FCC SAR Test Report

APPLICANT	:	Hewlett-Packard Company
EQUIPMENT	:	Tablet PC
BRAND NAME	:	HP
MODEL NAME	:	TPN-C119
FCC ID	:	B94TNC119HWFR
STANDARD	:	FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2003

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 / Deputy Manager

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL INC.
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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA462459	Rev. 01	Initial issue of report	Jul. 31, 2014

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Hewlett-Packard Company, Tablet PC, TPN-C119**, are as follows.

Equipment Class	Frequency Band	Highest SAR Summary	
		Body 1g SAR (W/kg)	Simultaneous Transmission 1g SAR (W/kg)
PCB	LTE Band 17	**1.35**	1.59
	LTE Band 13	1.15	
	LTE Band 5	1.11	
	LTE Band 4	1.11	
	LTE Band 2	1.21	
Date of Testing:		07/04/2014 ~ 07/09/2014	

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 1528-2003.

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 Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978

Applicant	
Company Name	Hewlett-Packard Company
Address	3000 Hanover Street, Palo Alto, California 94304, USA

Manufacturer	
Company Name	COMPAL ELECTRONICS, INC.
Address	No.581, Ruiguang Rd., Neihu District, Taipei City 11492, Taiwan (R.O.C.)

3. Guidance Standard

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 1528-2003
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03
- FCC KDB 865664 D02 SAR Reporting v01r01
- FCC KDB 447498 D01 General RF Exposure Guidance v05r02
- FCC KDB 616217 D04 SAR for laptop and tablets v01r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r03

4. Equipment Under Test (EUT)

4.1 General Information

Product Feature & Specification	
Equipment Name	Tablet PC
Brand Name	HP
Model Name	TPN-C119
FCC ID	B94TNC119HWFR
Integrated WWAN Module	Brand Name: HUAWEI Model Name: ME206
IMEI Code	354019060000108
Wireless Technology and Frequency Range	LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz
Mode	・LTE: QPSK, 16QAM
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information is declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. The below table WLAN modules are also integrated into this host and the 2.4GHz WLAN and Bluetooth SAR testing results are also used perform transmission simultaneous analysis, and these WLAN modules were also integrated into the same location and used the same antenna in this host (TPN-C119) separately tested.
3. This product have three kinds battery option, RF exposure evaluation was selected battery1 as the main test, battery2 will verify worse found in battery2, since the battery3 is the same battery2, therefore battery3 was net performed.

Battery option				
Battery 1	Brand Name	hp	Model Name	HSTNN-DB6G
	Power Rating	7.4Vdc, 4000mAh	Type	Li-ion
Battery 2	Brand Name	hp	Model Name	HSTNN-DB6H
	Power Rating	7.4Vdc, 2860mAh	Type	Li-ion
Battery 3	Brand Name	hp	Model Name	HSTNN-DB6H
	Power Rating	7.4Vdc, 2860mAh	Type	Li-ion

WLAN Module Information		
Integrated Module 1	Brand Name	Broadcom
	Model Name	BCM943142Y
	FCC ID	QDS-BRCM1079
	Report No	FA431032
	Final Action Date	04/09/2014
	Mode	・802.11 b/g/n ・Bluetooth
Integrated Module 2	Brand Name	Intel
	Model Name	Intel® Dual Band Wireless-AC 3160 (Model 3160NGW)
	FCC ID	PD93160NG
	Report No	SAR.20140310
	Final Action Date	03/26/2014
	Mode	・802.11 a/b/g/n/ac ・Bluetooth

4.2 Maximum Tune-up Limit

LTE Band 2						
average power(dBm)						
Modulation	BW (MHz)	RB size	Full Power mode (MPR)	Full power mode	Reduced Power mode (MPR)	Reduced power mode
QPSK	20	≤ 18	0	24.0	0	18.0
QPSK	20	> 18	1	23.0	1	17.0
16QAM	20	≤ 18	1	23.0	1	17.0
16QAM	20	> 18	2	22.0	2	16.0
QPSK	15	≤ 16	0	24.0	0	18.0
QPSK	15	> 16	1	23.0	1	17.0
16QAM	15	≤ 16	1	23.0	1	17.0
16QAM	15	> 16	2	22.0	2	16.0
QPSK	10	≤ 12	0	24.0	0	18.0
QPSK	10	> 12	1	23.0	1	17.0
16QAM	10	≤ 12	1	23.0	1	17.0
16QAM	10	> 12	2	22.0	2	16.0
QPSK	5	≤ 8	0	24.0	0	18.0
QPSK	5	> 8	1	23.0	1	17.0
16QAM	5	≤ 8	1	23.0	1	17.0
16QAM	5	> 8	2	22.0	2	16.0
QPSK	3	≤ 4	0	24.0	0	18.0
QPSK	3	> 4	1	23.0	1	17.0
16QAM	3	≤ 4	1	23.0	1	17.0
16QAM	3	> 4	2	22.0	2	16.0
QPSK	1.4	≤ 5	0	24.0	0	18.0
QPSK	1.4	> 5	1	23.0	1	17.0
16QAM	1.4	≤ 5	1	23.0	1	17.0
16QAM	1.4	> 5	2	22.0	2	16.0

LTE Band 4						
average power(dBm)						
Modulation	BW (MHz)	RB size	Full Power mode (MPR)	Full power mode	Reduced Power mode (MPR)	Reduced power mode
QPSK	20	≤ 18	0	24.0	0	19.0
QPSK	20	> 18	1	23.0	1	18.0
16QAM	20	≤ 18	1	23.0	1	18.0
16QAM	20	> 18	2	22.0	2	17.0
QPSK	15	≤ 16	0	24.0	0	19.0
QPSK	15	> 16	1	23.0	1	18.0
16QAM	15	≤ 16	1	23.0	1	18.0
16QAM	15	> 16	2	22.0	2	17.0
QPSK	10	≤ 12	0	24.0	0	19.0
QPSK	10	> 12	1	23.0	1	18.0
16QAM	10	≤ 12	1	23.0	1	18.0
16QAM	10	> 12	2	22.0	2	17.0
QPSK	5	≤ 8	0	24.0	0	19.0
QPSK	5	> 8	1	23.0	1	18.0
16QAM	5	≤ 8	1	23.0	1	18.0
16QAM	5	> 8	2	22.0	2	17.0
QPSK	3	≤ 4	0	24.0	0	19.0
QPSK	3	> 4	1	23.0	1	18.0
16QAM	3	≤ 4	1	23.0	1	18.0
16QAM	3	> 4	2	22.0	2	17.0
QPSK	1.4	≤ 5	0	24.0	0	19.0
QPSK	1.4	> 5	1	23.0	1	18.0
16QAM	1.4	≤ 5	1	23.0	1	18.0
16QAM	1.4	> 5	2	22.0	2	17.0

LTE Band 5						
average power(dBm)						
Modulation	BW (MHz)	RB size	Full Power mode (MPR)	Full power mode	Reduced Power mode (MPR)	Reduced power mode
QPSK	10	≤ 12	0	24.0	0	22.0
QPSK	10	> 12	1	23.0	1	21.0
16QAM	10	≤ 12	1	23.0	1	21.0
16QAM	10	> 12	2	22.0	2	20.0
QPSK	5	≤ 8	0	24.0	0	22.0
QPSK	5	> 8	1	23.0	1	21.0
16QAM	5	≤ 8	1	23.0	1	21.0
16QAM	5	> 8	2	22.0	2	20.0
QPSK	3	≤ 4	0	24.0	0	22.0
QPSK	3	> 4	1	23.0	1	21.0
16QAM	3	≤ 4	1	23.0	1	21.0
16QAM	3	> 4	2	22.0	2	20.0
QPSK	1.4	≤ 5	0	24.0	0	22.0
QPSK	1.4	> 5	1	23.0	1	21.0
16QAM	1.4	≤ 5	1	23.0	1	21.0
16QAM	1.4	> 5	2	22.0	2	20.0

LTE Band 13						
average power(dBm)						
Modulation	BW (MHz)	RB size	Full Power mode (MPR)	Full power mode	Reduced Power mode (MPR)	Reduced power mode
QPSK	10	≤ 12	0	24.0	0	21.0
QPSK	10	> 12	1	23.0	1	20.0
16QAM	10	≤ 12	1	23.0	1	20.0
16QAM	10	> 12	2	22.0	2	19.0
QPSK	5	≤ 8	0	24.0	0	21.0
QPSK	5	> 8	1	23.0	1	20.0
16QAM	5	≤ 8	1	23.0	1	20.0
16QAM	5	> 8	2	22.0	2	19.0

LTE Band 17						
average power(dBm)						
Modulation	BW (MHz)	RB size	Full Power mode (MPR)	Full power mode	Reduced Power mode (MPR)	Reduced power mode
QPSK	10	≤ 12	0	24.0	0	22.0
QPSK	10	> 12	1	23.0	1	21.0
16QAM	10	≤ 12	1	23.0	1	21.0
16QAM	10	> 12	2	22.0	2	20.0
QPSK	5	≤ 8	0	24.0	0	22.0
QPSK	5	> 8	1	23.0	1	21.0
16QAM	5	≤ 8	1	23.0	1	21.0
16QAM	5	> 8	2	22.0	2	20.0

4.3 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r03	
FCC ID	B94TNC119HWFR
Equipment Name	Tablet PC
Operating Frequency Range of each LTE transmission band	LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 05: 824.7 MHz ~ 848.3 MHz LTE Band 04: 1710.7 MHz ~ 1754.3 MHz LTE Band 02: 1850.7 MHz ~ 1909.3 MHz
Channel Bandwidth	LTE Band 17: 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 05:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 04:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 02: 1.4MHz, 3MHz, 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
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.
Power reduction applied to satisfy SAR compliance	Yes, proximity sensor.

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

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

LTE Band 17

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

LTE Band 13

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

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 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 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

5. Proximity Sensor Triggering Test

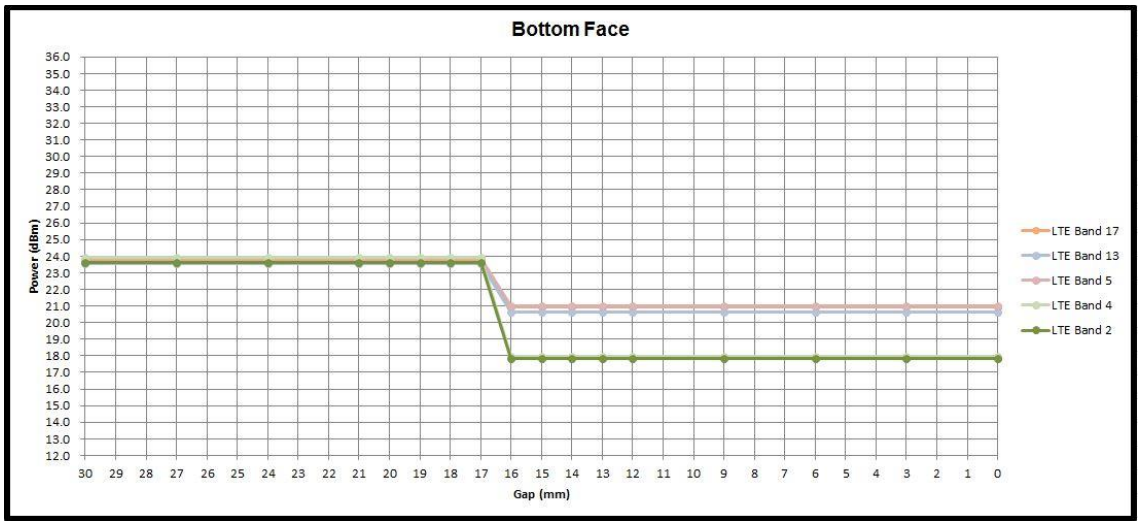
Proximity sensor power reduction

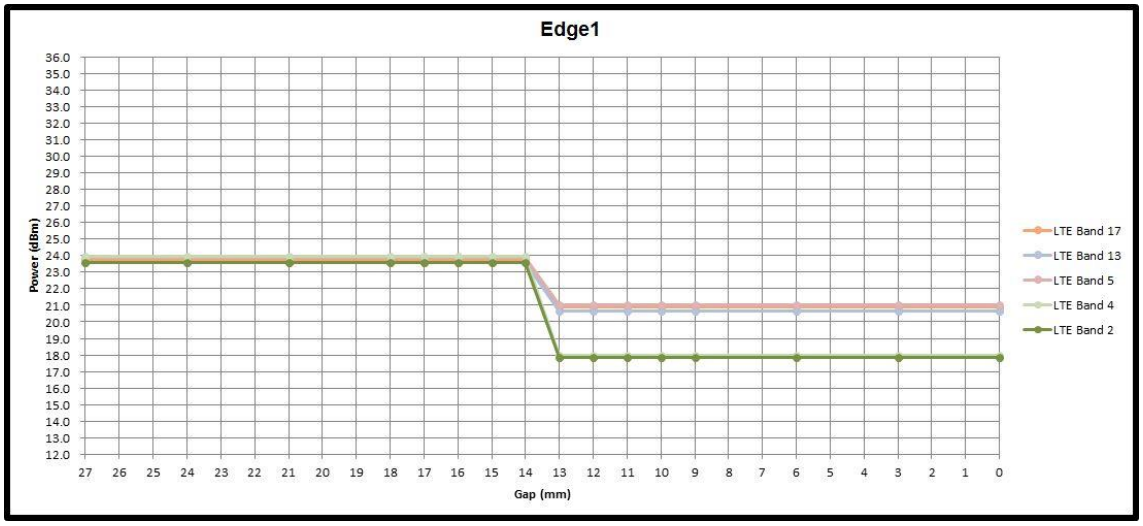
Exposure Position / wireless mode	Bottom Face(1)	Edge 1(1)	Curved surface of Edge1(1)	Edge 2	Edge 3	Edge 4
LTE Band 17	2.0 dB	2.0 dB	2.0 dB	0 dB	0 dB	0 dB
LTE Band 13	3.0 dB	3.0 dB	3.0 dB			
LTE Band 5	2.0 dB	2.0 dB	2.0 dB			
LTE Band 4	6.0 dB	6.0 dB	6.0 dB			
LTE Band 2	5.0 dB	5.0 dB	5.0 dB			

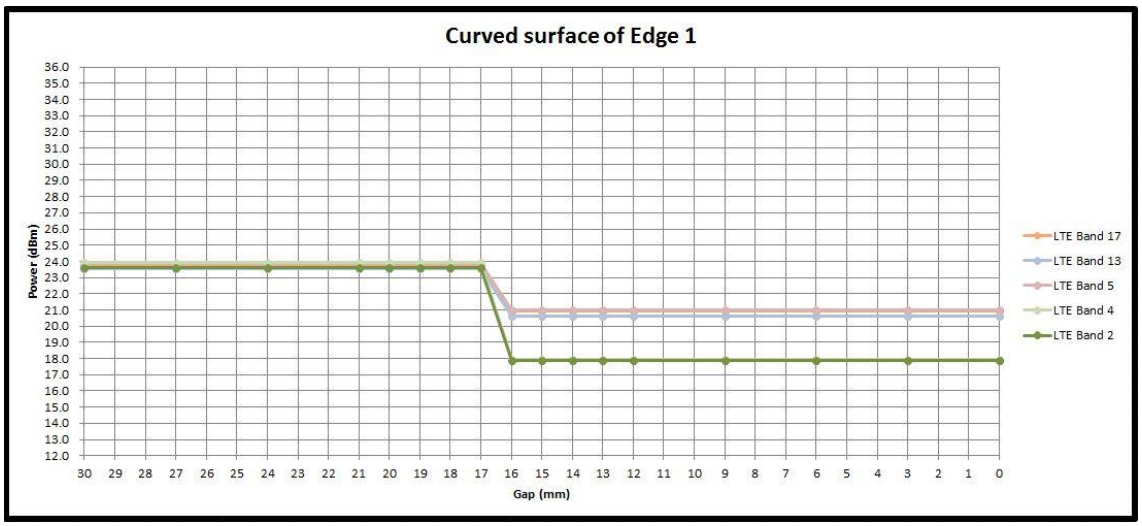
Remark:
1. (1): Reduced maximum limit applied by activation of proximity sensor.
2. Power reduction is not applicable for WLAN and Bluetooth.
3. Tests were performed in accordance with KDB 616217 D04 section 6.1, 6.2, 6.3, 6.4 and 6.5 and compliant results are shown and described in exhibit "P-Sensor 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 Face: 11 mm
   - Edge1: 11 mm
   - Curved surface of Edge 1: 11 mm

Power Measurement during Sensor Trigger distance testing

Band/Mode	Ch #	Measured power reduction (dBm)		Reduction Levels
		w/o power back-off	w/ power back-off	(dB)
LTE Band 17 1RB 24 offset	23780	23.77	20.92	2.85
LTE Band 13 1RB 24 offset	23230	23.56	20.64	2.92
LTE Band 5 1RB 0offset	20450	23.89	21.00	2.89
LTE Band 4 1RB 0offset	20300	23.95	17.95	6.00
LTE Band 2 1RB 0offset	18900	23.61	17.86	5.75




Edge1
Power (dBm)
Gap (mm)
LTE Band 17
LTE Band 13
LTE Band 5
LTE Band 4
LTE Band 2


Curved surface of Edge 1
Power (dBm)
Gap (mm)
LTE Band 17
LTE Band 13
LTE Band 5
LTE Band 4
LTE Band 2

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:

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

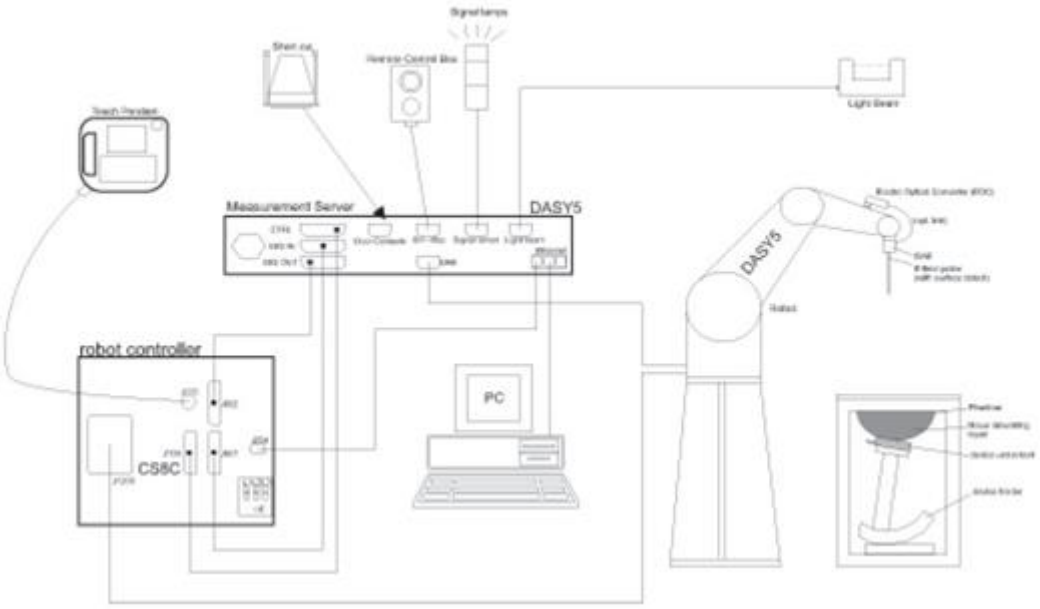
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

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.

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 D01v01r03 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 D01v01r03 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. 16, 2014	May. 15, 2015
SPEAG	835MHz System Validation Kit	D835V2	499	Mar. 24, 2014	Mar. 23, 2015
SPEAG	1750MHz System Validation Kit	D1750V2	1068	Nov. 27, 2013	Nov. 26, 2014
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Mar. 21, 2014	Mar. 20, 2015
SPEAG	Data Acquisition Electronics	DAE4	1425	Mar. 03, 2014	Mar. 02, 2015
SPEAG	Data Acquisition Electronics	DAE3	495	May. 19, 2014	May. 18, 2015
SPEAG	Data Acquisition Electronics	DAE4	1399	Nov. 07, 2013	Nov. 06, 2014
SPEAG	Dosimetric E-Field Probe	EX3DV4	3954	Nov. 04, 2013	Nov. 03, 2014
SPEAG	Dosimetric E-Field Probe	EX3DV4	3925	May. 22, 2014	May. 21, 2015
SPEAG	Dosimetric E-Field Probe	EX3DV4	3955	Nov. 12, 2013	Nov. 11, 2014
Wisewind	Thermometer	HTC-1	TM642	Oct. 22, 2013	Oct. 21, 2014
Wisewind	Thermometer	HTC-1	TM281	Oct. 22, 2013	Oct. 21, 2014
H.M.IRIS	Thermometer	TH-08	TM658	Oct. 22, 2013	Oct. 21, 2014
Anritsu	Radio Communication Analyzer	MT8820C	6201074414	Feb. 11, 2014	Feb. 10, 2015
Anritsu	Radio Communication Analyzer	MT8820C	6201341950	Dec. 25, 2013	Dec. 24, 2014
SPEAG	Device Holder	N/A	N/A	NCR	NCR
Agilent	Signal Generator	E4438C	MY49070755	Oct. 08, 2013	Oct. 07, 2014
SPEAG	Dielectric Probe Kit	DAK-3.5	1138	Nov. 03, 2013	Nov. 02, 2014
Agilent	ENA Network Analyzer	E5071C	MY46316648	Feb. 07, 2014	Feb. 06, 2015
Anritsu	Power Meter	ML2495A	1349001	Dec. 04, 2013	Dec. 03, 2014
Anritsu	Power Sensor	MA2411B	1306099	Dec. 03, 2013	Dec. 02, 2014
R&S	Spectrum Analyzer	FSP30	101067	Nov. 20, 2013	Nov. 19, 2014
Agilent	Dual Directional Coupler	778D	50422	Note 1	
Woken	Attenuator	WK0602-XX	N/A	Note 1	
PE	Attenuator	PE7005-10	N/A	Note 1	
PE	Attenuator	PE7005- 3	N/A	Note 1	
AR	Power Amplifier	5S1G4M2	0328767	Note 1	
Mini-Circuits	Power Amplifier	ZVE-3W	162601250	Note 1	
Mini-Circuits	Power Amplifier	ZHL-42W+	13440021344	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 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	Body	22.5	0.975	54.039	0.96	55.50	1.56	-2.63	±5	2014/7/8
835	Body	22.3	0.963	54.541	0.97	55.20	-0.72	-1.19	±5	2014/7/9
835	Body	22.3	0.997	55.120	0.97	55.20	2.78	-0.14	±5	2014/7/9
1750	Body	22.6	1.518	52.076	1.49	53.40	1.88	-2.48	±5	2014/7/4
1900	Body	22.6	1.544	51.591	1.52	53.30	1.58	-3.21	±5	2014/7/4

11.2 System Performance Check Results

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

Date	Frequency (MHz)	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 (%)
2014/7/8	750	Body	250	D750V3-1012	3925	495	2.28	8.65	9.12	5.43
2014/7/9	835	Body	250	D835V2-499	3954	1425	2.33	9.46	9.32	-1.48
2014/7/9	835	Body	250	D835V2-499	3955	1399	2.51	9.46	10.04	6.13
2014/7/4	1750	Body	250	D1750V2-1068	3925	495	9.27	37.50	37.08	-1.12
2014/7/4	1900	Body	250	D1900V2-5d041	3925	495	10.00	41.00	40.00	-2.44

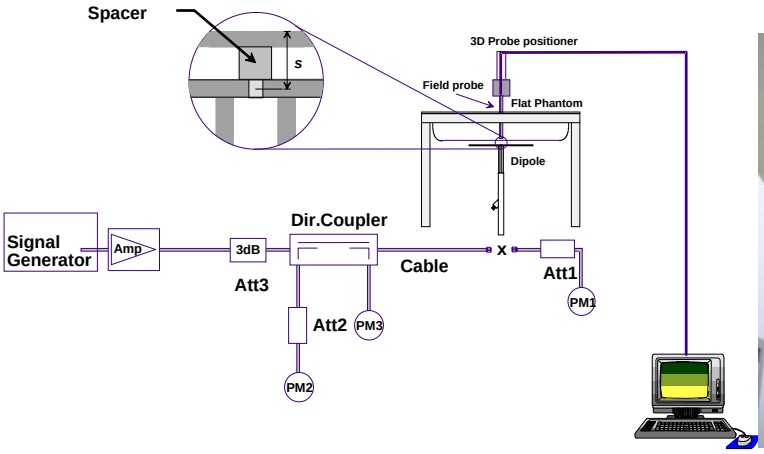


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

12. RF Exposure Positions

12.1 SAR Testing for Tablet

This device can be used also in full sized tablet exposure conditions, due to its size. Per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR exclusion threshold in KDB 447498 D01v05r02 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

13. Conducted RF Output Power (Unit: dBm)

<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 D05v02r03, 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 D05v02r03, 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 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r03, 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 D05v02r03, 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 D05v02r03, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r03, 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 D05v02r03, smaller bandwidth SAR testing is not required.

Maximum Average RF Power (Proximity Sensor Inactive)

<LTE Band 17>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				23780	23790	23800		
Frequency (MHz)				709	710	711		
10	QPSK	1	0	23.77	23.71	23.71	24	0
10	QPSK	1	24	23.75	23.74	23.68		
10	QPSK	1	49	23.65	23.62	23.61		
10	QPSK	25	0	22.99	22.97	22.97	23	1
10	QPSK	25	12	22.94	22.92	22.93		
10	QPSK	25	24	22.96	22.93	22.95		
10	QPSK	50	0	22.99	22.96	22.97		
10	16QAM	1	0	23.00	22.97	22.96	23	1
10	16QAM	1	24	22.96	22.93	22.97		
10	16QAM	1	49	22.92	22.93	22.92		
10	16QAM	25	0	21.78	21.76	21.76	22	2
10	16QAM	25	12	21.72	21.71	21.75		
10	16QAM	25	24	21.75	21.74	21.76		
10	16QAM	50	0	21.75	21.76	21.79		
Channel				23755	23790	23825	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				706.5	710	713.5		
5	QPSK	1	0	23.74	23.66	23.66	24	0
5	QPSK	1	12	23.73	23.69	23.66		
5	QPSK	1	24	23.71	23.62	23.64		
5	QPSK	12	0	22.98	22.98	22.97	23	1
5	QPSK	12	6	22.94	22.95	22.95		
5	QPSK	12	11	22.94	22.98	22.96		
5	QPSK	25	0	22.93	22.98	22.98		
5	16QAM	1	0	22.96	22.92	22.94	23	1
5	16QAM	1	12	22.93	22.94	22.93		
5	16QAM	1	24	22.89	22.89	22.87		
5	16QAM	12	0	21.83	21.80	21.76	22	2
5	16QAM	12	6	21.78	21.75	21.74		
5	16QAM	12	11	21.76	21.74	21.75		
5	16QAM	25	0	21.77	21.76	21.76		

<LTE Band 13>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel					23230			
Frequency (MHz)					782			
10	QPSK	1	0		23.56		24	0
10	QPSK	1	24		23.55			
10	QPSK	1	49		23.08			
10	QPSK	25	0		22.85		23	1
10	QPSK	25	12		22.73			
10	QPSK	25	24		22.72			
10	QPSK	50	0		22.80			
10	16QAM	1	0		22.88		23	1
10	16QAM	1	24		22.70			
10	16QAM	1	49		22.22			
10	16QAM	25	0		21.83		22	2
10	16QAM	25	12		21.68			
10	16QAM	25	24		21.68			
10	16QAM	50	0		21.77			
Channel				23205	23230	23255	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	23.49	23.50	23.44	24	0
5	QPSK	1	12	23.50	23.47	23.41		
5	QPSK	1	24	23.42	23.37	23.32		
5	QPSK	12	0	22.82	22.77	22.72	23	1
5	QPSK	12	6	22.79	22.73	22.67		
5	QPSK	12	11	22.77	22.71	22.67		
5	QPSK	25	0	22.75	22.71	22.66		
5	16QAM	1	0	22.70	22.69	22.76	23	1
5	16QAM	1	12	22.72	22.67	22.72		
5	16QAM	1	24	22.63	22.55	22.59		
5	16QAM	12	0	21.79	21.74	21.71	22	2
5	16QAM	12	6	21.74	21.70	21.65		
5	16QAM	12	11	21.72	21.65	21.61		
5	16QAM	25	0	21.73	21.68	21.62		

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	23.89	23.64	23.71	24	0
10	QPSK	1	24	23.75	23.61	23.68		
10	QPSK	1	49	23.60	23.56	23.49		
10	QPSK	25	0	22.99	22.86	22.94	23	1
10	QPSK	25	12	22.90	22.84	22.93		
10	QPSK	25	24	22.85	22.84	22.94		
10	QPSK	50	0	22.96	22.90	22.95		
10	16QAM	1	0	22.98	22.82	22.97	23	1
10	16QAM	1	24	22.83	22.81	22.94		
10	16QAM	1	49	22.73	22.71	22.82		
10	16QAM	25	0	21.94	21.80	21.87	22	2
10	16QAM	25	12	21.88	21.79	21.86		
10	16QAM	25	24	21.84	21.80	21.87		
10	16QAM	50	0	21.92	21.84	21.87		
Channel				20425	20525	20625	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	23.70	23.54	23.62	24	0
5	QPSK	1	12	23.66	23.55	23.63		
5	QPSK	1	24	23.56	23.53	23.51		
5	QPSK	12	0	22.94	22.89	22.98	23	1
5	QPSK	12	6	22.98	22.87	22.97		
5	QPSK	12	11	22.95	22.86	22.97		
5	QPSK	25	0	22.97	22.86	22.93		
5	16QAM	1	0	22.90	22.93	22.97	23	1
5	16QAM	1	12	22.84	22.97	22.91		
5	16QAM	1	24	22.71	22.89	22.84		
5	16QAM	12	0	21.97	21.87	21.91	22	2
5	16QAM	12	6	21.92	21.82	21.92		
5	16QAM	12	11	21.90	21.80	21.90		
5	16QAM	25	0	21.92	21.80	21.90		
Channel				20415	20525	20635	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	23.78	23.60	23.65	24	0
3	QPSK	1	7	23.74	23.58	23.60		
3	QPSK	1	14	23.67	23.55	23.55		
3	QPSK	8	0	22.98	22.87	22.97	23	1
3	QPSK	8	4	22.93	22.83	22.93		
3	QPSK	8	7	22.93	22.84	22.95		
3	QPSK	15	0	22.94	22.84	22.96		
3	16QAM	1	0	22.94	22.90	22.91	23	1
3	16QAM	1	7	22.92	22.93	22.92		
3	16QAM	1	14	22.81	22.90	22.82		
3	16QAM	8	0	21.84	21.83	21.95	22	2
3	16QAM	8	4	21.81	21.83	21.92		
3	16QAM	8	7	21.80	21.84	21.91		
3	16QAM	15	0	21.81	21.80	21.90		

Channel				20407	20525	20643	Tune up Limit (dBm)	Target MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	23.87	23.64	23.74	24	0
1.4	QPSK	1	2	23.85	23.62	23.72		
1.4	QPSK	1	5	23.83	23.64	23.66		
1.4	QPSK	3	0	23.87	23.66	23.74		
1.4	QPSK	3	1	23.88	23.67	23.73		
1.4	QPSK	3	2	23.87	23.68	23.73		
1.4	QPSK	6	0	22.96	22.87	22.93	23	1
1.4	16QAM	1	0	22.96	22.86	22.93	23	1
1.4	16QAM	1	2	22.92	22.85	22.86		
1.4	16QAM	1	5	22.94	22.86	22.85		
1.4	16QAM	3	0	22.81	22.67	22.76		
1.4	16QAM	3	1	22.80	22.67	22.76		
1.4	16QAM	3	2	22.77	22.65	22.73		
1.4	16QAM	6	0	21.89	21.77	21.85	22	2

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	23.89	23.70	23.95	24	0
20	QPSK	1	49	23.30	23.33	23.53		
20	QPSK	1	99	23.21	23.25	23.54		
20	QPSK	50	0	22.92	22.93	22.97	23	1
20	QPSK	50	24	22.64	22.71	22.90		
20	QPSK	50	49	22.63	22.71	22.94		
20	QPSK	100	0	22.74	22.82	22.87		
20	16QAM	1	0	22.79	22.95	22.93	23	1
20	16QAM	1	49	22.72	22.81	22.91		
20	16QAM	1	99	22.65	22.72	22.89		
20	16QAM	50	0	21.90	21.85	21.93	22	2
20	16QAM	50	24	21.58	21.63	21.82		
20	16QAM	50	49	21.57	21.66	21.85		
20	16QAM	100	0	21.71	21.76	21.95		
Channel				20025	20175	20325	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	23.94	23.92	23.84	24	0
15	QPSK	1	37	23.44	23.51	23.66		
15	QPSK	1	74	23.41	23.61	23.73		
15	QPSK	36	0	22.90	22.91	22.94	23	1
15	QPSK	36	18	22.64	22.83	22.97		
15	QPSK	36	37	22.65	22.85	22.99		
15	QPSK	75	0	22.75	22.91	22.88		
15	16QAM	1	0	22.83	22.93	22.89	23	1
15	16QAM	1	37	22.82	22.90	22.81		
15	16QAM	1	74	22.85	22.91	22.84		
15	16QAM	36	0	21.93	21.95	21.93	22	2
15	16QAM	36	18	21.68	21.73	21.87		
15	16QAM	36	37	21.66	21.74	21.89		
15	16QAM	75	0	21.78	21.82	21.81		
Channel				20000	20175	20350	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	23.79	23.67	23.89	24	0
10	QPSK	1	24	23.38	23.43	23.66		
10	QPSK	1	49	23.37	23.46	23.68		
10	QPSK	25	0	22.83	22.85	22.88	23	1
10	QPSK	25	12	22.68	22.75	22.96		
10	QPSK	25	24	22.66	22.78	22.96		
10	QPSK	50	0	22.75	22.85	22.92		
10	16QAM	1	0	22.88	22.87	22.96	23	1
10	16QAM	1	24	22.82	22.84	22.89		
10	16QAM	1	49	22.81	22.89	22.92		
10	16QAM	25	0	21.81	21.83	21.82	22	2
10	16QAM	25	12	21.65	21.70	21.69		
10	16QAM	25	24	21.61	21.72	21.69		
10	16QAM	50	0	21.71	21.77	21.75		

Channel				19975	20175	20375	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	23.55	23.51	23.52	24	0
5	QPSK	1	12	23.40	23.46	23.46		
5	QPSK	1	24	23.34	23.44	23.42		
5	QPSK	12	0	22.76	22.81	22.82	23	1
5	QPSK	12	6	22.71	22.76	22.77		
5	QPSK	12	11	22.68	22.75	22.77		
5	QPSK	25	0	22.72	22.76	22.79		
5	16QAM	1	0	22.95	22.99	22.87	23	1
5	16QAM	1	12	22.82	22.91	22.82		
5	16QAM	1	24	22.79	22.89	22.75		
5	16QAM	12	0	21.78	21.77	21.99	22	2
5	16QAM	12	6	21.69	21.71	21.92		
5	16QAM	12	11	21.67	21.70	21.90		
5	16QAM	25	0	21.70	21.68	21.92		
Channel				19965	20175	20385	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	23.47	23.48	23.75	24	0
3	QPSK	1	7	23.37	23.41	23.67		
3	QPSK	1	14	23.36	23.43	23.64		
3	QPSK	8	0	22.75	22.77	22.78	23	1
3	QPSK	8	4	22.70	22.73	22.73		
3	QPSK	8	7	22.71	22.73	22.74		
3	QPSK	15	0	22.73	22.74	22.75		
3	16QAM	1	0	22.88	22.92	22.91	23	1
3	16QAM	1	7	22.82	22.91	22.88		
3	16QAM	1	14	22.77	22.87	22.87		
3	16QAM	8	0	21.77	21.75	21.77	22	2
3	16QAM	8	4	21.71	21.74	21.71		
3	16QAM	8	7	21.71	21.77	21.72		
3	16QAM	15	0	21.71	21.76	21.71		
Channel				19957	20175	20393	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	23.53	23.51	23.75	24	0
1.4	QPSK	1	2	23.51	23.50	23.72		
1.4	QPSK	1	5	23.48	23.48	23.73		
1.4	QPSK	3	0	23.52	23.45	23.56		
1.4	QPSK	3	1	23.50	23.42	23.56		
1.4	QPSK	3	2	23.52	23.44	23.56		
1.4	QPSK	6	0	22.69	22.72	22.76	23	1
1.4	16QAM	1	0	22.86	22.94	22.96	23	1
1.4	16QAM	1	2	22.84	22.93	22.93		
1.4	16QAM	1	5	22.83	22.93	22.93		
1.4	16QAM	3	0	22.72	22.73	22.77		
1.4	16QAM	3	1	22.69	22.74	22.76		
1.4	16QAM	3	2	22.68	22.70	22.75		
1.4	16QAM	6	0	21.77	21.75	21.79	22	2

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	23.56	23.61	23.55	24	0
20	QPSK	1	49	23.14	23.20	23.10		
20	QPSK	1	99	23.07	22.97	22.98		
20	QPSK	50	0	22.71	22.82	22.67	23	1
20	QPSK	50	24	22.50	22.54	22.45		
20	QPSK	50	49	22.52	22.42	22.43		
20	QPSK	100	0	22.64	22.66	22.58		
20	16QAM	1	0	22.88	22.98	22.91	23	1
20	16QAM	1	49	22.57	22.56	22.51		
20	16QAM	1	99	22.45	22.33	22.32		
20	16QAM	50	0	21.62	21.73	21.61	22	2
20	16QAM	50	24	21.41	21.45	21.34		
20	16QAM	50	49	21.47	21.36	21.32		
20	16QAM	100	0	21.57	21.56	21.44		
Channel				18675	18900	19125	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	23.60	23.56	23.48	24	0
15	QPSK	1	37	23.33	23.36	23.25		
15	QPSK	1	74	23.31	23.29	23.26		
15	QPSK	36	0	22.67	22.85	22.71	23	1
15	QPSK	36	18	22.56	22.64	22.52		
15	QPSK	36	37	22.58	22.58	22.51		
15	QPSK	75	0	22.64	22.73	22.61		
15	16QAM	1	0	22.98	22.74	22.76	23	1
15	16QAM	1	37	22.69	22.70	22.66		
15	16QAM	1	74	22.72	22.66	22.61		
15	16QAM	36	0	21.62	21.77	21.62	22	2
15	16QAM	36	18	21.49	21.54	21.40		
15	16QAM	36	37	21.50	21.48	21.39		
15	16QAM	75	0	21.56	21.64	21.50		
Channel				18650	18900	19150	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	23.37	23.57	23.42	24	0
10	QPSK	1	24	23.24	23.33	23.23		
10	QPSK	1	49	23.22	23.23	23.21		
10	QPSK	25	0	22.56	22.67	22.55	23	1
10	QPSK	25	12	22.49	22.51	22.44		
10	QPSK	25	24	22.47	22.48	22.43		
10	QPSK	50	0	22.55	22.60	22.51		
10	16QAM	1	0	22.81	22.96	22.87	23	1
10	16QAM	1	24	22.69	22.72	22.62		
10	16QAM	1	49	22.68	22.65	22.62		
10	16QAM	25	0	21.46	21.66	21.49	22	2
10	16QAM	25	12	21.37	21.51	21.37		
10	16QAM	25	24	21.36	21.48	21.36		
10	16QAM	50	0	21.42	21.57	21.42		

Channel				18625	18900	19175	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	23.17	23.37	23.21	24	0
5	QPSK	1	12	23.16	23.28	23.14		
5	QPSK	1	24	23.13	23.20	23.16		
5	QPSK	12	0	22.43	22.59	22.48	23	1
5	QPSK	12	6	22.41	22.55	22.44		
5	QPSK	12	11	22.42	22.52	22.40		
5	QPSK	25	0	22.44	22.56	22.43		
5	16QAM	1	0	22.59	22.79	22.60	23	1
5	16QAM	1	12	22.57	22.70	22.54		
5	16QAM	1	24	22.53	22.61	22.52		
5	16QAM	12	0	21.40	21.57	21.42	22	2
5	16QAM	12	6	21.36	21.50	21.36		
5	16QAM	12	11	21.37	21.47	21.34		
5	16QAM	25	0	21.38	21.49	21.35		
Channel				18615	18900	19185	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	23.16	23.35	23.21	24	0
3	QPSK	1	7	23.11	23.26	23.13		
3	QPSK	1	14	23.12	23.25	23.18		
3	QPSK	8	0	22.39	22.58	22.45	23	1
3	QPSK	8	4	22.36	22.54	22.43		
3	QPSK	8	7	22.37	22.52	22.42		
3	QPSK	15	0	22.40	22.55	22.43		
3	16QAM	1	0	22.56	22.70	22.59	23	1
3	16QAM	1	7	22.55	22.67	22.55		
3	16QAM	1	14	22.53	22.63	22.55		
3	16QAM	8	0	21.41	21.55	21.42	22	2
3	16QAM	8	4	21.37	21.50	21.38		
3	16QAM	8	7	21.40	21.51	21.40		
3	16QAM	15	0	21.36	21.49	21.39		
Channel				18607	18900	19193	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	23.18	23.31	23.27	24	0
1.4	QPSK	1	2	23.18	23.29	23.26		
1.4	QPSK	1	5	23.20	23.29	23.23		
1.4	QPSK	3	0	23.22	23.38	23.29		
1.4	QPSK	3	1	23.20	23.36	23.26		
1.4	QPSK	3	2	23.24	23.38	23.29		
1.4	QPSK	6	0	22.34	22.48	22.38	23	1
1.4	16QAM	1	0	22.56	22.70	22.61	23	1
1.4	16QAM	1	2	22.54	22.70	22.62		
1.4	16QAM	1	5	22.56	22.67	22.59		
1.4	16QAM	3	0	22.37	22.52	22.42		
1.4	16QAM	3	1	22.33	22.51	22.42		
1.4	16QAM	3	2	22.31	22.48	22.42		
1.4	16QAM	6	0	21.38	21.55	21.49	22	2

Reduced Average RF Power (Proximity Sensor active)

<LTE Band 17>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				23780	23790	23800		
Frequency (MHz)				709	710	711		
10	QPSK	1	0	20.92	20.80	20.83	22	0
10	QPSK	1	24	20.90	20.87	20.82		
10	QPSK	1	49	20.88	20.75	20.71		
10	QPSK	25	0	19.86	19.81	19.78	21	1
10	QPSK	25	12	19.83	19.81	19.77		
10	QPSK	25	24	19.84	19.78	19.76		
10	QPSK	50	0	19.87	19.82	19.79		
10	16QAM	1	0	19.95	19.95	19.72	21	1
10	16QAM	1	24	19.91	19.90	19.79		
10	16QAM	1	49	19.85	19.88	19.67		
10	16QAM	25	0	18.75	18.81	18.77	20	2
10	16QAM	25	12	18.70	18.80	18.77		
10	16QAM	25	24	18.72	18.78	18.75		
10	16QAM	50	0	18.75	18.81	18.76		
Channel				23755	23790	23825	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				706.5	710	713.5		
5	QPSK	1	0	20.76	20.89	20.84	22	0
5	QPSK	1	12	20.72	20.65	20.76		
5	QPSK	1	24	20.88	20.73	20.84		
5	QPSK	12	0	19.63	19.80	19.67	21	1
5	QPSK	12	6	19.83	19.83	19.69		
5	QPSK	12	11	19.57	19.66	19.62		
5	QPSK	25	0	19.63	19.69	19.83		
5	16QAM	1	0	19.84	19.77	19.69	21	1
5	16QAM	1	12	19.86	19.61	19.70		
5	16QAM	1	24	19.56	19.73	19.60		
5	16QAM	12	0	18.46	18.56	18.55	20	2
5	16QAM	12	6	18.44	18.42	18.45		
5	16QAM	12	11	18.64	18.53	18.42		
5	16QAM	25	0	18.54	18.66	18.57		

<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		20.64		21	0
10	QPSK	1	24		20.61			
10	QPSK	1	49		20.23			
10	QPSK	25	0		19.95		20	1
10	QPSK	25	12		19.82			
10	QPSK	25	24		19.80			
10	QPSK	50	0		19.86			
10	16QAM	1	0		19.75		20	1
10	16QAM	1	24		19.82			
10	16QAM	1	49		19.29			
10	16QAM	25	0		18.90		19	2
10	16QAM	25	12		18.77			
10	16QAM	25	24		18.76			
10	16QAM	50	0		18.83			
Channel				23205	23230	23255	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	20.63	20.53	20.54	21	0
5	QPSK	1	12	20.62	20.61	20.56		
5	QPSK	1	24	20.15	20.23	20.13		
5	QPSK	12	0	19.92	19.92	19.86	20	1
5	QPSK	12	6	19.82	19.82	19.75		
5	QPSK	12	11	19.77	19.75	19.72		
5	QPSK	25	0	19.81	19.86	19.86		
5	16QAM	1	0	19.73	19.68	19.72	20	1
5	16QAM	1	12	19.77	19.82	19.82		
5	16QAM	1	24	19.27	19.28	19.20		
5	16QAM	12	0	18.89	18.90	18.82	19	2
5	16QAM	12	6	18.74	18.73	18.72		
5	16QAM	12	11	18.67	18.75	18.70		
5	16QAM	25	0	18.77	18.74	18.80		

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	21.00	20.90	20.92	22	0
10	QPSK	1	24	20.91	20.83	20.86		
10	QPSK	1	49	20.76	20.74	20.77		
10	QPSK	25	0	19.94	19.91	19.93	21	1
10	QPSK	25	12	19.87	19.84	19.94		
10	QPSK	25	24	19.90	19.83	19.94		
10	QPSK	50	0	19.95	19.89	19.87		
10	16QAM	1	0	19.93	19.95	19.90	21	1
10	16QAM	1	24	19.95	19.89	19.88		
10	16QAM	1	49	19.91	19.82	19.84		
10	16QAM	25	0	18.90	18.78	18.84	20	2
10	16QAM	25	12	18.80	18.72	18.79		
10	16QAM	25	24	18.76	18.73	18.81		
10	16QAM	50	0	18.82	18.79	18.82		
Channel				20425	20525	20625	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	20.74	20.78	20.73	22	0
5	QPSK	1	12	20.62	20.62	20.56		
5	QPSK	1	24	20.62	20.65	20.70		
5	QPSK	12	0	19.73	19.67	19.91	21	1
5	QPSK	12	6	19.71	19.82	19.55		
5	QPSK	12	11	19.60	19.65	19.71		
5	QPSK	25	0	19.75	19.65	19.74		
5	16QAM	1	0	19.87	19.90	19.85	21	1
5	16QAM	1	12	19.93	19.86	19.73		
5	16QAM	1	24	19.86	19.98	19.81		
5	16QAM	12	0	18.71	18.77	18.49	20	2
5	16QAM	12	6	18.50	18.71	18.67		
5	16QAM	12	11	18.65	18.71	18.58		
5	16QAM	25	0	18.52	18.61	18.67		
Channel				20415	20525	20635	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	20.76	20.80	20.54	22	0
3	QPSK	1	7	20.72	20.69	20.43		
3	QPSK	1	14	20.46	20.61	20.37		
3	QPSK	8	0	19.80	19.70	19.47	21	1
3	QPSK	8	4	19.75	19.77	19.74		
3	QPSK	8	7	19.75	19.76	19.47		
3	QPSK	15	0	19.65	19.89	19.41		
3	16QAM	1	0	19.83	19.96	19.72	21	1
3	16QAM	1	7	19.85	19.89	19.87		
3	16QAM	1	14	19.74	19.95	19.91		
3	16QAM	8	0	18.61	18.54	18.74	20	2
3	16QAM	8	4	18.54	18.57	18.53		
3	16QAM	8	7	18.53	18.48	18.50		
3	16QAM	15	0	18.59	18.51	18.36		

Channel				20407	20525	20643	Tune up Limit (dBm)	Target MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	20.72	20.59	20.80	22	0
1.4	QPSK	1	2	20.80	20.66	20.68		
1.4	QPSK	1	5	20.81	20.57	20.61		
1.4	QPSK	3	0	20.72	20.75	20.81		
1.4	QPSK	3	1	20.88	20.85	20.76		
1.4	QPSK	3	2	20.67	20.74	20.83		
1.4	QPSK	6	0	19.96	19.66	19.91	21	1
1.4	16QAM	1	0	19.82	19.84	19.89	21	1
1.4	16QAM	1	2	19.79	19.76	19.91		
1.4	16QAM	1	5	19.69	19.89	19.88		
1.4	16QAM	3	0	19.59	19.79	19.60		
1.4	16QAM	3	1	19.68	19.68	19.66		
1.4	16QAM	3	2	19.60	19.63	19.72		
1.4	16QAM	6	0	18.69	18.67	18.68	20	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	17.94	17.86	17.95	19	0
20	QPSK	1	49	17.51	17.48	17.63		
20	QPSK	1	99	17.26	17.39	17.31		
20	QPSK	50	0	16.97	16.90	16.99	18	1
20	QPSK	50	24	16.66	16.64	16.75		
20	QPSK	50	49	16.58	16.64	16.72		
20	QPSK	100	0	16.73	16.78	16.80		
20	16QAM	1	0	16.88	16.94	16.98	18	1
20	16QAM	1	49	16.86	16.85	16.97		
20	16QAM	1	99	16.65	16.79	16.74		
20	16QAM	50	0	15.85	15.79	15.78	17	2
20	16QAM	50	24	15.56	15.54	15.63		
20	16QAM	50	49	15.51	15.53	15.61		
20	16QAM	100	0	15.63	15.64	15.67		
Channel				20025	20175	20325	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	17.64	17.83	17.80	19	0
15	QPSK	1	37	17.22	17.43	17.45		
15	QPSK	1	74	17.04	17.23	17.25		
15	QPSK	36	0	16.83	16.76	16.87	18	1
15	QPSK	36	18	16.29	16.31	16.42		
15	QPSK	36	37	16.32	16.35	16.53		
15	QPSK	75	0	16.44	16.36	16.43		
15	16QAM	1	0	16.70	16.86	16.71	18	1
15	16QAM	1	37	16.68	16.51	16.56		
15	16QAM	1	74	16.29	16.33	16.44		
15	16QAM	36	0	15.73	15.77	15.56	17	2
15	16QAM	36	18	15.31	15.27	15.27		
15	16QAM	36	37	15.35	15.30	15.37		
15	16QAM	75	0	15.37	15.37	15.37		
Channel				20000	20175	20350	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	17.80	17.58	17.73	19	0
10	QPSK	1	24	17.21	17.35	17.20		
10	QPSK	1	49	17.17	17.00	17.13		
10	QPSK	25	0	16.66	16.81	16.77	18	1
10	QPSK	25	12	16.41	16.46	16.55		
10	QPSK	25	24	16.54	16.19	16.51		
10	QPSK	50	0	16.70	16.67	16.70		
10	16QAM	1	0	16.55	16.53	16.79	18	1
10	16QAM	1	24	16.66	16.74	16.49		
10	16QAM	1	49	16.42	16.37	16.38		
10	16QAM	25	0	15.77	15.64	15.55	17	2
10	16QAM	25	12	15.41	15.28	15.36		
10	16QAM	25	24	15.15	15.28	15.45		
10	16QAM	50	0	15.56	15.41	15.45		

Channel				19975	20175	20375	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	17.74	17.79	17.55	19	0
5	QPSK	1	12	17.42	17.17	17.18		
5	QPSK	1	24	17.06	17.26	17.21		
5	QPSK	12	0	16.74	16.73	16.77	18	1
5	QPSK	12	6	16.36	16.37	16.59		
5	QPSK	12	11	16.40	16.38	16.33		
5	QPSK	25	0	16.56	16.54	16.72		
5	16QAM	1	0	16.52	16.87	16.59	18	1
5	16QAM	1	12	16.83	16.80	16.85		
5	16QAM	1	24	16.64	16.39	16.25		
5	16QAM	12	0	15.58	15.45	15.64	17	2
5	16QAM	12	6	15.19	15.33	15.48		
5	16QAM	12	11	15.48	15.37	15.51		
5	16QAM	25	0	15.28	15.27	15.50		
Channel				19965	20175	20385	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	17.92	17.71	17.57	19	0
3	QPSK	1	7	17.26	17.51	17.31		
3	QPSK	1	14	17.23	17.16	17.00		
3	QPSK	8	0	16.82	16.64	16.71	18	1
3	QPSK	8	4	16.49	16.47	16.42		
3	QPSK	8	7	16.54	16.25	16.53		
3	QPSK	15	0	16.65	16.54	16.52		
3	16QAM	1	0	16.54	16.56	16.66	18	1
3	16QAM	1	7	16.72	16.81	16.49		
3	16QAM	1	14	16.43	16.62	16.43		
3	16QAM	8	0	15.66	15.76	15.58	17	2
3	16QAM	8	4	15.39	15.21	15.53		
3	16QAM	8	7	15.37	15.28	15.25		
3	16QAM	15	0	15.38	15.50	15.46		
Channel				19957	20175	20393	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	17.76	17.36	17.65	19	0
1.4	QPSK	1	2	17.23	17.26	17.33		
1.4	QPSK	1	5	17.25	17.20	17.04		
1.4	QPSK	3	0	17.12	17.16	17.00		
1.4	QPSK	3	1	17.31	17.06	17.10		
1.4	QPSK	3	2	17.22	17.01	17.27		
1.4	QPSK	6	0	16.55	16.51	16.62	18	1
1.4	16QAM	1	0	16.55	16.63	16.87	18	1
1.4	16QAM	1	2	16.53	16.58	16.84		
1.4	16QAM	1	5	16.50	16.52	16.57		
1.4	16QAM	3	0	16.24	16.10	16.05		
1.4	16QAM	3	1	16.13	16.16	16.23		
1.4	16QAM	3	2	16.28	16.01	16.27		
1.4	16QAM	6	0	15.26	15.35	15.37	17	2

<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	17.72	17.86	17.72	18	0
20	QPSK	1	49	17.46	17.60	17.28		
20	QPSK	1	99	17.24	17.24	17.12		
20	QPSK	50	0	16.81	16.83	16.74	17	1
20	QPSK	50	24	16.60	16.78	16.48		
20	QPSK	50	49	16.57	16.69	16.43		
20	QPSK	100	0	16.67	16.85	16.58		
20	16QAM	1	0	16.85	16.84	16.79	17	1
20	16QAM	1	49	16.78	16.72	16.64		
20	16QAM	1	99	16.57	16.40	16.46		
20	16QAM	50	0	15.80	15.78	15.72	16	2
20	16QAM	50	24	15.57	15.57	15.47		
20	16QAM	50	49	15.53	15.46	15.41		
20	16QAM	100	0	15.60	15.61	15.53		
Channel				18675	18900	19125	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	17.56	17.69	17.51	18	0
15	QPSK	1	37	17.17	17.43	17.40		
15	QPSK	1	74	16.88	17.03	16.99		
15	QPSK	36	0	16.64	16.67	16.77	17	1
15	QPSK	36	18	16.59	16.45	16.51		
15	QPSK	36	37	16.44	16.18	16.17		
15	QPSK	75	0	16.28	16.46	16.64		
15	16QAM	1	0	16.78	16.64	16.52	17	1
15	16QAM	1	37	16.56	16.48	16.60		
15	16QAM	1	74	16.47	16.33	16.25		
15	16QAM	36	0	15.57	15.63	15.51	16	2
15	16QAM	36	18	15.19	15.37	15.30		
15	16QAM	36	37	15.27	15.27	15.44		
15	16QAM	75	0	15.49	15.41	15.41		
Channel				18650	18900	19150	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	17.43	17.39	17.34	18	0
10	QPSK	1	24	17.13	17.30	17.28		
10	QPSK	1	49	17.20	16.96	16.94		
10	QPSK	25	0	16.60	16.63	16.45	17	1
10	QPSK	25	12	16.37	16.29	16.47		
10	QPSK	25	24	16.37	16.18	16.19		
10	QPSK	50	0	16.45	16.40	16.55		
10	16QAM	1	0	16.55	16.65	16.64	17	1
10	16QAM	1	24	16.56	16.68	16.56		
10	16QAM	1	49	16.29	16.50	16.41		
10	16QAM	25	0	15.72	15.42	15.64	16	2
10	16QAM	25	12	15.44	15.18	15.25		
10	16QAM	25	24	15.19	15.18	15.48		
10	16QAM	50	0	15.34	15.46	15.26		

Channel				18625	18900	19175	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	17.32	17.52	17.67	18	0
5	QPSK	1	12	17.37	17.15	17.29		
5	QPSK	1	24	16.85	16.92	17.09		
5	QPSK	12	0	16.51	16.81	16.51	17	1
5	QPSK	12	6	16.43	16.33	16.31		
5	QPSK	12	11	16.47	16.35	16.37		
5	QPSK	25	0	16.42	16.46	16.37		
5	16QAM	1	0	16.73	16.69	16.63	17	1
5	16QAM	1	12	16.74	16.75	16.68		
5	16QAM	1	24	16.53	16.23	16.55		
5	16QAM	12	0	15.71	15.41	15.67	16	2
5	16QAM	12	6	15.51	15.47	15.37		
5	16QAM	12	11	15.16	15.23	15.37		
5	16QAM	25	0	15.24	15.53	15.46		
Channel				18615	18900	19185	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	17.43	17.54	17.50	18	0
3	QPSK	1	7	17.25	17.14	17.42		
3	QPSK	1	14	17.01	16.90	17.21		
3	QPSK	8	0	16.50	16.75	16.51	17	1
3	QPSK	8	4	16.55	16.23	16.33		
3	QPSK	8	7	16.36	16.26	16.42		
3	QPSK	15	0	16.36	16.64	16.38		
3	16QAM	1	0	16.79	16.70	16.60	17	1
3	16QAM	1	7	16.39	16.61	16.75		
3	16QAM	1	14	16.38	16.52	16.33		
3	16QAM	8	0	15.75	15.59	15.59	16	2
3	16QAM	8	4	15.34	15.47	15.22		
3	16QAM	8	7	15.41	15.44	15.21		
3	16QAM	15	0	15.60	15.32	15.30		
Channel				18607	18900	19193	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	17.53	17.35	17.30	18	0
1.4	QPSK	1	2	17.34	17.06	17.31		
1.4	QPSK	1	5	17.18	17.09	16.88		
1.4	QPSK	3	0	16.97	16.66	16.70		
1.4	QPSK	3	1	17.09	16.81	17.04		
1.4	QPSK	3	2	16.91	16.82	16.73		
1.4	QPSK	6	0	16.28	16.23	16.07	17	1
1.4	16QAM	1	0	16.70	16.49	16.60	17	1
1.4	16QAM	1	2	16.60	16.32	16.30		
1.4	16QAM	1	5	16.34	15.95	16.27		
1.4	16QAM	3	0	16.24	15.89	16.18		
1.4	16QAM	3	1	16.24	15.95	16.07		
1.4	16QAM	3	2	16.08	15.86	15.94		
1.4	16QAM	6	0	15.24	15.03	15.10	16	2

14. Antenna Location

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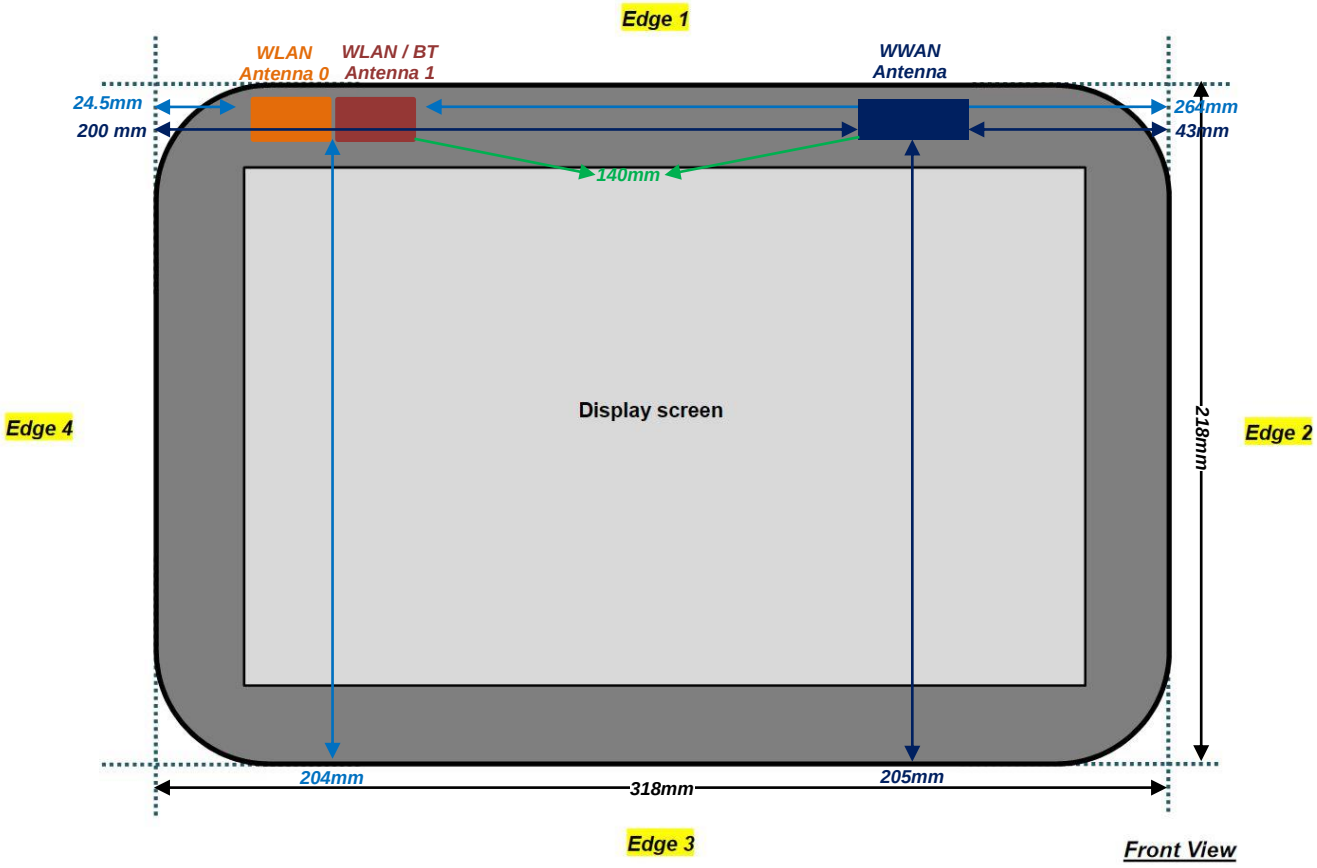

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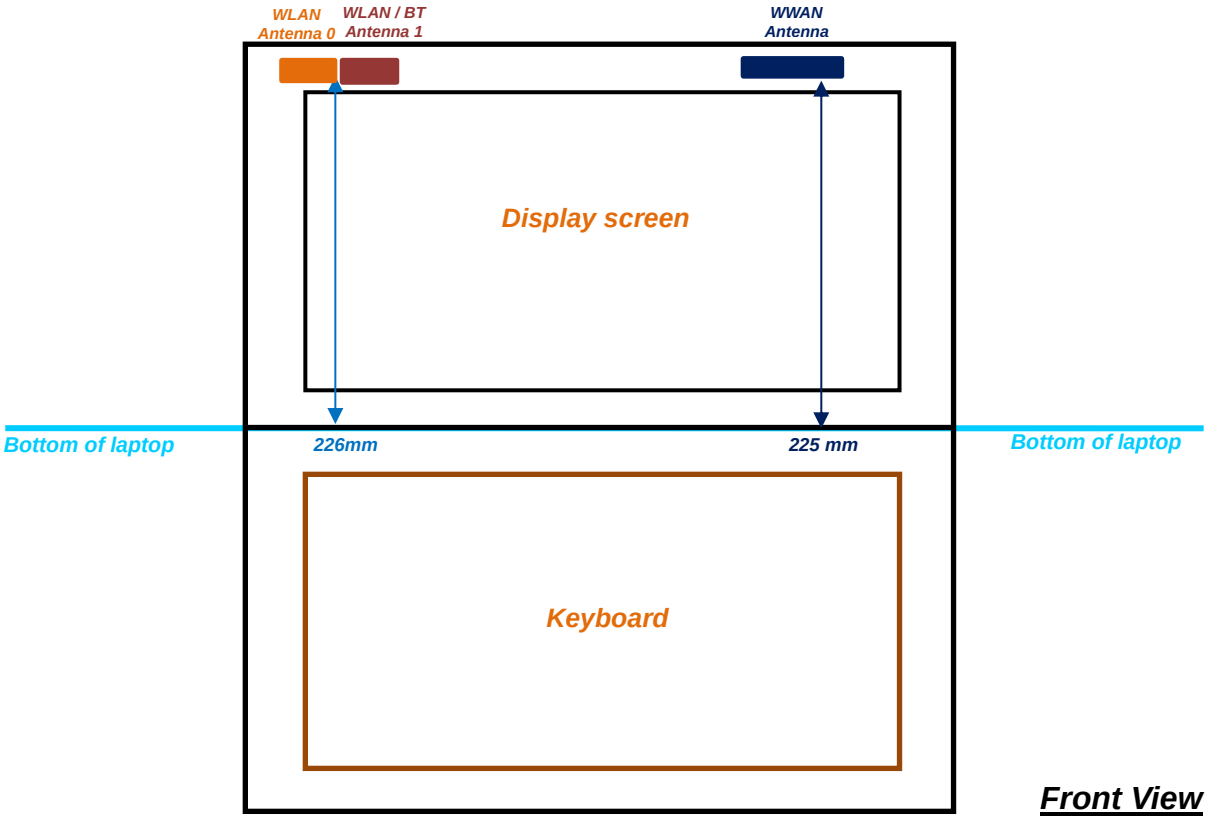


Front View

<SAR test exclusion table>

General Note:

1. The below table, when the distance is < 50 mm exclusion threshold is "Ratio", when the distance is > 50 mm exclusion threshold is "mW"
2. Maximum power is the source-based time-average power and represents the maximum RF output power among production units
3. Per KDB 447498 D01v05r02, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
4. Per KDB 447498 D01v05r02, standalone SAR test exclusion threshold is applied; If the test separation distance is < 5mm, 5mm is used to determine SAR exclusion threshold.
5. Per KDB 447498 D01v05r02, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
   [(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
   - f(GHz) is the RF channel transmit frequency in GHz
   - Power and distance are rounded to the nearest mW and mm before calculation
   - The result is rounded to one decimal place for comparison
6. Per KDB 447498 D01v05r02, at 100 MHz to 6 GHz and for *test separation distances* > 50 mm, the SAR test exclusion threshold is determined according to the following
   a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz
   b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

Exposure Position	Wireless Interface	LTE Band 17	LTE Band 13	LTE Band 5	LTE Band 4	LTE Band 2
	Calculated Frequency	713MHz	784MHz	848MHz	1754MHz	1909MHz
	Maximum power (dBm)	24	24	24	24	24
	Maximum rated power(mW)	251	251	251	251	251
Bottom Face	Separation distance(mm)	5.0				
	exclusion threshold	42	44	46	66	69
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Edge 1	Separation distance(mm)	5.0				
	exclusion threshold	42	44	46	66	69
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Edge 2	Separation distance(mm)	43.0				
	exclusion threshold	5	5	5	8	8
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Edge 3	Separation distance(mm)	205.0				
	exclusion threshold	914	980	1039	1663	1659
	Testing required?	**No**	**No**	**No**	**No**	**No**
Edge 4	Separation distance(mm)	200.0				
	exclusion threshold	891	953	1011	1613	1609
	Testing required?	**No**	**No**	**No**	**No**	**No**
Bottom of Laptop	Separation distance(mm)	225.0				
	exclusion threshold	1009	1084	1152	1863	1859
	Testing required?	**No**	**No**	**No**	**No**	**No**

15. SAR Test Results

General Note:

1. Per KDB 447498 D01v05r02, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
2. Per KDB 447498 D01v05r02, 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. 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; 1.1cm for bottom face, 1.1cm for Curved surface of Edge1, 1.1cm for edge1
4. Considering the curvature transition from bottom face to the edge, SAR testing at the curvature was performed. The SAR test setup is included in test setup photo exhibit, and the details of the curvature are included in operation description exhibit.
5. Per KDB 616217 D04v01r01, the additional separation introduced by the contour against a flat phantom is > 5 mm on this device a curved or contoured back surface or edge SAR is not required, more detail information please refer to the setup photo.
6. For SAR testing of the curved region of the device, the device was placed directly against the phantom at the point where the distance between the antenna and device exterior is a minimum.
7. Per KDB 941225 D05v02r03, 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.
8. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
9. Per KDB 941225 D05v02r03, 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.
10. Per KDB 941225 D05v02r03, 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 D05v02r03, 16QAM SAR testing is not required.
11. Per KDB 941225 D05v02r03, 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 D05v02r03, smaller bandwidth SAR testing is not required.

15.1 Body SAR

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (cm)	Battery	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 17	10M	QPSK	1	0	Bottom Face	1.1cm	Battery 1	OFF	23780	709	23.77	24.00	0.06	0.275	0.290
	LTE Band 17	10M	QPSK	25	0	Bottom Face	1.1cm	Battery 1	OFF	23780	709	22.99	23.00	-0.03	0.235	0.236
	LTE Band 17	10M	QPSK	1	0	Edge 1	1.1cm	Battery 1	OFF	23780	709	23.77	24.00	0.01	0.508	0.536
	LTE Band 17	10M	QPSK	25	0	Edge 1	1.1cm	Battery 1	OFF	23780	709	22.99	23.00	-0.14	0.325	0.326
	LTE Band 17	10M	QPSK	1	0	Edge 2	0cm	Battery 1	OFF	23780	709	23.77	24.00	-0.07	0.060	0.063
	LTE Band 17	10M	QPSK	25	0	Edge 2	0cm	Battery 1	OFF	23780	709	22.99	23.00	-0.04	0.050	0.050
	LTE Band 17	10M	QPSK	1	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	23780	709	23.77	24.00	-0.02	0.619	0.653
	LTE Band 17	10M	QPSK	25	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	23780	709	22.99	23.00	0	0.520	0.521
	LTE Band 17	10M	QPSK	1	0	Bottom Face	0cm	Battery 1	ON	23780	709	20.92	22.00	0.04	0.471	0.604
	LTE Band 17	10M	QPSK	25	0	Bottom Face	0cm	Battery 1	ON	23780	709	19.86	21.00	-0.01	0.403	0.524
	LTE Band 17	10M	QPSK	1	0	Edge 1	0cm	Battery 1	ON	23780	709	20.92	22.00	-0.16	0.901	1.155
	LTE Band 17	10M	QPSK	25	0	Edge 1	0cm	Battery 1	ON	23780	709	19.86	21.00	-0.18	0.737	0.958
	LTE Band 17	10M	QPSK	50	0	Edge 1	0cm	Battery 1	ON	23780	709	19.87	21.00	-0.11	0.730	0.947
01	LTE Band 17	10M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	23780	709	20.92	22.00	0.12	1.050	**1.346**
	LTE Band 17	10M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 2	ON	23780	709	20.92	22.00	-0.12	1.030	1.321
	LTE Band 17	10M	QPSK	25	0	Curved surface of Edge1	0cm	Battery 1	ON	23780	709	19.86	21.00	0.04	0.869	1.130
	LTE Band 17	10M	QPSK	50	0	Curved surface of Edge1	0cm	Battery 1	ON	23780	709	19.87	21.00	0.15	0.877	1.138
	LTE Band 13	10M	QPSK	1	0	Bottom Face	1.1cm	Battery 1	OFF	23230	782	23.56	24.00	-0.03	0.369	0.408
	LTE Band 13	10M	QPSK	25	0	Bottom Face	1.1cm	Battery 1	OFF	23230	782	22.85	23.00	-0.01	0.334	0.346
	LTE Band 13	10M	QPSK	1	0	Edge 1	1.1cm	Battery 1	OFF	23230	782	23.56	24.00	0.04	0.491	0.543
	LTE Band 13	10M	QPSK	25	0	Edge 1	1.1cm	Battery 1	OFF	23230	782	22.85	23.00	0.03	0.446	0.462
	LTE Band 13	10M	QPSK	1	0	Edge 2	0cm	Battery 1	OFF	23230	782	23.56	24.00	-0.05	0.085	0.094
	LTE Band 13	10M	QPSK	25	0	Edge 2	0cm	Battery 1	OFF	23230	782	22.85	23.00	-0.04	0.082	0.085
	LTE Band 13	10M	QPSK	1	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	23230	782	23.56	24.00	0.01	0.566	0.626
	LTE Band 13	10M	QPSK	25	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	23230	782	22.85	23.00	0.02	0.518	0.536
	LTE Band 13	10M	QPSK	1	0	Bottom Face	0cm	Battery 1	ON	23230	782	20.64	21.00	0.02	0.607	0.659
	LTE Band 13	10M	QPSK	25	0	Bottom Face	0cm	Battery 1	ON	23230	782	19.95	20.00	-0.05	0.507	0.513
	LTE Band 13	10M	QPSK	1	0	Edge 1	0cm	Battery 1	ON	23230	782	20.64	21.00	-0.1	0.926	1.006
	LTE Band 13	10M	QPSK	25	0	Edge 1	0cm	Battery 1	ON	23230	782	19.95	20.00	-0.12	0.806	0.815
	LTE Band 13	10M	QPSK	50	0	Edge 1	0cm	Battery 1	ON	23230	782	19.86	20.00	-0.13	0.791	0.817
02	LTE Band 13	10M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	23230	782	20.64	21.00	0.04	1.060	**1.152**
	LTE Band 13	10M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 2	ON	23230	782	20.64	21.00	0.04	1.030	1.119
	LTE Band 13	10M	QPSK	25	0	Curved surface of Edge1	0cm	Battery 1	ON	23230	782	19.95	20.00	0.03	0.933	0.944
	LTE Band 13	10M	QPSK	50	0	Curved surface of Edge1	0cm	Battery 1	ON	23230	782	19.86	20.00	0.03	0.905	0.935

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (cm)	Battery	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 5	10M	QPSK	1	0	Bottom Face	1.1cm	Battery 1	OFF	20450	829	23.89	24.00	-0.06	0.345	0.354
	LTE Band 5	10M	QPSK	25	0	Bottom Face	1.1cm	Battery 1	OFF	20450	829	22.99	23.00	-0.07	0.281	0.282
	LTE Band 5	10M	QPSK	1	0	Edge 1	1.1cm	Battery 1	OFF	20450	829	23.89	24.00	-0.12	0.537	0.551
	LTE Band 5	10M	QPSK	25	0	Edge 1	1.1cm	Battery 1	OFF	20450	829	22.99	23.00	-0.1	0.438	0.439
	LTE Band 5	10M	QPSK	1	0	Edge 2	0cm	Battery 1	OFF	20450	829	23.89	24.00	-0.03	0.088	0.090
	LTE Band 5	10M	QPSK	25	0	Edge 2	0cm	Battery 1	OFF	20450	829	22.99	23.00	-0.12	0.070	0.070
	LTE Band 5	10M	QPSK	1	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	20450	829	23.89	24.00	-0.08	0.818	0.839
	LTE Band 5	10M	QPSK	1	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	20525	836.5	23.64	24.00	-0.05	0.773	0.840
	LTE Band 5	10M	QPSK	1	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	20600	844	23.71	24.00	-0.09	0.777	0.831
	LTE Band 5	10M	QPSK	25	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	20450	829	22.99	23.00	-0.09	0.677	0.679
	LTE Band 5	10M	QPSK	50	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	20450	829	22.96	23.00	0	0.663	0.669
	LTE Band 5	10M	QPSK	1	0	Bottom Face	0cm	Battery 1	ON	20450	829	21.00	22.00	-0.02	0.775	0.976
	LTE Band 5	10M	QPSK	1	0	Bottom Face	0cm	Battery 1	ON	20525	836.5	20.90	22.00	0.07	0.809	1.042
	LTE Band 5	10M	QPSK	1	0	Bottom Face	0cm	Battery 1	ON	20600	844	20.92	22.00	-0.04	0.706	0.905
	LTE Band 5	10M	QPSK	25	0	Bottom Face	0cm	Battery 1	ON	20450	829	19.94	21.00	-0.04	0.614	0.784
	LTE Band 5	10M	QPSK	50	0	Bottom Face	0cm	Battery 1	ON	20450	829	19.95	21.00	-0.14	0.601	0.765
	LTE Band 5	10M	QPSK	1	0	Edge 1	0cm	Battery 1	ON	20450	829	21.00	22.00	-0.13	0.864	1.088
	LTE Band 5	10M	QPSK	1	0	Edge 1	0cm	Battery 1	ON	20525	836.5	20.90	22.00	-0.12	0.791	1.019
	LTE Band 5	10M	QPSK	1	0	Edge 1	0cm	Battery 1	ON	20600	844	20.92	22.00	-0.14	0.734	0.941
	LTE Band 5	10M	QPSK	25	0	Edge 1	0cm	Battery 1	ON	20450	829	19.94	21.00	-0.14	0.628	0.802
	LTE Band 5	10M	QPSK	25	0	Edge 1	0cm	Battery 1	ON	20525	836.5	19.91	21.00	-0.09	0.569	0.731
	LTE Band 5	10M	QPSK	25	0	Edge 1	0cm	Battery 1	ON	20600	844	19.93	21.00	-0.01	0.541	0.692
	LTE Band 5	10M	QPSK	50	0	Edge 1	0cm	Battery 1	ON	20450	829	19.95	21.00	-0.18	0.603	0.768
03	LTE Band 5	10M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	20450	829	21.00	22.00	-0.16	0.884	**1.113**
	LTE Band 5	10M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	20525	836.5	20.90	22.00	-0.15	0.835	1.076
	LTE Band 5	10M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	20600	844	20.92	22.00	-0.14	0.776	0.995
	LTE Band 5	10M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 2	ON	20450	829	21.00	22.00	-0.18	0.861	1.084
	LTE Band 5	10M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 2	ON	20525	836.5	20.90	22.00	-0.17	0.834	1.074
	LTE Band 5	10M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 2	ON	20600	844	20.92	22.00	-0.19	0.778	0.998
	LTE Band 5	10M	QPSK	25	0	Curved surface of Edge1	0cm	Battery 1	ON	20450	829	19.94	21.00	-0.16	0.691	0.882
	LTE Band 5	10M	QPSK	25	0	Curved surface of Edge1	0cm	Battery 1	ON	20525	836.5	19.91	21.00	-0.02	0.651	0.837
	LTE Band 5	10M	QPSK	25	0	Curved surface of Edge1	0cm	Battery 1	ON	20600	844	19.93	21.00	-0.04	0.601	0.769
	LTE Band 5	10M	QPSK	50	0	Curved surface of Edge1	0cm	Battery 1	ON	20450	829	19.95	21.00	-0.11	0.667	0.849

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (cm)	Battery	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 4	20M	QPSK	1	0	Bottom Face	1.1cm	Battery 1	OFF	20300	1745	23.95	24.00	-0.01	0.410	0.415
	LTE Band 4	20M	QPSK	50	0	Bottom Face	1.1cm	Battery 1	OFF	20300	1745	22.97	23.00	0	0.351	0.353
	LTE Band 4	20M	QPSK	1	0	Edge 1	1.1cm	Battery 1	OFF	20300	1745	23.95	24.00	-0.03	0.460	0.465
	LTE Band 4	20M	QPSK	50	0	Edge 1	1.1cm	Battery 1	OFF	20300	1745	22.97	23.00	-0.06	0.379	0.382
	LTE Band 4	20M	QPSK	1	0	Edge 2	0cm	Battery 1	OFF	20300	1745	23.95	24.00	0.02	0.147	0.149
	LTE Band 4	20M	QPSK	50	0	Edge 2	0cm	Battery 1	OFF	20300	1745	22.97	23.00	0.01	0.123	0.124
	LTE Band 4	20M	QPSK	1	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	20300	1745	23.95	24.00	-0.03	0.561	0.567
	LTE Band 4	20M	QPSK	50	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	20300	1745	22.97	23.00	-0.04	0.470	0.473
	LTE Band 4	20M	QPSK	1	0	Bottom Face	0cm	Battery 1	ON	20300	1745	17.95	19.00	-0.1	0.483	0.615
	LTE Band 4	20M	QPSK	50	0	Bottom Face	0cm	Battery 1	ON	20300	1745	16.99	18.00	-0.05	0.392	0.495
	LTE Band 4	20M	QPSK	1	0	Edge 1	0cm	Battery 1	ON	20300	1745	17.95	19.00	-0.16	0.593	0.755
	LTE Band 4	20M	QPSK	50	0	Edge 1	0cm	Battery 1	ON	20300	1745	16.99	18.00	-0.12	0.479	0.604
	LTE Band 4	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	20300	1745	17.95	19.00	-0.11	0.843	1.074
	LTE Band 4	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	20050	1720	17.94	19.00	-0.08	0.818	1.044
04	LTE Band 4	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	20175	1732.5	17.86	19.00	-0.11	0.854	**1.110**
	LTE Band 4	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 2	ON	20175	1732.5	17.86	19.00	-0.13	0.789	1.026
	LTE Band 4	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 2	ON	20050	1720	17.94	19.00	-0.16	0.748	0.955
	LTE Band 4	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 2	ON	20300	1745	17.95	19.00	-0.19	0.772	0.983
	LTE Band 4	20M	QPSK	50	0	Curved surface of Edge1	0cm	Battery 1	ON	20300	1745	16.99	18.00	-0.1	0.732	0.924
	LTE Band 4	20M	QPSK	50	0	Curved surface of Edge1	0cm	Battery 1	ON	20050	1720	16.97	18.00	-0.13	0.629	0.797
	LTE Band 4	20M	QPSK	50	0	Curved surface of Edge1	0cm	Battery 1	ON	20175	1732.5	16.90	18.00	-0.12	0.655	0.844
	LTE Band 4	20M	QPSK	100	0	Curved surface of Edge1	0cm	Battery 1	ON	20300	1745	16.80	18.00	-0.09	0.737	0.972
	LTE Band 2	20M	QPSK	1	0	Bottom Face	1.1cm	Battery 1	OFF	18900	1880	23.61	24.00	0.14	0.488	0.534
	LTE Band 2	20M	QPSK	50	0	Bottom Face	1.1cm	Battery 1	OFF	18900	1880	22.82	23.00	0.03	0.405	0.422
	LTE Band 2	20M	QPSK	1	0	Edge 1	1.1cm	Battery 1	OFF	18900	1880	23.61	24.00	-0.05	0.654	0.715
	LTE Band 2	20M	QPSK	50	0	Edge 1	1.1cm	Battery 1	OFF	18900	1880	22.82	23.00	0.02	0.537	0.560
	LTE Band 2	20M	QPSK	1	0	Edge 2	0cm	Battery 1	OFF	18900	1880	23.61	24.00	-0.11	0.183	0.200
	LTE Band 2	20M	QPSK	50	0	Edge 2	0cm	Battery 1	OFF	18900	1880	22.82	23.00	0.03	0.142	0.148
	LTE Band 2	20M	QPSK	1	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	18900	1880	23.61	24.00	-0.07	0.742	0.812
	LTE Band 2	20M	QPSK	1	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	18700	1860	23.56	24.00	-0.08	0.708	0.783
	LTE Band 2	20M	QPSK	1	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	19100	1900	23.55	24.00	-0.03	0.711	0.789
	LTE Band 2	20M	QPSK	50	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	18900	1880	22.82	23.00	-0.09	0.615	0.641
	LTE Band 2	20M	QPSK	100	0	Curved surface of Edge1	1.1cm	Battery 1	OFF	18900	1880	22.66	23.00	-0.02	0.614	0.664
	LTE Band 2	20M	QPSK	1	0	Bottom Face	0cm	Battery 1	ON	18900	1880	17.86	18.00	0	0.565	0.584
	LTE Band 2	20M	QPSK	50	0	Bottom Face	0cm	Battery 1	ON	18900	1880	16.83	17.00	-0.02	0.466	0.485
	LTE Band 2	20M	QPSK	1	0	Edge 1	0cm	Battery 1	ON	18900	1880	17.86	18.00	0	0.988	1.020
	LTE Band 2	20M	QPSK	1	0	Edge 1	0cm	Battery 1	ON	18700	1860	17.72	18.00	-0.11	0.913	0.974
	LTE Band 2	20M	QPSK	1	0	Edge 1	0cm	Battery 1	ON	19100	1900	17.72	18.00	-0.14	0.968	1.032
	LTE Band 2	20M	QPSK	50	0	Edge 1	0cm	Battery 1	ON	18900	1880	16.83	17.00	-0.07	0.788	0.819
	LTE Band 2	20M	QPSK	50	0	Edge 1	0cm	Battery 1	ON	18700	1860	16.81	17.00	-0.06	0.758	0.792
	LTE Band 2	20M	QPSK	50	0	Edge 1	0cm	Battery 1	ON	19100	1900	16.74	17.00	-0.08	0.790	0.839
	LTE Band 2	20M	QPSK	100	0	Edge 1	0cm	Battery 1	ON	18900	1900	16.85	17.00	-0.02	0.740	0.766
	LTE Band 2	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	18900	1880	17.86	18.00	-0.12	1.160	1.198
	LTE Band 2	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	18700	1860	17.72	18.00	-0.1	1.040	1.109
05	LTE Band 2	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	19100	1900	17.72	18.00	-0.11	1.130	**1.205**
	LTE Band 2	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 2	ON	19100	1900	17.72	18.00	0.14	1.100	1.173
	LTE Band 2	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 2	ON	18700	1860	17.72	18.00	-0.12	1.060	1.131
	LTE Band 2	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 2	ON	18900	1880	17.86	18.00	0.09	1.150	1.188
	LTE Band 2	20M	QPSK	50	0	Curved surface of Edge1	0cm	Battery 1	ON	18900	1880	16.83	17.00	-0.09	0.925	0.962
	LTE Band 2	20M	QPSK	50	0	Curved surface of Edge1	0cm	Battery 1	ON	18700	1860	16.81	17.00	0.02	0.880	0.919
	LTE Band 2	20M	QPSK	50	0	Curved surface of Edge1	0cm	Battery 1	ON	19100	1900	16.74	17.00	-0.09	0.911	0.967
	LTE Band 2	20M	QPSK	100	0	Curved surface of Edge1	0cm	Battery 1	ON	18900	1880	16.85	17.00	-0.08	0.900	0.932

15.2 Repeated SAR Measurement

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (cm)	Battery	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 13	10M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	23230	782	20.64	21.00	0.04	1.060	-	1.152
2nd	LTE Band 13	10M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	23230	782	20.64	21.00	-0.11	1.050	1.01	1.141
1st	LTE Band 5	10M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	20450	829	21.00	22.00	-0.16	0.884	-	1.113
2nd	LTE Band 5	10M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	20450	829	21.00	22.00	-0.12	0.879	1.01	1.107
1st	LTE Band 4	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	20175	1732.5	17.86	19.00	-0.11	0.854	-	1.110
2nd	LTE Band 4	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	20175	1732.5	17.86	19.00	0.16	0.851	1.00	1.106
1st	LTE Band 2	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	18900	1880	17.86	18.00	-0.12	1.160	-	1.198
2nd	LTE Band 2	20M	QPSK	1	0	Curved surface of Edge1	0cm	Battery 1	ON	18900	1880	17.86	18.00	-0.11	1.150	1.01	1.188

General Note:

1. Per KDB 865664 D01v01r03, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg
2. Per KDB 865664 D01v01r03, 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.

16. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Portable Tablet	Note
		Body	
1.	LTE(Data) + WLAN2.4GHz(data)	Yes	Hotspot / WiFi Direct
2.	LTE(Data) + Bluetooth(data)	Yes	
3.	LTE(data) + WLAN5GHz(data)	No	

General Note:

1. The below table WLAN modules are also integrated into this host and the 2.4GHz WLAN and Bluetooth SAR testing results are also used perform transmission simultaneous analysis.
2. The worst case 2.4 GHz WLAN and Bluetooth SAR for each configuration in below each WLAN report was used for SAR summation; therefore, the following summations represent the absolute worst cases for simultaneous transmission with WLAN and Bluetooth.
3. This device supports 2.4GHz WLAN hotspot and WiFi direct operation only, therefore when the device operate in 5GHz WLAN transmit cannot be transmitted simultaneously with WWAN
4. For simultaneous transmission analysis for exposure position of edge1 1.1cm, Curved surface of Edge1 1.1cm and bottom face 1.1cm, WLAN SAR tested at 0mm separation is worse and the test data is used for conservative SAR summation.
5. The Scaled SAR summation is calculated based on the same configuration and test position.
6. Per KDB 447498 D01v05r02, 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 16.2.

WLAN Module Information		
Integrated Module 1	Brand Name	Broadcom
	Model Name	BCM943142Y
	FCC ID	QDS-BRCM1079
	Report No	FA431032
	Final Action Date	04/09/2014
	Mode	・802.11 b/g/n ・Bluetooth
Integrated Module 2	Brand Name	Intel
	Model Name	Intel® Dual Band Wireless-AC 3160 (Model 3160NGW)
	FCC ID	PD93160NG
	Report No	SAR.20140310
	Final Action Date	03/26/2014
	Mode	・802.11 a/b/g/n/ac ・Bluetooth

16.1 Body Exposure Conditions

16.1.1 Transmit simultaneous with Broadcom BCM943142Y

WWAN Band		Exposure Position	WWAN	2.4GHz WLAN Antenna 0	Summed SAR (W/kg)	SPLSR	Case No
			SAR (W/kg)	SAR (W/kg)			
LTE	Band 17	Bottom Face at 1.1 cm	0.290	0.202	**0.49**		
		Edge1 at 1.1 cm	0.536	0.180	**0.72**		
		Edge2 at 0 cm	0.063		**0.06**		
		Curved surface of Edge1 1.1cm	0.653	0.183	**0.84**		
		Bottom Face at 0 cm	0.604	0.202	**0.81**		
		Edge1 at 0 cm	1.155	0.180	**1.34**		
		Curved surface of Edge1 0cm	1.346	0.183	**1.53**		
	Band 13	Bottom Face at 1.1 cm	0.408	0.202	**0.61**		
		Edge1 at 1.1 cm	0.543	0.180	**0.72**		
		Edge2 at 0 cm	0.094		**0.09**		
		Curved surface of Edge1 1.1cm	0.626	0.183	**0.81**		
		Bottom Face at 0 cm	0.659	0.202	**0.86**		
		Edge1 at 0 cm	1.006	0.180	**1.19**		
		Curved surface of Edge1 0cm	1.152	0.183	**1.34**		
	Band 5	Bottom Face at 1.1 cm	0.354	0.202	**0.56**		
		Edge1 at 1.1 cm	0.551	0.180	**0.73**		
		Edge2 at 0 cm	0.090		**0.09**		
		Curved surface of Edge1 1.1cm	0.840	0.183	**1.02**		
		Bottom Face at 0 cm	1.042	0.202	**1.24**		
		Edge1 at 0 cm	1.088	0.180	**1.27**		
		Curved surface of Edge1 0cm	1.113	0.183	**1.30**		
	Band 4	Bottom Face at 1.1 cm	0.415	0.202	**0.62**		
		Edge1 at 1.1 cm	0.465	0.180	**0.65**		
		Edge2 at 0 cm	0.149		**0.15**		
		Curved surface of Edge1 1.1cm	0.567	0.183	**0.75**		
		Bottom Face at 0 cm	0.615	0.202	**0.82**		
		Edge1 at 0 cm	0.755	0.180	**0.94**		
		Curved surface of Edge1 0cm	1.110	0.183	**1.29**		
	Band 2	Bottom Face at 1.1 cm	0.534	0.202	**0.74**		
		Edge1 at 1.1 cm	0.715	0.180	**0.90**		
		Edge2 at 0 cm	0.200		**0.20**		
		Curved surface of Edge1 1.1cm	0.812	0.183	**1.00**		
		Bottom Face at 0 cm	0.584	0.202	**0.79**		
		Edge1 at 0 cm	1.032	0.180	**1.21**		
		Curved surface of Edge1 0cm	1.205	0.183	**1.39**		

WWAN Band		Exposure Position	WWAN SAR (W/kg)	2.4GHz WLAN Antenna 1 SAR (W/kg)	**Summed SAR (W/kg)**	SPLSR	Case No
LTE	Band 17	Bottom Face at 1.1 cm	0.290	0.360	**0.65**		
		Edge1 at 1.1 cm	0.536	0.077	**0.61**		
		Edge2 at 0 cm	0.063		**0.06**		
		Curved surface of Edge1 1.1cm	0.653	0.330	**0.98**		
		Bottom Face at 0 cm	0.604	0.360	**0.96**		
		Edge1 at 0 cm	1.155	0.077	**1.23**		
		Curved surface of Edge1 0cm	1.346	0.330	**1.68**	0.01	Case 1
	Band 13	Bottom Face at 1.1 cm	0.408	0.360	**0.77**		
		Edge1 at 1.1 cm	0.543	0.077	**0.62**		
		Edge2 at 0 cm	0.094		**0.09**		
		Curved surface of Edge1 1.1cm	0.626	0.330	**0.96**		
		Bottom Face at 0 cm	0.659	0.360	**1.02**		
		Edge1 at 0 cm	1.006	0.077	**1.08**		
		Curved surface of Edge1 0cm	1.152	0.330	**1.48**		
	Band 5	Bottom Face at 1.1 cm	0.354	0.360	**0.71**		
		Edge1 at 1.1 cm	0.551	0.077	**0.63**		
		Edge2 at 0 cm	0.090		**0.09**		
		Curved surface of Edge1 1.1cm	0.840	0.330	**1.17**		
		Bottom Face at 0 cm	1.042	0.360	**1.40**		
		Edge1 at 0 cm	1.088	0.077	**1.17**		
		Curved surface of Edge1 0cm	1.113	0.330	**1.44**		
	Band 4	Bottom Face at 1.1 cm	0.415	0.360	**0.78**		
		Edge1 at 1.1 cm	0.465	0.077	**0.54**		
		Edge2 at 0 cm	0.149		**0.15**		
		Curved surface of Edge1 1.1cm	0.567	0.330	**0.90**		
		Bottom Face at 0 cm	0.615	0.360	**0.98**		
		Edge1 at 0 cm	0.755	0.077	**0.83**		
		Curved surface of Edge1 0cm	1.110	0.330	**1.44**		
	Band 2	Bottom Face at 1.1 cm	0.534	0.360	**0.89**		
		Edge1 at 1.1 cm	0.715	0.077	**0.79**		
		Edge2 at 0 cm	0.200		**0.20**		
		Curved surface of Edge1 1.1cm	0.812	0.330	**1.14**		
		Bottom Face at 0 cm	0.584	0.360	**0.94**		
		Edge1 at 0 cm	1.032	0.077	**1.11**		
		Curved surface of Edge1 0cm	1.205	0.330	**1.54**		

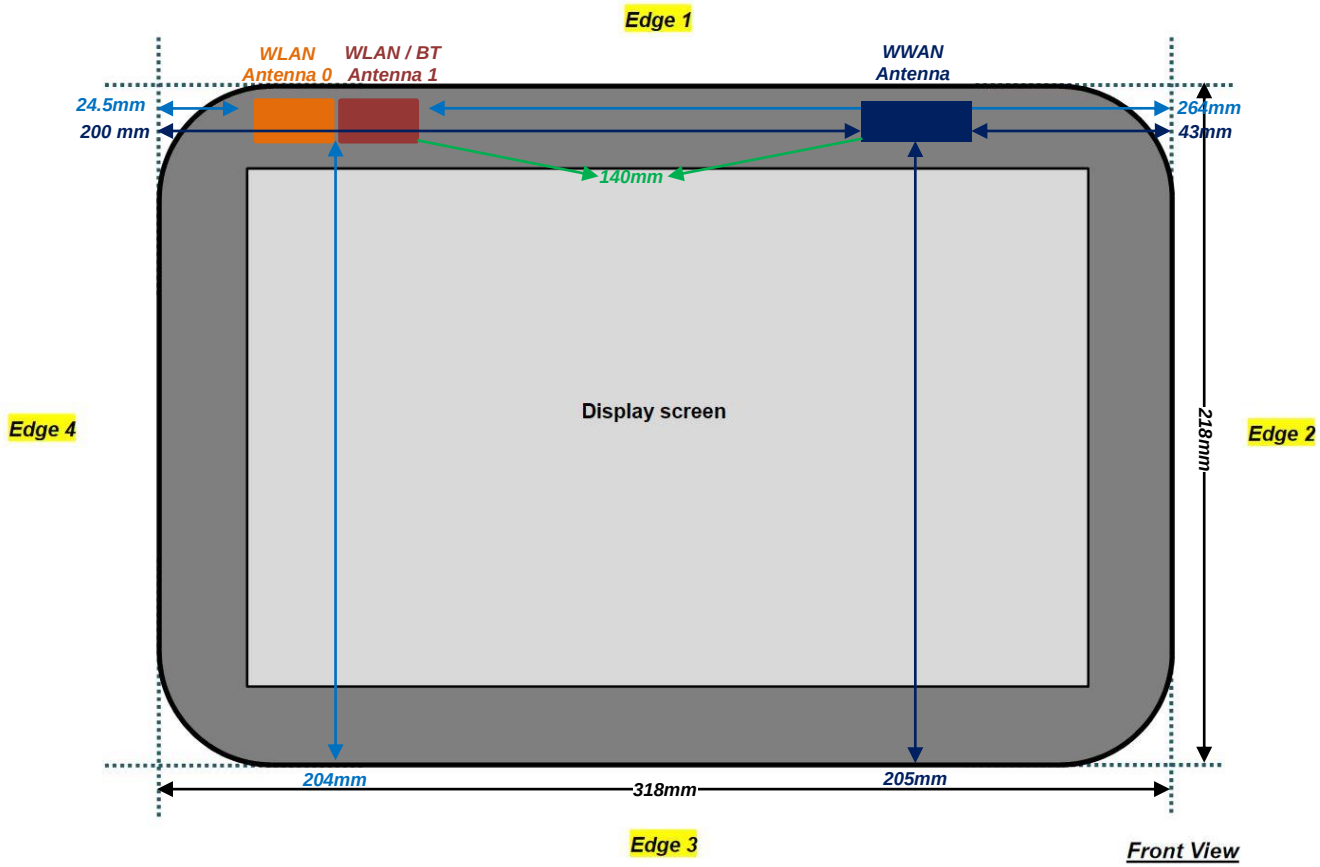
WWAN Band		Exposure Position	WWAN SAR (W/kg)	Bluetooth Antenna 1 Estimated SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
LTE	Band 17	Bottom Face at 1.1 cm	0.290	0.042	**0.33**		
		Edge1 at 1.1 cm	0.536	0.042	**0.58**		
		Edge2 at 0 cm	0.063		**0.06**		
		Curved surface of Edge1 1.1cm	0.653	0.042	**0.70**		
		Bottom Face at 0 cm	0.604	0.042	**0.65**		
		Edge1 at 0 cm	1.155	0.042	**1.20**		
		Curved surface of Edge1 0cm	1.346	0.042	**1.39**		
	Band 13	Bottom Face at 1.1 cm	0.408	0.042	**0.45**		
		Edge1 at 1.1 cm	0.543	0.042	**0.59**		
		Edge2 at 0 cm	0.094		**0.09**		
		Curved surface of Edge1 1.1cm	0.626	0.042	**0.67**		
		Bottom Face at 0 cm	0.659	0.042	**0.70**		
		Edge1 at 0 cm	1.006	0.042	**1.05**		
		Curved surface of Edge1 0cm	1.152	0.042	**1.19**		
	Band 5	Bottom Face at 1.1 cm	0.354	0.042	**0.40**		
		Edge1 at 1.1 cm	0.551	0.042	**0.59**		
		Edge2 at 0 cm	0.090		**0.09**		
		Curved surface of Edge1 1.1cm	0.840	0.042	**0.88**		
		Bottom Face at 0 cm	1.042	0.042	**1.08**		
		Edge1 at 0 cm	1.088	0.042	**1.13**		
		Curved surface of Edge1 0cm	1.113	0.042	**1.16**		
	Band 4	Bottom Face at 1.1 cm	0.415	0.042	**0.46**		
		Edge1 at 1.1 cm	0.465	0.042	**0.51**		
		Edge2 at 0 cm	0.149		**0.15**		
		Curved surface of Edge1 1.1cm	0.567	0.042	**0.61**		
		Bottom Face at 0 cm	0.615	0.042	**0.66**		
		Edge1 at 0 cm	0.755	0.042	**0.80**		
		Curved surface of Edge1 0cm	1.110	0.042	**1.15**		
	Band 2	Bottom Face at 1.1 cm	0.534	0.042	**0.58**		
		Edge1 at 1.1 cm	0.715	0.042	**0.76**		
		Edge2 at 0 cm	0.200		**0.20**		
		Curved surface of Edge1 1.1cm	0.812	0.042	**0.85**		
		Bottom Face at 0 cm	0.584	0.042	**0.63**		
		Edge1 at 0 cm	1.032	0.042	**1.07**		
		Curved surface of Edge1 0cm	1.205	0.042	**1.25**		

16.1.2 Transmit simultaneous with Intel 3160NGW

WWAN Band		Exposure Position	WWAN SAR (W/kg)	2.4GHz WLAN Antenna 0 SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
LTE	Band 17	Bottom Face at 1.1 cm	0.290	0.270	**0.56**		
		Edge1 at 1.1 cm	0.536	0.350	**0.89**		
		Edge2 at 0 cm	0.063		**0.06**		
		Curved surface of Edge1 1.1cm	0.653	0.960	**1.61**	0.01	Case 2
		Bottom Face at 0 cm	0.604	0.270	**0.87**		
		Edge1 at 0 cm	1.155	0.350	**1.51**		
		Curved surface of Edge1 0cm	1.346	0.960	**2.31**	0.03	Case 3
	Band 13	Bottom Face at 1.1 cm	0.408	0.270	**0.68**		
		Edge1 at 1.1 cm	0.543	0.350	**0.89**		
		Edge2 at 0 cm	0.094		**0.09**		
		Curved surface of Edge1 1.1cm	0.626	0.960	**1.59**		
		Bottom Face at 0 cm	0.659	0.270	**0.93**		
		Edge1 at 0 cm	1.006	0.350	**1.36**		
		Curved surface of Edge1 0cm	1.152	0.960	**2.11**	0.02	Case 4
	Band 5	Bottom Face at 1.1 cm	0.354	0.270	**0.62**		
		Edge1 at 1.1 cm	0.551	0.350	**0.90**		
		Edge2 at 0 cm	0.090		**0.09**		
		Curved surface of Edge1 1.1cm	0.840	0.960	**1.80**	0.02	Case 5
		Bottom Face at 0 cm	1.042	0.270	**1.31**		
		Edge1 at 0 cm	1.088	0.350	**1.44**		
		Curved surface of Edge1 0cm	1.113	0.960	**2.07**	0.02	Case 6
	Band 4	Bottom Face at 1.1 cm	0.415	0.270	**0.69**		
		Edge1 at 1.1 cm	0.465	0.350	**0.82**		
		Edge2 at 0 cm	0.149		**0.15**		
		Curved surface of Edge1 1.1cm	0.567	0.960	**1.53**		
		Bottom Face at 0 cm	0.615	0.270	**0.89**		
		Edge1 at 0 cm	0.755	0.350	**1.11**		
		Curved surface of Edge1 0cm	1.110	0.960	**2.07**	0.02	Case 7
	Band 2	Bottom Face at 1.1 cm	0.534	0.270	**0.80**		
		Edge1 at 1.1 cm	0.715	0.350	**1.07**		
		Edge2 at 0 cm	0.200		**0.20**		
		Curved surface of Edge1 1.1cm	0.812	0.960	**1.77**	0.02	Case 8
		Bottom Face at 0 cm	0.584	0.270	**0.85**		
		Edge1 at 0 cm	1.032	0.350	**1.38**		
		Curved surface of Edge1 0cm	1.205	0.960	**2.17**	0.02	Case 9

WWAN Band		Exposure Position	WWAN SAR (W/kg)	Bluetooth Antenna 1 Estimated SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
LTE	Band 17	Bottom Face at 1.1 cm	0.290	0.084	**0.37**		
		Edge1 at 1.1 cm	0.536	0.084	**0.62**		
		Edge2 at 0 cm	0.063	0.084	**0.15**		
		Curved surface of Edge1 1.1cm	0.653	0.084	**0.74**		
		Bottom Face at 0 cm	0.604	0.084	**0.69**		
		Edge1 at 0 cm	1.155	0.084	**1.24**		
		Curved surface of Edge1 0cm	1.346	0.084	**1.43**		
	Band 13	Bottom Face at 1.1 cm	0.408	0.084	**0.49**		
		Edge1 at 1.1 cm	0.543	0.084	**0.63**		
		Edge2 at 0 cm	0.094	0.084	**0.18**		
		Curved surface of Edge1 1.1cm	0.626	0.084	**0.71**		
		Bottom Face at 0 cm	0.659	0.084	**0.74**		
		Edge1 at 0 cm	1.006	0.084	**1.09**		
		Curved surface of Edge1 0cm	1.152	0.084	**1.24**		
	Band 5	Bottom Face at 1.1 cm	0.354	0.084	**0.44**		
		Edge1 at 1.1 cm	0.551	0.084	**0.64**		
		Edge2 at 0 cm	0.090	0.084	**0.17**		
		Curved surface of Edge1 1.1cm	0.840	0.084	**0.92**		
		Bottom Face at 0 cm	1.042	0.084	**1.13**		
		Edge1 at 0 cm	1.088	0.084	**1.17**		
		Curved surface of Edge1 0cm	1.113	0.084	**1.20**		
	Band 4	Bottom Face at 1.1 cm	0.415	0.084	**0.50**		
		Edge1 at 1.1 cm	0.465	0.084	**0.55**		
		Edge2 at 0 cm	0.149	0.084	**0.23**		
		Curved surface of Edge1 1.1cm	0.567	0.084	**0.65**		
		Bottom Face at 0 cm	0.615	0.084	**0.70**		
		Edge1 at 0 cm	0.755	0.084	**0.84**		
		Curved surface of Edge1 0cm	1.110	0.084	**1.19**		
	Band 2	Bottom Face at 1.1 cm	0.534	0.084	**0.62**		
		Edge1 at 1.1 cm	0.715	0.084	**0.80**		
		Edge2 at 0 cm	0.200	0.084	**0.28**		
		Curved surface of Edge1 1.1cm	0.812	0.084	**0.90**		
		Bottom Face at 0 cm	0.584	0.084	**0.67**		
		Edge1 at 0 cm	1.032	0.084	**1.12**		
		Curved surface of Edge1 0cm	1.205	0.084	**1.29**		

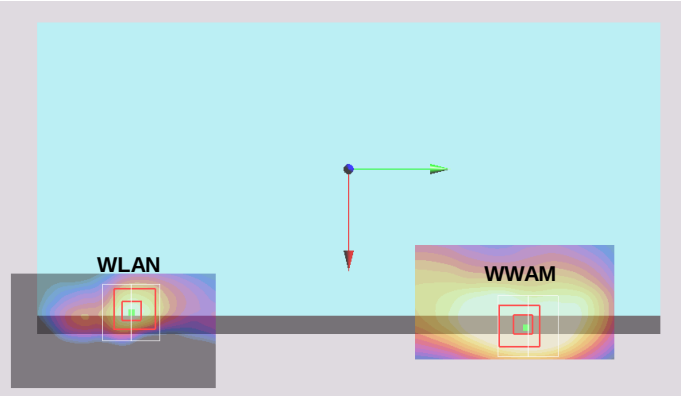
16.2 SPLSR Evaluation and Analysis



General Note:

1. WLAN/Bluetooth module of FCC ID: PD93160NG would be integrated into this host, and the identical WLAN antenna is used for either one module integration.
2. For SPLSR analysis of colocation with PD93160NG, the minimum distances between each antenna pair was used for conservative SPLSR calculation. This is justified to compare the SAR peak separation in SPLSR analysis case 1 with SPLSR analysis case2 ~ case9.
3. 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 (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 1	LTE Band 17	Curved surface of Edge1 0cm	1.346	0	0.0825	0.0945	-0.179	208.7	1.68	0.01	Not required
	2.4GHz WLAN		0.330	0	0.0754	-0.114	-0.175				



	Band	Position	SAR (W/kg)	Gap (cm)	Minimum distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 2	LTE Band 17	Curved surface of Edge1 1.1cm	0.653	1.1	140.0	1.61	0.01	Not required
	2.4GHz WLAN		0.960	0				

	Band	Position	SAR (W/kg)	Gap (cm)	Minimum distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 3	LTE Band 17	Curved surface of Edge1 0cm	1.346	0	140.0	2.31	0.03	Not required
	2.4GHz WLAN		0.960	0				

	Band	Position	SAR (W/kg)	Gap (cm)	Minimum distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 4	LTE Band 13	Curved surface of Edge1 0cm	1.152	0	140.0	2.11	0.02	Not required
	2.4GHz WLAN		0.960	0				

	Band	Position	SAR (W/kg)	Gap (cm)	Minimum distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 5	LTE Band 5	Curved surface of Edge1 1.1cm	0.840	1.1	140.0	1.80	0.02	Not required
	2.4GHz WLAN		0.960	0				

	Band	Position	SAR (W/kg)	Gap (cm)	Minimum distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 6	LTE Band 5	Curved surface of Edge1 0cm	1.113	0	140.0	2.07	0.02	Not required
	2.4GHz WLAN		0.960	0				

	Band	Position	SAR (W/kg)	Gap (cm)	Minimum distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 7	LTE Band 4	Curved surface of Edge1 0cm	1.110	0	140.0	2.07	0.02	Not required
	2.4GHz WLAN		0.960	0				

	Band	Position	SAR (W/kg)	Gap (cm)	Minimum distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 8	LTE Band 2	Curved surface of Edge1 1.1cm	0.812	1.1	140.0	1.77	0.02	Not required
	2.4GHz WLAN		0.960	0				

	Band	Position	SAR (W/kg)	Gap (cm)	Minimum distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 9	LTE Band 2	Curved surface of Edge1 0cm	1.205	0	140.0	2.17	0.02	Not required
	2.4GHz WLAN		0.960	0				

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17. 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/√3	1/√6	1/√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 14.1. 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 Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)
Measurement System							
Probe Calibration	6.0	Normal	1	1	1	± 6.0 %	± 6.0 %
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %
Boundary Effects	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Linearity	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %
Response Time	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Probe Positioner	0.4	Rectangular	√3	1	1	± 0.2 %	± 0.2 %
Probe Positioning	2.9	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Max. SAR Eval.	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Test Sample Related							
Device Positioning	2.9	Normal	1	1	1	± 2.9 %	± 2.9 %
Device Holder	3.6	Normal	1	1	1	± 3.6 %	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %
Phantom and Setup							
Phantom Uncertainty	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	0.43	± 1.6 %	± 1.1 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	0.49	± 1.5 %	± 1.2 %
Combined Standard Uncertainty						± 11.0 %	± 10.8 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						**± 22.0 %**	**± 21.5 %**

Table 14.2. Uncertainty Budget for frequency range 300 MHz to 3 GHz

18. References

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

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

[3] IEEE Std. 1528-2003, “Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, December 2003

[4] SPEAG DASY System Handbook

[5] FCC KDB 447498 D01 v05r02, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Feb 2014

[6] FCC KDB 941225 D05 v02r03, “SAR Evaluation Considerations for LTE Devices”, Dec 2013

[7] FCC KDB 616217 D04 v01r01, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, May 2013

[8] FCC KDB 865664 D01 v01r03, "SAR Measurement Requirements for 100 MHz to 6 GHz", Feb 2014.

[9] FCC KDB 865664 D02 v01r01, “RF Exposure Compliance Reporting and Documentation Considerations” May 2013.