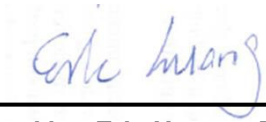
FCC SAR Test Report

APPLICANT	:	LC Future Center Limited Taiwan Branch
EQUIPMENT	:	Notebook
BRAND NAME	:	Lenovo
MODEL NAME	:	TP00086A
FCC ID	:	2AJN7-TP00086A
STANDARD	:	FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2013

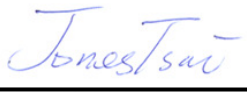
Equipment: AirPrime EM7455 and Intel 8265NGW tested inside of Lenovo Notebook Computer

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

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



Reviewed by: Eric Huang / Manager



Approved by: Jones Tsai / Manager

Testing Laboratory
1190

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

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA6N0822	Rev. 01	Initial issue of report	Jan. 23, 2017
FA6N0822	Rev. 02	1. Added power reduction description on page8 and page79. 2. Added system validation summary in appendix E. 3. Revised typo on page87.	Jan. 30, 2017

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **LC Future Center Limited Taiwan Branch, Notebook, TP00086A**, are as follows.

Equipment Class	Frequency Band	Highest SAR Summary Body (Separation 0mm) 1g SAR (W/kg)	Highest Simultaneous Transmission 1g SAR (W/kg)
Licensed	WCDMA II	1.20	1.59
	WCDMA IV	1.17	
	WCDMA V	1.15	
	LTE Band 4	1.08	
	LTE Band 7	1.19	
	LTE Band 12	1.16	
	LTE Band 13	1.20	
	LTE Band 25	1.20	
	LTE Band 26	1.13	
	LTE Band 41	1.15	
DTS	2.4GHz WLAN	0.78	1.57
NII	5GHz WLAN	1.19	1.59
DSS	Bluetooth	0.09	1.59
Date of Testing:		2016/11/20 ~ 2016/12/28	

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

2. Administration Data

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

Applicant	
Company Name	LC Future Center Limited Taiwan Branch
Address	7F., No.780, Bei'an Rd., Zhongshan Dist., Taipei City 104, Taiwan (R.O.C.)

Manufacturer	
Company Name	LC Future Center Limited Taiwan Branch
Address	7F., No.780, Bei'an Rd., Zhongshan Dist., Taipei City 104, Taiwan (R.O.C.)

3. Guidance Applied

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

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Notebook
Brand Name	Lenovo
Model Name	TP00086A
FCC ID	2AJN7-TP00086A
Integrated WWAN Module	Manufacturer: Sierra Wireles Brand Name: AirPrime Model Name: EM7455
Integrated WLAN Module	Brand Name: Intel Model Name: 8265NGW
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 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 41: 2496 MHz ~ 2690 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2472 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM 802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE/HS
EUT Stage	Production Unit

Remark:

1. For WWAN RF exposure evaluation is selected antenna vendor of “Amphenol” as the main tested and spot check antenna vendor of “Speedwire” to ensure both antenna vendors are compliant with the FCC limit
2. For WLAN RF exposure evaluation is selected antenna vendor of “Speedwire” as the main tested and spot check antenna vendor of “Amphenol” to ensure both antenna vendors are compliant with the FCC limit

WWAN Antenna information				
Antenna 1	Manufacturer	Amphenol	Max. Peak gain (dBi)	2.97
	P/N	LX-7845-16-000-C	Type	PIFA
Antenna 2	Manufacturer	Speedwire	Max. Peak gain (dBi)	2.94
	P/N	F.0G.ZV-0006-001-00	Type	PIFA

WLAN Antenna Information			
Antenna 1	Manufacturer	Amphenol	
	Antenna Type	Main:PIFA Antenna	Aux:PIFA Antenna
	Part number	LX7847-16-000-C	LX7848-16-000-C
	Max. Peak Gain (dBi)	WLAN(2.4G):-6.76 WLAN(5G):-1.84	WLAN(2.4G):-6.52 BT :-6.52 WLAN(5G):0.14
Antenna 2	Manufacturer	Speedwire	
	Antenna Type	Main:PIFA Antenna	Aux:PIFA Antenna
	Part number	F.0G.ZV-0006-003-00	F.0G.ZV-0006-004-00
	Max. Peak Gain (dBi)	WLAN(2.4G):1.5 WLAN(5G):-1.97	WLAN(2.4G):1.68 BT :1.68 WLAN(5G):-0.3

4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	2AJN7-TP00086A
Equipment Name	NOTEBOOK
Operating Frequency Range of each LTE transmission band	LTE Band 02: 1850 MHz ~ 1910 MHz LTE Band 04: 1710 MHz ~ 1755 MHz LTE Band 05: 824 MHz ~ 849 MHz LTE Band 07: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 41: 2496 MHz ~ 2690 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, and 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 3** Modulation | Channel bandwidth / Transmission bandwidth (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
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, power reduction activated by Proximity sensor and G-sensor. Power reduction will not be activated, if either sensor is not triggered
LTE Carrier Aggregation Combinations	Inter-Band and Intra-Band possible combinations as below page and the detail power verification please referred to page66.
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)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844

LTE Band 7								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510
M	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560

LTE Band 12								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

LTE Band 13				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	23205	779.5	23230	782
M	23230	782		
H	23255	784.5		

LTE Band 25												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26047	1850.7	26055	1851.5	26065	1852.5	26090	1855	26115	1857.5	26140	1860
M	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880
H	26683	1914.3	26675	1913.5	26665	1912.5	26640	1910	26615	1907.5	26590	1905

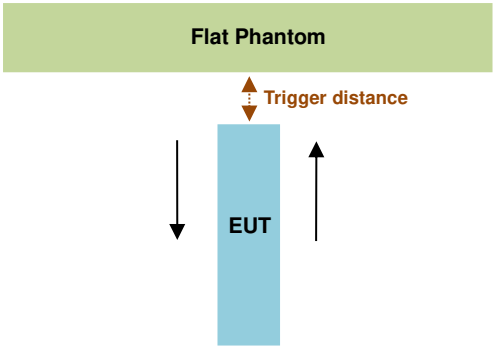
LTE Band 26										
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5

LTE Band 41								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	39675	2498.5	39700	2501	39725	2503.5	39750	2506
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

5. Proximity Sensor Triggering Test

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

Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed. The details are illustrated in the exhibit “P-Sensor operational description”, and the shortest triggering distances were reported and used for SAR assessment.
In the preliminary triggering distance testing, the tissue-equivalent medium for different frequency bands were used for verification; no other frequency bands tissue-equivalent medium was found to result in shortest triggering distance than that for 1900MHz, and the tissue-equivalent medium for 1900MHz was used for formal proximity sensor triggering testing.



Proximity Sensor Trigger Distance (mm)	
Position	Bottom of Laptop
Minimum	9

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

If a sensor is spatially offset from the antenna(s), it is necessary to verify sensor triggering for conditions where the antenna is next to the user but the sensor is laterally further away to ensure sensor coverage is sufficient for reducing the power to maintain compliance. For p-sensor coverage testing, the device is moved and “along the direction of maximum antenna and sensor offset”.
Illustrated in the internal photo exhibit, although the senor is spatially offset, there is no trigger condition where the antenna is next to the user but the sensor is laterally further away, therefore proximity sensor coverage testing is not required.
This procedure is not required because antenna and sensor are collocated and the peak SAR location is overlapping with the sensor.

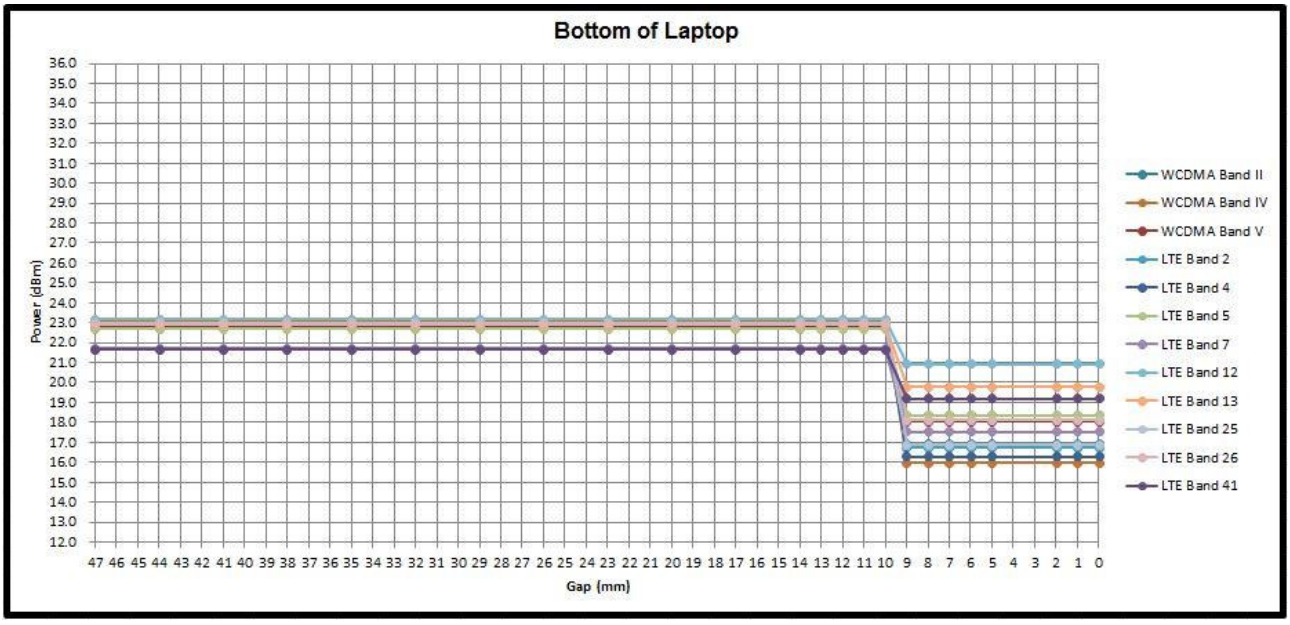
Proximity sensor power reduction

Exposure Position / wireless mode	Bottom of Laptop(1)
WCDMA Band II	6.5 dB
WCDMA Band IV	7.5 dB
WCDMA Band V	5.0 dB
LTE Band 2	6.5 dB
LTE Band 4	7.5 dB
LTE Band 5	5.0 dB
LTE Band 7	4.5 dB
LTE Band 12	2.5 dB
LTE Band 13	4.0 dB
LTE Band 25	6.5 dB
LTE Band 26	5.0 dB
LTE Band 41	3.5 dB

Remark:

1. (1): Reduced maximum limit applied by activation of proximity sensor and G-Sensor.
2. Power reduction is not applicable for WLAN and Bluetooth.
3. Tests were performed in accordance with KDB 616217 D04 section 6.1, 6.2, 6.3, 6.4 and 6.5 and compliant results are shown and described in exhibit "P-Sensor operational description
4. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance was performed:
   - Bottom of Laptop: 8 mm

<Sensor triggers distance V.S Measure power>



6. RF Exposure Limits

6.1 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.

6.2 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.

7. Specific Absorption Rate (SAR)

7.1 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.

7.2 SAR Definition

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

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

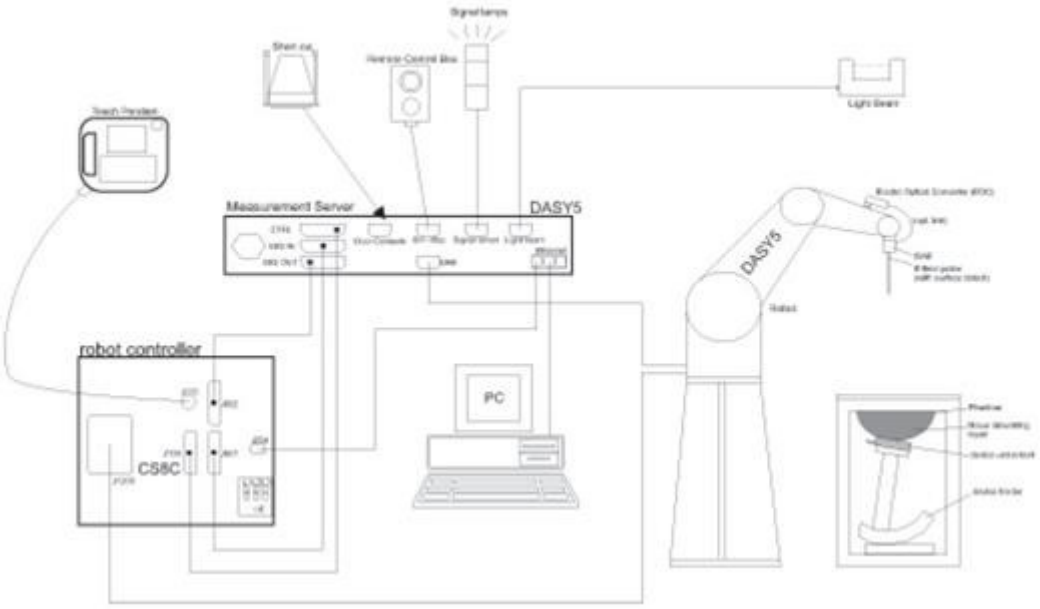
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

8. 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.

8.1 E-Field Probe

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

<ES3DV3 Probe>

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

<EX3DV4 Probe>

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

8.2 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.

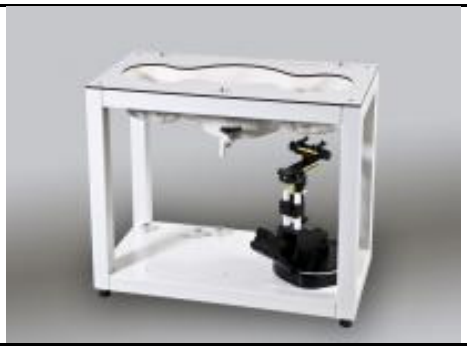
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

8.3 Phantom

<SAM Twin Phantom>

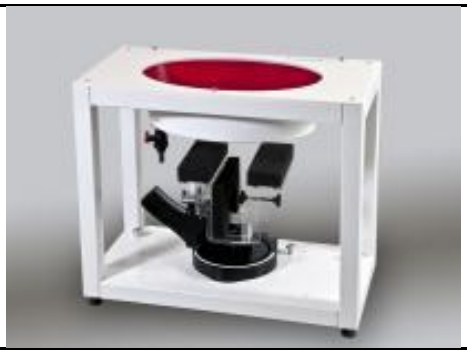
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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.

8.4 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

9. 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

9.1 Spatial Peak SAR Evaluation

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

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

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

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

9.2 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.

9.3 Area Scan

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

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

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

9.4 Zoom Scan

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

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

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

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

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

9.5 Volume Scan Procedures

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

9.6 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.

10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1012	May. 18, 2016	May. 17, 2017
SPEAG	835MHz System Validation Kit	D835V2	499	Mar. 21, 2016	Mar. 20, 2017
SPEAG	1750MHz System Validation Kit	D1750V2	1023	Jun. 23, 2016	Jun. 22, 2017
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Sep. 30, 2016	Sep. 29, 2017
SPEAG	2450MHz System Validation Kit	D2450V2	926	Jul. 25, 2016	Jul. 24, 2017
SPEAG	2600MHz System Validation Kit	D2600V2	1008	Aug. 30, 2016	Aug. 29, 2017
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Sep. 27, 2016	Sep. 26, 2017
SPEAG	Data Acquisition Electronics	DAE4	679	Jun. 13, 2016	Jun. 12, 2017
SPEAG	Data Acquisition Electronics	DAE4	1388	Oct. 10, 2016	Oct. 09, 2017
SPEAG	Data Acquisition Electronics	DAE3	495	May. 27, 2016	May. 26, 2017
SPEAG	Data Acquisition Electronics	DAE4	778	May. 12, 2016	May. 11, 2017
SPEAG	Dosimetric E-Field Probe	EX3DV4	3898	Jul. 11, 2016	Jul. 10, 2017
SPEAG	Dosimetric E-Field Probe	EX3DV4	3697	Oct. 25, 2016	Oct. 24, 2017
SPEAG	Dosimetric E-Field Probe	EX3DV4	3925	May. 26, 2016	May. 25, 2017
SPEAG	Dosimetric E-Field Probe	ES3DV3	3270	Aug. 26, 2016	Aug. 25, 2017
WonDer	Thermometer	WD-5015	TM642	Oct. 12, 2016	Oct. 11, 2017
WonDer	Thermometer	WD-5015	TM281	Oct. 12, 2016	Oct. 11, 2017
Wisewind	Thermometer	HTC-1	TM560	Oct. 12, 2016	Oct. 11, 2017
Wisewind	Thermometer	HTC-1	TM225	Oct. 12, 2016	Oct. 11, 2017
Anritsu	Radio Communication Analyzer	MT8820C	6201381760	May. 10, 2016	May. 09, 2017
Agilent	Wireless Communication Test Set	E5515C	MY50266977	May. 17, 2016	May. 16, 2017
R&S	BT Base Station	CBT32	100519	Jun. 03, 2016	Jun. 02, 2017
SPEAG	Device Holder	N/A	N/A	N/A	N/A
R&S	Signal Generator	SMF100A	101107	May. 19, 2016	May. 18, 2017
Agilent	ENA Network Analyzer	E5071C	MY46316648	Jan. 12, 2016	Jan. 11, 2017
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Jul. 19, 2016	Jul. 18, 2017
LINE SEIKI	Digital Thermometer	LKMelectronic	DTM3000SPEZIAL	Sep. 05, 2016	Sep. 04, 2017
Anritsu	Power Meter	ML2495A	1419002	May. 10, 2016	May. 09, 2017
Anritsu	Power Sensor	MA2411B	1339124	May. 10, 2016	May. 09, 2017
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jun. 21, 2016	Jun. 20, 2017
Mini-Circuits	Power Amplifier	ZVE-8G+	D120604	Mar. 16, 2016	Mar. 15, 2017
Mini-Circuits	Power Amplifier	ZHL-42W+	QA1344002	Mar. 16, 2016	Mar. 15, 2017
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.

11. System Verification

11.1 Tissue Simulating Liquids

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

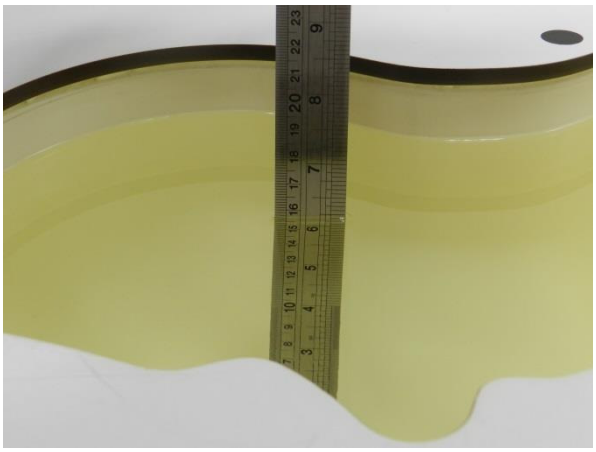


Fig 10.1Photo of Liquid Height for Head SAR

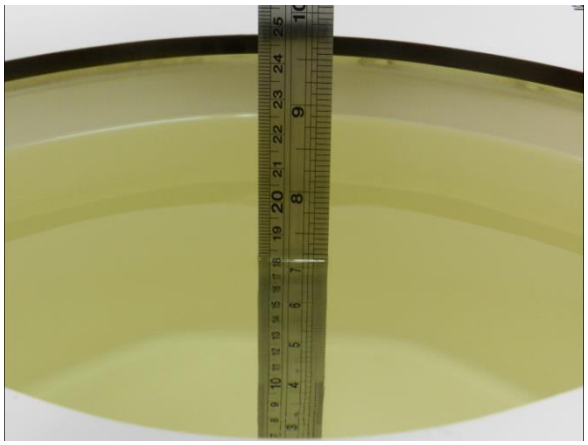


Fig 10.2 Photo of Liquid Height for Body SAR

11.2 Tissue Verification

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

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

Simulating Liquid for 5GHz, Manufactured by SPEAG

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

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	MSL	22.4	0.955	54.439	0.96	55.50	-0.52	-1.91	±5	2016/11/29
750	MSL	22.3	0.965	56.454	0.96	55.50	0.52	1.72	±5	2016/12/28
835	MSL	22.5	0.949	57.141	0.97	55.20	-2.16	3.52	±5	2016/11/28
835	MSL	22.3	0.952	56.293	0.97	55.20	-1.86	1.98	±5	2016/12/28
1750	MSL	22.5	1.478	55.944	1.49	53.40	-0.81	4.76	±5	2016/11/26
1900	MSL	22.8	1.546	55.371	1.52	53.30	1.71	3.89	±5	2016/11/25
2450	MSL	22.3	2.000	52.692	1.95	52.70	2.56	-0.02	±5	2016/11/20
2600	MSL	22.7	2.144	50.855	2.16	52.50	-0.74	-3.13	±5	2016/11/22
5250	MSL	22.6	5.529	47.115	5.36	48.95	3.15	-3.75	±5	2016/11/21
5600	MSL	22.3	5.997	46.503	5.77	48.50	3.93	-4.12	±5	2016/11/21
5750	MSL	22.3	6.207	46.247	5.94	48.28	4.49	-4.21	±5	2016/11/21

11.3 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 (%)
2016/11/29	750	MSL	250	D750V3-1012	ES3DV3 - SN3270	DAE4 Sn778	2.28	8.72	9.12	4.59
2016/12/28	750	MSL	250	D750V3-1012	EX3DV4 - SN3697	DAE4 Sn1388	2.33	8.72	9.32	6.88
2016/11/28	835	MSL	250	D835V2-499	ES3DV3 - SN3270	DAE4 Sn778	2.32	9.52	9.28	-2.52
2016/12/28	835	MSL	250	D835V2-499	EX3DV4 - SN3697	DAE4 Sn1388	2.39	9.52	9.56	0.42
2016/11/26	1750	MSL	250	D1750V2-1023	EX3DV4 - SN3925	DAE3 Sn495	8.90	36.40	35.60	-2.20
2016/11/25	1900	MSL	250	D1900V2-5d041	EX3DV4 - SN3925	DAE3 Sn495	9.13	38.80	36.52	-5.88
2016/11/20	2450	MSL	250	D2450V2-926	EX3DV4 - SN3697	DAE4 Sn1388	12.20	51.20	48.80	-4.69
2016/11/22	2600	MSL	250	D2600V2-1008	ES3DV3 - SN3270	DAE4 Sn778	14.20	55.20	56.80	2.90
2016/11/21	5250	MSL	100	D5GHzV2-1006	EX3DV4 - SN3898	DAE4 Sn679	7.47	75.50	74.70	-1.06
2016/11/21	5600	MSL	100	D5GHzV2-1006	EX3DV4 - SN3898	DAE4 Sn679	7.79	78.60	77.90	-0.89
2016/11/21	5750	MSL	100	D5GHzV2-1006	EX3DV4 - SN3898	DAE4 Sn679	7.79	74.60	77.90	4.42

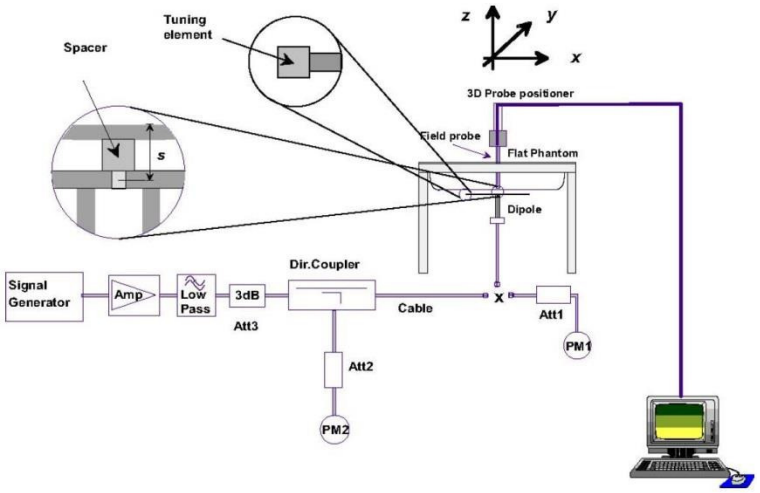


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

12. 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} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

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

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

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

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

Setup Configuration

HSUPA Setup Configuration:

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

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: 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 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

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

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

C.8.1.12 Fixed Reference Channel Definition H-Set 12

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

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

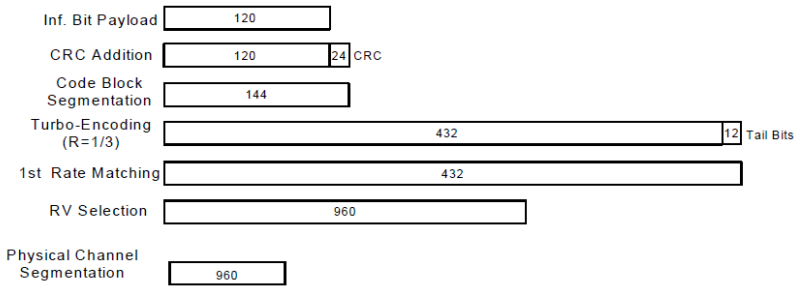


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

General Note:

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

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	22.90	22.93	22.92	24.00	22.79	22.77	23.09	24.00	22.77	22.78	22.69	24.00
3GPP Rel 6	HSDPA Subtest-1	22.14	22.24	22.16	24.00	22.05	22.00	22.30	24.00	22.00	22.15	22.26	24.00
3GPP Rel 6	HSDPA Subtest-2	22.10	22.09	22.06	24.00	22.11	22.05	22.27	24.00	22.01	22.15	22.20	24.00
3GPP Rel 6	HSDPA Subtest-3	21.61	21.58	21.56	23.50	21.59	21.55	21.76	23.50	21.53	21.64	21.70	23.50
3GPP Rel 6	HSDPA Subtest-4	21.60	21.59	21.58	23.50	21.61	22.04	21.70	23.50	21.52	21.64	21.68	23.50
3GPP Rel 8	DC-HSDPA Subtest-1	22.13	22.20	22.12	24.00	22.04	22.01	22.26	24.00	22.04	22.13	22.23	24.00
3GPP Rel 8	DC-HSDPA Subtest-2	22.06	22.08	22.05	24.00	22.09	22.02	22.25	24.00	22.05	22.12	22.16	24.00
3GPP Rel 8	DC-HSDPA Subtest-3	21.59	21.55	21.58	23.50	21.56	21.53	21.75	23.50	21.51	21.54	21.60	23.50
3GPP Rel 8	DC-HSDPA Subtest-4	21.60	21.58	21.57	23.50	21.56	21.53	21.74	23.50	21.51	21.60	21.56	23.50
3GPP Rel 6	HSUPA Subtest-1	22.10	22.23	22.20	24.00	22.00	22.04	22.21	24.00	22.06	22.14	22.21	24.00
3GPP Rel 6	HSUPA Subtest-2	20.75	20.82	20.80	22.00	20.61	20.68	20.85	22.00	20.40	20.49	20.58	22.00
3GPP Rel 6	HSUPA Subtest-3	21.06	21.13	21.11	23.00	21.01	21.06	21.23	23.00	21.01	21.04	21.07	23.00
3GPP Rel 6	HSUPA Subtest-4	21.61	21.57	21.63	22.00	21.41	21.47	21.64	22.00	21.31	21.28	21.35	22.00
3GPP Rel 6	HSUPA Subtest-5	22.08	22.14	22.10	24.00	22.01	22.05	22.29	24.00	22.03	22.13	22.21	24.00

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	16.84	16.90	16.88	17.50	15.75	15.74	15.95	16.50	18.00	18.05	18.01	19.00
3GPP Rel 6	HSDPA Subtest-1	15.79	15.90	15.95	17.00	14.84	14.66	14.77	16.00	17.05	17.00	17.02	18.50
3GPP Rel 6	HSDPA Subtest-2	15.79	15.91	15.95	17.00	14.77	14.66	14.79	16.00	17.05	17.00	17.01	18.50
3GPP Rel 6	HSDPA Subtest-3	15.27	15.40	15.45	16.50	14.11	14.15	14.26	15.50	16.52	16.51	16.50	18.00
3GPP Rel 6	HSDPA Subtest-4	15.27	15.40	15.43	16.50	14.25	14.14	14.27	15.50	16.52	16.56	16.50	18.00
3GPP Rel 8	DC-HSDPA Subtest-1	15.74	15.87	15.91	17.00	14.80	14.56	14.76	16.00	17.01	16.96	17.01	18.50
3GPP Rel 8	DC-HSDPA Subtest-2	15.77	15.91	15.94	17.00	14.76	14.57	14.70	16.00	16.99	16.91	16.92	18.50
3GPP Rel 8	DC-HSDPA Subtest-3	15.24	15.39	15.43	16.50	14.10	14.09	14.24	15.50	16.48	16.42	16.44	18.00
3GPP Rel 8	DC-HSDPA Subtest-4	15.25	15.30	15.37	16.50	14.19	14.10	14.26	15.50	16.44	16.54	16.45	18.00
3GPP Rel 6	HSUPA Subtest-1	15.42	15.50	15.68	17.00	14.41	14.36	14.45	16.00	16.78	16.70	16.72	18.50
3GPP Rel 6	HSUPA Subtest-2	14.82	14.80	15.00	15.00	13.87	13.68	13.84	14.00	16.08	15.92	15.87	16.50
3GPP Rel 6	HSUPA Subtest-3	14.53	14.49	14.56	16.00	13.76	13.65	13.70	15.00	15.71	15.53	15.60	17.50
3GPP Rel 6	HSUPA Subtest-4	14.92	15.00	14.96	15.00	14.00	13.95	13.98	14.00	16.00	16.10	15.89	16.50
3GPP Rel 6	HSUPA Subtest-5	15.80	15.90	16.00	17.00	14.80	14.70	14.90	16.00	17.10	17.00	17.02	18.50

<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B12 / B26 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE band 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 ≤ the larger band to qualify for the SAR test exclusion
    b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

Default Power Mode

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	22.85	22.89	22.99	24	0
20	QPSK	1	49	22.73	22.86	22.80		
20	QPSK	1	99	22.60	22.75	22.64		
20	QPSK	50	0	21.93	21.94	21.95	23	1
20	QPSK	50	24	21.83	21.93	21.88		
20	QPSK	50	50	21.82	21.90	21.86		
20	QPSK	100	0	21.83	21.92	21.93		
20	16QAM	1	0	22.14	22.14	22.21	23	1
20	16QAM	1	49	22.01	22.19	22.06		
20	16QAM	1	99	21.90	22.05	21.93		
20	16QAM	50	0	20.95	20.92	20.86	22	2
20	16QAM	50	24	20.87	20.97	20.83		
20	16QAM	50	50	20.84	20.94	20.81		
20	16QAM	100	0	20.84	20.92	20.78		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.83	22.82	22.79	24	0
15	QPSK	1	37	22.79	22.90	22.74		
15	QPSK	1	74	22.78	22.79	22.82		
15	QPSK	36	0	21.87	21.83	21.77	23	1
15	QPSK	36	20	21.87	21.95	21.90		
15	QPSK	36	39	21.77	21.80	21.85		
15	QPSK	75	0	21.86	21.84	21.84		
15	16QAM	1	0	22.17	22.10	22.05	23	1
15	16QAM	1	37	22.05	22.17	21.97		
15	16QAM	1	74	22.03	22.16	22.05		
15	16QAM	36	0	20.85	20.90	20.76	22	2
15	16QAM	36	20	20.87	21.02	20.92		
15	16QAM	36	39	20.73	20.93	20.88		
15	16QAM	75	0	20.87	20.89	20.86		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.98	22.87	22.94	24	0
10	QPSK	1	25	22.78	22.91	22.88		
10	QPSK	1	49	22.95	22.86	22.81		
10	QPSK	25	0	22.01	21.88	21.84	23	1
10	QPSK	25	12	21.95	21.94	21.71		
10	QPSK	25	25	21.87	21.88	21.79		
10	QPSK	50	0	21.93	21.95	21.82		
10	16QAM	1	0	22.28	22.15	22.17	23	1
10	16QAM	1	25	22.08	22.17	21.96		
10	16QAM	1	49	22.18	22.13	22.10		
10	16QAM	25	0	20.99	20.90	20.86	22	2
10	16QAM	25	12	20.92	20.92	20.73		
10	16QAM	25	25	20.85	20.91	20.76		
10	16QAM	50	0	20.89	20.91	20.82		

Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.86	22.86	22.78	24	0
5	QPSK	1	12	22.86	22.86	22.70		
5	QPSK	1	24	22.74	22.65	22.58		
5	QPSK	12	0	21.80	21.80	21.62	23	1
5	QPSK	12	7	21.87	21.89	21.68		
5	QPSK	12	13	21.77	21.66	21.61		
5	QPSK	25	0	21.83	21.88	21.65		
5	16QAM	1	0	22.11	22.16	22.06	23	1
5	16QAM	1	12	22.17	22.15	22.05		
5	16QAM	1	24	22.07	21.95	21.91		
5	16QAM	12	0	20.81	20.83	20.68	22	2
5	16QAM	12	7	20.84	20.89	20.70		
5	16QAM	12	13	20.80	20.76	20.63		
5	16QAM	25	0	20.80	20.88	20.59		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.73	22.75	22.69	24	0
3	QPSK	1	8	22.78	22.81	22.57		
3	QPSK	1	14	22.63	22.65	22.53		
3	QPSK	8	0	21.82	21.77	21.57	23	1
3	QPSK	8	4	21.84	21.81	21.63		
3	QPSK	8	7	21.80	21.73	21.61		
3	QPSK	15	0	21.82	21.76	21.61		
3	16QAM	1	0	21.97	21.91	21.87	23	1
3	16QAM	1	8	22.13	22.06	21.96		
3	16QAM	1	14	21.86	21.74	21.80		
3	16QAM	8	0	20.88	20.84	20.63	22	2
3	16QAM	8	4	20.92	20.86	20.66		
3	16QAM	8	7	20.85	20.80	20.62		
3	16QAM	15	0	20.84	20.75	20.62		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.75	22.77	22.73	24	0
1.4	QPSK	1	3	22.75	22.83	22.67		
1.4	QPSK	1	5	22.68	22.65	22.62		
1.4	QPSK	3	0	22.68	22.74	22.59		
1.4	QPSK	3	1	22.78	22.81	22.65		
1.4	QPSK	3	3	22.69	22.80	22.60		
1.4	QPSK	6	0	21.69	21.79	21.61	23	1
1.4	16QAM	1	0	22.03	22.06	21.97	23	1
1.4	16QAM	1	3	22.04	22.13	22.01		
1.4	16QAM	1	5	22.01	22.00	21.92		
1.4	16QAM	3	0	21.79	21.83	21.67		
1.4	16QAM	3	1	21.80	21.84	21.65		
1.4	16QAM	3	3	21.77	21.85	21.67		
1.4	16QAM	6	0	20.77	20.88	20.68	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	22.74	22.91	22.89	24	0
20	QPSK	1	49	22.58	22.80	22.87		
20	QPSK	1	99	22.50	22.56	22.77		
20	QPSK	50	0	21.74	21.88	21.87	23	1
20	QPSK	50	24	21.71	21.79	21.84		
20	QPSK	50	50	21.62	21.76	21.82		
20	QPSK	100	0	21.73	21.90	21.89		
20	16QAM	1	0	22.07	22.00	22.22	23	1
20	16QAM	1	49	21.97	22.13	22.17		
20	16QAM	1	99	21.77	21.83	22.04		
20	16QAM	50	0	20.67	20.75	20.89	22	2
20	16QAM	50	24	20.70	20.80	20.92		
20	16QAM	50	50	20.59	20.77	20.80		
20	16QAM	100	0	20.72	20.76	20.89		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.56	22.77	22.82	24	0
15	QPSK	1	37	22.41	22.71	22.71		
15	QPSK	1	74	22.79	22.72	22.56		
15	QPSK	36	0	21.74	21.71	21.71	23	1
15	QPSK	36	20	21.79	21.91	21.85		
15	QPSK	36	39	21.64	21.80	21.64		
15	QPSK	75	0	21.67	21.85	21.72		
15	16QAM	1	0	21.80	22.01	22.08	23	1
15	16QAM	1	37	21.83	22.01	21.94		
15	16QAM	1	74	21.98	21.91	21.85		
15	16QAM	36	0	20.66	20.77	20.67	22	2
15	16QAM	36	20	20.64	20.94	20.79		
15	16QAM	36	39	20.62	20.74	20.63		
15	16QAM	75	0	20.63	20.89	20.77		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	22.88	22.86	22.74	24	0
10	QPSK	1	25	22.84	22.69	22.60		
10	QPSK	1	49	22.66	22.62	22.55		
10	QPSK	25	0	21.89	21.83	21.66	23	1
10	QPSK	25	12	21.71	21.70	21.62		
10	QPSK	25	25	21.68	21.69	21.57		
10	QPSK	50	0	21.73	21.75	21.62		
10	16QAM	1	0	22.04	22.09	22.15	23	1
10	16QAM	1	25	21.92	21.85	21.76		
10	16QAM	1	49	22.06	21.97	21.82		
10	16QAM	25	0	20.85	20.88	20.77	22	2
10	16QAM	25	12	20.66	20.84	20.70		
10	16QAM	25	25	20.78	20.78	20.60		
10	16QAM	50	0	20.81	20.77	20.63		

Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	22.87	22.81	22.66	24	0
5	QPSK	1	12	22.64	22.70	22.83		
5	QPSK	1	24	22.66	22.51	22.65		
5	QPSK	12	0	21.65	21.76	21.72	23	1
5	QPSK	12	7	21.63	21.57	21.74		
5	QPSK	12	13	21.52	21.43	21.64		
5	QPSK	25	0	21.57	21.51	21.78		
5	16QAM	1	0	22.07	21.96	21.91	23	1
5	16QAM	1	12	22.10	21.95	22.17		
5	16QAM	1	24	21.94	21.73	21.76		
5	16QAM	12	0	20.71	20.72	20.69	22	2
5	16QAM	12	7	20.68	20.73	20.79		
5	16QAM	12	13	20.64	20.45	20.62		
5	16QAM	25	0	20.60	20.59	20.68		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	22.64	22.63	22.65	24	0
3	QPSK	1	8	22.67	22.52	22.52		
3	QPSK	1	14	22.64	22.46	22.50		
3	QPSK	8	0	21.49	21.51	21.63	23	1
3	QPSK	8	4	21.68	21.44	21.55		
3	QPSK	8	7	21.56	21.51	21.55		
3	QPSK	15	0	21.70	21.54	21.55		
3	16QAM	1	0	21.77	21.85	21.84	23	1
3	16QAM	1	8	21.88	21.83	21.82		
3	16QAM	1	14	21.71	21.81	21.73		
3	16QAM	8	0	20.70	20.75	20.55	22	2
3	16QAM	8	4	20.67	20.62	20.60		
3	16QAM	8	7	20.65	20.50	20.42		
3	16QAM	15	0	20.69	20.59	20.41		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	22.78	22.77	22.66	24	0
1.4	QPSK	1	3	22.78	22.62	22.58		
1.4	QPSK	1	5	22.73	22.46	22.53		
1.4	QPSK	3	0	22.60	22.49	22.51		
1.4	QPSK	3	1	22.62	22.67	22.68		
1.4	QPSK	3	3	22.61	22.64	22.51		
1.4	QPSK	6	0	21.63	21.65	21.37	23	1
1.4	16QAM	1	0	22.08	21.95	21.79	23	1
1.4	16QAM	1	3	22.01	21.84	22.01		
1.4	16QAM	1	5	21.79	21.74	21.72		
1.4	16QAM	3	0	21.62	21.57	21.57		
1.4	16QAM	3	1	21.65	21.52	21.46		
1.4	16QAM	3	3	21.71	21.62	21.61		
1.4	16QAM	6	0	20.57	20.55	20.56	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		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	22.66	22.69	22.68	24	0
10	QPSK	1	25	22.62	22.56	22.65		
10	QPSK	1	49	22.40	22.43	22.54		
10	QPSK	25	0	21.50	21.51	21.47	23	1
10	QPSK	25	12	21.49	21.45	21.46		
10	QPSK	25	25	21.37	21.41	21.45		
10	QPSK	50	0	21.50	21.51	21.44		
10	16QAM	1	0	21.90	21.76	21.80	23	1
10	16QAM	1	25	21.77	21.76	21.86		
10	16QAM	1	49	21.70	21.69	21.78		
10	16QAM	25	0	20.53	20.43	20.44	22	2
10	16QAM	25	12	20.53	20.46	20.47		
10	16QAM	25	25	20.43	20.43	20.56		
10	16QAM	50	0	20.52	20.40	20.47		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.54	22.54	22.49	24	0
5	QPSK	1	12	22.40	22.50	22.43		
5	QPSK	1	24	22.52	22.52	22.41		
5	QPSK	12	0	21.40	21.46	21.44	23	1
5	QPSK	12	7	21.41	21.50	21.49		
5	QPSK	12	13	21.37	21.41	21.37		
5	QPSK	25	0	21.49	21.53	21.48		
5	16QAM	1	0	21.75	21.81	21.72	23	1
5	16QAM	1	12	21.81	21.86	21.80		
5	16QAM	1	24	21.70	21.81	21.64		
5	16QAM	12	0	20.47	20.50	20.56	22	2
5	16QAM	12	7	20.45	20.55	20.48		
5	16QAM	12	13	20.48	20.53	20.53		
5	16QAM	25	0	20.45	20.50	20.44		
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.39	22.50	22.37	24	0
3	QPSK	1	8	22.36	22.55	22.51		
3	QPSK	1	14	22.34	22.49	22.39		
3	QPSK	8	0	21.28	21.45	21.50	23	1
3	QPSK	8	4	21.46	21.56	21.46		
3	QPSK	8	7	21.31	21.50	21.40		
3	QPSK	15	0	21.44	21.42	21.32		
3	16QAM	1	0	21.32	21.39	21.34	23	1
3	16QAM	1	8	21.44	21.46	21.33		
3	16QAM	1	14	21.32	21.52	21.37		
3	16QAM	8	0	20.17	20.28	20.26	22	2
3	16QAM	8	4	20.17	20.31	20.23		
3	16QAM	8	7	20.18	20.28	20.21		
3	16QAM	15	0	20.11	20.16	20.07		

Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.47	22.46	22.51	24	0
1.4	QPSK	1	3	22.47	22.57	22.51		
1.4	QPSK	1	5	22.38	22.52	22.34		
1.4	QPSK	3	0	22.36	22.36	22.48		
1.4	QPSK	3	1	22.39	22.46	22.47		
1.4	QPSK	3	3	22.42	22.41	22.44		
1.4	QPSK	6	0	21.28	21.41	21.30	23	1
1.4	16QAM	1	0	21.71	21.81	21.73	23	1
1.4	16QAM	1	3	21.67	21.75	21.79		
1.4	16QAM	1	5	21.76	21.91	21.72		
1.4	16QAM	3	0	21.35	21.46	21.43		
1.4	16QAM	3	1	21.45	21.50	21.46		
1.4	16QAM	3	3	21.44	21.52	21.51		
1.4	16QAM	6	0	20.39	20.49	20.53	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	21.49	21.71	21.36	23	0
20	QPSK	1	49	21.42	21.71	21.34		
20	QPSK	1	99	21.48	21.49	21.27		
20	QPSK	50	0	20.55	20.74	20.39	22	1
20	QPSK	50	24	20.46	20.73	20.38		
20	QPSK	50	50	20.54	20.66	20.33		
20	QPSK	100	0	20.46	20.68	20.37		
20	16QAM	1	0	20.65	20.86	20.57	22	1
20	16QAM	1	49	20.64	20.97	20.62		
20	16QAM	1	99	20.74	20.76	20.51		
20	16QAM	50	0	19.48	19.71	19.25	21	2
20	16QAM	50	24	19.43	19.81	19.38		
20	16QAM	50	50	19.53	19.70	19.37		
20	16QAM	100	0	19.51	19.72	19.41		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	21.41	21.57	21.22	23	0
15	QPSK	1	37	21.63	21.52	21.44		
15	QPSK	1	74	21.44	21.40	21.14		
15	QPSK	36	0	20.54	20.77	20.25	22	1
15	QPSK	36	20	20.70	20.73	20.36		
15	QPSK	36	39	20.61	20.55	20.23		
15	QPSK	75	0	20.62	20.67	20.33		
15	16QAM	1	0	20.65	20.99	20.54	22	1
15	16QAM	1	37	20.96	20.97	20.68		
15	16QAM	1	74	20.71	20.68	20.67		
15	16QAM	36	0	19.57	19.78	19.31	21	2
15	16QAM	36	20	19.77	19.72	19.42		
15	16QAM	36	39	19.62	19.58	19.35		
15	16QAM	75	0	19.61	19.60	19.36		
Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	21.43	21.49	21.18	23	0
10	QPSK	1	25	21.55	21.62	21.39		
10	QPSK	1	49	21.31	21.34	21.15		
10	QPSK	25	0	20.35	20.51	20.21	22	1
10	QPSK	25	12	20.46	20.58	20.36		
10	QPSK	25	25	20.35	20.45	20.20		
10	QPSK	50	0	20.42	20.49	20.24		
10	16QAM	1	0	20.76	20.90	20.55	22	1
10	16QAM	1	25	20.72	20.91	20.66		
10	16QAM	1	49	20.65	20.65	20.39		
10	16QAM	25	0	19.44	19.55	19.20	21	2
10	16QAM	25	12	19.42	19.52	19.30		
10	16QAM	25	25	19.30	19.48	19.26		
10	16QAM	50	0	19.43	19.45	19.21		

Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	21.41	21.48	21.27	23	0
5	QPSK	1	12	21.39	21.56	21.23		
5	QPSK	1	24	21.39	21.51	21.20		
5	QPSK	12	0	20.26	20.47	20.23	22	1
5	QPSK	12	7	20.36	20.48	20.32		
5	QPSK	12	13	20.34	20.52	20.26		
5	QPSK	25	0	20.34	20.49	20.27		
5	16QAM	1	0	20.65	20.83	20.56	22	1
5	16QAM	1	12	20.77	20.87	20.71		
5	16QAM	1	24	20.63	20.70	20.53		
5	16QAM	12	0	19.36	19.59	19.36	21	2
5	16QAM	12	7	19.39	19.55	19.33		
5	16QAM	12	13	19.36	19.52	19.36		
5	16QAM	25	0	19.39	19.56	19.27		

<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	23.16	23.18	23.11	24	0
10	QPSK	1	25	23.15	23.07	23.10		
10	QPSK	1	49	22.96	23.09	22.96		
10	QPSK	25	0	22.11	22.12	21.89	23	1
10	QPSK	25	12	22.10	21.94	21.88		
10	QPSK	25	25	21.97	21.84	21.88		
10	QPSK	50	0	22.02	22.03	21.95		
10	16QAM	1	0	22.32	22.30	22.32	23	1
10	16QAM	1	25	22.38	22.36	22.28		
10	16QAM	1	49	22.24	22.28	22.26		
10	16QAM	25	0	21.02	20.99	20.91	22	2
10	16QAM	25	12	21.09	20.96	20.91		
10	16QAM	25	25	20.98	20.90	20.91		
10	16QAM	50	0	21.01	20.95	20.95		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	22.84	23.00	22.69	24	0
5	QPSK	1	12	23.05	22.99	22.91		
5	QPSK	1	24	22.84	22.86	22.58		
5	QPSK	12	0	21.97	22.21	21.73	23	1
5	QPSK	12	7	22.18	22.15	21.86		
5	QPSK	12	13	22.02	22.03	21.71		
5	QPSK	25	0	22.02	22.09	21.76		
5	16QAM	1	0	22.13	22.47	22.01	23	1
5	16QAM	1	12	22.40	22.42	22.14		
5	16QAM	1	24	22.17	22.12	22.10		
5	16QAM	12	0	21.04	21.19	20.72	22	2
5	16QAM	12	7	21.20	21.16	20.87		
5	16QAM	12	13	21.04	21.00	20.75		
5	16QAM	25	0	21.08	21.10	20.79		
Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	22.87	22.97	22.62	24	0
3	QPSK	1	8	22.97	23.05	22.84		
3	QPSK	1	14	22.80	22.77	22.63		
3	QPSK	8	0	21.81	21.98	21.61	23	1
3	QPSK	8	4	21.91	21.99	21.76		
3	QPSK	8	7	21.75	21.92	21.69		
3	QPSK	15	0	21.84	21.95	21.71		
3	16QAM	1	0	22.18	22.31	21.97	23	1
3	16QAM	1	8	22.19	22.33	22.08		
3	16QAM	1	14	22.06	22.09	21.87		
3	16QAM	8	0	20.88	21.01	20.64	22	2
3	16QAM	8	4	20.92	20.98	20.78		
3	16QAM	8	7	20.75	20.92	20.71		
3	16QAM	15	0	20.86	20.94	20.71		

Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	22.85	22.97	22.72	24	0
1.4	QPSK	1	3	22.80	22.96	22.73		
1.4	QPSK	1	5	22.80	22.91	22.67		
1.4	QPSK	3	0	22.16	22.35	22.11		
1.4	QPSK	3	1	22.23	22.37	22.19		
1.4	QPSK	3	3	22.15	22.32	22.11		
1.4	QPSK	6	0	21.78	21.93	21.73	23	1
1.4	16QAM	1	0	22.15	22.30	22.04	23	1
1.4	16QAM	1	3	22.18	22.32	22.18		
1.4	16QAM	1	5	22.10	22.19	22.02		
1.4	16QAM	3	0	21.26	21.39	21.19		
1.4	16QAM	3	1	21.27	21.39	21.19		
1.4	16QAM	3	3	21.18	21.37	21.19		
1.4	16QAM	6	0	20.80	20.96	20.75	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		22.88		24	0
10	QPSK	1	25		22.86			
10	QPSK	1	49		22.60			
10	QPSK	25	0		21.70		23	1
10	QPSK	25	12		21.67			
10	QPSK	25	25		21.63			
10	QPSK	50	0		21.76			
10	16QAM	1	0		21.82		23	1
10	16QAM	1	25		22.12			
10	16QAM	1	49		21.95			
10	16QAM	25	0		20.72		22	2
10	16QAM	25	12		20.70			
10	16QAM	25	25		20.55			
10	16QAM	50	0		20.71			
Channel				23205	23230	23255	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	22.49	22.61	22.67	24	0
5	QPSK	1	12	22.78	22.57	22.62		
5	QPSK	1	24	22.73	22.54	22.82		
5	QPSK	12	0	21.67	21.60	21.60	23	1
5	QPSK	12	7	21.69	21.63	21.72		
5	QPSK	12	13	21.72	21.48	21.70		
5	QPSK	25	0	21.72	21.58	21.61		
5	16QAM	1	0	21.94	21.87	21.93	23	1
5	16QAM	1	12	22.09	21.92	22.02		
5	16QAM	1	24	22.02	21.72	22.09		
5	16QAM	12	0	20.64	20.57	20.62	22	2
5	16QAM	12	7	20.71	20.59	20.71		
5	16QAM	12	13	20.71	20.60	20.73		
5	16QAM	25	0	20.84	20.65	20.59		

<LTE Band 25>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				26140	26340	26590		
Frequency (MHz)				1860	1880	1905		
20	QPSK	1	0	22.98	23.01	22.98	24	0
20	QPSK	1	49	22.81	22.85	22.84		
20	QPSK	1	99	22.73	22.63	22.83		
20	QPSK	50	0	21.93	21.92	21.98	23	1
20	QPSK	50	24	21.90	21.91	21.91		
20	QPSK	50	50	21.92	21.85	21.84		
20	QPSK	100	0	21.85	21.96	21.97		
20	16QAM	1	0	22.25	22.33	22.29	23	1
20	16QAM	1	49	22.16	22.28	22.19		
20	16QAM	1	99	22.04	21.98	22.12		
20	16QAM	50	0	20.87	20.86	20.95	22	2
20	16QAM	50	24	20.87	20.96	20.93		
20	16QAM	50	50	20.89	20.88	20.88		
20	16QAM	100	0	20.91	20.96	20.99		
Channel				26115	26340	26615	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1907.5		
15	QPSK	1	0	22.66	22.72	22.76	24	0
15	QPSK	1	37	22.87	22.61	22.91		
15	QPSK	1	74	22.67	22.72	22.79		
15	QPSK	36	0	21.60	21.68	21.67	23	1
15	QPSK	36	20	21.80	21.83	21.77		
15	QPSK	36	39	21.78	21.79	21.79		
15	QPSK	75	0	21.54	21.65	21.72		
15	16QAM	1	0	21.91	21.95	22.06	23	1
15	16QAM	1	37	21.96	21.93	22.10		
15	16QAM	1	74	22.07	21.88	22.02		
15	16QAM	36	0	20.54	20.60	20.83	22	2
15	16QAM	36	20	20.87	20.63	20.82		
15	16QAM	36	39	20.77	20.66	20.76		
15	16QAM	75	0	20.70	20.79	20.74		
Channel				26090	26340	26640	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1910		
10	QPSK	1	0	22.72	22.68	22.61	24	0
10	QPSK	1	25	22.48	22.50	22.58		
10	QPSK	1	49	22.43	22.74	22.61		
10	QPSK	25	0	21.53	21.69	21.49	23	1
10	QPSK	25	12	21.51	21.75	21.49		
10	QPSK	25	25	21.49	21.58	21.59		
10	QPSK	50	0	21.51	21.77	21.57		
10	16QAM	1	0	21.99	21.98	21.94	23	1
10	16QAM	1	25	21.79	21.81	21.88		
10	16QAM	1	49	21.94	21.89	21.89		
10	16QAM	25	0	20.55	20.59	20.44	22	2
10	16QAM	25	12	20.49	20.58	20.69		
10	16QAM	25	25	20.45	20.68	20.54		
10	16QAM	50	0	20.52	20.70	20.57		

Channel				26065	26340	26665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1912.5		
5	QPSK	1	0	22.57	22.63	22.70	24	0
5	QPSK	1	12	22.40	22.65	22.72		
5	QPSK	1	24	22.42	22.45	22.53		
5	QPSK	12	0	21.59	21.69	21.52	23	1
5	QPSK	12	7	21.53	21.49	21.53		
5	QPSK	12	13	21.49	21.48	21.64		
5	QPSK	25	0	21.50	21.53	21.60		
5	16QAM	1	0	21.76	21.85	21.82	23	1
5	16QAM	1	12	21.64	21.77	21.89		
5	16QAM	1	24	21.68	21.88	21.72		
5	16QAM	12	0	20.56	20.65	20.55	22	2
5	16QAM	12	7	20.68	20.63	20.58		
5	16QAM	12	13	20.48	20.65	20.69		
5	16QAM	25	0	20.55	20.56	20.66		
Channel				26055	26340	26675	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1913.5		
3	QPSK	1	0	22.61	22.69	22.48	24	0
3	QPSK	1	8	22.46	22.43	22.52		
3	QPSK	1	14	22.43	22.50	22.43		
3	QPSK	8	0	21.81	21.60	21.35	23	1
3	QPSK	8	4	21.90	21.61	21.58		
3	QPSK	8	7	21.76	21.48	21.39		
3	QPSK	15	0	21.85	21.44	21.56		
3	16QAM	1	0	21.82	21.82	21.63	23	1
3	16QAM	1	8	21.74	21.81	21.64		
3	16QAM	1	14	21.81	21.70	21.57		
3	16QAM	8	0	20.64	20.55	20.49	22	2
3	16QAM	8	4	20.61	20.54	20.50		
3	16QAM	8	7	20.67	20.54	20.39		
3	16QAM	15	0	20.47	20.51	20.52		
Channel				26047	26340	26683	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1914.3		
1.4	QPSK	1	0	22.57	22.48	22.38	24	0
1.4	QPSK	1	3	22.37	22.58	22.46		
1.4	QPSK	1	5	22.31	22.44	22.40		
1.4	QPSK	3	0	22.43	22.47	22.48		
1.4	QPSK	3	1	22.42	22.67	22.50		
1.4	QPSK	3	3	22.48	22.47	22.30		
1.4	QPSK	6	0	21.29	21.45	21.37	23	1
1.4	16QAM	1	0	21.87	21.83	21.73	23	1
1.4	16QAM	1	3	21.73	21.63	21.79		
1.4	16QAM	1	5	21.63	21.72	21.64		
1.4	16QAM	3	0	21.44	21.59	21.50		
1.4	16QAM	3	1	21.53	21.63	21.61		
1.4	16QAM	3	3	21.45	21.46	21.52		
1.4	16QAM	6	0	20.57	20.49	20.47	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		
Frequency (MHz)				821.5	831.5	841.5		
15	QPSK	1	0	22.91	22.93	22.92	24	0
15	QPSK	1	37	22.85	22.65	22.87		
15	QPSK	1	74	22.76	22.86	22.90		
15	QPSK	36	0	21.87	21.96	21.94	23	1
15	QPSK	36	20	21.85	21.83	21.83		
15	QPSK	36	39	21.80	21.70	21.83		
15	QPSK	75	0	21.87	21.92	21.91		
15	16QAM	1	0	22.16	22.12	22.04	23	1
15	16QAM	1	37	22.08	22.05	22.10		
15	16QAM	1	74	21.94	22.05	22.16		
15	16QAM	36	0	20.88	20.70	20.82	22	2
15	16QAM	36	20	20.89	20.77	20.82		
15	16QAM	36	39	20.70	20.68	20.76		
15	16QAM	75	0	20.83	20.81	20.95		
Channel				26740	26865	26990	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	22.87	22.62	22.67	24	0
10	QPSK	1	25	22.81	22.50	22.62		
10	QPSK	1	49	22.65	22.40	22.41		
10	QPSK	25	0	21.78	21.40	21.42	23	1
10	QPSK	25	12	21.65	21.43	21.39		
10	QPSK	25	25	21.71	21.33	21.40		
10	QPSK	50	0	21.74	21.45	21.50		
10	16QAM	1	0	22.25	21.93	21.96	23	1
10	16QAM	1	25	22.08	21.73	21.86		
10	16QAM	1	49	22.00	21.70	21.74		
10	16QAM	25	0	20.76	20.40	20.42	22	2
10	16QAM	25	12	20.64	20.41	20.37		
10	16QAM	25	25	20.66	20.34	20.35		
10	16QAM	50	0	20.67	20.39	20.45		
Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	22.76	22.65	22.69	24	0
5	QPSK	1	12	22.67	22.55	22.71		
5	QPSK	1	24	22.76	22.58	22.68		
5	QPSK	12	0	21.79	21.42	21.58	23	1
5	QPSK	12	7	21.72	21.57	21.69		
5	QPSK	12	13	21.62	21.49	21.58		
5	QPSK	25	0	21.75	21.52	21.70		
5	16QAM	1	0	22.07	21.88	21.98	23	1
5	16QAM	1	12	22.05	21.95	22.00		
5	16QAM	1	24	21.96	21.80	21.91		
5	16QAM	12	0	20.73	20.37	20.61	22	2
5	16QAM	12	7	20.65	20.57	20.66		
5	16QAM	12	13	20.70	20.47	20.63		
5	16QAM	25	0	20.72	20.53	20.65		

Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	22.80	22.57	22.72	24	0
3	QPSK	1	8	22.79	22.56	22.82		
3	QPSK	1	14	22.62	22.55	22.66		
3	QPSK	8	0	21.75	21.51	21.71	23	1
3	QPSK	8	4	21.82	21.64	21.68		
3	QPSK	8	7	21.66	21.48	21.70		
3	QPSK	15	0	21.75	21.61	21.65		
3	16QAM	1	0	21.94	21.75	21.99	23	1
3	16QAM	1	8	22.06	21.88	22.06		
3	16QAM	1	14	22.00	21.80	21.91		
3	16QAM	8	0	20.76	20.46	20.68	22	2
3	16QAM	8	4	20.76	20.63	20.72		
3	16QAM	8	7	20.82	20.56	20.73		
3	16QAM	15	0	20.77	20.50	20.67		
Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	22.67	22.68	22.73	24	0
1.4	QPSK	1	3	22.77	22.61	22.75		
1.4	QPSK	1	5	22.79	22.45	22.73		
1.4	QPSK	3	0	22.68	22.49	22.68		
1.4	QPSK	3	1	22.72	22.66	22.75		
1.4	QPSK	3	3	22.72	22.63	22.74		
1.4	QPSK	6	0	21.71	21.48	21.60	23	1
1.4	16QAM	1	0	21.98	21.85	21.96	23	1
1.4	16QAM	1	3	22.10	21.87	21.96		
1.4	16QAM	1	5	22.04	21.79	21.95		
1.4	16QAM	3	0	21.67	21.67	21.71		
1.4	16QAM	3	1	21.82	21.62	21.69		
1.4	16QAM	3	3	21.84	21.66	21.75		
1.4	16QAM	6	0	20.73	20.53	20.70	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	16.63	16.69	16.73	17.5	0
20	QPSK	1	49	16.50	16.69	16.61		
20	QPSK	1	99	16.29	16.53	16.53		
20	QPSK	50	0	16.67	16.73	16.73	17.5	0
20	QPSK	50	24	16.59	16.72	16.69		
20	QPSK	50	50	16.58	16.71	16.71		
20	QPSK	100	0	16.53	16.75	16.73		
20	16QAM	1	0	16.92	16.98	17.04	17.5	0
20	16QAM	1	49	16.82	17.00	16.92		
20	16QAM	1	99	16.62	16.84	16.83		
20	16QAM	50	0	16.68	16.73	16.69	17.5	0
20	16QAM	50	24	16.55	16.77	16.67		
20	16QAM	50	50	16.57	16.72	16.66		
20	16QAM	100	0	16.57	16.73	16.72		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	16.54	16.67	16.73	17.5	0
15	QPSK	1	37	16.46	16.63	16.56		
15	QPSK	1	74	16.25	16.48	16.52		
15	QPSK	36	0	16.57	16.69	16.73	17.5	0
15	QPSK	36	20	16.50	16.72	16.64		
15	QPSK	36	39	16.48	16.71	16.62		
15	QPSK	75	0	16.43	16.72	16.71		
15	16QAM	1	0	16.86	16.90	17.03	17.5	0
15	16QAM	1	37	16.80	16.99	16.88		
15	16QAM	1	74	16.56	16.84	16.74		
15	16QAM	36	0	16.66	16.64	16.61	17.5	0
15	16QAM	36	20	16.54	16.68	16.64		
15	16QAM	36	39	16.56	16.67	16.58		
15	16QAM	75	0	16.52	16.72	16.70		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	16.61	16.63	16.63	17.5	0
10	QPSK	1	25	16.45	16.67	16.60		
10	QPSK	1	49	16.24	16.44	16.52		
10	QPSK	25	0	16.64	16.68	16.71	17.5	0
10	QPSK	25	12	16.56	16.69	16.67		
10	QPSK	25	25	16.56	16.71	16.66		
10	QPSK	50	0	16.52	16.74	16.66		
10	16QAM	1	0	16.87	16.88	17.02	17.5	0
10	16QAM	1	25	16.73	16.97	16.90		
10	16QAM	1	49	16.52	16.74	16.73		
10	16QAM	25	0	16.61	16.63	16.67	17.5	0
10	16QAM	25	12	16.47	16.68	16.67		
10	16QAM	25	25	16.57	16.71	16.56		
10	16QAM	50	0	16.52	16.67	16.69		

Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	16.61	16.62	16.66	17.5	0
5	QPSK	1	12	16.45	16.65	16.55		
5	QPSK	1	24	16.25	16.51	16.44		
5	QPSK	12	0	16.57	16.71	16.73	17.5	0
5	QPSK	12	7	16.53	16.66	16.60		
5	QPSK	12	13	16.48	16.70	16.66		
5	QPSK	25	0	16.47	16.71	16.65		
5	16QAM	1	0	16.86	16.98	17.01	17.5	0
5	16QAM	1	12	16.74	16.94	16.92		
5	16QAM	1	24	16.57	16.75	16.79		
5	16QAM	12	0	16.61	16.66	16.63	17.5	0
5	16QAM	12	7	16.49	16.68	16.61		
5	16QAM	12	13	16.54	16.63	16.59		
5	16QAM	25	0	16.52	16.71	16.63		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	16.57	16.64	16.63	17.5	0
3	QPSK	1	8	16.43	16.66	16.56		
3	QPSK	1	14	16.29	16.48	16.49		
3	QPSK	8	0	16.57	16.72	16.66	17.5	0
3	QPSK	8	4	16.54	16.70	16.69		
3	QPSK	8	7	16.56	16.71	16.67		
3	QPSK	15	0	16.49	16.66	16.65		
3	16QAM	1	0	16.91	16.91	16.99	17.5	0
3	16QAM	1	8	16.76	16.94	16.88		
3	16QAM	1	14	16.60	16.80	16.81		
3	16QAM	8	0	16.68	16.68	16.66	17.5	0
3	16QAM	8	4	16.50	16.69	16.66		
3	16QAM	8	7	16.54	16.63	16.57		
3	16QAM	15	0	16.57	16.70	16.70		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	16.52	16.73	16.43	17.5	0
1.4	QPSK	1	3	16.68	16.63	16.59		
1.4	QPSK	1	5	16.44	16.52	16.60		
1.4	QPSK	3	0	16.46	16.53	16.49		
1.4	QPSK	3	1	16.56	16.64	16.55		
1.4	QPSK	3	3	16.48	16.59	16.53		
1.4	QPSK	6	0	16.52	16.54	16.47	17.5	0
1.4	16QAM	1	0	16.85	16.89	16.81	17.5	0
1.4	16QAM	1	3	16.85	16.98	16.87		
1.4	16QAM	1	5	16.84	16.82	16.92		
1.4	16QAM	3	0	16.59	16.56	16.56		
1.4	16QAM	3	1	16.58	16.64	16.56		
1.4	16QAM	3	3	16.55	16.61	16.59		
1.4	16QAM	6	0	16.61	16.72	16.57	17.5	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	16.20	16.26	16.23	16.5	0
20	QPSK	1	49	16.05	16.15	16.24		
20	QPSK	1	99	16.00	16.03	16.09		
20	QPSK	50	0	16.15	16.25	16.22	16.5	0
20	QPSK	50	24	16.13	16.20	16.17		
20	QPSK	50	50	16.01	16.15	16.20		
20	QPSK	100	0	16.14	16.23	16.16		
20	16QAM	1	0	16.35	16.49	16.43	16.5	0
20	16QAM	1	49	16.38	16.46	16.40		
20	16QAM	1	99	16.19	16.25	16.41		
20	16QAM	50	0	16.14	16.14	16.22	16.5	0
20	16QAM	50	24	16.16	16.22	16.29		
20	16QAM	50	50	16.04	16.18	16.22		
20	16QAM	100	0	16.13	16.15	16.25		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	16.17	16.04	16.23	16.5	0
15	QPSK	1	37	16.02	16.08	16.18		
15	QPSK	1	74	15.81	15.84	16.00		
15	QPSK	36	0	16.15	16.12	16.14	16.5	0
15	QPSK	36	20	16.04	16.15	16.17		
15	QPSK	36	39	15.97	16.05	16.19		
15	QPSK	75	0	16.04	16.07	16.24		
15	16QAM	1	0	16.46	16.35	16.41	16.5	0
15	16QAM	1	37	16.35	16.45	16.45		
15	16QAM	1	74	16.18	16.18	16.32		
15	16QAM	36	0	16.08	16.12	16.18	16.5	0
15	16QAM	36	20	16.09	16.16	16.23		
15	16QAM	36	39	15.94	16.17	16.15		
15	16QAM	75	0	16.09	16.10	16.20		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	16.15	16.09	16.18	16.5	0
10	QPSK	1	25	16.00	16.08	16.21		
10	QPSK	1	49	15.80	15.83	16.02		
10	QPSK	25	0	16.08	16.10	16.12	16.5	0
10	QPSK	25	12	16.10	16.18	16.27		
10	QPSK	25	25	15.91	16.11	16.15		
10	QPSK	50	0	16.13	16.10	16.26		
10	16QAM	1	0	16.47	16.33	16.45	16.5	0
10	16QAM	1	25	16.31	16.37	16.43		
10	16QAM	1	49	16.10	16.24	16.38		
10	16QAM	25	0	16.13	16.12	16.20	16.5	0
10	16QAM	25	12	16.10	16.14	16.20		
10	16QAM	25	25	15.96	16.17	16.12		
10	16QAM	50	0	16.08	16.13	16.16		

Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	16.14	16.01	16.19	16.5	0
5	QPSK	1	12	16.02	16.09	16.21		
5	QPSK	1	24	15.83	15.92	16.04		
5	QPSK	12	0	16.05	16.06	16.19	16.5	0
5	QPSK	12	7	16.04	16.16	16.20		
5	QPSK	12	13	15.96	16.14	16.13		
5	QPSK	25	0	16.13	16.16	16.20		
5	16QAM	1	0	16.43	16.38	16.45	16.5	0
5	16QAM	1	12	16.29	16.45	16.44		
5	16QAM	1	24	16.15	16.18	16.36		
5	16QAM	12	0	16.07	16.13	16.21	16.5	0
5	16QAM	12	7	16.12	16.14	16.24		
5	16QAM	12	13	15.94	16.16	16.17		
5	16QAM	25	0	16.11	16.14	16.21		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	16.10	16.09	16.13	16.5	0
3	QPSK	1	8	15.97	16.10	16.14		
3	QPSK	1	14	15.82	15.90	16.05		
3	QPSK	8	0	16.15	16.11	16.17	16.5	0
3	QPSK	8	4	16.12	16.15	16.26		
3	QPSK	8	7	16.00	16.07	16.11		
3	QPSK	15	0	16.14	16.13	16.20		
3	16QAM	1	0	16.45	16.30	16.40	16.5	0
3	16QAM	1	8	16.35	16.39	16.45		
3	16QAM	1	14	16.18	16.23	16.37		
3	16QAM	8	0	16.06	16.09	16.21	16.5	0
3	16QAM	8	4	16.07	16.13	16.27		
3	16QAM	8	7	16.04	16.13	16.20		
3	16QAM	15	0	16.10	16.12	16.15		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	16.18	16.28	16.42	16.5	0
1.4	QPSK	1	3	16.16	16.18	16.30		
1.4	QPSK	1	5	16.07	16.07	16.30		
1.4	QPSK	3	0	16.02	16.02	16.34		
1.4	QPSK	3	1	16.11	16.19	16.41		
1.4	QPSK	3	3	16.10	16.13	16.33		
1.4	QPSK	6	0	16.02	16.06	16.29	16.5	0
1.4	16QAM	1	0	16.33	16.41	16.40	16.5	0
1.4	16QAM	1	3	16.43	16.48	16.40		
1.4	16QAM	1	5	16.31	16.38	16.44		
1.4	16QAM	3	0	16.05	16.03	16.33		
1.4	16QAM	3	1	16.15	16.19	16.33		
1.4	16QAM	3	3	16.09	16.11	16.32		
1.4	16QAM	6	0	16.14	16.16	16.37	16.5	0

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	18.33	18.34	18.26	19	0
10	QPSK	1	25	18.21	18.33	18.43		
10	QPSK	1	49	18.08	18.21	18.28		
10	QPSK	25	0	18.19	18.24	18.20	19	0
10	QPSK	25	12	18.19	18.23	18.29		
10	QPSK	25	25	18.10	18.19	18.31		
10	QPSK	50	0	18.21	18.16	18.23		
10	16QAM	1	0	18.59	18.50	18.60	19	0
10	16QAM	1	25	18.54	18.57	18.70		
10	16QAM	1	49	18.34	18.51	18.58		
10	16QAM	25	0	18.19	18.22	18.23	19	0
10	16QAM	25	12	18.21	18.25	18.25		
10	16QAM	25	25	18.10	18.21	18.34		
10	16QAM	50	0	18.20	18.16	18.24		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	18.32	18.21	18.23	19	0
5	QPSK	1	12	18.19	18.27	18.34		
5	QPSK	1	24	18.05	18.15	18.21		
5	QPSK	12	0	18.16	18.16	18.18	19	0
5	QPSK	12	7	18.13	18.15	18.27		
5	QPSK	12	13	18.00	18.11	18.21		
5	QPSK	25	0	18.11	18.09	18.16		
5	16QAM	1	0	18.50	18.48	18.55	19	0
5	16QAM	1	12	18.47	18.48	18.61		
5	16QAM	1	24	18.26	18.51	18.48		
5	16QAM	12	0	18.10	18.22	18.22	19	0
5	16QAM	12	7	18.12	18.24	18.20		
5	16QAM	12	13	18.09	18.21	18.34		
5	16QAM	25	0	18.19	18.15	18.22		
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	18.24	18.20	18.17	19	0
3	QPSK	1	8	18.11	18.26	18.39		
3	QPSK	1	14	18.07	18.12	18.26		
3	QPSK	8	0	18.11	18.16	18.19	19	0
3	QPSK	8	4	18.17	18.19	18.28		
3	QPSK	8	7	18.03	18.11	18.30		
3	QPSK	15	0	18.18	18.11	18.22		
3	16QAM	1	0	18.50	18.46	18.51	19	0
3	16QAM	1	8	18.51	18.55	18.66		
3	16QAM	1	14	18.33	18.43	18.48		
3	16QAM	8	0	18.14	18.19	18.23	19	0
3	16QAM	8	4	18.20	18.17	18.24		
3	16QAM	8	7	18.07	18.19	18.31		
3	16QAM	15	0	18.17	18.14	18.23		

Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	18.42	18.22	18.36	19	0
1.4	QPSK	1	3	18.39	18.19	18.34		
1.4	QPSK	1	5	18.35	18.17	18.34		
1.4	QPSK	3	0	18.29	18.13	18.35		
1.4	QPSK	3	1	18.47	18.28	18.32		
1.4	QPSK	3	3	18.41	18.17	18.29		
1.4	QPSK	6	0	18.31	18.11	18.28	19	0
1.4	16QAM	1	0	18.66	18.54	18.65	19	0
1.4	16QAM	1	3	18.68	18.59	18.68		
1.4	16QAM	1	5	18.67	18.51	18.67		
1.4	16QAM	3	0	18.31	18.16	18.37		
1.4	16QAM	3	1	18.46	18.24	18.34		
1.4	16QAM	3	3	18.42	18.18	18.40		
1.4	16QAM	6	0	18.47	18.25	18.37	19	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	17.57	17.53	17.58	18.5	0
20	QPSK	1	49	17.55	17.52	17.53		
20	QPSK	1	99	17.56	17.50	17.44		
20	QPSK	50	0	17.64	17.70	17.72	18.5	0
20	QPSK	50	24	17.56	17.70	17.56		
20	QPSK	50	50	17.54	17.69	17.55		
20	QPSK	100	0	17.60	17.74	17.54		
20	16QAM	1	0	17.80	17.94	17.80	18.5	0
20	16QAM	1	49	17.82	18.00	17.86		
20	16QAM	1	99	17.88	17.85	17.77		
20	16QAM	50	0	17.57	17.72	17.42	18.5	0
20	16QAM	50	24	17.54	17.81	17.58		
20	16QAM	50	50	17.64	17.71	17.52		
20	16QAM	100	0	17.64	17.76	17.55		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	17.48	17.61	17.48	18.5	0
15	QPSK	1	37	17.45	17.70	17.49		
15	QPSK	1	74	17.53	17.45	17.38		
15	QPSK	36	0	17.49	17.68	17.35	18.5	0
15	QPSK	36	20	17.53	17.75	17.50		
15	QPSK	36	39	17.59	17.66	17.55		
15	QPSK	75	0	17.51	17.67	17.49		
15	16QAM	1	0	17.73	17.84	17.76	18.5	0
15	16QAM	1	37	17.79	17.92	17.76		
15	16QAM	1	74	17.78	17.80	17.68		
15	16QAM	36	0	17.55	17.69	17.41	18.5	0
15	16QAM	36	20	17.47	17.81	17.53		
15	16QAM	36	39	17.63	17.62	17.42		
15	16QAM	75	0	17.63	17.76	17.52		
Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	17.44	17.54	17.51	18.5	0
10	QPSK	1	25	17.50	17.66	17.46		
10	QPSK	1	49	17.53	17.54	17.36		
10	QPSK	25	0	17.50	17.65	17.38	18.5	0
10	QPSK	25	12	17.45	17.77	17.48		
10	QPSK	25	25	17.61	17.72	17.47		
10	QPSK	50	0	17.54	17.72	17.49		
10	16QAM	1	0	17.76	17.91	17.77	18.5	0
10	16QAM	1	25	17.81	17.95	17.86		
10	16QAM	1	49	17.85	17.79	17.70		
10	16QAM	25	0	17.54	17.68	17.37	18.5	0
10	16QAM	25	12	17.44	17.73	17.58		
10	16QAM	25	25	17.64	17.65	17.43		
10	16QAM	50	0	17.54	17.70	17.51		

Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	17.44	17.69	17.44	18.5	0
5	QPSK	1	12	17.48	17.63	17.46		
5	QPSK	1	24	17.48	17.65	17.44		
5	QPSK	12	0	17.41	17.55	17.38	18.5	0
5	QPSK	12	7	17.38	17.61	17.42		
5	QPSK	12	13	17.48	17.56	17.42		
5	QPSK	25	0	17.44	17.55	17.41		
5	16QAM	1	0	17.67	17.89	17.71	18.5	0
5	16QAM	1	12	17.83	17.99	17.85		
5	16QAM	1	24	17.80	17.89	17.61		
5	16QAM	12	0	17.43	17.58	17.42	18.5	0
5	16QAM	12	7	17.41	17.63	17.46		
5	16QAM	12	13	17.48	17.62	17.44		
5	16QAM	25	0	17.50	17.59	17.41		

<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	20.79	20.91	20.86	21.5	0
10	QPSK	1	25	20.96	20.90	20.85		
10	QPSK	1	49	20.77	20.87	20.78		
10	QPSK	25	0	20.79	20.77	20.66	21.5	0
10	QPSK	25	12	20.87	20.76	20.68		
10	QPSK	25	25	20.74	20.67	20.68		
10	QPSK	50	0	20.79	20.73	20.73		
10	16QAM	1	0	21.05	21.14	21.07	21.5	0
10	16QAM	1	25	21.23	21.13	21.03		
10	16QAM	1	49	20.98	21.04	20.99		
10	16QAM	25	0	20.81	20.78	20.71	21.5	0
10	16QAM	25	12	20.88	20.77	20.69		
10	16QAM	25	25	20.79	20.67	20.66		
10	16QAM	50	0	20.78	20.73	20.75		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	20.71	20.78	20.78	21.5	0
5	QPSK	1	12	20.87	20.88	20.80		
5	QPSK	1	24	20.77	20.84	20.71		
5	QPSK	12	0	20.79	20.67	20.64	21.5	0
5	QPSK	12	7	20.81	20.73	20.62		
5	QPSK	12	13	20.67	20.66	20.66		
5	QPSK	25	0	20.77	20.70	20.64		
5	16QAM	1	0	21.03	21.10	20.98	21.5	0
5	16QAM	1	12	21.18	21.03	20.99		
5	16QAM	1	24	20.93	21.04	20.91		
5	16QAM	12	0	20.79	20.72	20.71	21.5	0
5	16QAM	12	7	20.88	20.69	20.64		
5	16QAM	12	13	20.73	20.62	20.59		
5	16QAM	25	0	20.68	20.72	20.68		
Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	20.79	20.79	20.83	21.5	0
3	QPSK	1	8	20.90	20.89	20.77		
3	QPSK	1	14	20.67	20.79	20.77		
3	QPSK	8	0	20.76	20.77	20.56	21.5	0
3	QPSK	8	4	20.79	20.68	20.59		
3	QPSK	8	7	20.71	20.60	20.66		
3	QPSK	15	0	20.72	20.68	20.71		
3	16QAM	1	0	20.99	21.08	20.99	21.5	0
3	16QAM	1	8	21.16	21.13	20.94		
3	16QAM	1	14	20.95	20.97	20.93		
3	16QAM	8	0	20.78	20.71	20.65	21.5	0
3	16QAM	8	4	20.79	20.69	20.68		
3	16QAM	8	7	20.77	20.66	20.57		
3	16QAM	15	0	20.73	20.63	20.72		

Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	21.00	20.83	20.79	21.5	0
1.4	QPSK	1	3	21.04	20.89	20.83		
1.4	QPSK	1	5	20.98	20.76	20.81		
1.4	QPSK	3	0	20.84	20.64	20.65		
1.4	QPSK	3	1	20.90	20.75	20.81		
1.4	QPSK	3	3	20.79	20.67	20.73		
1.4	QPSK	6	0	20.76	20.63	20.66	21.5	0
1.4	16QAM	1	0	21.15	21.08	21.08	21.5	0
1.4	16QAM	1	3	21.14	21.12	21.09		
1.4	16QAM	1	5	21.20	20.99	21.06		
1.4	16QAM	3	0	20.85	20.71	20.65		
1.4	16QAM	3	1	20.86	20.72	20.83		
1.4	16QAM	3	3	20.83	20.68	20.73		
1.4	16QAM	6	0	20.89	20.73	20.77	21.5	0

<LTE Band 13>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel					23230			
Frequency (MHz)					782			
10	QPSK	1	0		19.79		20	0
10	QPSK	1	25		19.78			
10	QPSK	1	49		19.58			
10	QPSK	25	0		19.64		20	0
10	QPSK	25	12		19.60			
10	QPSK	25	25		19.54			
10	QPSK	50	0		19.69			
10	16QAM	1	0		20.00		20	0
10	16QAM	1	25		20.00			
10	16QAM	1	49		19.91			
10	16QAM	25	0		19.64		20	0
10	16QAM	25	12		19.63			
10	16QAM	25	25		19.55			
10	16QAM	50	0		19.60			
Channel				23205	23230	23255	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	19.78	19.60	19.61	20	0
5	QPSK	1	12	19.48	19.58	19.59		
5	QPSK	1	24	19.52	19.52	19.58		
5	QPSK	12	0	19.60	19.52	19.53	20	0
5	QPSK	12	7	19.55	19.57	19.58		
5	QPSK	12	13	19.52	19.51	19.50		
5	QPSK	25	0	19.62	19.54	19.58		
5	16QAM	1	0	19.99	19.85	19.86	20	0
5	16QAM	1	12	20.00	19.99	20.00		
5	16QAM	1	24	19.82	19.81	19.85		
5	16QAM	12	0	19.61	19.56	19.52	20	0
5	16QAM	12	7	19.56	19.56	19.60		
5	16QAM	12	13	19.52	19.49	19.60		
5	16QAM	25	0	19.71	19.61	19.55		

<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	16.85	16.86	16.73	17.5	0
20	QPSK	1	49	16.66	16.69	16.59		
20	QPSK	1	99	16.57	16.52	16.56		
20	QPSK	50	0	16.76	16.74	16.73	17.5	0
20	QPSK	50	24	16.73	16.69	16.64		
20	QPSK	50	50	16.74	16.65	16.57		
20	QPSK	100	0	16.69	16.75	16.72		
20	16QAM	1	0	17.08	17.09	17.06	17.5	0
20	16QAM	1	49	16.98	17.06	16.97		
20	16QAM	1	99	16.96	16.80	16.83		
20	16QAM	50	0	16.72	16.73	16.69	17.5	0
20	16QAM	50	24	16.72	16.81	16.69		
20	16QAM	50	50	16.74	16.71	16.64		
20	16QAM	100	0	16.71	16.78	16.69		
Channel				26115	26340	26615	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1907.5		
15	QPSK	1	0	16.77	16.81	16.65	17.5	0
15	QPSK	1	37	16.57	16.65	16.56		
15	QPSK	1	74	16.57	16.49	16.47		
15	QPSK	36	0	16.66	16.60	16.63	17.5	0
15	QPSK	36	20	16.66	16.72	16.57		
15	QPSK	36	39	16.73	16.58	16.49		
15	QPSK	75	0	16.63	16.70	16.70		
15	16QAM	1	0	17.05	17.08	16.97	17.5	0
15	16QAM	1	37	16.92	17.01	16.88		
15	16QAM	1	74	16.95	16.70	16.75		
15	16QAM	36	0	16.68	16.70	16.62	17.5	0
15	16QAM	36	20	16.63	16.78	16.66		
15	16QAM	36	39	16.65	16.69	16.54		
15	16QAM	75	0	16.66	16.78	16.65		
Channel				26090	26340	26640	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1910		
10	QPSK	1	0	16.82	16.84	16.66	17.5	0
10	QPSK	1	25	16.66	16.67	16.56		
10	QPSK	1	49	16.52	16.49	16.55		
10	QPSK	25	0	16.75	16.61	16.72	17.5	0
10	QPSK	25	12	16.69	16.67	16.57		
10	QPSK	25	25	16.66	16.60	16.52		
10	QPSK	50	0	16.59	16.67	16.72		
10	16QAM	1	0	17.02	17.06	17.03	17.5	0
10	16QAM	1	25	16.89	16.96	16.95		
10	16QAM	1	49	16.86	16.75	16.73		
10	16QAM	25	0	16.62	16.69	16.60	17.5	0
10	16QAM	25	12	16.65	16.79	16.68		
10	16QAM	25	25	16.74	16.70	16.61		
10	16QAM	50	0	16.66	16.71	16.66		

Channel				26065	26340	26665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1912.5		
5	QPSK	1	0	16.85	16.77	16.64	17.5	0
5	QPSK	1	12	16.58	16.60	16.49		
5	QPSK	1	24	16.56	16.40	16.49		
5	QPSK	12	0	16.69	16.60	16.71	17.5	0
5	QPSK	12	7	16.72	16.71	16.64		
5	QPSK	12	13	16.65	16.65	16.57		
5	QPSK	25	0	16.65	16.68	16.67		
5	16QAM	1	0	17.00	17.02	17.04	17.5	0
5	16QAM	1	12	16.96	17.00	16.90		
5	16QAM	1	24	16.92	16.75	16.74		
5	16QAM	12	0	16.64	16.69	16.64	17.5	0
5	16QAM	12	7	16.72	16.78	16.59		
5	16QAM	12	13	16.69	16.71	16.63		
5	16QAM	25	0	16.71	16.71	16.59		
Channel				26055	26340	26675	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1913.5		
3	QPSK	1	0	16.81	16.76	16.65	17.5	0
3	QPSK	1	8	16.57	16.62	16.51		
3	QPSK	1	14	16.52	16.43	16.47		
3	QPSK	8	0	16.71	16.62	16.64	17.5	0
3	QPSK	8	4	16.65	16.66	16.56		
3	QPSK	8	7	16.71	16.57	16.53		
3	QPSK	15	0	16.69	16.69	16.66		
3	16QAM	1	0	17.00	17.01	17.00	17.5	0
3	16QAM	1	8	16.90	16.96	16.90		
3	16QAM	1	14	16.87	16.77	16.75		
3	16QAM	8	0	16.69	16.65	16.60	17.5	0
3	16QAM	8	4	16.71	16.71	16.68		
3	16QAM	8	7	16.71	16.68	16.61		
3	16QAM	15	0	16.71	16.72	16.67		
Channel				26047	26340	26683	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1914.3		
1.4	QPSK	1	0	16.65	16.55	16.54	17.5	0
1.4	QPSK	1	3	16.56	16.72	16.65		
1.4	QPSK	1	5	16.42	16.65	16.62		
1.4	QPSK	3	0	16.58	16.66	16.55		
1.4	QPSK	3	1	16.62	16.63	16.67		
1.4	QPSK	3	3	16.54	16.72	16.60		
1.4	QPSK	6	0	16.49	16.59	16.59	17.5	0
1.4	16QAM	1	0	16.83	17.01	16.91	17.5	0
1.4	16QAM	1	3	16.79	16.87	16.92		
1.4	16QAM	1	5	16.69	17.02	16.89		
1.4	16QAM	3	0	16.48	16.68	16.67		
1.4	16QAM	3	1	16.69	16.79	16.69		
1.4	16QAM	3	3	16.42	16.74	16.68		
1.4	16QAM	6	0	16.66	16.75	16.67	17.5	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		
Frequency (MHz)				821.5	831.5	841.5		
15	QPSK	1	0	18.19	18.10	17.91	19	0
15	QPSK	1	37	17.99	17.71	17.78		
15	QPSK	1	74	17.89	17.81	17.76		
15	QPSK	36	0	18.12	18.09	17.89	19	0
15	QPSK	36	20	18.11	17.96	17.86		
15	QPSK	36	39	17.93	17.85	17.83		
15	QPSK	75	0	18.04	18.09	17.88		
15	16QAM	1	0	18.50	18.22	18.15	19	0
15	16QAM	1	37	18.30	18.04	18.08		
15	16QAM	1	74	18.17	18.14	18.07		
15	16QAM	36	0	18.12	17.89	17.90	19	0
15	16QAM	36	20	18.12	17.95	17.85		
15	16QAM	36	39	17.93	17.85	17.82		
15	16QAM	75	0	18.04	17.91	17.88		
Channel				26740	26865	26990	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	18.18	17.85	17.89	19	0
10	QPSK	1	25	17.89	17.63	17.69		
10	QPSK	1	49	17.84	17.79	17.68		
10	QPSK	25	0	18.09	17.80	17.83	19	0
10	QPSK	25	12	18.01	17.94	17.85		
10	QPSK	25	25	17.90	17.80	17.77		
10	QPSK	50	0	17.97	17.80	17.78		
10	16QAM	1	0	18.46	18.18	18.12	19	0
10	16QAM	1	25	18.28	17.98	18.06		
10	16QAM	1	49	18.16	18.12	17.97		
10	16QAM	25	0	18.11	17.85	17.81	19	0
10	16QAM	25	12	18.05	17.85	17.84		
10	16QAM	25	25	17.84	17.84	17.74		
10	16QAM	50	0	18.00	17.89	17.86		
Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	18.12	17.84	17.86	19	0
5	QPSK	1	12	17.95	17.66	17.72		
5	QPSK	1	24	17.79	17.76	17.72		
5	QPSK	12	0	18.11	17.87	17.85	19	0
5	QPSK	12	7	18.09	17.87	17.82		
5	QPSK	12	13	17.90	17.85	17.77		
5	QPSK	25	0	17.95	17.82	17.78		
5	16QAM	1	0	18.41	18.16	18.06	19	0
5	16QAM	1	12	18.22	17.99	18.03		
5	16QAM	1	24	18.10	18.09	18.03		
5	16QAM	12	0	18.03	17.89	17.87	19	0
5	16QAM	12	7	18.12	17.87	17.81		
5	16QAM	12	13	17.84	17.78	17.74		
5	16QAM	25	0	17.94	17.87	17.84		

Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	18.13	17.87	17.84	19	0
3	QPSK	1	8	17.91	17.69	17.78		
3	QPSK	1	14	17.80	17.75	17.67		
3	QPSK	8	0	18.10	17.80	17.86	19	0
3	QPSK	8	4	18.01	17.89	17.84		
3	QPSK	8	7	17.83	17.75	17.74		
3	QPSK	15	0	18.02	17.88	17.87		
3	16QAM	1	0	18.45	18.22	18.10	19	0
3	16QAM	1	8	18.27	18.02	18.06		
3	16QAM	1	14	18.13	18.08	18.04		
3	16QAM	8	0	18.09	17.83	17.86	19	0
3	16QAM	8	4	18.06	17.92	17.81		
3	16QAM	8	7	17.91	17.81	17.76		
3	16QAM	15	0	18.03	17.87	17.85		
Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	18.33	17.79	17.85	19	0
1.4	QPSK	1	3	18.24	17.79	17.90		
1.4	QPSK	1	5	18.14	17.75	17.82		
1.4	QPSK	3	0	18.08	17.79	17.77		
1.4	QPSK	3	1	18.19	17.77	17.84		
1.4	QPSK	3	3	18.13	17.69	17.79		
1.4	QPSK	6	0	18.08	17.68	17.75	19	0
1.4	16QAM	1	0	18.46	18.18	18.19	19	0
1.4	16QAM	1	3	18.43	18.01	18.12		
1.4	16QAM	1	5	18.46	18.16	18.20		
1.4	16QAM	3	0	18.12	17.80	17.82		
1.4	16QAM	3	1	18.22	17.71	17.84		
1.4	16QAM	3	3	18.18	17.73	17.84		
1.4	16QAM	6	0	18.26	17.75	17.84	19	0

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

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

a. 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations

b. "special subframe S" contains both uplink and downlink transmissions, it has been taken into consideration to determine the transmission duty factor according to the worst case uplink and downlink cyclic prefix requirements for UpPTS

c. Establishing connections with base station simulators ensure a consistent means for testing SAR and recommended for evaluating SAR. The Anritsu MT8820C (firmware: #22.52#004) was used for LTE output power measurements and SAR testing.

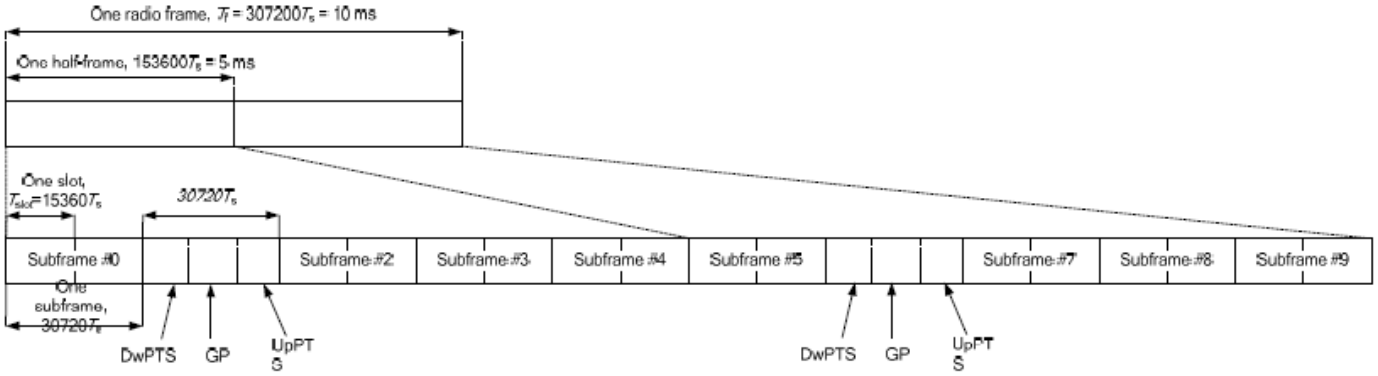


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

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

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

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

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

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

The highest duty factor is resulted from:

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

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

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

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

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

Default Power Mode

<LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				39750	40185	40620	41055	41490		
Frequency (MHz)				2506	2549.5	2593	2636.5	2680		
20	QPSK	1	0	21.52	21.47	21.63	21.51	21.57	23	0
20	QPSK	1	49	21.51	21.43	21.62	21.39	21.56		
20	QPSK	1	99	21.46	21.40	21.49	21.47	21.50		
20	QPSK	50	0	20.78	20.45	20.73	20.68	20.77	22	1
20	QPSK	50	24	20.77	20.43	20.72	20.51	20.82		
20	QPSK	50	50	20.65	20.44	20.66	20.67	20.76		
20	QPSK	100	0	20.69	20.44	20.69	20.45	20.77		
20	16QAM	1	0	20.63	20.55	20.52	20.37	20.88	22	1
20	16QAM	1	49	20.80	20.51	20.72	20.54	20.84		
20	16QAM	1	99	20.58	20.44	20.56	20.67	20.82		
20	16QAM	50	0	19.68	19.42	19.51	19.45	19.79	21	2
20	16QAM	50	24	19.80	19.49	19.73	19.52	19.81		
20	16QAM	50	50	19.75	19.46	19.67	19.69	19.79		
20	16QAM	100	0	19.77	19.48	19.69	19.50	19.81		
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	21.54	21.35	21.40	21.25	21.59	23	0
15	QPSK	1	37	21.67	21.49	21.39	21.48	21.70		
15	QPSK	1	74	21.25	21.30	21.29	21.24	21.31		
15	QPSK	36	0	20.58	20.30	20.25	20.31	20.61	22	1
15	QPSK	36	20	20.54	20.30	20.26	20.27	20.52		
15	QPSK	36	39	20.37	20.13	20.15	20.23	20.40		
15	QPSK	75	0	20.44	20.23	20.19	20.23	20.47		
15	16QAM	1	0	20.45	20.39	20.42	20.33	20.51	22	1
15	16QAM	1	37	20.51	20.12	20.36	20.44	20.55		
15	16QAM	1	74	20.19	20.05	20.08	20.09	20.39		
15	16QAM	36	0	19.56	19.26	19.20	19.25	19.51	21	2
15	16QAM	36	20	19.49	19.28	19.22	19.23	19.50		
15	16QAM	36	39	19.27	19.08	19.07	19.22	19.36		
15	16QAM	75	0	19.42	19.23	19.20	19.24	19.41		
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2501	2547	2593	2639	2685		
10	QPSK	1	0	21.56	21.30	21.26	21.35	21.33	23	0
10	QPSK	1	25	21.73	21.32	21.29	21.45	21.25		
10	QPSK	1	49	21.52	21.23	21.26	21.27	21.24		
10	QPSK	25	0	20.63	20.24	20.15	20.39	20.34	22	1
10	QPSK	25	12	20.62	20.21	20.24	20.38	20.30		
10	QPSK	25	25	20.48	20.17	20.19	20.31	20.29		
10	QPSK	50	0	20.53	20.14	20.16	20.37	20.36		
10	16QAM	1	0	20.71	20.25	20.30	20.55	20.46	22	1
10	16QAM	1	25	20.71	20.35	20.39	20.61	20.49		
10	16QAM	1	49	20.56	20.25	20.24	20.34	20.28		
10	16QAM	25	0	19.65	19.28	19.18	19.46	19.35	21	2
10	16QAM	25	12	19.66	19.23	19.25	19.47	19.36		
10	16QAM	25	25	19.47	19.29	19.28	19.34	19.28		
10	16QAM	50	0	19.58	19.16	19.18	19.42	19.36		

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	21.43	21.26	21.16	21.24	21.17	23	0
5	QPSK	1	12	21.46	21.25	21.15	21.23	21.21		
5	QPSK	1	24	21.36	21.09	21.15	21.13	21.08		
5	QPSK	12	0	20.57	20.25	20.24	20.40	20.34	22	1
5	QPSK	12	7	20.64	20.28	20.21	20.39	20.39		
5	QPSK	12	13	20.60	20.15	20.16	20.32	20.36		
5	QPSK	25	0	20.54	20.23	20.16	20.36	20.34		
5	16QAM	1	0	20.67	20.31	20.29	20.55	20.52	22	1
5	16QAM	1	12	20.76	20.53	20.31	20.51	20.61		
5	16QAM	1	24	20.69	20.27	20.32	20.48	20.49		
5	16QAM	12	0	19.57	19.23	19.22	19.40	19.32	21	2
5	16QAM	12	7	19.61	19.28	19.21	19.41	19.35		
5	16QAM	12	13	19.61	19.14	19.18	19.35	19.33		
5	16QAM	25	0	19.62	19.29	19.21	19.40	19.38		

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	19.17	19.14	19.18	19.05	19.10	19.5	0
20	QPSK	1	49	19.16	19.05	19.17	19.04	19.06		
20	QPSK	1	99	19.17	18.99	19.07	19.01	19.07		
20	QPSK	50	0	19.21	19.12	19.10	19.13	19.15	19.5	0
20	QPSK	50	24	19.19	19.11	19.09	19.02	19.14		
20	QPSK	50	50	19.20	19.07	19.05	19.12	19.05		
20	QPSK	100	0	19.28	19.05	19.24	18.98	19.10		
20	16QAM	1	0	19.21	19.17	19.11	18.95	19.17	19.5	0
20	16QAM	1	49	19.42	19.11	19.33	19.07	19.16		
20	16QAM	1	99	19.22	19.06	19.14	19.13	19.09		
20	16QAM	50	0	19.24	19.06	19.12	18.95	19.12	19.5	0
20	16QAM	50	24	19.28	19.13	19.31	19.03	19.14		
20	16QAM	50	50	19.21	19.11	19.26	19.17	19.09		
20	16QAM	100	0	19.22	19.10	19.28	19.02	19.15		
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	19.21	19.05	19.01	18.84	19.08	19.5	0
15	QPSK	1	37	19.30	19.01	19.18	19.02	19.01		
15	QPSK	1	74	19.12	18.94	19.03	19.02	19.05		
15	QPSK	36	0	19.19	18.99	19.05	18.84	19.06	19.5	0
15	QPSK	36	20	19.31	19.07	19.24	18.99	19.07		
15	QPSK	36	39	19.23	18.98	19.13	19.04	18.95		
15	QPSK	75	0	19.25	19.04	19.18	18.93	19.00		
15	16QAM	1	0	19.19	19.16	19.09	18.92	19.14	19.5	0
15	16QAM	1	37	19.38	19.11	19.23	18.98	19.13		
15	16QAM	1	74	19.16	19.01	19.12	19.10	18.99		
15	16QAM	36	0	19.20	19.01	19.06	18.95	19.08	19.5	0
15	16QAM	36	20	19.19	19.11	19.26	18.96	19.06		
15	16QAM	36	39	19.18	19.09	19.25	19.08	19.03		
15	16QAM	75	0	19.19	19.09	19.23	18.96	19.14		
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2501	2547	2593	2639	2685		
10	QPSK	1	0	19.15	19.10	19.02	18.83	19.06	19.5	0
10	QPSK	1	25	19.30	19.02	19.19	18.94	19.05		
10	QPSK	1	49	19.17	18.94	19.04	19.02	19.05		
10	QPSK	25	0	19.19	18.97	19.10	18.93	19.06	19.5	0
10	QPSK	25	12	19.27	19.10	19.25	18.99	19.04		
10	QPSK	25	25	19.22	19.03	19.12	19.02	19.04		
10	QPSK	50	0	19.28	18.98	19.21	18.89	19.10		
10	16QAM	1	0	19.18	19.07	19.09	18.88	19.12	19.5	0
10	16QAM	1	25	19.32	19.05	19.32	19.07	19.12		
10	16QAM	1	49	19.12	18.96	19.06	19.12	19.03		
10	16QAM	25	0	19.23	18.97	19.09	18.94	19.03	19.5	0
10	16QAM	25	12	19.22	19.12	19.24	19.01	19.06		
10	16QAM	25	25	19.11	19.10	19.24	19.10	19.03		
10	16QAM	50	0	19.22	19.03	19.22	19.01	19.06		

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	19.25	18.99	19.12	19.01	19.16	19.5	0
5	QPSK	1	12	19.30	19.01	19.18	19.12	19.12		
5	QPSK	1	24	19.22	18.94	19.15	19.13	19.08		
5	QPSK	12	0	19.13	19.06	19.14	19.10	18.99	19.5	0
5	QPSK	12	7	19.21	19.07	19.23	19.14	19.08		
5	QPSK	12	13	19.19	19.00	19.15	19.12	19.05		
5	QPSK	25	0	19.17	18.98	19.16	19.09	19.01		
5	16QAM	1	0	19.22	19.09	19.23	19.11	19.19	19.5	0
5	16QAM	1	12	19.47	19.25	19.36	19.26	19.27		
5	16QAM	1	24	19.37	19.15	19.34	19.27	19.23		
5	16QAM	12	0	19.18	19.03	19.12	19.07	19.02	19.5	0
5	16QAM	12	7	19.24	19.03	19.23	19.12	19.10		
5	16QAM	12	13	19.25	18.95	19.14	19.09	19.06		
5	16QAM	25	0	19.27	19.06	19.21	19.12	19.09		

<LTE Carrier Aggregation>

General Note:

1. This device supports Carrier Aggregation on downlink only for inter and intra band, Uplink CA is not supported. For the device supports bands and bandwidths and configurations are provided as follow table was according to 3GPP.
2. All permutations exist. No restrictions on Pcell & Scell combinations. Only LTE Band 29A is limited to Scell.

E-UTRA CA Configuration	E-UTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum aggregated bandwidth [MHz]	Bandwidth combination set
CA_2A-5A	2			Yes	Yes	Yes	Yes	30	0
	5			Yes	Yes				
CA_2A-5A	2			Yes	Yes			20	1
	5			Yes	Yes				
CA_2A-12A	2			Yes	Yes	Yes	Yes	30	0
	12			Yes	Yes				
CA_2A-12A	2			Yes	Yes	Yes	Yes	30	1
	12		Yes	Yes	Yes				
CA_2A-12A	2			Yes	Yes			20	2
	12			Yes	Yes				
CA_2A-13A	2			Yes	Yes	Yes	Yes	30	0
	13				Yes				
CA_2A-13A	2			Yes	Yes			20	1
	13				Yes				
CA_2A-29A	2			Yes	Yes			20	0
	29		Yes	Yes	Yes				
CA_2A-29A	2			Yes	Yes			20	1
	29			Yes	Yes				
CA_2A-29A	2			Yes	Yes	Yes	Yes	30	2
CA_4A-5A	4			Yes	Yes			20	0
	5			Yes	Yes				
CA_4A-5A	4			Yes	Yes	Yes	Yes	30	1
	5			Yes	Yes				
CA_4A-12A	4	Yes	Yes	Yes	Yes			20	0
	12			Yes	Yes				
CA_4A-12A	4	Yes	Yes	Yes	Yes	Yes	Yes	30	1
	12			Yes	Yes				
CA_4A-12A	4			Yes	Yes	Yes	Yes	30	2
	12		Yes	Yes	Yes				
CA_4A-12A	4			Yes	Yes			20	3
	12			Yes	Yes				
CA_4A-12A	4			Yes	Yes	Yes	Yes	30	4
	12			Yes	Yes				
CA_4A-12A	4			Yes	Yes	Yes		20	5
	12			Yes					
CA_4A-13A	4			Yes	Yes	Yes	Yes	30	0
	13				Yes				
CA_4A-13A	4			Yes	Yes			20	1
	13				Yes				
CA_4A-29A	4			Yes	Yes			20	0
	29		Yes	Yes	Yes				
CA_4A-29A	4			Yes	Yes			20	1
	29			Yes	Yes				
CA_4A-29A	4			Yes	Yes	Yes	Yes	30	2
	29			Yes	Yes				

E-UTRA CA Configuration	Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]	Maximum aggregated bandwidth [MHz]	Bandwidth combination set
CA_2C	5	20	40	0
	10	15,20		
	15	10,15,20		
	20	5,10,15,20		
CA_7C	15	15	40	0
	20	20		
	10	20	40	1
	15	15,20		
	20	10,15,20		
	15	10,15	40	2
	20	15,20		
CA_41C	10	20	40	0
	15	15,20		
	20	10,15,20		
	5,10	20	40	1
	15	15,20		
	20	5,10,15,20		
CA_2A-2A	5,10,15,20	5,10,15,20	40	0
CA_7A-7A	5	15	40	0
	10	10,15		
	15	15,20		
	20	20		
	5,10,15,20	5,10,15,20	40	1
CA_41A-41A	10,15,20	10,15,20	40	0
	5,10,15,20	5,10,15,20	40	1

<LTE Carrier Aggregation Power verification>

General Note:

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

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

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

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

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

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

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

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

Configure		PCC							SCC				Power	
		LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Inter-Band Contiguous		Band 2	20	1900	19100	QPSK	1	0	Band 5	10	881.5	2525	22.98	22.99
		Band 5	10	836.5	20525	QPSK	1	0	Band 2	20	1960	900	22.65	22.69
		Band 2	20	1900	19100	QPSK	1	0	Band 12	10	737.5	5095	22.98	22.99
		Band 12	10	707.5	23095	QPSK	1	0	Band 2	20	1960	900	23.15	23.18
		Band 2	20	1900	19100	QPSK	1	0	Band 13	10	751	5230	22.95	22.99
		Ban 13	10	782	23230	QPSK	1	0	Band 2	20	1960	900	22.86	22.88
		Band 2	20	1900	19100	QPSK	1	0	Band 29	10	722.5	9715	22.96	22.99
		Band 4	20	1732.5	20175	QPSK	1	0	Band 5	10	881.5	2525	22.90	22.91
		Band 5	10	836.5	20525	QPSK	1	0	Band 4	20	2132.5	2175	22.66	22.69
		Band 4	20	1732.5	20175	QPSK	1	0	Band 12	10	737.5	5095	22.89	22.91
		Band 12	10	707.5	23095	QPSK	1	0	Band 4	20	2132.5	2175	23.16	23.18
		Band 4	20	1732.5	20175	QPSK	1	0	Band 13	10	751	5230	22.88	22.91
		Ban 13	10	782	23230	QPSK	1	0	Band 4	20	2132.5	2175	22.85	22.88
		Band 4	20	1732.5	20175	QPSK	1	0	Band 29	10	722.5	9715	22.85	22.91
Intra-Band	Non-Contiguous	Band 2	20	1900	19100	QPSK	1	0	Band 2	5	1932.5	625	22.95	22.99
		Band 7	20	2535	21100	QPSK	1	0	Band 7	5	2687.5	3425	21.70	21.71
		Band 41	10	2501	39700	QPSK	1	25	Band 41	5	2687.5	41565	21.70	21.73
	Contiguous	Band 2	20	1900	19100	QPSK	1	0	Band 2	20	1960.2	902	22.97	22.99
		Band 7	20	2535	21100	QPSK	1	0	Band 7	20	2649.8	3048	21.69	21.71
		Band 41	10	2501	39700	QPSK	1	0	Band 41	20	2612.8	40818	21.72	21.73

<WLAN Conducted Power>

General Note:

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

<2.4GHz WLAN ANT 1>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN ANT 1	802.11b	CH 1	2412	1Mbps	17.50	17.50	98.56
		CH 6	2437		17.49	17.50	
		CH 11	2462		17.22	17.50	
		CH 12	2467		16.46	16.50	
		CH 13	2472		11.40	11.50	
	802.11g	CH 1	2412	6Mbps	17.09	17.50	94.44
		CH 6	2437		17.31	17.50	
		CH 11	2462		16.94	17.50	
		CH 12	2467		12.47	12.50	
		CH 13	2472		-2.09	-1.00	
	802.11n-HT20	CH 1	2412	MCS0	16.76	17.50	95.00
		CH 6	2437		17.47	17.50	
		CH 11	2462		16.10	16.50	
		CH 12	2467		12.29	12.50	
		CH 13	2472		-2.31	-1.00	
	802.11n-HT40	CH 3	2422	MCS0	16.77	17.50	96.37
		CH 6	2437		17.16	17.50	
		CH 9	2452		14.89	15.50	
		CH 10	2457		13.30	13.50	
		CH 11	2462		-3.97	-3.00	

<2.4GHz WLAN ANT 2>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN ANT 2	802.11b	CH 1	2412	1Mbps	17.22	17.50	98.56
		CH 6	2437		17.46	17.50	
		CH 11	2462		17.10	17.50	
		CH 12	2467		16.36	16.50	
		CH 13	2472		11.17	11.50	
	802.11g	CH 1	2412	6Mbps	16.95	17.50	94.50
		CH 6	2437		17.27	17.50	
		CH 11	2462		16.78	17.50	
		CH 12	2467		12.36	12.50	
		CH 13	2472		-2.73	-1.00	
	802.11n-HT20	CH 1	2412	MCS0	16.63	17.50	95.00
		CH 6	2437		17.12	17.50	
		CH 11	2462		15.95	16.50	
		CH 12	2467		12.16	12.50	
		CH 13	2472		-2.37	-1.00	
	802.11n-HT40	CH 3	2422	MCS0	16.65	17.50	96.91
		CH 6	2437		16.95	17.50	
		CH 9	2452		14.80	15.50	
		CH 10	2457		13.14	13.50	
		CH 11	2462		-4.61	-3.00	

<2.4GHz WLAN ANT 1+2>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN ANT 1+2	802.11n-HT20	CH 1	2412	MCS0	17.44	17.50	96.00
		CH 6	2437		17.31	17.50	
		CH 11	2462		16.87	17.50	
		CH 12	2467		9.46	9.50	
		CH 13	2472		-6.59	-6.00	
	802.11n-HT40	CH 3	2422	MCS0	14.79	15.00	92.48
		CH 6	2437		17.42	17.50	
		CH 9	2452		15.01	15.50	
		CH 10	2457		10.93	11.00	
		CH 11	2462		-5.97	-5.00	

<5GHz WLAN ANT1>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN ANT 1	802.11a	CH 36	5180	6Mbps	15.85	16.00	94.50
		CH 40	5200		15.80	16.00	
		CH 44	5220		15.76	16.00	
		CH 48	5240		15.66	16.00	
	802.11n-HT20	CH 36	5180	MCS0	15.73	16.00	95.03
		CH 40	5200		15.82	16.00	
		CH 44	5220		15.81	16.00	
		CH 48	5240		15.83	16.00	
	802.11n-HT40	CH 38	5190	MCS0	15.64	16.00	96.91
		CH 46	5230		15.80	16.00	
	802.11ac-VHT20	CH 36	5180	MCS0	15.70	16.00	95.52
		CH 40	5200		15.76	16.00	
		CH 44	5220		15.72	16.00	
		CH 48	5240		15.76	16.00	
	802.11ac-VHT40	CH 38	5190	MCS0	15.60	16.00	96.94
		CH 46	5230		15.75	16.00	
	802.11ac-VHT80	CH 42	5210	MCS0	12.99	13.10	93.88

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN ANT 1	802.11a	CH 52	5260	6Mbps	15.63	16.00	94.50
		CH 56	5280		15.68	16.00	
		CH 60	5300		15.65	16.00	
		CH 64	5320		15.61	16.00	
	802.11n-HT20	CH 52	5260	MCS0	15.85	16.00	95.03
		CH 56	5280		15.90	16.00	
		CH 60	5300		15.81	16.00	
		CH 64	5320		15.83	16.00	
	802.11n-HT40	CH 54	5270	MCS0	15.60	16.00	96.91
		CH 62	5310		12.16	12.50	
	802.11ac-VHT20	CH 52	5260	MCS0	15.80	16.00	95.52
		CH 56	5280		15.83	16.00	
		CH 60	5300		15.71	16.00	
		CH 64	5320		15.78	16.00	
	802.11ac-VHT40	CH 54	5270	MCS0	15.59	16.00	96.94
		CH 62	5310		12.16	12.50	
	802.11ac-VHT80	CH 58	5290	MCS0	12.53	12.60	93.88

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN ANT 1	802.11a	CH 100	5500	6Mbps	15.92	16.00	94.50
		CH 116	5580		15.86	16.00	
		CH 124	5620		15.90	16.00	
		CH 132	5660		15.86	16.00	
		CH 144	5720		15.66	16.00	
	802.11n-HT20	CH 100	5500	MCS0	15.80	16.00	95.03
		CH 116	5580		15.74	16.00	
		CH 124	5620		15.77	16.00	
		CH 132	5660		15.78	16.00	
		CH 144	5720		15.79	16.00	
	802.11n-HT40	CH 102	5510	MCS0	15.84	16.00	96.91
		CH 110	5550		15.66	16.00	
		CH 126	5630		15.73	16.00	
		CH 134	5670		15.75	16.00	
		CH 142	5710		15.68	16.00	
	802.11ac-VHT20	CH 100	5500	MCS0	15.72	16.00	95.52
		CH 116	5580		15.70	16.00	
		CH 124	5620		15.65	16.00	
		CH 132	5660		15.60	16.00	
		CH 144	5720		15.66	16.00	
	802.11ac-VHT40	CH 102	5510	MCS0	15.81	16.00	96.94
		CH 110	5550		15.64	16.00	
		CH 126	5630		15.63	16.00	
		CH 134	5670		15.66	16.00	
		CH 142	5710		15.69	16.00	
	802.11ac-VHT80	CH 106	5530	MCS0	11.53	12.00	93.88
		CH 122	5610		15.53	16.00	
		CH 138	5690		15.66	16.00	

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN ANT 1	802.11a	CH 149	5745	MCS0	15.90	16.00	94.50
		CH 157	5785		15.88	16.00	
		CH 165	5825		15.90	16.00	
	802.11n-HT20	CH 149	5745	MCS0	15.67	16.00	95.03
		CH 157	5785		15.83	16.00	
		CH 165	5825		15.71	16.00	
	802.11n-HT40	CH 151	5755	MCS0	15.96	16.00	96.91
		CH 159	5795		15.86	16.00	
	802.11ac-VHT20	CH 149	5745	MCS0	15.60	16.00	95.52
		CH 157	5785		15.81	16.00	
		CH 165	5825		15.69	16.00	
	802.11ac-VHT40	CH 151	5755	MCS0	15.89	16.00	96.94
		CH 159	5795		15.85	16.00	
	802.11ac-VHT80	CH 155	5775	MCS0	15.79	16.00	93.88

<5GHz WLAN ANT2>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN ANT 2	802.11a	CH 36	5180	6Mbps	15.92	16.00	94.50
		CH 40	5200		15.79	16.00	
		CH 44	5220		15.77	16.00	
		CH 48	5240		15.69	16.00	
	802.11n-HT20	CH 36	5180	MCS0	15.87	16.00	95.52
		CH 40	5200		15.80	16.00	
		CH 44	5220		15.97	16.00	
		CH 48	5240		15.83	16.00	
	802.11n-HT40	CH 38	5190	MCS0	15.67	16.00	96.91
		CH 46	5230		15.82	16.00	
	802.11ac-VHT20	CH 36	5180	MCS0	15.83	16.00	95.52
		CH 40	5200		15.73	16.00	
		CH 44	5220		15.90	16.00	
		CH 48	5240		15.75	16.00	
	802.11ac-VHT40	CH 38	5190	MCS0	15.64	16.00	96.92
		CH 46	5230		15.77	16.00	
	802.11ac-VHT80	CH 42	5210	MCS0	13.01	13.10	93.88

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN ANT 2	802.11a	CH 52	5260	6Mbps	15.64	16.00	94.50
		CH 56	5280		15.65	16.00	
		CH 60	5300		15.68	16.00	
		CH 64	5320		15.66	16.00	
	802.11n-HT20	CH 52	5260	MCS0	15.90	16.00	95.52
		CH 56	5280		15.82	16.00	
		CH 60	5300		15.85	16.00	
		CH 64	5320		15.82	16.00	
	802.11n-HT40	CH 54	5270	MCS0	15.75	16.00	96.91
		CH 62	5310		12.40	12.50	
	802.11ac-VHT20	CH 52	5260	MCS0	15.81	16.00	95.52
		CH 56	5280		15.81	16.00	
		CH 60	5300		15.83	16.00	
		CH 64	5320		15.78	16.00	
	802.11ac-VHT40	CH 54	5270	MCS0	15.69	16.00	96.92
		CH 62	5310		12.30	12.50	
	802.11ac-VHT80	CH 58	5290	MCS0	12.58	12.60	93.88

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN ANT 2	802.11a	CH 100	5500	6Mbps	15.95	16.00	94.50
		CH 116	5580		15.91	16.00	
		CH 124	5620		15.84	16.00	
		CH 132	5660		15.83	16.00	
		CH 144	5720		15.49	16.00	
	802.11n-HT20	CH 100	5500	MCS0	15.77	16.00	95.52
		CH 116	5580		15.71	16.00	
		CH 124	5620		15.66	16.00	
		CH 132	5660		15.70	16.00	
		CH 144	5720		15.70	16.00	
	802.11n-HT40	CH 102	5510	MCS0	15.86	16.00	96.91
		CH 110	5550		15.79	16.00	
		CH 126	5630		15.69	16.00	
		CH 134	5670		15.94	16.00	
		CH 142	5710		15.66	16.00	
	802.11ac-VHT20	CH 100	5500	MCS0	15.72	16.00	95.52
		CH 116	5580		15.69	16.00	
		CH 124	5620		15.62	16.00	
		CH 132	5660		15.58	16.00	
		CH 144	5720		15.60	16.00	
	802.11ac-VHT40	CH 102	5510	MCS0	15.82	16.00	96.92
		CH 110	5550		15.76	16.00	
		CH 126	5630		15.61	16.00	
		CH 134	5670		15.83	16.00	
		CH 142	5710		15.67	16.00	
	802.11ac-VHT80	CH 106	5530	MCS0	11.58	12.00	93.88
		CH 122	5610		15.60	16.00	
		CH 138	5690		15.64	16.00	

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN ANT 2	802.11a	CH 149	5745	MCS0	15.91	16.00	94.50
		CH 157	5785		15.90	16.00	
		CH 165	5825		15.92	16.00	
	802.11n-HT20	CH 149	5745	MCS0	15.66	16.00	95.52
		CH 157	5785		15.83	16.00	
		CH 165	5825		15.72	16.00	
	802.11n-HT40	CH 151	5755	MCS0	15.97	16.00	96.91
		CH 159	5795		15.89	16.00	
	802.11ac-VHT20	CH 149	5745	MCS0	15.70	16.00	95.52
		CH 157	5785		15.92	16.00	
		CH 165	5825		15.80	16.00	
	802.11ac-VHT40	CH 151	5755	MCS0	15.92	16.00	96.92
		CH 159	5795		15.87	16.00	
	802.11ac-VHT80	CH 155	5775	MCS0	15.82	16.00	93.88

<5GHz WLAN ANT1+2>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN ANT 1+2	802.11n-HT20	CH 36	5180	MCS0	15.78	16.00	95.10
		CH 40	5200		15.76	16.00	
		CH 44	5220		15.81	16.00	
		CH 48	5240		15.85	16.00	
	802.11n-HT40	CH 38	5190	MCS0	15.91	16.00	92.45
		CH 46	5230		15.98	16.00	
	802.11ac-VHT20	CH 36	5180	MCS0	15.72	16.00	97.96
		CH 40	5200		15.70	16.00	
		CH 44	5220		15.75	16.00	
		CH 48	5240		15.79	16.00	
	802.11ac-VHT40	CH 38	5190	MCS0	15.79	16.00	95.96
		CH 46	5230		15.86	16.00	
	802.11ac-VHT80	CH 42	5210	MCS0	14.63	15.00	86.21

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN ANT 1+2	802.11n-HT20	CH 52	5260	MCS0	15.91	16.00	95.10
		CH 56	5280		15.83	16.00	
		CH 60	5300		15.88	16.00	
		CH 64	5320		15.99	16.00	
	802.11n-HT40	CH 54	5270	MCS0	15.98	16.00	92.45
		CH 62	5310		13.10	13.20	
	802.11ac-VHT20	CH 52	5260	MCS0	15.83	16.00	97.96
		CH 56	5280		15.80	16.00	
		CH 60	5300		15.82	16.00	
		CH 64	5320		15.91	16.00	
	802.11ac-VHT40	CH 54	5270	MCS0	15.87	16.00	95.96
		CH 62	5310		12.73	13.20	
	802.11ac-VHT80	CH 58	5290	MCS0	13.04	13.20	86.21

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN ANT 1+2	802.11n-HT20	CH 100	5500	MCS0	15.95	16.00	95.10
		CH 116	5580		15.74	16.00	
		CH 124	5620		15.70	16.00	
		CH 132	5660		15.82	16.00	
		CH 144	5720		15.76	16.00	
	802.11n-HT40	CH 102	5510	MCS0	15.37	16.00	92.45
		CH 110	5550		15.91	16.00	
		CH 126	5630		15.80	16.00	
		CH 134	5670		15.99	16.00	
		CH 142	5710		15.86	16.00	
	802.11ac-VHT20	CH 100	5500	MCS0	15.84	16.00	97.96
		CH 116	5580		15.72	16.00	
		CH 124	5620		15.66	16.00	
		CH 132	5660		15.79	16.00	
		CH 144	5720		15.70	16.00	
	802.11ac-VHT40	CH 102	5510	MCS0	15.07	16.00	95.96
		CH 110	5550		15.83	16.00	
		CH 126	5630		15.76	16.00	
		CH 134	5670		15.88	16.00	
		CH 142	5710		15.80	16.00	
	802.11ac-VHT80	CH 106	5530	MCS0	14.21	15.00	86.21
		CH 122	5610		15.70	16.00	
		CH 138	5690		15.83	16.00	

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN ANT 1+2	802.11n-HT20	CH 149	5745	MCS0	15.74	16.00	95.10
		CH 157	5785		15.96	16.00	
		CH 165	5825		15.80	16.00	
	802.11n-HT40	CH 151	5755	MCS0	15.75	16.00	92.45
		CH 159	5795		15.94	16.00	
	802.11ac-VHT20	CH 149	5745	MCS0	15.63	16.00	97.96
		CH 157	5785		15.85	16.00	
		CH 165	5825		15.69	16.00	
	802.11ac-VHT40	CH 151	5755	MCS0	15.56	16.00	95.96
		CH 159	5795		15.74	16.00	
	802.11ac-VHT80	CH 155	5775	MCS0	15.78	16.00	86.21

<2.4GHz Bluetooth>

Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
BR / EDR	CH 00	2402	9.30	6.97	6.06
	CH 39	2441	9.10	6.96	6.02
	CH 78	2480	9.22	6.92	6.04
Tune-up Limit			9.5	9.5	9.5

Mode	Channel	Frequency (MHz)	Average power (dBm)
			GFSK
LE	CH 00	2402	7.98
	CH 19	2440	8.90
	CH 39	2480	8.73
Tune-up Limit			9.5

General Note:

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

13. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For WLAN / Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   e. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
4. For the body SAR measurement was used a low-loss foam block performed testing, the relative permittivity and loss tangent of the foam material is 1.0 and 10-5, respectively, therefore holder perturbation verification is not required even highest reported SAR is >1.2W/kg.
5. For the exposure positions that proximity sensor power reduction is applied for SAR compliance, additional SAR testing with EUT transmitting full power in normal mode was performed; 8mm for bottom of Laptop.
6. The proximity sensor is used to detect the human proximity, and the G-sensor is used to detect EUT motion and determine whether the proximity sensor is triggered by human or fixed objects such as the table. During SAR test for EUT at the power reduction mode, the EUT positioning was stationary for stable measurement, and G-sensor was manually set not enabled to successfully set EUT in the power reduction mode

UMTS Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”.
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. If the maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / B12 / B26 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE band 2 / 5 SAR test was covered by Band 25 / 26; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. The maximum output power, including tolerance, for the smaller band is ≤ 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.

WLAN Note:

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. Per KDB 248227 D01v02r02, U-NII-1 SAR testing is not required when the U-NII-2A band highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band.
3. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
4. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
5. For WLAN SAR testing was performed on single antenna RF power in SISO mode is larger or equal to the single antenna RF power in MIMO mode, and for RF exposure assessment of MIMO mode simultaneous transmission exclusion analysis was performed with SAR test results of each antenna in SISO mode.
6. Per KDB 248227 D01v02r02, the simultaneous SAR provisions in KDB publication 447498 should be applied to determine simultaneous transmission SAR test exclusion for WiFi MIMO. If the sum of 1g single transmission chain SAR measurements is < 1.6W/kg and SAR peak to location ratio ≤ 0.04, no additional SAR measurements for MIMO.
7. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

13.1 Body SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna Vendor	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Amphenol	ON	9400	1880	16.90	17.50	1.148	-0.07	0.937	1.076
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Amphenol	ON	9262	1852.4	16.84	17.50	1.164	0.15	1.000	1.164
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Amphenol	ON	9538	1907.6	16.88	17.50	1.153	0	0.891	1.028
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	8mm	Amphenol	OFF	9400	1880	22.93	24.00	1.279	0.03	0.934	1.195
01	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	8mm	Amphenol	OFF	9262	1852.4	22.90	24.00	1.288	-0.03	0.931	1.199
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	8mm	Amphenol	OFF	9538	1907.6	22.92	24.00	1.282	0	0.885	1.135
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Speedwire	ON	9262	1852.4	16.84	17.50	1.164	-0.03	0.842	0.980
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Speedwire	ON	9400	1880	16.90	17.50	1.148	-0.04	0.819	0.940
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Speedwire	ON	9538	1907.6	16.88	17.50	1.153	-0.03	0.806	0.930
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	8mm	Speedwire	OFF	9262	1852.4	22.90	24.00	1.288	0.03	0.881	1.135
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	8mm	Speedwire	OFF	9400	1880	22.93	24.00	1.279	-0.11	0.918	1.174
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	8mm	Speedwire	OFF	9538	1907.6	22.92	24.00	1.282	-0.18	0.845	1.084
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Amphenol	ON	1513	1752.6	15.95	16.50	1.135	-0.07	0.906	1.028
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Amphenol	ON	1312	1712.4	15.75	16.50	1.189	-0.06	0.850	1.010
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Amphenol	ON	1413	1732.6	15.74	16.50	1.191	-0.06	0.829	0.988
02	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	8mm	Amphenol	OFF	1513	1752.6	23.09	24.00	1.233	-0.06	0.949	1.170
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	8mm	Amphenol	OFF	1413	1732.6	22.79	24.00	1.321	-0.02	0.819	1.082
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	8mm	Amphenol	OFF	1312	1712.4	22.77	24.00	1.327	-0.07	0.762	1.011
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Speedwire	ON	1513	1752.6	15.95	16.50	1.135	-0.07	0.802	0.910
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Speedwire	ON	1312	1712.4	15.75	16.50	1.189	-0.07	0.777	0.923
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Speedwire	ON	1413	1732.6	15.74	16.50	1.191	-0.04	0.754	0.898
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	8mm	Speedwire	OFF	1513	1752.6	23.09	24.00	1.233	-0.05	0.947	1.168
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	8mm	Speedwire	OFF	1312	1712.4	22.79	24.00	1.321	-0.04	0.869	1.148
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	8mm	Speedwire	OFF	1413	1732.6	22.77	24.00	1.327	0	0.880	1.168
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	Amphenol	ON	4182	836.4	18.05	19.00	1.245	0.18	0.878	1.093
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	Amphenol	ON	4132	826.4	18.00	19.00	1.259	0.13	0.870	1.095
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	Amphenol	ON	4233	846.6	18.01	19.00	1.256	0.14	0.883	1.109
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	8mm	Amphenol	OFF	4182	836.4	22.78	24.00	1.324	0.11	0.838	1.110
03	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	8mm	Amphenol	OFF	4132	826.4	22.77	24.00	1.327	0.08	0.867	1.151
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	8mm	Amphenol	OFF	4233	846.6	22.69	24.00	1.352	0.18	0.800	1.082
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	Speedwire	ON	4233	846.6	18.01	19.00	1.256	-0.19	0.832	1.045
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	Speedwire	ON	4132	826.4	18.00	19.00	1.259	-0.15	0.852	1.073
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	Speedwire	ON	4182	836.4	18.05	19.00	1.245	0.08	0.814	1.013
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	8mm	Speedwire	OFF	4132	826.4	22.77	24.00	1.327	0.08	0.804	1.067
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	8mm	Speedwire	OFF	4182	836.4	22.78	24.00	1.324	0.03	0.746	0.988
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	8mm	Speedwire	OFF	4233	846.6	22.69	24.00	1.352	0.07	0.747	1.010

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna Vendor	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 4	20M	QPSK	1	0	Bottom of Laptop	0mm	Amphenol	ON	20175	1732.5	16.26	16.50	1.057	-0.06	0.901	0.952
	LTE Band 4	20M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	20175	1732.5	16.25	16.50	1.059	-0.03	0.930	0.985
	LTE Band 4	20M	QPSK	100	0	Bottom of Laptop	0mm	Amphenol	ON	20175	1732.5	16.23	16.50	1.064	-0.04	0.942	1.002
04	LTE Band 4	20M	QPSK	1	0	Bottom of Laptop	8mm	Amphenol	OFF	20175	1732.5	22.91	24.00	1.285	-0.08	0.839	1.078
	LTE Band 4	20M	QPSK	50	0	Bottom of Laptop	8mm	Amphenol	OFF	20175	1732.5	21.88	23.00	1.294	-0.1	0.685	0.887
	LTE Band 4	20M	QPSK	100	0	Bottom of Laptop	8mm	Amphenol	OFF	20175	1732.5	21.90	23.00	1.288	0.01	0.709	0.913
	LTE Band 4	20M	QPSK	1	0	Bottom of Laptop	8mm	Speedwire	OFF	20175	1732.5	22.91	24.00	1.285	-0.07	0.834	1.072
	LTE Band 7	20M	QPSK	1	0	Bottom of Laptop	0mm	Amphenol	ON	21350	2560	17.58	18.50	1.236	-0.06	0.910	1.125
	LTE Band 7	20M	QPSK	1	0	Bottom of Laptop	0mm	Amphenol	ON	20850	2510	17.57	18.50	1.239	0.09	0.885	1.096
	LTE Band 7	20M	QPSK	1	0	Bottom of Laptop	0mm	Amphenol	ON	21100	2535	17.53	18.50	1.250	-0.18	0.917	1.146
	LTE Band 7	20M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	21350	2560	17.72	18.50	1.197	0.06	0.960	1.149
	LTE Band 7	20M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	20850	2510	17.64	18.50	1.219	0.02	0.910	1.109
05	LTE Band 7	20M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	21100	2535	17.70	18.50	1.202	0	0.989	1.189
	LTE Band 7	20M	QPSK	100	0	Bottom of Laptop	0mm	Amphenol	ON	21100	2535	17.74	18.50	1.191	0.06	0.964	1.148
	LTE Band 7	20M	QPSK	1	0	Bottom of Laptop	8mm	Amphenol	OFF	21100	2535	21.71	23.00	1.346	0.13	0.592	0.797
	LTE Band 7	20M	QPSK	50	0	Bottom of Laptop	8mm	Amphenol	OFF	21100	2535	20.74	22.00	1.337	0.01	0.472	0.631
	LTE Band 7	20M	QPSK	50	0	Bottom of Laptop	0mm	Speedwire	ON	21100	2535	17.70	18.50	1.202	0.05	0.541	0.650
06	LTE Band 12	10M	QPSK	1	0	Bottom of Laptop	0mm	Amphenol	ON	23095	707.5	20.91	21.50	1.146	0.05	1.010	1.157
	LTE Band 12	10M	QPSK	25	0	Bottom of Laptop	0mm	Amphenol	ON	23095	707.5	20.77	21.50	1.183	0.09	0.960	1.136
	LTE Band 12	10M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	23095	707.5	20.73	21.50	1.194	0.11	0.956	1.141
	LTE Band 12	10M	QPSK	1	0	Bottom of Laptop	8mm	Amphenol	OFF	23095	707.5	23.18	24.00	1.208	0	0.697	0.842
	LTE Band 12	10M	QPSK	25	0	Bottom of Laptop	8mm	Amphenol	OFF	23095	707.5	22.12	23.00	1.225	-0.02	0.501	0.614
	LTE Band 12	10M	QPSK	50	0	Bottom of Laptop	8mm	Amphenol	OFF	23095	707.5	22.03	23.00	1.250	-0.01	0.466	0.583
	LTE Band 12	10M	QPSK	1	0	Bottom of Laptop	0mm	Speedwire	ON	23095	707.5	20.91	21.50	1.146	-0.15	0.995	1.140
	LTE Band 13	10M	QPSK	1	0	Bottom of Laptop	0mm	Amphenol	ON	23230	782	19.79	20.00	1.050	0.13	1.100	1.154
07	LTE Band 13	10M	QPSK	25	0	Bottom of Laptop	0mm	Amphenol	ON	23230	782	19.64	20.00	1.086	0.11	1.100	1.195
	LTE Band 13	10M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	23230	782	19.69	20.00	1.074	0.17	1.110	1.192
	LTE Band 13	10M	QPSK	1	0	Bottom of Laptop	8mm	Amphenol	OFF	23230	782	22.88	24.00	1.294	0.07	0.584	0.756
	LTE Band 13	10M	QPSK	25	0	Bottom of Laptop	8mm	Amphenol	OFF	23230	782	21.70	23.00	1.349	0.07	0.476	0.642
	LTE Band 13	10M	QPSK	25	0	Bottom of Laptop	0mm	Speedwire	ON	23230	782	19.64	20.00	1.086	0.02	1.090	1.184
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	0mm	Amphenol	ON	26340	1880	16.86	17.50	1.159	0.01	0.859	0.995
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	0mm	Amphenol	ON	26140	1860	16.85	17.50	1.161	0.1	0.920	1.069
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	0mm	Amphenol	ON	26590	1905	16.73	17.50	1.194	-0.06	0.826	0.986
	LTE Band 25	20M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	26140	1860	16.76	17.50	1.186	-0.03	0.884	1.048
	LTE Band 25	20M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	26340	1880	16.74	17.50	1.191	-0.03	0.850	1.013
	LTE Band 25	20M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	26590	1905	16.73	17.50	1.194	-0.02	0.827	0.987
	LTE Band 25	20M	QPSK	100	0	Bottom of Laptop	0mm	Amphenol	ON	26340	1880	16.75	17.50	1.189	-0.03	0.875	1.040
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	8mm	Amphenol	OFF	26340	1880	23.01	24.00	1.256	-0.01	0.953	1.197
08	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	8mm	Amphenol	OFF	26140	1860	22.98	24.00	1.265	0.01	0.948	1.199
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	8mm	Amphenol	OFF	26590	1905	22.98	24.00	1.265	0.01	0.939	1.188
	LTE Band 25	20M	QPSK	50	0	Bottom of Laptop	8mm	Amphenol	OFF	26590	1905	21.98	23.00	1.265	-0.01	0.741	0.937
	LTE Band 25	20M	QPSK	50	0	Bottom of Laptop	8mm	Amphenol	OFF	26140	1860	21.93	23.00	1.279	-0.02	0.742	0.949
	LTE Band 25	20M	QPSK	50	0	Bottom of Laptop	8mm	Amphenol	OFF	26340	1880	21.92	23.00	1.282	-0.02	0.729	0.935
	LTE Band 25	20M	QPSK	100	0	Bottom of Laptop	8mm	Amphenol	OFF	26590	1905	21.97	23.00	1.268	0	0.741	0.939
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	8mm	Speedwire	OFF	26140	1860	22.98	24.00	1.265	0.03	0.935	1.183
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	8mm	Speedwire	OFF	26340	1880	23.01	24.00	1.256	-0.04	0.934	1.173
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	8mm	Speedwire	OFF	26590	1905	22.98	24.00	1.265	-0.02	0.902	1.141

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna Vendor	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 26	15M	QPSK	1	0	Bottom of Laptop	0mm	Amphenol	ON	26865	831.5	18.10	18.50	1.096	0.09	0.895	0.981
09	LTE Band 26	15M	QPSK	36	0	Bottom of Laptop	0mm	Amphenol	ON	26865	831.5	18.09	19.00	1.233	0.04	0.918	1.132
	LTE Band 26	15M	QPSK	75	0	Bottom of Laptop	0mm	Amphenol	ON	26865	831.5	18.09	19.00	1.233	0.1	0.909	1.121
	LTE Band 26	15M	QPSK	1	0	Bottom of Laptop	8mm	Amphenol	OFF	26865	831.5	22.93	24.00	1.279	0.18	0.853	1.091
	LTE Band 26	15M	QPSK	36	0	Bottom of Laptop	8mm	Amphenol	OFF	26865	831.5	21.96	23.00	1.271	0.01	0.653	0.830
	LTE Band 26	15M	QPSK	75	0	Bottom of Laptop	8mm	Amphenol	OFF	26865	831.5	21.92	23.00	1.282	0.04	0.650	0.834
	LTE Band 26	15M	QPSK	36	0	Bottom of Laptop	0mm	Speedwire	ON	26865	831.5	18.09	19.00	1.233	-0.07	0.916	1.130
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	0mm	Amphenol	ON	40620	2593	19.18	19.50	1.076	0.03	0.845	0.915
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	0mm	Amphenol	ON	39750	2506	19.17	19.50	1.079	0.03	0.816	0.886
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	0mm	Amphenol	ON	40185	2549.5	19.14	19.50	1.086	0.11	0.890	0.973
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	0mm	Amphenol	ON	41055	2636.5	19.05	19.50	1.109	0.03	0.932	1.040
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	0mm	Amphenol	ON	41490	2680	19.10	19.50	1.096	-0.17	0.668	0.737
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	39750	2506	19.21	19.50	1.069	0.19	0.923	0.993
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	40185	2549.5	19.12	19.50	1.091	0.1	0.950	1.043
10	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	40620	2593	19.10	19.50	1.096	0.09	1.040	1.147
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	41055	2636.5	19.13	19.50	1.089	0	0.923	1.011
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	41490	2680	19.15	19.50	1.084	0.09	0.620	0.676
	LTE Band 41	20M	QPSK	100	0	Bottom of Laptop	0mm	Amphenol	ON	39750	2506	19.28	19.50	1.052	0.13	0.933	0.987
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	8mm	Amphenol	OFF	40620	2593	21.63	23.00	1.371	-0.13	0.394	0.543
	LTE Band 41	20M	QPSK	50	24	Bottom of Laptop	8mm	Amphenol	OFF	41490	2680	20.82	22.00	1.312	0.08	0.217	0.286
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	Speedwire	ON	40620	2593	19.10	19.50	1.096	0.07	0.692	0.763
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	Speedwire	ON	39750	2506	19.21	19.50	1.069	-0.04	0.529	0.569
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	Speedwire	ON	40185	2549.5	19.12	19.50	1.091	-0.04	0.581	0.638
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	Speedwire	ON	41055	2636.5	19.13	19.50	1.089	-0.04	0.664	0.727
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	Speedwire	ON	41490	2680	19.15	19.50	1.084	-0.04	0.522	0.569

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Antenna Vendor	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Bottom of Laptop	0mm	Ant 1	Speedwire	1	2412	17.50	17.50	1.000	98.56	1.015	0.1	0.613	0.622
	WLAN2.4GHz	802.11b 1Mbps	Bottom of Laptop	0mm	Ant 1	Speedwire	6	2437	17.49	17.50	1.002	98.56	1.015	0.07	0.617	0.627
	WLAN2.4GHz	802.11b 1Mbps	Bottom of Laptop	0mm	Ant 1	Speedwire	11	2462	17.22	17.50	1.066	98.56	1.015	0.06	0.631	0.683
11	WLAN2.4GHz	802.11b 1Mbps	Bottom of Laptop	0mm	Ant 1	Amphenol	11	2462	17.22	17.50	1.066	98.56	1.015	0.03	0.718	0.777
	WLAN2.4GHz	802.11b 1Mbps	Bottom of Laptop	0mm	Ant 2	Speedwire	6	2437	17.46	17.50	1.009	98.56	1.015	-0.03	0.596	0.610
	WLAN2.4GHz	802.11b 1Mbps	Bottom of Laptop	0mm	Ant 2	Amphenol	6	2437	17.46	17.50	1.009	98.56	1.015	0.02	0.535	0.548
	WLAN5GHz	802.11n-HT40 MCS0	Bottom of Laptop	0mm	Ant 1	Speedwire	54	5270	15.60	16.00	1.097	96.91	1.032	-0.11	0.460	0.521
	WLAN5GHz	802.11n-HT40 MCS0	Bottom of Laptop	0mm	Ant 1	Amphenol	54	5270	15.60	16.00	1.097	96.91	1.032	-0.02	0.652	0.738
	WLAN5GHz	802.11n-HT40 MCS0	Bottom of Laptop	0mm	Ant 2	Speedwire	54	5270	15.75	16.00	1.060	96.91	1.032	-0.11	1.030	1.127
	WLAN5GHz	802.11a 6Mbps	Bottom of Laptop	0mm	Ant 2	Speedwire	60	5300	15.68	16.00	1.077	94.5	1.058	-0.11	1.010	1.151
12	WLAN5GHz	802.11n-HT40 MCS0	Bottom of Laptop	0mm	Ant 2	Amphenol	54	5270	15.75	16.00	1.060	96.91	1.032	0.12	1.090	1.193
	WLAN5GHz	802.11a 6Mbps	Bottom of Laptop	0mm	Ant 2	Amphenol	60	5300	15.68	16.00	1.077	94.5	1.058	0.15	0.998	1.138
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom of Laptop	0mm	Ant 1	Speedwire	138	5690	15.66	16.00	1.081	93.88	1.065	-0.11	0.353	0.407
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom of Laptop	0mm	Ant 1	Amphenol	138	5690	15.66	16.00	1.081	93.88	1.065	0.05	0.641	0.738
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom of Laptop	0mm	Ant 2	Speedwire	138	5690	15.64	16.00	1.086	93.88	1.065	-0.05	0.597	0.691
13	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom of Laptop	0mm	Ant 2	Amphenol	138	5690	15.64	16.00	1.086	93.88	1.065	-0.03	0.685	0.793
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom of Laptop	0mm	Ant 2	Amphenol	106	5530	11.58	12.00	1.100	93.88	1.065	-0.01	0.345	0.404
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom of Laptop	0mm	Ant 1	Speedwire	155	5775	15.79	16.00	1.048	93.88	1.065	0.03	0.213	0.238
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom of Laptop	0mm	Ant 1	Amphenol	155	5775	15.79	16.00	1.048	93.88	1.065	0.04	0.326	0.364
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom of Laptop	0mm	Ant 2	Speedwire	155	5775	15.82	16.00	1.041	93.88	1.065	-0.14	0.681	0.755
14	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom of Laptop	0mm	Ant 2	Amphenol	155	5775	15.82	16.00	1.041	93.88	1.065	0	0.775	0.859

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Antenna Vendor	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)
	Bluetooth	1Mbps	Bottom of Laptop	0mm	Ant 2	Speedwire	0	2402	9.30	9.50	1.047	76.6	1.087	0.05	0.068	0.077
15	Bluetooth	1Mbps	Bottom of Laptop	0mm	Ant 2	Speedwire	39	2441	9.10	9.50	1.096	76.6	1.087	0.06	0.077	0.092
	Bluetooth	1Mbps	Bottom of Laptop	0mm	Ant 2	Speedwire	78	2480	9.22	9.50	1.067	76.6	1.087	0.05	0.070	0.081
	Bluetooth	1Mbps	Bottom of Laptop	0mm	Ant 2	Amphenol	39	2441	9.10	9.50	1.096	76.6	1.087	0.05	0.061	0.073

13.2 Repeated SAR Measurement

No.	Band	Mode	Test Position	Gap (mm)	Antenna Vendor	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Amphenol	ON	9262	1852.4	16.84	17.50	1.164	0.15	1.000	-	1.164
2nd	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Amphenol	ON	9262	1852.4	16.84	17.50	1.164	-0.17	0.912	1.1	1.062
1st	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	8mm	Amphenol	OFF	1513	1752.6	23.09	24.00	1.233	-0.06	0.949	-	1.170
2nd	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	8mm	Amphenol	OFF	1513	1752.6	23.09	24.00	1.233	-0.16	0.898	1.06	1.107

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna Vendor	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 13	10M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	23230	782	19.69	20.00	1.074	0.17	1.110	-	1.192
2nd	LTE Band 13	10M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	23230	782	19.69	20.00	1.074	-0.13	1.080	1.03	1.160
1st	LTE Band 26	15M	QPSK	36	0	Bottom of Laptop	0mm	Amphenol	ON	26865	831.5	18.09	19.00	1.233	0.04	0.918	-	1.132
2nd	LTE Band 26	15M	QPSK	36	0	Bottom of Laptop	0mm	Amphenol	ON	26865	831.5	18.09	19.00	1.233	0.1	0.892	1.03	1.100
1st	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	40620	2593	19.10	19.50	1.096	0.09	1.040	-	1.147
2nd	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	Amphenol	ON	40620	2593	19.10	19.50	1.096	0.15	0.996	1.04	1.099

No.	Band	Mode	Test Position	Gap (mm)	Antenna	Antenna Vendor	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WLAN5GHz	802.11n-HT40 MCS0	Bottom of Laptop	0mm	Ant 2	Amphenol	54	5270	15.75	16.00	1.060	96.91	1.032	0.12	1.090	-	1.193
2nd	WLAN5GHz	802.11n-HT40 MCS0	Bottom of Laptop	0mm	Ant 2	Amphenol	54	5270	15.75	16.00	1.060	96.91	1.032	0.12	0.991	1.1	1.084

General Note:

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

14. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Notebook
		Body
1.	WCDMA + WLAN2.4GHz	Yes
2.	LTE + WLAN2.4GHz	Yes
3.	WCDMA+ Bluetooth	Yes
4.	LTE + Bluetooth	Yes
5.	WCDMA + WLAN5GHz	Yes
6.	LTE + WLAN5GHz	Yes
7.	WCDMA + WLAN ANT 1 + Bluetooth ANT 2	Yes
8.	LTE + WLAN ANT 1 + Bluetooth ANT 2	Yes

General Note:

1. The worst case WLAN reported SAR for each configuration was used for SAR summation. Therefore, the following summations represent the absolute worst cases for simultaneous transmission with WLAN.
2. For SAR testing was performed on single antenna RF power in SISO mode is larger or equal to the single antenna RF power in MIMO mode, and for RF exposure assessment of MIMO mode simultaneous transmission exclusion analysis was performed with SAR test results of each antenna in SISO mode.
3. For simultaneous transmission analysis for exposure position of bottom of laptop 8mm, WLAN SAR tested at 0mm separation is worse and the test data is used for conservative SAR summation.
4. 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.
5. The Scaled SAR summation is calculated based on the same configuration and test position.
6. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.
   v) The SPLSR calculated results please refer to section 14.2

14.1 Body Exposure Conditions

WWAN Band		Exposure Position	1	2	3	7	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+2+3 Summed 1g SAR (W/kg)	1+7 Summed 1g SAR (W/kg)	1+2+7 Summed 1g SAR (W/kg)	SPLSR	Case No
			WWAN	2.4GHz WLAN Ant 1	2.4GHz WLAN Ant 2	Bluetooth Ant 2							
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)							
WCDMA	WCDMA II	Bottom of Laptop at 0mm	1.164	0.777	0.610	0.092	1.94	1.77	2.55	1.26	2.03	0.02	Case 1
		Bottom of Laptop at 8mm	1.199	0.777	0.610	0.092	1.98	1.81	2.59	1.29	2.07	0.02	Case 2
	WCDMA IV	Bottom of Laptop at 0mm	1.028	0.777	0.610	0.092	1.81	1.64	2.42	1.12	1.90	0.02	Case 3
		Bottom of Laptop at 8mm	1.170	0.777	0.610	0.092	1.95	1.78	2.56	1.26	2.04	0.02	Case 4
	WCDMA V	Bottom of Laptop at 0mm	1.109	0.777	0.610	0.092	1.89	1.72	2.50	1.20	1.98	0.02	Case 5
		Bottom of Laptop at 8mm	1.151	0.777	0.610	0.092	1.93	1.76	2.54	1.24	2.02	0.02	Case 6
LTE	LTE Band 4	Bottom of Laptop at 0mm	1.002	0.777	0.610	0.092	1.78	1.61	2.39	1.09	1.87	0.02	Case 7
		Bottom of Laptop at 8mm	1.078	0.777	0.610	0.092	1.86	1.69	2.47	1.17	1.95	0.02	Case 8
	LTE Band 7	Bottom of Laptop at 0mm	1.189	0.777	0.610	0.092	1.97	1.80	2.58	1.28	2.06	0.02	Case 9
		Bottom of Laptop at 8mm	0.797	0.777	0.610	0.092	1.57	1.41	2.18	0.89	1.67	0.02	Case 10
	LTE Band 12	Bottom of Laptop at 0mm	1.157	0.777	0.610	0.092	1.93	1.77	2.54	1.25	2.03	0.02	Case 11
		Bottom of Laptop at 8mm	0.842	0.777	0.610	0.092	1.62	1.45	2.23	0.93	1.71	0.02	Case 12
	LTE Band 13	Bottom of Laptop at 0mm	1.195	0.777	0.610	0.092	1.97	1.81	2.58	1.29	2.06	0.02	Case 13
		Bottom of Laptop at 8mm	0.756	0.777	0.610	0.092	1.53	1.37	2.14	0.85	1.63	0.02	Case 14
	LTE Band 25	Bottom of Laptop at 0mm	1.069	0.777	0.610	0.092	1.85	1.68	2.46	1.16	1.94	0.02	Case 15
		Bottom of Laptop at 8mm	1.199	0.777	0.610	0.092	1.98	1.81	2.59	1.29	2.07	0.02	Case 16
	LTE Band 26	Bottom of Laptop at 0mm	1.132	0.777	0.610	0.092	1.91	1.74	2.52	1.22	2.00	0.02	Case 17
		Bottom of Laptop at 8mm	1.091	0.777	0.610	0.092	1.87	1.70	2.48	1.18	1.96	0.02	Case 18
	LTE Band 41	Bottom of Laptop at 0mm	1.147	0.777	0.610	0.092	1.92	1.76	2.53	1.24	2.02	0.02	Case 19
		Bottom of Laptop at 8mm	0.543	0.777	0.610	0.092	1.32	1.15	1.93	0.64	1.41	0.02	Case 20

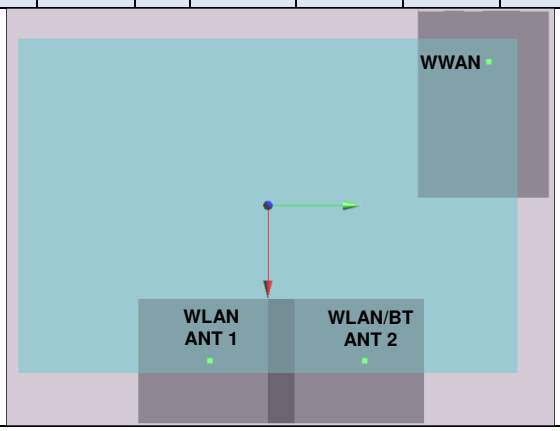
WWAN Band		Exposure Position	1	4	5	7	1+4 Summed 1g SAR (W/kg)	1+5 Summed 1g SAR (W/kg)	1+4+5 Summed 1g SAR (W/kg)	1+4+7 Summed 1g SAR (W/kg)	SPLSR	Case No
			WWAN	5GHz WLAN Ant 1	5GHz WLAN Ant 2	Bluetooth Ant 2						
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)						
WCDMA	WCDMA II	Bottom of Laptop at 0mm	1.164	0.738	1.193	0.092	1.90	2.36	3.10	1.99	0.03	Case 21
		Bottom of Laptop at 8mm	1.199	0.738	1.193	0.092	1.94	2.39	3.13	2.03	0.03	Case 22
	WCDMA IV	Bottom of Laptop at 0mm	1.028	0.738	1.193	0.092	1.77	2.22	2.96	1.86	0.03	Case 23
		Bottom of Laptop at 8mm	1.170	0.738	1.193	0.092	1.91	2.36	3.10	2.00	0.03	Case 24
	WCDMA V	Bottom of Laptop at 0mm	1.109	0.738	1.193	0.092	1.85	2.30	3.04	1.94	0.03	Case 25
		Bottom of Laptop at 8mm	1.151	0.738	1.193	0.092	1.89	2.34	3.08	1.98	0.03	Case 26
LTE	LTE Band 4	Bottom of Laptop at 0mm	1.002	0.738	1.193	0.092	1.74	2.20	2.93	1.83	0.03	Case 27
		Bottom of Laptop at 8mm	1.078	0.738	1.193	0.092	1.82	2.27	3.01	1.91	0.03	Case 28
	LTE Band 7	Bottom of Laptop at 0mm	1.189	0.738	1.193	0.092	1.93	2.38	3.12	2.02	0.03	Case 29
		Bottom of Laptop at 8mm	0.797	0.738	1.193	0.092	1.54	1.99	2.73	1.63	0.03	Case 30
	LTE Band 12	Bottom of Laptop at 0mm	1.157	0.738	1.193	0.092	1.90	2.35	3.09	1.99	0.03	Case 31
		Bottom of Laptop at 8mm	0.842	0.738	1.193	0.092	1.58	2.04	2.77	1.67	0.03	Case 32
	LTE Band 13	Bottom of Laptop at 0mm	1.195	0.738	1.193	0.092	1.93	2.39	3.13	2.03	0.03	Case 33
		Bottom of Laptop at 8mm	0.756	0.738	1.193	0.092	1.49	1.95	2.69	1.59	0.03	Case 34
	LTE Band 25	Bottom of Laptop at 0mm	1.069	0.738	1.193	0.092	1.81	2.26	3.00	1.90	0.03	Case 35
		Bottom of Laptop at 8mm	1.199	0.738	1.193	0.092	1.94	2.39	3.13	2.03	0.03	Case 36
	LTE Band 26	Bottom of Laptop at 0mm	1.132	0.738	1.193	0.092	1.87	2.33	3.06	1.96	0.03	Case 37
		Bottom of Laptop at 8mm	1.091	0.738	1.193	0.092	1.83	2.28	3.02	1.92	0.03	Case 38
	LTE Band 41	Bottom of Laptop at 0mm	1.147	0.738	1.193	0.092	1.89	2.34	3.08	1.98	0.03	Case 39
		Bottom of Laptop at 8mm	0.543	0.738	1.193	0.092	1.28	1.74	2.47	1.37	0.03	Case 40

14.2 SPLSR Evaluation and Analysis

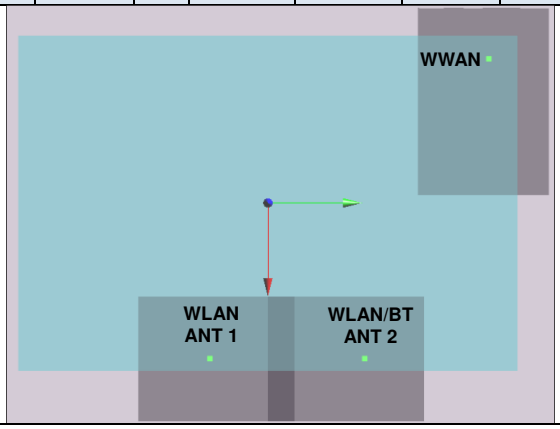
General Note:

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

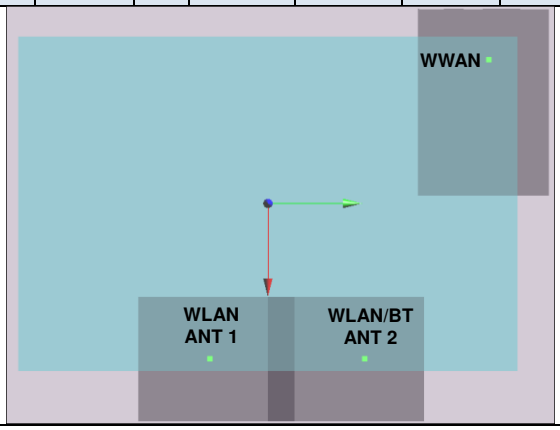
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 1	WCDMA II	Bottom of Laptop	1.164	0	-8.85	14.04	-0.11	259.8	1.94	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	WCDMA II		1.164	0	-8.85	14.04	-0.11	211.0	1.77	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	WCDMA II		1.164	0	-8.85	14.04	-0.11	220.2	1.26	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



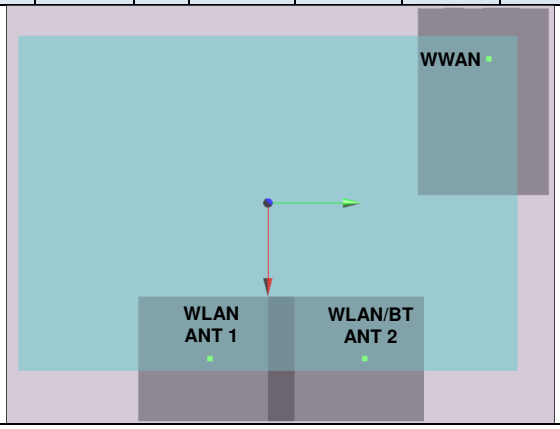
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 2	WCDMA II	Bottom of Laptop	1.199	8	-8.69	13.45	-0.26	254.6	1.98	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	WCDMA II		1.199	8	-8.69	13.45	-0.26	207.2	1.81	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	WCDMA II		1.199	8	-8.69	13.45	-0.26	216.2	1.29	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



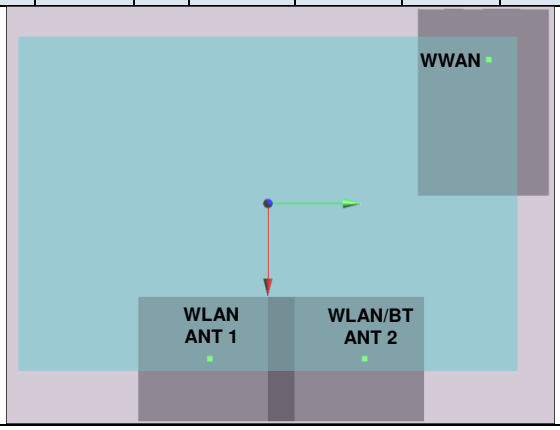
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 3	WCDMA IV	Bottom of Laptop	1.028	0	-9.46	13.75	-0.12	262.4	1.81	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	WCDMA IV		1.028	0	-9.46	13.75	-0.12	215.4	1.64	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	WCDMA IV		1.028	0	-9.46	13.75	-0.12	224.3	1.12	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



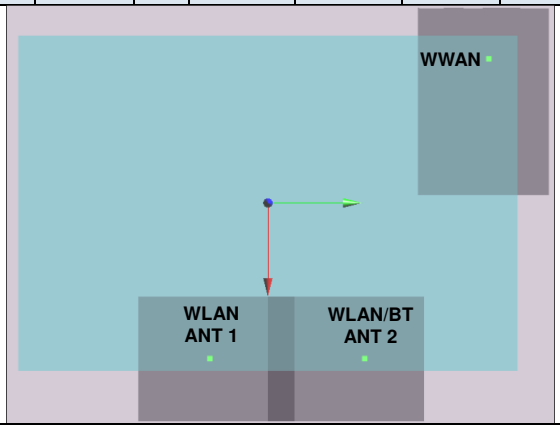
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 4	WCDMA IV	Bottom of Laptop	1.109	8	-9.3	13.14	-0.25	257.2	1.89	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	WCDMA IV		1.109	8	-9.3	13.14	-0.25	211.6	1.72	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	WCDMA IV		1.109	8	-9.3	13.14	-0.25	220.4	1.20	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



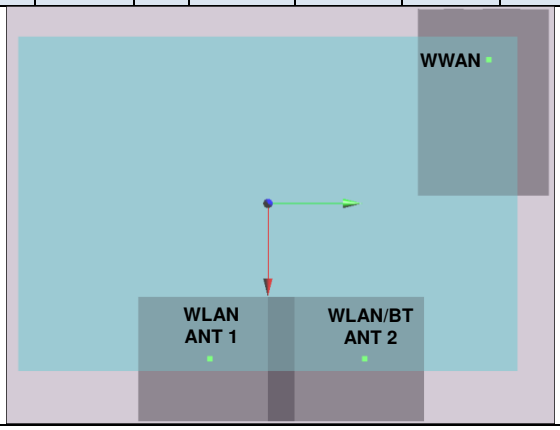
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 5	WCDMA V	Bottom of Laptop	1.109	0	-9.44	14.33	-1.16	266.4	1.89	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	WCDMA V		1.109	0	-9.44	14.33	-1.16	218.1	1.72	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	WCDMA V		1.109	0	-9.44	14.33	-1.16	227.3	1.20	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



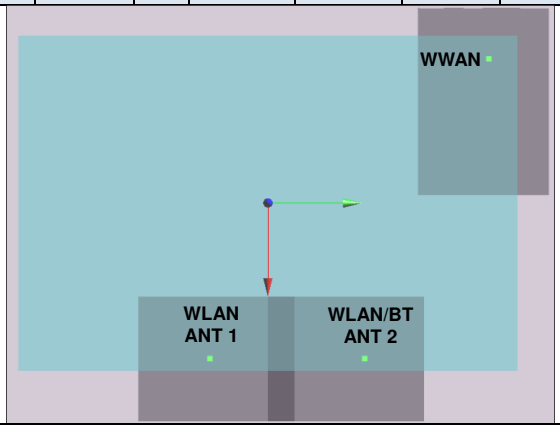
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 6	WCDMA V	Bottom of Laptop	1.151	8	-9.29	13.91	-0.25	262.2	1.93	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	WCDMA V		1.151	8	-9.29	13.91	-0.25	214.5	1.76	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	WCDMA V		1.151	8	-9.29	13.91	-0.25	223.6	1.24	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



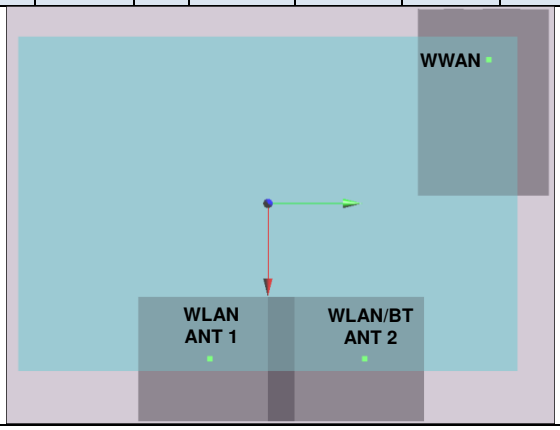
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 7	LTE B4	Bottom of Laptop	1.002	0	-9.15	14.04	-0.1	262.0	1.78	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	LTE B4		1.002	0	-9.15	14.04	-0.1	213.8	1.61	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	LTE B4		1.002	0	-9.15	14.04	-0.1	222.8	1.09	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



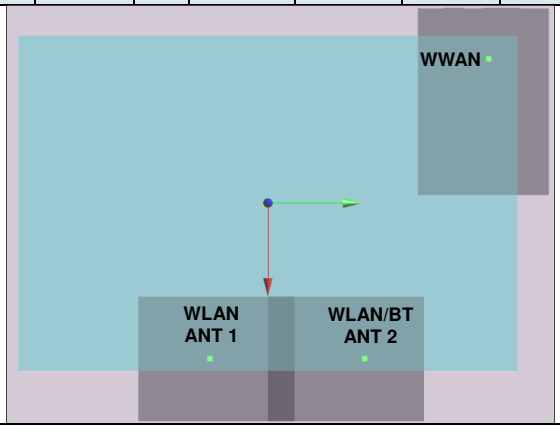
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 8	LTE B4	Bottom of Laptop	1.078	8	-8.98	13.29	-0.25	255.8	1.86	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	LTE B4		1.078	8	-8.98	13.29	-0.25	209.2	1.69	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	LTE B4		1.078	8	-8.98	13.29	-0.25	218.1	1.17	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



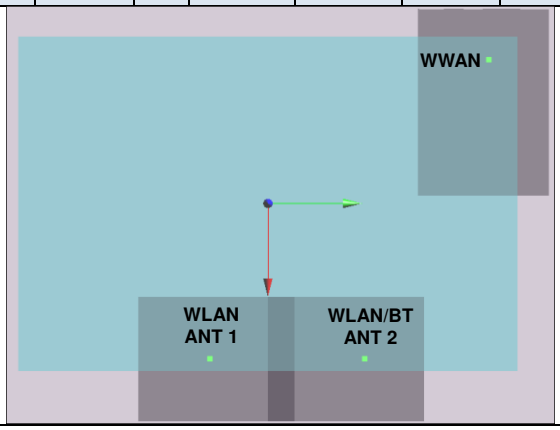
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 9	LTE B7	Bottom of Laptop	1.189	0	-9.28	14.16	-0.18	263.8	1.97	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	LTE B7		1.189	0	-9.28	14.16	-0.18	215.5	1.80	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	LTE B7		1.189	0	-9.28	14.16	-0.18	224.6	1.28	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



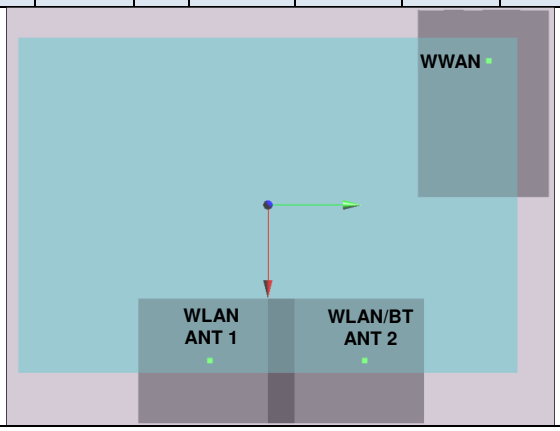
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 10	LTE B7	Bottom of Laptop	0.797	8	-9.26	14.36	-0.24	265.0	1.57	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	LTE B7		0.797	8	-9.26	14.36	-0.24	216.1	1.41	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	LTE B7		0.797	8	-9.26	14.36	-0.24	225.3	0.89	0.00	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



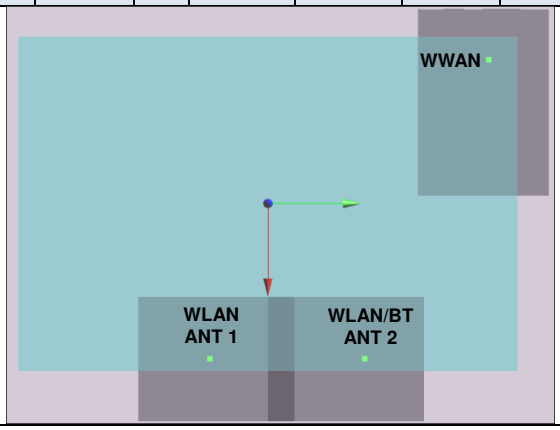
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 11	LTE B12	Bottom of Laptop	1.157	0	-7.69	15.65	-0.19	262.8	1.93	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	LTE B12		1.157	0	-7.69	15.65	-0.19	208.2	1.77	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	LTE B12		1.157	0	-7.69	15.65	-0.19	218.0	1.25	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



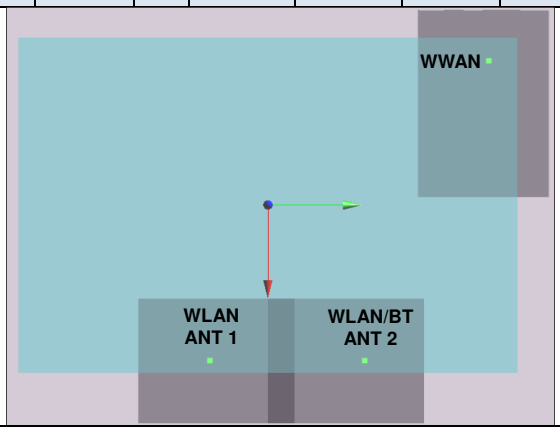
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 12	LTE B12	Bottom of Laptop	0.842	8	-7.38	15.02	-0.29	256.1	1.62	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	LTE B12		0.842	8	-7.38	15.02	-0.29	202.4	1.45	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	LTE B12		0.842	8	-7.38	15.02	-0.29	212.1	0.93	0.00	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



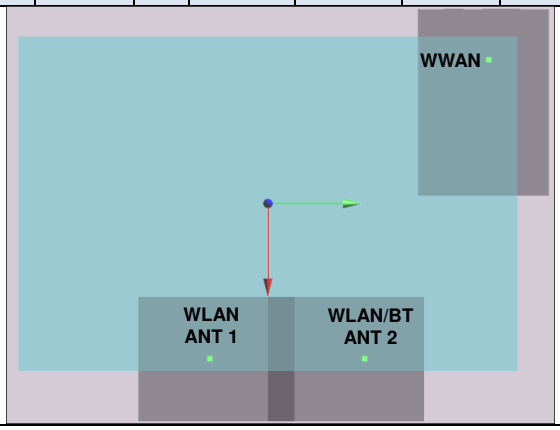
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 13	LTE B13	Bottom of Laptop	1.195	0	-9.45	14.05	-0.18	264.3	1.97	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	LTE B13		1.195	0	-9.45	14.05	-0.18	216.5	1.81	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	LTE B13		1.195	0	-9.45	14.05	-0.18	225.6	1.29	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



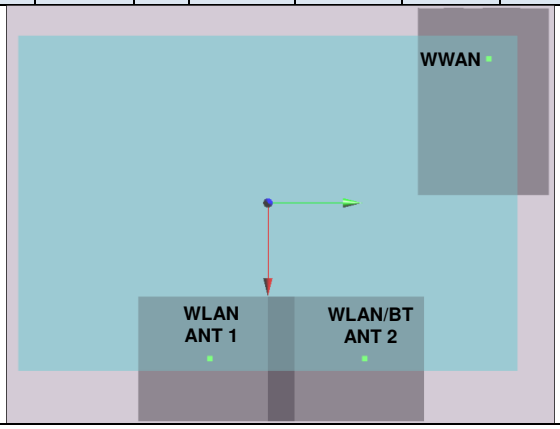
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 14	LTE B13	Bottom of Laptop	0.756	8	-9.15	13.91	-0.28	261.1	1.53	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	LTE B13		0.756	8	-9.15	13.91	-0.28	213.3	1.37	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	LTE B13		0.756	8	-9.15	13.91	-0.28	222.3	0.85	0.00	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



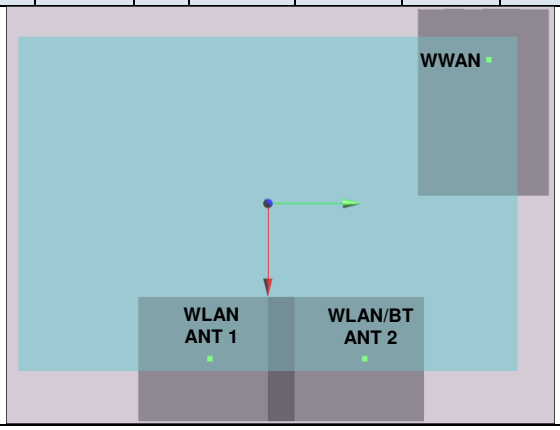
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 15	LTE B25	Bottom of Laptop	1.069	0	-9.15	14.04	-0.13	262.0	1.85	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	LTE B25		1.069	0	-9.15	14.04	-0.13	213.8	1.68	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	LTE B25		1.069	0	-9.15	14.04	-0.13	222.8	1.16	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



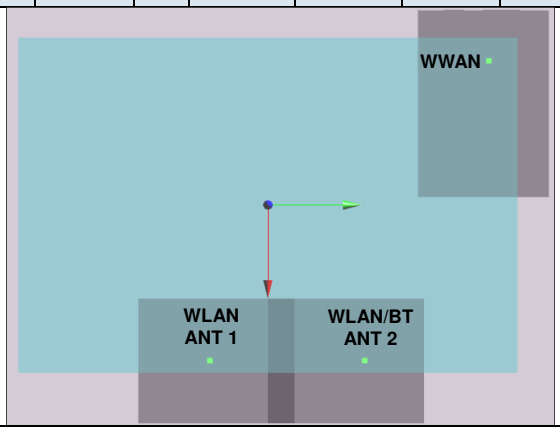
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 16	LTE B25	Bottom of Laptop	1.199	8	-9.15	13.3	-0.25	257.1	1.98	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	LTE B25		1.199	8	-9.15	13.3	-0.25	210.8	1.81	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	LTE B25		1.199	8	-9.15	13.3	-0.25	219.7	1.29	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



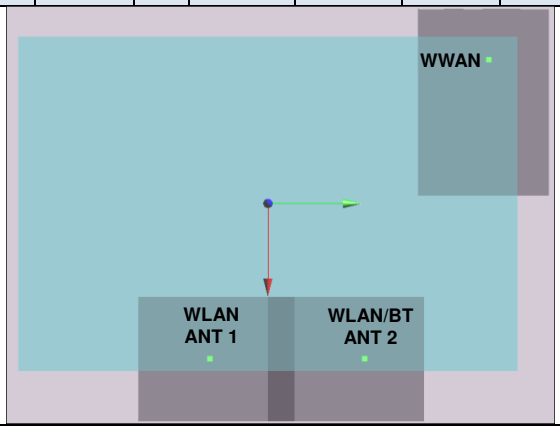
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 17	LTE B26	Bottom of Laptop	1.132	0	-9.13	14.16	-0.14	262.6	1.91	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	LTE B26		1.132	0	-9.13	14.16	-0.14	214.1	1.74	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	LTE B26		1.132	0	-9.13	14.16	-0.14	223.2	1.22	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



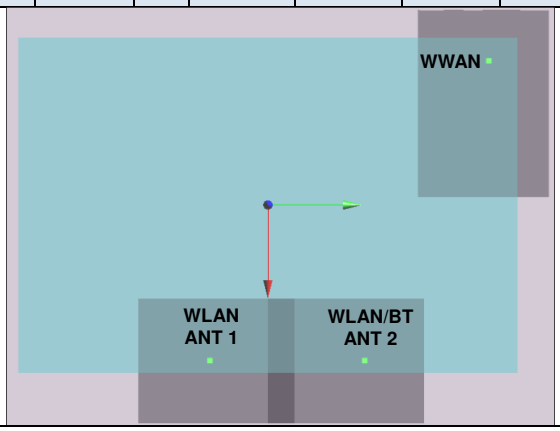
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 18	LTE B26	Bottom of Laptop	1.091	8	-8.99	13.75	-0.28	258.9	1.87	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	LTE B26		1.091	8	-8.99	13.75	-0.28	211.1	1.70	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	LTE B26		1.091	8	-8.99	13.75	-0.28	220.2	1.18	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



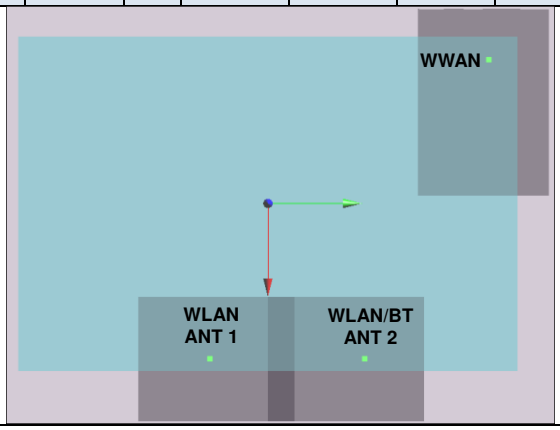
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 19	LTE B41	Bottom of Laptop	1.147	0	-9.4	14.06	-0.09	264.0	1.92	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	LTE B41		1.147	0	-9.4	14.06	-0.09	216.1	1.76	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	LTE B41		1.147	0	-9.4	14.06	-0.09	225.2	1.24	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



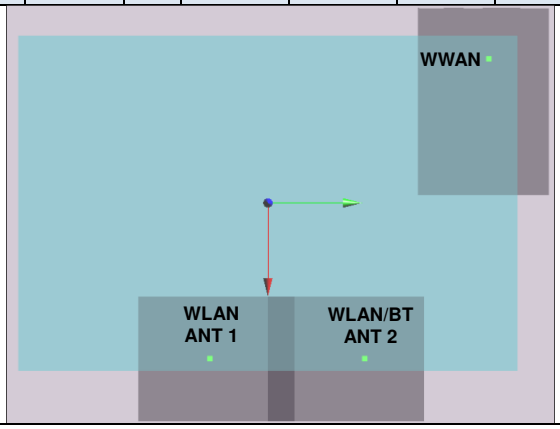
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 20	LTE B41	Bottom of Laptop	0.543	8	-9.31	14.68	-0.23	267.5	1.32	0.01	Not required
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28				
	LTE B41		0.543	8	-9.31	14.68	-0.23	218.0	1.15	0.01	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	85.8	1.39	0.02	Not required
	2.4GHz WLAN ANT 2		0.610	0	10.28	5.14	0.31				
	LTE B41		0.543	8	-9.31	14.68	-0.23	227.2	0.64	0.00	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	2.4GHz WLAN ANT 1		0.777	0	10.36	-3.44	0.28	75.2	0.87	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



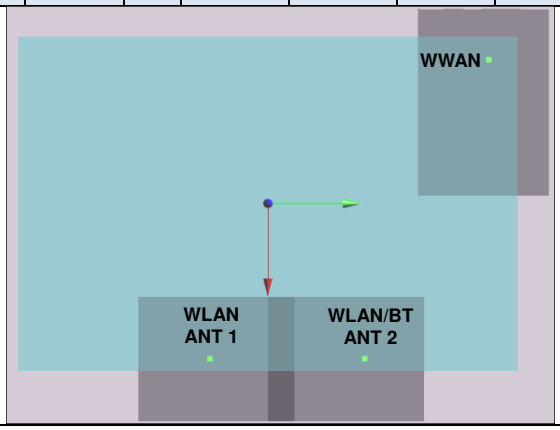
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 21	WCDMA II	Bottom of Laptop	1.164	0	-8.85	14.04	-0.11	260.4	1.90	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	WCDMA II		1.164	0	-8.85	14.04	-0.11	202.0	2.36	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	WCDMA II		1.164	0	-8.85	14.04	-0.11	220.2	1.26	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



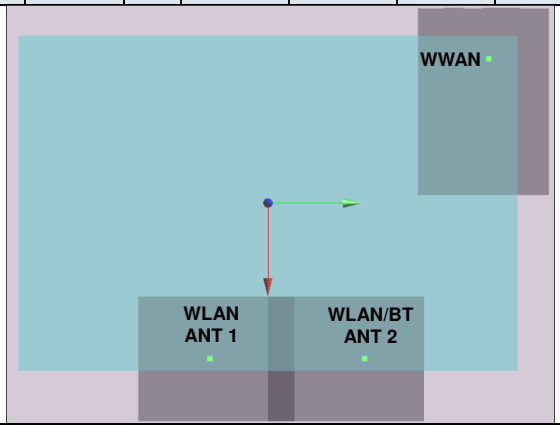
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 22	WCDMA II	Bottom of Laptop	1.199	8	-8.69	13.45	-0.26	255.2	1.94	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	WCDMA II		1.199	8	-8.69	13.45	-0.26	198.4	2.39	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	WCDMA II		1.199	8	-8.69	13.45	-0.26	216.2	1.29	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



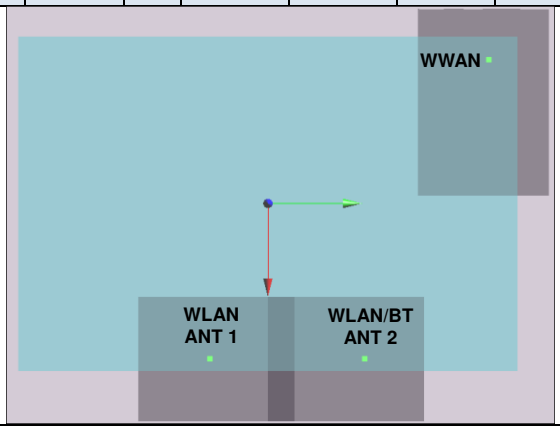
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 23	WCDMA IV	Bottom of Laptop	1.028	0	-9.46	13.75	-0.12	262.9	1.77	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	WCDMA IV		1.028	0	-9.46	13.75	-0.12	206.6	2.22	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	WCDMA IV		1.028	0	-9.46	13.75	-0.12	224.3	1.12	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



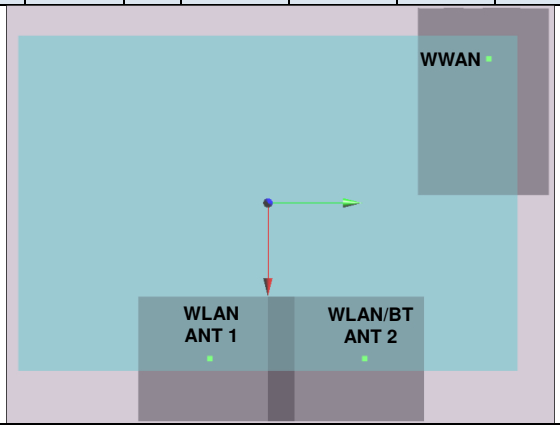
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 24	WCDMA IV	Bottom of Laptop	1.109	8	-9.3	13.14	-0.25	257.7	1.85	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	WCDMA IV		1.109	8	-9.3	13.14	-0.25	203.1	2.30	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	WCDMA IV		1.109	8	-9.3	13.14	-0.25	220.4	1.20	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



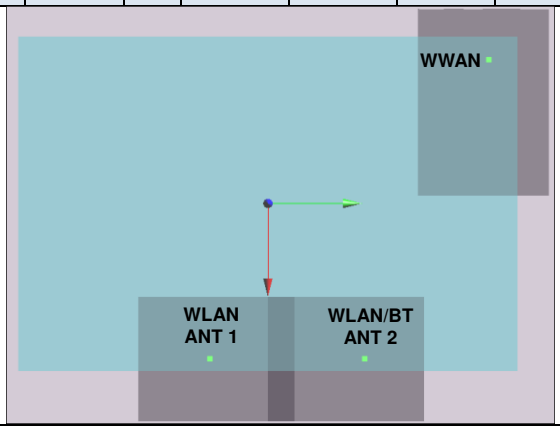
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 25	WCDMA V	Bottom of Laptop	1.109	0	-9.44	14.33	-1.16	267.0	1.85	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	WCDMA V		1.109	0	-9.44	14.33	-1.16	209.0	2.30	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	WCDMA V		1.109	0	-9.44	14.33	-1.16	227.3	1.20	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



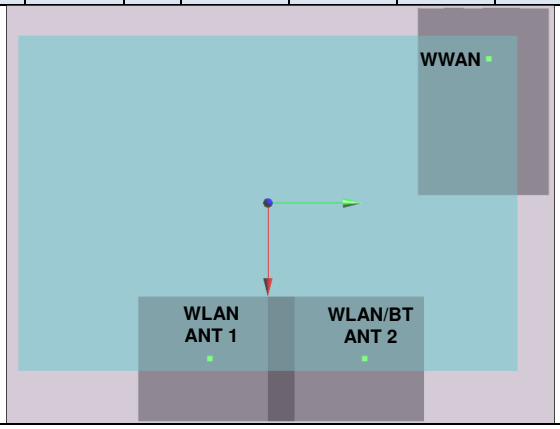
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 26	WCDMA V	Bottom of Laptop	1.151	8	-9.29	13.91	-0.25	262.8	1.89	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	WCDMA V		1.151	8	-9.29	13.91	-0.25	205.6	2.34	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	WCDMA V		1.151	8	-9.29	13.91	-0.25	223.6	1.24	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



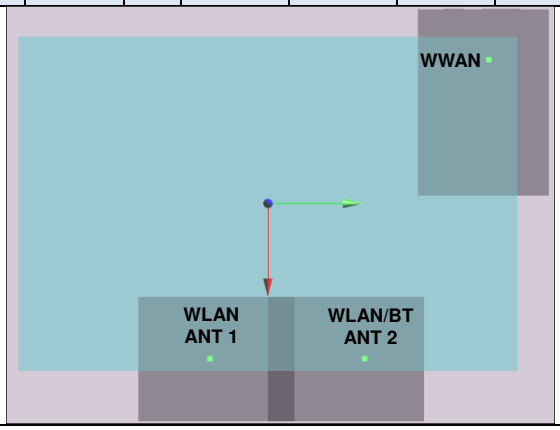
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 27	LTE B4	Bottom of Laptop	1.002	0	-9.15	14.04	-0.1	262.6	1.74	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	LTE B4		1.002	0	-9.15	14.04	-0.1	204.8	2.20	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	LTE B4		1.002	0	-9.15	14.04	-0.1	222.8	1.09	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



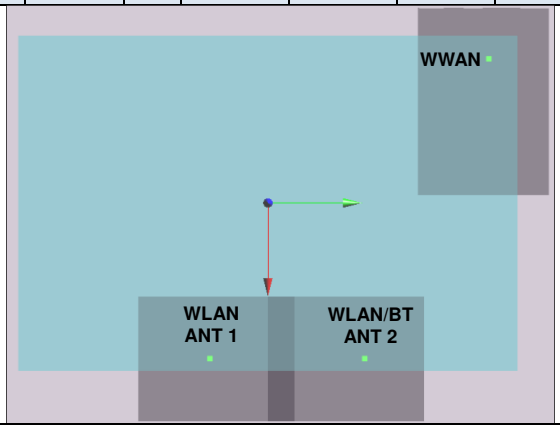
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 28	LTE B4	Bottom of Laptop	1.078	8	-8.98	13.29	-0.25	256.3	1.82	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	LTE B4		1.078	8	-8.98	13.29	-0.25	200.6	2.27	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	LTE B4		1.078	8	-8.98	13.29	-0.25	218.1	1.17	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



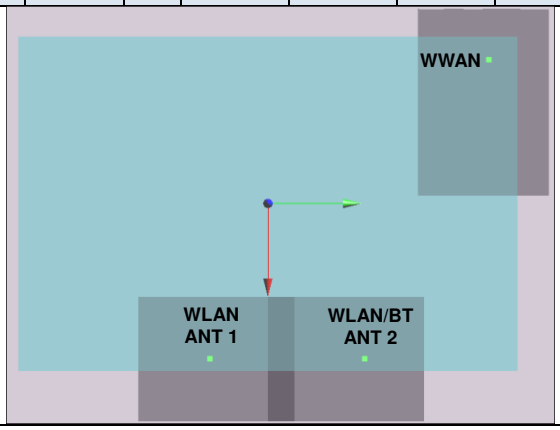
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 29	LTE B7	Bottom of Laptop	1.189	0	-9.28	14.16	-0.18	264.3	1.93	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	LTE B7		1.189	0	-9.28	14.16	-0.18	206.4	2.38	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	LTE B7		1.189	0	-9.28	14.16	-0.18	224.6	1.28	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



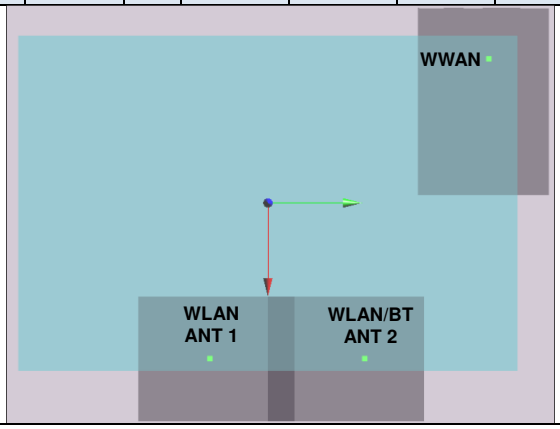
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 30	LTE B7	Bottom of Laptop	0.797	8	-9.26	14.36	-0.24	265.6	1.54	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	LTE B7		0.797	8	-9.26	14.36	-0.24	207.0	1.99	0.01	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	LTE B7		0.797	8	-9.26	14.36	-0.24	225.3	0.89	0.00	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



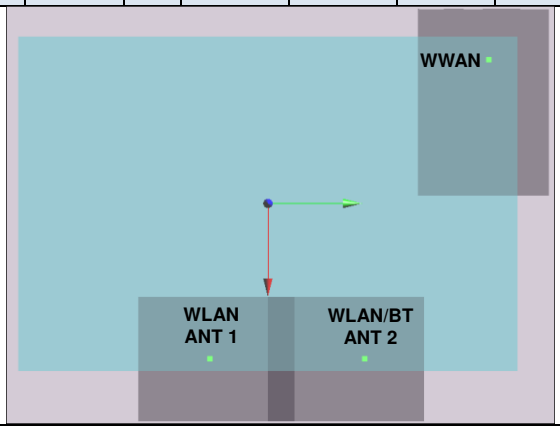
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 31	LTE B12	Bottom of Laptop	1.157	0	-7.69	15.65	-0.19	263.6	1.90	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	LTE B12		1.157	0	-7.69	15.65	-0.19	198.2	2.35	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	LTE B12		1.157	0	-7.69	15.65	-0.19	218.0	1.25	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



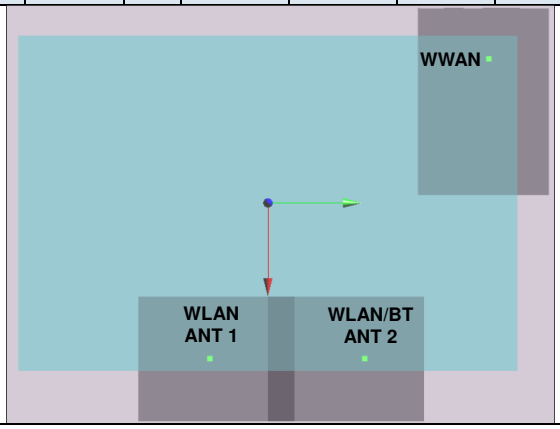
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 32	LTE B12	Bottom of Laptop	0.842	8	-7.38	15.02	-0.29	256.9	1.58	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	LTE B12		0.842	8	-7.38	15.02	-0.29	192.6	2.04	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	LTE B12		0.842	8	-7.38	15.02	-0.29	212.1	0.93	0.00	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



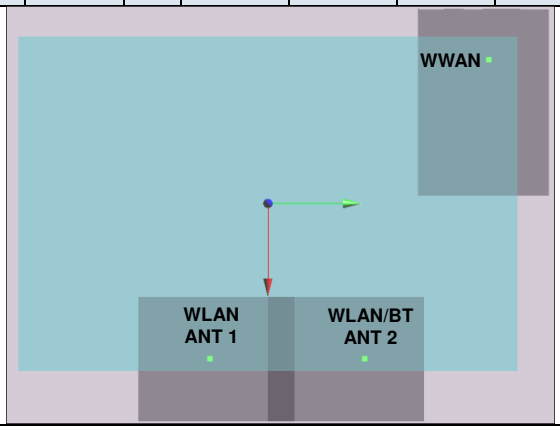
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 33	LTE B13	Bottom of Laptop	1.195	0	-9.45	14.05	-0.18	264.9	1.93	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	LTE B13		1.195	0	-9.45	14.05	-0.18	207.6	2.39	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	LTE B13		1.195	0	-9.45	14.05	-0.18	225.6	1.29	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



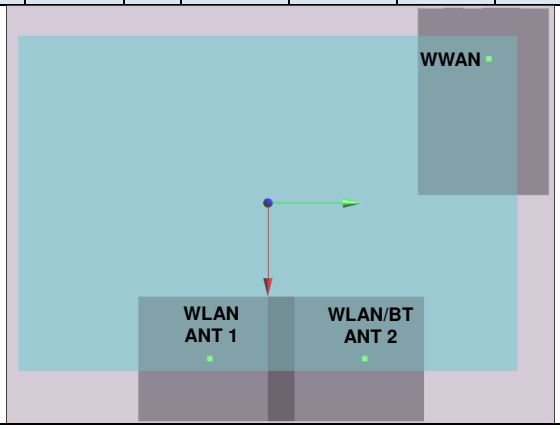
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 34	LTE B13	Bottom of Laptop	0.756	8	-9.15	13.91	-0.28	261.7	1.49	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	LTE B13		0.756	8	-9.15	13.91	-0.28	204.3	1.95	0.01	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	LTE B13		0.756	8	-9.15	13.91	-0.28	222.3	0.85	0.00	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



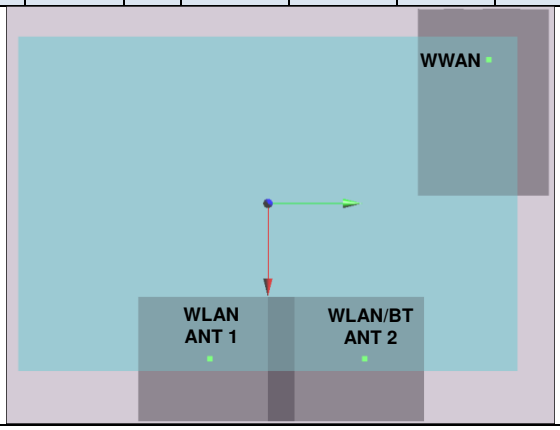
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 35	LTE B25	Bottom of Laptop	1.069	0	-9.15	14.04	-0.13	262.6	1.81	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	LTE B25		1.069	0	-9.15	14.04	-0.13	204.8	2.26	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	LTE B25		1.069	0	-9.15	14.04	-0.13	222.8	1.16	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



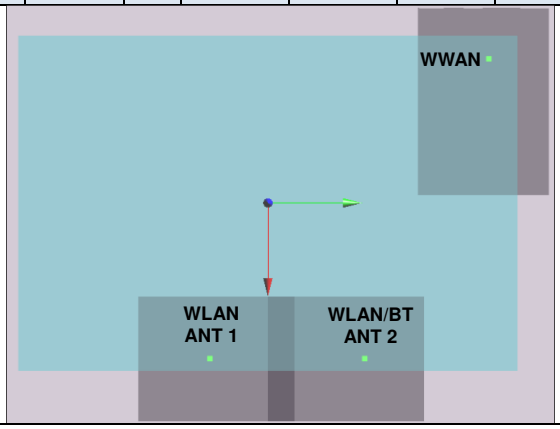
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 36	LTE B25	Bottom of Laptop	1.199	8	-9.15	13.3	-0.25	257.7	1.94	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	LTE B25		1.199	8	-9.15	13.3	-0.25	202.2	2.39	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	LTE B25		1.199	8	-9.15	13.3	-0.25	219.7	1.29	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



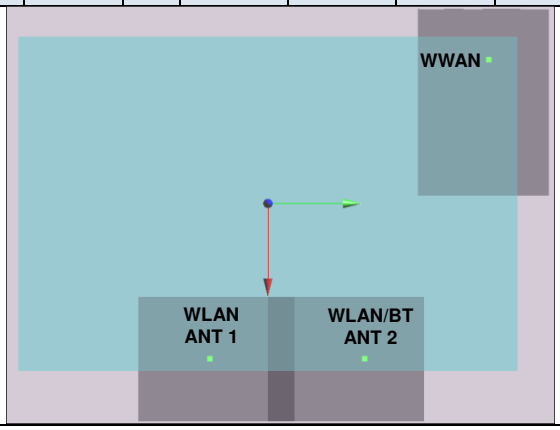
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 37	LTE B26	Bottom of Laptop	1.132	0	-9.13	14.16	-0.14	263.2	1.87	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	LTE B26		1.132	0	-9.13	14.16	-0.14	205.0	2.33	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	LTE B26		1.132	0	-9.13	14.16	-0.14	223.2	1.22	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



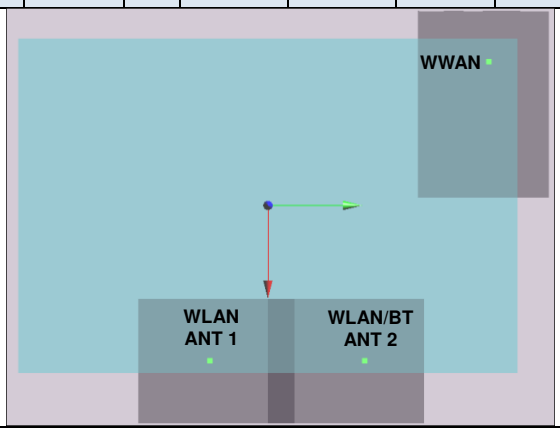
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 38	LTE B26	Bottom of Laptop	1.091	8	-8.99	13.75	-0.28	259.5	1.83	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	LTE B26		1.091	8	-8.99	13.75	-0.28	202.3	2.28	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	LTE B26		1.091	8	-8.99	13.75	-0.28	220.2	1.18	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 39	LTE B41	Bottom of Laptop	1.147	0	-9.4	14.06	-0.09	264.5	1.89	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	LTE B41		1.147	0	-9.4	14.06	-0.09	207.2	2.34	0.02	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	LTE B41		1.147	0	-9.4	14.06	-0.09	225.2	1.24	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 40	LTE B41	Bottom of Laptop	0.543	8	-9.31	14.68	-0.23	268.1	1.28	0.01	Not required
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33				
	LTE B41		0.543	8	-9.31	14.68	-0.23	208.7	1.74	0.01	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	102.3	1.93	0.03	Not required
	5GHz WLAN ANT 2		1.193	0	9.9	6.54	0.32				
	LTE B41		0.543	8	-9.31	14.68	-0.23	227.2	0.64	0.00	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				
	5GHz WLAN ANT 1		0.738	0	10.22	-3.68	0.33	77.7	0.83	0.01	Not required
	BT ANT 2		0.092	0	10.76	4.06	0.64				



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15. Uncertainty Assessment

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

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

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

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

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

(b) κ is the coverage factor

Table 15.1. Standard Uncertainty for Assumed Distribution

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

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

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

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

Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	7.00	N	1	1	1	7.0	7.0
Axial Isotropy	4.70	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.60	R	1.732	0.7	0.7	3.9	3.9
Boundary Effects	2.00	R	1.732	1	1	1.2	1.2
Linearity	4.70	R	1.732	1	1	2.7	2.7
System Detection Limits	1.00	R	1.732	1	1	0.6	0.6
Modulation Response	4.68	R	1.732	1	1	2.7	2.7
Readout Electronics	0.30	N	1	1	1	0.3	0.3
Response Time	0.00	R	1.732	1	1	0.0	0.0
Integration Time	2.60	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.00	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.00	R	1.732	1	1	1.7	1.7
Probe Positioner	0.40	R	1.732	1	1	0.2	0.2
Probe Positioning	6.70	R	1.732	1	1	3.9	3.9
Max. SAR Eval.	4.00	R	1.732	1	1	2.3	2.3
Test Sample Related							
Device Positioning	3.03	N	1	1	1	3.0	3.0
Device Holder	3.60	N	1	1	1	3.6	3.6
Power Drift	5.00	R	1.732	1	1	2.9	2.9
Power Scaling	0.00	R	1.732	1	1	0.0	0.0
Phantom and Setup							
Phantom Uncertainty	6.60	R	1.732	1	1	3.8	3.8
SAR correction	0.00	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.03	N	1	0.78	0.71	0.0	0.0
Liquid Conductivity (target)	5.00	R	1.732	0.78	0.71	2.3	2.0
Liquid Conductivity (mea.)	2.50	R	1.732	0.78	0.71	1.1	1.0
Temp. unc. - Conductivity	3.68	R	1.732	0.78	0.71	1.7	1.5
Liquid Permittivity Repeatability	0.02	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.00	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.50	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.84	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						12.9%	12.9%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						25.9%	25.8%

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

16. References

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

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

[4] SPEAG DASY System Handbook

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

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

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

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

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

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

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

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