	12	7	22.26	22.25	22.02		
5	QPSK	12	13	22.19	22.17	22.19		
5	QPSK	25	0	22.24	22.31	22.13	23	1
5	16QAM	1	0	22.41	22.53	22.49		
5	16QAM	1	12	22.49	22.45	22.42		
5	16QAM	1	24	22.35	22.32	22.32	22	2
5	16QAM	12	0	21.19	21.21	21.21		
5	16QAM	12	7	21.23	21.37	21.07		
5	16QAM	12	13	21.09	21.25	21.19	22	2
5	16QAM	25	0	21.17	21.26	21.12		
5	64QAM	1	0	21.38	21.38	21.40		
5	64QAM	1	12	21.46	21.43	21.27	22	2
5	64QAM	1	24	21.25	21.37	21.36		
5	64QAM	12	0	20.32	20.28	20.05		
5	64QAM	12	7	20.27	20.23	20.13	21	3
5	64QAM	12	13	20.14	20.27	20.18		
5	64QAM	25	0	20.24	20.42	20.14		
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	23.29	23.34	23.09	24	0
3	QPSK	1	8	23.17	23.29	23.09		
3	QPSK	1	14	23.05	23.18	23.15		
3	QPSK	8	0	22.20	22.33	22.21	23	1
3	QPSK	8	4	22.19	22.40	22.14		
3	QPSK	8	7	22.25	22.24	22.21		
3	QPSK	15	0	22.21	22.23	22.07	23	1
3	16QAM	1	0	22.46	22.60	22.34		
3	16QAM	1	8	22.40	22.57	22.25		



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3	16QAM	1	14	22.29	22.38	22.32		
3	16QAM	8	0	21.16	21.25	21.09	22	2
3	16QAM	8	4	21.22	21.22	21.16		
3	16QAM	8	7	21.14	21.21	21.18		
3	16QAM	15	0	21.24	21.23	21.10		
3	64QAM	1	0	21.45	21.35	21.29	22	2
3	64QAM	1	8	21.44	21.45	21.34		
3	64QAM	1	14	21.30	21.29	21.35		
3	64QAM	8	0	20.27	20.37	20.09	21	3
3	64QAM	8	4	20.24	20.35	20.24		
3	64QAM	8	7	20.10	20.08	20.09		
3	64QAM	15	0	20.23	20.35	20.11		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	23.31	23.39	23.22	24	0
1.4	QPSK	1	3	23.06	23.16	23.18		
1.4	QPSK	1	5	23.13	23.13	23.03		
1.4	QPSK	3	0	23.15	23.30	23.18		
1.4	QPSK	3	1	23.25	23.27	23.12		
1.4	QPSK	3	3	22.99	23.04	23.14		
1.4	QPSK	6	0	22.21	22.38	22.09	23	1
1.4	16QAM	1	0	22.20	22.30	22.04	23	1
1.4	16QAM	1	3	22.25	22.05	22.09		
1.4	16QAM	1	5	22.25	22.32	22.03		
1.4	16QAM	3	0	22.52	22.43	22.35		
1.4	16QAM	3	1	22.38	22.57	22.30		
1.4	16QAM	3	3	22.44	22.37	22.29		
1.4	16QAM	6	0	21.32	21.23	21.22	22	2
1.4	64QAM	1	0	21.21	21.37	21.21	22	2
1.4	64QAM	1	3	21.09	21.16	21.15		
1.4	64QAM	1	5	21.30	21.33	21.11		
1.4	64QAM	3	0	21.40	21.45	21.46		
1.4	64QAM	3	1	21.44	21.31	21.33		
1.4	64QAM	3	3	21.37	21.30	21.39		
1.4	64QAM	6	0	20.19	20.38	20.19	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	21.64	21.50	21.99	23	0
20	QPSK	1	49	21.49	21.32	21.80		
20	QPSK	1	99	21.51	21.35	21.79		
20	QPSK	50	0	20.55	20.46	20.76	22	1
20	QPSK	50	24	20.49	20.32	20.74		
20	QPSK	50	50	20.52	20.29	20.63		
20	QPSK	100	0	20.46	20.29	20.57		
20	16QAM	1	0	20.89	20.75	21.08	22	1
20	16QAM	1	49	20.77	20.56	20.81		
20	16QAM	1	99	20.85	20.62	21.02		
20	16QAM	50	0	19.56	19.41	19.69	21	2
20	16QAM	50	24	19.52	19.30	19.62		
20	16QAM	50	50	19.51	19.25	19.45		
20	16QAM	100	0	19.48	19.19	19.53		
20	64QAM	1	0	19.81	19.48	19.81	21	2
20	64QAM	1	49	19.64	19.37	19.48		
20	64QAM	1	99	19.72	19.17	19.50		
20	64QAM	50	0	18.43	18.30	18.21	20	3
20	64QAM	50	24	18.46	18.10	18.17		
20	64QAM	50	50	18.44	18.60	18.05		
20	64QAM	100	0	18.43	18.58	18.10		
Channel				20825	21100	21375		
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	21.54	21.56	21.83	23	0
15	QPSK	1	37	21.59	21.32	21.78		
15	QPSK	1	74	21.41	21.33	21.77		
15	QPSK	36	0	20.46	20.55	20.73	22	1
15	QPSK	36	20	20.48	20.32	20.74		
15	QPSK	36	39	20.58	20.29	20.59		
15	QPSK	75	0	20.42	20.37	20.67		
15	16QAM	1	0	20.96	20.76	21.16	22	1
15	16QAM	1	37	20.74	20.61	20.89		
15	16QAM	1	74	20.84	20.67	21.00		
15	16QAM	36	0	19.53	19.33	19.74	21	2
15	16QAM	36	20	19.59	19.32	19.53		
15	16QAM	36	39	19.48	19.26	19.47		
15	16QAM	75	0	19.55	19.13	19.52		
15	64QAM	1	0	19.91	19.38	19.73	21	2
15	64QAM	1	37	19.64	19.38	19.53		
15	64QAM	1	74	19.78	19.12	19.57		
15	64QAM	36	0	18.46	18.37	18.19	20	3
15	64QAM	36	20	18.55	18.04	18.24		
15	64QAM	36	39	18.51	18.70	18.01		
15	64QAM	75	0	18.46	18.50	18.06		
Channel				20800	21100	21400		
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	21.63	21.55	21.78	23	0
10	QPSK	1	25	21.49	21.35	21.72		
10	QPSK	1	49	21.45	21.45	21.79		
10	QPSK	25	0	20.42	20.50	20.82	22	1
10	QPSK	25	12	20.45	20.39	20.68		
10	QPSK	25	25	20.46	20.31	20.67		
10	QPSK	50	0	20.40	20.29	20.53		
10	16QAM	1	0	20.96	20.73	20.98	22	1
10	16QAM	1	25	20.70	20.56	20.86		



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10	16QAM	1	49	20.83	20.59	21.11		
10	16QAM	25	0	19.55	19.49	19.62	21	2
10	16QAM	25	12	19.62	19.26	19.58		
10	16QAM	25	25	19.41	19.28	19.50		
10	16QAM	50	0	19.51	19.21	19.45		
10	64QAM	1	0	19.88	19.44	19.76	21	2
10	64QAM	1	25	19.60	19.31	19.54		
10	64QAM	1	49	19.74	19.24	19.48		
10	64QAM	25	0	18.47	18.22	18.21	20	3
10	64QAM	25	12	18.51	18.11	18.20		
10	64QAM	25	25	18.49	18.62	18.06		
10	64QAM	50	0	18.52	18.67	18.08		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	21.67	21.44	21.73	23	0
5	QPSK	1	12	21.55	21.38	21.74		
5	QPSK	1	24	21.56	21.27	21.72		
5	QPSK	12	0	20.55	20.38	20.75	22	1
5	QPSK	12	7	20.54	20.26	20.78		
5	QPSK	12	13	20.49	20.23	20.67		
5	QPSK	25	0	20.52	20.31	20.49		
5	16QAM	1	0	20.82	20.76	21.04	22	1
5	16QAM	1	12	20.79	20.55	20.86		
5	16QAM	1	24	20.90	20.57	21.12		
5	16QAM	12	0	19.65	19.46	19.70	21	2
5	16QAM	12	7	19.50	19.36	19.59		
5	16QAM	12	13	19.51	19.27	19.47		
5	16QAM	25	0	19.48	19.22	19.53		
5	64QAM	1	0	19.82	19.41	19.90	21	2
5	64QAM	1	12	19.71	19.30	19.48		
5	64QAM	1	24	19.73	19.22	19.41		
5	64QAM	12	0	18.48	18.22	18.25	20	3
5	64QAM	12	7	18.37	18.08	18.21		
5	64QAM	12	13	18.48	18.59	18.90		
5	64QAM	25	0	18.36	18.58	18.01		



<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	23.19	23.25	23.10	24	0
10	QPSK	1	25	23.12	23.06	23.04		
10	QPSK	1	49	23.18	23.15	23.07		
10	QPSK	25	0	22.26	22.28	22.12	23	1
10	QPSK	25	12	22.24	22.17	22.11		
10	QPSK	25	25	22.21	22.21	22.08		
10	QPSK	50	0	22.22	22.23	22.11	23	1
10	16QAM	1	0	22.27	22.36	22.25		
10	16QAM	1	25	22.40	22.33	22.30		
10	16QAM	1	49	22.34	22.44	22.33	22	2
10	16QAM	25	0	21.13	21.17	20.99		
10	16QAM	25	12	21.22	21.18	21.13		
10	16QAM	25	25	21.21	21.22	21.11	22	2
10	16QAM	50	0	21.24	21.14	21.14		
10	64QAM	1	0	21.28	21.33	21.16		
10	64QAM	1	25	21.30	21.35	21.29	22	2
10	64QAM	1	49	21.32	21.37	21.23		
10	64QAM	25	0	20.14	20.19	20.02		
10	64QAM	25	12	20.26	20.18	20.16	21	3
10	64QAM	25	25	20.20	20.21	20.10		
10	64QAM	50	0	20.25	20.16	20.11		
Channel				23035	23095	23155		
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	23.10	23.19	23.09	24	0
5	QPSK	1	12	23.04	23.16	22.99		
5	QPSK	1	24	23.24	23.05	23.02		
5	QPSK	12	0	22.22	22.29	22.09	23	1
5	QPSK	12	7	22.20	22.13	22.09		
5	QPSK	12	13	22.16	22.14	21.99		
5	QPSK	25	0	22.15	22.17	22.14	23	1
5	16QAM	1	0	22.26	22.44	22.21		
5	16QAM	1	12	22.35	22.36	22.34		
5	16QAM	1	24	22.44	22.51	22.43	22	2
5	16QAM	12	0	21.12	21.26	21.00		
5	16QAM	12	7	21.30	21.11	21.04		
5	16QAM	12	13	21.14	21.16	21.14	22	2
5	16QAM	25	0	21.17	21.12	21.14		
5	64QAM	1	0	21.32	21.41	21.20		
5	64QAM	1	12	21.26	21.29	21.29	22	2
5	64QAM	1	24	21.40	21.29	21.24		
5	64QAM	12	0	20.12	20.17	20.00		
5	64QAM	12	7	20.18	20.19	20.19	21	3
5	64QAM	12	13	20.20	20.31	20.07		
5	64QAM	25	0	20.19	20.23	20.18		
Channel				23025	23095	23165		
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	23.22	23.24	23.10	24	0
3	QPSK	1	8	23.20	23.04	23.04		
3	QPSK	1	14	23.10	23.16	23.06		
3	QPSK	8	0	22.18	22.24	22.05	23	1
3	QPSK	8	4	22.26	22.15	22.04		
3	QPSK	8	7	22.24	22.15	22.11		
3	QPSK	15	0	22.17	22.18	22.03	23	1
3	16QAM	1	0	22.27	22.39	22.30		
3	16QAM	1	8	22.50	22.26	22.38		



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3	16QAM	1	14	22.42	22.48	22.35		
3	16QAM	8	0	21.12	21.15	21.08	22	2
3	16QAM	8	4	21.27	21.21	21.13		
3	16QAM	8	7	21.28	21.13	21.01		
3	16QAM	15	0	21.30	21.09	21.23		
3	64QAM	1	0	21.34	21.34	21.14	22	2
3	64QAM	1	8	21.21	21.35	21.28		
3	64QAM	1	14	21.38	21.41	21.13		
3	64QAM	8	0	20.12	20.09	19.92	21	3
3	64QAM	8	4	20.32	20.12	20.10		
3	64QAM	8	7	20.12	20.27	20.01		
3	64QAM	15	0	20.29	20.13	20.19		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	23.22	23.11	23.00	24	0
1.4	QPSK	1	3	23.19	23.00	23.02		
1.4	QPSK	1	5	23.09	23.12	23.01		
1.4	QPSK	3	0	23.22	23.19	23.02		
1.4	QPSK	3	1	23.15	23.04	23.12		
1.4	QPSK	3	3	23.23	23.19	23.11	23	1
1.4	QPSK	6	0	22.32	22.35	22.08		
1.4	16QAM	1	0	22.32	22.20	22.12		
1.4	16QAM	1	3	22.31	22.11	22.05		
1.4	16QAM	1	5	22.20	22.18	22.05		
1.4	16QAM	3	0	22.19	22.45	22.24	22	2
1.4	16QAM	3	1	22.33	22.40	22.36		
1.4	16QAM	3	3	22.44	22.45	22.35		
1.4	16QAM	6	0	21.23	21.21	21.07		
1.4	64QAM	1	0	21.16	21.12	21.05		
1.4	64QAM	1	3	21.18	21.26	21.03	22	2
1.4	64QAM	1	5	21.29	21.19	21.18		
1.4	64QAM	3	0	21.33	21.27	21.22		
1.4	64QAM	3	1	21.21	21.26	21.19		
1.4	64QAM	3	3	21.39	21.37	21.26		
1.4	64QAM	6	0	20.20	20.09	20.08	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	23.19			24	0
10	QPSK	1	25	23.12				
10	QPSK	1	49	23.04				
10	QPSK	25	0	22.28			23	1
10	QPSK	25	12	22.19				
10	QPSK	25	25	22.15				
10	QPSK	50	0	22.17			23	1
10	16QAM	1	0	22.32				
10	16QAM	1	25	22.41				
10	16QAM	1	49	22.33			22	2
10	16QAM	25	0	21.10				
10	16QAM	25	12	21.20				
10	16QAM	25	25	21.15			22	2
10	16QAM	50	0	21.19				
10	64QAM	1	0	21.25				
10	64QAM	1	25	21.31			22	2
10	64QAM	1	49	21.22				
10	64QAM	25	0	20.12				
10	64QAM	25	12	20.21			21	3
10	64QAM	25	25	20.17				
10	64QAM	50	0	20.21				
Channel				23205	23230	23255	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	23.12	23.07	23.04	24	0
5	QPSK	1	12	23.14	23.15	23.04		
5	QPSK	1	24	23.02	22.98	23.03		
5	QPSK	12	0	22.17	22.15	22.02	23	1
5	QPSK	12	7	22.23	22.20	22.19		
5	QPSK	12	13	22.20	22.21	22.25		
5	QPSK	25	0	22.22	22.15	22.08	23	1
5	16QAM	1	0	22.38	22.29	22.42		
5	16QAM	1	12	22.37	22.37	22.40		
5	16QAM	1	24	22.24	22.33	22.35	22	2
5	16QAM	12	0	21.03	21.20	21.02		
5	16QAM	12	7	21.20	21.18	21.20		
5	16QAM	12	13	21.10	21.19	21.13	22	2
5	16QAM	25	0	21.18	21.10	21.14		
5	64QAM	1	0	21.30	21.25	21.33		
5	64QAM	1	12	21.34	21.29	21.35	22	2
5	64QAM	1	24	21.25	21.30	21.12		
5	64QAM	12	0	20.19	20.20	20.05		
5	64QAM	12	7	20.15	20.15	20.14	21	3
5	64QAM	12	13	20.12	20.17	20.25		
5	64QAM	25	0	20.29	20.27	20.25		

<LTE Band 26>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				26765	26865	26965		
Frequency (MHz)				821.5	831.5	841.5		
15	QPSK	1	0	22.53	22.54	22.27	24	0
15	QPSK	1	37	22.51	22.31	22.06		
15	QPSK	1	74	22.53	22.26	22.13		
15	QPSK	36	0	21.25	21.30	21.21	23	1
15	QPSK	36	20	21.16	21.30	21.03		
15	QPSK	36	39	21.23	21.26	21.09		
15	QPSK	75	0	21.09	21.23	21.10	23	1
15	16QAM	1	0	21.34	21.58	21.50		
15	16QAM	1	37	21.41	21.61	21.34		
15	16QAM	1	74	21.40	21.56	21.20	22	2
15	16QAM	36	0	20.02	20.29	20.15		
15	16QAM	36	20	20.09	20.25	20.20		
15	16QAM	36	39	20.02	20.28	20.23	22	2
15	16QAM	75	0	20.15	20.21	20.18		
15	64QAM	1	0	20.11	20.44	20.41		
15	64QAM	1	37	20.12	20.43	20.22	22	2
15	64QAM	1	74	20.25	20.38	20.07		
15	64QAM	36	0	19.19	19.26	19.23		
15	64QAM	36	20	19.08	19.24	19.20	21	3
15	64QAM	36	39	19.10	19.25	19.22		
15	64QAM	75	0	19.30	19.18	19.25		
Channel				26740	26865	26990	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	22.53	22.35	22.24	24	0
10	QPSK	1	25	22.49	22.11	22.06		
10	QPSK	1	49	22.50	22.21	22.20		
10	QPSK	25	0	21.24	21.11	21.11	23	1
10	QPSK	25	12	21.01	21.30	21.06		
10	QPSK	25	25	21.04	21.10	21.18		
10	QPSK	50	0	21.03	21.13	21.09	23	1
10	16QAM	1	0	21.16	21.39	21.40		
10	16QAM	1	25	21.26	21.53	21.20		
10	16QAM	1	49	21.36	21.41	21.19	22	2
10	16QAM	25	0	20.18	20.15	20.10		
10	16QAM	25	12	20.15	20.17	20.01		
10	16QAM	25	25	20.10	20.08	20.13	22	2
10	16QAM	50	0	20.03	20.07	20.11		
10	64QAM	1	0	20.14	20.42	20.22		
10	64QAM	1	25	20.06	20.27	20.19	22	2
10	64QAM	1	49	20.18	20.34	20.16		
10	64QAM	25	0	19.17	19.14	19.12		
10	64QAM	25	12	19.20	19.22	19.04	21	3
10	64QAM	25	25	19.06	19.21	19.09		
10	64QAM	50	0	19.11	19.13	19.15		
Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	22.34	22.50	22.12	24	0
5	QPSK	1	12	22.39	22.19	22.06		
5	QPSK	1	24	22.35	22.24	22.11		
5	QPSK	12	0	21.15	21.14	21.12	23	1
5	QPSK	12	7	21.02	21.22	21.11		
5	QPSK	12	13	21.15	21.21	21.02		
5	QPSK	25	0	21.06	21.21	21.00	23	1
5	16QAM	1	0	21.18	21.50	21.33		
5	16QAM	1	12	21.35	21.41	21.19		



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5	16QAM	1	24	21.38	21.45	21.10	22	2
5	16QAM	12	0	20.15	20.18	20.04		
5	16QAM	12	7	20.10	20.14	20.12		
5	16QAM	12	13	20.15	20.21	20.23		
5	16QAM	25	0	20.10	20.03	20.09		
5	64QAM	1	0	20.05	20.33	20.36	22	2
5	64QAM	1	12	20.06	20.42	20.07		
5	64QAM	1	24	20.07	20.33	20.21		
5	64QAM	12	0	19.18	19.21	19.22	21	3
5	64QAM	12	7	19.10	19.21	19.01		
5	64QAM	12	13	19.04	19.20	19.05		
5	64QAM	25	0	19.16	19.09	19.19		
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	22.48	22.53	22.22	24	0
3	QPSK	1	8	22.43	22.30	22.10		
3	QPSK	1	14	22.40	22.08	22.12		
3	QPSK	8	0	21.21	21.12	21.18	23	1
3	QPSK	8	4	21.09	21.27	21.05		
3	QPSK	8	7	21.06	21.14	21.01		
3	QPSK	15	0	21.10	21.20	21.04		
3	16QAM	1	0	21.22	21.41	21.42	23	1
3	16QAM	1	8	21.39	21.44	21.21		
3	16QAM	1	14	21.32	21.37	21.05		
3	16QAM	8	0	20.12	20.14	20.06	22	2
3	16QAM	8	4	20.05	20.06	20.12		
3	16QAM	8	7	20.40	20.25	20.22		
3	16QAM	15	0	20.13	20.14	20.04		
3	64QAM	1	0	20.01	20.35	20.21	22	2
3	64QAM	1	8	20.10	20.29	20.04		
3	64QAM	1	14	20.13	20.19	20.05		
3	64QAM	8	0	19.10	19.22	19.13	21	3
3	64QAM	8	4	19.03	19.24	19.18		
3	64QAM	8	7	19.09	19.10	19.17		
3	64QAM	15	0	19.16	19.05	19.21		
Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	22.44	22.47	22.23	24	0
1.4	QPSK	1	3	22.38	22.19	22.09		
1.4	QPSK	1	5	22.35	22.08	22.06		
1.4	QPSK	3	0	22.38	22.42	22.22		
1.4	QPSK	3	1	22.46	22.28	22.15		
1.4	QPSK	3	3	22.34	22.06	22.12	23	1
1.4	QPSK	6	0	21.23	21.23	21.17		
1.4	16QAM	1	0	21.14	21.18	21.08		
1.4	16QAM	1	3	21.06	21.18	21.05		
1.4	16QAM	1	5	21.08	21.13	21.07	23	1
1.4	16QAM	3	0	21.25	21.42	21.49		
1.4	16QAM	3	1	21.41	21.54	21.16		
1.4	16QAM	3	3	21.30	21.37	21.03		
1.4	16QAM	6	0	20.16	20.10	20.15	22	2
1.4	64QAM	1	0	20.13	20.23	20.10	22	2
1.4	64QAM	1	3	20.05	20.14	20.07		
1.4	64QAM	1	5	20.02	20.20	20.01		
1.4	64QAM	3	0	20.10	20.40	20.41		
1.4	64QAM	3	1	20.07	20.25	20.10		
1.4	64QAM	3	3	20.11	20.24	20.16		
1.4	64QAM	6	0	19.16	19.23	19.20	21	3



<LTE Band 66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	22.49	23.16	22.82	24	0
20	QPSK	1	49	22.41	22.68	22.57		
20	QPSK	1	99	22.45	22.55	22.53		
20	QPSK	50	0	21.38	21.74	21.73	23	1
20	QPSK	50	24	21.29	21.65	21.71		
20	QPSK	50	50	21.37	21.50	21.70		
20	QPSK	100	0	21.35	21.82	21.80	23	1
20	16QAM	1	0	21.97	22.20	22.32		
20	16QAM	1	49	21.90	21.91	21.96		
20	16QAM	1	99	21.75	21.93	21.58	22	2
20	16QAM	50	0	20.26	20.92	20.56		
20	16QAM	50	24	20.04	20.86	20.83		
20	16QAM	50	50	20.04	20.70	20.77	22	2
20	16QAM	100	0	20.19	20.80	20.79		
20	64QAM	1	0	20.37	21.20	21.24		
20	64QAM	1	49	20.11	20.87	20.89	22	2
20	64QAM	1	99	20.16	20.82	20.87		
20	64QAM	50	0	19.26	19.91	19.93		
20	64QAM	50	24	19.45	19.82	19.94	21	3
20	64QAM	50	50	19.30	19.64	19.78		
20	64QAM	100	0	19.46	19.74	19.72		
Channel				132047	132322	132597		
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	22.62	23.14	23.01	24	0
15	QPSK	1	37	22.46	22.72	22.61		
15	QPSK	1	74	22.57	22.70	22.64		
15	QPSK	36	0	21.41	21.76	21.85	23	1
15	QPSK	36	20	21.41	21.71	21.78		
15	QPSK	36	39	21.53	21.68	21.93		
15	QPSK	75	0	21.45	21.91	21.80	23	1
15	16QAM	1	0	21.99	22.25	22.49		
15	16QAM	1	37	22.06	21.92	21.99		
15	16QAM	1	74	21.80	22.11	21.72	22	2
15	16QAM	36	0	20.30	20.96	20.76		
15	16QAM	36	20	20.19	21.05	20.97		
15	16QAM	36	39	20.06	20.89	20.79	22	2
15	16QAM	75	0	20.32	20.99	20.87		
15	64QAM	1	0	20.41	21.21	21.31		
15	64QAM	1	37	20.19	21.07	21.01	22	2
15	64QAM	1	74	20.25	20.97	21.02		
15	64QAM	36	0	19.35	20.09	19.98		
15	64QAM	36	20	19.47	19.90	19.94	21	3
15	64QAM	36	39	19.38	19.67	19.97		
15	64QAM	75	0	19.29	19.89	19.90		
Channel				132022	132322	132622		
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	22.65	23.00	23.01	24	0
10	QPSK	1	25	22.55	22.88	22.70		
10	QPSK	1	49	22.60	22.71	22.67		
10	QPSK	25	0	21.49	21.82	21.97	23	1
10	QPSK	25	12	21.48	21.83	21.88		
10	QPSK	25	25	21.49	21.68	21.92		
10	QPSK	50	0	21.40	21.87	21.90	23	1
10	16QAM	1	0	21.98	22.30	22.47		
10	16QAM	1	25	22.05	22.02	22.10		



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10	16QAM	1	49	21.92	21.94	21.65	22	2
10	16QAM	25	0	20.45	20.92	20.73		
10	16QAM	25	12	20.21	20.92	20.96		
10	16QAM	25	25	20.24	20.80	20.89		
10	16QAM	50	0	20.22	20.91	20.91		
10	64QAM	1	0	20.57	21.37	21.36	22	2
10	64QAM	1	25	20.12	21.06	21.08		
10	64QAM	1	49	20.28	20.83	20.90		
10	64QAM	25	0	19.42	20.11	20.05	21	3
10	64QAM	25	12	19.63	19.94	19.98		
10	64QAM	25	25	19.40	19.83	19.82		
10	64QAM	50	0	19.35	19.86	19.73		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	22.56	23.05	23.01	24	0
5	QPSK	1	12	22.43	22.68	22.60		
5	QPSK	1	24	22.63	22.64	22.58		
5	QPSK	12	0	21.57	21.78	21.81	23	1
5	QPSK	12	7	21.42	21.70	21.95		
5	QPSK	12	13	21.41	21.59	21.89		
5	QPSK	25	0	21.55	21.74	21.86		
5	16QAM	1	0	22.12	22.35	22.48	23	1
5	16QAM	1	12	21.99	22.11	22.16		
5	16QAM	1	24	21.80	22.03	21.62		
5	16QAM	12	0	20.30	21.12	20.58	22	2
5	16QAM	12	7	20.21	20.87	20.97		
5	16QAM	12	13	20.17	20.79	20.80		
5	16QAM	25	0	20.28	20.85	20.95		
5	64QAM	1	0	20.51	21.39	21.38	22	2
5	64QAM	1	12	20.16	20.93	21.04		
5	64QAM	1	24	20.35	20.91	20.94		
5	64QAM	12	0	19.26	20.10	20.04	21	3
5	64QAM	12	7	19.61	19.87	20.08		
5	64QAM	12	13	19.25	19.84	19.87		
5	64QAM	25	0	19.36	19.78	19.72		
Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	22.63	23.05	22.82	24	0
3	QPSK	1	8	22.49	22.70	22.74		
3	QPSK	1	14	22.61	22.71	22.67		
3	QPSK	8	0	21.56	21.79	21.80	23	1
3	QPSK	8	4	21.32	21.82	21.90		
3	QPSK	8	7	21.48	21.53	21.89		
3	QPSK	15	0	21.44	21.77	21.91		
3	16QAM	1	0	22.14	22.28	22.51	23	1
3	16QAM	1	8	21.91	22.06	21.96		
3	16QAM	1	14	21.85	22.08	21.63		
3	16QAM	8	0	20.31	21.11	20.70	22	2
3	16QAM	8	4	20.20	20.90	21.01		
3	16QAM	8	7	20.13	20.82	20.78		
3	16QAM	15	0	20.34	20.88	20.94		
3	64QAM	1	0	20.53	21.24	21.29	22	2
3	64QAM	1	8	20.30	21.04	20.95		
3	64QAM	1	14	20.39	20.96	20.97		
3	64QAM	8	0	19.40	20.00	20.06	21	3
3	64QAM	8	4	19.50	19.82	19.98		
3	64QAM	8	7	19.30	19.66	19.86		
3	64QAM	15	0	19.12	19.83	19.76		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		



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1.4	QPSK	1	0	22.68	23.01	22.86	24	0
1.4	QPSK	1	3	22.42	22.77	22.70		
1.4	QPSK	1	5	22.48	22.64	22.65		
1.4	QPSK	3	0	22.50	23.01	22.95		
1.4	QPSK	3	1	22.55	22.88	22.74		
1.4	QPSK	3	3	22.50	22.66	22.70		
1.4	QPSK	6	0	21.41	21.76	21.90	23	1
1.4	16QAM	1	0	21.29	21.79	21.85	23	1
1.4	16QAM	1	3	21.54	21.53	21.89		
1.4	16QAM	1	5	21.54	21.84	21.99		
1.4	16QAM	3	0	21.97	22.24	22.33		
1.4	16QAM	3	1	22.06	21.94	22.05		
1.4	16QAM	3	3	21.88	22.12	21.74		
1.4	16QAM	6	0	20.35	21.10	20.60	22	2
1.4	64QAM	1	0	20.11	20.92	20.92	22	2
1.4	64QAM	1	3	20.04	20.70	20.89		
1.4	64QAM	1	5	20.29	20.80	20.81		
1.4	64QAM	3	0	20.53	21.34	21.35		
1.4	64QAM	3	1	20.26	20.96	21.03		
1.4	64QAM	3	3	20.30	20.99	20.94		
1.4	64QAM	6	0	19.54	19.75	19.89	21	3

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	19.5	0
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	18.81	19.18	19.10	19.5	0
20	QPSK	1	49	18.66	18.60	18.89		
20	QPSK	1	99	18.47	18.56	18.95		
20	QPSK	50	0	18.81	19.15	19.10	19.5	0
20	QPSK	50	24	18.75	18.72	19.04		
20	QPSK	50	50	18.55	18.66	18.98		
20	QPSK	100	0	18.75	18.93	18.82	19.5	0
20	16QAM	1	0	19.12	19.02	19.16		
20	16QAM	1	49	18.96	18.95	19.02		
20	16QAM	1	99	18.85	18.91	19.13	19.5	0
20	16QAM	50	0	18.84	18.73	19.16		
20	16QAM	50	24	18.78	18.75	19.09		
20	16QAM	50	50	18.59	18.74	19.03	19.5	0
20	16QAM	100	0	18.77	18.76	19.09		
20	64QAM	1	0	19.05	18.88	19.03		
20	64QAM	1	49	18.90	18.83	19.13	19.5	0
20	64QAM	1	99	18.66	18.76	19.16		
20	64QAM	50	0	18.87	18.73	19.17		
20	64QAM	50	24	18.79	18.78	19.08	19.5	0
20	64QAM	50	50	18.63	18.73	19.02		
20	64QAM	100	0	18.83	18.76	19.11		
Channel				18675	18900	19125	19.5	0
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	18.80	19.09	18.94	19.5	0
15	QPSK	1	37	18.52	18.40	18.89		
15	QPSK	1	74	18.38	18.54	18.95		
15	QPSK	36	0	18.74	19.08	18.97	19.5	0
15	QPSK	36	20	18.58	18.61	18.98		
15	QPSK	36	39	18.38	18.64	18.91		
15	QPSK	75	0	18.65	18.83	18.80	19.5	0
15	16QAM	1	0	18.97	18.85	19.06		
15	16QAM	1	37	18.87	18.87	18.88		
15	16QAM	1	74	18.74	18.83	19.02	19.5	0
15	16QAM	36	0	18.77	18.62	19.09		
15	16QAM	36	20	18.62	18.66	19.05		
15	16QAM	36	39	18.48	18.55	18.99	19.5	0
15	16QAM	75	0	18.63	18.72	19.03		
15	64QAM	1	0	18.92	18.87	18.91		
15	64QAM	1	37	18.83	18.72	19.10	19.5	0
15	64QAM	1	74	18.50	18.64	19.14		
15	64QAM	36	0	18.74	18.60	18.98		
15	64QAM	36	20	18.64	18.61	18.95	19.5	0
15	64QAM	36	39	18.61	18.68	18.94		
15	64QAM	75	0	18.81	18.62	19.09		
Channel				18650	18900	19150	19.5	0
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	18.74	19.06	19.08	19.5	0
10	QPSK	1	25	18.51	18.40	18.70		
10	QPSK	1	49	18.32	18.41	18.79		
10	QPSK	25	0	18.64	18.98	18.96	19.5	0
10	QPSK	25	12	18.64	18.66	18.84		
10	QPSK	25	25	18.47	18.47	18.98		
10	QPSK	50	0	18.74	18.87	18.67	19.5	0
10	16QAM	1	0	18.99	19.01	19.04		



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10	16QAM	1	25	18.76	18.92	18.82	19.5	0
10	16QAM	1	49	18.68	18.83	19.05		
10	16QAM	25	0	18.69	18.55	18.98		
10	16QAM	25	12	18.60	18.58	19.06		
10	16QAM	25	25	18.46	18.60	18.87		
10	16QAM	50	0	18.62	18.62	19.00	19.5	0
10	64QAM	1	0	18.87	18.72	18.92		
10	64QAM	1	25	18.82	18.68	19.01		
10	64QAM	1	49	18.61	18.75	19.12		
10	64QAM	25	0	18.72	18.65	19.05		
10	64QAM	25	12	18.73	18.64	19.06	19.5	0
10	64QAM	25	25	18.63	18.64	18.99		
10	64QAM	50	0	18.73	18.72	18.93		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	18.68	19.14	19.09	19.5	0
5	QPSK	1	12	18.47	18.56	18.77		
5	QPSK	1	24	18.31	18.53	18.82		
5	QPSK	12	0	18.65	19.08	19.08		
5	QPSK	12	7	18.67	18.70	19.03		
5	QPSK	12	13	18.40	18.66	18.94	19.5	0
5	QPSK	25	0	18.57	18.88	18.63		
5	16QAM	1	0	19.03	18.85	19.01		
5	16QAM	1	12	18.88	18.94	18.83		
5	16QAM	1	24	18.72	18.77	19.08		
5	16QAM	12	0	18.64	18.64	19.07	19.5	0
5	16QAM	12	7	18.62	18.69	19.06		
5	16QAM	12	13	18.56	18.69	18.92		
5	16QAM	25	0	18.64	18.70	18.93		
5	64QAM	1	0	18.93	18.80	18.97		
5	64QAM	1	12	18.73	18.77	18.99	19.5	0
5	64QAM	1	24	18.52	18.72	19.08		
5	64QAM	12	0	18.68	18.68	19.15		
5	64QAM	12	7	18.71	18.59	18.96		
5	64QAM	12	13	18.56	18.60	18.83		
5	64QAM	25	0	18.79	18.61	19.11	Tune-up limit (dBm)	MPR (dB)
Channel				18615	18900	19185		
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	18.66	19.03	18.95	19.5	0
3	QPSK	1	8	18.52	18.53	18.86		
3	QPSK	1	14	18.34	18.54	18.91		
3	QPSK	8	0	18.79	19.13	18.91		
3	QPSK	8	4	18.56	18.68	18.91		
3	QPSK	8	7	18.51	18.57	18.93	19.5	0
3	QPSK	15	0	18.73	18.84	18.74		
3	16QAM	1	0	19.07	18.85	18.96		
3	16QAM	1	8	18.92	18.95	18.88		
3	16QAM	1	14	18.76	18.82	19.10		
3	16QAM	8	0	18.65	18.53	19.05	19.5	0
3	16QAM	8	4	18.63	18.64	18.89		
3	16QAM	8	7	18.45	18.57	18.89		
3	16QAM	15	0	18.59	18.63	18.90		
3	64QAM	1	0	18.87	18.73	18.85		
3	64QAM	1	8	18.82	18.75	19.03	19.5	0
3	64QAM	1	14	18.48	18.72	19.11		
3	64QAM	8	0	18.67	18.66	18.99		
3	64QAM	8	4	18.60	18.71	18.90		
3	64QAM	8	7	18.57	18.69	18.96		
3	64QAM	15	0	18.76	18.57	19.05	Tune-up limit (dBm)	MPR (dB)
Channel				18607	18900	19193		

Frequency (MHz)				1850.7	1880	1909.3	(dBm)	(dB)
1.4	QPSK	1	0	18.75	19.11	18.98	19.5	0
1.4	QPSK	1	3	18.53	18.59	18.70		
1.4	QPSK	1	5	18.44	18.46	18.95		
1.4	QPSK	3	0	18.64	19.13	18.98		
1.4	QPSK	3	1	18.56	18.62	18.86		
1.4	QPSK	3	3	18.51	18.53	18.85	19.5	0
1.4	QPSK	6	0	18.56	18.80	18.69		
1.4	16QAM	1	0	19.01	18.84	19.03	19.5	0
1.4	16QAM	1	3	18.76	18.78	18.99		
1.4	16QAM	1	5	18.81	18.76	19.02		
1.4	16QAM	3	0	18.72	18.55	19.14		
1.4	16QAM	3	1	18.73	18.72	19.07		
1.4	16QAM	3	3	18.40	18.60	18.86	19.5	0
1.4	16QAM	6	0	18.77	18.74	18.92		
1.4	64QAM	1	0	18.99	18.84	18.93	19.5	0
1.4	64QAM	1	3	18.80	18.70	19.07		
1.4	64QAM	1	5	18.49	18.60	19.12		
1.4	64QAM	3	0	18.87	18.69	19.04		
1.4	64QAM	3	1	18.59	18.67	19.06		
1.4	64QAM	3	3	18.52	18.72	18.85	19.5	0
1.4	64QAM	6	0	18.79	18.60	19.05		

<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	20.5	0
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	20.21	20.48	20.28		
20	QPSK	1	49	20.06	20.02	19.99	20.5	0
20	QPSK	1	99	20.02	20.00	19.98		
20	QPSK	50	0	20.12	20.20	20.20		
20	QPSK	50	24	20.18	20.16	20.13	20.5	0
20	QPSK	50	50	20.12	20.10	20.03		
20	QPSK	100	0	20.17	20.17	20.15		
20	16QAM	1	0	20.33	20.31	20.38	20.5	0
20	16QAM	1	49	20.22	20.36	20.32		
20	16QAM	1	99	20.35	20.38	20.34		
20	16QAM	50	0	20.18	20.24	20.23	20.5	0
20	16QAM	50	24	20.19	20.17	20.12		
20	16QAM	50	50	20.11	20.09	20.04		
20	16QAM	100	0	20.15	20.18	20.15	20.5	0
20	64QAM	1	0	20.36	20.36	20.22		
20	64QAM	1	49	20.25	20.27	20.25		
20	64QAM	1	99	20.29	20.23	20.22	20.5	0
20	64QAM	50	0	20.16	20.22	20.23		
20	64QAM	50	24	20.19	20.15	20.15		
20	64QAM	50	50	20.15	20.11	20.05	20.5	0
20	64QAM	100	0	20.18	20.19	20.15		
Channel				20025	20175	20325	20.5	0
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	20.09	20.36	20.15		
15	QPSK	1	37	19.89	19.88	19.88	20.5	0
15	QPSK	1	74	19.86	19.99	19.82		
15	QPSK	36	0	20.05	20.08	20.13		
15	QPSK	36	20	20.09	20.15	20.10	20.5	0
15	QPSK	36	39	20.12	20.01	19.96		
15	QPSK	75	0	20.06	20.04	20.01		
15	16QAM	1	0	20.22	20.18	20.24	20.5	0
15	16QAM	1	37	20.21	20.16	20.29		

15	16QAM	1	74	20.17	20.19	20.22	20.5	0
15	16QAM	36	0	19.98	20.22	20.03		
15	16QAM	36	20	20.16	20.07	20.06		
15	16QAM	36	39	20.09	20.00	19.92		
15	16QAM	75	0	20.13	20.12	20.12		
15	64QAM	1	0	20.25	20.34	20.14	20.5	0
15	64QAM	1	37	20.16	20.21	20.25		
15	64QAM	1	74	20.23	20.15	20.04		
15	64QAM	36	0	20.02	20.18	20.08	20.5	0
15	64QAM	36	20	20.16	20.07	19.98		
15	64QAM	36	39	20.13	20.02	19.85		
15	64QAM	75	0	20.07	20.08	20.10		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	20.07	20.30	20.20	20.5	0
10	QPSK	1	25	20.04	19.85	19.94		
10	QPSK	1	49	19.97	19.89	19.85		
10	QPSK	25	0	20.04	20.15	20.10	20.5	0
10	QPSK	25	12	20.06	19.96	19.97		
10	QPSK	25	25	20.11	19.96	19.94		
10	QPSK	50	0	20.02	20.17	20.08		
10	16QAM	1	0	20.16	20.29	20.25	20.5	0
10	16QAM	1	25	20.03	20.30	20.14		
10	16QAM	1	49	20.15	20.24	20.16		
10	16QAM	25	0	20.17	20.13	20.11	20.5	0
10	16QAM	25	12	20.03	20.05	20.10		
10	16QAM	25	25	19.93	19.93	19.99		
10	16QAM	50	0	20.08	20.17	19.95		
10	64QAM	1	0	20.22	20.35	20.12	20.5	0
10	64QAM	1	25	20.15	20.22	20.25		
10	64QAM	1	49	20.28	20.16	20.04		
10	64QAM	25	0	20.10	20.11	20.06	20.5	0
10	64QAM	25	12	19.99	19.98	20.04		
10	64QAM	25	25	19.95	20.07	19.97		
10	64QAM	50	0	20.06	20.15	19.96		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	20.16	20.38	20.09	20.5	0
5	QPSK	1	12	19.99	19.93	19.96		
5	QPSK	1	24	19.82	19.92	19.92		
5	QPSK	12	0	19.94	20.15	20.03	20.5	0
5	QPSK	12	7	20.17	20.06	19.97		
5	QPSK	12	13	19.93	20.02	19.93		
5	QPSK	25	0	20.10	20.10	20.12		
5	16QAM	1	0	20.14	20.16	20.19	20.5	0
5	16QAM	1	12	20.15	20.23	20.29		
5	16QAM	1	24	20.21	20.27	20.22		
5	16QAM	12	0	20.12	20.13	20.09	20.5	0
5	16QAM	12	7	20.06	20.07	19.99		
5	16QAM	12	13	20.06	19.96	19.87		
5	16QAM	25	0	19.99	20.00	20.08		
5	64QAM	1	0	20.20	20.23	20.11	20.5	0
5	64QAM	1	12	20.10	20.13	20.22		
5	64QAM	1	24	20.09	20.18	20.14		
5	64QAM	12	0	20.09	20.12	20.13	20.5	0
5	64QAM	12	7	20.01	19.99	20.03		
5	64QAM	12	13	20.11	20.00	20.05		
5	64QAM	25	0	20.12	20.13	20.05		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		



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3	QPSK	1	0	20.10	20.40	20.19	20.5	0
3	QPSK	1	8	19.89	19.95	19.94		
3	QPSK	1	14	20.00	19.86	19.89		
3	QPSK	8	0	19.97	20.07	20.16	20.5	0
3	QPSK	8	4	20.06	20.13	20.00		
3	QPSK	8	7	20.05	20.03	19.95		
3	QPSK	15	0	19.97	20.13	20.03	20.5	0
3	16QAM	1	0	20.16	20.26	20.35		
3	16QAM	1	8	20.04	20.35	20.28		
3	16QAM	1	14	20.25	20.29	20.34	20.5	0
3	16QAM	8	0	20.12	20.11	20.16		
3	16QAM	8	4	20.13	20.00	20.08		
3	16QAM	8	7	20.02	20.06	19.94	20.5	0
3	16QAM	15	0	20.06	20.01	20.05		
3	64QAM	1	0	20.16	20.29	20.11		
3	64QAM	1	8	20.18	20.09	20.16	20.5	0
3	64QAM	1	14	20.27	20.14	20.13		
3	64QAM	8	0	20.01	20.08	20.18		
3	64QAM	8	4	20.16	20.11	20.06	20.5	0
3	64QAM	8	7	20.10	20.03	19.93		
3	64QAM	15	0	20.10	20.19	20.04		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	20.17	20.37	20.23	20.5	0
1.4	QPSK	1	3	19.97	19.97	19.85		
1.4	QPSK	1	5	20.02	19.91	19.87		
1.4	QPSK	3	0	19.99	20.06	20.11	20.5	0
1.4	QPSK	3	1	19.98	20.00	19.97		
1.4	QPSK	3	3	20.10	19.97	19.87		
1.4	QPSK	6	0	20.05	19.97	20.13	20.5	0
1.4	16QAM	1	0	20.22	20.16	20.35	20.5	0
1.4	16QAM	1	3	20.16	20.17	20.20		
1.4	16QAM	1	5	20.19	20.32	20.28		
1.4	16QAM	3	0	20.11	20.19	20.03	20.5	0
1.4	16QAM	3	1	20.08	20.08	19.99		
1.4	16QAM	3	3	20.07	20.05	20.03		
1.4	16QAM	6	0	20.10	20.12	19.99	20.5	0
1.4	64QAM	1	0	20.29	20.34	20.05	20.5	0
1.4	64QAM	1	3	20.18	20.27	20.11		
1.4	64QAM	1	5	20.19	20.16	20.03		
1.4	64QAM	3	0	20.12	20.03	20.17	20.5	0
1.4	64QAM	3	1	20.06	20.01	20.06		
1.4	64QAM	3	3	19.95	20.09	19.93		
1.4	64QAM	6	0	20.16	20.08	19.99	20.5	0



<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	21.81	21.84	21.75	22.5	0
10	QPSK	1	25	21.65	21.62	21.45		
10	QPSK	1	49	21.60	21.47	21.50		
10	QPSK	25	0	21.75	21.79	21.63	22.5	0
10	QPSK	25	12	21.74	21.71	21.55		
10	QPSK	25	25	21.66	21.59	21.59		
10	QPSK	50	0	21.70	21.75	21.50	22.5	0
10	16QAM	1	0	21.80	21.75	21.74		
10	16QAM	1	25	21.79	21.79	21.78		
10	16QAM	1	49	21.82	21.81	21.80	21.5	1
10	16QAM	25	0	21.22	21.25	21.03		
10	16QAM	25	12	21.24	21.23	21.05		
10	16QAM	25	25	21.16	21.04	21.07	21.5	1
10	16QAM	50	0	21.20	21.20	21.01		
10	64QAM	1	0	21.36	21.29	21.20		
10	64QAM	1	25	21.38	21.38	21.15	21.5	1
10	64QAM	1	49	21.24	21.17	21.30		
10	64QAM	25	0	20.23	20.25	20.04		
10	64QAM	25	12	20.24	20.25	20.04	20.5	2
10	64QAM	25	25	20.18	20.07	20.09		
10	64QAM	50	0	20.23	20.23	20.03		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	21.79	21.72	21.71	22.5	0
5	QPSK	1	12	21.48	21.48	21.37		
5	QPSK	1	24	21.46	21.43	21.38		
5	QPSK	12	0	21.65	21.61	21.54	22.5	0
5	QPSK	12	7	21.74	21.64	21.45		
5	QPSK	12	13	21.61	21.54	21.57		
5	QPSK	25	0	21.63	21.59	21.45	22.5	0
5	16QAM	1	0	21.78	21.56	21.57		
5	16QAM	1	12	21.78	21.67	21.74		
5	16QAM	1	24	21.64	21.77	21.65	21.5	1
5	16QAM	12	0	21.17	21.19	20.87		
5	16QAM	12	7	21.11	21.22	21.02		
5	16QAM	12	13	21.04	20.94	21.00	21.5	1
5	16QAM	25	0	21.16	21.18	20.91		
5	64QAM	1	0	21.36	21.12	21.18		
5	64QAM	1	12	21.22	21.18	21.08	20.5	2
5	64QAM	1	24	21.11	21.17	21.16		
5	64QAM	12	0	20.03	20.13	19.86		
5	64QAM	12	7	20.06	20.08	19.89	20.5	2
5	64QAM	12	13	20.06	19.96	20.05		
5	64QAM	25	0	20.08	20.14	19.94		
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	21.68	21.81	21.69	22.5	0
3	QPSK	1	8	21.48	21.52	21.33		
3	QPSK	1	14	21.59	21.37	21.41		
3	QPSK	8	0	21.75	21.63	21.50	22.5	0
3	QPSK	8	4	21.73	21.52	21.37		
3	QPSK	8	7	21.50	21.59	21.42		
3	QPSK	15	0	21.51	21.56	21.49	22.5	0
3	16QAM	1	0	21.68	21.74	21.67		
3	16QAM	1	8	21.74	21.62	21.67		



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3	16QAM	1	14	21.71	21.72	21.72	21.5	1
3	16QAM	8	0	21.02	21.19	20.85		
3	16QAM	8	4	21.19	21.22	20.98		
3	16QAM	8	7	21.05	20.84	20.92		
3	16QAM	15	0	21.01	21.09	20.91		
3	64QAM	1	0	21.34	21.11	21.17	21.5	1
3	64QAM	1	8	21.25	21.18	20.99		
3	64QAM	1	14	21.20	21.14	21.15		
3	64QAM	8	0	20.18	20.18	19.91	20.5	2
3	64QAM	8	4	20.15	20.08	19.94		
3	64QAM	8	7	20.06	20.02	20.09		
3	64QAM	15	0	20.10	20.13	20.01		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	21.76	21.65	21.57	22.5	0
1.4	QPSK	1	3	21.45	21.56	21.40		
1.4	QPSK	1	5	21.57	21.32	21.37		
1.4	QPSK	3	0	21.73	21.63	21.48		
1.4	QPSK	3	1	21.58	21.56	21.51		
1.4	QPSK	3	3	21.59	21.50	21.39		
1.4	QPSK	6	0	21.65	21.57	21.45	22.5	0
1.4	16QAM	1	0	21.71	21.71	21.61	22.5	0
1.4	16QAM	1	3	21.66	21.61	21.64		
1.4	16QAM	1	5	21.79	21.77	21.73		
1.4	16QAM	3	0	21.55	21.77	21.44		
1.4	16QAM	3	1	21.64	21.70	21.39		
1.4	16QAM	3	3	21.51	21.57	21.59		
1.4	16QAM	6	0	21.04	20.90	20.93	21.5	1
1.4	64QAM	1	0	21.16	21.09	20.97	21.5	1
1.4	64QAM	1	3	21.30	21.09	21.11		
1.4	64QAM	1	5	21.34	21.34	21.09		
1.4	64QAM	3	0	21.11	20.97	21.29		
1.4	64QAM	3	1	21.24	21.19	21.10		
1.4	64QAM	3	3	21.10	21.10	21.18		
1.4	64QAM	6	0	20.20	20.07	19.90	20.5	2



<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	16.03	16.28	16.09	17	0
20	QPSK	1	49	15.89	15.87	15.86		
20	QPSK	1	99	15.92	15.99	15.94		
20	QPSK	50	0	15.99	16.11	16.10	17	0
20	QPSK	50	24	15.97	15.96	16.00		
20	QPSK	50	50	15.98	15.96	15.96		
20	QPSK	100	0	16.00	16.03	15.98		
20	16QAM	1	0	16.20	16.19	16.23	17	0
20	16QAM	1	49	16.19	16.25	16.14		
20	16QAM	1	99	16.20	16.22	16.22		
20	16QAM	50	0	16.04	16.14	16.01	17	0
20	16QAM	50	24	16.02	16.01	16.01		
20	16QAM	50	50	16.02	16.01	15.99		
20	16QAM	100	0	16.00	15.98	15.98		
20	64QAM	1	0	16.15	16.25	16.25	17	0
20	64QAM	1	49	16.08	16.12	16.04		
20	64QAM	1	99	16.16	16.26	16.12		
20	64QAM	50	0	16.00	16.17	16.01	17	0
20	64QAM	50	24	16.01	16.04	16.03		
20	64QAM	50	50	16.00	16.02	16.01		
20	64QAM	100	0	16.02	16.06	16.01		
Channel				20825	21100	21375		
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	15.83	16.19	15.96	17	0
15	QPSK	1	37	15.85	15.68	15.81		
15	QPSK	1	74	15.92	15.95	15.91		
15	QPSK	36	0	15.92	16.01	15.90	17	0
15	QPSK	36	20	15.78	15.77	15.86		
15	QPSK	36	39	15.86	15.91	15.95		
15	QPSK	75	0	15.89	15.90	15.86		
15	16QAM	1	0	16.07	16.15	16.10	17	0
15	16QAM	1	37	16.03	16.19	16.04		
15	16QAM	1	74	16.15	16.27	16.20		
15	16QAM	36	0	16.03	16.10	15.93	17	0
15	16QAM	36	20	15.94	15.87	15.96		
15	16QAM	36	39	15.92	15.81	15.80		
15	16QAM	75	0	15.95	15.92	15.82		
15	64QAM	1	0	16.07	16.13	16.10	17	0
15	64QAM	1	37	15.94	16.01	15.98		
15	64QAM	1	74	15.96	16.23	16.11		
15	64QAM	36	0	15.96	16.17	15.88	17	0
15	64QAM	36	20	15.96	15.94	15.87		
15	64QAM	36	39	15.91	16.00	15.84		
15	64QAM	75	0	15.92	15.99	15.99		
Channel				20800	21100	21400		
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	15.90	15.99	15.93	17	0
10	QPSK	1	25	15.80	15.72	15.85		
10	QPSK	1	49	15.88	15.83	15.91		
10	QPSK	25	0	15.93	16.03	15.92	17	0
10	QPSK	25	12	15.85	15.89	15.93		
10	QPSK	25	25	15.86	15.81	15.86		
10	QPSK	50	0	15.83	15.97	15.87		
10	16QAM	1	0	16.08	15.99	16.27	17	0
10	16QAM	1	25	16.11	16.13	16.02		



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10	16QAM	1	49	16.15	16.21	16.10		
10	16QAM	25	0	15.99	16.01	15.90	17	0
10	16QAM	25	12	15.88	15.86	15.81		
10	16QAM	25	25	15.92	15.82	15.82		
10	16QAM	50	0	15.83	15.85	15.83		
10	64QAM	1	0	16.07	16.24	16.11	17	0
10	64QAM	1	25	16.08	15.99	15.85		
10	64QAM	1	49	16.06	16.10	16.10		
10	64QAM	25	0	15.95	16.13	16.01	17	0
10	64QAM	25	12	15.89	16.01	15.93		
10	64QAM	25	25	15.96	15.95	15.88		
10	64QAM	50	0	15.94	15.99	15.84		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	15.90	16.25	15.89	17	0
5	QPSK	1	12	15.82	15.82	15.78		
5	QPSK	1	24	15.84	15.80	15.92		
5	QPSK	12	0	15.99	15.99	15.95	17	0
5	QPSK	12	7	15.89	15.77	15.97		
5	QPSK	12	13	15.95	15.84	15.83		
5	QPSK	25	0	15.94	15.91	15.85		
5	16QAM	1	0	16.17	16.14	16.19	17	0
5	16QAM	1	12	16.15	16.13	16.04		
5	16QAM	1	24	16.10	16.12	16.17		
5	16QAM	12	0	15.94	15.97	15.94	17	0
5	16QAM	12	7	15.97	15.94	15.99		
5	16QAM	12	13	15.87	15.97	15.91		
5	16QAM	25	0	15.84	15.92	15.93		
5	64QAM	1	0	16.05	16.23	16.15	17	0
5	64QAM	1	12	16.00	16.00	15.84		
5	64QAM	1	24	16.15	16.25	16.05		
5	64QAM	12	0	15.96	16.05	15.82	17	0
5	64QAM	12	7	15.95	15.98	15.99		
5	64QAM	12	13	15.98	16.00	15.85		
5	64QAM	25	0	15.88	16.04	15.87		

<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	22.22	22.26	22.10	23	0
10	QPSK	1	25	22.06	21.99	21.97		
10	QPSK	1	49	22.04	22.05	21.97		
10	QPSK	25	0	22.20	22.21	22.15	23	0
10	QPSK	25	12	22.14	22.10	22.12		
10	QPSK	25	25	22.15	22.13	22.11		
10	QPSK	50	0	22.11	22.16	22.15	23	0
10	16QAM	1	0	22.23	22.20	22.11		
10	16QAM	1	25	22.21	22.23	22.16		
10	16QAM	1	49	22.19	22.25	22.15	22	1
10	16QAM	25	0	21.07	21.20	21.06		
10	16QAM	25	12	21.18	21.19	21.17		
10	16QAM	25	25	21.08	21.24	21.13	22	1
10	16QAM	50	0	21.16	21.17	21.19		
10	64QAM	1	0	21.21	21.37	21.22		
10	64QAM	1	25	21.25	21.23	21.34	22	1
10	64QAM	1	49	21.25	21.36	21.26		
10	64QAM	25	0	20.10	20.21	20.06		
10	64QAM	25	12	20.18	20.20	20.18	21	2
10	64QAM	25	25	20.11	20.18	20.16		
10	64QAM	50	0	20.17	20.09	20.15		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	22.14	22.24	21.90	23	0
5	QPSK	1	12	21.96	21.99	21.78		
5	QPSK	1	24	21.92	22.05	21.77		
5	QPSK	12	0	22.03	22.08	22.13	23	0
5	QPSK	12	7	22.11	21.98	21.92		
5	QPSK	12	13	22.01	22.10	22.06		
5	QPSK	25	0	21.97	21.96	21.99	23	0
5	16QAM	1	0	22.12	22.18	22.10		
5	16QAM	1	12	22.10	22.17	22.09		
5	16QAM	1	24	22.12	22.15	21.95	22	1
5	16QAM	12	0	20.98	21.19	20.94		
5	16QAM	12	7	21.12	21.11	21.08		
5	16QAM	12	13	20.90	21.12	21.12	22	1
5	16QAM	25	0	21.02	20.98	21.19		
5	64QAM	1	0	21.08	21.21	21.20		
5	64QAM	1	12	21.16	21.04	21.25	22	1
5	64QAM	1	24	21.05	21.31	21.20		
5	64QAM	12	0	19.92	20.19	19.98		
5	64QAM	12	7	20.03	20.10	20.05	21	2
5	64QAM	12	13	20.05	20.12	19.98		
5	64QAM	25	0	20.05	20.02	20.13		
Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	22.22	22.12	21.93	23	0
3	QPSK	1	8	21.86	21.98	21.78		
3	QPSK	1	14	21.91	22.02	21.95		
3	QPSK	8	0	22.03	22.03	22.03	23	0
3	QPSK	8	4	22.10	22.02	22.09		
3	QPSK	8	7	22.08	22.08	22.04		
3	QPSK	15	0	22.07	22.10	22.11	23	0
3	16QAM	1	0	22.08	22.01	21.99		
3	16QAM	1	8	22.19	22.04	21.96		



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3	16QAM	1	14	22.10	22.24	22.03		
3	16QAM	8	0	20.98	21.05	21.06	22	1
3	16QAM	8	4	20.98	21.06	21.11		
3	16QAM	8	7	21.03	21.07	21.04		
3	16QAM	15	0	20.96	21.17	21.04		
3	64QAM	1	0	21.10	21.26	21.08	22	1
3	64QAM	1	8	21.17	21.11	21.16		
3	64QAM	1	14	21.08	21.21	21.11		
3	64QAM	8	0	19.91	20.16	20.02	21	2
3	64QAM	8	4	20.10	20.07	19.98		
3	64QAM	8	7	19.97	20.04	20.05		
3	64QAM	15	0	19.98	19.90	20.05		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	22.10	22.18	21.91	23	0
1.4	QPSK	1	3	22.05	21.89	21.92		
1.4	QPSK	1	5	21.95	22.03	21.84		
1.4	QPSK	3	0	22.14	22.20	21.99		
1.4	QPSK	3	1	21.96	22.06	22.12		
1.4	QPSK	3	3	22.00	22.11	22.11		
1.4	QPSK	6	0	22.00	22.11	22.12	23	0
1.4	16QAM	1	0	22.15	22.15	22.01	23	0
1.4	16QAM	1	3	22.11	22.19	21.97		
1.4	16QAM	1	5	22.02	21.92	22.12		
1.4	16QAM	3	0	22.05	22.07	21.94		
1.4	16QAM	3	1	21.92	21.99	22.00		
1.4	16QAM	3	3	22.22	22.01	21.99		
1.4	16QAM	6	0	21.07	21.01	20.87	22	1
1.4	64QAM	1	0	21.17	21.07	21.10	22	1
1.4	64QAM	1	3	21.06	21.04	21.05		
1.4	64QAM	1	5	21.08	21.02	21.14		
1.4	64QAM	3	0	20.96	21.09	21.07		
1.4	64QAM	3	1	21.04	21.07	21.06		
1.4	64QAM	3	3	21.05	21.32	21.18		
1.4	64QAM	6	0	20.02	20.16	20.13	21	2

<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			Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				782				
10	QPSK	1	0	22.35			23	0
10	QPSK	1	25	22.13				
10	QPSK	1	49	22.06				
10	QPSK	25	0	22.25			23	0
10	QPSK	25	12	22.20				
10	QPSK	25	25	22.20				
10	QPSK	50	0	22.22			23	0
10	16QAM	1	0	22.21				
10	16QAM	1	25	22.26				
10	16QAM	1	49	22.12			22	1
10	16QAM	25	0	21.15				
10	16QAM	25	12	21.25				
10	16QAM	25	25	21.14			22	1
10	16QAM	50	0	21.27				
10	64QAM	1	0	21.32				
10	64QAM	1	25	21.32			22	1
10	64QAM	1	49	21.28				
10	64QAM	25	0	20.18				
10	64QAM	25	12	20.24			21	2
10	64QAM	25	25	20.20				
10	64QAM	50	0	20.26				
Channel				23205	23230	23255	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	22.18	22.23	22.21	23	0
5	QPSK	1	12	22.03	21.97	22.11		
5	QPSK	1	24	22.00	21.98	21.95		
5	QPSK	12	0	22.18	22.19	22.14	23	0
5	QPSK	12	7	22.20	22.20	22.18		
5	QPSK	12	13	22.15	22.08	22.13		
5	QPSK	25	0	22.22	22.11	22.17	23	0
5	16QAM	1	0	22.11	22.04	22.19		
5	16QAM	1	12	22.17	22.22	22.10		
5	16QAM	1	24	21.95	21.97	22.07	22	1
5	16QAM	12	0	21.01	21.14	20.95		
5	16QAM	12	7	21.16	21.12	21.06		
5	16QAM	12	13	21.00	21.08	21.10	22	1
5	16QAM	25	0	21.15	21.24	21.09		
5	64QAM	1	0	21.20	21.17	21.22		
5	64QAM	1	12	21.12	21.25	21.23	22	1
5	64QAM	1	24	21.11	21.16	21.12		
5	64QAM	12	0	20.06	20.01	20.02		
5	64QAM	12	7	20.08	20.12	20.04	21	2
5	64QAM	12	13	20.14	20.01	20.08		
5	64QAM	25	0	20.24	20.18	20.17		

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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	21.66	21.76	21.74	22.5	0
15	QPSK	1	37	21.57	21.60	21.58		
15	QPSK	1	74	21.48	21.66	21.42		
15	QPSK	36	0	21.64	21.66	21.63	22.5	0
15	QPSK	36	20	21.63	21.64	21.55		
15	QPSK	36	39	21.48	21.65	21.53		
15	QPSK	75	0	21.51	21.71	21.57	22.5	0
15	16QAM	1	0	21.66	21.73	21.69		
15	16QAM	1	37	21.56	21.73	21.68		
15	16QAM	1	74	21.70	21.73	21.72	21.5	1
15	16QAM	36	0	21.06	21.20	21.10		
15	16QAM	36	20	21.16	21.21	21.06		
15	16QAM	36	39	21.01	21.16	21.02	21.5	1
15	16QAM	75	0	21.06	21.21	21.06		
15	64QAM	1	0	21.15	21.37	21.21		
15	64QAM	1	37	21.32	21.39	21.29	21.5	1
15	64QAM	1	74	21.25	21.39	21.12		
15	64QAM	36	0	20.09	20.24	20.07		
15	64QAM	36	20	20.19	20.24	20.10	20.5	2
15	64QAM	36	39	20.01	20.16	19.98		
15	64QAM	75	0	20.04	20.20	20.10		
Channel				26740	26865	26990	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	21.63	21.72	21.57	22.5	0
10	QPSK	1	25	21.38	21.41	21.44		
10	QPSK	1	49	21.46	21.46	21.33		
10	QPSK	25	0	21.53	21.67	21.63	22.5	0
10	QPSK	25	12	21.59	21.66	21.47		
10	QPSK	25	25	21.30	21.62	21.36		
10	QPSK	50	0	21.51	21.51	21.41	22.5	0
10	16QAM	1	0	21.65	21.74	21.63		
10	16QAM	1	25	21.72	21.70	21.64		
10	16QAM	1	49	21.58	21.54	21.53	21.5	1
10	16QAM	25	0	21.06	21.07	21.10		
10	16QAM	25	12	21.01	21.13	21.01		
10	16QAM	25	25	20.99	21.01	20.84	21.5	1
10	16QAM	50	0	20.91	21.02	21.04		
10	64QAM	1	0	21.14	21.25	21.16		
10	64QAM	1	25	21.28	21.24	21.24	21.5	1
10	64QAM	1	49	21.25	21.30	20.93		
10	64QAM	25	0	19.99	20.23	20.01		
10	64QAM	25	12	20.05	20.10	19.94	20.5	2
10	64QAM	25	25	19.90	20.11	19.82		
10	64QAM	50	0	19.86	20.17	20.09		
Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	21.50	21.68	21.74	22.5	0
5	QPSK	1	12	21.43	21.41	21.52		
5	QPSK	1	24	21.43	21.55	21.34		
5	QPSK	12	0	21.59	21.69	21.55	22.5	0
5	QPSK	12	7	21.50	21.68	21.47		
5	QPSK	12	13	21.48	21.51	21.42		
5	QPSK	25	0	21.40	21.69	21.39	22.5	0
5	16QAM	1	0	21.67	21.75	21.68		
5	16QAM	1	12	21.70	21.63	21.67		

5	16QAM	1	24	21.67	21.58	21.55	21.5	1
5	16QAM	12	0	20.89	21.03	20.96		
5	16QAM	12	7	21.07	21.13	20.91		
5	16QAM	12	13	20.97	21.12	20.90		
5	16QAM	25	0	21.01	21.01	20.93	21.5	1
5	64QAM	1	0	20.96	21.35	21.09		
5	64QAM	1	12	21.24	21.26	21.19		
5	64QAM	1	24	21.25	21.29	20.94		
5	64QAM	12	0	20.00	20.11	19.98	20.5	2
5	64QAM	12	7	20.03	20.24	20.03		
5	64QAM	12	13	19.95	19.99	19.96		
5	64QAM	25	0	19.95	20.10	19.90		
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	21.53	21.73	21.58	22.5	0
3	QPSK	1	8	21.49	21.43	21.43		
3	QPSK	1	14	21.45	21.53	21.40		
3	QPSK	8	0	21.47	21.72	21.51	22.5	0
3	QPSK	8	4	21.62	21.70	21.39		
3	QPSK	8	7	21.37	21.51	21.48		
3	QPSK	15	0	21.36	21.61	21.48		
3	16QAM	1	0	21.66	21.66	21.62	22.5	0
3	16QAM	1	8	21.73	21.71	21.72		
3	16QAM	1	14	21.63	21.56	21.64		
3	16QAM	8	0	21.05	21.20	21.09	21.5	1
3	16QAM	8	4	21.12	21.07	20.88		
3	16QAM	8	7	20.95	21.01	20.85		
3	16QAM	15	0	20.97	21.10	20.89		
3	64QAM	1	0	21.02	21.21	21.10	21.5	1
3	64QAM	1	8	21.24	21.35	21.21		
3	64QAM	1	14	21.06	21.28	20.99		
3	64QAM	8	0	19.89	20.07	19.91	20.5	2
3	64QAM	8	4	20.12	20.17	20.07		
3	64QAM	8	7	19.95	20.02	19.85		
3	64QAM	15	0	20.00	20.01	20.03		
Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	21.59	21.71	21.57	22.5	0
1.4	QPSK	1	3	21.53	21.47	21.48		
1.4	QPSK	1	5	21.48	21.64	21.36		
1.4	QPSK	3	0	21.59	21.60	21.58		
1.4	QPSK	3	1	21.60	21.55	21.45		
1.4	QPSK	3	3	21.42	21.51	21.48	22.5	0
1.4	QPSK	6	0	21.39	21.56	21.54	22.5	0
1.4	16QAM	1	0	21.70	21.63	21.74		
1.4	16QAM	1	3	21.64	21.71	21.74		
1.4	16QAM	1	5	21.60	21.64	21.65		
1.4	16QAM	3	0	21.48	21.64	21.36		
1.4	16QAM	3	1	21.59	21.60	21.58	21.5	1
1.4	16QAM	3	3	21.60	21.55	21.45		
1.4	16QAM	6	0	21.03	21.05	21.04		
1.4	64QAM	1	0	21.01	21.34	21.17		
1.4	64QAM	1	3	21.26	21.39	21.26		
1.4	64QAM	1	5	21.11	21.34	21.05	21.5	1
1.4	64QAM	3	0	20.96	21.13	20.92		
1.4	64QAM	3	1	21.13	21.19	20.88		
1.4	64QAM	3	3	20.94	21.11	20.87	20.5	2
1.4	64QAM	6	0	20.04	20.19	20.03		

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BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	20.15	20.30	20.20	20.5	0
20	QPSK	1	49	19.91	19.99	19.97		
20	QPSK	1	99	20.03	19.87	19.88		
20	QPSK	50	0	20.12	20.20	20.13	20.5	0
20	QPSK	50	24	20.08	20.13	20.04		
20	QPSK	50	50	20.14	19.94	19.98		
20	QPSK	100	0	20.06	20.12	20.07	20.5	0
20	16QAM	1	0	20.22	20.18	20.20		
20	16QAM	1	49	20.27	20.20	20.25		
20	16QAM	1	99	20.26	20.21	20.22	20.5	0
20	16QAM	50	0	20.18	20.20	20.12		
20	16QAM	50	24	20.07	20.12	20.02		
20	16QAM	50	50	20.10	19.94	20.00	20.5	0
20	16QAM	100	0	20.04	20.12	20.07		
20	64QAM	1	0	20.17	20.22	20.28		
20	64QAM	1	49	20.12	20.20	20.15	20.5	0
20	64QAM	1	99	20.20	20.06	20.12		
20	64QAM	50	0	20.13	20.23	20.17		
20	64QAM	50	24	20.06	20.13	20.06	20.5	0
20	64QAM	50	50	20.12	19.97	19.99		
20	64QAM	100	0	20.06	20.14	20.07		
Channel				132047	132322	132597		
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	20.12	20.19	20.13	20.5	0
15	QPSK	1	37	19.86	19.85	19.96		
15	QPSK	1	74	19.89	19.80	19.76		
15	QPSK	36	0	19.95	20.17	19.95	20.5	0
15	QPSK	36	20	19.89	20.08	19.93		
15	QPSK	36	39	20.00	19.75	19.80		
15	QPSK	75	0	19.97	19.97	19.92	20.5	0
15	16QAM	1	0	20.07	20.16	20.03		
15	16QAM	1	37	20.13	20.19	20.23		
15	16QAM	1	74	20.11	20.12	20.03	20.5	0
15	16QAM	36	0	20.02	20.04	20.05		
15	16QAM	36	20	20.00	20.05	19.95		
15	16QAM	36	39	19.98	19.85	19.93	20.5	0
15	16QAM	75	0	19.98	19.93	20.03		
15	64QAM	1	0	19.98	20.14	20.22		
15	64QAM	1	37	19.98	20.01	20.06	20.5	0
15	64QAM	1	74	20.12	19.98	20.04		
15	64QAM	36	0	20.09	20.05	20.17		
15	64QAM	36	20	20.02	20.11	20.04	20.5	0
15	64QAM	36	39	19.96	19.93	19.83		
15	64QAM	75	0	19.94	20.00	20.05		
Channel				132022	132322	132622		
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	20.02	20.22	20.20	20.5	0
10	QPSK	1	25	19.82	19.90	19.86		
10	QPSK	1	49	19.84	19.71	19.80		
10	QPSK	25	0	20.10	20.17	19.99	20.5	0
10	QPSK	25	12	19.99	19.93	20.03		
10	QPSK	25	25	20.05	19.87	19.84		
10	QPSK	50	0	20.02	19.94	19.98	20.5	0
10	16QAM	1	0	20.11	20.16	20.18		
10	16QAM	1	25	20.15	20.18	20.11		



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10	16QAM	1	49	20.11	20.11	20.02	20.5	0
10	16QAM	25	0	19.98	20.00	20.11		
10	16QAM	25	12	19.94	19.95	19.82		
10	16QAM	25	25	20.06	19.92	19.85		
10	16QAM	50	0	20.03	20.00	19.98		
10	64QAM	1	0	20.04	20.04	20.23	20.5	0
10	64QAM	1	25	20.12	20.14	20.11		
10	64QAM	1	49	20.12	19.89	20.04		
10	64QAM	25	0	20.02	20.04	20.14	20.5	0
10	64QAM	25	12	20.05	20.04	20.00		
10	64QAM	25	25	20.07	19.80	19.79		
10	64QAM	50	0	19.97	20.10	19.97		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	20.14	20.26	20.07	20.5	0
5	QPSK	1	12	19.86	19.92	19.81		
5	QPSK	1	24	19.88	19.72	19.70		
5	QPSK	12	0	20.09	20.00	19.94	20.5	0
5	QPSK	12	7	19.90	20.09	19.87		
5	QPSK	12	13	19.94	19.80	19.92		
5	QPSK	25	0	19.87	20.02	19.96		
5	16QAM	1	0	20.12	20.14	20.02	20.5	0
5	16QAM	1	12	20.24	20.04	20.23		
5	16QAM	1	24	20.07	20.04	20.03		
5	16QAM	12	0	20.09	20.05	20.03	20.5	0
5	16QAM	12	7	19.89	20.01	19.91		
5	16QAM	12	13	19.90	19.79	19.84		
5	16QAM	25	0	19.90	20.03	20.01		
5	64QAM	1	0	20.05	20.08	20.20	20.5	0
5	64QAM	1	12	19.96	20.01	20.00		
5	64QAM	1	24	20.15	20.01	20.12		
5	64QAM	12	0	20.04	20.17	20.00	20.5	0
5	64QAM	12	7	20.06	19.93	19.97		
5	64QAM	12	13	20.10	19.81	19.84		
5	64QAM	25	0	19.90	19.98	20.02		
Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	20.06	20.27	20.15	20.5	0
3	QPSK	1	8	19.79	19.85	19.87		
3	QPSK	1	14	19.87	19.82	19.79		
3	QPSK	8	0	20.04	20.00	20.04	20.5	0
3	QPSK	8	4	19.96	20.09	19.93		
3	QPSK	8	7	20.06	19.94	19.89		
3	QPSK	15	0	19.87	19.93	20.00		
3	16QAM	1	0	20.16	20.05	20.04	20.5	0
3	16QAM	1	8	20.16	20.19	20.22		
3	16QAM	1	14	20.08	20.19	20.12		
3	16QAM	8	0	20.11	20.18	19.92	20.5	0
3	16QAM	8	4	19.96	20.01	19.97		
3	16QAM	8	7	19.99	19.74	19.82		
3	16QAM	15	0	19.90	20.06	19.89		
3	64QAM	1	0	20.10	20.12	20.19	20.5	0
3	64QAM	1	8	20.04	20.18	20.15		
3	64QAM	1	14	20.00	19.87	20.00		
3	64QAM	8	0	20.06	20.10	19.98	20.5	0
3	64QAM	8	4	19.90	19.98	19.97		
3	64QAM	8	7	19.93	19.85	19.95		
3	64QAM	15	0	19.96	19.97	20.02		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		



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1.4	QPSK	1	0	20.05	20.25	20.00	20.5	0
1.4	QPSK	1	3	19.79	19.83	19.92		
1.4	QPSK	1	5	19.94	19.73	19.82		
1.4	QPSK	3	0	20.03	20.18	20.04		
1.4	QPSK	3	1	20.08	20.02	19.90		
1.4	QPSK	3	3	20.00	19.92	19.88		
1.4	QPSK	6	0	20.03	19.92	19.93	20.5	0
1.4	16QAM	1	0	20.21	20.17	20.07	20.5	0
1.4	16QAM	1	3	20.13	20.10	20.19		
1.4	16QAM	1	5	20.25	20.07	20.04		
1.4	16QAM	3	0	20.02	20.18	20.02		
1.4	16QAM	3	1	19.92	20.10	19.91		
1.4	16QAM	3	3	20.01	19.92	19.82		
1.4	16QAM	6	0	20.04	20.07	19.91	20.5	0
1.4	64QAM	1	0	20.07	20.09	20.23	20.5	0
1.4	64QAM	1	3	20.02	20.08	20.08		
1.4	64QAM	1	5	20.14	19.94	19.92		
1.4	64QAM	3	0	19.97	20.19	20.07		
1.4	64QAM	3	1	19.99	20.02	19.86		
1.4	64QAM	3	3	19.92	19.89	19.97		
1.4	64QAM	6	0	20.02	20.01	19.96	20.5	0

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

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

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

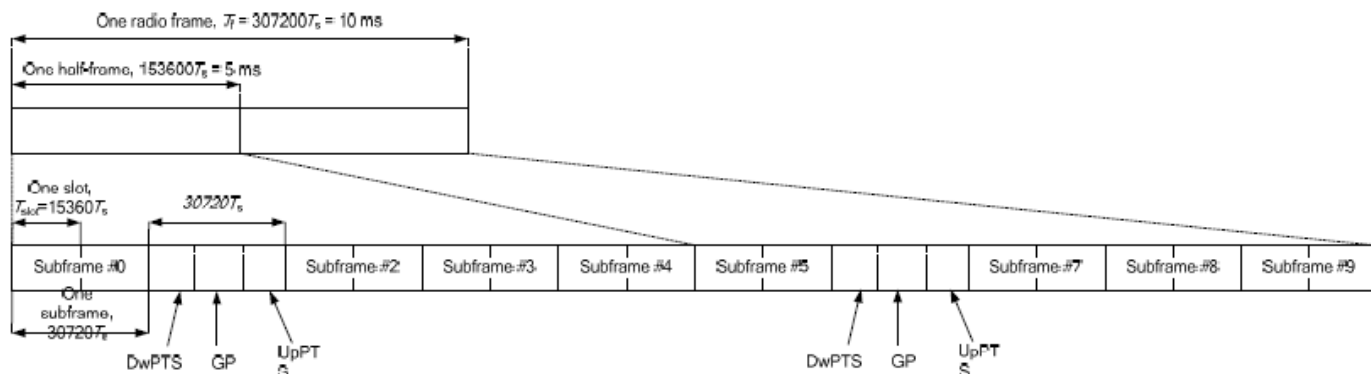


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

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

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

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

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

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

The highest duty factor is resulted from:

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

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	22.17	22.17	22.31	22.27	22.26	23	0
20	QPSK	1	49	21.93	21.99	22.12	22.05	21.91		
20	QPSK	1	99	21.91	22.01	22.11	22.02	21.88		
20	QPSK	50	0	21.13	21.11	21.25	21.19	21.18	22	1
20	QPSK	50	24	20.99	21.06	21.21	21.14	21.02		
20	QPSK	50	50	20.91	20.98	21.17	21.05	20.93		
20	QPSK	100	0	20.99	21.09	21.17	21.10	21.06	22	1
20	16QAM	1	0	21.39	21.33	21.36	21.48	21.33		
20	16QAM	1	49	20.98	21.22	21.20	21.19	21.07		
20	16QAM	1	99	21.06	21.11	21.13	21.17	21.10	21	2
20	16QAM	50	0	20.18	20.12	20.24	20.18	20.20		
20	16QAM	50	24	20.02	20.11	20.20	20.15	20.03		
20	16QAM	50	50	19.96	20.04	20.18	20.10	20.00	21	2
20	16QAM	100	0	20.01	20.07	20.24	20.13	20.07		
20	64QAM	1	0	19.99	19.99	20.00	20.14	20.07		
20	64QAM	1	49	19.89	19.83	19.90	19.85	19.83	21	2
20	64QAM	1	99	19.86	19.85	19.92	19.86	19.86		
20	64QAM	50	0	19.18	19.11	19.25	19.18	19.16		
20	64QAM	50	24	18.97	19.07	19.21	19.12	19.05	20	3
20	64QAM	50	50	18.97	19.07	19.19	19.09	19.00		
20	64QAM	100	0	19.01	19.08	19.24	19.13	19.08		
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	21.99	22.17	22.12	22.18	22.12	23.00	0
15	QPSK	1	37	21.80	21.87	22.04	21.85	21.71		
15	QPSK	1	74	21.90	21.84	22.07	21.83	21.83		
15	QPSK	36	0	20.95	20.93	21.10	21.10	21.02	22	1
15	QPSK	36	20	20.96	20.89	21.05	20.95	20.96		
15	QPSK	36	39	20.91	20.91	21.07	20.88	20.92		
15	QPSK	75	0	20.89	21.02	21.16	21.01	21.03	22	1
15	16QAM	1	0	21.34	21.28	21.27	21.30	21.14		
15	16QAM	1	37	20.94	21.15	21.18	21.16	21.01		
15	16QAM	1	74	20.98	21.06	21.05	21.14	21.02	21	2
15	16QAM	36	0	20.05	19.93	20.19	20.07	20.11		
15	16QAM	36	20	19.90	19.94	20.03	20.13	19.98		
15	16QAM	36	39	19.90	19.97	20.06	20.00	19.80	21	2
15	16QAM	75	0	19.93	19.87	20.17	20.10	20.05		
15	64QAM	1	0	19.96	19.84	19.99	20.14	19.89		
15	64QAM	1	37	19.78	19.67	19.77	19.66	19.71	21	2
15	64QAM	1	74	19.75	19.74	19.86	19.71	19.83		
15	64QAM	36	0	19.09	19.02	19.25	19.16	19.14		
15	64QAM	36	20	18.88	18.87	19.11	18.96	18.88	20	3
15	64QAM	36	39	18.94	19.00	19.10	18.93	18.95		
15	64QAM	75	0	18.89	19.05	19.19	19.08	18.91		
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2501	2547	2593	2639	2685		
10	QPSK	1	0	22.08	22.02	22.09	22.29	22.19	23.00	0
10	QPSK	1	25	21.84	21.91	21.93	21.94	21.88		
10	QPSK	1	49	21.85	21.91	21.98	21.98	21.79		
10	QPSK	25	0	21.13	21.01	21.25	21.15	21.08	22	1
10	QPSK	25	12	20.83	21.06	21.07	21.11	20.87		
10	QPSK	25	25	20.89	20.79	21.02	21.02	20.81		
10	QPSK	50	0	20.96	20.90	21.05	20.92	20.90	22	1
10	16QAM	1	0	21.38	21.22	21.19	21.37	21.32		



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10	16QAM	1	25	20.93	21.04	21.06	21.11	20.93	21	2
10	16QAM	1	49	21.04	20.98	21.08	21.14	21.04		
10	16QAM	25	0	20.14	20.09	20.06	19.99	20.17		
10	16QAM	25	12	19.95	20.07	20.11	20.07	20.03		
10	16QAM	25	25	19.89	19.90	20.12	20.02	20.00		
10	16QAM	50	0	19.87	20.07	20.21	20.12	19.88	21	2
10	64QAM	1	0	19.81	19.97	19.96	20.07	19.88		
10	64QAM	1	25	19.84	19.70	19.80	19.79	19.70		
10	64QAM	1	49	19.79	19.78	19.92	19.74	19.81		
10	64QAM	25	0	19.08	18.95	19.13	19.15	19.16		
10	64QAM	25	12	18.84	18.98	19.09	19.10	18.89	20	3
10	64QAM	25	25	18.95	18.89	19.18	19.09	18.95		
10	64QAM	50	0	18.81	19.04	19.10	19.01	18.92		
Channel				39675	40148	40620	41093	41565		
Frequency (MHz)				2498.5	2545.8	2593	2640.30	2687.5		
5	QPSK	1	0	21.94	21.92	22.01	22.21	22.07	23.00	0
5	QPSK	1	12	21.79	21.84	21.81	21.84	21.86		
5	QPSK	1	24	21.79	21.71	21.98	21.87	21.70		
5	QPSK	12	0	21.03	20.98	21.06	20.98	20.90		
5	QPSK	12	7	20.66	21.05	20.87	20.94	20.79		
5	QPSK	12	13	20.89	20.79	20.84	20.82	20.65	22	1
5	QPSK	25	0	20.84	20.89	20.99	20.89	20.86		
5	16QAM	1	0	21.20	21.14	21.13	21.20	21.27		
5	16QAM	1	12	20.85	20.99	20.86	21.02	20.85		
5	16QAM	1	24	20.95	20.87	20.92	21.02	20.96		
5	16QAM	12	0	20.00	20.07	19.96	19.86	20.05	21	2
5	16QAM	12	7	19.81	19.88	20.05	19.89	19.90		
5	16QAM	12	13	19.81	19.72	20.07	19.91	19.85		
5	16QAM	25	0	19.71	19.91	20.15	19.94	19.72		
5	64QAM	1	0	19.68	19.90	19.85	19.98	19.87		
5	64QAM	1	12	19.65	19.66	19.70	19.63	19.60	21	2
5	64QAM	1	24	19.59	19.69	19.81	19.56	19.79		
5	64QAM	12	0	19.02	18.94	19.06	19.02	19.10		
5	64QAM	12	7	18.75	18.98	18.89	19.08	18.88		
5	64QAM	12	13	18.92	18.74	19.05	19.09	18.87		
5	64QAM	25	0	18.62	18.85	19.09	18.95	18.73	20	3



<LTE Band 42>

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				43190	43340	43490		
Frequency (MHz)				3560	3575	3590		
20	QPSK	1	0	22.40	22.47	22.27	23	0
20	QPSK	1	49	22.03	21.99	21.93		
20	QPSK	1	99	21.80	21.69	21.91		
20	QPSK	50	0	21.41	21.24	21.18	22	1
20	QPSK	50	24	21.10	20.98	21.16		
20	QPSK	50	50	21.01	20.99	20.99		
20	QPSK	100	0	21.15	21.10	21.03	22	1
20	16QAM	1	0	21.51	21.52	21.38		
20	16QAM	1	49	21.06	21.00	21.05		
20	16QAM	1	99	20.89	20.80	20.97	21	2
20	16QAM	50	0	20.36	20.20	20.16		
20	16QAM	50	24	20.23	20.06	20.08		
20	16QAM	50	50	20.06	19.99	19.94	21	2
20	16QAM	100	0	20.15	20.07	20.02		
20	64QAM	1	0	20.38	20.18	20.24		
20	64QAM	1	49	19.79	19.91	19.67	21	2
20	64QAM	1	99	19.44	19.47	19.70		
20	64QAM	50	0	19.36	19.06	19.25		
20	64QAM	50	24	19.14	19.07	19.02	20	3
20	64QAM	50	50	18.93	18.88	19.02		
20	64QAM	100	0	19.18	19.13	19.13		
Channel				43165	43340	43515		
Frequency (MHz)				3557.5	3575	3592.5		
15	QPSK	1	0	22.23	22.33	22.14	23	0
15	QPSK	1	37	21.83	21.82	21.92		
15	QPSK	1	74	21.67	21.52	21.73		
15	QPSK	36	0	21.21	21.12	21.00	22	1
15	QPSK	36	20	21.09	20.86	21.06		
15	QPSK	36	39	20.98	20.89	20.80		
15	QPSK	75	0	21.02	20.94	20.98	22	1
15	16QAM	1	0	21.34	21.41	21.38		
15	16QAM	1	37	20.95	20.89	20.87		
15	16QAM	1	74	20.81	20.78	20.84	21	2
15	16QAM	36	0	20.34	20.18	20.13		
15	16QAM	36	20	20.06	19.88	20.05		
15	16QAM	36	39	19.87	19.96	19.87	21	2
15	16QAM	75	0	20.06	19.90	19.88		
15	64QAM	1	0	20.27	19.99	20.20		
15	64QAM	1	37	19.74	19.81	19.67	21	2
15	64QAM	1	74	19.35	19.47	19.60		
15	64QAM	36	0	19.29	18.98	19.10		
15	64QAM	36	20	19.00	18.95	18.96	20	3
15	64QAM	36	39	18.88	18.77	18.91		
15	64QAM	75	0	19.05	18.95	19.08		
Channel				43140	43340	43540		
Frequency (MHz)				3555	3575	3595		
10	QPSK	1	0	22.24	22.30	22.16	23	0
10	QPSK	1	25	21.88	21.99	21.80		
10	QPSK	1	49	21.74	21.56	21.91		
10	QPSK	25	0	21.33	21.22	21.17	22	1
10	QPSK	25	12	21.09	20.89	21.11		
10	QPSK	25	25	20.97	20.86	20.99		
10	QPSK	50	0	20.97	21.03	20.91	22	1
10	16QAM	1	0	21.46	21.40	21.32		
10	16QAM	1	25	20.99	20.96	20.89		



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10	16QAM	1	49	20.69	20.67	20.84	21	2
10	16QAM	25	0	20.27	20.09	20.04		
10	16QAM	25	12	20.11	20.04	19.90		
10	16QAM	25	25	19.88	19.83	19.89		
10	16QAM	50	0	20.06	19.90	19.95		
10	64QAM	1	0	20.33	20.03	20.04	21	2
10	64QAM	1	25	19.64	19.85	19.67		
10	64QAM	1	49	19.31	19.39	19.55		
10	64QAM	25	0	19.21	18.96	19.22	20	3
10	64QAM	25	12	19.14	19.04	18.83		
10	64QAM	25	25	18.73	18.74	18.84		
10	64QAM	50	0	19.10	18.97	18.98		
Channel				43115	43340	43565	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				3552.5	3575	3597.5		
5	QPSK	1	0	22.24	22.30	22.16	23	0
5	QPSK	1	12	21.88	21.99	21.80		
5	QPSK	1	24	21.74	21.56	21.91		
5	QPSK	12	0	21.33	21.22	21.17	22	1
5	QPSK	12	7	21.09	20.89	21.11		
5	QPSK	12	13	20.97	20.86	20.99		
5	QPSK	25	0	20.97	21.03	20.91		
5	16QAM	1	0	21.46	21.40	21.32	22	1
5	16QAM	1	12	20.99	20.96	20.89		
5	16QAM	1	24	20.69	20.67	20.84		
5	16QAM	12	0	20.27	20.09	20.04	21	2
5	16QAM	12	7	20.11	20.04	19.90		
5	16QAM	12	13	19.88	19.83	19.89		
5	16QAM	25	0	20.06	19.90	19.95		
5	64QAM	1	0	20.33	20.03	20.04	21	2
5	64QAM	1	12	19.64	19.85	19.67		
5	64QAM	1	24	19.31	19.39	19.55		
5	64QAM	12	0	19.21	18.96	19.22	20	3
5	64QAM	12	7	19.14	19.04	18.83		
5	64QAM	12	13	18.73	18.74	18.84		
5	64QAM	25	0	19.10	18.97	18.98		



<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	21.92	21.91	21.88	21.82	23	0
20	QPSK	1	49	21.86	21.84	21.85	21.87		
20	QPSK	1	99	21.88	21.78	21.81	21.62		
20	QPSK	50	0	20.52	20.53	20.27	20.25	22	1
20	QPSK	50	24	20.24	20.32	20.20	20.05		
20	QPSK	50	50	20.13	20.29	20.00	20.01		
20	QPSK	100	0	20.42	20.35	20.28	20.17	22	1
20	16QAM	1	0	20.72	20.82	20.63	20.66		
20	16QAM	1	49	20.32	20.27	20.19	20.16		
20	16QAM	1	99	20.17	20.05	20.08	20.05	21	2
20	16QAM	50	0	19.48	19.49	19.29	19.40		
20	16QAM	50	24	19.37	19.30	19.22	19.19		
20	16QAM	50	50	19.20	19.18	19.03	19.20	21	2
20	16QAM	100	0	19.36	19.38	19.13	19.04		
20	64QAM	1	0	19.47	19.39	19.44	19.20		
20	64QAM	1	49	19.06	19.09	19.18	19.30	21	2
20	64QAM	1	99	19.15	19.10	19.20	19.21		
20	64QAM	50	0	18.47	18.50	18.43	18.35		
20	64QAM	50	24	18.35	18.25	18.21	18.17	20	3
20	64QAM	50	50	18.26	18.18	18.06	18.07		
20	64QAM	100	0	18.38	18.43	18.23	18.18		
Channel				55315	55820	56160	56665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				3557.5	3608	3642	3692.5		
15	QPSK	1	0	21.87	21.86	21.83	21.79	23	0
15	QPSK	1	37	21.78	21.74	21.73	21.86		
15	QPSK	1	74	21.71	21.73	21.79	21.54		
15	QPSK	36	0	20.50	20.53	20.24	20.25	22	1
15	QPSK	36	20	20.14	20.22	20.20	20.10		
15	QPSK	36	39	20.11	20.20	20.15	20.05		
15	QPSK	75	0	20.39	20.34	20.23	20.07	22	1
15	16QAM	1	0	20.70	20.75	20.55	20.63		
15	16QAM	1	37	20.22	20.23	20.13	20.08		
15	16QAM	1	74	20.08	20.05	20.05	20.04	21	2
15	16QAM	36	0	19.39	19.41	19.26	19.31		
15	16QAM	36	20	19.34	19.24	19.16	19.18		
15	16QAM	36	39	19.17	19.16	19.06	19.18	21	2
15	16QAM	75	0	19.27	19.28	19.08	19.05		
15	64QAM	1	0	19.44	19.29	19.36	19.15		
15	64QAM	1	37	19.03	19.00	19.11	19.24	21	2
15	64QAM	1	74	19.08	19.09	19.10	19.18		
15	64QAM	36	0	18.44	18.42	18.34	18.34		
15	64QAM	36	20	18.27	18.22	18.16	18.15	20	3
15	64QAM	36	39	18.26	18.13	18.02	18.06		
15	64QAM	75	0	18.37	18.39	18.17	18.12		
Channel				55290	55815	56165	56690	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				3555	3607.5	3642.5	3695		
10	QPSK	1	0	21.86	21.90	21.81	21.77	23	0
10	QPSK	1	25	21.83	21.92	21.73	21.71		
10	QPSK	1	49	21.59	21.57	21.79	21.37		
10	QPSK	25	0	20.44	20.47	20.19	20.23	22	1
10	QPSK	25	12	20.16	20.26	20.12	20.06		



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10	QPSK	25	25	20.06	20.23	20.14	20.12		
10	QPSK	50	0	20.36	20.27	20.28	20.11		
10	16QAM	1	0	20.70	20.72	20.58	20.60		
10	16QAM	1	25	20.32	20.17	20.09	20.08	22	1
10	16QAM	1	49	20.14	20.07	20.05	20.05		
10	16QAM	25	0	19.39	19.41	19.24	19.38		
10	16QAM	25	12	19.31	19.20	19.18	19.15	21	2
10	16QAM	25	25	19.12	19.12	19.06	19.17		
10	16QAM	50	0	19.31	19.36	19.11	19.10		
10	64QAM	1	0	19.37	19.38	19.41	19.18	21	2
10	64QAM	1	25	19.18	19.01	19.18	19.20		
10	64QAM	1	49	19.11	19.08	19.16	19.12		
10	64QAM	25	0	18.46	18.40	18.33	18.30	20	3
10	64QAM	25	12	18.29	18.23	18.12	18.14		
10	64QAM	25	25	18.16	18.14	18.01	18.05		
10	64QAM	50	0	18.34	18.35	18.17	18.11		
Channel				55265	55810	56170	56715	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				3552.5	3607	3643	3697.5		
5	QPSK	1	0	21.89	21.85	21.74	21.69	23	0
5	QPSK	1	12	21.90	21.84	21.84	21.80		
5	QPSK	1	24	21.77	21.68	21.74	21.48		
5	QPSK	12	0	20.45	20.45	20.25	20.22	22	1
5	QPSK	12	7	20.24	20.27	20.11	20.04		
5	QPSK	12	13	20.11	20.25	20.15	20.00		
5	QPSK	25	0	20.33	20.26	20.28	20.10	22	1
5	16QAM	1	0	20.71	20.79	20.63	20.66		
5	16QAM	1	12	20.29	20.26	20.12	20.07		
5	16QAM	1	24	20.10	20.03	20.07	20.10	21	2
5	16QAM	12	0	19.44	19.43	19.19	19.35		
5	16QAM	12	7	19.36	19.29	19.16	19.14		
5	16QAM	12	13	19.11	19.10	19.03	19.10	21	2
5	16QAM	25	0	19.34	19.38	19.10	19.15		
5	64QAM	1	0	19.42	19.32	19.39	19.13		
5	64QAM	1	12	19.01	19.01	19.14	19.28	21	2
5	64QAM	1	24	19.08	19.07	19.16	19.19		
5	64QAM	12	0	18.41	18.42	18.35	18.27		
5	64QAM	12	7	18.28	18.15	18.12	18.12	20	3
5	64QAM	12	13	18.24	18.11	18.04	18.10		
5	64QAM	25	0	18.36	18.38	18.19	18.13		

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	19.5	0
Frequency (MHz)				2506	2549.5	2593	2636.5	2680		
20	QPSK	1	0	19.01	19.01	19.20	19.19	19.05	19.5	0
20	QPSK	1	49	18.83	18.85	18.87	18.78	18.74		
20	QPSK	1	99	18.82	18.88	19.00	18.79	18.78		
20	QPSK	50	0	19.08	19.09	19.10	19.04	19.08	19.5	0
20	QPSK	50	24	18.95	19.03	19.07	18.96	18.90		
20	QPSK	50	50	18.88	18.99	19.00	18.90	18.79		
20	QPSK	100	0	18.95	19.04	19.08	19.00	18.90	19.5	0
20	16QAM	1	0	19.16	19.12	19.15	19.16	19.15		
20	16QAM	1	49	19.14	19.11	19.13	19.09	19.05		
20	16QAM	1	99	19.05	19.16	19.14	19.12	19.10	19.5	0
20	16QAM	50	0	19.07	19.07	19.11	19.01	19.05		
20	16QAM	50	24	18.94	19.03	19.09	18.96	18.91		
20	16QAM	50	50	18.89	18.99	19.04	18.94	18.84	19.5	0
20	16QAM	100	0	18.94	19.03	19.06	18.96	18.87		
20	64QAM	1	0	19.13	19.17	19.13	19.13	19.16		
20	64QAM	1	49	18.93	18.98	19.10	18.98	19.01	19.5	0
20	64QAM	1	99	19.00	19.06	19.16	18.91	18.93		
20	64QAM	50	0	19.08	19.05	19.12	18.99	19.03		
20	64QAM	50	24	18.96	19.00	19.03	18.97	18.91	19.5	0
20	64QAM	50	50	18.93	18.96	19.00	18.92	18.80		
20	64QAM	100	0	18.93	19.04	19.02	18.97	18.92		
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	18.91	18.88	19.16	19.04	18.92	19.5	0
15	QPSK	1	37	18.83	18.74	18.83	18.66	18.54		
15	QPSK	1	74	18.70	18.69	18.98	18.65	18.67		
15	QPSK	36	0	19.08	19.03	18.93	18.87	18.92	19.5	0
15	QPSK	36	20	18.83	18.95	19.05	18.87	18.83		
15	QPSK	36	39	18.82	18.80	18.87	18.89	18.69		
15	QPSK	75	0	18.87	18.89	18.96	18.85	18.86	19.5	0
15	16QAM	1	0	18.99	19.02	18.97	19.09	18.95		
15	16QAM	1	37	18.97	18.91	19.06	19.02	19.01		
15	16QAM	1	74	18.89	19.04	19.10	19.01	19.05	19.5	0
15	16QAM	36	0	18.94	18.94	19.01	18.92	19.05		
15	16QAM	36	20	18.79	18.91	19.00	18.87	18.72		
15	16QAM	36	39	18.78	18.88	19.02	18.76	18.73	19.5	0
15	16QAM	75	0	18.93	18.95	19.02	18.95	18.68		
15	64QAM	1	0	18.95	18.97	19.00	19.13	19.02		
15	64QAM	1	37	18.91	18.94	19.06	18.81	18.90	19.5	0
15	64QAM	1	74	18.84	18.99	19.04	18.80	18.73		
15	64QAM	36	0	18.98	19.02	19.11	18.79	18.89		
15	64QAM	36	20	18.96	18.82	18.87	18.96	18.76	19.5	0
15	64QAM	36	39	18.80	18.96	19.00	18.81	18.70		
15	64QAM	75	0	18.78	18.85	19.01	18.91	18.90		
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2501	2547	2593	2639	2685		
10	QPSK	1	0	18.87	18.96	19.12	19.10	18.99	19.5	0
10	QPSK	1	25	18.83	18.75	18.87	18.61	18.58		
10	QPSK	1	49	18.76	18.77	18.92	18.68	18.58		
10	QPSK	25	0	18.88	19.04	18.99	18.87	19.04	19.5	0
10	QPSK	25	12	18.89	18.86	18.97	18.79	18.85		
10	QPSK	25	25	18.71	18.95	18.96	18.77	18.60		
10	QPSK	50	0	18.84	19.03	19.02	18.84	18.73	19.5	0
10	16QAM	1	0	19.06	18.94	18.99	19.04	19.06		



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10	16QAM	1	25	19.00	19.02	18.95	18.93	19.05	19.5	0
10	16QAM	1	49	18.94	19.13	19.07	18.94	18.96		
10	16QAM	25	0	18.95	19.00	18.97	18.82	18.92		
10	16QAM	25	12	18.86	18.93	18.99	18.87	18.86		
10	16QAM	25	25	18.82	18.87	18.91	18.74	18.67		
10	16QAM	50	0	18.89	18.84	18.94	18.91	18.83	19.5	0
10	64QAM	1	0	19.09	19.01	19.02	19.00	19.02		
10	64QAM	1	25	18.77	18.84	19.02	18.81	18.99		
10	64QAM	1	49	18.87	19.04	18.97	18.91	18.91		
10	64QAM	25	0	19.07	19.04	19.09	18.89	18.91		
10	64QAM	25	12	18.86	18.80	18.85	18.77	18.78	19.5	0
10	64QAM	25	25	18.73	18.77	18.97	18.74	18.63		
10	64QAM	50	0	18.92	19.03	18.82	18.94	18.80		
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	18.97	18.82	19.16	19.04	19.04	19.5	0
5	QPSK	1	12	18.74	18.72	18.70	18.76	18.56		
5	QPSK	1	24	18.77	18.77	18.92	18.69	18.65		
5	QPSK	12	0	18.88	18.97	18.96	18.93	19.08		
5	QPSK	12	7	18.83	18.89	18.90	18.92	18.86		
5	QPSK	12	13	18.82	18.84	18.81	18.79	18.75	19.5	0
5	QPSK	25	0	18.86	18.91	18.88	18.99	18.89		
5	16QAM	1	0	19.10	19.01	19.06	19.06	19.15		
5	16QAM	1	12	19.03	19.07	18.98	19.06	18.89		
5	16QAM	1	24	19.03	19.15	19.09	19.07	18.90		
5	16QAM	12	0	18.97	18.96	19.06	18.91	19.05	19.5	0
5	16QAM	12	7	18.79	19.02	19.05	18.82	18.87		
5	16QAM	12	13	18.73	18.81	19.00	18.89	18.84		
5	16QAM	25	0	18.89	18.91	19.03	18.81	18.78		
5	64QAM	1	0	19.06	19.11	18.94	19.08	18.96		
5	64QAM	1	12	18.78	18.86	18.93	18.92	18.86	19.5	0
5	64QAM	1	24	18.91	18.90	19.09	18.91	18.73		
5	64QAM	12	0	19.07	19.04	18.93	18.98	18.93		
5	64QAM	12	7	18.87	18.96	18.91	18.90	18.73		
5	64QAM	12	13	18.93	18.76	18.94	18.79	18.73		
5	64QAM	25	0	18.88	18.99	18.92	18.85	18.76	19.5	0

<LTE Band 42>

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				43190	43340	43490		
Frequency (MHz)				3560	3575	3590		
20	QPSK	1	0	21.29	21.45	21.14	22	0
20	QPSK	1	49	20.94	20.86	20.85		
20	QPSK	1	99	20.71	20.66	20.89		
20	QPSK	50	0	20.37	20.23	20.01	21	1
20	QPSK	50	24	20.04	19.83	19.97		
20	QPSK	50	50	19.84	19.86	19.81		
20	QPSK	100	0	20.11	19.97	19.94		
20	16QAM	1	0	20.48	20.44	20.37	21	1
20	16QAM	1	49	19.99	19.95	19.94		
20	16QAM	1	99	19.89	19.67	19.78		
20	16QAM	50	0	19.20	19.20	19.01	20	2
20	16QAM	50	24	19.20	18.90	18.90		
20	16QAM	50	50	19.02	18.95	18.78		
20	16QAM	100	0	19.02	19.04	19.00		
20	64QAM	1	0	19.28	19.03	19.16	20	2
20	64QAM	1	49	18.72	18.74	18.58		
20	64QAM	1	99	18.24	18.29	18.62		
20	64QAM	50	0	18.28	17.88	18.14	19	3
20	64QAM	50	24	18.04	17.93	18.01		
20	64QAM	50	50	17.90	17.83	17.84		
20	64QAM	100	0	18.18	18.02	18.13		
Channel				43165	43340	43515		
Frequency (MHz)				3557.5	3575	3592.5		
15	QPSK	1	0	21.12	21.30	20.99	22	0
15	QPSK	1	37	20.78	20.68	20.83		
15	QPSK	1	74	20.59	20.34	20.67		
15	QPSK	36	0	20.09	20.02	19.86	21	1
15	QPSK	36	20	20.06	19.71	20.00		
15	QPSK	36	39	19.82	19.84	19.61		
15	QPSK	75	0	20.00	19.75	19.90		
15	16QAM	1	0	20.18	20.41	20.33	21	1
15	16QAM	1	37	19.77	19.79	19.78		
15	16QAM	1	74	19.66	19.67	19.67		
15	16QAM	36	0	19.25	18.99	18.97	20	2
15	16QAM	36	20	18.87	18.72	18.86		
15	16QAM	36	39	18.77	18.92	18.80		
15	16QAM	75	0	18.88	18.79	18.88		
15	64QAM	1	0	19.22	18.95	19.09	20	2
15	64QAM	1	37	18.68	18.61	18.54		
15	64QAM	1	74	18.23	18.31	18.56		
15	64QAM	36	0	18.10	17.87	17.99	19	3
15	64QAM	36	20	17.87	17.85	17.76		
15	64QAM	36	39	17.79	17.69	17.86		
15	64QAM	75	0	18.03	17.87	18.02		
Channel				43140	43340	43540		
Frequency (MHz)				3555	3575	3595		
10	QPSK	1	0	21.20	21.11	21.01	22	0
10	QPSK	1	25	20.70	20.90	20.62		
10	QPSK	1	49	20.62	20.48	20.73		
10	QPSK	25	0	20.25	20.08	20.14	21	1
10	QPSK	25	12	19.92	19.78	20.02		
10	QPSK	25	25	19.95	19.67	19.94		
10	QPSK	50	0	19.83	19.94	19.77		
10	16QAM	1	0	20.46	20.25	20.15	21	1
10	16QAM	1	25	19.86	19.91	19.80		



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10	16QAM	1	49	19.61	19.50	19.73		
10	16QAM	25	0	19.08	18.96	19.02	20	2
10	16QAM	25	12	19.11	18.88	18.77		
10	16QAM	25	25	18.70	18.76	18.75		
10	16QAM	50	0	18.92	18.81	18.92		
10	64QAM	1	0	19.31	19.01	18.86	20	2
10	64QAM	1	25	18.53	18.82	18.49		
10	64QAM	1	49	18.18	18.25	18.37		
10	64QAM	25	0	18.06	17.84	18.12	19	3
10	64QAM	25	12	18.11	17.99	17.71		
10	64QAM	25	25	17.66	17.58	17.80		
10	64QAM	50	0	18.09	17.89	17.92		
Channel				43115	43340	43565	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				3552.5	3575	3597.5		
5	QPSK	1	0	21.04	21.17	21.14	22	0
5	QPSK	1	12	20.71	20.98	20.72		
5	QPSK	1	24	20.56	20.38	20.89		
5	QPSK	12	0	20.21	20.09	20.17	21	1
5	QPSK	12	7	19.96	19.89	20.07		
5	QPSK	12	13	19.94	19.86	19.96		
5	QPSK	25	0	19.91	19.93	19.90		
5	16QAM	1	0	20.33	20.21	20.28	21	1
5	16QAM	1	12	19.99	19.85	19.72		
5	16QAM	1	24	19.58	19.49	19.82		
5	16QAM	12	0	19.15	19.03	18.95	20	2
5	16QAM	12	7	18.93	18.92	18.87		
5	16QAM	12	13	18.87	18.73	18.85		
5	16QAM	25	0	19.05	18.72	18.80		
5	64QAM	1	0	19.29	18.84	18.94	20	2
5	64QAM	1	12	18.58	18.77	18.60		
5	64QAM	1	24	18.27	18.34	18.46		
5	64QAM	12	0	18.17	17.80	18.10	19	3
5	64QAM	12	7	17.97	18.04	17.75		
5	64QAM	12	13	17.64	17.59	17.74		
5	64QAM	25	0	18.10	17.97	17.91		

<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	22	0
Frequency (MHz)				3560	3609	3641	3690		
20	QPSK	1	0	21.55	21.50	21.37	21.22	22	0
20	QPSK	1	49	21.15	21.05	20.75	20.84		
20	QPSK	1	99	20.92	20.90	20.64	20.60		
20	QPSK	50	0	19.72	19.71	19.47	19.45	21	1
20	QPSK	50	24	19.44	19.52	19.40	19.25		
20	QPSK	50	50	19.33	19.49	19.20	19.21		
20	QPSK	100	0	19.62	19.55	19.48	19.37	21	1
20	16QAM	1	0	19.92	20.02	19.83	19.86		
20	16QAM	1	49	19.52	19.47	19.39	19.36		
20	16QAM	1	99	19.37	19.25	19.28	19.25	20	2
20	16QAM	50	0	18.68	18.69	18.49	18.60		
20	16QAM	50	24	18.57	18.50	18.42	18.39		
20	16QAM	50	50	18.40	18.38	18.23	18.40	20	2
20	16QAM	100	0	18.56	18.58	18.33	18.24		
20	64QAM	1	0	18.67	18.59	18.64	18.40		
20	64QAM	1	49	18.26	18.29	18.38	18.50	20	2
20	64QAM	1	99	18.35	18.30	18.40	18.41		
20	64QAM	50	0	17.67	17.70	17.63	17.55		
20	64QAM	50	24	17.55	17.45	17.41	17.37	19	3
20	64QAM	50	50	17.46	17.38	17.26	17.27		
20	64QAM	100	0	17.58	17.63	17.43	17.38		
Channel				55315	55820	56160	56665	22	0
Frequency (MHz)				3557.5	3608	3642	3692.5		
15	QPSK	1	0	21.53	21.46	21.19	21.18	22	0
15	QPSK	1	37	21.07	20.94	20.73	20.83		
15	QPSK	1	74	20.72	20.74	20.61	20.56		
15	QPSK	36	0	19.62	19.64	19.45	19.35	21	1
15	QPSK	36	20	19.42	19.50	19.30	19.22		
15	QPSK	36	39	19.32	19.47	19.14	19.21		
15	QPSK	75	0	19.56	19.48	19.45	19.34	21	1
15	16QAM	1	0	19.92	19.92	19.80	19.76		
15	16QAM	1	37	19.48	19.41	19.31	19.33		
15	16QAM	1	74	19.28	19.25	19.21	19.22	20	2
15	16QAM	36	0	18.61	18.59	18.42	18.56		
15	16QAM	36	20	18.51	18.43	18.35	18.38		
15	16QAM	36	39	18.39	18.37	18.23	18.32	20	2
15	16QAM	75	0	18.48	18.57	18.23	18.18		
15	64QAM	1	0	18.59	18.59	18.61	18.33		
15	64QAM	1	37	18.26	18.21	18.32	18.45	20	2
15	64QAM	1	74	18.35	18.21	18.38	18.40		
15	64QAM	36	0	17.65	17.61	17.57	17.47		
15	64QAM	36	20	17.48	17.42	17.34	17.28	19	3
15	64QAM	36	39	17.42	17.36	17.18	17.17		
15	64QAM	75	0	17.51	17.60	17.33	17.30		
Channel				55290	55815	56165	56690	22	0
Frequency (MHz)				3555	3607.5	3642.5	3695		
10	QPSK	1	0	21.54	21.41	21.25	21.07	22	0
10	QPSK	1	25	20.99	21.04	20.65	20.79		
10	QPSK	1	49	20.72	20.72	20.61	20.56		
10	QPSK	25	0	19.70	19.69	19.46	19.41	21	1
10	QPSK	25	12	19.43	19.45	19.40	19.21		
10	QPSK	25	25	19.31	19.41	19.18	19.13		
10	QPSK	50	0	19.55	19.50	19.42	19.36	21	1
10	16QAM	1	0	19.85	19.99	19.79	19.83		
10	16QAM	1	25	19.51	19.47	19.33	19.33		



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10	16QAM	1	49	19.27	19.22	19.24	19.20		
10	16QAM	25	0	18.59	18.60	18.47	18.59	20	2
10	16QAM	25	12	18.49	18.50	18.37	18.34		
10	16QAM	25	25	18.38	18.35	18.16	18.38		
10	16QAM	50	0	18.49	18.54	18.25	18.19		
10	64QAM	1	0	18.63	18.53	18.60	18.38	20	2
10	64QAM	1	25	18.24	18.22	18.33	18.46		
10	64QAM	1	49	18.32	18.25	18.30	18.39		
10	64QAM	25	0	17.60	17.66	17.54	17.53	19	3
10	64QAM	25	12	17.53	17.36	17.38	17.37		
10	64QAM	25	25	17.41	17.33	17.19	17.21		
10	64QAM	50	0	17.49	17.60	17.38	17.31		
Channel				55265	55810	56170	56715	Tune-up limit	MPR
Frequency (MHz)				3552.5	3607	3643	3697.5	(dBm)	(dB)
5	QPSK	1	0	21.38	21.50	21.35	21.03	22	0
5	QPSK	1	12	21.13	21.00	20.64	20.84		
5	QPSK	1	24	20.74	20.85	20.50	20.55		
5	QPSK	12	0	19.65	19.73	19.40	19.45	21	1
5	QPSK	12	7	19.38	19.48	19.35	19.23		
5	QPSK	12	13	19.29	19.44	19.13	19.16		
5	QPSK	25	0	19.59	19.49	19.44	19.29		
5	16QAM	1	0	19.88	19.93	19.76	19.76	21	1
5	16QAM	1	12	19.42	19.37	19.29	19.33		
5	16QAM	1	24	19.29	19.25	19.24	19.22		
5	16QAM	12	0	18.58	18.59	18.49	18.55	20	2
5	16QAM	12	7	18.48	18.46	18.41	18.33		
5	16QAM	12	13	18.32	18.31	18.17	18.36		
5	16QAM	25	0	18.54	18.48	18.31	18.18		
5	64QAM	1	0	18.66	18.51	18.58	18.39	20	2
5	64QAM	1	12	18.17	18.22	18.32	18.50		
5	64QAM	1	24	18.26	18.28	18.30	18.38		
5	64QAM	12	0	17.64	17.63	17.63	17.52	19	3
5	64QAM	12	7	17.51	17.41	17.41	17.31		
5	64QAM	12	13	17.37	17.28	17.21	17.17		
5	64QAM	25	0	17.48	17.53	17.41	17.37		

<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.

2CC Downlink Carrier Aggregation				3CC Downlink Carrier Aggregation			
Number	Combination	Restriction	Covered by Measurement Superset	Number	Combination	Restriction	Covered by Measurement Superset
1	CA_2A-2A		3CC-1	1	CA_2A-2A-5A		
2	CA_2A-4A		3CC-20	2	CA_2A-2A-12A		
3	CA_2A-5A		3CC-1	3	CA_2A-2A-13A		
4	CA_2A-7A		3CC-8	4	CA_4A-4A-5A		
5	CA_2A-12A		3CC-2	5	CA_4A-4A-12A		
6	CA_2A-13A		3CC-3	6	CA_4A-4A-13A		
7	CA_2A-30A		3CC-27	7	CA_2A-7A-7A		
8	CA_2A-66A		3CC-10	8	CA_4A-7A-7A		
9	CA_4A-4A		3CC-4	9	CA_5A-66A-66A		
10	CA_4A-5A		3CC-4	10	CA_2A-66A-66A		
11	CA_4A-7A		3CC-8	11	CA_66A-66C		
12	CA_4A-12A		3CC-5	12	CA_66A-66B		
13	CA_4A-13A		3CC-6	13	CA_13A-66B		
14	CA_4A-30A		3CC-31	14	CA_41A-42B		
15	CA_5A-30A		3CC-29	15	CA_41A-42C		
16	CA_5A-66A		3CC-25	16	CA_48A-48C		
17	CA_4A-29A	B29 SCC Only	3CC-23	17	CA_2A-66B		
18	CA_2A-29A	B29 SCC Only	3CC-23	18	CA_2A-66C		
19	CA_7A-7A		3CC-8	19	CA_5A-66C		
20	CA_7A-12A		3CC-30	20	CA_2A-4A-5A		
21	CA_12A-30A		3CC-31	21	CA_2A-4A-7A		
22	CA_12A-66A		3CC-33	22	CA_2A-4A-12A		
23	CA_13A-66A		3CC-34	23	CA_2A-4A-29A	B29 SCC Only	
24	CA_30A-66A		3CC-35	24	CA_2A-5A-30A		
25	CA_66A-66A		3CC-10	25	CA_2A-5A-66A		
26	CA_2C			26	CA_2A-7A-12A		
27	CA_7C			27	CA_2A-12A-30A		
28	CA_7B			28	CA_2A-13A-66A		
29	CA_66B			29	CA_4A-5A-30A		
30	CA_66C			30	CA_4A-7A-12A		
31	CA_41C			31	CA_4A-12A-30A		
32	CA_48A-48A			32	CA_5A-30A-66A		
33	CA_2A-46A	B46 SCC Only		33	CA_12A-30A-66A		
34	CA_4A-46A	B46 SCC Only		34	CA_13A-30A-66A		
35	CA_13A-46A	B46 SCC Only		35	CA_29A-30A-66A	B29 SCC Only	
36	CA_42C		3CC-15	36	CA_2A-29A-30A	B29 SCC Only	
37	CA_48C		3CC-16	37	CA_4A-29A-30A	B29 SCC Only	
				38	CA_2A-4A-13A		
				39	CA_41D		
				40	CA_48D		

<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.

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

<Two Carrier power verification>

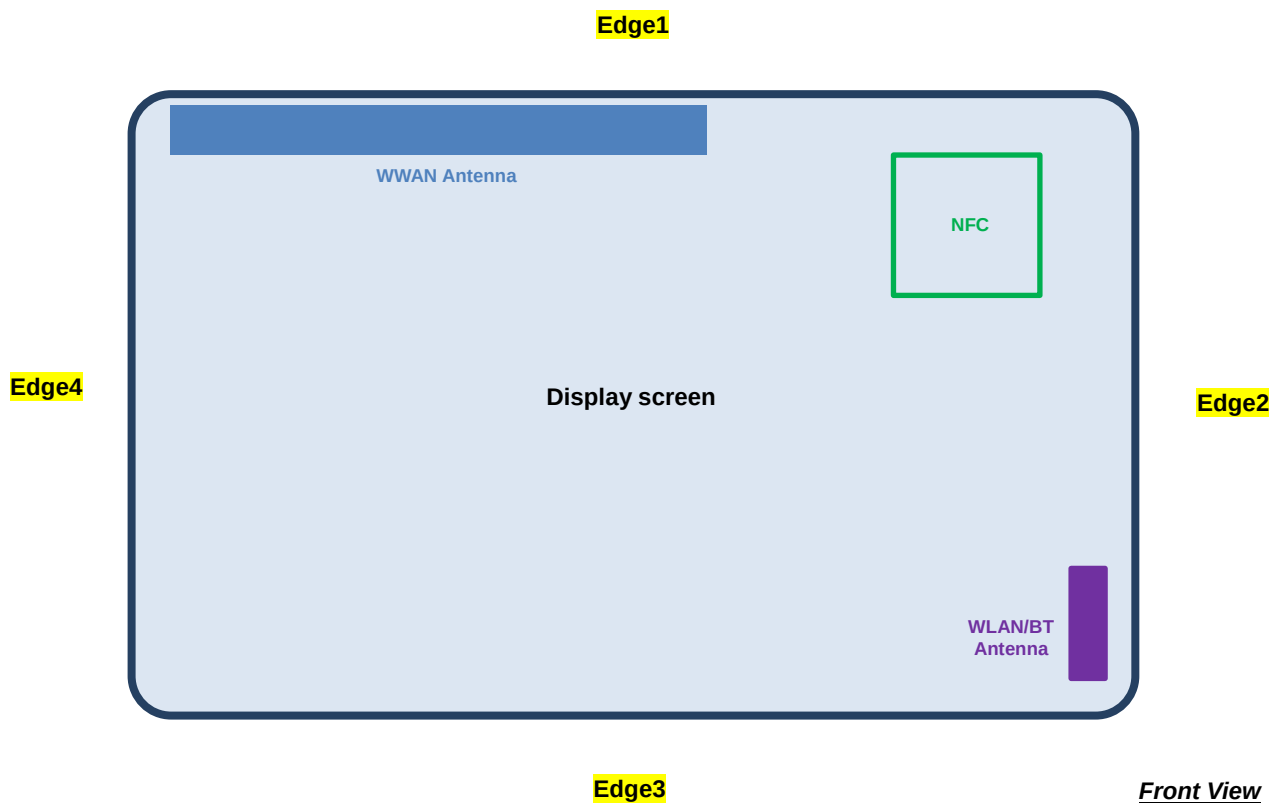
Configure		CA Configuration (BCS)	PCC						SCC				Power		
			LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Inter-Band		CA_2A-46A	2	20	1880	18900	QPSK	1	0	46	20	5537.5	50665	22.45	22.50
		CA_4A-46A	4	20	1732.5	20175	QPSK	1	0	46	20	5537.5	50665	22.34	22.46
		CA_13A-46A	13	10	782	23230	QPSK	1	0	46	20	5537.5	50665	23.10	23.19
Intra-Band	Non-Contiguous	CA_48A-48A	48	20	3560	55340	QPSK	1	0	48	5	3697.5	56715	21.89	21.92
	Contiguous	CA_2C	2	20	1880	18900	QPSK	1	0	2	20	1979.80	1098	22.45	22.50
		CA_7C	7	20	2560	21350	QPSK	1	0	7	20	2660.20	3152	21.85	21.99
		CA_7B	7	15	2535	21100	QPSK	1	0	7	5	2664.30	3193	21.47	21.56
		CA_66B	66	15	1745	132322	QPSK	1	0	66	5	2164.30	66979	23.05	23.14
		CA_66C	66	20	1745	132322	QPSK	1	0	66	20	2164.80	67084	23.08	23.16
		CA_41C	41	20	2593	40620	QPSK	1	0	41	20	2612.80	40818	22.26	22.31

<Three Carrier power verification>

Configure		CA Configuration (BCS)	PCC						SCC1				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		CA_2A-2A-5A	2	20	1880	18900	QPSK	1	0	2	5	1987.5	1175	5	10	881.5	2525	22.45	22.50
		CA_2A-2A-12A	2	20	1900	19100	QPSK	1	0	2	5	1960	900	12	10	737.5	5095	22.45	22.50
		CA_2A-2A-13A	2	20	1900	19100	QPSK	1	0	2	5	1960	900	13	10	751	5230	22.45	22.50
		CA_4A-4A-5A	4	20	1732.5	20175	QPSK	1	0	4	5	2152.5	2375	5	10	881.5	2525	22.34	22.46
		CA_4A-4A-12A	4	20	1732.5	20175	QPSK	1	0	4	5	2152.5	2375	12	10	737.5	5095	22.34	22.46
		CA_4A-4A-13A	4	20	1732.5	20175	QPSK	1	0	4	5	2152.5	2375	13	10	751	5230	22.34	22.46
		CA_2A-7A-7A	2	20	1880	18900	QPSK	1	0	7	5	2687.5	3425	7	20	2655	3100	22.45	22.50
		CA_4A-7A-7A	4	20	1732.5	20175	QPSK	1	0	7	5	2687.5	3425	7	20	2655	3100	22.34	22.46
		CA_5A-66A-66A	5	10	836.5	20525	QPSK	1	0	66	5	2112.5	66461	66	5	2197.5	67311	23.36	23.40
		CA_2A-66A-66A	2	20	1880	18900	QPSK	1	0	66	5	2112.5	66461	66	5	2197.5	67311	22.45	22.50
		CA_66A-66C	66	20	1745	132322	QPSK	1	0	66	20	2190	67236	66	20	2170.2	67038	23.08	23.16
		CA_66A-66B	66	20	1745	132322	QPSK	1	0	66	5	2197.5	67311	66	15	2188.2	67218	23.08	23.16
		CA_13A-66B	13	10	782	23230	QPSK	1	0	66	5	2197.5	67311	66	15	2188.2	67218	23.12	23.19
		CA_41A-42B	41	20	2593	40620	QPSK	1	0	42	15	3575	43340	42	5	3584.3	43349.3	22.26	22.31
		CA_41A-42C	41	20	2593	40620	QPSK	1	0	42	20	3560	43190	42	20	3579.8	43388	22.26	22.31
		CA_48A-48C	48	20	3560	55340	QPSK	1	0	48	20	3697.5	56715	48	20	3677.7	56517	21.90	21.92
		CA_2A-66B	2	20	1880	18900	QPSK	1	0	66	15	2155	66886	66	5	2164.3	66979	22.45	22.50
		CA_2A-66C	2	20	1880	18900	QPSK	1	0	66	20	2155	66886	66	20	2174.8	67084	22.45	22.50
		CA_5A-66C	5	10	836.5	20525	QPSK	1	0	66	20	2155	66886	66	20	2174.8	67084	23.36	23.40
		CA_2A-4A-5A	2	20	1880	18900	QPSK	1	0	4	20	2132.5	2175	5	10	881.5	2525	22.45	22.50
		CA_2A-4A-7A	2	20	1880	18900	QPSK	1	0	4	20	2132.5	2175	7	20	2655	3100	22.45	22.50
		CA_2A-4A-12A	2	20	1880	18900	QPSK	1	0	4	20	2132.5	2175	12	10	737.5	5095	22.45	22.50
		CA_2A-4A-29A	2	20	1880	18900	QPSK	1	0	4	20	2132.5	2175	29	10	722.5	9715	22.45	22.50
		CA_2A-5A-30A	2	20	1880	18900	QPSK	1	0	5	10	881.5	2525	30	10	2355	9820	22.45	22.50
		CA_2A-5A-66A	2	20	1880	18900	QPSK	1	0	5	10	881.5	2525	66	20	2155	66886	22.45	22.50
		CA_2A-7A-12A	2	20	1880	18900	QPSK	1	0	7	20	2655	3100	12	10	737.5	5095	22.45	22.50
		CA_2A-12A-30A	2	20	1880	18900	QPSK	1	0	12	10	737.5	5095	30	10	2355	9820	22.45	22.50
		CA_2A-13A-66A	2	20	1880	18900	QPSK	1	0	13	10	751	5230	66	20	2155	66886	22.45	22.50
		CA_4A-5A-30A	4	20	1732.5	20175	QPSK	1	0	5	10	881.5	2525	30	10	2355	9820	22.34	22.46
		CA_4A-7A-12A	4	20	1732.5	20175	QPSK	1	0	7	20	2655	3100	12	10	737.5	5095	22.34	22.46
		CA_4A-12A-30A	4	20	1732.5	20175	QPSK	1	0	12	10	737.5	5095	30	10	2355	9820	22.34	22.46
		CA_5A-30A-66A	5	10	836.5	20525	QPSK	1	0	30	10	2355	9820	66	20	2155	66886	23.36	23.40
		CA_12A-30A-66A	12	10	707.5	23095	QPSK	1	0	30	10	2355	9820	66	20	2155	66886	23.23	23.25
		CA_13A-30A-66A	13	10	782	23230	QPSK	1	0	30	10	2355	9820	66	20	2155	66886	23.12	23.19
		CA_66A-29A-30A	66	20	1745	132322	QPSK	1	0	29	10	722.5	9715	30	10	2355	9820	23.08	23.16
		CA_2A-29A-30A	2	20	1880	18900	QPSK	1	0	29	10	722.5	9715	30	10	2355	9820	22.45	22.50
		CA_4A-29A-30A	4	20	1732.5	20175	QPSK	1	0	29	10	722.5	9715	30	10	2355	9820	22.34	22.46
		CA_2A-4A-13A	2	20	1880	18900	QPSK	1	0	4	20	2132.5	2175	13	10	751	5230	22.45	22.50
Intra-Band	Contiguous	CA_41D	41	20	2593	40620	QPSK	1	0	41	20	2612.80	40818	41	20	2632.60	41016	22.26	22.31
		CA_48D	48	20	3560	55340	QPSK	1	0	48	20	3579.80	55538	48	20	3599.60	55736	21.90	21.92

12. Antenna Location

<For Tablet>



The separation distance for antenna to edge:

Antenna	To Edge1 (mm)	To Edge2 (mm)	To Edge3 (mm)	To Edge4 (mm)
WWAN Antenna	≤ 5	94.7	135.6	13
WLAN / BT Antenna	115	11.5	15	224

<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:

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR}$$
 - 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
7. For the bottom-face that proximity sensor power reduction is applied for SAR compliance, additional SAR testing at "sensor trigger distance – 1mm" with EUT transmitting full power in normal mode was performed.
8. The below table, exemption limits for routine evaluation based on frequency and separation distance was according to SAR-based Exemption – §1.1307(b)(3)(i)(B).

Exposure Position	Wireless Interface	WCDMA Band V	WCDMA Band IV	WCDMA Band II	LTE Band 12	LTE Band 13	LTE Band 5	LTE Band 26	LTE Band 4	LTE Band 66	LTE Band 2	LTE Band 42	LTE Band 48	LTE Band 7	LTE Band 41
	Calculated Frequency	846MHz	1750MHz	1907MHz	715MHz	784MHz	848MHz	848MHz	1754MHz	1779MHz	1909MHz	3597MHz	3697MHz	2567MHz	2687MHz
	Maximum power (dBm)	24	24	24	24	24	24	24	24	24	24	23	23	23	23
	Maximum rated power(mW)	251.0	251.0	251.0	251.0	251.0	251.0	251.0	251.0	251.0	251.0	200.0	200.0	200.0	200.0
Bottom Face	Separation distance(mm)	5.0													
	exclusion threshold	46.2	66.4	69.3	42.5	44.5	46.2	46.2	66.5	67.0	69.4	75.9	76.9	64.1	65.6
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edge 1	Separation distance(mm)	5.0													
	exclusion threshold	46.2	66.4	69.3	42.5	44.5	46.2	46.2	66.5	67.0	69.4	75.9	76.9	64.1	65.6
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edge 2	Separation distance(mm)	94.7													
	exclusion threshold	415.0	560.0	556.0	390.0	403.0	416.0	416.0	560.0	559.0	556.0	526.0	525.0	541.0	539.0
	Testing required?	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Edge 3	Separation distance(mm)	135.6													
	exclusion threshold	646.0	969.0	965.0	585.0	617.0	647.0	647.0	969.0	968.0	965.0	935.0	934.0	950.0	948.0
	Testing required?	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Edge 4	Separation distance(mm)	13.0													
	exclusion threshold	17.8	25.5	26.7	16.3	17.1	17.8	17.8	25.6	25.8	26.7	29.2	29.6	24.7	25.2
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

13. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
 - b. For 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 ≥ 0.8 W/kg.
4. For the exposure positions that proximity sensor power reduction is applied for SAR compliance, additional SAR testing with EUT transmitting full power in normal mode was performed; 15mm for bottom face, 15mm 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 / HSPA+ is $\leq \frac{1}{4}$ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA, HSPA+) are less than $\frac{1}{4}$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

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 $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4/B5/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 4/5/42 SAR test was covered by Band 66/26/48; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. The maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion.
 - b. The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

13.1 Body SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	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)
01	WCDMA II	RMC 12.2Kbps	Bottom Face	0mm	ON	9538	1907.6	19.23	19.50	1.064	-0.11	1.080	1.149
	WCDMA II	RMC 12.2Kbps	Bottom Face	0mm	ON	9262	1852.4	19.20	19.50	1.072	-0.14	1.050	1.125
	WCDMA II	RMC 12.2Kbps	Bottom Face	0mm	ON	9400	1880	19.14	19.50	1.086	-0.09	1.010	1.097
	WCDMA II	RMC 12.2Kbps	Edge 1	0mm	ON	9538	1907.6	19.23	19.50	1.064	0.05	0.544	0.579
	WCDMA II	RMC 12.2Kbps	Bottom Face	15mm	OFF	9538	1907.6	23.29	24.00	1.178	0.08	0.278	0.327
	WCDMA II	RMC 12.2Kbps	Edge 1	15mm	OFF	9538	1907.6	23.29	24.00	1.178	0.04	0.488	0.575
	WCDMA II	RMC 12.2Kbps	Edge 4	0mm	OFF	9538	1907.6	23.29	24.00	1.178	0.06	0.123	0.145
	WCDMA IV	RMC 12.2Kbps	Bottom Face	0mm	ON	1413	1732.6	20.44	21.00	1.138	-0.05	0.969	1.102
02	WCDMA IV	RMC 12.2Kbps	Bottom Face	0mm	ON	1312	1712.4	20.43	21.00	1.140	-0.1	1.020	1.163
	WCDMA IV	RMC 12.2Kbps	Bottom Face	0mm	ON	1513	1752.6	20.34	21.00	1.164	0.02	0.892	1.038
	WCDMA IV	RMC 12.2Kbps	Edge 1	0mm	ON	1413	1732.6	20.44	21.00	1.138	-0.03	0.701	0.797
	WCDMA IV	RMC 12.2Kbps	Bottom Face	15mm	OFF	1413	1732.6	23.26	24.00	1.186	0.14	0.188	0.223
	WCDMA IV	RMC 12.2Kbps	Edge 1	15mm	OFF	1413	1732.6	23.26	24.00	1.186	0.06	0.297	0.352
	WCDMA IV	RMC 12.2Kbps	Edge 4	0mm	OFF	1413	1732.6	23.26	24.00	1.186	0.05	0.543	0.644
	WCDMA V	RMC 12.2Kbps	Bottom Face	0mm	ON	4182	836.4	22.55	23.00	1.109	0.01	1.010	1.120
	WCDMA V	RMC 12.2Kbps	Bottom Face	0mm	ON	4132	826.4	22.52	23.00	1.117	-0.09	0.999	1.116
03	WCDMA V	RMC 12.2Kbps	Bottom Face	0mm	ON	4233	846.6	22.53	23.00	1.114	-0.03	1.050	1.170
	WCDMA V	RMC 12.2Kbps	Edge 1	0mm	ON	4182	836.4	22.55	23.00	1.109	-0.04	0.493	0.547
	WCDMA V	RMC 12.2Kbps	Bottom Face	15mm	OFF	4182	836.4	23.60	24.00	1.096	-0.12	0.330	0.362
	WCDMA V	RMC 12.2Kbps	Edge 1	15mm	OFF	4182	836.4	23.60	24.00	1.096	0.08	0.259	0.284
	WCDMA V	RMC 12.2Kbps	Edge 4	0mm	OFF	4182	836.4	23.60	24.00	1.096	0.08	0.217	0.238

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
04	LTE Band 2	20M	QPSK	1	0	Bottom Face	0mm	ON	18900	1880	19.18	19.50	1.076	0.12	0.813	0.875
	LTE Band 2	20M	QPSK	1	0	Bottom Face	0mm	ON	18700	1860	18.81	19.50	1.172	0.17	0.868	1.017
	LTE Band 2	20M	QPSK	1	0	Bottom Face	0mm	ON	19100	1900	19.10	19.50	1.096	-0.01	0.986	1.081
	LTE Band 2	20M	QPSK	50	0	Bottom Face	0mm	ON	18900	1880	19.15	19.50	1.084	0.07	0.912	0.989
	LTE Band 2	20M	QPSK	50	0	Bottom Face	0mm	ON	18700	1860	18.81	19.50	1.172	0.05	0.873	1.023
	LTE Band 2	20M	QPSK	50	0	Bottom Face	0mm	ON	19100	1900	19.10	19.50	1.096	-0.04	0.974	1.068
	LTE Band 2	20M	QPSK	100	0	Bottom Face	0mm	ON	18900	1880	18.93	19.50	1.140	0.01	0.883	1.007
	LTE Band 2	20M	QPSK	1	0	Edge 1	0mm	ON	18900	1880	19.18	19.50	1.076	0.01	0.392	0.422
	LTE Band 2	20M	QPSK	50	0	Edge 1	0mm	ON	18900	1880	19.15	19.50	1.084	0.08	0.391	0.424
	LTE Band 2	20M	QPSK	1	0	Bottom Face	15mm	OFF	18900	1880	22.50	24.00	1.413	0.06	0.194	0.274
05	LTE Band 2	20M	QPSK	50	0	Bottom Face	15mm	OFF	18900	1880	21.41	23.00	1.442	-0.01	0.153	0.221
	LTE Band 2	20M	QPSK	1	0	Edge 1	15mm	OFF	18900	1880	22.50	24.00	1.413	-0.08	0.411	0.581
	LTE Band 2	20M	QPSK	50	0	Edge 1	15mm	OFF	18900	1880	21.41	23.00	1.442	0.02	0.322	0.464
	LTE Band 2	20M	QPSK	1	0	Edge 4	0mm	OFF	18900	1880	22.50	24.00	1.413	-0.09	0.120	0.170
	LTE Band 2	20M	QPSK	50	0	Edge 4	0mm	OFF	18900	1880	21.41	23.00	1.442	-0.17	0.099	0.143
	LTE Band 7	20M	QPSK	1	0	Bottom Face	0mm	ON	21100	2535	16.28	17.00	1.180	0.12	0.889	1.049
	LTE Band 7	20M	QPSK	1	0	Bottom Face	0mm	ON	21350	2560	16.09	17.00	1.233	0.08	0.840	1.036
	LTE Band 7	20M	QPSK	1	0	Bottom Face	0mm	ON	20850	2510	16.03	17.00	1.250	-0.09	0.920	1.150
	LTE Band 7	20M	QPSK	50	0	Bottom Face	0mm	ON	21100	2535	16.11	17.00	1.227	0.01	0.834	1.024
	LTE Band 7	20M	QPSK	50	0	Bottom Face	0mm	ON	21350	2560	16.10	17.00	1.230	-0.14	0.841	1.035
	LTE Band 7	20M	QPSK	50	0	Bottom Face	0mm	ON	20850	2510	15.99	17.00	1.262	0.01	0.890	1.123
	LTE Band 7	20M	QPSK	100	0	Bottom Face	0mm	ON	21100	2535	16.03	17.00	1.250	0.01	0.830	1.038
	LTE Band 7	20M	QPSK	1	0	Edge 1	0mm	ON	21100	2535	16.28	17.00	1.180	0.08	0.186	0.220
	LTE Band 7	20M	QPSK	50	0	Edge 1	0mm	ON	21100	2535	16.11	17.00	1.227	-0.06	0.179	0.220
	LTE Band 7	20M	QPSK	1	0	Bottom Face	15mm	OFF	21350	2560	21.99	23.00	1.262	-0.05	0.220	0.278
	LTE Band 7	20M	QPSK	50	0	Bottom Face	15mm	OFF	21350	2560	20.76	22.00	1.330	0.04	0.172	0.229
	LTE Band 7	20M	QPSK	1	0	Edge 1	15mm	OFF	21350	2560	21.99	23.00	1.262	-0.02	0.209	0.264
	LTE Band 7	20M	QPSK	50	0	Edge 1	15mm	OFF	21350	2560	20.76	22.00	1.330	0.05	0.164	0.218
	LTE Band 7	20M	QPSK	1	0	Edge 4	0mm	OFF	21350	2560	21.99	23.00	1.262	-0.02	0.367	0.463
	LTE Band 7	20M	QPSK	50	0	Edge 4	0mm	OFF	21350	2560	20.76	22.00	1.330	0.07	0.285	0.379



FCC SAR TEST REPORT

Report No. : FA710507-21

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
06	LTE Band 12	10M	QPSK	1	0	Bottom Face	0mm	ON	23095	707.5	22.26	23.00	1.186	-0.04	0.979	1.161
	LTE Band 12	10M	QPSK	25	0	Bottom Face	0mm	ON	23095	707.5	22.21	23.00	1.199	0.06	0.963	1.155
	LTE Band 12	10M	QPSK	50	0	Bottom Face	0mm	ON	23095	707.5	22.16	23.00	1.213	-0.03	0.955	1.159
	LTE Band 12	10M	QPSK	1	0	Edge 1	0mm	ON	23095	707.5	22.26	23.00	1.186	-0.13	0.453	0.537
	LTE Band 12	10M	QPSK	25	0	Edge 1	0mm	ON	23095	707.5	22.21	23.00	1.199	0.06	0.445	0.534
	LTE Band 12	10M	QPSK	1	0	Bottom Face	15mm	OFF	23095	707.5	23.25	24.00	1.189	0.04	0.204	0.242
	LTE Band 12	10M	QPSK	25	0	Bottom Face	15mm	OFF	23095	707.5	22.28	23.00	1.180	0.14	0.148	0.175
	LTE Band 12	10M	QPSK	1	0	Edge 1	15mm	OFF	23095	707.5	23.25	24.00	1.189	-0.09	0.155	0.184
	LTE Band 12	10M	QPSK	25	0	Edge 1	15mm	OFF	23095	707.5	22.28	23.00	1.180	-0.08	0.125	0.148
	LTE Band 12	10M	QPSK	1	0	Edge 4	0mm	OFF	23095	707.5	23.25	24.00	1.189	-0.18	0.134	0.159
	LTE Band 12	10M	QPSK	25	0	Edge 4	0mm	OFF	23095	707.5	22.28	23.00	1.180	0.04	0.092	0.109
07	LTE Band 13	10M	QPSK	1	0	Bottom Face	0mm	ON	23230	782	22.35	23.00	1.161	-0.06	0.947	1.100
	LTE Band 13	10M	QPSK	25	0	Bottom Face	0mm	ON	23230	782	22.25	23.00	1.189	0.05	0.924	1.098
	LTE Band 13	10M	QPSK	50	0	Bottom Face	0mm	ON	23230	782	22.22	23.00	1.197	0.11	0.912	1.091
	LTE Band 13	10M	QPSK	1	0	Edge 1	0mm	ON	23230	782	22.35	23.00	1.161	-0.09	0.698	0.811
	LTE Band 13	10M	QPSK	25	0	Edge 1	0mm	ON	23230	782	22.25	23.00	1.189	-0.14	0.693	0.824
	LTE Band 13	10M	QPSK	50	0	Edge 1	0mm	ON	23230	782	22.22	23.00	1.197	0.08	0.685	0.820
	LTE Band 13	10M	QPSK	1	0	Bottom Face	15mm	OFF	23230	782	23.19	24.00	1.205	0.03	0.282	0.340
	LTE Band 13	10M	QPSK	25	0	Bottom Face	15mm	OFF	23230	782	22.28	23.00	1.180	0.08	0.234	0.276
	LTE Band 13	10M	QPSK	1	0	Edge 1	15mm	OFF	23230	782	23.19	24.00	1.205	0.11	0.238	0.287
	LTE Band 13	10M	QPSK	25	0	Edge 1	15mm	OFF	23230	782	22.28	23.00	1.180	-0.08	0.193	0.228
	LTE Band 13	10M	QPSK	1	0	Edge 4	0mm	OFF	23230	782	23.19	24.00	1.205	0.12	0.149	0.180
	LTE Band 13	10M	QPSK	25	0	Edge 4	0mm	OFF	23230	782	22.28	23.00	1.180	-0.08	0.126	0.149
08	LTE Band 26	15M	QPSK	1	0	Bottom Face	0mm	ON	26865	831.5	21.76	22.50	1.186	-0.06	0.906	1.074
	LTE Band 26	15M	QPSK	36	0	Bottom Face	0mm	ON	26865	831.5	21.66	22.50	1.213	-0.12	0.879	1.067
	LTE Band 26	15M	QPSK	75	0	Bottom Face	0mm	ON	26865	831.5	21.71	22.50	1.199	-0.1	0.886	1.063
	LTE Band 26	15M	QPSK	1	0	Edge 1	0mm	ON	26865	831.5	21.76	22.50	1.186	0.06	0.468	0.555
	LTE Band 26	15M	QPSK	36	0	Edge 1	0mm	ON	26865	831.5	21.66	22.50	1.213	0.04	0.472	0.573
	LTE Band 26	15M	QPSK	1	0	Bottom Face	15mm	OFF	26865	831.5	22.54	24.00	1.400	0.05	0.323	0.452
	LTE Band 26	15M	QPSK	36	0	Bottom Face	15mm	OFF	26865	831.5	21.30	23.00	1.479	-0.14	0.270	0.399
	LTE Band 26	15M	QPSK	1	0	Edge 1	15mm	OFF	26865	831.5	22.54	24.00	1.400	-0.03	0.288	0.403
	LTE Band 26	15M	QPSK	36	0	Edge 1	15mm	OFF	26865	831.5	21.30	23.00	1.479	0.08	0.238	0.352
	LTE Band 26	15M	QPSK	1	0	Edge 4	0mm	OFF	26865	831.5	22.54	24.00	1.400	-0.13	0.135	0.189
	LTE Band 26	15M	QPSK	36	0	Edge 4	0mm	OFF	26865	831.5	21.30	23.00	1.479	0.08	0.099	0.146
	LTE Band 66	20M	QPSK	1	0	Bottom Face	0mm	ON	132322	1745	20.30	20.50	1.047	0.07	0.981	1.027
09	LTE Band 66	20M	QPSK	1	0	Bottom Face	0mm	ON	132072	1720	20.15	20.50	1.084	-0.05	0.988	1.071
	LTE Band 66	20M	QPSK	1	0	Bottom Face	0mm	ON	132572	1770	20.20	20.50	1.072	-0.18	0.899	0.963
	LTE Band 66	20M	QPSK	50	0	Bottom Face	0mm	ON	132322	1745	20.20	20.50	1.072	-0.09	0.945	1.013
	LTE Band 66	20M	QPSK	50	0	Bottom Face	0mm	ON	132072	1720	20.12	20.50	1.091	0.02	0.927	1.012
	LTE Band 66	20M	QPSK	50	0	Bottom Face	0mm	ON	132572	1770	20.13	20.50	1.089	-0.09	0.889	0.968
	LTE Band 66	20M	QPSK	100	0	Bottom Face	0mm	ON	132322	1745	20.12	20.50	1.091	0.04	0.894	0.976
	LTE Band 66	20M	QPSK	1	0	Edge 1	0mm	ON	132322	1745	20.30	20.50	1.047	0.07	0.729	0.763
	LTE Band 66	20M	QPSK	50	0	Edge 1	0mm	ON	132322	1745	20.20	20.50	1.072	-0.18	0.722	0.774
	LTE Band 66	20M	QPSK	1	0	Bottom Face	15mm	OFF	132322	1745	23.16	24.00	1.213	0.05	0.193	0.234
	LTE Band 66	20M	QPSK	50	0	Bottom Face	15mm	OFF	132322	1745	21.74	23.00	1.337	0.01	0.153	0.204
	LTE Band 66	20M	QPSK	1	0	Edge 1	15mm	OFF	132322	1745	23.16	24.00	1.213	0.09	0.307	0.373
	LTE Band 66	20M	QPSK	50	0	Edge 1	15mm	OFF	132322	1745	21.74	23.00	1.337	-0.14	0.222	0.297
	LTE Band 66	20M	QPSK	1	0	Edge 4	0mm	OFF	132322	1745	23.16	24.00	1.213	0.06	0.563	0.683
	LTE Band 66	20M	QPSK	50	0	Edge 4	0mm	OFF	132322	1745	21.74	23.00	1.337	0.01	0.444	0.593



<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
10	LTE Band 41	20M	QPSK	1	0	Bottom Face	0mm	ON	40620	2593	19.20	19.50	1.072	62.9	1.006	-0.08	0.607	0.654
	LTE Band 41	20M	QPSK	1	0	Bottom Face	0mm	ON	39750	2506	19.01	19.50	1.119	62.9	1.006	-0.11	1.050	1.182
	LTE Band 41	20M	QPSK	1	0	Bottom Face	0mm	ON	40185	2549.5	19.01	19.50	1.119	62.9	1.006	0.03	0.899	1.012
	LTE Band 41	20M	QPSK	1	0	Bottom Face	0mm	ON	41055	2636.5	19.19	19.50	1.074	62.9	1.006	-0.09	0.819	0.885
	LTE Band 41	20M	QPSK	1	0	Bottom Face	0mm	ON	41490	2680	19.05	19.50	1.109	62.9	1.006	-0.17	0.686	0.765
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	ON	40620	2593	19.10	19.50	1.096	62.9	1.006	0.05	0.643	0.709
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	ON	39750	2506	19.08	19.50	1.102	62.9	1.006	0.05	1.010	1.119
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	ON	40185	2549.5	19.09	19.50	1.099	62.9	1.006	0.05	0.876	0.969
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	ON	41055	2636.5	19.04	19.50	1.112	62.9	1.006	0.05	0.803	0.898
	LTE Band 41	20M	QPSK	50	0	Bottom Face	0mm	ON	41490	2680	19.08	19.50	1.102	62.9	1.006	0.05	0.688	0.762
11	LTE Band 41	20M	QPSK	100	0	Bottom Face	0mm	ON	40620	2593	19.08	19.50	1.102	62.9	1.006	0.05	0.613	0.679
	LTE Band 41	20M	QPSK	1	0	Edge 1	0mm	ON	40620	2593	19.20	19.50	1.072	62.9	1.006	0.07	0.198	0.213
	LTE Band 41	20M	QPSK	50	0	Edge 1	0mm	ON	40620	2593	19.10	19.50	1.096	62.9	1.006	0.03	0.193	0.213
	LTE Band 41	20M	QPSK	1	0	Bottom Face	15mm	OFF	40620	2593	22.31	23.00	1.172	62.9	1.006	-0.13	0.069	0.081
	LTE Band 41	20M	QPSK	50	0	Bottom Face	15mm	OFF	40620	2593	21.25	22.00	1.189	62.9	1.006	0.09	0.057	0.068
	LTE Band 41	20M	QPSK	1	0	Edge 1	15mm	OFF	40620	2593	22.31	23.00	1.172	62.9	1.006	-0.14	0.073	0.086
	LTE Band 41	20M	QPSK	50	0	Edge 1	15mm	OFF	40620	2593	21.25	22.00	1.189	62.9	1.006	0.05	0.049	0.059
	LTE Band 41	20M	QPSK	1	0	Edge 4	0mm	OFF	40620	2593	22.31	23.00	1.172	62.9	1.006	-0.14	0.180	0.212
	LTE Band 41	20M	QPSK	50	0	Edge 4	0mm	OFF	40620	2593	21.25	22.00	1.189	62.9	1.006	-0.06	0.135	0.161
	LTE Band 48	20M	QPSK	1	0	Bottom Face	0mm	ON	55340	3560	21.55	22.00	1.109	62.9	1.006	0.02	0.846	0.944
	LTE Band 48	20M	QPSK	1	0	Bottom Face	0mm	ON	55830	3609	21.50	22.00	1.122	62.9	1.006	-0.08	0.738	0.833
	LTE Band 48	20M	QPSK	1	0	Bottom Face	0mm	ON	56150	3641	21.37	22.00	1.156	62.9	1.006	0.1	0.732	0.851
	LTE Band 48	20M	QPSK	1	0	Bottom Face	0mm	ON	56640	3690	21.22	22.00	1.197	62.9	1.006	0.05	0.848	1.021
	LTE Band 48	20M	QPSK	50	0	Bottom Face	0mm	ON	55340	3560	19.72	21.00	1.343	62.9	1.006	-0.05	0.676	0.913
	LTE Band 48	20M	QPSK	50	0	Bottom Face	0mm	ON	55830	3609	19.71	21.00	1.346	62.9	1.006	-0.08	0.654	0.885
	LTE Band 48	20M	QPSK	50	0	Bottom Face	0mm	ON	56150	3641	19.47	21.00	1.422	62.9	1.006	0.03	0.660	0.944
	LTE Band 48	20M	QPSK	50	0	Bottom Face	0mm	ON	56640	3690	19.45	21.00	1.429	62.9	1.006	0.07	0.668	0.960
	LTE Band 48	20M	QPSK	100	0	Bottom Face	0mm	ON	55340	3560	19.62	21.00	1.374	62.9	1.006	-0.14	0.635	0.878
	LTE Band 48	20M	QPSK	1	0	Edge 1	0mm	ON	55340	3560	21.55	22.00	1.109	62.9	1.006	0.07	0.111	0.124
	LTE Band 48	20M	QPSK	50	0	Edge 1	0mm	ON	55340	3560	19.72	21.00	1.343	62.9	1.006	0.04	0.098	0.132
	LTE Band 48	20M	QPSK	1	0	Bottom Face	15mm	OFF	55340	3560	21.92	23.00	1.282	62.9	1.006	-0.01	0.077	0.099
	LTE Band 48	20M	QPSK	50	0	Bottom Face	15mm	OFF	55830	3609	20.53	22.00	1.403	62.9	1.006	0.03	0.058	0.082
	LTE Band 48	20M	QPSK	1	0	Edge 1	15mm	OFF	55340	3560	21.92	23.00	1.282	62.9	1.006	-0.04	0.068	0.088
	LTE Band 48	20M	QPSK	50	0	Edge 1	15mm	OFF	55830	3609	20.53	22.00	1.403	62.9	1.006	0.05	0.051	0.072
	LTE Band 48	20M	QPSK	1	0	Edge 4	0mm	OFF	55340	3560	21.92	23.00	1.282	62.9	1.006	0.02	0.003	0.004
	LTE Band 48	20M	QPSK	50	0	Edge 4	0mm	OFF	55830	3609	20.53	22.00	1.403	62.9	1.006	-0.09	0.001	0.001

13.2 Repeated SAR Measurement

No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WCDMA II	RMC 12.2Kbps	Bottom Face	0mm	ON	9538	1907.6	19.23	19.5	1.064			-0.11	1.08	-	1.149
2nd	WCDMA II	RMC 12.2Kbps	Bottom Face	0mm	ON	9538	1907.6	19.23	19.5	1.064			0.06	1.01	1.069	1.075
1st	WCDMA IV	RMC 12.2Kbps	Bottom Face	0mm	ON	1312	1712.4	20.43	21	1.14			-0.1	1.02	-	1.163
2nd	WCDMA IV	RMC 12.2Kbps	Bottom Face	0mm	ON	1312	1712.4	20.43	21	1.14			0.01	0.993	1.027	1.132
1st	WCDMA V	RMC 12.2Kbps	Bottom Face	0mm	ON	4233	846.6	22.53	23	1.114			-0.03	1.05	-	1.17
2nd	WCDMA V	RMC 12.2Kbps	Bottom Face	0mm	ON	4233	846.6	22.53	23	1.114			0.08	1.02	1.029	1.137
1st	LTE Band 12	10M_QPSK_1_0	Bottom Face	0mm	ON	23095	707.5	22.26	23	1.186			-0.04	0.979	-	1.161
2nd	LTE Band 12	10M_QPSK_1_0	Bottom Face	0mm	ON	23095	707.5	22.26	23	1.186			0.04	0.961	1.019	1.14
1st	LTE Band 41	20M_QPSK_1_0	Bottom Face	0mm	ON	39750	2506	19.01	19.5	1.119	62.9	1.006	-0.11	1.05	-	1.182
2nd	LTE Band 41	20M_QPSK_1_0	Bottom Face	0mm	ON	39750	2506	19.01	19.5	1.119	62.9	1.006	0.04	0.991	1.060	1.116
1st	LTE Band 48	20M_QPSK_1_0	Bottom Face	0mm	ON	56640	3690	21.22	22	1.197	62.9	1.006	0.05	0.848	-	1.021
2nd	LTE Band 48	20M_QPSK_1_0	Bottom Face	0mm	ON	56640	3690	21.22	22	1.197	62.9	1.006	0.02	0.833	1.018	1.003

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is $\geq 0.8\text{W/kg}$.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR $< 1.45\text{W/kg}$, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

14. Simultaneous Transmission Analysis

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

General Note:

- The AMPAK AP6234 WLAN / Bluetooth module is also integrated into this host, WLAN /Bluetooth power and WLAN SAR testing results which can refer to Sporton SAR Test Report, FCC ID: QYLAP6234E, Report No.: FA710507-03.
- The worst case WLAN reported SAR for each configuration was used for SAR summation. Therefore, the following summations represent the absolute worst cases for simultaneous transmission with WLAN.
- WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
- EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
- The Scaled SAR summation is calculated based on the same configuration and test position.
- Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
 - Scalar SAR summation $< 1.6\text{W/kg}$.
 - $\text{SPLSR} = (\text{SAR1} + \text{SAR2})^{1.5} / (\text{min. separation distance, mm})$, and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where $(x1, y1, z1)$ and $(x2, y2, z2)$ are the coordinates of the extrapolated peak SAR locations in the zoom scan.
 - If $\text{SPLSR} \leq 0.04$, simultaneously transmission SAR measurement is not necessary.
 - Simultaneously transmission SAR measurement, and the reported multi-band SAR $< 1.6\text{W/kg}$.
 - The SPLSR calculated results please refer to section 14.2.
- For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01v06 based on the formula below.
 - $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f(\text{GHz})} / x] \text{ W/kg}$ for test separation distances $\leq 50 \text{ mm}$; where $x = 7.5$ for 1-g SAR, and $x = 18.75$ for 10-g SAR.
 - When the minimum separation distance is $< 5\text{mm}$, the distance is used 5mm to determine SAR test exclusion.
 - 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is $> 50 \text{ mm}$.
 - Bluetooth estimated SAR is conservatively determined by 5mm separation, for all applicable exposure positions.

Bluetooth Max Power	Exposure Position	All Positions
5 dBm	Estimated SAR (W/kg)	0.133 W/kg

14.1 Body Exposure Conditions

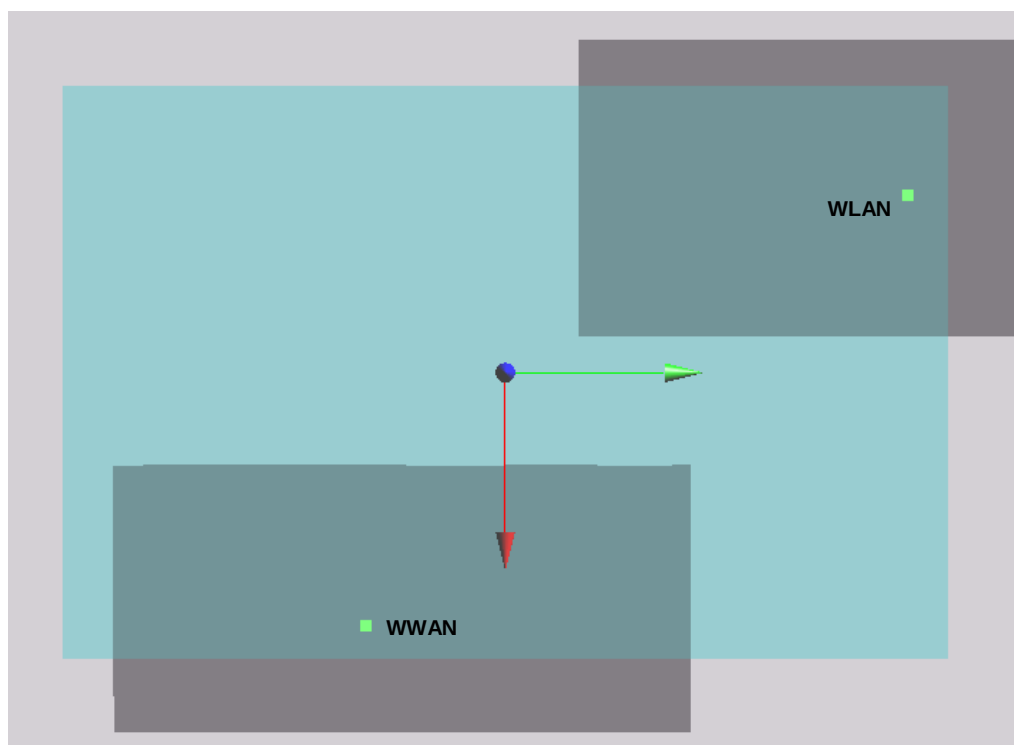
WWAN Band	Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	SPLSR	Case No
		WWAN 1g SAR (W/kg)	2.4GHz WLAN 1g SAR (W/kg)	5GHz WLAN 1g SAR (W/kg)	Bluetooth Estimated 1g SAR (W/kg)					
WCDMA II	Bottom Face at 15mm	0.327	0.260	0.466	0.133	0.587	0.793	0.460		
	Edge 1 at 15mm	0.575				0.575	0.575	0.575		
	Bottom Face at 0mm	1.149	0.260	0.466	0.133	1.409	1.615	1.282	0.03	Case 1
	Edge 1 at 0mm	0.579				0.579	0.579	0.579		
	Edge 4 at 0mm	0.145				0.145	0.145	0.145		
WCDMA IV	Bottom Face at 15mm	0.223	0.260	0.466	0.133	0.483	0.689	0.356		
	Edge 1 at 15mm	0.352				0.352	0.352	0.352		
	Bottom Face at 0mm	1.163	0.260	0.466	0.133	1.423	1.629	1.296	0.03	Case 2
	Edge 1 at 0mm	0.797				0.797	0.797	0.797		
	Edge 4 at 0mm	0.644				0.644	0.644	0.644		
WCDMA V	Bottom Face at 15mm	0.362	0.260	0.466	0.133	0.622	0.828	0.495		
	Edge 1 at 15mm	0.284				0.284	0.284	0.284		
	Bottom Face at 0mm	1.170	0.260	0.466	0.133	1.430	1.636	1.303	0.03	Case 3
	Edge 1 at 0mm	0.547				0.547	0.547	0.547		
	Edge 4 at 0mm	0.238				0.238	0.238	0.238		
LTE Band 2	Bottom Face at 15mm	0.274	0.260	0.466	0.133	0.534	0.740	0.407		
	Edge 1 at 15mm	0.581				0.581	0.581	0.581		
	Bottom Face at 0mm	1.081	0.260	0.466	0.133	1.341	1.547	1.214		
	Edge 1 at 0mm	0.424				0.424	0.424	0.424		
	Edge 4 at 0mm	0.170				0.170	0.170	0.170		
LTE Band 7	Bottom Face at 15mm	0.278	0.260	0.466	0.133	0.538	0.744	0.411		
	Edge 1 at 15mm	0.264				0.264	0.264	0.264		
	Bottom Face at 0mm	1.150	0.260	0.466	0.133	1.410	1.616	1.283	0.03	Case 4
	Edge 1 at 0mm	0.220				0.220	0.220	0.220		
	Edge 4 at 0mm	0.463				0.463	0.463	0.463		
LTE Band 12	Bottom Face at 15mm	0.242	0.260	0.466	0.133	0.502	0.708	0.375		
	Edge 1 at 15mm	0.184				0.184	0.184	0.184		
	Bottom Face at 0mm	1.161	0.260	0.466	0.133	1.421	1.627	1.294	0.03	Case 5
	Edge 1 at 0mm	0.537				0.537	0.537	0.537		
	Edge 4 at 0mm	0.159				0.159	0.159	0.159		
LTE Band 13	Bottom Face at 15mm	0.340	0.260	0.466	0.133	0.600	0.806	0.473		
	Edge 1 at 15mm	0.287				0.287	0.287	0.287		
	Bottom Face at 0mm	1.100	0.260	0.466	0.133	1.360	1.566	1.233		
	Edge 1 at 0mm	0.824				0.824	0.824	0.824		
	Edge 4 at 0mm	0.180				0.180	0.180	0.180		
LTE Band 26	Bottom Face at 15mm	0.452	0.260	0.466	0.133	0.712	0.918	0.585		
	Edge 1 at 15mm	0.403				0.403	0.403	0.403		
	Bottom Face at 0mm	1.074	0.260	0.466	0.133	1.334	1.540	1.207		
	Edge 1 at 0mm	0.573				0.573	0.573	0.573		
	Edge 4 at 0mm	0.189				0.189	0.189	0.189		
LTE Band 66	Bottom Face at 15mm	0.234	0.260	0.466	0.133	0.494	0.700	0.367		
	Edge 1 at 15mm	0.373				0.373	0.373	0.373		
	Bottom Face at 0mm	1.071	0.260	0.466	0.133	1.331	1.537	1.204		
	Edge 1 at 0mm	0.774				0.774	0.774	0.774		
	Edge 4 at 0mm	0.683				0.683	0.683	0.683		
LTE Band 41	Bottom Face at 15mm	0.081	0.260	0.466	0.133	0.341	0.547	0.214		
	Edge 1 at 15mm	0.086				0.086	0.086	0.086		
	Bottom Face at 0mm	1.182	0.260	0.466	0.133	1.442	1.648	1.315	0.03	Case 6
	Edge 1 at 0mm	0.213				0.213	0.213	0.213		
	Edge 4 at 0mm	0.212				0.212	0.212	0.212		
LTE Band 48	Bottom Face at 15mm	0.099	0.260	0.466	0.133	0.359	0.565	0.232		
	Edge 1 at 15mm	0.088				0.088	0.088	0.088		
	Bottom Face at 0mm	1.021	0.260	0.466	0.133	1.281	1.487	1.154		
	Edge 1 at 0mm	0.132				0.132	0.132	0.132		
	Edge 4 at 0mm	0.004				0.004	0.004	0.004		

14.2 SPLSR Evaluation and Analysis

General Note:

1. $SPLSR = (SAR_1 + SAR_2)^{1.5} / (\text{min. separation distance, mm})$. If $SPLSR \leq 0.04$, simultaneously transmission SAR measurement is not necessary
2. The detail hotspot point for each transmitter in each exposure condition are showing as below figure and the minimum 3D distance for each sum combination is used for SPLSR analysis.

Case 1	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 1	WCDMA Band 2	Bottom Face	1.149	0	65.44	-26.58	-4.2	71.4	1.62	0.03	Not required
	WLAN5GHz		0.466	0	4.74	10.76	0.12				
Case 2	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 2	WCDMA Band 4	Bottom Face	1.163	0	67.05	-27.99	-4.22	73.5	1.63	0.03	Not required
	WLAN5GHz		0.466	0	4.74	10.76	0.12				
Case 3	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 3	WCDMA Band 5	Bottom Face	1.17	0	68.66	-23.66	-4.21	72.7	1.64	0.03	Not required
	WLAN5GHz		0.466	0	4.74	10.76	0.12				
Case 4	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 4	LTE Band 7	Bottom Face	1.15	0	62.43	-28.18	-3.74	69.7	1.62	0.03	Not required
	WLAN5GHz		0.466	0	4.74	10.76	0.12				
Case 5	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 5	LTE Band 12	Bottom Face	1.161	0	64.07	-29.68	-3.73	71.9	1.63	0.03	Not required
	WLAN5GHz		0.466	0	4.74	10.76	0.12				
Case 6	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 6	LTE Band 41	Bottom Face	1.182	0	60.24	-31.58	-4.45	70.0	1.65	0.03	Not required
	WLAN5GHz		0.466	0	4.74	10.76	0.12				


Test Engineer : Ken Li and Mood Huang

15. Uncertainty Assessment

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

Declaration of Conformity:

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

Comments and Explanations:

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

16. References

- [1] FCC 47 CFR Part 2 "Frequency Allocations and Radio Treaty Matters; General Rules and Regulations"
- [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.