FCC SAR Test Report

APPLICANT	:	Motorola Mobility, LLC
EQUIPMENT	:	Mobile Cellular Phone
BRAND NAME	:	Motorola
MODEL NAME	:	10722
FCC ID	:	IHDT56WB4
STANDARD	:	FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2013

We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and had been in compliance with the applicable technical standards.

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

Reviewed by: Eric Huang / Manager

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

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

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA733129-08	Rev. 01	Initial issue of report	Jun. 02, 2017

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Motorola Mobility, LLC, Mobile Cellular Phone, 10722 are as follows.

Equipment Class	Frequency Band	Highest SAR Summary			
		Head (Separation 0mm)	Body-worn (Separation 10mm)	Hotspot (Separation 10mm)	Product Specific (Separation 0mm)
		1g SAR (W/kg)			10g SAR (W/kg)
Licensed	GSM850	0.22	0.44	0.44	
	GSM1900	0.22	0.45	0.45	
	WCDMA II	0.36	0.60	0.60	3.04
	WCDMA IV	0.42	0.61	0.61	2.33
	WCDMA V	0.31	0.54	0.54	
	LTE Band 2	0.38	0.59	0.59	3.10
	LTE Band 4	0.38	0.60	0.60	2.90
	LTE Band 5	0.22	0.66	0.66	
	LTE Band 7	0.41	0.49	0.49	
	LTE Band 12	0.20	0.58	0.58	
	LTE Band 17	0.23	0.83	0.83	
	LTE Band 25	0.42	0.78	1.12	3.29
	LTE Band 26	0.27	0.66	0.66	
	LTE Band 30	0.37	0.79	0.79	
	LTE Band 38	0.28	0.92	0.91	
	LTE Band 41	0.21	0.64	0.64	
	LTE Band 66	0.47	0.76	1.01	
DTS	2.4GHz WLAN	0.61	0.24	0.35	
NII	5GHz WLAN	0.86	0.19	0.21	1.43
DSS	Bluetooth		0.03		
Date of Testing:		2017/5/25 ~ 2017/5/30			

Remark:
1. Since SAR results in this report are small than original filing, for simultaneous transmission analysis can refer to the original report FCC ID: IHDT56WB4 (Sporton Report No. FA733129).

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

2. Administration Data

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

Applicant	
Company Name	Motorola Mobility, LLC
Address	222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

Manufacturer	
Company Name	Motorola Mobility, LLC
Address	222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

3. Guidance Applied

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

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r03
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01
- FCC KDB 648474 D03 Wireless Chargers Battery Cover v01r04

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Cellular Phone
Brand Name	Motorola
Model Name	10722
FCC ID	IHDT56WB4
IMEI Code	353311080000171
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 25: 1850.7 MHz ~ 1914.3 MHz LTE Band 26: 814.7 MHz ~ 848.3 MHz LTE Band 30: 2307.5 MHz ~ 2312.5 MHz LTE Band 38: 2572.5 MHz ~ 2617.5 MHz LTE Band 41: 2547.5 MHz ~ 2652.5 MHz LTE Band 66: 1710.7 MHz ~ 1779.3 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM, 64QAM WLAN 2.4GHz : 802.11b/g/n/ac HT20/VHT20 WLAN 5GHz : 802.11a/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC:ASK
GSM / (E)GPRS Transfer mode	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.
EUT Stage	Identical Prototype
Remark: 1. This is a variant report to add WPC accessory and include verification of worst case found in the original report, FCC ID: IHDT56WB4 (Sporton Report No. FA733129) performed testing.	

4.2 General LTE SAR Test and Reporting Considerations

<table>
<tr><th colspan="2">Summarized necessary items addressed in KDB 941225 D05 v02r05</th></tr>
<tr><td>FCC ID</td><td>IHDT56WB4</td></tr>
<tr><td>Equipment Name</td><td>Mobile Cellular Phone</td></tr>
<tr><td>Operating Frequency Range of each LTE transmission band</td><td>LTE Band 2: 1850.7 MHz ~ 1909.3 MHz
LTE Band 4: 1710.7 MHz ~ 1754.3 MHz
LTE Band 5: 824.7 MHz ~ 848.3 MHz
LTE Band 7: 2502.5 MHz ~ 2567.5 MHz
LTE Band 12: 699.7 MHz ~ 715.3 MHz
LTE Band 17: 706.5 MHz ~ 713.5 MHz
LTE Band 25: 1850.7 MHz ~ 1914.3 MHz
LTE Band 26: 814.7 MHz ~ 848.3 MHz
LTE Band 30: 2307.5 MHz ~ 2312.5 MHz
LTE Band 38: 2572.5 MHz ~ 2617.5 MHz
LTE Band 41: 2547.5 MHz ~ 2652.5 MHz
LTE Band 66: 1710.7 MHz ~ 1779.3 MHz</td></tr>
<tr><td>Channel Bandwidth</td><td>LTE Band 02:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 04:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 05:1.4MHz, 3MHz, 5MHz, 10MHz
LTE Band 07: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz
LTE Band 17: 5MHz, 10MHz
LTE Band 25:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 26:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz
LTE Band 30: 5MHz, 10MHz
LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz</td></tr>
<tr><td>uplink modulations used</td><td>QPSK, 16QAM, 64QAM</td></tr>
<tr><td>LTE Voice / Data requirements</td><td>Voice and Data</td></tr>
<tr><td>LTE MPR permanently built-in by design</td><td>
<table>
<tr><th colspan="7">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3</th></tr>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
</table>
<table>
<tr><th colspan="7">Table 6.2.3_3.3-1: Maximum Power Reduction (MPR) for Power Class 3</th></tr>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth configuration [RB]</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr>
</table>
</td></tr>
<tr><td>LTE A-MPR</td><td>In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)</td></tr>
<tr><td>Spectrum plots for RB configuration</td><td>A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.</td></tr>
<tr><td>Power reduction applied to satisfy SAR compliance</td><td>Yes, when operating in hotspot mode that LTE B2 / B4 / B5 / B7 / B17 / B25 / B26 / B30 / B66 power reduction applied to satisfy SAR compliance.</td></tr>
<tr><td>LTE Carrier Aggregation Combinations</td><td>Inter-Band and Intra-Band possible combinations as below page and the detail power verification please referred to section 12</td></tr>
<tr><td>LTE Carrier Aggregation Additional Information</td><td>This device supports a maximum of 4 carriers in the downlink only. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. Due to carrier capability, only the combinations listed above are supported. The following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.</td></tr>
</table>

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

LTE Band 2

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

LTE Band 4

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

LTE Band 5

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

LTE Band 7

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

LTE Band 12

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

LTE Band 17

	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq. (MHz)
L	23755	706.5	23780	709
M	23790	710	23790	710
H	23825	713.5	23800	711

LTE Band 25

	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	26047	1850.7	26055	1851.5	26065	1852.5	26090	1855	26115	1857.5	26140	1860
M	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880
H	26683	1914.3	26675	1913.5	26665	1912.5	26640	1910	26615	1907.5	26590	1905

LTE Band 26

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5

LTE Band 30				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	27685	2307.5	27710	2310
M	27710	2310		
H	27735	2312.5		

LTE Band 38								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	37775	2572.5	37800	2575	37825	2577.5	37850	2580
M	38000	2595	38000	2595	38000	2595	38000	2595
H	38225	2617.5	38200	2615	38175	2612.5	38150	2610

LTE Band 41								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	40165	2547.5	40190	2550	40215	2552.5	40240	2555
L M	40485	2579.5	40490	2580	40495	2580.5	40500	2581
H M	40805	2611.5	40790	2610	40785	2609.5	40770	2608
H	41215	2652.5	41190	2650	41165	2647.5	41140	2645

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

5. RF Exposure Limits

5.1 Uncontrolled Environment

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

5.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

6. Specific Absorption Rate (SAR)

6.1 Introduction

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

6.2 SAR Definition

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

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

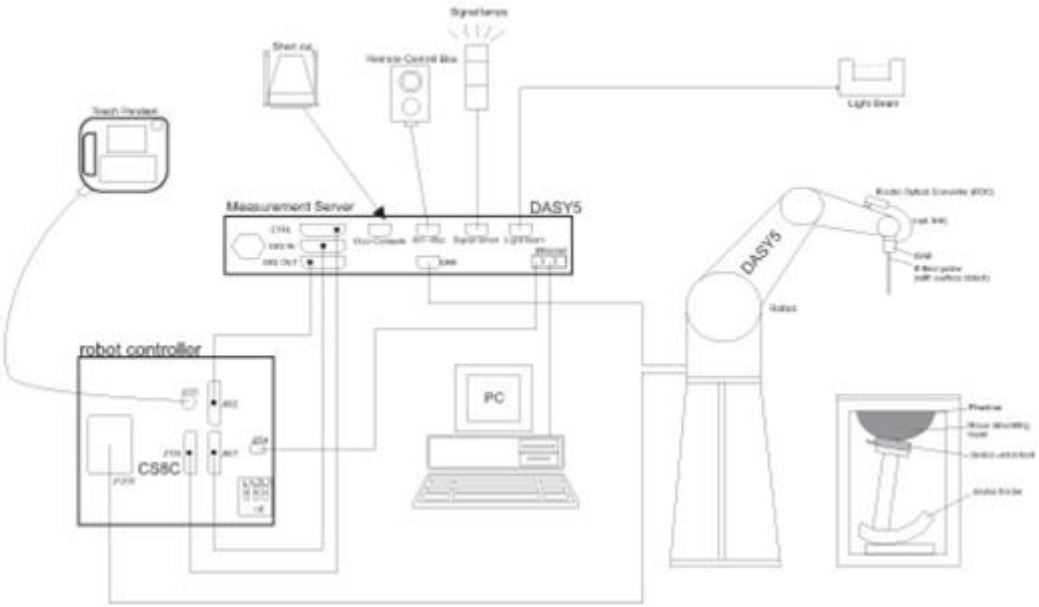
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

7. System Description and Setup

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



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

7.1 E-Field Probe

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

<ES3DV3 Probe>

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

<EX3DV4 Probe>

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

7.2 Data Acquisition Electronics (DAE)

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

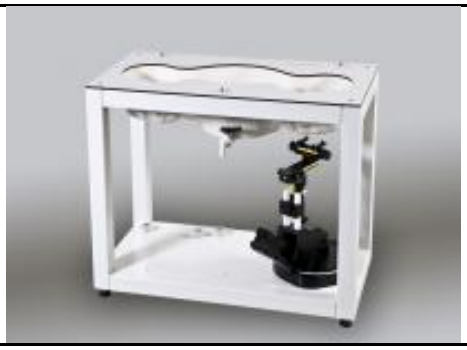
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

7.3 Phantom

<SAM Twin Phantom>

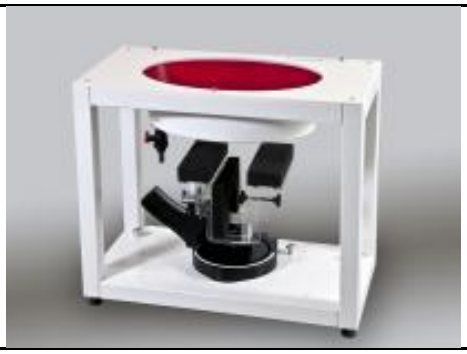
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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

<ELI Phantom>

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



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

7.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

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

Mounting Device for Hand-Held Transmitters

Mounting Device Adaptor for Wide-Phones

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

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

Mounting Device for Laptops

8. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

8.1 Spatial Peak SAR Evaluation

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

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

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

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

8.2 Power Reference Measurement

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

8.3 Area Scan

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

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

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

8.4 Zoom Scan

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

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

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

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

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

8.5 Volume Scan Procedures

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

8.6 Power Drift Monitoring

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

9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1078	Jun. 22, 2016	Jun. 21, 2017
SPEAG	835MHz System Validation Kit	D835V2	499	Mar. 21, 2017	Mar. 20, 2018
SPEAG	1750MHz System Validation Kit	D1750V2	1068	Nov. 16, 2016	Nov. 15, 2017
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Sep. 30, 2016	Sep. 29, 2017
SPEAG	2300MHz System Validation Kit	D2300V2	1006	Jan. 25, 2017	Jan. 24, 2018
SPEAG	2450MHz System Validation Kit	D2450V2	736	Aug. 30, 2016	Aug. 29, 2017
SPEAG	2600MHz System Validation Kit	D2600V2	1008	Aug. 30, 2016	Aug. 29, 2017
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Sep. 27, 2016	Sep. 26, 2017
SPEAG	5GHz System Validation Kit	D5GHzV2	1128	Jul. 27, 2016	Jul. 26, 2017
SPEAG	Data Acquisition Electronics	DAE4	1305	Dec. 15, 2016	Dec. 14, 2017
SPEAG	Data Acquisition Electronics	DAE3	577	Sep. 28, 2016	Sep. 27, 2017
SPEAG	Dosimetric E-Field Probe	EX3DV4	7375	Dec. 08, 2016	Dec. 07, 2017
SPEAG	Dosimetric E-Field Probe	EX3DV4	3931	Oct. 03, 2016	Oct. 02, 2017
TESTO	Hygro meter	608-H1	34913631	Aug. 18, 2016	Aug. 17, 2017
TESTO	Hygro meter	608-H1	34852481	Sep. 21, 2016	Sep. 20, 2017
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Apr. 20, 2017	Apr. 19, 2018
Agilent	Wireless Communication Test Set	E5515C	MY48360820	Jan. 11, 2016	Jan. 10, 2018
R&S	BT Base Station	CBT32	100522	Mar. 14, 2017	Mar. 13, 2018
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Dec. 09, 2016	Dec. 08, 2017
Agilent	ENA Network Analyzer	E5071C	MY46316648	Jan. 04, 2017	Jan. 03, 2018
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Jul. 19, 2016	Jul. 18, 2017
LINE SEIKI	Digital Thermometer	LKMelectronic	DTM3000SPEZIAL	Sep. 05, 2016	Sep. 04, 2017
Anritsu	Power Meter	ML2495A	1438002	Dec. 06, 2016	Dec. 05, 2017
Anritsu	Power Sensor	MA2411B	1339195	Dec. 06, 2016	Dec. 05, 2017
Anritsu	Power Meter	ML2495A	1419002	May. 15, 2017	May. 14, 2018
Anritsu	Power Sensor	MA2411B	1339124	May. 15, 2017	May. 14, 2018
Agilent	Spectrum Analyzer	E4408B	MY44211028	Aug. 22, 2016	Aug. 21, 2017
Mini-Circuits	Power Amplifier	ZVE-8G+	D120604	Mar. 09, 2017	Mar. 08, 2018
Mini-Circuits	Power Amplifier	ZHL-42W+	QA1344002	Mar. 09, 2017	Mar. 08, 2018
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

General Note:

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

10. System Verification

10.1 Tissue Simulating Liquids

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

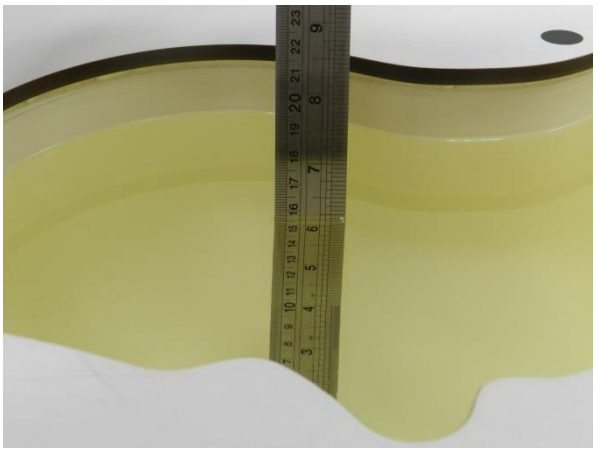


Fig 10.1Photo of Liquid Height for Head SAR

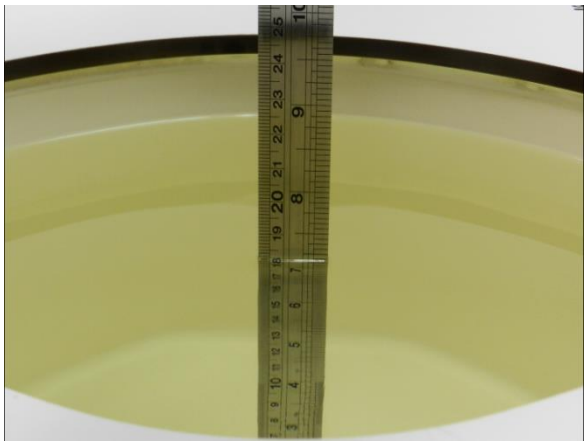


Fig 10.2 Photo of Liquid Height for Body SAR

10.2 Tissue Verification

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

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
900	40.3	57.9	0.2	1.4	0.2	0	0.97	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0
For Body								
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
900	50.8	48.2	0	0.9	0.1	0	1.05	55.0
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7
2600	68.1	0	0	0.1	0	31.8	2.16	52.5

Simulating Liquid for 5GHz, Manufactured by SPEAG

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

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	HSL	22.4	0.895	40.718	0.89	41.90	0.56	-2.82	±5	2017/5/30
750	MSL	22.5	0.975	54.274	0.96	55.50	1.56	-2.21	±5	2017/5/28
835	HSL	22.4	0.885	42.274	0.90	41.50	-1.67	1.87	±5	2017/5/30
835	MSL	22.5	0.960	54.591	0.97	55.20	-1.03	-1.10	±5	2017/5/28
1750	HSL	22.3	1.411	40.564	1.37	40.10	2.99	1.16	±5	2017/5/25
1750	MSL	22.3	1.529	55.734	1.49	53.40	2.62	4.37	±5	2017/5/25
1750	MSL	22.6	1.471	55.215	1.49	53.40	-1.28	3.40	±5	2017/5/30
1900	HSL	22.3	1.432	40.626	1.40	40.00	2.29	1.56	±5	2017/5/26
1900	MSL	22.3	1.539	54.579	1.52	53.30	1.25	2.40	±5	2017/5/27
1900	MSL	22.6	1.534	54.474	1.52	53.30	0.92	2.20	±5	2017/5/30
2300	HSL	22.3	1.662	39.242	1.67	39.50	-0.48	-0.65	±5	2017/5/25
2300	MSL	22.5	1.737	55.221	1.81	52.90	-4.03	4.39	±5	2017/5/29
2450	HSL	22.3	1.835	38.629	1.80	39.20	1.94	-1.46	±5	2017/5/25
2450	MSL	22.5	1.943	54.731	1.95	52.70	-0.36	3.85	±5	2017/5/29
2600	HSL	22.3	2.012	38.002	1.96	39.00	2.65	-2.56	±5	2017/5/25
2600	MSL	22.5	2.149	54.206	2.16	52.50	-0.51	3.25	±5	2017/5/29
5250	HSL	22.2	4.493	35.431	4.71	35.95	-4.61	-1.44	±5	2017/5/30
5250	MSL	22.5	5.442	46.777	5.36	48.95	1.53	-4.44	±5	2017/5/29
5600	HSL	22.2	4.823	34.970	5.07	35.50	-4.87	-1.49	±5	2017/5/30
5600	MSL	22.5	5.900	46.172	5.77	48.50	2.25	-4.80	±5	2017/5/29
5750	HSL	22.2	4.969	34.777	5.22	35.35	-4.81	-1.62	±5	2017/5/30
5750	MSL	22.5	6.102	45.942	5.94	48.28	2.73	-4.84	±5	2017/5/29

<Tissue Dielectric Parameter Check for Low / Middle / High Frequencies>

General Note:

The tissue measure results for low / middle / high frequencies list below, the results were used in the Dasy SAR system to perform interpolation to determine the dielectric parameters on the SAR test device. The SAR test plots may slightly difference between the tables below due to the digit rounding in the software calculated.

CH	Frequency (MHz)	Liquid Type	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
20850	2510	Head	1.905	38.378	1.864	39.120	2.43	-1.85	±5	May. 25, 2017
21100	2535	Head	1.935	38.270	1.891	39.087	2.37	-2.12	±5	May. 25, 2017
21350	2560	Head	1.964	38.158	1.917	39.053	2.27	-2.41	±5	May. 25, 2017
37850	2580	Head	1.988	38.076	1.938	39.025	2.48	-2.37	±5	May. 25, 2017
38000	2595	Head	2.006	38.019	1.955	39.006	2.85	-2.51	±5	May. 25, 2017
38150	2610	Head	2.022	37.966	1.971	38.987	2.65	-2.65	±5	May. 25, 2017
27710	2310	Head	1.673	39.190	1.673	39.424	0.20	-0.53	±5	May. 25, 2017
40240	2555	Head	1.958	38.182	1.915	39.066	2.50	-2.35	±5	May. 25, 2017
40500	2581	Head	1.989	38.071	1.943	39.033	2.55	-2.38	±5	May. 25, 2017
40770	2608	Head	2.020	37.975	1.972	38.999	2.56	-2.63	±5	May. 25, 2017
41140	2645	Head	2.063	37.807	2.013	38.952	2.63	-3.06	±5	May. 25, 2017
1	2412	Head	1.790	38.794	1.766	39.268	1.14	-1.29	±5	May. 25, 2017
3	2422	Head	1.803	38.747	1.775	39.250	1.27	-1.16	±5	May. 25, 2017
6	2437	Head	1.820	38.691	1.788	39.223	1.65	-1.30	±5	May. 25, 2017
9	2452	Head	1.838	38.619	1.802	39.197	2.09	-1.48	±5	May. 25, 2017
11	2462	Head	1.850	38.574	1.813	39.184	2.21	-1.60	±5	May. 25, 2017
0	2402	Head	1.779	38.842	1.757	39.285	1.06	-1.17	±5	May. 25, 2017
39	2441	Head	1.824	38.675	1.792	39.216	1.91	-1.34	±5	May. 25, 2017
78	2480	Head	1.872	38.497	1.800	39.200	4.01	-1.79	±5	May. 25, 2017
512	1850.2	Head	1.382	40.844	1.400	40.000	-1.32	2.11	±5	May. 26, 2017
661	1880	Head	1.412	40.726	1.400	40.000	0.83	1.81	±5	May. 26, 2017
810	1909.8	Head	1.443	40.594	1.400	40.000	3.08	1.49	±5	May. 26, 2017
9262	1852.4	Head	1.384	40.839	1.400	40.000	-1.15	2.10	±5	May. 26, 2017
9400	1880	Head	1.412	40.726	1.400	40.000	0.83	1.81	±5	May. 26, 2017
9538	1907.6	Head	1.441	40.600	1.400	40.000	2.91	1.50	±5	May. 26, 2017
18700	1860	Head	1.391	40.813	1.400	40.000	-0.61	2.03	±5	May. 26, 2017
18900	1880	Head	1.412	40.726	1.400	40.000	0.83	1.81	±5	May. 26, 2017
19100	1900	Head	1.432	40.626	1.400	40.000	2.29	1.57	±5	May. 26, 2017
26140	1860	Head	1.391	40.813	1.400	40.000	-0.61	2.03	±5	May. 26, 2017
26340	1880	Head	1.412	40.726	1.400	40.000	0.83	1.81	±5	May. 26, 2017
26590	1905	Head	1.438	40.609	1.400	40.000	2.70	1.52	±5	May. 26, 2017
1312	1712.4	Head	1.371	40.740	1.352	40.162	1.58	1.34	±5	May. 25, 2017
1413	1732.6	Head	1.392	40.645	1.362	40.129	2.36	1.36	±5	May. 25, 2017
1513	1752.6	Head	1.413	40.554	1.372	40.095	3.16	1.13	±5	May. 25, 2017

Table of Low/Middle/High Channel for Liquid Validation

CH	Frequency (MHz)	Liquid Type	Conductivity (σ)	Permittivity (εr)	Conductivity Target (σ)	Permittivity Target (εr)	Delta (σ) (%)	Delta (εr) (%)	Limit (%)	Date
20050	1720	Head	1.379	40.701	1.356	40.149	1.39	1.50	±5	May. 25, 2017
20175	1732.5	Head	1.392	40.646	1.362	40.129	2.35	1.36	±5	May. 25, 2017
20300	1745	Head	1.406	40.583	1.368	40.108	2.60	1.20	±5	May. 25, 2017
132072	1720	Head	1.379	40.701	1.369	40.089	0.65	1.50	±5	May. 25, 2017
132322	1745	Head	1.406	40.583	1.384	40.046	1.85	1.46	±5	May. 25, 2017
132572	1770	Head	1.431	40.480	1.395	40.015	2.92	1.20	±5	May. 25, 2017
512	1850.2	Body	1.482	54.724	1.520	53.300	-2.53	2.67	±5	May. 27, 2017
661	1880	Body	1.515	54.649	1.520	53.300	-0.32	2.53	±5	May. 27, 2017
810	1909.8	Body	1.552	54.537	1.520	53.300	2.08	2.32	±5	May. 27, 2017
9262	1852.4	Body	1.484	54.720	1.520	53.300	-2.35	2.66	±5	May. 27, 2017
9400	1880	Body	1.515	54.649	1.520	53.300	-0.32	2.53	±5	May. 27, 2017
9538	1907.6	Body	1.549	54.547	1.520	53.300	1.92	2.34	±5	May. 27, 2017
18700	1860	Body	1.492	54.710	1.520	53.300	-1.83	2.65	±5	May. 27, 2017
18900	1880	Body	1.515	54.649	1.520	53.300	-0.32	2.53	±5	May. 27, 2017
19100	1900	Body	1.539	54.579	1.520	53.300	1.24	2.40	±5	May. 27, 2017
26140	1860	Body	1.492	54.710	1.520	53.300	-1.83	2.65	±5	May. 27, 2017
26340	1880	Body	1.515	54.649	1.520	53.300	-0.32	2.53	±5	May. 27, 2017
26590	1905	Body	1.546	54.559	1.520	53.300	1.71	2.36	±5	May. 27, 2017
1312	1712.4	Body	1.490	55.840	1.471	53.471	1.36	4.37	±5	May. 25, 2017
1413	1732.6	Body	1.510	55.788	1.481	53.433	2.06	4.47	±5	May. 25, 2017
1513	1752.6	Body	1.531	55.728	1.492	53.395	2.76	4.36	±5	May. 25, 2017
20050	1720	Body	1.498	55.821	1.474	53.456	1.89	4.34	±5	May. 25, 2017
20175	1732.5	Body	1.510	55.789	1.481	53.433	2.05	4.47	±5	May. 25, 2017
20300	1745	Body	1.524	55.747	1.487	53.409	2.27	4.40	±5	May. 25, 2017
128	824.2	Body	0.950	54.704	0.969	55.238	-2.05	-0.90	±5	May. 28, 2017
189	836.4	Body	0.962	54.578	0.972	55.196	-0.87	-1.13	±5	May. 28, 2017
251	848.8	Body	0.974	54.458	0.987	55.158	-1.64	-1.34	±5	May. 28, 2017
4132	826.4	Body	0.952	54.683	0.969	55.230	-1.85	-0.94	±5	May. 28, 2017
4182	836.4	Body	0.962	54.578	0.972	55.196	-0.87	-1.13	±5	May. 28, 2017
4233	846.6	Body	0.971	54.478	0.984	55.164	-0.89	-1.31	±5	May. 28, 2017
20450	829	Body	0.955	54.653	0.969	55.221	-1.60	-0.99	±5	May. 28, 2017
20525	836.5	Body	0.962	54.577	0.972	55.195	-0.86	-1.13	±5	May. 28, 2017
20600	844	Body	0.969	54.504	0.981	55.172	-1.16	-1.26	±5	May. 28, 2017
23060	704	Body	0.932	54.725	0.957	55.684	-2.93	-1.75	±5	May. 28, 2017
23095	707.5	Body	0.935	54.695	0.957	55.670	-2.58	-1.80	±5	May. 28, 2017
23130	711	Body	0.939	54.657	0.957	55.656	-2.24	-1.87	±5	May. 28, 2017
23780	709	Body	0.937	54.680	0.957	55.664	-2.43	-1.83	±5	May. 28, 2017
23790	710	Body	0.938	54.671	0.957	55.660	-2.32	-1.85	±5	May. 28, 2017
23800	711	Body	0.939	54.657	0.957	55.656	-2.24	-1.87	±5	May. 28, 2017

Table of Low/Middle/High Channel for Liquid Validation

CH	Frequency (MHz)	Liquid Type	Conductivity (σ)	Permittivity (εr)	Conductivity Target (σ)	Permittivity Target (εr)	Delta (σ) (%)	Delta (εr) (%)	Limit (%)	Date
26765	821.5	Body	0.948	54.730	0.968	55.248	-2.30	-0.85	±5	May. 28, 2017
26865	831.5	Body	0.957	54.628	0.970	55.212	-1.34	-1.04	±5	May. 28, 2017
26965	841.5	Body	0.967	54.528	0.978	55.180	-1.38	-1.22	±5	May. 28, 2017
26865	831.5	Body	0.957	54.628	0.968	55.248	-1.34	-1.04	±5	May. 28, 2017
26915	836.5	Body	0.962	54.577	0.970	55.212	-0.86	-1.13	±5	May. 28, 2017
26965	841.5	Body	0.967	54.528	0.978	55.180	-1.38	-1.22	±5	May. 28, 2017
20850	2510	Body	2.023	54.522	2.034	52.620	-0.32	3.65	±5	May. 29, 2017
21100	2535	Body	2.057	54.433	2.069	52.587	-0.62	3.48	±5	May. 29, 2017
21350	2560	Body	2.092	54.340	2.104	52.553	-0.37	3.31	±5	May. 29, 2017
27710	2310	Body	1.750	55.191	1.780	52.884	-1.66	4.33	±5	May. 29, 2017
37850	2580	Body	2.121	54.269	2.131	52.535	-0.42	3.37	±5	May. 29, 2017
38000	2595	Body	2.142	54.223	2.153	52.516	-0.39	3.28	±5	May. 29, 2017
38150	2610	Body	2.162	54.170	2.175	52.497	-0.37	3.18	±5	May. 29, 2017
40240	2555	Body	2.085	54.359	2.099	52.566	-0.70	3.34	±5	May. 29, 2017
40500	2581	Body	2.123	54.265	2.136	52.533	-0.81	3.36	±5	May. 29, 2017
40770	2608	Body	2.159	54.179	2.174	52.499	-0.50	3.20	±5	May. 29, 2017
41140	2645	Body	2.211	54.031	2.227	52.452	-0.84	2.92	±5	May. 29, 2017
0	2402	Body	1.878	54.925	1.904	52.764	-1.14	4.02	±5	May. 29, 2017
39	2441	Body	1.930	54.773	1.941	52.712	-0.51	3.93	±5	May. 29, 2017
78	2480	Body	1.985	54.619	1.950	52.700	1.80	3.64	±5	May. 29, 2017
1	2412	Body	1.892	54.882	1.914	52.751	-0.95	3.94	±5	May. 29, 2017
3	2422	Body	1.906	54.841	1.923	52.737	-0.73	4.06	±5	May. 29, 2017
6	2437	Body	1.925	54.789	1.938	52.717	-0.79	3.96	±5	May. 29, 2017
9	2452	Body	1.946	54.722	1.953	52.697	-0.20	3.84	±5	May. 29, 2017
11	2462	Body	1.960	54.683	1.967	52.684	-0.50	3.76	±5	May. 29, 2017
36	5180	Body	5.357	46.900	5.276	49.027	1.45	-4.29	±5	May. 29, 2017
38	5190	Body	5.368	46.888	5.288	49.013	1.47	-4.31	±5	May. 29, 2017
40	5200	Body	5.379	46.866	5.300	49.000	1.48	-4.36	±5	May. 29, 2017
42	5210	Body	5.391	46.847	5.312	48.990	1.53	-4.39	±5	May. 29, 2017
44	5220	Body	5.405	46.823	5.323	48.980	1.59	-4.44	±5	May. 29, 2017
46	5230	Body	5.420	46.801	5.335	48.970	1.68	-4.49	±5	May. 29, 2017
48	5240	Body	5.433	46.792	5.346	48.960	1.55	-4.51	±5	May. 29, 2017
52	5260	Body	5.455	46.749	5.370	48.940	1.57	-4.40	±5	May. 29, 2017
54	5270	Body	5.470	46.730	5.381	48.930	1.67	-4.44	±5	May. 29, 2017
56	5280	Body	5.486	46.717	5.393	48.920	1.78	-4.46	±5	May. 29, 2017
58	5290	Body	5.498	46.706	5.404	48.910	1.82	-4.49	±5	May. 29, 2017
60	5300	Body	5.509	46.694	5.416	48.900	1.64	-4.51	±5	May. 29, 2017
62	5310	Body	5.520	46.675	5.428	48.787	1.65	-4.35	±5	May. 29, 2017
64	5320	Body	5.533	46.652	5.439	48.673	1.71	-4.20	±5	May. 29, 2017

Table of Low/Middle/High Channel for Liquid Validation

CH	Frequency (MHz)	Liquid Type	Conductivity (σ)	Permittivity (εr)	Conductivity Target (σ)	Permittivity Target (εr)	Delta (σ) (%)	Delta (εr) (%)	Limit (%)	Date
100	5500	Body	5.765	46.350	5.650	48.600	2.03	-4.63	±5	May. 29, 2017
102	5510	Body	5.777	46.340	5.661	48.590	2.07	-4.65	±5	May. 29, 2017
104	5520	Body	5.789	46.321	5.673	48.580	2.10	-4.69	±5	May. 29, 2017
106	5530	Body	5.803	46.301	5.685	48.570	2.16	-4.73	±5	May. 29, 2017
108	5540	Body	5.817	46.279	5.696	48.560	2.05	-4.77	±5	May. 29, 2017
110	5550	Body	5.833	46.260	5.708	48.550	2.15	-4.82	±5	May. 29, 2017
112	5560	Body	5.844	46.254	5.720	48.540	2.17	-4.63	±5	May. 29, 2017
116	5580	Body	5.866	46.205	5.743	48.520	2.20	-4.73	±5	May. 29, 2017
120	5600	Body	5.900	46.173	5.770	48.500	2.25	-4.80	±5	May. 29, 2017
122	5610	Body	5.914	46.165	5.778	48.485	2.31	-4.82	±5	May. 29, 2017
124	5620	Body	5.926	46.152	5.790	48.470	2.34	-4.84	±5	May. 29, 2017
126	5630	Body	5.938	46.136	5.801	48.455	2.39	-4.87	±5	May. 29, 2017
128	5640	Body	5.952	46.119	5.813	48.440	2.45	-4.71	±5	May. 29, 2017
132	5660	Body	5.981	46.087	5.837	48.410	2.42	-4.78	±5	May. 29, 2017
134	5670	Body	5.991	46.074	5.848	48.395	2.41	-4.81	±5	May. 29, 2017
136	5680	Body	6.002	46.049	5.860	48.380	2.42	-4.86	±5	May. 29, 2017
138	5690	Body	6.017	46.019	5.872	48.365	2.50	-4.92	±5	May. 29, 2017
140	5700	Body	6.034	46.005	5.883	48.350	2.61	-4.95	±5	May. 29, 2017
142	5710	Body	6.050	45.997	5.895	48.335	2.72	-4.77	±5	May. 29, 2017
144	5720	Body	6.062	45.988	5.907	48.320	2.58	-4.79	±5	May. 29, 2017
149	5745	Body	6.096	45.951	5.936	48.283	2.62	-4.86	±5	May. 29, 2017
151	5755	Body	6.110	45.931	5.947	48.268	2.69	-4.90	±5	May. 29, 2017
153	5765	Body	6.124	45.919	5.959	48.253	2.75	-4.93	±5	May. 29, 2017
155	5775	Body	6.135	45.908	5.971	48.238	2.76	-4.75	±5	May. 29, 2017
157	5785	Body	6.144	45.886	5.982	48.223	2.74	-4.80	±5	May. 29, 2017
159	5795	Body	6.158	45.857	5.994	48.208	2.80	-4.86	±5	May. 29, 2017
161	5805	Body	6.176	45.839	6.000	48.200	2.93	-4.90	±5	May. 29, 2017
165	5825	Body	6.205	45.816	6.030	48.200	2.91	-4.95	±5	May. 29, 2017
36	5180	Head	4.429	35.51	4.639	36.02	-4.55	-1.36	±5	May. 30, 2017
38	5190	Head	4.437	35.5	4.65	36.01	-4.58	-1.39	±5	May. 30, 2017
40	5200	Head	4.444	35.48	4.66	36	-4.64	-1.44	±5	May. 30, 2017
42	5210	Head	4.454	35.46	4.67	35.99	-4.63	-1.50	±5	May. 30, 2017
44	5220	Head	4.466	35.45	4.68	35.98	-4.57	-1.53	±5	May. 30, 2017
46	5230	Head	4.478	35.43	4.69	35.97	-4.52	-1.58	±5	May. 30, 2017
48	5240	Head	4.488	35.43	4.7	35.96	-4.51	-1.58	±5	May. 30, 2017

Table of Low/Middle/High Channel for Liquid Validation

CH	Frequency (MHz)	Liquid Type	Conductivity (σ)	Permittivity (εr)	Conductivity Target (σ)	Permittivity Target (εr)	Delta (σ) (%)	Delta (εr) (%)	Limit (%)	Date
52	5260	Head	4.498	35.41	4.72	35.94	-4.70	-1.36	±5	May. 30, 2017
54	5270	Head	4.51	35.39	4.73	35.93	-4.65	-1.42	±5	May. 30, 2017
56	5280	Head	4.522	35.37	4.74	35.92	-4.60	-1.48	±5	May. 30, 2017
58	5290	Head	4.532	35.37	4.75	35.91	-4.59	-1.48	±5	May. 30, 2017
60	5300	Head	4.54	35.35	4.76	35.9	-4.62	-1.53	±5	May. 30, 2017
62	5310	Head	4.547	35.33	4.77	35.89	-4.68	-1.59	±5	May. 30, 2017
64	5320	Head	4.559	35.32	4.781	35.87	-4.62	-1.62	±5	May. 30, 2017
100	5500	Head	4.723	35.1	4.967	35.63	-4.97	-1.40	±5	May. 30, 2017
102	5510	Head	4.732	35.09	4.977	35.62	-4.98	-1.43	±5	May. 30, 2017
104	5520	Head	4.75	35.07	4.987	35.61	-4.81	-1.49	±5	May. 30, 2017
106	5530	Head	4.752	35.05	4.998	35.59	-4.96	-1.54	±5	May. 30, 2017
108	5540	Head	4.764	35.04	5.008	35.58	-4.91	-1.57	±5	May. 30, 2017
110	5550	Head	4.777	35.02	5.018	35.57	-4.84	-1.63	±5	May. 30, 2017
112	5560	Head	4.787	35.03	5.029	35.55	-4.83	-1.60	±5	May. 30, 2017
116	5580	Head	4.8	35	5.049	35.53	-4.95	-1.41	±5	May. 30, 2017
120	5600	Head	4.823	34.97	5.07	35.5	-4.87	-1.49	±5	May. 30, 2017
122	5610	Head	4.832	34.96	5.08	35.49	-4.88	-1.52	±5	May. 30, 2017
124	5620	Head	4.839	34.95	5.09	35.48	-4.93	-1.55	±5	May. 30, 2017
126	5630	Head	4.848	34.93	5.1	35.47	-4.94	-1.61	±5	May. 30, 2017
128	5640	Head	4.861	34.91	5.11	35.46	-4.87	-1.66	±5	May. 30, 2017
132	5660	Head	4.886	34.89	5.13	35.44	-4.76	-1.44	±5	May. 30, 2017
134	5670	Head	4.893	34.89	5.14	35.43	-4.81	-1.44	±5	May. 30, 2017
136	5680	Head	4.899	34.88	5.15	35.42	-4.87	-1.47	±5	May. 30, 2017
138	5690	Head	4.909	34.86	5.16	35.41	-4.86	-1.53	±5	May. 30, 2017
140	5700	Head	4.921	34.84	5.17	35.4	-4.82	-1.58	±5	May. 30, 2017
142	5710	Head	4.932	34.83	5.18	35.39	-4.79	-1.61	±5	May. 30, 2017
144	5720	Head	4.94	34.82	5.19	35.38	-4.82	-1.64	±5	May. 30, 2017
149	5745	Head	4.963	34.78	5.215	35.36	-4.92	-1.75	±5	May. 30, 2017
151	5755	Head	4.975	34.77	5.225	35.35	-4.88	-1.78	±5	May. 30, 2017
153	5765	Head	4.988	34.76	5.235	35.34	-4.81	-1.53	±5	May. 30, 2017
155	5775	Head	4.995	34.77	5.245	35.33	-4.86	-1.50	±5	May. 30, 2017
157	5785	Head	5	34.75	5.255	35.32	-4.94	-1.56	±5	May. 30, 2017
159	5795	Head	5.01	34.73	5.265	35.31	-4.93	-1.61	±5	May. 30, 2017
161	5805	Head	5.023	34.71	5.275	35.3	-4.87	-1.67	±5	May. 30, 2017
165	5825	Head	5.041	34.7	5.296	35.28	-4.89	-1.70	±5	May. 30, 2017
128	824.2	Head	0.874	42.337	0.899	41.551	-2.84	1.77	±5	May. 30, 2017
189	836.4	Head	0.886	42.267	0.902	41.500	-1.57	1.85	±5	May. 30, 2017
251	848.8	Head	0.898	42.211	0.915	41.500	-1.34	1.71	±5	May. 30, 2017

Table of Low/Middle/High Channel for Liquid Validation

CH	Frequency (MHz)	Liquid Type	Conductivity (σ)	Permittivity (εr)	Conductivity Target (σ)	Permittivity Target (εr)	Delta (σ) (%)	Delta (εr) (%)	Limit (%)	Date
4132	826.4	Head	0.877	42.329	0.899	41.540	-2.60	2.00	±5	May. 30, 2017
4182	836.4	Head	0.886	42.267	0.902	41.500	-1.57	1.85	±5	May. 30, 2017
4233	846.6	Head	0.896	42.213	0.912	41.500	-1.59	1.72	±5	May. 30, 2017
20450	829	Head	0.879	42.314	0.899	41.528	-2.33	1.96	±5	May. 30, 2017
20525	836.5	Head	0.886	42.267	0.902	41.500	-1.56	1.85	±5	May. 30, 2017
20600	844	Head	0.893	42.218	0.910	41.500	-1.88	1.73	±5	May. 30, 2017
23060	704	Head	0.852	41.293	0.887	42.145	-4.31	-1.92	±5	May. 30, 2017
23095	707.5	Head	0.855	41.236	0.887	42.127	-3.97	-2.05	±5	May. 30, 2017
23130	711	Head	0.858	41.185	0.887	42.108	-3.62	-2.17	±5	May. 30, 2017
23780	709	Head	0.856	41.204	0.887	42.119	-3.84	-2.13	±5	May. 30, 2017
23790	710	Head	0.857	41.194	0.887	42.113	-3.73	-2.15	±5	May. 30, 2017
23800	711	Head	0.858	41.185	0.887	42.108	-3.62	-2.17	±5	May. 30, 2017
26765	821.5	Head	0.872	42.357	0.898	41.564	-3.12	1.82	±5	May. 30, 2017
26865	831.5	Head	0.881	42.302	0.900	41.516	-2.07	1.93	±5	May. 30, 2017
26965	841.5	Head	0.890	42.224	0.907	41.500	-2.16	1.75	±5	May. 30, 2017
26865	831.5	Head	0.881	42.302	0.898	41.564	-2.07	1.69	±5	May. 30, 2017
26915	836.5	Head	0.886	42.267	0.900	41.516	-1.56	1.85	±5	May. 30, 2017
26965	841.5	Head	0.890	42.224	0.907	41.500	-2.16	1.75	±5	May. 30, 2017

Table of Low/Middle/High Channel for Liquid Validation

10.3 System Performance Check Results

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

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2017/5/30	750	HSL	250	D750V3-1078	EX3DV4 - SN3931	DAE3 Sn577	2.12	8.18	8.48	3.67
2017/5/28	750	MSL	250	D750V3-1078	EX3DV4 - SN3931	DAE3 Sn577	2.29	8.63	9.16	6.14
2017/5/30	835	HSL	250	D835V2-499	EX3DV4 - SN3931	DAE3 Sn577	2.30	9.45	9.20	-2.65
2017/5/28	835	MSL	250	D835V2-499	EX3DV4 - SN3931	DAE3 Sn577	2.48	9.67	9.92	2.59
2017/5/25	1750	HSL	250	D1750V2-1068	EX3DV4 - SN7375	DAE4 Sn1305	9.73	36.60	38.92	6.34
2017/5/25	1750	MSL	250	D1750V2-1068	EX3DV4 - SN7375	DAE4 Sn1305	9.34	36.20	37.36	3.20
2017/5/30	1750	MSL	250	D1750V2-1068	EX3DV4 - SN3931	DAE3 Sn577	9.49	36.20	37.96	4.86
2017/5/26	1900	HSL	250	D1900V2-5d041	EX3DV4 - SN7375	DAE4 Sn1305	10.20	40.50	40.80	0.74
2017/5/27	1900	MSL	250	D1900V2-5d041	EX3DV4 - SN7375	DAE4 Sn1305	10.20	38.80	40.80	5.15
2017/5/30	1900	MSL	250	D1900V2-5d041	EX3DV4 - SN3931	DAE3 Sn577	10.00	38.80	40.00	3.09
2017/5/25	2300	HSL	250	D2300V2-1006	EX3DV4 - SN7375	DAE4 Sn1305	12.90	49.00	51.60	5.31
2017/5/29	2300	MSL	250	D2300V2-1006	EX3DV4 - SN3931	DAE3 Sn577	11.80	47.90	47.20	-1.46
2017/5/25	2450	HSL	250	D2450V2-736	EX3DV4 - SN7375	DAE4 Sn1305	13.90	53.10	55.60	4.71
2017/5/29	2450	MSL	250	D2450V2-736	EX3DV4 - SN3931	DAE3 Sn577	12.10	52.10	48.40	-7.10
2017/5/25	2600	HSL	250	D2600V2-1008	EX3DV4 - SN7375	DAE4 Sn1305	14.40	56.80	57.60	1.41
2017/5/29	2600	MSL	250	D2600V2-1008	EX3DV4 - SN3931	DAE3 Sn577	13.80	55.20	55.20	0.00
2017/5/30	5250	HSL	100	D5GHzV2-1128	EX3DV4 - SN3931	DAE3 Sn577	7.20	77.90	72.00	-7.57
2017/5/29	5250	MSL	100	D5GHzV2-1006	EX3DV4 - SN3931	DAE3 Sn577	8.07	75.50	80.70	6.89
2017/5/30	5600	HSL	100	D5GHzV2-1128	EX3DV4 - SN3931	DAE3 Sn577	8.37	81.20	83.70	3.08
2017/5/29	5600	MSL	100	D5GHzV2-1006	EX3DV4 - SN3931	DAE3 Sn577	8.34	78.60	83.40	6.11
2017/5/30	5750	HSL	100	D5GHzV2-1128	EX3DV4 - SN3931	DAE3 Sn577	7.68	78.30	76.80	-1.92
2017/5/29	5750	MSL	100	D5GHzV2-1006	EX3DV4 - SN3931	DAE3 Sn577	7.88	74.60	78.80	5.63

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2017/5/30	1750	MSL	250	D1750V2-1068	EX3DV4 - SN3931	DAE3 Sn577	5.14	19.40	20.56	5.98
2017/5/30	1900	MSL	250	D1900V2-5d041	EX3DV4 - SN3931	DAE3 Sn577	5.25	20.60	21.00	1.94
2017/5/29	5250	MSL	100	D5GHzV2-1006	EX3DV4 - SN3931	DAE3 Sn577	2.23	21.20	22.30	5.19
2017/5/29	5600	MSL	100	D5GHzV2-1006	EX3DV4 - SN3931	DAE3 Sn577	2.25	22.00	22.50	2.27

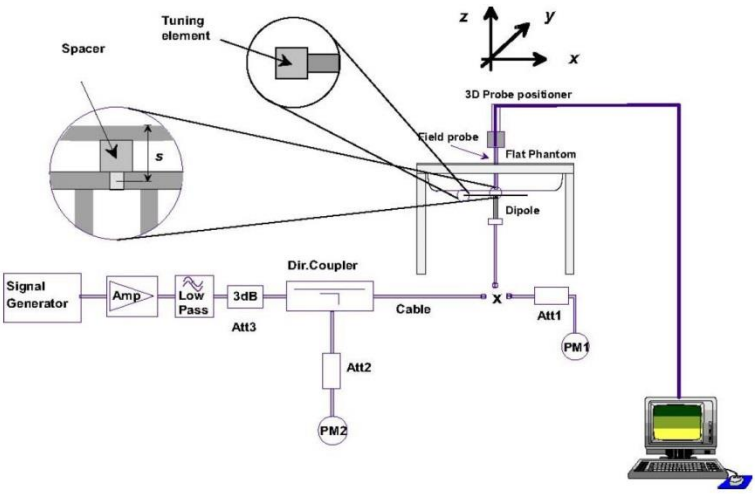


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

11. RF Exposure Positions

11.1 Ear and handset reference point

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

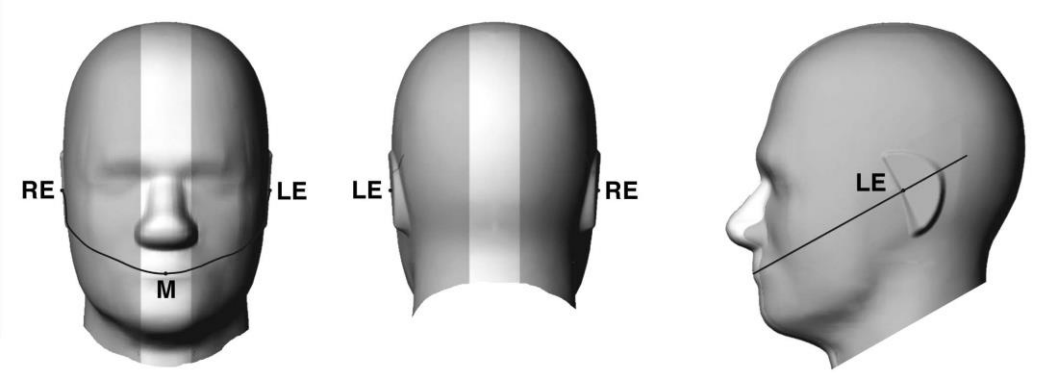


Fig 9.1.1 Front, back, and side views of SAM twin phantom

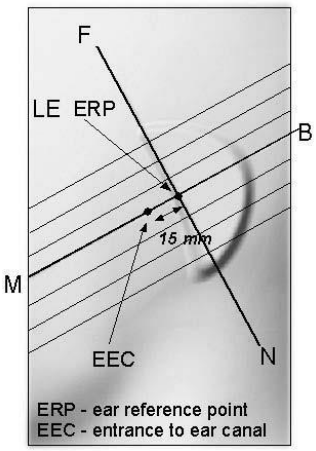


Fig 9.1.2 Close-up side view of phantom showing the ear region.

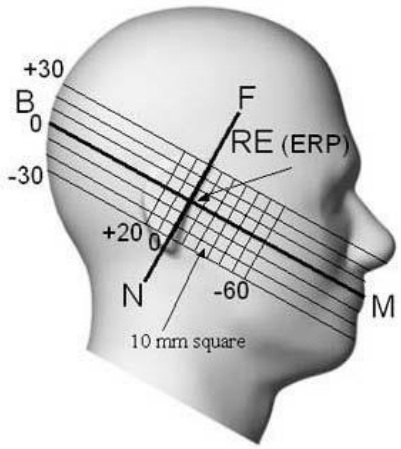


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

11.2 Definition of the cheek position

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

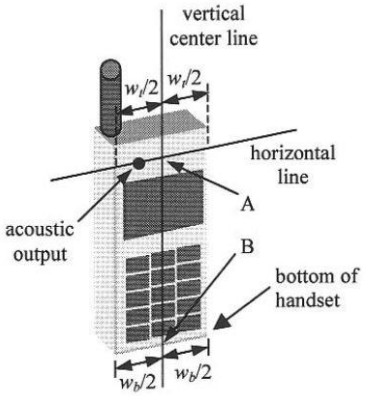


Fig 9.2.1 Handset vertical and horizontal reference lines—"fixed case

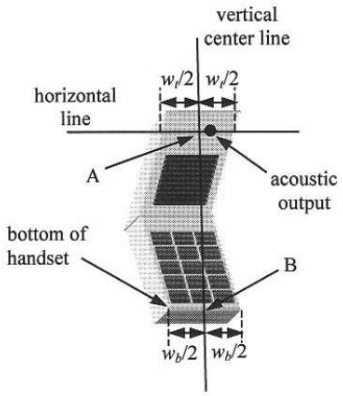


Fig 9.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

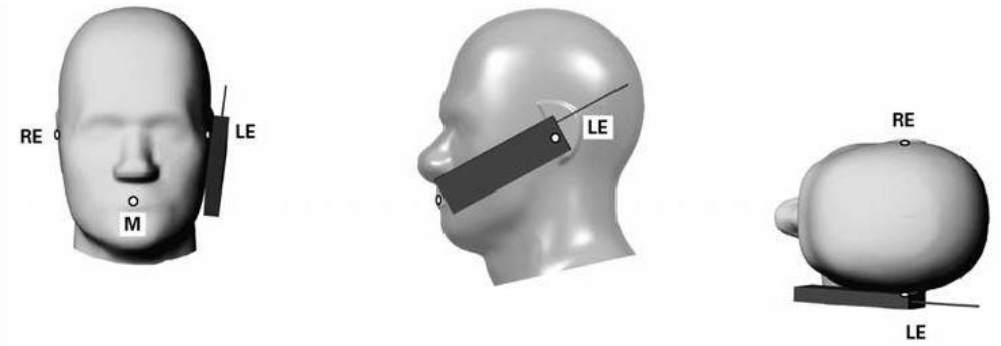


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

11.3 Definition of the tilt position

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

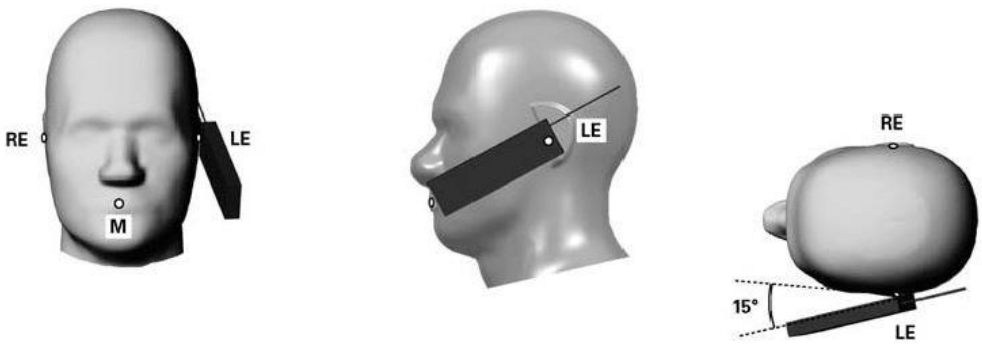


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

11.4 Body Worn Accessory

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

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

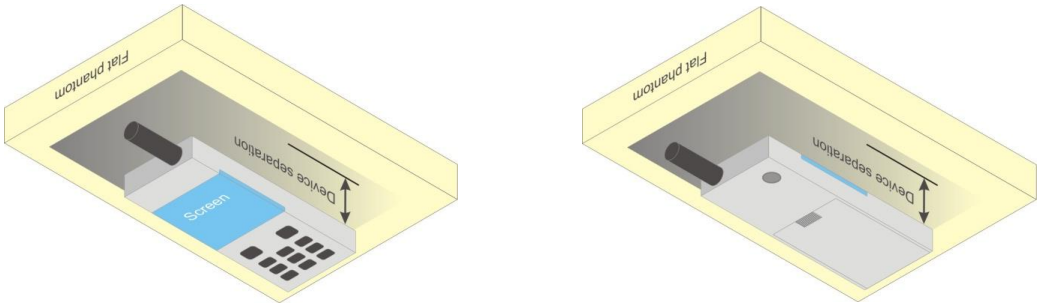


Fig 9.4 Body Worn Position

11.5 Product Specific

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, According to KDB648474 D04v01r03, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.

2. The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g Product Specific SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions.6 The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g Product Specific SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

11.6 Wireless Router

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

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

12. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

General Note:

1. Per KDB 447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS (4Tx slots) for GSM850/GSM1900 is considered as the primary mode.
3. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode, SAR measurement is not required for the secondary mode

<At-Head and Default Power Mode>

GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	128	189	251		128	189	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GSM 1 Tx slot	33.19	33.13	32.95	33.50	24.19	24.13	23.95	24.50
GPRS 1 Tx slot	33.20	33.16	33.07	33.50	24.20	24.16	24.07	24.50
GPRS 2 Tx slots	29.01	28.82	28.86	30.50	23.01	22.82	22.86	24.50
GPRS 3 Tx slots	27.23	27.14	27.38	28.75	22.97	22.88	23.12	24.49
GPRS 4 Tx slots	26.57	26.45	26.34	27.50	23.57	23.45	23.34	24.50
EDGE 1 Tx slot	26.05	26.12	26.00	28.00	17.05	17.12	17.00	19.00
EDGE 2 Tx slots	25.73	25.64	25.63	28.00	19.73	19.64	19.63	22.00
EDGE 3 Tx slots	24.89	25.11	24.79	26.25	20.63	20.85	20.53	21.99
EDGE 4 Tx slots	23.85	24.07	23.77	25.00	20.85	21.07	20.77	22.00

GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	29.18	29.20	29.22	30.50	20.18	20.20	20.22	21.50
GPRS 1 Tx slot	29.14	29.19	29.28	30.50	20.14	20.19	20.28	21.50
GPRS 2 Tx slots	25.62	25.72	25.77	27.50	19.62	19.72	19.77	21.50
GPRS 3 Tx slots	24.16	24.18	24.21	25.75	19.90	19.92	19.95	21.49
GPRS 4 Tx slots	22.79	22.75	22.90	24.50	19.79	19.75	19.90	21.50
EDGE 1 Tx slot	25.01	25.12	25.07	27.00	16.01	16.12	16.07	18.00
EDGE 2 Tx slots	24.68	24.75	25.03	27.00	18.68	18.75	19.03	21.00
EDGE 3 Tx slots	23.42	23.65	23.48	25.25	19.16	19.39	19.22	20.99
EDGE 4 Tx slots	22.02	22.13	22.20	24.00	19.02	19.13	19.20	21.00

<Near-body and Hotspot Mode>

GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	128	189	251		128	189	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GSM 1 Tx slot	33.19	33.13	32.95	33.50	24.19	24.13	23.95	24.50
GPRS 1 Tx slot	33.20	33.16	33.07	33.50	24.20	24.16	24.07	24.50
GPRS 2 Tx slots	29.01	28.82	28.86	30.50	23.01	22.82	22.86	24.50
GPRS 3 Tx slots	27.23	27.14	27.38	28.75	22.97	22.88	23.12	24.49
GPRS 4 Tx slots	26.57	26.45	26.34	27.50	23.57	23.45	23.34	24.50
EDGE 1 Tx slot	26.05	26.12	26.00	28.00	17.05	17.12	17.00	19.00
EDGE 2 Tx slots	25.73	25.64	25.63	28.00	19.73	19.64	19.63	22.00
EDGE 3 Tx slots	24.89	25.11	24.79	26.25	20.63	20.85	20.53	21.99
EDGE 4 Tx slots	23.85	24.07	23.77	25.00	20.85	21.07	20.77	22.00

GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	29.18	29.20	29.22	30.50	20.18	20.20	20.22	21.50
GPRS 1 Tx slot	29.14	29.19	29.28	30.50	20.14	20.19	20.28	21.50
GPRS 2 Tx slots	25.62	25.72	25.77	27.50	19.62	19.72	19.77	21.50
GPRS 3 Tx slots	24.16	24.18	24.21	25.75	19.90	19.92	19.95	21.49
GPRS 4 Tx slots	22.79	22.75	22.90	24.50	19.79	19.75	19.90	21.50
EDGE 1 Tx slot	25.01	25.12	25.07	27.00	16.01	16.12	16.07	18.00
EDGE 2 Tx slots	24.68	24.75	25.03	27.00	18.68	18.75	19.03	21.00
EDGE 3 Tx slots	23.42	23.65	23.48	25.25	19.16	19.39	19.22	20.99
EDGE 4 Tx slots	22.02	22.13	22.20	24.00	19.02	19.13	19.20	21.00

<WCDMA Conducted Power>

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

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

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

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

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

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

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

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

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

Setup Configuration

HSUPA Setup Configuration:

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

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

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

Note 1: For sub-test 1 to 4, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c . For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c .
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.
Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

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

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

C.8.1.12 Fixed Reference Channel Definition H-Set 12

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

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

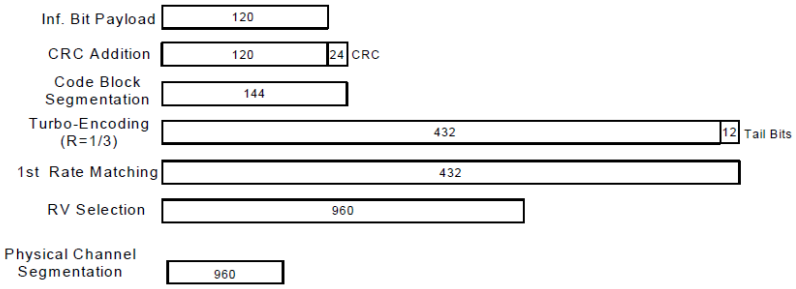


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

General Note:

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

< At-Head and Default Power Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	22.38	22.05	22.41	24.00	22.31	22.42	22.38	24.00	23.16	23.14	22.85	24.00
3GPP Rel 99	RMC 12.2Kbps	22.51	22.25	22.50	24.00	22.38	22.54	22.40	24.00	23.18	23.17	22.88	24.00
3GPP Rel 6	HSDPA Subtest-1	21.50	21.36	21.48	23.00	21.37	21.53	21.29	23.00	22.21	22.07	21.81	23.00
3GPP Rel 6	HSDPA Subtest-2	21.42	21.31	21.43	23.00	21.32	21.50	21.28	23.00	22.17	22.10	21.78	23.00
3GPP Rel 6	HSDPA Subtest-3	20.94	20.87	20.91	22.50	20.78	20.93	20.97	22.50	21.73	21.67	21.44	22.50
3GPP Rel 6	HSDPA Subtest-4	20.92	20.84	20.90	22.50	20.80	20.91	20.92	22.50	21.66	21.58	21.34	22.50
3GPP Rel 8	DC-HSDPA Subtest-1	21.34	21.30	21.44	23.00	21.36	21.53	21.12	23.00	22.21	22.04	21.73	23.00
3GPP Rel 8	DC-HSDPA Subtest-2	21.36	21.11	21.39	23.00	21.23	21.47	21.15	23.00	22.03	21.91	21.61	23.00
3GPP Rel 8	DC-HSDPA Subtest-3	20.76	20.76	20.81	22.50	20.70	20.78	20.79	22.50	21.64	21.60	21.44	22.50
3GPP Rel 8	DC-HSDPA Subtest-4	20.92	20.75	20.90	22.50	20.68	20.84	20.75	22.50	21.66	21.50	21.18	22.50
3GPP Rel 6	HSUPA Subtest-1	21.28	21.13	21.06	23.00	21.22	21.10	21.06	23.00	22.09	22.16	21.78	23.00
3GPP Rel 6	HSUPA Subtest-2	19.26	19.15	19.07	21.00	19.20	19.10	19.08	21.00	20.01	20.08	19.81	21.00
3GPP Rel 6	HSUPA Subtest-3	20.21	20.16	20.10	22.00	20.28	20.19	20.11	22.00	21.12	21.14	20.80	22.00
3GPP Rel 6	HSUPA Subtest-4	19.20	19.12	19.07	21.00	19.26	19.18	19.09	21.00	20.03	20.04	19.80	21.00
3GPP Rel 6	HSUPA Subtest-5	21.52	21.37	21.11	23.00	21.37	21.52	21.50	23.00	22.29	22.19	21.84	23.00

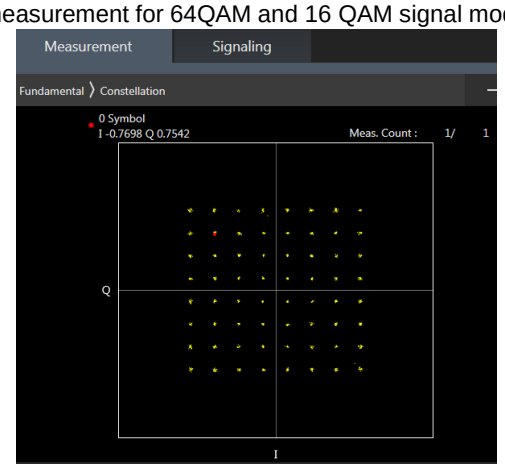
<Near-body and Hotspot Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	21.51	21.35	21.41	23.00	20.98	20.84	20.87	22.50	21.59	21.57	21.19	22.50
3GPP Rel 99	RMC 12.2Kbps	21.55	21.36	21.41	23.00	21.01	20.85	20.94	22.50	21.60	21.58	21.20	22.50
3GPP Rel 6	HSDPA Subtest-1	20.44	20.10	20.53	22.00	20.05	20.37	19.71	21.50	20.52	20.58	20.20	21.50
3GPP Rel 6	HSDPA Subtest-2	20.50	20.44	20.48	22.00	20.07	20.13	19.92	21.50	20.54	20.57	20.21	21.50
3GPP Rel 6	HSDPA Subtest-3	20.10	19.72	19.98	21.50	19.32	19.24	19.29	21.00	20.09	20.13	19.80	21.00
3GPP Rel 6	HSDPA Subtest-4	20.04	20.03	19.88	21.50	19.41	19.33	19.44	21.00	20.06	20.12	19.77	21.00
3GPP Rel 8	DC-HSDPA Subtest-1	20.57	20.27	20.39	22.00	20.40	20.14	19.88	21.50	20.48	20.57	20.19	21.50
3GPP Rel 8	DC-HSDPA Subtest-2	20.44	20.29	20.51	22.00	20.02	20.06	19.98	21.50	20.51	20.55	20.20	21.50
3GPP Rel 8	DC-HSDPA Subtest-3	19.84	19.75	19.96	21.50	19.29	19.53	19.55	21.00	20.08	20.11	19.78	21.00
3GPP Rel 8	DC-HSDPA Subtest-4	20.01	19.93	20.09	21.50	19.61	19.51	19.18	21.00	20.08	20.12	19.79	21.00
3GPP Rel 6	HSUPA Subtest-1	20.35	20.30	20.32	22.00	20.05	19.68	19.75	21.50	20.50	20.58	20.20	21.50
3GPP Rel 6	HSUPA Subtest-2	18.28	18.18	18.32	20.00	17.99	17.92	18.03	19.50	18.49	18.59	18.22	19.50
3GPP Rel 6	HSUPA Subtest-3	19.39	19.38	19.39	21.00	19.09	18.77	18.93	20.50	19.52	19.61	19.23	20.50
3GPP Rel 6	HSUPA Subtest-4	18.51	18.47	18.24	20.00	18.18	17.97	17.78	19.50	18.51	18.60	18.21	19.50
3GPP Rel 6	HSUPA Subtest-5	20.62	20.24	20.37	22.00	20.06	19.94	20.06	21.50	20.53	20.60	20.20	21.50

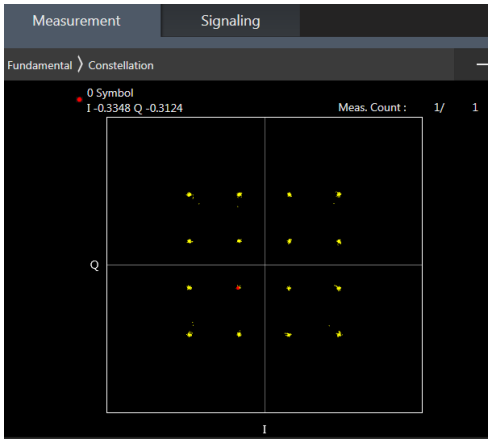
<LTE Conducted Power>

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/64QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B5 / B12 / B17 / B26 / B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. According to 2017 TCB workshop, for 64 QAM and 16 QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore the conducted power measurement for 64QAM and 16 QAM signal modulation are correct.



64QAM



16QAM

<At-Head and 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	22.67	22.59	22.78	24	0
20	QPSK	1	49	22.33	22.28	22.50		
20	QPSK	1	99	22.41	22.44	22.53		
20	QPSK	50	0	21.48	21.44	21.68	23	1
20	QPSK	50	24	21.44	21.41	21.64		
20	QPSK	50	50	21.41	21.39	21.58		
20	QPSK	100	0	21.45	21.44	21.63		
20	16QAM	1	0	21.91	21.81	21.97	23	1
20	16QAM	1	49	21.58	21.49	21.68		
20	16QAM	1	99	21.61	21.66	21.74		
20	16QAM	50	0	20.54	20.48	20.71	22	2
20	16QAM	50	24	20.45	20.43	20.63		
20	16QAM	50	50	20.40	20.39	20.59		
20	16QAM	100	0	20.45	20.42	20.64		
20	64QAM	1	0	21.78	21.69	21.83	22	2
20	64QAM	1	49	21.49	21.38	21.63		
20	64QAM	1	99	21.50	21.48	21.54		
20	64QAM	50	0	20.53	20.45	20.61	21	3
20	64QAM	50	24	20.42	20.37	20.64		
20	64QAM	50	50	20.35	20.32	20.66		
20	64QAM	100	0	20.38	20.53	20.67		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.44	22.39	22.61	24	0
15	QPSK	1	37	22.30	22.26	22.49		
15	QPSK	1	74	22.30	22.26	22.51		
15	QPSK	36	0	21.44	21.45	21.66	23	1
15	QPSK	36	20	21.42	21.38	21.63		
15	QPSK	36	39	21.37	21.35	21.58		
15	QPSK	75	0	21.43	21.38	21.62		
15	16QAM	1	0	21.71	21.66	21.86	23	1
15	16QAM	1	37	21.56	21.52	21.72		
15	16QAM	1	74	21.56	21.54	21.77		
15	16QAM	36	0	20.47	20.46	20.66	22	2
15	16QAM	36	20	20.41	20.43	20.64		
15	16QAM	36	39	20.36	20.39	20.60		
15	16QAM	75	0	20.43	20.41	20.63		
15	64QAM	1	0	21.63	21.45	21.75	22	2
15	64QAM	1	37	21.30	21.46	21.50		
15	64QAM	1	74	21.44	21.30	21.53		
15	64QAM	36	0	20.52	20.39	20.64	21	3
15	64QAM	36	20	20.48	20.44	20.72		
15	64QAM	36	39	20.32	20.29	20.53		
15	64QAM	75	0	20.33	20.35	20.69		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.62	22.59	22.62	24	0
10	QPSK	1	25	22.30	22.30	22.53		
10	QPSK	1	49	22.52	22.51	22.54		
10	QPSK	25	0	21.40	21.39	21.63	23	1
10	QPSK	25	12	21.36	21.36	21.58		
10	QPSK	25	25	21.36	21.33	21.57		
10	QPSK	50	0	21.35	21.38	21.61		
10	16QAM	1	0	21.77	21.77	21.80	23	1
10	16QAM	1	25	21.53	21.50	21.74		
10	16QAM	1	49	21.69	21.70	21.74		
10	16QAM	25	0	20.43	20.40	20.62	22	2
10	16QAM	25	12	20.40	20.40	20.62		
10	16QAM	25	25	20.36	20.37	20.60		
10	16QAM	50	0	20.41	20.39	20.61		
10	64QAM	1	0	21.79	21.66	21.66	22	2
10	64QAM	1	25	21.39	21.38	21.71		
10	64QAM	1	49	21.56	21.65	21.58		
10	64QAM	25	0	20.42	20.37	20.64	21	3
10	64QAM	25	12	20.27	20.40	20.67		
10	64QAM	25	25	20.29	20.43	20.58		
10	64QAM	50	0	20.35	20.45	20.68		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.36	22.34	22.61	24	0
5	QPSK	1	12	22.27	22.27	22.54		
5	QPSK	1	24	22.32	22.33	22.57		
5	QPSK	12	0	21.35	21.37	21.62	23	1
5	QPSK	12	7	21.33	21.37	21.62		
5	QPSK	12	13	21.31	21.33	21.60		
5	QPSK	25	0	21.33	21.34	21.57		
5	16QAM	1	0	21.51	21.52	21.75	23	1
5	16QAM	1	12	21.50	21.50	21.76		
5	16QAM	1	24	21.48	21.51	21.74		
5	16QAM	12	0	20.37	20.40	20.62	22	2
5	16QAM	12	7	20.37	20.39	20.67		
5	16QAM	12	13	20.34	20.35	20.61		
5	16QAM	25	0	20.34	20.37	20.62		
5	64QAM	1	0	21.50	21.50	21.64	22	2
5	64QAM	1	12	21.32	21.43	21.67		
5	64QAM	1	24	21.47	21.47	21.57		
5	64QAM	12	0	20.34	20.32	20.69	21	3
5	64QAM	12	7	20.32	20.43	20.57		
5	64QAM	12	13	20.35	20.28	20.53		
5	64QAM	25	0	20.40	20.34	20.60		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.30	22.32	22.55	24	0
3	QPSK	1	8	22.28	22.30	22.54		
3	QPSK	1	14	22.28	22.28	22.53		
3	QPSK	8	0	21.32	21.35	21.58	23	1
3	QPSK	8	4	21.32	21.35	21.58		
3	QPSK	8	7	21.30	21.34	21.57		
3	QPSK	15	0	21.28	21.34	21.58		
3	16QAM	1	0	21.44	21.48	21.71	23	1
3	16QAM	1	8	21.48	21.49	21.75		
3	16QAM	1	14	21.45	21.46	21.65		
3	16QAM	8	0	20.37	20.41	20.65	22	2
3	16QAM	8	4	20.38	20.42	20.68		
3	16QAM	8	7	20.33	20.40	20.62		
3	16QAM	15	0	20.36	20.36	20.61		
3	64QAM	1	0	21.30	21.46	21.62	22	2
3	64QAM	1	8	21.36	21.39	21.61		
3	64QAM	1	14	21.48	21.31	21.66		
3	64QAM	8	0	20.42	20.25	20.67	21	3
3	64QAM	8	4	20.40	20.31	20.54		
3	64QAM	8	7	20.20	20.37	20.48		
3	64QAM	15	0	20.26	20.29	20.62		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.18	22.21	22.47	24	0
1.4	QPSK	1	3	22.26	22.28	22.50		
1.4	QPSK	1	5	22.16	22.22	22.43		
1.4	QPSK	3	0	22.25	22.26	22.54		
1.4	QPSK	3	1	22.31	22.34	22.59		
1.4	QPSK	3	3	22.23	22.25	22.53		
1.4	QPSK	6	0	21.24	21.28	21.51	23	1
1.4	16QAM	1	0	21.35	21.37	21.66	23	1
1.4	16QAM	1	3	21.45	21.50	21.70		
1.4	16QAM	1	5	21.37	21.42	21.62		
1.4	16QAM	3	0	21.21	21.27	21.51		
1.4	16QAM	3	1	21.28	21.30	21.54		
1.4	16QAM	3	3	21.22	21.23	21.47		
1.4	16QAM	6	0	20.32	20.36	20.59	22	2
1.4	64QAM	1	0	21.21	21.21	21.55	22	2
1.4	64QAM	1	3	21.42	21.32	21.66		
1.4	64QAM	1	5	21.30	21.22	21.55		
1.4	64QAM	3	0	21.28	21.31	21.57		
1.4	64QAM	3	1	21.36	21.27	21.49		
1.4	64QAM	3	3	21.14	21.27	21.47		
1.4	64QAM	6	0	20.24	20.23	20.41	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	22.72	22.76	22.68	24	0
20	QPSK	1	49	22.45	22.39	22.56		
20	QPSK	1	99	22.32	22.37	22.54		
20	QPSK	50	0	21.63	21.69	21.68	23	1
20	QPSK	50	24	21.59	21.56	21.67		
20	QPSK	50	50	21.52	21.50	21.65		
20	QPSK	100	0	21.57	21.65	21.68		
20	16QAM	1	0	21.99	21.95	21.89	23	1
20	16QAM	1	49	21.69	21.62	21.82		
20	16QAM	1	99	21.55	21.63	21.78		
20	16QAM	50	0	20.66	20.63	20.69	22	2
20	16QAM	50	24	20.56	20.57	20.67		
20	16QAM	50	50	20.53	20.50	20.63		
20	16QAM	100	0	20.58	20.58	20.67		
20	64QAM	1	0	21.84	21.92	21.83	22	2
20	64QAM	1	49	21.61	21.50	21.59		
20	64QAM	1	99	21.35	21.57	21.73		
20	64QAM	50	0	20.60	20.64	20.63	21	3
20	64QAM	50	24	20.59	20.56	20.70		
20	64QAM	50	50	20.43	20.43	20.60		
20	64QAM	100	0	20.65	20.69	20.70		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.72	22.53	22.65	24	0
15	QPSK	1	37	22.42	22.37	22.56		
15	QPSK	1	74	22.41	22.42	22.55		
15	QPSK	36	0	21.69	21.58	21.74	23	1
15	QPSK	36	20	21.53	21.55	21.70		
15	QPSK	36	39	21.50	21.49	21.64		
15	QPSK	75	0	21.54	21.53	21.68		
15	16QAM	1	0	21.94	21.81	21.91	23	1
15	16QAM	1	37	21.68	21.62	21.84		
15	16QAM	1	74	21.68	21.64	21.83		
15	16QAM	36	0	20.70	20.58	20.73	22	2
15	16QAM	36	20	20.57	20.56	20.69		
15	16QAM	36	39	20.50	20.46	20.63		
15	16QAM	75	0	20.54	20.54	20.68		
15	64QAM	1	0	21.83	21.54	21.77	22	2
15	64QAM	1	37	21.54	21.54	21.74		
15	64QAM	1	74	21.54	21.59	21.57		
15	64QAM	36	0	20.78	20.64	20.73	21	3
15	64QAM	36	20	20.51	20.55	20.69		
15	64QAM	36	39	20.47	20.55	20.61		
15	64QAM	75	0	20.48	20.45	20.59		

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	22.67	22.55	22.69	24	0
10	QPSK	1	25	22.57	22.42	22.57		
10	QPSK	1	49	22.45	22.40	22.54		
10	QPSK	25	0	21.66	21.56	21.67	23	1
10	QPSK	25	12	21.61	21.52	21.65		
10	QPSK	25	25	21.52	21.49	21.64		
10	QPSK	50	0	21.61	21.51	21.65		
10	16QAM	1	0	21.87	21.73	21.92	23	1
10	16QAM	1	25	21.78	21.63	21.82		
10	16QAM	1	49	21.66	21.61	21.79		
10	16QAM	25	0	20.66	20.52	20.67	22	2
10	16QAM	25	12	20.63	20.53	20.66		
10	16QAM	25	25	20.51	20.45	20.61		
10	16QAM	50	0	20.63	20.52	20.66		
10	64QAM	1	0	21.86	21.68	21.84	22	2
10	64QAM	1	25	21.73	21.57	21.77		
10	64QAM	1	49	21.53	21.57	21.65		
10	64QAM	25	0	20.72	20.58	20.67	21	3
10	64QAM	25	12	20.71	20.59	20.75		
10	64QAM	25	25	20.57	20.49	20.73		
10	64QAM	50	0	20.56	20.55	20.73		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	22.58	22.49	22.62	24	0
5	QPSK	1	12	22.53	22.42	22.57		
5	QPSK	1	24	22.55	22.41	22.58		
5	QPSK	12	0	21.64	21.51	21.67	23	1
5	QPSK	12	7	21.61	21.48	21.64		
5	QPSK	12	13	21.59	21.46	21.60		
5	QPSK	25	0	21.61	21.51	21.64		
5	16QAM	1	0	21.80	21.65	21.89	23	1
5	16QAM	1	12	21.78	21.60	21.85		
5	16QAM	1	24	21.76	21.60	21.81		
5	16QAM	12	0	20.64	20.50	20.68	22	2
5	16QAM	12	7	20.62	20.50	20.65		
5	16QAM	12	13	20.60	20.46	20.61		
5	16QAM	25	0	20.63	20.50	20.64		
5	64QAM	1	0	21.71	21.61	21.66	22	2
5	64QAM	1	12	21.61	21.62	21.72		
5	64QAM	1	24	21.71	21.46	21.67		
5	64QAM	12	0	20.57	20.45	20.68	21	3
5	64QAM	12	7	20.65	20.45	20.65		
5	64QAM	12	13	20.68	20.54	20.59		
5	64QAM	25	0	20.58	20.49	20.58		

Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	22.55	22.45	22.58	24	0
3	QPSK	1	8	22.53	22.42	22.55		
3	QPSK	1	14	22.53	22.39	22.53		
3	QPSK	8	0	21.57	21.48	21.64	23	1
3	QPSK	8	4	21.61	21.48	21.65		
3	QPSK	8	7	21.55	21.49	21.58		
3	QPSK	15	0	21.58	21.45	21.60		
3	16QAM	1	0	21.73	21.58	21.83	23	1
3	16QAM	1	8	21.75	21.60	21.81		
3	16QAM	1	14	21.72	21.57	21.77		
3	16QAM	8	0	20.63	20.52	20.68	22	2
3	16QAM	8	4	20.66	20.54	20.70		
3	16QAM	8	7	20.59	20.53	20.65		
3	16QAM	15	0	20.61	20.49	20.62		
3	64QAM	1	0	21.65	21.48	21.65	22	2
3	64QAM	1	8	21.65	21.51	21.61		
3	64QAM	1	14	21.56	21.40	21.71		
3	64QAM	8	0	20.55	20.42	20.74	21	3
3	64QAM	8	4	20.66	20.43	20.66		
3	64QAM	8	7	20.60	20.42	20.48		
3	64QAM	15	0	20.63	20.35	20.63		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	22.45	22.31	22.49	24	0
1.4	QPSK	1	3	22.51	22.41	22.58		
1.4	QPSK	1	5	22.45	22.31	22.51		
1.4	QPSK	3	0	22.52	22.40	22.57		
1.4	QPSK	3	1	22.57	22.44	22.62		
1.4	QPSK	3	3	22.52	22.39	22.55		
1.4	QPSK	6	0	21.50	21.41	21.54	23	1
1.4	16QAM	1	0	21.66	21.52	21.76	23	1
1.4	16QAM	1	3	21.74	21.59	21.81		
1.4	16QAM	1	5	21.65	21.51	21.76		
1.4	16QAM	3	0	21.51	21.38	21.58		
1.4	16QAM	3	1	21.56	21.42	21.61		
1.4	16QAM	3	3	21.48	21.34	21.55		
1.4	16QAM	6	0	20.56	20.47	20.61	22	2
1.4	64QAM	1	0	21.46	21.33	21.52	22	2
1.4	64QAM	1	3	21.51	21.56	21.69		
1.4	64QAM	1	5	21.64	21.46	21.71		
1.4	64QAM	3	0	21.46	21.36	21.62		
1.4	64QAM	3	1	21.65	21.34	21.59		
1.4	64QAM	3	3	21.49	21.44	21.58		
1.4	64QAM	6	0	20.52	20.32	20.51	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	23.59	23.64	23.55	24	0
10	QPSK	1	25	23.52	23.55	23.39		
10	QPSK	1	49	23.52	23.45	23.26		
10	QPSK	25	0	22.59	22.63	22.54	23	1
10	QPSK	25	12	22.59	22.61	22.46		
10	QPSK	25	25	22.63	22.56	22.40		
10	QPSK	50	0	22.56	22.56	22.44		
10	16QAM	1	0	22.85	22.92	22.89	23	1
10	16QAM	1	25	22.78	22.88	22.68		
10	16QAM	1	49	22.82	22.78	22.60		
10	16QAM	25	0	21.59	21.62	21.56	22	2
10	16QAM	25	12	21.59	21.62	21.45		
10	16QAM	25	25	21.59	21.53	21.37		
10	16QAM	50	0	21.59	21.62	21.44		
10	64QAM	1	0	21.45	21.40	21.35	22	2
10	64QAM	1	25	21.41	21.35	21.15		
10	64QAM	1	49	21.39	21.24	21.03		
10	64QAM	25	0	20.32	20.24	20.17	21	3
10	64QAM	25	12	20.32	20.23	20.04		
10	64QAM	25	25	20.31	20.16	20.00		
10	64QAM	50	0	20.30	20.19	20.03		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	23.60	23.60	23.60	24	0
5	QPSK	1	12	23.54	23.57	23.54		
5	QPSK	1	24	23.52	23.53	23.52		
5	QPSK	12	0	22.62	22.58	22.62	23	1
5	QPSK	12	7	22.60	22.53	22.60		
5	QPSK	12	13	22.56	22.45	22.56		
5	QPSK	25	0	22.59	22.49	22.59		
5	16QAM	1	0	22.87	22.86	22.87	23	1
5	16QAM	1	12	22.83	22.81	22.83		
5	16QAM	1	24	22.80	22.79	22.80		
5	16QAM	12	0	21.65	21.54	21.65	22	2
5	16QAM	12	7	21.63	21.55	21.63		
5	16QAM	12	13	21.60	21.50	21.60		
5	16QAM	25	0	21.62	21.52	21.62		
5	64QAM	1	0	21.25	21.31	21.18	22	2
5	64QAM	1	12	21.29	21.28	21.10		
5	64QAM	1	24	21.24	21.05	20.85		
5	64QAM	12	0	20.32	20.18	19.99	21	3
5	64QAM	12	7	20.22	20.18	20.03		
5	64QAM	12	13	20.15	20.14	19.97		
5	64QAM	25	0	20.28	20.11	20.03		

Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	23.60	23.56	23.37	24	0
3	QPSK	1	8	23.57	23.52	23.37		
3	QPSK	1	14	23.57	23.51	23.30		
3	QPSK	8	0	22.65	22.57	22.38	23	1
3	QPSK	8	4	22.66	22.59	22.41		
3	QPSK	8	7	22.63	22.46	22.39		
3	QPSK	15	0	22.61	22.48	22.39		
3	16QAM	1	0	22.83	22.85	22.75	23	1
3	16QAM	1	8	22.81	22.83	22.69		
3	16QAM	1	14	22.78	22.81	22.61		
3	16QAM	8	0	21.69	21.57	21.47	22	2
3	16QAM	8	4	21.72	21.59	21.50		
3	16QAM	8	7	21.67	21.55	21.43		
3	16QAM	15	0	21.66	21.52	21.38		
3	64QAM	1	0	21.33	21.29	21.27	22	2
3	64QAM	1	8	21.39	21.23	21.06		
3	64QAM	1	14	21.23	21.09	20.87		
3	64QAM	8	0	20.23	20.12	20.00	21	3
3	64QAM	8	4	20.19	20.03	19.89		
3	64QAM	8	7	20.19	20.07	19.88		
3	64QAM	15	0	20.16	20.04	19.96		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	23.48	23.47	23.27	24	0
1.4	QPSK	1	3	23.55	23.57	23.33		
1.4	QPSK	1	5	23.46	23.44	23.24		
1.4	QPSK	3	0	23.51	23.52	23.31		
1.4	QPSK	3	1	23.59	23.57	23.36		
1.4	QPSK	3	3	23.51	23.50	23.30		
1.4	QPSK	6	0	22.51	22.50	22.29	23	1
1.4	16QAM	1	0	22.75	22.83	22.58	23	1
1.4	16QAM	1	3	22.84	22.90	22.67		
1.4	16QAM	1	5	22.75	22.81	22.55		
1.4	16QAM	3	0	22.55	22.57	22.36		
1.4	16QAM	3	1	22.61	22.63	22.38		
1.4	16QAM	3	3	22.52	22.56	22.34		
1.4	16QAM	6	0	21.61	21.56	21.38	22	2
1.4	64QAM	1	0	21.25	21.27	21.33	22	2
1.4	64QAM	1	3	21.21	21.32	20.96		
1.4	64QAM	1	5	21.34	21.22	20.90		
1.4	64QAM	3	0	20.28	20.12	20.12		
1.4	64QAM	3	1	20.22	20.09	20.03		
1.4	64QAM	3	3	20.11	20.07	20.01		
1.4	64QAM	6	0	20.20	20.10	19.83	21	3

<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	22.69	22.61	22.73	24	0
20	QPSK	1	49	22.65	22.51	22.64		
20	QPSK	1	99	22.65	22.38	22.56		
20	QPSK	50	0	21.63	21.58	21.71	23	1
20	QPSK	50	24	21.74	21.55	21.73		
20	QPSK	50	50	21.70	21.53	21.56		
20	QPSK	100	0	21.72	21.57	21.70		
20	16QAM	1	0	21.95	21.74	22.01	23	1
20	16QAM	1	49	21.93	21.77	21.92		
20	16QAM	1	99	22.06	21.65	21.83		
20	16QAM	50	0	20.69	20.58	20.74	22	2
20	16QAM	50	24	20.75	20.56	20.72		
20	16QAM	50	50	20.70	20.54	20.57		
20	16QAM	100	0	20.70	20.55	20.70		
20	64QAM	1	0	20.90	20.83	20.93	22	2
20	64QAM	1	49	20.79	20.81	20.80		
20	64QAM	1	99	20.88	20.65	20.66		
20	64QAM	50	0	19.73	19.81	19.97	21	3
20	64QAM	50	24	19.99	19.70	20.03		
20	64QAM	50	50	19.96	19.80	19.85		
20	64QAM	100	0	19.94	19.83	19.90		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	22.46	22.43	22.73	24	0
15	QPSK	1	37	22.46	22.49	22.54		
15	QPSK	1	74	22.45	22.38	22.56		
15	QPSK	36	0	21.42	21.58	21.70	23	1
15	QPSK	36	20	21.51	21.56	21.62		
15	QPSK	36	39	21.47	21.55	21.58		
15	QPSK	75	0	21.50	21.55	21.59		
15	16QAM	1	0	21.73	21.72	22.00	23	1
15	16QAM	1	37	21.74	21.78	21.84		
15	16QAM	1	74	21.73	21.66	21.84		
15	16QAM	36	0	20.45	20.56	20.72	22	2
15	16QAM	36	20	20.52	20.58	20.61		
15	16QAM	36	39	20.50	20.55	20.54		
15	16QAM	75	0	20.51	20.53	20.20		
15	64QAM	1	0	20.68	20.82	20.86	22	2
15	64QAM	1	37	20.57	20.72	20.73		
15	64QAM	1	74	20.58	20.54	20.70		
15	64QAM	36	0	19.71	19.83	19.90	21	3
15	64QAM	36	20	19.69	19.72	19.80		
15	64QAM	36	39	19.69	19.67	19.72		
15	64QAM	75	0	19.63	19.78	19.88		

Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	22.83	22.59	23.00	24	0
10	QPSK	1	25	22.83	22.59	22.97		
10	QPSK	1	49	22.72	22.60	22.96		
10	QPSK	25	0	21.84	21.61	22.01	23	1
10	QPSK	25	12	21.90	21.62	22.01		
10	QPSK	25	25	21.86	21.61	22.01		
10	QPSK	50	0	21.84	21.61	22.00		
10	16QAM	1	0	22.12	21.84	22.25	23	1
10	16QAM	1	25	22.11	21.87	22.25		
10	16QAM	1	49	21.98	21.86	22.24		
10	16QAM	25	0	20.86	20.60	20.99	22	2
10	16QAM	25	12	20.90	20.63	21.05		
10	16QAM	25	25	20.85	20.60	20.98		
10	16QAM	50	0	20.88	20.62	21.03		
10	64QAM	1	0	21.06	20.80	21.27	22	2
10	64QAM	1	25	20.98	20.82	21.25		
10	64QAM	1	49	20.96	20.71	21.08		
10	64QAM	25	0	20.14	19.91	20.15	21	3
10	64QAM	25	12	20.09	19.79	20.17		
10	64QAM	25	25	20.04	19.84	20.25		
10	64QAM	50	0	19.96	19.88	20.29		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	22.81	22.58	22.99	24	0
5	QPSK	1	12	22.83	22.60	23.00		
5	QPSK	1	24	22.81	22.59	23.00		
5	QPSK	12	0	21.85	21.65	22.04	23	1
5	QPSK	12	7	21.89	21.65	22.10		
5	QPSK	12	13	21.86	21.63	22.06		
5	QPSK	25	0	21.83	21.63	22.04		
5	16QAM	1	0	22.10	21.86	22.29	23	1
5	16QAM	1	12	22.12	21.90	22.33		
5	16QAM	1	24	22.06	21.87	22.28		
5	16QAM	12	0	20.89	20.65	21.06	22	2
5	16QAM	12	7	20.93	20.71	21.12		
5	16QAM	12	13	20.85	20.64	21.03		
5	16QAM	25	0	20.88	20.64	21.06		
5	64QAM	1	0	21.10	20.78	21.16	22	2
5	64QAM	1	12	20.98	20.74	21.30		
5	64QAM	1	24	20.93	20.69	21.18		
5	64QAM	12	0	20.08	19.85	20.26	21	3
5	64QAM	12	7	20.12	19.88	20.35		
5	64QAM	12	13	20.02	19.73	20.19		
5	64QAM	25	0	20.03	19.84	20.34		

<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	22.60	23.50	23.34	24	0
10	QPSK	1	25	22.57	23.37	23.32		
10	QPSK	1	49	22.56	23.32	23.33		
10	QPSK	25	0	22.39	21.61	22.36	23	1
10	QPSK	25	12	22.42	21.53	22.40		
10	QPSK	25	25	22.41	21.44	22.44		
10	QPSK	50	0	22.41	21.60	22.34		
10	16QAM	1	0	22.64	21.85	22.63	23	1
10	16QAM	1	25	22.61	21.85	22.60		
10	16QAM	1	49	22.61	21.84	22.71		
10	16QAM	25	0	21.42	20.59	21.36	22	2
10	16QAM	25	12	21.43	20.65	21.38		
10	16QAM	25	25	21.39	20.58	21.43		
10	16QAM	50	0	21.43	20.63	21.35		
10	64QAM	1	0	21.19	21.17	21.20	22	2
10	64QAM	1	25	21.30	21.28	21.15		
10	64QAM	1	49	21.22	21.17	21.27		
10	64QAM	25	0	20.02	20.12	20.11	21	3
10	64QAM	25	12	20.16	20.13	20.10		
10	64QAM	25	25	20.11	20.09	20.14		
10	64QAM	50	0	20.13	20.09	20.08		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	23.46	23.37	23.31	24	0
5	QPSK	1	12	23.41	23.36	23.36		
5	QPSK	1	24	23.49	23.37	23.34		
5	QPSK	12	0	22.46	22.40	22.44	23	1
5	QPSK	12	7	22.47	22.40	22.44		
5	QPSK	12	13	22.45	22.40	22.43		
5	QPSK	25	0	22.45	22.39	22.42		
5	16QAM	1	0	22.76	22.70	22.60	23	1
5	16QAM	1	12	22.78	22.63	22.74		
5	16QAM	1	24	22.87	22.57	22.72		
5	16QAM	12	0	21.49	21.46	21.45	22	2
5	16QAM	12	7	21.49	21.45	21.48		
5	16QAM	12	13	21.34	21.37	21.43		
5	16QAM	25	0	21.37	21.41	21.43		
5	64QAM	1	0	21.12	21.15	21.10	22	2
5	64QAM	1	12	21.27	21.10	21.02		
5	64QAM	1	24	21.06	21.03	21.13		
5	64QAM	12	0	19.91	20.09	20.06	21	3
5	64QAM	12	7	19.97	20.07	20.05		
5	64QAM	12	13	19.93	19.89	20.12		
5	64QAM	25	0	19.99	19.96	20.05		

Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	23.33	23.36	23.37	24	0
3	QPSK	1	8	23.32	23.34	23.33		
3	QPSK	1	14	23.29	23.34	23.32		
3	QPSK	8	0	22.33	22.37	22.42	23	1
3	QPSK	8	4	22.38	22.38	22.45		
3	QPSK	8	7	22.36	22.35	22.40		
3	QPSK	15	0	22.35	22.39	22.41		
3	16QAM	1	0	22.65	22.67	22.73	23	1
3	16QAM	1	8	22.70	22.63	22.75		
3	16QAM	1	14	22.71	22.59	22.73		
3	16QAM	8	0	21.42	21.44	21.47	22	2
3	16QAM	8	4	21.42	21.47	21.49		
3	16QAM	8	7	21.42	21.44	21.47		
3	16QAM	15	0	21.35	21.40	21.41		
3	64QAM	1	0	21.08	20.97	21.08	22	2
3	64QAM	1	8	21.30	21.14	21.09		
3	64QAM	1	14	21.20	21.14	21.14		
3	64QAM	8	0	19.87	20.04	20.07	21	3
3	64QAM	8	4	20.15	19.96	19.90		
3	64QAM	8	7	20.01	20.06	20.11		
3	64QAM	15	0	20.00	19.91	19.98		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	23.25	23.27	23.26	24	0
1.4	QPSK	1	3	23.35	23.33	23.36		
1.4	QPSK	1	5	23.27	23.24	23.24		
1.4	QPSK	3	0	23.31	23.31	23.28		
1.4	QPSK	3	1	23.36	23.38	23.36		
1.4	QPSK	3	3	23.32	23.31	23.32		
1.4	QPSK	6	0	22.30	22.30	22.31	23	1
1.4	16QAM	1	0	22.58	22.56	22.65	23	1
1.4	16QAM	1	3	22.65	22.60	22.70		
1.4	16QAM	1	5	22.61	22.54	22.62		
1.4	16QAM	3	0	22.24	22.31	22.38		
1.4	16QAM	3	1	22.36	22.37	22.43		
1.4	16QAM	3	3	22.23	22.31	22.36		
1.4	16QAM	6	0	21.34	21.34	21.38	22	2
1.4	64QAM	1	0	21.05	21.07	21.09	22	2
1.4	64QAM	1	3	21.19	21.23	21.06		
1.4	64QAM	1	5	21.20	21.00	21.21		
1.4	64QAM	3	0	21.00	21.05	20.93		
1.4	64QAM	3	1	21.07	21.13	21.00		
1.4	64QAM	3	3	20.94	21.04	20.94		
1.4	64QAM	6	0	20.07	19.90	19.92	21	3

<LTE Band 17>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23780	23790	23800		
Frequency (MHz)				709	710	711		
10	QPSK	1	0	23.18	23.48	23.28	24	0
10	QPSK	1	25	23.37	23.34	23.35		
10	QPSK	1	49	23.41	23.38	23.39		
10	QPSK	25	0	22.43	22.53	22.42	23	1
10	QPSK	25	12	22.45	22.44	22.43		
10	QPSK	25	25	22.43	22.49	22.50		
10	QPSK	50	0	22.42	22.42	22.38		
10	16QAM	1	0	22.52	22.59	22.56	23	1
10	16QAM	1	25	22.63	22.61	22.61		
10	16QAM	1	49	22.78	22.75	22.72		
10	16QAM	25	0	21.44	21.44	21.43	22	2
10	16QAM	25	12	21.46	21.44	21.43		
10	16QAM	25	25	21.40	21.45	21.45		
10	16QAM	50	0	21.44	21.42	21.40		
10	64QAM	1	0	21.09	21.16	21.15	22	2
10	64QAM	1	25	21.23	21.22	21.25		
10	64QAM	1	49	21.32	21.29	21.28		
10	64QAM	25	0	20.13	20.13	20.11	21	3
10	64QAM	25	12	20.15	20.15	20.12		
10	64QAM	25	25	20.11	20.19	20.14		
10	64QAM	50	0	20.14	20.14	20.11		
Channel				23755	23790	23825	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				706.5	710	713.5		
5	QPSK	1	0	23.20	23.38	23.33	24	0
5	QPSK	1	12	23.29	23.35	23.41		
5	QPSK	1	24	23.39	23.46	23.39		
5	QPSK	12	0	22.34	22.42	22.46	23	1
5	QPSK	12	7	22.35	22.43	22.48		
5	QPSK	12	13	22.36	22.36	22.42		
5	QPSK	25	0	22.32	22.42	22.47		
5	16QAM	1	0	22.56	22.61	22.61	23	1
5	16QAM	1	12	22.59	22.61	22.78		
5	16QAM	1	24	22.62	22.75	22.75		
5	16QAM	12	0	21.39	21.42	21.47	22	2
5	16QAM	12	7	21.41	21.41	21.48		
5	16QAM	12	13	21.34	21.38	21.43		
5	16QAM	25	0	21.35	21.42	21.44		
5	64QAM	1	0	20.96	20.98	21.00	22	2
5	64QAM	1	12	21.14	21.13	21.05		
5	64QAM	1	24	21.15	21.21	21.08		
5	64QAM	12	0	20.00	20.09	20.08	21	3
5	64QAM	12	7	19.95	20.14	20.12		
5	64QAM	12	13	20.03	20.05	20.05		
5	64QAM	25	0	19.97	20.02	19.92		

<LTE Band 25>

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				26140	26340	26590		
Frequency (MHz)				1860	1880	1905		
20	QPSK	1	0	22.63	22.68	22.61	24	0
20	QPSK	1	49	22.36	22.34	22.50		
20	QPSK	1	99	22.38	22.40	22.41		
20	QPSK	50	0	21.48	21.55	21.54	23	1
20	QPSK	50	24	21.36	21.48	21.48		
20	QPSK	50	50	21.36	21.38	21.49		
20	QPSK	100	0	21.40	21.63	21.59		
20	16QAM	1	0	21.97	21.98	21.90	23	1
20	16QAM	1	49	21.59	21.68	21.76		
20	16QAM	1	99	21.63	21.66	21.65		
20	16QAM	50	0	20.46	20.46	20.57	22	2
20	16QAM	50	24	20.43	20.41	20.54		
20	16QAM	50	50	20.16	20.37	20.47		
20	16QAM	100	0	20.43	20.49	20.84		
20	64QAM	1	0	20.67	20.88	20.78	22	2
20	64QAM	1	49	20.50	20.49	20.53		
20	64QAM	1	99	20.40	20.54	20.51		
20	64QAM	50	0	19.40	19.64	19.48	21	3
20	64QAM	50	24	19.35	19.53	19.57		
20	64QAM	50	50	19.43	19.41	19.52		
20	64QAM	100	0	19.39	19.70	19.56		
Channel				26115	26340	26615	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1907.5		
15	QPSK	1	0	22.38	22.43	22.60	24	0
15	QPSK	1	37	22.23	22.29	22.35		
15	QPSK	1	74	22.17	22.21	22.39		
15	QPSK	36	0	21.36	21.45	21.59	23	1
15	QPSK	36	20	21.32	21.44	21.47		
15	QPSK	36	39	21.31	21.38	21.45		
15	QPSK	75	0	21.37	21.43	21.50		
15	16QAM	1	0	21.63	21.70	21.88	23	1
15	16QAM	1	37	21.51	21.57	21.64		
15	16QAM	1	74	21.41	21.49	21.59		
15	16QAM	36	0	20.41	20.48	20.62	22	2
15	16QAM	36	20	20.35	20.43	20.49		
15	16QAM	36	39	20.31	20.39	20.45		
15	16QAM	75	0	20.37	20.44	20.46		
15	64QAM	1	0	20.47	20.48	20.79	22	2
15	64QAM	1	37	20.28	20.43	20.37		
15	64QAM	1	74	20.27	20.25	20.54		
15	64QAM	36	0	19.43	19.48	19.67	21	3
15	64QAM	36	20	19.31	19.46	19.50		
15	64QAM	36	39	19.37	19.29	19.38		
15	64QAM	75	0	19.41	19.52	19.56		

Channel				26090	26340	26640	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1910		
10	QPSK	1	0	22.53	22.60	22.47	24	0
10	QPSK	1	25	22.24	22.33	22.37		
10	QPSK	1	49	22.42	22.50	22.42		
10	QPSK	25	0	21.35	21.43	21.47	23	1
10	QPSK	25	12	21.31	21.38	21.48		
10	QPSK	25	25	21.31	21.40	21.49		
10	QPSK	50	0	21.33	21.42	21.48		
10	16QAM	1	0	21.74	21.83	21.72	23	1
10	16QAM	1	25	21.48	21.58	21.62		
10	16QAM	1	49	21.64	21.72	21.54		
10	16QAM	25	0	20.37	20.47	20.50	22	2
10	16QAM	25	12	20.35	20.45	20.49		
10	16QAM	25	25	20.33	20.39	20.46		
10	16QAM	50	0	20.36	20.42	20.51		
10	64QAM	1	0	20.54	20.62	20.66	22	2
10	64QAM	1	25	20.24	20.44	20.54		
10	64QAM	1	49	20.47	20.62	20.57		
10	64QAM	25	0	19.38	19.33	19.42	21	3
10	64QAM	25	12	19.29	19.40	19.43		
10	64QAM	25	25	19.29	19.46	19.48		
10	64QAM	50	0	19.35	19.42	19.53		
Channel				26065	26340	26665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1912.5		
5	QPSK	1	0	22.28	22.37	22.45	24	0
5	QPSK	1	12	22.20	22.29	22.38		
5	QPSK	1	24	22.24	22.34	22.44		
5	QPSK	12	0	21.29	21.40	21.48	23	1
5	QPSK	12	7	21.32	21.41	21.48		
5	QPSK	12	13	21.25	21.37	21.44		
5	QPSK	25	0	21.25	21.39	21.49		
5	16QAM	1	0	21.50	21.59	21.64	23	1
5	16QAM	1	12	21.46	21.55	21.59		
5	16QAM	1	24	21.45	21.58	21.54		
5	16QAM	12	0	20.34	20.42	20.46	22	2
5	16QAM	12	7	20.31	20.43	20.45		
5	16QAM	12	13	20.28	20.40	20.42		
5	16QAM	25	0	20.31	20.40	20.46		
5	64QAM	1	0	20.41	20.49	20.61	22	2
5	64QAM	1	12	20.34	20.42	20.55		
5	64QAM	1	24	20.38	20.49	20.51		
5	64QAM	12	0	19.34	19.33	19.49	21	3
5	64QAM	12	7	19.30	19.41	19.38		
5	64QAM	12	13	19.27	19.36	19.41		
5	64QAM	25	0	19.24	19.45	19.43		

Channel				26055	26340	26675	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1913.5		
3	QPSK	1	0	22.22	22.34	22.42	24	0
3	QPSK	1	8	22.21	22.30	22.42		
3	QPSK	1	14	22.21	22.29	22.43		
3	QPSK	8	0	21.26	21.37	21.48	23	1
3	QPSK	8	4	21.27	21.40	21.50		
3	QPSK	8	7	21.27	21.36	21.50		
3	QPSK	15	0	21.26	21.36	21.47		
3	16QAM	1	0	21.45	21.54	21.55	23	1
3	16QAM	1	8	21.44	21.53	21.57		
3	16QAM	1	14	21.43	21.52	21.53		
3	16QAM	8	0	20.33	20.46	20.52	22	2
3	16QAM	8	4	20.35	20.45	20.52		
3	16QAM	8	7	20.30	20.42	20.55		
3	16QAM	15	0	20.32	20.41	20.45		
3	64QAM	1	0	20.27	20.39	20.53	22	2
3	64QAM	1	8	20.37	20.41	20.53		
3	64QAM	1	14	20.37	20.32	20.45		
3	64QAM	8	0	19.34	19.46	19.46	21	3
3	64QAM	8	4	19.31	19.40	19.53		
3	64QAM	8	7	19.36	19.40	19.41		
3	64QAM	15	0	19.24	19.38	19.48		
Channel				26047	26340	26683	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1914.3		
1.4	QPSK	1	0	22.14	22.26	22.31	24	0
1.4	QPSK	1	3	22.17	22.31	22.39		
1.4	QPSK	1	5	22.12	22.25	22.30		
1.4	QPSK	3	0	22.19	22.32	22.38		
1.4	QPSK	3	1	22.25	22.35	22.43		
1.4	QPSK	3	3	22.17	22.30	22.39		
1.4	QPSK	6	0	21.17	21.29	21.41	23	1
1.4	16QAM	1	0	21.38	21.48	21.49	23	1
1.4	16QAM	1	3	21.44	21.54	21.57		
1.4	16QAM	1	5	21.38	21.47	21.48		
1.4	16QAM	3	0	21.19	21.30	21.39		
1.4	16QAM	3	1	21.25	21.36	21.41		
1.4	16QAM	3	3	21.19	21.30	21.36		
1.4	16QAM	6	0	20.27	20.37	20.47	22	2
1.4	64QAM	1	0	20.32	20.66	20.45	22	2
1.4	64QAM	1	3	20.24	20.43	20.43		
1.4	64QAM	1	5	20.12	20.33	20.30		
1.4	64QAM	3	0	20.13	20.30	20.36		
1.4	64QAM	3	1	20.21	20.42	20.38		
1.4	64QAM	3	3	20.20	20.38	20.32		
1.4	64QAM	6	0	19.08	19.26	19.39	21	3

<LTE Band 26>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				26765	26865	26965		
Frequency (MHz)				821.5	831.5	841.5		
15	QPSK	1	0	23.62	23.65	23.64	24	0
15	QPSK	1	37	23.61	23.61	23.52		
15	QPSK	1	74	23.49	23.42	23.35		
15	QPSK	36	0	22.70	22.70	22.64	23	1
15	QPSK	36	20	22.64	22.67	22.63		
15	QPSK	36	39	22.59	22.56	22.51		
15	QPSK	75	0	22.62	22.69	22.59		
15	16QAM	1	0	22.88	22.92	22.90	23	1
15	16QAM	1	37	22.88	22.86	22.79		
15	16QAM	1	74	22.73	22.68	22.63		
15	16QAM	36	0	21.66	21.70	21.64	22	2
15	16QAM	36	20	21.71	21.70	21.64		
15	16QAM	36	39	21.64	21.58	21.50		
15	16QAM	75	0	21.72	21.65	21.60		
15	64QAM	1	0	21.44	21.52	21.53	22	2
15	64QAM	1	37	21.41	21.50	21.32		
15	64QAM	1	74	21.34	21.39	21.16		
15	64QAM	36	0	20.34	20.38	20.37	21	3
15	64QAM	36	20	20.31	20.43	20.24		
15	64QAM	36	39	20.33	20.30	20.14		
15	64QAM	75	0	20.29	20.37	20.16		
Channel				26740	26865	26990	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	23.54	23.60	23.47	24	0
10	QPSK	1	25	23.57	23.63	23.39		
10	QPSK	1	49	23.58	23.50	23.28		
10	QPSK	25	0	22.55	22.70	22.47	23	1
10	QPSK	25	12	22.64	22.71	22.48		
10	QPSK	25	25	22.58	22.62	22.42		
10	QPSK	50	0	22.59	22.66	22.46		
10	16QAM	1	0	22.85	22.85	22.79	23	1
10	16QAM	1	25	22.88	22.88	22.69		
10	16QAM	1	49	22.85	22.84	22.60		
10	16QAM	25	0	21.57	21.72	21.51	22	2
10	16QAM	25	12	21.66	21.70	21.49		
10	16QAM	25	25	21.57	21.61	21.40		
10	16QAM	50	0	21.64	21.70	21.48		
10	64QAM	1	0	21.32	21.32	21.35	22	2
10	64QAM	1	25	21.25	21.46	21.25		
10	64QAM	1	49	21.31	21.29	21.04		
10	64QAM	25	0	20.22	20.29	20.22	21	3
10	64QAM	25	12	20.22	20.33	20.24		
10	64QAM	25	25	20.25	20.15	20.13		
10	64QAM	50	0	20.12	20.32	20.16		

Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	23.53	23.64	23.40	24	0
5	QPSK	1	12	23.47	23.60	23.35		
5	QPSK	1	24	23.55	23.57	23.35		
5	QPSK	12	0	22.56	22.70	22.43	23	1
5	QPSK	12	7	22.58	22.69	22.45		
5	QPSK	12	13	22.60	22.65	22.39		
5	QPSK	25	0	22.53	22.64	22.44		
5	16QAM	1	0	22.85	22.92	22.73	23	1
5	16QAM	1	12	22.81	22.92	22.69		
5	16QAM	1	24	22.89	22.91	22.65		
5	16QAM	12	0	21.61	21.71	21.47	22	2
5	16QAM	12	7	21.58	21.69	21.44		
5	16QAM	12	13	21.62	21.66	21.39		
5	16QAM	25	0	21.55	21.65	21.44		
5	64QAM	1	0	21.43	21.37	21.41	22	2
5	64QAM	1	12	21.23	21.44	21.14		
5	64QAM	1	24	21.33	21.26	21.16		
5	64QAM	12	0	20.25	20.25	20.27	21	3
5	64QAM	12	7	20.13	20.42	20.20		
5	64QAM	12	13	20.16	20.21	20.13		
5	64QAM	25	0	20.20	20.33	20.14		
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	23.51	23.64	23.38	24	0
3	QPSK	1	8	23.49	23.60	23.33		
3	QPSK	1	14	23.46	23.57	23.29		
3	QPSK	8	0	22.53	22.64	22.39	23	1
3	QPSK	8	4	22.56	22.69	22.42		
3	QPSK	8	7	22.55	22.64	22.41		
3	QPSK	15	0	22.56	22.66	22.39		
3	16QAM	1	0	22.83	22.91	22.76	23	1
3	16QAM	1	8	22.84	22.94	22.71		
3	16QAM	1	14	22.82	22.92	22.62		
3	16QAM	8	0	21.62	21.74	21.48	22	2
3	16QAM	8	4	21.64	21.75	21.51		
3	16QAM	8	7	21.59	21.69	21.45		
3	16QAM	15	0	21.60	21.70	21.40		
3	64QAM	1	0	21.32	21.52	21.52	22	2
3	64QAM	1	8	21.23	21.48	21.26		
3	64QAM	1	14	21.29	21.39	21.08		
3	64QAM	8	0	20.14	20.36	20.22	21	3
3	64QAM	8	4	20.11	20.42	20.24		
3	64QAM	8	7	20.32	20.30	20.09		
3	64QAM	15	0	20.12	20.33	20.07		

Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	23.46	23.51	23.27	24	0
1.4	QPSK	1	3	23.53	23.61	23.33		
1.4	QPSK	1	5	23.45	23.53	23.23		
1.4	QPSK	3	0	23.50	23.59	23.30		
1.4	QPSK	3	1	23.53	23.62	23.36		
1.4	QPSK	3	3	23.47	23.57	23.31		
1.4	QPSK	6	0	22.48	22.56	22.32	23	1
1.4	16QAM	1	0	22.77	22.83	22.59	23	1
1.4	16QAM	1	3	22.83	22.88	22.65		
1.4	16QAM	1	5	22.74	22.84	22.54		
1.4	16QAM	3	0	22.50	22.61	22.36		
1.4	16QAM	3	1	22.56	22.65	22.39		
1.4	16QAM	3	3	22.51	22.57	22.35		
1.4	16QAM	6	0	21.56	21.66	21.40	22	2
1.4	64QAM	1	0	21.30	21.44	21.46	22	2
1.4	64QAM	1	3	21.31	21.48	21.25		
1.4	64QAM	1	5	21.21	21.21	21.11		
1.4	64QAM	3	0	21.14	21.28	21.17		
1.4	64QAM	3	1	21.17	21.36	21.08		
1.4	64QAM	3	3	21.16	21.24	21.10		
1.4	64QAM	6	0	20.11	20.20	20.05	21	3

<LTE Band 30>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				27710				
Frequency (MHz)				2310				
10	QPSK	1	0	22.83			24	0
10	QPSK	1	25	22.74				
10	QPSK	1	49	22.69				
10	QPSK	25	0	21.82			23	1
10	QPSK	25	12	21.79				
10	QPSK	25	25	21.75				
10	QPSK	50	0	21.78				
10	16QAM	1	0	22.12			23	1
10	16QAM	1	25	22.03				
10	16QAM	1	49	21.98				
10	16QAM	25	0	20.81			22	2
10	16QAM	25	12	20.81				
10	16QAM	25	25	20.74				
10	16QAM	50	0	20.83				
10	64QAM	1	0	21.07			22	2
10	64QAM	1	25	20.98				
10	64QAM	1	49	20.93				
10	64QAM	25	0	19.88			21	3
10	64QAM	25	12	19.86				
10	64QAM	25	25	19.79				
10	64QAM	50	0	19.84				
Channel				27685	27710	27735	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2307.5	2310	2312.5		
5	QPSK	1	0	22.80	22.81	22.81	24	0
5	QPSK	1	12	22.73	22.77	22.76		
5	QPSK	1	24	22.76	22.76	22.77		
5	QPSK	12	0	21.82	21.80	21.82	23	1
5	QPSK	12	7	21.80	21.84	21.83		
5	QPSK	12	13	21.75	21.77	21.77		
5	QPSK	25	0	21.80	21.77	21.79		
5	16QAM	1	0	22.10	22.10	22.14	23	1
5	16QAM	1	12	22.06	22.08	22.08		
5	16QAM	1	24	22.03	22.06	22.04		
5	16QAM	12	0	20.81	20.84	20.85	22	2
5	16QAM	12	7	20.80	20.86	20.88		
5	16QAM	12	13	20.77	20.79	20.78		
5	16QAM	25	0	20.81	20.80	20.81		
5	64QAM	1	0	20.93	20.98	21.05	22	2
5	64QAM	1	12	20.83	21.01	20.86		
5	64QAM	1	24	20.97	21.05	21.04		
5	64QAM	12	0	20.06	19.90	20.00	21	3
5	64QAM	12	7	19.91	19.95	19.93		
5	64QAM	12	13	20.00	20.02	19.96		
5	64QAM	25	0	20.02	19.98	20.06		

<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	22.96	22.84	22.74	24	0
20	QPSK	1	49	22.75	22.53	22.36		
20	QPSK	1	99	22.60	22.40	22.31		
20	QPSK	50	0	21.88	21.68	21.67	23	1
20	QPSK	50	24	21.82	21.65	21.49		
20	QPSK	50	50	21.69	21.54	21.44		
20	QPSK	100	0	21.86	21.65	21.50		
20	16QAM	1	0	21.87	21.93	21.99	23	1
20	16QAM	1	49	21.97	21.77	21.61		
20	16QAM	1	99	21.84	21.65	21.51		
20	16QAM	50	0	20.93	20.75	20.70	22	2
20	16QAM	50	24	20.85	20.67	20.50		
20	16QAM	50	50	20.67	20.61	20.41		
20	16QAM	100	0	20.83	20.64	20.49		
20	64QAM	1	0	21.54	21.36	21.27	22	2
20	64QAM	1	49	21.30	21.06	20.93		
20	64QAM	1	99	21.19	20.94	20.88		
20	64QAM	50	0	20.41	20.12	20.19	21	3
20	64QAM	50	24	20.39	20.25	19.90		
20	64QAM	50	50	20.29	19.96	20.04		
20	64QAM	100	0	20.30	20.14	20.07		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	22.87	22.78	22.67	24	0
15	QPSK	1	37	22.69	22.51	22.34		
15	QPSK	1	74	22.60	22.50	22.32		
15	QPSK	36	0	21.84	21.69	21.53	23	1
15	QPSK	36	20	21.83	21.60	21.48		
15	QPSK	36	39	21.66	21.60	21.41		
15	QPSK	75	0	21.82	21.64	21.48		
15	16QAM	1	0	21.92	21.94	21.92	23	1
15	16QAM	1	37	21.95	21.80	21.59		
15	16QAM	1	74	21.83	21.78	21.59		
15	16QAM	36	0	20.86	20.67	20.53	22	2
15	16QAM	36	20	20.83	20.64	20.49		
15	16QAM	36	39	20.66	20.59	20.43		
15	16QAM	75	0	20.83	20.64	20.49		
15	64QAM	1	0	21.38	21.21	21.12	22	2
15	64QAM	1	37	21.13	20.97	20.92		
15	64QAM	1	74	21.12	21.01	20.73		
15	64QAM	36	0	20.37	20.10	20.05	21	3
15	64QAM	36	20	20.32	20.06	19.98		
15	64QAM	36	39	20.09	20.15	19.95		
15	64QAM	75	0	20.23	20.11	19.99		

Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	22.79	22.62	22.64	24	0
10	QPSK	1	25	22.72	22.52	22.53		
10	QPSK	1	49	22.71	22.49	22.51		
10	QPSK	25	0	21.82	21.64	21.64	23	1
10	QPSK	25	12	21.77	21.60	21.61		
10	QPSK	25	25	21.76	21.59	21.56		
10	QPSK	50	0	21.81	21.58	21.59		
10	16QAM	1	0	21.93	21.86	21.87	23	1
10	16QAM	1	25	21.96	21.80	21.80		
10	16QAM	1	49	21.94	21.77	21.76		
10	16QAM	25	0	20.82	20.61	20.56	22	2
10	16QAM	25	12	20.80	20.63	20.62		
10	16QAM	25	25	20.77	20.56	20.54		
10	16QAM	50	0	20.79	20.62	20.60		
10	64QAM	1	0	21.34	21.04	21.11	22	2
10	64QAM	1	25	21.18	21.04	21.09		
10	64QAM	1	49	21.29	20.93	21.08		
10	64QAM	25	0	20.28	20.04	20.21	21	3
10	64QAM	25	12	20.24	20.07	20.19		
10	64QAM	25	25	20.28	20.11	20.07		
10	64QAM	50	0	20.22	20.06	20.19		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	22.79	22.57	22.46	24	0
5	QPSK	1	12	22.73	22.51	22.37		
5	QPSK	1	24	22.74	22.51	22.38		
5	QPSK	12	0	21.76	21.63	21.45	23	1
5	QPSK	12	7	21.79	21.60	21.45		
5	QPSK	12	13	21.75	21.56	21.41		
5	QPSK	25	0	21.78	21.59	21.45		
5	16QAM	1	0	21.97	21.82	21.66	23	1
5	16QAM	1	12	21.96	21.77	21.61		
5	16QAM	1	24	21.95	21.77	21.55		
5	16QAM	12	0	20.80	20.62	20.45	22	2
5	16QAM	12	7	20.80	20.59	20.45		
5	16QAM	12	13	20.75	20.57	20.40		
5	16QAM	25	0	20.74	20.61	20.44		
5	64QAM	1	0	21.28	21.16	20.95	22	2
5	64QAM	1	12	21.14	20.98	20.92		
5	64QAM	1	24	21.18	21.02	20.97		
5	64QAM	12	0	20.23	20.03	19.90	21	3
5	64QAM	12	7	20.24	20.01	19.94		
5	64QAM	12	13	20.18	20.00	19.88		
5	64QAM	25	0	20.29	20.16	20.02		

Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	22.71	22.53	22.41	24	0
3	QPSK	1	8	22.68	22.51	22.37		
3	QPSK	1	14	22.69	22.47	22.37		
3	QPSK	8	0	21.72	21.58	21.42	23	1
3	QPSK	8	4	21.74	21.59	21.45		
3	QPSK	8	7	21.72	21.52	21.44		
3	QPSK	15	0	21.69	21.55	21.42		
3	16QAM	1	0	21.93	21.76	21.57	23	1
3	16QAM	1	8	21.92	21.74	21.58		
3	16QAM	1	14	21.89	21.75	21.49		
3	16QAM	8	0	20.78	20.63	20.48	22	2
3	16QAM	8	4	20.81	20.64	20.52		
3	16QAM	8	7	20.75	20.59	20.46		
3	16QAM	15	0	20.76	20.57	20.44		
3	64QAM	1	0	21.16	21.10	20.92	22	2
3	64QAM	1	8	21.24	21.05	20.77		
3	64QAM	1	14	21.14	20.97	20.78		
3	64QAM	8	0	20.12	20.07	19.94	21	3
3	64QAM	8	4	20.17	20.04	19.90		
3	64QAM	8	7	20.21	20.09	19.85		
3	64QAM	15	0	20.24	20.06	19.90		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	22.61	22.44	22.42	24	0
1.4	QPSK	1	3	22.66	22.51	22.38		
1.4	QPSK	1	5	22.59	22.43	22.30		
1.4	QPSK	3	0	22.65	22.49	22.36		
1.4	QPSK	3	1	22.69	22.53	22.41		
1.4	QPSK	3	3	22.65	22.47	22.36		
1.4	QPSK	6	0	21.64	21.47	21.37	23	1
1.4	16QAM	1	0	21.82	21.70	21.52	23	1
1.4	16QAM	1	3	21.89	21.75	21.56		
1.4	16QAM	1	5	21.82	21.68	21.49		
1.4	16QAM	3	0	21.66	21.51	21.37		
1.4	16QAM	3	1	21.69	21.53	21.42		
1.4	16QAM	3	3	21.64	21.45	21.36		
1.4	16QAM	6	0	20.72	20.53	20.43	22	2
1.4	64QAM	1	0	21.15	20.94	20.99	22	2
1.4	64QAM	1	3	21.12	21.10	20.85		
1.4	64QAM	1	5	21.11	20.95	20.84		
1.4	64QAM	3	0	21.17	21.04	20.96		
1.4	64QAM	3	1	21.19	21.06	20.95		
1.4	64QAM	3	3	21.21	20.99	20.93		
1.4	64QAM	6	0	20.21	19.90	19.79	21	3

<Near-body and Hotspot Mode>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	21.49	21.53	21.83	23	0
20	QPSK	1	49	21.16	21.22	21.45		
20	QPSK	1	99	21.20	21.34	21.47		
20	QPSK	50	0	21.32	21.38	21.63	23	0
20	QPSK	50	24	21.29	21.33	21.55		
20	QPSK	50	50	21.24	21.30	21.53		
20	QPSK	100	0	21.28	21.35	21.58		
20	16QAM	1	0	21.78	21.79	21.74	23	0
20	16QAM	1	49	21.48	21.54	21.70		
20	16QAM	1	99	21.51	21.64	21.73		
20	16QAM	50	0	20.33	20.39	20.62	22	1
20	16QAM	50	24	20.28	20.35	20.58		
20	16QAM	50	50	20.24	20.30	20.51		
20	16QAM	100	0	20.28	20.31	20.57		
20	64QAM	1	0	21.48	21.52	21.73	22	1
20	64QAM	1	49	21.22	21.25	21.38		
20	64QAM	1	99	21.22	21.31	21.39		
20	64QAM	50	0	20.43	20.34	20.60	21	2
20	64QAM	50	24	20.32	20.45	20.48		
20	64QAM	50	50	20.19	20.27	20.52		
20	64QAM	100	0	20.23	20.24	20.57		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	21.30	21.39	21.63	23	0
15	QPSK	1	37	21.13	21.22	21.47		
15	QPSK	1	74	21.16	21.23	21.50		
15	QPSK	36	0	21.29	21.37	21.60	23	0
15	QPSK	36	20	21.24	21.35	21.59		
15	QPSK	36	39	21.23	21.30	21.54		
15	QPSK	75	0	21.27	21.35	21.58		
15	16QAM	1	0	21.60	21.69	21.73	23	0
15	16QAM	1	37	21.49	21.58	21.76		
15	16QAM	1	74	21.47	21.54	21.78		
15	16QAM	36	0	20.32	20.35	20.59	22	1
15	16QAM	36	20	20.26	20.35	20.57		
15	16QAM	36	39	20.20	20.31	20.54		
15	16QAM	75	0	20.29	20.36	20.58		
15	64QAM	1	0	21.26	21.43	21.67	22	1
15	64QAM	1	37	21.06	21.29	21.48		
15	64QAM	1	74	21.16	21.33	21.55		
15	64QAM	36	0	20.24	20.34	20.49	21	2
15	64QAM	36	20	20.35	20.28	20.57		
15	64QAM	36	39	20.11	20.33	20.56		
15	64QAM	75	0	20.30	20.33	20.53		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	21.42	21.49	21.56	23	0
10	QPSK	1	25	21.15	21.23	21.46		
10	QPSK	1	49	21.31	21.39	21.47		
10	QPSK	25	0	21.22	21.32	21.55	23	0
10	QPSK	25	12	21.21	21.30	21.55		
10	QPSK	25	25	21.20	21.27	21.53		
10	QPSK	50	0	21.20	21.29	21.54		
10	16QAM	1	0	21.70	21.80	21.81	23	0
10	16QAM	1	25	21.46	21.55	21.76		
10	16QAM	1	49	21.63	21.70	21.73		
10	16QAM	25	0	20.27	20.36	20.57	22	1
10	16QAM	25	12	20.24	20.33	20.57		
10	16QAM	25	25	20.19	20.28	20.54		
10	16QAM	50	0	20.25	20.34	20.58		
10	64QAM	1	0	21.48	21.50	21.49	22	1
10	64QAM	1	25	21.10	21.30	21.55		
10	64QAM	1	49	21.28	21.48	21.49		
10	64QAM	25	0	20.23	20.33	20.59	21	2
10	64QAM	25	12	20.23	20.33	20.61		
10	64QAM	25	25	20.11	20.24	20.62		
10	64QAM	50	0	20.35	20.41	20.49		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	21.17	21.27	21.51	23	0
5	QPSK	1	12	21.10	21.21	21.46		
5	QPSK	1	24	21.11	21.24	21.49		
5	QPSK	12	0	21.20	21.30	21.56	23	0
5	QPSK	12	7	21.19	21.27	21.56		
5	QPSK	12	13	21.18	21.28	21.54		
5	QPSK	25	0	21.18	21.27	21.54		
5	16QAM	1	0	21.48	21.60	21.80	23	0
5	16QAM	1	12	21.44	21.58	21.81		
5	16QAM	1	24	21.45	21.55	21.79		
5	16QAM	12	0	20.22	20.32	20.60	22	1
5	16QAM	12	7	20.22	20.31	20.61		
5	16QAM	12	13	20.18	20.27	20.56		
5	16QAM	25	0	20.19	20.29	20.56		
5	64QAM	1	0	21.25	21.35	21.54	22	1
5	64QAM	1	12	21.01	21.30	21.38		
5	64QAM	1	24	21.17	21.29	21.54		
5	64QAM	12	0	20.14	20.25	20.51	21	2
5	64QAM	12	7	20.16	20.28	20.51		
5	64QAM	12	13	20.21	20.29	20.49		
5	64QAM	25	0	20.29	20.19	20.53		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	21.08	21.19	21.44	23	0
3	QPSK	1	8	21.08	21.19	21.44		
3	QPSK	1	14	21.06	21.15	21.42		
3	QPSK	8	0	21.13	21.22	21.52	23	0
3	QPSK	8	4	21.14	21.27	21.54		
3	QPSK	8	7	21.10	21.23	21.48		
3	QPSK	15	0	21.11	21.21	21.50		
3	16QAM	1	0	21.38	21.51	21.73	23	0
3	16QAM	1	8	21.39	21.51	21.75		
3	16QAM	1	14	21.36	21.47	21.69		
3	16QAM	8	0	20.19	20.29	20.57	22	1
3	16QAM	8	4	20.21	20.33	20.58		
3	16QAM	8	7	20.17	20.29	20.55		
3	16QAM	15	0	20.16	20.25	20.54		
3	64QAM	1	0	21.18	21.23	21.49	22	1
3	64QAM	1	8	21.11	21.26	21.52		
3	64QAM	1	14	21.08	21.23	21.41		
3	64QAM	8	0	20.18	20.36	20.49	21	2
3	64QAM	8	4	20.18	20.39	20.54		
3	64QAM	8	7	20.10	20.29	20.53		
3	64QAM	15	0	20.23	20.18	20.56		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	21.02	21.13	21.40	23	0
1.4	QPSK	1	3	21.08	21.20	21.47		
1.4	QPSK	1	5	21.02	21.12	21.36		
1.4	QPSK	3	0	21.06	21.21	21.43		
1.4	QPSK	3	1	21.09	21.23	21.50		
1.4	QPSK	3	3	21.08	21.19	21.44		
1.4	QPSK	6	0	21.03	21.15	21.42	23	0
1.4	16QAM	1	0	21.28	21.42	21.67	23	0
1.4	16QAM	1	3	21.38	21.49	21.71		
1.4	16QAM	1	5	21.29	21.41	21.64		
1.4	16QAM	3	0	21.08	21.24	21.44		
1.4	16QAM	3	1	21.14	21.28	21.52		
1.4	16QAM	3	3	21.06	21.23	21.45		
1.4	16QAM	6	0	20.13	20.24	20.52	22	1
1.4	64QAM	1	0	21.11	21.23	21.38	22	1
1.4	64QAM	1	3	21.18	21.30	21.41		
1.4	64QAM	1	5	21.09	21.17	21.33		
1.4	64QAM	3	0	21.14	21.15	21.35		
1.4	64QAM	3	1	21.20	21.37	21.62		
1.4	64QAM	3	3	21.02	21.26	21.41		
1.4	64QAM	6	0	20.16	20.24	20.59	21	2

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	20.63	20.93	20.68	22	0
20	QPSK	1	49	20.35	20.41	20.55		
20	QPSK	1	99	20.20	20.45	20.60		
20	QPSK	50	0	20.50	20.74	20.58	22	0
20	QPSK	50	24	20.45	20.65	20.54		
20	QPSK	50	50	20.41	20.74	20.54		
20	QPSK	100	0	20.46	20.60	20.53		
20	16QAM	1	0	20.73	20.84	20.92	22	0
20	16QAM	1	49	20.61	20.68	20.86		
20	16QAM	1	99	20.47	20.79	20.92		
20	16QAM	50	0	20.52	20.56	20.75	22	0
20	16QAM	50	24	20.45	20.53	20.70		
20	16QAM	50	50	20.40	20.57	20.73		
20	16QAM	100	0	20.43	20.53	20.67		
20	64QAM	1	0	20.56	20.92	20.61	22	0
20	64QAM	1	49	20.31	20.38	20.65		
20	64QAM	1	99	20.21	20.49	20.50		
20	64QAM	50	0	20.56	20.73	20.55	21	1
20	64QAM	50	24	20.39	20.64	20.48		
20	64QAM	50	50	20.40	20.64	20.64		
20	64QAM	100	0	20.39	20.69	20.63		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	20.62	20.58	20.79	22	0
15	QPSK	1	37	20.35	20.42	20.59		
15	QPSK	1	74	20.35	20.52	20.67		
15	QPSK	36	0	20.58	20.55	20.70	22	0
15	QPSK	36	20	20.41	20.54	20.70		
15	QPSK	36	39	20.41	20.46	20.70		
15	QPSK	75	0	20.43	20.51	20.69		
15	16QAM	1	0	20.90	20.85	20.84	22	0
15	16QAM	1	37	20.64	20.70	20.74		
15	16QAM	1	74	20.62	20.82	20.89		
15	16QAM	36	0	20.59	20.53	20.75	22	0
15	16QAM	36	20	20.47	20.53	20.70		
15	16QAM	36	39	20.37	20.44	20.70		
15	16QAM	75	0	20.43	20.49	20.68		
15	64QAM	1	0	20.57	20.61	20.84	22	0
15	64QAM	1	37	20.28	20.37	20.54		
15	64QAM	1	74	20.38	20.57	20.69		
15	64QAM	36	0	20.63	20.53	20.70	21	1
15	64QAM	36	20	20.45	20.64	20.79		
15	64QAM	36	39	20.31	20.46	20.72		
15	64QAM	75	0	20.34	20.60	20.75		

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	20.53	20.52	20.67	22	0
10	QPSK	1	25	20.45	20.43	20.68		
10	QPSK	1	49	20.32	20.37	20.61		
10	QPSK	25	0	20.54	20.52	20.69	22	0
10	QPSK	25	12	20.54	20.47	20.73		
10	QPSK	25	25	20.39	20.45	20.71		
10	QPSK	50	0	20.53	20.49	20.77		
10	16QAM	1	0	20.81	20.75	20.82	22	0
10	16QAM	1	25	20.71	20.68	20.81		
10	16QAM	1	49	20.60	20.66	20.78		
10	16QAM	25	0	20.56	20.49	20.49	22	0
10	16QAM	25	12	20.61	20.47	20.55		
10	16QAM	25	25	20.47	20.44	20.50		
10	16QAM	50	0	20.60	20.48	20.57		
10	64QAM	1	0	20.53	20.62	20.76	22	0
10	64QAM	1	25	20.49	20.37	20.78		
10	64QAM	1	49	20.30	20.43	20.60		
10	64QAM	25	0	20.51	20.60	20.70	21	1
10	64QAM	25	12	20.48	20.40	20.70		
10	64QAM	25	25	20.35	20.54	20.70		
10	64QAM	50	0	20.55	20.39	20.81		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	20.60	20.47	20.52	22	0
5	QPSK	1	12	20.53	20.43	20.48		
5	QPSK	1	24	20.53	20.41	20.48		
5	QPSK	12	0	20.58	20.51	20.56	22	0
5	QPSK	12	7	20.59	20.46	20.55		
5	QPSK	12	13	20.54	20.45	20.53		
5	QPSK	25	0	20.59	20.48	20.53		
5	16QAM	1	0	20.86	20.73	20.88	22	0
5	16QAM	1	12	20.84	20.69	20.82		
5	16QAM	1	24	20.83	20.69	20.83		
5	16QAM	12	0	20.61	20.48	20.56	22	0
5	16QAM	12	7	20.61	20.51	20.56		
5	16QAM	12	13	20.55	20.44	20.56		
5	16QAM	25	0	20.56	20.46	20.55		
5	64QAM	1	0	20.56	20.39	20.61	22	0
5	64QAM	1	12	20.43	20.49	20.49		
5	64QAM	1	24	20.55	20.32	20.39		
5	64QAM	12	0	20.57	20.41	20.53	21	1
5	64QAM	12	7	20.66	20.49	20.47		
5	64QAM	12	13	20.53	20.47	20.47		
5	64QAM	25	0	20.53	20.41	20.43		

Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	20.39	20.39	20.66	22	0
3	QPSK	1	8	20.36	20.36	20.62		
3	QPSK	1	14	20.35	20.36	20.60		
3	QPSK	8	0	20.42	20.45	20.66	22	0
3	QPSK	8	4	20.45	20.43	20.69		
3	QPSK	8	7	20.38	20.42	20.67		
3	QPSK	15	0	20.44	20.39	20.70		
3	16QAM	1	0	20.70	20.67	20.80	22	0
3	16QAM	1	8	20.71	20.65	20.78		
3	16QAM	1	14	20.68	20.65	20.75		
3	16QAM	8	0	20.52	20.48	20.55	22	0
3	16QAM	8	4	20.50	20.48	20.54		
3	16QAM	8	7	20.48	20.45	20.53		
3	16QAM	15	0	20.43	20.41	20.51		
3	64QAM	1	0	20.46	20.42	20.62	22	0
3	64QAM	1	8	20.35	20.40	20.61		
3	64QAM	1	14	20.44	20.31	20.63		
3	64QAM	8	0	20.37	20.36	20.61	21	1
3	64QAM	8	4	20.55	20.38	20.65		
3	64QAM	8	7	20.41	20.42	20.77		
3	64QAM	15	0	20.38	20.49	20.78		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	20.32	20.32	20.60	22	0
1.4	QPSK	1	3	20.39	20.41	20.69		
1.4	QPSK	1	5	20.32	20.31	20.59		
1.4	QPSK	3	0	20.34	20.35	20.62		
1.4	QPSK	3	1	20.40	20.38	20.68		
1.4	QPSK	3	3	20.37	20.35	20.63		
1.4	QPSK	6	0	20.36	20.33	20.64	22	0
1.4	16QAM	1	0	20.61	20.59	20.84	22	0
1.4	16QAM	1	3	20.69	20.66	20.87		
1.4	16QAM	1	5	20.60	20.60	20.91		
1.4	16QAM	3	0	20.38	20.35	20.67		
1.4	16QAM	3	1	20.42	20.42	20.72		
1.4	16QAM	3	3	20.36	20.37	20.64		
1.4	16QAM	6	0	20.43	20.40	20.70	22	0
1.4	64QAM	1	0	20.31	20.31	20.51	22	0
1.4	64QAM	1	3	20.47	20.44	20.76		
1.4	64QAM	1	5	20.22	20.35	20.55		
1.4	64QAM	3	0	20.40	20.44	20.58		
1.4	64QAM	3	1	20.50	20.29	20.75		
1.4	64QAM	3	3	20.42	20.25	20.55		
1.4	64QAM	6	0	20.35	20.33	20.55	21	1

<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	21.86	22.08	21.81	23	0
10	QPSK	1	25	21.81	21.83	21.75		
10	QPSK	1	49	21.79	21.72	21.64		
10	QPSK	25	0	21.89	21.91	21.82	23	0
10	QPSK	25	12	21.89	21.89	21.81		
10	QPSK	25	25	21.90	21.83	21.76		
10	QPSK	50	0	21.86	21.89	21.80		
10	16QAM	1	0	22.06	22.04	22.04	23	0
10	16QAM	1	25	21.97	22.04	21.95		
10	16QAM	1	49	22.01	21.96	21.84		
10	16QAM	25	0	20.90	20.93	20.84	22	1
10	16QAM	25	12	20.88	20.92	20.84		
10	16QAM	25	25	20.90	20.81	20.76		
10	16QAM	50	0	20.86	20.88	20.81		
10	64QAM	1	0	21.12	21.13	21.06	22	1
10	64QAM	1	25	21.03	21.07	20.97		
10	64QAM	1	49	21.03	20.98	20.86		
10	64QAM	25	0	20.00	20.01	19.92	21	2
10	64QAM	25	12	19.98	20.00	19.91		
10	64QAM	25	25	20.03	19.93	19.85		
10	64QAM	50	0	19.98	19.70	19.90		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	21.97	21.84	21.82	23	0
5	QPSK	1	12	21.93	21.78	21.78		
5	QPSK	1	24	21.89	21.75	21.76		
5	QPSK	12	0	21.99	21.88	21.84	23	0
5	QPSK	12	7	21.97	21.85	21.84		
5	QPSK	12	13	21.94	21.79	21.82		
5	QPSK	25	0	21.97	21.85	21.84		
5	16QAM	1	0	22.06	22.07	22.06	23	0
5	16QAM	1	12	22.01	22.05	22.05		
5	16QAM	1	24	22.05	22.00	21.96		
5	16QAM	12	0	20.99	20.87	20.86	22	1
5	16QAM	12	7	20.97	20.86	20.86		
5	16QAM	12	13	20.95	20.80	20.84		
5	16QAM	25	0	20.96	20.87	20.83		
5	64QAM	1	0	21.03	21.04	21.06	22	1
5	64QAM	1	12	20.98	20.93	20.91		
5	64QAM	1	24	20.88	20.90	20.82		
5	64QAM	12	0	19.94	19.89	19.72	21	2
5	64QAM	12	7	19.80	19.81	19.81		
5	64QAM	12	13	19.91	19.92	19.76		
5	64QAM	25	0	19.97	19.65	19.82		

Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	21.95	21.81	21.71	23	0
3	QPSK	1	8	21.90	21.78	21.69		
3	QPSK	1	14	21.91	21.76	21.65		
3	QPSK	8	0	22.00	21.85	21.74	23	0
3	QPSK	8	4	21.97	21.85	21.73		
3	QPSK	8	7	21.95	21.79	21.72		
3	QPSK	15	0	21.95	21.81	21.71		
3	16QAM	1	0	22.07	22.04	21.93	23	0
3	16QAM	1	8	22.03	22.03	21.90		
3	16QAM	1	14	22.05	21.98	21.83		
3	16QAM	8	0	21.03	20.90	20.81	22	1
3	16QAM	8	4	21.03	20.93	20.79		
3	16QAM	8	7	21.01	20.87	20.78		
3	16QAM	15	0	20.98	20.87	20.75		
3	64QAM	1	0	21.11	21.08	20.90	22	1
3	64QAM	1	8	20.94	20.95	20.79		
3	64QAM	1	14	20.86	20.94	20.79		
3	64QAM	8	0	19.83	19.95	19.80	21	2
3	64QAM	8	4	19.82	20.00	19.84		
3	64QAM	8	7	19.96	19.78	19.79		
3	64QAM	15	0	19.82	19.51	19.80		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	21.74	21.70	21.67	23	0
1.4	QPSK	1	3	21.79	21.75	21.73		
1.4	QPSK	1	5	21.71	21.67	21.63		
1.4	QPSK	3	0	21.77	21.73	21.64		
1.4	QPSK	3	1	21.83	21.80	21.67		
1.4	QPSK	3	3	21.76	21.75	21.62		
1.4	QPSK	6	0	21.79	21.72	21.62	23	0
1.4	16QAM	1	0	21.95	21.96	21.81	23	0
1.4	16QAM	1	3	21.99	22.02	21.87		
1.4	16QAM	1	5	21.90	21.96	21.79		
1.4	16QAM	3	0	21.80	21.77	21.66		
1.4	16QAM	3	1	21.84	21.79	21.68		
1.4	16QAM	3	3	21.76	21.73	21.62		
1.4	16QAM	6	0	20.86	20.81	20.70	22	1
1.4	64QAM	1	0	21.06	20.95	20.94	22	1
1.4	64QAM	1	3	20.89	20.92	20.78		
1.4	64QAM	1	5	20.90	20.82	20.80		
1.4	64QAM	3	0	20.81	20.86	20.85		
1.4	64QAM	3	1	20.90	20.82	20.85		
1.4	64QAM	3	3	20.90	20.85	20.82		
1.4	64QAM	6	0	19.90	19.52	19.81	21	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	20.70	20.83	21.00	22	0
20	QPSK	1	49	20.55	20.67	20.60		
20	QPSK	1	99	20.63	20.66	20.66		
20	QPSK	50	0	20.73	20.80	20.81	22	0
20	QPSK	50	24	20.64	20.79	20.69		
20	QPSK	50	50	20.68	20.66	20.69		
20	QPSK	100	0	20.66	20.79	20.67		
20	16QAM	1	0	20.98	20.90	20.99	22	0
20	16QAM	1	49	20.82	20.97	20.88		
20	16QAM	1	99	20.91	20.93	20.94		
20	16QAM	50	0	20.78	20.79	20.80	22	0
20	16QAM	50	24	20.67	20.80	20.71		
20	16QAM	50	50	20.65	20.80	20.70		
20	16QAM	100	0	20.65	20.78	20.67		
20	64QAM	1	0	20.58	20.80	20.83	22	0
20	64QAM	1	49	20.39	20.65	20.55		
20	64QAM	1	99	20.54	20.61	20.64		
20	64QAM	50	0	19.64	19.73	19.78	21	1
20	64QAM	50	24	19.54	19.71	19.61		
20	64QAM	50	50	19.68	19.61	19.66		
20	64QAM	100	0	19.63	19.76	19.63		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	20.69	20.74	20.78	22	0
15	QPSK	1	37	20.61	20.68	20.63		
15	QPSK	1	74	20.57	20.75	20.65		
15	QPSK	36	0	20.70	20.75	20.71	22	0
15	QPSK	36	20	20.72	20.79	20.73		
15	QPSK	36	39	20.62	20.78	20.67		
15	QPSK	75	0	20.70	20.76	20.71		
15	16QAM	1	0	20.95	20.98	20.93	22	0
15	16QAM	1	37	20.92	20.98	20.91		
15	16QAM	1	74	20.86	20.99	20.96		
15	16QAM	36	0	20.73	20.78	20.72	22	0
15	16QAM	36	20	20.73	20.78	20.74		
15	16QAM	36	39	20.64	20.78	20.67		
15	16QAM	75	0	20.72	20.79	20.71		
15	64QAM	1	0	20.58	20.70	20.69	22	0
15	64QAM	1	37	20.41	20.52	20.55		
15	64QAM	1	74	20.50	20.60	20.60		
15	64QAM	36	0	19.68	19.70	19.61	21	1
15	64QAM	36	20	19.68	19.70	19.67		
15	64QAM	36	39	19.59	19.78	19.61		
15	64QAM	75	0	19.64	19.70	19.71		

Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	20.60	20.68	20.65	22	0
10	QPSK	1	25	20.59	20.69	20.62		
10	QPSK	1	49	20.49	20.70	20.63		
10	QPSK	25	0	20.64	20.72	20.66	22	0
10	QPSK	25	12	20.67	20.74	20.67		
10	QPSK	25	25	20.65	20.71	20.69		
10	QPSK	50	0	20.64	20.72	20.64		
10	16QAM	1	0	20.85	20.94	20.89	22	0
10	16QAM	1	25	20.84	20.95	20.88		
10	16QAM	1	49	20.75	20.92	20.90		
10	16QAM	25	0	20.63	20.71	20.65	22	0
10	16QAM	25	12	20.67	20.73	20.71		
10	16QAM	25	25	20.64	20.74	20.68		
10	16QAM	50	0	20.66	20.72	20.69		
10	64QAM	1	0	20.45	20.54	20.50	22	0
10	64QAM	1	25	20.40	20.60	20.51		
10	64QAM	1	49	20.39	20.69	20.57		
10	64QAM	25	0	19.62	19.69	19.66	21	1
10	64QAM	25	12	19.60	19.66	19.65		
10	64QAM	25	25	19.60	19.65	19.65		
10	64QAM	50	0	19.64	19.65	19.57		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	20.53	20.63	20.58	22	0
5	QPSK	1	12	20.54	20.66	20.62		
5	QPSK	1	24	20.53	20.67	20.61		
5	QPSK	12	0	20.62	20.68	20.67	22	0
5	QPSK	12	7	20.65	20.76	20.72		
5	QPSK	12	13	20.60	20.69	20.68		
5	QPSK	25	0	20.58	20.70	20.67		
5	16QAM	1	0	20.80	20.91	20.89	22	0
5	16QAM	1	12	20.82	20.93	20.92		
5	16QAM	1	24	20.79	20.92	20.88		
5	16QAM	12	0	20.62	20.73	20.67	22	0
5	16QAM	12	7	20.64	20.75	20.71		
5	16QAM	12	13	20.59	20.73	20.67		
5	16QAM	25	0	20.61	20.69	20.66		
5	64QAM	1	0	20.36	20.49	20.47	22	0
5	64QAM	1	12	20.49	20.60	20.56		
5	64QAM	1	24	20.45	20.58	20.54		
5	64QAM	12	0	19.58	19.65	19.64	21	1
5	64QAM	12	7	19.64	19.69	19.72		
5	64QAM	12	13	19.58	19.69	19.61		
5	64QAM	25	0	19.54	19.65	19.57		

<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	22.60	23.50	23.34	24	0
10	QPSK	1	25	22.57	23.37	23.32		
10	QPSK	1	49	22.56	23.32	23.33		
10	QPSK	25	0	22.39	21.61	22.36	23	1
10	QPSK	25	12	22.42	21.53	22.40		
10	QPSK	25	25	22.41	21.44	22.44		
10	QPSK	50	0	22.41	21.60	22.34		
10	16QAM	1	0	22.64	21.85	22.63	23	1
10	16QAM	1	25	22.61	21.85	22.60		
10	16QAM	1	49	22.61	21.84	22.71		
10	16QAM	25	0	21.42	20.59	21.36	22	2
10	16QAM	25	12	21.43	20.65	21.38		
10	16QAM	25	25	21.39	20.58	21.43		
10	16QAM	50	0	21.43	20.63	21.35		
10	64QAM	1	0	21.19	21.17	21.20	22	2
10	64QAM	1	25	21.30	21.28	21.15		
10	64QAM	1	49	21.22	21.17	21.27		
10	64QAM	25	0	20.02	20.12	20.11	21	3
10	64QAM	25	12	20.16	20.13	20.10		
10	64QAM	25	25	20.11	20.09	20.14		
10	64QAM	50	0	20.13	20.09	20.08		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	23.46	23.37	23.31	24	0
5	QPSK	1	12	23.41	23.36	23.36		
5	QPSK	1	24	23.49	23.37	23.34		
5	QPSK	12	0	22.46	22.40	22.44	23	1
5	QPSK	12	7	22.47	22.40	22.44		
5	QPSK	12	13	22.45	22.40	22.43		
5	QPSK	25	0	22.45	22.39	22.42		
5	16QAM	1	0	22.76	22.70	22.60	23	1
5	16QAM	1	12	22.78	22.63	22.74		
5	16QAM	1	24	22.87	22.57	22.72		
5	16QAM	12	0	21.49	21.46	21.45	22	2
5	16QAM	12	7	21.49	21.45	21.48		
5	16QAM	12	13	21.34	21.37	21.43		
5	16QAM	25	0	21.37	21.41	21.43		
5	64QAM	1	0	21.12	21.15	21.10	22	2
5	64QAM	1	12	21.27	21.10	21.02		
5	64QAM	1	24	21.06	21.03	21.13		
5	64QAM	12	0	19.91	20.09	20.06	21	3
5	64QAM	12	7	19.97	20.07	20.05		
5	64QAM	12	13	19.93	19.89	20.12		
5	64QAM	25	0	19.99	19.96	20.05		

Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	23.33	23.36	23.37	24	0
3	QPSK	1	8	23.32	23.34	23.33		
3	QPSK	1	14	23.29	23.34	23.32		
3	QPSK	8	0	22.33	22.37	22.42	23	1
3	QPSK	8	4	22.38	22.38	22.45		
3	QPSK	8	7	22.36	22.35	22.40		
3	QPSK	15	0	22.35	22.39	22.41		
3	16QAM	1	0	22.65	22.67	22.73	23	1
3	16QAM	1	8	22.70	22.63	22.75		
3	16QAM	1	14	22.71	22.59	22.73		
3	16QAM	8	0	21.42	21.44	21.47	22	2
3	16QAM	8	4	21.42	21.47	21.49		
3	16QAM	8	7	21.42	21.44	21.47		
3	16QAM	15	0	21.35	21.40	21.41		
3	64QAM	1	0	21.08	20.97	21.08	22	2
3	64QAM	1	8	21.30	21.14	21.09		
3	64QAM	1	14	21.20	21.14	21.14		
3	64QAM	8	0	19.87	20.04	20.07	21	3
3	64QAM	8	4	20.15	19.96	19.90		
3	64QAM	8	7	20.01	20.06	20.11		
3	64QAM	15	0	20.00	19.91	19.98		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	23.25	23.27	23.26	24	0
1.4	QPSK	1	3	23.35	23.33	23.36		
1.4	QPSK	1	5	23.27	23.24	23.24		
1.4	QPSK	3	0	23.31	23.31	23.28		
1.4	QPSK	3	1	23.36	23.38	23.36		
1.4	QPSK	3	3	23.32	23.31	23.32		
1.4	QPSK	6	0	22.30	22.30	22.31	23	1
1.4	16QAM	1	0	22.58	22.56	22.65	23	1
1.4	16QAM	1	3	22.65	22.60	22.70		
1.4	16QAM	1	5	22.61	22.54	22.62		
1.4	16QAM	3	0	22.24	22.31	22.38		
1.4	16QAM	3	1	22.36	22.37	22.43		
1.4	16QAM	3	3	22.23	22.31	22.36		
1.4	16QAM	6	0	21.34	21.34	21.38	22	2
1.4	64QAM	1	0	21.05	21.07	21.09	22	2
1.4	64QAM	1	3	21.19	21.23	21.06		
1.4	64QAM	1	5	21.20	21.00	21.21		
1.4	64QAM	3	0	21.00	21.05	20.93		
1.4	64QAM	3	1	21.07	21.13	21.00		
1.4	64QAM	3	3	20.94	21.04	20.94		
1.4	64QAM	6	0	20.07	19.90	19.92	21	3

<LTE Band 17>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23780	23790	23800		
Frequency (MHz)				709	710	711		
10	QPSK	1	0	21.66	21.91	21.72	23	0
10	QPSK	1	25	21.71	21.71	21.69		
10	QPSK	1	49	21.66	21.64	21.63		
10	QPSK	25	0	21.79	21.79	21.77	23	0
10	QPSK	25	12	21.71	21.77	21.78		
10	QPSK	25	25	21.79	21.77	21.73		
10	QPSK	50	0	21.73	21.77	21.74		
10	16QAM	1	0	21.86	21.86	21.82	23	0
10	16QAM	1	25	21.89	21.84	21.83		
10	16QAM	1	49	21.81	21.80	21.88		
10	16QAM	25	0	20.79	20.78	20.78	22	1
10	16QAM	25	12	20.81	20.80	20.78		
10	16QAM	25	25	20.76	20.74	20.72		
10	16QAM	50	0	20.78	20.77	20.74		
10	64QAM	1	0	21.02	20.99	21.08	22	1
10	64QAM	1	25	21.05	21.03	21.00		
10	64QAM	1	49	21.01	21.00	21.02		
10	64QAM	25	0	20.01	20.00	19.99	21	2
10	64QAM	25	12	20.02	20.00	19.99		
10	64QAM	25	25	19.97	19.94	19.95		
10	64QAM	50	0	20.00	20.01	19.98		
Channel				23755	23790	23825	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				706.5	710	713.5		
5	QPSK	1	0	21.55	21.72	21.69	23	0
5	QPSK	1	12	21.62	21.69	21.65		
5	QPSK	1	24	21.65	21.69	21.64		
5	QPSK	12	0	21.62	21.77	21.70	23	0
5	QPSK	12	7	21.75	21.77	21.72		
5	QPSK	12	13	21.70	21.74	21.69		
5	QPSK	25	0	21.69	21.75	21.70		
5	16QAM	1	0	21.84	21.89	21.84	23	0
5	16QAM	1	12	21.88	21.90	21.87		
5	16QAM	1	24	21.81	21.90	21.88		
5	16QAM	12	0	20.65	20.74	20.71	22	1
5	16QAM	12	7	20.75	20.74	20.75		
5	16QAM	12	13	20.69	20.72	20.71		
5	16QAM	25	0	20.71	20.75	20.71		
5	64QAM	1	0	20.84	20.81	21.07	22	1
5	64QAM	1	12	20.90	20.84	20.91		
5	64QAM	1	24	20.83	20.80	21.02		
5	64QAM	12	0	20.01	19.80	19.80	21	2
5	64QAM	12	7	19.96	19.97	19.86		
5	64QAM	12	13	19.79	19.90	19.93		
5	64QAM	25	0	20.00	19.97	19.84		

<LTE Band 25>

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				26140	26340	26590		
Frequency (MHz)				1860	1880	1905		
20	QPSK	1	0	21.63	21.93	21.84	23	0
20	QPSK	1	49	21.29	21.41	21.67		
20	QPSK	1	99	21.34	21.47	21.61		
20	QPSK	50	0	21.44	21.89	21.82	23	0
20	QPSK	50	24	21.40	21.53	21.77		
20	QPSK	50	50	21.26	21.52	21.68		
20	QPSK	100	0	21.42	21.77	21.70		
20	16QAM	1	0	21.85	21.88	21.90	23	0
20	16QAM	1	49	21.53	21.65	21.84		
20	16QAM	1	99	21.56	21.70	21.76		
20	16QAM	50	0	20.48	20.58	20.86	22	1
20	16QAM	50	24	20.41	20.55	20.82		
20	16QAM	50	50	20.38	20.53	20.70		
20	16QAM	100	0	20.50	20.56	21.45		
20	64QAM	1	0	20.93	20.95	21.01	22	1
20	64QAM	1	49	20.60	20.62	20.89		
20	64QAM	1	99	20.61	20.66	20.77		
20	64QAM	50	0	19.58	19.61	19.89	21	2
20	64QAM	50	24	19.52	19.56	19.81		
20	64QAM	50	50	19.39	19.54	19.71		
20	64QAM	100	0	19.51	19.55	19.88		
Channel				26115	26340	26615	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1907.5		
15	QPSK	1	0	21.41	21.55	21.82	23	0
15	QPSK	1	37	21.26	21.43	21.58		
15	QPSK	1	74	21.19	21.33	21.63		
15	QPSK	36	0	21.41	21.57	21.79	23	0
15	QPSK	36	20	21.35	21.53	21.70		
15	QPSK	36	39	21.33	21.50	21.67		
15	QPSK	75	0	21.36	21.53	21.73		
15	16QAM	1	0	21.64	21.81	21.90	23	0
15	16QAM	1	37	21.54	21.68	21.87		
15	16QAM	1	74	21.47	21.61	21.80		
15	16QAM	36	0	20.42	20.60	20.84	22	1
15	16QAM	36	20	20.38	20.55	20.71		
15	16QAM	36	39	20.31	20.51	20.69		
15	16QAM	75	0	20.38	20.57	20.73		
15	64QAM	1	0	20.62	20.77	21.02	22	1
15	64QAM	1	37	20.47	20.63	20.80		
15	64QAM	1	74	20.38	20.55	20.79		
15	64QAM	36	0	19.43	19.58	19.85	21	2
15	64QAM	36	20	19.41	19.58	19.72		
15	64QAM	36	39	19.39	19.54	19.71		
15	64QAM	75	0	19.38	19.53	19.71		

Channel				26090	26340	26640	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1910		
10	QPSK	1	0	21.53	21.70	21.68	23	0
10	QPSK	1	25	21.25	21.41	21.61		
10	QPSK	1	49	21.46	21.63	21.64		
10	QPSK	25	0	21.35	21.52	21.69	23	0
10	QPSK	25	12	21.31	21.51	21.69		
10	QPSK	25	25	21.32	21.48	21.72		
10	QPSK	50	0	21.33	21.51	21.69		
10	16QAM	1	0	21.76	21.86	21.93	23	0
10	16QAM	1	25	21.51	21.67	21.84		
10	16QAM	1	49	21.71	21.88	21.80		
10	16QAM	25	0	20.39	20.53	20.71	22	1
10	16QAM	25	12	20.37	20.55	20.72		
10	16QAM	25	25	20.34	20.51	20.71		
10	16QAM	50	0	20.37	20.54	20.73		
10	64QAM	1	0	20.71	20.88	20.83	22	1
10	64QAM	1	25	20.42	20.62	20.80		
10	64QAM	1	49	20.59	20.82	20.73		
10	64QAM	25	0	19.37	19.56	19.71	21	2
10	64QAM	25	12	19.37	19.54	19.72		
10	64QAM	25	25	19.35	19.52	19.70		
10	64QAM	50	0	19.36	19.54	19.75		
Channel				26065	26340	26665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1912.5		
5	QPSK	1	0	21.26	21.46	21.65	23	0
5	QPSK	1	12	21.19	21.40	21.62		
5	QPSK	1	24	21.23	21.43	21.65		
5	QPSK	12	0	21.30	21.48	21.69	23	0
5	QPSK	12	7	21.31	21.53	21.68		
5	QPSK	12	13	21.23	21.50	21.67		
5	QPSK	25	0	21.24	21.44	21.73		
5	16QAM	1	0	21.50	21.68	21.86	23	0
5	16QAM	1	12	21.47	21.67	21.79		
5	16QAM	1	24	21.47	21.67	21.75		
5	16QAM	12	0	20.32	20.51	20.69	22	1
5	16QAM	12	7	20.32	20.51	20.66		
5	16QAM	12	13	20.27	20.47	20.64		
5	16QAM	25	0	20.29	20.51	20.68		
5	64QAM	1	0	20.46	20.67	20.84	22	1
5	64QAM	1	12	20.41	20.62	20.76		
5	64QAM	1	24	20.41	20.62	20.74		
5	64QAM	12	0	19.34	19.56	19.76	21	2
5	64QAM	12	7	19.35	19.56	19.77		
5	64QAM	12	13	19.29	19.52	19.75		
5	64QAM	25	0	19.27	19.51	19.70		

Channel				26055	26340	26675	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1913.5		
3	QPSK	1	0	21.28	21.42	21.63	23	0
3	QPSK	1	8	21.25	21.39	21.60		
3	QPSK	1	14	21.27	21.40	21.61		
3	QPSK	8	0	21.33	21.45	21.70	23	0
3	QPSK	8	4	21.36	21.47	21.72		
3	QPSK	8	7	21.33	21.46	21.73		
3	QPSK	15	0	21.32	21.45	21.68		
3	16QAM	1	0	21.53	21.64	21.77	23	0
3	16QAM	1	8	21.53	21.66	21.78		
3	16QAM	1	14	21.51	21.65	21.73		
3	16QAM	8	0	20.39	20.52	20.73	22	1
3	16QAM	8	4	20.42	20.56	20.74		
3	16QAM	8	7	20.38	20.50	20.75		
3	16QAM	15	0	20.35	20.48	20.68		
3	64QAM	1	0	20.48	20.58	20.74	22	1
3	64QAM	1	8	20.47	20.58	20.74		
3	64QAM	1	14	20.46	20.59	20.73		
3	64QAM	8	0	19.39	19.51	19.72	21	2
3	64QAM	8	4	19.40	19.54	19.77		
3	64QAM	8	7	19.36	19.48	19.73		
3	64QAM	15	0	19.34	19.47	19.71		
Channel				26047	26340	26683	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1914.3		
1.4	QPSK	1	0	21.19	21.35	21.49	23	0
1.4	QPSK	1	3	21.26	21.40	21.58		
1.4	QPSK	1	5	21.20	21.32	21.51		
1.4	QPSK	3	0	21.24	21.42	21.57		
1.4	QPSK	3	1	21.29	21.45	21.64		
1.4	QPSK	3	3	21.24	21.39	21.59		
1.4	QPSK	6	0	21.26	21.40	21.60	23	0
1.4	16QAM	1	0	21.41	21.54	21.70	23	0
1.4	16QAM	1	3	21.53	21.64	21.76		
1.4	16QAM	1	5	21.43	21.57	21.66		
1.4	16QAM	3	0	21.27	21.40	21.57		
1.4	16QAM	3	1	21.33	21.43	21.62		
1.4	16QAM	3	3	21.25	21.39	21.56		
1.4	16QAM	6	0	20.32	20.47	20.68	22	1
1.4	64QAM	1	0	20.40	20.52	20.73	22	1
1.4	64QAM	1	3	20.46	20.60	20.79		
1.4	64QAM	1	5	20.41	20.51	20.72		
1.4	64QAM	3	0	20.37	20.50	20.68		
1.4	64QAM	3	1	20.43	20.57	20.74		
1.4	64QAM	3	3	20.36	20.50	20.69		
1.4	64QAM	6	0	19.28	19.40	19.60	22	1

<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	21.99	22.20	21.98	23	0
15	QPSK	1	37	22.01	21.98	21.88		
15	QPSK	1	74	21.93	21.82	21.73		
15	QPSK	36	0	22.02	22.13	22.00	23	0
15	QPSK	36	20	22.10	22.10	22.00		
15	QPSK	36	39	22.01	21.98	21.88		
15	QPSK	75	0	22.06	22.08	21.96		
15	16QAM	1	0	22.17	22.19	22.06	23	0
15	16QAM	1	37	22.03	22.04	22.14		
15	16QAM	1	74	22.16	22.10	21.98		
15	16QAM	36	0	21.05	21.11	21.03	22	1
15	16QAM	36	20	21.13	21.09	21.00		
15	16QAM	36	39	20.99	20.97	20.89		
15	16QAM	75	0	21.06	21.04	20.98		
15	64QAM	1	0	21.36	21.17	21.24	22	1
15	64QAM	1	37	21.35	21.19	21.15		
15	64QAM	1	74	21.25	21.08	20.99		
15	64QAM	36	0	20.19	20.20	20.09	21	2
15	64QAM	36	20	20.30	20.17	20.05		
15	64QAM	36	39	20.18	20.02	19.96		
15	64QAM	75	0	20.20	20.11	20.00		
Channel				26740	26865	26990	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	21.89	21.91	21.91	23	0
10	QPSK	1	25	21.90	21.94	21.82		
10	QPSK	1	49	21.84	21.85	21.73		
10	QPSK	25	0	21.91	22.05	21.89	23	0
10	QPSK	25	12	21.97	22.02	21.88		
10	QPSK	25	25	21.93	21.94	21.83		
10	QPSK	50	0	21.94	22.03	21.89		
10	16QAM	1	0	22.12	22.14	22.14	23	0
10	16QAM	1	25	22.15	22.18	22.07		
10	16QAM	1	49	22.04	22.10	21.92		
10	16QAM	25	0	20.89	21.06	20.91	22	1
10	16QAM	25	12	21.00	21.06	20.90		
10	16QAM	25	25	20.93	20.97	20.84		
10	16QAM	50	0	20.97	21.00	20.90		
10	64QAM	1	0	21.16	21.14	21.14	22	1
10	64QAM	1	25	21.22	21.06	21.06		
10	64QAM	1	49	21.25	20.99	20.91		
10	64QAM	25	0	20.09	20.15	20.07	21	2
10	64QAM	25	12	20.26	20.16	20.05		
10	64QAM	25	25	20.12	19.96	19.82		
10	64QAM	50	0	20.09	19.95	19.91		

Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	21.95	22.00	21.83	23	0
5	QPSK	1	12	21.93	21.94	21.79		
5	QPSK	1	24	21.98	21.90	21.74		
5	QPSK	12	0	22.00	22.00	21.86	23	0
5	QPSK	12	7	22.01	22.03	21.86		
5	QPSK	12	13	21.96	21.94	21.79		
5	QPSK	25	0	21.95	22.01	21.85		
5	16QAM	1	0	22.09	22.11	22.04	23	0
5	16QAM	1	12	22.17	22.16	22.04		
5	16QAM	1	24	22.13	22.14	21.94		
5	16QAM	12	0	21.01	21.04	20.88	22	1
5	16QAM	12	7	21.03	21.00	20.85		
5	16QAM	12	13	20.97	20.98	20.81		
5	16QAM	25	0	20.98	20.98	20.83		
5	64QAM	1	0	21.32	21.04	21.12	22	1
5	64QAM	1	12	21.28	21.00	21.06		
5	64QAM	1	24	21.25	20.98	20.86		
5	64QAM	12	0	20.09	20.20	19.89	21	2
5	64QAM	12	7	20.22	20.02	19.95		
5	64QAM	12	13	20.04	19.83	19.94		
5	64QAM	25	0	20.02	19.92	19.94		
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	21.95	21.97	21.81	23	0
3	QPSK	1	8	21.92	21.94	21.79		
3	QPSK	1	14	21.91	21.91	21.75		
3	QPSK	8	0	21.98	21.98	21.84	23	0
3	QPSK	8	4	22.03	22.00	21.82		
3	QPSK	8	7	21.95	21.99	21.81		
3	QPSK	15	0	21.96	21.96	21.80		
3	16QAM	1	0	22.15	22.16	22.02	23	0
3	16QAM	1	8	22.18	22.16	22.00		
3	16QAM	1	14	22.13	22.14	21.91		
3	16QAM	8	0	21.05	21.06	20.90	22	1
3	16QAM	8	4	21.07	21.06	20.88		
3	16QAM	8	7	21.03	21.01	20.87		
3	16QAM	15	0	21.01	21.00	20.84		
3	64QAM	1	0	21.29	20.98	21.15	22	1
3	64QAM	1	8	21.19	21.05	21.08		
3	64QAM	1	14	21.22	20.92	20.95		
3	64QAM	8	0	20.17	20.14	19.96	21	2
3	64QAM	8	4	20.21	20.03	20.02		
3	64QAM	8	7	20.10	19.82	19.96		
3	64QAM	15	0	20.20	20.06	19.99		

Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	21.85	21.86	21.67	23	0
1.4	QPSK	1	3	21.90	21.90	21.73		
1.4	QPSK	1	5	21.83	21.82	21.65		
1.4	QPSK	3	0	21.92	21.89	21.71		
1.4	QPSK	3	1	21.98	21.95	21.78		
1.4	QPSK	3	3	21.89	21.89	21.70		
1.4	QPSK	6	0	21.91	21.92	21.72	23	0
1.4	16QAM	1	0	22.11	22.08	21.92	23	0
1.4	16QAM	1	3	22.17	22.13	21.99		
1.4	16QAM	1	5	22.10	22.06	21.88		
1.4	16QAM	3	0	21.93	21.90	21.73		
1.4	16QAM	3	1	21.96	21.94	21.78		
1.4	16QAM	3	3	21.90	21.89	21.71		
1.4	16QAM	6	0	20.97	20.97	20.81	22	1
1.4	64QAM	1	0	21.26	21.00	21.10	22	1
1.4	64QAM	1	3	21.30	21.09	21.03		
1.4	64QAM	1	5	21.06	20.97	20.82		
1.4	64QAM	3	0	21.09	21.08	20.89		
1.4	64QAM	3	1	21.24	21.03	20.95		
1.4	64QAM	3	3	21.12	20.98	20.80		
1.4	64QAM	6	0	20.03	20.08	19.89	21	2

<LTE Band 30>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				27710				
Frequency (MHz)				2310				
10	QPSK	1	0	21.02			22	0
10	QPSK	1	25	20.74				
10	QPSK	1	49	20.67				
10	QPSK	25	0	20.83			22	0
10	QPSK	25	12	20.80				
10	QPSK	25	25	20.74				
10	QPSK	50	0	20.80				
10	16QAM	1	0	20.98			22	0
10	16QAM	1	25	21.01				
10	16QAM	1	49	20.95				
10	16QAM	25	0	20.82			22	0
10	16QAM	25	12	20.83				
10	16QAM	25	25	20.77				
10	16QAM	50	0	20.81				
10	64QAM	1	0	20.96			22	0
10	64QAM	1	25	20.66				
10	64QAM	1	49	20.63				
10	64QAM	25	0	20.73			21	1
10	64QAM	25	12	20.80				
10	64QAM	25	25	20.72				
10	64QAM	50	0	20.76				
Channel				27685	27710	27735	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2307.5	2310	2312.5		
5	QPSK	1	0	20.76	20.73	20.74	22	0
5	QPSK	1	12	20.69	20.70	20.70		
5	QPSK	1	24	20.71	20.71	20.67		
5	QPSK	12	0	20.76	20.78	20.76	22	0
5	QPSK	12	7	20.75	20.77	20.79		
5	QPSK	12	13	20.76	20.72	20.74		
5	QPSK	25	0	20.78	20.75	20.72		
5	16QAM	1	0	20.96	20.97	20.95	22	0
5	16QAM	1	12	21.00	20.94	20.99		
5	16QAM	1	24	21.00	20.99	20.94		
5	16QAM	12	0	20.80	20.81	20.81	22	0
5	16QAM	12	7	20.78	20.82	20.80		
5	16QAM	12	13	20.75	20.77	20.78		
5	16QAM	25	0	20.78	20.76	20.76		
5	64QAM	1	0	20.67	20.72	20.69	22	0
5	64QAM	1	12	20.65	20.61	20.70		
5	64QAM	1	24	20.66	20.68	20.59		
5	64QAM	12	0	20.74	20.72	20.74	21	1
5	64QAM	12	7	20.72	20.70	20.78		
5	64QAM	12	13	20.74	20.66	20.72		
5	64QAM	25	0	20.68	20.66	20.68		

<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	20.84	21.37	20.95	22	0
20	QPSK	1	49	20.65	20.99	20.74		
20	QPSK	1	99	20.61	20.83	20.56		
20	QPSK	50	0	20.81	21.14	20.94	22	0
20	QPSK	50	24	20.75	21.08	20.85		
20	QPSK	50	50	20.72	21.06	20.66		
20	QPSK	100	0	20.74	21.11	20.84		
20	16QAM	1	0	21.13	21.23	21.26	22	0
20	16QAM	1	49	20.94	21.33	21.02		
20	16QAM	1	99	20.92	21.17	20.87		
20	16QAM	50	0	20.84	21.19	20.93	22	0
20	16QAM	50	24	20.78	21.14	20.87		
20	16QAM	50	50	20.72	21.09	20.70		
20	16QAM	100	0	20.78	21.12	20.85		
20	64QAM	1	0	20.72	21.27	21.03	22	0
20	64QAM	1	49	20.63	20.91	20.84		
20	64QAM	1	99	20.52	20.73	20.56		
20	64QAM	50	0	19.89	20.29	19.94	21	1
20	64QAM	50	24	19.86	20.21	19.84		
20	64QAM	50	50	19.64	20.08	19.67		
20	64QAM	100	0	19.86	20.13	19.88		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	20.80	21.09	21.02	22	0
15	QPSK	1	37	20.63	20.91	20.72		
15	QPSK	1	74	20.64	20.75	20.68		
15	QPSK	36	0	20.77	20.96	20.98	22	0
15	QPSK	36	20	20.73	20.90	20.74		
15	QPSK	36	39	20.70	20.88	20.66		
15	QPSK	75	0	20.74	20.93	20.74		
15	16QAM	1	0	21.11	21.32	21.22	22	0
15	16QAM	1	37	20.97	21.16	20.94		
15	16QAM	1	74	20.97	21.07	20.91		
15	16QAM	36	0	20.80	20.98	20.87	22	0
15	16QAM	36	20	20.78	20.95	20.74		
15	16QAM	36	39	20.71	20.88	20.67		
15	16QAM	75	0	20.77	20.95	20.75		
15	64QAM	1	0	20.69	21.04	20.97	22	0
15	64QAM	1	37	20.67	20.96	20.68		
15	64QAM	1	74	20.56	20.72	20.59		
15	64QAM	36	0	19.88	19.99	19.80	21	1
15	64QAM	36	20	19.87	19.90	19.82		
15	64QAM	36	39	19.76	19.78	19.74		
15	64QAM	75	0	19.87	19.99	19.76		

Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	20.68	21.04	20.91	22	0
10	QPSK	1	25	20.61	20.94	20.71		
10	QPSK	1	49	20.58	20.89	20.65		
10	QPSK	25	0	20.70	21.04	20.84	22	0
10	QPSK	25	12	20.69	21.02	20.81		
10	QPSK	25	25	20.66	20.96	20.76		
10	QPSK	50	0	20.68	20.99	20.68		
10	16QAM	1	0	21.02	21.10	21.11	22	0
10	16QAM	1	25	20.94	21.27	20.93		
10	16QAM	1	49	20.88	21.27	20.87		
10	16QAM	25	0	20.73	21.06	20.74	22	0
10	16QAM	25	12	20.71	21.06	20.70		
10	16QAM	25	25	20.65	21.00	20.66		
10	16QAM	50	0	20.71	21.04	20.69		
10	64QAM	1	0	20.46	20.94	20.97	22	0
10	64QAM	1	25	20.62	21.02	20.71		
10	64QAM	1	49	20.64	20.91	20.70		
10	64QAM	25	0	19.80	20.06	19.80	21	1
10	64QAM	25	12	19.66	19.97	19.70		
10	64QAM	25	25	19.66	19.90	19.72		
10	64QAM	50	0	19.70	19.94	19.78		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	20.63	20.98	20.67	22	0
5	QPSK	1	12	20.58	20.92	20.61		
5	QPSK	1	24	20.57	20.93	20.59		
5	QPSK	12	0	20.67	20.99	20.69	22	0
5	QPSK	12	7	20.68	21.01	20.67		
5	QPSK	12	13	20.62	20.94	20.65		
5	QPSK	25	0	20.66	21.00	20.69		
5	16QAM	1	0	20.97	21.15	20.99	22	0
5	16QAM	1	12	20.91	21.32	20.92		
5	16QAM	1	24	20.90	21.32	20.89		
5	16QAM	12	0	20.72	21.05	20.70	22	0
5	16QAM	12	7	20.67	21.05	20.73		
5	16QAM	12	13	20.65	20.99	20.66		
5	16QAM	25	0	20.66	21.02	20.70		
5	64QAM	1	0	20.51	20.95	20.69	22	0
5	64QAM	1	12	20.68	20.98	20.52		
5	64QAM	1	24	20.65	20.88	20.61		
5	64QAM	12	0	19.63	20.07	19.78	21	1
5	64QAM	12	7	19.68	20.02	19.74		
5	64QAM	12	13	19.75	20.08	19.68		
5	64QAM	25	0	19.58	19.95	19.68		

Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	20.57	20.94	20.63	22	0
3	QPSK	1	8	20.56	20.94	20.62		
3	QPSK	1	14	20.54	20.90	20.59		
3	QPSK	8	0	20.63	20.98	20.66	22	0
3	QPSK	8	4	20.62	20.99	20.70		
3	QPSK	8	7	20.58	20.97	20.67		
3	QPSK	15	0	20.64	20.97	20.64		
3	16QAM	1	0	20.90	21.13	20.93	22	0
3	16QAM	1	8	20.90	21.31	20.93		
3	16QAM	1	14	20.86	21.28	20.89		
3	16QAM	8	0	20.71	21.05	20.73	22	0
3	16QAM	8	4	20.73	21.08	20.78		
3	16QAM	8	7	20.68	21.05	20.73		
3	16QAM	15	0	20.67	21.01	20.69		
3	64QAM	1	0	20.31	20.86	20.53	22	0
3	64QAM	1	8	20.60	20.91	20.59		
3	64QAM	1	14	20.60	20.95	20.60		
3	64QAM	8	0	19.68	20.06	19.74	21	1
3	64QAM	8	4	19.83	20.13	19.82		
3	64QAM	8	7	19.73	20.07	19.78		
3	64QAM	15	0	19.60	19.96	19.73		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	20.53	20.88	20.56	22	0
1.4	QPSK	1	3	20.60	20.96	20.64		
1.4	QPSK	1	5	20.50	20.87	20.56		
1.4	QPSK	3	0	20.56	20.93	20.59		
1.4	QPSK	3	1	20.61	20.97	20.67		
1.4	QPSK	3	3	20.57	20.92	20.57		
1.4	QPSK	6	0	20.57	20.92	20.59	22	0
1.4	16QAM	1	0	20.86	21.20	20.87	22	0
1.4	16QAM	1	3	20.93	21.31	20.91		
1.4	16QAM	1	5	20.85	21.23	20.85		
1.4	16QAM	3	0	20.59	20.99	20.64		
1.4	16QAM	3	1	20.64	21.03	20.71		
1.4	16QAM	3	3	20.58	20.97	20.64		
1.4	16QAM	6	0	20.63	21.02	20.73	22	0
1.4	64QAM	1	0	20.31	20.81	20.51	22	0
1.4	64QAM	1	3	20.60	20.89	20.69		
1.4	64QAM	1	5	20.45	20.96	20.53		
1.4	64QAM	3	0	20.21	20.62	20.23		
1.4	64QAM	3	1	20.24	20.66	20.16		
1.4	64QAM	3	3	20.03	20.43	20.28		
1.4	64QAM	6	0	19.64	19.92	19.78	21	1

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

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

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

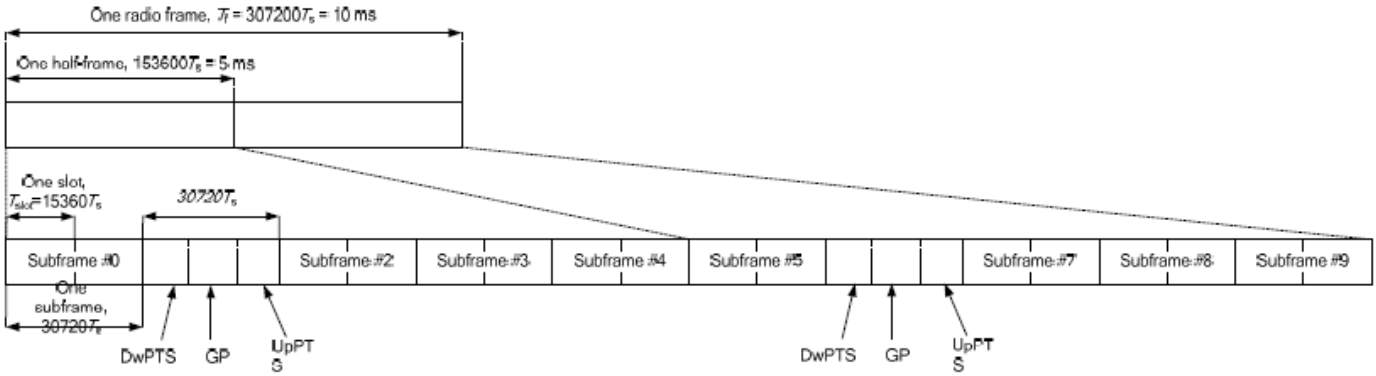


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

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

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

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

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

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

The highest duty factor is resulted from:

i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subfames, uplink operation is in 3 uplink subframes and 1 special subframe.

ii. special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink

iii. for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is: (3+0.167)/5 = 63.3%

iv. for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is: (3+0.143)/5 = 62.9%

v. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.

<At-Head and Default Power Mode>

<LTE Band 38>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				37850	38000	38150		
Frequency (MHz)				2580	2595	2610		
20	QPSK	1	0	22.74	22.67	22.66	24	0
20	QPSK	1	49	22.69	22.59	22.61		
20	QPSK	1	99	22.58	22.58	22.60		
20	QPSK	50	0	21.62	21.60	21.62	23	1
20	QPSK	50	24	21.62	21.61	21.68		
20	QPSK	50	50	21.49	21.62	21.52		
20	QPSK	100	0	21.52	21.57	21.63		
20	16QAM	1	0	21.81	21.69	21.76	23	1
20	16QAM	1	49	21.72	21.61	21.69		
20	16QAM	1	99	21.66	21.67	21.67		
20	16QAM	50	0	20.70	20.64	20.58	22	2
20	16QAM	50	24	20.69	20.65	20.70		
20	16QAM	50	50	20.54	20.63	20.53		
20	16QAM	100	0	20.71	20.62	20.62		
20	64QAM	1	0	21.99	21.93	21.90	22	2
20	64QAM	1	49	21.98	21.95	21.90		
20	64QAM	1	99	21.82	21.82	21.92		
20	64QAM	50	0	20.89	20.84	20.98	21	3
20	64QAM	50	24	20.99	20.96	20.98		
20	64QAM	50	50	20.81	20.95	20.86		
20	64QAM	100	0	20.85	20.92	20.99		
Channel				37825	38000	38175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2577.5	2595	2612.5		
15	QPSK	1	0	22.68	22.67	22.67	24	0
15	QPSK	1	37	22.64	22.66	22.69		
15	QPSK	1	74	22.56	22.61	22.64		
15	QPSK	36	0	21.63	21.58	21.58	23	1
15	QPSK	36	20	21.58	21.60	21.64		
15	QPSK	36	39	21.51	21.46	21.51		
15	QPSK	75	0	21.61	21.56	21.60		
15	16QAM	1	0	21.72	21.76	21.79	23	1
15	16QAM	1	37	21.80	21.69	21.76		
15	16QAM	1	74	21.73	21.65	21.73		
15	16QAM	36	0	20.67	20.58	20.54	22	2
15	16QAM	36	20	20.73	20.56	20.66		
15	16QAM	36	39	20.64	20.53	20.55		
15	16QAM	75	0	20.73	20.66	20.72		
15	64QAM	1	0	21.90	21.92	21.98	22	2
15	64QAM	1	37	22.00	21.88	21.99		
15	64QAM	1	74	21.92	21.93	21.84		
15	64QAM	36	0	20.97	20.95	20.92	21	3
15	64QAM	36	20	20.90	20.95	20.86		
15	64QAM	36	39	20.90	20.69	20.83		
15	64QAM	75	0	20.93	20.85	20.87		

Channel				37800	38000	38200	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2575	2595	2615		
10	QPSK	1	0	22.70	22.69	22.73	24	0
10	QPSK	1	25	22.65	22.68	22.61		
10	QPSK	1	49	22.68	22.66	22.65		
10	QPSK	25	0	21.63	21.57	21.67	23	1
10	QPSK	25	12	21.68	21.62	21.58		
10	QPSK	25	25	21.63	21.55	21.60		
10	QPSK	50	0	21.60	21.56	21.58		
10	16QAM	1	0	21.75	21.79	21.84	23	1
10	16QAM	1	25	21.77	21.74	21.72		
10	16QAM	1	49	21.73	21.74	21.70		
10	16QAM	25	0	20.69	20.59	20.71	22	2
10	16QAM	25	12	20.67	20.64	20.61		
10	16QAM	25	25	20.62	20.51	20.58		
10	16QAM	50	0	20.66	20.60	20.59		
10	64QAM	1	0	21.86	21.96	21.88	22	2
10	64QAM	1	25	21.82	21.91	21.71		
10	64QAM	1	49	21.82	21.93	21.92		
10	64QAM	25	0	20.92	20.77	20.81	21	3
10	64QAM	25	12	20.94	20.85	20.73		
10	64QAM	25	25	20.73	20.79	20.78		
10	64QAM	50	0	20.76	20.71	20.81		
Channel				37775	38000	38225	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2572.5	2595	2617.5		
5	QPSK	1	0	22.66	22.61	22.62	24	0
5	QPSK	1	12	22.61	22.63	22.57		
5	QPSK	1	24	22.58	22.62	22.61		
5	QPSK	12	0	21.64	21.60	21.53	23	1
5	QPSK	12	7	21.58	21.59	21.61		
5	QPSK	12	13	21.60	21.55	21.53		
5	QPSK	25	0	21.61	21.61	21.58		
5	16QAM	1	0	21.69	21.69	21.66	23	1
5	16QAM	1	12	21.72	21.75	21.68		
5	16QAM	1	24	21.68	21.70	21.68		
5	16QAM	12	0	20.63	20.61	20.57	22	2
5	16QAM	12	7	20.66	20.61	20.58		
5	16QAM	12	13	20.62	20.56	20.54		
5	16QAM	25	0	20.66	20.65	20.57		
5	64QAM	1	0	21.93	21.78	21.90	22	2
5	64QAM	1	12	21.91	21.82	21.86		
5	64QAM	1	24	21.80	21.88	21.91		
5	64QAM	12	0	20.84	20.84	20.81	21	3
5	64QAM	12	7	20.80	20.89	20.78		
5	64QAM	12	13	20.88	20.71	20.80		
5	64QAM	25	0	20.91	20.91	20.80		

<LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Low Ch. / Freq.	Power Middle High Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				40240	40500	40770	41140		
Frequency (MHz)				2555	2581	2608	2645		
20	QPSK	1	0	22.89	22.96	22.92	22.72	24	0
20	QPSK	1	49	22.83	22.91	22.67	22.63		
20	QPSK	1	99	22.82	22.79	22.78	22.64		
20	QPSK	50	0	21.81	21.82	21.73	21.66	23	1
20	QPSK	50	24	21.84	21.75	21.69	21.53		
20	QPSK	50	50	21.67	21.66	21.60	21.43		
20	QPSK	100	0	21.81	21.79	21.70	21.51		
20	16QAM	1	0	21.97	22.02	21.99	21.84	23	1
20	16QAM	1	49	21.89	21.95	21.75	21.67		
20	16QAM	1	99	21.86	21.88	21.83	21.71		
20	16QAM	50	0	20.80	20.85	20.72	20.68	22	2
20	16QAM	50	24	20.85	20.82	20.75	20.63		
20	16QAM	50	50	20.74	20.72	20.64	20.47		
20	16QAM	100	0	20.82	20.81	20.71	20.55		
20	64QAM	1	0	20.67	20.79	20.65	20.46	22	2
20	64QAM	1	49	20.56	20.73	20.51	20.49		
20	64QAM	1	99	20.65	20.65	20.57	20.41		
20	64QAM	50	0	19.57	19.68	19.55	19.38	21	3
20	64QAM	50	24	19.59	19.51	19.40	19.36		
20	64QAM	50	50	19.49	19.45	19.32	19.28		
20	64QAM	100	0	19.63	19.51	19.46	19.27		
Channel				40215	40495	40785	41165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2552.5	2580.5	2609.5	2647.5		
15	QPSK	1	0	22.92	22.95	22.90	22.84	24	0
15	QPSK	1	37	22.86	22.90	22.66	22.70		
15	QPSK	1	74	22.78	22.81	22.72	22.63		
15	QPSK	36	0	21.78	21.67	21.69	21.43	23	1
15	QPSK	36	20	21.83	21.74	21.62	21.56		
15	QPSK	36	39	21.85	21.64	21.60	21.36		
15	QPSK	75	0	21.80	21.71	21.70	21.54		
15	16QAM	1	0	21.96	22.02	21.93	21.80	23	1
15	16QAM	1	37	21.92	21.98	21.74	21.72		
15	16QAM	1	74	21.84	21.86	21.84	21.66		
15	16QAM	36	0	20.79	20.80	20.73	20.52	22	2
15	16QAM	36	20	20.87	20.78	20.69	20.47		
15	16QAM	36	39	20.80	20.62	20.66	20.54		
15	16QAM	75	0	20.88	20.67	20.67	20.59		
15	64QAM	1	0	20.76	20.73	20.77	20.63	22	2
15	64QAM	1	37	20.66	20.74	20.55	20.60		
15	64QAM	1	74	20.61	20.66	20.51	20.52		
15	64QAM	36	0	19.61	19.38	19.49	19.24	21	3
15	64QAM	36	20	19.61	19.54	19.51	19.40		
15	64QAM	36	39	19.57	19.47	19.30	19.18		
15	64QAM	75	0	19.56	19.47	19.44	19.38		

Channel				40190	40490	40790	41190	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2550	2580	2610	2650		
10	QPSK	1	0	22.83	22.92	22.84	22.75	24	0
10	QPSK	1	25	22.86	22.93	22.80	22.71		
10	QPSK	1	49	22.87	22.77	22.79	22.71		
10	QPSK	25	0	21.78	21.75	21.70	21.56	23	1
10	QPSK	25	12	21.82	21.85	21.64	21.41		
10	QPSK	25	25	21.83	21.76	21.64	21.46		
10	QPSK	50	0	21.79	21.79	21.66	21.46		
10	16QAM	1	0	21.92	22.04	21.93	21.77	23	1
10	16QAM	1	25	21.98	22.01	21.84	21.64		
10	16QAM	1	49	21.92	21.86	21.86	21.67		
10	16QAM	25	0	20.86	20.82	20.72	20.63	22	2
10	16QAM	25	12	20.82	20.86	20.70	20.52		
10	16QAM	25	25	20.82	20.74	20.58	20.52		
10	16QAM	50	0	20.86	20.81	20.63	20.58		
10	64QAM	1	0	20.55	20.76	20.61	20.45	22	2
10	64QAM	1	25	20.58	20.72	20.69	20.41		
10	64QAM	1	49	20.69	20.55	20.56	20.42		
10	64QAM	25	0	19.52	19.57	19.43	19.39	21	3
10	64QAM	25	12	19.69	19.67	19.34	19.20		
10	64QAM	25	25	19.53	19.66	19.53	19.29		
10	64QAM	50	0	19.59	19.63	19.44	19.35		
Channel				40165	40485	40805	41215	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2547.5	2579.5	2611.5	2652.5		
5	QPSK	1	0	22.77	22.95	22.78	22.67	24	0
5	QPSK	1	12	22.78	22.89	22.74	22.70		
5	QPSK	1	24	22.80	22.87	22.73	22.69		
5	QPSK	12	0	21.77	21.76	21.65	21.57	23	1
5	QPSK	12	7	21.77	21.77	21.67	21.56		
5	QPSK	12	13	21.75	21.79	21.74	21.59		
5	QPSK	25	0	21.75	21.76	21.68	21.60		
5	16QAM	1	0	21.86	21.95	21.86	21.74	23	1
5	16QAM	1	12	21.80	21.99	21.82	21.81		
5	16QAM	1	24	21.85	21.97	21.83	21.78		
5	16QAM	12	0	20.75	20.85	20.72	20.57	22	2
5	16QAM	12	7	20.78	20.79	20.74	20.59		
5	16QAM	12	13	20.74	20.79	20.66	20.51		
5	16QAM	25	0	20.77	20.84	20.75	20.61		
5	64QAM	1	0	20.55	20.84	20.56	20.55	22	2
5	64QAM	1	12	20.58	20.60	20.59	20.57		
5	64QAM	1	24	20.59	20.58	20.49	20.41		
5	64QAM	12	0	19.48	19.65	19.37	19.41	21	3
5	64QAM	12	7	19.52	19.56	19.38	19.40		
5	64QAM	12	13	19.49	19.63	19.63	19.35		
5	64QAM	25	0	19.53	19.62	19.58	19.31		

<Near-body and Hotspot Mode>

<LTE Band 38>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				37850	38000	38150		
Frequency (MHz)				2580	2595	2610		
20	QPSK	1	0	22.74	22.67	22.66	24	0
20	QPSK	1	49	22.69	22.59	22.61		
20	QPSK	1	99	22.58	22.58	22.60		
20	QPSK	50	0	21.62	21.60	21.62	23	1
20	QPSK	50	24	21.62	21.61	21.68		
20	QPSK	50	50	21.49	21.62	21.52		
20	QPSK	100	0	21.52	21.57	21.63		
20	16QAM	1	0	21.81	21.69	21.76	23	1
20	16QAM	1	49	21.72	21.61	21.69		
20	16QAM	1	99	21.66	21.67	21.67		
20	16QAM	50	0	20.70	20.64	20.58	22	2
20	16QAM	50	24	20.69	20.65	20.70		
20	16QAM	50	50	20.54	20.63	20.53		
20	16QAM	100	0	20.71	20.62	20.62		
20	64QAM	1	0	21.99	21.93	21.90	22	2
20	64QAM	1	49	21.98	21.95	21.90		
20	64QAM	1	99	21.82	21.82	21.92		
20	64QAM	50	0	20.89	20.84	20.98	21	3
20	64QAM	50	24	20.99	20.96	20.98		
20	64QAM	50	50	20.81	20.95	20.86		
20	64QAM	100	0	20.85	20.92	20.99		
Channel				37825	38000	38175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2577.5	2595	2612.5		
15	QPSK	1	0	22.68	22.67	22.67	24	0
15	QPSK	1	37	22.64	22.66	22.69		
15	QPSK	1	74	22.56	22.61	22.64		
15	QPSK	36	0	21.63	21.58	21.58	23	1
15	QPSK	36	20	21.58	21.60	21.64		
15	QPSK	36	39	21.51	21.46	21.51		
15	QPSK	75	0	21.61	21.56	21.60		
15	16QAM	1	0	21.72	21.76	21.79	23	1
15	16QAM	1	37	21.80	21.69	21.76		
15	16QAM	1	74	21.73	21.65	21.73		
15	16QAM	36	0	20.67	20.58	20.54	22	2
15	16QAM	36	20	20.73	20.56	20.66		
15	16QAM	36	39	20.64	20.53	20.55		
15	16QAM	75	0	20.73	20.66	20.72		
15	64QAM	1	0	21.90	21.92	21.98	22	2
15	64QAM	1	37	22.00	21.88	21.99		
15	64QAM	1	74	21.92	21.93	21.84		
15	64QAM	36	0	20.97	20.95	20.92	21	3
15	64QAM	36	20	20.90	20.95	20.86		
15	64QAM	36	39	20.90	20.69	20.83		
15	64QAM	75	0	20.93	20.85	20.87		

Channel				37800	38000	38200	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2575	2595	2615		
10	QPSK	1	0	22.70	22.69	22.73	24	0
10	QPSK	1	25	22.65	22.68	22.61		
10	QPSK	1	49	22.68	22.66	22.65		
10	QPSK	25	0	21.63	21.57	21.67	23	1
10	QPSK	25	12	21.68	21.62	21.58		
10	QPSK	25	25	21.63	21.55	21.60		
10	QPSK	50	0	21.60	21.56	21.58		
10	16QAM	1	0	21.75	21.79	21.84	23	1
10	16QAM	1	25	21.77	21.74	21.72		
10	16QAM	1	49	21.73	21.74	21.70		
10	16QAM	25	0	20.69	20.59	20.71	22	2
10	16QAM	25	12	20.67	20.64	20.61		
10	16QAM	25	25	20.62	20.51	20.58		
10	16QAM	50	0	20.66	20.60	20.59		
10	64QAM	1	0	21.86	21.96	21.88	22	2
10	64QAM	1	25	21.82	21.91	21.71		
10	64QAM	1	49	21.82	21.93	21.92		
10	64QAM	25	0	20.92	20.77	20.81	21	3
10	64QAM	25	12	20.94	20.85	20.73		
10	64QAM	25	25	20.73	20.79	20.78		
10	64QAM	50	0	20.76	20.71	20.81		
Channel				37775	38000	38225	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2572.5	2595	2617.5		
5	QPSK	1	0	22.66	22.61	22.62	24	0
5	QPSK	1	12	22.61	22.63	22.57		
5	QPSK	1	24	22.58	22.62	22.61		
5	QPSK	12	0	21.64	21.60	21.53	23	1
5	QPSK	12	7	21.58	21.59	21.61		
5	QPSK	12	13	21.60	21.55	21.53		
5	QPSK	25	0	21.61	21.61	21.58		
5	16QAM	1	0	21.69	21.69	21.66	23	1
5	16QAM	1	12	21.72	21.75	21.68		
5	16QAM	1	24	21.68	21.70	21.68		
5	16QAM	12	0	20.63	20.61	20.57	22	2
5	16QAM	12	7	20.66	20.61	20.58		
5	16QAM	12	13	20.62	20.56	20.54		
5	16QAM	25	0	20.66	20.65	20.57		
5	64QAM	1	0	21.93	21.78	21.90	22	2
5	64QAM	1	12	21.91	21.82	21.86		
5	64QAM	1	24	21.80	21.88	21.91		
5	64QAM	12	0	20.84	20.84	20.81	21	3
5	64QAM	12	7	20.80	20.89	20.78		
5	64QAM	12	13	20.88	20.71	20.80		
5	64QAM	25	0	20.91	20.91	20.80		

<LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Low Ch. / Freq.	Power Middle High Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				40240	40500	40770	41140		
Frequency (MHz)				2555	2581	2608	2645		
20	QPSK	1	0	22.89	22.96	22.92	22.72	24	0
20	QPSK	1	49	22.83	22.91	22.67	22.63		
20	QPSK	1	99	22.82	22.79	22.78	22.64		
20	QPSK	50	0	21.81	21.82	21.73	21.66	23	1
20	QPSK	50	24	21.84	21.75	21.69	21.53		
20	QPSK	50	50	21.67	21.66	21.60	21.43		
20	QPSK	100	0	21.81	21.79	21.70	21.51		
20	16QAM	1	0	21.97	22.02	21.99	21.84	23	1
20	16QAM	1	49	21.89	21.95	21.75	21.67		
20	16QAM	1	99	21.86	21.88	21.83	21.71		
20	16QAM	50	0	20.80	20.85	20.72	20.68	22	2
20	16QAM	50	24	20.85	20.82	20.75	20.63		
20	16QAM	50	50	20.74	20.72	20.64	20.47		
20	16QAM	100	0	20.82	20.81	20.71	20.55		
20	64QAM	1	0	20.67	20.79	20.65	20.46	22	2
20	64QAM	1	49	20.56	20.73	20.51	20.49		
20	64QAM	1	99	20.65	20.65	20.57	20.41		
20	64QAM	50	0	19.57	19.68	19.55	19.38	21	3
20	64QAM	50	24	19.59	19.51	19.40	19.36		
20	64QAM	50	50	19.49	19.45	19.32	19.28		
20	64QAM	100	0	19.63	19.51	19.46	19.27		
Channel				40215	40495	40785	41165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2552.5	2580.5	2609.5	2647.5		
15	QPSK	1	0	22.92	22.95	22.90	22.84	24	0
15	QPSK	1	37	22.86	22.90	22.66	22.70		
15	QPSK	1	74	22.78	22.81	22.72	22.63		
15	QPSK	36	0	21.78	21.67	21.69	21.43	23	1
15	QPSK	36	20	21.83	21.74	21.62	21.56		
15	QPSK	36	39	21.85	21.64	21.60	21.36		
15	QPSK	75	0	21.80	21.71	21.70	21.54		
15	16QAM	1	0	21.96	22.02	21.93	21.80	23	1
15	16QAM	1	37	21.92	21.98	21.74	21.72		
15	16QAM	1	74	21.84	21.86	21.84	21.66		
15	16QAM	36	0	20.79	20.80	20.73	20.52	22	2
15	16QAM	36	20	20.87	20.78	20.69	20.47		
15	16QAM	36	39	20.80	20.62	20.66	20.54		
15	16QAM	75	0	20.88	20.67	20.67	20.59		
15	64QAM	1	0	20.76	20.73	20.77	20.63	22	2
15	64QAM	1	37	20.66	20.74	20.55	20.60		
15	64QAM	1	74	20.61	20.66	20.51	20.52		
15	64QAM	36	0	19.61	19.38	19.49	19.24	21	3
15	64QAM	36	20	19.61	19.54	19.51	19.40		
15	64QAM	36	39	19.57	19.47	19.30	19.18		
15	64QAM	75	0	19.56	19.47	19.44	19.38		

Channel				40190	40490	40790	41190	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2550	2580	2610	2650		
10	QPSK	1	0	22.83	22.92	22.84	22.75	24	0
10	QPSK	1	25	22.86	22.93	22.80	22.71		
10	QPSK	1	49	22.87	22.77	22.79	22.71		
10	QPSK	25	0	21.78	21.75	21.70	21.56	23	1
10	QPSK	25	12	21.82	21.85	21.64	21.41		
10	QPSK	25	25	21.83	21.76	21.64	21.46		
10	QPSK	50	0	21.79	21.79	21.66	21.46		
10	16QAM	1	0	21.92	22.04	21.93	21.77	23	1
10	16QAM	1	25	21.98	22.01	21.84	21.64		
10	16QAM	1	49	21.92	21.86	21.86	21.67		
10	16QAM	25	0	20.86	20.82	20.72	20.63	22	2
10	16QAM	25	12	20.82	20.86	20.70	20.52		
10	16QAM	25	25	20.82	20.74	20.58	20.52		
10	16QAM	50	0	20.86	20.81	20.63	20.58		
10	64QAM	1	0	20.55	20.76	20.61	20.45	22	2
10	64QAM	1	25	20.58	20.72	20.69	20.41		
10	64QAM	1	49	20.69	20.55	20.56	20.42		
10	64QAM	25	0	19.52	19.57	19.43	19.39	21	3
10	64QAM	25	12	19.69	19.67	19.34	19.20		
10	64QAM	25	25	19.53	19.66	19.53	19.29		
10	64QAM	50	0	19.59	19.63	19.44	19.35		
Channel				40165	40485	40805	41215	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2547.5	2579.5	2611.5	2652.5		
5	QPSK	1	0	22.77	22.95	22.78	22.67	24	0
5	QPSK	1	12	22.78	22.89	22.74	22.70		
5	QPSK	1	24	22.80	22.87	22.73	22.69		
5	QPSK	12	0	21.77	21.76	21.65	21.57	23	1
5	QPSK	12	7	21.77	21.77	21.67	21.56		
5	QPSK	12	13	21.75	21.79	21.74	21.59		
5	QPSK	25	0	21.75	21.76	21.68	21.60		
5	16QAM	1	0	21.86	21.95	21.86	21.74	23	1
5	16QAM	1	12	21.80	21.99	21.82	21.81		
5	16QAM	1	24	21.85	21.97	21.83	21.78		
5	16QAM	12	0	20.75	20.85	20.72	20.57	22	2
5	16QAM	12	7	20.78	20.79	20.74	20.59		
5	16QAM	12	13	20.74	20.79	20.66	20.51		
5	16QAM	25	0	20.77	20.84	20.75	20.61		
5	64QAM	1	0	20.55	20.84	20.56	20.55	22	2
5	64QAM	1	12	20.58	20.60	20.59	20.57		
5	64QAM	1	24	20.59	20.58	20.49	20.41		
5	64QAM	12	0	19.48	19.65	19.37	19.41	21	3
5	64QAM	12	7	19.52	19.56	19.38	19.40		
5	64QAM	12	13	19.49	19.63	19.63	19.35		
5	64QAM	25	0	19.53	19.62	19.58	19.31		

<LTE Carrier Aggregation>

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 bands and bandwidths and configurations are provided as follow table was according to 3GPP.
2. All permutations exist. No restrictions on Pcell & Scell combinations. Only LTE Band 29A is limited to Scell.
3. This device supported inter-band up to 4 DL carrier aggregation, for intra-band supported non-contiguous and contiguous configuration.

<Inter-Band Two Carrier combination>

E-UTRA Configure	E-UTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum Aggregated bandwidth [MHz]
CA_2A-4A	2	Yes	Yes	Yes	Yes	Yes	Yes	40
	4			Yes	Yes	Yes	Yes	
CA_2A-5A	2			Yes	Yes	Yes	Yes	30
	5			Yes	Yes			
CA_2A-12A	2			Yes	Yes	Yes	Yes	30
	12		Yes	Yes	Yes			
CA_2A-17A	2			Yes	Yes			20
	17			Yes	Yes			
CA_2A-29A	2			Yes	Yes			20
	29		Yes	Yes	Yes			
CA_2A-30A	2			Yes	Yes	Yes	Yes	30
	30			Yes	Yes			
CA_2A-66A	2	Yes	Yes	Yes	Yes	Yes	Yes	40
	66			Yes	Yes	Yes	Yes	
CA_2A-252A	2			Yes	Yes	Yes	Yes	40
	252						Yes	
CA_2A-255A	2			Yes	Yes	Yes	Yes	40
	255						Yes	
CA_4A-5A	4			Yes	Yes			20
	5			Yes	Yes			
CA_4A-7A	4			Yes	Yes			30
	7			Yes	Yes	Yes	Yes	
CA_4A-12A	4	Yes	Yes	Yes	Yes			20
	12			Yes	Yes			
CA_4A-17A	4			Yes	Yes			20
	17			Yes	Yes			
CA_4A-29A	4			Yes	Yes			20
	29		Yes	Yes	Yes			
CA_4A-30A	4			Yes	Yes	Yes	Yes	30
	30			Yes	Yes			
CA_4A-252A	4			Yes	Yes	Yes	Yes	40
	252						Yes	
CA_4A-255A	4			Yes	Yes	Yes	Yes	40
	255						Yes	
CA_5A-7A	5	Yes	Yes	Yes	Yes			30
	7				Yes	Yes	Yes	
CA_5A-30A	5			Yes	Yes			20
	30			Yes	Yes			
CA_5A-66A	5			Yes	Yes			30
	66			Yes	Yes	Yes	Yes	
CA_12A-30A	12			Yes	Yes			20
	30			Yes	Yes			
CA_12A-66A	12			Yes	Yes			30
	66	Yes	Yes	Yes	Yes	Yes	Yes	
CA_29A-30A	29			Yes	Yes			20
	30			Yes	Yes			
CA_29A-66A	29			Yes	Yes			30
	66			Yes	Yes	Yes	Yes	
CA_30A-66A	30			Yes	Yes			30
	66			Yes	Yes	Yes	Yes	

<Inter-Band Three Carrier combination>

E-UTRA Configure	E-UTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum Aggregated bandwidth [MHz]
CA_4A-252C	4			Yes	Yes	Yes	Yes	60
	252						Yes	
	252						Yes	
CA_4A-255C	4			Yes	Yes	Yes	Yes	60
	255						Yes	
	255						Yes	
CA_2A-2A-4A	2			Yes	Yes	Yes	Yes	60
	2			Yes	Yes	Yes	Yes	
	4			Yes	Yes	Yes	Yes	
CA_2A-2A-5A	2			Yes	Yes	Yes	Yes	50
	2			Yes	Yes	Yes	Yes	
	5			Yes	Yes			
CA_2A-2A-12A	2			Yes	Yes	Yes	Yes	50
	2			Yes	Yes	Yes	Yes	
	12			Yes	Yes			
CA_2A-2A-29A	2			Yes	Yes	Yes	Yes	50
	2			Yes	Yes	Yes	Yes	
	29			Yes	Yes			
CA_2A-2A-30A	2			Yes	Yes	Yes	Yes	50
	2			Yes	Yes	Yes	Yes	
	30			Yes	Yes			
CA_2A-4A-4A	2			Yes	Yes	Yes	Yes	60
	4			Yes	Yes	Yes	Yes	
	4			Yes	Yes	Yes	Yes	
CA_2A-4A-5A	2			Yes	Yes	Yes	Yes	50
	4			Yes	Yes	Yes	Yes	
	5			Yes	Yes			
CA_2A-4A-7A	2			Yes	Yes	Yes	Yes	60
	4			Yes	Yes	Yes	Yes	
	7			Yes	Yes	Yes	Yes	
CA_2A-4A-12A	2			Yes	Yes	Yes	Yes	50
	4			Yes	Yes	Yes	Yes	
	12			Yes	Yes			
CA_2A-4A-29A	2			Yes	Yes	Yes	Yes	50
	4			Yes	Yes	Yes	Yes	
	29			Yes	Yes			
CA_2A-5A-30A	2			Yes	Yes	Yes	Yes	40
	5			Yes	Yes			
	30			Yes	Yes			
CA_2A-5A-66A	2			Yes	Yes	Yes	Yes	50
	5			Yes	Yes			
	66			Yes	Yes	Yes	Yes	
CA_2A-12A-30A	2			Yes	Yes	Yes	Yes	40
	12			Yes	Yes			
	30			Yes	Yes			
CA_2A-12A-66A	2			Yes	Yes	Yes	Yes	50
	12			Yes	Yes			
	66			Yes	Yes	Yes	Yes	
CA_2A-29A-30A	2			Yes	Yes	Yes	Yes	40
	29			Yes	Yes			
	30			Yes	Yes			

E-UTRA Configure	E-UTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum Aggregated bandwidth [MHz]
CA_2A-66B	2			Yes	Yes	Yes	Yes	40
	66			66B BCS 0				
	66							
CA_2A-66C	2			Yes	Yes	Yes	Yes	60
	66			66C BCS 0				
	66							
CA_2A-66A-66A	2			Yes	Yes	Yes	Yes	60
	66			Yes	Yes	Yes	Yes	
	66			Yes	Yes	Yes	Yes	
CA_4A-4A-5A	4			Yes	Yes	Yes	Yes	50
	4			Yes	Yes	Yes	Yes	
	5			Yes	Yes			
CA_4A-4A-12A	4			Yes	Yes	Yes	Yes	50
	4			Yes	Yes	Yes	Yes	
	12			Yes	Yes			
CA_4A-4A-29A	4			Yes	Yes	Yes	Yes	50
	4			Yes	Yes	Yes	Yes	
	29			Yes	Yes			
CA_4A-4A-30A	4			Yes	Yes	Yes	Yes	50
	4			Yes	Yes	Yes	Yes	
	30			Yes	Yes			
CA_4A-5A-30A	4			Yes	Yes	Yes	Yes	40
	5			Yes	Yes			
	30			Yes	Yes			
CA_4A-7A-12A	4			Yes	Yes			40
	7			Yes	Yes	Yes	Yes	
	12			Yes	Yes			
CA_4A-12A-30A	4			Yes	Yes	Yes	Yes	40
	12			Yes	Yes			
	30			Yes	Yes			
CA_4A-29A-30A	4			Yes	Yes	Yes	Yes	40
	29			Yes	Yes			
	30			Yes	Yes			
CA_5A-30A-66A	5			Yes	Yes			40
	30			Yes	Yes			
	66			Yes	Yes	Yes	Yes	
CA_5A-66B	5			Yes	Yes			30
	66			66B BCS 0				
	66							
CA_5A-66C	5			Yes	Yes			50
	66			66C BCS 0				
	66							
CA_5A-66A-66A	5			Yes	Yes			50
	66			Yes	Yes	Yes	Yes	
	66			Yes	Yes	Yes	Yes	
CA_12A-30A-66A	12			Yes	Yes			40
	30			Yes	Yes			
	66			Yes	Yes	Yes	Yes	
CA_12A-66C	12				Yes	Yes		50
	66			66C BCS 0				
	66							
CA_12A-66A-66A	12				Yes	Yes		50
	66			Yes	Yes	Yes	Yes	
	66			Yes	Yes	Yes	Yes	

<Inter-Band Four Carrier combination>

E-UTRA Configure	E-UTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum Aggregated bandwidth [MHz]
CA_2A-2A-4A-4A	2			Yes	Yes	Yes	Yes	80
	2			Yes	Yes	Yes	Yes	
	4			Yes	Yes	Yes	Yes	
	4			Yes	Yes	Yes	Yes	
CA_2A-2A-4A-12A	2			Yes	Yes	Yes	Yes	70
	2			Yes	Yes	Yes	Yes	
	4			Yes	Yes	Yes	Yes	
	12			Yes	Yes			
CA_2A-2A-5A-30A	2			Yes	Yes	Yes	Yes	60
	2			Yes	Yes	Yes	Yes	
	5			Yes	Yes			
	30			Yes	Yes			
CA_2A-2A-12A-30A	2			Yes	Yes	Yes	Yes	60
	2			Yes	Yes	Yes	Yes	
	12			Yes	Yes			
	30			Yes	Yes			
CA_2A-2A-29A-30A	2			Yes	Yes	Yes	Yes	60
	2			Yes	Yes	Yes	Yes	
	29			Yes	Yes			
	30			Yes	Yes			
CA_2A-4A-4A-12A	2			Yes	Yes	Yes	Yes	70
	4			Yes	Yes	Yes	Yes	
	4			Yes	Yes	Yes	Yes	
	12			Yes	Yes			
CA_2A-4A-5A-30A	2			Yes	Yes	Yes	Yes	60
	4			Yes	Yes	Yes	Yes	
	5			Yes	Yes			
	30			Yes	Yes			
CA_2A-4A-7A-12A	2			Yes	Yes	Yes	Yes	70
	4			Yes	Yes	Yes	Yes	
	7			Yes	Yes	Yes	Yes	
	12			Yes	Yes			
CA_2A-4A-12A-30A	2			Yes	Yes	Yes	Yes	60
	4			Yes	Yes	Yes	Yes	
	12			Yes	Yes			
	30			Yes	Yes			
CA_2A-4A-29A-30A	2			Yes	Yes	Yes	Yes	60
	4			Yes	Yes	Yes	Yes	
	29			Yes	Yes			
	30			Yes	Yes			
CA_2A-5A-30A-66A	2			Yes	Yes	Yes	Yes	60
	5			Yes	Yes			
	30			Yes	Yes			
	66			Yes	Yes	Yes	Yes	
CA_2A-12A-30A-66A	2			Yes	Yes	Yes	Yes	60
	12			Yes	Yes			
	30			Yes	Yes			
	66			Yes	Yes	Yes	Yes	
CA_4A-4A-5A-30A	4			Yes	Yes	Yes	Yes	60
	4			Yes	Yes	Yes	Yes	
	5			Yes	Yes			
	30			Yes	Yes			
CA_4A-4A-12A-30A	4			Yes	Yes	Yes	Yes	60
	4			Yes	Yes	Yes	Yes	
	12			Yes	Yes			
	30			Yes	Yes			
CA_4A-4A-29A-30A	4			Yes	Yes	Yes	Yes	60
	4			Yes	Yes	Yes	Yes	
	29			Yes	Yes			
	30			Yes	Yes			
CA_12A-30A-66A-66A	12			Yes	Yes	Yes	Yes	60
	30			Yes	Yes	Yes	Yes	
	66			Yes	Yes			
	66			Yes	Yes			

<Intra-Band Carrier combination>

E-UTRA CA Configuration	Component carriers in order of increasing carrier frequency		Maximum aggregates bandwidth[MHz]
	Channel bandwidths for carrier[MHz]	Channel bandwidths for carrier[MHz]	
CA_2A-2A	5, 10, 15, 20	5, 10, 15, 20	40
CA_4A-4A	5, 10, 15, 20	5, 10, 15, 20	40
CA_5B	5, 10	10	20
	10	5	
CA_7A-7A	5	15	40
	10	10, 15	
	15	15, 20	
	20	20	
CA_25A-25A	5, 10	5, 10	20
CA_66B	5	5, 10, 15	20
	10	5, 10	
	15	5	
CA_66C	5	20	40
	10	15, 20	
	15	10, 15, 20	
	20	5, 10, 15, 20	
CA_66A-66A	5, 10, 15, 20	5, 10, 15, 20	40
CA_66A-66C	5, 10, 15, 20	66C BCS 0	60
	66C BCS 0	5, 10, 15, 20	

<LTE Carrier Aggregation Power verification>

General Note:

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

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

iii. The device supports downlink carrier aggregation only. Uplink carrier aggregation is not supported. For power measurement were control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.

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

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

vi. For inter-band CA, the SCC selected highest bandwidth and near the middle of its transmission band.

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

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

viii. This device supported LTE-U band 252 and 255 in DL carrier aggregation and detail supported channel, frequency bandwidth as below form according to manufacturer's design, verify measured conducted power when the downlink carrier aggregation is active, and 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.

Allowed channels (only supported 20MHz BW)					
B252 (UNII-1)			B255 (UNII-3)		
Channel	Frequency (MHz)	BW(MHz)	Channel	Frequency (MHz)	BW(MHz)
255244	5160	20	261094	5745	20
255444	5180	20	261294	5765	20
255644	5200	20	261494	5785	20
255844	5220	20	261694	5805	20
256044	5240	20	261894	5825	20

<Maximum output power for Two Carrier power verification>

Configure		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		Band 2	20	1900	19100	QPSK	1	0	Band 4	20	2132.5	2175	22.75	22.78
		Band 4	20	1732.5	20175	QPSK	1	0	Band 2	20	1960	900	22.75	22.76
		Band 2	20	1900	19100	QPSK	1	0	Band 5	10	881.5	2525	22.76	22.78
		Band 5	10	836.5	20525	QPSK	1	0	Band 2	20	1960	900	23.60	23.64
		Band 2	20	1900	19100	QPSK	1	0	Band 12	10	737.5	5095	22.74	22.78
		Band 12	10	707.5	23095	QPSK	1	0	Band 2	20	1960	900	23.48	23.50
		Band 2	10	1905	19150	QPSK	1	0	Band 17	10	740	5790	22.60	22.62
		Ban 17	10	710	23790	QPSK	1	0	Band 2	10	1960	900	23.45	23.48
		Band 2	10	1905	19150	QPSK	1	0	Band 29	10	722.5	9715	22.60	22.62
		Band 2	20	1900	19100	QPSK	1	0	Band 30	10	2355	9820	22.76	22.78
		Band 30	10	2310	27710	QPSK	1	0	Band 2	20	1960	900	22.80	22.83
		Band 2	20	1900	19100	QPSK	1	0	Band 66	20	2145	66786	22.75	22.78
		Band 66	20	1720	132072	QPSK	1	0	Band 2	20	1960	900	22.90	22.96
		Band 2	20	1900	19100	QPSK	1	0	Band 252	20	5200	255644	22.70	22.78
		Band 2	20	1900	19100	QPSK	1	0	Band 255	20	5785	261494	22.71	22.78
		Band 4	10	1750	20350	QPSK	1	0	Band 5	10	881.5	2525	22.65	22.69
		Band 5	10	836.5	20525	QPSK	1	0	Band 4	10	2132.5	2175	23.60	23.64
		Band 4	10	1750	20350	QPSK	1	0	Band 7	20	2655	3100	22.65	22.69
		Band 7	10	2565	21400	QPSK	1	0	Band 4	10	2132.5	2175	23.00	23.00
		Band 4	10	1750	20350	QPSK	1	0	Band 12	10	737.5	5095	22.65	22.69
		Band 12	10	707.5	23095	QPSK	1	0	Band 4	10	2132.5	2175	23.45	23.50
		Band 4	10	1750	20350	QPSK	1	0	Band 17	10	740	5790	22.67	22.69
		Band 17	10	710	23790	QPSK	1	0	Band 4	10	2132.5	2175	23.45	23.48
		Band 4	10	1750	20350	QPSK	1	0	Band 29	10	722.5	9715	22.66	22.69
		Band 4	20	1732.5	20175	QPSK	1	0	Band 30	10	2355	9820	22.74	22.76
		Band 30	10	2310	27710	QPSK	1	0	Band 4	20	2132.5	2175	22.80	22.83
		Band 4	20	1732.5	20175	QPSK	1	0	Band 252	20	5200	255644	22.73	22.76
		Band 4	20	1732.5	20175	QPSK	1	0	Band 255	20	5785	261494	22.70	22.76
		Band 5	10	836.5	20525	QPSK	1	0	Band 7	20	2655	3100	23.60	23.64
		Band 7	10	2565	21400	QPSK	1	0	Band 5	10	881.5	2525	23.00	23.00
		Band 5	10	836.5	20525	QPSK	1	0	Band 30	10	2355	9820	23.61	23.64
		Band 30	10	2310	27710	QPSK	1	0	Band 5	10	881.5	2525	22.81	22.83
		Band 5	10	836.5	20525	QPSK	1	0	Band 66	20	2145	66786	23.64	23.64
		Band 66	20	1720	132072	QPSK	1	0	Band 5	10	881.5	2525	22.95	22.96
		Band 12	10	707.5	23095	QPSK	1	0	Band 30	10	2355	9820	23.45	23.50
		Band 30	10	2310	27710	QPSK	1	0	Band 12	10	737.5	5095	22.82	22.83
		Band 12	10	707.5	23095	QPSK	1	0	Band 66	20	2145	66786	23.48	23.50
		Band 66	20	1720	132072	QPSK	1	0	Band 12	10	737.5	5095	22.90	22.96
		Band 30	10	2310	27710	QPSK	1	0	Band 29	10	722.5	9715	22.79	22.83
		Band 66	20	1720	132072	QPSK	1	0	Band 29	10	722.5	9715	22.90	22.96
		Band 30	10	2310	27710	QPSK	1	0	Band 66	20	2145	66786	22.82	22.83
		Band 66	20	1720	132072	QPSK	1	0	Band 30	10	2355	9820	22.89	22.96
Intra-Band	Non-Contiguous	Band 2	20	1900	19100	QPSK	1	0	Band 2	5	1932.5	625	22.76	22.78
		Band 4	20	1732.5	20175	QPSK	1	0	Band 4	5	2152.5	2375	22.74	22.76
		Band 7	10	2565	21400	QPSK	1	0	Band 7	10	2625	2800	22.99	23.00
		Band 25	10	1880	26340	QPSK	1	0	Band 25	5	1992.5	8665	22.59	22.60
		Band 66	20	1720	132072	QPSK	1	0	Band 66	5	2197.5	67311	22.95	22.96
	Contiguous	Band 5	10	836.5	20525	QPSK	1	0	Band 5	10	891.4	2624	23.64	23.64
		Band 66	15	1717.5	132047	QPSK	1	0	Band 66	5	2126.8	66604	22.86	22.87
		Band 66	20	1720	132072	QPSK	1	0	Band 66	20	2139.8	66734	22.95	22.96

<Maximum output power for Three Carrier power verification>

Configure	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	Band 2	20	1900	19100	QPSK	1	0	Band 4	20	2132.5	2175	Band 5	10	881.5	2525	22.75	22.78
	Band 4	20	1732.5	20175	QPSK	1	0	Band 2	20	1960	900	Band 5	10	881.5	2525	22.74	22.76
	Band 5	10	836.5	20525	QPSK	1	0	Band 2	20	1960	900	Band 4	20	2132.5	2175	23.60	23.64
	Band 2	20	1900	19100	QPSK	1	0	Band 4	20	2132.5	2175	Band 7	20	2655	3100	22.78	22.78
	Band 4	20	1732.5	20175	QPSK	1	0	Band 7	20	2655	3100	Band 2	20	1960	900	22.75	22.76
	Band 7	10	2565	21400	QPSK	1	0	Band 2	20	1960	900	Band 4	20	2132.5	2175	22.98	23.00
	Band 2	20	1900	19100	QPSK	1	0	Band 4	20	2132.5	2175	Band 12	10	737.5	5095	22.77	22.78
	Band 4	20	1732.5	20175	QPSK	1	0	Band 2	20	1960	900	Band 12	10	737.5	5095	22.74	22.76
	Band 12	10	707.5	23095	QPSK	1	0	Band 2	20	1960	900	Band 4	20	2132.5	2175	23.45	23.50
	Band 2	20	1900	19100	QPSK	1	0	Band 4	20	2132.5	2175	Band 29	10	722.5	9715	22.76	22.78
	Band 4	20	1732.5	20175	QPSK	1	0	Band 2	20	1960	900	Band 29	10	722.5	9715	22.74	22.76
	Band 2	20	1900	19100	QPSK	1	0	Band 5	10	881.5	2525	Band 30	10	2355	9820	22.75	22.78
	Band 5	10	836.5	20525	QPSK	1	0	Band 2	20	1960	900	Band 30	10	2355	9820	23.60	23.64
	Band 30	10	2310	27710	QPSK	1	0	Band 2	20	1960	900	Band 5	10	881.5	2525	22.81	22.83
	Band 2	20	1900	19100	QPSK	1	0	Band 5	10	881.5	2525	Band 66	20	2145	66786	22.75	22.78
	Band 5	10	836.5	20525	QPSK	1	0	Band 2	20	1960	900	Band 66	20	2145	66786	23.62	23.64
	Band 66	20	1720	132072	QPSK	1	0	Band 2	20	1960	900	Band 5	10	881.5	2525	22.96	22.96
	Band 2	20	1900	19100	QPSK	1	0	Band 12	10	737.5	5095	Band 30	10	2355	9820	22.76	22.78
	Band 12	10	707.5	23095	QPSK	1	0	Band 2	20	1960	900	Band 30	10	2355	9820	23.48	23.50
	Band 30	10	2310	27710	QPSK	1	0	Band 2	20	1960	900	Band 12	10	737.5	5095	22.82	22.83
	Band 2	20	1900	19100	QPSK	1	0	Band 12	10	737.5	5095	Band 66	20	2145	66786	22.75	22.78
	Band 12	10	707.5	23095	QPSK	1	0	Band 2	20	1960	900	Band 66	20	2145	66786	23.48	23.50
	Band 66	20	1720	132072	QPSK	1	0	Band 2	20	1960	900	Band 12	10	737.5	5095	22.95	22.96
	Band 2	20	1900	19100	QPSK	1	0	Band 29	10	722.5	9715	Band 30	10	2355	9820	22.76	22.78
	Band 30	10	2310	27710	QPSK	1	0	Band 2	20	1960	900	Band 29	10	722.5	9715	22.82	22.83
	Band 4	20	1732.5	20175	QPSK	1	0	Band 5	10	881.5	2525	Band 30	10	2355	9820	22.75	22.76
	Band 5	10	836.5	20525	QPSK	1	0	Band 4	20	2132.5	2175	Band 30	10	2355	9820	23.62	23.64
	Band 30	10	2310	27710	QPSK	1	0	Band 4	20	2132.5	2175	Band 5	10	881.5	2525	22.80	22.83
	Band 4	10	1750	20350	QPSK	1	0	Band 7	20	2655	3100	Band 12	10	737.5	5095	22.66	22.69
	Band 7	10	2565	21400	QPSK	1	0	Band 4	20	2132.5	2175	Band 12	10	737.5	5095	22.98	23.00
	Band 12	10	707.5	23095	QPSK	1	0	Band 4	20	2132.5	2175	Band 7	20	2655	3100	23.45	23.50
	Band 4	20	1732.5	20175	QPSK	1	0	Band 12	10	737.5	5095	Band 30	10	2355	9820	22.75	22.76
	Band 12	10	707.5	23095	QPSK	1	0	Band 4	20	2132.5	2175	Band 30	10	2355	9820	23.48	23.50
	Band 30	10	2310	27710	QPSK	1	0	Band 4	20	2132.5	2175	Band 12	10	737.5	5095	22.80	22.83
	Band 4	20	1732.5	20175	QPSK	1	0	Band 29	10	722.5	9715	Band 30	10	2355	9820	22.75	22.76
	Band 30	10	2310	27710	QPSK	1	0	Band 4	20	2132.5	2175	Band 29	10	722.5	9715	22.82	22.83
	Band 5	10	836.5	20525	QPSK	1	0	Band 30	10	2355	9820	Band 66	20	2145	66786	23.63	23.64
	Band 30	10	2310	27710	QPSK	1	0	Band 5	10	881.5	2525	Band 66	20	2145	66786	22.81	22.83
	Band 66	20	1720	132072	QPSK	1	0	Band 5	10	881.5	2525	Band 30	10	2355	9820	22.95	22.96
	Band 12	10	707.5	23095	QPSK	1	0	Band 30	10	2355	9820	Band 66	20	2145	66786	23.45	23.50
	Band 30	10	2310	27710	QPSK	1	0	Band 12	10	737.5	5095	Band 66	20	2145	66786	22.82	22.83
	Band 66	20	1720	132072	QPSK	1	0	Band 12	10	737.5	5095	Band 30	10	2355	9820	22.94	22.96

Configure		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		Band 2	20	1900	19100	QPSK	1	0	Band 2	5	1932.5	625	Band 4	20	2132.5	2175	22.75	22.78
		Band 4	20	1732.5	20175	QPSK	1	0	Band 2	20	1960	900	Band 2	5	1932.5	625	22.74	22.76
		Band 2	20	1900	19100	QPSK	1	0	Band 2	5	1932.5	625	Band 5	10	881.5	2525	22.75	22.78
		Band 5	10	836.5	20525	QPSK	1	0	Band 2	20	1960	900	Band 2	5	1932.5	625	23.60	23.64
		Band 2	20	1900	19100	QPSK	1	0	Band 2	5	1932.5	625	Band 12	10	737.5	5095	22.76	22.78
		Band 12	10	707.5	23095	QPSK	1	0	Band 2	20	1960	900	Band 2	5	1932.5	625	23.45	23.50
		Band 2	20	1900	19100	QPSK	1	0	Band 2	5	1932.5	625	Band 29	10	722.5	9715	22.75	22.78
		Band 2	20	1900	19100	QPSK	1	0	Band 2	5	1932.5	625	Band 30	10	2355	9820	22.75	22.78
		Band 30	10	2310	27710	QPSK	1	0	Band 2	20	1960	900	Band 2	5	1932.5	625	22.80	22.83
		Band 2	20	1900	19100	QPSK	1	0	Band 4	20	2132.5	2175	Band 4	5	2152.5	2375	22.78	22.78
		Band 4	20	1732.5	20175	QPSK	1	0	Band 4	5	2152.5	2375	Band 2	20	1960	900	22.75	22.76
		Band 2	20	1900	19100	QPSK	1	0	Band 66	20	2145	66786	Band 66	5	2197.5	67311	22.70	22.78
		Band 66	20	1720	132072	QPSK	1	0	Band 66	5	2197.5	67311	Band 2	20	1960	900	22.89	22.96
		Band 4	20	1732.5	20175	QPSK	1	0	Band 4	5	2152.5	2375	Band 5	10	881.5	2525	22.75	22.76
		Band 5	10	836.5	20525	QPSK	1	0	Band 4	20	2132.5	2175	Band 4	5	2152.5	2375	23.60	23.64
		Band 4	20	1732.5	20175	QPSK	1	0	Band 4	5	2152.5	2375	Band 12	10	737.5	5095	22.74	22.76
		Band 12	10	707.5	23095	QPSK	1	0	Band 4	20	2132.5	2175	Band 4	5	2152.5	2375	23.45	23.50
		Band 4	20	1732.5	20175	QPSK	1	0	Band 4	5	2152.5	2375	Band 29	10	722.5	9715	22.74	22.76
		Band 4	20	1732.5	20175	QPSK	1	0	Band 4	5	2152.5	2375	Band 30	10	2355	9820	22.74	22.76
		Band 30	10	2310	27710	QPSK	1	0	Band 4	20	2132.5	2175	Band 4	5	2152.5	2375	22.81	22.83
		Band 5	10	836.5	20525	QPSK	1	0	Band 66	20	2145	66786	Band 66	5	2197.5	67311	23.60	23.64
		Band 66	20	1720	132072	QPSK	1	0	Band 66	5	2197.5	67311	Band 5	10	881.5	2525	22.90	22.96
		Band 12	10	707.5	23095	QPSK	1	0	Band 66	20	2145	66786	Band 66	5	2197.5	67311	23.45	23.50
		Band 66	20	1720	132072	QPSK	1	0	Band 66	5	2197.5	67311	Band 12	10	737.5	5095	22.95	22.96
		Band 4	20	1732.5	20175	QPSK	1	0	Band 252	20	5200	255644	Band 252	20	5219.8	255842	22.71	22.76
		Band 4	20	1732.5	20175	QPSK	1	0	Band 255	20	5785	261494	Band 255	20	5804.8	261692	22.70	22.76
		Band 2	20	1900	19100	QPSK	1	0	Band 66	15	2145	66786	Band 66	5	2154.3	66879	22.70	22.78
		Band 66	15	1717.5	132047	QPSK	1	0	Band 66	5	2126.8	66604	Band 2	20	1960	900	22.81	22.87
		Band 2	20	1900	19100	QPSK	1	0	Band 66	20	2145	66786	Band 66	20	2164.8	66984	22.75	22.78
		Band 66	20	1720	132072	QPSK	1	0	Band 66	20	2139.8	66734	Band 2	20	1960	900	22.95	22.96
		Band 5	10	836.5	20525	QPSK	1	0	Band 66	15	2145	66786	Band 66	5	2154.3	66879	23.62	23.64
		Band 66	15	1717.5	132047	QPSK	1	0	Band 66	5	2126.8	66604	Band 2	20	1960	900	22.86	22.87
		Band 5	10	836.5	20525	QPSK	1	0	Band 66	20	2145	66786	Band 66	20	2164.8	66984	23.60	23.64
		Band 66	20	1720	132072	QPSK	1	0	Band 66	20	2139.8	66734	Band 5	10	881.5	2525	22.90	22.96
		Band 12	10	707.5	23095	QPSK	1	0	Band 66	20	2145	66786	Band 66	20	2164.8	66984	23.40	23.50
		Band 66	20	1720	132072	QPSK	1	0	Band 66	20	2139.8	66734	Band 12	10	737.5	5095	22.92	22.96
Intra-Band	Non-Contiguous	Band 66	20	1720	132072	QPSK	1	0	Band 66	5	2177.5	67111	Band 66	20	2189.2	67228	22.93	22.96
		Band 66	20	1720	132072	QPSK	1	0	Band 66	20	2139.8	66734	Band 66	5	2197.5	67311	22.93	22.96

<Maximum output power for Four Carrier power verification>

Configure	PCC							SCC1				SCC2				SCC3				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	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Inter-Band	Band 2	20	1900	19100	QPSK	1	0	Band 4	20	2132.5	2175	Band 5	10	881.5	2525	Band 30	10	2355	9820	22.75	22.78
	Band 4	20	1732.5	20175	QPSK	1	0	Band 2	20	1960	900	Band 5	10	881.5	2525	Band 30	10	2355	9820	22.70	22.76
	Band 5	10	836.5	20525	QPSK	1	0	Band 2	20	1960	900	Band 4	20	2132.5	2175	Band 30	10	2355	9820	23.60	23.64
	Band 30	10	2310	27710	QPSK	1	0	Band 2	20	1960	900	Band 4	20	2132.5	2175	Band 5	10	881.5	2525	22.82	22.83
	Band 2	20	1900	19100	QPSK	1	0	Band 4	20	2132.5	2175	Band 7	20	2655	3100	Band 12	10	737.5	5095	22.75	22.78
	Band 4	20	1732.5	20175	QPSK	1	0	Band 2	20	1960	900	Band 7	20	2655	3100	Band 12	10	737.5	5095	22.74	22.76
	Band 7	10	2565	21400	QPSK	1	0	Band 2	20	1960	900	Band 4	20	2132.5	2175	Band 12	10	737.5	5095	22.99	23.00
	Band 12	10	707.5	23095	QPSK	1	0	Band 2	20	1960	900	Band 4	20	2132.5	2175	Band 7	20	2655	3100	23.45	23.50
	Band 2	20	1900	19100	QPSK	1	0	Band 4	20	2132.5	2175	Band 12	10	737.5	5095	Band 30	10	2355	9820	22.75	22.78
	Band 4	20	1732.5	20175	QPSK	1	0	Band 2	20	1960	900	Band 12	10	737.5	5095	Band 30	10	2355	9820	22.74	22.76
	Band 12	10	707.5	23095	QPSK	1	0	Band 2	20	1960	900	Band 4	20	2132.5	2175	Band 30	10	2355	9820	23.48	23.50
	Band 30	10	2310	27710	QPSK	1	0	Band 2	20	1960	900	Band 4	20	2132.5	2175	Band 12	10	737.5	5095	22.82	22.83
	Band 2	20	1900	19100	QPSK	1	0	Band 4	20	2132.5	2175	Band 29	10	722.5	9715	Band 30	10	2355	9820	22.75	22.78
	Band 4	20	1732.5	20175	QPSK	1	0	Band 2	20	1960	900	Band 29	10	722.5	9715	Band 30	10	2355	9820	22.70	22.76
	Band 30	10	2310	27710	QPSK	1	0	Band 2	20	1960	900	Band 4	20	2132.5	2175	Band 29	10	722.5	9715	22.79	22.83
	Band 2	20	1900	19100	QPSK	1	0	Band 5	10	881.5	2525	Band 30	10	2355	9820	Band 66	20	2145	66786	22.76	22.78
	Band 5	10	836.5	20525	QPSK	1	0	Band 2	20	1960	900	Band 30	10	2355	9820	Band 66	20	2145	66786	23.59	23.64
	Band 30	10	2310	27710	QPSK	1	0	Band 2	20	1960	900	Band 5	10	881.5	2525	Band 66	20	2145	66786	22.80	22.83
	Band 66	20	1720	132072	QPSK	1	0	Band 2	20	1960	900	Band 5	10	881.5	2525	Band 30	10	2355	9820	22.90	22.96
	Band 2	20	1900	19100	QPSK	1	0	Band 12	10	737.5	5095	Band 30	10	2355	9820	Band 66	20	2145	66786	22.76	22.78
	Band 12	10	707.5	23095	QPSK	1	0	Band 2	20	1960	900	Band 30	10	2355	9820	Band 66	20	2145	66786	23.46	23.50
	Band 30	10	2310	27710	QPSK	1	0	Band 2	20	1960	900	Band 12	10	737.5	5095	Band 66	20	2145	66786	22.77	22.83
	Band 66	20	1720	132072	QPSK	1	0	Band 2	20	1960	900	Band 12	10	737.5	5095	Band 30	10	2355	9820	22.89	22.96
	Band 2	20	1900	19100	QPSK	1	0	Band 2	5	1932.5	625	Band 4	20	2132.5	2175	Band 4	5	2152.5	2375	22.75	22.78
	Band 4	20	1732.5	20175	QPSK	1	0	Band 4	5	2152.5	2375	Band 2	20	1960	900	Band 2	5	1932.5	625	22.75	22.76
	Band 2	20	1900	19100	QPSK	1	0	Band 2	5	1932.5	625	Band 4	20	2132.5	2175	Band 12	10	737.5	5095	22.77	22.78
	Band 4	20	1732.5	20175	QPSK	1	0	Band 2	20	1960	900	Band 2	5	1932.5	625	Band 12	10	737.5	5095	22.74	22.76
	Band 12	10	707.5	23095	QPSK	1	0	Band 2	20	1960	900	Band 2	5	1932.5	625	Band 4	20	2132.5	2175	23.49	23.50
	Band 2	20	1900	19100	QPSK	1	0	Band 2	5	1932.5	625	Band 5	10	881.5	2525	Band 30	10	2355	9820	22.74	22.78
	Band 5	10	836.5	20525	QPSK	1	0	Band 2	20	1960	900	Band 2	5	1932.5	625	Band 30	10	2355	9820	23.62	23.64
	Band 30	10	2310	27710	QPSK	1	0	Band 2	20	1960	900	Band 2	5	1932.5	625	Band 5	10	881.5	2525	22.80	22.83
	Band 2	20	1900	19100	QPSK	1	0	Band 2	5	1932.5	625	Band 12	10	737.5	5095	Band 30	10	2355	9820	22.75	22.78
	Band 12	10	707.5	23095	QPSK	1	0	Band 2	20	1960	900	Band 2	5	1932.5	625	Band 30	10	2355	9820	23.45	23.50
	Band 30	10	2310	27710	QPSK	1	0	Band 2	20	1960	900	Band 2	5	1932.5	625	Band 12	10	737.5	5095	22.80	22.83
	Band 2	20	1900	19100	QPSK	1	0	Band 2	5	1932.5	625	Band 29	10	722.5	9715	Band 30	10	2355	9820	22.76	22.78
	Band 30	10	2310	27710	QPSK	1	0	Band 2	20	1960	900	Band 2	5	1932.5	625	Band 29	10	722.5	9715	22.81	22.83
	Band 2	20	1900	19100	QPSK	1	0	Band 4	20	2132.5	2175	Band 4	5	2152.5	2375	Band 12	10	737.5	5095	22.75	22.78
	Band 4	20	1732.5	20175	QPSK	1	0	Band 2	20	1960	900	Band 4	5	2152.5	2375	Band 12	10	737.5	5095	22.75	22.76
	Band 12	10	707.5	23095	QPSK	1	0	Band 2	20	1960	900	Band 4	20	2132.5	2175	Band 4	5	2152.5	2375	23.49	23.50
	Band 4	20	1732.5	20175	QPSK	1	0	Band 4	5	2152.5	2375	Band 5	10	881.5	2525	Band 30	10	2355	9820	22.74	22.76
	Band 5	10	836.5	20525	QPSK	1	0	Band 4	20	2132.5	2175	Band 4	5	2152.5	2375	Band 30	10	2355	9820	23.64	23.64
	Band 30	10	2310	27710	QPSK	1	0	Band 4	20	2132.5	2175	Band 4	5	2152.5	2375	Band 5	10	881.5	2525	22.80	22.83
	Band 4	20	1732.5	20175	QPSK	1	0	Band 4	5	2152.5	2375	Band 12	10	737.5	5095	Band 30	10	2355	9820	22.71	22.76
	Band 12	10	707.5	23095	QPSK	1	0	Band 4	20	2132.5	2175	Band 4	5	2152.5	2375	Band 30	10	2355	9820	23.45	23.50
	Band 30	10	2310	27710	QPSK	1	0	Band 4	20	2132.5	2175	Band 4	5	2152.5	2375	Band 12	10	737.5	5095	22.80	22.83
	Band 4	20	1732.5	20175	QPSK	1	0	Band 4	5	2152.5	2375	Band 29	10	722.5	9715	Band 30	10	2355	9820	22.74	22.76
	Band 30	10	2310	27710	QPSK	1	0	Band 4	20	2132.5	2175	Band 4	5	2152.5	2375	Band 29	10	722.5	9715	22.82	22.83
	Band 12	10	707.5	23095	QPSK	1	0	Band 30	10	2355	9820	Band 66	20	2145	66786	Band 66	5	2197.5	67311	23.45	23.50
	Band 30	10	2310	27710	QPSK	1	0	Band 12	10	737.5	5095	Band 66	20	2145	66786	Band 66	5	2197.5	67311	22.81	22.83
	Band 66	20	1720	132072	QPSK	1	0	Band 12	10	737.5	5095	Band 30	10	2355	9820	Band 66	5	2197.5	67311	22.95	22.96

<WLAN Conducted Power>

General Note:

1. For each antenna, transmit power in SISO operation is larger than (or equal to) the power in MIMO operation, RF exposure compliance of MIMO mode can be deduced from the compliance simultaneous transmission of antennas operating in SISO mode.
2. Per KDB 248227 D01v02r02, the simultaneous SAR provisions in KDB publication 447498 should be applied to determine simultaneous transmission SAR test exclusion for WiFi MIMO. If the sum of 1g single transmission chain SAR measurements is < 1.6W/kg and SAR peak to location ratio ≤ 0.04, no additional SAR measurements for MIMO.
3. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
4. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
5. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
6. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
   a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
   b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
   c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

<Default Power Mode>

<2.4GHz WLAN ANT 1>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	15.90	16.50	100.00
		6	2437	15.90	16.50	
		11	2462	15.85	16.50	
	802.11g 6Mbps	1	2412	15.30	16.50	94.14
		6	2437	15.86	16.50	
		11	2462	15.26	16.50	
	802.11n-HT20 MCS0	1	2412	14.40	14.50	93.75
		6	2437	15.81	16.50	
		11	2462	13.73	14.00	
	802.11ac-VHT20 MCS0	1	2412	14.34	14.50	94.53
		6	2437	15.83	16.50	
		11	2462	13.14	13.50	

<2.4GHz WLAN ANT 2>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	15.90	16.50	100.00
		6	2437	15.66	16.50	
		11	2462	15.60	16.50	
	802.11g 6Mbps	1	2412	15.15	16.50	94.85
		6	2437	15.36	16.50	
		11	2462	14.83	15.50	
	802.11n-HT20 MCS0	1	2412	14.18	14.50	93.75
		6	2437	15.43	16.50	
		11	2462	13.41	14.00	
	802.11ac-VHT20 MCS0	1	2412	14.17	14.50	93.75
		6	2437	15.43	16.50	
		11	2462	12.95	13.50	

<2.4GHz WLAN ANT 1+2>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	18.90	19.50	100.00
		6	2437	18.80	19.50	
		11	2462	18.75	19.50	
	802.11g 6Mbps	1	2412	18.26	19.50	94.85
		6	2437	18.58	19.50	
		11	2462	18.08	19.50	
	802.11n-HT20 MCS0	1	2412	17.33	17.50	94.49
		6	2437	18.62	19.50	
		11	2462	16.61	17.00	
	802.11ac-VHT20 MCS0	1	2412	17.30	17.50	94.53
		6	2437	18.58	19.50	
		11	2462	16.08	16.50	

<5GHz WLAN ANT1>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	18.16	19.00	94.16
		40	5200	18.13	19.00	
		44	5220	18.12	19.00	
		48	5240	18.01	19.00	
	802.11n-HT20 MCS0	36	5180	18.15	19.00	93.75
		40	5200	18.10	19.00	
		44	5220	18.09	19.00	
		48	5240	18.05	19.00	
	802.11n-HT40 MCS0	38	5190	17.38	18.00	89.62
		46	5230	17.40	18.00	
	802.11ac-VHT20 MCS0	36	5180	18.19	19.00	94.53
		40	5200	18.15	19.00	
		44	5220	18.12	19.00	
		48	5240	18.07	19.00	
	802.11ac-VHT40 MCS0	38	5190	17.39	18.00	90.48
		46	5230	17.41	18.00	
	802.11ac-VHT80 MCS0	42	5210	15.13	15.50	86.51

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	18.11	19.00	94.16
		56	5280	18.13	19.00	
		60	5300	18.16	19.00	
		64	5320	18.26	19.00	
	802.11n-HT20 MCS0	52	5260	18.08	19.00	93.75
		56	5280	18.09	19.00	
		60	5300	18.10	19.00	
		64	5320	18.24	19.00	
	802.11n-HT40 MCS0	54	5270	17.28	18.00	89.62
		62	5310	15.28	15.50	
	802.11ac-VHT20 MCS0	52	5260	18.09	19.00	94.53
		56	5280	18.10	19.00	
		60	5300	18.11	19.00	
		64	5320	18.25	19.00	
	802.11ac-VHT40 MCS0	54	5270	17.29	18.00	90.48
		62	5310	15.23	15.50	
	802.11ac-VHT80 MCS0	58	5290	13.80	14.00	86.51

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	18.29	19.00	94.16
		116	5580	18.21	19.00	
		124	5620	18.19	19.00	
		132	5660	17.90	19.00	
		140	5700	17.84	19.00	
		144	5720	18.25	19.00	
	802.11n-HT20 MCS0	100	5500	18.32	19.00	93.75
		116	5580	18.25	19.00	
		124	5620	18.20	19.00	
		132	5660	17.96	19.00	
		140	5700	16.98	17.00	
		144	5720	18.16	19.00	
	802.11n-HT40 MCS0	102	5510	17.60	18.00	89.62
		110	5550	17.45	18.00	
		126	5630	17.39	18.00	
		134	5670	17.26	18.00	
		142	5710	17.15	18.00	
	802.11ac-VHT20 MCS0	100	5500	18.34	19.00	94.53
		116	5580	18.26	19.00	
		124	5620	18.23	19.00	
		132	5660	17.91	19.00	
		140	5700	16.41	17.00	
		144	5720	17.88	19.00	
	802.11ac-VHT40 MCS0	102	5510	17.61	18.00	90.48
		110	5550	17.48	18.00	
		126	5630	17.39	18.00	
		134	5670	17.28	18.00	
		142	5710	17.17	18.00	
	802.11ac-VHT80 MCS0	106	5530	15.16	15.50	86.51
		122	5610	18.13	19.00	
		138	5690	18.25	19.00	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	18.11	19.00	94..16
		157	5785	18.07	19.00	
		165	5825	18.03	19.00	
	802.11n-HT20 MCS0	149	5745	18.13	19.00	93.75
		157	5785	18.03	19.00	
		165	5825	18.00	19.00	
	802.11n-HT40 MCS0	151	5755	17.42	18.00	89.62
		159	5795	17.48	18.00	
	802.11ac-VHT20 MCS0	149	5745	18.14	19.00	94.53
		157	5785	18.04	19.00	
		165	5825	18.02	19.00	
	802.11ac-VHT40 MCS0	151	5755	17.43	18.00	90.48
		159	5795	17.49	18.00	
	802.11ac-VHT80 MCS0	155	5775	18.18	19.00	86.51

<5GHz WLAN ANT2>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	18.10	19.00	94.85
		40	5200	18.08	19.00	
		44	5220	18.07	19.00	
		48	5240	17.96	19.00	
	802.11n-HT20 MCS0	36	5180	18.02	19.00	94.49
		40	5200	18.00	19.00	
		44	5220	17.97	19.00	
		48	5240	17.90	19.00	
	802.11n-HT40 MCS0	38	5190	17.09	18.00	90.48
		46	5230	17.13	18.00	
	802.11ac-VHT20 MCS0	36	5180	18.04	19.00	93.75
		40	5200	18.02	19.00	
		44	5220	18.03	19.00	
		48	5240	17.98	19.00	
	802.11ac-VHT40 MCS0	38	5190	17.14	18.00	89.62
		46	5230	17.31	18.00	
	802.11ac-VHT80 MCS0	42	5210	15.48	15.50	85.71

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	17.92	19.00	94.85
		56	5280	18.00	19.00	
		60	5300	18.06	19.00	
		64	5320	18.13	19.00	
	802.11n-HT20 MCS0	52	5260	17.95	19.00	94.49
		56	5280	17.98	19.00	
		60	5300	18.02	19.00	
		64	5320	18.05	19.00	
	802.11n-HT40 MCS0	54	5270	17.05	18.00	90.48
		62	5310	15.43	15.50	
	802.11ac-VHT20 MCS0	52	5260	18.08	19.00	93.75
		56	5280	18.09	19.00	
		60	5300	18.10	19.00	
		64	5320	18.14	19.00	
	802.11ac-VHT40 MCS0	54	5270	17.13	18.00	89.62
		62	5310	15.48	15.50	
	802.11ac-VHT80 MCS0	58	5290	14.00	14.00	85.71

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	18.21	19.00	94.85
		116	5580	18.09	19.00	
		124	5620	18.07	19.00	
		132	5660	17.80	19.00	
		140	5700	17.74	19.00	
		144	5720	17.74	19.00	
	802.11n-HT20 MCS0	100	5500	18.17	19.00	94.49
		116	5580	18.11	19.00	
		124	5620	18.08	19.00	
		132	5660	17.80	19.00	
		140	5700	16.98	17.00	
		144	5720	17.77	19.00	
	802.11n-HT40 MCS0	102	5510	17.47	18.00	90.48
		110	5550	17.23	18.00	
		126	5630	17.18	18.00	
		134	5670	17.15	18.00	
		142	5710	16.82	18.00	
	802.11ac-VHT20 MCS0	100	5500	18.29	19.00	93.75
		116	5580	18.20	19.00	
		124	5620	18.17	19.00	
		132	5660	17.90	19.00	
		140	5700	16.83	17.00	
		144	5720	17.73	19.00	
	802.11ac-VHT40 MCS0	102	5510	17.48	18.00	89.62
		110	5550	17.28	18.00	
		126	5630	17.25	18.00	
		134	5670	17.23	18.00	
		142	5710	16.75	18.00	
	802.11ac-VHT80 MCS0	106	5530	15.42	15.50	85.71
		122	5610	17.98	19.00	
		138	5690	18.00	19.00	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	18.13	19.00	94.86
		157	5785	18.11	19.00	
		165	5825	18.08	19.00	
	802.11n-HT20 MCS0	149	5745	18.21	19.00	94.49
		157	5785	18.09	19.00	
		165	5825	18.08	19.00	
	802.11n-HT40 MCS0	151	5755	17.43	18.00	90.48
		159	5795	17.55	18.00	
	802.11ac-VHT20 MCS0	149	5745	18.23	19.00	93.75
		157	5785	18.19	19.00	
		165	5825	18.18	19.00	
	802.11ac-VHT40 MCS0	151	5755	17.49	18.00	89.62
		159	5795	17.64	18.00	
	802.11ac-VHT80 MCS0	155	5775	18.30	19.00	85.71

<5GHz WLAN ANT1+2>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	20.99	22.00	94.85
		40	5200	20.96	22.00	
		44	5220	20.98	22.00	
		48	5240	20.97	22.00	
	802.11n-HT20 MCS0	36	5180	20.98	22.00	94.49
		40	5200	20.96	22.00	
		44	5220	20.97	22.00	
		48	5240	20.93	22.00	
	802.11n-HT40 MCS0	38	5190	20.24	21.00	89.52
		46	5230	20.42	21.00	
	802.11ac-VHT20 MCS0	36	5180	20.99	22.00	94.53
		40	5200	20.97	22.00	
		44	5220	20.98	22.00	
		48	5240	20.96	22.00	
	802.11ac-VHT40 MCS0	38	5190	20.30	21.00	89.72
		46	5230	20.49	21.00	
	802.11ac-VHT80 MCS0	42	5210	18.40	18.50	85.71

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	21.02	22.00	94.85
		56	5280	21.04	22.00	
		60	5300	21.06	22.00	
		64	5320	21.17	22.00	
	802.11n-HT20 MCS0	52	5260	21.06	22.00	94.49
		56	5280	21.08	22.00	
		60	5300	21.10	22.00	
		64	5320	21.19	22.00	
	802.11n-HT40 MCS0	54	5270	20.27	21.00	89.52
		62	5310	18.50	18.50	
	802.11ac-VHT20 MCS0	52	5260	21.09	22.00	94.53
		56	5280	21.10	22.00	
		60	5300	21.11	22.00	
		64	5320	21.22	22.00	
	802.11ac-VHT40 MCS0	54	5270	20.31	21.00	89.72
		62	5310	18.44	18.50	
	802.11ac-VHT80 MCS0	58	5290	16.97	17.00	85.71

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	21.34	22.00	94.85
		116	5580	21.18	22.00	
		124	5620	21.16	22.00	
		132	5660	20.85	22.00	
		140	5700	20.75	22.00	
		144	5720	20.89	22.00	
	802.11n-HT20 MCS0	100	5500	21.29	22.00	94.49
		116	5580	21.22	22.00	
		124	5620	21.19	22.00	
		132	5660	20.83	22.00	
		140	5700	19.99	20.00	
		144	5720	20.99	22.00	
	802.11n-HT40 MCS0	102	5510	20.58	21.00	89.52
		110	5550	20.45	21.00	
		126	5630	20.39	21.00	
		134	5670	20.32	21.00	
		142	5710	19.96	21.00	
	802.11ac-VHT20 MCS0	100	5500	21.41	22.00	94.53
		116	5580	21.26	22.00	
		124	5620	21.20	22.00	
		132	5660	20.91	22.00	
		140	5700	19.65	20.00	
		144	5720	20.89	22.00	
	802.11ac-VHT40 MCS0	102	5510	20.60	21.00	89.72
		110	5550	20.48	21.00	
		126	5630	20.40	21.00	
		134	5670	20.35	21.00	
		142	5710	19.93	21.00	
	802.11ac-VHT80 MCS0	106	5530	18.38	18.50	85.71
		122	5610	21.14	22.00	
		138	5690	21.11	22.00	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a MCS0	149	5745	21.07	22.00	94.85
		157	5785	21.05	22.00	
		165	5825	21.02	22.00	
	802.11n-HT20 MCS0	149	5745	21.06	22.00	94.49
		157	5785	21.03	22.00	
		165	5825	21.01	22.00	
	802.11n-HT40 MCS0	151	5755	20.35	21.00	89.52
		159	5795	20.50	21.00	
	802.11ac-VHT20 MCS0	149	5745	21.20	22.00	94.53
		157	5785	21.15	22.00	
		165	5825	21.13	22.00	
	802.11ac-VHT40 MCS0	151	5755	20.38	21.00	89.72
		159	5795	20.52	21.00	
	802.11ac-VHT80 MCS0	155	5775	21.21	22.00	85.71

<At-Head Power Mode>

<2.4GHz WLAN ANT 1>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	15.90	16.50	100.00
		6	2437	15.90	16.50	
		11	2462	15.85	16.50	
	802.11g 6Mbps	1	2412	15.30	16.50	94.14
		6	2437	15.86	16.50	
		11	2462	15.26	16.50	
	802.11n-HT20 MCS0	1	2412	14.40	14.50	93.75
		6	2437	15.81	16.50	
		11	2462	13.73	14.00	
	802.11ac-VHT20 MCS0	1	2412	14.34	14.50	94.53
		6	2437	15.83	16.50	
		11	2462	13.14	13.50	

<2.4GHz WLAN ANT 2>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	15.90	16.50	100.00
		6	2437	15.66	16.50	
		11	2462	15.60	16.50	
	802.11g 6Mbps	1	2412	15.15	16.50	94.85
		6	2437	15.36	16.50	
		11	2462	14.83	15.50	
	802.11n-HT20 MCS0	1	2412	14.18	14.50	93.75
		6	2437	15.43	16.50	
		11	2462	13.41	14.00	
	802.11ac-VHT20 MCS0	1	2412	14.17	14.50	93.75
		6	2437	15.43	16.50	
		11	2462	12.95	13.50	

<2.4GHz WLAN ANT 1+2>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	18.90	19.50	100.00
		6	2437	18.80	19.50	
		11	2462	18.75	19.50	
	802.11g 6Mbps	1	2412	18.26	19.50	94.85
		6	2437	18.58	19.50	
		11	2462	18.08	19.50	
	802.11n-HT20 MCS0	1	2412	17.33	17.50	94.49
		6	2437	18.62	19.50	
		11	2462	16.61	17.00	
	802.11ac-VHT20 MCS0	1	2412	17.30	17.50	94.53
		6	2437	18.58	19.50	
		11	2462	16.08	16.50	

<5GHz WLAN ANT1>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	14.73	15.00	94.16
		40	5200	14.70	15.00	
		44	5220	14.68	15.00	
		48	5240	14.63	15.00	
	802.11n-HT20 MCS0	36	5180	14.77	15.00	93.75
		40	5200	14.78	15.00	
		44	5220	14.74	15.00	
		48	5240	14.68	15.00	
	802.11n-HT40 MCS0	38	5190	14.83	15.00	89.62
		46	5230	14.88	15.00	
	802.11ac-VHT20 MCS0	36	5180	14.77	15.00	94.53
		40	5200	14.80	15.00	
		44	5220	14.76	15.00	
		48	5240	14.67	15.00	
	802.11ac-VHT40 MCS0	38	5190	14.83	15.00	90.48
		46	5230	14.87	15.00	
	802.11ac-VHT80 MCS0	42	5210	14.53	15.00	86.51

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	14.61	15.00	94.16
		56	5280	14.53	15.00	
		60	5300	14.58	15.00	
		64	5320	14.69	15.00	
	802.11n-HT20 MCS0	52	5260	14.63	15.00	93.75
		56	5280	14.59	15.00	
		60	5300	14.62	15.00	
		64	5320	14.65	15.00	
	802.11n-HT40 MCS0	54	5270	14.79	15.00	89.62
		62	5310	14.75	15.00	
	802.11ac-VHT20 MCS0	52	5260	14.68	15.00	94.53
		56	5280	14.60	15.00	
		60	5300	14.66	15.00	
		64	5320	14.70	15.00	
	802.11ac-VHT40 MCS0	54	5270	14.76	15.00	90.48
		62	5310	14.63	15.00	
	802.11ac-VHT80 MCS0	58	5290	13.80	14.00	86.51

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	14.75	15.00	94.16
		116	5580	14.59	15.00	
		124	5620	14.43	15.00	
		132	5660	14.54	15.00	
		140	5700	14.41	15.00	
		144	5720	14.54	15.00	
	802.11n-HT20 MCS0	100	5500	14.85	15.00	93.75
		116	5580	14.48	15.00	
		124	5620	14.45	15.00	
		132	5660	14.43	15.00	
		140	5700	14.57	15.00	
		144	5720	13.90	15.00	
	802.11n-HT40 MCS0	102	5510	14.89	15.00	89.62
		110	5550	14.78	15.00	
		126	5630	14.76	15.00	
		134	5670	14.49	15.00	
		142	5710	14.41	15.00	
	802.11ac-VHT20 MCS0	100	5500	14.79	15.00	94.53
		116	5580	14.62	15.00	
		124	5620	14.57	15.00	
		132	5660	14.49	15.00	
		140	5700	14.60	15.00	
		144	5720	14.24	15.00	
	802.11ac-VHT40 MCS0	102	5510	14.81	15.00	90.48
		110	5550	14.79	15.00	
		126	5630	14.65	15.00	
		134	5670	14.60	15.00	
		142	5710	14.24	15.00	
	802.11ac-VHT80 MCS0	106	5530	14.91	15.00	86.51
		122	5610	14.90	15.00	
		138	5690	14.88	15.00	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a MCS0	149	5745	14.76	15.00	94.16
		157	5785	14.64	15.00	
		165	5825	14.67	15.00	
	802.11n-HT20 MCS0	149	5745	14.69	15.00	93.75
		157	5785	14.64	15.00	
		165	5825	14.68	15.00	
	802.11n-HT40 MCS0	151	5755	14.80	15.00	89.62
		159	5795	14.87	15.00	
	802.11ac-VHT20 MCS0	149	5745	14.71	15.00	94.53
		157	5785	14.65	15.00	
		165	5825	14.69	15.00	
	802.11ac-VHT40 MCS0	151	5755	14.82	15.00	90.48
		159	5795	14.94	15.00	
	802.11ac-VHT80 MCS0	155	5775	14.63	15.00	86.51

<5GHz WLAN ANT2>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	14.88	15.00	94.85
		40	5200	14.89	15.00	
		44	5220	14.94	15.00	
		48	5240	14.91	15.00	
	802.11n-HT20 MCS0	36	5180	14.97	15.00	94.49
		40	5200	14.94	15.00	
		44	5220	14.89	15.00	
		48	5240	14.94	15.00	
	802.11n-HT40 MCS0	38	5190	14.86	15.00	90.48
		46	5230	14.93	15.00	
	802.11ac-VHT20 MCS0	36	5180	14.93	15.00	93.75
		40	5200	14.94	15.00	
		44	5220	14.92	15.00	
		48	5240	14.93	15.00	
	802.11ac-VHT40 MCS0	38	5190	14.92	15.00	89.62
		46	5230	14.92	15.00	
	802.11ac-VHT80 MCS0	42	5210	14.89	15.00	85.71

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	14.92	15.00	94.85
		56	5280	14.80	15.00	
		60	5300	14.73	15.00	
		64	5320	14.98	15.00	
	802.11n-HT20 MCS0	52	5260	14.81	15.00	94.49
		56	5280	14.85	15.00	
		60	5300	14.75	15.00	
		64	5320	14.94	15.00	
	802.11n-HT40 MCS0	54	5270	14.86	15.00	90.48
		62	5310	14.81	15.00	
	802.11ac-VHT20 MCS0	52	5260	14.84	15.00	93.75
		56	5280	14.91	15.00	
		60	5300	14.89	15.00	
		64	5320	14.91	15.00	
	802.11ac-VHT40 MCS0	54	5270	14.85	15.00	89.62
		62	5310	14.92	15.00	
	802.11ac-VHT80 MCS0	58	5290	14.00	14.00	85.71

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	14.87	15.00	94.85
		116	5580	14.89	15.00	
		124	5620	14.74	15.00	
		132	5660	14.74	15.00	
		140	5700	14.80	15.00	
		144	5720	14.82	15.00	
	802.11n-HT20 MCS0	100	5500	14.76	15.00	94.49
		116	5580	14.81	15.00	
		124	5620	14.81	15.00	
		132	5660	14.85	15.00	
		140	5700	14.79	15.00	
		144	5720	14.97	15.00	
	802.11n-HT40 MCS0	102	5510	14.87	15.00	90.48
		110	5550	14.93	15.00	
		126	5630	14.83	15.00	
		134	5670	14.79	15.00	
		142	5710	14.91	15.00	
	802.11ac-VHT20 MCS0	100	5500	14.93	15.00	93.75
		116	5580	14.93	15.00	
		124	5620	14.93	15.00	
		132	5660	14.87	15.00	
		140	5700	14.87	15.00	
		144	5720	14.95	15.00	
	802.11ac-VHT40 MCS0	102	5510	14.90	15.00	89.62
		110	5550	14.89	15.00	
		126	5630	14.87	15.00	
		134	5670	14.88	15.00	
		142	5710	14.94	15.00	
	802.11ac-VHT80 MCS0	106	5530	14.88	15.00	85.71
		122	5610	14.87	15.00	
		138	5690	14.85	15.00	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a MCS0	149	5745	14.84	15.00	94.85
		157	5785	14.88	15.00	
		165	5825	14.95	15.00	
	802.11n-HT20 MCS0	149	5745	14.81	15.00	94.49
		157	5785	14.83	15.00	
		165	5825	14.81	15.00	
	802.11n-HT40 MCS0	151	5755	14.82	15.00	90.48
		159	5795	14.81	15.00	
	802.11ac-VHT20 MCS0	149	5745	14.85	15.00	93.75
		157	5785	14.77	15.00	
		165	5825	14.89	15.00	
	802.11ac-VHT40 MCS0	151	5755	14.81	15.00	89.62
		159	5795	14.96	15.00	
	802.11ac-VHT80 MCS0	155	5775	14.79	15.00	85.71

<5GHz WLAN ANT1+2>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	17.91	18.00	94.85
		40	5200	17.87	18.00	
		44	5220	17.88	18.00	
		48	5240	17.87	18.00	
	802.11n-HT20 MCS0	36	5180	17.88	18.00	94.49
		40	5200	17.82	18.00	
		44	5220	17.83	18.00	
		48	5240	17.81	18.00	
	802.11n-HT40 MCS0	38	5190	17.84	18.00	89.52
		46	5230	17.95	18.00	
	802.11ac-VHT20 MCS0	36	5180	17.89	18.00	94.53
		40	5200	17.96	18.00	
		44	5220	17.94	18.00	
		48	5240	17.87	18.00	
	802.11ac-VHT40 MCS0	38	5190	17.88	18.00	89.72
		46	5230	17.96	18.00	
	802.11ac-VHT80 MCS0	42	5210	17.97	18.00	85.71

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	17.78	18.00	94.85
		56	5280	17.77	18.00	
		60	5300	17.74	18.00	
		64	5320	17.86	18.00	
	802.11n-HT20 MCS0	52	5260	17.82	18.00	94.49
		56	5280	17.77	18.00	
		60	5300	17.71	18.00	
		64	5320	17.77	18.00	
	802.11n-HT40 MCS0	54	5270	17.88	18.00	89.52
		62	5310	17.90	18.00	
	802.11ac-VHT20 MCS0	52	5260	17.85	18.00	94.53
		56	5280	17.77	18.00	
		60	5300	17.79	18.00	
		64	5320	17.85	18.00	
	802.11ac-VHT40 MCS0	54	5270	17.87	18.00	89.72
		62	5310	17.94	18.00	
	802.11ac-VHT80 MCS0	58	5290	16.97	17.00	85.71

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	17.94	18.00	94.85
		116	5580	17.81	18.00	
		124	5620	17.85	18.00	
		132	5660	17.74	18.00	
		140	5700	17.68	18.00	
		144	5720	17.95	18.00	
	802.11n-HT20 MCS0	100	5500	17.90	18.00	94.49
		116	5580	17.75	18.00	
		124	5620	17.74	18.00	
		132	5660	17.68	18.00	
		140	5700	17.78	18.00	
		144	5720	17.61	18.00	
	802.11n-HT40 MCS0	102	5510	17.79	18.00	89.52
		110	5550	17.82	18.00	
		126	5630	17.84	18.00	
		134	5670	17.83	18.00	
		142	5710	17.82	18.00	
	802.11ac-VHT20 MCS0	100	5500	17.89	18.00	94.53
		116	5580	17.80	18.00	
		124	5620	17.67	18.00	
		132	5660	17.71	18.00	
		140	5700	17.82	18.00	
		144	5720	17.54	18.00	
	802.11ac-VHT40 MCS0	102	5510	17.92	18.00	89.72
		110	5550	17.87	18.00	
		126	5630	17.84	18.00	
		134	5670	17.78	18.00	
		142	5710	17.68	18.00	
	802.11ac-VHT80 MCS0	106	5530	17.74	18.00	85.71
		122	5610	17.72	18.00	
		138	5690	17.92	18.00	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a MCS0	149	5745	17.98	18.00	94.85
		157	5785	17.83	18.00	
		165	5825	17.88	18.00	
	802.11n-HT20 MCS0	149	5745	17.96	18.00	94.49
		157	5785	17.84	18.00	
		165	5825	17.92	18.00	
	802.11n-HT40 MCS0	151	5755	17.93	18.00	89.52
		159	5795	17.93	18.00	
	802.11ac-VHT20 MCS0	149	5745	17.91	18.00	94.53
		157	5785	17.83	18.00	
		165	5825	17.98	18.00	
	802.11ac-VHT40 MCS0	151	5755	17.88	18.00	89.72
		159	5795	17.90	18.00	
	802.11ac-VHT80 MCS0	155	5775	17.88	18.00	85.71

<2.4GHz Bluetooth>

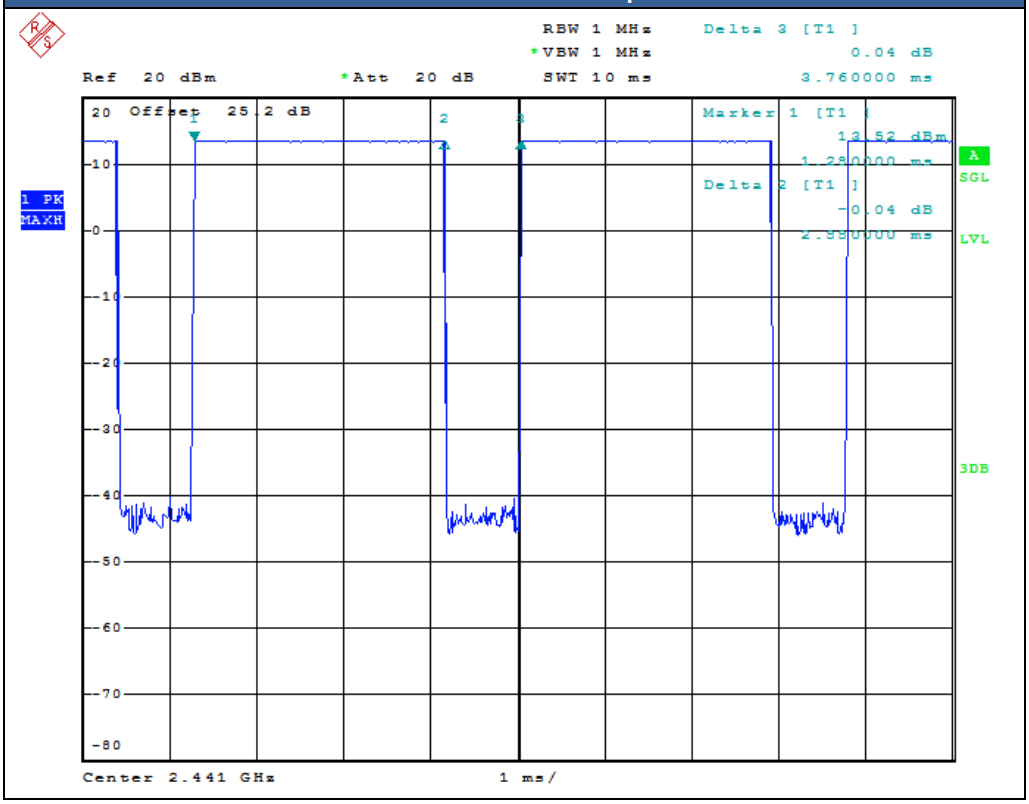
Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
BR / EDR	CH 00	2402	14.81	9.10	9.14
	CH 39	2441	14.56	9.22	9.25
	CH 78	2480	14.16	9.03	9.08
Tune-up Limit			16.	10	10

Mode	Channel	Frequency (MHz)	Average power (dBm)	
			1Mbps	2Mbps
LE	CH 00	2402	9.18	9.15
	CH 19	2440	8.46	8.83
	CH 39	2480	9.12	8.50
Tune-up Limit			10	10

General Note:

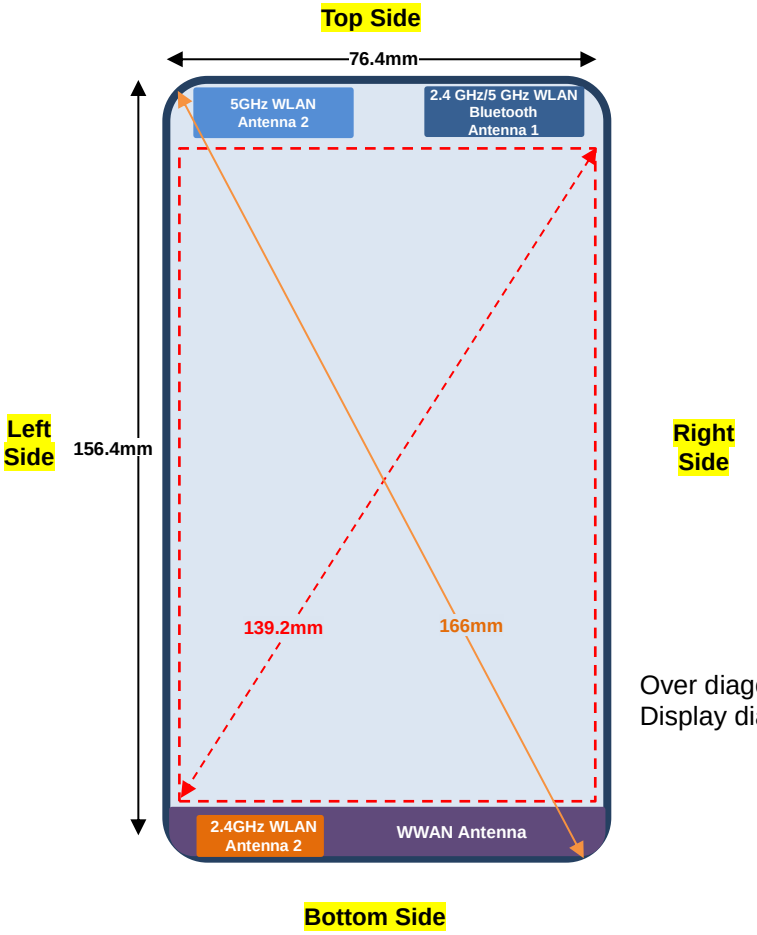
1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps, due to its highest average power.
2. The Bluetooth duty cycle is 76.6 % as following figure, according to 2016 Oct. TCB workshop for Bluetooth SAR scaling need further consideration and the theoretical duty cycle is 83.3%, therefore the actual duty cycle will be scaled up to the theoretical value of Bluetooth reported SAR calculation

Bluetooth time-domain plot



13. Antenna Location

<Mobile Phone>



Over diagonal: 166mm
Display diagonal: 139.2mm

Front View

Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Antenna	≤ 25mm	≤ 25mm	>25 mm	≤ 25mm	≤ 25mm	≤ 25mm
2.4GHz / 5GHz WLAN & BT Antenna 1	≤ 25mm	≤ 25mm	≤ 25mm	>25 mm	≤ 25mm	>25 mm
2.4GHz WLAN Antenna 2	≤ 25mm	≤ 25mm	>25 mm	≤ 25mm	>25 mm	≤ 25mm
5GHz WLAN Antenna 2	≤ 25mm	≤ 25mm	≤ 25mm	>25 mm	>25 mm	≤ 25mm
2.4GHz WLAN MIMO	≤ 25mm	≤ 25mm	≤ 25mm	≤ 25mm	≤ 25mm	≤ 25mm
5GHz WLAN MIMO	≤ 25mm	≤ 25mm	≤ 25mm	>25 mm	≤ 25mm	≤ 25mm

Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Antenna	Yes	Yes	No	Yes	Yes	Yes
2.4GHz / 5GHz WLAN & BT Antenna 1	Yes	Yes	Yes	No	Yes	No
2.4GHz WLAN Antenna 2	Yes	Yes	No	Yes	No	Yes
5GHz WLAN Antenna 2	Yes	Yes	Yes	No	No	Yes
2.4GHz WLAN MIMO	Yes	Yes	Yes	Yes	Yes	Yes
5GHz WLAN MIMO	Yes	Yes	Yes	No	Yes	Yes

General Note:

1. Referring to KDB 941225 D06 v02r01, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.
2. Since the device supports MIMO operated, when each chain transmits at the same time that bottom side can be exempt for 5GHz WLAN only.

14. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   e. 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 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
3. When the device operating under different conditions of At-Head, body-worn, near-body, hotspot and free space will limit different maximum output powers in several cellular transmitters and the detail mechanisms description of the different output power levels are included in the operation description.
4. The device used different output power mechanisms for SAR compliance for WLAN transmitter for held-to-ear exposure conditions and detail descriptions of the output power mechanism are included in the operational description.
5. While operating in “Front” and “Back” configuration by end user, the device will limit different maximum output powers on the WCDMA B2 / B4 / B5 and LTE B2 / B4 / B5 / B7 / B17 / B25 / B26 / B30 / B66 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.
6. While operating in body-adjacent exposure configuration during a mobile hotspot session, the device will reduced output powers on the WCDMA B2 / B4 / B5 and LTE B2 / B4 / B5 / B7 / B17 / B25 / B26 / B30 / B66 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.
7. Per KDB 648474 D03v01r04, the highest SAR reported for each wireless technology (1xRTT, EVDO, WCDMA, GSM, Wi-Fi etc.), frequency band, operating mode (different modes/configurations within each wireless technology) and exposure condition (head, body-worn accessory, hotspot mode, etc.) must be repeated using the wireless charging battery cover.
8. Per KDB 648474 D03v01r04, for test cases where the measured SAR for a handset with normal battery cover is greater than 1.2 W/kg, these tests should be repeated with the wireless charging battery cover.

14.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
01	GSM850	GPRS (4 Tx slots)	Left Cheek	0mm	251	848.8	26.34	27.50	1.306	0.14	0.165	0.216
02	GSM1900	GPRS (4 Tx slots)	Left Cheek	0mm	810	1909.8	22.90	24.50	1.445	0.14	0.155	0.224

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
03	WCDMA II	RMC 12.2Kbps	Left Cheek	0mm	9400	1880	22.25	24.00	1.496	0.12	0.241	0.361
04	WCDMA IV	RMC 12.2Kbps	Left Cheek	0mm	1312	1712.4	22.38	24.00	1.452	0.09	0.290	0.421
05	WCDMA V	RMC 12.2Kbps	Left Cheek	0mm	4132	826.4	23.18	24.00	1.208	0.04	0.258	0.312

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
06	LTE Band 2	20M	QPSK	1	0	Left Cheek	0mm	19100	1900	22.78	24.00	1.324	0.11	0.284	0.376
07	LTE Band 4	20M	QPSK	1	0	Right Cheek	0mm	20175	1732.5	22.76	24.00	1.330	0.05	0.283	0.377
08	LTE Band 5	10M	QPSK	1	0	Right Cheek	0mm	20525	836.5	23.64	24.00	1.086	0.13	0.200	0.217
09	LTE Band 7	20M	QPSK	1	0	Right Cheek	0mm	21350	2560	22.73	24.00	1.340	-0.05	0.304	0.407
10	LTE Band 12	10M	QPSK	1	0	Right Cheek	0mm	23095	707.5	23.50	24.00	1.122	-0.03	0.174	0.195
11	LTE Band 17	10M	QPSK	1	0	Right Cheek	0mm	23790	710	23.48	24.00	1.127	-0.03	0.206	0.232
12	LTE Band 25	20M	QPSK	1	0	Left Cheek	0mm	26590	1905	22.61	24.00	1.377	0.15	0.307	0.423
13	LTE Band 26	15M	QPSK	1	0	Left Cheek	0mm	26865	831.5	23.65	24.00	1.084	-0.04	0.245	0.266
14	LTE Band 30	10M	QPSK	1	0	Right Cheek	0mm	27710	2355	22.83	24.00	1.309	0.03	0.286	0.374
15	LTE Band 66	20M	QPSK	1	0	Left Cheek	0mm	132572	1770	22.74	24.00	1.337	0.07	0.353	0.472

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
16	LTE Band 38	20M	QPSK	1	0	Right Cheek	0mm	38150	2610	22.66	24.00	1.361	62.9	1.006	0.12	0.206	0.282
17	LTE Band 41	20M	QPSK	1	0	Right Cheek	0mm	40500	2581	22.96	24.00	1.271	62.9	1.006	0.15	0.161	0.206

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	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)
18	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 1	11	2462	15.85	16.50	1.161	100	1.000	-0.17	0.528	0.613
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 2	1	2412	15.90	16.50	1.148	100	1.000	0.03	0.037	0.042
19	WLAN5GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Ant 1	54	5270	14.79	15.00	1.050	89.62	1.116	-0.12	0.380	0.445
	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 2	54	5270	14.86	15.00	1.033	90.48	1.105	-0.08	0.309	0.353
20	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 1	106	5530	14.91	15.00	1.021	86.51	1.156	-0.11	0.524	0.618
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 2	106	5530	14.88	15.00	1.028	85.71	1.167	0.01	0.432	0.518
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 1	155	5775	14.63	15.00	1.089	86.51	1.156	-0.06	0.478	0.602
21	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 2	155	5775	14.79	15.00	1.050	85.71	1.167	0.06	0.701	0.859

14.2 Hotspot SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
22	GSM850	GPRS (4 Tx slots)	Back	10mm	189	836.4	26.34	27.50	1.306	0.07	0.337	0.440
23	GSM1900	GPRS (4 Tx slots)	Back	10mm	810	1909.8	22.90	24.50	1.445	-0.17	0.308	0.445

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
24	WCDMA II	RMC 12.2Kbps	Back	10mm	9262	1852.4	21.55	23.00	1.396	-0.01	0.430	0.600
25	WCDMA IV	RMC 12.2Kbps	Back	10mm	1513	1752.6	20.94	22.50	1.432	-0.05	0.425	0.609
26	WCDMA V	RMC 12.2Kbps	Back	10mm	4182	836.4	21.58	22.50	1.236	0.06	0.439	0.543

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
27	LTE Band 2	20M	QPSK	1	0	Back	10mm	18700	1860	21.49	23.00	1.416	-0.06	0.415	0.588
28	LTE Band 4	20M	QPSK	100	0	Back	10mm	20175	1732.5	20.60	22.00	1.380	-0.05	0.435	0.600
29	LTE Band 5	10M	QPSK	1	0	Back	10mm	20525	836.5	22.08	23.00	1.236	0.04	0.531	0.656
30	LTE Band 7	20M	QPSK	50	0	Back	10mm	21100	2535	20.80	22.00	1.318	-0.07	0.374	0.493
31	LTE Band 12	10M	QPSK	1	0	Back	10mm	23095	707.5	23.50	24.00	1.122	0.06	0.519	0.582
32	LTE Band 17	10M	QPSK	1	0	Front	10mm	23790	710	21.91	23.00	1.285	0	0.647	0.832
33	LTE Band 25	20M	QPSK	1	0	Bottom Side	10mm	26140	1860	21.63	23.00	1.371	-0.04	0.820	1.124
34	LTE Band 26	15M	QPSK	1	0	Back	10mm	26865	831.5	22.20	23.00	1.202	0.04	0.545	0.655
35	LTE Band 30	10M	QPSK	25	0	Front	10mm	27710	2355	20.83	22.00	1.309	0.1	0.603	0.789
36	LTE Band 66	20M	QPSK	50	0	Bottom Side	10mm	132572	1770	20.94	22.00	1.276	0.15	0.787	1.005

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
37	LTE Band 38	20M	QPSK	1	0	Bottom Side	10mm	38150	2610	22.66	24.00	1.361	62.9	1.006	-0.12	0.662	0.907
38	LTE Band 41	20M	QPSK	1	0	Front	10mm	41140	2645	22.72	24.00	1.343	62.9	1.006	-0.02	0.475	0.642

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Ant 1	1	2412	15.90	16.50	1.148	100	1.000	-0.11	0.119	0.137
39	WLAN2.4GHz	802.11b 1Mbps	Bottom Side	10mm	Ant 2	11	2462	15.60	16.50	1.230	100	1.000	-0.13	0.284	0.349
40	WLAN5GHz	802.11a 6Mbps	Front	10mm	Ant 1	36	5180	18.16	19.00	1.213	94.16	1.062	-0.04	0.105	0.135
	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 2	36	5180	18.10	19.00	1.230	94.85	1.054	0.14	0.037	0.048
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	10mm	Ant 1	155	5775	18.18	19.00	1.208	86.51	1.156	0.14	0.023	0.032
41	WLAN5GHz	802.11ac-VHT80 MCS0	Top Side	10mm	Ant 2	155	5775	18.30	19.00	1.175	85.71	1.167	-0.18	0.153	0.210

14.3 Product Specific SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
42	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	9262	1852.4	22.51	24.00	1.409	-0.18	2.160	3.044
43	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	1513	1752.6	22.40	24.00	1.445	-0.13	1.610	2.327

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
44	LTE Band 2	20M	QPSK	1	0	Bottom Side	0mm	19100	1900	22.78	24.00	1.324	0.04	2.340	3.099
45	LTE Band 4	20M	QPSK	1	0	Bottom Side	0mm	20175	1732.5	22.76	24.00	1.330	-0.02	2.180	2.900
46	LTE Band 25	20M	QPSK	1	0	Bottom Side	0mm	26140	1860	22.63	24.00	1.371	0.04	2.400	3.290

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
47	WLAN5GHz	802.11a 6Mbps	Front	0mm	Ant 1	5320	64	18.26	19.00	1.186	94.16	1.062	-0.07	0.549	0.691
	WLAN5GHz	802.11a 6Mbps	Front	0mm	Ant 2	5320	64	18.13	19.00	1.222	94.85	1.054	-0.08	0.351	0.452
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	0mm	Ant 1	5690	138	18.25	19.00	1.189	86.51	1.156	-0.03	0.561	0.771
48	WLAN5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Ant 2	5690	138	18.00	19.00	1.259	85.71	1.167	0.1	0.970	1.425

14.4 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
49	GSM850	GPRS (4 Tx slots)	Back	10mm	189	836.4	26.34	27.50	1.306	0.07	0.337	0.440
50	GSM1900	GPRS (4 Tx slots)	Back	10mm	810	1909.8	22.90	24.50	1.445	-0.17	0.308	0.445

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
51	WCDMA II	RMC 12.2Kbps	Back	10mm	9262	1852.4	21.55	23.00	1.396	-0.01	0.430	0.600
52	WCDMA IV	RMC 12.2Kbps	Back	10mm	1513	1752.6	20.94	22.50	1.432	-0.05	0.425	0.609
53	WCDMA V	RMC 12.2Kbps	Back	10mm	4182	836.4	21.58	22.50	1.236	0.06	0.439	0.543

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
54	LTE Band 2	20M	QPSK	1	0	Back	10mm	18700	1860	21.49	23.00	1.416	-0.06	0.415	0.588
55	LTE Band 4	20M	QPSK	100	0	Back	10mm	20175	1732.5	20.60	22.00	1.380	-0.05	0.435	0.600
56	LTE Band 5	10M	QPSK	1	0	Back	10mm	20525	836.5	22.08	23.00	1.236	0.04	0.531	0.656
57	LTE Band 7	20M	QPSK	50	0	Back	10mm	21100	2535	20.80	22.00	1.318	-0.07	0.374	0.493
58	LTE Band 12	10M	QPSK	1	0	Back	10mm	23095	707.5	23.50	24.00	1.122	0.06	0.519	0.582
59	LTE Band 17	10M	QPSK	1	0	Front	10mm	23790	710	21.91	23.00	1.285	0	0.647	0.832
60	LTE Band 25	20M	QPSK	1	0	Back	10mm	26140	1860	21.63	23.00	1.371	-0.04	0.567	0.777
61	LTE Band 26	15M	QPSK	1	0	Back	10mm	26865	831.5	22.20	23.00	1.202	0.04	0.545	0.655
62	LTE Band 30	10M	QPSK	25	0	Front	10mm	27710	2355	20.83	22.00	1.309	0.1	0.603	0.789
63	LTE Band 66	20M	QPSK	50	0	Front	10mm	132322	1745	21.14	22.00	1.219	-0.02	0.623	0.759

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
64	LTE Band 38	20M	QPSK	1	0	Front	10mm	38150	2610	22.66	24.00	1.361	62.9	1.006	-0.04	0.673	0.922
65	LTE Band 41	20M	QPSK	1	0	Front	10mm	41140	2645	22.72	24.00	1.343	62.9	1.006	-0.02	0.475	0.642

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Ant 1	1	2412	15.90	16.50	1.148	100	1.000	-0.11	0.119	0.137
66	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Ant 2	11	2462	15.60	16.50	1.230	100	1.000	0.07	0.195	0.240
67	WLAN5GHz	802.11a 6Mbps	Front	10mm	Ant 1	64	5320	18.26	19.00	1.186	94.16	1.062	0.02	0.084	0.106
	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 2	56	5280	18.00	19.00	1.259	94.85	1.054	-0.06	0.057	0.076
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	10mm	Ant 1	138	5690	18.25	19.00	1.189	86.51	1.156	-0.09	0.115	0.158
68	WLAN5GHz	802.11ac-VHT80 MCS0	Front	10mm	Ant 2	138	5690	18.00	19.00	1.259	85.71	1.167	-0.03	0.124	0.182
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	10mm	Ant 1	155	5775	18.18	19.00	1.208	86.51	1.156	0.14	0.023	0.032
69	WLAN5GHz	802.11ac-VHT80 MCS0	Front	10mm	Ant 2	155	5775	18.30	19.00	1.175	85.71	1.167	0.18	0.138	0.189

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	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)
70	Bluetooth	1Mbps	Back	10mm	Ant 1	78	2480	14.16	16.00	1.528	76.6	1.087	-0.06	0.017	0.028

14.5 Repeated SAR Measurement

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 25	20M	QPSK	1	0	Bottom Side	10mm	26140	1860	21.63	23.00	1.371	-0.04	0.820		1.124
2nd	LTE Band 25	20M	QPSK	1	0	Bottom Side	10mm	26140	1860	21.63	23.00	1.371	0.06	0.810	1.01	1.110

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Ratio	Reported 10g SAR (W/kg)
1st	LTE Band 4	20M	QPSK	1	0	Bottom Side	0mm	20175	1732.5	22.76	24.00	1.330	-0.02	2.180		2.900
2nd	LTE Band 4	20M	QPSK	1	0	Bottom Side	0mm	20175	1732.5	22.76	24.00	1.330	0.08	2.100	1.04	2.794
1st	LTE Band 25	20M	QPSK	1	0	Bottom Side	0mm	26140	1860	22.63	24.00	1.371	0.04	2.400		3.290
2nd	LTE Band 25	20M	QPSK	1	0	Bottom Side	0mm	26140	1860	22.63	24.00	1.371	0.09	2.300	1.04	3.153

General Note:

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

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15. Uncertainty Assessment

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in table below.

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[(a)]	1/k[(b)]	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Table 15.1. Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	6.00	N	1	1	1	6.0	6.0
Axial Isotropy	4.70	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.60	R	1.732	0.7	0.7	3.9	3.9
Boundary Effects	1.00	R	1.732	1	1	0.6	0.6
Linearity	4.70	R	1.732	1	1	2.7	2.7
System Detection Limits	1.00	R	1.732	1	1	0.6	0.6
Modulation Response	4.68	R	1.732	1	1	2.7	2.7
Readout Electronics	0.30	N	1	1	1	0.3	0.3
Response Time	0.00	R	1.732	1	1	0.0	0.0
Integration Time	2.60	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.00	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.00	R	1.732	1	1	1.7	1.7
Probe Positioner	0.40	R	1.732	1	1	0.2	0.2
Probe Positioning	2.90	R	1.732	1	1	1.7	1.7
Max. SAR Eval.	2.00	R	1.732	1	1	1.2	1.2
Test Sample Related							
Device Positioning	3.03	N	1	1	1	3.0	3.0
Device Holder	3.60	N	1	1	1	3.6	3.6
Power Drift	5.00	R	1.732	1	1	2.9	2.9
Power Scaling	0.00	R	1.732	1	1	0.0	0.0
Phantom and Setup							
Phantom Uncertainty	6.10	R	1.732	1	1	3.5	3.5
SAR correction	0.00	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.03	N	1	0.78	0.71	0.0	0.0
Liquid Conductivity (target)	5.00	R	1.732	0.78	0.71	2.3	2.0
Liquid Conductivity (mea.)	2.50	R	1.732	0.78	0.71	1.1	1.0
Temp. unc. - Conductivity	3.68	R	1.732	0.78	0.71	1.7	1.5
Liquid Permittivity Repeatability	0.02	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.00	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.50	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.84	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						11.6%	11.6%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						23.2%	23.1%

Table 15.2. Uncertainty Budget for frequency range 300 MHz to 3 GHz

Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	6.55	N	1	1	1	6.6	6.6
Axial Isotropy	4.70	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.60	R	1.732	0.7	0.7	3.9	3.9
Boundary Effects	2.00	R	1.732	1	1	1.2	1.2
Linearity	4.70	R	1.732	1	1	2.7	2.7
System Detection Limits	1.00	R	1.732	1	1	0.6	0.6
Modulation Response	4.68	R	1.732	1	1	2.7	2.7
Readout Electronics	0.30	N	1	1	1	0.3	0.3
Response Time	0.00	R	1.732	1	1	0.0	0.0
Integration Time	2.60	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.00	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.00	R	1.732	1	1	1.7	1.7
Probe Positioner	0.40	R	1.732	1	1	0.2	0.2
Probe Positioning	6.70	R	1.732	1	1	3.9	3.9
Max. SAR Eval.	4.00	R	1.732	1	1	2.3	2.3
Test Sample Related							
Device Positioning	3.03	N	1	1	1	3.0	3.0
Device Holder	3.60	N	1	1	1	3.6	3.6
Power Drift	5.00	R	1.732	1	1	2.9	2.9
Power Scaling	0.00	R	1.732	1	1	0.0	0.0
Phantom and Setup							
Phantom Uncertainty	6.60	R	1.732	1	1	3.8	3.8
SAR correction	0.00	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.03	N	1	0.78	0.71	0.0	0.0
Liquid Conductivity (target)	5.00	R	1.732	0.78	0.71	2.3	2.0
Liquid Conductivity (mea.)	2.50	R	1.732	0.78	0.71	1.1	1.0
Temp. unc. - Conductivity	3.68	R	1.732	0.78	0.71	1.7	1.5
Liquid Permittivity Repeatability	0.02	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.00	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.50	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.84	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						12.7%	12.6%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						25.4%	25.3%

Table 15.3. Uncertainty Budget for frequency range 3 GHz to 6 GHz

16. References

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

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

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

[4] SPEAG DASY System Handbook

[5] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.

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

[7] FCC KDB 648474 D04 v01r03, “SAR Evaluation Considerations for Wireless Handsets”, Oct 2015.

[8] FCC KDB 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, Oct 2015

[9] FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015

[10] FCC KDB 941225 D05A v01r02, “Rel. 10 LTE SAR Test Guidance and KDB Inquiries”, Oct 2015

[11] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.

[12] FCC KDB 616217 D04 v01r02, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, Oct 2015

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

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

[15] FCC KDB 648474 D03 v01r04, “Evaluation and Approval Considerations for Handsets with Specific Wireless Charging Battery Covers” Dec 2015.