



**KDB 865664 D01 SAR Measurement 100MHz to 6GHz
FCC 47 CFR part 2 (2.1093)**

SAR EVALUATION REPORT

For

Sony

FCC ID: PY7PM-0801

**Report Number UL-SAR-RP10295122JD06A V6.0
ISSUE DATE: 01 August 2014**

Prepared for

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REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
--	24 June 2014	Initial Issue	--
1	25 June 2014	Made the following changes: <ol style="list-style-type: none"> 1. Added an extra note in section 6.4 for PHF and in all body worn configuration SAR results table, section 9.2 2. Typo errors corrected in section 6.6 	Naseer Mirza
2	30 June 2014	Made the following changes: <ol style="list-style-type: none"> 1. Typo error corrected in section 6.6 page 13 2. Typo error corrected in section 7.7.5 page 45 	Naseer Mirza
3	11 July 2014	Made the following changes: <ol style="list-style-type: none"> 1. Typo error corrected in section 9.2.29 page 66 2. Re-measured of conducted RF power for Wi-Fi 2.4 GHz 802.11n HT20/Wi-Fi 5.0 GHz 802.11n HT20/802.11ac VHT20 3. Additional SAR test results included to support Wi-Fi 5.0 GHz 802.11n HT20 	Naseer Mirza
4	15 July 2014	Made the following changes: <ol style="list-style-type: none"> 1. Additional note #3 included in section 9.2.31 and 9.2.32, to provide further information 2. Missing plot for scan # 204 included in appendix 3 and other graphic serial numbers updated 	Naseer Mirza
5	01 Aug 2014	Made the following changes: <ol style="list-style-type: none"> 1. In section 1, The EUT is a GSM/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac + NFC & ANT+ 2. Description sentence removed in section 6.2 	Naseer Mirza

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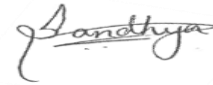
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1. ATTESTATION OF TEST RESULTS

Applicant Name:	Sony Mobile Communications Inc			
Application Purpose	<input checked="" type="checkbox"/> Original Grant			
DUT Description	The EUT is a GSM/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac + NFC & ANT+			
Test Device is	An identical prototype			
Device category	Portable			
Exposure Category	General Population/Uncontrolled Exposure (1g SAR limit: 1.6 W/kg)			
Date Tested	27 May 2014 to 09 July 2014			
The highest reported SAR values	RF Exposure Conditions	Equipment Class		
		Licensed	DTS	UNII
	Head	0.542 W/kg	0.988 W/kg	0.689 W/kg
	Body-worn Accessory	0.985 W/kg	0.177 W/kg	0.288 W/kg
	Wireless Router (Hotspot)	1.489 W/kg	0.486 W/kg	0.288 W/kg
	Simultaneous Transmission	1.530 W/kg	1.530 W/kg	1.480 W/kg
Applicable Standards	FCC 47 CFR part 2 (2.1093) KDB publication IEEE Std 1528-2013			
Test Results	Pass			

UL Verification Services Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties are in accordance with the above standard and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample(s), under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by UKAS. This report is written to support regulatory compliance of the applicable standards stated above.

Approved & Released By:	Prepared By:
	
Naseer Mirza Project Lead UL Verification Services Ltd.	Sandhya Menon Laboratory Engineer UL Verification Services Ltd.

2. TEST SPECIFICATION, METHODS AND PROCEDURES

2.1. Test Specification

Reference:	KDB 865664 D01 SAR Measurement 100 Mhz to 6 GHz v01r03
Title:	SAR Measurement Requirements for 100 MHz to 6 GHz
Purpose of Test:	Field probes, tissue dielectric properties, SAR scans, measurement accuracy and variability of the measured results are discussed. The field probe and SAR scan requirements are derived from criteria considered in draft standard IEEE P1528-2011.
The Equipment Under Test complied with the Specific Absorption Rate for general population/uncontrolled exposure limit of 1.6 W/kg as specified in FCC 47 CFR part 2 (2.1093) and ANSI C95.1-1992 and has been tested in accordance with the reference documents in section 2.2 of this report.	

2.2. Methods and Procedures Reference Documentation

The methods and procedures used were as detailed in:

IEEE 1528: 2013

IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques

Thomas Schmid, Oliver Egger and Neils Kuster, “Automated E-field scanning system for dosimetric assessments”, IEEE Transaction on microwave theory and techniques, Vol. 44, pp. 105-113, January 1996.

Neils Kuster, Ralph Kastle and Thomas Schmid, “Dosimetric evaluation of mobile communications equipment with know precision”, IEICE Transactions of communications, Vol. E80-B, No.5, pp. 645-652, May 1997.

FCC KDB Publication:

- KDB 248227 D01 SAR measurements for 802.11a/b/g v01r02
- KDB 447498 D01 General RF Exposure Guidance v05r02
- KDB 648474 D04 SAR Handsets SAR v01r02
- KDB 941225 D01 SAR test for 3G devices v02
- KDB 941225 D03 SAR Test Reduction GSM GPRS EDGE v01
- KDB 941225 D05 SAR for LTE Devices v02r03
- KDB 941225 D06 Hotspot Mode SAR v01r01
- KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03
- KDB 865664 D02 SAR Reporting v01r01

2.3. Definition of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the methods & procedures section above. Appendix 1 contains a list of the test equipment used.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at

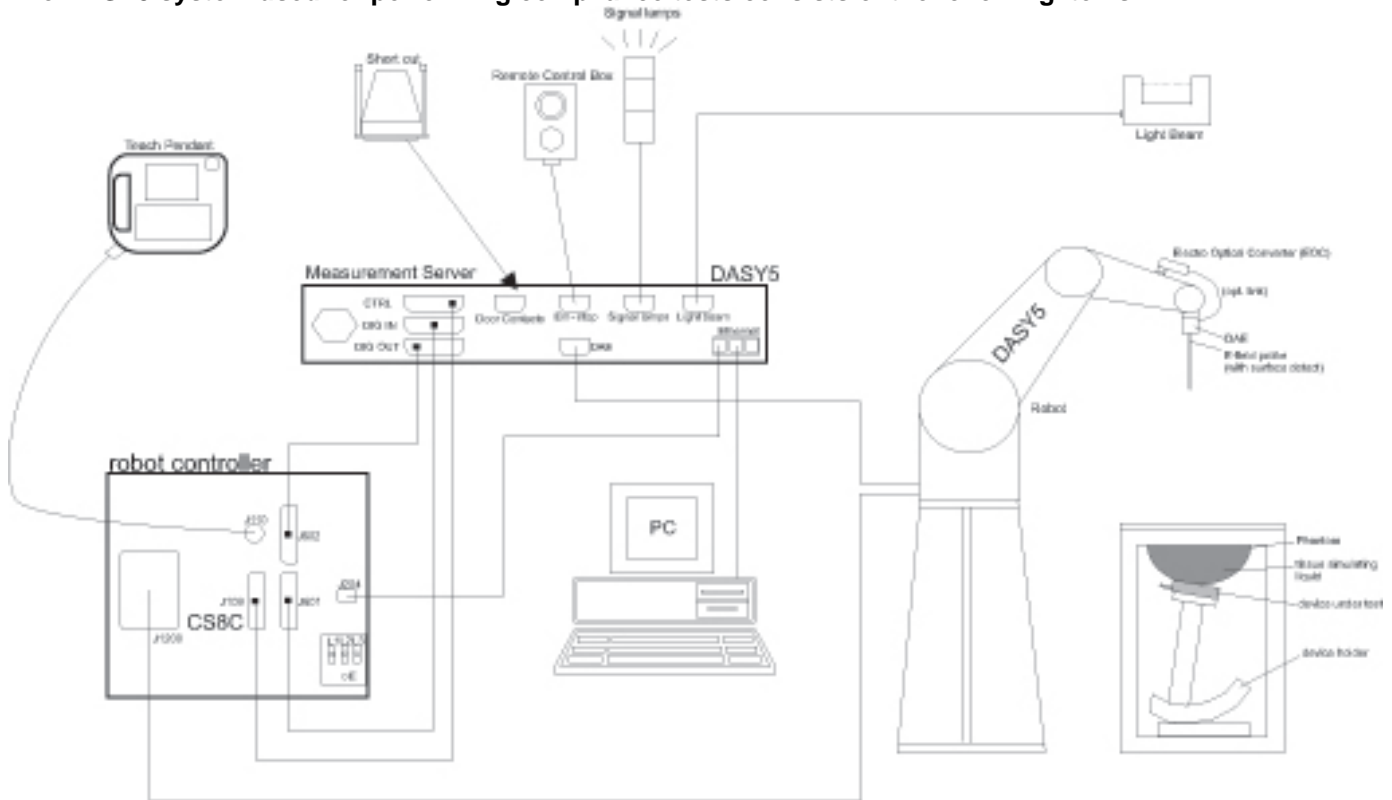
Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire, RG23 8BG UK	Facility Type
SAR Lab 56	Controlled Environment Chamber
SAR Lab 57	Controlled Environment Chamber
SAR Lab 58	Controlled Environment Chamber
SAR Lab 59	Controlled Environment Chamber
SAR Lab 60	Controlled Environment Chamber
SAR Lab 61	Controlled Environment Chamber

UL Verification Services Ltd, is accredited by UKAS (United Kingdom Accreditation Service), Laboratory UKAS Code 0644.

4. SAR MEASUREMENT SYSTEM & TEST EQUIPMENT

4.1. SAR Measurement System

The DASY5 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 DASY 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.

4.2. Test Equipment

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards. [Appendix 1](#) of the report details the equipment used.

5. MEASUREMENT UNCERTAINTY

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor, such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Test Name	Confidence Level	Calculated Uncertainty
Specific Absorption Rate-GSM 850/ UMTS FDD 5 / LTE Band 12 Head Configuration 1g	95%	±18.77%
Specific Absorption Rate-GSM / GPRS / EDGE 850 / UMTS FDD 5 / LTE Band 12 Body Configurations 1g	95%	±18.36%
Specific Absorption Rate-UMTS FDD 4 / LTE Band 4 Head Configuration 1g	95%	±18.45%
Specific Absorption Rate-UMTS FDD 4 / LTE Band 4 Body Configuration 1g	95%	±18.45%
Specific Absorption Rate-PCS 1900 / UMTS FDD 2/ LTE Band 2 Head Configuration 1g	95%	±18.88%
Specific Absorption Rate-GSM / GPRS / EDGE 1900 / UMTS FDD 2 / LTE Band 2 Body Configuration 1g	95%	±18.26%
Specific Absorption Rate-Wi-Fi 2450 MHz Head Configuration 1g	95%	±18.13%
Specific Absorption Rate-Wi-Fi 2450 MHz Body Configuration 1g	95%	±18.35%
Specific Absorption Rate-Wi-Fi 5GHz Head Configuration 1g	95%	±21.25%
Specific Absorption Rate-Wi-Fi 5GHz Body Configuration 1g	95%	±19.90%

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the appropriate accreditation body is followed.

See [Appendix 7](#) for all uncertainty tables.

6. EQUIPMENT UNDER TEST (EUT)

6.1. Identification of Equipment Under Test (EUT)

<p>Serial Number/ IMEI Number:</p>	<p>Cellular Radiated Samples: CB5A1Z1S0V ; 004402452752508 - used to perform GSM850 SAR measurements only CB5A1Z1S12 ; 004402452752474 - used to perform PCS1900 SAR measurements only. CB5A1Z1RYM ; 004402452752458 - used to perform UMTS FDD 2 Head and UMTS FDD 5 SAR measurements only. CB5A1Z1S1S ; 004402452752524 - used to perform UMTS FDD 2 Body and UMTS FDD 4 SAR measurements only. CB5A1Z1S18 ; 004402452750643 - used to perform LTE Band 2 Head SAR measurements only. CB5A1Z1RYK ; 004402452751518 - used to perform LTE Band 2 Body and LTE Band 12 Head SAR measurements only. CB5A1Z13W7 ; 004402452750585 - used to perform LTE Band 4 and LTE Band 12 Body SAR measurements only. Cellular Conducted Sample: CB5A1Z1RZD ; 004402452751229 - used to perform Cellular Conducted power measurements. CB5A1Z1RYH ; 004402452751203 - used to perform Cellular Conducted power measurements. WLAN Radiated Samples: CB5A1Z1RXV ; 004402452752557 - used to perform WLAN 5GHz Head measurements only CB5A1Z1S1L ; 004402452752573 - used to perform WLAN 5GHz Body measurement only CB5A1Z1RY6 ; 004402452752581 - used to perform WLAN 2.4GHz SAR measurements only. WLAN Conducted Sample: CB5A1Z1RXZ ; 004402452751119 - used to perform WLAN Conducted power measurements.</p>
<p>Hardware Version Number:</p>	<p>Cellular Sample: A; WLAN Sample: A</p>
<p>Software Version Number:</p>	<p>Cellular Sample: ATPV:1283-9868 ; WLAN Sample: 0_25_3_16_A</p>
<p>Country of Manufacture:</p>	<p>China</p>
<p>Date of Receipt:</p>	<p>02 June 2014</p>

6.2. Further Description of EUT

The EUT supports GSM 850/1900MHz bands, WCDMA FDD bands 2/4/5, LTE FDD bands 2/4/12 bands. It also supports GPRS service with multi-slots class 12, EGPRS service with multi-slots class 12, HSPA with HSDPA (Category 24) and HSUPA (Category 6) features are also supported. It has MP3, camera, FM radio, USB memory, GPS receiver, NFC, Mobile High-Definition Link (MHL), Bluetooth (EDR and Bluetooth 4.0), WLAN (802.11 a/b/g/n/ac), IR Proximity Sensor and Wi-Fi hotspot functions with ‘Auto RF Power Back-Off’ (UMTS FDD 2) mode capabilities.”

6.3. Modifications Incorporated in the EUT

There were no modification during the course of testing the device

6.4. Accessories

The following accessories were supplied with the EUT during testing:

Description:	Memory Card	Personal Hands-Free Kit (PHF)	Dummy Battery
Brand Name:	None Stated (Generic)	Sony	None Stated
Model Name or Number:	None Stated	MH410c	None Stated
Serial Number:	None Stated	None Stated	None Stated
Cable Length and Type:	Not Applicable	~1.2 m	~0.5m
Country of Manufacture:	China	None Stated	None Stated
Connected to Port	Micro SD Slot	3.5mm Audio jack and custom type	Unique to Manufacturer

Note(s):

1. This Dummy Battery was only used to perform conducted power measurements.
2. As per 648474 D04 Handsets SAR v01r02, “When the reported SAR for a 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 headset attached to the handset”. Hence, Body worn configurations were not evaluated with PHF attached.

6.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	Brand Name:	Model Name or Number:	Serial Number:	Cable Length and Type:	Connected to Port
Communication Test Set	Agilent	8960 Series 10 (E5515C)	GB46311280	~4.0m Utiflex Cable	RF (Input / Output) Air Link
Communication Test Set	Agilent	8960 Series 10 (E5515E)	GB46200666	~4.0m Utiflex Cable	RF (Input / Output) Air Link
Communication Test Set	Anritsu	MT8820C	6200938937	~4.0m Utiflex Cable	RF (Input / Output) Air Link
Communication Test Set	CMU200	1100.0008K02	119317	~4.0m Utiflex Cable	RF (Input / Output) Air Link
Communication Test Set	CMW500	1201.0002K50	145922	~4.0m Utiflex Cable	RF (Input / Output) Air Link
Communication Test Set	CMW500	1201.0002K50	146526	~4.0m Utiflex Cable	RF (Input / Output) Air Link
Communication Test Set	CMW500	1201.0002K50	145921	~4.0m Utiflex Cable	RF (Input / Output) Air Link

6.6. Additional Information Related to Testing

Equipment Category	2G GSM PCS	TDMA 850/ 1900	Voice, GPRS, EDGE Data
	3G UMTS Band	FDD 2 / 4 / 5	RMC12.2 HSDPA Cat 24 HSUPA Data Cat 6
	4G LTE Band	FDD 2 / 4 / 12	Data
	Wi-Fi Band	(2.4 / 5.0) GHz	Data 802.11a/b/g/n/ac
Type of Unit	Portable Transceiver		
Intended Operating Environment:	Within GSM, UMTS, LTE , Wi-Fi and <i>Bluetooth</i> Coverage		
Transmitter Maximum Output Power Characteristics:	GSM850	Communication Test Set was configured to allow the EUT to transmit at a maximum power using Power Control Level (PCL) setting of 5.	
	PCS1900	Communication Test Set was configured to allow the EUT to transmit at a maximum power using Power Control Level (PCL) setting of 0.	
	UMTS FDD 2	Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D01.	
	UMTS FDD 4	Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D01.	
	UMTS FDD 5	Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D01.	
	LTE Band 2	Communication Test Set configured to allow to EUT to transmit at a maximum power as per 3GPP Spec.	
	LTE Band 4	Communication Test Set configured to allow to EUT to transmit at a maximum power as per 3GPP Spec.	
	LTE Band 12	Communication Test Set configured to allow to EUT to transmit at a maximum power as per 3GPP Spec.	
	2.4 GHz Wi-Fi 802.11b/g/n	Test Software was used to configure the EUT to transmit at a maximum measured power.	
	5.0 GHz Wi-Fi 802.11a	Test Software was used to configure the EUT to transmit at a maximum measured power.	
	5.0 GHz Wi-Fi 802.11n (HT20 / HT40)	Test Software was used to configure the EUT to transmit at a maximum measured power.	
	5.0 GHz Wi-Fi 802.11ac (VHT20 / VHT40 / VHT80)	Test Software was used to configure the EUT to transmit at a maximum measured power.	

Additional Information Related to Testing (Continued)

Transmitter Frequency Range:		
	GSM850	(824 to 849) MHz
	PCS1900	(1850 to 1910) MHz
	UMTS FDD 2	(1852 to 1908) MHz
	UMTS FDD 4	(1712 to 1753) MHz
	UMTS FDD 5	(826 to 847) MHz
	LTE Band 2	(1850 to 1910) MHz
	LTE Band 4	(1710 to 1755) MHz
	LTE Band 12	(704 to 711) MHz
	2.4 GHz Wi-Fi 802.11b/g/n	(2412 to 2462) MHz
	5.0 GHz Sub band 1 Wi-Fi 802.11a/n/ac	(5180 to 5240) MHz
	5.0 GHz Sub band 2 Wi-Fi 802.11a/n/ac	(5260 to 5320) MHz
	5.0 GHz Sub band 3 Wi-Fi 802.11a/n/ac	(5500 to 5700) MHz
	5.0 GHz Sub band 4 Wi-Fi 802.11a/n/ac	(5745 to 5825) MHz

Additional Information Related to Testing (Continued)

Transmitter Frequency Allocation of EUT When Under Test:	Bands	Channel Number	Channel Description	Frequency (MHz)
	GSM850	128	Low	824.2
		190	Middle	836.6
		251	High	848.8
	PCS1900	512	Low	1850.2
		661	Middle	1880.0
		810	High	1909.8
	UMTS FDD 2	9262	Low	1852.4
		9400	Middle	1880.0
		9538	High	1907.6
	UMTS FDD 4	1312	Low	1712.4
		1412	Middle	1732.6
		1513	High	1752.6
	UMTS FDD 5	4132	Low	826.4
		4183	Middle	836.6
		4233	High	846.6
	LTE Band 2	18700	Low	1860.0
		18900	Middle	1880.0
		19100	High	1900.0
	LTE Band 4	20050	Low	1720.0
		20175	Middle	1732.5
		20300	High	1745.0
LTE Band 12	23060	Low	704.0	
	23095	Middle	707.5	
	23130	High	711.0	

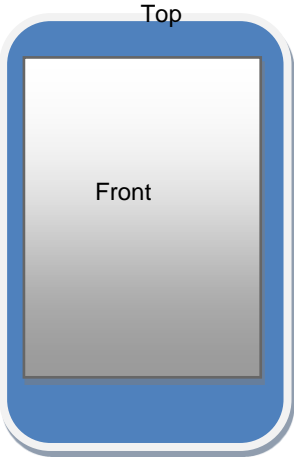
Additional Information Related to Testing (Continued)

Transmitter Frequency Allocation of EUT When Under Test:	Band: 2.4 / 5.0 GHz Wi-Fi 802.11a/n/AC (HT20 / HT40/HT80)						
	Rule	20 MHz BW Ch.#	Frq. (MHz)	40 MHz BW Ch.#	Frq. (MHz)	80 MHz BW Ch.#	Frq. (MHz)
	15.247	1	2412.0				
		6	2437.0				
		11	2462.0				
	5.2 U-NII-1	36	5180.0	38	5190.0		
		40	5200.0			42	5210.0
		44	5220.0	46	5230.0		
		48	5240.0				
	5.3 U-NII-2A	52	5260.0	54	5270.0		
		56	5280.0			58	5290.0
		60	5300.0	62	5310.0		
		64	5320.0				
	5.6 U-NII-2C	100	5500.0	102	5510.0		
		104	5520.0			106	5530.0
		108	5540.0	110	5550.0		
		112	5560.0				
		116	5580.0	118	5590.0		
		120	5600.0			122	5610.0
		124	5620.0	126	5630.0		
		128	5640.0				
		132	5660.0	134	5670.0		
136		5680.0					
5.8 UNII-3	149	5745.0	151	5755.0			
	153	5765.0			155	5775.0	
	157	5785.0	159	5795.0			
	161	5805.0					
	165	5825.0					
Modulation(s):	GMSK (GSM/ GPRS):					217 Hz	
	QPSK(UMTS / HSDPA/HSPA):					0Hz	
	DBPSK, BPSK, CCK (Wi-Fi):					0 Hz	
	QPSK, 16QAM (LTE):					0 Hz	
Modulation Scheme (Crest Factor):	GMSK (GPRS850 2-Uplink):					4	
	GMSK (GPRS1900 4- Uplink):					2	
	DBPSK, BPSK, CCK (Wi-Fi802.11a/b/g/n/ac):					1	
	QPSK(UMTS/ FDD / HSDPA):					1	
	QPSK, 16QAM (LTE):					1	
Antenna Type:	Internal integral						
Antenna Length:	As specified in Appendix 10						
Number of Antenna Positions:	WWAN ~ LTE / UMTS / GSM					1 fixed	
	WLAN/ BT					1 fixed	
	Felica/NFC					1 fixed	
	Sub/GPS					1 fixed	
Power Supply Requirement:	4.2 V						
Battery Type(s):	Embedded Li-ion						

Additional Information Related to LTE Test parameter

#	Description	Parameter
1	Identify the operating frequency range of each LTE transmission FCC band used by the device	Band 2: frequency range – 1850 MHz– 1910 MHz Band 4: frequency range – 1710 MHz– 1755 MHz Band 12: frequency range – 704 MHz – 711 MHz
2	Identify the channel bandwidths used in each frequency band; e.g.: 1.4, 3, 5, 10, 15, 20 MHz etc.	Channel Bandwidths used are: B2 (1.4, 3, 5, 10, 15, 20) MHz B4 (1.4, 3, 5, 10, 15, 20) MHz B12 (5, 10) MHz
3	Identify the high, middle and low (L, M, H) channel numbers and frequencies tested in each LTE frequency band	B2 -20 MHz (H,M,L)= CH (19100,18900,18700); Freq:(1900, 1880, 1860) MHz B4 -20 MHz (H,M,L)= CH (20300, 20175, 20050); Freq: (1745, 1732.5, 1720) MHz B12 -10MHz (H,M,L)= CH (23130, 23095, 23060); Freq: (711, 707.5, 704) MHz
4	Specify the UE category and uplink modulations used	The UE Category is 4 and the Uplink modulations used are QPSK, 16QAM.
5	Descriptions of the LTE transmitter and antenna implementation & identify whether it is a standalone transmitter operating independently of other wireless transmitters in the device or sharing hardware components and/or antenna(s) with other transmitters etc.	This model has only one main antenna for LTE/UMTS/GSM bands (as pictured in Appendix 10).

Additional Information Related to LTE Test parameter (Continued):

#	Description	Parameter
6	Identify the LTE Band Voice/data requirements in each operating mode and exposure condition with respect to head and body test configurations, antenna locations, handset flip-cover or slide positions, antenna diversity conditions, etc.	<p>The following exposure condition with respect to head and body test are required for both voice and data modes due to EUT functionality and antenna locations.</p> <ol style="list-style-type: none"> 1) Body-worn SAR is required at 15 mm separation distance 2) Mobile Hot Spot Mode will be tested by positioning the smart phone with 10 mm separation distance. <p>- Wireless Personal Hotspot mode with consideration for the Front Display of EUT, Back of EUT, Left Hand side of EUT, Right Hand side of EUT, Top Edge of EUT and Bottom Edge of EUT with respect to the antenna location. The test separation distance between the EUT edge and phantom flat surface for this mode will be 10mm as the dimensions of the device is > 9cm x 5cm.</p> <ol style="list-style-type: none"> 3) Head SAR is required in LTE Data Mode (QPSK) as this model does not supports SVLTE operation. <div style="text-align: center;">  <p>The diagram shows a blue smartphone with a white screen. It is oriented vertically. Labels indicate the following directions: 'Top' at the top edge, 'Bottom' at the bottom edge, 'Front' on the screen area, 'Left hand side' on the left edge, and 'Right hand side' on the right edge.</p> </div>

Additional Information Related to LTE Test parameter (Continued):

#	Description	Parameter
7	Identify if Maximum Power Reduction (MPR) is optional or mandatory, i.e. built-in by design: a) only mandatory MPR may be considered during SAR testing, when the maximum output power is permanently limited by the MPR implemented within the UE; and only for the applicable RB (resource block) configurations specified in LTE standards b) A-MPR (additional MPR) must be disabled.	The EUT incorporates MPR as per 36.101 as shown in the section 8. MPR cannot be disabled after the phone is manufactured, MPR is mandatory. * Target MPR
8	Include the maximum average conducted output power measured on the required test channels for each channel bandwidth and UL modulation used in each frequency band: a) using 1 RB allocated at the low edge, centered and high edge of a channel b) using 50% RB allocated at the low edge, centered and high edge of a channel c) using 100% RB allocation	This is included in the section 8.3 of this report.
9	Identify all other U.S. wireless operating modes (3G, Wi-Fi, WiMax, Bluetooth etc), device/exposure configurations (head and body, antenna and handset flip-cover or slide positions, antenna diversity conditions etc.) and frequency bands used for these modes	The following bands are supported for the exposure conditions 1) GSM (850/1900) and UMTS FDD (850, 1700, 1900) - Exposure conditions: Head/Body SAR required for GSM / UMTS FDD and wireless personal hotspot. DTM is Not Supported. 2) Bluetooth 2.4GHz (Basic Rate & EDR) - Exposure conditions: BT SAR is not required as per section 10.3.1 of the report 3) Wi-Fi 2.4GHz - Exposure conditions: Head/Body SAR required for wireless personal hotspot. Power reduction is supported on Head mode only and Hotspot Mode and Body-Worn mode with the reduced power. 4) Wi-Fi 5 GHz - Exposure conditions: Head/Body SAR required for wireless personal hotspot. No power reduction supported.

Additional Information Related to LTE Test parameter (Continued):

#	Description	Parameter
10	Include the maximum average conducted output power measured for the other wireless mode and frequency bands	This is included in the section 8 of this report.
11	Identify the simultaneous transmission conditions for the voice and data configurations supported by all wireless modes, device configurations and frequency bands, for the head and body exposure conditions and device operating configurations (handset flip or cover positions, antenna diversity conditions etc.)	Bluetooth average power measurement is below the rated threshold therefore Individual SAR will not be tested. Sim_Tx consideration will be based on the estimated SAR level. All simultaneous transmission combinations are identified and summarised in Section 9.5 of the report.
12	When power reduction is applied to certain wireless modes to satisfy SAR compliance for simultaneous transmission conditions, other equipment certification or operating requirements, include the maximum average conducted output power measured in each power reduction mode applicable to the simultaneous voice/data transmission configurations for such wireless configurations and frequency bands; and also include details of the power reduction implementation and measurement setup	Not applicable.
13	Include descriptions of the test equipment, test software, built-in test firmware etc. required to support testing the device when power reduction is applied to one or more transmitters/antennas for simultaneous voice/data transmission	Anritsu MT8820C and R&S CMW500 communication simulator Communication tester which support LTE modes (Data) were used for testing.
14	When appropriate, include a SAR test plan proposal with respect to the above.	Not Applicable
15	If applicable, include preliminary SAR test data and/or supporting information in laboratory testing inquiries to address specific issues and concerns or for requesting further test reduction considerations appropriate for the device; for example simultaneous transmission configurations.	Not Applicable

6.6.1. Operating Modes

The EUT was tested in the following operating mode(s) unless otherwise stated:

- GSM850 – Voice allocated mode with Communication Test Set configured to allow the EUT to transmit at a maximum power using Power Control Level (PCL) setting of 5.
- GPRS850 – Data allocated mode with Communication Test Set configured to allow the EUT to transmit at a maximum power using Power Control Level (PCL) setting of 5. Tested using 2 Uplink time slots with CS1 for GPRS.
- PCS1900 – Voice allocated mode with Communication Test Set configured to allow the EUT to transmit at a maximum power using Power Control Level (PCL) setting of 0.
- GPRS1900 – Data allocated mode with Communication Test Set configured to allow the EUT to transmit at a maximum power using Power Control Level (PCL) setting of 0. Tested using 4 Uplink time slots with CS1 for GPRS.

GSM850: Power Table Settings used for Test Set		PCS1900: Power Table Settings used for Test Set	
Power Control Level PCL	Nominal Power (dBm)	Power Control Level PCL	Nominal Power (dBm)
0 ... 2	39	22 ... 29	Reserved
3	37	30	33
4	35	31	32
5	33	0	30
6	31	1	28
7	29	2	26
8	27	3	24
9	25	4	22
10	23	5	20
11	21	6	18
12	19	7	16
13	17	8	14
14	15	9	12
15	13	10	10
16	11	11	8
17	9	12	6
18	7	13	4
19 ... 31	5	14	2
		15	0
		16 ... 21	Reserved

- UMTS FDD 2, 4, 5 Call allocated mode with Communication Test Set configured to allow the EUT to transmit at a maximum as per KDB 941225 D01.
- UMTS FDD 2, 4, 5 - RMC 12.2kbps + HSUPA with Test loop mode 1 and TPC bits configured to all "1's", Sub-test 5, AG Index set to 21 and E-TFCI set to 81 with Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D01.
- UMTS FDD 2, 4, 5 - RMC 12.2kbps + HSDPA with Test loop mode 1 and TPC bits configured to all "1's", Sub-test 1 with Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D01.
- UMTS FDD 2, 4, 5 - DC HSDPA (Cat 24) with Test loop mode 1 and TPC bits configured to all "1's", Sub-test 1 with Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D01. (See Appendix 9 for detailed description)

Operating Modes (Continued)

- LTE Band 2, LTE Band 4 and LTE Band 12 data allocated mode at QPSK on 20MHz BW channels, using a Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D05.
- 2.4 GHz Wi-Fi802.11b/g/n Data allocated mode using 'HyperTerminal' software to excise mode 'b', 'g' and 'n', with maximum power of up to 18.0 dBm for 'b' mode and 16.9 dBm for 'g' and 17.3 dBm for 'n' modes.
- 5.0 GHz Wi-Fi802.11a/n/ac Sub band 1 - Data allocated mode using 'HyperTerminal' software to excise mode 'a' 'n' and 'ac', with maximum power of up to 16.6 dBm for 'a' mode, 17.3 dBm for 'n' mode and 16.0 dBm for 'ac' modes.
- 5.0 GHz Wi-Fi802.11a/n/ac Sub band 2 - Data allocated mode using 'HyperTerminal' software to excise mode 'a' 'n' and 'ac', with maximum power of up to 16.5 dBm for 'a' mode, 17.5 dBm for 'n' mode and 16.0 dBm for 'ac' modes.
- 5.0 GHz Wi-Fi802.11a/n/ac Sub band 3 - Data allocated mode using 'HyperTerminal' software to excise mode 'a' 'n' and 'ac', with maximum power of up to 16.5 dBm for 'a' mode, 17.0 dBm for 'n' mode and 16.5 dBm for 'ac' modes.
- 5.0 GHz Wi-Fi802.11a/n/ac Sub band 4 - Data allocated mode using 'HyperTerminal' software to excise mode 'a' 'n' and 'ac', with maximum power of up to 16.4 dBm for 'a' mode, 17.5 dBm for 'n' mode and 16.5 dBm for 'ac' modes.

**6.7.Nominal and Maximum Output power:
Power Back-off Not Supported**

Bands	Speech (Voice Mode)							
	Target (dBm)				Tolerance ± (dB)			
GSM850	31.8				-0.5~+0.5			
PCS1900	30.0				-0.7~+0.7			
Bands	GPRS							
	Tx Slot 1		Tx Slot 2		Tx Slot 3		Tx Slot 4	
	Target (dBm)	Tolerance ± (dB)	Target (dBm)	Tolerance ± (dB)	Target (dBm)	Tolerance ± (dB)	Target (dBm)	Tolerance ± (dB)
GSM850	31.8	-0.5~+0.5	31.0	-1.5~+0.6	29.0	-1.5~+0.6	28.0	-1.5~+0.6
PCS1900	30.0	-0.7~+0.7	28.0	-1.5~+0.6	27.0	-1.5~+0.6	26.0	-1.5~+0.6
Bands	EDGE GMSK (MCS1-4)							
GSM850	31.8	-0.5~+0.5	31.0	-1.5~+0.6	29.0	-1.5~+0.6	28.0	-1.5~+0.6
PCS1900	30.0	-0.7~+0.7	28.0	-1.5~+0.6	27.0	-1.5~+0.6	26.0	-1.5~+0.6
Bands	EDGE 8PSK (MCS5-9)							
GSM850	27.0	-1.5~+1.0	25.0	-1.5~+1.0	24.0	-1.5~+1.0	22.0	-1.5~+1.0
PCS1900	26.0	-1.5~+1.0	24.0	-1.5~+1.0	23.0	-1.5~+1.0	22.0	-1.5~+1.0

Power Back-off Not Supported

Band	CS		HS	
	Target (dBm)	Tolerance ± (dB)	Target (dBm)	Tolerance ± (dB)
UMTS FDD 4	24.0	-0.7~+0.5	24.0	-0.7~+0.5
UMTS FDD 5	24.0	-0.7~+0.5	24.0	-0.7~+0.5
Power Back-off Supported & Disabled				
UMTS FDD 2	23.5	-0.7~+0.5	23.5	-0.7~+0.5
Power Back-off Supported & Enabled				
UMTS FDD 2	22.0	-0.7~+0.5	22.0	-0.7~+0.5

Power Back-off Not Supported

Bands	Target (dBm)						Tolerance ± (dB)
	QPSK			16QAM			
	1RB	50% RB	100% RB	1RB	50% RB	100% RB	
LTE Band 2	23.0	22.0	22.0	22.0	21.0	21.0	-1.0 ~ +0.7
LTE Band 4	23.0	22.0	22.0	22.0	21.0	21.0	-1.0 ~ +1.0
LTE Band 12	23.0	22.0	22.0	22.0	21.0	21.0	-1.0 ~ +1.0

Nominal and Maximum Output power (Continued):

IR Sensor Supported & Disabled

	WLAN Modes					
	2.4 GHz 802.11b		2.4 GHz 802.11g		2.4 GHz 802.11n	
	1 Mbps	11 Mbps	6 Mbps	54 Mbps	6.5 Mbps	65 Mbps
Max Power {Target + Upper Tolerance} (dBm)	18.0	18.0	17.0	17.0	17.5	17.5
IR Sensor Supported & Enabled						
Max Power {Target + Upper Tolerance} (dBm)	14.5	14.5	14.5	14.5	14.4	13.4

Power Back-off Not Supported

5.0 GHz 802.11a	5.2 GHz 802.11a		5.3 GHz 802.11a		5.5 GHz 802.11a		5.8 GHz 802.11a	
	6 Mbps	54 Mbps	6 Mbps	54 Mbps	6 Mbps	54 Mbps	6 Mbps	54 Mbps
Max Power {Target + Upper Tolerance} (dBm)	16.8	16.8	16.8	16.8	17.0	17.0	17.0	17.0
5.0 GHz 802.11n HT-20 / 11ac VHT-20	5.2 GHz 802.11n		5.3 GHz 802.11n		5.5 GHz 802.11n		5.8 GHz 802.11n	
	6.5 Mbps	65 Mbps	6.5 Mbps	65 Mbps	6.5 Mbps	65 Mbps	6.5 Mbps	65 Mbps
Max Power {Target + Upper Tolerance} (dBm)	17.5	13.8	17.5	13.8	17.5	14.2	17.5	14.2
5.0 GHz 802.11n HT-40 / 11ac VHT-40	5.2 GHz 802.11n		5.3 GHz 802.11n		5.5 GHz 802.11n		5.8 GHz 802.11n	
	13.5 Mbps	135 Mbps	13.5 Mbps	135 Mbps	13.5 Mbps	135 Mbps	13.5 Mbps	135 Mbps
Max Power {Target + Upper Tolerance} (dBm)	14.8	12.8	14.8	12.8	15.2	13.2	15.2	13.2
5.0 GHz 802.11ac VHT-80	5.2 GHz 802.11ac		5.3 GHz 802.11ac		5.5 GHz 802.11ac		5.8 GHz 802.11ac	
	13.5 Mbps	135 Mbps	13.5 Mbps	135 Mbps	13.5 Mbps	135 Mbps	13.5 Mbps	135 Mbps
Max Power {Target + Upper Tolerance} (dBm)	14.7	12.7	14.7	12.7	15.0	13.1	15.0	13.1

Band	Max Power {Target (dBm) + Upper Tolerance (dBm)}		
Bluetooth	BR	EDR	BLE
		10.0	7.9

Note:

1. As per KDB865664 D02 SAR Reporting v01, 2.1.4(a), the nominal and maximum average source based rated power, declared and supplied by manufacturer are shown in the above tables.
2. These are specified maximum allowed average power for all the wireless modes and frequencies bands supported.

6.8. Simultaneous Transmission Conditions

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna.

#	Simultaneous transmission conditions					
	LTE BAND Data	WWAN GSM Voice/Data	UMTS Voice/Data	WLAN Wi-Fi 802.11 b/g/n	WLAN Wi-Fi 802.11a/n/ac	WPAN Bluetooth
1	X			X		
2		X		X		
3			X	X		
4	X				X	
5		X			X	
6			X		X	
7	X					X
8		X				X
9			X			X
10					X	X
11	X				X	X
12		X			X	X
13			X		X	X

Note:

Based on the customer declaration, the following are the possible combination of the Simultaneous Transmission possibilities in the EUT:

1. WWAN + WLAN 2.4 GHz
2. WWAN + WLAN 5.0GHz
3. WWAN + WPAN
4. WPAN + WLAN 5.0 GHz
5. WWAN + WLAN 5.0GHz + WPAN

7. RF EXPOSURE CONDITIONS (TEST CONFIGURATIONS)

Refer to Appendix "Antenna Locations and Separation Distances" for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

7.1. Configuration and Peripherals

The EUT was tested in the following configuration(s) unless otherwise stated:

- Standalone fully charged battery powered.
- Head, Hotspot Mode and Body-worn configurations were evaluated.
- The applied FCC body-worn Personal Hotspot orientations where the corresponding edge(s) closest to the user with the most conservative exposure condition were all evaluated at 10 mm from the body. For configuration that did not overlap with Personal hotspot, SAR evaluation was performed at 15mm separation.
- GSM, GPRS and EDGE power measurement were all measured as per FCC pubs. 941225 D03. Although power reduction was allowed SAR test was performed on GPRS using GMSK. Test reduction was applied to EDGE using GMSK and 8PSK modulation scheme.

Head Configuration

- a) The EUT was placed in a normal operating position with the centre of the ear-piece aligned with the ear canal on the phantom.
- b) With the ear-piece touching the phantom the centre line of the EUT was aligned with an imaginary plane (X and Y axis) consisting of three lines connecting both ears and the mouth.
- c) For the cheek position the EUT was gradually moved towards the cheek until any point of the mouth-piece or keypad touched the cheek.
- d) For the tilted position the EUT was positioned as for the cheek position, and then the horizontal angle was increased by fifteen degrees (the phone keypad was moved away from the cheek by fifteen degrees).
- e) SAR measurements were evaluated at maximum power and the unit was operated for an appropriate period prior to the evaluation in order to minimise the drift.
- f) The device was keyed to operate continuously in the transmit mode for the duration of the test.
- g) The location of the maximum spatial SAR distribution (hotspot) was determined relative to the EUT and its antenna.
- h) The EUT was transmitting at full power throughout the duration of the test powered by a fully charged battery.

Body Configuration

- a) The EUT was placed in a normal operating position where the centre of EUT was aligned with the centre reference point on the flat section of the 'SAM' or 'Eli' phantom.
- b) With the EUT touching the phantom at an imaginary centre line. The EUT was aligned with a marked plane (X and Y axis) consisting of two lines.
- c) For the touch-safe position the EUT was gradually moved towards the flat section of the 'SAM' phantom until any point of the EUT touched the phantom.
- d) For position(s) greater than 0mm separation the EUT was positioned as per the touch-safe position, and then the vertical height was decreased/adjusted as required.
- e) SAR measurements were evaluated at maximum power and the unit was operated for an appropriate period prior to the evaluation in order to minimise the drift.
- f) The device was keyed to operate continuously in the transmit mode for the duration of the test.
- g) The location of the maximum spatial SAR distribution (hotspot) was determined relative to the EUT and its antenna.
- h) The EUT was transmitting at full power throughout the duration of the test powered by a fully charged battery.

7.2. Configuration Consideration

Technology Antenna	Configuration	Antenna-to-User Separation	Position	Antenna-to-Edge Separation	Evaluation Considered
WWAN	Head	0mm	Touch Left	<25mm	Yes
			Tilt Left	<25mm	Yes
			Touch Right	<25mm	Yes
			Tilt Right	<25mm	Yes
	Hotspot	10mm	Front	<25mm	Yes
			Back	<25mm	Yes
			Top Edge	>25mm	No
			Bottom Edge	<25mm	Yes
			Right Edge	<25mm	Yes
	Body	15mm	Left Edge	<25mm	Yes
			Front	<25mm	Yes
			Back	<25mm	Yes
WLAN	Head	0mm	Touch Left	<25mm	Yes
			Tilt Left	<25mm	Yes
			Touch Right	<25mm	Yes
			Tilt Right	<25mm	Yes
	Hotspot	10mm	Front	<25mm	Yes
			Back	<25mm	Yes
			Top Edge	<25mm	Yes
			Bottom Edge	>25mm	No
			Right Edge	>25mm	No
	Body	15mm	Left Edge	<25mm	Yes
			Front	<25mm	Yes
			Back	<25mm	Yes

Note:

1. The Antenna to Edge distances is included in the Appendix 10 of the report.
2. Test distances are as per FCC KDB publication 447498 D01v05 for mobile handsets.
3. Bluetooth standalone SAR is excluded as the output power meets the exclusion threshold:

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f_{\text{(GHz)}}}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR,}^{16} \text{ where}$$

- $f_{\text{(GHz)}}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation¹⁷
- The result is rounded to one decimal place for comparison

” Taken from FCC KDB publication 447498 D01v05r02

7.3. SAR Test Exclusion Consideration

Frequency Band	Configuration(s)		
	Head	Hotspot Mode	Body-worn
GSM850	No	No	No
PCS1900	No	No	No
UMTS FDD 2	No	No	No
UMTS FDD 4	No	No	No
UMTS FDD 5	No	No	No
LTE Band 2	No	No	No
LTE Band 4	No	No	No
LTE Band 12	No	No	No
WLAN 2.4 GHz	No	No	No
WLAN 5.0 GHz	No	No	No
<i>Bluetooth</i>	N/A	Yes	Yes

Note:

- As per KDB 447498 D01 General RF Exposure Guidance v05r02, The Frequency Bands with Rated Power including Upper tolerance, which qualify for **Standalone SAR Test Exclusion**, are as per the above table.

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})]^* [\sqrt{f_{(\text{GHz})}}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

- $f_{(\text{GHz})}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest *mW* and *mm* before calculation
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Applying the above formula for *Bluetooth* Hotspot Mode we get:

➤ For 2450MHz, $[(10)/10] * [\sqrt{2.45}] = 1.6 \leq 3.0$

Applying the above formula for *Bluetooth* Body-worn we get:

➤ For 2450MHz, $[(10)/15] * [\sqrt{2.45}] = 1.1 \leq 3.0$

Hence, testing is not required on *Bluetooth* Hotspot Mode and Body-worn configurations.

- The details for the **Maximum Rated Power** and tolerance(s) can be found in section 6.7.

7.4. Conducted Output Power Measurements

7.4.1. RF Output Average Power Measurement: 2G

**7.4.2. GSM850
Power back-off Not Supported**

Voice Mode GSM (GMSK)

Channel Number	Frequency (MHZ)	Avg Burst Power (dBm)	Frame Power (dBm)
128	824.2	32.0	23.0
190	836.6	32.1	23.1
251	848.8	32.1	23.1

GPRS (GMSK) – Coding Scheme: CS1

Channel Number	Frequency (MHZ)	Avg Burst Power (dBm)				Frame Power (dBm)			
		1Uplink	2Uplink	3Uplink	4Uplink	1Uplink	2Uplink	3Uplink	4Uplink
128	824.2	32.1	31.0	29.0	27.9	23.1	25.0	24.7	24.9
190	836.6	32.1	31.1	28.9	27.9	23.1	25.1	24.6	24.9
251	848.8	32.1	31.1	28.9	27.9	23.1	25.1	24.6	24.9

EDGE (GMSK) – Coding Scheme: MCS4

Channel Number	Frequency (MHZ)	Avg Burst Power (dBm)				Frame Power (dBm)			
		1Uplink	2Uplink	3Uplink	4Uplink	1Uplink	2Uplink	3Uplink	4Uplink
128	824.2	32.1	31.0	29.0	27.8	23.1	25.0	24.7	24.8
190	836.6	32.1	31.1	28.9	27.9	23.1	25.1	24.6	24.9
251	848.8	32.1	31.1	28.9	27.8	23.1	25.1	24.6	24.8

EDGE (8PSK) – Coding Scheme: MCS9

Channel Number	Frequency (MHZ)	Avg Burst Power (dBm)				Frame Power (dBm)			
		1Uplink	2Uplink	3Uplink	4Uplink	1Uplink	2Uplink	3Uplink	4Uplink
128	824.2	28.0	25.4	24.5	22.4	19.0	19.4	20.2	19.4
190	836.6	28.0	25.5	24.5	22.6	19.0	19.5	20.2	19.6
251	848.8	28.0	25.5	24.5	22.5	19.0	19.5	20.2	19.5

Note:

Scale factor for uplink time slot:

1. 1 Uplink: time slot ratio = 8:1 => $10 \cdot \log(8/1) = 9.03 \text{ dB}$
2. 2 Uplink: time slot ratio = 8:2 => $10 \cdot \log(8/2) = 6.02 \text{ dB}$
3. 3 Uplink: time slot ratio = 8:3 => $10 \cdot \log(8/3) = 4.26 \text{ dB}$
4. 4 Uplink: time slot ratio = 8:4 => $10 \cdot \log(8/4) = 3.01 \text{ dB}$

Conclusions:

The worst-case configuration and mode for SAR testing is determined to be as follows:

- For Head SAR Testing, GSM should be evaluated; therefore the EUT was set in **GSM (Voice Mode)**.
- For Hotspot Mode SAR Testing, GPRS should be evaluated; therefore the EUT was set in **GPRS 2 Tx slots** due its highest Frame Average Power (dBm)
- For Body worn SAR Testing, GSM should be evaluated; therefore the EUT was set in **GSM (Voice Mode)**.

7.4.3.PCS1900 Power back-off Not Supported

Voice Mode GSM (GMSK)

Channel Number	Frequency (MHZ)	Avg Burst Power (dBm)	Frame Power (dBm)
512	1850.2	30.2	21.2
661	1880.0	30.5	21.5
810	1909.8	30.4	21.4

GPRS (GMSK) – Coding Scheme: CS1

Channel Number	Frequency (MHZ)	Avg Burst Power (dBm)				Frame Power (dBm)			
		1Uplink	2Uplink	3Uplink	4Uplink	1Uplink	2Uplink	3Uplink	4Uplink
512	1850.2	30.3	27.8	26.7	25.6	21.3	21.8	22.4	22.6
661	1880.0	30.5	27.9	26.7	25.7	21.5	21.9	22.4	22.7
810	1909.8	30.5	28.0	26.8	25.7	21.5	22.0	22.5	22.7

EDGE (GMSK) – Coding Scheme: MCS4

975	880.2	30.3	27.8	26.6	25.7	21.3	21.8	22.3	22.7
37	897.4	30.5	27.9	26.6	25.7	21.5	21.9	22.3	22.7
124	914.8	30.5	28.0	26.7	25.7	21.5	22.0	22.4	22.7

EDGE (8PSK) – Coding Scheme: MCS9

512	1850.2	26.7	24.6	23.8	22.6	17.7	18.6	19.5	19.6
661	1880.0	26.8	24.7	23.8	22.8	17.8	18.7	19.5	19.8
810	1909.8	26.9	24.8	23.9	22.8	17.9	18.8	19.6	19.8

Note:

Scale factor for uplink time slot:

- 1 Uplink: time slot ratio = 8:1 => $10 \cdot \log(8/1) = 9.03 \text{ dB}$
- 2 Uplink: time slot ratio = 8:2 => $10 \cdot \log(8/2) = 6.02 \text{ dB}$
- 3 Uplink: time slot ratio = 8:3 => $10 \cdot \log(8/3) = 4.26 \text{ dB}$
- 4 Uplink: time slot ratio = 8:4 => $10 \cdot \log(8/4) = 3.01 \text{ dB}$

Conclusions:

The worst-case configuration and mode for SAR testing is determined to be as follows:

- For Head SAR Testing, GSM should be evaluated; therefore the EUT was set in **GSM (Voice Mode)**.
- For Hotspot Mode SAR Testing, GPRS should be evaluated; therefore the EUT was set in **GPRS 4 Tx slots** due its highest Frame Average Power (dBm)
- For Body worn SAR Testing, GSM should be evaluated; therefore the EUT was set in **GSM (Voice Mode)**.

7.5. RF Output Average Power Measurement: 3G

**7.5.1. WCDMA Band 2, Band 4 and Band 5 on RMC / HSDPA / HSUPA modes
Power Back-off Not Supported**

Modes		HSDPA				HSUPA					WCDMA
Sets		1	2	3	4	1	2	3	4	5	Voice / RMC 12.2kbps
Band	Channel	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]
1700 (Band 4)	1312 1537	23.5	23.6	23.6	23.6	22.9	22.5	22.6	22.8	22.6	24.1
	1412 1637	23.6	23.7	23.7	23.7	23.6	22.8	23.1	22.7	22.4	24.1
	1513 1738	23.5	23.6	23.5	23.6	23.4	22.5	23.0	22.7	22.5	24.0
850 (Band 5)	4132 4357	24.2	24.2	23.8	23.8	23.8	22.8	22.8	23.0	22.9	24.3
	4183 4408	24.1	24.1	23.8	23.8	23.8	22.7	22.8	23.0	22.8	24.2
	4233 4458	24.2	24.2	23.9	23.9	23.9	22.2	22.9	23.1	22.9	24.3

Power Back-off Supported & Disabled

1900 (Band 2)	9262 9662	23.4	23.6	23.5	23.6	23.4	22.6	22.9	22.5	22.3	23.9
	9400 9800	23.5	23.6	23.6	23.6	23.1	22.1	22.8	22.9	22.0	23.9
	9538 9938	23.4	23.4	23.3	23.2	22.9	22.3	22.7	22.6	22.6	23.9
βc		2	12	15	15	11	6	15	2	15	
βd		15	15	8	4	15	15	9	15	15	
ΔACK, ΔNACK, ΔCQI		8	8	8	8	8	8	8	8	8	
AGV		-	-	-	-	20	12	15	17	21	

**7.5.2. WCDMA Band 2, Band 4 and Band 5 on DC-HSDPA (Cat 24)
Power Back-off Not Supported**

Modes		DC HSDPA (Cat 24)				WCDMA
Sets		1	2	3	4	Voice / RMC 12.2kbps
Band	Channel	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]
1700 (Band 4)	1312 1537	21.5	21.5	21.6	21.5	24.1
	1412 1637	21.4	21.5	21.5	21.6	24.1
	1513 1738	21.6	21.5	21.6	21.6	24.0
850 (Band 5)	4132 4357	22.1	22.1	22.0	22.0	24.3
	4183 4408	21.9	22.0	21.9	22.0	24.2
	4233 4458	22.0	22.0	22.0	22.0	24.3
Power Back-off Supported & Disabled						
1900 (Band 2)	9262 9662	21.5	21.5	21.4	21.4	23.9
	9400 9800	21.6	21.6	21.5	21.4	23.9
	9538 9938	21.5	21.5	21.5	21.5	23.9
β_c		2	12	15	15	
β_d		15	15	8	4	
$\Delta ACK, \Delta NACK, \Delta CQI$		8	8	8	8	
AGV		-	-	-	-	

**7.5.3. WCDMA Band 2 on RMC / HSDPA / HSUPA :
Power Back-off Supported & Enabled**

Modes		HSDPA				HSUPA					WCDMA
Sets		1	2	3	4	1	2	3	4	5	Voice / RMC 12.2kbps
Band	Channel	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]
1900 (Band 2)	9262 9662	21.3	21.3	21.3	21.4	21.0	19.9	20.7	20.8	19.9	21.8
	9400 9800	21.4	21.5	21.4	21.4	20.9	20.2	20.4	20.3	20.1	21.8
	9538 9938	21.2	21.3	21.3	21.3	20.8	20.0	20.2	20.2	19.9	21.8

Power Back-off Supported & Enabled

Modes		DC HSDPA (Cat 24)				WCDMA
Sets		1	2	3	4	Voice / RMC 12.2kbps
Band	Channel	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]
1900 (Band 2)	9262 9662	20.1	20.0	20.3	20.4	21.8
	9400 9800	20.0	20.1	20.3	20.4	21.8
	9538 9938	20.0	20.0	20.3	20.4	21.8
βc		2	12	15	15	
βd		15	15	8	4	
ΔACK, ΔNACK, ΔCQI		8	8	8	8	
AGV		-	-	-	-	

The module power levels were measured in both HSPA and 3G RMC 12.2kbps modes and compared to ensure the correct mode of operation had been established.

The following tables taken from FCC 3G SAR procedures (KDB 941225 D01 SAR test for 3G devices v02) below were applied using an wireless communications test set which supports 3G / HSDPA release 5 / HSUPA release 6.

Sub-test Setup for Release 5 HSDPA

Sub-test	β_c	β_d	B_d (SF)	β_c/β_d	$\beta_{hs}^{(1)}$	SM (dB) ⁽²⁾
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 ⁽³⁾	15/15 ⁽³⁾	64	12/15 ⁽³⁾	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $B_{hs}/\beta_c = 24/15$

Note 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$

Sub-test Setup for Release 6 HSUPA

Sub-test	β_c	β_d	B_d (SF)	β_c/β_d	$\beta_{hs}^{(1)}$	B_{oc}	B_{od}	B_{od} (SF)	B_{od} (codes)	CM ⁽²⁾ (dB)	Power Back-off (dB)	AG ⁽⁴⁾) Index	E-TFCI
1	11/15 ⁽³⁾	15/15 ⁽³⁾	64	11/15 ⁽³⁾	22/15	209/225	1039/225	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	31/15	B_{a11} : 47/15 B_{a12} : 47/15	4	1	2.0	1.0	15	92
4	2/15	15/15	64	2/15	2/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 ⁽⁴⁾	15/15 ⁽⁴⁾	64	15/15 ⁽⁴⁾	24/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$

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

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

Note 4: 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 $\beta_c = 14/15$ and $\beta_d = 15/15$.

Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Tavle 5.1g.

Note 6: B_{od} can not be set directly; it is set by Absolute Grant Value.

7.6. RF Output Average Power Measurement: LTE

7.6.1. LTE Band 2 (1900 MHz)

Power Back-off Not Supported

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-off	Actual Max Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1860.0 MHz (Low)	Frequency 1880.0 MHz (Middle)	Frequency 1900.0 MHz (High)
20 MHz	QPSK	1	Low	0	(0)	23.0	23.2	23.2	23.3
		1	Mid	49	(0)	23.0	23.3	23.2	23.3
		1	High	99	(0)	23.0	23.3	23.2	23.3
		50	low	0	(0)	22.0	22.3	22.2	22.1
		50	Mid	25	(0)	22.0	22.3	22.2	22.1
		50	High	50	(0)	22.0	22.3	22.3	22.1
		100	-	0	(1)	22.0	22.3	22.2	22.1
	16QAM	1	Low	0	(1)	22.0	22.5	22.5	22.5
		1	Mid	49	(1)	22.0	22.5	22.4	22.5
		1	High	99	(1)	22.0	22.4	22.4	22.6
		50	low	0	(2)	21.0	21.3	21.2	21.2
		50	Mid	25	(2)	21.0	21.2	21.2	21.2
		50	High	50	(2)	21.0	21.3	21.3	21.3
		100	-	0	(2)	21.0	21.3	21.3	21.2
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-off	Actual Max Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1857.5 MHz (Low)	Frequency 1880.0 MHz (Middle)	Frequency 1902.5 MHz (High)
15 MHz	QPSK	1	Low	0	(0)	23.0	23.3	23.3	23.2
		1	Mid	37	(0)	23.0	23.3	23.3	23.2
		1	High	74	(0)	23.0	23.3	23.4	23.3
		36	low	0	(1)	22.0	22.3	22.2	22.2
		36	Mid	19	(1)	22.0	22.3	22.2	22.1
		36	High	39	(1)	22.0	22.3	22.2	22.1
		75	-	0	(1)	22.0	22.3	22.3	22.1
	16QAM	1	Low	0	(1)	22.0	22.5	22.4	22.3
		1	Mid	37	(1)	22.0	22.5	22.4	22.1
		1	High	74	(1)	22.0	22.3	22.4	22.4
		36	low	0	(2)	21.0	21.3	21.2	21.4
		36	Mid	19	(2)	21.0	21.3	21.2	21.3
		36	High	39	(2)	21.0	21.3	21.3	21.3
		75	-	0	(2)	21.0	21.3	21.3	21.2

LTE Band 2 (1900 MHz)
Power Back-off Not Supported(Continued)

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-off	Actual Max Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1855.0 MHz (Low)	Frequency 1880.0 MHz (Middle)	Frequency 1905.0 MHz (High)
10 MHz	QPSK	1	Low	0	(0)	23.0	23.4	23.1	23.3
		1	Mid	24	(0)	23.0	23.3	23.1	23.2
		1	High	49	(0)	23.0	23.4	23.1	23.2
		25	Low	0	(1)	22.0	22.2	22.3	22.1
		25	Mid	12	(1)	22.0	22.3	22.2	22.0
		25	High	25	(1)	22.0	22.3	22.3	22.1
		50	-	0	(1)	22.0	22.3	22.3	22.1
	16QAM	1	Low	0	(1)	22.0	22.4	22.3	22.2
		1	mid	24	(1)	22.0	22.4	22.3	22.2
		1	High	49	(1)	22.0	22.5	22.4	22.2
		25	Low	0	(2)	21.0	21.4	21.3	21.2
		25	Mid	12	(2)	21.0	21.3	21.3	21.2
		25	High	25	(2)	21.0	21.3	21.3	21.3
		50	-	0	(2)	21.0	21.3	21.3	21.1
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-off	Actual Max Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1852.5 MHz (Low)	Frequency 1880.0 MHz (Middle)	Frequency 1907.5 MHz (High)
5 MHz	QPSK	1	Low	0	(0)	23.0	23.1	23.2	23.3
		1	Mid	12	(0)	23.0	23.1	23.3	23.3
		1	High	24	(0)	23.0	23.2	23.4	23.3
		12	low	0	(1)	22.0	22.3	22.2	22.1
		12	Mid	6	(1)	22.0	22.3	22.3	22.1
		12	High	13	(1)	22.0	22.3	22.3	22.2
		25	-	0	(1)	22.0	22.3	22.3	22.2
	16QAM	1	Low	0	(1)	22.0	22.3	22.5	22.4
		1	Mid	12	(1)	22.0	22.2	22.4	22.3
		1	High	24	(1)	22.0	22.3	22.4	22.5
		12	low	0	(2)	21.0	21.2	21.3	21.3
		12	Mid	6	(2)	21.0	21.2	21.4	21.3
		12	High	13	(2)	21.0	21.2	21.4	21.3
		25	-	0	(2)	21.0	21.3	21.3	21.2

LTE Band 2 (1900 MHz)
Power Back-off Not Supported (Continued)

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-off	Actual Max Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1851.5 MHz (Low)	Frequency 1880 MHz (Middle)	Frequency 1908.5 MHz (High)
3 MHz	QPSK	1	Low	0	(0)	23.0	23.3	23.2	23.3
		1	Mid	7	(0)	23.0	23.2	23.2	23.3
		1	High	14	(0)	21.5	23.3	23.2	23.3
		8	Low	0	(1)	23.0	22.3	22.2	22.1
		8	Mid	4	(1)	22.0	22.3	22.2	22.2
		8	High	7	(1)	22.0	22.3	22.2	22.2
		15	-	0	(1)	22.0	22.3	22.3	22.1
	16QAM	1	Low	0	(1)	22.0	22.3	22.2	22.3
		1	Mid	7	(1)	22.0	22.4	22.2	22.2
		1	High	14	(1)	22.0	22.4	22.2	22.3
		8	Low	0	(2)	21.0	21.3	21.3	21.2
		8	Mid	4	(2)	21.0	21.3	21.2	21.3
		8	High	7	(2)	21.0	21.3	21.2	21.2
		15	-	0	(2)	21.0	21.4	21.3	21.2
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-off	Actual Max Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1850.7 MHz (Low)	Frequency 1880 MHz (Middle)	Frequency 1909.3 MHz (High)
1.4 MHz	QPSK	1	Low	0	(0)	23.0	23.2	23.4	23.2
		1	Mid	3	(0)	23.0	23.2	23.4	23.1
		1	High	5	(0)	23.0	23.3	23.4	23.2
		3	Low	0	(0)	23.0	23.3	23.3	23.3
		3	Mid	1	(0)	23.0	23.2	23.3	23.2
		3	high	3	(0)	23.0	23.3	23.3	23.2
		6	-	0	(1)	22.0	22.4	22.3	22.2
	16QAM	1	Low	0	(1)	22.0	22.2	22.3	22.2
		1	Mid	3	(1)	22.0	22.2	22.4	22.2
		1	High	5	(1)	22.0	22.3	22.4	22.2
		3	Low	0	(1)	22.0	22.2	22.2	22.3
		3	Mid	1	(1)	22.0	22.2	22.3	22.2
		3	high	3	(1)	22.0	22.3	22.3	22.2
		6	-	0	(2)	21.0	21.3	21.3	21.2

7.6.2. LTE Band 4 (1700 MHz)

Power Back-off Not Supported

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-off	Actual Max Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1720.0 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1745.0 MHz (High)
20 MHz	QPSK	1	Low	0	(0)	23.0	23.2	23.2	22.3
		1	Mid	49	(0)	23.0	23.3	23.2	23.4
		1	High	99	(0)	23.0	23.3	23.2	23.2
		50	low	0	(1)	22.0	22.3	22.2	22.2
		50	Mid	25	(1)	22.0	22.2	22.3	22.2
		50	High	50	(1)	22.0	22.2	22.2	22.2
		100	-	0	(1)	22.0	22.2	22.2	22.2
	16QAM	1	Low	0	(1)	22.0	22.2	22.2	22.3
		1	Mid	49	(1)	22.0	22.2	22.2	22.3
		1	High	99	(1)	22.0	22.3	22.1	22.3
		50	low	0	(2)	21.0	21.2	21.2	21.2
		50	Mid	25	(2)	21.0	21.2	21.2	21.2
		50	High	50	(2)	21.0	21.2	21.2	21.2
		100	-	0	(2)	21.0	21.3	21.1	21.1
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-off	Actual Max Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1717.5 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1747.5 MHz (High)
15 MHz	QPSK	1	Low	0	(0)	23.0	23.2	23.2	23.1
		1	Mid	37	(1)	23.0	23.3	23.3	23.2
		1	High	74	(1)	23.0	23.3	23.3	23.2
		36	low	0	(1)	22.0	22.2	22.3	22.2
		36	Mid	19	(1)	22.0	22.1	22.2	22.1
		36	High	39	(1)	22.0	22.3	22.3	22.2
		75	-	0	(1)	22.0	22.3	22.3	22.2
	16QAM	1	Low	0	(1)	22.0	22.2	22.2	22.2
		1	Mid	37	(2)	22.0	22.2	22.2	22.2
		1	High	74	(2)	22.0	22.3	22.2	22.2
		36	low	0	(2)	21.0	21.1	21.3	21.1
		36	Mid	19	(2)	21.0	21.2	21.3	21.1
		36	High	39	(0)	21.0	21.3	21.3	21.2
		75	-	0	(0)	21.0	21.3	21.2	21.1

**LTE Band 4 (1700 MHz)
Power Back-off Not Supported (Continued)**

							Measured Avg Power (dBm).		
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-off	Actual Max Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1715.0 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1750 MHz (High)
10 MHz	QPSK	1	Low	0	(0)	23.0	23.2	23.3	23.1
		1	Mid	24	(0)	23.0	23.2	23.3	23.1
		1	High	49	(0)	23.0	23.3	23.3	23.0
		25	Low	0	(1)	22.0	22.2	22.2	22.1
		25	Mid	12	(1)	22.0	22.2	22.2	22.2
		25	High	25	(1)	22.0	22.2	22.2	22.1
		50	-	0	(1)	22.0	22.2	22.3	22.2
	16QAM	1	Low	0	(1)	22.0	22.2	22.3	22.1
		1	mid	24	(1)	22.0	22.2	22.3	22.1
		1	High	49	(1)	22.0	22.3	22.3	22.1
		25	Low	0	(2)	21.0	21.1	21.2	21.1
		25	Mid	12	(2)	21.0	21.1	21.2	21.1
		25	High	25	(2)	21.0	21.2	21.2	21.1
		50	-	0	(2)	21.0	21.2	21.2	21.2
							Frequency 1712.5 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1752.5 MHz (High)
5 MHz	QPSK	1	Low	0	(0)	23.0	23.2	23.3	23.1
		1	Mid	12	(0)	23.0	23.2	23.3	23.0
		1	High	24	(0)	23.0	23.2	23.3	23.0
		12	low	0	(1)	22.0	22.2	22.2	22.2
		12	Mid	6	(1)	22.0	22.1	22.2	22.2
		12	High	13	(1)	22.0	22.2	22.2	22.1
		25	-	0	(1)	22.0	22.3	22.2	22.1
	16QAM	1	Low	0	(1)	22.0	22.1	22.2	22.1
		1	Mid	12	(1)	22.0	22.1	22.3	22.1
		1	High	24	(1)	22.0	22.1	22.3	22.1
		12	low	0	(2)	21.0	21.3	21.2	21.1
		12	Mid	6	(2)	21.0	21.2	21.2	21.1
		12	High	13	(2)	21.0	21.3	21.2	21.2
		25	-	0	(2)	21.0	21.3	21.2	21.2

LTE Band 4 (1700 MHz)

Power Back-off Not Supported (Continued)

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-off	Actual Max Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1711.5 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1753.5 MHz (High)
3 MHz	QPSK	1	Low	0	(0)	23.0	23.3	23.3	23.2
		1	Mid	7	(0)	23.0	23.2	23.4	23.2
		1	High	14	(0)	23.0	23.3	23.3	23.2
		8	Low	0	(1)	22.0	22.3	22.2	22.2
		8	Mid	4	(1)	22.0	22.2	22.2	22.1
		8	High	7	(1)	22.0	22.2	22.2	22.1
		15	-	0	(1)	22.0	22.2	22.3	22.1
	16QAM	1	Low	0	(1)	22.0	22.2	22.2	22.1
		1	Mid	7	(1)	22.0	22.2	22.2	22.2
		1	High	14	(1)	22.0	22.3	22.2	22.2
		8	Low	0	(2)	21.0	21.3	21.2	21.2
		8	Mid	4	(2)	21.0	21.3	21.3	21.2
		8	High	7	(2)	21.0	21.2	21.3	21.3
		15	-	0	(2)	21.0	21.3	21.2	21.2
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-off	Actual Max Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1710.7 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1754.3 MHz (High)
1.4 MHz	QPSK	1	Low	0	(0)	23.0	23.2	23.3	23.1
		1	Mid	3	(0)	23.0	23.1	23.4	23.1
		1	High	5	(0)	23.0	23.2	23.4	23.1
		3	Low	0	(0)	23.0	23.3	23.3	23.2
		3	Mid	1	(0)	23.0	23.2	23.3	23.2
		3	high	3	(0)	23.0	23.3	23.3	23.2
		6	-	0	(1)	22.0	22.3	22.3	22.1
	16QAM	1	Low	0	(1)	22.0	22.2	22.2	22.2
		1	Mid	3	(1)	22.0	22.1	22.3	22.2
		1	High	5	(1)	22.0	22.1	22.3	22.1
		3	Low	0	(1)	22.0	22.2	22.2	22.2
		3	Mid	1	(1)	22.0	22.2	22.3	22.2
		3	high	3	(1)	22.0	22.2	22.2	22.2
		6	-	0	(2)	21.0	21.2	21.3	21.2

7.6.3. LTE Band 12 (700 MHz)
Power Back-off Not Supported

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-off	Actual Max Power (dBm)	Measured Avg Power (dBm).		
							Frequency 704.0 MHz (Low)	Frequency 707.5 MHz (Middle)	Frequency 711 MHz (High)
10 MHz	QPSK	1	Low	0	(0)	23.0	23.5	23.4	23.2
		1	Mid	24	(0)	23.0	23.4	23.3	23.2
		1	High	49	(0)	23.0	23.4	23.4	23.2
		25	Low	0	(1)	22.0	22.3	22.3	22.4
		25	Mid	12	(1)	22.0	22.2	22.3	22.3
		25	High	25	(1)	22.0	22.4	22.4	22.4
		50	-	0	(1)	22.0	22.3	22.4	22.4
	16QAM	1	Low	0	(1)	22.0	22.4	22.4	22.2
		1	mid	24	(1)	22.0	22.4	22.4	22.2
		1	High	49	(1)	22.0	22.4	22.3	22.3
		25	Low	0	(2)	21.0	21.3	21.3	21.3
		25	Mid	12	(2)	21.0	21.2	21.3	21.3
		25	High	25	(2)	21.0	21.3	21.4	21.4
		50	-	0	(2)	21.0	21.3	21.4	21.3
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-off	Actual Max Power (dBm)	Frequency 701.5 MHz (Low)	Frequency 707.5 MHz (Middle)	Frequency 713.5 MHz (High)
5 MHz	QPSK	1	Low	0	(0)	23.0	23.4	23.4	23.2
		1	Mid	12	(0)	23.0	23.2	23.4	23.1
		1	High	24	(0)	23.0	23.5	23.4	23.2
		12	low	0	(1)	22.0	22.3	22.3	22.3
		12	Mid	6	(1)	22.0	22.3	22.3	22.3
		12	High	13	(1)	22.0	22.3	22.4	22.3
		25	-	0	(1)	22.0	22.3	22.4	22.3
	16QAM	1	Low	0	(1)	22.0	22.4	22.4	22.1
		1	Mid	12	(1)	22.0	22.2	22.4	22.2
		1	High	24	(1)	22.0	22.3	22.3	22.2
		12	low	0	(2)	21.0	21.3	21.3	21.3
		12	Mid	6	(2)	21.0	21.3	21.2	21.3
		12	High	13	(2)	21.0	21.2	21.3	21.2
		25	-	0	(2)	21.0	21.3	21.3	21.3

LTE Band 12 (700 MHz)

Power Back-off Not Supported (Continued)

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-off	Actual Max Power (dBm)	Measured Avg Power (dBm).		
							Frequency 700.5 MHz (Low)	Frequency 707.5 MHz (Middle)	Frequency 714.5 MHz (High)
3 MHz	QPSK	1	Low	0	(0)	23.0	23.5	23.2	23.4
		1	Mid	7	(0)	23.0	23.4	23.2	23.4
		1	High	14	(0)	23.0	23.4	23.2	23.3
		8	Low	0	(1)	22.0	22.3	22.4	22.4
		8	Mid	4	(1)	22.0	22.3	22.4	22.3
		8	High	7	(1)	22.0	22.3	22.4	22.4
		15	-	0	(1)	22.0	22.3	22.4	22.3
	16QAM	1	Low	0	(1)	22.0	22.5	22.2	23.3
		1	Mid	7	(1)	22.0	22.4	22.2	22.3
		1	High	14	(1)	22.0	22.4	22.2	22.3
		8	Low	0	(2)	21.0	21.2	21.3	21.3
		8	Mid	4	(2)	21.0	21.3	21.3	21.3
		8	High	7	(2)	21.0	21.3	21.3	21.4
15		-	0	(2)	21.0	21.3	21.4	21.3	
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-off	Actual Max Power (dBm)	Measured Avg Power (dBm).		
							Frequency 699.7 MHz (Low)	Frequency 707.5 MHz (Middle)	Frequency 715.3 MHz (High)
1.4 MHz	QPSK	1	Low	0	(0)	23.0	23.5	23.3	23.2
		1	Mid	3	(0)	23.0	23.4	23.3	23.2
		1	High	5	(0)	23.0	23.4	23.3	23.3
		3	Low	0	(0)	23.0	23.4	23.4	23.3
		3	Mid	1	(0)	23.0	23.4	23.3	23.3
		3	high	3	(0)	23.0	23.3	23.3	23.3
		6	-	0	(1)	22.0	22.4	22.4	22.4
	16QAM	1	Low	0	(1)	22.0	22.4	22.3	22.2
		1	Mid	3	(1)	22.0	22.4	22.3	22.2
		1	High	5	(1)	22.0	22.3	22.3	22.3
		3	Low	0	(1)	22.0	22.3	22.3	22.3
		3	Mid	1	(1)	22.0	22.4	22.4	22.2
		3	high	3	(1)	22.0	22.3	22.3	22.3
6		-	0	(2)	21.0	21.3	21.3	21.3	

7.7.RF Output Average Power Measurement: Wi-Fi

**7.7.1.Wi-Fi 802.11b/g/n (2.4 GHz)
IR Sensor Supported & Disabled**

		Avg Power (dBm)	
Channel Number	Frequency (MHZ)	(1Mbps)	Operating Mode
1	2412.0	17.8	802.11b
6	2437.0	17.7	
11	2462.0	18.0	
Channel Number	Frequency (MHZ)	(6Mbps)	Operating Mode
1	2412.0	16.7	802.11g
6	2437.0	16.8	
11	2462.0	16.9	
Channel Number	Frequency (MHZ)	(6.5Mbps)	Operating Mode
1	2412.0	17.2	802.11n HT20
6	2437.0	17.2	
11	2462.0	17.3	

**Wi-Fi 802.11b/g/n (2.4 GHz)
IR Sensor Supported & Enabled**

		Avg Power (dBm)	
Channel Number	Frequency (MHZ)	(1Mbps)	Operating Mode
1	2412.0	14.1	802.11b
6	2437.0	14.0	
11	2462.0	14.1	
Channel Number	Frequency (MHZ)	(6Mbps)	Operating Mode
1	2412.0	12.9	802.11g
6	2437.0	13.0	
11	2462.0	13.1	
Channel Number	Frequency (MHZ)	(6.5Mbps)	Operating Mode
1	2412.0	12.8	802.11n HT20
6	2437.0	13.0	
11	2462.0	13.0	

**7.7.2.Wi-Fi802.11a/n/ac (5.0 GHz) –Sub Band 1 (5.2 GHz UNII)
Power Back-off Not Supported**

		Avg Power (dBm)	
Channel Number	Frequency (MHZ)	6 Mbps	Operating Mode
36	5180.0	16.2	802.11a
40	5200.0	16.4	
44	5220.0	16.6	
48	5240.0	16.6	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
36	5180.0	17.2	802.11n, HT20
40	5200.0	17.2	
44	5220.0	17.3	
48	5240.0	17.3	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
36	5180.0	15.9	802.11ac, VHT20
40	5200.0	16.0	
44	5220.0	16.0	
48	5240.0	16.0	
Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
38	5190.0	14.1	802.11n, HT40
46	5230.0	14.0	
Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
38	5190.0	14.3	802.11ac, VHT40
46	5230.0	14.2	
Channel Number	Frequency (MHZ)	29.3 Mbps	Operating Mode
42	5210.0	13.7	802.11ac, VHT80

**7.7.3.Wi-Fi802.11a/n/ac (5.0 GHz) –Sub Band 2 (5.3 GHz UNII)
Power Back-off Not Supported**

		Avg Power (dBm)	
Channel Number	Frequency (MHZ)	6 Mbps	Operating Mode
52	5260.0	16.5	802.11a
56	5280.0	16.5	
60	5300.0	16.5	
64	5320.0	16.5	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
52	5260.0	17.4	802.11n, HT20
56	5280.0	17.1	
60	5300.0	17.5	
64	5320.0	17.5	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
52	5260.0	16.0	802.11ac, VHT20
56	5280.0	15.9	
60	5300.0	15.9	
64	5320.0	15.9	
Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
54	5270.0	14.0	802.11n, HT40
62	5310.0	14.0	
Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
54	5270.0	14.1	802.11ac, VHT40
62	5310.0	14.1	
Channel Number	Frequency (MHZ)	29.3 Mbps	Operating Mode
58	5290.0	13.9	802.11ac, VHT80

**7.7.4.Wi-Fi802.11a/n/ac (5.0 GHz) –Sub Band 3 (5.5 GHz UNII)
Power Back-off Not Supported**

		Avg Power (dBm)	
Channel Number	Frequency (MHZ)	6 Mbps	Operating Mode
100	5500.0	16.5	802.11a
104	5520.0	16.5	
108	5540.0	16.4	
112	5560.0	16.5	
116	5580.0	16.4	
132	5660.0	16.3	
136	5680.0	16.1	
140	5700.0	16.3	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
100	5500.0	17.4	802.11n, HT20
104	5520.0	17.3	
108	5540.0	17.3	
112	5560.0	17.5	
116	5580.0	17.4	
132	5660.0	17.4	
136	5680.0	17.2	
140	5700.0	17.3	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
100	5500.0	16.4	802.11ac, VHT20
104	5520.0	16.4	
108	5540.0	16.3	
112	5560.0	16.5	
116	5580.0	16.3	
132	5660.0	16.2	
136	5680.0	16.3	
140	5700.0	16.2	

**Wi-Fi 802.11a/n/ac (5.0 GHz) –Sub Band 3 (5.5 GHz UNII)
Power Back-off Not Supported (Continued)**

Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
102	5510.0	14.7	802.11n, HT40
110	5550.0	14.6	
134	5670.0	14.8	
Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
102	5510.0	14.6	802.11ac, VHT40
110	5550.0	14.4	
134	5670.0	14.7	
Channel Number	Frequency (MHZ)	29.3 Mbps	Operating Mode
106	5530.0	14.2	802.11ac, VHT80

7.7.5.Wi-Fi802.11a/n/ac (5.0 GHz) –Sub Band 4 (5.8 GHz UNII)**Power Back-off Not Supported**

		Avg Power (dBm)	
Channel Number	Frequency (MHZ)	6 Mbps	Operating Mode
149	5745.0	16.4	802.11a
153	5765.0	16.4	
157	5785.0	16.3	
161	5805.0	16.1	
165	5825.0	16.4	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
149	5745.0	17.5	802.11n, HT20
153	5765.0	17.5	
157	5785.0	17.4	
161	5805.0	17.5	
165	5825.0	17.4	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
149	5745.0	16.5	802.11ac, VHT20
153	5765.0	16.2	
157	5785.0	16.2	
161	5805.0	16.1	
165	5825.0	16.2	
Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
151	5755.0	14.4	802.11n, HT40
159	5795.0	14.4	
Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
151	5755.0	15.0	802.11ac, VHT40
159	5795.0	14.8	
Channel Number	Frequency (MHZ)	29.3 Mbps	Operating Mode
155	5775.0	14.2	802.11ac, VHT80

8. SYSTEM CHECK AND DIELECTRIC PARAMETERS

See [Appendix 5](#) and [Appendix 6](#) for tables and measurements.

9. MEASUREMENTS, EXAMINATIONS AND DERIVED RESULTS

9.1. General Comments

This section contains test results only.

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to section 8 for details of measurement uncertainties.

Prior to testing the FCC was contacted for LTE Release 10 SAR evaluations on the EUT and testing was performed as per KDB 941225 after their confirmation.

Prior to testing the FCC was contacted for IR proximity Sensor SAR evaluations and testing was performed according to the agreed test plan.

9.2. Specific Absorption Rate - Test Results

For All SAR measurement in this report the 1g-SAR limit tested to is 1.6 W/Kg

9.2.1. GSM 850 - Head - Power Back-off Not Supported

Max Reported SAR = 0.173 (W/kg):

Mode or Modulation	Separation Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
GMSK (Voice)	0	Touch Left	190	836.6	N/A	N/A	32.3	32.1	0.103	0.108	-	1
GMSK (Voice)	0	Tilt Left	190	836.6	N/A	N/A	32.3	32.1	0.060	0.063	-	2
GMSK (Voice)	0	Touch Right	190	836.6	N/A	N/A	32.3	32.1	0.133	0.139	-	3
GMSK (Voice)	0	Tilt Right	190	836.6	N/A	N/A	32.3	32.1	0.068	0.071	-	4
GMSK (Voice)	0	Touch Right	128	824.2	N/A	N/A	32.3	32.0	0.161	0.173	-	5
GMSK (Voice)	0	Touch Right	251	848.8	N/A	N/A	32.3	32.1	0.116	0.121	-	6

9.2.2. GSM 850 Hotspot Mode - Power Back-off Not Supported

Max Reported SAR = 0.514 (W/kg):

Mode or Modulation	Separation Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
GMSK (Data 2 Slot)	10	Front	190	836.6	N/A	N/A	31.6	31.1	0.298	0.334	1	7
GMSK (Data 2 Slot)	10	Back	190	836.6	N/A	N/A	31.6	31.1	0.414	0.465	1	8
GMSK (Data 2 Slot)	10	Left Hand Side	190	836.6	N/A	N/A	31.6	31.1	0.185	0.208	1	9
GMSK (Data 2 Slot)	10	Right Hand Side	190	836.6	N/A	N/A	31.6	31.1	0.378	0.424	1	10
GMSK (Data 2 Slot)	10	Bottom	190	836.6	N/A	N/A	31.6	31.1	0.170	0.191	1	11
GMSK (Data 2 Slot)	10	Back	128	824.2	N/A	N/A	31.6	31.0	0.444	0.510	1	12
GMSK (Data 2 Slot)	10	Back	251	848.8	N/A	N/A	31.6	31.1	0.438	0.491	1	13

Note(s):

1. KDB 941225 D03 - SAR is not required for EDGE technology when the maximum average output power is lower than that measured on the corresponding GPRS channels.

9.2.3. GSM 850 - Body-Worn - Power Back-off Not Supported**Max Reported SAR = 0.243(W/kg)**

Mode or Modulation	Separation Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
GMSK (Voice)	15	Front	190	190	N/A	N/A	32.3	32.1	0.202	0.212	-	14
GMSK (Voice)	15	Back	190	190	N/A	N/A	32.3	32.1	0.217	0.227	-	15
GMSK (Voice)	15	Back	128	824.2	N/A	N/A	32.3	32.0	0.227	0.243	-	16
GMSK (Voice)	15	Back	251	848.8	N/A	N/A	32.3	32.1	0.198	0.207	-	17

Note(s):

*As per 648474 D04 Handsets SAR v01r02, "When the reported SAR for a 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 headset attached to the handset". Hence, Body worn configurations were not evaluated with PHF attached.

9.2.4. PCS 1900 - Head - Power Back-off Not Supported**Reported SAR = 0.389 (W/kg)**

					For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
GMSK (Voice)	0	Touch Left	661	1880.0	N/A	N/A	30.7	30.5	0.275	0.288	-	18
GMSK (Voice)	0	Tilt Left	661	1880.0	N/A	N/A	30.7	30.5	0.201	0.210	-	19
GMSK (Voice)	0	Touch Right	661	1880.0	N/A	N/A	30.7	30.5	0.356	0.373	-	20
GMSK (Voice)	0	Tilt Right	661	1880.0	N/A	N/A	30.7	30.5	0.150	0.157	-	21
GMSK (Voice)	0	Touch Right	512	1850.2	N/A	N/A	30.7	30.2	0.347	0.389	-	22
GMSK (Voice)	0	Touch Right	810	1909.8	N/A	N/A	30.7	30.4	0.301	0.323	-	23

9.2.5. PCS 1900 - Hotspot Mode - Power Back-off Not Supported**Max Reported SAR = 1.489 (W/kg)**

					For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
GMSK (Data 4 Slots)	10	Front	661	1880.0	N/A	N/A	26.6	25.7	0.661	0.813	-	24
GMSK (Data 4 Slots)	10	Front	512	1850.2	N/A	N/A	26.6	25.6	0.505	0.636	-	25
GMSK (Data 4 Slots)	10	Front	810	1909.8	N/A	N/A	26.6	25.7	0.830	1.021	-	26
GMSK (Data 4 Slots)	10	Back	661	1880.0	N/A	N/A	26.6	25.7	0.581	0.715	-	27
GMSK (Data 4 Slots)	10	Left Hand Side	661	1880.0	N/A	N/A	26.6	25.7	0.253	0.311	-	28
GMSK (Data 4 Slots)	10	Right Hand Side	661	1880.0	N/A	N/A	26.6	25.7	0.272	0.335	-	29
GMSK (Data 4 Slots)	10	Bottom	661	1880.0	N/A	N/A	26.6	25.7	0.822	1.011	-	30
GMSK (Data 4 Slots)	10	Bottom	512	1850.2	N/A	N/A	26.6	25.6	0.682	0.859	-	31
GMSK (Data 4 Slots)	10	Bottom	810	1909.8	N/A	N/A	26.6	25.7	1.210	1.489	1	32

Note(s):

- As per 865664 D01, the highest SAR measured > 0.8 W/kg has been re-measured and included in the report in section 10.4 under **SAR Measurement Variability and Measurement Uncertainty Analysis Results** Table.

*KDB 941225 D03 - SAR is not required for EDGE technology when the maximum average output power is lower than that measured on the corresponding GPRS channels.

9.2.6. PCS 1900 - Body-Worn - Power Back-off Not Supported

Reported SAR = 0.355 (W/kg)

Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
GMSK (Voice)	15	Front	661	1880.0	N/A	N/A	30.7	30.5	0.261	0.273	-	33
GMSK (Voice)	15	Back	661	1880.0	N/A	N/A	30.7	30.5	0.272	0.285	-	34
GMSK (Voice)	15	Back	512	1850.2	N/A	N/A	30.7	30.2	0.217	0.243	-	35
GMSK (Voice)	15	Back	810	1909.8	N/A	N/A	30.7	30.4	0.331	0.355	-	36

Note(s):

*As per 648474 D04 Handsets SAR v01r02, "When the reported SAR for a 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 headset attached to the handset". Hence, Body worn configurations were not evaluated with PHF attached.

9.2.7. UMTS FDD 2 - Head - Power Back-off Supported and Disabled

Max Reported SAR = 0.542 (W/kg)

					For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	0	Touch Left	9400	1880.0	N/A	N/A	24.0	23.9	0.530	0.542	1	37
QPSK	0	Tilt Left	9400	1880.0	N/A	N/A	24.0	23.9	0.272	0.278	1	38
QPSK	0	Touch Right	9400	1880.0	N/A	N/A	24.0	23.9	0.447	0.457	1	39
QPSK	0	Tilt Right	9400	1880.0	N/A	N/A	24.0	23.9	0.235	0.240	1	40
QPSK	0	Touch Left	9262	1852.4	N/A	N/A	24.0	23.9	0.511	0.523	1	41
QPSK	0	Touch Left	9538	1907.6	N/A	N/A	24.0	23.9	0.372	0.381	1	42

Note(s):

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"

9.2.8. UMTS FDD 2 - Hotspot Mode - Power Back-off Supported and Enabled

Max Reported SAR = 0.790 (W/kg)

					For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	10	Front	9400	1880.0	N/A	N/A	22.5	21.8	0.557	0.654	1	43
QPSK	10	Back	9400	1880.0	N/A	N/A	22.5	21.8	0.564	0.663	1	44
QPSK	10	Left Hand Side	9400	1880.0	N/A	N/A	22.5	21.8	0.072	0.085	1	45
QPSK	10	Right Hand Side	9400	1880.0	N/A	N/A	22.5	21.8	0.197	0.231	1	46
QPSK	10	Bottom	9400	1880.0	N/A	N/A	22.5	21.8	0.484	0.569	1	47
QPSK	10	Back	9262	1852.4	N/A	N/A	22.5	21.8	0.455	0.535	1	48
QPSK	10	Back	9538	1907.6	N/A	N/A	22.5	21.8	0.672	0.790	1	49

Note(s):

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's".

*KDB 941225 D02 - SAR is not required for RMC+HSPA or RMC+DC-HSDPA (HSDPA/HSUPA/DC-HSDPA) channels when the maximum average output power is less than ¼ dB higher than that measured on the corresponding RMC channels and 1g SAR level reported in 'RMC 12.2kbps' is <75% SAR limit.

9.2.9. UMTS FDD 2 - Body-Worn - Power Back-off Supported and Disabled

Max Reported SAR = 0.523 (W/kg)

Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	15	Front	9538	1907.6	N/A	N/A	24.0	23.9	0.511	0.523	1	50
QPSK	15	Back	9538	1907.6	N/A	N/A	24.0	23.9	0.424	0.434	1	51
QPSK	15	Front	9262	1852.4	N/A	N/A	24.0	23.9	0.349	0.357	1	52
QPSK	15	Front	9400	1880.0	N/A	N/A	24.0	23.9	0.433	0.443	1	53

Note(s):

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"

*KDB 941225 D02 - SAR is not required for RMC+HSPA or RMC+DC-HSDPA (HSDPA/HSUPA/DC-HSDPA) channels when the maximum average output power is less than ¼ dB higher than that measured on the corresponding RMC channels and 1g SAR level reported in 'RMC 12.2kbps' is <75% SAR limit.

*As per 648474 D04 Handsets SAR v01r02, "When the reported SAR for a 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 headset attached to the handset". Hence, Body worn configurations were not evaluated with PHF attached.

9.2.10. UMTS FDD 4 Head - Power Back-off Not Supported

Max Reported SAR = 0.538 (W/kg)

					For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	0	Touch Left	1412	1732.6	N/A	N/A	24.5	24.1	0.482	0.529	1	54
QPSK	0	Tilt Left	1412	1732.6	N/A	N/A	24.5	24.1	0.274	0.300	1	55
QPSK	0	Touch Right	1412	1732.6	N/A	N/A	24.5	24.1	0.490	0.537	1	56
QPSK	0	Tilt Right	1412	1732.6	N/A	N/A	24.5	24.1	0.252	0.276	1	57
QPSK	0	Touch Right	1312	1712.4	N/A	N/A	24.5	24.1	0.473	0.519	1	58
QPSK	0	Touch Right	1513	1752.6	N/A	N/A	24.5	24.1	0.491	0.538	1	59

Note(s):

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"

9.2.11. UMTS FDD 4 - Hotspot Mode - Power Back-off Not Supported

Max Reported SAR = 0.973 (W/kg)

					For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	10	Front	1412	1732.6	N/A	N/A	24.5	24.1	0.869	0.953	1	60
QPSK	10	Front	1312	1712.4	N/A	N/A	24.5	24.1	0.871	0.955	1, 2	61
QPSK	10	Front	1513	1752.6	N/A	N/A	24.5	24.0	0.867	0.973	1	62
QPSK	10	Back	1412	1732.6	N/A	N/A	24.5	24.1	0.825	0.905	1	63
QPSK	10	Back	1312	1712.4	N/A	N/A	24.5	24.1	0.845	0.927	1	64
QPSK	10	Back	1513	1752.6	N/A	N/A	24.5	24.0	0.840	0.942	1	65
QPSK	10	Left Hand Side	1412	1732.6	N/A	N/A	24.5	24.1	0.325	0.356	1	66
QPSK	10	Right Hand Side	1412	1732.6	N/A	N/A	24.5	24.1	0.200	0.219	1	67
QPSK	10	Bottom	1412	1732.6	N/A	N/A	24.5	24.1	0.347	0.380	1	68

Note(s):

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"
2. As per 865664 D01, the highest SAR measured > 0.8 W/kg has been re-measured and included in the report in section 10.4 under **SAR Measurement Variability and Measurement Uncertainty Analysis Results** Table.

*KDB 941225 D02 - SAR is not required for RMC+HSPA or RMC+DC-HSDPA (HSDPA/HSUPA/DC-HSDPA) channels when the maximum average output power is less than ¼ dB higher than that measured on the corresponding RMC channels and 1g SAR level reported in 'RMC 12.2kbps' is <75% SAR limit.

9.2.12. UMTS FDD 4 - Body-Worn - Power Back-off Not Supported

Max Reported SAR = 0.973 (W/kg)

For body-worn configuration indicated below the test position overlap with hotspot and the power back –off was Not Supported meaning hotspot mode was most conservative.

Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	10	Front	1412	1732.6	N/A	N/A	24.5	24.1	0.869	0.953	1	60
QPSK	10	Front	1312	1712.4	N/A	N/A	24.5	24.1	0.871	0.955	1, 2	61
QPSK	10	Front	1513	1752.6	N/A	N/A	24.5	24.0	0.867	0.973	1	62
QPSK	10	Back	1412	1732.6	N/A	N/A	24.5	24.1	0.825	0.905	1	63
QPSK	10	Back	1312	1712.4	N/A	N/A	24.5	24.1	0.845	0.927	1	64
QPSK	10	Back	1513	1752.6	N/A	N/A	24.5	24.0	0.840	0.942	1	65

Note(s):

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"
2. As per 865664 D01, the highest SAR measured > 0.8 W/kg has been re-measured and included in the report in section 10.4 under **SAR Measurement Variability and Measurement Uncertainty Analysis Results** Table.

*KDB 941225 D02 - SAR is not required for RMC+HSPA or RMC+DC-HSDPA (HSDPA/HSUPA/DC-HSDPA) channels when the maximum average output power is less than ¼ dB higher than that measured on the corresponding RMC channels and 1g SAR level reported in 'RMC 12.2kbps' is <75% SAR limit.

*As per 648474 D04 Handsets SAR v01r02, "When the reported SAR for a 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 headset attached to the handset". Hence, Body worn configurations were not evaluated with PHF attached.

9.2.13. UMTS FDD 5 - Head - Power Back-off Not Supported

Max Reported SAR = 0.226 (W/kg)

					For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	0	Touch Left	4183	836.6	N/A	N/A	24.5	24.2	0.165	0.177	1	69
QPSK	0	Tilt Left	4183	836.6	N/A	N/A	24.5	24.2	0.110	0.118	1	70
QPSK	0	Touch Right	4183	836.6	N/A	N/A	24.5	24.2	0.211	0.226	1	71
QPSK	0	Tilt Right	4183	836.6	N/A	N/A	24.5	24.2	0.111	0.119	1	72
QPSK	0	Touch Right	4132	826.4	N/A	N/A	24.5	24.3	0.210	0.220	1	73
QPSK	0	Touch Right	4223	846.6	N/A	N/A	24.5	24.3	0.180	0.188	1	74

Note(s):

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"

9.2.14. UMTS FDD 5 - Hotspot Mode - Power Back-off Not Supported

Max Reported SAR = 0.405 (W/kg)

					For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	10	Front	4183	836.6	N/A	N/A	24.5	24.2	0.378	0.405	1	75
QPSK	10	Back	4183	836.6	N/A	N/A	24.5	24.2	0.174	0.186	1	76
QPSK	10	Left Hand Side	4183	836.6	N/A	N/A	24.5	24.2	0.137	0.147	1	77
QPSK	10	Right Hand Side	4183	836.6	N/A	N/A	24.5	24.2	0.133	0.143	1	78
QPSK	10	Bottom	4183	836.6	N/A	N/A	24.5	24.2	0.218	0.234	1	79
QPSK	10	Front	4132	826.4	N/A	N/A	24.5	24.3	0.341	0.357	1	80
QPSK	10	Front	4233	846.6	N/A	N/A	24.5	24.3	0.358	0.375	1	81

Note(s):

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"

*KDB 941225 D02 - SAR is not required for RMC+HSPA or RMC+DC-HSDPA (HSDPA/HSUPA/DC-HSDPA) channels when the maximum average output power is less than ¼ dB higher than that measured on the corresponding RMC channels and 1g SAR level reported in 'RMC 12.2kbps' is <75% SAR limit.

9.2.15. UMTS FDD 5 - Body-Worn - Power Back-off Not Supported

Max Reported SAR = 0.405 (W/kg)

For body-worn configuration indicated below the test position overlap with hotspot and the power back –off was Not Supported meaning hotspot mode was most conservative.

Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	10	Front	4183	836.6	N/A	N/A	24.5	24.2	0.378	0.405	1	75
QPSK	10	Back	4183	836.6	N/A	N/A	24.5	24.2	0.174	0.186	1	76
QPSK	10	Front	4132	826.4	N/A	N/A	24.5	24.3	0.341	0.357	1	80
QPSK	10	Front	4233	846.6	N/A	N/A	24.5	24.3	0.358	0.375	1	81

Note(s):

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"

*KDB 941225 D02 - SAR is not required for RMC+HSPA or RMC+DC-HSDPA (HSDPA/HSUPA/DC-HSDPA) channels when the maximum average output power is less than ¼ dB higher than that measured on the corresponding RMC channels and 1g SAR level reported in 'RMC 12.2kbps' is <75% SAR limit.

*As per 648474 D04 Handsets SAR v01r02, "When the reported SAR for a 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 headset attached to the handset". Hence, Body worn configurations were not evaluated with PHF attached.

9.2.16. GENERAL NOTE FOR LTE

As per KDB 941225 D05 SAR for LTE Devices v02r02, the following steps were followed to perform SAR evaluation Largest Channel BW

1. QPSK 1RB Allocation

Start with 1RB offset Config with the highest maximum output power on required test channel (1RB low, 1RB high or 1RB mid). If value in (1) is <0.8W/kg, testing of remaining RB offset configurations and test channels not required for 1RB

2. QPSK 50% RB Allocation

Apply steps followed in (1) for measuring 50% RB

3. QPSK 100% RB Allocation

SAR not required if highest output power from (1) and (2) is higher than 100% RB output power and if SAR Values in step (1) and (2) ≤0.8W/kg

4. 16 QAM

Apply steps (1), (2) and (3) for testing 16-QAM/64-QAM, for each configuration SAR required only when highest maximum output power for the highest order modulation (ex. 16-QAM) > QPSK by 0.5dB or when reported SAR for QPSK > 1.45W/kg

9.2.17. LTE Band 2; 20MHz Channel BW Head - Power Back-off Not Supported

Max Reported SAR = 0.512 (W/kg)

Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only 20 MHz BW		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	0	Touch Left	18700	1860.0	1	49	23.7	23.3	0.467	0.512	-	82
QPSK	0	Touch Left	18700	1860.0	50	25	22.7	22.3	0.368	0.404	-	83
QPSK	0	Tilt Left	18700	1860.0	1	49	23.7	23.3	0.237	0.260	-	84
QPSK	0	Tilt Left	18700	1860.0	50	25	22.7	22.3	0.190	0.208	-	85
QPSK	0	Touch Right	18700	1860.0	1	49	23.7	23.3	0.395	0.433	-	86
QPSK	0	Touch Right	18700	1860.0	50	25	22.7	22.3	0.280	0.307	-	87
QPSK	0	Tilt Right	18700	1860.0	1	49	23.7	23.3	0.176	0.193	-	88
QPSK	0	Tilt Right	18700	1860.0	50	25	22.7	22.3	0.138	0.151	-	89
QPSK	0	Touch Left	18900	1880.0	1	49	23.7	23.2	0.411	0.461	-	90
QPSK	0	Touch Left	19100	1900.0	1	49	23.7	23.3	0.363	0.398	-	91

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9.2.18. LTE Band 2; 20MHz Channel BW - Hotspot Mode**Max Reported SAR = 0.985 (W/kg)**

Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	10	Front	18700	1860.0	1	49	23.7	23.3	0.344	0.377	-	92
QPSK	10	Front	18700	1860.0	50	25	22.7	22.3	0.563	0.617	-	93
QPSK	10	Back	18700	1860.0	1	49	23.7	23.3	0.780	0.855	-	94
QPSK	10	Back	18900	1880.0	1	49	23.7	23.2	0.762	0.855	-	95
QPSK	10	Back	19100	1900.0	1	49	23.7	23.3	0.898	0.985	1	96
QPSK	10	Back	18700	1860.0	50	25	22.7	22.3	0.611	0.670	-	97
QPSK	10	Back	19100	1900.0	100	0	22.7	22.1	0.454	0.521	-	98
QPSK	10	Left Hand Side	18700	1860.0	1	49	23.7	23.3	0.295	0.323	-	99
QPSK	10	Left Hand Side	18700	1860.0	50	25	22.7	22.3	0.233	0.255	-	100
QPSK	10	Right Hand Side	18700	1860.0	1	49	23.7	23.3	0.273	0.299	-	101
QPSK	10	Right Hand Side	18700	1860.0	50	25	22.7	22.3	0.166	0.182	-	102
QPSK	10	Bottom	18700	1860.0	1	49	23.7	23.3	0.683	0.749	-	103
QPSK	10	Bottom	18700	1860.0	50	25	22.7	22.3	0.303	0.332	-	104

Note(s):

- As per 865664 D01, the highest SAR measured > 0.8 W/kg has been re-measured and included in the report in section 10.4 under **SAR Measurement Variability and Measurement Uncertainty Analysis Results** Table

9.2.19. LTE Band 2; 20MHz Channel BW - Body-Worn - Power Back-off Not Supported

Max Reported SAR = 0.985(W/kg)

For body-worn configuration indicated below the test position overlap with hotspot and the power back –off was Not Supported meaning hotspot mode was most conservative.

Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK		Front	18700	1860.0	1	49	23.7	23.3	0.344	0.377	-	92
QPSK		Front	18700	1860.0	50	25	22.7	22.3	0.563	0.617	-	93
QPSK		Back	18700	1860.0	1	49	23.7	23.3	0.780	0.855	-	94
QPSK		Back	18900	1880.0	1	49	23.7	23.2	0.762	0.855	-	95
QPSK		Back	19100	1900.0	1	49	23.7	23.3	0.898	0.985	1	96
QPSK		Back	18700	1860.0	50	25	22.7	22.3	0.611	0.670	-	97
QPSK		Back	19100	1900.0	100	0	22.7	22.1	0.454	0.521	-	98

Note(s):

- As per 865664 D01, the highest SAR measured > 0.8 W/kg has been re-measured and included in the report in section 10.4 under **SAR Measurement Variability and Measurement Uncertainty Analysis Results** Table

*As per 648474 D04 Handsets SAR v01r02, "When the reported SAR for a 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 headset attached to the handset". Hence, Body worn configurations were not evaluated with PHF attached.

9.2.20. LTE Band 4; 20MHz Channel BW - Head - Power Back-off Not Supported

Max Reported SAR = 0.510 (W/kg)

Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	0	Touch Left	20300	1745.0	1	49	24.0	23.4	0.403	0.463	-	105
QPSK	0	Touch Left	20175	1732.5	50	25	23.0	22.3	0.310	0.364	-	106
QPSK	0	Tilt Left	20300	1745.0	1	49	24.0	23.4	0.207	0.238	-	107
QPSK	0	Tilt Left	20175	1732.5	50	25	23.0	22.3	0.166	0.195	-	108
QPSK	0	Touch Right	20300	1745.0	1	49	24.0	23.4	0.323	0.371	-	109
QPSK	0	Touch Right	20175	1732.5	50	25	23.0	22.3	0.320	0.376	-	110
QPSK	0	Tilt Right	20300	1745.0	1	49	24.0	23.4	0.206	0.237	-	111
QPSK	0	Tilt Right	20175	1732.5	50	25	23.0	22.3	0.206	0.242	-	112
QPSK	0	Touch Left	20050	1720.0	1	49	24.0	23.3	0.402	0.472	-	113
QPSK	0	Touch Left	20175	1732.5	1	49	24.0	23.2	0.424	0.510	-	114

9.2.21. LTE Band 4; 20MHz Channel BW - Hotspot Mode Power Back-off Not Supported

Max Reported SAR = 0.847 (W/kg)

Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	10	Front	20300	1745.0	1	49	24.0	23.4	0.625	0.718	-	115
QPSK	10	Front	20175	1732.5	50	25	23.0	22.3	0.520	0.611	-	116
QPSK	10	Back	20300	1745.0	1	49	24.0	23.4	0.738	0.847	-	117
QPSK	10	Back	20050	1720.0	1	49	24.0	23.3	0.672	0.790	-	118
QPSK	10	Back	20175	1732.5	1	49	24.0	23.2	0.639	0.768	-	119
QPSK	10	Back	20175	1732.5	50	25	23.0	22.3	0.521	0.612	-	120
QPSK	10	Back	20300	1745.0	100	0	23.0	22.2	0.403	0.485	-	121
QPSK	10	Left Hand Side	20300	1745.0	1	49	24.0	23.4	0.349	0.401	-	122
QPSK	10	Left Hand Side	20175	1732.5	50	25	23.0	22.3	0.367	0.431	-	123
QPSK	10	Right Hand Side	20300	1745.0	1	49	24.0	23.4	0.222	0.255	-	124
QPSK	10	Right Hand Side	20175	1732.5	50	25	23.0	22.3	0.218	0.256	-	125
QPSK	10	Bottom	20300	1745.0	1	49	24.0	23.4	0.541	0.621	-	126
QPSK	10	Bottom	20175	1732.5	50	25	23.0	22.3	0.407	0.478	-	127

9.2.22. LTE Band 4; 20MHz Channel BW - Body-Worn - Power Back-off Not Supported

Max Reported SAR = 0.847 (W/kg)

For body-worn configuration indicated below the test position overlap with hotspot and the power back –off was Not Supported meaning hotspot mode was most conservative.

Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	10	Front	20300	1745.0	1	49	24.0	23.4	0.625	0.718	-	115
QPSK	10	Front	20175	1732.5	50	25	23.0	22.3	0.520	0.611	-	116
QPSK	10	Back	20300	1745.0	1	49	24.0	23.4	0.738	0.847	-	117
QPSK	10	Back	20050	1720.0	1	49	24.0	23.3	0.672	0.790	-	118
QPSK	10	Back	20175	1732.5	1	49	24.0	23.2	0.639	0.768	-	119
QPSK	10	Back	20175	1732.5	50	25	23.0	22.3	0.521	0.612	-	120
QPSK	10	Back	20300	1745.0	100	0	23.0	22.2	0.403	0.485	-	121

Note(s):

*As per 648474 D04 Handsets SAR v01r02, "When the reported SAR for a 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 headset attached to the handset". Hence, Body worn configurations were not evaluated with PHF attached.

9.2.23. LTE Band 12; 10MHz Channel BW Head - Power Back-off Not Supported

Max Reported SAR = 0.179(W/kg)

Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	0	Touch Left	23060	704.0	1	0	24.0	23.5	0.134	0.150	-	128
QPSK	0	Touch Left	23060	704.0	25	24	23.0	22.4	0.135	0.155	-	129
QPSK	0	Tilt Left	23060	704.0	1	0	24.0	23.5	0.077	0.086	-	130
QPSK	0	Tilt Left	23060	704.0	25	24	23.0	22.4	0.079	0.091	-	131
QPSK	0	Touch Right	23060	704.0	1	0	24.0	23.5	0.144	0.162	-	132
QPSK	0	Touch Right	23060	704.0	25	24	23.0	22.4	0.123	0.141	-	133
QPSK	0	Tilt Right	23060	704.0	1	0	24.0	23.5	0.069	0.077	-	134
QPSK	0	Tilt Right	23060	704.0	25	24	23.0	22.4	0.067	0.077	-	135
QPSK	0	Touch Right	23095	707.5	1	0	24.0	23.4	0.144	0.165	-	136
QPSK	0	Touch Right	23130	711.0	1	0	24.0	23.2	0.149	0.179	-	137

9.2.24. LTE Band 12; 10MHz Channel BW - Hotspot Mode Power Back-off Not Supported

Max Reported SAR = 0.407 (W/kg)

Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
QPSK	10	Front	23060	704.0	1	0	24.0	23.5	0.271	0.304	-	138
QPSK	10	Front	23060	704.0	25	24	23.0	22.4	0.280	0.321	-	139
QPSK	10	Back	23060	704.0	1	0	24.0	23.5	0.363	0.407	-	140
QPSK	10	Back	23060	704.0	25	24	23.0	22.4	0.310	0.356	-	141
QPSK	10	Left Hand Side	23060	704.0	1	0	24.0	23.5	0.169	0.190	-	142
QPSK	10	Left Hand Side	23060	704.0	25	24	23.0	22.4	0.189	0.217	-	143
QPSK	10	Right Hand Side	23060	704.0	1	0	24.0	23.5	0.071	0.080	-	144
QPSK	10	Right Hand Side	23060	704.0	25	24	23.0	22.4	0.184	0.211	-	145
QPSK	10	Bottom	23060	704.0	1	0	24.0	23.5	0.028	0.031	-	146
QPSK	10	Bottom	23060	704.0	25	24	23.0	22.4	0.035	0.040	-	147
QPSK	10	Back	23095	707.5	1	0	24.0	23.4	0.267	0.307	-	148
QPSK	10	Back	23130	711.0	1	0	24.0	23.2	0.295	0.355	-	149

9.2.25. LTE Band 12; 10MHz Channel BW - Body-Worn - Power Back-off Not Supported

Max Reported SAR = 0.407 (W/kg)

For body-worn configuration indicated below the test position overlap with hotspot and the power back –off was Not Supported meaning hotspot mode was most conservative.

					For LTE Only		Power (dBm)		1g : SAR Results (W/kg)			
Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled	Note(s)	Scan No.
QPSK	10	Front	23060	704.0	1	0	24.0	23.5	0.271	0.304	-	138
QPSK	10	Front	23060	704.0	25	24	23.0	22.4	0.280	0.321	-	139
QPSK	10	Back	23060	704.0	1	0	24.0	23.5	0.363	0.407	-	140
QPSK	10	Back	23060	704.0	25	24	23.0	22.4	0.310	0.356	-	141
QPSK	10	Back	23095	707.5	1	0	24.0	23.4	0.269	0.309	-	148
QPSK	10	Back	23130	711.0	1	0	24.0	23.2	0.295	0.355	-	149

Note(s):

*As per 648474 D04 Handsets SAR v01r02, "When the reported SAR for a 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 headset attached to the handset". Hence, Body worn configurations were not evaluated with PHF attached.

9.2.26. Wi-Fi 2.4 GHz - Head - IR sensor Supported & Enabled

Max Reported SAR = 0.988 (W/kg)

					For LTE Only		Power (dBm)		1g : SAR Results (W/kg)			
Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled	Note(s)	Scan No.
DBPSK (802.11b 1Mbps)	0	Touch Left	6	2437	N/A	N/A	14.5	14.0	0.378	0.424	-	150
DBPSK (802.11b 1Mbps)	0	Tilt Left	6	2437	N/A	N/A	14.5	14.0	0.221	0.248	-	151
DBPSK (802.11b 1Mbps)	0	Touch Right	6	2437	N/A	N/A	14.5	14.0	0.881	0.988	-	152
DBPSK (802.11b 1Mbps)	0	Tilt Right	6	2437	N/A	N/A	14.5	14.0	0.665	0.746	-	153
DBPSK (802.11b 1Mbps)	0	Touch Right	1	2412	N/A	N/A	14.5	14.1	0.594	0.651	-	154
DBPSK (802.11b 1Mbps)	0	Touch Right	11	2462	N/A	N/A	14.5	14.1	0.855	0.937	-	155

Note(s):

*KDB 248227 - SAR is not required for 802.11g/n channels when the maximum average output power is equal to that measured on the corresponding 802.11b channels.

9.2.27. Wi-Fi 2.4 GHz - Hotspot Mode - IR Sensor Supported & Disabled

Max Reported SAR = 0.486 (W/kg)

					For LTE Only		Power (dBm)		1g : SAR Results (W/kg)			
Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled	Note(s)	Scan No.
DBPSK (802.11b 1Mbps)	10	Front	6	2437	N/A	N/A	18.0	17.7	0.454	0.486	-	156
DBPSK (802.11b 1Mbps)	10	Back	6	2437	N/A	N/A	18.0	17.7	0.369	0.395	-	157
DBPSK (802.11b 1Mbps)	10	Left Hand Side	6	2437	N/A	N/A	18.0	17.7	0.018	0.019	-	158
DBPSK (802.11b 1Mbps)	10	Top	6	2437	N/A	N/A	18.0	17.7	0.075	0.080	-	159
DBPSK (802.11b 1Mbps)	10	Front	1	2412	N/A	N/A	18.0	17.8	0.345	0.361	-	160
DBPSK (802.11b 1Mbps)	10	Front	11	2462	N/A	N/A	18.0	18.0	0.400	0.400	-	161

9.2.28. Wi-Fi 2.4 GHz - Body-Worn - IR Sensor Supported & Disabled

Max Reported SAR = 0.177(W/kg)

Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
DBPSK (802.11b 1Mbps)	15	Front	6	2437	N/A	N/A	18.0	17.7	0.165	0.177	-	162
DBPSK (802.11b 1Mbps)	15	Back	6	2437	N/A	N/A	18.0	17.7	0.124	0.133	-	163
DBPSK (802.11b 1Mbps)	15	Front	1	2412	N/A	N/A	18.0	17.8	0.162	0.170	-	164
DBPSK (802.11b 1Mbps)	15	Front	11	2462	N/A	N/A	18.0	18.0	0.146	0.146	-	165

Note(s):

*KDB 248227 - SAR is not required for 802.11g/n channels when the maximum average output power is equal to that measured on the corresponding 802.11b channels.

*As per 648474 D04 Handsets SAR v01r02, "When the reported SAR for a 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 headset attached to the handset". Hence, Body worn configurations were not evaluated with PHF attached.

9.2.29. Wi-Fi 2.4 GHz Body - Additional Test as per KDB inquiry

(Result for Information Purpose Only)

Max Reported SAR = 0.963 (W/kg)

Mode or Modulation	Dist (mm)	Test Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
DBPSK (802.11b 1Mbps)	0	Front	6	2437	N/A	N/A	14.5	14.0	0.858	0.963	1	166
DBPSK (802.11b 1Mbps)	18	Front	6	2437	N/A	N/A	18.0	17.7	0.029	0.031	2	167

Note(s):

1. IR Sensor was Enabled
2. IR Sensor was Disabled

9.2.30. Wi-Fi 5.0 GHz - Head - Power Back-off Not Supported

Max Reported SAR = 0.689(W/kg)

					For LTE Only		Power (dBm)		1g : SAR Results (W/kg)			
Mode or Modulation	Dist (mm)	Test Position	Ch No.	Freq (MHz)	RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled	Note(s)	Scan No.
BPSK (802.11a 6Mbps)	0	Touch Left	48	5240	N/A	N/A	16.8	16.6	0.297	0.311	1	168
BPSK (802.11a 6Mbps)	0	Tilt Left	48	5240	N/A	N/A	16.8	16.6	0.147	0.154	1	169
BPSK (802.11a 6Mbps)	0	Touch Right	48	5240	N/A	N/A	16.8	16.6	0.487	0.510	1	170
BPSK (802.11a 6Mbps)	0	Tilt Right	48	5240	N/A	N/A	16.8	16.6	0.230	0.241	1	171
BPSK (802.11a HT20 6Mbps)	0	Touch Right	52	5260	N/A	N/A	16.8	16.5	0.643	0.689	1	172
BPSK (802.11a HT20 6Mbps)	0	Touch Right	104	5520	N/A	N/A	17.0	16.5	0.253	0.284	2	173
BPSK (802.11a HT20 6Mbps)	0	Touch Right	149	5745	N/A	N/A	17.0	16.4	0.357	0.410	1	174
BPSK (802.11n HT20 6.5Mbps)	0	Touch Right	48	5240	N/A	N/A	17.5	17.3	0.428	0.448	1	175
BPSK (802.11n HT20 6.5Mbps)	0	Touch Right	64	5320	N/A	N/A	17.5	17.5	0.417	0.417	1	176
BPSK (802.11n HT20 6.5Mbps)	0	Touch Right	112	5560	N/A	N/A	17.5	17.5	0.348	0.348	2	177
BPSK (802.11n HT20 6.5Mbps)	0	Touch Right	149	5745	N/A	N/A	17.5	17.5	0.396	0.396	1	178
BPSK (802.11ac VHT40 13.5Mbps)	0	Touch Right	38	5190	N/A	N/A	14.8	14.3	0.371	0.416	1	179
BPSK (802.11ac VHT40 13.5Mbps)	0	Touch Right	54	5270	N/A	N/A	14.8	14.1	0.310	0.364	1	180
BPSK (802.11ac VHT40 13.5Mbps)	0	Touch Right	134	5670	N/A	N/A	15.2	14.7	0.231	0.259	2	181
BPSK (802.11ac VHT40 13.5Mbps)	0	Touch Right	151	5755	N/A	N/A	15.2	15.0	0.281	0.294	1	182
BPSK (802.11ac VHT80 29.3Mbps)	0	Touch Right	42	5210	N/A	N/A	14.7	13.7	0.268	0.337	1	183
BPSK (802.11ac VHT80 29.3Mbps)	0	Touch Right	58	5290	N/A	N/A	14.7	13.9	0.259	0.311	1	184
BPSK (802.11ac VHT80 29.3Mbps)	0	Touch Right	106	5530	N/A	N/A	15.0	14.2	0.128	0.154	2	185
BPSK (802.11ac VHT80 29.3Mbps)	0	Touch Right	155	5775	N/A	N/A	15.0	14.2	0.191	0.230	1	186

Note(s):

- For frequency bands with an operating range of ≤ 100 MHz, when the SAR measured for the highest output power channel within is ≤ 0.8 W/kg, SAR for the remaining channels is not required. Per KDB 447498 D01, section 4.3.3
- For frequency bands with an operating range of ≥ 200 MHz, when the SAR for the highest output power channel within is ≤ 0.4 W/kg, SAR for the remaining channels is not required. Per KDB 447498 D01, section 4.3.3

*KDB 248227 - SAR is not required for 802.11ac VHT20 channels as the maximum average output power is less than ¼ dB higher than 802.11a.

*KDB 248227 - SAR is not required for 802.11n HT40 channels as the maximum average output power is less than ¼ dB higher than 802.11ac VHT40.

9.2.31. Wi-Fi 5.0 GHz Hotspot Mode - Power Back-off Not Supported

Max Reported SAR = 0.288 (W/kg)

					For LTE Only		Power (dBm)		1g : SAR Results (W/kg)			
Mode or Modulation	Dist (mm)	Test Position	Ch No.	Freq (MHz)	RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled	Note(s)	Scan No.
BPSK (802.11a 6Mbps)	10	Front	48	5240	N/A	N/A	16.8	16.6	0.043	0.045	1	187
BPSK (802.11a 6Mbps)	10	Back	48	5240	N/A	N/A	16.8	16.6	0.275	0.288	1	188
BPSK (802.11a 6Mbps)	10	Left Hand Side	48	5240	N/A	N/A	16.8	16.6	0.035	0.036	1	189
BPSK (802.11a 6Mbps)	10	Top	48	5240	N/A	N/A	16.8	16.6	0.024	0.025	1	190
BPSK (802.11a 6Mbps)	10	Back	52	5260	N/A	N/A	16.8	16.5	0.243	0.260	1	191
BPSK (802.11a 6Mbps)	10	Back	104	5520	N/A	N/A	17.0	16.5	0.088	0.099	2	192
BPSK (802.11a 6Mbps)	10	Back	149	5745	N/A	N/A	17.0	16.4	0.092	0.106	1	193
BPSK (802.11n HT20 6.5Mbps)	10	Back	48	5240	N/A	N/A	17.5	17.3	0.234	0.245	1	194
BPSK (802.11n HT20 6.5Mbps)	10	Back	64	5320	N/A	N/A	17.5	17.5	0.098	0.098	1	195
BPSK (802.11n HT20 6.5Mbps)	10	Back	112	5560	N/A	N/A	17.5	17.5	0.000	0.000	2, 3	196
BPSK (802.11n HT20 6.5Mbps)	10	Back	149	5745	N/A	N/A	17.5	17.5	0.072	0.072	1	197
BPSK (802.11ac VHT40 13.5Mbps)	10	Back	38	5190	N/A	N/A	14.8	14.3	0.199	0.223	1	198
BPSK (802.11ac VHT40 13.5Mbps)	10	Back	54	5270	N/A	N/A	14.8	14.1	0.188	0.221	1	199
BPSK (802.11ac VHT40 13.5Mbps)	10	Back	134	5670	N/A	N/A	15.2	14.7	0.041	0.045	2	200
BPSK (802.11ac VHT40 13.5Mbps)	10	Back	151	5755	N/A	N/A	15.2	15.0	0.049	0.052	1	201
BPSK (802.11ac VHT80 29.3Mbps)	10	Back	42	5210	N/A	N/A	14.7	13.7	0.150	0.189	1	202
BPSK (802.11ac VHT80 29.3Mbps)	10	Back	58	5290	N/A	N/A	14.7	13.9	0.108	0.130	1	203
BPSK (802.11ac VHT80 29.3Mbps)	10	Back	106	5530	N/A	N/A	15.0	14.2	0.000	0.000	2, 3	204
BPSK (802.11ac VHT80 29.3Mbps)	10	Back	155	5775	N/A	N/A	15.0	14.2	0.043	0.052	1	205

Note(s):

- For frequency bands with an operating range of ≤ 100 MHz, when the SAR measured for the highest output power channel within is ≤ 0.8 W/kg, SAR for the remaining channels is not required. Per KDB 447498 D01, section 4.3.3
- For frequency bands with an operating range of ≥ 200 MHz, when the SAR for the highest output power channel within is ≤ 0.4 W/kg, SAR for the remaining channels is not required. Per KDB 447498 D01, section 4.3.3
- The SAR level measured was below noise floor.

*KDB 248227 - SAR is not required for 802.11ac VHT20 channels as the maximum average output power is less than ¼ dB higher than 802.11a.

*KDB 248227 - SAR is not required for 802.11n HT40 channels as the maximum average output power is less than ¼ dB higher than 802.11ac VHT40.

9.2.32. Wi-Fi 5.0 GHz - Body-Worn - Power Back-off Not Supported

Max Reported SAR = 0.288 (W/kg)

For body-worn configuration indicated below the test position overlap with hotspot and the power back –off was Not Supported meaning hotspot mode was most conservative.

Mode or Modulation	Dist (mm)	Test Position	Ch No.	Freq (MHz)	For LTE Only		Power (dBm)		1g : SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
BPSK (802.11a 6Mbps)	10	Front	48	5240	N/A	N/A	16.8	16.6	0.043	0.045	1	187
BPSK (802.11a 6Mbps)	10	Back	48	5240	N/A	N/A	16.8	16.6	0.275	0.288	1	188
BPSK (802.11a 6Mbps)	10	Back	52	5260	N/A	N/A	16.8	16.5	0.243	0.260	1	191
BPSK (802.11a 6Mbps)	10	Back	104	5520	N/A	N/A	17.0	16.5	0.088	0.099	2	192
BPSK (802.11a 6Mbps)	10	Back	149	5745	N/A	N/A	17.0	16.4	0.092	0.106	1	193
BPSK (802.11n HT20 6.5Mbps)	10	Back	48	5240	N/A	N/A	17.5	17.3	0.234	0.245	1	194
BPSK (802.11n HT20 6.5Mbps)	10	Back	64	5320	N/A	N/A	17.5	17.5	0.098	0.098	1	195
BPSK (802.11n HT20 6.5Mbps)	10	Back	112	5560	N/A	N/A	17.5	17.5	0.000	0.000	2, 3	196
BPSK (802.11n HT20 6.5Mbps)	10	Back	149	5745	N/A	N/A	17.5	17.5	0.072	0.072	1	197
BPSK (802.11ac VHT40 13.5Mbps)	10	Back	38	5190	N/A	N/A	14.8	14.3	0.199	0.223	1	198
BPSK (802.11ac VHT40 13.5Mbps)	10	Back	54	5270	N/A	N/A	14.8	14.1	0.188	0.221	1	199
BPSK (802.11ac VHT40 13.5Mbps)	10	Back	134	5670	N/A	N/A	15.2	14.7	0.041	0.045	2	200
BPSK (802.11ac VHT40 13.5Mbps)	10	Back	151	5755	N/A	N/A	15.2	15.0	0.049	0.052	1	201
BPSK (802.11ac VHT80 29.3Mbps)	10	Back	42	5210	N/A	N/A	14.7	13.7	0.150	0.189	1	202
BPSK (802.11ac VHT80 29.3Mbps)	10	Back	58	5290	N/A	N/A	14.7	13.9	0.108	0.130	1	203
BPSK (802.11ac VHT80 29.3Mbps)	10	Back	106	5530	N/A	N/A	15.0	14.2	0.000	0.000	2, 3	204
BPSK (802.11ac VHT80 29.3Mbps)	10	Back	155	5775	N/A	N/A	15.0	14.2	0.043	0.052	1	205

Note(s):

- For frequency bands with an operating range of ≤ 100 MHz, when the SAR measured for the highest output power channel within is ≤ 0.8 W/kg, SAR for the remaining channels is not required. Per KDB 447498 D01, section 4.3.3
- For frequency bands with an operating range of ≥ 200 MHz, when the SAR for the highest output power channel within is ≤ 0.4 W/kg, SAR for the remaining channels is not required. Per KDB 447498 D01, section 4.3.3
- The SAR level measured was below noise floor.

*KDB 248227 - SAR is not required for 802.11ac VHT20 channels as the maximum average output power is less than ¼ dB higher than 802.11a.

*KDB 248227 - SAR is not required for 802.11n HT40 channels as the maximum average output power is less than ¼ dB higher than 802.11ac VHT40.

*As per 648474 D04 Handsets SAR v01r02, "When the reported SAR for a 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 headset attached to the handset". Hence, Body worn configurations were not evaluated with PHF attached.

9.3. Bluetooth

9.3.1. Estimated SAR

- As per FCC KDB 447498 D01, Bluetooth maximum source based time average power was below the allowed threshold for both 10 and 15mm separation distances.

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

- $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f_{\text{GHz}} / x}] \text{ W/kg}$ for test separation distances $\leq 50 \text{ mm}$;
where $x = 7.5$ for 1-g SAR, and $x = 18.75$ for 10-g SAR.

For the estimated SAR level calculation, the Maximum Target power + Upper tolerance for *Bluetooth* = 10.0 dBm (~ 10mW) is considered.

- 10mm Bluetooth estimated SAR level:**

$$\text{Estimated Bluetooth SAR} = (10\text{mW}/10\text{mm}) \cdot (\sqrt{2.4 / 7.5}) = 0.207 \text{ W/kg}$$

- 15mm Bluetooth estimated SAR level:**

$$\text{Estimated Bluetooth SAR} = (10\text{mW}/15\text{mm}) \cdot (\sqrt{2.4 / 7.5}) = 0.138 \text{ W/kg}$$

Worst case separation distance of 10mm was considered for the body-worn testing listed in the table

Estimated SAR Result for Body-worn Accessory Conditions:

Test Configuration	Max. tune-up tolerance limit (mW)	Min. test separation distance (mm)	Frequency (GHz)	Estimated 1-g SAR (W/kg)
Rear/Front	10	10	2.4	0.207
Rear/Front	10	15	2.4	0.138

9.4. SAR measurement variability and measurement uncertainty analysis:

Exposure Configuration	Technology Band	Measured 1g -SAR (W/Kg)	Equipment Class	Max Meas. Source base Avg Power [dBm]	Ratio of Largest to Smallest SAR Measured
HEAD (Separation Distance 0mm)	WLAN 2.4GHz	0.881	DTS	14.5	1.01
	WLAN 2.4GHz	0.869			
HOTSPOT (Separation Distance 10mm)	PCS1900	1.210	PCE	26.6	1.03
	PCS1900	1.180			
	UMTS FDD 4	0.871		24.5	1.03
	UMTS FDD 4	0.849			
	LTE Band 2	0.898		23.7	1.09
	LTE Band 2	0.824			

Note(s):

1. The following step below were followed as per KDB publication 865664 D01:

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

9.5. Simultaneous Transmission SAR Analysis

According to the worst case configuration Simultaneous transmission analysis of worst cases is shown in the tables below.

Overall Worst Case:

1. WWAN + WLAN 2.4GHz
2. WWAN + WLAN 5.0GHz
3. WWAN + WPAN
4. WPAN + WLAN 5.0 GHz
5. WWAN + WLAN 5.0GHz + WPAN

Simultaneous Transmission SAR Analysis (Continued)

Head 1g – Worst cases measurements WWAN + WLAN 2.4GHz

EUT Position	Reported SAR 1g (W/Kg)					Sum of WWAN & WLAN
	WWAN				WLAN	
	GSM850	PCS1900	UMTS FDD 2	UMTS FDD 4	Wi-Fi	
Touch Left	0.108				0.424	0.532
Tilt Left	0.063				0.248	0.311
Touch Right	0.173				0.988	1.161
Tilt Right	0.121				0.746	0.867
Touch Left		0.288			0.424	0.712
Tilt Left		0.210			0.248	0.458
Touch Right		0.389			0.988	1.377
Tilt Right		0.157			0.746	0.903
Touch Left			0.542		0.424	0.966
Tilt Left			0.278		0.248	0.526
Touch Right			0.457		0.988	1.455
Tilt Right			0.240		0.746	0.986
Touch Left				0.529	0.424	0.953
Tilt Left				0.300	0.248	0.548
Touch Right				0.538	0.988	1.526
Tilt Right				0.276	0.746	1.022

Head 1g – Worst cases measurements WWAN + WLAN 2.4GHz

EUT Position	Reported SAR 1g (W/Kg)					Sum of WWAN & WLAN
	WWAN				WLAN	
	UMTS FDD 5	LTE Band 2	LTE Band 4	LTE Band 12	Wi-Fi	
Touch Left	0.177				0.424	0.601
Tilt Left	0.118				0.248	0.366
Touch Right	0.226				0.988	1.214
Tilt Right	0.119				0.746	0.865
Touch Left		0.512			0.424	0.936
Tilt Left		0.260			0.248	0.508
Touch Right		0.433			0.988	1.421
Tilt Right		0.193			0.746	0.939
Touch Left			0.510		0.424	0.934
Tilt Left			0.238		0.248	0.486
Touch Right			0.376		0.988	1.364
Tilt Right			0.242		0.746	0.988
Touch Left				0.155	0.424	0.579
Tilt Left				0.091	0.248	0.339
Touch Right				0.179	0.988	1.167
Tilt Right				0.077	0.746	0.823

Simultaneous Transmission SAR Analysis (Continued)
Hotspot Mode 1g – Worst cases measurements WWAN + WLAN 2.4GHz

EUT Position	Reported SAR 1g (W/Kg)					Sum of WWAN & WLAN
	WWAN				WLAN	
	GSM850	PCS1900	UMTS FDD 2	UMTS FDD 4	Wi-Fi 802.11b/g/n	
Front	0.334				0.486	0.820
Back	0.510				0.395	0.905
Left Hand Side	0.208				0.019	0.227
Right Hand Side	0.424					0.424
Bottom	0.191					0.191
Top					0.080	0.080
Front		1.021			0.486	1.507
Back		0.715			0.395	1.110
Left Hand Side		0.311			0.019	0.330
Right Hand Side		0.335				0.335
Bottom		1.489				1.489
Top					0.080	0.080
Front			0.654		0.486	1.140
Back			0.790		0.395	1.185
Left Hand Side			0.085		0.019	0.104
Right Hand Side			0.231			0.231
Bottom			0.569			0.569
Top					0.080	0.080
Front				0.973	0.486	1.459
Back				0.942	0.395	1.337
Left Hand Side				0.356	0.019	0.375
Right Hand Side				0.219		0.219
Bottom				0.380		0.380
Top					0.080	0.080
EUT Position	UMTS FDD 5	LTE Band 2	LTE Band 4	LTE Band 12	Wi-Fi 802.11b/g/n	Sum of WWAN & WLAN
Front	0.405				0.486	0.891
Back	0.186				0.395	0.581
Left Hand Side	0.147				0.019	0.166
Right Hand Side	0.143					0.143
Bottom	0.234					0.234
Top					0.080	0.080
Front		0.617			0.486	1.103
Back		0.985			0.395	1.380
Left Hand Side		0.323			0.019	0.342
Right Hand Side		0.299				0.299
Bottom		0.749				0.749
Top					0.080	0.080
Front			0.718		0.486	1.204
Back			0.847		0.395	1.242
Left Hand Side			0.431		0.019	0.450
Right Hand Side			0.256			0.256
Bottom			0.621			0.621
Top					0.080	0.080
Front				0.321	0.486	0.807
Back				0.407	0.395	0.802
Left Hand Side				0.217	0.019	0.206
Right Hand Side				0.211		0.211
Bottom				0.040		0.040
Top					0.080	0.080

Simultaneous Transmission SAR Analysis (Continued)

Body-worn 1g – Worst cases measurements WWAN + WLAN 2.4GHz

EUT Position	Reported SAR 1g (W/Kg)					Sum of WWAN & WLAN
	WWAN				WLAN	
	GSM850	PCS1900	UMTS FDD 2	UMTS FDD 4	Wi-Fi 802.11b/g/n	
Front	0.227				0.177	0.404
Back	0.243				0.133	0.376
Front		0.273			0.177	0.450
Back		0.335			0.133	0.468
Front			0.523		0.177	0.700
Back			0.434		0.133	0.567
Front				0.973	0.177	1.150
Back				0.942	0.133	1.075

Body-worn 1g – Worst cases measurements WWAN + WLAN 2.4GHz

EUT Position	Reported SAR 1g (W/Kg)					Sum of WWAN & WLAN
	WWAN				WLAN	
	UMTS FDD 5	LTE Band 2	LTE Band 4	LTE Band 12	Wi-Fi 802.11b/g/n	
Front	0.405				0.177	0.582
Back	0.186				0.133	0.319
Front		0.617			0.177	0.794
Back		0.985			0.133	1.118
Front			0.718		0.177	0.895
Back			0.847		0.133	0.980
Front				0.321	0.177	0.498
Back				0.407	0.133	0.540

Simultaneous Transmission SAR Analysis (Continued)

Head 1g – Worst cases measurements WWAN + WLAN 5.0GHz

EUT Position	Reported SAR 1g (W/Kg)					Sum of WWAN & WLAN
	WWAN				WLAN	
	GSM850	PCS1900	UMTS FDD 2	UMTS FDD 4	Wi-Fi	
Touch Left	0.108				0.311	0.419
Tilt Left	0.063				0.154	0.217
Touch Right	0.173				0.689	0.862
Tilt Right	0.121				0.241	0.362
Touch Left		0.288			0.311	0.599
Tilt Left		0.210			0.154	0.364
Touch Right		0.389			0.689	1.078
Tilt Right		0.157			0.241	0.398
Touch Left			0.542		0.311	0.853
Tilt Left			0.278		0.154	0.432
Touch Right			0.457		0.689	1.146
Tilt Right			0.240		0.241	0.481
Touch Left				0.529	0.311	0.840
Tilt Left				0.300	0.154	0.454
Touch Right				0.538	0.689	1.227
Tilt Right				0.276	0.241	0.517

Head 1g – Worst cases measurements WWAN + WLAN 5.0GHz

EUT Position	Reported SAR 1g (W/Kg)					Sum of WWAN & WLAN
	WWAN				WLAN	
	UMTS FDD 5	LTE Band 2	LTE Band 4	LTE Band 12	Wi-Fi	
Touch Left	0.177				0.311	0.488
Tilt Left	0.118				0.154	0.272
Touch Right	0.226				0.689	0.915
Tilt Right	0.119				0.241	0.360
Touch Left		0.512			0.311	0.823
Tilt Left		0.260			0.154	0.414
Touch Right		0.433			0.689	1.122
Tilt Right		0.193			0.241	0.434
Touch Left			0.510		0.311	0.821
Tilt Left			0.238		0.154	0.392
Touch Right			0.376		0.689	1.065
Tilt Right			0.242		0.241	0.483
Touch Left				0.155	0.311	0.466
Tilt Left				0.091	0.154	0.245
Touch Right				0.179	0.689	0.868
Tilt Right				0.077	0.241	0.318

Simultaneous Transmission SAR Analysis (Continued)

Hotspot Mode 1g – Worst cases measurements WWAN + WLAN 5.0GHz

EUT Position	Reported SAR 1g (W/Kg)					Sum of WWAN & WLAN
	WWAN				WLAN	
	GSM850	PCS1900	UMTS FDD 2	UMTS FDD 4	Wi-Fi 802.11a/n/ac	
Front	0.334				0.045	0.379
Back	0.510				0.288	0.798
Left Hand Side	0.208				0.036	0.244
Right Hand Side	0.424					0.424
Bottom	0.191					0.191
Top					0.029	0.029
Front		1.021			0.045	1.066
Back		0.715			0.288	1.003
Left Hand Side		0.311			0.036	0.347
Right Hand Side		0.335				0.335
Bottom		1.489				1.489
Top					0.029	0.029
Front			0.654		0.045	0.699
Back			0.790		0.288	1.078
Left Hand Side			0.085		0.036	0.121
Right Hand Side			0.231			0.231
Bottom			0.569			0.569
Top					0.029	0.029
Front				0.973	0.045	1.018
Back				0.942	0.288	1.230
Left Hand Side				0.356	0.036	0.392
Right Hand Side				0.219		0.219
Bottom				0.380		0.380
Top					0.029	0.029

Simultaneous Transmission SAR Analysis (Continued)**Hotspot Mode 1g – Worst cases measurements WWAN + WLAN 5.0GHz**

EUT Position	Reported SAR 1g (W/Kg)					Sum of WWAN & WLAN
	WWAN			WLAN		
	UMTS FDD 5	LTE Band 2	LTE Band 4	LTE Band 12	Wi-Fi 802.11a/n/ac	
Front	0.405				0.045	0.450
Back	0.186				0.288	0.474
Left Hand Side	0.147				0.036	0.183
Right Hand Side	0.143					0.143
Bottom	0.234					0.234
Top					0.029	0.029
Front		0.617			0.045	0.662
Back		0.985			0.288	1.273
Left Hand Side		0.323			0.036	0.359
Right Hand Side		0.299				0.299
Bottom		0.749				0.749
Top					0.029	0.029
Front			0.718		0.045	0.763
Back			0.847		0.288	1.135
Left Hand Side			0.431		0.036	0.467
Right Hand Side			0.256			0.256
Bottom			0.621			0.621
Top					0.029	0.029
Front				0.321	0.045	0.366
Back				0.407	0.288	0.695
Left Hand Side				0.217	0.036	0.253
Right Hand Side				0.211		0.211
Bottom				0.040		0.040
Top					0.029	0.029

Simultaneous Transmission SAR Analysis (Continued)

Body-worn 1g – Worst cases measurements WWAN + WLAN 5.0GHz

EUT Position	Reported SAR 1g (W/Kg)					Sum of WWAN & WLAN
	WWAN				WLAN	
	GSM850	PCS1900	UMTS FDD 2	UMTS FDD 4	Wi-Fi 802.11a/n/ac	
Front	0.212				0.045	0.257
Back	0.243				0.288	0.531
Front		0.273			0.045	0.318
Back		0.335			0.288	0.623
Front			0.523		0.045	0.568
Back			0.434		0.288	0.722
Front				0.973	0.045	1.018
Back				0.942	0.288	1.230

Body-worn 1g – Worst cases measurements WWAN + WLAN 5.0GHz

EUT Position	Reported SAR 1g (W/Kg)					Sum of WWAN & WLAN
	WWAN				WLAN	
	UMTS FDD 5	LTE Band 2	LTE Band 4	LTE Band 12	Wi-Fi 802.11a/n/ac	
Front	0.405				0.045	0.450
Back	0.186				0.288	0.474
Front		0.617			0.045	0.662
Back		0.985			0.288	1.273
Front			0.718		0.045	0.763
Back			0.847		0.288	1.135
Front				0.321	0.045	0.366
Back				0.407	0.288	0.695

Simultaneous Transmission SAR Analysis (Continued)

Hotspot Mode 1g – Worst cases measurements WWAN + WPAN

EUT Position	Reported SAR 1g (W/Kg)					Sum of WWAN & WPAN
	WWAN				WPAN	
	GSM850	PCS1900	UMTS FDD 2	UMTS FDD 4	Bluetooth	
Front	0.334				0.207	0.541
Back	0.510				0.207	0.717
Left Hand Side	0.208				0.207	0.415
Right Hand Side	0.424					0.424
Bottom	0.191					0.191
Top					0.207	0.207
Front		1.021			0.207	1.228
Back		0.715			0.207	0.922
Left Hand Side		0.311			0.207	0.518
Right Hand Side		0.335				0.335
Bottom		1.489				1.489
Top					0.207	0.207
Front			0.654		0.207	0.861
Back			0.790		0.207	0.997
Left Hand Side			0.085		0.207	0.292
Right Hand Side			0.231			0.231
Bottom			0.569			0.569
Top					0.207	0.207
Front				0.973	0.207	1.180
Back				0.942	0.207	1.149
Left Hand Side				0.356	0.207	0.563
Right Hand Side				0.219		0.219
Bottom				0.380		0.38
Top					0.207	0.207

Hotspot Mode 1g – Worst cases measurements WWAN + WPAN

EUT Position	Reported SAR 1g (W/Kg)					Sum of WWAN & WPAN
	WWAN				WPAN	
	UMTS FDD 5	LTE Band 2	LTE Band 4	LTE Band 12	Bluetooth	
Front	0.405				0.207	0.612
Back	0.186				0.207	0.393
Left Hand Side	0.147				0.207	0.354
Right Hand Side	0.143					0.143
Bottom	0.234					0.234
Top					0.207	0.207
Front		0.617			0.207	0.824
Back		0.985			0.207	1.192
Left Hand Side		0.323			0.207	0.530
Right Hand Side		0.299				0.299
Bottom		0.749				0.749
Top					0.207	0.207
Front			0.718		0.207	0.925
Back			0.847		0.207	1.054
Left Hand Side			0.431		0.207	0.638
Right Hand Side			0.256			0.463
Bottom			0.621			0.621
Top					0.207	0.207
Front				0.321	0.207	0.528
Back				0.407	0.207	0.614
Left Hand Side				0.217	0.207	0.424
Right Hand Side				0.211		0.211
Bottom				0.040		0.040
Top					0.207	0.207

Simultaneous Transmission SAR Analysis (Continued)

Body-worn 1g – Worst cases measurements WWAN + WPAN

EUT Position	Reported SAR 1g (W/Kg)					Sum of WWAN & WLAN
	WWAN				WPAN	
	GSM850	PCS1900	UMTS FDD 2	UMTS FDD 4	Bluetooth	
Front	0.212				0.138	0.350
Back	0.243				0.138	0.381
Front		0.273			0.138	0.411
Back		0.335			0.138	0.473
Front			0.523		0.138	0.661
Back			0.434		0.138	0.572
Front				0.973	0.138	1.111
Back				0.942	0.138	1.080

Body-worn 1g – Worst cases measurements WWAN + WPAN

EUT Position	Reported SAR 1g (W/Kg)					Sum of WWAN & WLAN
	WWAN				WPAN	
	UMTS FDD 5	LTE Band 2	LTE Band 4	LTE Band 12	Bluetooth	
Front	0.405				0.138	0.543
Back	0.186				0.138	0.324
Front		0.617			0.138	0.755
Back		0.985			0.138	1.123
Front			0.718		0.138	0.856
Back			0.847		0.138	0.985
Front				0.321	0.138	0.459
Back				0.407	0.138	0.545



Simultaneous Transmission SAR Analysis (Continued)

Hotspot Mode 1g – Worst cases measurements WWAN + WLAN 5.0GHz + WPAN

EUT Position	Reported SAR 1g (W/Kg)						Sum of WWAN, WLAN & WPAN
	WWAN				WLAN	WPAN	
	GSM850	PCS1900	UMTS FDD 2	UMTS FDD 4	Wi-Fi	Bluetooth	
Front	0.334				0.045	0.207	0.586
Back	0.510				0.288	0.207	1.005
Left Hand Side	0.208				0.036	0.207	0.208
Right Hand Side	0.424						0.424
Bottom	0.191						0.191
Top					0.029	0.207	0.236
Front		1.021			0.045	0.207	1.273
Back		0.715			0.288	0.207	1.210
Left Hand Side		0.311			0.036	0.207	0.554
Right Hand Side		0.335					0.335
Bottom		1.489					1.489
Top					0.029	0.207	0.236
Front			0.654		0.045	0.207	0.906
Back			0.790		0.288	0.207	1.285
Left Hand Side			0.085		0.036	0.207	0.328
Right Hand Side			0.231				0.231
Bottom			0.569				0.569
Top					0.029	0.207	0.236
Front				0.973	0.045	0.207	1.225
Back				0.942	0.288	0.207	1.437
Left Hand Side				0.356	0.036	0.207	0.599
Right Hand Side				0.219			0.219
Bottom				0.380			0.380
Top					0.029	0.207	0.236

Simultaneous Transmission SAR Analysis (Continued)

Hotspot Mode 1g – Worst cases measurements WWAN + WLAN 5.0GHz + WPAN

EUT Position	Reported SAR 1g (W/Kg)						Sum of WWAN, WLAN & WPAN
	WWAN				WLAN	WPAN	
	UMTS FDD 5	LTE Band 2	LTE Band 4	LTE Band 12	Wi-Fi	Bluetooth	
Front	0.405				0.045	0.207	0.657
Back	0.186				0.288	0.207	0.681
Left Hand Side	0.147				0.036	0.207	0.390
Right Hand Side	0.143						0.143
Bottom	0.234						0.234
Top					0.029	0.207	0.236
Front		0.617			0.045	0.207	0.869
Back		0.985			0.288	0.207	1.480
Left Hand Side		0.323			0.036	0.207	0.566
Right Hand Side		0.299					0.299
Bottom		0.749					0.749
Top					0.029	0.207	0.236
Front			0.718		0.045	0.207	0.970
Back			0.847		0.288	0.207	1.342
Left Hand Side			0.431		0.036	0.207	0.674
Right Hand Side			0.256				0.256
Bottom			0.621				0.621
Top					0.029	0.207	0.236
Front				0.321	0.045	0.207	0.573
Back				0.407	0.288	0.207	0.902
Left Hand Side				0.217	0.036	0.207	0.460
Right Hand Side				0.211			0.211
Bottom				0.040			0.040
Top					0.029	0.207	0.236

Simultaneous Transmission SAR Analysis (Continued)

Body-Worn 1g – Worst cases measurements WWAN + WLAN 5.0GHz + WPAN

EUT Position	Reported SAR 1g (W/Kg)						Sum of WWAN, WLAN & WPAN
	WWAN			WLAN	WPAN		
	GSM850	PCS1900	UMTS FDD 2	UMTS FDD 4	Wi-Fi 802.11b/g/n		
Front	0.212				0.045	0.138	0.395
Back	0.243				0.288	0.138	0.669
Front		0.273			0.045	0.138	0.456
Back		0.335			0.288	0.138	0.761
Front			0.523		0.045	0.138	0.706
Back			0.434		0.288	0.138	0.860
Front				0.973	0.045	0.138	1.156
Back				0.942	0.288	0.138	1.368

Body-Worn 1g – Worst cases measurements WWAN + WLAN 5.0GHz + WPAN

EUT Position	Reported SAR 1g (W/Kg)						Sum of WWAN, WLAN & WPAN	
	WWAN				WLAN	WPAN		
	UMTS FDD 5	LTE Band 2	LTE Band 4	LTE Band 12	Wi-Fi 802.11b/g/n	Bluetooth		
Front	0.405				0.045	0.138	0.588	
Back	0.186				0.288	0.138	0.612	
Front		0.617			0.045	0.138	0.800	
Back		0.985			0.288	0.138	1.411	
Front			0.718		0.045	0.138	0.901	
Back			0.847		0.288	0.138	1.273	
Front				0.321	0.045	0.138	0.504	
Back				0.407	0.288	0.138	0.833	

Note(s):

1. The sum of reported SAR does not exceed 1.6W/kg in any of the above cases and hence, the SAR to peak location separation ratio distance was not calculated.

APPENDIX 1. TEST EQUIPMENT USED

UL No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A034	Narda 20W Termination	Narda	374BNM	8706	Calibrated as part of system	-
A1097	SMA Directional Coupler	MiDISCO	MDC6223-30	None	Calibrated as part of system	-
A1137	3dB Attenuator	Narda	779	04690	Calibrated as part of system	-
A1174	Dielectric Probe Kit	Agilent Technologies	85070C	Us99360072	Calibrated before use	-
A1328	Handset Positioner	Schmid & Partner Engineering AG	Modification	SD 000 H01 DA	-	-
A1182	Handset Positioner	Schmid & Partner Engineering AG	V3.0	None	-	-
A2111	Data Acquisition Electronics	Schmid & Partner Engineering AG	DAE3	432	28 Aug 2014	12
A2110	Data Acquisition Electronics	Schmid & Partner Engineering AG	DAE3	431	18 Nov 2014	12
A1234	Data Acquisition Electronics	Schmid & Partner Engineering AG	DAE3	450	12 Nov 2014	12
A2109	Data Acquisition Electronics	Schmid & Partner Engineering AG	DAE3	417	10 Apr 2014	12
A2546	Data Acquisition Electronics	Schmid & Partner Engineering AG	DAE4	1435	12 May 2014	12
A2547	Data Acquisition Electronics	Schmid & Partner Engineering AG	DAE4	1438	12 May 2014	12
A2077	Probe	Schmid & Partner Engineering AG	EX3 DV4	3814	24 Sep 2014	12
A1185	Probe	Schmid & Partner Engineering AG	EX3 DV4	1528	16 Apr 2014	12
A2243	Probe	Schmid & Partner Engineering AG	ES3DV3	3304	02 Sept 2014	12
A2436	Probe	Schmid & Partner Engineering AG	ES3DV3	3335	09 Jan 2015	12
A2544	Probe	Schmid & Partner Engineering AG	ES3DV3	3994	09 May 2015	12
A2545	Probe	Schmid & Partner Engineering AG	ES3DV3	3995	09 May 2015	12

UL No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A1985	750 MHz Dipole Kit	Schmid & Partner Engineering AG	D75V3	1011	13 Feb 2013	24
A2201	900 MHz Dipole Kit	Schmid & Partner Engineering AG	D900V2	035	20 Jan 2014	12
A1236	1800 MHz Dipole Kit	Schmid & Partner Engineering AG	D1800V2	2d009	16 Jan 2014	12
A2200	1900 MHz Dipole Kit	Schmid & Partner Engineering AG	D1900V2	537	22 Jan 2014	12
A2202	2440 MHz Dipole Kit	Schmid & Partner Engineering AG	D2440V2	701	14 Jan 2014	12
A1377	5.0 GHz Dipole Kit	Schmid & Partner Engineering AG	D5GHzV2	1016	20 Feb 2014	12
A1497	Amplifier	Mini-Circuits	zh1-42w (sma)	e020105	Calibrated as part of system	-
A1566	SAM Phantom	Schmid & Partner Engineering AG	SAM a (Site 56)	002	Calibrated before use	-
A1238	SAM Phantom	Schmid & Partner Engineering AG	SAM b (Site 56)	001	Calibrated before use	-
A2125	SAM Phantom	Schmid & Partner Engineering AG	SAM b (Site 57)	TP-1031	Calibrated before use	-
A2124	SAM Phantom	Schmid & Partner Engineering AG	SAM a (Site 57)	TP-1030	Calibrated before use	-
A2438	SAM Phantom	Schmid & Partner Engineering AG	SAM a	1805	Calibrated before use	-
A2551	SAM Phantom	Schmid & Partner Engineering AG	SAM a	1832	Calibrated before use	-
A2552	SAM Phantom	Schmid & Partner Engineering AG	SAM a	1836	Calibrated before use	-
A2437	Eli Phantom	Schmid & Partner Engineering AG	Eli5	1235	Calibrated before use	-
A2252	2mm Oval Phantom	Schmid & Partner Engineering AG	Eli5	1177	Calibrated before use	-
A2549	2mm Oval Phantom	Schmid & Partner Engineering AG	Eli5	00T01 DA	Calibrated before use	-
A2550	2mm Oval Phantom	Schmid & Partner Engineering AG	Eli5	00T01 DA	Calibrated before use	-
A215	20 dB Attenuator	Narda	766-20	9402	Calibrated as part of system	-
A1531	Antenna	AARONIA AG	7025	02458	-	-
A2263	Digital Camera	Samsung	PL211	9453C90B 607487L	-	-

UL No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
M1015	Network Analyser	Agilent Technologies	8753ES	US39172406	04 Oct 2013	12
C1145	Cable	Rosenberger MICRO-COAX	FA147A F030003030	41843-1	Calibrated as part of system	-
C1146	Cable	Rosenberger MICRO-COAX	FA147A F030003030	41752-1	Calibrated as part of system	-
G0528	Robot Power Supply	Schmid & Partner Engineering AG	DASY4	None	Calibrated before use	-
GO591	Robot Power Supply	Schmid & Partner Engineering AG	DASY4	None	Calibrated before use	-
G0592	Robot Power Supply	Schmid & Partner Engineering AG	DASY53	None	Calibrated before use	-
G0610	Robot Power Supply	Schmid & Partner Engineering AG	DASY53	None	Calibrated before use	-
G0611	Robot Power Supply	Schmid & Partner Engineering AG	DASY53	None	Calibrated before use	-
G0612	Robot Power Supply	Schmid & Partner Engineering AG	DASY53	None	Calibrated before use	-
G087	PSU	Thurlby Thandar	CPX200	100701	Calibrated before use	-
M1047	Robot Arm	Staubli	RX908 L	F00/SD8 9A1/A/01	Calibrated before use	-
M1653	Robot Arm	Staubli	RX908 L	F01/5J8 6A1/C/01	Calibrated before use	-
M1680	Robot Arm	Staubli	TX60 L	F12/5MZ7 A1/A/01	Calibrated before use	-
M1875	Robot Arm	Staubli	TX60 L	F13/5SC6F1/A/01	Calibrated before use	-
M1876	Robot Arm	Staubli	TX60 L	F14/5T5ZA1/A/01	Calibrated before use	-
M1877	Robot Arm	Staubli	TX60 L	F14/5UA6A1/A/01	Calibrated before use	-
M1839	Signal Generator	R&S	SME06	837633/001	15 Apr 2014	12
M1838	Signal Generator	R&S	SME06	831377/005	15 Apr 2014	12
M1270	Digital Thermometer	RS	N/A	N/A	Internal Checked 06 May 2014	12
M1013	Dual Channel Power Meter	R & S	NRVD	863715/0030	01 May 2014	12
S0566	SAR Lab	UL	Site 56	N/A	Calibrated before use	-
S0567	SAR Lab	UL	Site 57	N/A	Calibrated before use	-
S0568	SAR Lab	UL	Site 58	N/A	Calibrated before use	-
S0569	SAR Lab	UL	Site 59	N/A	Calibrated before use	-

UL No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
S0570	SAR Lab	UL	Site 60	N/A	Calibrated before use	-
S0571	SAR Lab	UL	Site 61	N/A	Calibrated before use	-