



FCC SAR TEST REPORT

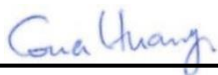
FCC ID : EJE-EM7455D2
Equipment : LTE Module
Brand Name : Sierra Wireless Inc.
Model Name : EM7455
Applicant : FUJITSU CLIENT COMPUTING LIMITED
1-1, Kamikonadaka 4-chome, Nakahara-ku,
Kawasaki, 211-8588 Japan
Manufacturer : FUJITSU CLIENT COMPUTING LIMITED
1-1, Kamikodanaka 4-chome, Nakahara-ku,
Kawasaki, 211-8588 Japan
Standard : FCC 47 CFR Part 2 (2.1093)
ANSI/IEEE C95.1-1992
IEEE 1528-2013

The product was installed into STYLISTIC Q739 (Brand Name FUJITSU, Model Name: PQ13B) during test.

The product was received on Dec. 25, 2018 and testing was started from Dec. 25, 2018 and completed on Dec. 27, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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

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



Approved by: Cona Huang / Deputy Manager

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History of this test report

Report No.	Version	Description	Issued Date
FA8D1723-01	01	Initial issue of report	Mar. 13, 2019

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for FUJITSU CLIENT COMPUTING LIMITED, LTE Module, EM7455, are as follows.

Equipment Class	Frequency Band	Highest SAR Summary	Highest Simultaneous Transmission 1g SAR (W/kg)
		Body	
		1g SAR (W/kg)	
Licensed	WCDMA II	1.41	1.43
	WCDMA IV	1.31	
	WCDMA V	1.23	
	LTE Band 4	1.35	
	LTE Band 7	1.22	
	LTE Band 12	1.25	
	LTE Band 13	1.31	
	LTE Band 25	1.4	
	LTE Band 26	1.22	
	LTE Band 41	1.35	
Date of Testing:		2018/12/25 ~ 2018/12/27	

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

Reviewed by: Jason Wang

Report Producer: Wan Liu

2. Guidance Applied

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

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02



3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	LTE Module
Brand Name	Sierra Wireless Inc.
Model Name	EM7455
FCC ID	EJE-EM7455D2
Wireless Technology and Frequency Range	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 13: 779.5 MHz ~ 784.5 MHz LTE Band 25: 1850.7 MHz ~ 1914.3 MHz LTE Band 26: 814.7 MHz ~ 848.3 MHz LTE Band 41: 2498.5 MHz ~ 2687.5 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM
Remark: 1. The WWAN module will be integrated into below host (FCC ID: EJE-WB0109, Fujitsu, PQ13B), and below host is the same FCC ID: EJE-WB0104, sporton report no: FA7N1801-02 (Fujitsu, Q738), the two hosts which the WWAN module, WLAN/WWAN antenna, housing, component layout are the same, only difference is the WLAN module is change from Intel 8265NGW to Intel 9560NGW, and the CMU platform is changed, 2. The test result in this report is spot check worst case according to FCC ID: EJE-EM7455D2, Sporton report no.: FA7N1801-02 to check the above change was not impact RF exposure compliance, for this report also the WWAN DPR level and the P-sensor trigger distance and the movement detection was not changed, please refer to FCC ID: EJE-EM7455D2, Sporton report no.: FA7N1801-02 page10 for the detail.	

Host Information	
Equipment Name	STYLISTIC Q739
Brand Name	FUJITSU
Model Name	PQ13B
FCC ID	EJE-WB0109
Integrated WLAN Module	Brand name: Intel Model name: 9560NGW
Integrated SNAP Module	Brand name: SiBeam Model name: SB6212
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz SNAP : 60.48GHz
Mode	WLAN 2.4GHz : 802.11b/g/n HT20/HT40 WLAN 5GHz : 802.11a/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE SANP: OOK



WWAN Antenna Information	
Antenna Type	PIFA
Band / Peak Gain (dBi)	
WCDMA Band 2	2.51
WCDMA Band 4	2.07
WCDMA Band 5	-0.36
LTE Band 2	2.51
LTE Band 4	2.07
LTE Band 5	-0.19
LTE Band 7	0.76
LTE Band 12	-1.71
LTE Band 13	-0.68
LTE Band 25	2.51
LTE Band 26	-0.19
LTE Band 41	1.41

3.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05												
FCC ID			EJE-EM7455D2									
Equipment Name			LTE Module									
Operating Frequency Range of each LTE transmission band			LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 25: 1850.7 MHz ~ 1914.3 MHz LTE Band 26: 814.7 MHz ~ 848.3 MHz LTE Band 41: 2498.5 MHz ~ 2687.5 MHz									
Channel Bandwidth			LTE Band 02:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 04:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 05:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 07: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 25:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 26:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz									
uplink modulations used			QPSK / 16QAM									
LTE Voice / Data requirements			Data only									
LTE MPR permanently built-in by design			Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3									
			Modulation	Channel bandwidth / Transmission bandwidth (N _{RB})						MPR (dB)		
				1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz			
			QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1		
			16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1		
			16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2		
			64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2		
			64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3		
256 QAM							≥ 1	≤ 5				
LTE A-MPR			In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)									
Spectrum plots for RB configuration			A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.									
Power reduction applied to satisfy SAR compliance			Yes (Proximity sensor conjunction with Movement detection)									
LTE Carrier Aggregation Combinations			Inter-Band and Intra-Band possible combinations as below page and the detail power verification please referred to FCC ID: EJE-EM7455D2, Sporton report no.: FA7N1801-02 page 78									
LTE Carrier Aggregation Additional Information			This device does not support full CA features on 3GPP Release 10. It supports a maximum of 2 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.									
Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900

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

4. RF Exposure Limits

4.1 Uncontrolled Environment

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

4.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

5. Specific Absorption Rate (SAR)

5.1 Introduction

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

5.2 SAR Definition

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

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

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

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

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

6. System Description and Setup

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



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

6.1 E-Field Probe

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

<ES3DV3 Probe>

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

<EX3DV4 Probe>

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

6.2 Data Acquisition Electronics (DAE)

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

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



Fig 5.1 Photo of DAE

6.3 Phantom

<SAM Twin Phantom>

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

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

<ELI Phantom>

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

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

6.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

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



Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

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

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



Mounting Device for Laptops

7. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

7.1 Spatial Peak SAR Evaluation

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

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

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

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

7.2 Power Reference Measurement

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

7.3 Area Scan

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

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

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

7.4 Zoom Scan

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

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

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

7.5 Volume Scan Procedures

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

7.6 Power Drift Monitoring

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

8. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1012	Sep. 05, 2018	Sep. 04, 2019
SPEAG	835MHz System Validation Kit	D835V2	499	Sep. 06, 2018	Sep. 05, 2019
SPEAG	1750MHz System Validation Kit	D1750V2	1068	Nov. 19, 2018	Nov. 18, 2019
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Sep. 11, 2018	Sep. 10, 2019
SPEAG	2600MHz System Validation Kit	D2600V2	1008	Aug. 31, 2018	Aug. 30, 2019
SPEAG	Data Acquisition Electronics	DAE4	853	Jul. 24, 2018	Jul. 23, 2019
SPEAG	Data Acquisition Electronics	DAE4	854	Jun. 14, 2018	Jun. 13, 2019
SPEAG	Dosimetric E-Field Probe	ES3DV3	3270	Sep. 24, 2018	Sep. 23, 2019
SPEAG	Dosimetric E-Field Probe	EX3DV4	7515	Oct. 03, 2018	Oct. 02, 2019
RCPTWN	Thermometer	HTC-1	TM281-1	Mar. 16, 2018	Mar. 15, 2019
RCPTWN	Thermometer	HTC-1	TM281-2	Mar. 16, 2018	Mar. 15, 2019
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Apr. 17, 2018	Apr. 16, 2019
Agilent	Wireless Communication Test Set	E5515C	MY50266977	May. 21, 2018	May. 20, 2019
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Dec. 11, 2018	Dec. 10, 2019
Agilent	ENA Network Analyzer	E5071C	MY46316648	Jan. 17, 2018	Jan. 16, 2019
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 19, 2018	Sep. 18, 2019
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3169	Sep. 11, 2018	Sep. 10, 2019
Anritsu	Power Meter	ML2495A	1419002	May. 18, 2018	May. 17, 2019
Anritsu	Power Sensor	MA2411B	1339124	May. 18, 2018	May. 17, 2019
Anritsu	Power Meter	ML2495A	1240001	Sep. 13, 2018	Sep. 12, 2019
Anritsu	Power Sensor	MA2411B	1207349	Sep. 13, 2018	Sep. 12, 2019
Agilent	Spectrum Analyzer	E4408B	MY44211028	Aug. 28, 2018	Aug. 27, 2019
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jun. 23, 2018	Jun. 22, 2019
Mini-Circuits	Power Amplifier	ZVE-8G+	6382	Aug. 09, 2018	Aug. 08, 2019
Mini-Circuits	Power Amplifier	ZHL-42W+	15542	Aug. 09, 2018	Aug. 08, 2019
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.

9. System Verification

9.1 Tissue Simulating Liquids

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



Fig 10.1 Photo of Liquid Height for Head SAR

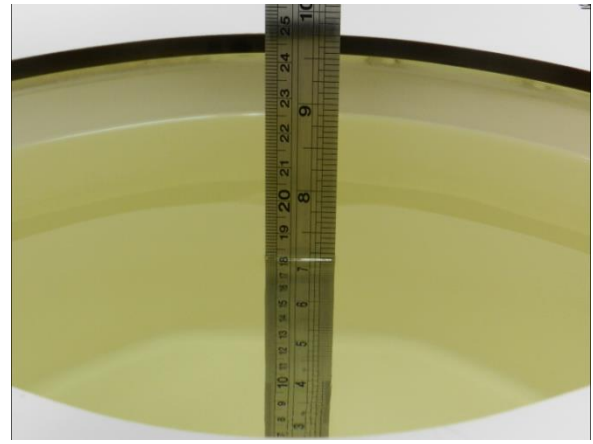


Fig 10.2 Photo of Liquid Height for Body SAR

9.2 Tissue Verification

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

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (ϵ_r)
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. (°C)	Conductivity (σ)	Permittivity (ϵ_r)	Conductivity Target (σ)	Permittivity Target (ϵ_r)	Delta (σ) (%)	Delta (ϵ_r) (%)	Limit (%)	Date
750	MSL	22.6	0.957	56.072	0.96	55.50	-0.31	1.03	±5	2018/12/27
835	MSL	22.3	0.956	55.309	0.97	55.20	-1.44	0.20	±5	2018/12/26
1750	MSL	22.6	1.481	55.248	1.49	53.40	-0.60	3.46	±5	2018/12/26
1900	MSL	22.2	1.577	52.594	1.52	53.30	3.75	-1.32	±5	2018/12/25
2600	MSL	22.6	2.138	50.714	2.16	52.50	-1.02	-3.40	±5	2018/12/27

9.3 System Performance Check Results

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

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2018/12/27	750	MSL	250	D750V3-1012	ES3DV3 - SN3270	DAE4 Sn854	2.21	8.76	8.84	0.91
2018/12/26	835	MSL	250	D835V2-499	ES3DV3 - SN3270	DAE4 Sn854	2.53	9.82	10.12	3.05
2018/12/26	1750	MSL	250	D1750V2-1068	ES3DV3 - SN3270	DAE4 Sn854	9.78	37.00	39.12	5.73
2018/12/25	1900	MSL	250	D1900V2-5d041	EX3DV4 - SN7515	DAE4 Sn853	10.10	40.20	40.4	0.50
2018/12/27	2600	MSL	250	D2600V2-1008	ES3DV3 - SN3270	DAE4 Sn854	13.90	55.30	55.6	0.54

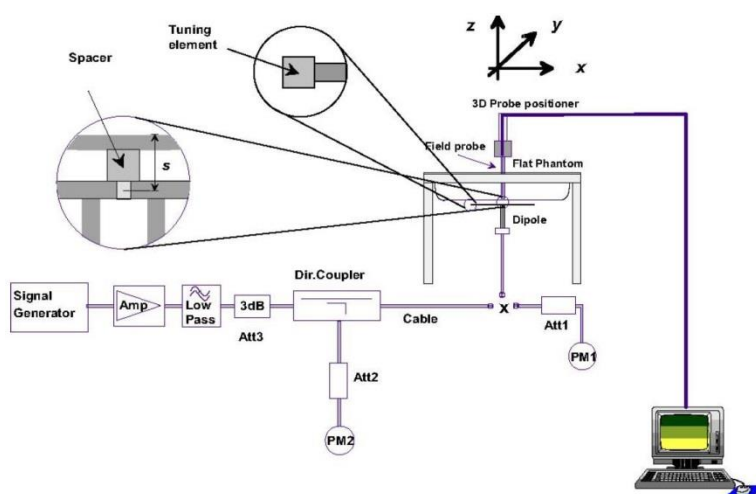


Fig 8.3.1 System Performance Check Setup



Fig 8.3.2 Setup Photo

10. Conducted RF Output Power (Unit: dBm)

<WCDMA Conducted Power>

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

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

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

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

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

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

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

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. For all other combinations of 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 $\beta_c = 11/15$ and $\beta_d = 15/15$.

Setup Configuration

HSUPA Setup Configuration:

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

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

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

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

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

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

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

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

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

Setup Configuration

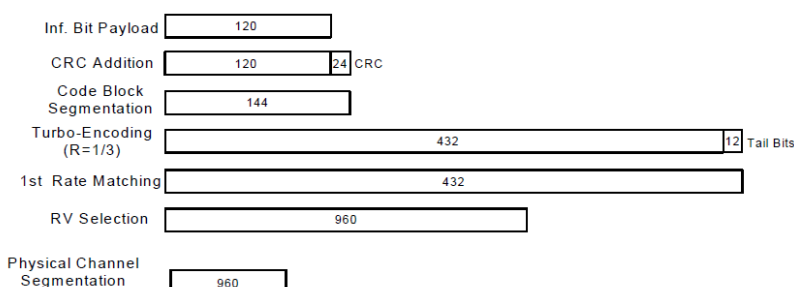
DC-HSDPA 3GPP release 8 Setup Configuration:

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

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

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

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


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

<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 $\leq \frac{1}{4}$ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA 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 $\frac{1}{4}$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

<Default Power Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	RMC 12.2Kbps	23.37	23.23	23.24	24.00	23.27	23.37	23.31	24.00	22.50	22.61	22.74	24.00
3GPP Rel 6	HSDPA Subtest-1	22.22	22.12	22.17	23.00	22.08	22.18	22.15	23.00	21.45	21.55	21.71	23.00
3GPP Rel 6	HSDPA Subtest-2	22.24	22.16	22.21	23.00	22.11	22.22	22.19	23.00	21.48	21.60	21.76	23.00
3GPP Rel 6	HSDPA Subtest-3	21.72	21.28	21.70	22.50	21.59	21.70	21.67	22.50	20.97	21.10	21.26	22.50
3GPP Rel 6	HSDPA Subtest-4	21.72	21.63	21.70	22.50	21.59	21.70	21.67	22.50	20.96	21.03	21.24	22.50
3GPP Rel 8	DC-HSDPA Subtest-1	22.31	22.14	22.31	23.00	22.26	22.34	22.30	23.00	21.46	21.56	21.76	23.00
3GPP Rel 8	DC-HSDPA Subtest-2	22.37	22.30	22.35	23.00	22.18	22.21	22.17	23.00	21.55	21.80	21.89	23.00
3GPP Rel 8	DC-HSDPA Subtest-3	21.89	21.28	21.81	22.50	22.16	22.28	22.26	22.50	21.08	21.10	21.41	22.50
3GPP Rel 8	DC-HSDPA Subtest-4	21.77	21.82	21.73	22.50	21.66	21.88	21.69	22.50	21.12	21.15	21.32	22.50
3GPP Rel 6	HSUPA Subtest-1	21.46	21.83	21.85	23.00	21.85	21.84	21.88	23.00	21.25	21.25	21.32	23.00
3GPP Rel 6	HSUPA Subtest-2	20.88	20.96	21.00	21.00	20.94	21.00	21.00	21.00	20.54	20.58	20.74	21.00
3GPP Rel 6	HSUPA Subtest-3	20.82	20.75	20.80	22.00	20.75	20.79	20.77	22.00	20.16	20.16	20.30	22.00
3GPP Rel 6	HSUPA Subtest-4	20.68	20.76	20.80	21.00	20.94	20.99	20.97	21.00	20.46	20.46	20.62	21.00
3GPP Rel 6	HSUPA Subtest-5	22.20	22.20	22.20	23.00	22.10	22.20	22.20	23.00	21.60	21.60	21.70	23.00

<Reduced Power Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	RMC 12.2Kbps	15.98	15.96	15.88	17.00	16.91	16.96	16.90	17.50	19.28	19.31	19.33	20.00
3GPP Rel 6	HSDPA Subtest-1	14.97	14.85	14.98	15.00	15.37	15.35	15.23	16.00	17.96	18.08	18.30	19.00
3GPP Rel 6	HSDPA Subtest-2	14.95	14.85	14.95	15.00	15.34	15.38	15.18	16.00	17.92	18.03	18.32	19.00
3GPP Rel 6	HSDPA Subtest-3	14.42	14.32	14.10	14.50	14.82	14.84	14.53	15.50	17.37	17.56	17.78	18.50
3GPP Rel 6	HSDPA Subtest-4	14.42	13.96	14.42	14.50	14.80	14.80	14.70	15.50	17.36	17.48	17.38	18.50
3GPP Rel 8	DC-HSDPA Subtest-1	14.88	14.80	14.92	15.00	15.41	15.42	15.32	16.00	17.87	18.01	18.33	19.00
3GPP Rel 8	DC-HSDPA Subtest-2	14.98	14.81	14.87	15.00	15.26	15.45	15.14	16.00	17.89	18.05	18.33	19.00
3GPP Rel 8	DC-HSDPA Subtest-3	14.37	14.35	14.00	14.50	14.92	14.76	14.43	15.50	17.45	17.54	17.68	18.50
3GPP Rel 8	DC-HSDPA Subtest-4	14.32	14.05	14.46	14.50	14.83	14.90	14.66	15.50	17.39	17.53	17.40	18.50
3GPP Rel 6	HSUPA Subtest-1	13.25	13.12	13.40	14.00	14.25	14.20	14.04	15.00	17.99	17.74	17.95	19.00
3GPP Rel 6	HSUPA Subtest-2	13.48	13.58	13.46	14.00	14.49	14.39	14.33	15.00	16.64	17.24	17.37	18.00
3GPP Rel 6	HSUPA Subtest-3	13.88	13.93	13.75	14.00	14.81	14.81	14.81	15.00	16.75	16.84	16.92	18.00
3GPP Rel 6	HSUPA Subtest-4	13.99	13.95	13.79	14.00	14.94	14.85	14.78	15.00	17.05	17.42	17.18	18.00
3GPP Rel 6	HSUPA Subtest-5	14.87	14.79	14.98	15.00	15.40	15.40	15.30	16.00	18.10	18.20	18.40	19.00

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

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. LTE band 2 / 5 SAR test was covered by Band 25 / 26; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. the maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion
 - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

<Default Power Mode>
<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100	24	0
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	23.09	22.79	22.83		
20	QPSK	1	49	22.87	22.88	22.92	23	1
20	QPSK	1	99	22.62	22.58	22.65		
20	QPSK	50	0	21.95	21.81	21.88		
20	QPSK	50	24	22.06	21.89	21.99	23	1
20	QPSK	50	50	21.98	21.78	21.91		
20	QPSK	100	0	21.84	21.80	21.92		
20	16QAM	1	0	22.16	22.09	22.09	23	1
20	16QAM	1	49	22.09	22.06	22.15		
20	16QAM	1	99	21.80	21.81	21.91		
20	16QAM	50	0	20.87	20.84	20.86	22	2
20	16QAM	50	24	20.92	20.93	20.99		
20	16QAM	50	50	20.84	20.79	20.93		
20	16QAM	100	0	20.85	20.81	20.90	24	0
Channel				18675	18900	19125		
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.91	22.86	22.94	24	0
15	QPSK	1	37	22.82	22.79	22.94		
15	QPSK	1	74	22.73	22.75	22.81		
15	QPSK	36	0	21.89	21.92	21.90	23	1
15	QPSK	36	20	21.91	22.01	22.03		
15	QPSK	36	39	21.81	21.93	21.98		
15	QPSK	75	0	21.81	21.95	21.94	23	1
15	16QAM	1	0	22.15	22.12	22.11		
15	16QAM	1	37	22.10	22.13	22.25		
15	16QAM	1	74	21.98	21.99	22.03	22	2
15	16QAM	36	0	20.89	20.91	20.85		
15	16QAM	36	20	20.91	20.98	21.01		
15	16QAM	36	39	20.83	20.87	20.92	24	0
15	16QAM	75	0	20.85	20.95	20.96		
Channel				18650	18900	19150		
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.92	22.83	23.00	24	0
10	QPSK	1	25	23.02	23.01	23.08		
10	QPSK	1	49	22.85	22.76	22.91		
10	QPSK	25	0	21.99	21.85	21.95	23	1
10	QPSK	25	12	22.04	21.90	22.01		
10	QPSK	25	25	21.94	21.83	21.89		
10	QPSK	50	0	21.94	21.80	21.83	23	1
10	16QAM	1	0	22.18	22.06	22.23		
10	16QAM	1	25	22.28	22.22	22.23		
10	16QAM	1	49	22.05	22.02	22.15	22	2
10	16QAM	25	0	20.98	20.87	20.90		
10	16QAM	25	12	21.02	20.88	21.01		
10	16QAM	25	25	20.95	20.83	20.88	22	2
10	16QAM	50	0	20.93	20.82	20.85		



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Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.97	22.94	22.99	24	0
5	QPSK	1	12	23.08	22.99	23.05		
5	QPSK	1	24	22.96	22.82	22.95		
5	QPSK	12	0	21.90	21.89	21.95	23	1
5	QPSK	12	7	22.02	21.94	21.96		
5	QPSK	12	13	21.98	21.82	21.88		
5	QPSK	25	0	21.96	21.88	21.92		
5	16QAM	1	0	22.23	22.16	22.25	23	1
5	16QAM	1	12	22.34	22.28	22.29		
5	16QAM	1	24	22.27	22.13	22.27		
5	16QAM	12	0	20.94	20.91	20.98	22	2
5	16QAM	12	7	21.02	20.93	20.96		
5	16QAM	12	13	21.01	20.84	20.89		
5	16QAM	25	0	21.01	20.91	20.90		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	23.01	22.86	22.93	24	0
3	QPSK	1	8	23.03	22.93	22.93		
3	QPSK	1	14	22.96	22.94	22.95		
3	QPSK	8	0	21.97	21.89	21.86	23	1
3	QPSK	8	4	22.03	21.94	21.92		
3	QPSK	8	7	21.97	21.86	21.90		
3	QPSK	15	0	21.89	21.89	21.90		
3	16QAM	1	0	22.08	22.05	22.11	23	1
3	16QAM	1	8	22.26	22.16	22.21		
3	16QAM	1	14	22.12	22.06	22.17		
3	16QAM	8	0	20.94	20.96	20.92	22	2
3	16QAM	8	4	20.98	20.99	20.97		
3	16QAM	8	7	20.95	20.94	20.97		
3	16QAM	15	0	20.92	20.90	20.92		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.99	22.87	22.94	24	0
1.4	QPSK	1	3	23.05	22.90	23.01		
1.4	QPSK	1	5	23.08	22.86	23.05		
1.4	QPSK	3	0	22.98	22.83	22.90		
1.4	QPSK	3	1	23.06	22.91	22.98		
1.4	QPSK	3	3	22.99	22.82	22.93		
1.4	QPSK	6	0	21.83	21.85	21.88	23	1
1.4	16QAM	1	0	22.19	22.20	22.26	23	1
1.4	16QAM	1	3	22.27	22.26	22.27		
1.4	16QAM	1	5	22.19	22.20	22.24		
1.4	16QAM	3	0	21.90	21.93	21.95		
1.4	16QAM	3	1	21.93	21.92	21.94		
1.4	16QAM	3	3	21.92	21.90	21.97		
1.4	16QAM	6	0	20.92	20.94	20.95	22	2

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	23.10	23.37	22.99		
20	QPSK	1	49	23.09	23.03	22.92	24	0
20	QPSK	1	99	22.75	22.62	22.57		
20	QPSK	50	0	22.04	22.15	22.06		
20	QPSK	50	24	22.12	22.18	22.04	23	1
20	QPSK	50	50	22.01	22.13	22.03		
20	QPSK	100	0	21.96	21.95	21.88		
20	16QAM	1	0	22.23	22.29	22.28	23	1
20	16QAM	1	49	22.34	22.32	22.21		
20	16QAM	1	99	22.03	21.88	21.87		
20	16QAM	50	0	21.00	20.92	20.95	22	2
20	16QAM	50	24	21.10	20.98	20.92		
20	16QAM	50	50	20.95	20.89	20.80		
20	16QAM	100	0	20.93	20.92	20.86		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.99	22.96	22.97		
15	QPSK	1	37	23.00	22.78	22.82	24	0
15	QPSK	1	74	22.98	22.84	22.71		
15	QPSK	36	0	22.04	21.99	21.88		
15	QPSK	36	20	22.07	21.98	21.97	23	1
15	QPSK	36	39	22.07	21.91	21.90		
15	QPSK	75	0	22.04	21.96	21.96		
15	16QAM	1	0	22.26	22.19	22.25	23	1
15	16QAM	1	37	22.32	22.11	22.18		
15	16QAM	1	74	22.25	22.10	21.99		
15	16QAM	36	0	20.96	20.94	20.87	22	2
15	16QAM	36	20	21.04	20.95	20.95		
15	16QAM	36	39	21.01	20.93	20.88		
15	16QAM	75	0	21.01	20.95	20.96		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	23.06	22.91	22.93		
10	QPSK	1	25	23.27	22.96	22.98	24	0
10	QPSK	1	49	23.05	22.84	22.85		
10	QPSK	25	0	21.90	21.86	21.90		
10	QPSK	25	12	21.92	21.89	21.90	23	1
10	QPSK	25	25	21.91	21.72	21.92		
10	QPSK	50	0	21.91	21.75	21.89		
10	16QAM	1	0	22.26	22.17	22.16	23	1
10	16QAM	1	25	22.22	22.09	22.08		
10	16QAM	1	49	22.16	22.05	22.13		
10	16QAM	25	0	20.86	20.83	20.85	22	2
10	16QAM	25	12	20.91	20.86	20.86		
10	16QAM	25	25	20.88	20.73	20.87		
10	16QAM	50	0	20.87	20.85	20.84		



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Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	23.06	23.11	22.92	24	0
5	QPSK	1	12	22.93	22.98	22.94		
5	QPSK	1	24	23.04	22.90	22.94		
5	QPSK	12	0	21.98	21.88	21.95	23	1
5	QPSK	12	7	21.95	21.83	21.94		
5	QPSK	12	13	21.84	21.75	21.89		
5	QPSK	25	0	21.94	21.79	21.93		
5	16QAM	1	0	22.34	22.25	22.20	23	1
5	16QAM	1	12	22.32	22.22	22.21		
5	16QAM	1	24	22.23	22.25	22.26		
5	16QAM	12	0	20.92	20.97	20.89	22	2
5	16QAM	12	7	20.90	20.92	20.91		
5	16QAM	12	13	20.84	20.89	20.88		
5	16QAM	25	0	20.89	20.88	20.89		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	23.01	23.05	22.96	24	0
3	QPSK	1	8	23.00	22.93	22.92		
3	QPSK	1	14	23.04	22.94	22.93		
3	QPSK	8	0	21.97	21.93	21.92	23	1
3	QPSK	8	4	21.97	21.94	21.97		
3	QPSK	8	7	21.94	21.95	21.92		
3	QPSK	15	0	21.94	21.89	21.92		
3	16QAM	1	0	22.21	22.19	22.14	23	1
3	16QAM	1	8	22.20	22.22	22.27		
3	16QAM	1	14	22.19	22.12	22.16		
3	16QAM	8	0	20.98	20.96	20.93	22	2
3	16QAM	8	4	20.98	20.97	20.96		
3	16QAM	8	7	20.95	20.99	20.94		
3	16QAM	15	0	20.92	20.90	20.92		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	23.05	22.84	22.96	24	0
1.4	QPSK	1	3	23.02	22.87	22.96		
1.4	QPSK	1	5	23.09	22.92	22.99		
1.4	QPSK	3	0	22.93	22.86	22.93		
1.4	QPSK	3	1	22.99	22.93	22.94		
1.4	QPSK	3	3	22.93	22.82	22.82		
1.4	QPSK	6	0	21.91	21.73	21.78	23	1
1.4	16QAM	1	0	22.30	22.18	22.20	23	1
1.4	16QAM	1	3	22.33	22.14	22.20		
1.4	16QAM	1	5	22.24	22.20	22.09		
1.4	16QAM	3	0	22.04	21.88	21.84		
1.4	16QAM	3	1	22.02	21.88	21.84		
1.4	16QAM	3	3	21.99	21.83	21.87		
1.4	16QAM	6	0	20.96	20.78	20.83	22	2

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600	24	0
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	22.34	22.20	22.30		
10	QPSK	1	25	22.44	22.57	22.43	23	1
10	QPSK	1	49	22.17	22.27	22.37		
10	QPSK	25	0	21.25	21.30	21.32		
10	QPSK	25	12	21.29	21.42	21.30		
10	QPSK	25	25	21.19	21.27	21.37	23	1
10	QPSK	50	0	21.20	21.34	21.34		
10	16QAM	1	0	21.63	21.57	21.62		
10	16QAM	1	25	21.60	21.69	21.65		
10	16QAM	1	49	21.45	21.61	21.65	22	2
10	16QAM	25	0	20.27	20.30	20.36		
10	16QAM	25	12	20.33	20.43	20.32		
10	16QAM	25	25	20.19	20.29	20.37		
10	16QAM	50	0	20.20	20.34	20.34	24	0
Channel				20425	20525	20625		
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.24	22.32	22.30	24	0
5	QPSK	1	12	22.30	22.29	22.33		
5	QPSK	1	24	22.20	22.29	22.37		
5	QPSK	12	0	21.24	21.27	21.29	23	1
5	QPSK	12	7	21.27	21.37	21.34		
5	QPSK	12	13	21.25	21.32	21.35		
5	QPSK	25	0	21.25	21.39	21.43		
5	16QAM	1	0	21.49	21.59	21.56	23	1
5	16QAM	1	12	21.65	21.78	21.76		
5	16QAM	1	24	21.46	21.65	21.65		
5	16QAM	12	0	20.28	20.33	20.37	22	2
5	16QAM	12	7	20.30	20.37	20.39		
5	16QAM	12	13	20.27	20.37	20.45		
5	16QAM	25	0	20.30	20.38	20.40		
Channel				20415	20525	20635	24	0
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.27	22.33	22.39		
3	QPSK	1	8	22.31	22.35	22.48	23	1
3	QPSK	1	14	22.23	22.30	22.37		
3	QPSK	8	0	21.20	21.30	21.27		
3	QPSK	8	4	21.28	21.37	21.45		
3	QPSK	8	7	21.17	21.29	21.37	23	1
3	QPSK	15	0	21.25	21.32	21.31		
3	16QAM	1	0	21.43	21.61	21.56		
3	16QAM	1	8	21.54	21.63	21.69		
3	16QAM	1	14	21.46	21.60	21.61	22	2
3	16QAM	8	0	20.28	20.36	20.31		
3	16QAM	8	4	20.35	20.38	20.47		
3	16QAM	8	7	20.25	20.33	20.41		
3	16QAM	15	0	20.28	20.33	20.36	24	0



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Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.32	22.42	22.55	24	0
1.4	QPSK	1	3	22.35	22.41	22.53		
1.4	QPSK	1	5	22.26	22.32	22.42		
1.4	QPSK	3	0	22.20	22.24	22.34		
1.4	QPSK	3	1	22.31	22.32	22.46		
1.4	QPSK	3	3	22.17	22.25	22.38		
1.4	QPSK	6	0	21.16	21.26	21.34	23	1
1.4	16QAM	1	0	21.60	21.77	21.77	23	1
1.4	16QAM	1	3	21.59	21.69	21.74		
1.4	16QAM	1	5	21.60	21.68	21.76		
1.4	16QAM	3	0	21.25	21.33	21.39		
1.4	16QAM	3	1	21.27	21.35	21.40		
1.4	16QAM	3	3	21.19	21.31	21.40		
1.4	16QAM	6	0	20.28	20.33	20.41	22	2



<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	21.50	21.89	21.43	23	0
20	QPSK	1	49	21.66	21.75	21.60		
20	QPSK	1	99	21.55	21.54	21.50		
20	QPSK	50	0	20.69	20.65	20.53	22	1
20	QPSK	50	24	20.72	20.77	20.64		
20	QPSK	50	50	20.76	20.76	20.56		
20	QPSK	100	0	20.73	20.68	20.63		
20	16QAM	1	0	20.77	20.88	20.65	22	1
20	16QAM	1	49	20.95	20.97	20.93		
20	16QAM	1	99	20.83	20.78	20.76		
20	16QAM	50	0	19.66	19.70	19.53	21	2
20	16QAM	50	24	19.65	19.80	19.65		
20	16QAM	50	50	19.74	19.78	19.63		
20	16QAM	100	0	19.72	19.72	19.66		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	21.52	21.71	21.42	23	0
15	QPSK	1	37	21.78	21.77	21.61		
15	QPSK	1	74	21.60	21.64	21.56		
15	QPSK	36	0	20.63	20.73	20.56	22	1
15	QPSK	36	20	20.81	20.80	20.75		
15	QPSK	36	39	20.71	20.71	20.61		
15	QPSK	75	0	20.72	20.71	20.67		
15	16QAM	1	0	20.80	20.94	20.69	22	1
15	16QAM	1	37	21.15	21.02	21.01		
15	16QAM	1	74	20.88	20.87	20.80		
15	16QAM	36	0	19.62	19.73	19.53	21	2
15	16QAM	36	20	19.79	19.81	19.70		
15	16QAM	36	39	19.69	19.77	19.62		
15	16QAM	75	0	19.72	19.74	19.66		
Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	21.63	21.70	21.49	23	0
10	QPSK	1	25	21.85	21.88	21.74		
10	QPSK	1	49	21.71	21.74	21.60		
10	QPSK	25	0	20.58	20.65	20.55	22	1
10	QPSK	25	12	20.72	20.75	20.53		
10	QPSK	25	25	20.62	20.74	20.55		
10	QPSK	50	0	20.70	20.73	20.49		
10	16QAM	1	0	20.95	21.00	20.83	22	1
10	16QAM	1	25	21.12	21.09	20.86		
10	16QAM	1	49	21.05	20.99	20.81		
10	16QAM	25	0	19.57	19.69	19.58	21	2
10	16QAM	25	12	19.73	19.80	19.56		
10	16QAM	25	25	19.62	19.79	19.59		
10	16QAM	50	0	19.70	19.75	19.54		



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Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	21.66	21.77	21.58	23	0
5	QPSK	1	12	21.62	21.74	21.64		
5	QPSK	1	24	21.74	21.72	21.62		
5	QPSK	12	0	20.55	20.73	20.51	22	1
5	QPSK	12	7	20.73	20.79	20.58		
5	QPSK	12	13	20.64	20.72	20.56		
5	QPSK	25	0	20.56	20.76	20.56		
5	16QAM	1	0	20.92	20.98	20.78	22	1
5	16QAM	1	12	21.17	21.13	21.07		
5	16QAM	1	24	21.06	20.97	20.90		
5	16QAM	12	0	19.57	19.86	19.55	21	2
5	16QAM	12	7	19.69	19.82	19.62		
5	16QAM	12	13	19.67	19.83	19.57		
5	16QAM	25	0	19.59	19.81	19.61		



<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130	24	0
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	23.04	23.05	23.06		
10	QPSK	1	25	23.24	23.23	23.20	23	1
10	QPSK	1	49	23.16	23.14	23.02		
10	QPSK	25	0	21.98	21.96	21.98		
10	QPSK	25	12	22.12	22.10	22.04		
10	QPSK	25	25	22.02	22.00	21.96	23	1
10	QPSK	50	0	22.09	22.04	22.03		
10	16QAM	1	0	22.28	22.34	22.33		
10	16QAM	1	25	22.46	22.45	22.45		
10	16QAM	1	49	22.41	22.38	22.29	22	2
10	16QAM	25	0	20.95	20.99	20.99		
10	16QAM	25	12	21.11	21.09	21.03		
10	16QAM	25	25	21.06	21.00	20.94		
10	16QAM	50	0	21.06	21.03	21.02	24	0
Channel				23035	23095	23155		
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	23.10	23.08	23.02	24	0
5	QPSK	1	12	23.03	23.07	22.94		
5	QPSK	1	24	23.09	22.98	22.97		
5	QPSK	12	0	21.99	22.00	21.92	23	1
5	QPSK	12	7	22.00	22.13	22.00		
5	QPSK	12	13	21.96	21.97	21.91		
5	QPSK	25	0	22.06	22.06	21.99		
5	16QAM	1	0	22.36	22.31	22.27	23	1
5	16QAM	1	12	22.54	22.54	22.53		
5	16QAM	1	24	22.38	22.28	22.29		
5	16QAM	12	0	20.94	21.04	20.94	22	2
5	16QAM	12	7	20.94	21.12	21.01		
5	16QAM	12	13	20.91	21.00	20.97		
5	16QAM	25	0	21.03	21.02	20.95		
Channel				23025	23095	23165	24	0
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	23.06	23.07	22.96		
3	QPSK	1	8	23.12	23.13	22.94	23	1
3	QPSK	1	14	22.94	22.99	22.92		
3	QPSK	8	0	21.99	21.96	21.97		
3	QPSK	8	4	22.03	22.10	21.91		
3	QPSK	8	7	21.92	22.04	21.91	23	1
3	QPSK	15	0	22.02	22.08	21.93		
3	16QAM	1	0	22.29	22.28	22.21		
3	16QAM	1	8	22.36	22.39	22.14	23	1
3	16QAM	1	14	22.21	22.24	22.23		
3	16QAM	8	0	21.07	21.06	20.99		
3	16QAM	8	4	21.10	21.13	20.91	22	2
3	16QAM	8	7	20.98	21.08	20.92		
3	16QAM	15	0	21.03	21.06	20.92		
3	16QAM	15	0	21.03	21.06	20.92		



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Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	23.20	23.16	23.02	24	0
1.4	QPSK	1	3	23.20	23.20	23.09		
1.4	QPSK	1	5	23.19	23.13	23.02		
1.4	QPSK	3	0	23.01	22.94	22.85		
1.4	QPSK	3	1	23.05	23.01	22.87		
1.4	QPSK	3	3	22.96	23.02	22.98		
1.4	QPSK	6	0	21.94	21.88	21.79	23	1
1.4	16QAM	1	0	22.45	22.44	22.28	23	1
1.4	16QAM	1	3	22.45	22.50	22.38		
1.4	16QAM	1	5	22.49	22.56	22.39		
1.4	16QAM	3	0	22.08	21.97	21.92		
1.4	16QAM	3	1	22.01	21.97	21.89		
1.4	16QAM	3	3	22.03	22.07	22.03		
1.4	16QAM	6	0	21.02	21.01	20.91	22	2

<LTE Band 13>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23230				
Frequency (MHz)				782				
10	QPSK	1	0	22.85			24	0
10	QPSK	1	25	23.00				
10	QPSK	1	49	22.59				
10	QPSK	25	0	21.82			23	1
10	QPSK	25	12	21.88				
10	QPSK	25	25	21.75				
10	QPSK	50	0	21.84				
10	16QAM	1	0	22.12			23	1
10	16QAM	1	25	22.23				
10	16QAM	1	49	21.85				
10	16QAM	25	0	20.81			22	2
10	16QAM	25	12	20.93				
10	16QAM	25	25	20.74				
10	16QAM	50	0	20.82				
Channel				23205	23230	23255	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	22.85	22.79	22.81	24	0
5	QPSK	1	12	22.82	22.93	22.67		
5	QPSK	1	24	22.83	22.79	22.57		
5	QPSK	12	0	21.81	21.81	21.78	23	1
5	QPSK	12	7	21.80	21.81	21.77		
5	QPSK	12	13	21.77	21.77	21.68		
5	QPSK	25	0	21.78	21.80	21.67	23	1
5	16QAM	1	0	22.13	22.04	22.07		
5	16QAM	1	12	22.25	22.33	22.26		
5	16QAM	1	24	22.13	22.04	21.80	22	2
5	16QAM	12	0	20.71	20.83	20.75		
5	16QAM	12	7	20.83	20.77	20.70		
5	16QAM	12	13	20.80	20.75	20.64		
5	16QAM	25	0	20.81	20.85	20.72		



<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	23.08	22.88	23.09	24	0
20	QPSK	1	49	22.96	22.84	23.01		
20	QPSK	1	99	22.70	22.69	22.86		
20	QPSK	50	0	22.01	21.89	22.01	23	1
20	QPSK	50	24	22.01	21.89	22.03		
20	QPSK	50	50	21.90	21.87	22.02		
20	QPSK	100	0	21.96	21.92	22.01		
20	16QAM	1	0	22.20	22.14	22.32	23	1
20	16QAM	1	49	22.27	22.24	22.27		
20	16QAM	1	99	21.97	21.93	22.06		
20	16QAM	50	0	21.00	20.93	21.00	22	2
20	16QAM	50	24	21.01	20.93	21.07		
20	16QAM	50	50	20.94	20.85	20.99		
20	16QAM	100	0	20.96	20.90	21.00		
Channel				26115	26340	26615	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1907.5		
15	QPSK	1	0	22.99	22.87	23.01	24	0
15	QPSK	1	37	23.07	22.99	23.08		
15	QPSK	1	74	22.75	22.76	22.93		
15	QPSK	36	0	21.97	21.88	22.01	23	1
15	QPSK	36	20	22.05	21.94	22.06		
15	QPSK	36	39	21.97	21.85	22.09		
15	QPSK	75	0	21.99	21.91	22.03		
15	16QAM	1	0	22.22	22.16	22.27	23	1
15	16QAM	1	37	22.31	22.18	22.31		
15	16QAM	1	74	22.06	22.05	22.16		
15	16QAM	36	0	20.96	20.90	20.94	22	2
15	16QAM	36	20	21.06	20.95	21.01		
15	16QAM	36	39	20.99	20.85	21.06		
15	16QAM	75	0	20.98	20.92	21.04		
Channel				26090	26340	26640	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1910		
10	QPSK	1	0	22.97	22.93	23.07	24	0
10	QPSK	1	25	23.05	22.98	23.08		
10	QPSK	1	49	22.78	22.90	23.04		
10	QPSK	25	0	21.87	21.95	21.90	23	1
10	QPSK	25	12	21.93	21.88	22.00		
10	QPSK	25	25	21.80	21.92	22.06		
10	QPSK	50	0	21.94	21.90	22.10		
10	16QAM	1	0	22.18	22.26	22.29	23	1
10	16QAM	1	25	22.30	22.29	22.44		
10	16QAM	1	49	22.04	22.14	22.35		
10	16QAM	25	0	20.87	20.95	20.92	22	2
10	16QAM	25	12	20.95	20.91	20.97		
10	16QAM	25	25	20.84	20.95	21.04		
10	16QAM	50	0	20.93	20.94	21.06		



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Channel				26065	26340	26665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1912.5		
5	QPSK	1	0	22.97	23.01	23.08	24	0
5	QPSK	1	12	22.97	22.95	23.07		
5	QPSK	1	24	22.90	22.97	23.06		
5	QPSK	12	0	21.91	21.83	22.07	23	1
5	QPSK	12	7	21.99	21.93	22.12		
5	QPSK	12	13	21.87	21.89	22.09		
5	QPSK	25	0	21.91	21.88	22.14		
5	16QAM	1	0	22.18	22.35	22.45	23	1
5	16QAM	1	12	22.19	22.21	22.47		
5	16QAM	1	24	22.16	22.24	22.32		
5	16QAM	12	0	20.97	20.95	21.07	22	2
5	16QAM	12	7	20.98	20.98	21.10		
5	16QAM	12	13	20.95	20.98	21.17		
5	16QAM	25	0	20.95	20.92	21.10		
Channel				26055	26340	26675	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1913.5		
3	QPSK	1	0	23.01	22.88	23.06	24	0
3	QPSK	1	8	22.99	22.89	22.96		
3	QPSK	1	14	23.02	22.91	23.00		
3	QPSK	8	0	21.97	21.86	22.00	23	1
3	QPSK	8	4	22.01	21.91	22.04		
3	QPSK	8	7	21.86	21.85	22.03		
3	QPSK	15	0	21.85	21.87	22.01		
3	16QAM	1	0	22.18	22.15	22.23	23	1
3	16QAM	1	8	22.17	22.23	22.27		
3	16QAM	1	14	22.20	22.16	22.28		
3	16QAM	8	0	21.02	20.92	21.01	22	2
3	16QAM	8	4	21.08	20.97	21.03		
3	16QAM	8	7	20.93	20.93	21.02		
3	16QAM	15	0	20.88	20.90	20.99		
Channel				26047	26340	26683	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1914.3		
1.4	QPSK	1	0	23.08	22.84	23.05	24	0
1.4	QPSK	1	3	22.99	22.89	23.02		
1.4	QPSK	1	5	22.93	22.80	23.00		
1.4	QPSK	3	0	22.85	22.80	22.88		
1.4	QPSK	3	1	22.95	22.97	23.01		
1.4	QPSK	3	3	22.83	22.87	22.95		
1.4	QPSK	6	0	21.85	21.82	21.92	23	1
1.4	16QAM	1	0	22.21	22.20	22.42	23	1
1.4	16QAM	1	3	22.24	22.21	22.28		
1.4	16QAM	1	5	22.15	22.12	22.35		
1.4	16QAM	3	0	21.88	21.90	21.99		
1.4	16QAM	3	1	22.01	21.95	22.01		
1.4	16QAM	3	3	21.87	21.94	22.03		
1.4	16QAM	6	0	20.98	20.93	21.00	22	2

<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	24	0
Frequency (MHz)				821.5	831.5	841.5		
15	QPSK	1	0	22.47	22.57	22.49		
15	QPSK	1	37	22.36	22.32	22.43	23	1
15	QPSK	1	74	22.23	22.40	22.43		
15	QPSK	36	0	21.52	21.54	21.49		
15	QPSK	36	20	21.51	21.42	21.48	23	1
15	QPSK	36	39	21.40	21.37	21.50		
15	QPSK	75	0	21.47	21.55	21.54		
15	16QAM	1	0	21.80	21.65	21.72	23	1
15	16QAM	1	37	21.66	21.62	21.69		
15	16QAM	1	74	21.44	21.66	21.68		
15	16QAM	36	0	20.52	20.34	20.46	22	2
15	16QAM	36	20	20.49	20.39	20.45		
15	16QAM	36	39	20.39	20.37	20.53		
15	16QAM	75	0	20.43	20.44	20.55		
Channel				26740	26865	26990	24	0
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	22.49	22.33	22.52		
10	QPSK	1	25	22.50	22.46	22.48	23	1
10	QPSK	1	49	22.31	22.31	22.35		
10	QPSK	25	0	21.43	21.29	21.46		
10	QPSK	25	12	21.34	21.25	21.34	23	1
10	QPSK	25	25	21.34	21.27	21.33		
10	QPSK	50	0	21.35	21.30	21.43		
10	16QAM	1	0	21.81	21.62	21.80	23	1
10	16QAM	1	25	21.75	21.63	21.70		
10	16QAM	1	49	21.58	21.56	21.65		
10	16QAM	25	0	20.38	20.29	20.44	22	2
10	16QAM	25	12	20.36	20.23	20.35		
10	16QAM	25	25	20.33	20.30	20.30		
10	16QAM	50	0	20.32	20.30	20.40		
Channel				26715	26865	27015	24	0
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	22.55	22.33	22.37		
5	QPSK	1	12	22.49	22.22	22.42	23	1
5	QPSK	1	24	22.44	22.31	22.37		
5	QPSK	12	0	21.54	21.19	21.27		
5	QPSK	12	7	21.53	21.36	21.36	23	1
5	QPSK	12	13	21.43	21.18	21.27		
5	QPSK	25	0	21.43	21.22	21.36		
5	16QAM	1	0	21.84	21.57	21.58	23	1
5	16QAM	1	12	21.91	21.65	21.73		
5	16QAM	1	24	21.71	21.57	21.61		
5	16QAM	12	0	20.50	20.17	20.30	22	2
5	16QAM	12	7	20.46	20.35	20.39		
5	16QAM	12	13	20.44	20.19	20.38		
5	16QAM	25	0	20.44	20.22	20.31		

Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	22.56	22.37	22.41	24	0
3	QPSK	1	8	22.54	22.24	22.44		
3	QPSK	1	14	22.51	22.22	22.39		
3	QPSK	8	0	21.54	21.29	21.34	23	1
3	QPSK	8	4	21.51	21.27	21.40		
3	QPSK	8	7	21.49	21.28	21.37		
3	QPSK	15	0	21.48	21.32	21.34		
3	16QAM	1	0	21.76	21.57	21.58	23	1
3	16QAM	1	8	21.83	21.52	21.66		
3	16QAM	1	14	21.76	21.39	21.63		
3	16QAM	8	0	20.59	20.31	20.35	22	2
3	16QAM	8	4	20.54	20.30	20.39		
3	16QAM	8	7	20.53	20.30	20.40		
3	16QAM	15	0	20.46	20.32	20.35		
Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	22.52	22.39	22.48	24	0
1.4	QPSK	1	3	22.37	22.35	22.46		
1.4	QPSK	1	5	22.47	22.33	22.47		
1.4	QPSK	3	0	22.55	22.29	22.35		
1.4	QPSK	3	1	22.47	22.25	22.40		
1.4	QPSK	3	3	22.55	22.19	22.39		
1.4	QPSK	6	0	21.57	21.16	21.29	23	1
1.4	16QAM	1	0	21.88	21.67	21.76	23	1
1.4	16QAM	1	3	21.97	21.61	21.68		
1.4	16QAM	1	5	21.92	21.64	21.71		
1.4	16QAM	3	0	21.67	21.30	21.36		
1.4	16QAM	3	1	21.69	21.25	21.38		
1.4	16QAM	3	3	21.60	21.22	21.42		
1.4	16QAM	6	0	20.61	20.27	20.37	22	2

<Reduced Power Mode>
<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	15.67	15.57	15.59	17	0
20	QPSK	1	49	15.58	15.58	15.59		
20	QPSK	1	99	15.29	15.32	15.44		
20	QPSK	50	0	15.63	15.58	15.63	17	0
20	QPSK	50	24	15.74	15.67	15.74		
20	QPSK	50	50	15.66	15.55	15.68		
20	QPSK	100	0	15.59	15.57	15.68	17	0
20	16QAM	1	0	15.94	15.85	15.90		
20	16QAM	1	49	15.89	15.87	15.87		
20	16QAM	1	99	15.57	15.64	15.74	17	0
20	16QAM	50	0	15.65	15.60	15.64		
20	16QAM	50	24	15.73	15.68	15.76		
20	16QAM	50	50	15.64	15.55	15.71	17	0
20	16QAM	100	0	15.63	15.60	15.69		
Channel				18675	18900	19125		
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	15.54	15.45	15.42	17	0
15	QPSK	1	37	15.52	15.65	15.31		
15	QPSK	1	74	15.36	15.38	15.23		
15	QPSK	36	0	15.53	15.33	15.55	17	0
15	QPSK	36	20	15.50	15.51	15.75		
15	QPSK	36	39	15.49	15.50	15.71		
15	QPSK	75	0	15.46	15.33	15.49	17	0
15	16QAM	1	0	15.81	15.93	15.74		
15	16QAM	1	37	15.83	15.90	15.79		
15	16QAM	1	74	15.41	15.55	15.71	17	0
15	16QAM	36	0	15.55	15.56	15.55		
15	16QAM	36	20	15.75	15.56	15.58		
15	16QAM	36	39	15.53	15.56	15.63	17	0
15	16QAM	75	0	15.57	15.39	15.67		
Channel				18650	18900	19150		
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	15.54	15.53	15.49	17	0
10	QPSK	1	25	15.52	15.58	15.40		
10	QPSK	1	49	15.29	15.28	15.32		
10	QPSK	25	0	15.57	15.42	15.49	17	0
10	QPSK	25	12	15.59	15.59	15.73		
10	QPSK	25	25	15.52	15.41	15.63		
10	QPSK	50	0	15.45	15.42	15.52	17	0
10	16QAM	1	0	15.81	15.85	15.84		
10	16QAM	1	25	15.80	15.84	15.85		
10	16QAM	1	49	15.38	15.48	15.67	17	0
10	16QAM	25	0	15.51	15.49	15.58		
10	16QAM	25	12	15.69	15.53	15.59		
10	16QAM	25	25	15.44	15.50	15.59	17	0
10	16QAM	50	0	15.58	15.42	15.63		



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Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	15.64	15.61	15.49	17	0
5	QPSK	1	12	15.57	15.56	15.39		
5	QPSK	1	24	15.23	15.31	15.37		
5	QPSK	12	0	15.61	15.34	15.41	17	0
5	QPSK	12	7	15.65	15.53	15.75		
5	QPSK	12	13	15.49	15.48	15.63		
5	QPSK	25	0	15.40	15.50	15.59		
5	16QAM	1	0	15.71	15.90	15.79	17	0
5	16QAM	1	12	15.85	15.75	15.85		
5	16QAM	1	24	15.39	15.52	15.61		
5	16QAM	12	0	15.49	15.47	15.56	17	0
5	16QAM	12	7	15.74	15.60	15.67		
5	16QAM	12	13	15.53	15.57	15.60		
5	16QAM	25	0	15.62	15.40	15.68		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	15.57	15.61	15.58	17	0
3	QPSK	1	8	15.49	15.58	15.34		
3	QPSK	1	14	15.25	15.41	15.45		
3	QPSK	8	0	15.54	15.39	15.38	17	0
3	QPSK	8	4	15.73	15.51	15.71		
3	QPSK	8	7	15.46	15.48	15.62		
3	QPSK	15	0	15.41	15.50	15.64		
3	16QAM	1	0	15.69	15.84	15.88	17	0
3	16QAM	1	8	15.93	15.74	15.81		
3	16QAM	1	14	15.43	15.50	15.67		
3	16QAM	8	0	15.41	15.53	15.53	17	0
3	16QAM	8	4	15.65	15.63	15.58		
3	16QAM	8	7	15.60	15.51	15.64		
3	16QAM	15	0	15.68	15.31	15.76		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	15.51	15.51	15.59	17	0
1.4	QPSK	1	3	15.40	15.59	15.28		
1.4	QPSK	1	5	15.18	15.50	15.42		
1.4	QPSK	3	0	15.55	15.43	15.42		
1.4	QPSK	3	1	15.71	15.49	15.70		
1.4	QPSK	3	3	15.45	15.41	15.52		
1.4	QPSK	6	0	15.48	15.45	15.61	17	0
1.4	16QAM	1	0	15.65	15.86	15.75	17	0
1.4	16QAM	1	3	15.93	15.76	15.78		
1.4	16QAM	1	5	15.49	15.44	15.66		
1.4	16QAM	3	0	15.48	15.51	15.55		
1.4	16QAM	3	1	15.65	15.67	15.67		
1.4	16QAM	3	3	15.67	15.59	15.73		
1.4	16QAM	6	0	15.68	15.33	15.80	17	0



<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	16.91	16.92	16.87		
20	QPSK	1	49	16.73	16.75	16.66	17.5	0
20	QPSK	1	99	16.50	16.39	16.34		
20	QPSK	50	0	16.75	16.89	16.76		
20	QPSK	50	24	16.77	16.99	16.72	17.5	0
20	QPSK	50	50	16.72	16.79	16.63		
20	QPSK	100	0	16.82	16.85	16.75		
20	16QAM	1	0	16.66	16.47	16.49	17.5	0
20	16QAM	1	49	16.69	16.72	16.74		
20	16QAM	1	99	16.82	16.68	16.62		
20	16QAM	50	0	16.82	16.72	16.75	17.5	0
20	16QAM	50	24	16.40	16.78	16.69		
20	16QAM	50	50	16.79	16.70	16.65		
20	16QAM	100	0	16.74	16.70	16.67		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	16.63	16.68	16.67		
15	QPSK	1	37	16.67	16.75	16.61	17.5	0
15	QPSK	1	74	16.49	16.29	16.28		
15	QPSK	36	0	16.73	16.74	16.73		
15	QPSK	36	20	16.84	16.69	16.70	17.5	0
15	QPSK	36	39	16.73	16.68	16.59		
15	QPSK	75	0	16.69	16.62	16.55		
15	16QAM	1	0	16.50	16.40	16.58	17.5	0
15	16QAM	1	37	16.73	16.60	16.85		
15	16QAM	1	74	16.81	16.58	16.53		
15	16QAM	36	0	16.81	16.71	16.66	17.5	0
15	16QAM	36	20	16.89	16.76	16.67		
15	16QAM	36	39	16.72	16.69	16.62		
15	16QAM	75	0	16.71	16.63	16.64		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	16.67	16.63	16.64		
10	QPSK	1	25	16.58	16.58	16.66	17.5	0
10	QPSK	1	49	16.47	16.25	16.26		
10	QPSK	25	0	16.70	16.63	16.74		
10	QPSK	25	12	16.70	16.64	16.68	17.5	0
10	QPSK	25	25	16.59	16.56	16.52		
10	QPSK	50	0	16.69	16.65	16.45		
10	16QAM	1	0	16.65	16.76	16.53	17.5	0
10	16QAM	1	25	16.70	16.76	16.75		
10	16QAM	1	49	16.74	16.63	16.47		
10	16QAM	25	0	16.63	16.52	16.67	17.5	0
10	16QAM	25	12	16.75	16.69	16.65		
10	16QAM	25	25	16.64	16.69	16.57		
10	16QAM	50	0	16.72	16.58	16.53		



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Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	16.61	16.63	16.70	17.5	0
5	QPSK	1	12	16.67	16.56	16.62		
5	QPSK	1	24	16.50	16.23	16.18		
5	QPSK	12	0	16.63	16.69	16.75	17.5	0
5	QPSK	12	7	16.66	16.54	16.75		
5	QPSK	12	13	16.49	16.59	16.54		
5	QPSK	25	0	16.60	16.74	16.38		
5	16QAM	1	0	16.77	16.74	16.76	17.5	0
5	16QAM	1	12	16.46	16.50	16.69		
5	16QAM	1	24	16.69	16.57	16.44		
5	16QAM	12	0	16.73	16.54	16.75	17.5	0
5	16QAM	12	7	16.79	16.71	16.66		
5	16QAM	12	13	16.61	16.78	16.52		
5	16QAM	25	0	16.72	16.68	16.45		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	16.55	16.66	16.71	17.5	0
3	QPSK	1	8	16.59	16.61	16.66		
3	QPSK	1	14	16.44	16.17	16.08		
3	QPSK	8	0	16.64	16.64	16.84	17.5	0
3	QPSK	8	4	16.71	16.57	16.68		
3	QPSK	8	7	16.39	16.57	16.47		
3	QPSK	15	0	16.51	16.78	16.30		
3	16QAM	1	0	16.88	16.52	16.75	17.5	0
3	16QAM	1	8	16.61	16.64	16.66		
3	16QAM	1	14	16.75	16.61	16.42		
3	16QAM	8	0	16.83	16.54	16.72	17.5	0
3	16QAM	8	4	16.82	16.63	16.75		
3	16QAM	8	7	16.54	16.82	16.61		
3	16QAM	15	0	16.75	16.73	16.42		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	16.52	16.52	16.60	17.5	0
1.4	QPSK	1	3	16.68	16.54	16.75		
1.4	QPSK	1	5	16.55	16.23	16.03		
1.4	QPSK	3	0	16.71	16.58	16.72		
1.4	QPSK	3	1	16.71	16.64	16.85		
1.4	QPSK	3	3	16.55	16.57	16.50		
1.4	QPSK	6	0	16.42	16.87	16.50	17.5	0
1.4	16QAM	1	0	16.46	16.44	16.54	17.5	0
1.4	16QAM	1	3	16.45	16.50	16.74		
1.4	16QAM	1	5	16.79	16.48	16.38		
1.4	16QAM	3	0	16.78	16.46	16.75		
1.4	16QAM	3	1	16.67	16.85	16.58		
1.4	16QAM	3	3	16.63	16.80	16.38		
1.4	16QAM	6	0	16.70	16.62	16.41	17.5	0

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600	20	0
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	19.12	19.12	19.21		
10	QPSK	1	25	19.28	19.37	19.36	20	0
10	QPSK	1	49	19.21	19.16	19.28		
10	QPSK	25	0	19.05	19.26	19.26		
10	QPSK	25	12	19.08	19.58	19.25	20	0
10	QPSK	25	25	19.26	19.30	19.28		
10	QPSK	50	0	19.18	19.33	19.23		
10	16QAM	1	0	19.37	19.41	19.49	20	0
10	16QAM	1	25	19.48	19.61	19.56		
10	16QAM	1	49	19.23	19.48	19.48		
10	16QAM	25	0	19.10	19.19	19.24	20	0
10	16QAM	25	12	19.13	19.32	19.24		
10	16QAM	25	25	18.99	19.18	19.29		
10	16QAM	50	0	18.97	19.24	19.23		
Channel				20425	20525	20625	20	0
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	19.06	19.07	19.11		
5	QPSK	1	12	19.20	19.31	19.34	20	0
5	QPSK	1	24	18.87	19.14	19.19		
5	QPSK	12	0	19.01	19.09	19.21	20	0
5	QPSK	12	7	19.07	19.22	19.15		
5	QPSK	12	13	18.97	19.11	19.20		
5	QPSK	25	0	18.93	19.16	19.23	20	0
5	16QAM	1	0	19.37	19.36	19.41		
5	16QAM	1	12	19.39	19.59	19.47		
5	16QAM	1	24	19.17	19.38	19.46	20	0
5	16QAM	12	0	19.05	19.10	19.23		
5	16QAM	12	7	19.12	19.31	19.24		
5	16QAM	12	13	18.99	19.13	19.29	20	0
5	16QAM	25	0	18.89	19.17	19.23		
Channel				20415	20525	20635	20	0
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	18.99	19.04	19.08		
3	QPSK	1	8	19.15	19.18	19.25	20	0
3	QPSK	1	14	18.88	18.96	19.25		
3	QPSK	8	0	18.96	19.01	19.07	20	0
3	QPSK	8	4	18.98	19.30	19.09		
3	QPSK	8	7	18.91	19.06	19.13		
3	QPSK	15	0	18.89	19.13	19.08	20	0
3	16QAM	1	0	19.37	19.25	19.40		
3	16QAM	1	8	19.47	19.47	19.53		
3	16QAM	1	14	19.17	19.37	19.34	20	0
3	16QAM	8	0	18.93	19.14	19.09		
3	16QAM	8	4	19.11	19.19	19.16		
3	16QAM	8	7	18.99	19.07	19.13	20	0
3	16QAM	15	0	18.87	19.18	19.03		



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Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	19.05	19.03	19.05	20	0
1.4	QPSK	1	3	19.11	19.24	19.28		
1.4	QPSK	1	5	18.82	19.04	19.35		
1.4	QPSK	3	0	18.95	18.95	19.15		
1.4	QPSK	3	1	18.90	19.29	19.00		
1.4	QPSK	3	3	18.95	19.07	19.23		
1.4	QPSK	6	0	18.96	19.20	19.03	20	0
1.4	16QAM	1	0	19.33	19.23	19.40	20	0
1.4	16QAM	1	3	19.55	19.44	19.53		
1.4	16QAM	1	5	19.22	19.27	19.32		
1.4	16QAM	3	0	19.00	19.19	19.04		
1.4	16QAM	3	1	19.02	19.16	19.22		
1.4	16QAM	3	3	18.92	19.16	19.11		
1.4	16QAM	6	0	18.86	19.08	18.94	20	0



<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	18.75	18.80	18.53		
20	QPSK	1	49	18.65	18.75	18.40	19	0
20	QPSK	1	99	18.67	18.58	18.50		
20	QPSK	50	0	18.82	18.76	18.48		
20	QPSK	50	24	18.88	18.93	18.59	19	0
20	QPSK	50	50	18.80	18.80	18.54		
20	QPSK	100	0	18.78	18.83	18.61		
20	16QAM	1	0	18.90	18.93	18.62	19	0
20	16QAM	1	49	18.93	19.00	18.83		
20	16QAM	1	99	18.95	18.84	18.75		
20	16QAM	50	0	18.83	18.79	18.50	19	0
20	16QAM	50	24	18.80	18.85	18.58		
20	16QAM	50	50	18.87	18.80	18.56		
20	16QAM	100	0	18.86	18.76	18.61		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	18.46	18.71	18.33		
15	QPSK	1	37	18.64	18.73	18.48	19	0
15	QPSK	1	74	18.58	18.55	18.38		
15	QPSK	36	0	18.71	18.66	18.34		
15	QPSK	36	20	18.68	18.72	18.55	19	0
15	QPSK	36	39	18.73	18.66	18.34		
15	QPSK	75	0	18.72	18.70	18.45		
15	16QAM	1	0	18.78	18.83	18.61	19	0
15	16QAM	1	37	18.93	19.00	18.81		
15	16QAM	1	74	18.85	18.76	18.69		
15	16QAM	36	0	18.78	18.73	18.33	19	0
15	16QAM	36	20	18.79	18.82	18.46		
15	16QAM	36	39	18.74	18.64	18.55		
15	16QAM	75	0	18.86	18.69	18.49		
Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	18.53	18.72	18.24		
10	QPSK	1	25	18.68	18.82	18.38	19	0
10	QPSK	1	49	18.59	18.49	18.31		
10	QPSK	25	0	18.63	18.67	18.40		
10	QPSK	25	12	18.65	18.66	18.51	19	0
10	QPSK	25	25	18.78	18.65	18.31		
10	QPSK	50	0	18.77	18.77	18.49		
10	16QAM	1	0	18.82	18.93	18.66	19	0
10	16QAM	1	25	18.93	18.90	18.88		
10	16QAM	1	49	18.90	18.69	18.69		
10	16QAM	25	0	18.87	18.65	18.38	19	0
10	16QAM	25	12	18.77	18.80	18.51		
10	16QAM	25	25	18.72	18.74	18.58		
10	16QAM	50	0	18.79	18.60	18.43		



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Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	18.48	18.68	18.22	19	0
5	QPSK	1	12	18.62	18.88	18.45		
5	QPSK	1	24	18.52	18.46	18.40		
5	QPSK	12	0	18.59	18.69	18.49	19	0
5	QPSK	12	7	18.59	18.69	18.52		
5	QPSK	12	13	18.70	18.60	18.30		
5	QPSK	25	0	18.84	18.72	18.55		
5	16QAM	1	0	18.73	18.90	18.68	19	0
5	16QAM	1	12	18.93	18.97	18.90		
5	16QAM	1	24	18.94	18.71	18.61		
5	16QAM	12	0	18.94	18.70	18.40	19	0
5	16QAM	12	7	18.84	18.84	18.50		
5	16QAM	12	13	18.74	18.82	18.49		
5	16QAM	25	0	18.70	18.70	18.38		



<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	21	0
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	20.31	20.18	19.97		
10	QPSK	1	25	20.51	20.39	20.08	21	0
10	QPSK	1	49	20.44	20.20	19.95		
10	QPSK	25	0	20.27	19.99	19.98		
10	QPSK	25	12	20.41	20.32	20.11	21	0
10	QPSK	25	25	20.32	20.02	20.03		
10	QPSK	50	0	20.37	20.50	20.10		
10	16QAM	1	0	20.48	20.39	20.48	21	0
10	16QAM	1	25	20.67	20.51	20.65		
10	16QAM	1	49	20.61	20.36	20.48		
10	16QAM	25	0	20.13	19.91	20.17	21	0
10	16QAM	25	12	20.25	20.04	20.15		
10	16QAM	25	25	20.18	19.91	19.98		
10	16QAM	50	0	20.15	19.95	20.04	21	0
Channel				23035	23095	23155		
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	20.28	20.10	19.89	21	0
5	QPSK	1	12	20.47	20.39	20.05		
5	QPSK	1	24	20.36	20.12	19.95		
5	QPSK	12	0	20.26	19.95	19.95	21	0
5	QPSK	12	7	20.32	20.07	20.11		
5	QPSK	12	13	20.32	19.92	20.03		
5	QPSK	25	0	20.36	19.95	20.05	21	0
5	16QAM	1	0	20.44	20.39	20.39		
5	16QAM	1	12	20.63	20.45	20.59		
5	16QAM	1	24	20.57	20.33	20.38	21	0
5	16QAM	12	0	20.08	19.81	20.11		
5	16QAM	12	7	20.17	20.03	20.13		
5	16QAM	12	13	20.11	19.87	19.91	21	0
5	16QAM	25	0	20.12	19.95	20.02		
Channel				23025	23095	23165		
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	20.26	20.09	19.90	21	0
3	QPSK	1	8	20.46	20.32	20.05		
3	QPSK	1	14	20.40	20.11	19.84		
3	QPSK	8	0	20.08	19.93	19.87	21	0
3	QPSK	8	4	20.26	19.93	19.97		
3	QPSK	8	7	20.24	19.85	20.03		
3	QPSK	15	0	20.37	19.92	20.04	21	0
3	16QAM	1	0	20.29	20.21	20.47		
3	16QAM	1	8	20.62	20.48	20.51		
3	16QAM	1	14	20.55	20.33	20.28	21	0
3	16QAM	8	0	20.12	19.90	20.11		
3	16QAM	8	4	20.15	19.84	20.06		
3	16QAM	8	7	20.02	19.89	19.96	21	0
3	16QAM	15	0	20.02	19.95	19.97		



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Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	20.24	20.09	19.77	21	0
1.4	QPSK	1	3	20.45	20.26	19.95		
1.4	QPSK	1	5	20.39	20.03	19.77		
1.4	QPSK	3	0	20.27	19.83	19.86		
1.4	QPSK	3	1	20.41	20.04	19.94		
1.4	QPSK	3	3	20.32	19.97	20.02		
1.4	QPSK	6	0	20.35	20.02	20.03	21	0
1.4	16QAM	1	0	20.47	20.38	20.30	21	0
1.4	16QAM	1	3	20.63	20.40	20.45		
1.4	16QAM	1	5	20.58	20.31	20.36		
1.4	16QAM	3	0	20.09	19.85	20.00		
1.4	16QAM	3	1	20.07	19.84	20.13		
1.4	16QAM	3	3	20.15	19.76	19.94		
1.4	16QAM	6	0	20.13	19.89	19.93	21	0

<LTE Band 13>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23230				
Frequency (MHz)				782				
10	QPSK	1	0	18.25			19.5	0
10	QPSK	1	25	18.33				
10	QPSK	1	49	17.95				
10	QPSK	25	0	18.06			19.5	0
10	QPSK	25	12	18.13				
10	QPSK	25	25	18.00				
10	QPSK	50	0	18.50			19.5	0
10	16QAM	1	0	18.36				
10	16QAM	1	25	18.47				
10	16QAM	1	49	18.12			19.5	0
10	16QAM	25	0	18.08				
10	16QAM	25	12	18.16				
10	16QAM	25	25	18.01			19.5	0
10	16QAM	50	0	18.13				
Channel				23205	23230	23255	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	18.23	18.17	18.13	19.5	0
5	QPSK	1	12	18.31	18.23	18.22		
5	QPSK	1	24	17.75	17.85	17.88		
5	QPSK	12	0	17.99	17.96	17.99	19.5	0
5	QPSK	12	7	18.00	18.03	18.04		
5	QPSK	12	13	17.85	17.90	17.96		
5	QPSK	25	0	17.91	17.99	18.03	19.5	0
5	16QAM	1	0	18.24	18.26	18.33		
5	16QAM	1	12	18.42	18.37	18.42		
5	16QAM	1	24	18.02	18.02	17.92	19.5	0
5	16QAM	12	0	17.91	17.98	17.98		
5	16QAM	12	7	18.11	18.06	18.15		
5	16QAM	12	13	17.94	17.91	17.81	19.5	0
5	16QAM	25	0	17.95	18.03	17.99		



<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	17	0
Frequency (MHz)				1860	1880	1905		
20	QPSK	1	0	15.85	15.72	15.83		
20	QPSK	1	49	15.80	15.64	15.80	17	0
20	QPSK	1	99	15.51	15.49	15.56		
20	QPSK	50	0	15.81	15.67	15.80		
20	QPSK	50	24	15.79	15.90	15.77	17	0
20	QPSK	50	50	15.72	15.63	15.70		
20	QPSK	100	0	15.79	15.66	15.70		
20	16QAM	1	0	16.00	15.95	15.99	17	0
20	16QAM	1	49	15.99	15.99	15.98		
20	16QAM	1	99	15.78	15.75	15.79		
20	16QAM	50	0	15.82	15.65	15.80	17	0
20	16QAM	50	24	15.79	15.66	15.85		
20	16QAM	50	50	15.70	15.62	15.81		
20	16QAM	100	0	15.74	15.70	15.76	17	0
Channel				26115	26340	26615		
Frequency (MHz)				1857.5	1880	1907.5		
15	QPSK	1	0	15.73	15.54	15.70	17	0
15	QPSK	1	37	15.70	15.62	15.73		
15	QPSK	1	74	15.41	15.39	15.46		
15	QPSK	36	0	15.70	15.56	15.69	17	0
15	QPSK	36	20	15.67	15.57	15.71		
15	QPSK	36	39	15.60	15.53	15.62		
15	QPSK	75	0	15.60	15.56	15.69	17	0
15	16QAM	1	0	15.91	15.85	15.99		
15	16QAM	1	37	15.99	15.89	15.99		
15	16QAM	1	74	15.68	15.65	15.69	17	0
15	16QAM	36	0	15.72	15.55	15.70		
15	16QAM	36	20	15.69	15.56	15.75		
15	16QAM	36	39	15.60	15.52	15.71	17	0
15	16QAM	75	0	15.64	15.60	15.66		
Channel				26090	26340	26640		
Frequency (MHz)				1855	1880	1910		
10	QPSK	1	0	15.74	15.63	15.80	17	0
10	QPSK	1	25	15.79	15.52	15.80		
10	QPSK	1	49	15.35	15.49	15.50		
10	QPSK	25	0	15.61	15.49	15.78	17	0
10	QPSK	25	12	15.68	15.67	15.80		
10	QPSK	25	25	15.67	15.46	15.68		
10	QPSK	50	0	15.65	15.61	15.79	17	0
10	16QAM	1	0	15.94	15.80	15.95		
10	16QAM	1	25	15.99	15.80	15.91		
10	16QAM	1	49	15.77	15.61	15.59	17	0
10	16QAM	25	0	15.82	15.63	15.68		
10	16QAM	25	12	15.65	15.46	15.80		
10	16QAM	25	25	15.51	15.60	15.79	17	0
10	16QAM	50	0	15.70	15.61	15.70		



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Channel				26065	26340	26665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1912.5		
5	QPSK	1	0	15.84	15.57	15.78	17	0
5	QPSK	1	12	15.61	15.71	15.64		
5	QPSK	1	24	15.45	15.49	15.44		
5	QPSK	12	0	15.73	15.56	15.61	17	0
5	QPSK	12	7	15.64	15.65	15.68		
5	QPSK	12	13	15.51	15.49	15.65		
5	QPSK	25	0	15.70	15.61	15.69		
5	16QAM	1	0	15.94	15.91	15.97	17	0
5	16QAM	1	12	15.94	15.91	15.93		
5	16QAM	1	24	15.73	15.62	15.76		
5	16QAM	12	0	15.71	15.52	15.77	17	0
5	16QAM	12	7	15.63	15.47	15.73		
5	16QAM	12	13	15.66	15.57	15.65		
5	16QAM	25	0	15.55	15.57	15.66		
Channel				26055	26340	26675	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1913.5		
3	QPSK	1	0	14.76	14.44	14.72	17	0
3	QPSK	1	8	14.78	14.55	14.79		
3	QPSK	1	14	14.43	14.49	14.36		
3	QPSK	8	0	14.61	14.61	14.70	17	0
3	QPSK	8	4	14.73	14.57	14.78		
3	QPSK	8	7	14.54	14.44	14.67		
3	QPSK	15	0	14.66	14.61	14.71		
3	16QAM	1	0	14.96	14.86	15.07	17	0
3	16QAM	1	8	15.05	14.89	14.90		
3	16QAM	1	14	14.66	14.65	14.65		
3	16QAM	8	0	14.80	14.53	14.67	17	0
3	16QAM	8	4	14.62	14.49	14.79		
3	16QAM	8	7	14.59	14.60	14.71		
3	16QAM	15	0	14.65	14.51	14.71		
Channel				26047	26340	26683	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1914.3		
1.4	QPSK	1	0	15.76	15.44	15.72	17	0
1.4	QPSK	1	3	15.78	15.55	15.79		
1.4	QPSK	1	5	15.43	15.49	15.36		
1.4	QPSK	3	0	15.61	15.61	15.70		
1.4	QPSK	3	1	15.73	15.57	15.78		
1.4	QPSK	3	3	15.54	15.44	15.67		
1.4	QPSK	6	0	15.66	15.61	15.71	17	0
1.4	16QAM	1	0	15.96	15.86	15.97	17	0
1.4	16QAM	1	3	15.95	15.89	15.90		
1.4	16QAM	1	5	15.66	15.65	15.65		
1.4	16QAM	3	0	15.80	15.53	15.67		
1.4	16QAM	3	1	15.62	15.49	15.79		
1.4	16QAM	3	3	15.59	15.60	15.71		
1.4	16QAM	6	0	15.65	15.51	15.71	17	0

<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	20	0
Frequency (MHz)				821.5	831.5	841.5		
15	QPSK	1	0	19.38	19.40	19.35		
15	QPSK	1	37	19.20	19.25	19.23	20	0
15	QPSK	1	74	19.18	19.21	19.18		
15	QPSK	36	0	19.28	19.38	19.29		
15	QPSK	36	20	19.32	19.21	19.26	20	0
15	QPSK	36	39	19.17	19.18	19.28		
15	QPSK	75	0	19.22	19.36	19.31		
15	16QAM	1	0	19.38	19.43	19.30	20	0
15	16QAM	1	37	19.41	19.40	19.35		
15	16QAM	1	74	19.22	19.25	19.36		
15	16QAM	36	0	19.32	19.15	19.28	20	0
15	16QAM	36	20	19.31	19.22	19.27		
15	16QAM	36	39	19.19	19.22	19.28		
15	16QAM	75	0	19.25	19.24	19.34	20	0
Channel				26740	26865	26990		
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	18.88	18.73	18.85	20	0
10	QPSK	1	25	18.80	18.57	18.83		
10	QPSK	1	49	18.57	18.76	18.78		
10	QPSK	25	0	18.88	18.74	18.89	20	0
10	QPSK	25	12	18.92	18.81	18.86		
10	QPSK	25	25	18.77	18.78	18.88		
10	QPSK	50	0	18.82	18.80	18.91	20	0
10	16QAM	1	0	19.18	19.03	19.10		
10	16QAM	1	25	19.01	19.00	19.06		
10	16QAM	1	49	18.82	19.05	19.06	20	0
10	16QAM	25	0	18.92	18.75	18.88		
10	16QAM	25	12	18.91	18.82	18.87		
10	16QAM	25	25	18.79	18.82	18.88	20	0
10	16QAM	50	0	18.85	18.84	18.94		
Channel				26715	26865	27015		
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	18.86	18.79	18.76	20	0
5	QPSK	1	12	18.79	18.60	18.89		
5	QPSK	1	24	18.65	18.67	18.81		
5	QPSK	12	0	18.92	18.73	18.89	20	0
5	QPSK	12	7	18.93	18.85	18.82		
5	QPSK	12	13	18.82	18.75	18.83		
5	QPSK	25	0	18.80	18.73	18.87	20	0
5	16QAM	1	0	19.14	19.06	19.04		
5	16QAM	1	12	19.10	19.10	19.10		
5	16QAM	1	24	18.79	19.15	19.05	20	0
5	16QAM	12	0	19.00	18.80	18.92		
5	16QAM	12	7	18.85	18.89	18.79		
5	16QAM	12	13	18.87	18.85	18.95	20	0
5	16QAM	25	0	18.80	18.80	18.88		



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Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	18.92	18.68	18.85	20	0
3	QPSK	1	8	18.90	18.65	18.88		
3	QPSK	1	14	18.53	18.73	18.87		
3	QPSK	8	0	18.79	18.78	18.95	20	0
3	QPSK	8	4	18.89	18.72	18.86		
3	QPSK	8	7	18.82	18.71	18.95		
3	QPSK	15	0	18.74	18.74	18.87		
3	16QAM	1	0	19.19	19.01	19.07	20	0
3	16QAM	1	8	19.03	19.08	18.98		
3	16QAM	1	14	18.79	19.14	18.96		
3	16QAM	8	0	19.00	18.68	18.96	20	0
3	16QAM	8	4	18.97	18.82	18.77		
3	16QAM	8	7	18.82	18.90	18.92		
3	16QAM	15	0	18.77	18.85	18.86		
Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	18.88	18.74	18.95	20	0
1.4	QPSK	1	3	18.87	18.49	18.89		
1.4	QPSK	1	5	18.59	18.85	18.75		
1.4	QPSK	3	0	18.89	18.66	18.93		
1.4	QPSK	3	1	18.95	18.79	18.80		
1.4	QPSK	3	3	18.72	18.79	18.91		
1.4	QPSK	6	0	18.73	18.89	18.82	20	0
1.4	16QAM	1	0	19.23	18.95	19.19	20	0
1.4	16QAM	1	3	18.99	19.00	19.02		
1.4	16QAM	1	5	18.75	19.12	19.08		
1.4	16QAM	3	0	19.01	18.66	18.93		
1.4	16QAM	3	1	18.95	18.78	18.83		
1.4	16QAM	3	3	18.80	18.89	18.82		
1.4	16QAM	6	0	18.76	18.92	18.95	20	0

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

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

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

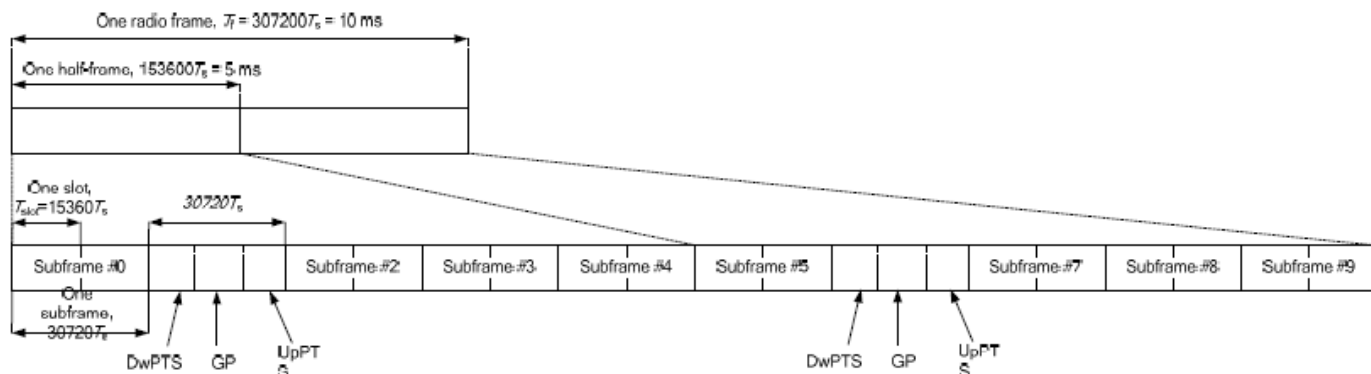


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

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

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

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

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

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

The highest duty factor is resulted from:

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

<Default Power Mode>
<LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				39750	40185	40620	41055	41490		
Frequency (MHz)				2506	2549.5	2593	2636.5	2680		
20	QPSK	1	0	21.90	21.78	21.83	21.58	21.68	23	0
20	QPSK	1	49	22.31	21.88	21.95	21.87	21.72		
20	QPSK	1	99	21.96	21.77	21.83	21.58	21.29		
20	QPSK	50	0	21.14	20.77	20.90	20.71	20.96	22	1
20	QPSK	50	24	21.07	20.74	20.84	20.64	20.87		
20	QPSK	50	50	21.09	20.72	20.87	20.66	20.88		
20	QPSK	100	0	21.08	20.74	20.77	20.57	20.90	22	1
20	16QAM	1	0	20.99	20.76	20.86	20.64	20.86		
20	16QAM	1	49	21.23	20.91	20.97	20.76	20.83		
20	16QAM	1	99	20.95	20.74	20.81	20.73	20.40	21	2
20	16QAM	50	0	20.05	19.81	19.79	19.70	19.91		
20	16QAM	50	24	20.12	19.83	19.86	19.72	19.92		
20	16QAM	50	50	20.05	19.84	19.88	19.70	19.89	21	2
20	16QAM	50	50	20.05	19.84	19.88	19.70	19.89		
20	16QAM	100	0	20.07	19.76	19.82	19.68	19.93		
Channel				39725	40173	40620	41068	41515	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5		
15	QPSK	1	0	21.91	21.67	21.75	21.46	22.08	23	0
15	QPSK	1	37	22.21	21.96	21.86	21.74	21.74		
15	QPSK	1	74	21.75	21.70	21.68	21.34	21.60		
15	QPSK	36	0	20.83	20.68	20.71	20.44	20.88	22	1
15	QPSK	36	20	21.00	20.76	20.79	20.52	21.03		
15	QPSK	36	39	20.83	20.69	20.78	20.49	20.94		
15	QPSK	75	0	20.77	20.70	20.73	20.47	20.96	22	1
15	16QAM	1	0	20.81	20.70	20.77	20.42	21.01		
15	16QAM	1	37	20.67	21.04	20.93	20.56	20.80		
15	16QAM	1	74	20.78	20.70	20.72	20.45	20.70	21	2
15	16QAM	36	0	19.78	19.66	19.64	19.42	19.87		
15	16QAM	36	20	19.94	19.73	19.77	19.51	20.00		
15	16QAM	36	39	19.83	19.63	19.72	19.44	19.93	21	2
15	16QAM	36	39	19.83	19.63	19.72	19.44	19.93		
15	16QAM	75	0	19.83	19.69	19.74	19.47	19.99		
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2501	2547	2593	2639	2685		
10	QPSK	1	0	21.48	21.54	21.61	21.30	21.56	23	0
10	QPSK	1	25	21.66	21.69	21.73	21.46	21.67		
10	QPSK	1	49	21.64	21.53	21.66	21.28	21.54		
10	QPSK	25	0	20.77	20.69	20.79	20.51	20.80	22	1
10	QPSK	25	12	20.84	20.78	20.85	20.58	20.98		
10	QPSK	25	25	20.78	20.75	20.83	20.54	20.98		
10	QPSK	50	0	20.70	20.71	20.80	20.53	20.82	22	1
10	16QAM	1	0	20.75	20.61	20.76	20.44	21.00		
10	16QAM	1	25	20.82	20.78	20.85	20.59	21.02		
10	16QAM	1	49	20.59	20.66	20.68	20.46	20.72	21	2
10	16QAM	25	0	19.78	19.72	19.83	19.58	19.87		
10	16QAM	25	12	19.85	19.80	19.88	19.60	19.97		
10	16QAM	25	25	19.84	19.73	19.87	19.59	20.02	21	2
10	16QAM	25	25	19.84	19.73	19.87	19.59	20.02		
10	16QAM	50	0	19.80	19.74	19.87	19.56	19.87		



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Channel				39675	40148	40620	41093	41565	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2498.5	2545.8	2593	2640.30	2687.5		
5	QPSK	1	0	21.73	21.69	21.68	21.43	21.45	23	0
5	QPSK	1	12	21.86	21.72	21.68	21.45	21.43		
5	QPSK	1	24	21.82	21.64	21.68	21.39	21.30		
5	QPSK	12	0	20.98	20.79	20.79	20.58	20.79	22	1
5	QPSK	12	7	21.08	20.86	20.80	20.58	20.86		
5	QPSK	12	13	21.00	20.75	20.73	20.59	20.82		
5	QPSK	25	0	21.02	20.78	20.72	20.54	20.81		
5	16QAM	1	0	21.04	20.82	20.89	20.56	20.73	22	1
5	16QAM	1	12	21.22	20.96	20.90	20.71	20.58		
5	16QAM	1	24	21.21	20.86	20.90	20.59	20.51		
5	16QAM	12	0	19.99	19.75	19.77	19.56	19.80	21	2
5	16QAM	12	7	20.06	19.82	19.80	19.61	19.86		
5	16QAM	12	13	19.97	19.72	19.71	19.57	19.83		
5	16QAM	25	0	20.07	19.84	19.78	19.66	19.86		

<Reduced Power Mode>
<LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				39750	40185	40620	41055	41490		
Frequency (MHz)				2506	2549.5	2593	2636.5	2680		
20	QPSK	1	0	19.18	19.10	19.13	19.04	19.15	21	0
20	QPSK	1	49	19.31	19.03	19.10	19.14	19.28		
20	QPSK	1	99	19.11	19.07	19.17	19.00	19.07		
20	QPSK	50	0	19.27	19.16	19.19	19.08	19.25	21	0
20	QPSK	50	24	19.26	19.13	19.11	19.06	19.65		
20	QPSK	50	50	19.25	19.06	19.17	19.02	19.26		
20	QPSK	100	0	19.24	19.06	19.15	19.00	19.21	21	0
20	16QAM	1	0	19.54	19.25	19.34	19.22	19.58		
20	16QAM	1	49	19.66	19.42	19.46	19.36	19.65		
20	16QAM	1	99	19.34	19.26	19.37	19.23	19.56	21	0
20	16QAM	50	0	19.21	19.05	19.14	19.19	19.27		
20	16QAM	50	24	19.27	19.17	19.22	19.05	19.41		
20	16QAM	50	50	19.26	19.07	19.16	19.04	19.42	21	0
20	16QAM	100	0	19.25	19.11	19.16	19.01	19.29		
Channel				39725	40173	40620	41068	41515	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5		
15	QPSK	1	0	19.10	19.07	19.04	19.07	19.25	21	0
15	QPSK	1	37	19.32	19.04	19.02	19.09	19.21		
15	QPSK	1	74	19.09	19.13	19.13	19.08	19.04		
15	QPSK	36	0	19.20	19.17	19.19	19.09	19.32	21	0
15	QPSK	36	20	19.21	19.06	19.07	19.01	19.27		
15	QPSK	36	39	19.32	19.03	19.27	19.00	19.16		
15	QPSK	75	0	19.20	19.07	19.14	19.03	19.16	21	0
15	16QAM	1	0	19.48	19.16	19.31	19.26	19.48		
15	16QAM	1	37	19.64	19.39	19.38	19.42	19.58		
15	16QAM	1	74	19.41	19.22	19.38	19.32	19.47	21	0
15	16QAM	36	0	19.25	19.15	19.21	19.18	19.18		
15	16QAM	36	20	19.17	19.18	19.29	19.11	19.48		
15	16QAM	36	39	19.18	19.16	19.09	19.05	19.42	21	0
15	16QAM	75	0	19.15	19.04	19.23	19.07	19.30		
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2501	2547	2593	2639	2685		
10	QPSK	1	0	19.23	19.07	19.05	19.08	19.06	21	0
10	QPSK	1	25	19.29	19.17	19.11	19.01	19.28		
10	QPSK	1	49	19.20	19.15	19.11	19.06	19.06		
10	QPSK	25	0	19.28	19.23	19.18	19.08	19.33	21	0
10	QPSK	25	12	19.34	19.06	19.10	19.16	19.17		
10	QPSK	25	25	19.20	19.03	19.17	19.18	19.33		
10	QPSK	50	0	19.32	19.02	19.18	19.16	19.15	21	0
10	16QAM	1	0	19.55	19.17	19.27	19.12	19.52		
10	16QAM	1	25	19.61	19.40	19.45	19.34	19.66		
10	16QAM	1	49	19.37	19.19	19.37	19.29	19.64	21	0
10	16QAM	25	0	19.15	19.04	19.22	19.13	19.34		
10	16QAM	25	12	19.18	19.12	19.32	19.18	19.36		
10	16QAM	25	25	19.20	19.05	19.13	19.14	19.39	21	0
10	16QAM	50	0	19.33	19.04	19.10	19.09	19.25		



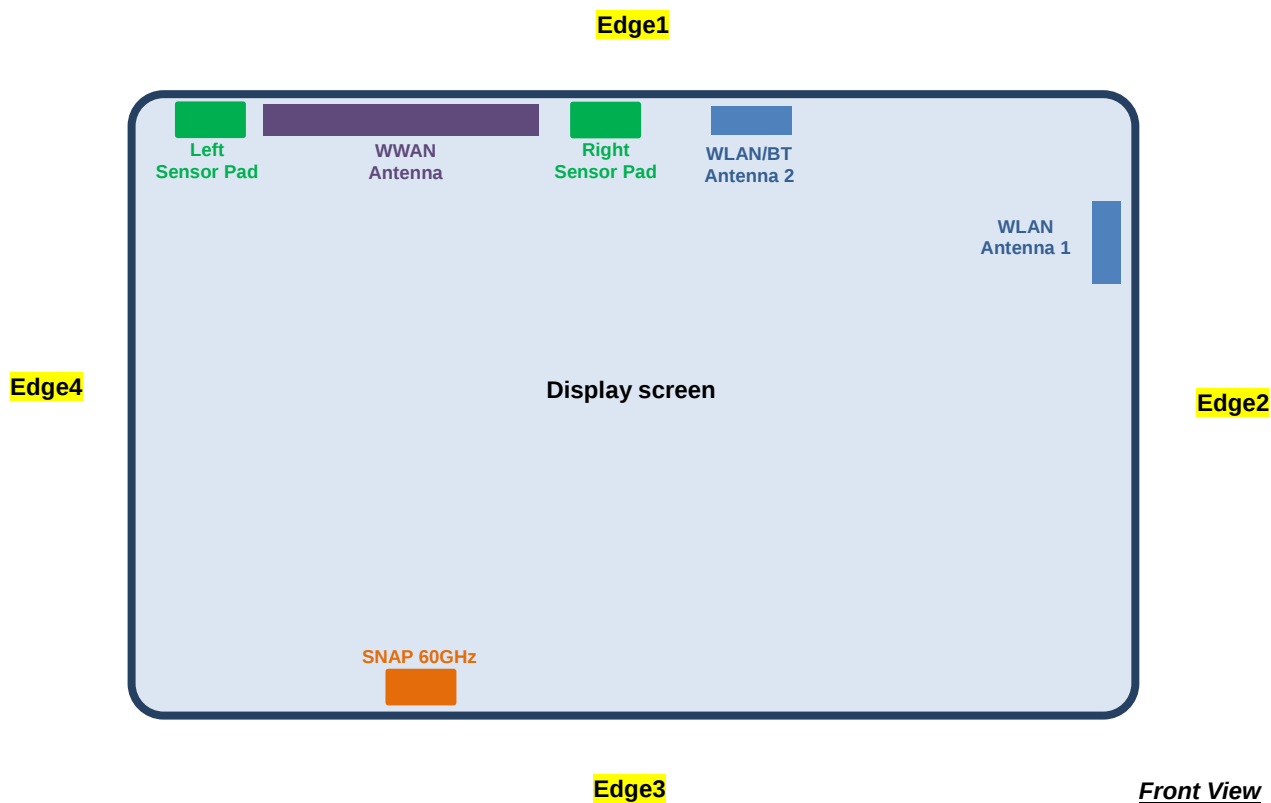
FCC SAR TEST REPORT

Report No. : FA8D1723-01

Channel				39675	40148	40620	41093	41565	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2498.5	2545.8	2593	2640.30	2687.5		
5	QPSK	1	0	19.21	19.13	19.00	19.12	19.23	21	0
5	QPSK	1	12	19.28	19.06	19.02	19.08	19.21		
5	QPSK	1	24	19.08	19.02	19.09	19.00	19.04		
5	QPSK	12	0	19.37	19.17	19.21	19.02	19.27	21	0
5	QPSK	12	7	19.28	19.16	19.09	19.15	19.29		
5	QPSK	12	13	19.26	19.16	19.13	19.08	19.25		
5	QPSK	25	0	19.23	19.13	19.22	19.05	19.21	21	0
5	16QAM	1	0	19.46	19.20	19.37	19.13	19.52		
5	16QAM	1	12	19.59	19.32	19.47	19.27	19.62		
5	16QAM	1	24	19.43	19.23	19.42	19.25	19.50	21	0
5	16QAM	12	0	19.31	19.15	19.15	19.02	19.36		
5	16QAM	12	7	19.26	19.23	19.28	19.10	19.39		
5	16QAM	12	13	19.32	19.08	19.14	19.15	19.47		
5	16QAM	25	0	19.35	19.01	19.19	19.02	19.24		

11. Antenna Location

<For Tablet>



The separation distance for antenna to edge :

Antenna	To Edge1 (mm)	To Edge2 (mm)	To Edge3 (mm)	To Edge4 (mm)
WWAN Antenna	2.6	183.7	190	41.2
WLAN Antenna 1	36.4	5.5	131.2	309.6
WLAN/BT Antenna 2	5.7	106.2	182.1	190.2

12. SAR Test Results

General Note:

- The test result in this report is spot check worst case according to FCC ID: EJE-EM7455D2, Sporton report no.: FA7N1801-02 to check the above change was not impact RF exposure compliance, for this report also the WWAN DPR level and the P-sensor trigger distance and the movement detection was not changed, please refer to FCC ID: EJE-EM7455D2, Sporton report no.: FA7N1801-02 page10 for the detail.
- Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - 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.
 - 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)"
 - For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
 - For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
 - 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.
- Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
- Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.

12.1 Body SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
01	WCDMA II	RMC 12.2Kbps	Bottom Face	0mm	ON	9538	1907.6	15.88	17.00	1.294	0	1.090	1.411
02	WCDMA IV	RMC 12.2Kbps	Bottom Face	0mm	ON	1513	1752.6	16.90	17.50	1.148	0.05	1.140	1.309
03	WCDMA V	RMC 12.2Kbps	Bottom Face	0mm	ON	4132	826.4	19.28	20.00	1.180	-0.11	1.040	1.228

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
04	LTE Band 4	20M	QPSK	50	24	Bottom Face	0mm	ON	20175	1732.5	16.99	17.50	1.125	0.04	1.200	1.350
05	LTE Band 7	20M	QPSK	1	0	Bottom Face	0mm	ON	21100	2535	18.8	19.00	1.047	-0.18	1.160	1.215
06	LTE Band 12	10M	QPSK	50	0	Edge 1	0mm	ON	23095	707.5	20.50	21.00	1.122	-0.06	1.110	1.245
07	LTE Band 13	10M	QPSK	50	0	Bottom Face	0mm	ON	23230	782	18.50	19.50	1.259	-0.12	1.040	1.309
08	LTE Band 25	20M	QPSK	50	24	Bottom Face	0mm	ON	26340	1880	15.90	17.00	1.288	-0.07	1.090	1.404
09	LTE Band 26	15M	QPSK	1	0	Bottom Face	0mm	ON	26865	831.5	19.40	20.00	1.148	0.14	1.060	1.217

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
10	LTE Band 41	20M	QPSK	50	24	Bottom Face	0mm	ON	41490	2680	19.65	21.00	1.365	62.9	1.006	-0.12	0.980	1.345

12.2 Repeated SAR Measurement

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 4	20M	QPSK	50	24	Bottom Face	0mm	ON	20175	1732.5	16.99	17.50	1.125	0.04	1.200	-	1.350
2nd	LTE Band 4	20M	QPSK	50	24	Bottom Face	0mm	ON	20175	1732.5	16.99	17.50	1.125	0.01	1.110	1.08	1.248
1st	LTE Band 7	20M	QPSK	1	0	Bottom Face	0mm	ON	21100	2535	18.8	19.00	1.047	-0.18	1.160	-	1.215
2nd	LTE Band 7	20M	QPSK	1	0	Bottom Face	0mm	ON	21100	2535	18.8	19.00	1.047	0.04	1.120	1.04	1.173
1st	LTE Band 12	10M	QPSK	50	0	Edge 1	0mm	ON	23095	707.5	20.50	21.00	1.122	-0.06	1.110	-	1.245
2nd	LTE Band 12	10M	QPSK	50	0	Edge 1	0mm	ON	23095	707.5	20.50	21.00	1.122	0.05	0.976	1.14	1.095
1st	LTE Band 25	20M	QPSK	50	24	Bottom Face	0mm	ON	26340	1880	15.90	17.00	1.288	-0.07	1.090	-	1.404
2nd	LTE Band 25	20M	QPSK	50	24	Bottom Face	0mm	ON	26340	1880	15.90	17.00	1.288	0.01	0.984	1.11	1.268
1st	LTE Band 26	15M	QPSK	1	0	Bottom Face	0mm	ON	26865	831.5	19.40	20.00	1.148	0.14	1.060	-	1.217
2nd	LTE Band 26	15M	QPSK	1	0	Bottom Face	0mm	ON	26865	831.5	19.40	20.00	1.148	-0.04	0.988	1.07	1.138

General Note:

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

13. Simultaneous Transmission Analysis

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

General Note:

1. The WLAN/BT module Brand name Intel Model: 9560NGW installed in host Q739 is full tested under FCC ID: EJE-WB0109 , Sporton Report No.: Report No. FA8D1723. In this report simultaneous transmission analysis of WLAN/BT and WWAN transmitters are reported.
2. All the WWAN result is referring to FCC ID: EJE-EM7455D2, Sporton report No.: FA7N1801-02 and also used perform simultaneous transmission analysis; due to the result is the worst case for summation.
3. The worst case reported SAR for each configuration was used for SAR summation. Therefore, the following summations represent the absolute worst cases for simultaneous transmission analysis
4. WLAN and Bluetooth share the same antenna 2, and cannot transmit simultaneously.
5. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
6. The Scaled SAR summation is calculated based on the same configuration and test position.
7. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
 - i) Scalar SAR summation $< 1.6\text{W/kg}$.
 - ii) $\text{SPLSR} = (\text{SAR1} + \text{SAR2})^{1.5} / (\text{min. separation distance, mm})$, and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where $(x1, y1, z1)$ and $(x2, y2, z2)$ are the coordinates of the extrapolated peak SAR locations in the zoom scan.
 - iii) If $\text{SPLSR} \leq 0.04$, simultaneously transmission SAR measurement is not necessary.
 - iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR $< 1.6\text{W/kg}$.
 - v) The SPLSR calculated results please refer to section 13.2.



13.1 Body Exposure Conditions

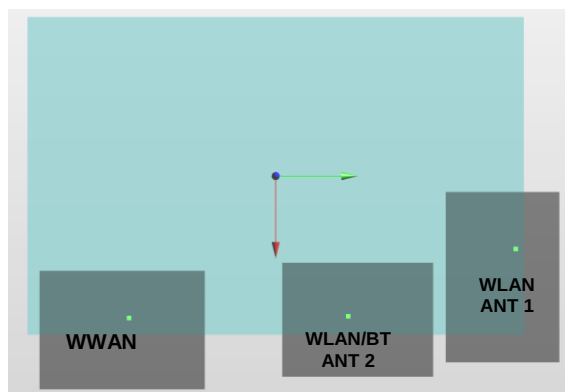
WWAN Band		Exposure Position	1	2	3	4	5	6	1+2+3 Summed 1g SAR (W/kg)	1+4+5 Summed 1g SAR (W/kg)	1+2+6 Summed 1g SAR (W/kg)	1+4+6 Summed 1g SAR (W/kg)	1+4+5+6 Summed 1g SAR (W/kg)	SPLSR	Case No
			WWAN	2.4GHz WLAN Ant 1	2.4GHz WLAN Ant 2	5GHz WLAN Ant 1	5GHz WLAN Ant 2	Bluetooth Ant 2							
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)							
WCDMA	WCDMA II	Bottom Face at 0mm	1.417	1.019	1.170	1.055	1.014	0.323	3.606	3.486	2.759	2.795	3.809	0.03	Case 1
		Edge 1 at 0mm	0.585		0.120		1.283	0.134	0.705	1.868	0.719	0.719	2.002	0.02	Case 2
		Edge 4 at 0mm	0.545						0.545	0.545	0.545	0.545	0.545		
	WCDMA IV	Bottom Face at 0mm	1.330	1.019	1.170	1.055	1.014	0.323	3.519	3.399	2.672	2.708	3.722	0.03	Case 3
		Edge 1 at 0mm	0.691		0.120		1.283	0.134	0.811	1.974	0.825	0.825	2.108	0.02	Case 4
		Edge 4 at 0mm	0.286						0.286	0.286	0.286	0.286	0.286		
	WCDMA V	Bottom Face at 0mm	1.234	1.019	1.170	1.055	1.014	0.323	3.423	3.303	2.576	2.612	3.626	0.04	Case 5
		Edge 1 at 0mm	1.032		0.120		1.283	0.134	1.152	2.315	1.166	1.166	2.449	0.03	Case 6
		Edge 4 at 0mm	0.150						0.150	0.150	0.150	0.150	0.150		
LTE	LTE Band 4	Bottom Face at 0mm	1.373	1.019	1.170	1.055	1.014	0.323	3.562	3.442	2.715	2.751	3.765	0.03	Case 7
		Edge 1 at 0mm	0.634		0.120		1.283	0.134	0.754	1.917	0.768	0.768	2.051	0.02	Case 8
		Edge 4 at 0mm	0.072						0.072	0.072	0.072	0.072	0.072		
	LTE Band 7	Bottom Face at 0mm	1.222	1.019	1.170	1.055	1.014	0.323	3.411	3.291	2.564	2.600	3.614	0.03	Case 9
		Edge 1 at 0mm	0.638		0.120		1.283	0.134	0.758	1.921	0.772	0.772	2.055	0.02	Case 10
		Edge 4 at 0mm	0.052						0.052	0.052	0.052	0.052	0.052		
	LTE Band 12	Bottom Face at 0mm	1.012	1.019	1.170	1.055	1.014	0.323	3.201	3.081	2.354	2.390	3.404	0.03	Case 11
		Edge 1 at 0mm	1.292		0.120		1.283	0.134	1.412	2.575	1.426	1.426	2.709	0.04	Case 12
		Edge 4 at 0mm	0.054						0.054	0.054	0.054	0.054	0.054		
	LTE Band 13	Bottom Face at 0mm	1.339	1.019	1.170	1.055	1.014	0.323	3.528	3.408	2.681	2.717	3.731	0.04	Case 13
		Edge 1 at 0mm	1.058		0.120		1.283	0.134	1.178	2.341	1.192	1.192	2.475	0.03	Case 14
		Edge 4 at 0mm	0.171						0.171	0.171	0.171	0.171	0.171		
	LTE Band 25	Bottom Face at 0mm	1.410	1.019	1.170	1.055	1.014	0.323	3.599	3.479	2.752	2.788	3.802	0.03	Case 15
		Edge 1 at 0mm	0.632		0.120		1.283	0.134	0.752	1.915	0.766	0.766	2.049	0.02	Case 16
		Edge 4 at 0mm	0.573						0.573	0.573	0.573	0.573	0.573		
	LTE Band 26	Bottom Face at 0mm	1.238	1.019	1.170	1.055	1.014	0.323	3.427	3.307	2.580	2.616	3.630	0.03	Case 17
		Edge 1 at 0mm	1.056		0.120		1.283	0.134	1.176	2.339	1.190	1.190	2.473	0.03	Case 18
		Edge 4 at 0mm	0.211						0.211	0.211	0.211	0.211	0.211		
	LTE Band 41	Bottom Face at 0mm	1.347	1.019	1.170	1.055	1.014	0.323	3.536	3.416	2.689	2.725	3.739	0.03	Case 19
		Edge 1 at 0mm	0.824		0.120		1.283	0.134	0.944	2.107	0.958	0.958	2.241	0.02	Case 20
		Edge 4 at 0mm	0.063						0.063	0.063	0.063	0.063	0.063		

13.2 SPLSR Evaluation and Analysis

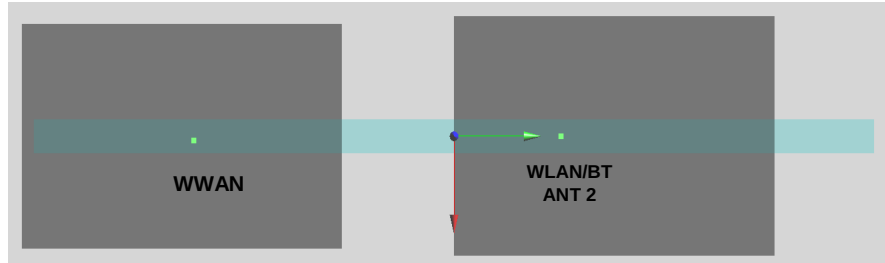
General Note:

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

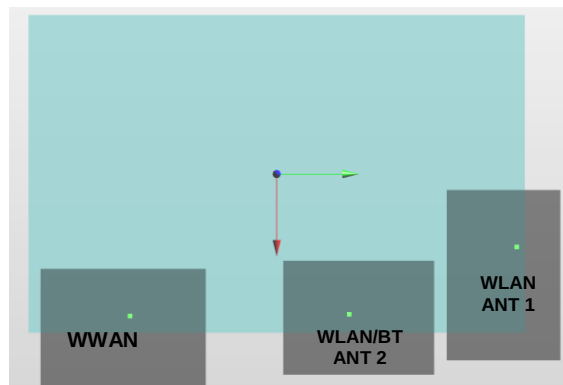
	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 1	WCDMA II	Bottom Face	1.417	0	92.2	-93.6	0.4	250.7	2.44	0.02	Not required
	WLAN2.4G Ant 1		1.019	0	46.8	153	1.47				
	WCDMA II	Bottom Face	1.417	0	92.2	-93.6	0.4	140.9	2.59	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	113.2	2.19	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	WCDMA II	Bottom Face	1.417	0	92.2	-93.6	0.4	248.6	2.47	0.02	Not required
	WLAN5G Ant 1		1.055	0	57	152.4	5.88				
	WCDMA II	Bottom Face	1.417	0	92.2	-93.6	0.4	140.9	2.43	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	109.1	2.07	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	WCDMA II	Bottom Face	1.417	0	92.2	-93.6	0.4	139.2	1.74	0.02	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	115.3	1.34	0.01	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	WCDMA II	Bottom Face	1.417	0	92.2	-93.6	0.4	139.2	2.75	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	111.5	2.39	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				



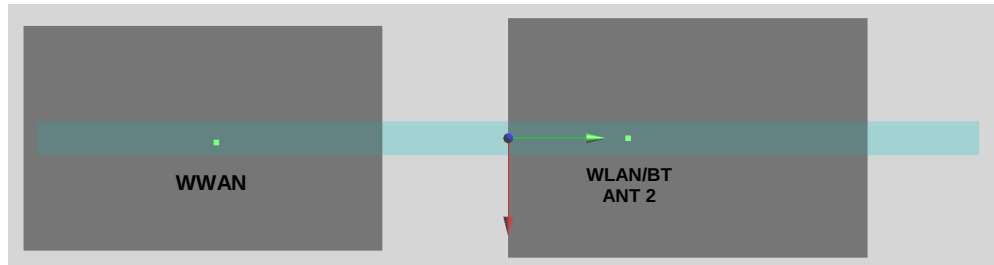
Case 2	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	WCDMA II	Edge 1	0.585	0	-0.9	-101.4	2.32	143.8	2.00	0.02	Not required
	WLAN5G Ant 2+BT Ant 2		1.417	0	0.8	42.4	3.61				



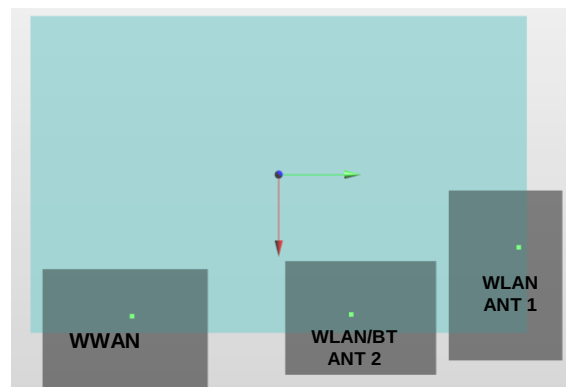
Case 3	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	WCDMA IV	Bottom Face	1.33	0	87.6	-90.5	0.67	246.9	2.35	0.01	Not required
	WLAN2.4G Ant 1		1.019	0	46.8	153	1.47				
	WCDMA IV	Bottom Face	1.33	0	87.6	-90.5	0.67	137.7	2.50	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	113.2	2.19	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	WCDMA IV	Bottom Face	1.33	0	87.6	-90.5	0.67	244.9	2.39	0.02	Not required
	WLAN5G Ant 1		1.055	0	57	152.4	5.88				
	WCDMA IV	Bottom Face	1.33	0	87.6	-90.5	0.67	137.6	2.34	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	109.1	2.07	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	WCDMA IV	Bottom Face	1.33	0	87.6	-90.5	0.67	136.1	1.65	0.02	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	115.3	1.34	0.01	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	WCDMA IV	Bottom Face	1.33	0	87.6	-90.5	0.67	136.1	2.67	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	111.5	2.39	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				



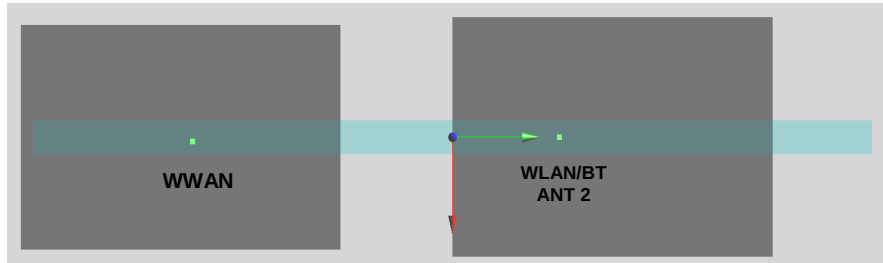
Case 4	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	WCDMA IV	Edge 1	0.691	0	-0.9	-101.4	2.99	143.8	2.11	0.02	Not required
	WLAN5G Ant 2+BT Ant 2		1.417	0	0.8	42.4	3.61				



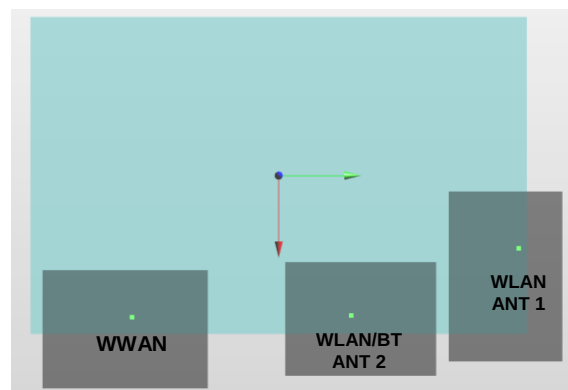
Case 5	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	WCDMA V	Bottom Face	1.234	0	99.4	-70.5	-0.55	229.6	2.25	0.01	Not required
	WLAN2.4G Ant 1		1.019	0	46.8	153	1.47				
	WCDMA V	Bottom Face	1.234	0	99.4	-70.5	-0.55	118.4	2.40	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	113.2	2.19	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	WCDMA V	Bottom Face	1.234	0	99.4	-70.5	-0.55	227.0	2.29	0.02	Not required
	WLAN5G Ant 1		1.055	0	57	152.4	5.88				
	WCDMA V	Bottom Face	1.234	0	99.4	-70.5	-0.55	118.6	2.25	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	109.1	2.07	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	WCDMA V	Bottom Face	1.234	0	99.4	-70.5	-0.55	116.6	1.56	0.02	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	115.3	1.34	0.01	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	WCDMA V	Bottom Face	1.234	0	99.4	-70.5	-0.55	116.6	2.57	0.04	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	111.5	2.39	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				



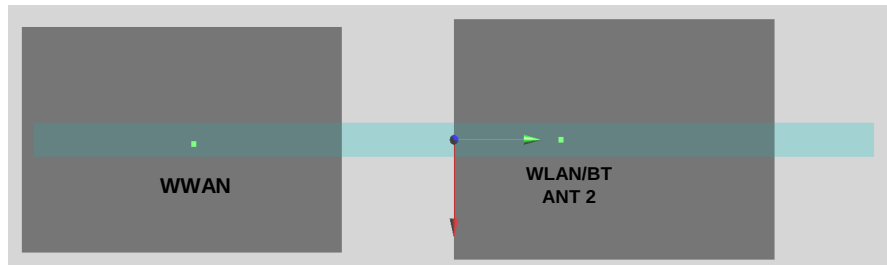
Case 6	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	WCDMA V	Edge 1	1.032	0	-1	-74	-1.37	116.5	2.45	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.417	0	0.8	42.4	3.61				



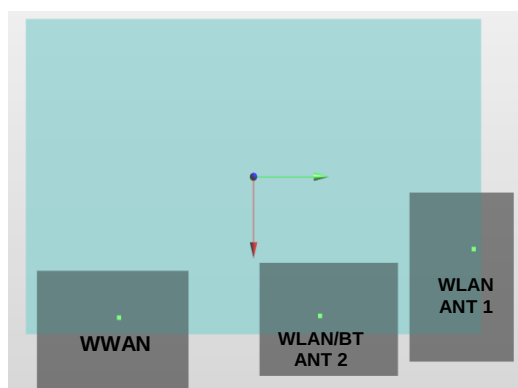
Case 7	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 4	Bottom Face	1.373	0	89.1	-90.5	-0.09	247.2	2.39	0.01	Not required
	WLAN2.4G Ant 1		1.019	0	46.8	153	1.47				
	LTE Band 4	Bottom Face	1.373	0	89.1	-90.5	-0.09	137.8	2.54	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	113.2	2.19	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	LTE Band 4	Bottom Face	1.373	0	89.1	-90.5	-0.09	245.1	2.43	0.02	Not required
	WLAN5G Ant 1		1.055	0	57	152.4	5.88				
	LTE Band 4	Bottom Face	1.373	0	89.1	-90.5	-0.09	137.7	2.39	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	109.1	2.07	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	LTE Band 4	Bottom Face	1.373	0	89.1	-90.5	-0.09	136.1	1.70	0.02	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	115.3	1.34	0.01	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	LTE Band 4	Bottom Face	1.373	0	89.1	-90.5	-0.09	136.1	2.71	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	111.5	2.39	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				



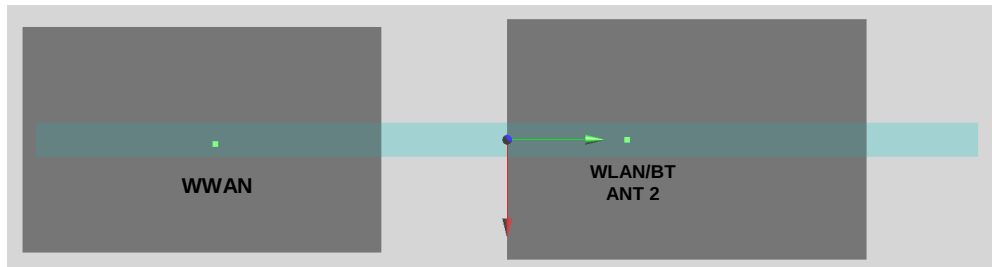
Case 8	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 4	Edge 1	0.634	0	0.5	-101.4	-2.23	143.9	2.05	0.02	Not required
	WLAN5G Ant 2+BT Ant 2		1.417	0	0.8	42.4	3.61				



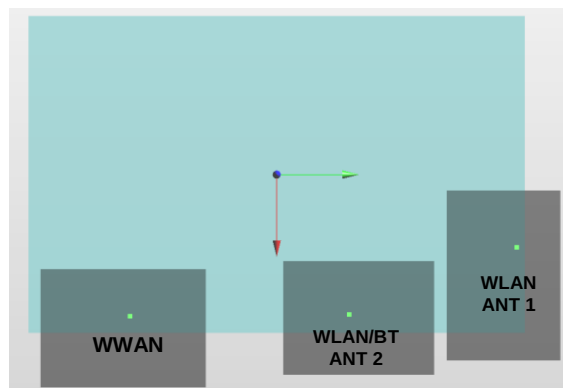
Case 9	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 7	Bottom Face	1.222	0	94.4	-91.6	-0.29	249.2	2.24	0.01	Not required
	WLAN2.4G Ant 1		1.019	0	46.8	153	1.47				
	LTE Band 7	Bottom Face	1.222	0	94.4	-91.6	-0.29	139.0	2.39	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	113.2	2.19	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	LTE Band 7	Bottom Face	1.222	0	94.4	-91.6	-0.29	246.9	2.28	0.01	Not required
	WLAN5G Ant 1		1.055	0	57	152.4	5.88				
	LTE Band 7	Bottom Face	1.222	0	94.4	-91.6	-0.29	139.1	2.24	0.02	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	109.1	2.07	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	LTE Band 7	Bottom Face	1.222	0	94.4	-91.6	-0.29	137.3	1.55	0.01	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	115.3	1.34	0.01	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	LTE Band 7	Bottom Face	1.222	0	94.4	-91.6	-0.29	137.3	2.56	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	111.5	2.39	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				



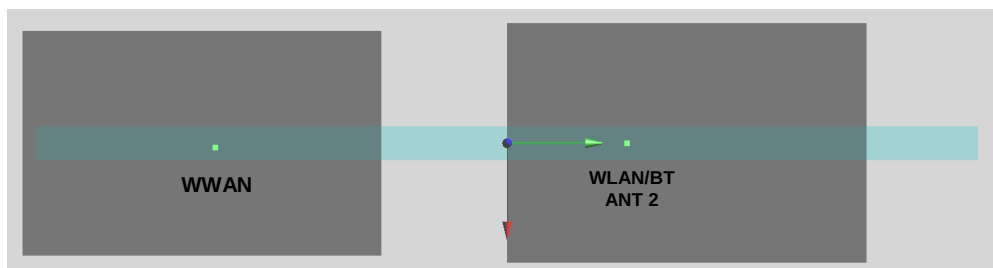
Case 10	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 7	Edge 1	0.638	0	-2.2	-138.8	-1.53	181.3	2.06	0.02	Not required
	WLAN5G Ant 2+BT Ant 2		1.417	0	0.8	42.4	3.61				



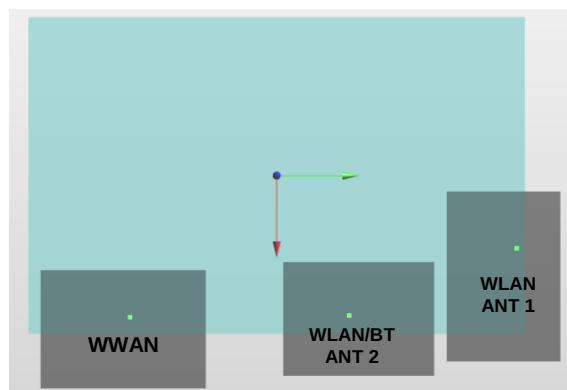
	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 11	LTE Band 12	Bottom Face	1.012	0	93.5	-88.8	0.24	246.3	2.03	0.01	Not required
	WLAN2.4G Ant 1		1.019	0	46.8	153	1.47				
	LTE Band 12	Bottom Face	1.012	0	93.5	-88.8	0.24	136.2	2.18	0.02	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	113.2	2.19	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	LTE Band 12	Bottom Face	1.012	0	93.5	-88.8	0.24	244.0	2.07	0.01	Not required
	WLAN5G Ant 1		1.055	0	57	152.4	5.88				
	LTE Band 12	Bottom Face	1.012	0	93.5	-88.8	0.24	136.2	2.03	0.02	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	109.1	2.07	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	LTE Band 12	Bottom Face	1.012	0	93.5	-88.8	0.24	134.5	1.34	0.01	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	115.3	1.34	0.01	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	LTE Band 12	Bottom Face	1.012	0	93.5	-88.8	0.24	134.5	2.35	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	111.5	2.39	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				



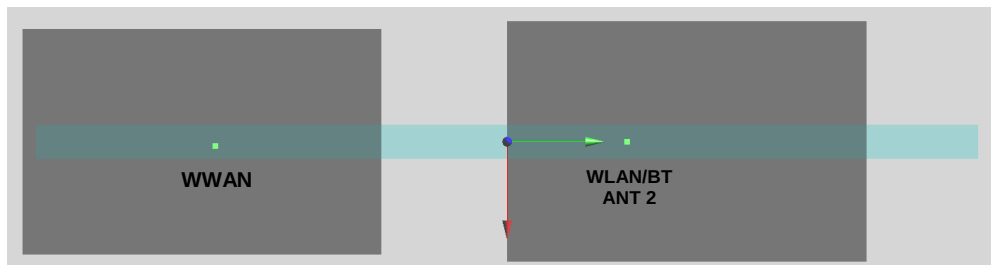
Case 12	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 12	Edge 1	1.292	0	-1	-66.4	-2.56	109.0	2.71	0.04	Not required
	WLAN5G Ant 2+BT Ant 2		1.417	0	0.8	42.4	3.61				



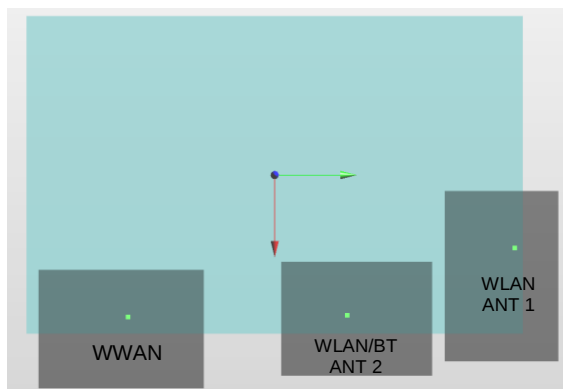
Case 13	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 13	Bottom Face	1.339	0	99.7	-73	-1.18	232.1	2.36	0.02	Not required
	WLAN2.4G Ant 1		1.019	0	46.8	153	1.47				
	LTE Band 13	Bottom Face	1.339	0	99.7	-73	-1.18	120.9	2.51	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	113.2	2.19	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	LTE Band 13	Bottom Face	1.339	0	99.7	-73	-1.18	229.5	2.39	0.02	Not required
	WLAN5G Ant 1		1.055	0	57	152.4	5.88				
	LTE Band 13	Bottom Face	1.339	0	99.7	-73	-1.18	121.1	2.35	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	109.1	2.07	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	LTE Band 13	Bottom Face	1.339	0	99.7	-73	-1.18	119.1	1.66	0.02	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	115.3	1.34	0.01	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	LTE Band 13	Bottom Face	1.339	0	99.7	-73	-1.18	119.1	2.68	0.04	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	111.5	2.39	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				



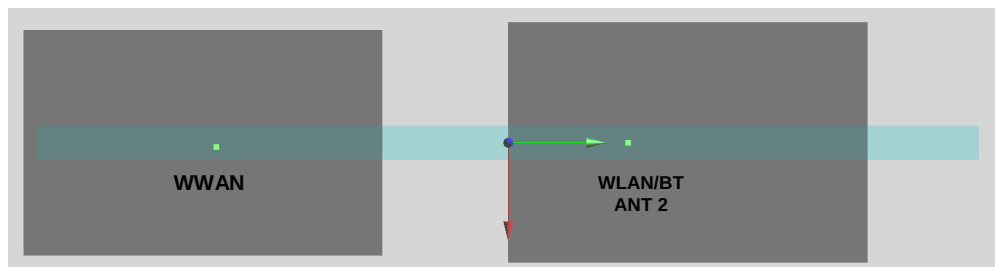
Case 14	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 13	Edge 1	1.058	0	-1	-69.5	-3.08	112.1	2.48	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.417	0	0.8	42.4	3.61				



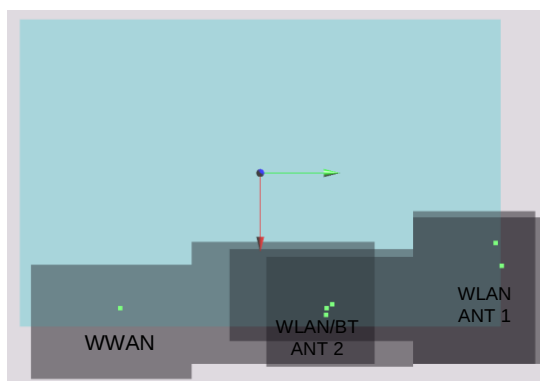
Case 15	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 25	Bottom Face	1.41	0	95	-95.1	-0.14	252.7	2.43	0.01	Not required
	WLAN2.4G Ant 1		1.019	0	46.8	153	1.47				
	LTE Band 25	Bottom Face	1.41	0	95	-95.1	-0.14	142.6	2.58	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	113.2	2.19	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	LTE Band 25	Bottom Face	1.41	0	95	-95.1	-0.14	250.5	2.47	0.02	Not required
	WLAN5G Ant 1		1.055	0	57	152.4	5.88				
	LTE Band 25	Bottom Face	1.41	0	95	-95.1	-0.14	142.6	2.42	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	109.1	2.07	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	LTE Band 25	Bottom Face	1.41	0	95	-95.1	-0.14	140.8	1.73	0.02	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	115.3	1.34	0.01	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	LTE Band 25	Bottom Face	1.41	0	95	-95.1	-0.14	140.8	2.75	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	111.5	2.39	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				



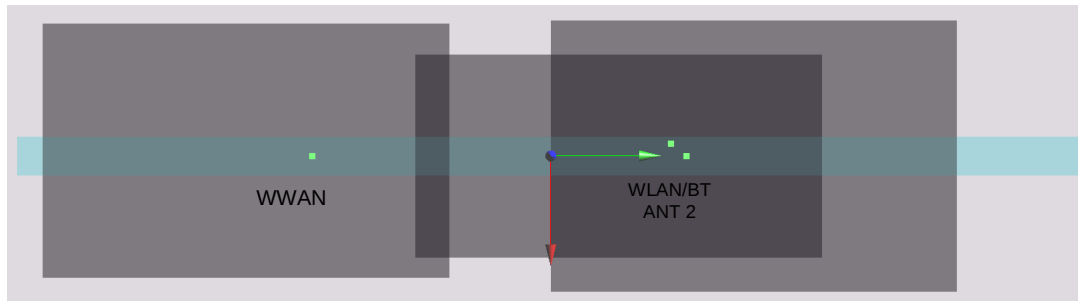
Case 16	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 25	Edge 1	0.632	0	X	Y	Z	145.4	2.05	0.02	Not required
	WLAN5G Ant 2+BT Ant 2		1.417	0	0.8	42.4	3.61				



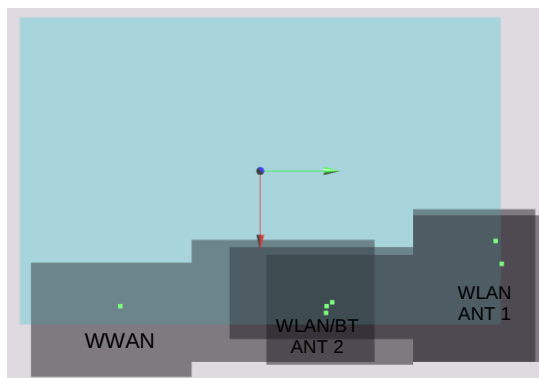
Case 17	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 26	Bottom Face	1.238	0	100.9	-73.6	0.43	233.0	2.26	0.01	Not required
	WLAN2.4G Ant 1		1.019	0	46.8	153	1.47				
	LTE Band 26	Bottom Face	1.238	0	100.9	-73.6	0.43	121.6	2.41	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	113.2	2.19	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	LTE Band 26	Bottom Face	1.238	0	100.9	-73.6	0.43	230.3	2.29	0.02	Not required
	WLAN5G Ant 1		1.055	0	57	152.4	5.88				
	LTE Band 26	Bottom Face	1.238	0	100.9	-73.6	0.43	121.8	2.25	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	109.1	2.07	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	LTE Band 26	Bottom Face	1.238	0	100.9	-73.6	0.43	119.8	1.56	0.02	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	115.3	1.34	0.01	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	LTE Band 26	Bottom Face	1.238	0	100.9	-73.6	0.43	119.8	2.58	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	111.5	2.39	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				



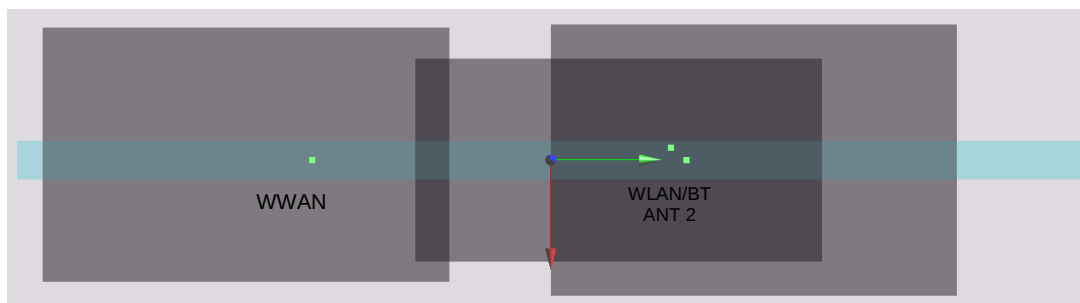
Case	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
18	LTE Band 26	Edge 1	1.056	0	-1	-71.1	-3.08	113.7	2.47	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.417	0	0.8	42.4	3.61				



Case	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
19	LTE Band 41	Bottom Face	1.347	0	89.2	-91.8	-0.88	248.5	2.37	0.01	Not required
	WLAN2.4G Ant 1		1.019	0	46.8	153	1.47				
	LTE Band 41	Bottom Face	1.347	0	89.2	-91.8	-0.88	139.1	2.52	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	113.2	2.19	0.03	Not required
	WLAN2.4G Ant 2		1.17	0	87	47.2	3.21				
	LTE Band 41	Bottom Face	1.347	0	89.2	-91.8	-0.88	246.4	2.40	0.02	Not required
	WLAN5G Ant 1		1.055	0	57	152.4	5.88				
	LTE Band 41	Bottom Face	1.347	0	89.2	-91.8	-0.88	139.0	2.36	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	109.1	2.07	0.03	Not required
	WLAN5G Ant 2		1.014	0	85	47	6.11				
	LTE Band 41	Bottom Face	1.347	0	89.2	-91.8	-0.88	137.4	1.67	0.02	Not required
	BT Ant 2		0.323	0	88.6	45.59	0.09				
	WLAN2.4G Ant 1	Bottom Face	1.019	0	46.8	153	1.47	115.3	1.34	0.01	Not required
	BT		0.323	0	88.6	45.59	0.09				
	LTE Band 41	Bottom Face	1.347	0	89.2	-91.8	-0.88	137.4	2.68	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				
	WLAN5G Ant 1	Bottom Face	1.055	0	57	152.4	5.88	111.5	2.39	0.03	Not required
	WLAN5G Ant 2+BT Ant 2		1.337	0	88.6	45.59	0.09				



Case	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
20	LTE Band 41	Edge 1	0.824	0	0	-104.2	-1.8	146.7	2.24	0.02	Not required
	WLAN5G Ant 2+BT Ant 2		1.417	0	0.8	42.4	3.61				



Test Engineer : Carter Jhuang Randy Lin and Lemon Su

14. Uncertainty Assessment

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

15. References

- [1] FCC 47 CFR Part 2 "Frequency Allocations and Radio Treaty Matters; General Rules and Regulations"
- [2] ANSI/IEEE Std. C95.1-1992, "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz", September 1992
- [3] IEEE Std. 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", Sep 2013
- [4] SPEAG DASY System Handbook
- [5] FCC KDB 447498 D01 v06, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", Oct 2015
- [6] FCC KDB 941225 D01 v03r01, "3G SAR MEAUREMENT PROCEDURES", Oct 2015
- [7] FCC KDB 941225 D05 v02r05, "SAR Evaluation Considerations for LTE Devices", Dec 2015
- [8] FCC KDB 941225 D05A v01r02, "Rel. 10 LTE SAR Test Guidance and KDB Inquiries", Oct 2015
- [9] FCC KDB 616217 D04 v01r02, "SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers", Oct 2015
- [10] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.
- [11] FCC KDB 865664 D02 v01r02, "RF Exposure Compliance Reporting and Documentation Considerations" Oct 2015.