FCC SAR Test Report

APPLICANT	:	VERTU Corporation Limited
EQUIPMENT	:	Cellular Telephone
BRAND NAME	:	VERTU
MODEL NAME	:	ASTER T
TYPE	:	VM-01T
FCC ID	:	P7QVM-01T
STANDARD	:	FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2003

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

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

Reviewed by: Eric Huang / Deputy Manager

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA492650	Rev. 01	Initial issue of report	Dec. 03, 2014

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **VERTU Corporation Limited, Cellular Telephone, ASTER T** are as follows.

Equipment Class	Frequency Band	Highest SAR Summary			
		Head (Separation 0mm) 1g SAR (W/kg)	Body-worn (Separation 10mm) 1g SAR (W/kg)	Wireless Router (Separation 10mm) 1g SAR (W/kg)	Highest Simultaneous Transmission 1g SAR (W/kg)
PCE	GSM850	0.24	0.49	0.49	1.47
	GSM1900	0.45	0.60	0.60	
	WCDMA Band V	0.29	0.49	0.52	
	WCDMA Band IV	0.57	0.65	0.65	
	WCDMA Band II	0.60	0.93	0.93	
	LTE Band 5	0.27	0.53	0.53	
	LTE Band 4	0.59	0.67	0.67	
	LTE Band 2	0.53	0.70	0.70	
	LTE Band 25	0.53	0.57	0.57	
	LTE Band 7	**0.62**	**1.19**	**1.19**	
	LTE Band 38	0.52	0.96	0.96	
	LTE Band 41	0.48	0.85	0.85	
DTS	2.4GHz WLAN	0.44	0.16	0.16	1.35
NII	5.2GHz WLAN	0.38	0.28		1.47
	5.3GHz WLAN	0.28	0.14		
	5.5GHz WLAN	0.47	0.26		
	5.8GHz WLAN	0.28	0.21		
DSS	Bluetooth	0.04	0.01	0.01	1.20
Date of Testing:		11/05/2014 ~ 11/17/2014			

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2003.

2. Administration Data

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

Applicant	
Company Name	VERTU Corporation Limited
Address	Beacon Hill Road, Church Crookham, Hampshire GU52 8DY, United Kingdom

Manufacturer	
Company Name	VERTU Corporation Limited
Address	Beacon Hill Road, Church Crookham, Hampshire GU52 8DY, United Kingdom

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 SAR meas for 802 11abg v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03
- FCC KDB 941225 D05 SAR for LTE Devices v02r03
- FCC KDB 941225 D06 Hotspot Mode SAR v01r01

4. Equipment Under Test (EUT)

4.1 General Information

Product Feature & Specification	
Equipment Name	Cellular Telephone
Brand Name	VERTU
Model Name	ASTER T
Type	VM-01T
FCC ID	P7QVM-01T
IMEI Code	355398060000089
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 IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 25: 1850.7 MHz ~ 1914.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 38: 2572.5 MHz ~ 2617.5 MHz LTE Band 41: 2498.5 MHz ~ 2687.5 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Mode	・GSM/GPRS/EGPRS ・AMR / RMC 12.2Kbps ・HSDPA ・HSUPA ・DC-HSDPA ・LTE: QPSK, 16QAM ・802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80 ・Bluetooth v3.0+EDR，Bluetooth v4.0-LE ・NFC:ASK
HW Version	F2
GSM / (E)GPRS Dual Transfer mode	Class A – EUT can support Packet Switched and Circuit Switched Network simultaneously.
EUT Stage	Identical Prototype
Remark: 1. This device supported VoIP in EGPRS, WCDMA, LTE (e.g. 3rd party VoIP). 2. This device supports GRPS/EGPRS mode up to multi-slot class33 and supports DTM up to multi-slot class11.	

4.2 Maximum Tune-up Limit

Mode		Burst average power(dBm)	
		GSM 850	GSM 1900
GSM (GMSK, 1 Tx slot)		33.50	30.50
GPRS/EDGE (GMSK, 1 Tx slot)		33.50	30.50
GPRS/EDGE (GMSK, 2 Tx slots)		30.50	27.50
GPRS/EDGE (GMSK, 3 Tx slots)		28.00	25.50
GPRS/EDGE (GMSK, 4 Tx slots)		27.50	24.00
EDGE (8PSK, 1 Tx slot)		27.50	26.00
EDGE (8PSK, 2 Tx slots)		27.50	26.00
EDGE (8PSK, 3 Tx slots)		27.50	26.00
EDGE (8PSK, 4 Tx slots)		27.50	26.00
DTM 5	GSM (GMSK, 1 Tx slot)	30.50	27.50
	GPRS (GMSK, 1 Tx slot)	30.50	27.50
DTM 9	GSM (GMSK, 1 Tx slot)	30.50	27.50
	GPRS (GMSK, 1 Tx slot)	30.50	27.50
DTM 11	GSM (GMSK, 1 Tx slot)	28.00	25.50
	GPRS (GMSK, 2 Tx slots)	28.00	25.50
DTM 5	GSM (GMSK, 1 Tx slot)	30.50	27.50
	EDGE (8PSK, 1 Tx slot)	27.50	26.00
DTM 9	GSM (GMSK, 1 Tx slot)	30.50	27.50
	EDGE (8PSK, 1 Tx slot)	27.50	26.00
DTM 11	GSM (GMSK, 1 Tx slot)	28.00	25.50
	EDGE (8PSK, 2 Tx slots)	27.50	26.00

Mode	Average power(dBm)		
	WCDMA Band V	WCDMA Band II	WCDMA Band IV
RMC / AMR 12.2Kbps	24.00	24.00	24.00
HSDPA Subtest-1	23.00	23.00	23.00
DC-HSDPA Subtest-1	23.00	23.00	23.00
HSUPA Subtest-5	23.00	23.00	23.00

LTE Band 5				
Modulation	BW (MHz)	RB size	MPR	Average Power(dBm)
QPSK	10	≤ 12	0	24.00
QPSK	10	> 12	1	23.00
16QAM	10	≤ 12	1	23.00
16QAM	10	> 12	2	22.00
QPSK	5	≤ 8	0	24.00
QPSK	5	> 8	1	23.00
16QAM	5	≤ 8	1	23.00
16QAM	5	> 8	2	22.00
QPSK	3	≤ 4	0	24.00
QPSK	3	> 4	1	23.00
16QAM	3	≤ 4	1	23.00
16QAM	3	> 4	2	22.00
QPSK	1.4	≤ 5	0	24.00
QPSK	1.4	> 5	1	23.00
16QAM	1.4	≤ 5	1	23.00
16QAM	1.4	> 5	2	22.00

LTE Band 4				
Modulation	BW (MHz)	RB size	MPR	Average Power(dBm)
QPSK	20	≤ 18	0	24.00
QPSK	20	> 18	1	23.00
16QAM	20	≤ 18	1	23.00
16QAM	20	> 18	2	22.00
QPSK	15	≤ 16	0	24.00
QPSK	15	> 16	1	23.00
16QAM	15	≤ 16	1	23.00
16QAM	15	> 16	2	22.00
QPSK	10	≤ 12	0	24.00
QPSK	10	> 12	1	23.00
16QAM	10	≤ 12	1	23.00
16QAM	10	> 12	2	22.00
QPSK	5	≤ 8	0	24.00
QPSK	5	> 8	1	23.00
16QAM	5	≤ 8	1	23.00
16QAM	5	> 8	2	22.00
QPSK	3	≤ 4	0	24.00
QPSK	3	> 4	1	23.00
16QAM	3	≤ 4	1	23.00
16QAM	3	> 4	2	22.00
QPSK	1.4	≤ 5	0	24.00
QPSK	1.4	> 5	1	23.00
16QAM	1.4	≤ 5	1	23.00
16QAM	1.4	> 5	2	22.00

LTE Band 2				
Modulation	BW (MHz)	RB size	MPR	Average Power(dBm)
QPSK	20	≤ 18	0	24.00
QPSK	20	> 18	1	23.00
16QAM	20	≤ 18	1	23.00
16QAM	20	> 18	2	22.00
QPSK	15	≤ 16	0	24.00
QPSK	15	> 16	1	23.00
16QAM	15	≤ 16	1	23.00
16QAM	15	> 16	2	22.00
QPSK	10	≤ 12	0	24.00
QPSK	10	> 12	1	23.00
16QAM	10	≤ 12	1	23.00
16QAM	10	> 12	2	22.00
QPSK	5	≤ 8	0	24.00
QPSK	5	> 8	1	23.00
16QAM	5	≤ 8	1	23.00
16QAM	5	> 8	2	22.00
QPSK	3	≤ 4	0	24.00
QPSK	3	> 4	1	23.00
16QAM	3	≤ 4	1	23.00
16QAM	3	> 4	2	22.00
QPSK	1.4	≤ 5	0	24.00
QPSK	1.4	> 5	1	23.00
16QAM	1.4	≤ 5	1	23.00
16QAM	1.4	> 5	2	22.00

LTE Band 25				
Modulation	BW (MHz)	RB size	MPR	Average Power(dBm)
QPSK	20	≤ 18	0	24.00
QPSK	20	> 18	1	23.00
16QAM	20	≤ 18	1	23.00
16QAM	20	> 18	2	22.00
QPSK	15	≤ 16	0	24.00
QPSK	15	> 16	1	23.00
16QAM	15	≤ 16	1	23.00
16QAM	15	> 16	2	22.00
QPSK	10	≤ 12	0	24.00
QPSK	10	> 12	1	23.00
16QAM	10	≤ 12	1	23.00
16QAM	10	> 12	2	22.00
QPSK	5	≤ 8	0	24.00
QPSK	5	> 8	1	23.00
16QAM	5	≤ 8	1	23.00
16QAM	5	> 8	2	22.00
QPSK	3	≤ 4	0	24.00
QPSK	3	> 4	1	23.00
16QAM	3	≤ 4	1	23.00
16QAM	3	> 4	2	22.00
QPSK	1.4	≤ 5	0	24.00
QPSK	1.4	> 5	1	23.00
16QAM	1.4	≤ 5	1	23.00
16QAM	1.4	> 5	2	22.00

LTE Band 7				
Modulation	BW (MHz)	RB size	MPR	Average Power(dBm)
QPSK	20	≤ 18	0	24.00
QPSK	20	> 18	1	23.00
16QAM	20	≤ 18	1	23.00
16QAM	20	> 18	2	22.00
QPSK	15	≤ 16	0	24.00
QPSK	15	> 16	1	23.00
16QAM	15	≤ 16	1	23.00
16QAM	15	> 16	2	22.00
QPSK	10	≤ 12	0	24.00
QPSK	10	> 12	1	23.00
16QAM	10	≤ 12	1	23.00
16QAM	10	> 12	2	22.00
QPSK	5	≤ 8	0	24.00
QPSK	5	> 8	1	23.00
16QAM	5	≤ 8	1	23.00
16QAM	5	> 8	2	22.00

LTE Band 38				
Modulation	BW (MHz)	RB size	MPR	Average Power(dBm)
QPSK	20	≤ 18	0	24.00
QPSK	20	> 18	1	23.00
16QAM	20	≤ 18	1	23.00
16QAM	20	> 18	2	22.00
QPSK	15	≤ 16	0	24.00
QPSK	15	> 16	1	23.00
16QAM	15	≤ 16	1	23.00
16QAM	15	> 16	2	22.00
QPSK	10	≤ 12	0	24.00
QPSK	10	> 12	1	23.00
16QAM	10	≤ 12	1	23.00
16QAM	10	> 12	2	22.00
QPSK	5	≤ 8	0	24.00
QPSK	5	> 8	1	23.00
16QAM	5	≤ 8	1	23.00
16QAM	5	> 8	2	22.00

LTE Band 41				
Modulation	BW (MHz)	RB size	MPR	Average Power(dBm)
QPSK	20	≤ 18	0	24.00
QPSK	20	> 18	1	23.00
16QAM	20	≤ 18	1	23.00
16QAM	20	> 18	2	22.00
QPSK	15	≤ 16	0	24.00
QPSK	15	> 16	1	23.00
16QAM	15	≤ 16	1	23.00
16QAM	15	> 16	2	22.00
QPSK	10	≤ 12	0	24.00
QPSK	10	> 12	1	23.00
16QAM	10	≤ 12	1	23.00
16QAM	10	> 12	2	22.00
QPSK	5	≤ 8	0	24.00
QPSK	5	> 8	1	23.00
16QAM	5	≤ 8	1	23.00
16QAM	5	> 8	2	22.00

Band / Frequency (MHz)	IEEE 802.11 Average Power (dBm)					
	11b	11g	HT20	HT40	VTH20	VTH40
2.4GHz Band	17	14	10.5	10.5	10.5	10.5

Band / Frequency (MHz)	IEEE 802.11 Average Power (dBm)					
	11a	HT20	HT40	VHT20	VHT40	VHT80
5.2GHz Band	13.5	11.5	10.5	9	9	9
5.3GHz Band						
5.5GHz Band						
5.8GHz Band		10.5				

Band / Mode	Average Power (dBm)	
	v3.0+EDR	v4.0+LE
Bluetooth	9	2

4.3 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r03	
FCC ID	P7QVM-01T
Equipment Name	Cellular Telephone
Operating Frequency Range of each LTE transmission band	LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 25: 1850.7 MHz ~ 1914.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 38: 2572.5 MHz ~ 2617.5 MHz LTE Band 41: 2498.5 MHz ~ 2687.5 MHz
Channel Bandwidth	LTE Band 5: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 4: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 2: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 25: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz
Release and category	Rel8, cat4
uplink modulations used	QPSK, and 16QAM
LTE Voice / Data requirements	Data only
LTE MPR permanently built-in by design	Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.

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

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

LTE Band 5

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

LTE Band 4

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

LTE Band 2

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

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

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

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

LTE Band 41								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	39675	2498.5	39700	2501	39725	2503.5	39750	2506
LM	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5
M	40620	2593	40620	2590	40620	2593	40620	2593
HM	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5
H	41565	2687.5	41540	2685	41515	2682.5	41490	2680

5. RF Exposure Limits

5.1 Uncontrolled Environment

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

5.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

6. Specific Absorption Rate (SAR)

6.1 Introduction

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

6.2 SAR Definition

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

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

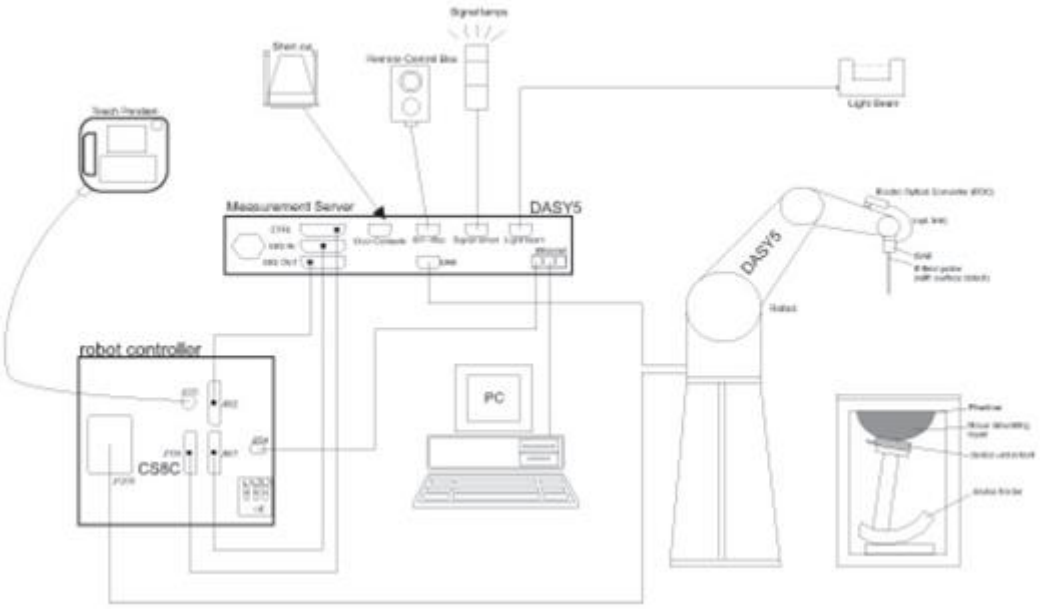
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

7. System Description and Setup

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



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

8. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

8.1 Spatial Peak SAR Evaluation

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

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

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

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

8.2 Power Reference Measurement

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

8.3 Area Scan

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

Area scan parameters extracted from FCC KDB 865664 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.	

8.4 Zoom Scan

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

Zoom scan parameters extracted from FCC KDB 865664 D01v01r03 SAR measurement 100 MHz to 6 GHz.

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

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

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

8.5 Volume Scan Procedures

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

8.6 Power Drift Monitoring

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

9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	835MHz System Validation Kit	D835V2	499	Mar. 24, 2014	Mar. 23, 2015
SPEAG	1750MHz System Validation Kit	D1750V2	1068	Nov. 27, 2013	Nov. 26, 2014
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Mar. 21, 2014	Mar. 20, 2015
SPEAG	2450MHz System Validation Kit	D2450V2	869	Jun. 13, 2014	Jun. 12, 2015
SPEAG	2600MHz System Validation Kit	D2600V2	1008	Aug. 21, 2014	Aug. 20, 2015
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Sep. 25, 2014	Sep. 24, 2015
SPEAG	Data Acquisition Electronics	DAE4	911	Feb. 25, 2014	Feb. 24, 2015
SPEAG	Data Acquisition Electronics	DAE4	1388	Sep. 24, 2014	Sep. 23, 2015
SPEAG	Dosimetric E-Field Probe	EX3DV4	3697	Sep. 29, 2014	Sep. 28, 2015
SPEAG	Dosimetric E-Field Probe	EX3DV4	3578	Jun. 24, 2014	Jun. 23, 2015
Wisewind	Thermometer	ETP-101	TM560	Oct. 21, 2014	Oct. 20, 2015
Wisewind	Thermometer	ETP-101	TM685	Oct. 21, 2014	Oct. 20, 2015
Anritsu	Radio Communication Analyzer	MT8820C	6201074414	Feb. 11, 2014	Feb. 10, 2015
Agilent	Wireless Communication Test Set	E5515C	MY50266977	May. 27, 2014	May. 26, 2015
SPEAG	Device Holder	N/A	N/A	NCR	NCR
R&S	Signal Generator	SMU200A	102502	Jul. 07, 2014	Jul. 06, 2015
SPEAG	Dielectric Probe Kit	DAKS-3.5	0004	Mar. 04, 2014	Mar. 03, 2015
Agilent	ENA Network Analyzer	E5071C	MY46316648	Feb. 07, 2014	Feb. 06, 2015
Anritsu	Power Meter	ML2495A	1036004	Aug. 09, 2014	Aug. 08, 2015
Anritsu	Power Sensor	MA2411B	1027253	Aug. 11, 2014	Aug. 10, 2015
R&S	Spectrum Analyzer	FSP 7	101131	Jul. 10, 2014	Jul. 09, 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.

10. System Verification

10.1 Tissue Verification

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

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

Simulating Liquid for 5GHz, Manufactured by SPEAG

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

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
835	HSL	22.2	0.906	42.904	0.90	41.50	0.67	3.38	±5	2014/11/17
835	MSL	22.8	0.973	54.841	0.97	55.20	0.31	-0.65	±5	2014/11/12
1750	HSL	22.4	1.402	40.810	1.37	40.10	2.34	1.77	±5	2014/11/16
1750	MSL	22.5	1.518	51.047	1.49	53.40	1.88	-4.41	±5	2014/11/11
1900	HSL	22.6	1.427	38.337	1.40	40.00	1.93	-4.16	±5	2014/11/15
1900	MSL	22.3	1.534	51.496	1.52	53.30	0.92	-3.38	±5	2014/11/9
2450	HSL	22.7	1.840	38.700	1.80	39.20	2.22	-1.28	±5	2014/11/5
2450	MSL	22.4	1.930	53.600	1.95	52.70	-1.03	1.71	±5	2014/11/5
2600	HSL	22.7	1.980	38.479	1.96	39.00	1.02	-1.34	±5	2014/11/14
2600	MSL	22.6	2.201	52.823	2.16	52.50	1.90	0.62	±5	2014/11/6
2600	MSL	22.2	2.215	51.228	2.16	52.50	2.55	-2.42	±5	2014/11/7
5200	HSL	22.5	4.790	35.500	4.66	36.00	2.79	-1.39	±5	2014/11/6
5200	MSL	22.5	5.240	47.500	5.30	49.00	-1.13	-3.06	±5	2014/11/8
5300	HSL	22.5	4.900	35.400	4.76	35.90	2.94	-1.39	±5	2014/11/6
5300	MSL	22.3	5.380	47.200	5.42	48.90	-0.74	-3.48	±5	2014/11/10
5600	HSL	22.5	5.200	34.800	5.07	35.50	2.56	-1.97	±5	2014/11/6
5600	MSL	22.3	5.850	47.700	5.77	48.50	1.39	-1.65	±5	2014/11/10
5800	HSL	22.5	5.420	34.300	5.27	35.30	2.85	-2.83	±5	2014/11/7
5800	MSL	22.3	6.110	47.400	6.00	48.20	1.83	-1.66	±5	2014/11/10

10.2 System Performance Check Results

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

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2014/11/17	835	HSL	250	D835V2-499	EX3DV4 - SN3578	DAE4 Sn911	2.37	9.13	9.48	3.83
2014/11/12	835	MSL	250	D835V2-499	EX3DV4 - SN3578	DAE4 Sn911	2.50	9.46	10.00	5.71
2014/11/16	1750	HSL	250	D1750V2-1068	EX3DV4 - SN3578	DAE4 Sn911	8.82	37.30	35.28	-5.42
2014/11/11	1750	MSL	250	D1750V2-1068	EX3DV4 - SN3578	DAE4 Sn911	9.07	37.50	36.28	-3.25
2014/11/15	1900	HSL	250	D1900V2-5d041	EX3DV4 - SN3578	DAE4 Sn911	9.66	41.00	38.64	-5.76
2014/11/9	1900	MSL	250	D1900V2-5d041	EX3DV4 - SN3578	DAE4 Sn911	10.30	41.00	41.20	0.49
2014/11/5	2450	HSL	250	D2450V2-869	EX3DV4 - SN3697	DAE4 Sn1388	13.70	52.80	54.80	3.79
2014/11/5	2450	MSL	250	D2450V2-869	EX3DV4 - SN3697	DAE4 Sn1388	12.60	50.30	50.40	0.20
2014/11/14	2600	HSL	250	D2600V2-1008	EX3DV4 - SN3578	DAE4 Sn911	14.40	57.10	57.60	0.88
2014/11/6	2600	MSL	250	D2600V2-1008	EX3DV4 - SN3578	DAE4 Sn911	14.10	55.30	56.40	1.99
2014/11/7	2600	MSL	250	D2600V2-1008	EX3DV4 - SN3578	DAE4 Sn911	14.00	55.30	56.00	1.27
2014/11/6	5200	HSL	100	D5GHzV2-1006	EX3DV4 - SN3697	DAE4 Sn1388	7.51	81.10	75.10	-7.40
2014/11/8	5200	MSL	100	D5GHzV2-1006	EX3DV4 - SN3697	DAE4 Sn1388	7.23	77.50	72.30	-6.71
2014/11/6	5300	HSL	100	D5GHzV2-1006	EX3DV4 - SN3697	DAE4 Sn1388	8.68	86.60	86.80	0.23
2014/11/10	5300	MSL	100	D5GHzV2-1006	EX3DV4 - SN3697	DAE4 Sn1388	8.12	80.00	81.20	1.50
2014/11/6	5600	HSL	100	D5GHzV2-1006	EX3DV4 - SN3697	DAE4 Sn1388	8.65	85.80	86.50	0.82
2014/11/10	5600	MSL	100	D5GHzV2-1006	EX3DV4 - SN3697	DAE4 Sn1388	8.17	85.20	81.70	-4.11
2014/11/7	5800	HSL	100	D5GHzV2-1006	EX3DV4 - SN3697	DAE4 Sn1388	8.83	82.90	88.30	6.51
2014/11/10	5800	MSL	100	D5GHzV2-1006	EX3DV4 - SN3697	DAE4 Sn1388	8.03	78.40	80.30	2.42

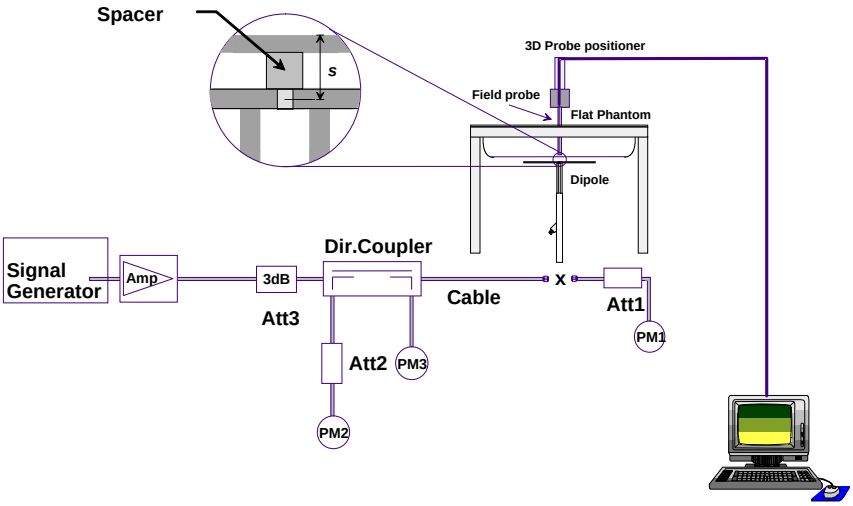


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

11. RF Exposure Positions

11.1 Ear and handset reference point

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

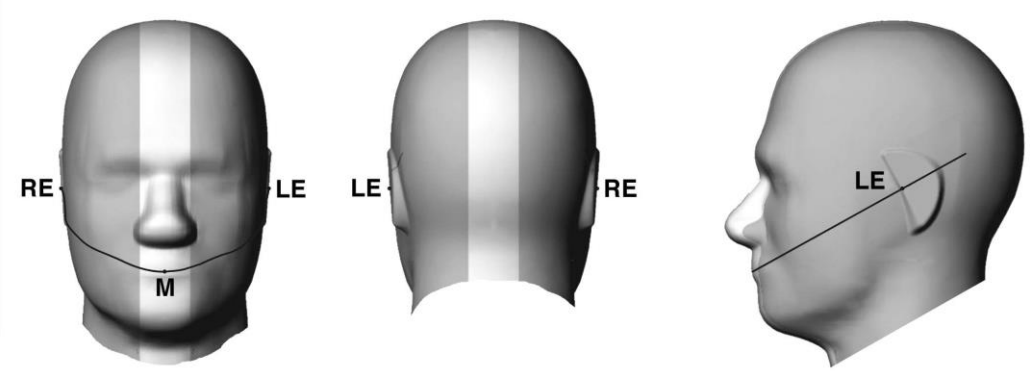


Fig 9.1.1 Front, back, and side views of SAM twin phantom

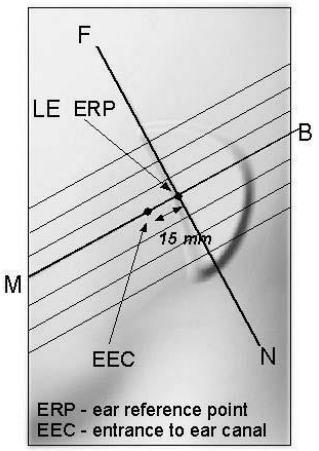


Fig 9.1.2 Close-up side view of phantom showing the ear region.

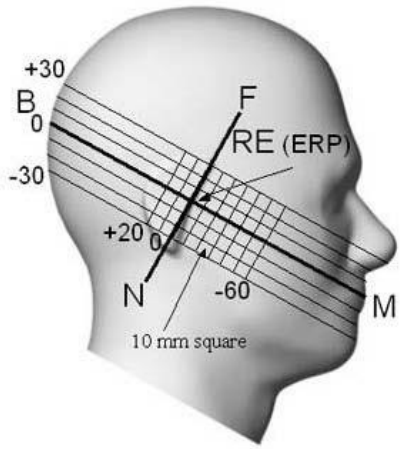


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

11.2 Definition of the cheek position

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

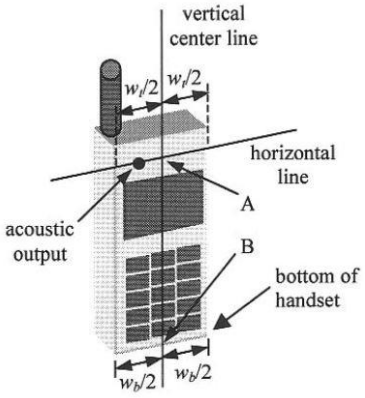


Fig 9.2.1 Handset vertical and horizontal reference lines—"fixed case

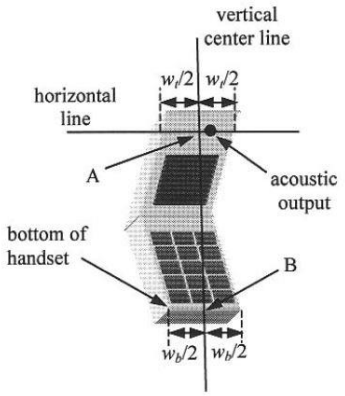


Fig 9.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

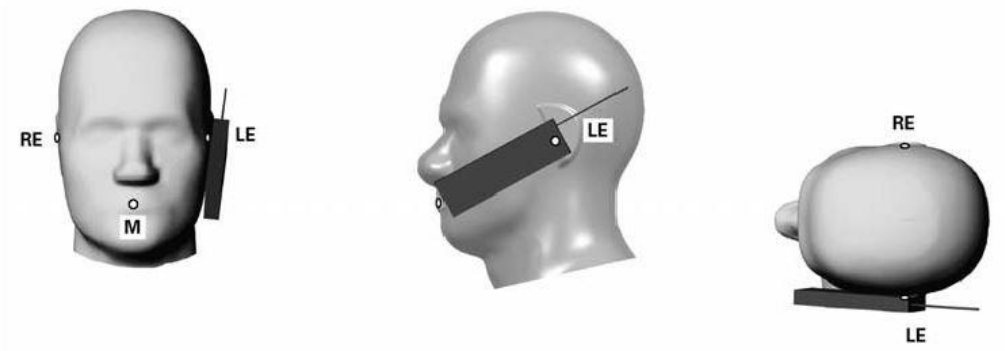


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

11.3 Definition of the tilt position

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

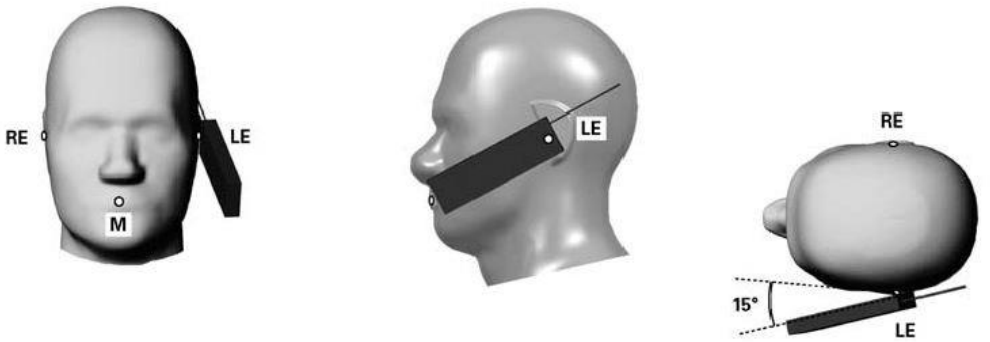


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

11.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 9.4). Per KDB 648474 D04v01r02, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01v05r02 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is < 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.

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

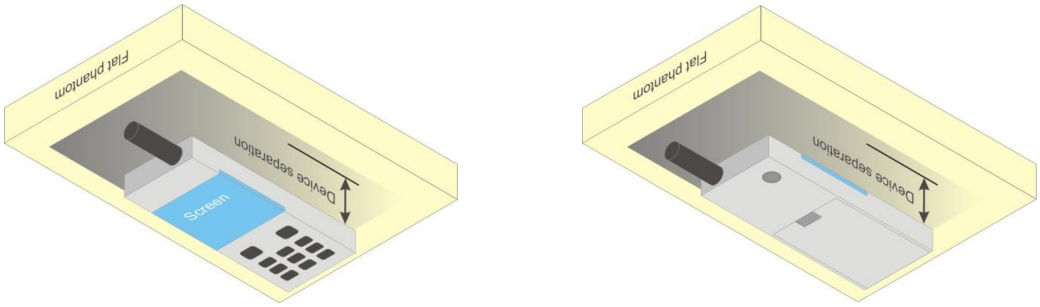


Fig 9.4 Body Worn Position

11.5 Wireless Router

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC HDB Publication 941225 D06v01r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined form general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v05r02 publication procedures. The “Portable Hotspot” feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

12. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

General Note:

1. For DTM multi-slot class mode, the device was linked with base station simulator (Agilent E5515C) and transmit maximum power on maximum number of TX slots, i.e. one CS timeslot, and additional PS timeslots (1 for DTM class 5 and 9, 2 for DTM class 11) in one TDMA frame.
2. Agilent E5515C was used to setup the device operated under DTM mode for power measurement and SAR testing. For conducted power, the power of the burst for voice and the power of the bursts for data was reported separately in the table above, and the frame-average power is derived below to determine SAR testing.

   *DTM frame average power (dBm) = 10*log [∑(power of each slot, in mW)/8]*
3. Per KDB 447498 D01v05r02, the maximum output power channel is used for SAR testing and for further SAR test reduction.
4. Per KDB 941225 D01v03, considering the possibility of e.g. 3rd party VoIP operation for Head and body-worn SAR test reduction for GSM and GPRS and EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the EUT was set in GPRS (4Tx slots) for GSM850 and GPRS 2 Tx slots for GSM1900.
5. Per KDB 941225 D01v03, for Hotspot SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance, for modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested, therefore, the EUT was set in GPRS (4Tx slots) for GSM850 and GPRS 2 Tx slots for GSM1900.
6. Since the EDGE1900 (4Tx slots) maximum source-based time average power is high then GPRS mode, therefore the EDGE1900 (4Tx slots) will verify worse case found in GPRS mode.

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)		32.29	32.14	32.00	33.50	23.29	23.14	23.00	24.50
GPRS (GMSK, 1 Tx slot)		32.26	32.18	32.11	33.50	23.26	23.18	23.11	24.50
GPRS (GMSK, 2 Tx slots)		29.11	29.08	29.01	30.50	23.11	23.08	23.01	24.50
GPRS (GMSK, 3 Tx slots)		27.36	27.25	27.21	28.00	23.10	22.99	22.95	23.74
GPRS (GMSK, 4 Tx slots)		26.34	26.27	26.22	27.50	23.34	23.27	23.22	24.50
EDGE (8PSK, 1 Tx slot)		25.94	25.69	25.77	27.50	16.94	16.69	16.77	18.50
EDGE (8PSK, 2 Tx slots)		25.89	25.64	25.72	27.50	19.89	19.64	19.72	21.50
EDGE (8PSK, 3 Tx slots)		26.00	25.88	25.95	27.50	21.74	21.62	21.69	23.24
EDGE (8PSK, 4 Tx slots)		26.14	25.99	26.03	27.50	23.14	22.99	23.03	24.50
DTM 5 (2Tx slots)	GSM (GMSK, 1 Tx slot)	29.10	29.07	29.00	30.50	23.07	23.04	22.97	24.48
	GPRS (GMSK, 1 Tx slot)	29.09	29.06	28.98	30.50				
DTM 9 (2Tx slots)	GSM (GMSK, 1 Tx slot)	29.09	29.00	28.89	30.50	23.06	22.92	22.86	24.48
	GPRS (GMSK, 1 Tx slot)	29.07	28.88	28.87	30.50				
DTM 11 (3Tx slots)	GSM (GMSK, 1 Tx slot)	27.35	27.24	27.19	28.00	23.08	22.97	22.92	23.74
	GPRS (GMSK, 2 Tx slots)	27.34	27.22	27.17	28.00				
DTM 5 (2Tx slots)	GSM (GMSK, 1 Tx slot)	29.08	29.05	28.98	30.50	21.75	21.65	21.63	23.23
	EDGE (8PSK, 1 Tx slot)	25.88	25.63	25.72	27.50				
DTM 9 (2Tx slots)	GSM (GMSK, 1 Tx slot)	29.07	29.04	28.97	30.50	21.74	21.64	21.62	23.23
	EDGE (8PSK, 1 Tx slot)	25.87	25.62	25.70	27.50				
DTM 11 (3Tx slots)	GSM (GMSK, 1 Tx slot)	27.34	27.23	27.18	28.00	22.22	22.11	22.13	23.41
	EDGE (8PSK, 2 Tx slots)	25.98	25.87	25.93	27.50				

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)		29.10	28.84	28.79	30.50	20.10	19.84	19.79	21.50
GPRS (GMSK, 1 Tx slot)		29.08	28.89	28.82	30.50	20.08	19.89	19.82	21.50
GPRS (GMSK, 2 Tx slots)		26.24	25.91	25.97	27.50	20.24	19.91	19.97	21.50
GPRS (GMSK, 3 Tx slots)		24.39	24.19	24.20	25.50	20.13	19.93	19.94	21.24
GPRS (GMSK, 4 Tx slots)		23.20	22.91	22.94	24.00	20.20	19.91	19.94	21.00
EDGE (8PSK, 1 Tx slot)		25.33	25.00	25.11	26.00	16.33	16.00	16.11	17.00
EDGE (8PSK, 2 Tx slots)		25.25	25.18	25.20	26.00	19.25	19.18	19.20	20.00
EDGE (8PSK, 3 Tx slots)		25.12	25.05	25.08	26.00	20.86	20.79	20.82	21.74
EDGE (8PSK, 4 Tx slots)		25.02	24.91	24.98	26.00	22.02	21.91	21.98	23.00
DTM 5 (2Tx slots)	GSM (GMSK, 1 Tx slot)	26.20	25.88	25.92	27.50	20.15	19.84	19.88	21.48
	GPRS (GMSK, 1 Tx slot)	26.15	25.85	25.89	27.50				
DTM 9 (2Tx slots)	GSM (GMSK, 1 Tx slot)	26.18	25.87	25.90	27.50	20.12	19.82	19.87	21.48
	GPRS (GMSK, 1 Tx slot)	26.11	25.81	25.88	27.50				
DTM 11 (3Tx slots)	GSM (GMSK, 1 Tx slot)	24.38	24.11	24.10	25.50	20.07	19.84	19.83	21.24
	GPRS (GMSK, 2 Tx slots)	24.30	24.10	24.09	25.50				
DTM 5 (2Tx slots)	GSM (GMSK, 1 Tx slot)	26.19	25.87	25.90	27.50	19.72	19.51	19.54	20.79
	EDGE (8PSK, 1 Tx slot)	25.23	25.17	25.19	26.00				
DTM 9 (2Tx slots)	GSM (GMSK, 1 Tx slot)	26.17	25.86	25.88	27.50	19.65	19.44	19.46	20.79
	EDGE (8PSK, 1 Tx slot)	25.11	25.03	25.05	26.00				
DTM 11 (3Tx slots)	GSM (GMSK, 1 Tx slot)	24.37	24.09	24.07	25.50	20.60	20.48	20.45	21.58
	EDGE (8PSK, 2 Tx slots)	25.09	25.03	25.00	26.00				

<WCDMA Conducted Power>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 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	Proces ses	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.		
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

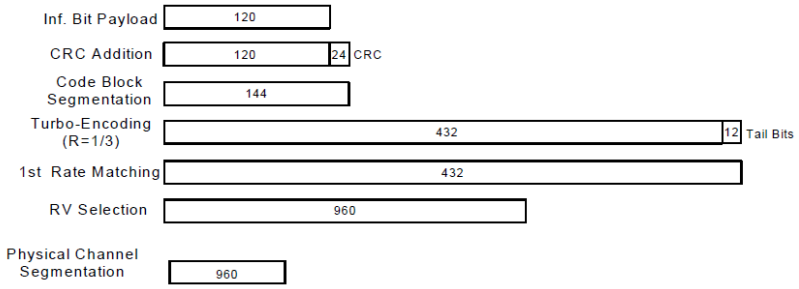


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

General Note:

1. Per KDB 941225 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.

Band			WCDMA V			WCDMA II			WCDMA IV		
TX Channel			4132	4182	4233	9262	9400	9538	1312	1413	1513
Rx Channel			4357	4407	4458	9662	9800	9938	1537	1638	1738
Frequency (MHz)			826.4	836.4	846.6	1852.4	1880	1907.6	1712.4	1732.6	1752.6
MPR (dB)	3GPP Rel 99	AMR 12.2Kbps	22.81	22.94	22.76	22.31	23.14	23.11	23.33	22.91	22.86
		RMC 12.2Kbps	22.89	22.95	22.78	22.34	23.19	23.12	23.39	22.96	22.89
0	3GPP Rel 6	HSDPA Subtest-1	21.97	22.03	21.95	21.31	22.14	22.14	22.41	22.00	21.85
0	3GPP Rel 6	HSDPA Subtest-2	21.99	21.98	21.89	21.35	22.22	22.13	22.42	22.06	21.89
0.5	3GPP Rel 6	HSDPA Subtest-3	21.41	21.56	21.94	20.81	21.65	21.64	21.94	21.53	21.27
0.5	3GPP Rel 6	HSDPA Subtest-4	21.47	21.46	21.30	20.79	21.62	21.55	21.92	21.51	21.23
0	3GPP Rel 8	DC-HSDPA Subtest-1	21.96	22.00	21.94	21.29	22.06	22.12	22.32	21.99	21.80
0	3GPP Rel 8	DC-HSDPA Subtest-2	21.97	21.97	21.81	21.33	22.19	22.06	22.33	21.99	21.85
0.5	3GPP Rel 8	DC-HSDPA Subtest-3	21.32	21.56	21.91	20.75	21.57	21.61	21.87	21.48	21.25
0.5	3GPP Rel 8	DC-HSDPA Subtest-4	21.42	21.46	21.21	20.73	21.53	21.51	21.87	21.42	21.15
0	3GPP Rel 6	HSUPA Subtest-1	21.53	21.51	21.69	21.20	21.95	21.73	22.42	22.33	22.28
2	3GPP Rel 6	HSUPA Subtest-2	20.80	20.41	20.30	20.23	20.95	20.35	20.94	20.88	20.85
1	3GPP Rel 6	HSUPA Subtest-3	20.43	20.39	20.31	20.00	20.55	20.74	20.88	20.82	20.73
2	3GPP Rel 6	HSUPA Subtest-4	20.67	21.39	20.60	20.72	21.13	21.33	21.42	21.36	21.32
0	3GPP Rel 6	HSUPA Subtest-5	21.80	22.00	21.70	21.20	22.00	22.00	22.40	22.35	22.31

<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.

<FDD LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	22.53	22.61	22.52	24	0
10	QPSK	1	24	22.51	22.53	22.50		
10	QPSK	1	49	22.50	22.54	22.39		
10	QPSK	25	0	21.59	21.59	21.60	23	1
10	QPSK	25	12	21.61	21.57	21.60		
10	QPSK	25	24	21.58	21.55	21.55		
10	QPSK	50	0	21.64	21.66	21.63		
10	16QAM	1	0	22.47	22.59	22.49	23	1
10	16QAM	1	24	22.45	22.48	22.48		
10	16QAM	1	49	22.33	22.49	22.34		
10	16QAM	25	0	20.63	20.61	20.62	22	2
10	16QAM	25	12	20.63	20.61	20.62		
10	16QAM	25	24	20.61	20.64	20.60		
10	16QAM	50	0	20.62	20.60	20.62		
Channel				20425	20525	20625	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.54	22.53	22.48	24	0
5	QPSK	1	12	22.53	22.50	22.43		
5	QPSK	1	24	22.53	22.52	22.40		
5	QPSK	12	0	21.62	21.62	21.52	23	1
5	QPSK	12	6	21.55	21.55	21.41		
5	QPSK	12	11	21.59	21.57	21.43		
5	QPSK	25	0	21.61	21.55	21.55		
5	16QAM	1	0	21.50	21.47	21.43	23	1
5	16QAM	1	12	21.49	21.45	21.31		
5	16QAM	1	24	21.47	21.45	21.34		
5	16QAM	12	0	20.63	20.63	20.62	22	2
5	16QAM	12	6	20.64	20.63	20.49		
5	16QAM	12	11	20.62	20.64	20.50		
5	16QAM	25	0	20.62	20.62	20.61		
Channel				20415	20525	20635	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.55	22.55	22.43	24	0
3	QPSK	1	7	22.43	22.52	22.39		
3	QPSK	1	14	22.52	22.52	22.42		
3	QPSK	8	0	21.62	21.59	21.48	23	1
3	QPSK	8	4	21.49	21.61	21.44		
3	QPSK	8	7	21.58	21.61	21.47		
3	QPSK	15	0	21.65	21.59	21.48		
3	16QAM	1	0	21.50	21.49	21.42	23	1
3	16QAM	1	7	21.36	21.45	21.33		
3	16QAM	1	14	21.46	21.48	21.35		
3	16QAM	8	0	20.67	20.61	20.52	22	2
3	16QAM	8	4	20.55	20.65	20.54		
3	16QAM	8	7	20.63	20.62	20.53		
3	16QAM	15	0	20.60	20.59	20.49		

Channel				20407	20525	20643	Tune up Limit (dBm)	Target MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.59	22.59	22.50	24	0
1.4	QPSK	1	2	22.55	22.55	22.46		
1.4	QPSK	1	5	22.49	22.58	22.49		
1.4	QPSK	3	0	22.57	22.57	22.45		
1.4	QPSK	3	1	22.54	22.56	22.46		
1.4	QPSK	3	2	22.57	22.57	22.42		
1.4	QPSK	6	0	21.65	21.59	21.49	23	1
1.4	16QAM	1	0	22.41	22.55	22.43	23	1
1.4	16QAM	1	2	22.40	22.54	22.41		
1.4	16QAM	1	5	21.41	21.52	21.39		
1.4	16QAM	3	0	21.58	21.53	21.43		
1.4	16QAM	3	1	21.55	21.53	21.42		
1.4	16QAM	3	2	21.56	21.53	21.39		
1.4	16QAM	6	0	20.52	20.54	20.41	22	2

<FDD LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	22.91	22.68	22.31	24	0
20	QPSK	1	49	22.67	22.48	22.26		
20	QPSK	1	99	22.35	22.20	22.17		
20	QPSK	50	0	21.82	21.63	21.21	23	1
20	QPSK	50	24	21.81	21.51	21.22		
20	QPSK	50	49	21.68	21.23	21.15		
20	QPSK	100	0	21.80	21.46	21.18		
20	16QAM	1	0	21.83	21.64	21.30	23	1
20	16QAM	1	49	21.69	21.38	21.22		
20	16QAM	1	99	21.32	21.13	21.11		
20	16QAM	50	0	20.81	20.66	20.30	22	2
20	16QAM	50	24	20.82	20.55	20.25		
20	16QAM	50	49	20.70	20.36	20.22		
20	16QAM	100	0	20.80	20.57	20.28		
Channel				20025	20175	20325	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.85	22.58	22.33	24	0
15	QPSK	1	37	22.69	22.39	22.19		
15	QPSK	1	74	22.59	22.23	22.22		
15	QPSK	36	0	21.87	21.51	21.21	23	1
15	QPSK	36	18	21.79	21.52	21.18		
15	QPSK	36	37	21.80	21.21	21.14		
15	QPSK	75	0	21.81	21.37	21.19		
15	16QAM	1	0	21.85	21.55	21.29	23	1
15	16QAM	1	37	21.70	21.30	21.14		
15	16QAM	1	74	21.56	21.15	21.15		
15	16QAM	36	0	20.79	20.54	20.27	22	2
15	16QAM	36	18	20.71	20.56	20.22		
15	16QAM	36	37	20.72	20.32	20.26		
15	16QAM	75	0	20.81	20.49	20.29		
Channel				20000	20175	20350	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	22.83	22.48	22.31	24	0
10	QPSK	1	24	22.67	22.47	22.21		
10	QPSK	1	49	22.68	22.26	22.21		
10	QPSK	25	0	21.80	21.49	21.20	23	1
10	QPSK	25	12	21.73	21.52	21.22		
10	QPSK	25	24	21.74	21.42	21.16		
10	QPSK	50	0	21.89	21.51	21.25		
10	16QAM	1	0	21.84	21.43	21.27	23	1
10	16QAM	1	24	21.67	21.40	21.15		
10	16QAM	1	49	21.63	21.21	21.14		
10	16QAM	25	0	20.84	20.58	20.34	22	2
10	16QAM	25	12	20.77	20.57	20.29		
10	16QAM	25	24	20.78	20.43	20.33		
10	16QAM	50	0	20.87	20.54	20.30		

Channel				19975	20175	20375	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	22.83	22.46	22.31	24	0
5	QPSK	1	12	22.74	22.35	22.21		
5	QPSK	1	24	22.65	22.35	22.26		
5	QPSK	12	0	21.91	21.54	21.33	23	1
5	QPSK	12	6	21.77	21.50	21.27		
5	QPSK	12	11	21.81	21.36	21.21		
5	QPSK	25	0	21.86	21.50	21.25		
5	16QAM	1	0	21.77	21.38	21.13	23	1
5	16QAM	1	12	21.69	21.28	21.24		
5	16QAM	1	24	21.63	21.30	21.18		
5	16QAM	12	0	20.91	20.58	20.41	22	2
5	16QAM	12	6	20.83	20.57	20.41		
5	16QAM	12	11	20.82	20.48	20.34		
5	16QAM	25	0	20.81	20.61	20.31		
Channel				19965	20175	20385	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	22.85	22.51	22.33	24	0
3	QPSK	1	7	22.75	22.38	22.22		
3	QPSK	1	14	22.76	22.37	22.29		
3	QPSK	8	0	21.87	21.54	21.30	23	1
3	QPSK	8	4	21.94	21.49	21.23		
3	QPSK	8	7	21.84	21.39	21.20		
3	QPSK	15	0	21.90	21.53	21.26		
3	16QAM	1	0	21.81	21.39	21.24	23	1
3	16QAM	1	7	21.69	21.28	21.13		
3	16QAM	1	14	21.68	21.30	21.19		
3	16QAM	8	0	20.94	20.56	20.42	22	2
3	16QAM	8	4	20.92	20.59	20.36		
3	16QAM	8	7	20.80	20.47	20.31		
3	16QAM	15	0	20.89	20.52	20.26		
Channel				19957	20175	20393	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	22.90	22.56	22.34	24	0
1.4	QPSK	1	2	22.87	22.50	22.30		
1.4	QPSK	1	5	22.87	22.43	22.33		
1.4	QPSK	3	0	22.85	22.53	22.32		
1.4	QPSK	3	1	22.88	22.49	22.33		
1.4	QPSK	3	2	22.89	22.49	22.32		
1.4	QPSK	6	0	21.93	21.53	21.27	23	1
1.4	16QAM	1	0	21.86	21.48	21.21	23	1
1.4	16QAM	1	2	21.81	21.47	21.22		
1.4	16QAM	1	5	21.85	21.32	21.24		
1.4	16QAM	3	0	21.85	21.46	21.24		
1.4	16QAM	3	1	21.83	21.46	21.17		
1.4	16QAM	3	2	21.83	21.47	21.22		
1.4	16QAM	6	0	20.80	20.48	20.25	22	2

<FDD LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	22.27	22.65	22.45	24	0
20	QPSK	1	49	22.22	22.49	22.44		
20	QPSK	1	99	22.11	22.45	22.39		
20	QPSK	50	0	21.25	21.54	21.34	23	1
20	QPSK	50	24	21.20	21.43	21.33		
20	QPSK	50	49	21.21	21.38	21.25		
20	QPSK	100	0	21.26	21.44	21.30		
20	16QAM	1	0	21.96	21.35	21.27	23	1
20	16QAM	1	49	21.05	21.40	21.26		
20	16QAM	1	99	21.88	21.27	21.23		
20	16QAM	50	0	20.19	20.44	20.38	22	2
20	16QAM	50	24	20.11	20.45	20.31		
20	16QAM	50	49	20.13	20.41	20.28		
20	16QAM	100	0	20.26	20.46	20.31		
Channel				18675	18900	19125	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.25	22.56	22.48	24	0
15	QPSK	1	37	22.21	22.52	22.42		
15	QPSK	1	74	22.22	22.45	22.37		
15	QPSK	36	0	21.18	21.38	21.31	23	1
15	QPSK	36	18	21.20	21.43	21.28		
15	QPSK	36	37	21.16	21.36	21.26		
15	QPSK	75	0	21.20	21.48	21.33		
15	16QAM	1	0	21.12	21.40	21.29	23	1
15	16QAM	1	37	21.13	21.39	21.28		
15	16QAM	1	74	21.05	21.25	21.26		
15	16QAM	36	0	20.11	20.41	20.34	22	2
15	16QAM	36	18	20.20	20.40	20.32		
15	16QAM	36	37	20.07	20.37	20.24		
15	16QAM	75	0	20.22	20.46	20.26		
Channel				18650	18900	19150	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.21	22.53	22.40	24	0
10	QPSK	1	24	22.19	22.52	22.34		
10	QPSK	1	49	22.15	22.50	22.37		
10	QPSK	25	0	21.12	21.44	21.29	23	1
10	QPSK	25	12	21.16	21.42	21.28		
10	QPSK	25	24	21.21	21.45	21.28		
10	QPSK	50	0	21.17	21.43	21.31		
10	16QAM	1	0	21.10	21.40	21.27	23	1
10	16QAM	1	24	21.07	21.38	21.22		
10	16QAM	1	49	21.02	21.32	21.24		
10	16QAM	25	0	20.15	20.46	20.34	22	2
10	16QAM	25	12	20.18	20.46	20.31		
10	16QAM	25	24	20.16	20.50	20.39		
10	16QAM	50	0	20.12	20.48	20.26		

Channel				18625	18900	19175	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.25	22.60	22.46	24	0
5	QPSK	1	12	22.10	22.54	22.40		
5	QPSK	1	24	22.20	22.58	22.39		
5	QPSK	12	0	21.16	21.40	21.35	23	1
5	QPSK	12	6	21.11	21.40	21.31		
5	QPSK	12	11	21.16	21.49	21.30		
5	QPSK	25	0	21.16	21.48	21.31		
5	16QAM	1	0	21.04	21.41	21.17	23	1
5	16QAM	1	12	21.04	21.37	21.25		
5	16QAM	1	24	21.05	21.40	21.22		
5	16QAM	12	0	20.15	20.44	20.41	22	2
5	16QAM	12	6	20.13	20.45	20.37		
5	16QAM	12	11	20.12	20.48	20.41		
5	16QAM	25	0	20.12	20.44	20.36		
Channel				18615	18900	19185	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.18	22.56	22.45	24	0
3	QPSK	1	7	22.17	22.51	22.41		
3	QPSK	1	14	22.17	22.52	22.40		
3	QPSK	8	0	21.11	21.44	21.35	23	1
3	QPSK	8	4	21.14	21.42	21.29		
3	QPSK	8	7	21.17	21.48	21.28		
3	QPSK	15	0	21.17	21.49	21.32		
3	16QAM	1	0	21.03	21.37	21.28	23	1
3	16QAM	1	7	21.07	21.38	21.26		
3	16QAM	1	14	21.04	21.39	21.25		
3	16QAM	8	0	20.14	20.49	20.37	22	2
3	16QAM	8	4	20.13	20.50	20.41		
3	16QAM	8	7	20.16	20.46	20.34		
3	16QAM	15	0	20.12	20.43	20.36		
Channel				18607	18900	19193	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.24	22.63	22.48	24	0
1.4	QPSK	1	2	22.21	22.62	22.46		
1.4	QPSK	1	5	22.20	22.59	22.47		
1.4	QPSK	3	0	22.14	22.58	22.46		
1.4	QPSK	3	1	22.21	22.61	22.47		
1.4	QPSK	3	2	22.05	22.60	22.47		
1.4	QPSK	6	0	21.25	21.48	21.36	23	1
1.4	16QAM	1	0	21.34	21.42	21.34	23	1
1.4	16QAM	1	2	21.11	21.45	21.32		
1.4	16QAM	1	5	21.09	21.41	21.28		
1.4	16QAM	3	0	21.10	21.42	21.27		
1.4	16QAM	3	1	21.09	21.38	21.24		
1.4	16QAM	3	2	21.12	21.39	21.29		
1.4	16QAM	6	0	20.06	20.39	20.30	22	2

<FDD LTE Band 25>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				26140	26340	26590		
Frequency (MHz)				1860	1880	1905		
20	QPSK	1	0	22.70	22.95	22.87	24	0
20	QPSK	1	49	22.67	22.89	22.84		
20	QPSK	1	99	22.53	22.63	22.24		
20	QPSK	50	0	21.43	21.79	21.75	23	1
20	QPSK	50	24	21.47	21.82	21.82		
20	QPSK	50	49	21.68	21.70	21.83		
20	QPSK	100	0	21.57	21.84	21.79		
20	16QAM	1	0	21.40	21.80	21.67	23	1
20	16QAM	1	49	21.33	21.72	21.70		
20	16QAM	1	99	21.57	21.48	21.58		
20	16QAM	50	0	20.37	20.73	20.78	22	2
20	16QAM	50	24	20.40	20.78	20.78		
20	16QAM	50	49	20.58	20.74	20.79		
20	16QAM	100	0	20.49	20.76	20.82		
Channel				26115	26340	26615	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1907.5		
15	QPSK	1	0	22.68	22.90	22.87	24	0
15	QPSK	1	37	22.54	22.82	22.86		
15	QPSK	1	74	22.67	22.77	22.40		
15	QPSK	36	0	21.44	21.78	21.89	23	1
15	QPSK	36	18	21.47	21.82	21.85		
15	QPSK	36	37	21.58	21.76	21.84		
15	QPSK	75	0	21.48	21.87	21.78		
15	16QAM	1	0	21.42	21.75	21.68	23	1
15	16QAM	1	37	21.32	21.63	21.66		
15	16QAM	1	74	21.51	21.59	21.67		
15	16QAM	36	0	20.38	20.72	20.81	22	2
15	16QAM	36	18	20.41	20.77	20.85		
15	16QAM	36	37	20.50	20.73	20.81		
15	16QAM	75	0	20.41	20.82	20.83		
Channel				26090	26340	26640	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1910		
10	QPSK	1	0	22.55	22.91	22.91	24	0
10	QPSK	1	24	22.35	22.88	22.89		
10	QPSK	1	49	22.50	22.73	22.39		
10	QPSK	25	0	21.39	21.81	21.97	23	1
10	QPSK	25	12	21.39	21.80	21.88		
10	QPSK	25	24	21.40	21.73	21.84		
10	QPSK	50	0	21.38	21.88	21.85		
10	16QAM	1	0	21.36	21.77	21.71	23	1
10	16QAM	1	24	21.28	21.74	21.74		
10	16QAM	1	49	21.34	21.59	21.72		
10	16QAM	25	0	20.39	20.82	20.90	22	2
10	16QAM	25	12	20.37	20.85	20.84		
10	16QAM	25	24	20.37	20.74	20.82		
10	16QAM	50	0	20.36	20.85	20.82		

Channel				26065	26340	26665	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1912.5		
5	QPSK	1	0	22.48	22.85	22.87	24	0
5	QPSK	1	12	22.40	22.77	22.73		
5	QPSK	1	24	22.22	22.79	22.33		
5	QPSK	12	0	21.39	21.76	21.96	23	1
5	QPSK	12	6	21.51	21.76	21.86		
5	QPSK	12	11	21.55	21.65	21.71		
5	QPSK	25	0	21.36	21.84	21.81		
5	16QAM	1	0	21.34	21.65	21.80	23	1
5	16QAM	1	12	21.22	21.63	21.68		
5	16QAM	1	24	21.23	21.62	21.65		
5	16QAM	12	0	20.42	20.81	20.83	22	2
5	16QAM	12	6	20.33	20.80	20.81		
5	16QAM	12	11	20.32	20.71	20.79		
5	16QAM	25	0	20.32	20.81	20.79		
Channel				26055	26340	26675	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1913.5		
3	QPSK	1	0	22.43	22.85	22.79	24	0
3	QPSK	1	7	22.33	22.75	22.53		
3	QPSK	1	14	22.20	22.77	22.28		
3	QPSK	8	0	21.30	21.78	21.77	23	1
3	QPSK	8	4	21.41	21.82	21.63		
3	QPSK	8	7	21.47	21.71	21.58		
3	QPSK	15	0	21.38	21.82	21.67		
3	16QAM	1	0	21.44	21.65	21.97	23	1
3	16QAM	1	7	21.61	21.59	21.66		
3	16QAM	1	14	21.21	21.58	21.61		
3	16QAM	8	0	20.38	20.77	20.79	22	2
3	16QAM	8	4	20.42	20.83	20.80		
3	16QAM	8	7	20.39	20.72	20.70		
3	16QAM	15	0	20.35	20.78	20.77		
Channel				26047	26340	26683	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1914.3		
1.4	QPSK	1	0	22.24	22.94	22.50	24	0
1.4	QPSK	1	2	22.12	22.89	22.48		
1.4	QPSK	1	5	22.20	22.84	22.25		
1.4	QPSK	3	0	22.12	22.92	22.38		
1.4	QPSK	3	1	22.21	22.87	22.44		
1.4	QPSK	3	2	22.23	22.91	22.42		
1.4	QPSK	6	0	21.24	21.84	21.50	23	1
1.4	16QAM	1	0	21.36	21.77	21.73	23	1
1.4	16QAM	1	2	21.52	21.76	21.79		
1.4	16QAM	1	5	21.49	21.65	21.61		
1.4	16QAM	3	0	21.20	21.77	21.55		
1.4	16QAM	3	1	21.30	21.75	21.57		
1.4	16QAM	3	2	21.33	21.75	21.57		
1.4	16QAM	6	0	20.36	20.74	20.65	22	2

<FDD 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	24.00	23.13	23.41	24	0
20	QPSK	1	49	23.49	22.69	23.31		
20	QPSK	1	99	23.57	22.71	22.98		
20	QPSK	50	0	22.51	22.00	22.63	23	1
20	QPSK	50	24	22.96	22.01	22.46		
20	QPSK	50	49	23.00	22.03	22.17		
20	QPSK	100	0	22.72	22.00	22.35		
20	16QAM	1	0	22.44	22.00	22.71	23	1
20	16QAM	1	49	22.99	22.02	22.65		
20	16QAM	1	99	22.88	22.41	22.28		
20	16QAM	50	0	21.52	21.02	21.69	22	2
20	16QAM	50	24	21.99	21.03	21.53		
20	16QAM	50	49	21.98	21.04	21.22		
20	16QAM	100	0	21.75	21.05	21.39		
Channel				20825	21100	21375	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	23.99	23.05	23.62	24	0
15	QPSK	1	37	23.71	22.75	23.07		
15	QPSK	1	74	23.40	22.76	23.19		
15	QPSK	36	0	22.52	21.95	22.49	23	1
15	QPSK	36	18	22.84	21.90	22.25		
15	QPSK	36	37	22.99	22.00	22.25		
15	QPSK	75	0	22.78	21.93	22.32		
15	16QAM	1	0	22.68	21.96	22.92	23	1
15	16QAM	1	37	22.99	22.00	22.37		
15	16QAM	1	74	22.98	21.99	22.49		
15	16QAM	36	0	21.56	20.98	21.56	22	2
15	16QAM	36	18	21.91	20.99	21.31		
15	16QAM	36	37	21.98	21.03	21.29		
15	16QAM	75	0	21.82	21.05	21.38		
Channel				20800	21100	21400	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	23.89	22.99	23.25	24	0
10	QPSK	1	24	23.55	22.71	23.10		
10	QPSK	1	49	23.48	22.70	23.21		
10	QPSK	25	0	22.49	21.75	22.23	23	1
10	QPSK	25	12	22.57	21.80	22.21		
10	QPSK	25	24	22.83	21.88	22.26		
10	QPSK	50	0	22.64	21.80	22.21		
10	16QAM	1	0	22.77	22.00	22.52	23	1
10	16QAM	1	24	22.84	21.97	22.37		
10	16QAM	1	49	22.90	22.11	22.49		
10	16QAM	25	0	21.53	20.81	21.29	22	2
10	16QAM	25	12	21.61	20.85	21.26		
10	16QAM	25	24	21.88	20.93	21.31		
10	16QAM	50	0	21.68	20.85	21.27		

Channel				20775	21100	21425	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	23.51	22.78	23.19	24	0
5	QPSK	1	12	23.39	22.68	23.13		
5	QPSK	1	24	23.45	22.63	23.18		
5	QPSK	12	0	22.51	21.71	22.23	23	1
5	QPSK	12	6	22.47	21.79	22.23		
5	QPSK	12	11	22.52	21.84	22.26		
5	QPSK	25	0	22.53	21.78	22.25		
5	16QAM	1	0	22.73	21.91	22.38	23	1
5	16QAM	1	12	22.68	21.96	22.42		
5	16QAM	1	24	22.78	22.05	22.47		
5	16QAM	12	0	21.56	20.76	21.28	22	2
5	16QAM	12	6	21.54	20.83	21.28		
5	16QAM	12	11	21.57	20.88	21.31		
5	16QAM	25	0	21.58	20.83	21.30		

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

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

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

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

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

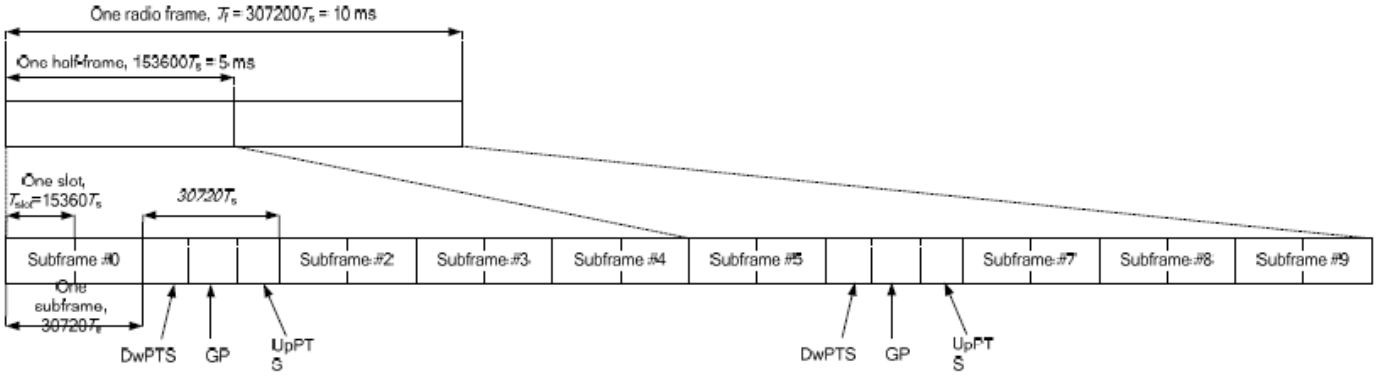


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

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

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

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

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

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

The highest duty factor is resulted from:

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

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

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

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

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

<TDD LTE Band 38>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Target Power (dBm)	MPR (dB)
Channel				37850	38000	38150		
Frequency (MHz)				2580	2595	2610		
20	QPSK	1	0	22.50	22.66	22.95	24	0
20	QPSK	1	49	22.40	22.58	22.82		
20	QPSK	1	99	22.29	22.33	22.53		
20	QPSK	50	0	21.49	21.62	21.97	23	1
20	QPSK	50	24	21.55	21.73	22.13		
20	QPSK	50	49	21.54	21.94	22.14		
20	QPSK	100	0	21.52	21.73	22.00		
20	16QAM	1	0	21.46	21.38	21.69	23	1
20	16QAM	1	49	21.47	21.66	21.99		
20	16QAM	1	99	21.58	21.79	22.04		
20	16QAM	50	0	20.62	20.57	21.13	22	2
20	16QAM	50	24	20.68	20.76	21.28		
20	16QAM	50	49	20.65	21.11	21.32		
20	16QAM	100	0	20.65	20.82	21.02		
Channel				37825	38000	38175	Target Power (dBm)	MPR (dB)
Frequency (MHz)				2577.5	2595	2612.5		
15	QPSK	1	0	22.46	22.77	22.91	24	0
15	QPSK	1	37	22.45	22.62	22.90		
15	QPSK	1	74	22.45	22.46	22.70		
15	QPSK	36	0	21.51	21.64	21.98	23	1
15	QPSK	36	18	21.52	21.69	22.10		
15	QPSK	36	37	21.49	21.91	22.14		
15	QPSK	75	0	21.52	21.69	22.11		
15	16QAM	1	0	21.49	21.48	21.70	23	1
15	16QAM	1	37	21.47	21.65	21.97		
15	16QAM	1	74	21.48	21.79	22.00		
15	16QAM	36	0	20.59	20.73	20.93	22	2
15	16QAM	36	18	20.62	20.76	21.05		
15	16QAM	36	37	20.61	20.89	21.07		
15	16QAM	75	0	20.66	20.80	21.13		
Channel				37800	38000	38200	Target Power (dBm)	MPR (dB)
Frequency (MHz)				2575	2595	2615		
10	QPSK	1	0	22.40	22.69	22.91	24	0
10	QPSK	1	24	22.34	22.56	22.85		
10	QPSK	1	49	22.39	22.34	22.90		
10	QPSK	25	0	21.52	21.66	22.09	23	1
10	QPSK	25	12	21.54	21.68	22.09		
10	QPSK	25	24	21.56	21.85	22.13		
10	QPSK	50	0	21.55	21.69	22.15		
10	16QAM	1	0	21.42	21.52	21.99	23	1
10	16QAM	1	24	21.46	21.71	22.00		
10	16QAM	1	49	21.44	21.77	22.02		
10	16QAM	25	0	20.70	20.81	21.10	22	2
10	16QAM	25	12	20.75	20.83	21.15		
10	16QAM	25	24	20.76	20.97	21.13		
10	16QAM	50	0	20.63	20.87	21.15		

Channel				37775	38000	38225	Target Power (dBm)	MPR (dB)
Frequency (MHz)				2572.5	2595	2617.5		
5	QPSK	1	0	22.44	22.61	22.89	24	0
5	QPSK	1	12	22.41	22.60	22.87		
5	QPSK	1	24	22.40	22.52	22.87		
5	QPSK	12	0	21.58	21.73	22.13	23	1
5	QPSK	12	6	21.58	21.74	22.12		
5	QPSK	12	11	21.57	21.82	22.11		
5	QPSK	25	0	21.56	21.66	22.11		
5	16QAM	1	0	21.44	21.58	21.97	23	1
5	16QAM	1	12	21.43	21.68	21.98		
5	16QAM	1	24	21.43	21.70	22.01		
5	16QAM	12	0	20.67	20.79	21.09	22	2
5	16QAM	12	6	20.62	20.75	21.04		
5	16QAM	12	11	20.68	20.85	21.12		
5	16QAM	25	0	20.72	20.78	21.20		

<TDD LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power Middle High Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				39750	40185	40620	41055	41490		
Frequency (MHz)				2506	2549.5	2593	2636.5	2680		
20	QPSK	1	0	22.70	22.53	22.56	22.86	22.67	24	0
20	QPSK	1	49	22.57	22.33	22.55	22.74	22.66		
20	QPSK	1	99	22.55	22.44	22.50	22.70	22.59		
20	QPSK	50	0	21.84	21.60	21.59	22.06	21.79	23	1
20	QPSK	50	24	21.82	21.69	21.72	21.94	21.76		
20	QPSK	50	49	21.84	21.63	21.74	21.91	21.85		
20	QPSK	100	0	21.76	21.61	21.74	21.91	21.79		
20	16QAM	1	0	21.71	21.42	21.52	21.90	21.62	23	1
20	16QAM	1	49	21.74	21.54	21.62	21.83	21.85		
20	16QAM	1	99	21.70	21.57	21.81	21.80	21.63		
20	16QAM	50	0	21.00	20.62	20.75	21.05	20.78	22	2
20	16QAM	50	24	21.02	20.79	20.87	20.98	20.73		
20	16QAM	50	49	20.98	20.71	20.86	21.00	20.82		
20	16QAM	100	0	20.94	20.76	20.86	21.03	20.80		
Channel				39725	40173	40620	41068	41515	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5		
15	QPSK	1	0	22.49	22.57	22.44	22.85	22.59	24	0
15	QPSK	1	37	22.59	22.51	22.59	22.77	22.69		
15	QPSK	1	74	22.63	22.35	22.60	22.76	22.56		
15	QPSK	36	0	21.74	21.56	21.60	21.94	21.75	23	1
15	QPSK	36	18	21.83	21.62	21.74	21.87	21.78		
15	QPSK	36	37	21.83	21.63	21.71	21.92	21.80		
15	QPSK	75	0	21.84	21.64	21.71	21.96	21.88		
15	16QAM	1	0	21.72	21.48	21.52	21.94	21.67	23	1
15	16QAM	1	37	21.79	21.53	21.64	21.80	21.65		
15	16QAM	1	74	21.77	21.64	21.72	21.79	21.56		
15	16QAM	36	0	20.90	20.57	20.69	20.91	20.68	22	2
15	16QAM	36	18	20.91	20.64	20.79	20.91	20.71		
15	16QAM	36	37	21.00	20.73	20.85	20.93	20.72		
15	16QAM	75	0	21.10	20.69	20.86	20.97	20.83		
Channel				39700	40160	40620	41080	41540	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2501	2547	2593	2639	2685		
10	QPSK	1	0	22.54	22.48	22.38	22.76	22.58	24	0
10	QPSK	1	24	22.49	22.43	22.51	22.75	22.61		
10	QPSK	1	49	22.54	22.36	22.48	22.75	22.52		
10	QPSK	25	0	21.80	21.55	21.60	21.90	21.83	23	1
10	QPSK	25	12	21.73	21.64	21.75	21.88	21.88		
10	QPSK	25	24	21.83	21.60	21.69	21.92	21.78		
10	QPSK	50	0	21.75	21.66	21.73	21.92	21.88		
10	16QAM	1	0	21.76	21.51	21.55	21.86	21.75	23	1
10	16QAM	1	24	21.74	21.60	21.62	21.83	21.82		
10	16QAM	1	49	21.77	21.57	21.66	21.79	21.72		
10	16QAM	25	0	20.99	20.71	20.85	21.06	20.92	22	2
10	16QAM	25	12	21.04	20.81	20.95	21.07	20.91		
10	16QAM	25	24	21.04	20.78	20.93	21.04	20.87		
10	16QAM	50	0	20.97	20.74	20.88	20.97	20.78		

Channel				39675	40148	40620	41093	41565	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2498.5	2545.8	2593	2640.3	2687.5		
5	QPSK	1	0	22.56	22.51	22.44	22.77	22.69	24	0
5	QPSK	1	12	22.53	22.42	22.54	22.73	22.53		
5	QPSK	1	24	22.47	22.38	22.52	22.69	22.42		
5	QPSK	12	0	21.80	21.60	21.61	21.92	21.89	23	1
5	QPSK	12	6	21.80	21.65	21.72	21.89	21.86		
5	QPSK	12	11	21.80	21.64	21.69	21.87	21.84		
5	QPSK	25	0	21.77	21.61	21.72	21.92	21.71		
5	16QAM	1	0	21.75	21.53	21.53	21.85	21.75	23	1
5	16QAM	1	12	21.69	21.52	21.62	21.82	21.73		
5	16QAM	1	24	21.77	21.52	21.65	21.84	21.42		
5	16QAM	12	0	21.01	20.70	20.77	21.01	20.79	22	2
5	16QAM	12	6	21.01	20.75	20.87	21.01	20.80		
5	16QAM	12	11	20.97	20.76	20.86	20.99	20.75		
5	16QAM	25	0	21.01	20.79	20.93	21.06	20.83		

<WLAN Conducted Power>

General Note:

1. For IEEE802.11a/b/g SAR testing, highest average RF output power channel for the lowest data rate for 802.11a/b were selected for SAR evaluation. 802.11g were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of 802.11a/b mode.
2. For IEEE802.11n/ac, SAR testing can be conducted on channel with the highest output power when taking into consideration tune-up tolerance for same test configuration that was identified during SAR evaluations for IEEE802.11a/b/g (as applicable) provided bandwidth and test position are the same.
3. For IEEE802.11n/ac with multiple channel BW configurations, highest channel BW configuration with highest output power limit shall be tested.
4. Testing of lower BW configurations is not required when the maximum average output of the default test channels in each lower BW configuration is less than 1/4dB higher than the default test channel in the highest BW configuration.

<2.4GHz WLAN>

WLAN 2.4GHz 802.11b Average Power (dBm)					
Power vs. Channel					
Channel	Frequency (MHz)	Data Rate	2Mbps	5.5Mbps	11Mbps
		1Mbps			
CH 1	2412	16.44	16.20	16.25	16.43
CH 6	2437	16.40			
CH 11	2462	16.25			

WLAN 2.4GHz 802.11g Average Power (dBm)									
Power vs. Channel			Power vs. Data Rate						
Channel	Frequency (MHz)	Data Rate	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
		6Mbps							
CH 1	2412	12.42	13.00	12.90	13.12	13.12	13.02	13.00	12.92
CH 6	2437	12.63							
CH 11	2462	13.17							

WLAN 2.4GHz 802.11n-HT20 Average Power (dBm)									
Power vs. Channel			Power vs. MCS Index						
Channel	Frequency (MHz)	MCS Index	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
		MCS0							
CH 1	2412	9.57	10.03	9.65	9.83	9.92	9.75	9.52	9.76
CH 6	2437	9.86							
CH 11	2462	10.09							

WLAN 2.4GHz 802.11n-HT40 Average Power (dBm)									
Power vs. Channel			Power vs. MCS Index						
Channel	Frequency (MHz)	MCS Index	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
		MCS0							
CH 3	2422	10.30	10.21	9.59	9.40	10.18	9.70	9.20	9.40
CH 6	2437	9.66							
CH 9	2452	10.40							

<5GHz WLAN>

WLAN 5GHz 802.11a Average Power (dBm)									
Power vs. Channel			Power vs. Data Rate						
Channel	Frequency (MHz)	Data Rate 6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 36	5180	11.69	12.03	12.06	12.04	11.93	12.04	11.86	12.08
CH 40	5200	11.59							
CH 44	5220	11.92							
CH 48	5240	12.09							
CH 52	5260	11.72	12.13	12.18	12.19	12.13	12.16	12.15	12.20
CH 56	5280	11.77							
CH 60	5300	11.97							
CH 64	5320	12.21							
CH 100	5500	11.88	11.53	11.43	11.60	11.67	11.83	11.75	11.80
CH 104	5520	11.64							
CH 108	5540	11.75							
CH 112	5560	11.53							
CH 116	5580	11.44							
CH 120	5600	11.31							
CH 124	5620	11.26							
CH 128	5640	11.74							
CH 132	5660	11.72							
CH 136	5680	11.83							
CH 140	5700	11.58							
CH 149	5745	11.24	11.86	11.89	11.83	11.83	11.82	11.88	11.87
CH 153	5765	11.70							
CH 157	5785	11.91							
CH 161	5805	11.66							
CH 165	5825	11.71							

WLAN 5GHz 802.11n-HT20 Average Power (dBm)									
Power vs. Channel			Power vs. MCS Index						
Channel	Frequency (MHz)	Data Rate / 6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 36	5180	9.72	9.75	9.71	9.65	9.78	9.80	9.70	9.77
CH 40	5200	9.54							
CH 44	5220	9.51							
CH 48	5240	9.81							
CH 52	5260	9.84	9.97	9.99	9.94	9.81	10.01	10.03	9.96
CH 56	5280	9.71							
CH 60	5300	10.06							
CH 64	5320	10.03							
CH 100	5500	9.91	9.63	9.72	9.54	9.73	9.88	9.81	9.76
CH 104	5520	9.71							
CH 108	5540	9.63							
CH 112	5560	9.52							
CH 116	5580	9.76							
CH 120	5600	9.44							
CH 124	5620	9.63							
CH 128	5640	9.70							
CH 132	5660	9.76							
CH 136	5680	9.59							
CH 140	5700	9.73							
CH 149	5745	10.13	10.12	10.07	9.98	10.08	10.09	10.09	10.11
CH 153	5765	9.76							
CH 157	5785	9.91							
CH 161	5805	9.81							
CH 165	5825	9.87							

WLAN 5GHz 802.11n-HT40 Average Power (dBm)									
Power vs. Channel			Power vs. MCS Index						
Channel	Frequency (MHz)	MCS Index / MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 38	5190	10.10	10.03	10.06	10.09	9.99	9.97	10.04	10.01
CH 46	5230	9.80							
CH 54	5270	9.88	9.70	9.57	9.56	9.61	9.74	9.59	9.87
CH 62	5310	9.91							
CH 102	5510	8.65	9.85	9.90	9.89	9.89	9.80	9.70	9.93
CH 110	5550	9.42							
CH 126	5630	9.71							
CH 134	5670	9.94							
CH 151	5755	9.95	9.84	9.89	9.88	9.84	9.90	9.82	9.87
CH 159	5795	9.67							

WLAN 5GHz 802.11ac-VHT20 Average Power (dBm)										
Power vs. Channel			Power vs. MCS Index							
Channel	Frequency (MHz)	MCS Index MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
CH 36	5180	7.68	7.93	7.80	7.90	7.89	7.86	7.94	7.83	7.89
CH 40	5200	7.64								
CH 44	5220	7.75								
CH 48	5240	7.95								
CH 52	5260	8.07	8.29	8.18	8.15	8.27	8.22	8.31	8.31	8.27
CH 56	5280	8.37								
CH 60	5300	8.32								
CH 64	5320	7.43								
CH 100	5500	8.03	8.08	8.12	7.90	8.03	8.03	8.09	8.01	8.08
CH 104	5520	7.41								
CH 108	5540	7.94								
CH 112	5560	8.01								
CH 116	5580	8.13								
CH 120	5600	7.93								
CH 124	5620	8.04								
CH 128	5640	8.07								
CH 132	5660	7.89								
CH 136	5680	7.47								
CH 140	5700	7.64								
CH 149	5745	7.67	7.87	7.90	7.75	7.90	7.79	7.86	7.81	7.91
CH 153	5765	7.45								
CH 157	5785	7.77								
CH 161	5805	7.38								
CH 165	5825	7.97								

WLAN 5GHz 802.11ac-VHT40 Average Power (dBm)										
Power vs. Channel			Power vs. MCS Index								
Channel	Frequency (MHz)	MCS Index MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
CH 38	5190	8.19	7.91	7.94	7.81	7.97	7.81	8.10	7.89	8.13	8.06
CH 46	5230	7.70									
CH 54	5270	7.56	8.32	8.34	8.27	8.24	8.05	8.19	8.17	8.29	8.21
CH 62	5310	8.40									
CH 102	5510	7.66	7.83	7.94	7.80	8.00	7.90	8.09	7.96	8.13	8.07
CH 110	5550	7.50									
CH 126	5630	7.64									
CH 134	5670	8.21									
CH 151	5755	8.41	7.99	8.17	8.00	8.23	8.05	8.22	8.14	8.29	8.22
CH 159	5795	7.90									

WLAN 5GHz 802.11ac-VHT80 Average Power (dBm)										
Power vs. Channel			Power vs. MCS Index								
Channel	Frequency (MHz)	MCS Index MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
CH 42	5210	7.62	7.20	7.25	7.25	7.40	7.57	7.40	7.59	7.34	7.52
CH 58	5290	8.36	8.29	8.24	8.32	8.17	8.30	8.23	8.35	8.35	8.29
CH 106	5530	8.41	8.37	8.29	8.39	8.31	8.37	8.09	8.33	8.26	8.25
CH 122	5610	8.25									
CH 155	5775	8.48	8.36	8.41	8.40	8.35	8.43	8.27	8.42	8.33	8.38

<2.4GHz Bluetooth>

General Note:

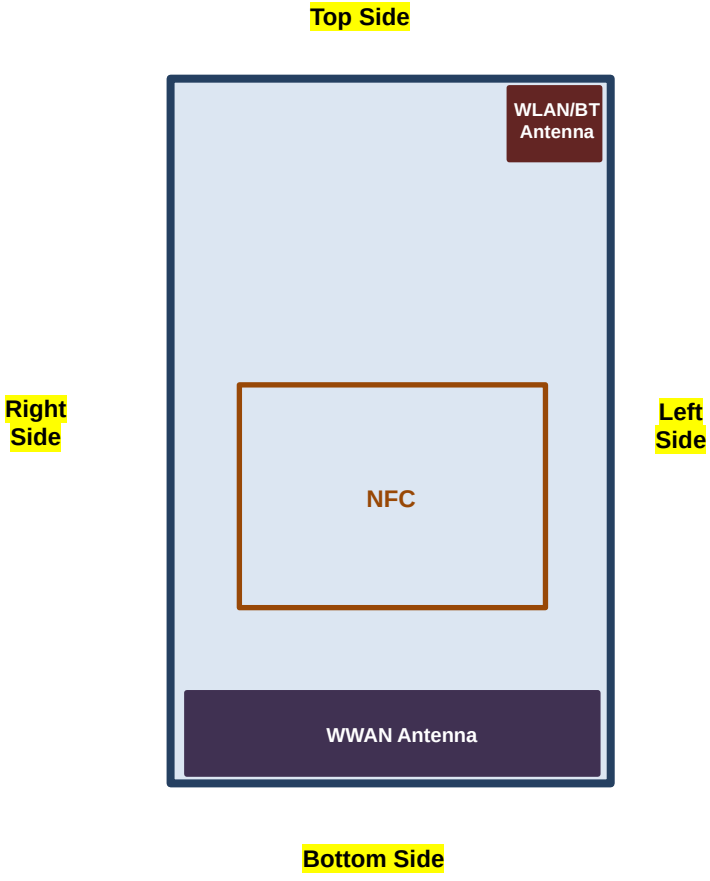
1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps, due to its highest average power.
2. The duty factor is selected theoretical 83.3% perform Bluetooth SAR testing.

Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
v3.0 with EDR	CH 00	2402	7.60	6.29	6.29
	CH 39	2441	8.75	7.47	7.45
	CH 78	2480	7.57	6.31	6.30

Mode	Channel	Frequency (MHz)	Average power (dBm)
			GFSK
v4.0 with LE	CH 00	2402	0.17
	CH 19	2440	1.26
	CH 39	2480	-0.03

13. Antenna Location

<Mobile Phone>



Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main	≤ 25mm	≤ 25mm	128mm	≤ 25mm	≤ 25mm	≤ 25mm
BT&WLAN	≤ 25mm	≤ 25mm	≤ 25mm	129mm	53.mm	≤ 25mm

Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main	Yes	Yes	No	Yes	Yes	Yes
BT&WLAN	Yes	Yes	Yes	No	No	Yes

General Note:

1. Referring to KDB 941225 D06 v01r01, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge

14. SAR Test Results

General Note:

1. Per KDB 447498 D01v05r02, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   d. 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.
   e. 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)"
   f. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   g. 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
1. Per KDB 941225 D01v03, considering the possibility of e.g. 3rd party VoIP operation for Head and body-worn SAR test reduction for GSM and GPRS and EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the EUT was set in GPRS (4Tx slots) for GSM850 and GPRS 2 Tx slots for GSM1900.
2. Per KDB 941225 D01v03, for Hotspot SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance, for modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested, therefore, the EUT was set in GPRS (4Tx slots) for GSM850 and GPRS 2 Tx slots for GSM1900.
3. Since the EDGE1900 (4Tx slots) maximum source-based time average power is high then GPRS mode, therefore the EDGE1900 (4Tx slots) will verify worse case found in GPRS mode.
4. Per KDB 941225 D01v03, SAR for next to the ear head / Hotspot / Body-worn exposure is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”.
5. 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.
6. 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.
7. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
8. 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.
9. 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.
10. 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.
11. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
12. Per KDB 648474 D04v01r02, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.
13. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

14.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	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 (4 Tx slots)	Right Cheek	128	824.2	26.34	27.50	1.306	0.05	0.159	0.208
	GSM850	GPRS (4 Tx slots)	Right Tilted	128	824.2	26.34	27.50	1.306	0	0.116	0.152
	GSM850	GPRS (4 Tx slots)	Left Cheek	128	824.2	26.34	27.50	1.306	0.06	0.168	0.219
	GSM850	GPRS (4 Tx slots)	Left Cheek	189	836.4	26.27	27.50	1.327	0.04	0.157	0.208
01	GSM850	GPRS (4 Tx slots)	Left Cheek	251	848.8	26.22	27.50	1.343	0.04	0.175	**0.235**
	GSM850	GPRS (4 Tx slots)	Left Tilted	128	824.2	26.34	27.50	1.306	0.19	0.108	0.141
	GSM1900	GPRS (2 Tx slots)	Right Cheek	512	1850.2	26.24	27.50	1.337	0	0.140	0.187
	GSM1900	GPRS (2 Tx slots)	Right Tilted	512	1850.2	26.24	27.50	1.337	0	0.089	0.119
	GSM1900	GPRS (2 Tx slots)	Left Cheek	512	1850.2	26.24	27.50	1.337	-0.05	0.247	0.330
02	GSM1900	EDGE (4 Tx slots)	Left Cheek	512	1850.2	25.02	26.00	1.253	0.07	0.362	**0.454**
	GSM1900	EDGE (4 Tx slots)	Left Cheek	661	1880	24.91	26.00	1.285	0	0.352	0.452
	GSM1900	EDGE (4 Tx slots)	Left Cheek	810	1909.8	24.98	26.00	1.265	-0.01	0.322	0.407
	GSM1900	GPRS (2 Tx slots)	Left Tilted	512	1850.2	26.24	27.50	1.337	0.08	0.124	0.166

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	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 V	RMC 12.2Kbps	Right Cheek	4182	836.4	22.95	24.00	1.274	-0.02	0.173	0.220
	WCDMA V	RMC 12.2Kbps	Right Tilted	4182	836.4	22.95	24.00	1.274	0.01	0.111	0.141
	WCDMA V	RMC 12.2Kbps	Left Cheek	4182	836.4	22.95	24.00	1.274	0.04	0.186	0.237
	WCDMA V	RMC 12.2Kbps	Left Cheek	4132	826.4	22.89	24.00	1.291	0.07	0.163	0.210
03	WCDMA V	RMC 12.2Kbps	Left Cheek	4233	846.6	22.78	24.00	1.324	0.04	0.218	**0.289**
	WCDMA V	RMC 12.2Kbps	Left Tilted	4182	836.4	22.95	24.00	1.274	0.06	0.102	0.130
	WCDMA IV	RMC 12.2Kbps	Right Cheek	1312	1712.4	23.39	24.00	1.151	0.01	0.290	0.334
	WCDMA IV	RMC 12.2Kbps	Right Tilted	1312	1712.4	23.39	24.00	1.151	0.03	0.180	0.207
	WCDMA IV	RMC 12.2Kbps	Left Cheek	1312	1712.4	23.39	24.00	1.151	0	0.473	0.544
04	WCDMA IV	RMC 12.2Kbps	Left Cheek	1413	1732.6	22.96	24.00	1.271	0.05	0.447	**0.568**
	WCDMA IV	RMC 12.2Kbps	Left Cheek	1513	1752.6	22.89	24.00	1.291	0.01	0.430	0.555
	WCDMA IV	RMC 12.2Kbps	Left Tilted	1312	1712.4	23.39	24.00	1.151	-0.09	0.246	0.283
	WCDMA II	RMC 12.2Kbps	Right Cheek	9400	1880	23.19	24.00	1.205	0.06	0.195	0.235
	WCDMA II	RMC 12.2Kbps	Right Tilted	9400	1880	23.19	24.00	1.205	0.07	0.144	0.174
	WCDMA II	RMC 12.2Kbps	Left Cheek	9400	1880	23.19	24.00	1.205	0.01	0.419	0.505
05	WCDMA II	RMC 12.2Kbps	Left Cheek	9262	1852.4	22.34	24.00	1.466	0	0.411	**0.602**
	WCDMA II	RMC 12.2Kbps	Left Cheek	9538	1907.6	23.12	24.00	1.225	-0.03	0.444	0.544
	WCDMA II	RMC 12.2Kbps	Left Tilted	9400	1880	23.19	24.00	1.205	0.17	0.150	0.181

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	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 5	10M	QPSK	1RB	0Offset	Right Cheek	20525	836.5	22.61	24.00	1.377	0.02	0.154	0.212
	LTE Band 5	10M	QPSK	25RB	12Offset	Right Cheek	20450	829	21.61	23.00	1.377	-0.04	0.120	0.165
	LTE Band 5	10M	QPSK	1RB	0Offset	Right Tilted	20525	836.5	22.61	24.00	1.377	0.03	0.105	0.145
	LTE Band 5	10M	QPSK	25RB	12Offset	Right Tilted	20450	829	21.61	23.00	1.377	0.04	0.084	0.116
	LTE Band 5	10M	QPSK	1RB	0Offset	Left Cheek	20525	836.5	22.61	24.00	1.377	0.05	0.165	0.227
	LTE Band 5	10M	QPSK	1RB	0Offset	Left Cheek	20450	829	22.53	24.00	1.403	0.03	0.148	0.208
06	LTE Band 5	10M	QPSK	1RB	0Offset	Left Cheek	20600	844	22.52	24.00	1.406	0.06	0.189	**0.266**
	LTE Band 5	10M	QPSK	25RB	12Offset	Left Cheek	20450	829	21.61	23.00	1.377	0.09	0.147	0.202
	LTE Band 5	10M	QPSK	1RB	0Offset	Left Tilted	20525	836.5	22.61	24.00	1.377	0.06	0.109	0.150
	LTE Band 5	10M	QPSK	25RB	12Offset	Left Tilted	20450	829	21.61	23.00	1.377	0.12	0.088	0.121
	LTE Band 4	20M	QPSK	1RB	0Offset	Right Cheek	20050	1720	22.91	24.00	1.285	0.01	0.199	0.256
	LTE Band 4	20M	QPSK	50RB	0Offset	Right Cheek	20050	1720	21.82	23.00	1.312	0.03	0.173	0.227
	LTE Band 4	20M	QPSK	1RB	0Offset	Right Tilted	20050	1720	22.91	24.00	1.285	0.07	0.133	0.171
	LTE Band 4	20M	QPSK	50RB	0Offset	Right Tilted	20050	1720	21.82	23.00	1.312	0.07	0.103	0.135
	LTE Band 4	20M	QPSK	1RB	0Offset	Left Cheek	20050	1720	22.91	24.00	1.285	-0.02	0.380	0.488
	LTE Band 4	20M	QPSK	1RB	0Offset	Left Cheek	20175	1732.5	22.68	24.00	1.355	0.04	0.398	0.539
07	LTE Band 4	20M	QPSK	1RB	0Offset	Left Cheek	20300	1745	22.31	24.00	1.476	0.04	0.400	**0.590**
	LTE Band 4	20M	QPSK	50RB	0Offset	Left Cheek	20050	1720	21.82	23.00	1.312	0.08	0.306	0.402
	LTE Band 4	20M	QPSK	1RB	0Offset	Left Tilted	20050	1720	22.91	24.00	1.285	0.05	0.180	0.231
	LTE Band 4	20M	QPSK	50RB	0Offset	Left Tilted	20050	1720	21.82	23.00	1.312	0.13	0.149	0.196
	LTE Band 2	20M	QPSK	1RB	0Offset	Right Cheek	18900	1880	22.65	24.00	1.365	0.13	0.165	0.225
	LTE Band 2	20M	QPSK	50RB	0Offset	Right Cheek	18900	1880	21.54	23.00	1.400	-0.03	0.142	0.199
	LTE Band 2	20M	QPSK	1RB	0Offset	Right Tilted	18900	1880	22.65	24.00	1.365	0.11	0.116	0.158
	LTE Band 2	20M	QPSK	50RB	0Offset	Right Tilted	18900	1880	21.54	23.00	1.400	0.04	0.100	0.140
	LTE Band 2	20M	QPSK	1RB	0Offset	Left Cheek	18900	1880	22.65	24.00	1.365	0	0.360	0.491
08	LTE Band 2	20M	QPSK	1RB	0Offset	Left Cheek	18700	1860	22.27	24.00	1.489	0.03	0.356	**0.530**
	LTE Band 2	20M	QPSK	1RB	0Offset	Left Cheek	19100	1900	22.45	24.00	1.429	-0.01	0.355	0.507
	LTE Band 2	20M	QPSK	50RB	0Offset	Left Cheek	18900	1880	21.54	23.00	1.400	0.01	0.296	0.414
	LTE Band 2	20M	QPSK	1RB	0Offset	Left Tilted	18900	1880	22.65	24.00	1.365	0.05	0.114	0.156
	LTE Band 2	20M	QPSK	50RB	0Offset	Left Tilted	18900	1880	21.54	23.00	1.400	0.19	0.101	0.141
	LTE Band 25	20M	QPSK	1RB	0Offset	Right Cheek	26340	1880	22.95	24.00	1.274	-0.12	0.186	0.237
	LTE Band 25	20M	QPSK	50RB	49Offset	Right Cheek	26590	1905	21.83	23.00	1.309	-0.08	0.160	0.209
	LTE Band 25	20M	QPSK	1RB	0Offset	Right Tilted	26340	1880	22.95	24.00	1.274	0.13	0.109	0.139
	LTE Band 25	20M	QPSK	50RB	49Offset	Right Tilted	26590	1905	21.83	23.00	1.309	-0.08	0.093	0.122
09	LTE Band 25	20M	QPSK	1RB	0ffset	Left Cheek	26340	1880	22.95	24.00	1.274	0.02	0.418	**0.532**
	LTE Band 25	20M	QPSK	1RB	0ffset	Left Cheek	26140	1860	22.70	24.00	1.349	0.01	0.373	0.503
	LTE Band 25	20M	QPSK	1RB	0ffset	Left Cheek	26590	1905	22.87	24.00	1.297	0.03	0.404	0.524
	LTE Band 25	20M	QPSK	50RB	49ffset	Left Cheek	26590	1905	21.83	23.00	1.309	-0.03	0.337	0.441
	LTE Band 25	20M	QPSK	1RB	0ffset	Left Tilted	26340	1880	22.95	24.00	1.274	0.07	0.118	0.150
	LTE Band 25	20M	QPSK	50RB	49ffset	Left Tilted	26590	1905	21.83	23.00	1.309	0.12	0.121	0.158
	LTE Band 7	20M	QPSK	1RB	0Offset	Right Cheek	20850	2510	24.00	24.00	1.000	0	0.155	0.155
	LTE Band 7	20M	QPSK	50RB	49Offset	Right Cheek	20850	2510	23.00	23.00	1.000	-0.06	0.144	0.144
	LTE Band 7	20M	QPSK	1RB	0Offset	Right Tilted	20850	2510	24.00	24.00	1.000	0.13	0.133	0.133
	LTE Band 7	20M	QPSK	50RB	49Offset	Right Tilted	20850	2510	23.00	23.00	1.000	0.08	0.129	0.129
	LTE Band 7	20M	QPSK	1RB	0Offset	Left Cheek	20850	2510	24.00	24.00	1.000	-0.01	0.377	0.377
	LTE Band 7	20M	QPSK	1RB	0Offset	Left Cheek	21100	2535	23.13	24.00	1.222	-0.02	0.443	0.541
10	LTE Band 7	20M	QPSK	1RB	0Offset	Left Cheek	21350	2560	23.41	24.00	1.146	0.01	0.539	**0.617**
	LTE Band 7	20M	QPSK	50RB	49Offset	Left Cheek	20850	2510	23.00	23.00	1.000	-0.01	0.288	0.288
	LTE Band 7	20M	QPSK	1RB	0Offset	Left Tilted	20850	2510	24.00	24.00	1.000	0.16	0.126	0.126
	LTE Band 7	20M	QPSK	50RB	49Offset	Left Tilted	20850	2510	23.00	23.00	1.000	0.12	0.112	0.112

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	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)
	LTE Band 38	20M	QPSK	1RB	0Offset	Right Cheek	38150	2610	22.95	24.00	1.274	62.9	1.006	-0.07	0.132	0.169
	LTE Band 38	20M	QPSK	50RB	49Offset	Right Cheek	38150	2610	22.14	23.00	1.219	62.9	1.006	0.14	0.111	0.136
	LTE Band 38	20M	QPSK	1RB	0Offset	Right Tilted	38150	2610	22.95	24.00	1.274	62.9	1.006	0.04	0.114	0.146
	LTE Band 38	20M	QPSK	50RB	49Offset	Right Tilted	38150	2610	22.14	23.00	1.219	62.9	1.006	0.12	0.099	0.121
	LTE Band 38	20M	QPSK	1RB	0Offset	Left Cheek	38150	2610	22.95	24.00	1.274	62.9	1.006	0.05	0.342	0.438
11	LTE Band 38	20M	QPSK	1RB	0Offset	Left Cheek	37850	2580	22.50	24.00	1.413	62.9	1.006	0.11	0.369	**0.524**
	LTE Band 38	20M	QPSK	1RB	0Offset	Left Cheek	38000	2595	22.66	24.00	1.361	62.9	1.006	0.06	0.356	0.488
	LTE Band 38	20M	QPSK	50RB	49Offset	Left Cheek	38150	2610	22.14	23.00	1.219	62.9	1.006	0.02	0.283	0.347
	LTE Band 38	20M	QPSK	1RB	0Offset	Left Tilted	38150	2610	22.95	24.00	1.274	62.9	1.006	0.13	0.106	0.136
	LTE Band 38	20M	QPSK	50RB	49Offset	Left Tilted	38150	2610	22.14	23.00	1.219	62.9	1.006	0.17	0.097	0.119
	LTE Band 41	20M	QPSK	1RB	0Offset	Right Cheek	41055	2636.5	22.86	24.00	1.300	62.9	1.006	0.04	0.119	0.156
	LTE Band 41	20M	QPSK	50RB	0Offset	Right Cheek	41055	2636.5	22.06	23.00	1.242	62.9	1.006	0.06	0.102	0.127
	LTE Band 41	20M	QPSK	1RB	0Offset	Right Tilted	41055	2636.5	22.86	24.00	1.300	62.9	1.006	0.03	0.113	0.148
	LTE Band 41	20M	QPSK	50RB	0Offset	Right Tilted	41055	2636.5	22.06	23.00	1.242	62.9	1.006	0.15	0.099	0.124
	LTE Band 41	20M	QPSK	1RB	0Offset	Left Cheek	41055	2636.5	22.86	24.00	1.300	62.9	1.006	0.02	0.308	0.403
	LTE Band 41	20M	QPSK	1RB	0Offset	Left Cheek	39750	2506	22.70	24.00	1.349	62.9	1.006	0.07	0.275	0.373
	LTE Band 41	20M	QPSK	1RB	0Offset	Left Cheek	40185	2549.5	22.53	24.00	1.403	62.9	1.006	0.04	0.336	0.474
12	LTE Band 41	20M	QPSK	1RB	0Offset	Left Cheek	40620	2593	22.56	24.00	1.393	62.9	1.006	0.03	0.345	**0.484**
	LTE Band 41	20M	QPSK	1RB	0Offset	Left Cheek	41490	2680	22.67	24.00	1.358	62.9	1.006	0	0.293	0.400
	LTE Band 41	20M	QPSK	50RB	0Offset	Left Cheek	41055	2636.5	22.06	23.00	1.242	62.9	1.006	0.04	0.264	0.330
	LTE Band 41	20M	QPSK	1RB	0Offset	Left Tilted	41055	2636.5	22.86	24.00	1.300	62.9	1.006	-0.01	0.127	0.166
	LTE Band 41	20M	QPSK	50RB	0Offset	Left Tilted	41055	2636.5	22.06	23.00	1.242	62.9	1.006	0.13	0.123	0.154

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	1	2412	16.44	17.00	1.137	97.63	1.024	0.087	0.353	0.411
13	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	1	2412	16.44	17.00	1.137	97.63	1.024	0.046	0.379	**0.441**
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	6	2437	16.40	17.00	1.147	97.63	1.024	0.042	0.261	0.307
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	11	2462	16.25	17.00	1.187	97.63	1.024	0.09	0.280	0.340
	WLAN2.4GHz	802.11n-HT40 MCS0	Right Tilted	9	2452	10.40	10.50	1.024	75.71	1.321	0.023	0.105	0.142
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	1	2412	16.44	17.00	1.137	97.63	1.024	0.032	0.160	0.186
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	1	2412	16.44	17.00	1.137	97.63	1.024	0.091	0.215	0.250
	WLAN5GHz	802.11a 6Mbps	Right Cheek	48	5240	12.09	13.50	1.382	83.87	1.192	0.01	0.095	0.157
14	WLAN5GHz	802.11a 6Mbps	Right Tilted	48	5240	12.09	13.50	1.382	83.87	1.192	0.01	0.232	**0.382**
	WLAN5GHz	802.11a 6Mbps	Right Tilted	36	5180	11.69	13.50	1.516	83.87	1.192	-0.08	0.201	0.363
	WLAN5GHz	802.11n-HT20 MCS0	Right Tilted	48	5240	9.81	11.50	1.477	83.05	1.204	0.087	0.128	0.228
	WLAN5GHz	802.11n-HT40 MCS0	Right Tilted	38	5190	10.10	10.50	1.096	71.1	1.406	-0.015	0.103	0.159
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	42	5210	7.62	9.00	1.373	55.31	1.808	-0.061	0.032	0.079
	WLAN5GHz	802.11a 6Mbps	Left Cheek	48	5240	12.09	13.50	1.382	83.87	1.192	0.079	0.056	0.092
	WLAN5GHz	802.11a 6Mbps	Left Tilted	48	5240	12.09	13.50	1.382	83.87	1.192	0.101	0.127	0.209
	WLAN5GHz	802.11a 6Mbps	Right Cheek	64	5320	12.21	13.50	1.345	83.87	1.192	-0.082	0.099	0.159
15	WLAN5GHz	802.11a 6Mbps	Right Tilted	64	5320	12.21	13.50	1.345	83.87	1.192	0.073	0.174	**0.279**
	WLAN5GHz	802.11a 6Mbps	Right Tilted	56	5280	11.77	13.50	1.489	83.87	1.192	-0.068	0.151	0.268
	WLAN5GHz	802.11n-HT20 MCS0	Right Tilted	60	5300	10.06	11.50	1.394	83.05	1.204	-0.034	0.087	0.146
	WLAN5GHz	802.11n-HT40 MCS0	Right Tilted	62	5310	9.91	10.50	1.145	71.1	1.406	-0.02	0.056	0.090
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	58	5290	8.36	9.00	1.158	55.31	1.808	-0.071	0.028	0.059
	WLAN5GHz	802.11a 6Mbps	Left Cheek	64	5320	12.21	13.50	1.345	83.87	1.192	0.086	0.046	0.074
	WLAN5GHz	802.11a 6Mbps	Left Tilted	64	5320	12.21	13.50	1.345	83.87	1.192	-0.097	0.103	0.165

Plot No.	Band	Mode	Test Position	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)
	WLAN5GHz	802.11a 6Mbps	Right Cheek	100	5500	11.88	13.50	1.451	83.87	1.192	0.011	0.068	0.118
	WLAN5GHz	802.11a 6Mbps	Right Tilted	100	5500	11.88	13.50	1.451	83.87	1.192	0.024	0.193	0.334
	WLAN5GHz	802.11a 6Mbps	Right Tilted	112	5560	11.53	13.50	1.574	83.87	1.192	0.162	0.175	0.328
	WLAN5GHz	802.11a 6Mbps	Right Tilted	128	5640	11.74	13.50	1.500	83.87	1.192	0.159	0.061	0.109
16	WLAN5GHz	802.11a 6Mbps	Right Tilted	136	5680	11.83	13.50	1.469	83.87	1.192	0.06	0.268	**0.469**
	WLAN5GHz	802.11n-HT20 MCS0	Right Tilted	100	5500	9.91	11.50	1.443	83.05	1.204	-0.003	0.115	0.200
	WLAN5GHz	802.11n-HT40 MCS0	Right Tilted	134	5670	9.94	10.50	1.137	71.1	1.406	0.049	0.145	0.232
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	106	5530	8.41	9.00	1.145	55.31	1.808	0.031	0.040	0.083
	WLAN5GHz	802.11a 6Mbps	Left Cheek	100	5500	11.88	13.50	1.451	83.87	1.192	0.05	0.066	0.114
	WLAN5GHz	802.11a 6Mbps	Left Tilted	100	5500	11.88	13.50	1.451	83.87	1.192	0.067	0.135	0.233
	WLAN5GHz	802.11a 6Mbps	Right Cheek	157	5785	11.91	13.50	1.441	83.87	1.192	0.075	0.068	0.117
	WLAN5GHz	802.11a 6Mbps	Right Tilted	157	5785	11.91	13.50	1.441	83.87	1.192	0.025	0.137	0.235
	WLAN5GHz	802.11a 6Mbps	Right Tilted	153	5765	11.70	13.50	1.514	83.87	1.192	-0.092	0.137	0.247
17	WLAN5GHz	802.11a 6Mbps	Right Tilted	165	5825	11.71	13.50	1.509	83.87	1.192	-0.005	0.157	**0.282**
	WLAN5GHz	802.11n-HT40 MCS0	Right Tilted	151	5755	9.95	10.50	1.135	71.1	1.406	0.081	0.064	0.102
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	155	5775	8.48	9.00	1.127	55.31	1.808	-0.004	0.027	0.055
	WLAN5GHz	802.11a 6Mbps	Left Cheek	157	5785	11.91	13.50	1.441	83.87	1.192	0.142	0.072	0.124
	WLAN5GHz	802.11a 6Mbps	Left Tilted	157	5785	11.91	13.50	1.441	83.87	1.192	0.136	0.128	0.220

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	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)
	Bluetooth	1Mbps	Right Cheek	39	2441	8.75	9.00	1.059	0.053	0.029	0.031
	Bluetooth	1Mbps	Right Cheek	0	2402	7.60	9.00	1.380	0.096	0.005	0.007
18	Bluetooth	1Mbps	Right Cheek	78	2480	7.57	9.00	1.390	0.03	0.032	**0.044**
	Bluetooth	1Mbps	Right Tilted	39	2441	8.75	9.00	1.059	0.018	0.024	0.025
	Bluetooth	1Mbps	Left Cheek	39	2441	8.75	9.00	1.059	-0.053	0.013	0.014
	Bluetooth	1Mbps	Left Tilted	39	2441	8.75	9.00	1.059	-0.021	0.019	0.020

14.2 Hotspot SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	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 (4 Tx slots)	Front	1cm	128	824.2	26.34	27.50	1.306	0.02	0.239	0.312
	GSM850	GPRS (4 Tx slots)	Back	1cm	128	824.2	26.34	27.50	1.306	0	0.363	0.474
	GSM850	GPRS (4 Tx slots)	Back	1cm	189	836.4	26.27	27.50	1.327	0	0.351	0.466
19	GSM850	GPRS (4 Tx slots)	Back	1cm	251	848.8	26.22	27.50	1.343	0.04	0.364	**0.489**
	GSM850	GPRS (4 Tx slots)	Left Side	1cm	128	824.2	26.34	27.50	1.306	-0.08	0.349	0.456
	GSM850	GPRS (4 Tx slots)	Right Side	1cm	128	824.2	26.34	27.50	1.306	0.01	0.308	0.402
	GSM850	GPRS (4 Tx slots)	Bottom Side	1cm	128	824.2	26.34	27.50	1.306	0.05	0.144	0.188
	GSM1900	GPRS (2 Tx slots)	Front	1cm	512	1850.2	26.24	27.50	1.337	0.09	0.179	0.239
	GSM1900	GPRS (2 Tx slots)	Back	1cm	512	1850.2	26.24	27.50	1.337	-0.01	0.277	0.370
	GSM1900	EDGE (4 Tx slots)	Back	1cm	512	1850.2	25.02	26.00	1.253	-0.01	0.454	0.569
20	GSM1900	EDGE (4 Tx slots)	Back	1cm	661	1880	24.91	26.00	1.285	-0.1	0.470	**0.604**
	GSM1900	EDGE (4 Tx slots)	Back	1cm	810	1909.8	24.98	26.00	1.265	-0.02	0.453	0.573
	GSM1900	GPRS (2 Tx slots)	Left Side	1cm	512	1850.2	26.24	27.50	1.337	0.02	0.256	0.342
	GSM1900	GPRS (2 Tx slots)	Right Side	1cm	512	1850.2	26.24	27.50	1.337	-0.06	0.154	0.206
	GSM1900	GPRS (2 Tx slots)	Bottom Side	1cm	512	1850.2	26.24	27.50	1.337	0.08	0.155	0.207

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	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 V	RMC 12.2Kbps	Front	1cm	4182	836.4	22.95	24.00	1.274	0.13	0.274	0.349
	WCDMA V	RMC 12.2Kbps	Back	1cm	4182	836.4	22.95	24.00	1.274	0	0.314	0.400
	WCDMA V	RMC 12.2Kbps	Left Side	1cm	4182	836.4	22.95	24.00	1.274	-0.01	0.351	0.447
	WCDMA V	RMC 12.2Kbps	Left Side	1cm	4132	826.4	22.89	24.00	1.291	-0.1	0.298	0.385
21	WCDMA V	RMC 12.2Kbps	Left Side	1cm	4233	846.6	22.78	24.00	1.324	-0.01	0.396	**0.524**
	WCDMA V	RMC 12.2Kbps	Right Side	1cm	4182	836.4	22.95	24.00	1.274	0	0.264	0.336
	WCDMA V	RMC 12.2Kbps	Bottom Side	1cm	4182	836.4	22.95	24.00	1.274	0.01	0.173	0.220
	WCDMA IV	RMC 12.2Kbps	Front	1cm	1312	1712.4	23.39	24.00	1.151	0.08	0.463	0.533
	WCDMA IV	RMC 12.2Kbps	Back	1cm	1312	1712.4	23.39	24.00	1.151	-0.04	0.497	0.572
	WCDMA IV	RMC 12.2Kbps	Back	1cm	1413	1732.6	22.96	24.00	1.271	-0.06	0.497	0.631
22	WCDMA IV	RMC 12.2Kbps	Back	1cm	1513	1752.6	22.89	24.00	1.291	-0.03	0.502	**0.648**
	WCDMA IV	RMC 12.2Kbps	Left Side	1cm	1312	1712.4	23.39	24.00	1.151	-0.04	0.496	0.571
	WCDMA IV	RMC 12.2Kbps	Right Side	1cm	1312	1712.4	23.39	24.00	1.151	0.02	0.277	0.319
	WCDMA IV	RMC 12.2Kbps	Bottom Side	1cm	1312	1712.4	23.39	24.00	1.151	-0.01	0.348	0.400
	WCDMA II	RMC 12.2Kbps	Front	1cm	9400	1880	23.19	24.00	1.205	0.01	0.450	0.542
	WCDMA II	RMC 12.2Kbps	Back	1cm	9400	1880	23.19	24.00	1.205	-0.12	0.756	0.911
	WCDMA II	RMC 12.2Kbps	Back	1cm	9262	1852.4	22.34	24.00	1.466	0	0.633	0.928
23	WCDMA II	RMC 12.2Kbps	Back	1cm	9538	1907.6	23.12	24.00	1.225	-0.01	0.759	**0.929**
	WCDMA II	RMC 12.2Kbps	Left Side	1cm	9400	1880	23.19	24.00	1.205	0.01	0.559	0.674
	WCDMA II	RMC 12.2Kbps	Right Side	1cm	9400	1880	23.19	24.00	1.205	0.01	0.273	0.329
	WCDMA II	RMC 12.2Kbps	Bottom Side	1cm	9400	1880	23.19	24.00	1.205	0	0.338	0.407

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (cm)	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 5	10M	QPSK	1RB	0Offset	Front	1cm	20525	836.5	22.61	24.00	1.377	0.03	0.225	0.310
	LTE Band 5	10M	QPSK	25RB	12Offset	Front	1cm	20450	829	21.61	23.00	1.377	0.01	0.175	0.241
	LTE Band 5	10M	QPSK	1RB	0Offset	Back	1cm	20525	836.5	22.61	24.00	1.377	0.01	0.320	0.441
	LTE Band 5	10M	QPSK	1RB	0Offset	Back	1cm	20450	829	22.53	24.00	1.403	-0.04	0.316	0.443
24	LTE Band 5	10M	QPSK	1RB	0Offset	Back	1cm	20600	844	22.52	24.00	1.406	0.02	0.374	**0.526**
	LTE Band 5	10M	QPSK	25RB	12Offset	Back	1cm	20450	829	21.61	23.00	1.377	-0.01	0.250	0.344
	LTE Band 5	10M	QPSK	1RB	0Offset	Left Side	1cm	20525	836.5	22.61	24.00	1.377	0.01	0.275	0.379
	LTE Band 5	10M	QPSK	25RB	12Offset	Left Side	1cm	20450	829	21.61	23.00	1.377	-0.01	0.254	0.350
	LTE Band 5	10M	QPSK	1RB	0Offset	Right Side	1cm	20525	836.5	22.61	24.00	1.377	-0.05	0.243	0.335
	LTE Band 5	10M	QPSK	25RB	12Offset	Right Side	1cm	20450	829	21.61	23.00	1.377	0.01	0.196	0.270
	LTE Band 5	10M	QPSK	1RB	0Offset	Bottom Side	1cm	20525	836.5	22.61	24.00	1.377	0.03	0.163	0.224
	LTE Band 5	10M	QPSK	25RB	12Offset	Bottom Side	1cm	20450	829	21.61	23.00	1.377	0.01	0.125	0.172
	LTE Band 4	20M	QPSK	1RB	0Offset	Front	1cm	20050	1720	22.91	24.00	1.285	-0.03	0.401	0.515
	LTE Band 4	20M	QPSK	50RB	0Offset	Front	1cm	20050	1720	21.82	23.00	1.312	-0.01	0.322	0.423
	LTE Band 4	20M	QPSK	1RB	0Offset	Back	1cm	20050	1720	22.91	24.00	1.285	-0.03	0.437	0.562
	LTE Band 4	20M	QPSK	1RB	0Offset	Back	1cm	20175	1732.5	22.68	24.00	1.355	-0.01	0.454	0.615
25	LTE Band 4	20M	QPSK	1RB	0Offset	Back	1cm	20300	1745	22.31	24.00	1.476	-0.01	0.453	**0.668**
	LTE Band 4	20M	QPSK	50RB	0Offset	Back	1cm	20050	1720	21.82	23.00	1.312	-0.08	0.355	0.466
	LTE Band 4	20M	QPSK	1RB	0Offset	Left Side	1cm	20050	1720	22.91	24.00	1.285	-0.02	0.360	0.463
	LTE Band 4	20M	QPSK	50RB	0Offset	Left Side	1cm	20050	1720	21.82	23.00	1.312	0.02	0.301	0.395
	LTE Band 4	20M	QPSK	1RB	0Offset	Right Side	1cm	20050	1720	22.91	24.00	1.285	0.02	0.226	0.290
	LTE Band 4	20M	QPSK	50RB	0Offset	Right Side	1cm	20050	1720	21.82	23.00	1.312	0.01	0.191	0.251
	LTE Band 4	20M	QPSK	1RB	0Offset	Bottom Side	1cm	20050	1720	22.91	24.00	1.285	-0.01	0.270	0.347
	LTE Band 4	20M	QPSK	50RB	0Offset	Bottom Side	1cm	20050	1720	21.82	23.00	1.312	0.01	0.217	0.285
	LTE Band 2	20M	QPSK	1RB	0Offset	Front	1cm	18900	1880	22.65	24.00	1.365	-0.1	0.249	0.340
	LTE Band 2	20M	QPSK	50RB	0Offset	Front	1cm	18900	1880	21.54	23.00	1.400	-0.06	0.196	0.274
	LTE Band 2	20M	QPSK	1RB	0Offset	Back	1cm	18900	1880	22.65	24.00	1.365	0.05	0.455	0.621
26	LTE Band 2	20M	QPSK	1RB	0Offset	Back	1cm	18700	1860	22.27	24.00	1.489	0	0.471	**0.701**
	LTE Band 2	20M	QPSK	1RB	0Offset	Back	1cm	19100	1900	22.45	24.00	1.429	-0.02	0.423	0.604
	LTE Band 2	20M	QPSK	50RB	0Offset	Back	1cm	18900	1880	21.54	23.00	1.400	0	0.353	0.494
	LTE Band 2	20M	QPSK	1RB	0Offset	Left Side	1cm	18900	1880	22.65	24.00	1.365	-0.02	0.383	0.523
	LTE Band 2	20M	QPSK	50RB	0Offset	Left Side	1cm	18900	1880	21.54	23.00	1.400	0.06	0.308	0.431
	LTE Band 2	20M	QPSK	1RB	0Offset	Right Side	1cm	18900	1880	22.65	24.00	1.365	0.11	0.139	0.190
	LTE Band 2	20M	QPSK	50RB	0Offset	Right Side	1cm	18900	1880	21.54	23.00	1.400	0.01	0.113	0.158
	LTE Band 2	20M	QPSK	1RB	0Offset	Bottom Side	1cm	18900	1880	22.65	24.00	1.365	0.05	0.194	0.265
	LTE Band 2	20M	QPSK	50RB	0Offset	Bottom Side	1cm	18900	1880	21.54	23.00	1.400	0.03	0.155	0.217
	LTE Band 25	20M	QPSK	1RB	0Offset	Front	1cm	26340	1880	22.95	24.00	1.274	-0.05	0.242	0.308
	LTE Band 25	20M	QPSK	50RB	49Offset	Front	1cm	26590	1905	21.83	23.00	1.309	-0.11	0.204	0.267
	LTE Band 25	20M	QPSK	1RB	0Offset	Back	1cm	26340	1880	22.95	24.00	1.274	0.06	0.429	0.546
27	LTE Band 25	20M	QPSK	1RB	0Offset	Back	1cm	26140	1860	22.70	24.00	1.349	0.01	0.421	**0.568**
	LTE Band 25	20M	QPSK	1RB	0Offset	Back	1cm	26590	1905	22.87	24.00	1.297	-0.05	0.409	0.531
	LTE Band 25	20M	QPSK	50RB	49Offset	Back	1cm	26590	1905	21.83	23.00	1.309	-0.04	0.364	0.477
	LTE Band 25	20M	QPSK	1RB	0Offset	Left Side	1cm	26340	1880	22.95	24.00	1.274	0.02	0.357	0.455
	LTE Band 25	20M	QPSK	50RB	49Offset	Left Side	1cm	26590	1905	21.83	23.00	1.309	0.04	0.308	0.403
	LTE Band 25	20M	QPSK	1RB	0Offset	Right Side	1cm	26340	1880	22.95	24.00	1.274	0	0.151	0.192
	LTE Band 25	20M	QPSK	50RB	49Offset	Right Side	1cm	26590	1905	21.83	23.00	1.309	-0.18	0.102	0.134
	LTE Band 25	20M	QPSK	1RB	0Offset	Bottom Side	1cm	26340	1880	22.95	24.00	1.274	0	0.194	0.247
	LTE Band 25	20M	QPSK	50RB	49Offset	Bottom Side	1cm	26590	1905	21.83	23.00	1.309	0.05	0.154	0.202

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (cm)	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	QPSK	1RB	0Offset	Front	1cm	20850	2510	24.00	24.00	1.000	-0.08	0.321	0.321
	LTE Band 7	20M	QPSK	50RB	49Offset	Front	1cm	20850	2510	23.00	23.00	1.000	0	0.292	0.292
	LTE Band 7	20M	QPSK	1RB	0Offset	Back	1cm	20850	2510	24.00	24.00	1.000	-0.03	0.888	0.888
	LTE Band 7	20M	QPSK	1RB	0Offset	Back	1cm	21100	2535	23.13	24.00	1.222	0.04	0.868	1.061
28	LTE Band 7	20M	QPSK	1RB	0Offset	Back	1cm	21350	2560	23.41	24.00	1.146	-0.02	1.040	**1.191**
	LTE Band 7	20M	QPSK	50RB	49Offset	Back	1cm	20850	2510	23.00	23.00	1.000	0.01	0.689	0.689
	LTE Band 7	20M	QPSK	1RB	0Offset	Left Side	1cm	20850	2510	24.00	24.00	1.000	-0.06	0.297	0.297
	LTE Band 7	20M	QPSK	50RB	49Offset	Left Side	1cm	20850	2510	23.00	23.00	1.000	0	0.289	0.289
	LTE Band 7	20M	QPSK	1RB	0Offset	Right Side	1cm	20850	2510	24.00	24.00	1.000	-0.02	0.085	0.085
	LTE Band 7	20M	QPSK	50RB	49Offset	Right Side	1cm	20850	2510	23.00	23.00	1.000	0.05	0.088	0.088
	LTE Band 7	20M	QPSK	1RB	0Offset	Bottom Side	1cm	20850	2510	24.00	24.00	1.000	-0.05	0.263	0.263
	LTE Band 7	20M	QPSK	50RB	49Offset	Bottom Side	1cm	20850	2510	23.00	23.00	1.000	-0.02	0.256	0.256

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (cm)	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)
	LTE Band 38	20M	QPSK	1RB	0Offset	Front	1cm	38150	2610	22.95	24.00	1.274	62.9	1.006	-0.05	0.269	0.345
	LTE Band 38	20M	QPSK	50RB	49Offset	Front	1cm	38150	2610	22.14	23.00	1.219	62.9	1.006	0.02	0.226	0.277
	LTE Band 38	20M	QPSK	1RB	0Offset	Back	1cm	38150	2610	22.95	24.00	1.274	62.9	1.006	0.01	0.623	0.798
29	LTE Band 38	20M	QPSK	1RB	0Offset	Back	1cm	37850	2580	22.50	24.00	1.413	62.9	1.006	0	0.673	**0.956**
	LTE Band 38	20M	QPSK	1RB	0Offset	Back	1cm	38000	2595	22.66	24.00	1.361	62.9	1.006	-0.02	0.656	0.898
	LTE Band 38	20M	QPSK	50RB	49Offset	Back	1cm	38150	2610	22.14	23.00	1.219	62.9	1.006	0	0.483	0.592
	LTE Band 38	20M	QPSK	1RB	0Offset	Left Side	1cm	38150	2610	22.95	24.00	1.274	62.9	1.006	0.04	0.276	0.354
	LTE Band 38	20M	QPSK	50RB	49Offset	Left Side	1cm	38150	2610	22.14	23.00	1.219	62.9	1.006	0.09	0.232	0.285
	LTE Band 38	20M	QPSK	1RB	0Offset	Right Side	1cm	38150	2610	22.95	24.00	1.274	62.9	1.006	0.04	0.129	0.165
	LTE Band 38	20M	QPSK	50RB	49Offset	Right Side	1cm	38150	2610	22.14	23.00	1.219	62.9	1.006	0.18	0.125	0.153
	LTE Band 38	20M	QPSK	1RB	0Offset	Bottom Side	1cm	38150	2610	22.95	24.00	1.274	62.9	1.006	0	0.252	0.323
	LTE Band 38	20M	QPSK	50RB	49Offset	Bottom Side	1cm	38150	2610	22.14	23.00	1.219	62.9	1.006	0.04	0.204	0.250
	LTE Band 41	20M	QPSK	1RB	0Offset	Front	1cm	41055	2636.5	22.86	24.00	1.300	62.9	1.006	-0.12	0.267	0.349
	LTE Band 41	20M	QPSK	50RB	0Offset	Front	1cm	41055	2636.5	22.06	23.00	1.242	62.9	1.006	0	0.224	0.280
	LTE Band 41	20M	QPSK	1RB	0Offset	Back	1cm	41055	2636.5	22.86	24.00	1.300	62.9	1.006	-0.04	0.563	0.736
	LTE Band 41	20M	QPSK	1RB	0Offset	Back	1cm	39750	2506	22.70	24.00	1.349	62.9	1.006	0.02	0.501	0.680
30	LTE Band 41	20M	QPSK	1RB	0Offset	Back	1cm	40185	2549.5	22.53	24.00	1.403	62.9	1.006	0.09	0.602	**0.850**
	LTE Band 41	20M	QPSK	1RB	0Offset	Back	1cm	40620	2593	22.56	24.00	1.393	62.9	1.006	-0.07	0.601	0.842
	LTE Band 41	20M	QPSK	1RB	0Offset	Back	1cm	41490	2680	22.67	24.00	1.358	62.9	1.006	-0.01	0.503	0.687
	LTE Band 41	20M	QPSK	50RB	0Offset	Back	1cm	41055	2636.5	22.06	23.00	1.242	62.9	1.006	0.04	0.424	0.530
	LTE Band 41	20M	QPSK	100RB	0Offset	Back	1cm	41055	2636.5	21.91	23.00	1.285	62.9	1.006	0	0.441	0.570
	LTE Band 41	20M	QPSK	1RB	0Offset	Left Side	1cm	41055	2636.5	22.86	24.00	1.300	62.9	1.006	0.12	0.216	0.283
	LTE Band 41	20M	QPSK	50RB	0Offset	Left Side	1cm	41055	2636.5	22.06	23.00	1.242	62.9	1.006	-0.14	0.179	0.224
	LTE Band 41	20M	QPSK	1RB	0Offset	Right Side	1cm	41055	2636.5	22.86	24.00	1.300	62.9	1.006	-0.06	0.087	0.114
	LTE Band 41	20M	QPSK	50RB	0Offset	Right Side	1cm	41055	2636.5	22.06	23.00	1.242	62.9	1.006	0.18	0.087	0.109
	LTE Band 41	20M	QPSK	1RB	0Offset	Bottom Side	1cm	41055	2636.5	22.86	24.00	1.300	62.9	1.006	0.03	0.202	0.264
	LTE Band 41	20M	QPSK	50RB	0Offset	Bottom Side	1cm	41055	2636.5	22.06	23.00	1.242	62.9	1.006	0.07	0.166	0.207

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	1cm	1	2412	16.44	17.00	1.137	97.63	1.024	0.042	0.092	0.107
31	WLAN2.4GHz	802.11b 1Mbps	Back	1cm	1	2412	16.44	17.00	1.137	97.63	1.024	0.01	0.136	**0.158**
	WLAN2.4GHz	802.11b 1Mbps	Back	1cm	6	2437	16.40	17.00	1.147	97.63	1.024	0.029	0.102	0.120
	WLAN2.4GHz	802.11b 1Mbps	Back	1cm	11	2462	16.25	17.00	1.187	97.63	1.024	0.051	0.100	0.122
	WLAN2.4GHz	802.11n-HT40 MCS0	Back	1cm	9	2452	10.40	10.50	1.024	75.71	1.321	0.039	0.024	0.032
	WLAN2.4GHz	802.11b 1Mbps	Left Side	1cm	1	2412	16.44	17.00	1.137	97.63	1.024	0.082	0.072	0.084
	WLAN2.4GHz	802.11b 1Mbps	Top Side	1cm	1	2412	16.44	17.00	1.137	97.63	1.024	0.04	0.108	0.126

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	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)
	Bluetooth	1Mbps	Front	1cm	39	2441	8.75	9.00	1.059	0.08	0.005	0.005
32	Bluetooth	1Mbps	Back	1cm	39	2441	8.75	9.00	1.059	-0.066	0.011	**0.012**
	Bluetooth	1Mbps	Back	1cm	0	2402	7.60	9.00	1.380	0.062	0.006	0.008
	Bluetooth	1Mbps	Back	1cm	78	2480	7.57	9.00	1.390	0.023	0.006	0.008
	Bluetooth	1Mbps	Left Side	1cm	39	2441	8.75	9.00	1.059	0.041	0.008	0.008
	Bluetooth	1Mbps	Top Side	1cm	39	2441	8.75	9.00	1.059	0.021	0.007	0.008

14.3 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	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 (4 Tx slots)	Front	1cm	128	824.2	26.34	27.50	1.306	0.02	0.239	0.312
	GSM850	GPRS (4 Tx slots)	Back	1cm	128	824.2	26.34	27.50	1.306	0	0.363	0.474
	GSM850	GPRS (4 Tx slots)	Back	1cm	189	836.4	26.27	27.50	1.327	0	0.351	0.466
33	GSM850	GPRS (4 Tx slots)	Back	1cm	251	848.8	26.22	27.50	1.343	0.04	0.364	**0.489**
	GSM850	GPRS (4 Tx slots)	Back	1.5cm	128	824.2	26.34	27.50	1.306	0	0.274	0.358
	GSM1900	GPRS (2 Tx slots)	Front	1cm	512	1850.2	26.24	27.50	1.337	0.09	0.179	0.239
	GSM1900	GPRS (2 Tx slots)	Back	1cm	512	1850.2	26.24	27.50	1.337	-0.01	0.277	0.370
	GSM1900	EDGE (4 Tx slots)	Back	1cm	512	1850.2	25.02	26.00	1.253	-0.01	0.454	0.569
34	GSM1900	EDGE (4 Tx slots)	Back	1cm	661	1880	24.91	26.00	1.285	-0.1	0.470	**0.604**
	GSM1900	EDGE (4 Tx slots)	Back	1cm	810	1909.8	24.98	26.00	1.265	-0.02	0.453	0.573
	GSM1900	GPRS (2 Tx slots)	Back	1.5cm	512	1850.2	26.24	27.50	1.337	0.03	0.168	0.225

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	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 V	RMC 12.2Kbps	Front	1cm	4182	836.4	22.95	24.00	1.274	0.13	0.274	0.349
	WCDMA V	RMC 12.2Kbps	Back	1cm	4182	836.4	22.95	24.00	1.274	0	0.314	0.400
	WCDMA V	RMC 12.2Kbps	Back	1cm	4132	826.4	22.89	24.00	1.291	-0.06	0.269	0.347
35	WCDMA V	RMC 12.2Kbps	Back	1cm	4233	846.6	22.78	24.00	1.324	-0.12	0.367	**0.486**
	WCDMA V	RMC 12.2Kbps	Back	1.5cm	4182	836.4	22.95	24.00	1.274	0	0.271	0.345
	WCDMA IV	RMC 12.2Kbps	Front	1cm	1312	1712.4	23.39	24.00	1.151	0.08	0.463	0.533
	WCDMA IV	RMC 12.2Kbps	Back	1cm	1312	1712.4	23.39	24.00	1.151	-0.04	0.497	0.572
	WCDMA IV	RMC 12.2Kbps	Back	1cm	1413	1732.6	22.96	24.00	1.271	-0.06	0.497	0.631
36	WCDMA IV	RMC 12.2Kbps	Back	1cm	1513	1752.6	22.89	24.00	1.291	-0.03	0.502	**0.648**
	WCDMA IV	RMC 12.2Kbps	Back	1.5cm	1312	1712.4	22.89	24.00	1.291	0.07	0.307	0.396
	WCDMA II	RMC 12.2Kbps	Front	1cm	9400	1880	23.19	24.00	1.205	0.01	0.450	0.542
	WCDMA II	RMC 12.2Kbps	Back	1cm	9400	1880	23.19	24.00	1.205	-0.12	0.756	0.911
	WCDMA II	RMC 12.2Kbps	Back	1cm	9262	1852.4	22.34	24.00	1.466	0	0.633	0.928
37	WCDMA II	RMC 12.2Kbps	Back	1cm	9538	1907.6	23.12	24.00	1.225	-0.01	0.759	**0.929**
	WCDMA II	RMC 12.2Kbps	Back	1.5cm	9400	1880	23.19	24.00	1.205	0	0.371	0.447

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (cm)	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 5	10M	QPSK	1RB	0Offset	Front	1cm	20525	836.5	22.61	24.00	1.377	0.03	0.225	0.310
	LTE Band 5	10M	QPSK	25RB	12Offset	Front	1cm	20450	829	21.61	23.00	1.377	0.01	0.175	0.241
	LTE Band 5	10M	QPSK	1RB	0Offset	Back	1cm	20525	836.5	22.61	24.00	1.377	0.01	0.320	0.441
	LTE Band 5	10M	QPSK	1RB	0Offset	Back	1cm	20450	829	22.53	24.00	1.403	-0.04	0.316	0.443
38	LTE Band 5	10M	QPSK	1RB	0Offset	Back	1cm	20600	844	22.52	24.00	1.406	0.02	0.374	**0.526**
	LTE Band 5	10M	QPSK	25RB	12Offset	Back	1cm	20450	829	21.61	23.00	1.377	-0.01	0.250	0.344
	LTE Band 5	10M	QPSK	1RB	0Offset	Back	1.5cm	20525	836.5	22.61	24.00	1.377	-0.03	0.239	0.329
	LTE Band 5	10M	QPSK	25RB	12Offset	Back	1.5cm	20450	829	21.61	23.00	1.377	-0.01	0.194	0.267
	LTE Band 4	20M	QPSK	1RB	0Offset	Front	1cm	20050	1720	22.91	24.00	1.285	-0.03	0.401	0.515
	LTE Band 4	20M	QPSK	50RB	0Offset	Front	1cm	20050	1720	21.82	23.00	1.312	-0.01	0.322	0.423
	LTE Band 4	20M	QPSK	1RB	0Offset	Back	1cm	20050	1720	22.91	24.00	1.285	-0.03	0.437	0.562
	LTE Band 4	20M	QPSK	1RB	0Offset	Back	1cm	20175	1732.5	22.68	24.00	1.355	-0.01	0.454	0.615
39	LTE Band 4	20M	QPSK	1RB	0Offset	Back	1cm	20300	1745	22.31	24.00	1.476	-0.01	0.453	**0.668**
	LTE Band 4	20M	QPSK	50RB	0Offset	Back	1cm	20050	1720	21.82	23.00	1.312	-0.08	0.355	0.466
	LTE Band 4	20M	QPSK	1RB	0Offset	Back	1.5cm	20050	1720	22.91	24.00	1.285	-0.01	0.248	0.319
	LTE Band 4	20M	QPSK	50RB	0Offset	Back	1.5cm	20050	1720	21.82	23.00	1.312	0	0.205	0.269
	LTE Band 2	20M	QPSK	1RB	0Offset	Front	1cm	18900	1880	22.65	24.00	1.365	-0.1	0.249	0.340
	LTE Band 2	20M	QPSK	50RB	0Offset	Front	1cm	18900	1880	21.54	23.00	1.400	-0.06	0.196	0.274
	LTE Band 2	20M	QPSK	1RB	0Offset	Back	1cm	18900	1880	22.65	24.00	1.365	0.05	0.455	0.621
40	LTE Band 2	20M	QPSK	1RB	0Offset	Back	1cm	18700	1860	22.27	24.00	1.489	0	0.471	**0.701**
	LTE Band 2	20M	QPSK	1RB	0Offset	Back	1cm	19100	1900	22.45	24.00	1.429	-0.02	0.423	0.604
	LTE Band 2	20M	QPSK	50RB	0Offset	Back	1cm	18900	1880	21.54	23.00	1.400	0	0.353	0.494
	LTE Band 2	20M	QPSK	1RB	0Offset	Back	1.5cm	18900	1880	22.65	24.00	1.365	-0.03	0.226	0.308
	LTE Band 2	20M	QPSK	50RB	0Offset	Back	1.5cm	18900	1880	21.54	23.00	1.400	0.03	0.181	0.253
	LTE Band 25	20M	QPSK	1RB	0Offset	Front	1cm	26340	1880	22.95	24.00	1.274	-0.05	0.242	0.308
	LTE Band 25	20M	QPSK	50RB	49Offset	Front	1cm	26590	1905	21.83	23.00	1.309	-0.11	0.204	0.267
	LTE Band 25	20M	QPSK	1RB	0Offset	Back	1cm	26340	1880	22.95	24.00	1.274	0.06	0.429	0.546
41	LTE Band 25	20M	QPSK	1RB	0Offset	Back	1cm	26140	1860	22.70	24.00	1.349	0.01	0.421	**0.568**
	LTE Band 25	20M	QPSK	1RB	0Offset	Back	1cm	26590	1905	22.87	24.00	1.297	-0.05	0.409	0.531
	LTE Band 25	20M	QPSK	50RB	49Offset	Back	1cm	26590	1905	21.83	23.00	1.309	-0.04	0.364	0.477
	LTE Band 25	20M	QPSK	1RB	0Offset	Back	1.5cm	26340	1880	22.95	24.00	1.274	-0.04	0.232	0.295
	LTE Band 25	20M	QPSK	50RB	49Offset	Back	1.5cm	26590	1905	21.83	23.00	1.309	0	0.175	0.229
	LTE Band 7	20M	QPSK	1RB	0Offset	Front	1cm	20850	2510	24.00	24.00	1.000	-0.08	0.321	0.321
	LTE Band 7	20M	QPSK	50RB	49Offset	Front	1cm	20850	2510	23.00	23.00	1.000	0	0.292	0.292
	LTE Band 7	20M	QPSK	1RB	0Offset	Back	1cm	20850	2510	24.00	24.00	1.000	-0.03	0.888	0.888
	LTE Band 7	20M	QPSK	1RB	0Offset	Back	1cm	21100	2535	23.13	24.00	1.222	0.04	0.868	1.061
42	LTE Band 7	20M	QPSK	1RB	0Offset	Back	1cm	21350	2560	23.41	24.00	1.146	-0.02	1.040	**1.191**
	LTE Band 7	20M	QPSK	50RB	49Offset	Back	1cm	20850	2510	23.00	23.00	1.000	0.01	0.689	0.689
	LTE Band 7	20M	QPSK	1RB	0Offset	Back	1.5cm	20850	2510	24.00	24.00	1.000	-0.01	0.349	0.349
	LTE Band 7	20M	QPSK	50RB	49Offset	Back	1.5cm	20850	2510	23.00	23.00	1.000	0.02	0.330	0.330

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (cm)	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)
	LTE Band 38	20M	QPSK	1RB	0Offset	Front	1cm	38150	2610	22.95	24.00	1.274	62.9	1.006	-0.05	0.269	0.345
	LTE Band 38	20M	QPSK	50RB	49Offset	Front	1cm	38150	2610	22.14	23.00	1.219	62.9	1.006	0.02	0.226	0.277
	LTE Band 38	20M	QPSK	1RB	0Offset	Back	1cm	38150	2610	22.95	24.00	1.274	62.9	1.006	0.01	0.623	0.798
43	LTE Band 38	20M	QPSK	1RB	0Offset	Back	1cm	37850	2580	22.50	24.00	1.413	62.9	1.006	0	0.673	**0.956**
	LTE Band 38	20M	QPSK	1RB	0Offset	Back	1cm	38000	2595	22.66	24.00	1.361	62.9	1.006	-0.02	0.656	0.898
	LTE Band 38	20M	QPSK	50RB	49Offset	Back	1cm	38150	2610	22.14	23.00	1.219	62.9	1.006	0	0.483	0.592
	LTE Band 38	20M	QPSK	1RB	0Offset	Back	1.5cm	38150	2610	22.95	24.00	1.274	62.9	1.006	-0.03	0.289	0.370
	LTE Band 38	20M	QPSK	50RB	49Offset	Back	1.5cm	38150	2610	22.14	23.00	1.219	62.9	1.006	0.06	0.235	0.288
	LTE Band 41	20M	QPSK	1RB	0Offset	Front	1cm	41055	2636.5	22.86	24.00	1.300	62.9	1.006	-0.12	0.267	0.349
	LTE Band 41	20M	QPSK	50RB	0Offset	Front	1cm	41055	2636.5	22.06	23.00	1.242	62.9	1.006	0	0.224	0.280
	LTE Band 41	20M	QPSK	1RB	0Offset	Back	1cm	41055	2636.5	22.86	24.00	1.300	62.9	1.006	-0.04	0.563	0.736
	LTE Band 41	20M	QPSK	1RB	0Offset	Back	1cm	39750	2506	22.70	24.00	1.349	62.9	1.006	0.02	0.501	0.680
44	LTE Band 41	20M	QPSK	1RB	0Offset	Back	1cm	40185	2549.5	22.53	24.00	1.403	62.9	1.006	0.09	0.602	**0.850**
	LTE Band 41	20M	QPSK	1RB	0Offset	Back	1cm	40620	2593	22.56	24.00	1.393	62.9	1.006	-0.07	0.601	0.842
	LTE Band 41	20M	QPSK	1RB	0Offset	Back	1cm	41490	2680	22.67	24.00	1.358	62.9	1.006	-0.01	0.503	0.687
	LTE Band 41	20M	QPSK	50RB	0Offset	Back	1cm	41055	2636.5	22.06	23.00	1.242	62.9	1.006	0.04	0.424	0.530
	LTE Band 41	20M	QPSK	1RB	0Offset	Back	1.5cm	41055	2636.5	22.86	24.00	1.300	62.9	1.006	-0.04	0.244	0.319
	LTE Band 41	20M	QPSK	50RB	0Offset	Back	1.5cm	41055	2636.5	22.06	23.00	1.242	62.9	1.006	-0.19	0.194	0.242

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	1cm	1	2412	16.44	17.00	1.137	97.63	1.024	0.042	0.092	0.107
45	WLAN2.4GHz	802.11b 1Mbps	Back	1cm	1	2412	16.44	17.00	1.137	97.63	1.024	0.01	0.136	**0.158**
	WLAN2.4GHz	802.11b 1Mbps	Back	1cm	6	2437	16.40	17.00	1.147	97.63	1.024	0.029	0.102	0.120
	WLAN2.4GHz	802.11b 1Mbps	Back	1cm	11	2462	16.25	17.00	1.187	97.63	1.024	0.051	0.100	0.122
	WLAN2.4GHz	802.11n-HT40 MCS0	Back	1cm	9	2452	10.40	10.50	1.024	75.71	1.321	0.039	0.024	0.032
	WLAN2.4GHz	802.11b 1Mbps	Back	1.5cm	1	2412	16.44	17.00	1.137	97.63	1.024	0.019	0.064	0.074
	WLAN5GHz	802.11a 6Mbps	Front	1cm	48	5240	12.09	13.50	1.382	83.87	1.192	0.19	0.022	0.036
	WLAN5GHz	802.11a 6Mbps	Back	1cm	48	5240	12.09	13.50	1.382	83.87	1.192	0.141	0.134	0.221
46	WLAN5GHz	802.11a 6Mbps	Back	1cm	36	5180	11.69	13.50	1.516	83.87	1.192	0.131	0.152	**0.275**
	WLAN5GHz	802.11n-HT20 MCS0	Back	1cm	48	5240	9.81	11.50	1.477	83.05	1.204	0.111	0.067	0.119
	WLAN5GHz	802.11n-HT40 MCS0	Back	1cm	38	5190	10.10	10.50	1.096	71.1	1.406	0.123	0.067	0.103
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	1cm	42	5210	7.62	9.00	1.373	55.31	1.808	0.12	0.014	0.035
	WLAN5GHz	802.11a 6Mbps	Back	1.5cm	36	5180	11.69	13.50	1.516	83.87	1.192	0.184	0.060	0.108
	WLAN5GHz	802.11a 6Mbps	Front	1cm	64	5320	12.21	13.50	1.345	83.87	1.192	0.028	0.018	0.029
47	WLAN5GHz	802.11a 6Mbps	Back	1cm	64	5320	12.21	13.50	1.345	83.87	1.192	0.033	0.087	**0.139**
	WLAN5GHz	802.11a 6Mbps	Back	1cm	56	5280	11.77	13.50	1.489	83.87	1.192	0.07	0.062	0.110
	WLAN5GHz	802.11n-HT20 MCS0	Back	1cm	60	5300	10.06	11.50	1.394	83.05	1.204	0.02	0.042	0.071
	WLAN5GHz	802.11n-HT40 MCS0	Back	1cm	62	5310	9.91	10.50	1.145	71.1	1.406	0.04	0.032	0.052
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	1cm	58	5290	8.36	9.00	1.158	55.31	1.808	0.1	0.002	0.004
	WLAN5GHz	802.11a 6Mbps	Back	1.5cm	64	5320	12.21	13.50	1.345	83.87	1.192	0.12	0.055	0.088

Plot No.	Band	Mode	Test Position	Gap (cm)	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)
	WLAN5GHz	802.11a 6Mbps	Front	1cm	100	5500	11.88	13.50	1.451	83.87	1.192	0.063	0.020	0.035
	WLAN5GHz	802.11a 6Mbps	Back	1cm	100	5500	11.88	13.50	1.451	83.87	1.192	0.04	0.079	0.137
	WLAN5GHz	802.11a 6Mbps	Back	1cm	112	5560	11.53	13.50	1.574	83.87	1.192	0.07	0.082	0.154
	WLAN5GHz	802.11a 6Mbps	Back	1cm	128	5640	11.74	13.50	1.500	83.87	1.192	0.03	0.112	0.200
48	WLAN5GHz	802.11a 6Mbps	Back	1cm	136	5680	11.83	13.50	1.469	83.87	1.192	0.054	0.148	**0.259**
	WLAN5GHz	802.11n-HT20 MCS0	Back	1cm	100	5500	9.91	11.50	1.443	83.05	1.204	0.05	0.046	0.080
	WLAN5GHz	802.11n-HT40 MCS0	Back	1cm	134	5670	9.94	10.50	1.137	71.1	1.406	0.14	0.067	0.107
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	1cm	106	5530	8.41	9.00	1.145	55.31	1.808	0.04	0.002	0.004
	WLAN5GHz	802.11a 6Mbps	Back	1.5cm	136	5680	11.83	13.50	1.469	83.87	1.192	0.029	0.041	0.072
	WLAN5GHz	802.11a 6Mbps	Front	1cm	157	5785	11.91	13.50	1.441	83.87	1.192	0.07	0.016	0.027
	WLAN5GHz	802.11a 6Mbps	Back	1cm	157	5785	11.91	13.50	1.441	83.87	1.192	0.053	0.103	0.177
	WLAN5GHz	802.11a 6Mbps	Back	1cm	153	5765	11.70	13.50	1.514	83.87	1.192	0.075	0.116	0.209
49	WLAN5GHz	802.11a 6Mbps	Back	1cm	165	5825	11.71	13.50	1.509	83.87	1.192	0.196	0.119	**0.214**
	WLAN5GHz	802.11n-HT40 MCS0	Back	1cm	151	5755	9.95	10.50	1.135	71.1	1.406	0.01	0.054	0.086
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	1cm	155	5775	8.48	9.00	1.127	55.31	1.808	0.18	0.010	0.020
	WLAN5GHz	802.11a 6Mbps	Back	1.5cm	165	5825	11.71	13.50	1.509	83.87	1.192	0.06	0.045	0.081

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	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)
	Bluetooth	1Mbps	Front	1cm	39	2441	8.75	9.00	1.059	0.08	0.005	0.005
50	Bluetooth	1Mbps	Back	1cm	39	2441	8.75	9.00	1.059	-0.066	0.011	**0.012**
	Bluetooth	1Mbps	Back	1cm	0	2402	7.60	9.00	1.380	0.062	0.006	0.008
	Bluetooth	1Mbps	Back	1cm	78	2480	7.57	9.00	1.390	0.023	0.006	0.008
	Bluetooth	1Mbps	Back	1.5cm	39	2441	8.75	9.00	1.059	0.052	0.001	0.001

14.4 Repeated SAR Measurement

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 7	20M	QPSK	1RB	0Offset	Back	1cm	21350	2560	23.41	24.00	1.146	-0.02	1.040	-	1.191
2nd	LTE Band 7	20M	QPSK	1RB	0Offset	Back	1cm	21350	2560	23.41	24.00	1.146	-0.1	0.979	1.06	1.121

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.

15. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Portable Handset			Note
		Head	Body-worn	Hotspot	
1.	GSM(Voice) + WLAN2.4GHz(data)	Yes	Yes		
2.	WCDMA(Voice) + WLAN2.4GHz(data)	Yes	Yes		
3.	GSM(Voice) + Bluetooth(data)	Yes	Yes		
4.	WCDMA((Voice) + Bluetooth(data)	Yes	Yes		
5.	GSM(Voice) + WLAN5GHz(data)	Yes	Yes		
6.	WCDMA((Voice) + WLAN5GHz(data)	Yes	Yes		
7.	GPRS/EDGE(Data) + WLAN2.4GHz(data)	Yes	Yes	Yes	2.4GHz Hotspot
8.	WCDMA(Data) + WLAN2.4GHz(data)	Yes	Yes	Yes	2.4GHz Hotspot
9.	LTE(Data) + WLAN2.4GHz(data)	Yes	Yes	Yes	2.4GHz Hotspot
10.	GPRS/EDGE(Data) + Bluetooth(data)	Yes	Yes	Yes	Bluetooth Tethering
11.	WCDMA(Data) + Bluetooth(data)	Yes	Yes	Yes	Bluetooth Tethering
12.	LTE(Data) + Bluetooth(data)	Yes	Yes	Yes	Bluetooth Tethering
13.	GPRS/EDGE(data) + WLAN5GHz(data)	Yes	Yes		
14.	WCDMA(data) + WLAN5GHz(data)	Yes	Yes		
15.	LTE(data) + WLAN5GHz(data)	Yes	Yes		

General Note:

1. This device supported VoIP in EGPRS, WCDMA, LTE (e.g. 3rd party VoIP).
2. The worst case WLAN reported SAR for each configuration was used for SAR summation. Therefore, the following summations represent the absolute worst cases for simultaneous transmission with WLAN.
3. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
4. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
5. The Scaled SAR summation is calculated based on the same configuration and test position.
6. Per KDB 447498 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.

15.1 Head Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 2.4GHz Bluetooth 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)
GSM	GSM850	Right Cheek	0.208	0.411	0.044	**0.62**	**0.25**
		Right Tilted	0.152	0.441	0.025	**0.59**	**0.18**
		Left Cheek	0.235	0.186	0.014	**0.42**	**0.25**
		Left Tilted	0.141	0.250	0.020	**0.39**	**0.16**
	GSM1900	Right Cheek	0.187	0.411	0.044	**0.60**	**0.23**
		Right Tilted	0.119	0.441	0.025	**0.56**	**0.14**
		Left Cheek	0.454	0.186	0.014	**0.64**	**0.47**
		Left Tilted	0.166	0.250	0.020	**0.42**	**0.19**
WCDMA	Band V	Right Cheek	0.220	0.411	0.044	**0.63**	**0.26**
		Right Tilted	0.141	0.441	0.025	**0.58**	**0.17**
		Left Cheek	0.289	0.186	0.014	**0.48**	**0.30**
		Left Tilted	0.130	0.250	0.020	**0.38**	**0.15**
	Band IV	Right Cheek	0.334	0.411	0.044	**0.75**	**0.38**
		Right Tilted	0.207	0.441	0.025	**0.65**	**0.23**
		Left Cheek	0.568	0.186	0.014	**0.75**	**0.58**
		Left Tilted	0.283	0.250	0.020	**0.53**	**0.30**
	Band II	Right Cheek	0.235	0.411	0.044	**0.65**	**0.28**
		Right Tilted	0.174	0.441	0.025	**0.62**	**0.20**
		Left Cheek	0.602	0.186	0.014	**0.79**	**0.62**
		Left Tilted	0.181	0.250	0.020	**0.43**	**0.20**
LTE	Band 5	Right Cheek	0.212	0.411	0.044	**0.62**	**0.26**
		Right Tilted	0.145	0.441	0.025	**0.59**	**0.17**
		Left Cheek	0.266	0.186	0.014	**0.45**	**0.28**
		Left Tilted	0.150	0.250	0.020	**0.40**	**0.17**
	Band 4	Right Cheek	0.256	0.411	0.044	**0.67**	**0.30**
		Right Tilted	0.171	0.441	0.025	**0.61**	**0.20**
		Left Cheek	0.590	0.186	0.014	**0.78**	**0.60**
		Left Tilted	0.231	0.250	0.020	**0.48**	**0.25**
	Band 2	Right Cheek	0.225	0.411	0.044	**0.64**	**0.27**
		Right Tilted	0.158	0.441	0.025	**0.60**	**0.18**
		Left Cheek	0.530	0.186	0.014	**0.72**	**0.54**
		Left Tilted	0.156	0.250	0.020	**0.41**	**0.18**
	Band 25	Right Cheek	0.237	0.411	0.044	**0.65**	**0.28**
		Right Tilted	0.139	0.441	0.025	**0.58**	**0.16**
		Left Cheek	0.532	0.186	0.014	**0.72**	**0.55**
		Left Tilted	0.158	0.250	0.020	**0.41**	**0.18**
	Band 7	Right Cheek	0.155	0.411	0.044	**0.57**	**0.20**
		Right Tilted	0.133	0.441	0.025	**0.57**	**0.16**
		Left Cheek	0.617	0.186	0.014	**0.80**	**0.63**
		Left Tilted	0.126	0.250	0.020	**0.38**	**0.15**
	Band 38	Right Cheek	0.169	0.411	0.044	**0.58**	**0.21**
		Right Tilted	0.146	0.441	0.025	**0.59**	**0.17**
		Left Cheek	0.524	0.186	0.014	**0.71**	**0.54**
		Left Tilted	0.136	0.250	0.020	**0.39**	**0.16**
	Band 41	Right Cheek	0.156	0.411	0.044	**0.57**	**0.20**
		Right Tilted	0.148	0.441	0.025	**0.59**	**0.17**
		Left Cheek	0.484	0.186	0.014	**0.67**	**0.50**
		Left Tilted	0.166	0.250	0.020	**0.42**	**0.19**

WWAN Band		Exposure Position	1	2		1+2 Summed 1g SAR (W/kg)
			WWAN	5.2GHz / 5.3GHz / 5.5GHz / 5.8GHz WLAN		
			1g SAR (W/kg)	Band	1g SAR (W/kg)	
GSM	GSM850	Right Cheek	0.208	5.2GHz WLAN	0.159	**0.37**
		Right Tilted	0.152	5.5GHz WLAN	0.469	**0.62**
		Left Cheek	0.235	5.8GHz WLAN	0.124	**0.36**
		Left Tilted	0.141	5.5GHz WLAN	0.233	**0.37**
	GSM1900	Right Cheek	0.187	5.2GHz WLAN	0.159	**0.35**
		Right Tilted	0.119	5.5GHz WLAN	0.469	**0.59**
		Left Cheek	0.454	5.8GHz WLAN	0.124	**0.58**
		Left Tilted	0.166	5.5GHz WLAN	0.233	**0.40**
WCDMA	Band V	Right Cheek	0.220	5.2GHz WLAN	0.159	**0.38**
		Right Tilted	0.141	5.5GHz WLAN	0.469	**0.61**
		Left Cheek	0.289	5.8GHz WLAN	0.124	**0.41**
		Left Tilted	0.130	5.5GHz WLAN	0.233	**0.36**
	Band IV	Right Cheek	0.334	5.2GHz WLAN	0.159	**0.49**
		Right Tilted	0.207	5.5GHz WLAN	0.469	**0.68**
		Left Cheek	0.568	5.8GHz WLAN	0.124	**0.69**
		Left Tilted	0.283	5.5GHz WLAN	0.233	**0.52**
	Band II	Right Cheek	0.235	5.2GHz WLAN	0.159	**0.39**
		Right Tilted	0.174	5.5GHz WLAN	0.469	**0.64**
		Left Cheek	0.602	5.8GHz WLAN	0.124	**0.73**
		Left Tilted	0.181	5.5GHz WLAN	0.233	**0.41**
LTE	Band 5	Right Cheek	0.212	5.2GHz WLAN	0.159	**0.37**
		Right Tilted	0.145	5.5GHz WLAN	0.469	**0.61**
		Left Cheek	0.266	5.8GHz WLAN	0.124	**0.39**
		Left Tilted	0.150	5.5GHz WLAN	0.233	**0.38**
	Band 4	Right Cheek	0.256	5.2GHz WLAN	0.159	**0.42**
		Right Tilted	0.171	5.5GHz WLAN	0.469	**0.64**
		Left Cheek	0.590	5.8GHz WLAN	0.124	**0.71**
		Left Tilted	0.231	5.5GHz WLAN	0.233	**0.46**
	Band 2	Right Cheek	0.225	5.2GHz WLAN	0.159	**0.38**
		Right Tilted	0.158	5.5GHz WLAN	0.469	**0.63**
		Left Cheek	0.530	5.8GHz WLAN	0.124	**0.65**
		Left Tilted	0.156	5.5GHz WLAN	0.233	**0.39**
	Band 25	Right Cheek	0.237	5.2GHz WLAN	0.159	**0.40**
		Right Tilted	0.139	5.5GHz WLAN	0.469	**0.61**
		Left Cheek	0.532	5.8GHz WLAN	0.124	**0.66**
		Left Tilted	0.158	5.5GHz WLAN	0.233	**0.39**
	Band 7	Right Cheek	0.155	5.2GHz WLAN	0.159	**0.31**
		Right Tilted	0.133	5.5GHz WLAN	0.469	**0.60**
		Left Cheek	0.617	5.8GHz WLAN	0.124	**0.74**
		Left Tilted	0.126	5.5GHz WLAN	0.233	**0.36**
	Band 38	Right Cheek	0.169	5.2GHz WLAN	0.159	**0.33**
		Right Tilted	0.146	5.5GHz WLAN	0.469	**0.62**
		Left Cheek	0.524	5.8GHz WLAN	0.124	**0.65**
		Left Tilted	0.136	5.5GHz WLAN	0.233	**0.37**
	Band 41	Right Cheek	0.156	5.2GHz WLAN	0.159	**0.32**
		Right Tilted	0.148	5.5GHz WLAN	0.469	**0.62**
		Left Cheek	0.484	5.8GHz WLAN	0.124	**0.61**
		Left Tilted	0.166	5.5GHz WLAN	0.233	**0.40**

15.2 Hotspot Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 2.4GHz Bluetooth 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)
GSM	GSM850	Front	0.312	0.107	0.005	**0.42**	**0.32**
		Back	0.489	0.158	0.012	**0.65**	**0.50**
		Left side	0.456	0.084	0.008	**0.54**	**0.46**
		Right side	0.402			**0.40**	**0.40**
		Top side		0.126	0.008	**0.13**	**0.01**
		Bottom side	0.188			**0.19**	**0.19**
	GSM1900	Front	0.239	0.107	0.005	**0.35**	**0.24**
		Back	0.604	0.158	0.012	**0.76**	**0.62**
		Left side	0.342	0.084	0.008	**0.43**	**0.35**
		Right side	0.206			**0.21**	**0.21**
		Top side		0.126	0.008	**0.13**	**0.01**
		Bottom side	0.207			**0.21**	**0.21**
WCDMA	Band V	Front	0.349	0.107	0.005	**0.46**	**0.35**
		Back	0.400	0.158	0.012	**0.56**	**0.41**
		Left side	0.524	0.084	0.008	**0.61**	**0.53**
		Right side	0.336			**0.34**	**0.34**
		Top side		0.126	0.008	**0.13**	**0.01**
		Bottom side	0.220			**0.22**	**0.22**
	Band IV	Front	0.533	0.107	0.005	**0.64**	**0.54**
		Back	0.648	0.158	0.012	**0.81**	**0.66**
		Left side	0.571	0.084	0.008	**0.66**	**0.58**
		Right side	0.319			**0.32**	**0.32**
		Top side		0.126	0.008	**0.13**	**0.01**
		Bottom side	0.400			**0.40**	**0.40**
	Band II	Front	0.542	0.107	0.005	**0.65**	**0.55**
		Back	0.929	0.158	0.012	**1.09**	**0.94**
		Left side	0.674	0.084	0.008	**0.76**	**0.68**
		Right side	0.329			**0.33**	**0.33**
		Top side		0.126	0.008	**0.13**	**0.01**
		Bottom side	0.407			**0.41**	**0.41**

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 2.4GHz Bluetooth 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)
LTE	Band 5	Front	0.310	0.107	0.005	**0.42**	**0.32**
		Back	0.526	0.158	0.012	**0.68**	**0.54**
		Left side	0.379	0.084	0.008	**0.46**	**0.39**
		Right side	0.335			**0.34**	**0.34**
		Top side		0.126	0.008	**0.13**	**0.01**
		Bottom side	0.224			**0.22**	**0.22**
	Band 4	Front	0.515	0.107	0.005	**0.62**	**0.52**
		Back	0.668	0.158	0.012	**0.83**	**0.68**
		Left side	0.463	0.084	0.008	**0.55**	**0.47**
		Right side	0.290			**0.29**	**0.29**
		Top side		0.126	0.008	**0.13**	**0.01**
		Bottom side	0.347			**0.35**	**0.35**
	Band 2	Front	0.340	0.107	0.005	**0.45**	**0.35**
		Back	0.701	0.158	0.012	**0.86**	**0.71**
		Left side	0.523	0.084	0.008	**0.61**	**0.53**
		Right side	0.190			**0.19**	**0.19**
		Top side		0.126	0.008	**0.13**	**0.01**
		Bottom side	0.265			**0.27**	**0.27**
	Band 25	Front	0.308	0.107	0.005	**0.42**	**0.31**
		Back	0.568	0.158	0.012	**0.73**	**0.58**
		Left side	0.455	0.084	0.008	**0.54**	**0.46**
		Right side	0.192			**0.19**	**0.19**
		Top side		0.126	0.008	**0.13**	**0.01**
		Bottom side	0.247			**0.25**	**0.25**
	Band 7	Front	0.321	0.107	0.005	**0.43**	**0.33**
		Back	1.191	0.158	0.012	**1.35**	**1.20**
		Left side	0.297	0.084	0.008	**0.38**	**0.31**
		Right side	0.088			**0.09**	**0.09**
		Top side		0.126	0.008	**0.13**	**0.01**
		Bottom side	0.263			**0.26**	**0.26**
	Band 38	Front	0.345	0.107	0.005	**0.45**	**0.35**
		Back	0.956	0.158	0.012	**1.11**	**0.97**
		Left side	0.354	0.084	0.008	**0.44**	**0.36**
		Right side	0.165			**0.17**	**0.17**
		Top side		0.126	0.008	**0.13**	**0.01**
		Bottom side	0.323			**0.32**	**0.32**
	Band 41	Front	0.349	0.107	0.005	**0.46**	**0.35**
		Back	0.850	0.158	0.012	**1.01**	**0.86**
		Left side	0.283	0.084	0.008	**0.37**	**0.29**
		Right side	0.114			**0.11**	**0.11**
		Top side		0.126	0.008	**0.13**	**0.01**
		Bottom side	0.264			**0.26**	**0.26**

15.3 Body-Worn Accessory Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 2.4GHz Bluetooth 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)
GSM	GSM850	Front	0.312	0.107	0.005	**0.42**	**0.32**
		Back	0.489	0.158	0.012	**0.65**	**0.50**
	GSM1900	Front	0.239	0.107	0.005	**0.35**	**0.24**
		Back	0.604	0.158	0.012	**0.76**	**0.62**
WCDMA	Band V	Front	0.349	0.107	0.005	**0.46**	**0.35**
		Back	0.400	0.158	0.012	**0.56**	**0.41**
	Band IV	Front	0.533	0.107	0.005	**0.64**	**0.54**
		Back	0.648	0.158	0.012	**0.81**	**0.66**
	Band II	Front	0.542	0.107	0.005	**0.65**	**0.55**
		Back	0.929	0.158	0.012	**1.09**	**0.94**
LTE	Band 5	Front	0.310	0.107	0.005	**0.42**	**0.32**
		Back	0.526	0.158	0.012	**0.68**	**0.54**
	Band 4	Front	0.515	0.107	0.005	**0.62**	**0.52**
		Back	0.668	0.158	0.012	**0.83**	**0.68**
	Band 2	Front	0.340	0.107	0.005	**0.45**	**0.35**
		Back	0.701	0.158	0.012	**0.86**	**0.71**
	Band 25	Front	0.308	0.107	0.005	**0.42**	**0.31**
		Back	0.568	0.158	0.012	**0.73**	**0.58**
	Band 7	Front	0.321	0.107	0.005	**0.43**	**0.33**
		Back	1.191	0.158	0.012	**1.35**	**1.20**
	Band 38	Front	0.345	0.107	0.005	**0.45**	**0.35**
		Back	0.956	0.158	0.012	**1.11**	**0.97**
	Band 41	Front	0.349	0.107	0.005	**0.46**	**0.35**
		Back	0.850	0.158	0.012	**1.01**	**0.86**

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 5.2GHz / 5.3GHz / 5.5GHz / 5.8GHz WLAN Band	2 5.2GHz / 5.3GHz / 5.5GHz / 5.8GHz WLAN 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)
GSM	GSM850	Front	0.312	5.2GHz WLAN	0.036	**0.35**
		Back	0.489	5.2GHz WLAN	0.275	**0.76**
	GSM1900	Front	0.239	5.2GHz WLAN	0.036	**0.28**
		Back	0.604	5.2GHz WLAN	0.275	**0.88**
WCDMA	Band V	Front	0.349	5.2GHz WLAN	0.036	**0.39**
		Back	0.400	5.2GHz WLAN	0.275	**0.68**
	Band IV	Front	0.533	5.2GHz WLAN	0.036	**0.57**
		Back	0.648	5.2GHz WLAN	0.275	**0.92**
	Band II	Front	0.542	5.2GHz WLAN	0.036	**0.58**
		Back	0.929	5.2GHz WLAN	0.275	**1.20**
LTE	Band 5	Front	0.310	5.2GHz WLAN	0.036	**0.35**
		Back	0.526	5.2GHz WLAN	0.275	**0.80**
	Band 4	Front	0.515	5.2GHz WLAN	0.036	**0.55**
		Back	0.668	5.2GHz WLAN	0.275	**0.94**
	Band 2	Front	0.340	5.2GHz WLAN	0.036	**0.38**
		Back	0.701	5.2GHz WLAN	0.275	**0.98**
	Band 25	Front	0.308	5.2GHz WLAN	0.036	**0.34**
		Back	0.568	5.2GHz WLAN	0.275	**0.84**
	Band 7	Front	0.321	5.2GHz WLAN	0.036	**0.36**
		Back	1.191	5.2GHz WLAN	0.275	**1.47**
	Band 38	Front	0.345	5.2GHz WLAN	0.036	**0.38**
		Back	0.956	5.2GHz WLAN	0.275	**1.23**
	Band 41	Front	0.349	5.2GHz WLAN	0.036	**0.39**
		Back	0.850	5.2GHz WLAN	0.275	**1.13**

Test Engineer： Vic Yang

16. Uncertainty Assessment

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

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

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

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[a]	1/k[b]	1/√3	1/√6	1/√2

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

(b) κ is the coverage factor

Table 16.1. 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 16.2. Uncertainty Budget for frequency range 300 MHz to 3 GHz

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)
Measurement System							
Probe Calibration	6.55	Normal	1	1	1	± 6.55 %	± 6.55 %
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	2.0	Rectangular	√3	1	1	± 1.2 %	± 1.2 %
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	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Probe Positioning	9.9	Rectangular	√3	1	1	± 5.7 %	± 5.7 %
Max. SAR Eval.	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
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						± 12.8 %	± 12.6 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						**± 25.6 %**	**± 25.2 %**

Table 16.3. Uncertainty Budget for frequency range 3 GHz to 6 GHz

17. 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 v01r02, “SAR Measurement Procedures for 802.11 a/b/g Transmitters”, May 2007

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

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

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

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

[10] FCC KDB 941225 D06 v01r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", May 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.