FCC SAR Test Report

APPLICANT	: TCL Communication Ltd.
EQUIPMENT	: HSUPA/HSDPA/UMTS quadbands / GSM quadbands/LTE 6 -band mobile phone
BRAND NAME	: ALCATEL ONETOUCH
MODEL NAME	: 9007A
MARKETING NAME	: ONETOUCH PIXI 3 (7)
FCC ID	: 2ACCJN004
STANDARD	: FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2003

We, SPORTON INTERNATIONAL (KUNSHAN) 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 (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by: Eric Huang / Deputy Manager

Approved by: Jones Tsai / Manager

Testing Laboratory 2627

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA552902	Rev. 01	Initial issue of report	Jul. 27, 2015
FA552902	Rev. 02	Added bottom face SAR test with headset	Jul. 30, 2015
FA552902	Rev. 03	1. Revised the Coding Scheme for EDGE (GMSK) to MCS1 from page 30 to 32. 2. Added a body system check for 2450MHz.	Jul. 31, 2015

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **TCL Communication Ltd., HSUPA/HSDPA/UMTS quadbands / GSM quadbands/LTE 6 -band mobile phone, 9007A**, are as follows.

Equipment Class	Frequency Band	Highest SAR Summary		
		Head 1g SAR (W/kg)	Body 1g SAR (W/kg)	Highest Simultaneous Transmission 1g SAR (W/kg)
PCB	GSM850	**1.40**	1.05	1.55
	GSM1900	1.05	1.40	
	WCDMA Band V	1.37	0.88	
	WCDMA Band II	0.60	1.46	
	LTE Band 4	0.67	1.36	
	LTE Band 2	1.22	1.39	
	LTE Band 7	0.95	1.42	
DTS	WLAN 2.4GHz Band	<0.10	**1.47**	1.47
DSS	Bluetooth			1.55
Date of Testing:		06/26/2015 ~ 07/30/2015		

Note:

1. The SAR value list above are all rounded to two decimal digits.
2. a. According to section 16.2, the maximum simultaneous SAR for WWAN+DTS is 2.87W/kg.
   b. Per KDB 447498 D01, when the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR to peak location separation ratio. The ratio is determined by $(SAR1 + SAR2)^{1.5}/Ri$, rounded to two decimal digits, and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion. For all configurations SPLSR is ≤ 0.04 and qualify for 1-g SAR test exclusion.

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 (KUNSHAN) INC.
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958

Applicant	
Company Name	TCL Communication Ltd.
Address	FLAT/RM 1910-12A BLOCK 3 19/F CHINA HONG KONG CITY 33 CANTON ROAD TSIMSHATSUI KL

Manufacturer	
Company Name	TCL Communication Ltd.
Address	FLAT/RM 1910-12A BLOCK 3 19/F CHINA HONG KONG CITY 33 CANTON ROAD TSIMSHATSUI KL

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 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r02
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r01
- FCC KDB 616217 D04 SAR for laptop and tablets v01r01
- FCC KDB 941225 D01 3G SAR Procedures v03
- FCC KDB 941225 D05 SAR for LTE Devices v02r03

4. Equipment Under Test (EUT)

4.1 General Information

Product Feature & Specification	
Equipment Name	HSUPA/HSDPA/UMTS quadbands / GSM quadbands/LTE 6 -band mobile phone
Brand Name	ALCATEL ONETOUCH
Model Name	9007A
Marketing Name	ONETOUCH PIXI 3 (7)
FCC ID	2ACCJN004
IMEI Code	014426000001371
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	· GSM/GPRS/EGPRS · RMC/AMR 12.2Kbps · HSDPA · HSUPA · DC-HSDPA · HSPA+ (Downlink Only) · LTE: QPSK, 16QAM · 802.11b/g/n HT20 · Bluetooth v3.0+EDR，Bluetooth v4.1 LE
HW Version	PIO
SW Version	V5B1A-3
EUT Stage	Identical Prototype

Remark:
1. 802.11n-HT40 is not supported in 2.4GHz WLAN.
2. The EUT do not support DTM function.
3. This device supported VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. 3rd party VoIP).
4. This device supports GRPS/EGPRS mode up to multi-slot class12.

4.2 Specification of Accessory

Specification of Accessory				
AC Adapter 1	**Brand Name**	ALCATEL ONETOUCH	**Model Name**	CBA0057AG0C1
	Power Rating	I/P: 100 - 240 Vac, 200 mA, O/P: 5 Vdc, 1000 mA		
AC Adapter 2	**Brand Name**	ALCATEL ONETOUCH	**Model Name**	CBA0057AG0C3
	Power Rating	I/P: 100 - 240 Vac, 200 mA, O/P: 5 Vdc, 1000 mA		
Battery 1	**Brand Name**	ALCATEL ONETOUCH	**Model Name**	CAC2820006C2(TLp028A2)
	Power Rating	3.75Vdc, 2820mAh		
Battery 2	**Brand Name**	ALCATEL ONETOUCH	**Model Name**	CAC2820003CC(TLp028AC)
	Power Rating	3.7Vdc, 2820mAh		
USB Cable 1	**Brand Name**	ALCATEL ONETOUCH	**Model Name**	CDA3122002C2
	Signal Line Type	1.01m shielded without core		
USB Cable 2	**Brand Name**	ALCATEL ONETOUCH	**Model Name**	CDA3122002C1
	Signal Line Type	1.01m shielded without core		
Earphone 1	**Brand Name**	Juwei	**Model Name**	CCB3160A11C6
	Signal Line Type	1.2m non-shielded without core		
Earphone 2	**Brand Name**	Juwei	**Model Name**	CCB3160A11C4
	Signal Line Type	1.2m non-shielded without core		

4.3 Maximum Tune-up Limit

Mode	Burst average power (dBm)			
	GSM 850		GSM 1900	
	Full power mode	Reduced power mode	Full power mode	Reduced power mode
GSM (GMSK, 1 Tx slot)	33.5	30.5	29.5	22.5
GPRS (GMSK, 1 Tx slot)	33.5	30.5	29.5	22.5
GPRS (GMSK, 2 Tx slots)	32.0	29.0	28.5	21.0
GPRS (GMSK, 3 Tx slots)	30.5	28.0	26.5	19.0
GPRS (GMSK, 4 Tx slots)	29.0	26.0	25.5	17.5
EDGE (GMSK, 1 Tx slot)	33.5	30.5	29.5	22.5
EDGE (GMSK, 2 Tx slots)	32.0	29.0	28.5	21.0
EDGE (GMSK, 3 Tx slots)	30.5	28.0	26.5	19.0
EDGE (GMSK, 4 Tx slots)	29.0	26.0	25.5	17.5
EDGE (8PSK, 1 Tx slot)	27.5	25.0	26.0	19.0
EDGE (8PSK, 2 Tx slots)	26.5	23.5	24.5	17.0
EDGE (8PSK, 3 Tx slots)	25.0	21.5	23.0	15.0
EDGE (8PSK, 4 Tx slots)	23.5	20.0	21.5	13.5

Mode	Average power (dBm)			
	WCDMA Band V		WCDMA Band II	
	Full power mode	Reduced power mode	Full power mode	Reduced power mode
AMR 12.2Kbps	23.5	23.0	23.0	14.0
RMC 12.2Kbps	23.5	23.0	23.0	14.0
HSDPA Subtest-1	22.0	21.0	21.0	13.0
HSDPA Subtest-2	22.0	21.0	21.0	13.0
HSDPA Subtest-3	22.0	21.0	21.0	13.0
HSDPA Subtest-4	22.0	21.0	21.0	13.0
DC-HSDPA Subtest-1	22.0	21.0	21.0	13.0
DC-HSDPA Subtest-2	22.0	21.0	21.0	13.0
DC-HSDPA Subtest-3	22.0	21.0	21.0	13.0
DC-HSDPA Subtest-4	22.0	21.0	21.0	13.0
HSUPA Subtest-1	22.0	21.0	22.0	14.0
HSUPA Subtest-2	21.0	21.0	21.0	13.0
HSUPA Subtest-3	21.0	21.0	21.0	12.5
HSUPA Subtest-4	21.5	21.0	21.5	13.0
HSUPA Subtest-5	22.0	21.0	22.0	13.0

LTE Band 2					
Average Power (dBm)					
Modulation	BW (MHz)	RB size	MPR	Full power mode	Reduced power mode
QPSK	20	≤ 18	0	23.5	15.5
QPSK	20	> 18	0-1	22.5	14.5
16QAM	20	≤ 18	0-1	22.5	14.5
16QAM	20	> 18	0-2	21.5	13.5
QPSK	15	≤ 16	0	23.5	15.5
QPSK	15	> 16	0-1	22.5	14.5
16QAM	15	≤ 16	0-1	22.5	14.5
16QAM	15	> 16	0-2	21.5	13.5
QPSK	10	≤ 12	0	23.5	15.5
QPSK	10	> 12	0-1	22.5	14.5
16QAM	10	≤ 12	0-1	22.5	14.5
16QAM	10	> 12	0-2	21.5	13.5
QPSK	5	≤ 8	0	23.5	15.5
QPSK	5	> 8	0-1	22.5	14.5
16QAM	5	≤ 8	0-1	22.5	14.5
16QAM	5	> 8	0-2	21.5	13.5
QPSK	3	≤ 4	0	23.5	15.5
QPSK	3	> 4	0-1	22.5	14.5
16QAM	3	≤ 4	0-1	22.5	14.5
16QAM	3	> 4	0-2	21.5	13.5
QPSK	1.4	≤ 5	0	23.5	15.5
QPSK	1.4	> 5	0-1	22.5	14.5
16QAM	1.4	≤ 5	0-1	22.5	14.5
16QAM	1.4	> 5	0-2	21.5	13.5

LTE Band 4					
Average Power (dBm)					
Modulation	BW (MHz)	RB size	MPR	Full power mode	Reduced power mode
QPSK	20	≤ 18	0	24.0	15.5
QPSK	20	> 18	0-1	23.0	14.5
16QAM	20	≤ 18	0-1	23.0	14.5
16QAM	20	> 18	0-2	22.0	13.5
QPSK	15	≤ 16	0	24.0	15.5
QPSK	15	> 16	0-1	23.0	14.5
16QAM	15	≤ 16	0-1	23.0	14.5
16QAM	15	> 16	0-2	22.0	13.5
QPSK	10	≤ 12	0	24.0	15.5
QPSK	10	> 12	0-1	23.0	14.5
16QAM	10	≤ 12	0-1	23.0	14.5
16QAM	10	> 12	0-2	22.0	13.5
QPSK	5	≤ 8	0	24.0	15.5
QPSK	5	> 8	0-1	23.0	14.5
16QAM	5	≤ 8	0-1	23.0	14.5
16QAM	5	> 8	0-2	22.0	13.5
QPSK	3	≤ 4	0	24.0	15.5
QPSK	3	> 4	0-1	23.0	14.5
16QAM	3	≤ 4	0-1	23.0	14.5
16QAM	3	> 4	0-2	22.0	13.5
QPSK	1.4	≤ 5	0	24.0	15.5
QPSK	1.4	> 5	0-1	23.0	14.5
16QAM	1.4	≤ 5	0-1	23.0	14.5
16QAM	1.4	> 5	0-2	22.0	13.5

LTE Band 7					
Average Power (dBm)					
Modulation	BW (MHz)	RB size	MPR	Full power mode	Reduced power mode
QPSK	20	≤ 18	0	22.0	15.5
QPSK	20	> 18	0-1	21.0	14.5
16QAM	20	≤ 18	0-1	21.0	14.5
16QAM	20	> 18	0-2	20.0	13.5
QPSK	15	≤ 16	0	22.0	15.5
QPSK	15	> 16	0-1	21.0	14.5
16QAM	15	≤ 16	0-1	21.0	14.5
16QAM	15	> 16	0-2	20.0	13.5
QPSK	10	≤ 12	0	22.0	15.5
QPSK	10	> 12	0-1	21.0	14.5
16QAM	10	≤ 12	0-1	21.0	14.5
16QAM	10	> 12	0-2	20.0	13.5
QPSK	5	≤ 8	0	22.0	15.5
QPSK	5	> 8	0-1	21.0	14.5
16QAM	5	≤ 8	0-1	21.0	14.5
16QAM	5	> 8	0-2	20.0	13.5

Mode		Average Power (dBm)
2.4GHz	802.11b	16.0
	802.11g	14.0
	802.11n-HT20	14.0
Bluetooth v3.0 + EDR		3.5
Bluetooth v4.1 LE		-2.5

4.4 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r03	
FCC ID	2ACCJN004
Equipment Name	HSUPA/HSDPA/UMTS quadbands / GSM quadbands/LTE 6 -band mobile phone
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz
Channel Bandwidth	1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz for LTE Band 2/4 5MHz, 10MHz, 15MHz, 20MHz for LTE Band 7
uplink modulations used	QPSK, and 16QAM
LTE Voice / Data requirements	Data only
LTE MPR permanently built-in by design	Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
LTE Release Version	R9, Category 4
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.
Power reduction applied to satisfy SAR compliance	Yes, proximity sensor.

LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900

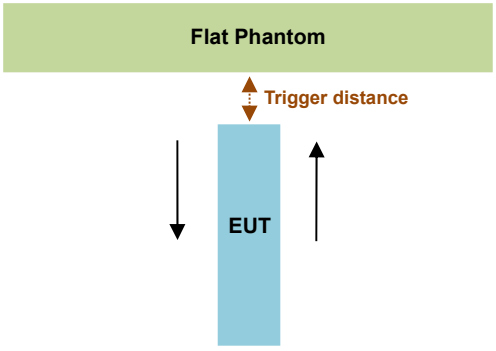
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745

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

5. Proximity Sensor Triggering Test

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

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



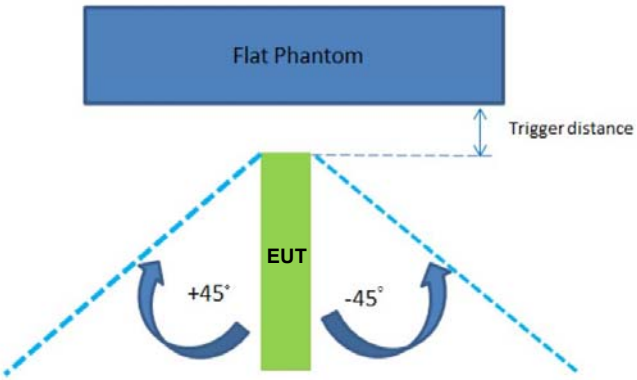
Proximity Sensor Trigger Distance (mm)			
Position	Bottom Face	Edge 1	Edge 2
Minimum	11	10	4

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

If a sensor is spatially offset from the antenna(s), it is necessary to verify sensor triggering for conditions where the antenna is next to the user but the sensor is laterally further away to ensure sensor coverage is sufficient for reducing the power to maintain compliance. For p-sensor coverage testing, the device is moved and “along the direction of maximum antenna and sensor offset”.

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

The influence of table tilt angles to proximity sensor triggering was determined by positioning each tablet edge that contains a transmitting antenna, perpendicular to the flat phantom, at 10 mm for Edge 1, 4 mm for Edge 2, separation. Rotating the tablet around the edge next to the phantom in ≤ 10° increments until the tablet is ± 45° from the vertical position at 0°, and the maximum output power remains in the reduced mode.



The Sensor Trigger Distance (mm)		
Position	Edge 1	Edge 2
Minimum	10	4

Proximity sensor power reduction

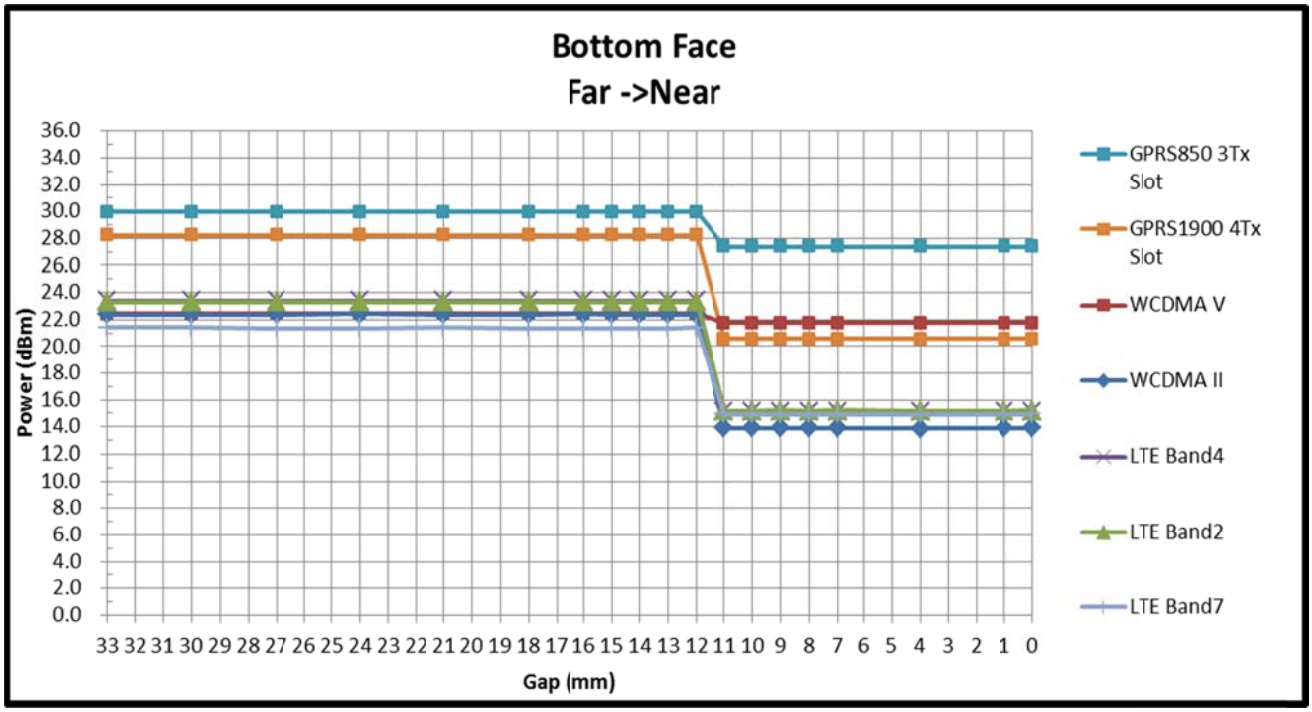
Exposure Position / wireless mode	Bottom Face(1)	Edge 1(1)	Edge 2(1)	Edge 3	Edge 4
GSM850 GSM (GMSK 1 Tx slot) - CS1	3.0 dB	3.0 dB	3.0 dB	0 dB	0 dB
GSM850 GPRS (GMSK 1 Tx slot) - CS1	3.0 dB	3.0 dB	3.0 dB	0 dB	0 dB
GSM850 GPRS (GMSK 2 Tx slot) - CS1	2.5 dB	2.5 dB	2.5 dB	0 dB	0 dB
GSM850 GPRS (GMSK 3 Tx slots) - CS1	2.5 dB	2.5 dB	2.5 dB	0 dB	0 dB
GSM850 GPRS (GMSK 4 Tx slots) - CS1	3.0 dB	3.0 dB	3.0 dB	0 dB	0 dB
GSM850 EDGE (8PSK 1 Tx slot) - MCS5	3.0 dB	3.0 dB	3.0 dB	0 dB	0 dB
GSM850 EDGE (8PSK 2 Tx slot) - MCS5	3.0 dB	3.0 dB	3.0 dB	0 dB	0 dB
GSM850 EDGE (8PSK 3 Tx slot) - MCS5	4.0 dB	4.0 dB	4.0 dB	0 dB	0 dB
GSM850 EDGE (8PSK 4 Tx slot) - MCS5	4.5 dB	4.5 dB	4.5 dB	0 dB	0 dB
GSM1900 GSM (GMSK 1 Tx slot) - CS1	7.0 dB	7.0 dB	7.0 dB	0 dB	0 dB
GSM1900 GPRS (GMSK 1 Tx slot) - CS1	7.0 dB	7.0 dB	7.0 dB	0 dB	0 dB
GSM1900 GPRS (GMSK 2 Tx slot) - CS1	7.5 dB	7.5 dB	7.5 dB	0 dB	0 dB
GSM1900 GPRS (GMSK 3 Tx slots) - CS1	8.0 dB	8.0 dB	8.0 dB	0 dB	0 dB
GSM1900 GPRS (GMSK 4 Tx slots) - CS1	8.5 dB	8.5 dB	8.5 dB	0 dB	0 dB
GSM1900 EDGE (8PSK 1 Tx slot) - MCS5	7.5 dB	7.5 dB	7.5 dB	0 dB	0 dB
GSM1900 EDGE (8PSK 2 Tx slot) - MCS5	8.0 dB	8.0 dB	8.0 dB	0 dB	0 dB
GSM1900 EDGE (8PSK 3 Tx slot) - MCS5	8.5 dB	8.5 dB	8.5 dB	0 dB	0 dB
GSM1900 EDGE (8PSK 4 Tx slot) - MCS5	8.5 dB	8.5 dB	8.5 dB	0 dB	0 dB
WCDMA Band V RMC 12.2kbps	0.5 dB	0.5 dB	0.5 dB	0 dB	0 dB
WCDMA Band II RMC 12.2kbps	9.0 dB	9.0 dB	9.0 dB	0 dB	0 dB
LTE Band 2	8.0 dB	8.0 dB	8.0 dB	0 dB	0 dB
LTE Band 4	8.5 dB	8.5 dB	8.5 dB	0 dB	0 dB
LTE Band 7	6.5 dB	6.5 dB	6.5 dB	0 dB	0 dB

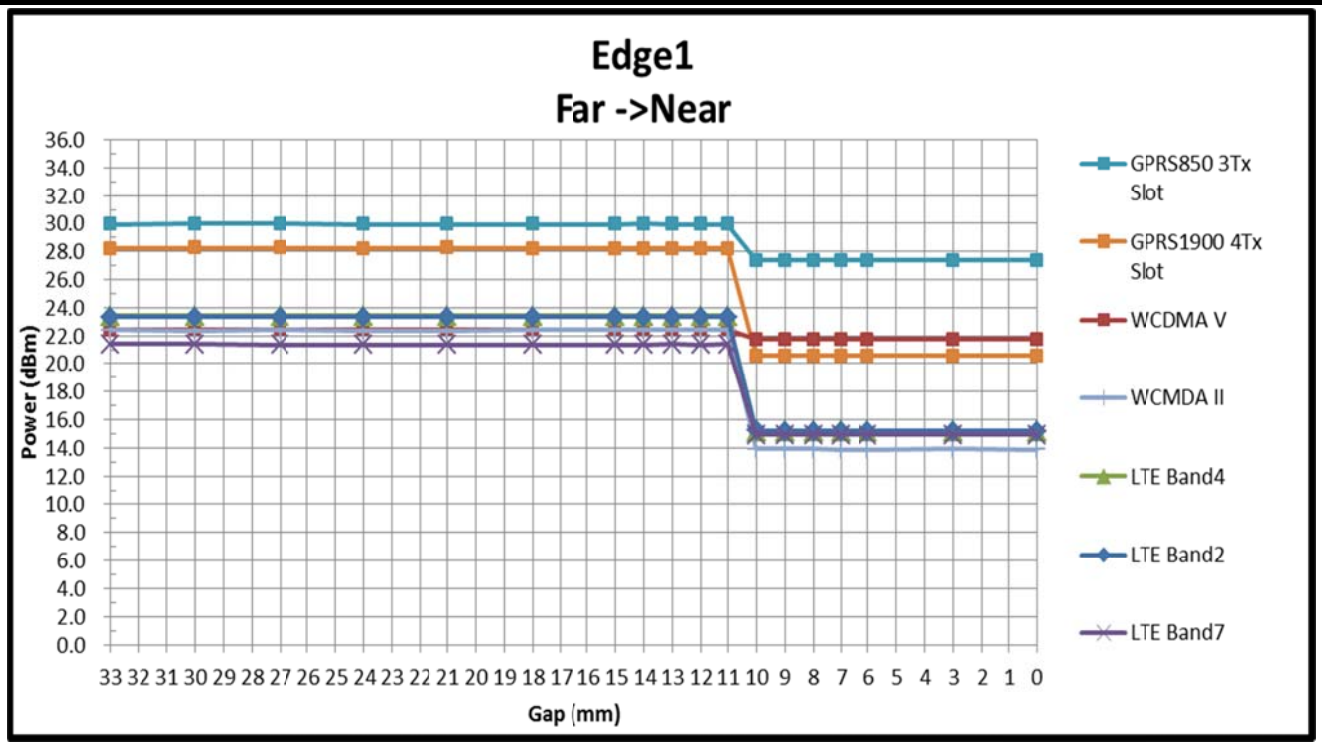
Remark:

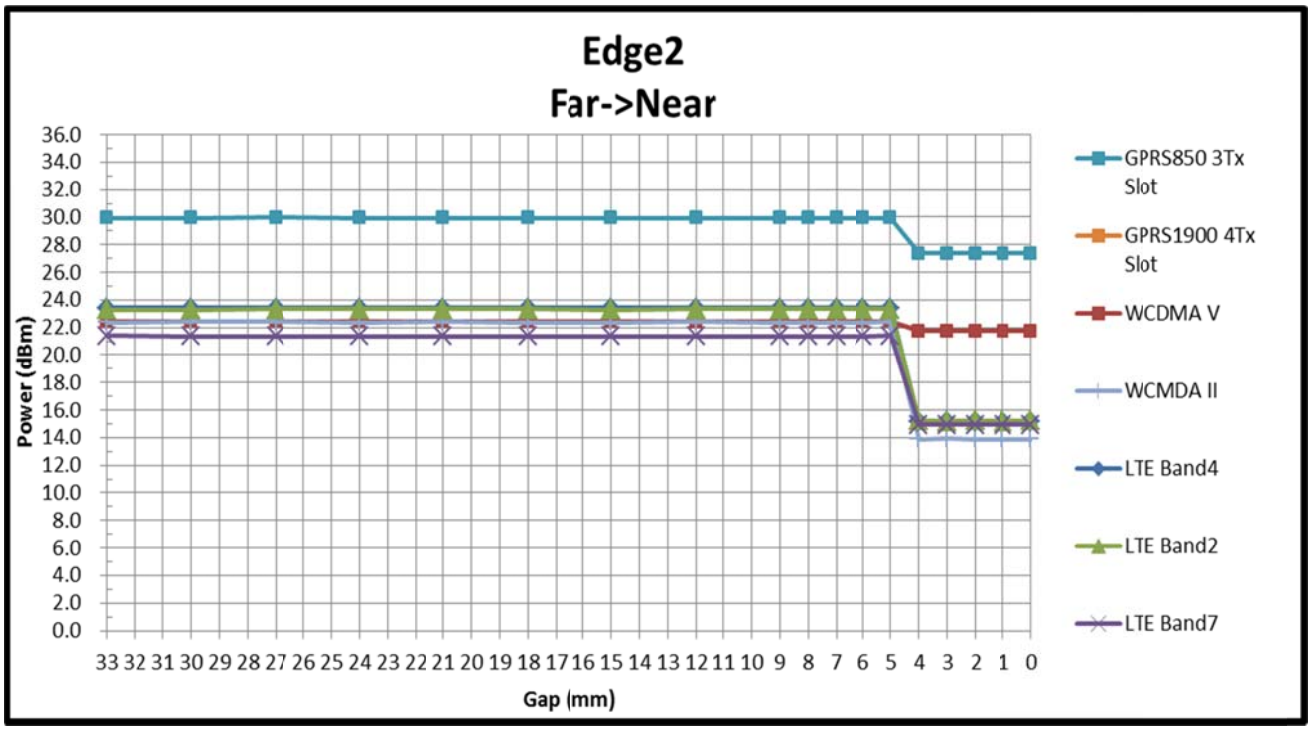
1. (1): Reduced maximum limit applied by activation of proximity sensor.
2. Power reduction is not applicable for WLAN and Bluetooth.
3. Tests were performed in accordance with KDB 616217 D04 section 6.1, 6.2, 6.3, 6.4 and 6.5 and compliant results are shown and described in exhibit “P-Sensor operational 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: 10 mm
   - Edge1: 9 mm
   - Edge2: 1 mm

Power Measurement during Sensor Trigger distance testing

Band/Mode	Ch #	Measured power reduction (dBm)		Reduction Levels (dB)
		w/o power back-off	w/ power back-off	
GSM850 GPRS (GMSK 3 Tx slots)	128	29.89	27.20	2.69
GSM1900 GPRS (GMSK 4 Tx slots)	661	24.83	16.74	8.09
WCDMA Band V RMC 12.2kbps	4182	21.91	21.18	0.73
WCDMA Band II RMC 12.2kbps	9400	22.38	13.89	8.49
LTE Band 2 (BW20,RB Size 1,RB Offset 49)	18900	22.92	14.04	8.88
LTE Band 4 (BW20,RB Size 1,RB Offset 0)	20175	23.41	15.13	8.28
LTE Band 7 (BW20,RB Size 1,RB Offset 0)	21100	21.36	14.93	6.43




Edge1
Far ->Near
Power (dBm)
36.0
34.0
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
Gap (mm)
GPRS850 3Tx Slot
GPRS1900 4Tx Slot
WCDMA V
WCMDA II
LTE Band4
LTE Band2
LTE Band7


Edge2
Far->Near
Power (dBm)
36.0
34.0
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
Gap (mm)
GPRS850 3Tx Slot
GPRS1900 4Tx Slot
WCDMA V
WCMDA II
LTE Band4
LTE Band2
LTE Band7

6. RF Exposure Limits

6.1 Uncontrolled Environment

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

6.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

7. Specific Absorption Rate (SAR)

7.1 Introduction

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

7.2 SAR Definition

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

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

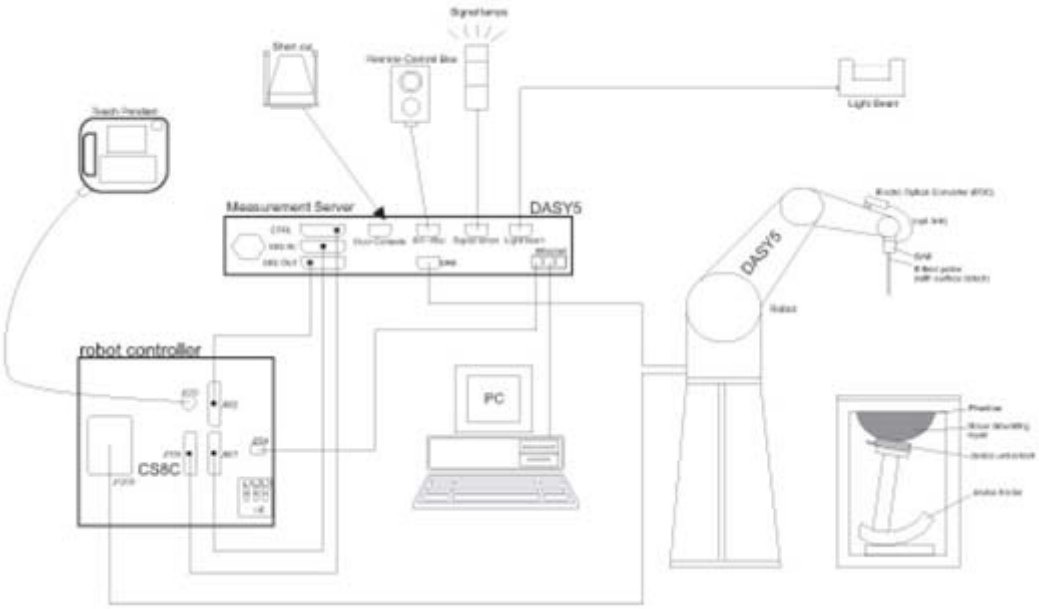
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

8. System Description and Setup

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



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

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	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

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

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

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	835MHz System Validation Kit	D835V2	4d091	Nov. 21, 2014	Nov. 20, 2015
SPEAG	1750MHz System Validation Kit	D1750V2	1069	Nov. 21, 2014	Nov. 20, 2015
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	Nov. 21, 2014	Nov. 20, 2015
SPEAG	2450MHz System Validation Kit	D2450V2	840	Nov. 19, 2014	Nov. 18, 2015
SPEAG	2600MHz System Validation Kit	D2600V2	1061	Nov. 19, 2014	Nov. 18, 2015
SPEAG	Data Acquisition Electronics	DAE4	1210	May 21, 2015	May 20, 2016
SPEAG	Data Acquisition Electronics	DAE4	905	Jul 14, 2014	Jul 13, 2015
SPEAG	Dosimetric E-Field Probe	EX3DV4	3857	May 28, 2015	May 27, 2016
SPEAG	Dosimetric E-Field Probe	EX3DV4	7350	Jan 08, 2015	Jan 07, 2016
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1477	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1479	NCR	NCR
SPEAG	ELI4 Phantom	QD OVA 001 BB	TP-1079	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201432831	Jan. 21, 2015	Jan. 20, 2016
Agilent	Wireless Communication Test Set	E5515C	MY52102706	May 04, 2015	May 03, 2016
Agilent	Wireless Communication Test Set	E5515E	MY53211040	Aug. 12, 2014	Aug. 11, 2015
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	May 04, 2015	May 03, 2016
Agilent	Dielectric Probe Kit	85070E	MY44300475	NCR	NCR
R&S	Signal Generator	SMBV100A	258305	Jan. 23, 2015	Jan. 22, 2016
mini-circuits	Amplifier	ZVE-3W-83+	162601250	NCR	NCR
Anritsu	Power Senor	MA2411B	0917070	Jan. 23, 2015	Jan. 22, 2016
Anritsu	Power Meter	ML2495A	1005002	Jan. 23, 2015	Jan. 22, 2016
R&S	CBT BLUETOOTH TESTER	CBT	100783	Aug. 11, 2014	Aug. 10, 2015
R&S	Spectrum Analyzer	FSP40	100319	Oct. 28, 2014	Oct. 27, 2015
Agilent	Dual Directional Coupler	778D	50422	Note1	
Woken	Attenuator 1	WK0602-XX	N/A	Note1	
PE	Attenuator 2	PE7005-10	N/A	Note1	
PE	Attenuator 3	PE7005- 3	N/A	Note1	
AR	Power Amplifier	5S1G4M2	0328767	Note1	
Mini-Circuits	Power Amplifier	ZVE-3W	162601250	Note1	
Mini-Circuits	Power Amplifier	ZHL-42W+	13440021344	Note1	

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 Body								
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1750	70.2	0	0	0.4	0	29.4	1.49	53.4
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

<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
835	Head	22.6	0.893	41.38	0.9	41.5	-0.78	-0.29	±5	2015/7/3
1750	Head	22.9	1.383	40.015	1.37	40.1	0.95	-0.21	±5	2015/7/20
1900	Head	22.9	1.424	39.08	1.4	40	1.71	-2.30	±5	2015/7/19
2450	Head	22.5	1.817	39.195	1.8	39.2	0.94	-0.01	±5	2015/7/3
2600	Head	22.7	1.974	38.204	1.96	39	0.71	-2.04	±5	2015/7/24
835	Body	22.9	0.982	54.866	0.97	55.2	1.24	-0.61	±5	2015/7/15
1750	Body	22.7	1.517	55.044	1.49	53.4	1.81	3.08	±5	2015/7/21
1900	Body	22.7	1.538	52.792	1.52	53.3	1.18	-0.95	±5	2015/7/17
1900	Body	22.6	1.55	53.584	1.52	53.3	1.97	0.53	±5	2015/7/22
2450	Body	22.6	1.943	50.964	1.95	52.7	-0.36	-3.29	±5	2015/6/26
2450	Body	22.6	1.943	50.964	1.95	52.7	-0.36	-3.29	±5	2015/6/26
2600	Body	22.9	2.201	52.823	2.16	52.5	1.90	0.62	±5	2015/7/23
1900	Body	22.7	1.53	53.582	1.52	53.3	0.66	0.53	±5	2015/7/29
2450	Body	22.8	1.94	50.928	1.95	52.7	-0.51	-3.36	±5	2015/7/30
2600	Body	22.5	2.209	51.123	2.16	52.5	2.27	-2.62	±5	2015/7/30

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 SAR (W/kg)	Targeted SAR (W/kg)	Normalized SAR (W/kg)	Deviation (%)
2015/7/3	835	Head	250	4d091	3857	1210	2.38	9.11	9.52	4.50
2015/7/20	1750	Head	250	1069	3857	1210	9.78	37.1	39.12	5.44
2015/7/19	1900	Head	250	5d118	3857	1210	10.6	40.1	42.4	5.74
2015/7/3	2450	Head	250	840	3857	1210	13.2	52.3	52.8	0.96
2015/7/24	2600	Head	250	1061	3857	1210	14.4	56.9	57.6	1.23
2015/7/15	835	Body	250	4d091	3857	1210	2.27	9.6	9.08	-5.42
2015/7/21	1750	Body	250	1069	3857	1210	9.99	38.1	39.96	4.88
2015/7/17	1900	Body	250	5d118	3857	1210	10.4	40	41.6	4.00
2015/7/22	1900	Body	250	5d118	3857	1210	10.5	40	42	5.00
2015/6/26	2450	Body	250	840	3857	1210	11.9	51	47.6	-6.67
2015/6/26	2450	Body	250	840	7350	905	12.3	51	49.2	-3.53
2015/7/23	2600	Body	250	1061	3857	1210	14.1	54.9	56.4	2.73
2015/7/29	1900	Body	250	5d118	3857	1210	10.5	40	42	5.00
2015/7/30	2450	Body	250	840	3857	1210	12	51	48	-5.88
2015/7/30	2600	Body	250	1061	3857	1210	14.2	54.9	56.8	3.46

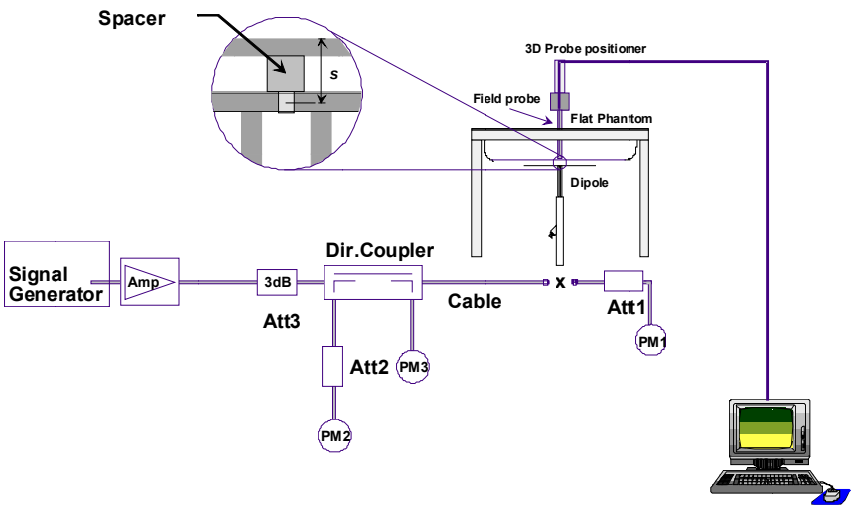


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

12. RF Exposure Positions

12.1 Ear and handset reference point

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

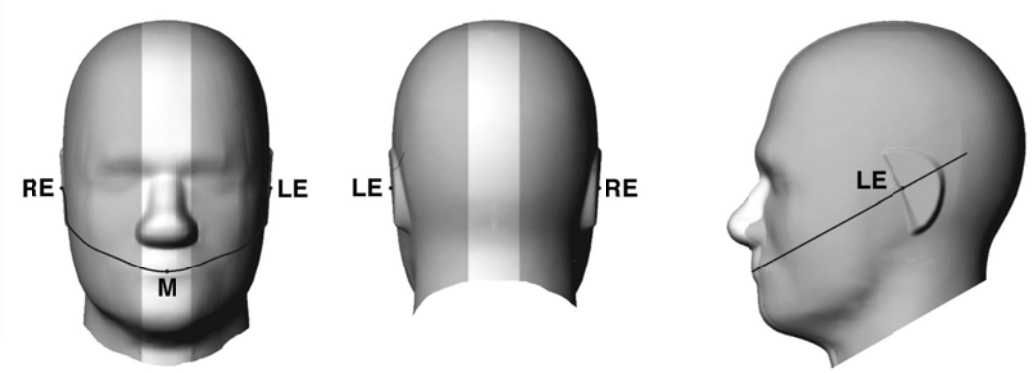


Fig 9.1.1 Front, back, and side views of SAM twin phantom

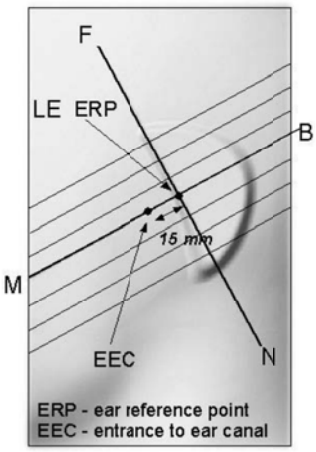


Fig 9.1.2 Close-up side view of phantom showing the ear region.

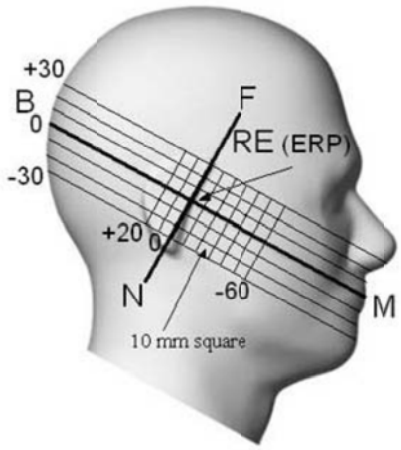


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

12.2 Definition of the cheek position

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

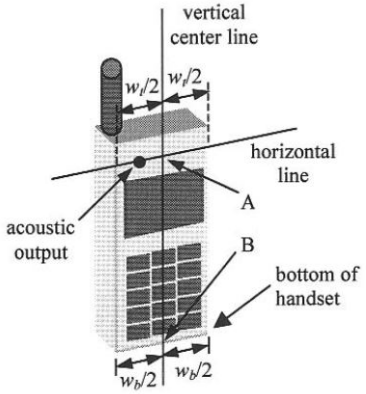


Fig 9.2.1 Handset vertical and horizontal reference lines—"fixed case

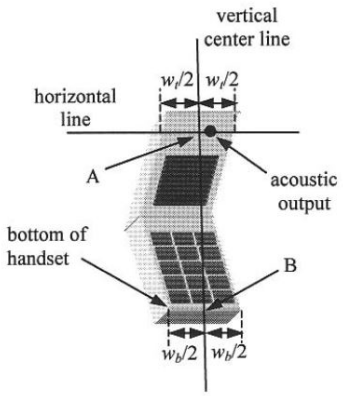


Fig 9.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

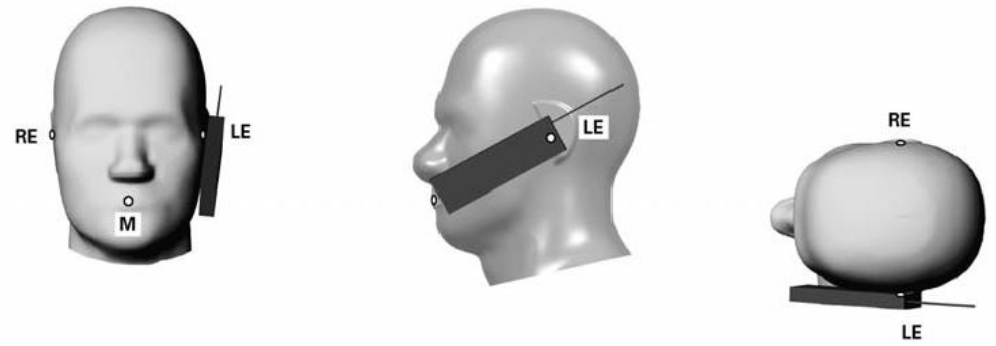


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

12.3 Definition of the tilt position

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

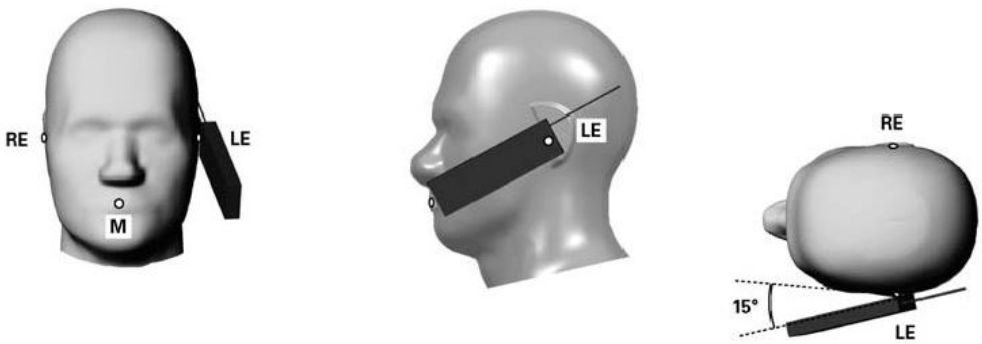


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

12.4 SAR Testing for Body

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.

This EUT was tested in five different positions. They are bottom-face of tablet PC, Edge1, Edge2, Edge3 and Edge4. EUT has proximity sensor function, it would be on bottom-face, Edge1, and Edge2 active, the sensor trigger distance is 11mm for bottom-face, 10mm for Edge1, and 4mm for Edge2, EUT transmitting reduced power was performed. Additional the surface of EUT is touching with phantom 0 cm for Edge3 and Edge4 with full power.

13. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

1. Per KDB 447498 D01v05r02, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03, for GSM and GPRS and EDGE modes are determined by the frame-average power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.
3. For head SAR ,Considering the possibility of e.g. 3rd party VoIP operation , Head SAR test reduction head exposure position the EUT is operating with power back-off, therefore, the GPRS (3Tx slots) and Voice for GSM850, and GPRS (2Tx slots) and Voice for GSM1900 was selected to be tested.
4. For body SAR testing was following KDB 941225 D01v03, the GPRS (3Tx slots) mode was selected when EUT operating without power back-off for GSM850, and GPRS (3Tx slots) mode was selected when EUT operating with power back-off for GSM850, the GPRS (4Tx slots) mode was selected when EUT operating without power back-off for GSM1900, and GPRS (2Tx slots) mode was selected when EUT operating with power back-off for GSM1900, according to the highest frame-average power.

Maximum Average RF Power (Proximity Sensor Inactive)

Band GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	128	189	251		128	189	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GSM (GMSK, 1 Tx slot) – CS1	**33.10**	33.09	32.68	33.5	24.10	24.09	23.68	24.50
GPRS (GMSK, 1 Tx slot) – CS1	33.08	33.07	32.66	33.5	24.08	24.07	23.66	24.50
GPRS (GMSK, 2 Tx slots) – CS1	31.55	31.46	31.42	32.0	25.55	25.46	25.42	26.00
GPRS (GMSK, 3 Tx slots) – CS1	29.93	29.89	29.75	30.5	**25.67**	25.63	25.49	26.24
GPRS (GMSK, 4 Tx slots) – CS1	28.78	28.69	28.52	29.0	25.78	25.69	25.52	26.00
EDGE (GMSK, 1 Tx slot) –MCS1	33.05	33.03	32.65	33.5	24.05	24.03	23.65	24.50
EDGE (GMSK, 2 Tx slots) –MCS1	31.5	31.45	31.41	32.0	25.50	25.45	25.41	26.00
EDGE (GMSK, 3 Tx slots) –MCS1	29.91	29.88	29.71	30.5	25.65	25.62	25.45	26.24
EDGE (GMSK, 4 Tx slots) –MCS1	28.75	28.65	28.5	29.0	25.75	25.65	25.5	26.00
EDGE (8PSK, 1 Tx slot) – MCS5	27.08	26.99	26.80	27.5	18.08	17.99	17.80	18.5
EDGE (8PSK, 2 Tx slots) – MCS5	26.24	26.11	25.99	26.5	20.24	20.11	19.99	20.5
EDGE (8PSK, 3 Tx slots) – MCS5	24.66	24.54	24.42	25.0	20.40	20.28	20.16	20.74
EDGE (8PSK, 4 Tx slots) – MCS5	23.04	22.94	22.78	23.5	20.04	19.94	19.78	20.50

Band GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM (GMSK, 1 Tx slot) – CS1	28.94	**29.02**	29.01	29.5	19.94	20.02	20.01	20.50
GPRS (GMSK, 1 Tx slot) – CS1	28.92	28.99	28.99	29.5	19.92	19.99	19.99	20.50
GPRS (GMSK, 2 Tx slots) – CS1	27.91	28.18	28.21	28.5	21.91	22.18	22.21	22.50
GPRS (GMSK, 3 Tx slots) – CS1	25.98	26.07	26.15	26.5	21.72	21.81	21.89	22.24
GPRS (GMSK, 4 Tx slots) – CS1	24.59	24.83	25.00	25.5	21.59	21.83	**22.00**	22.50
EDGE (GMSK, 1 Tx slot) –MCS1	28.91	28.95	28.96	29.5	19.91	19.95	19.96	20.50
EDGE (GMSK, 2 Tx slots) –MCS1	27.9	28.15	28.20	28.5	21.90	22.15	22.20	22.50
EDGE (GMSK, 3 Tx slots) –MCS1	25.96	26.04	26.15	26.5	21.70	21.78	21.89	22.24
EDGE (GMSK, 4 Tx slots) –MCS1	24.58	24.8	24.96	25.5	21.58	21.8	21.96	22.50
EDGE (8PSK, 1 Tx slot) – MCS5	25.46	25.55	25.58	26.0	16.46	16.55	16.58	17.00
EDGE (8PSK, 2 Tx slots) – MCS5	24.28	24.33	24.44	24.5	18.28	18.33	18.44	18.50
EDGE (8PSK, 3 Tx slots) – MCS5	22.63	22.68	22.81	23.0	18.37	18.42	18.55	18.74
EDGE (8PSK, 4 Tx slots) – MCS5	21.01	21.10	21.23	21.5	18.01	18.10	18.23	18.5

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.
The calculated method are shown as below:
Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB
Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB
Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB
Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

Reduced Average RF Power (Proximity Sensor active)

Band GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	128	189	251		128	189	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GSM (GMSK, 1 Tx slot) – CS1	**30.20**	30.17	29.91	30.5	21.20	21.17	20.91	21.50
GPRS (GMSK, 1 Tx slot) – CS1	30.18	30.16	29.90	30.5	21.18	21.16	20.90	21.50
GPRS (GMSK, 2 Tx slots) – CS1	28.99	28.73	28.70	29.0	22.99	22.73	22.70	23.00
GPRS (GMSK, 3 Tx slots) – CS1	27.36	27.20	27.10	28.0	**23.10**	22.94	22.84	23.74
GPRS (GMSK, 4 Tx slots) – CS1	25.64	25.60	25.52	26.0	22.64	22.60	22.52	23.00
EDGE (GMSK, 1 Tx slot) –MCS1	30.16	30.15	29.85	30.5	21.16	21.15	20.85	21.50
EDGE (GMSK, 2 Tx slots) –MCS1	28.96	28.71	28.68	29.0	22.96	22.71	22.68	23.00
EDGE (GMSK, 3 Tx slots) –MCS1	27.35	27.18	27.08	28.0	23.09	22.92	22.82	23.74
EDGE (GMSK, 4 Tx slots) –MCS1	25.63	25.58	25.51	26.0	22.63	22.58	22.51	23.00
EDGE (8PSK, 1 Tx slot) – MCS5	24.96	24.85	24.69	25.0	15.96	15.85	15.69	16.0
EDGE (8PSK, 2 Tx slots) – MCS5	23.33	23.19	23.02	23.5	17.33	17.19	17.02	17.5
EDGE (8PSK, 3 Tx slots) – MCS5	20.52	20.43	20.30	21.5	16.26	16.17	16.04	17.24
EDGE (8PSK, 4 Tx slots) – MCS5	19.09	18.93	18.88	20.0	16.09	15.93	15.88	17.00

Band GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM (GMSK, 1 Tx slot) – CS1	21.82	22.04	**22.11**	22.5	12.82	13.04	13.11	13.50
GPRS (GMSK, 1 Tx slot) – CS1	21.80	22.03	22.10	22.5	12.80	13.03	13.10	13.50
GPRS (GMSK, 2 Tx slots) – CS1	20.30	20.43	20.55	21.0	14.30	14.43	**14.55**	15.00
GPRS (GMSK, 3 Tx slots) – CS1	18.15	18.24	18.35	19.0	13.89	13.98	14.09	14.74
GPRS (GMSK, 4 Tx slots) – CS1	16.59	16.74	16.78	17.5	13.59	13.74	13.78	14.50
EDGE (GMSK, 1 Tx slot) –MCS1	21.79	22.00	22.06	22.5	12.79	13.00	13.06	13.50
EDGE (GMSK, 2 Tx slots) –MCS1	20.30	20.41	20.54	21.0	14.3	14.41	14.54	15.00
EDGE (GMSK, 3 Tx slots) –MCS1	18.11	18.23	18.31	19.0	13.85	13.97	14.05	14.74
EDGE (GMSK, 4 Tx slots) –MCS1	16.58	16.71	16.76	17.5	13.58	13.71	13.76	14.50
EDGE (8PSK, 1 Tx slot) – MCS5	17.79	17.85	17.96	19.0	8.79	8.85	8.96	10.00
EDGE (8PSK, 2 Tx slots) – MCS5	16.22	16.25	16.44	17.0	10.22	10.25	10.44	11.00
EDGE (8PSK, 3 Tx slots) – MCS5	14.04	14.11	14.26	15.0	9.78	9.85	10.00	10.74
EDGE (8PSK, 4 Tx slots) – MCS5	12.96	12.99	13.00	13.5	9.96	9.99	10.00	10.50

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.
The calculated method are shown as below:
Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB
Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB
Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB
Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

<WCDMA Conducted Power>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

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

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

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

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

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

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

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

Setup Configuration

HSUPA Setup Configuration:

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

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

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

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

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

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

C.8.1.12 Fixed Reference Channel Definition H-Set 12

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

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

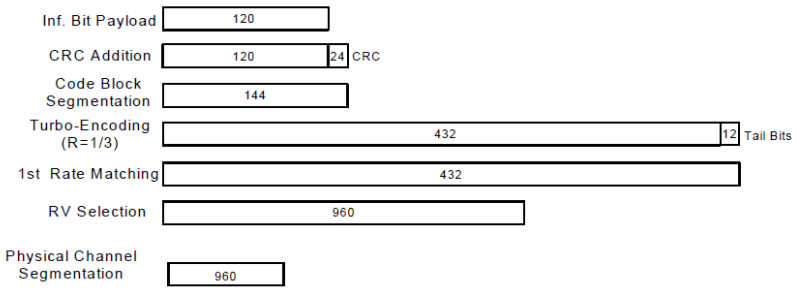


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

General Note:

1. Per KDB 941225 D01v03, SAR for Head / Hotspot / Body-worn exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03, RMC 12.2kbps setting is used to evaluate SAR. If the maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

Maximum Average RF Power (Proximity Sensor Inactive)

Band			WCDMA Band V			WCDMA Band II		
TX Channel			4132	4182	4233	9262	9400	9538
Rx Channel			4357	4407	4458	9662	9800	9938
Frequency (MHz)			826.4	836.4	846.6	1852.4	1880	1907.6
MPR (dB)	3GPP Rel 99	AMR 12.2Kbps	21.80	21.90	22.41	22.07	22.36	22.26
	3GPP Rel 99	RMC 12.2Kbps	21.82	21.91	**22.43**	22.09	**22.38**	22.28
0	3GPP Rel 6	HSDPA Subtest-1	21.22	21.11	21.62	20.88	20.60	20.64
0	3GPP Rel 6	HSDPA Subtest-2	21.23	21.11	21.63	20.79	20.59	20.63
0.5	3GPP Rel 6	HSDPA Subtest-3	21.20	21.12	21.61	20.78	20.61	20.63
0.5	3GPP Rel 6	HSDPA Subtest-4	21.21	21.10	21.58	20.82	20.57	20.62
0	3GPP Rel 8	DC-HSDPA Subtest-1	21.23	21.11	21.62	20.83	20.60	20.65
0	3GPP Rel 8	DC-HSDPA Subtest-2	21.25	21.13	21.60	20.85	20.61	20.66
0.5	3GPP Rel 8	DC-HSDPA Subtest-3	21.28	21.15	21.63	20.86	20.64	20.61
0.5	3GPP Rel 8	DC-HSDPA Subtest-4	21.21	21.17	21.60	20.88	20.62	20.64
0	3GPP Rel 6	HSUPA Subtest-1	20.70	21.04	21.42	20.89	21.34	21.62
2	3GPP Rel 6	HSUPA Subtest-2	20.25	20.48	20.89	20.40	20.81	20.48
1	3GPP Rel 6	HSUPA Subtest-3	19.96	20.15	20.55	20.12	20.51	20.19
2	3GPP Rel 6	HSUPA Subtest-4	20.46	20.69	21.01	20.68	21.04	20.72
0	3GPP Rel 6	HSUPA Subtest-5	21.22	21.30	21.12	21.48	21.15	20.97

Reduced Average RF Power (Proximity Sensor active)

Band			WCDMA Band V			WCDMA Band II		
TX Channel			4132	4182	4233	9262	9400	9538
Rx Channel			4357	4407	4458	9662	9800	9938
Frequency (MHz)			826.4	836.4	846.6	1852.4	1880	1907.6
MPR (dB)	3GPP Rel 99	AMR 12.2Kbps	21.11	21.16	21.70	13.38	13.87	13.46
	3GPP Rel 99	RMC 12.2Kbps	21.13	21.18	**21.73**	13.40	**13.89**	13.49
0	3GPP Rel 6	HSDPA Subtest-1	20.02	19.80	20.31	12.55	11.98	12.61
0	3GPP Rel 6	HSDPA Subtest-2	20.01	19.81	20.31	12.58	11.96	12.61
0.5	3GPP Rel 6	HSDPA Subtest-3	20.03	19.82	20.30	12.56	11.97	12.65
0.5	3GPP Rel 6	HSDPA Subtest-4	20.00	19.80	20.29	12.57	11.98	12.63
0	3GPP Rel 8	DC-HSDPA Subtest-1	20.02	19.80	20.31	12.58	12.02	12.68
0	3GPP Rel 8	DC-HSDPA Subtest-2	20.01	19.81	20.31	12.56	12.00	12.61
0.5	3GPP Rel 8	DC-HSDPA Subtest-3	20.03	19.82	20.30	12.57	12.03	12.60
0.5	3GPP Rel 8	DC-HSDPA Subtest-4	20.00	19.80	20.29	12.59	12.02	12.63
0	3GPP Rel 6	HSUPA Subtest-1	20.18	20.46	20.87	12.19	12.82	13.18
2	3GPP Rel 6	HSUPA Subtest-2	19.78	19.96	20.24	11.87	12.28	11.91
1	3GPP Rel 6	HSUPA Subtest-3	19.36	19.60	20.01	11.68	12.05	11.61
2	3GPP Rel 6	HSUPA Subtest-4	19.92	20.17	20.45	12.10	12.46	12.25
0	3GPP Rel 6	HSUPA Subtest-5	20.71	20.78	20.60	12.96	12.48	12.64

<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 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	23.16	22.86	22.89	23.5	0
20	QPSK	1	49	23.31	22.92	23.21		
20	QPSK	1	99	22.76	22.78	22.89		
20	QPSK	50	0	21.97	21.76	21.97	22.5	0-1
20	QPSK	50	24	22.09	21.96	21.98		
20	QPSK	50	49	21.99	21.74	21.90		
20	QPSK	100	0	22.01	21.80	21.92		
20	16QAM	1	0	21.93	22.04	22.18	22.5	0-1
20	16QAM	1	49	22.28	22.23	22.19		
20	16QAM	1	99	22.08	21.94	22.12		
20	16QAM	50	0	21.00	20.86	21.05	21.5	0-2
20	16QAM	50	24	20.88	20.73	20.88		
20	16QAM	50	49	20.91	20.68	20.81		
20	16QAM	100	0	20.83	20.72	21.02		
Channel				18675	18900	19125	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.88	22.91	22.88	23.5	0
15	QPSK	1	37	23.27	22.95	23.04		
15	QPSK	1	74	22.94	22.83	22.85		
15	QPSK	36	0	22.10	21.91	22.05	22.5	0-1
15	QPSK	36	18	22.02	21.80	21.95		
15	QPSK	36	37	22.07	21.71	21.97		
15	QPSK	75	0	22.00	21.86	21.91		
15	16QAM	1	0	22.03	22.21	21.99	22.5	0-1
15	16QAM	1	37	22.33	22.25	22.07		
15	16QAM	1	74	22.32	22.02	21.80		
15	16QAM	36	0	21.03	20.86	21.08	21.5	0-2
15	16QAM	36	18	21.04	20.72	20.92		
15	16QAM	36	37	20.92	20.74	20.93		
15	16QAM	75	0	20.97	20.77	20.95		
Channel				18650	18900	19150	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	23.02	22.84	22.98	23.5	0
10	QPSK	1	24	23.27	23.12	22.93		
10	QPSK	1	49	22.93	22.79	23.07		
10	QPSK	25	0	22.01	21.85	22.07	22.5	0-1
10	QPSK	25	12	22.01	21.87	21.97		
10	QPSK	25	24	22.00	21.81	22.02		
10	QPSK	50	0	22.01	21.88	21.97		
10	16QAM	1	0	22.25	22.06	22.27	22.5	0-1
10	16QAM	1	24	22.49	22.11	22.39		
10	16QAM	1	49	22.19	22.00	21.84		
10	16QAM	25	0	20.93	20.89	20.98	21.5	0-2
10	16QAM	25	12	21.12	20.82	21.04		
10	16QAM	25	24	20.94	20.85	20.96		
10	16QAM	50	0	20.95	20.79	20.80		

Channel				18625	18900	19175	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.91	22.78	22.96	23.5	0
5	QPSK	1	12	23.18	23.01	23.22		
5	QPSK	1	24	22.89	22.76	22.98		
5	QPSK	12	0	21.87	21.81	22.05	22.5	0-1
5	QPSK	12	6	21.95	21.73	21.93		
5	QPSK	12	11	21.99	21.71	21.96		
5	QPSK	25	0	22.01	21.76	21.97		
5	16QAM	1	0	22.24	22.03	22.24	22.5	0-1
5	16QAM	1	12	22.35	22.11	22.28		
5	16QAM	1	24	22.27	21.95	22.19		
5	16QAM	12	0	20.90	20.76	21.03	21.5	0-2
5	16QAM	12	6	20.83	20.75	20.92		
5	16QAM	12	11	20.93	20.76	20.90		
5	16QAM	25	0	20.93	20.80	20.85		
Channel				18615	18900	19185	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	23.01	22.86	23.01	23.5	0
3	QPSK	1	7	23.19	22.91	23.26		
3	QPSK	1	14	23.13	22.90	22.95		
3	QPSK	8	0	21.90	21.85	22.14	22.5	0-1
3	QPSK	8	4	22.00	21.84	22.05		
3	QPSK	8	7	22.07	21.82	22.10		
3	QPSK	15	0	21.99	21.84	22.06		
3	16QAM	1	0	22.37	22.07	22.34	22.5	0-1
3	16QAM	1	7	22.38	22.29	22.37		
3	16QAM	1	14	22.23	22.23	22.34		
3	16QAM	8	0	20.87	21.01	21.22	21.5	0-2
3	16QAM	8	4	20.89	20.96	21.04		
3	16QAM	8	7	21.15	20.98	20.90		
3	16QAM	15	0	20.93	20.91	20.96		
Channel				18607	18900	19193	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.78	22.73	22.93	23.5	0
1.4	QPSK	1	2	22.94	22.87	23.08		
1.4	QPSK	1	5	22.86	22.68	22.88		
1.4	QPSK	3	0	22.86	22.77	23.06		
1.4	QPSK	3	1	22.92	22.74	22.91		
1.4	QPSK	3	2	22.94	22.74	23.05		
1.4	QPSK	6	0	22.08	21.87	22.08	22.5	0-1
1.4	16QAM	1	0	22.28	22.07	22.20	22.5	0-1
1.4	16QAM	1	2	22.37	22.12	22.41		
1.4	16QAM	1	5	22.34	22.09	22.31		
1.4	16QAM	3	0	22.22	21.89	22.39		
1.4	16QAM	3	1	22.00	22.08	22.17		
1.4	16QAM	3	2	22.30	22.05	22.36		
1.4	16QAM	6	0	20.80	20.68	20.86	21.5	0-2

<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	23.29	23.41	23.22	24.0	0
20	QPSK	1	49	23.21	23.36	23.21		
20	QPSK	1	99	23.05	22.82	22.55		
20	QPSK	50	0	22.29	22.36	22.21	23.0	0-1
20	QPSK	50	24	22.21	22.33	22.10		
20	QPSK	50	49	22.27	22.31	22.08		
20	QPSK	100	0	22.27	22.29	22.05		
20	16QAM	1	0	22.39	22.65	22.45	23.0	0-1
20	16QAM	1	49	22.36	22.32	22.22		
20	16QAM	1	99	22.36	22.20	22.11		
20	16QAM	50	0	21.32	21.18	21.23	22.0	0-2
20	16QAM	50	24	21.06	21.16	21.01		
20	16QAM	50	49	21.07	21.09	20.90		
20	16QAM	100	0	21.16	21.16	21.05		
Channel				20025	20175	20325	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	23.31	23.20	23.05	24.0	0
15	QPSK	1	37	23.26	23.04	22.92		
15	QPSK	1	74	22.92	22.99	22.65		
15	QPSK	36	0	22.25	22.12	22.16	23.0	0-1
15	QPSK	36	18	22.18	22.12	21.99		
15	QPSK	36	37	22.15	22.02	21.85		
15	QPSK	75	0	22.16	22.12	21.95		
15	16QAM	1	0	22.79	22.46	22.51	23.0	0-1
15	16QAM	1	37	22.36	22.37	22.21		
15	16QAM	1	74	22.30	22.32	22.19		
15	16QAM	36	0	21.28	21.12	21.15	22.0	0-2
15	16QAM	36	18	21.14	21.12	20.96		
15	16QAM	36	37	21.12	21.03	20.89		
15	16QAM	75	0	21.10	21.01	20.88		
Channel				20000	20175	20350	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	23.40	23.28	23.24	24.0	0
10	QPSK	1	24	23.36	23.11	23.15		
10	QPSK	1	49	23.07	22.82	22.79		
10	QPSK	25	0	22.26	22.17	22.07	23.0	0-1
10	QPSK	25	12	22.23	22.19	22.08		
10	QPSK	25	24	22.24	22.08	22.06		
10	QPSK	50	0	22.20	22.16	22.11		
10	16QAM	1	0	22.55	22.46	22.32	23.0	0-1
10	16QAM	1	24	22.52	22.38	22.30		
10	16QAM	1	49	22.47	22.23	22.20		
10	16QAM	25	0	21.32	21.18	21.17	22.0	0-2
10	16QAM	25	12	21.26	21.29	21.09		
10	16QAM	25	24	21.18	21.10	20.99		
10	16QAM	50	0	21.13	21.16	20.89		

Channel				19975	20175	20375	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	23.18	23.12	22.97	24.0	0
5	QPSK	1	12	23.16	23.10	22.89		
5	QPSK	1	24	22.91	22.93	22.65		
5	QPSK	12	0	22.07	21.95	21.90	23.0	0-1
5	QPSK	12	6	22.12	22.01	21.88		
5	QPSK	12	11	22.13	22.04	21.81		
5	QPSK	25	0	22.06	21.96	21.80		
5	16QAM	1	0	22.45	22.39	22.19	23.0	0-1
5	16QAM	1	12	22.42	22.19	22.09		
5	16QAM	1	24	22.35	22.23	22.04		
5	16QAM	12	0	21.20	20.98	20.94	22.0	0-2
5	16QAM	12	6	21.09	21.04	20.84		
5	16QAM	12	11	21.02	20.96	20.85		
5	16QAM	25	0	21.11	20.97	20.78		
Channel				19965	20175	20385	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	23.26	23.02	22.89	24.0	0
3	QPSK	1	7	23.15	22.99	22.74		
3	QPSK	1	14	22.97	22.86	22.77		
3	QPSK	8	0	22.26	22.01	21.86	23.0	0-1
3	QPSK	8	4	22.13	22.02	21.78		
3	QPSK	8	7	22.14	22.01	21.81		
3	QPSK	15	0	22.14	22.02	21.88		
3	16QAM	1	0	22.50	22.39	22.23	23.0	0-1
3	16QAM	1	7	22.41	22.22	22.06		
3	16QAM	1	14	22.11	22.36	22.12		
3	16QAM	8	0	21.29	21.18	21.02	22.0	0-2
3	16QAM	8	4	21.29	21.17	20.94		
3	16QAM	8	7	21.06	21.18	20.97		
3	16QAM	15	0	21.10	21.04	20.81		
Channel				19957	20175	20393	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	23.10	23.03	22.89	24.0	0
1.4	QPSK	1	2	23.08	23.00	22.81		
1.4	QPSK	1	5	22.83	22.97	22.68		
1.4	QPSK	3	0	23.02	22.99	22.61		
1.4	QPSK	3	1	23.08	23.02	22.88		
1.4	QPSK	3	2	23.01	23.02	22.85		
1.4	QPSK	6	0	22.07	22.01	21.92	23.0	0-1
1.4	16QAM	1	0	22.51	22.27	22.18	23.0	0-1
1.4	16QAM	1	2	22.42	22.19	22.07		
1.4	16QAM	1	5	22.26	22.22	22.16		
1.4	16QAM	3	0	22.42	22.04	21.77		
1.4	16QAM	3	1	22.47	22.15	21.82		
1.4	16QAM	3	2	22.50	22.14	21.74		
1.4	16QAM	6	0	21.03	20.87	20.75	22.0	0-2

<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	21.17	**21.36**	21.31	22.0	0
20	QPSK	1	49	21.02	21.21	21.20		
20	QPSK	1	99	20.98	21.17	20.83		
20	QPSK	50	0	20.04	20.22	20.04	21.0	0-1
20	QPSK	50	24	20.00	20.02	19.97		
20	QPSK	50	49	19.96	19.97	20.00		
20	QPSK	100	0	20.01	20.15	20.07		
20	16QAM	1	0	20.34	20.38	20.47	21.0	0-1
20	16QAM	1	49	20.15	19.96	20.29		
20	16QAM	1	99	20.23	19.83	20.40		
20	16QAM	50	0	18.94	19.17	19.12	20.0	0-2
20	16QAM	50	24	18.99	18.98	19.12		
20	16QAM	50	49	19.08	18.90	19.07		
20	16QAM	100	0	19.00	19.08	19.11		
Channel				20825	21100	21375	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	21.16	21.32	21.07	22.0	0
15	QPSK	1	37	20.93	21.26	21.05		
15	QPSK	1	74	21.10	21.07	20.96		
15	QPSK	36	0	20.04	20.25	20.11	21.0	0-1
15	QPSK	36	18	19.85	20.12	20.10		
15	QPSK	36	37	20.04	20.10	20.07		
15	QPSK	75	0	20.00	20.14	20.08		
15	16QAM	1	0	20.43	20.47	20.47	21.0	0-1
15	16QAM	1	37	20.00	20.42	20.39		
15	16QAM	1	74	20.35	19.92	19.93		
15	16QAM	36	0	19.06	19.31	19.17	20.0	0-2
15	16QAM	36	18	18.86	19.17	19.17		
15	16QAM	36	37	19.13	19.30	19.06		
15	16QAM	75	0	19.01	19.18	19.06		

Channel				20800	21100	21400	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	21.32	21.29	21.09	22.0	0
10	QPSK	1	24	21.09	21.27	21.24		
10	QPSK	1	49	20.99	21.08	21.13		
10	QPSK	25	0	19.96	20.22	20.13	21.0	0-1
10	QPSK	25	12	19.92	20.09	20.10		
10	QPSK	25	24	19.86	20.14	20.05		
10	QPSK	50	0	19.96	20.20	20.04		
10	16QAM	1	0	20.34	20.42	20.38	21.0	0-1
10	16QAM	1	24	19.70	20.41	20.33		
10	16QAM	1	49	19.65	20.29	20.32		
10	16QAM	25	0	19.00	19.36	19.21	20.0	0-2
10	16QAM	25	12	18.95	19.24	19.26		
10	16QAM	25	24	18.98	19.20	19.04		
10	16QAM	50	0	19.12	19.26	19.04		
Channel				20775	21100	21425	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	21.04	21.29	21.12	22.0	0
5	QPSK	1	12	21.18	21.32	21.35		
5	QPSK	1	24	20.84	21.11	21.04		
5	QPSK	12	0	20.09	20.21	20.11	21.0	0-1
5	QPSK	12	6	19.96	20.11	19.99		
5	QPSK	12	11	20.01	20.22	19.98		
5	QPSK	25	0	20.01	20.16	20.03		
5	16QAM	1	0	20.33	20.43	20.34	21.0	0-1
5	16QAM	1	12	20.24	20.37	20.31		
5	16QAM	1	24	20.04	20.32	20.28		
5	16QAM	12	0	19.14	19.27	19.18	20.0	0-2
5	16QAM	12	6	18.89	19.17	19.06		
5	16QAM	12	11	19.06	19.16	18.86		
5	16QAM	25	0	19.26	19.22	19.10		

Reduced Average RF Power (Proximity Sensor active)

<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	14.49	13.79	13.96	15.5	0
20	QPSK	1	49	15.19	14.05	14.40		
20	QPSK	1	99	14.50	13.76	13.74		
20	QPSK	50	0	13.92	12.89	13.39	14.5	0-1
20	QPSK	50	24	14.30	13.00	13.43		
20	QPSK	50	49	14.12	12.82	12.92		
20	QPSK	100	0	14.00	12.90	13.14		
20	16QAM	1	0	13.49	13.35	13.06	14.5	0-1
20	16QAM	1	49	14.33	13.03	13.75		
20	16QAM	1	99	13.80	13.03	12.70		
20	16QAM	50	0	12.91	12.05	12.41	13.5	0-2
20	16QAM	50	24	13.50	11.89	12.48		
20	16QAM	50	49	13.16	11.82	11.97		
20	16QAM	100	0	13.00	11.90	12.16		
Channel				18675	18900	19125	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	13.90	13.86	14.12	15.5	0
15	QPSK	1	37	14.50	13.73	13.80		
15	QPSK	1	74	14.45	13.70	13.91		
15	QPSK	36	0	13.28	12.68	13.17	14.5	0-1
15	QPSK	36	18	13.39	12.77	12.87		
15	QPSK	36	37	13.15	12.79	12.59		
15	QPSK	75	0	13.72	12.52	12.77		
15	16QAM	1	0	13.80	13.12	13.43	14.5	0-1
15	16QAM	1	37	14.18	12.53	13.00		
15	16QAM	1	74	14.05	12.88	12.53		
15	16QAM	36	0	12.29	11.74	12.22	13.5	0-2
15	16QAM	36	18	12.99	11.51	11.93		
15	16QAM	36	37	11.92	11.69	11.74		
15	16QAM	75	0	12.73	11.54	11.82		
Channel				18650	18900	19150	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	13.91	13.81	13.99	15.5	0
10	QPSK	1	24	14.18	13.96	13.94		
10	QPSK	1	49	14.59	13.71	13.88		
10	QPSK	25	0	12.89	12.84	12.61	14.5	0-1
10	QPSK	25	12	13.5	12.9	12.55		
10	QPSK	25	24	13.81	12.79	12.51		
10	QPSK	50	0	13.25	12.59	12.50		
10	16QAM	1	0	13.15	12.51	12.81	14.5	0-1
10	16QAM	1	24	13.61	12.55	12.60		
10	16QAM	1	49	14.29	12.53	12.59		
10	16QAM	25	0	11.92	11.62	11.66	13.5	0-2
10	16QAM	25	12	12.52	11.65	11.56		
10	16QAM	25	24	12.82	11.62	11.52		
10	16QAM	50	0	12.27	11.59	11.53		

Channel				18625	18900	19175	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	13.95	13.65	13.97	15.5	0
5	QPSK	1	12	14.10	13.83	14.09		
5	QPSK	1	24	14.05	13.78	13.90		
5	QPSK	12	0	12.67	12.52	12.96	14.5	0-1
5	QPSK	12	6	12.81	12.53	12.83		
5	QPSK	12	11	13.04	12.56	12.56		
5	QPSK	25	0	12.88	12.51	12.52		
5	16QAM	1	0	12.80	12.86	12.73	14.5	0-1
5	16QAM	1	12	12.91	12.56	12.52		
5	16QAM	1	24	13.73	12.79	12.54		
5	16QAM	12	0	11.68	11.56	12.25	13.5	0-2
5	16QAM	12	6	11.83	11.52	12.33		
5	16QAM	12	11	12.06	11.50	12.48		
5	16QAM	25	0	11.89	11.53	12.22		
Channel				18615	18900	19185	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	13.80	13.66	13.80	15.5	0
3	QPSK	1	7	13.97	13.88	14.09		
3	QPSK	1	14	13.95	13.55	13.92		
3	QPSK	8	0	12.56	12.62	12.91	14.5	0-1
3	QPSK	8	4	12.62	12.61	12.83		
3	QPSK	8	7	12.69	12.61	12.52		
3	QPSK	15	0	12.62	12.62	12.50		
3	16QAM	1	0	12.71	12.66	12.89	14.5	0-1
3	16QAM	1	7	12.75	12.60	12.56		
3	16QAM	1	14	13.02	12.63	12.54		
3	16QAM	8	0	11.61	11.50	11.96	13.5	0-2
3	16QAM	8	4	11.68	11.52	11.85		
3	16QAM	8	7	11.74	11.50	11.69		
3	16QAM	15	0	11.65	11.55	11.55		
Channel				18607	18900	19193	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	13.96	13.72	13.77	15.5	0
1.4	QPSK	1	2	14.05	13.65	13.97		
1.4	QPSK	1	5	13.97	13.71	13.88		
1.4	QPSK	3	0	14.01	13.73	13.77		
1.4	QPSK	3	1	14.17	13.76	13.78		
1.4	QPSK	3	2	13.99	13.75	13.96		
1.4	QPSK	6	0	12.76	12.61	12.59	14.5	0-1
1.4	16QAM	1	0	12.88	12.79	12.85	14.5	0-1
1.4	16QAM	1	2	12.96	12.82	12.95		
1.4	16QAM	1	5	12.97	12.78	12.76		
1.4	16QAM	3	0	12.63	12.57	12.65		
1.4	16QAM	3	1	12.69	12.61	12.79		
1.4	16QAM	3	2	12.71	12.59	12.55		
1.4	16QAM	6	0	11.84	11.72	12.36	13.5	0-2

<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	15.10	15.13	15.06	15.5	0
20	QPSK	1	49	15.07	14.84	15.05		
20	QPSK	1	99	14.70	14.69	14.41		
20	QPSK	50	0	14.08	14.20	14.15	14.5	0-1
20	QPSK	50	24	13.85	14.12	14.12		
20	QPSK	50	49	13.77	14.08	13.81		
20	QPSK	100	0	13.88	14.12	14.03		
20	16QAM	1	0	14.29	14.12	14.25	14.5	0-1
20	16QAM	1	49	14.30	14.21	14.35		
20	16QAM	1	99	13.88	14.18	13.57		
20	16QAM	50	0	13.25	12.95	13.21	13.5	0-2
20	16QAM	50	24	12.95	12.98	13.20		
20	16QAM	50	49	12.91	12.95	12.92		
20	16QAM	100	0	12.90	12.93	13.04		
Channel				20025	20175	20325	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	15.00	15.00	15.11	15.5	0
15	QPSK	1	37	14.82	14.78	14.73		
15	QPSK	1	74	14.74	14.90	14.62		
15	QPSK	36	0	14.07	13.86	14.14	14.5	0-1
15	QPSK	36	18	13.97	13.88	13.97		
15	QPSK	36	37	13.85	13.92	13.82		
15	QPSK	75	0	13.95	13.89	13.91		
15	16QAM	1	0	14.40	14.27	14.39	14.5	0-1
15	16QAM	1	37	14.01	14.16	14.12		
15	16QAM	1	74	13.94	14.24	13.83		
15	16QAM	36	0	12.94	12.86	13.23	13.5	0-2
15	16QAM	36	18	12.85	12.88	13.10		
15	16QAM	36	37	12.83	12.93	12.92		
15	16QAM	75	0	12.82	12.89	13.02		
Channel				20000	20175	20350	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	14.90	14.88	14.97	15.5	0
10	QPSK	1	24	15.00	14.91	14.84		
10	QPSK	1	49	14.81	14.81	14.62		
10	QPSK	25	0	14.12	13.90	13.96	14.5	0-1
10	QPSK	25	12	14.01	13.94	13.91		
10	QPSK	25	24	13.94	13.87	13.63		
10	QPSK	50	0	13.98	13.93	13.78		
10	16QAM	1	0	14.30	13.78	14.05	14.5	0-1
10	16QAM	1	24	14.29	14.12	14.06		
10	16QAM	1	49	13.62	13.91	13.48		
10	16QAM	25	0	12.82	12.74	12.91	13.5	0-2
10	16QAM	25	12	12.89	12.87	12.87		
10	16QAM	25	24	12.90	12.79	12.80		
10	16QAM	50	0	12.86	12.75	12.78		

Channel				19975	20175	20375	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	15.03	14.99	14.81	15.5	0
5	QPSK	1	12	15.11	14.97	14.87		
5	QPSK	1	24	14.96	14.94	14.81		
5	QPSK	12	0	14.10	14.02	13.98	14.5	0-1
5	QPSK	12	6	13.92	14.00	13.81		
5	QPSK	12	11	13.94	14.03	13.74		
5	QPSK	25	0	13.97	14.04	13.86		
5	16QAM	1	0	14.42	14.29	14.43	14.5	0-1
5	16QAM	1	12	14.21	14.17	13.98		
5	16QAM	1	24	14.24	14.35	13.98		
5	16QAM	12	0	13.16	13.06	13.03	13.5	0-2
5	16QAM	12	6	12.92	13.02	12.85		
5	16QAM	12	11	12.91	13.06	12.79		
5	16QAM	25	0	12.94	13.06	12.89		
Channel				19965	20175	20385	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	15.10	15.04	14.89	15.5	0
3	QPSK	1	7	15.09	15.08	14.95		
3	QPSK	1	14	14.83	15.06	14.78		
3	QPSK	8	0	14.12	14.02	13.86	14.5	0-1
3	QPSK	8	4	14.04	14.03	13.78		
3	QPSK	8	7	13.94	14.03	13.68		
3	QPSK	15	0	13.93	14.00	13.75		
3	16QAM	1	0	14.45	14.25	14.02	14.5	0-1
3	16QAM	1	7	14.43	14.23	14.10		
3	16QAM	1	14	14.35	14.35	14.11		
3	16QAM	8	0	12.91	13.08	13.01	13.5	0-2
3	16QAM	8	4	12.92	13.08	12.95		
3	16QAM	8	7	12.90	13.09	12.89		
3	16QAM	15	0	12.93	13.04	12.90		
Channel				19957	20175	20393	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	15.09	14.82	14.73	15.5	0
1.4	QPSK	1	2	15.04	14.96	14.72		
1.4	QPSK	1	5	14.92	14.90	14.61		
1.4	QPSK	3	0	14.99	14.83	14.69		
1.4	QPSK	3	1	15.03	14.87	14.71		
1.4	QPSK	3	2	15.03	14.87	14.71		
1.4	QPSK	6	0	14.02	13.94	13.69	14.5	0-1
1.4	16QAM	1	0	14.36	14.18	14.02	14.5	0-1
1.4	16QAM	1	2	14.40	14.29	14.12		
1.4	16QAM	1	5	14.27	14.20	13.93		
1.4	16QAM	3	0	14.24	13.94	13.65		
1.4	16QAM	3	1	14.27	13.99	13.86		
1.4	16QAM	3	2	14.36	13.99	13.82		
1.4	16QAM	6	0	13.14	13.02	12.80	13.5	0-2

<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	14.20	**14.93**	14.56	15.5	0
20	QPSK	1	49	13.92	14.55	14.51		
20	QPSK	1	99	14.19	14.32	14.01		
20	QPSK	50	0	12.92	13.89	13.80	14.5	0-1
20	QPSK	50	24	12.85	13.65	13.75		
20	QPSK	50	49	12.91	13.32	13.56		
20	QPSK	100	0	12.56	13.61	13.58		
20	16QAM	1	0	13.51	14.34	13.60	14.5	0-1
20	16QAM	1	49	12.67	13.95	14.07		
20	16QAM	1	99	13.61	13.31	13.34		
20	16QAM	50	0	11.92	12.93	12.65	13.5	0-2
20	16QAM	50	24	11.51	12.68	12.78		
20	16QAM	50	49	11.94	12.34	12.60		
20	16QAM	100	0	11.58	12.62	12.60		
Channel				20825	21100	21375	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	13.62	14.90	14.82	15.5	0
15	QPSK	1	37	13.55	14.46	14.70		
15	QPSK	1	74	13.54	14.33	14.30		
15	QPSK	36	0	12.67	13.93	13.83	14.5	0-1
15	QPSK	36	18	12.54	13.66	13.77		
15	QPSK	36	37	12.53	13.43	13.61		
15	QPSK	75	0	12.57	13.68	13.72		
15	16QAM	1	0	12.78	14.42	14.12	14.5	0-1
15	16QAM	1	37	12.85	13.83	13.99		
15	16QAM	1	74	13.26	13.57	13.59		
15	16QAM	36	0	11.62	12.96	12.88	13.5	0-2
15	16QAM	36	18	11.56	12.69	12.82		
15	16QAM	36	37	11.54	12.45	12.64		
15	16QAM	75	0	11.86	12.70	12.75		

Channel				20800	21100	21400	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	14.09	14.49	14.48	15.5	0
10	QPSK	1	24	14.48	14.52	14.64		
10	QPSK	1	49	13.80	13.84	14.25		
10	QPSK	25	0	13.48	13.65	13.66	14.5	0-1
10	QPSK	25	12	13.50	13.56	13.64		
10	QPSK	25	24	13.29	13.30	13.37		
10	QPSK	50	0	13.28	13.47	13.51		
10	16QAM	1	0	13.48	13.89	13.80	14.5	0-1
10	16QAM	1	24	13.42	13.90	13.97		
10	16QAM	1	49	13.08	13.16	13.10		
10	16QAM	25	0	12.58	12.69	12.71	13.5	0-2
10	16QAM	25	12	12.52	12.60	12.69		
10	16QAM	25	24	12.49	12.33	12.42		
10	16QAM	50	0	12.23	12.51	12.56		
Channel				20775	21100	21425	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	14.73	14.91	14.91	15.5	0
5	QPSK	1	12	14.06	14.46	14.42		
5	QPSK	1	24	14.08	14.46	14.39		
5	QPSK	12	0	13.28	13.79	13.73	14.5	0-1
5	QPSK	12	6	13.15	13.62	13.54		
5	QPSK	12	11	13.39	13.55	13.47		
5	QPSK	25	0	13.26	13.66	13.59		
5	16QAM	1	0	14.11	14.29	14.19	14.5	0-1
5	16QAM	1	12	13.62	13.85	13.73		
5	16QAM	1	24	13.72	13.85	13.68		
5	16QAM	12	0	12.31	12.84	12.77	13.5	0-2
5	16QAM	12	6	12.22	12.67	12.59		
5	16QAM	12	11	12.44	12.61	12.51		
5	16QAM	25	0	12.32	12.72	12.63		

<WLAN Conducted Power>

General Note:

1. Per KDB 248227 D01v02r01, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
2. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
3. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
4. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
   a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
   b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
   c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

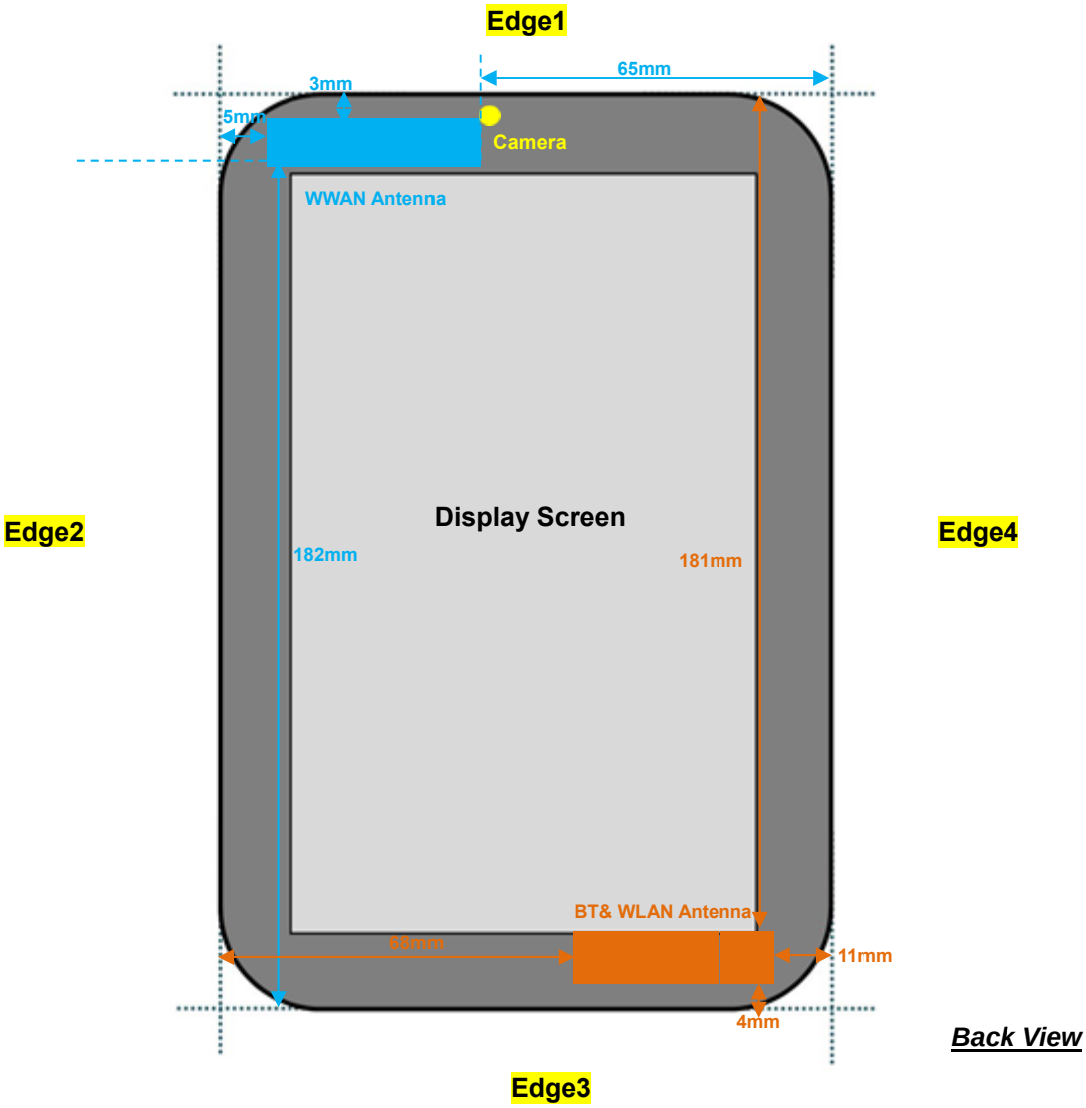
	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Duty Cycle %
2.4GHz WLAN	802.11b	CH 1	2412	1Mbps	14.26	97.59
		CH 6	2437		14.54	
		CH 11	2462		**14.77**	
	802.11g	CH 1	2412	6Mbps	12.34	87.04
		CH 6	2437		12.68	
		CH 11	2462		**13.29**	
	802.11n-HT20	CH 1	2412	MCS0	12.46	85.71
		CH 6	2437		12.79	
		CH 11	2462		**13.45**	

<Bluetooth Conducted Power>

Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
v3.0 with EDR	CH 00	2402	1.38	0.86	1.19
	CH 39	2441	3.36	1.64	1.78
	CH 78	2480	1.51	-0.19	-0.69

Mode	Channel	Frequency (MHz)	Average power (dBm)
			GFSK
v4.1 with LE	CH 00	2402	-3.20
	CH 19	2440	-2.78
	CH 39	2480	-4.59

14. Antenna Location



Diagonal Dimension: 212mm

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

SAR test exclusion table distance is ≤ 50mm

Exposure Position	Wireless Interface	GPRS 850 3 Tx slots	GPRS 1900 4 Tx slots	WCDMA Band V	WCDMA Band II	LTE Band 4	LTE Band 2	LTE Band 7	BT 2.4GHz	WLAN 2.4GHz 802.11b
	Calculated Frequency (MHz)	848.8	1909.8	846.6	1907.6	1754.3	1909.3	2567.5	2480	2462
	Tune-up Maximum power (dBm)	26.24	22.5	23.5	23	24	23.5	22	3.5	16
Bottom Face	Antenna to user (mm)	0							0	
	SAR exclusion threshold	77.5	49.2	41.2	55.2	66.5	61.9	50.7	0.63	12.6
	SAR testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**Yes**
Edge 1	Antenna to user (mm)	3								
	SAR exclusion threshold	77.5	49.2	41.2	55.2	66.5	61.9	50.7		
	SAR testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**		
Edge 2	Antenna to user (mm)	5								
	SAR exclusion threshold	77.5	49.2	41.2	55.2	66.5	61.9	50.7		
	SAR testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**		
Edge 3	Antenna to user (mm)								4	
	SAR exclusion threshold								0.7	12.6
	SAR testing required?								**No**	**Yes**
Edge 4	Antenna to user (mm)								11	
	SAR exclusion threshold								0.3	5.7
	SAR testing required?								**No**	**Yes**

SAR test exclusion table distance is >50mm

	Wireless Interface	GPRS 850 3 Tx slots	GPRS 1900 4 Tx slots	WCDMA Band V	WCDMA Band II	LTE Band 4	LTE Band 2	LTE Band 7	BT 2.4GHz	WLAN 2.4GHz 802.11b
Exposure Position	Calculated Frequency (MHz)	848.8	1909.8	846.6	1907.6	1754.3	1909.3	2567.5	2480	2462
	Tune-up Maximum power (dBm)	26.24	22.5	23.5	23	24	23.5	22	3.5	16
	Tune-up Maximum rated power (mW)	421	178	224	200	251	224	158	2	40
Edge 1	Antenna to user (mm)								181	
	SAR exclusion threshold								1405.0	1406.0
	SAR testing required?								No	No
Edge 2	Antenna to user (mm)								68	
	SAR exclusion threshold								275.0	276.0
	SAR testing required?								No	No
Edge 3	Antenna to user (mm)	182								
	SAR exclusion threshold	909.0	1429.0	908.0	1429.0	1433.0	1429.0	1414.0		
	SAR testing required?	No	No	No	No	No	No	No		
Edge 4	Antenna to user (mm)	65								
	SAR exclusion threshold	248.0	259.0	248.0	259.0	263.0	259.0	244.0		
	SAR testing required?	**Yes**	No	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. Duty cycle of TDD was fixed, therefore not require scaled to 100% of duty cycle. For SAR system, the crest factor 1:1.59 (62.9%) was used perform testing. Considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result.
   c. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   d. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   e. For WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * 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; 1.0cm for bottom face, 0.9cm for edge1 and 0.1cm for edge 2.
4. Per KDB 941225 D01v03, for GSM and GPRS and EDGE modes are determined by the frame-average power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.
5. For head SAR ,Considering the possibility of e.g. 3rd party VoIP operation , Head SAR test reduction head exposure position the EUT is operating with power back-off, therefore, the GPRS (3Tx slots) and Voice for GSM850, and GPRS (2Tx slots) and Voice for GSM1900 was selected to be tested.
6. For body SAR testing was following KDB 941225 D01v03, the GPRS (3Tx slots) mode was selected when EUT operating without power back-off for GSM850, and GPRS (3Tx slots) mode was selected when EUT operating with power back-off for GSM850, the GPRS (4Tx slots) mode was selected when EUT operating without power back-off for GSM1900, and GPRS (2Tx slots) mode was selected when EUT operating with power back-off for GSM1900, according to the highest frame-average power.
7. Pre KDB648474 D04v01r02, when the reported SAR for a body accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body accessory with a headset attached to the handset.
8. Per KDB 941225 D01v03, SAR for next to the ear head / Body exposure is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”.
9. Per KDB 941225 D01v03, RMC 12.2kbps setting is used to evaluate SAR. If the maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.
10. 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.
11. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
12. 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.
13. 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.
14. 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. Per KDB 248227 D01v02r01, for 2.4GHz 802.11n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
16. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
17. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
18. During SAR testing the WLAN transmission was verified using a spectrum analyzer.
19. Additional WLAN SAR Test Position of bottom Face 1.0cm testing and bottom Face with headset were performed for simultaneous transmission analysis.

15.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Battery	Power Back-off	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS (3 Tx slots)	Right Cheek	1	On	128	824.2	27.36	28	1.159	-0.04	0.494	0.572
	GSM850	GPRS (3 Tx slots)	Right Tilted	1	On	128	824.2	27.36	28	1.159	-0.05	0.415	0.481
	GSM850	GPRS (3 Tx slots)	Left Cheek	1	On	128	824.2	27.36	28	1.159	0.14	1.020	1.182
	GSM850	GPRS (3 Tx slots)	Left Cheek	1	On	189	836.4	27.2	28	1.202	0.05	1.050	1.262
01	GSM850	GPRS (3 Tx slots)	Left Cheek	1	On	251	848.8	27.1	28	1.230	0.07	1.140	**1.403**
	GSM850	GPRS (3 Tx slots)	Left Tilted	1	On	128	824.2	27.36	28	1.159	-0.03	0.670	0.776
	GSM850	GSM Voice	Left Cheek	1	On	128	824.2	30.2	30.5	1.072	0.06	0.754	0.808
	GSM850	GSM Voice	Left Cheek	1	On	189	836.4	30.17	30.5	1.079	0.09	0.778	0.839
	GSM850	GSM Voice	Left Cheek	1	On	251	848.8	29.91	30.5	1.146	0.06	0.786	0.900
	GSM850	GPRS (3 Tx slots)	Left Cheek	2	On	251	848.8	27.1	28	1.230	0.04	1.110	1.366
	GSM850	GPRS (3 Tx slots)	Left Cheek	2	On	189	836.4	27.2	28	1.202	0.06	1.060	1.274
	GSM850	GPRS (3 Tx slots)	Left Cheek	2	On	128	848.8	27.36	28	1.159	0.11	1.010	1.170
	GSM1900	GPRS (2 Tx slots)	Right Cheek	1	On	810	1909.8	20.55	21	1.109	-0.11	0.370	0.410
	GSM1900	GPRS (2 Tx slots)	Right Tilted	1	On	810	1909.8	20.55	21	1.109	-0.02	0.319	0.354
02	GSM1900	GPRS (2 Tx slots)	Left Cheek	1	On	810	1909.8	20.55	21	1.109	-0.0067	0.943	**1.046**
	GSM1900	GPRS (2 Tx slots)	Left Cheek	1	On	512	1909.8	20.3	21	1.175	-0.005	0.682	0.801
	GSM1900	GPRS (2 Tx slots)	Left Cheek	1	On	661	1909.8	20.43	21	1.140	0.01	0.829	0.945
	GSM1900	GPRS (2 Tx slots)	Left Tilted	1	On	810	1909.8	20.55	21	1.109	0.04	0.679	0.753
	GSM1900	GSM Voice	Left Cheek	1	On	810	1909.8	22.11	22.5	1.094	0.03	0.615	0.673
	GSM1900	GPRS (2 Tx slots)	Left Cheek	2	On	810	1909.8	20.55	21	1.109	-0.09	0.923	1.024
	GSM1900	GPRS (2 Tx slots)	Left Cheek	2	On	512	1909.8	20.3	21	1.175	0.1	0.679	0.798
	GSM1900	GPRS (2 Tx slots)	Left Cheek	2	On	661	1909.8	20.43	21	1.140	0.02	0.817	0.932

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Battery	Power Back-off	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA Band V	RMC 12.2Kbps	Right Cheek	1	On	4233	846.6	21.73	23	1.340	-0.11	0.443	0.593
	WCDMA Band V	RMC 12.2Kbps	Right Tilted	1	On	4233	846.6	21.73	23	1.340	-0.08	0.359	0.481
	WCDMA Band V	RMC 12.2Kbps	Left Cheek	1	On	4233	846.6	21.73	23	1.340	0.05	0.907	1.215
03	WCDMA Band V	RMC 12.2Kbps	Left Cheek	1	On	4132	826.4	21.13	23	1.538	0.11	0.889	**1.367**
	WCDMA Band V	RMC 12.2Kbps	Left Cheek	1	On	4182	836.4	21.18	23	1.521	0.0061	0.836	1.271
	WCDMA Band V	RMC 12.2Kbps	Left Tilted	1	On	4233	846.6	21.73	23	1.340	0.06	0.627	0.840
	WCDMA Band V	RMC 12.2Kbps	Left Tilted	1	On	4132	826.4	21.13	23	1.538	0.07	0.541	0.832
	WCDMA Band V	RMC 12.2Kbps	Left Tilted	1	On	4182	836.4	21.18	23	1.521	0.14	0.521	0.792
	WCDMA Band V	RMC 12.2Kbps	Left Cheek	2	On	4132	826.4	21.13	23	1.538	0.04	0.872	1.341
	WCDMA Band V	RMC 12.2Kbps	Left Cheek	2	On	4233	846.6	21.73	23	1.340	0.07	0.896	1.200
	WCDMA Band V	RMC 12.2Kbps	Left Cheek	2	On	4182	836.4	21.18	23	1.521	0.09	0.838	1.274
	WCDMA Band II	RMC 12.2Kbps	Right Cheek	1	On	9400	1880	13.89	14	1.026	-0.04	0.245	0.251
	WCDMA Band II	RMC 12.2Kbps	Right Tilted	1	On	9400	1880	13.89	14	1.026	0.02	0.201	0.206
04	WCDMA Band II	RMC 12.2Kbps	Left Cheek	1	On	9400	1880	13.89	14	1.026	-0.000 17	0.588	**0.603**
	WCDMA Band II	RMC 12.2Kbps	Left Tilted	1	On	9400	1880	13.89	14	1.026	0.12	0.448	0.459
	WCDMA Band II	RMC 12.2Kbps	Left Cheek	2	On	9400	1880	13.89	14	1.026	0.07	0.579	0.594

<LTE SAR>

Plot No.	Band	BW (MHz)	RB Size	RB Offset	Mode	Test Position	Battery	Power Back-off	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 4	10M	1	0	QPSK	Right Cheek	1	On	20175	1732.5	15.13	15.5	1.089	-0.023	0.222	0.242
	LTE Band 4	10M	50	0	QPSK	Right Cheek	1	On	20175	1732.5	14.2	14.5	1.072	-0.08	0.184	0.197
	LTE Band 4	10M	1	0	QPSK	Right Tilted	1	On	20175	1732.5	15.13	15.5	1.089	-0.05	0.205	0.223
	LTE Band 4	10M	50	0	QPSK	Right Tilted	1	On	20175	1732.5	14.2	14.5	1.072	-0.15	0.169	0.181
05	LTE Band 4	10M	1	0	QPSK	Left Cheek	1	On	20175	1732.5	15.13	15.5	1.089	0.13	0.613	**0.668**
	LTE Band 4	10M	50	0	QPSK	Left Cheek	1	On	20175	1732.5	14.2	14.5	1.072	-0.05	0.485	0.52
	LTE Band 4	10M	1	0	QPSK	Left Tilted	1	On	20175	1732.5	15.13	15.5	1.089	0.027	0.464	0.505
	LTE Band 4	10M	50	0	QPSK	Left Tilted	1	On	20175	1732.5	14.2	14.5	1.072	-0.0081	0.379	0.406
	LTE Band 4	10M	1	0	QPSK	Left Cheek	2	On	20175	1732.5	15.13	15.5	1.089	0.022	0.571	0.622
	LTE Band 2	20M	1	49	QPSK	Right Cheek	1	On	18700	1860	15.19	15.5	1.074	0.04	0.347	0.373
	LTE Band 2	20M	50	24	QPSK	Right Cheek	1	On	18700	1860	14.3	14.5	1.047	0.06	0.291	0.305
	LTE Band 2	20M	1	49	QPSK	Right Tilted	1	On	18700	1860	15.19	15.5	1.074	-0.08	0.296	0.318
	LTE Band 2	20M	50	24	QPSK	Right Tilted	1	On	18700	1860	14.3	14.5	1.047	-0.08	0.248	0.26
	LTE Band 2	20M	1	49	QPSK	Left Cheek	1	On	18700	1860	15.19	15.5	1.074	-0.08	0.864	0.928
06	LTE Band 2	20M	1	49	QPSK	Left Cheek	1	On	18900	1880	14.05	15.5	1.396	-0.05	0.875	**1.222**
	LTE Band 2	20M	1	49	QPSK	Left Cheek	1	On	19100	1900	14.4	15.5	1.288	-0.11	0.720	0.928
	LTE Band 2	20M	50	24	QPSK	Left Cheek	1	On	18700	1860	14.3	14.5	1.047	-0.09	0.726	0.760
	LTE Band 2	20M	100	0	QPSK	Left Cheek	1	On	18700	1860	14	14.5	1.122	0.05	0.739	0.829
	LTE Band 2	20M	1	49	QPSK	Left Tilted	1	On	18700	1860	15.19	15.5	1.074	0.04	0.709	0.761
	LTE Band 2	20M	50	24	QPSK	Left Tilted	1	On	18700	1860	14.3	14.5	1.047	0.05	0.580	0.607
	LTE Band 2	20M	1	49	QPSK	Left Cheek	2	On	18900	1880	14.05	15.5	1.396	-0.03	0.648	0.905
	LTE Band 2	20M	1	49	QPSK	Left Cheek	2	On	18700	1860	15.19	15.5	1.074	-0.04	0.866	0.930
	LTE Band 2	20M	1	49	QPSK	Left Cheek	2	On	19100	1900	14.4	15.5	1.288	0.08	0.712	0.917
	LTE Band 7	20M	1	0	QPSK	Right Cheek	1	On	21100	2560	14.93	15.5	1.140	-0.01	0.376	0.429
	LTE Band 7	20M	50	0	QPSK	Right Cheek	1	On	21100	2560	13.89	14.5	1.151	-0.02	0.318	0.366
	LTE Band 7	20M	1	0	QPSK	Right Tilted	1	On	21100	2560	14.93	15.5	1.140	-0.03	0.374	0.426
	LTE Band 7	20M	50	0	QPSK	Right Tilted	1	On	21100	2560	13.89	14.5	1.151	-0.06	0.317	0.365
	LTE Band 7	20M	1	0	QPSK	Left Cheek	1	On	21100	2560	14.93	15.5	1.140	-0.03	0.785	0.895
07	LTE Band 7	20M	1	0	QPSK	Left Cheek	1	On	20850	2560	14.2	15.5	1.349	-0.05	0.704	**0.950**
	LTE Band 7	20M	1	0	QPSK	Left Cheek	1	On	21350	2560	14.56	15.5	1.242	-0.09	0.591	0.734
	LTE Band 7	20M	50	0	QPSK	Left Cheek	1	On	21100	2560	13.89	14.5	1.151	0.01	0.670	0.771
	LTE Band 7	20M	100	0	QPSK	Left Cheek	1	On	21100	2560	13.61	14.5	1.227	-0.02	0.605	0.743
	LTE Band 7	20M	1	0	QPSK	Left Tilted	1	On	21100	2560	14.93	15.5	1.140	0.0056	0.598	0.682
	LTE Band 7	20M	50	0	QPSK	Left Tilted	1	On	21100	2560	13.89	14.5	1.151	-0.01	0.508	0.585
	LTE Band 7	20M	1	0	QPSK	Left Cheek	2	On	20850	2560	14.2	15.5	1.349	-0.04	0.698	0.942
	LTE Band 7	20M	1	0	QPSK	Left Cheek	2	On	21100	2560	14.93	15.5	1.140	-0.02	0.787	0.897
	LTE Band 7	20M	1	0	QPSK	Left Cheek	2	On	21350	2560	14.56	15.5	1.242	-0.06	0.591	0.734

<DTS WLAN SAR>

Plot No.	Band	Mode	Test Position	Battery	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN 2.4GHz	802.11b_1Mbps	Right Cheek	1	11	2462	14.77	16	1.327	97.59	1.025	0.11	0.031	0.042
08	WLAN 2.4GHz	802.11b_1Mbps	Right Tilted	1	11	2462	14.77	16	1.327	97.59	1.025	-0.07	0.034	**0.046**
	WLAN 2.4GHz	802.11b_1Mbps	Left Cheek	1	11	2462	14.77	16	1.327	97.59	1.025	0.01	0.031	0.042
	WLAN 2.4GHz	802.11b_1Mbps	Left Tilted	1	11	2462	14.77	16	1.327	97.59	1.025	-0.01	0.019	0.026
	WLAN 2.4GHz	802.11b_1Mbps	Right Tilted	2	11	2462	14.77	16	1.327	97.59	1.025	0.07	0.031	0.042

15.2 Body Accessory SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Battery	Power Back-off	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS (3 Tx slots)	Bottom Face	0	1	On	128	824.2	27.36	28	1.159	0.11	0.794	0.920
	GSM850	GPRS (3 Tx slots)	Bottom Face	0	1	On	189	836.4	27.2	28	1.202	0.04	0.814	0.979
09	GSM850	GPRS (3 Tx slots)	Bottom Face	0	1	On	251	848.8	27.1	28	1.230	0.13	0.852	**1.048**
	GSM850	GPRS (3 Tx slots)	Edge1	0	1	On	128	824.2	27.36	28	1.159	0.01	0.689	0.798
	GSM850	GPRS (3 Tx slots)	Edge2	0	1	On	128	824.2	27.36	28	1.159	0.14	0.255	0.295
	GSM850	GPRS (3 Tx slots)	Bottom Face	1	1	Off	128	824.2	29.93	30.5	1.140	0.1	0.579	0.66
	GSM850	GPRS (3 Tx slots)	Edge1	0.9	1	Off	128	824.2	29.93	30.5	1.140	0.0034	0.384	0.438
	GSM850	GPRS (3 Tx slots)	Edge2	0.1	1	Off	128	824.2	29.93	30.5	1.140	0.05	0.449	0.512
	GSM850	GPRS (3 Tx slots)	Edge4	0	1	Off	128	824.2	29.93	30.5	1.140	-0.08	0.153	0.174
	GSM850	GPRS (3 Tx slots)	Bottom Face	0	2	On	251	848.8	27.1	28	1.230	0.049	0.817	1.005
	GSM850	GPRS (3 Tx slots)	Bottom Face	0	2	On	128	824.2	27.36	28	1.159	0.17	0.764	0.885
	GSM850	GPRS (3 Tx slots)	Bottom Face	0	2	On	189	836.4	27.2	28	1.202	-0.15	0.775	0.932
10	GSM1900	GPRS (2 Tx slots)	Bottom Face	0	1	On	810	1909.8	20.55	21	1.109	0.068	1.260	**1.398**
	GSM1900	GSM Voice	Bottom Face with Headset 2	0	1	On	810	1909.8	22.11	22.5	1.094	0.05	0.826	0.904
	GSM1900	GPRS (2 Tx slots)	Bottom Face	0	1	On	512	1850.2	20.3	21	1.175	-0.07	0.983	1.155
	GSM1900	GPRS (2 Tx slots)	Bottom Face	0	1	On	661	1880	20.43	21	1.140	-0.044	1.170	1.334
	GSM1900	GPRS (2 Tx slots)	Edge1	0	1	On	810	1909.8	20.55	21	1.109	-0.13	0.727	0.806
	GSM1900	GPRS (2 Tx slots)	Edge1	0	1	On	512	1850.2	20.3	21	1.175	-0.14	0.553	0.650
	GSM1900	GPRS (2 Tx slots)	Edge1	0	1	On	661	1880	20.43	21	1.140	-0.022	0.628	0.716
	GSM1900	GPRS (2 Tx slots)	Edge2	0	1	On	810	1909.8	20.55	21	1.109	-0.009 5	0.215	0.238
	GSM1900	GPRS (4 Tx slots)	Bottom Face	1	1	Off	810	1909.8	25	25.5	1.122	0.1	1.090	1.223
	GSM1900	GPRS (4 Tx slots)	Bottom Face	1	1	Off	512	1850.2	24.59	25.5	1.233	-0.08	0.778	0.959
	GSM1900	GPRS (4 Tx slots)	Bottom Face	1	1	Off	661	1880	24.83	25.5	1.167	-0.09	0.901	1.051
	GSM1900	GPRS (4 Tx slots)	Edge1	0.9	1	Off	810	1909.8	25	25.5	1.122	-0.09	1.040	1.167
	GSM1900	GPRS (4 Tx slots)	Edge1	0.9	1	Off	512	1850.2	24.59	25.5	1.233	-0.09	0.751	0.926
	GSM1900	GPRS (4 Tx slots)	Edge1	0.9	1	Off	661	1880	24.83	25.5	1.167	-0.11	0.90	1.050
	GSM1900	GPRS (4 Tx slots)	Edge2	0.1	1	Off	810	1909.8	25	25.5	1.122	-0.04	1.170	1.313
	GSM1900	GPRS (4 Tx slots)	Edge2	0.1	1	Off	512	1850.2	24.59	25.5	1.233	-0.14	0.881	1.086
	GSM1900	GPRS (4 Tx slots)	Edge2	0.1	1	Off	661	1880	24.83	25.5	1.167	-0.12	1.110	1.295
	GSM1900	GPRS (2 Tx slots)	Bottom Face	0	2	On	810	1909.8	20.55	21	1.109	-0.058	1.210	1.342
	GSM1900	GPRS (2 Tx slots)	Bottom Face	0	2	On	512	1850.2	20.3	21	1.175	-0.075	0.953	1.120
	GSM1900	GPRS (2 Tx slots)	Bottom Face	0	2	On	661	1880	20.43	21	1.140	-0.072	1.100	1.254
	GSM1900	GPRS (4 Tx slots)	Bottom Face	1	2	Off	810	1909.8	25	25.5	1.122	-0.05	1.00	1.122
	GSM1900	GPRS (4 Tx slots)	Bottom Face	1	2	Off	512	1850.2	24.59	25.5	1.233	-0.18	0.700	0.863
	GSM1900	GPRS (4 Tx slots)	Bottom Face	1	2	Off	661	1880	24.83	25.5	1.167	-0.09	0.866	1.010
	GSM1900	GPRS (4 Tx slots)	Edge2	0.1	2	Off	810	1909.8	25	25.5	1.122	0.01	1.220	1.369
	GSM1900	GPRS (4 Tx slots)	Edge2	0.1	2	Off	512	1850.2	24.59	25.5	1.233	-0.01	0.920	1.134
	GSM1900	GPRS (4 Tx slots)	Edge2	0.1	2	Off	661	1880	24.83	25.5	1.167	0.073	1.110	1.295

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Battery	Power Back-off	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
11	WCDMA Band V	RMC 12.2Kbps	Bottom Face	0	1	On	4233	846.6	21.73	23	1.340	0.033	0.659	**0.883**
	WCDMA Band V	RMC 12.2Kbps	Bottom Face	0	1	On	4132	826.4	21.13	23	1.538	-0.01	0.572	0.88
	WCDMA Band V	RMC 12.2Kbps	Bottom Face	0	1	On	4182	836.4	21.18	23	1.521	-0.19	0.561	0.853
	WCDMA Band V	RMC 12.2Kbps	Edge1	0	1	On	4233	846.6	21.73	23	1.340	-0.01	0.541	0.725
	WCDMA Band V	RMC 12.2Kbps	Edge2	0	1	On	4233	846.6	21.73	23	1.340	0.09	0.248	0.332
	WCDMA Band V	RMC 12.2Kbps	Bottom Face	1	1	Off	4233	846.6	22.43	23.5	1.279	-0.05	0.292	0.374
	WCDMA Band V	RMC 12.2Kbps	Edge1	0.9	1	Off	4233	846.6	22.43	23.5	1.279	0.0047	0.193	0.247
	WCDMA Band V	RMC 12.2Kbps	Edge2	0.1	1	Off	4233	846.6	22.43	23.5	1.279	0.15	0.286	0.366
	WCDMA Band V	RMC 12.2Kbps	Bottom Face	0	2	On	4233	846.6	21.73	23	1.340	0.06	0.644	0.863
	WCDMA Band V	RMC 12.2Kbps	Bottom Face	0	2	On	4132	826.4	21.13	23	1.538	0.09	0.56	0.861
	WCDMA Band V	RMC 12.2Kbps	Bottom Face	0	2	On	4182	836.4	21.18	23	1.521	0.01	0.542	0.824
	WCDMA Band II	RMC 12.2Kbps	Bottom Face	0	1	On	9400	1880	13.89	14	1.026	-0.03	1.01	1.036
	WCDMA Band II	RMC 12.2Kbps	Bottom Face	0	1	On	9262	1852.4	13.4	14	1.148	-0.095	0.974	1.118
	WCDMA Band II	RMC 12.2Kbps	Bottom Face	0	1	On	9538	1907.6	13.49	14	1.125	-0.021	1.01	1.136
	WCDMA Band II	RMC 12.2Kbps	Edge1	0	1	On	9400	1880	13.89	14	1.026	0.02	0.623	0.639
	WCDMA Band II	RMC 12.2Kbps	Edge2	0	1	On	9400	1880	13.89	14	1.026	-0.023	0.132	0.135
	WCDMA Band II	RMC 12.2Kbps	Bottom Face	1	1	Off	9400	1880	22.38	23	1.153	-0.01	1.130	1.303
	WCDMA Band II	RMC 12.2Kbps	Bottom Face	1	1	Off	9262	1852.4	22.09	23	1.233	0.06	0.929	1.146
12	WCDMA Band II	RMC 12.2Kbps	Bottom Face	1	1	Off	9538	1907.6	22.28	23	1.180	0.05	1.240	**1.464**
	WCDMA Band II	RMC 12.2Kbps	Bottom Face with Headset 1	1	1	Off	9538	1907.6	22.28	23	1.180	-0.08	0.956	1.128
	WCDMA Band II	RMC 12.2Kbps	Bottom Face with Headset 2	1	1	Off	9538	1907.6	22.28	23	1.180	-0.04	0.968	1.143
	WCDMA Band II	RMC 12.2Kbps	Edge1	0.9	1	Off	9400	1880	22.38	23	1.153	-0.12	1.140	1.315
	WCDMA Band II	RMC 12.2Kbps	Edge1	0.9	1	Off	9262	1852.4	22.09	23	1.233	-0.11	1.020	1.258
	WCDMA Band II	RMC 12.2Kbps	Edge1	0.9	1	Off	9538	1907.6	22.28	23	1.180	-0.16	1.200	1.416
	WCDMA Band II	RMC 12.2Kbps	Edge2	0.1	1	Off	9400	1880	22.38	23	1.153	0.09	1.170	1.350
	WCDMA Band II	RMC 12.2Kbps	Edge2	0.1	1	Off	9262	1852.4	22.09	23	1.233	-0.07	1.010	1.245
	WCDMA Band II	RMC 12.2Kbps	Edge2	0.1	1	Off	9538	1907.6	22.28	23	1.180	-0.19	1.110	1.310
	WCDMA Band II	RMC 12.2Kbps	Bottom Face	1	2	Off	9538	1907.6	22.28	23	1.180	-0.16	0.966	1.140
	WCDMA Band II	RMC 12.2Kbps	Bottom Face	1	2	Off	9400	1880	22.38	23	1.153	-0.09	0.829	0.956
	WCDMA Band II	RMC 12.2Kbps	Bottom Face	1	2	Off	9262	1852.4	22.09	23	1.233	-0.076	0.980	1.208
	WCDMA Band II	RMC 12.2Kbps	Edge1	0.9	2	Off	9538	1907.6	22.28	23	1.180	-0.03	1.090	1.287
	WCDMA Band II	RMC 12.2Kbps	Edge1	0.9	2	Off	9400	1880	22.38	23	1.153	-0.11	0.894	1.031
	WCDMA Band II	RMC 12.2Kbps	Edge1	0.9	2	Off	9262	1852.4	22.09	23	1.233	-0.022	0.949	1.170
	WCDMA Band II	RMC 12.2Kbps	Edge2	0.1	2	Off	9400	1880	22.38	23	1.153	0.03	1.200	1.384
	WCDMA Band II	RMC 12.2Kbps	Edge2	0.1	2	Off	9262	1852.4	22.09	23	1.233	0.13	1.030	1.270
	WCDMA Band II	RMC 12.2Kbps	Edge2	0.1	2	Off	9538	1907.6	22.28	23	1.180	0.029	1.170	1.381

<LTE SAR>

Plot No.	Band	BW (MHz)	RB Size	RB Offset	Mode	Test Position	Gap (cm)	Battery	Power Back-off	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 4	20M	1	0	QPSK	Bottom Face	0	1	On	20175	1732.5	15.13	15.5	1.089	-0.17	1.01	1.1
	LTE Band 4	20M	1	0	QPSK	Bottom Face	0	1	On	20050	1720	15.1	15.5	1.096	-0.047	0.991	1.087
	LTE Band 4	20M	1	0	QPSK	Bottom Face	0	1	On	20300	1745	15.06	15.5	1.107	-0.051	1.03	1.14
	LTE Band 4	20M	50	0	QPSK	Bottom Face	0	1	On	20175	1732.5	14.2	14.5	1.072	-0.01	0.793	0.85
	LTE Band 4	20M	50	0	QPSK	Bottom Face	0	1	On	20050	1720	14.08	14.5	1.102	0.032	0.788	0.868
	LTE Band 4	20M	50	0	QPSK	Bottom Face	0	1	On	20300	1745	14.15	14.5	1.084	0.08	0.9	0.976
	LTE Band 4	20M	100	0	QPSK	Bottom Face	0	1	On	20175	1732.5	14.12	14.5	1.091	-0.04	0.804	0.878
	LTE Band 4	20M	1	0	QPSK	Edge1	0	1	On	20175	1732.5	15.13	15.5	1.089	0.18	0.763	0.831
	LTE Band 4	20M	1	0	QPSK	Edge1	0	1	On	20050	1720	15.1	15.5	1.096	-0.09	0.727	0.797
	LTE Band 4	20M	1	0	QPSK	Edge1	0	1	On	20300	1745	15.06	15.5	1.107	-0.04	0.732	0.81
	LTE Band 4	20M	50	0	QPSK	Edge1	0	1	On	20175	1732.5	14.2	14.5	1.072	-0.18	0.572	0.613
	LTE Band 4	20M	100	0	QPSK	Edge1	0	1	On	20175	1732.5	14.12	14.5	1.091	-0.04	0.566	0.618
	LTE Band 4	20M	1	0	QPSK	Edge2	0	1	On	20175	1732.5	15.13	15.5	1.089	-0.19	0.158	0.172
	LTE Band 4	20M	50	0	QPSK	Edge2	0	1	On	20175	1732.5	14.2	14.5	1.072	-0.15	0.127	0.136
	LTE Band 4	20M	1	0	QPSK	Bottom Face	1	1	Off	20175	1732.5	23.41	24	1.146	-0.12	0.713	0.817
	LTE Band 4	20M	1	0	QPSK	Bottom Face	1	1	Off	20050	1720	23.29	24	1.178	-0.04	0.699	0.823
	LTE Band 4	20M	1	0	QPSK	Bottom Face	1	1	Off	20300	1745	23.22	24	1.197	-0.13	0.712	0.852
	LTE Band 4	20M	50	0	QPSK	Bottom Face	1	1	Off	20175	1732.5	22.36	23	1.159	-0.17	0.770	0.892
	LTE Band 4	20M	50	0	QPSK	Bottom Face	1	1	Off	20050	1720	22.29	23	1.178	0.17	0.722	0.85
	LTE Band 4	20M	50	0	QPSK	Bottom Face	1	1	Off	20300	1745	22.21	23	1.199	-0.11	0.562	0.674
	LTE Band 4	20M	100	0	QPSK	Bottom Face	1	1	Off	20175	1732.5	22.29	23	1.178	-0.13	0.782	0.921
	LTE Band 4	20M	1	0	QPSK	Edge1	0.9	1	Off	20175	1732.5	23.41	24	1.146	0.18	1.060	1.214
	LTE Band 4	20M	1	0	QPSK	Edge1	0.9	1	Off	20050	1720	23.29	24	1.178	0.19	1.020	1.201
13	LTE Band 4	20M	1	0	QPSK	Edge1	0.9	1	Off	20300	1745	23.22	24	1.197	0.16	1.140	**1.364**
	LTE Band 4	20M	50	0	QPSK	Edge1	0.9	1	Off	20175	1732.5	22.36	23	1.159	-0.06	0.872	1.010
	LTE Band 4	20M	50	0	QPSK	Edge1	0.9	1	Off	20050	1720	22.29	23	1.178	-0.09	0.830	0.977
	LTE Band 4	20M	50	0	QPSK	Edge1	0.9	1	Off	20300	1745	22.21	23	1.199	-0.06	0.919	1.102
	LTE Band 4	20M	100	0	QPSK	Edge1	0.9	1	Off	20175	1732.5	22.29	23	1.178	-0.02	0.874	1.029
	LTE Band 4	20M	1	0	QPSK	Edge2	0.1	1	Off	20175	1732.5	23.41	24	1.146	0.08	0.964	1.104
	LTE Band 4	20M	1	0	QPSK	Edge2	0.1	1	Off	20050	1720	23.29	24	1.178	-0.07	1.030	1.213
	LTE Band 4	20M	1	0	QPSK	Edge2	0.1	1	Off	20300	1745	23.22	24	1.197	-0.04	1.120	1.340
	LTE Band 4	20M	50	0	QPSK	Edge2	0.1	1	Off	20175	1732.5	22.36	23	1.159	-0.03	0.799	0.926
	LTE Band 4	20M	50	0	QPSK	Edge2	0.1	1	Off	20050	1720	22.29	23	1.178	0.034	0.810	0.954
	LTE Band 4	20M	50	0	QPSK	Edge2	0.1	1	Off	20300	1745	22.21	23	1.199	-0.04	0.860	1.032
	LTE Band 4	20M	100	0	QPSK	Edge2	0.1	1	Off	20175	1732.5	22.29	23	1.178	-0.1	0.813	0.957
	LTE Band 4	20M	1	0	QPSK	Edge1	0.9	2	Off	20300	1745	23.22	24	1.197	-0.02	1.130	1.352
	LTE Band 4	20M	1	0	QPSK	Edge1	0.9	2	Off	20175	1732.5	23.41	24	1.146	-0.03	1.060	1.214
	LTE Band 4	20M	1	0	QPSK	Edge1	0.9	2	Off	20050	1720	23.29	24	1.178	-0.13	1.110	1.307
	LTE Band 4	20M	1	0	QPSK	Edge2	0.1	2	Off	20175	1732.5	23.41	24	1.146	-0.05	0.957	1.096
	LTE Band 4	20M	1	0	QPSK	Edge2	0.1	2	Off	20050	1720	23.29	24	1.178	-0.11	1.020	1.201
	LTE Band 4	20M	1	0	QPSK	Edge2	0.1	2	Off	20300	1745	23.22	24	1.197	-0.16	1.110	1.328

Plot No.	Band	BW (MHz)	RB Size	RB Offset	Mode	Test Position	Gap (cm)	Battery	Power Back-off	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	1	49	QPSK	Bottom Face	0	1	On	18700	1860	15.19	15.5	1.074	-0.01	1.270	1.364
	LTE Band 2	20M	1	49	QPSK	Bottom Face	0	1	On	18900	1880	14.05	15.5	1.396	-0.047	0.941	1.314
	LTE Band 2	20M	1	49	QPSK	Bottom Face	0	1	On	19100	1900	14.4	15.5	1.288	-0.077	1.060	1.366
	LTE Band 2	20M	50	24	QPSK	Bottom Face	0	1	On	18700	1860	14.3	14.5	1.047	-0.058	1.040	1.089
	LTE Band 2	20M	50	24	QPSK	Bottom Face	0	1	On	18900	1880	13	14.5	1.413	-0.04	0.643	0.908
	LTE Band 2	20M	50	24	QPSK	Bottom Face	0	1	On	19100	1900	13.43	14.5	1.279	-0.095	0.856	1.095
	LTE Band 2	20M	100	0	QPSK	Bottom Face	0	1	On	18700	1860	14	14.5	1.122	-0.047	0.908	1.019
	LTE Band 2	20M	1	49	QPSK	Edge1	0	1	On	18700	1860	15.19	15.5	1.074	0.07	0.978	1.050
	LTE Band 2	20M	1	49	QPSK	Edge1	0	1	On	18900	1880	14.05	15.5	1.396	-0.13	0.591	0.825
	LTE Band 2	20M	1	49	QPSK	Edge1	0	1	On	19100	1900	14.4	15.5	1.288	-0.04	0.730	0.940
	LTE Band 2	20M	50	24	QPSK	Edge1	0	1	On	18700	1860	14.3	14.5	1.047	-0.07	0.719	0.753
	LTE Band 2	20M	100	0	QPSK	Edge1	0	1	On	18700	1860	14	14.5	1.122	-0.05	0.626	0.702
	LTE Band 2	20M	1	49	QPSK	Edge2	0	1	On	18700	1860	15.19	15.5	1.074	-0.14	0.192	0.206
	LTE Band 2	20M	50	24	QPSK	Edge2	0	1	On	18700	1860	14.3	14.5	1.047	-0.15	0.160	0.168
	LTE Band 2	20M	1	49	QPSK	Bottom Face	1	1	Off	18700	1860	23.31	23.5	1.045	0.089	1.050	1.097
	LTE Band 2	20M	1	49	QPSK	Bottom Face	1	1	Off	18900	1880	22.92	23.5	1.143	-0.08	1.040	1.189
	LTE Band 2	20M	1	49	QPSK	Bottom Face	1	1	Off	19100	1900	23.21	23.5	1.069	-0.06	1.120	1.197
	LTE Band 2	20M	50	24	QPSK	Bottom Face	1	1	Off	18700	1860	22.09	22.5	1.099	-0.05	0.824	0.906
	LTE Band 2	20M	50	24	QPSK	Bottom Face	1	1	Off	18900	1880	21.96	22.5	1.132	-0.06	0.808	0.915
	LTE Band 2	20M	50	24	QPSK	Bottom Face	1	1	Off	19100	1900	21.98	22.5	1.127	-0.08	0.876	0.987
	LTE Band 2	20M	100	0	QPSK	Bottom Face	1	1	Off	18700	1860	22.01	22.5	1.119	-0.01	0.826	0.925
	LTE Band 2	20M	1	49	QPSK	Edge1	0.9	1	Off	18700	1860	23.31	23.5	1.045	0.03	1.270	1.327
	LTE Band 2	20M	1	49	QPSK	Edge1	0.9	1	Off	18900	1880	22.92	23.5	1.143	-0.04	1.130	1.291
	LTE Band 2	20M	1	49	QPSK	Edge1	0.9	1	Off	19100	1900	23.21	23.5	1.069	-0.029	1.210	1.294
	LTE Band 2	20M	50	24	QPSK	Edge1	0.9	1	Off	18700	1860	22.09	22.5	1.099	0.02	0.965	1.061
	LTE Band 2	20M	50	24	QPSK	Edge1	0.9	1	Off	18900	1880	21.96	22.5	1.132	-0.09	0.944	1.069
	LTE Band 2	20M	50	24	QPSK	Edge1	0.9	1	Off	19100	1900	21.98	22.5	1.127	-0.09	1.000	1.127
	LTE Band 2	20M	100	0	QPSK	Edge1	0.9	1	Off	18700	1860	22.01	22.5	1.119	-0.05	0.973	1.089
	LTE Band 2	20M	1	49	QPSK	Edge2	0.1	1	Off	18700	1860	23.31	23.5	1.045	0.07	1.320	1.379
	LTE Band 2	20M	1	49	QPSK	Edge2	0.1	1	Off	18900	1880	22.92	23.5	1.143	0.14	1.190	1.360
	LTE Band 2	20M	1	49	QPSK	Edge2	0.1	1	Off	19100	1900	23.21	23.5	1.069	-0.18	1.190	1.272
	LTE Band 2	20M	50	24	QPSK	Edge2	0.1	1	Off	18700	1860	22.09	22.5	1.099	-0.05	0.998	1.097
	LTE Band 2	20M	50	24	QPSK	Edge2	0.1	1	Off	18900	1880	21.96	22.5	1.132	-0.03	0.927	1.050
	LTE Band 2	20M	50	24	QPSK	Edge2	0.1	1	Off	19100	1900	21.98	22.5	1.127	-0.08	0.920	1.037
	LTE Band 2	20M	100	0	QPSK	Edge2	0.1	1	Off	18700	1860	22.01	22.5	1.119	-0.1	0.987	1.105
	LTE Band 2	20M	1	49	QPSK	Bottom Face	0	2	On	18700	1860	15.19	15.5	1.074	-0.09	1.250	1.342
	LTE Band 2	20M	1	49	QPSK	Bottom Face	0	2	On	18900	1880	14.05	15.5	1.396	0.071	0.922	1.287
14	LTE Band 2	20M	1	49	QPSK	Bottom Face	0	2	On	19100	1900	14.4	15.5	1.288	-0.19	1.080	**1.391**
	LTE Band 2	20M	1	49	QPSK	Bottom Face with Headset 2	0	2	On	19100	1900	14.4	15.5	1.288	-0.041	1.07	1.378
	LTE Band 2	20M	1	49	QPSK	Edge1	0.9	2	Off	18700	1860	23.31	23.5	1.045	-0.04	1.260	1.316
	LTE Band 2	20M	1	49	QPSK	Edge1	0.9	2	Off	18900	1880	22.92	23.5	1.143	-0.19	1.150	1.314
	LTE Band 2	20M	1	49	QPSK	Edge1	0.9	2	Off	19100	1900	23.21	23.5	1.069	-0.04	1.220	1.304
	LTE Band 2	20M	1	49	QPSK	Edge2	0.1	2	Off	18700	1860	23.31	23.5	1.045	0.057	1.230	1.285
	LTE Band 2	20M	1	49	QPSK	Edge2	0.1	2	Off	18900	1880	22.92	23.5	1.143	-0.11	1.090	1.246
	LTE Band 2	20M	1	49	QPSK	Edge2	0.1	2	Off	19100	1900	23.21	23.5	1.069	-0.04	1.080	1.155

Plot No.	Band	BW (MHz)	RB Size	RB offest	Modulation	Test Position	Gap (cm)	Battery	Power Back-off	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 7	20M	1	0	QPSK	Bottom Face	0	1	On	21100	2535	14.93	15.5	1.140	0.12	1.020	1.163
	LTE Band 7	20M	1	0	QPSK	Bottom Face	0	1	On	20850	2510	14.2	15.5	1.349	-0.04	0.960	1.295
	LTE Band 7	20M	1	0	QPSK	Bottom Face	0	1	On	21350	2560	14.56	15.5	1.242	-0.12	0.836	1.038
	LTE Band 7	20M	1	0	QPSK	Bottom Face with Headset 2	0	1	On	20850	2510	14.2	15.5	1.349	-0.07	0.902	1.217
	LTE Band 7	20M	50	0	QPSK	Bottom Face	0	1	On	21100	2535	13.89	14.5	1.151	-0.1	0.863	0.993
	LTE Band 7	20M	50	0	QPSK	Bottom Face	0	1	On	20850	2510	12.92	14.5	1.439	0.06	0.636	0.915
	LTE Band 7	20M	50	0	QPSK	Bottom Face	0	1	On	21350	2560	13.8	14.5	1.175	0.03	0.726	0.853
	LTE Band 7	20M	100	0	QPSK	Bottom Face	0	1	On	21100	2535	13.61	14.5	1.227	0.1	0.623	0.765
	LTE Band 7	20M	1	0	QPSK	Edge1	0	1	On	21100	2535	14.93	15.5	1.140	-0.17	1.130	1.288
	LTE Band 7	20M	1	0	QPSK	Edge1	0	1	On	20850	2510	14.2	15.5	1.349	-0.12	0.783	1.056
	LTE Band 7	20M	1	0	QPSK	Edge1	0	1	On	21350	2560	14.56	15.5	1.242	-0.17	0.655	0.813
	LTE Band 7	20M	50	0	QPSK	Edge1	0	1	On	21100	2535	13.89	14.5	1.151	-0.16	0.737	0.848
	LTE Band 7	20M	50	0	QPSK	Edge1	0	1	On	20850	2510	12.92	14.5	1.439	-0.15	0.433	0.623
	LTE Band 7	20M	50	0	QPSK	Edge1	0	1	On	21350	2560	13.8	14.5	1.175	-0.15	0.569	0.669
	LTE Band 7	20M	100	0	QPSK	Edge1	0	1	On	21100	2535	13.61	14.5	1.227	-0.15	0.672	0.825
	LTE Band 7	20M	1	0	QPSK	Edge2	0	1	On	21100	2535	14.93	15.5	1.140	-0.03	0.078	0.089
	LTE Band 7	20M	50	0	QPSK	Edge2	0	1	On	21100	2535	13.89	14.5	1.151	0.01	0.065	0.075
	LTE Band 7	20M	1	0	QPSK	Bottom Face	1	1	Off	21100	2535	21.36	22	1.159	-0.16	1.040	1.205
	LTE Band 7	20M	1	0	QPSK	Bottom Face	1	1	Off	20850	2510	21.17	22	1.211	0.13	1.040	1.259
	LTE Band 7	20M	1	0	QPSK	Bottom Face	1	1	Off	21350	2560	21.31	22	1.172	-0.03	0.940	1.102
	LTE Band 7	20M	50	0	QPSK	Bottom Face	1	1	Off	21100	2535	20.22	21	1.253	-0.1	0.782	0.936
	LTE Band 7	20M	50	0	QPSK	Bottom Face	1	1	Off	20850	2510	20.04	21	1.306	0.09	0.771	0.962
	LTE Band 7	20M	50	0	QPSK	Bottom Face	1	1	Off	21350	2560	20.04	21	1.306	-0.13	0.734	0.916
	LTE Band 7	20M	100	0	QPSK	Bottom Face	1	1	Off	21100	2535	20.15	21	1.274	-0.11	0.762	0.927
	LTE Band 7	20M	1	0	QPSK	Edge1	0.9	1	Off	21100	2535	21.36	22	1.159	-0.1	1.190	1.379
15	LTE Band 7	20M	1	0	QPSK	Edge1	0.9	1	Off	20850	2510	21.17	22	1.211	-0.09	1.170	**1.416**
	LTE Band 7	20M	1	0	QPSK	Edge1	0.9	1	Off	21350	2560	21.31	22	1.172	-0.02	1.180	1.383
	LTE Band 7	20M	50	0	QPSK	Edge1	0.9	1	Off	21100	2535	20.22	21	1.197	-0.1	0.972	1.163
	LTE Band 7	20M	50	0	QPSK	Edge1	0.9	1	Off	20850	2510	20.04	21	1.247	0.06	0.919	1.146
	LTE Band 7	20M	50	0	QPSK	Edge1	0.9	1	Off	21350	2560	20.04	21	1.247	0.05	0.945	1.179
	LTE Band 7	20M	100	0	QPSK	Edge1	0.9	1	Off	21100	2535	20.15	20	0.966	-0.0081	0.956	0.924
	LTE Band 7	20M	1	0	QPSK	Edge2	0.1	1	Off	21100	2535	21.36	22	1.159	0.02	0.321	0.372
	LTE Band 7	20M	50	0	QPSK	Edge2	0.1	1	Off	21100	2535	20.22	21	1.197	-0.043	0.250	0.299
	LTE Band 7	20M	1	0	QPSK	Bottom Face	0	2	On	20850	2510	14.2	15.5	1.349	-0.05	0.941	1.269
	LTE Band 7	20M	1	0	QPSK	Bottom Face	0	2	On	21100	2535	14.93	15.5	1.140	0.06	0.990	1.129
	LTE Band 7	20M	1	0	QPSK	Bottom Face	0	2	On	21350	2560	14.56	15.5	1.242	-0.05	0.790	0.981
	LTE Band 7	20M	1	0	QPSK	Edge1	0	2	On	21100	2535	14.93	15.5	1.140	-0.13	0.858	0.978
	LTE Band 7	20M	1	0	QPSK	Edge1	0	2	On	20850	2510	14.2	15.5	1.349	-0.04	0.793	1.07
	LTE Band 7	20M	1	0	QPSK	Edge1	0	2	On	21350	2560	14.56	15.5	1.242	-0.05	0.647	0.803
	LTE Band 7	20M	1	0	QPSK	Bottom Face	1	2	Off	20850	2510	21.17	22	1.211	0.07	1.010	1.223
	LTE Band 7	20M	1	0	QPSK	Bottom Face	1	2	Off	21100	2535	21.36	22	1.159	0.08	1.010	1.170
	LTE Band 7	20M	1	0	QPSK	Bottom Face	1	2	Off	21350	2560	21.31	22	1.172	0.01	0.905	1.061
	LTE Band 7	20M	1	0	QPSK	Edge1	0.9	2	Off	20850	2510	21.17	22	1.211	-0.09	1.160	1.404
	LTE Band 7	20M	1	0	QPSK	Edge1	0.9	2	Off	21100	2535	21.36	22	1.159	0.07	1.180	1.367
	LTE Band 7	20M	1	0	QPSK	Edge1	0.9	2	Off	21350	2560	21.31	22	1.172	-0.02	1.180	1.383

<DTS WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Battery	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
16	WLAN 2.4GHz	802.11b 1Mbps	Bottom Face	0	1	11	2462	14.77	16	1.327	97.59	1.025	0.08	1.08	**1.469**
	WLAN 2.4GHz	802.11b 1Mbps	Bottom Face	0	1	6	2437	14.54	16	1.400	97.59	1.025	0.05	0.79	1.133
	WLAN 2.4GHz	802.11b 1Mbps	Bottom Face	0	1	1	2412	14.26	16	1.493	97.59	1.025	0.03	0.921	1.409
	WLAN 2.4GHz	802.11b 1Mbps	Bottom Face with Headset 2	0	1	11	2462	14.77	16	1.327	97.59	1.025	-0.02	0.918	1.249
	WLAN 2.4GHz	802.11b 1Mbps	Edge3	0	1	11	2462	14.77	16	1.327	97.59	1.025	0.15	0.668	0.909
	WLAN 2.4GHz	802.11b 1Mbps	Edge3	0	1	6	2437	14.54	16	1.400	97.59	1.025	0.05	0.65	0.932
	WLAN 2.4GHz	802.11b 1Mbps	Edge4	0	1	11	2462	14.77	16	1.327	97.59	1.025	0.02	0.321	0.437
	WLAN 2.4GHz	802.11b 1Mbps	Bottom Face	1	1	11	2462	14.77	16	1.327	97.59	1.025	-0.03	0.134	0.182
	WLAN 2.4GHz	802.11b 1Mbps	Bottom Face with Headset 2	1	1	11	2462	14.77	16	1.327	97.59	1.025	-0.091	0.13	0.177
	WLAN 2.4GHz	802.11b 1Mbps	Bottom Face	0	2	11	2462	14.77	16	1.327	97.59	1.025	0.07	1.03	1.401
	WLAN 2.4GHz	802.11b 1Mbps	Bottom Face	0	2	6	2437	14.54	16	1.400	97.59	1.025	-0.01	0.721	1.034
	WLAN 2.4GHz	802.11b 1Mbps	Bottom Face	0	2	1	2412	14.26	16	1.493	97.59	1.025	0.04	0.905	1.385

15.3 Repeated SAR Measurement

No.	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Gap (cm)	Battery	Power Back-off	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	GSM850	GPRS (3 Tx slots)	-	-	-	Left Cheek	-	1	On	251	848.8	27.1	28	1.230	-	-	0.07	1.140	1	1.403
2nd	GSM850	GPRS (3 Tx slots)	-	-	-	Left Cheek	-	1	On	251	848.8	27.1	28	1.230	-	-	0.07	1.110	1.026	1.366
1st	LTE Band 4	QPSK	20M	1	0	Edge1	0.9	1	Off	20300	1745	23.22	24	1.197	-	-	0.16	1.140	1	1.364
2nd	LTE Band 4	QPSK	20M	1	0	Edge1	0.9	1	Off	20300	1745	23.22	24	1.197	-	-	-0.11	1.120	1.018	1.340
1st	LTE Band 2	QPSK	20M	1	49	Edge2	0	1	Off	18700	1860	23.31	23.5	1.045	-	-	0.07	1.320	1	1.379
2nd	LTE Band 2	QPSK	20M	1	49	Edge2	0	1	Off	18700	1860	23.31	23.5	1.045	-	-	0.01	1.310	1.008	1.369
1st	LTE Band7	QPSK	20M	1	0	Edge1	0.9	1	Off	21100	2535	21.36	22	1.159	-	-	-0.1	1.190	1	1.379
2nd	LTE Band7	QPSK	20M	1	0	Edge1	0.9	1	Off	21100	2535	21.36	22	1.159	-	-	-0.05	1.170	1.017	1.356
1st	WLAN 2.4GHz	802.11b 1Mbps	-	-	-	Bottom Face	0	1	-	11	2462	14.77	16	1.327	97.59	1.025	0.08	1.080	1	1.469
2nd	WLAN 2.4GHz	802.11b 1Mbps	-	-	-	Bottom Face	0	1	-	11	2462	14.77	16	1.327	97.59	1.025	0.02	1.070	1.009	1.456

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	Head	Body
1.	GSM(Voice) + WLAN2.4GHz(data)	Yes	
2.	WCDMA(Voice) + WLAN2.4GHz(data)	Yes	
3.	GSM(Voice) + Bluetooth(data)	Yes	
4.	WCDMA((Voice) + Bluetooth(data)	Yes	
5.	GPRS/EDGE(Data) + WLAN2.4GHz(data)	Yes	Yes
6.	WCDMA(Data) + WLAN2.4GHz(data)	Yes	Yes
7.	LTE(Data) + WLAN2.4GHz(data)	Yes	Yes
8.	GPRS/EDGE(Data) + Bluetooth(data)	Yes	Yes
9.	WCDMA(Data) + Bluetooth(data)	Yes	Yes
10.	LTE(Data) + Bluetooth(data)	Yes	Yes

General Note:

1. EUT will choose each GSM, WCDMA and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
2. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
3. The Scaled SAR summation is calculated based on the same configuration and test position.
4. 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 17.2.
5. For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01v05r02 based on the formula below.
   i) (*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)]·[√f(GHz)/*x*] W/kg for *test separation distances* ≤ 50 mm; where *x* = 7.5 for 1-g SAR, and *x* = 18.75 for 10-g SAR.
   ii) When the minimum separation distance is < 5mm, the distance is used 5mm to determine SAR test exclusion.
   iii) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the *test separation distances* is > 50 mm.
   iv) Bluetooth estimated SAR is conservatively determined by 5mm separation, for all applicable exposure positions.

Bluetooth Max Power	Exposure Position	All Positions
3.5 dBm	Estimated SAR (W/kg)	0.084 W/kg

16.1 Head Accessory Exposure Conditions

<WWAN PCB + WLAN DTS>

WWAN Band		Exposure Position	WWAN PCB Max. WWAN SAR (W/kg)	WLAN DTS Max. WLAN SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
GSM	GSM850	Right Cheek	0.572	0.042	0.61		
		Right Tilted	0.481	0.046	0.53		
		Left Cheek	1.403	0.042	1.45		
		Left Tilted	0.776	0.026	0.80		
	GSM1900	Right Cheek	0.410	0.042	0.45		
		Right Tilted	0.354	0.046	0.40		
		Left Cheek	1.046	0.042	1.09		
		Left Tilted	0.753	0.026	0.78		
WCDMA	Band V	Right Cheek	0.593	0.042	0.64		
		Right Tilted	0.481	0.046	0.53		
		Left Cheek	1.367	0.042	1.41		
		Left Tilted	0.84	0.026	0.87		
	Band II	Right Cheek	0.251	0.042	0.29		
		Right Tilted	0.206	0.046	0.25		
		Left Cheek	0.603	0.042	0.65		
		Left Tilted	0.459	0.026	0.49		
LTE	Band 4	Right Cheek	0.242	0.042	0.28		
		Right Tilted	0.223	0.046	0.27		
		Left Cheek	0.668	0.042	0.71		
		Left Tilted	0.505	0.026	0.53		
	Band 2	Right Cheek	0.373	0.042	0.42		
		Right Tilted	0.318	0.046	0.36		
		Left Cheek	1.222	0.042	1.26		
		Left Tilted	0.761	0.026	0.79		
	Band 7	Right Cheek	0.429	0.042	0.47		
		Right Tilted	0.426	0.046	0.47		
		Left Cheek	0.950	0.042	0.99		
		Left Tilted	0.682	0.026	0.71		

<WWAN PCB + Bluetooth DSS>

WWAN Band		Exposure Position	WWAN PCB Max. WWAN SAR (W/kg)	Bluetooth DSS Estimated Bluetooth SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
GSM	GSM850	Right Cheek	0.572	0.084	0.66		
		Right Tilted	0.481	0.084	0.57		
		Left Cheek	1.403	0.084	1.49		
		Left Tilted	0.776	0.084	0.86		
	GSM1900	Right Cheek	0.410	0.084	0.49		
		Right Tilted	0.354	0.084	0.44		
		Left Cheek	1.046	0.084	1.13		
		Left Tilted	0.753	0.084	0.84		
WCDMA	Band V	Right Cheek	0.593	0.084	0.68		
		Right Tilted	0.481	0.084	0.57		
		Left Cheek	1.367	0.084	1.45		
		Left Tilted	0.84	0.084	0.92		
	Band II	Right Cheek	0.251	0.084	0.34		
		Right Tilted	0.206	0.084	0.29		
		Left Cheek	0.603	0.084	0.69		
		Left Tilted	0.459	0.084	0.54		
LTE	Band 4	Right Cheek	0.242	0.084	0.33		
		Right Tilted	0.223	0.084	0.31		
		Left Cheek	0.668	0.084	0.75		
		Left Tilted	0.505	0.084	0.59		
	Band 2	Right Cheek	0.373	0.084	0.46		
		Right Tilted	0.318	0.084	0.40		
		Left Cheek	1.222	0.084	1.31		
		Left Tilted	0.761	0.084	0.85		
	Band 7	Right Cheek	0.429	0.084	0.51		
		Right Tilted	0.426	0.084	0.51		
		Left Cheek	0.950	0.084	1.03		
		Left Tilted	0.682	0.084	0.77		

16.2 Body Accessory Exposure Conditions

<WWAN PCB + WLAN DTS>

WWAN Band		Exposure Position	WWAN PCB Max. WWAN SAR (W/kg)	WLAN DTS Max. WLAN SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
GSM	GSM850	Bottom Face at 1cm	0.660	0.182	0.84		
		Edge1 at 0.9cm	0.438		0.44		
		Edge2 at 0.1cm	0.512		0.51		
		Bottom Face at 0cm	1.048	1.469	**2.52**	**0.02**	**#1**
		Edge1 at 0cm	0.798		0.80		
		Edge2 at 0cm	0.295		0.30		
		Edge3 at 0cm		0.909	0.91		
		Edge4 at 0cm	0.174	0.437	0.61		
	GSM1900	Bottom Face at 1cm	1.223	0.182	1.41		
		Edge1 at 0.9cm	1.167		1.17		
		Edge2 at 0.1cm	1.369		1.37		
		Bottom Face at 0cm	1.398	1.469	**2.87**	**0.03**	**#2**
		Bottom Face at 0cm with Headset	0.904	1.249	**2.15**	**0.02**	**#9**
		Edge1 at 0cm	0.806		0.81		
		Edge2 at 0cm	0.238		0.24		
		Edge3 at 0cm		0.909	0.91		
		Edge4 at 0cm		0.437	0.44		
WCDMA	Band V	Bottom Face at 1cm	0.333	0.182	0.52		
		Edge1 at 0.9cm	0.220		0.22		
		Edge2 at 0.1cm	0.326		0.33		
		Bottom Face at 0cm	0.883	1.469	**2.35**	**0.02**	**#3**
		Edge1 at 0cm	0.725		0.73		
		Edge2 at 0cm	0.332		0.33		
		Edge3 at 0cm		0.909	0.91		
		Edge4 at 0cm		0.437	0.44		
	Band II	Bottom Face at 1cm	1.464	0.182	**1.65**	**0.01**	**#4**
		Bottom Face at 1cm with Headset	1.143	0.177	1.32		
		Edge1 at 0.9cm	1.416		1.42		
		Edge2 at 0.1cm	1.384		1.38		
		Bottom Face at 0cm	1.136	1.469	**2.61**	**0.02**	**#5**
		Edge1 at 0cm	0.639		0.64		
		Edge2 at 0cm	0.135		0.14		
		Edge3 at 0cm		0.909	0.91		
		Edge4 at 0cm		0.437	0.44		

WWAN Band		Exposure Position	WWAN PCB Max. WWAN SAR (W/kg)	WLAN DTS Max. WLAN SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
LTE	Band 4	Bottom Face at 1cm	0.921	0.182	1.10		
		Edge1 at 0.9cm	1.364		1.36		
		Edge2 at 0.1cm	1.34		1.34		
		Bottom Face at 0cm	1.14	1.469	**2.61**	**0.02**	**#6**
		Edge1 at 0cm	0.831		0.83		
		Edge2 at 0cm	0.172		0.17		
		Edge3 at 0cm		0.909	0.91		
		Edge4 at 0cm		0.437	0.44		
	Band 2	Bottom Face at 1cm	1.197	0.182	1.38		
		Edge1 at 0.9cm	1.327		1.33		
		Edge2 at 0.1cm	1.379		1.38		
		Bottom Face at 0cm	1.391	1.469	**2.86**	**0.03**	**#7**
		Bottom Face at 0cm with Headset	1.378	1.249	**2.63**	**0.02**	**#10**
		Edge1 at 0cm	1.05		1.05		
		Edge2 at 0cm	0.206		0.21		
		Edge3 at 0cm		0.909	0.91		
		Edge4 at 0cm		0.437	0.44		
	Band 7	Bottom Face at 1cm	1.259	0.182	1.44		
		Edge1 at 0.9cm	1.416		1.42		
		Edge2 at 0.1cm	0.372		0.37		
		Bottom Face at 0cm	1.295	1.469	**2.76**	**0.02**	**#8**
		Bottom Face at 0cm with Headset	1.217	1.249	**2.47**	**0.02**	**#11**
		Edge1 at 0cm	1.288		1.29		
		Edge2 at 0cm	0.089		0.09		
		Edge3 at 0cm		0.909	0.91		
		Edge4 at 0cm		0.437	0.44		

<WWAN PCB + Bluetooth DSS>

WWAN Band		Exposure Position	WWAN PCB Max. WWAN SAR (W/kg)	Bluetooth DSS Estimated Bluetooth SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
GSM	GSM850	Bottom Face at 1cm	0.660	0.084	0.74		
		Edge1 at 0.9cm	0.438	0.084	0.52		
		Edge2 at 0.1cm	0.512	0.084	0.60		
		Bottom Face at 0cm	1.048	0.084	1.13		
		Edge1 at 0cm	0.798	0.084	0.88		
		Edge2 at 0cm	0.295	0.084	0.38		
		Edge3 at 0cm		0.084	0.08		
		Edge4 at 0cm	0.174	0.084	0.26		
	GSM1900	Bottom Face at 1cm	1.223	0.084	1.31		
		Edge1 at 0.9cm	1.167	0.084	1.25		
		Edge2 at 0.1cm	1.369	0.084	1.45		
		Bottom Face at 0cm	1.398	0.084	1.48		
		Bottom Face at 0cm with Headset	0.904	0.084	0.99		
		Edge1 at 0cm	0.806	0.084	0.89		
		Edge2 at 0cm	0.238	0.084	0.32		
		Edge3 at 0cm		0.084	0.08		
		Edge4 at 0cm		0.084	0.08		
WCDMA	Band V	Bottom Face at 1cm	0.333	0.084	0.42		
		Edge1 at 0.9cm	0.220	0.084	0.30		
		Edge2 at 0.1cm	0.326	0.084	0.41		
		Bottom Face at 0cm	0.883	0.084	0.97		
		Edge1 at 0cm	0.725	0.084	0.81		
		Edge2 at 0cm	0.332	0.084	0.42		
		Edge3 at 0cm		0.084	0.08		
		Edge4 at 0cm		0.084	0.08		
	Band II	Bottom Face at 1cm	1.464	0.084	**1.55**		
		Bottom Face at 1cm with Headset	1.143	0.084	1.23		
		Edge1 at 0.9cm	1.416	0.084	1.50		
		Edge2 at 0.1cm	1.384	0.084	1.47		
		Bottom Face at 0cm	1.136	0.084	1.22		
		Edge1 at 0cm	0.639	0.084	0.72		
		Edge2 at 0cm	0.135	0.084	0.22		
		Edge3 at 0cm		0.084	0.08		
		Edge4 at 0cm		0.084	0.08		

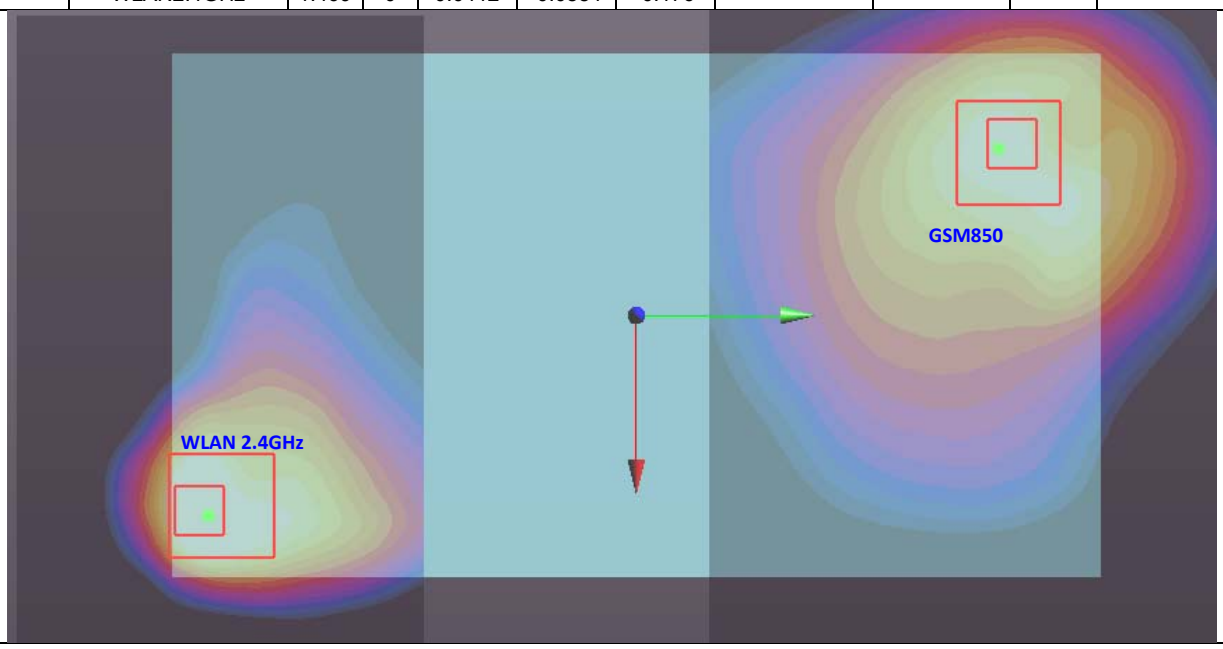
WWAN Band		Exposure Position	WWAN PCB Max. WWAN SAR (W/kg)	Bluetooth DSS Estimated Bluetooth SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
LTE	Band 4	Bottom Face at 1cm	0.921	0.084	1.01		
		Edge1 at 0.9cm	1.364	0.084	1.45		
		Edge2 at 0.1cm	1.34	0.084	1.42		
		Bottom Face at 0cm	1.14	0.084	1.22		
		Edge1 at 0cm	0.831	0.084	0.92		
		Edge2 at 0cm	0.172	0.084	0.26		
		Edge3 at 0cm		0.084	0.08		
		Edge4 at 0cm		0.084	0.08		
	Band 2	Bottom Face at 1cm	1.197	0.084	1.28		
		Edge1 at 0.9cm	1.327	0.084	1.41		
		Edge2 at 0.1cm	1.379	0.084	1.46		
		Bottom Face at 0cm	1.391	0.084	1.48		
		Bottom Face at 0cm with Headset	1.378	0.084	1.46		
		Edge1 at 0cm	1.05	0.084	1.13		
		Edge2 at 0cm	0.206	0.084	0.29		
		Edge3 at 0cm		0.084	0.08		
		Edge4 at 0cm		0.084	0.08		
	Band 7	Bottom Face at 1cm	1.259	0.084	1.34		
		Edge1 at 0.9cm	1.416	0.084	1.50		
		Edge2 at 0.1cm	0.372	0.084	0.46		
		Bottom Face at 0cm	1.295	0.084	1.38		
		Bottom Face at 0cm with Headset	1.217	0.084	1.30		
		Edge1 at 0cm	1.288	0.084	1.37		
		Edge2 at 0cm	0.089	0.084	0.17		
		Edge3 at 0cm		0.084	0.08		
		Edge4 at 0cm		0.084	0.08		

16.3 SPLSR Evaluation and Analysis

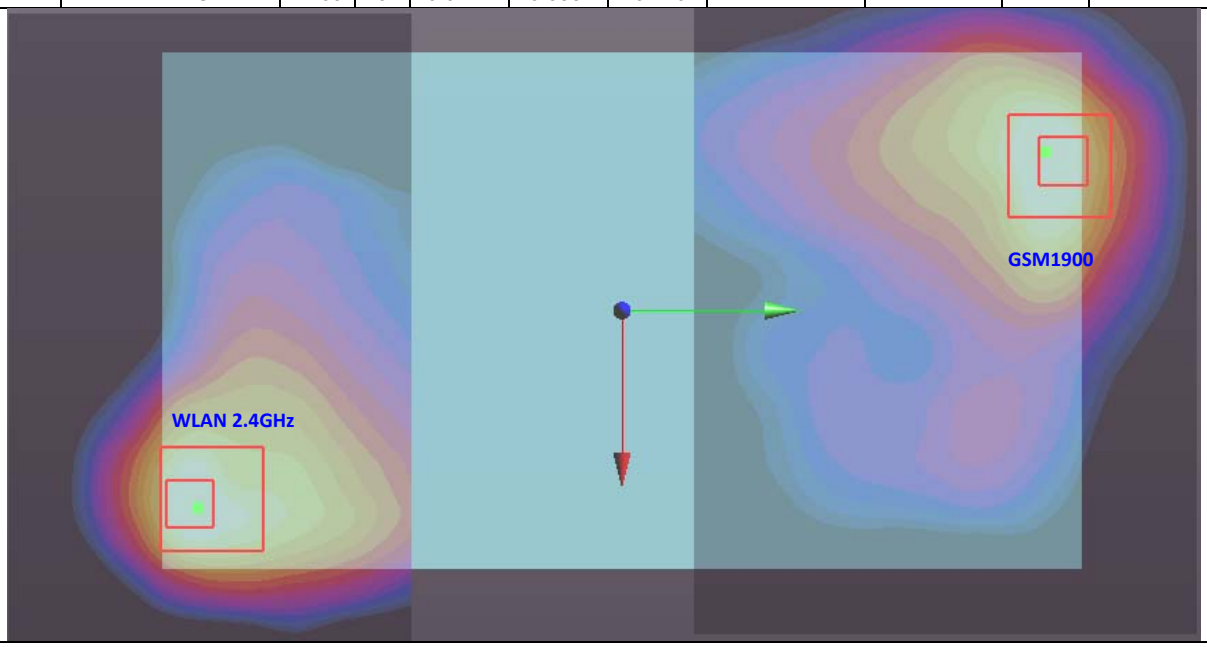
General Note:

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

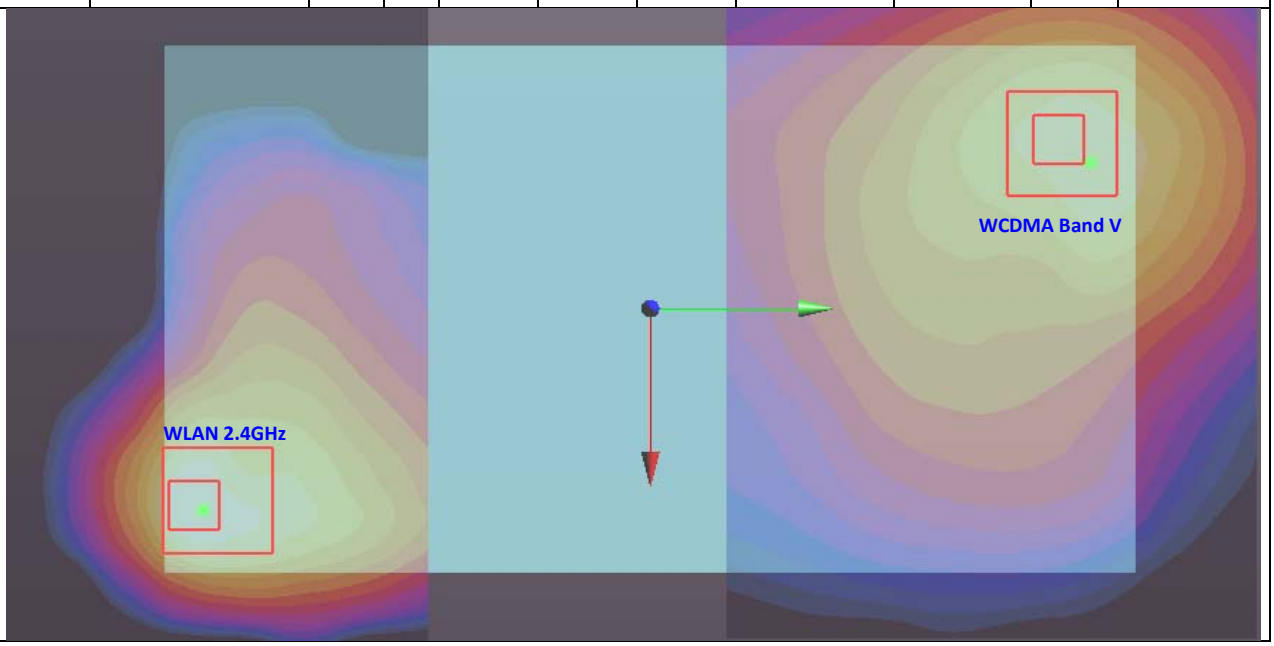
Case No #1 Position	Band	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
				X	Y	Z				
Bottom Face	GSM850	1.048	0	-0.0345	0.075	-0.179	180.1	2.52	0.02	Not required
	WLAN2.4GHz	1.469	0	0.0412	-0.0884	-0.176				



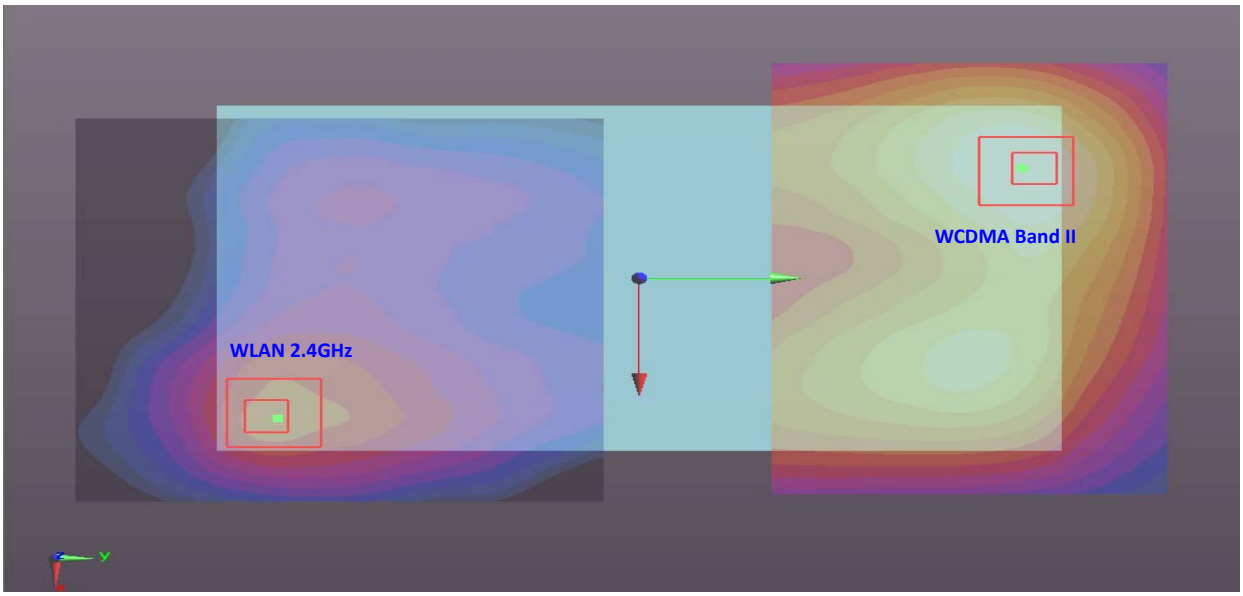
Case No #2 Position	Band	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
				X	Y	Z				
Bottom Face	GSM1900	1.398	0	-0.033	0.0885	-0.179	191.9	2.87	0.03	Not required
	WLAN2.4GHz	1.469	0	0.0412	-0.0884	-0.176				



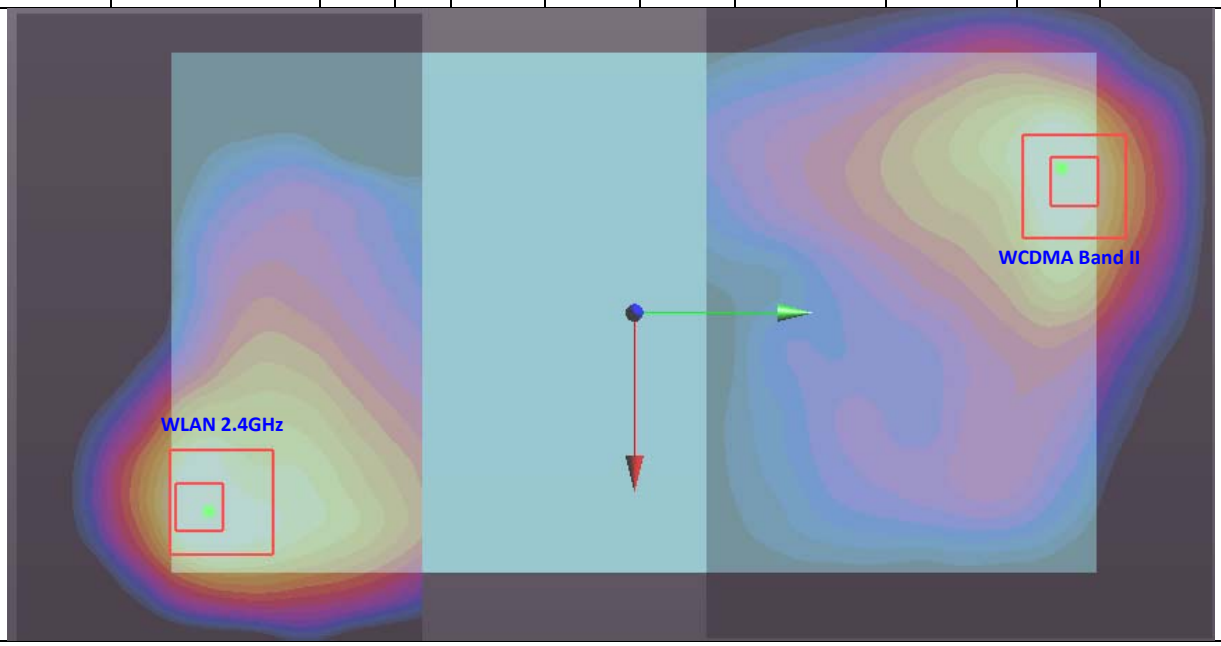
Case No #3	Band	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
Position				X	Y	Z				
Bottom Face	WCDMA Band V	0.883	0	-0.038	0.095	-0.178	199.8	2.35	0.02	Not required
	WLAN2.4GHz	1.469	0	0.0412	-0.0884	-0.176				



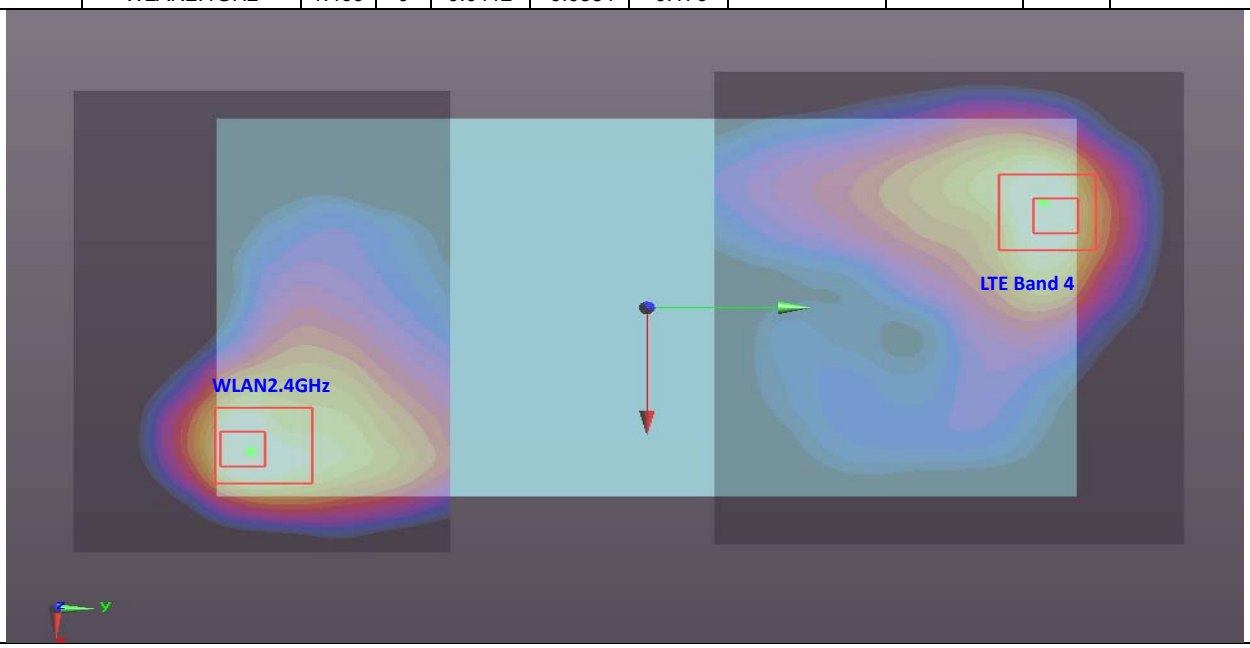
Case No #4	Band	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
Position				X	Y	Z				
Bottom Face	WCDMA Band II	1.464	1	-0.0345	0.087	-0.179	186.3	1.65	0.01	Not required
	WLAN2.4GHz	0.182	1	0.044	-0.082	-0.179				



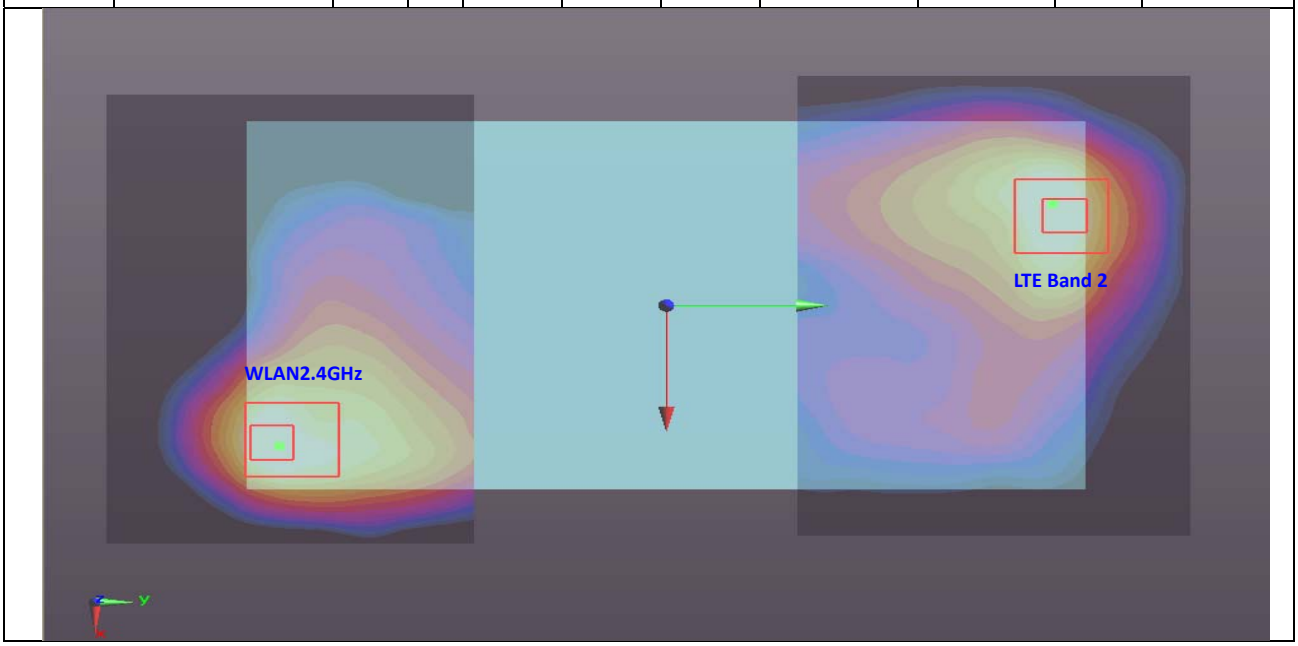
Case No #5 Position	Band	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
				X	Y	Z				
Bottom Face	WCDMA Band II	1.136	0	-0.03	0.0885	-0.178	190.7	2.61	0.02	Not required
	WLAN2.4GHz	1.469	0	0.0412	-0.0884	-0.176				



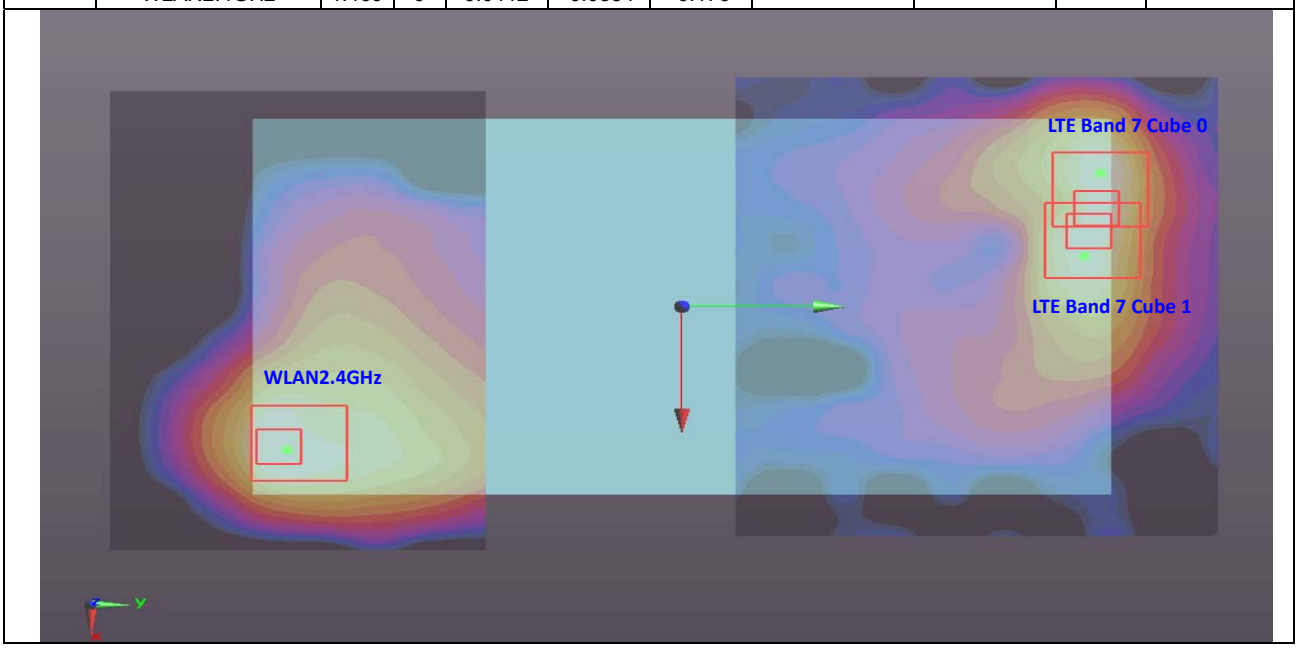
Case No #6 Position	Band	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
				X	Y	Z				
Bottom Face	LTE Band 4	1.14	0	-0.03	0.0885	-0.179	190.7	2.61	0.02	Not required
	WLAN2.4GHz	1.469	0	0.0412	-0.0884	-0.176				



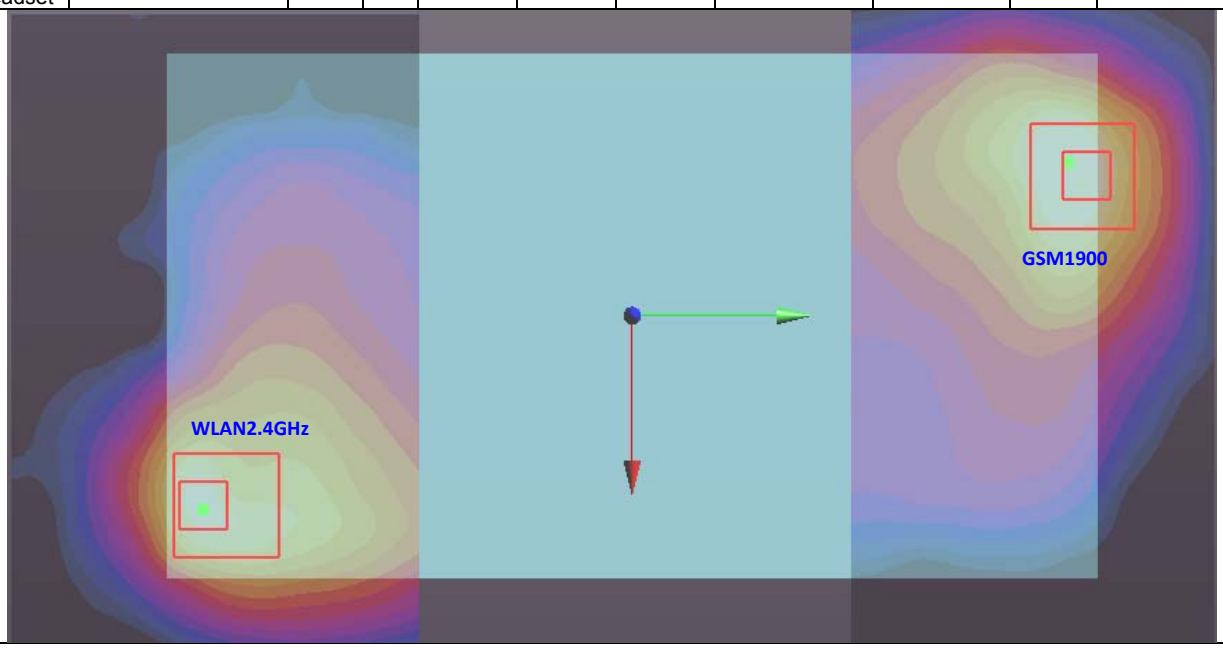
Case No #7 Position	Band	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
				X	Y	Z				
Bottom Face	LTE Band 2	1.391	0	-0.03	0.0885	-0.179	190.7	2.86	0.03	Not required
	WLAN2.4GHz	1.469	0	0.0412	-0.0884	-0.176				



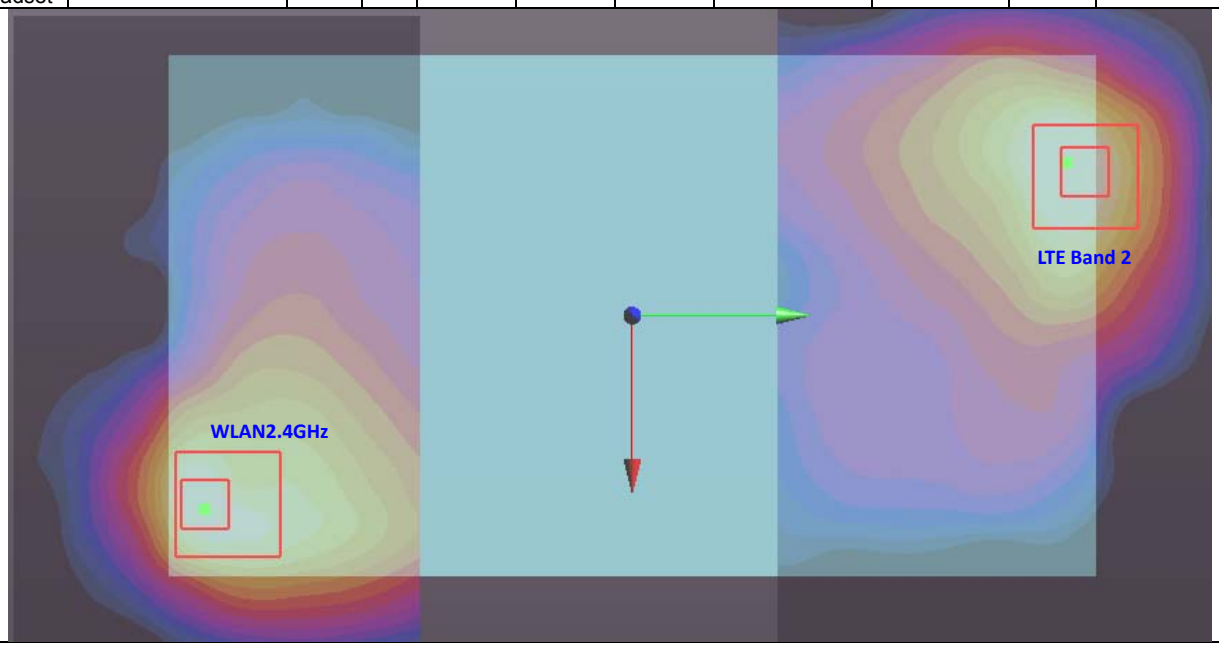
Case No #8 Position	Band	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
				X	Y	Z				
Bottom Face	LTE Band 7 Cube 0	1.295	0	-0.0384	0.0936	-0.178	198.7	2.76	0.02	Not required
	WLAN2.4GHz	1.469	0	0.0412	-0.0884	-0.176				
	LTE Band 7 Cube 1	1.248	0	-0.0194	0.09	-0.179	188.4	2.72	0.02	Not required
	WLAN2.4GHz	1.469	0	0.0412	-0.0884	-0.176				



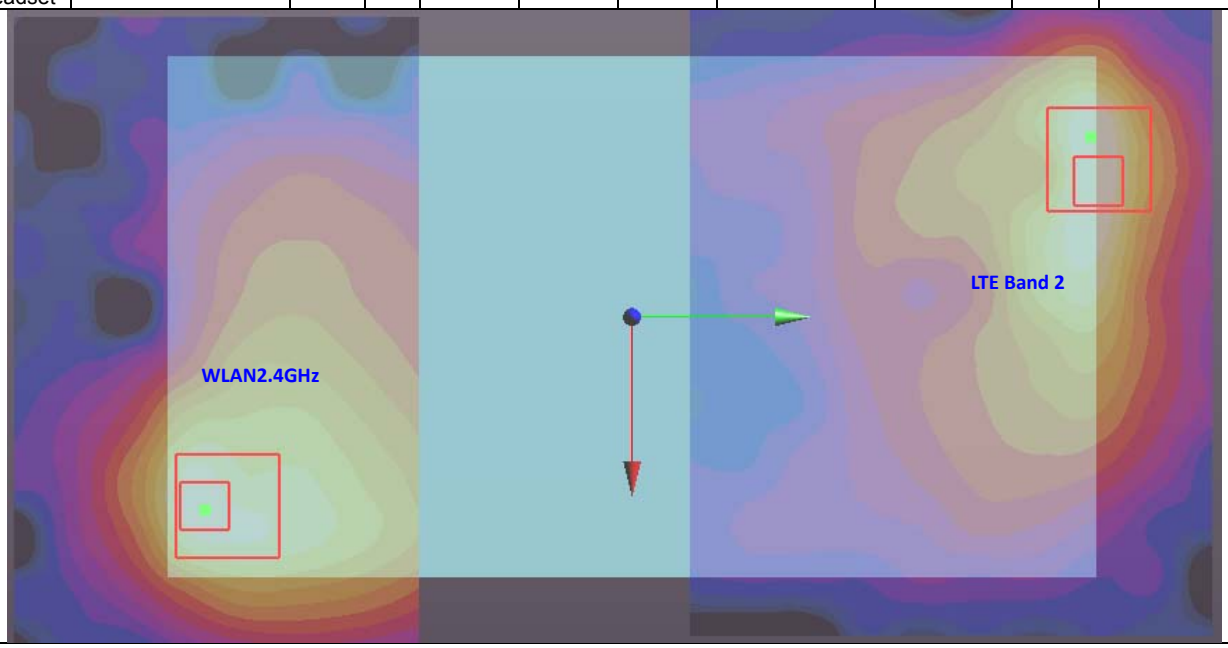
Case No #9 Position	Band	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
				X	Y	Z				
Bottom Face with Headset	GSM1900	0.904	0	-0.0315	0.0965	-0.179	198.2	2.15	0.02	Not required
	WLAN2.4GHz	1.249	0	0.04	-0.0884	-0.179				



Case No #10 Position	Band	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
				X	Y	Z				
Bottom Face with Headset	LTE Band 2	1.378	0	-0.0315	0.09	-0.179	192.2	2.63	0.02	Not required
	WLAN2.4GHz	1.249	0	0.04	-0.0884	-0.179				



Case No #11 Position	Band	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
				X	Y	Z				
Bottom Face with Headset	LTE Band 7	1.217	0	-0.0222	0.0948	-0.179	193.5	2.47	0.02	Not required
	WLAN2.4GHz	1.249	0	0.04	-0.0884	-0.179				



Test Engineer： Fulu Hu

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)]	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

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

(b) κ is the coverage factor

Table 17.1. 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 17.2. 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 248227 D01 v02r01, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Jun 2015.

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

[7] FCC KDB 941225 D01 v03, “3G SAR MEAUREMENT PROCEDURES”, Oct 2014

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

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

[10] FCC KDB 648474 D04 v01r02, “SAR Evaluation Considerations for Wireless Handsets”, Dec 2013.

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

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