

# FCC SAR Test Report

APPLICANT : COOSEA GROUP (HK) COMPANY LIMITED  
EQUIPMENT : Feature phone  
MODEL NAME : SL006D  
FCC ID : 2A28USL006D  
STANDARD : FCC 47 CFR PART 2 (2.1093)

We, Sporton International Inc. (Shenzhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Shenzhen), the test report shall not be reproduced except in full.



Approved by: Si Zhang

**Sporton International Inc. (Shenzhen)**

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People's Republic of China



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### Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA340708	Rev. 01	Initial issue of report	Jun. 30, 2023



### 1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **COOSEA GROUP (HK) COMPANY LIMITED, Feature phone, SL006D**, are as follows.

Highest 1g SAR Summary						
Equipment Class	Frequency Band		Head (Separation 0mm)	Hotspot (Separation 10mm)	Body-worn (Separation 15mm)	Highest Simultaneous Transmission 1g SAR (W/kg)
			1g SAR (W/kg)			
Licensed	GSM	GSM850	<b>0.61</b>	1.04	0.76	1.50
		GSM1900	0.22	0.73	0.86	
	WCDMA	WCDMA II	0.20	0.85	<b>0.97</b>	
		WCDMA IV	0.38	1.04	0.77	
		WCDMA V	0.56	0.92	0.56	
	LTE	LTE Band 2	0.38	0.78	0.68	
		LTE Band 12	0.28	0.64	0.39	
		LTE Band 14	0.33	0.70	0.44	
		LTE Band 71	0.18	0.51	0.30	
		LTE Band 5	0.43	0.84	0.66	
LTE Band 66/4		0.32	0.67	0.66		
		LTE Band 30	0.37	<b>1.36</b>	0.62	1.50
DTS	WLAN	2.4GHz WLAN	0.47	0.68	0.32	1.50
DSS	Bluetooth	2.4GHz Bluetooth	<0.10	<0.10	<0.10	1.44
Highest 10g SAR Summary						
Equipment Class	Frequency Band		Product Specific 10g SAR (W/kg) (Separation 0mm)			
Licensed	GSM	GSM1900	2.80			
	WCDMA	WCDMA II	<b>3.22</b>			
		WCDMA IV	2.40			
	LTE	LTE Band 2	2.66			
		LTE Band 30	2.43			
Date of Testing:			2023/5/12 ~ 2023/5/20			
<b>Remark:</b>						
1. This device supports LTE B4 and B66. Since the supported frequency span for LTE B4 falls completely within the supports frequency span for B66, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for B66.						

**Declaration of Conformity:**  
 The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**Comments and Explanations:**  
 The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.  
 This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 4.0 W/kg for Product Specific 10g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.



## 2. Administration Data

Sporton International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Testing Laboratory			
Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR01-SZ	CN1256	421272

Applicant	
Company Name	COOSEA GROUP (HK) COMPANY LIMITED
Address	UNIT 5-6 16/F MULTIFIELD PLAZA 3-7A PRAT AVENUE TSIMSHATSUI KL, HONG KONG, CHINA

Manufacturer	
Company Name	COOSEA GROUP (HK) COMPANY LIMITED
Address	PLAZA 3-7A PRAT AVENUE TSIMSHATSUI KL, HONG KONG, CHINA

## 3. Guidance Applied

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

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r03
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02



4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Feature phone
Model Name	SL006D
FCC ID	2A28USL006D
IMEI Code	358957940004335
Wireless Technology and Frequency Range	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+(16QAM uplink is supported) LTE: QPSK/ 16QAM WLAN 2.4GHz 802.11b/g/n HT20/HT40 Bluetooth BR/EDR/LE
HW Version	1.0
SW Version	SL006DD10008
GSM / (E)GPRS Transfer mode	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.
EUT Stage	Production Unit
<b>Remark:</b>	
<ol style="list-style-type: none"> <li>1. This device does not supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.</li> <li>2. This device does not support DTM operation and support GRPS/EGRPS mode up to multi-slot class 12.</li> <li>3. This device WLAN 2.4GHz supports hotspot operation and Bluetooth support tethering applications.</li> <li>4. The device implements the power management and proximity sensor /receiver detection/hotspot mode for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity) and the details about the power management decision and sensor detection are provided in the operational description. And the device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E.</li> </ol>	

**4.2 General LTE SAR Test and Reporting Considerations**

Summarized necessary items addressed in KDB 941225 D05 v02r05																																																															
FCC ID	2A28USL006D																																																														
Equipment Name	Feature phone																																																														
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz																																																														
Channel Bandwidth	LTE Band 2: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 12: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 14: 5MHz, 10MHz LTE Band 30: 5MHz, 10MHz LTE Band 66: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 71: 5MHz, 10MHz, 15MHz, 20MHz																																																														
Uplink Modulations used	QPSK / 16QAM																																																														
LTE Voice / Data requirements	Voice and Data																																																														
LTE Release Version	R11, category 5																																																														
CA Support	Not Supported																																																														
LTE MPR permanently built-in by design	<p><b>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</b></p> <table border="1"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth / Transmission bandwidth (N<sub>RB</sub>)</th> <th rowspan="2">MPR (dB)</th> </tr> <tr> <th>1.4 MHz</th> <th>3.0 MHz</th> <th>5 MHz</th> <th>10 MHz</th> <th>15 MHz</th> <th>20 MHz</th> </tr> </thead> <tbody> <tr> <td>QPSK</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 3</td> </tr> <tr> <td>256 QAM</td> <td colspan="6" style="text-align: center;">≥ 1</td> <td>≤ 5</td> </tr> </tbody> </table>	Modulation	Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> )						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2	64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3	256 QAM	≥ 1						≤ 5
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256 QAM	≥ 1						≤ 5																																																								
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)																																																														
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																																														
Power reduction applied to satisfy SAR compliance	Yes, when operating in Proximity sensors/receiver/hotspot detect mechanism trigger reduction power applied to satisfy SAR compliance the detail please referred to section 13.																																																														

Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745



LTE Band 5												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)		
L	20407	824.7	20415	825.5	20425	826.5	20450	829				
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5				
H	20643	848.3	20635	847.5	20625	846.5	20600	844				
LTE Band 12												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)		
L	23017	699.7	23025	700.5	23035	701.5	23060	704				
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5				
H	23173	715.3	23165	714.5	23155	713.5	23130	711				
LTE Band 14												
	Bandwidth 5 MHz				Bandwidth 10 MHz							
	Channel #		Channel #		Channel #		Freq.(MHz)					
L	23305		790.5		23330		793					
M	23330		793									
H	23355		795.5									
LTE Band 30												
	Bandwidth 5 MHz				Bandwidth 10 MHz							
	Channel #		Freq.(MHz)		Channel #		Freq.(MHz)					
L	27685		2307.5		27710		2310					
M	27710		2310									
H	27735		2312.5									
LTE Band 66												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745
H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770
LTE Band 71												
	Bandwidth 5 MHz				Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz			
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)		
L	133147	665.5	133172	668	133197	670.5	133222	673				
M	133247	675.5	133272	678	133297	680.5	133322	683				
H	133447	695.5	133422	693	133397	690.5	133372	688				



**For LTE Overlap Bands Description>**

1) LTE Bands BW

Band	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
LTE Band 4	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 66	Yes	Yes	Yes	Yes	Yes	Yes

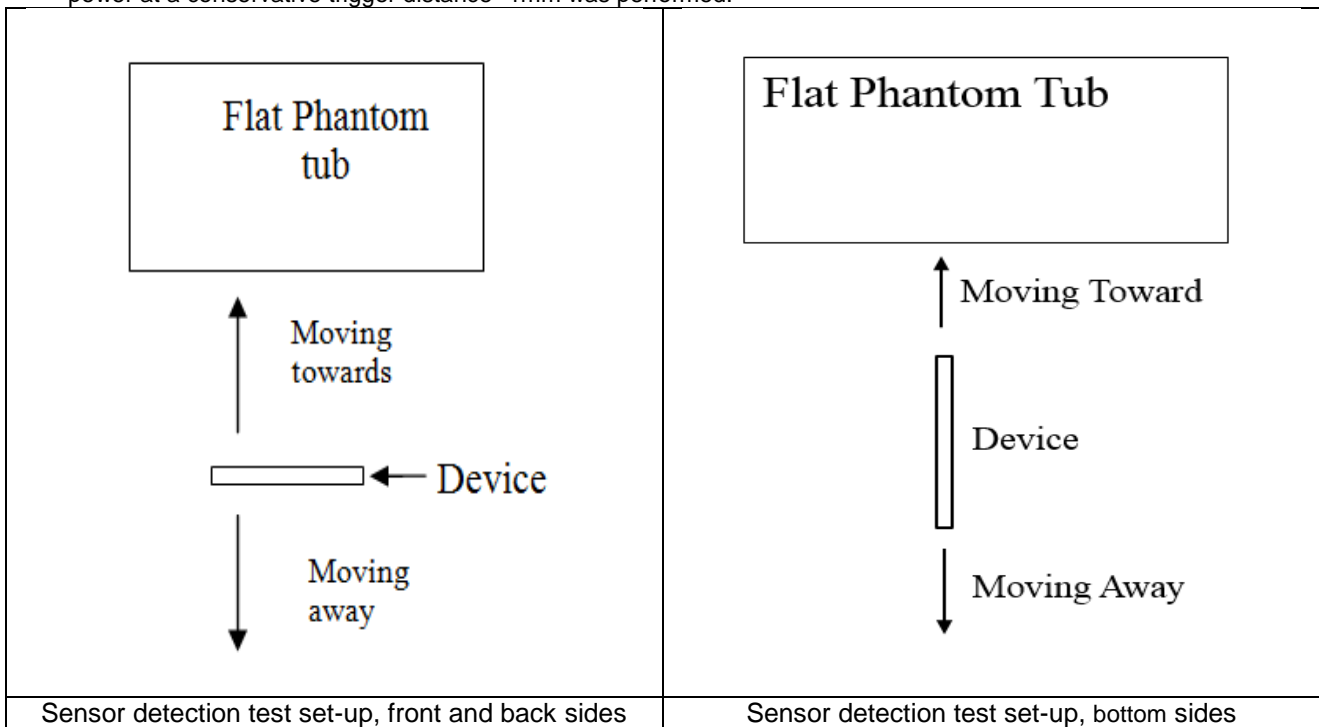
2) LTE Bands tune up:

Band	Receiver on	Sensor on	Sensor Off	Hotspot on	Default
					Tune-up Limit
LTE Band 4	25	22	25	21	25
LTE Band 66	25	22	25	21	25

## 5. Proximity Sensor Triggering Test

### 5.1 Proximity sensor triggering distances(Per KDB616217§6.2)

1. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed and the tissue-equivalent medium for highest frequency (2600MHz) and lowest (1750MHz) frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensors placed coincident with antenna elements at the left corners of the top ends of the phone are utilized to determine when the device comes in proximity of the user's body or finger or hand at the front or back or top or left sides of the device.
3. The device employs proximity sensors that detect the presence of the user's body or handheld states at the front, back, bottom sides of the device. When front, back, bottom sides of body condition or handheld states are detected reduced power will be active. The data shown in the sections below shows the distance(s).
4. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance -1mm was performed.



**<P-Sensor>**

**<Flip-Close Mode>**

Proximity Sensor Trigger Distance (mm)						
Position	Front		Back		Bottom Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	3	3	28	28	20	20

**<Flip-Open Mode>**

Proximity Sensor Trigger Distance (mm)						
Position	Front		Back		Bottom Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	19	19	30	30	22	22

**6. RF Exposure Limits**

**6.1 Uncontrolled Environment**

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

**6.2 Controlled Environment**

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

**Limits for Occupational/Controlled Exposure (W/kg)**

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

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

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

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

## **7. Specific Absorption Rate (SAR)**

### **7.1 Introduction**

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

### **7.2 SAR Definition**

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

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

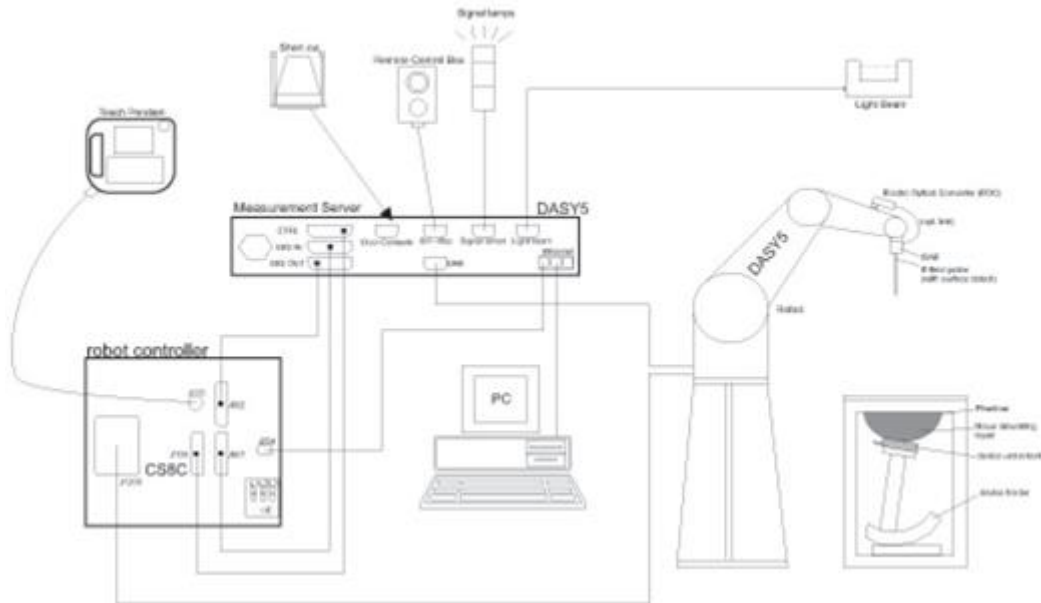
SAR is expressed in units of Watts per kilogram (W/kg)

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

Where:  $\sigma$  is the conductivity of the tissue,  $\rho$  is the mass density of the tissue and E is the RMS electrical field strength.

## 8. System Description and Setup

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




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


**8.1 E-Field Probe**

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

**<EX3DV4 Probe>**

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

**<ES3DV3 Probe>**

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

**8.2 Data Acquisition Electronics (DAE)**

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

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



**Photo of DAE**

**8.3 Phantom**

**<SAM Twin Phantom>**

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



The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

**<ELI Phantom>**

<b>Shell Thickness</b>	2 ± 0.2 mm (sagging: <1%)
<b>Filling Volume</b>	Approx. 30 liters
<b>Dimensions</b>	Major ellipse axis: 600 mm Minor axis: 400 mm



The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices or for evaluating transmitters operating at low frequencies. ELI is fully compatible with standard and all known tissue simulating liquids.

### 8.4 Device Holder

#### <Mounting Device for Hand-Held Transmitter>

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.



Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

#### <Mounting Device for Laptops and other Body-Worn Transmitters>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.



Mounting Device for Laptops



## **9. Measurement Procedures**

The measurement procedures are as follows:

### <Conducted power measurement>

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

### <SAR measurement>

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

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

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

### **9.1 Spatial Peak SAR Evaluation**

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

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

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

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

**9.2 Power Reference Measurement**

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

**9.3 Area Scan**

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

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

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

**9.4 Zoom Scan**

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

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

		≤ 3 GHz	> 3 GHz	
Maximum zoom scan spatial resolution: $\Delta x_{Zoom}, \Delta y_{Zoom}$		$\leq 2$ GHz: $\leq 8$ mm 2 – 3 GHz: $\leq 5$ mm*	3 – 4 GHz: $\leq 5$ mm* 4 – 6 GHz: $\leq 4$ mm*	
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$	$\leq 5$ mm	3 – 4 GHz: $\leq 4$ mm 4 – 5 GHz: $\leq 3$ mm 5 – 6 GHz: $\leq 2$ mm	
	graded grid	$\Delta z_{Zoom}(1)$ : between 1 <sup>st</sup> two points closest to phantom surface	$\leq 4$ mm	3 – 4 GHz: $\leq 3$ mm 4 – 5 GHz: $\leq 2.5$ mm 5 – 6 GHz: $\leq 2$ mm
		$\Delta z_{Zoom}(n>1)$ : between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z	$\geq 30$ mm	3 – 4 GHz: $\geq 28$ mm 4 – 5 GHz: $\geq 25$ mm 5 – 6 GHz: $\geq 22$ mm	
Note: $\delta$ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details. * When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is $\leq 1.4$ W/kg, $\leq 8$ mm, $\leq 7$ mm and $\leq 5$ mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

**9.5 Volume Scan Procedures**

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

**9.6 Power Drift Monitoring**

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



**10. Test Equipment List**

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1099	Dec. 15, 2021	Dec. 14, 2024
SPEAG	835MHz System Validation Kit	D835V2	4d162	Dec. 17, 2021	Dec. 16, 2024
SPEAG	1750MHz System Validation Kit	D1750V2	1137	Oct. 19, 2021	Oct. 18, 2024
SPEAG	1900MHz System Validation Kit	D1900V2	5d182	Dec. 20, 2021	Dec. 19, 2024
SPEAG	2300MHz System Validation Kit	D2300V2	1056	Oct. 20, 2021	Oct. 19, 2024
SPEAG	2450MHz System Validation Kit	D2450V2	924	Sep. 02, 2020	Aug. 31, 2023
SPEAG	Data Acquisition Electronics	DAE4	1386	Jun. 30, 2022	Jun. 29, 2023
SPEAG	Data Acquisition Electronics	DAE4	1210	Mar. 23, 2023	Mar. 22, 2024
SPEAG	Data Acquisition Electronics	DAE4	679	Jun. 06, 2022	Jun. 05, 2023
SPEAG	Dosimetric E-Field Probe	ES3DV3	3191	Feb. 17, 2023	Feb. 16, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7577	Nov. 23, 2022	Nov. 22, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	7576	Jul. 28, 2022	Jul. 27, 2023
SPEAG	SAM Twin Phantom	QD 000 P40 CD	1671	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201341952	Dec. 27, 2022	Dec. 26, 2023
Anritsu	Radio communication analyzer	MT8820C	6201563813	Dec. 27, 2022	Dec. 26, 2023
Anritsu	Radio communication analyzer	MT8821C	6262314715	Jun. 27, 2022	Jun. 26, 2023
Anritsu	Radio communication analyzer	MT8821C	6272278319	Jun. 27, 2022	Jun. 26, 2023
Agilent	Wireless Communication Test Set	E5515C	MY50267224	Jul. 07, 2022	Jul. 06, 2023
Keysight	Network Analyzer	E5071C	MY46523671	Oct. 17, 2022	Oct. 16, 2023
Speag	Dielectric Assessment KIT	DAK-3.5	1071	Feb. 20, 2023	Feb. 19, 2024
Agilent	Signal Generator	N5181A	MY50145381	Dec. 27, 2022	Dec. 26, 2023
Anritsu	Power Sensor	MA2411B	1306099	Oct. 17, 2022	Oct. 16, 2023
Anritsu	Power Meter	ML2495A	1349001	Oct. 17, 2022	Oct. 16, 2023
Anritsu	Power Sensor	MA2411B	1542004	Dec. 27, 2022	Dec. 26, 2023
Anritsu	Power Meter	ML2495A	1339473	Dec. 27, 2022	Dec. 26, 2023
R&S	CBT BLUETOOTH TESTER	CBT	100963	Dec. 27, 2022	Dec. 26, 2023
R&S	Spectrum Analyzer	FSP7	100818	Jul. 07, 2022	Jul. 06, 2023
TES	Hygrometer	1310	200505600	Jul. 12, 2022	Jul. 11, 2023
Anymetre	Thermo-Hygrometer	JR593	2015030904	Jul. 12, 2022	Jul. 11, 2023
SPEAG	Device Holder	N/A	N/A	N/A	N/A
AR	Amplifier	5S1G4	0333096	Note 1	
Mini-Circuits	Amplifier	ZVE-3W-83+	599201528	Note 1	
Mini-Circuits	Amplifier	ZVA-183W-S+	726202215	Note 1	
ARRA	Power Divider	A3200-2	N/A	Note 1	
ET Industries	Dual Directional Coupler	C-058-10	N/A	Note 1	
Weinschel	Attenuator 1	3M-10	N/A	Note 1	
Weinschel	Attenuator 2	3M-20	N/A	Note 1	

**Note:**

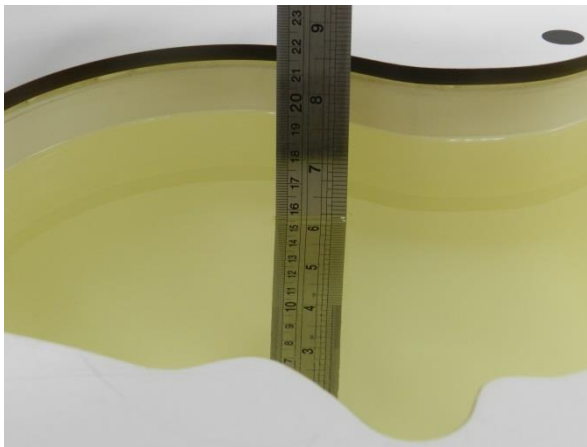
1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.

2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.

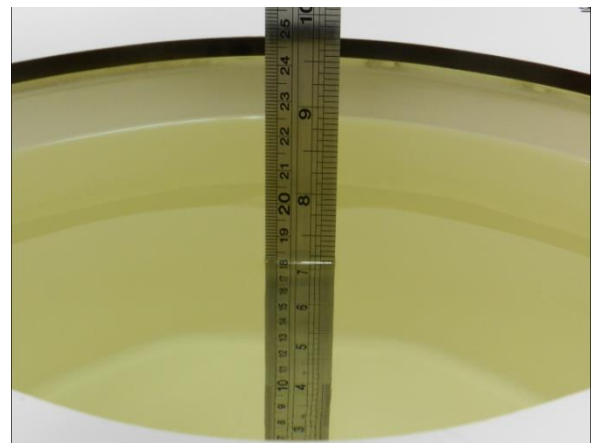
## **11. System Verification**

### **11.1 Tissue Simulating Liquids**

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



**Fig 10.1**Photo of Liquid Height for Head SAR



**Fig 10.2** Photo of Liquid Height for Body SAR

### **11.2 Tissue Verification**

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

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
<b>For Head</b>								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2

**<Tissue Dielectric Parameter Check Results>**

Frequency (MHz)	Tissue Type	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ε <sub>r</sub> )	Conductivity Target (σ)	Permittivity Target (ε <sub>r</sub> )	Delta (σ) (%)	Delta (ε <sub>r</sub> ) (%)	Limit (%)	Date
750	Head	22.6	0.888	40.879	0.89	41.90	-0.22	-2.44	±5	2023/5/12
750	Head	22.4	0.881	40.783	0.89	41.90	-1.01	-2.67	±5	2023/5/15
835	Head	22.5	0.915	41.980	0.90	41.50	1.67	1.16	±5	2023/5/14
835	Head	22.4	0.902	40.749	0.90	41.50	0.22	-1.81	±5	2023/5/16
1750	Head	22.5	1.404	40.106	1.37	40.10	2.48	0.01	±5	2023/5/15
1750	Head	22.7	1.360	38.143	1.37	40.10	-0.73	-4.88	±5	2023/5/17
1900	Head	22.5	1.440	39.914	1.40	40.00	2.86	-0.21	±5	2023/5/16
1900	Head	22.4	1.407	39.644	1.40	40.00	0.50	-0.89	±5	2023/5/18
2300	Head	22.3	1.710	37.893	1.67	39.50	2.40	-4.07	±5	2023/5/14
2300	Head	22.4	1.715	39.371	1.67	39.50	2.69	-0.33	±5	2023/5/19
2450	Head	22.4	1.850	38.466	1.80	39.20	2.78	-1.87	±5	2023/5/15
2450	Head	22.1	1.840	38.467	1.80	39.20	2.22	-1.87	±5	2023/5/20

**11.3 System Performance Check Results**

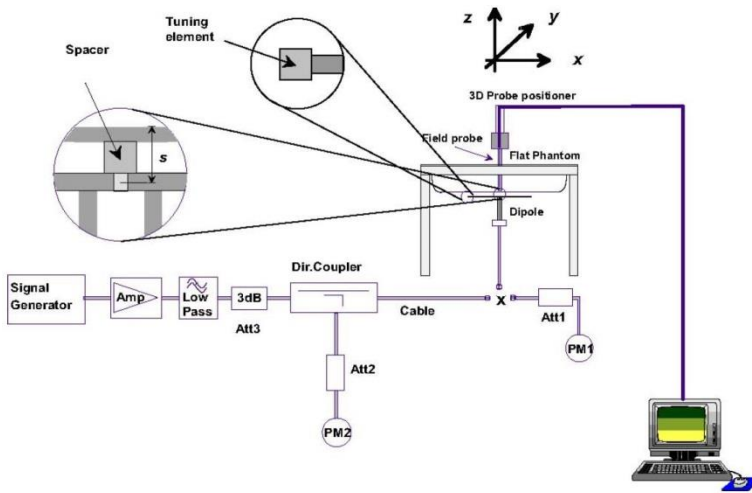
Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the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

<1g>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2023/5/12	750	Head	250	1099	7577	1386	2.030	8.540	8.12	-4.92
2023/5/15	750	Head	250	1099	7576	1210	2.130	8.540	8.52	-0.23
2023/5/14	835	Head	250	4d162	7577	1386	2.450	9.640	9.8	1.66
2023/5/16	835	Head	250	4d162	7576	1210	2.580	9.640	10.32	7.05
2023/5/15	1750	Head	250	1137	7577	1386	8.460	36.500	33.84	-7.29
2023/5/17	1750	Head	250	1137	7576	1210	8.620	36.500	34.48	-5.53
2023/5/16	1900	Head	250	5d182	7577	1386	9.360	39.600	37.44	-5.45
2023/5/18	1900	Head	250	5d182	7576	1210	9.590	39.600	38.36	-3.13
2023/5/14	2300	Head	250	1056	3191	679	12.500	48.800	50	2.46
2023/5/19	2300	Head	250	1056	3191	679	13.100	48.800	52.4	7.38
2023/5/15	2450	Head	250	924	7576	1210	12.100	51.400	48.4	-5.84
2023/5/20	2450	Head	250	924	7576	1210	12.900	51.400	51.6	0.39

<10g>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2023/5/12	750	Head	250	1099	7577	1386	1.330	5.650	5.32	-5.84
2023/5/15	750	Head	250	1099	7576	1210	1.420	5.650	5.68	0.53
2023/5/14	835	Head	250	4d162	7577	1386	1.610	6.260	6.44	2.88
2023/5/16	835	Head	250	4d162	7576	1210	1.640	6.260	6.56	4.79
2023/5/15	1750	Head	250	1137	7577	1386	4.480	19.200	17.92	-6.67
2023/5/17	1750	Head	250	1137	7576	1210	4.960	19.200	19.84	3.33
2023/5/16	1900	Head	250	5d182	7577	1386	5.210	20.200	20.84	3.17
2023/5/18	1900	Head	250	5d182	7576	1210	5.500	20.200	22	8.91
2023/5/14	2300	Head	250	1056	3191	679	5.890	22.800	23.56	3.33
2023/5/19	2300	Head	250	1056	3191	679	6.140	22.800	24.56	7.72
2023/5/15	2450	Head	250	924	7576	1210	5.480	24.000	21.92	-8.67
2023/5/20	2450	Head	250	924	7576	1210	5.840	24.000	23.36	-2.67



**Fig 10.3.1 System Performance Check Setup**



**Fig 10.3.2 Setup Photo**



## 12. RF Exposure Positions

### 12.1 Ear and handset reference point

Figure 11.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled “M,” the left ear reference point (ERP) is marked “LE,” and the right ERP is marked “RE.” Each ERP is 15 mm along the B-M (back-mouth) line behind the entrance-to-ear-canal (EEC) point, as shown in Figure 11.1.2 The Reference Plane is defined as passing through the two ear reference points and point M. The line N-F (neck-front), also called the reference pivoting line, is normal to the Reference Plane and perpendicular to both a line passing through RE and LE and the B-M line (see Figure 11.1.3). Both N-F and B-M lines should be marked on the exterior of the phantom shell to facilitate handset positioning. Posterior to the N-F line the ear shape is a flat surface with 6 mm thickness at each ERP, and forward of the N-F line the ear is truncated, as illustrated in Figure 11.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

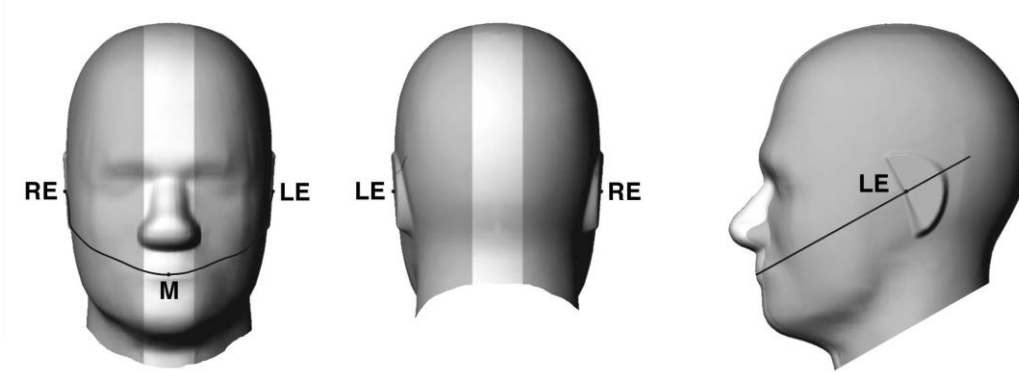


Fig 11.1.1 Front, back, and side views of SAM twin phantom

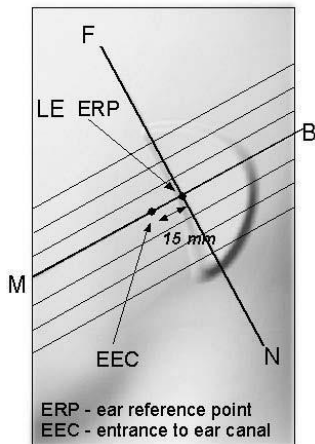


Fig 11.1.2 Close-up side view of phantom showing the ear region.

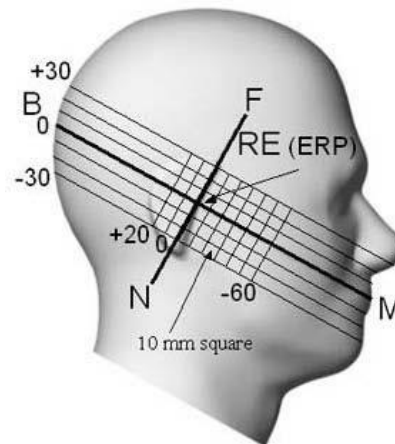


Fig 11.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

## 12.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width  $w_t$  of the handset at the level of the acoustic output (point A in Figure 11.2.1 and Figure 11.2.2), and the midpoint of the width  $w_b$  of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 11.2.1). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Figure 11.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
3. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 11.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
4. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP.
5. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
6. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.
7. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 11.2.3. The actual rotation angles should be documented in the test report.

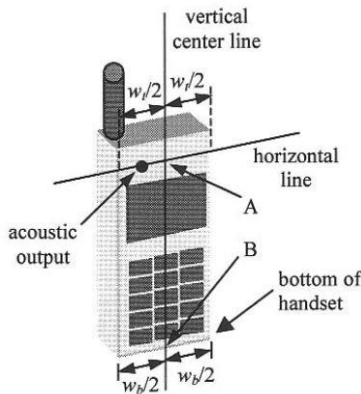


Fig 11.2.1 Handset vertical and horizontal reference lines—“fixed case”

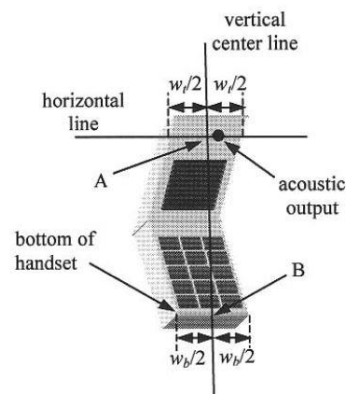


Fig 11.2.2 Handset vertical and horizontal reference lines—“clam-shell case”

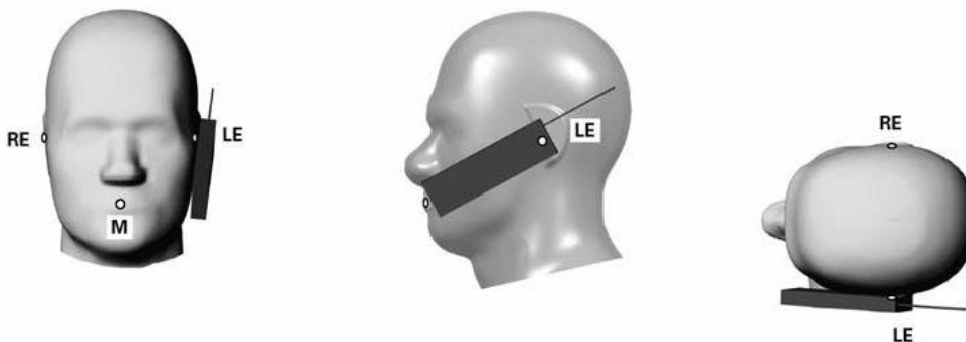


Fig 11.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

### 12.3 Definition of the tilt position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. While maintaining the orientation of the handset, move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15°.
3. Rotate the handset around the horizontal line by 15°.
4. While maintaining the orientation of the handset, move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact point is on the pinna. See Figure 11.3.1. If contact occurs at any location other than the pinna, e.g., the antenna at the back of the phantom head, the angle of the handset should be reduced. In this case, the tilt position is obtained if any point on the handset is in contact with the pinna and a second point

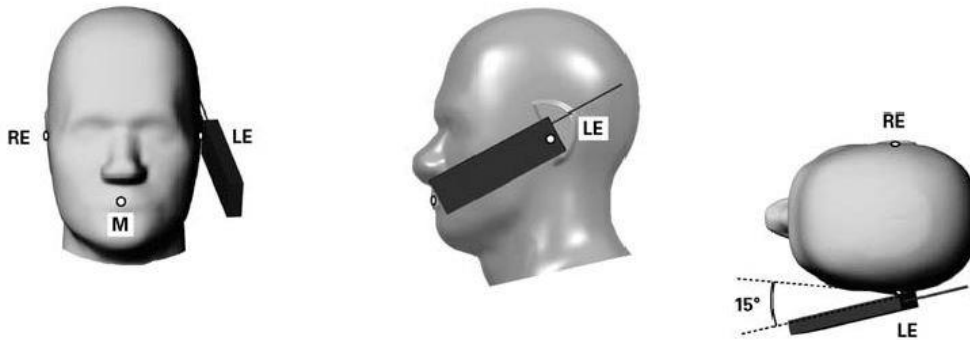


Fig 11.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

## 12.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 11.4). Per KDB648474 D04v01r03, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is  $> 1.2$  W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.

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

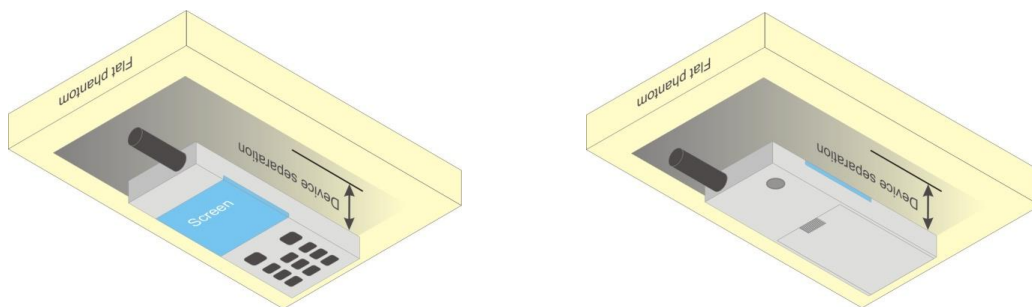


Fig 11.4 Body Worn Position



## **12.5 Product Specific 10g SAR Exposure**

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, that can provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets and support voice calls next to the ear, According to KDB648474 D04v01r03, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.
2. The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at  $\leq 25$  mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions.6 The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

## **12.6 Wireless Router**

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v02r01 where SAR test considerations for handsets (L x W  $\geq 9$  cm x 5 cm) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01 publication procedures. The "Portable Hotspot" feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

### **13. Conducted RF Output Power (Unit: dBm)**

The detailed conducted power table can refer to Appendix E.

#### **<GSM Conducted Power>**

**General Note:**

1. Per KDB 447498 D01, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.
3. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is  $\leq \frac{1}{4}$  dB higher than the primary mode, SAR measurement is not required for the secondary mode.

#### **<WCDMA Conducted Power>**

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For HSPA+ devices supporting 16 QAM in the uplink, power measurements procedure is according to the configurations in Table C.11.1.4 of 3GPP TS 34.121-1.
4. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

#### **HSDPA Setup Configuration:**

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

**Table C.10.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH**

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$ (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{HS} = 30/15 * \beta_c$ .

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

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

Note 4: For subtest 2 the  $\beta_c/\beta_d$  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  $\beta_d = 15/15$ .

**Setup Configuration**

**HSUPA Setup Configuration:**

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

**Table C.11.1.3:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH**

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$ (Note1)	$\beta_{ec}$	$\beta_{ed}$ (Note 4) (Note 5)	$\beta_{ed}$ (SF)	$\beta_{ed}$ (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCl
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ . For sub-test 5,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 5/15$  with  $\beta_{hs} = 5/15 * \beta_c$ .

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

Note 3: For subtest 1 the  $\beta_c/\beta_d$  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: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

**Setup Configuration**



**DC-HSDPA 3GPP release 8 Setup Configuration:**

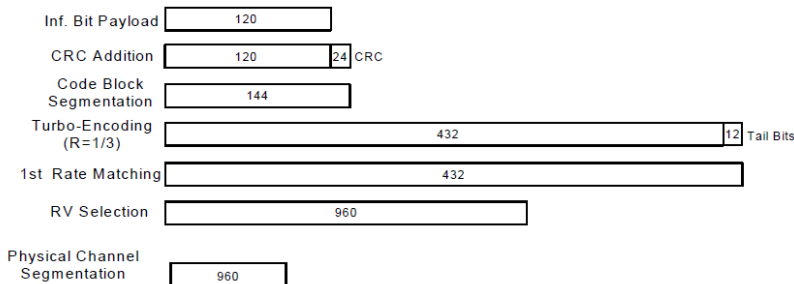
- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
  - i. Set RMC 12.2Kbps + HSDPA mode.
  - ii. Set Cell Power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

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

**C.8.1.12 Fixed Reference Channel Definition H-Set 12**

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

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



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

**Setup Configuration**

**HSPA+ 3GPP release 7 (uplink category 7) 16QAM, Setup Configuration:**

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting \* :
  - i. Call Configs = 5.2E:HSPA+:UL with 16QAM
  - ii. Set the Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.4, quoted from the TS 34.121-1 s5.2E
  - iii. Set Channel Parm
  - iv. Set Cell Power = -86 dBm
  - v. Set Channel Type = HSPA
  - vi. Set UE Target Power =21 dBm
  - vii. Power Ctrl Mode= All Up Bits
  - viii. Set Manual Uplink DPCH Bc/Bd = Manual
  - ix. Set Manual Uplink DPCH Bc and Bd=15,15(for 34.121-1 v8.10.0 table C11.1.4 sub-test 1)
  - x. Set HSPA Conn DL Channel Levels
  - xi. Set HS-SCCH Configs
  - xii. Set RB Test Mode Setup
  - xiii. Set Common HSUPA Parameters
  - xiv. Set Serving Grant
  - xv. Confirm that E-TFCI is equal to the target E-TFCI of 105 for sub-test 1, and other subtest's E-TFCI
- d. The transmitted maximum output power was recorded.

**Table C.11.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM**

Sub-test	$\beta_c$ (Note 3)	$\beta_d$	$\beta_{HS}$ (Note 1)	$\beta_{ec}$	$\beta_{ed}$ (2xSF2) (Note 4)	$\beta_{ed}$ (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	$\beta_{ed1}$ : 30/15 $\beta_{ed2}$ : 30/15	$\beta_{ed3}$ : 24/15 $\beta_{ed4}$ : 24/15	3.5	2.5	14	105	105

Note 1:  $\Delta_{ACK}, \Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{HS} = 30/15 * \beta_c$ .

Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).

Note 3: DPDCH is not configured, therefore the  $\beta_c$  is set to 1 and  $\beta_d = 0$  by default.

Note 4:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signaled to use the extrapolation algorithm.

**Setup Configuration**

**<WCDMA Conducted Power>**

**General Note:**

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA / HSPA+ is  $\leq 1/4$  dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than  $1/4$  dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.



**<LTE Conducted Power>**

**General Note:**

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B5 / B12 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE B4 SAR test was covered by B66; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
  - a. the maximum output power, including tolerance, for the smaller band is  $\leq$  the larger band to qualify for the SAR test exclusion
  - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

**<WLAN Conducted Power>**

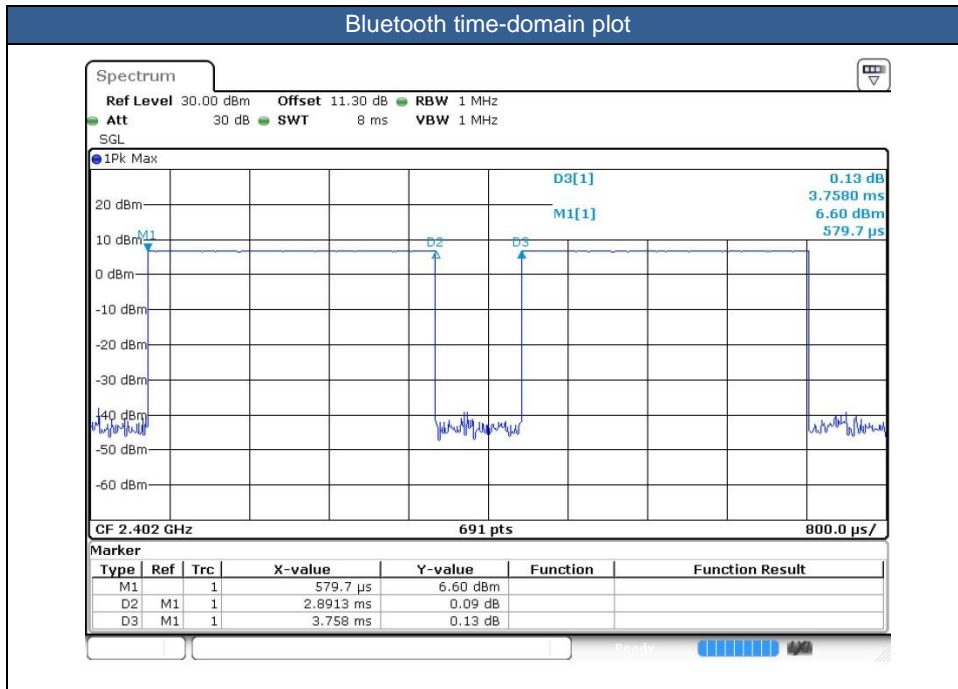
**General Note:**

1. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures. For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, additional output power measurements were not necessary.
2. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
3. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
4. For OFDM transmission configurations in the 2.4 GHz, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
5. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
  - a. When the reported SAR of the initial test position is  $\leq 0.4$  W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
  - b. When the reported SAR of the test position is  $> 0.4$  W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is  $\leq 0.8$  W/kg or all required test position are tested.
  - c. For all positions/configurations, when the reported SAR is  $> 0.8$  W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is  $\leq 1.2$  W/kg or all required channels are tested.

**<2.4GHz Bluetooth>**

**General Note:**

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps, due to its highest average power.
2. The Bluetooth duty cycle is 76.94% see as following figure, according to Oct. 2016 TCB workshop for Bluetooth SAR scaling need further consideration and the maximum duty cycle is 100%, therefore the actual duty cycle will be scaled up to 100% for Bluetooth reported SAR calculation.





## **14. Antenna Location**

The detailed antenna location information can refer to SAR Test Setup Photos.

## 15. SAR Test Results

### General Note:

1. Per KDB 447498 D01, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
  - a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
  - b. For SAR testing of WLAN/Bluetooth signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
  - c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)\*Tune-up Scaling Factor
  - d. For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)\* Duty Cycle scaling factor \* Tune-up scaling factor
2. Per KDB 447498 D01, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
  - $\leq 0.8$  W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\leq 100$  MHz
  - $\leq 0.6$  W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
  - $\leq 0.4$  W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\geq 200$  MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is  $\geq 0.8$ W/kg. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. Per KDB 648474 D04v01r03, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is  $\leq 1.2$  W/kg, SAR testing with a headset connected to the handset is not required.
5. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension  $> 15$ cm or an overall diagonal dimension  $> 16$ cm, when hotspot mode applies, 10-g product specific SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR  $> 1.2$  W/kg, in this report all the hotspot mode results are  $< 1.2$ W/kg.
6. The device implements the power management and proximity sensor /receiver detection/hotspot mode for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity) and the details about the power management decision and sensor detection are provided in the operational description. And the device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E.
7. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension  $> 15.0$  cm or an overall diagonal dimension  $> 16.0$  cm, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR  $> 1.2$  W/kg, however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power (for handheld on state, the maximum full power means reduced power), including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.
  - a. For this device SAR for WWAN transmitter scaled to maximum output power mode for product specific 10g SAR is higher than 1.2W/kg of GSM1900, WCDMA Band II/IV, LTE Band 2/30, therefore product specific 10g SAR is necessary.
  - b. When 10-g product specific 10g SAR is considered, SAR thresholds is specified in the procedures for SAR test reduction and exclusion should be multiplied by 2.5.
8. For distance SAR and non-distance SAR always chose higher SAR to do co-located analysis.
9. The EUT has two work states, flip open and flip close, SAR testing have been evaluated two states. For head mode, only flip open mode is performed SAR testing. When it is in flip close configuration since the diagonal dimension is  $< 160$  mm, 10-g extremity SAR tests are not required. When it is in flip open configuration since the diagonal dimension is  $> 160$  mm and  $< 200$  mm. Therefore, 10-g extremity SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR  $> 1.2$  W/kg. Additional SAR tests for 10-g extremity SAR were evaluated per KDB 616217 Section 6.

**GSM Note:**

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.
2. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is  $\leq \frac{1}{4}$  dB higher than the primary mode, SAR measurement is not required for the secondary mode.

**WCDMA Note:**

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA / HSPA+ is  $\leq \frac{1}{4}$  dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than  $\frac{1}{4}$  dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

**LTE Note:**

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / B5 / B12 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE B4 SAR test was covered by B66; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
  - a. the maximum output power, including tolerance, for the smaller band is  $\leq$  the larger band to qualify for the SAR test exclusion
  - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band





**WLAN/Bluetooth Note:**

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is  $\leq 1.2$  W/kg.
2. Per KDB 248227 D01v02r02, U-NII-1 SAR testing is not required when the U-NII-2A band highest reported SAR for a test configuration is  $\leq 1.2$  W/kg, SAR is not required for U-NII-1 band.
3. When the reported SAR of the test position is  $> 0.4$  W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is  $\leq 0.8$  W/kg or all required test position are tested.
4. For all positions / configurations, when the reported SAR is  $> 0.8$  W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is  $\leq 1.2$  W/kg or all required channels are tested.
5. During SAR testing the WLAN transmission was verified using a spectrum analyzer.



15.1 Head SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	EUT Flip State	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	
<b>750MHz</b>																			
01	LTE Band 12	10M	QPSK	1	0	-	Right Cheek	0mm	Reduced	23095	707.5	Open	24.53	25.00	1.114	0.05	0.254	<b>0.283</b>	
	LTE Band 12	10M	QPSK	1	0	-	Right Tilted	0mm	Reduced	23095	707.5	Open	24.53	25.00	1.114	0.09	0.099	0.110	
	LTE Band 12	10M	QPSK	1	0	-	Left Cheek	0mm	Reduced	23095	707.5	Open	24.53	25.00	1.114	-0.17	0.177	0.197	
	LTE Band 12	10M	QPSK	1	0	-	Left Tilted	0mm	Reduced	23095	707.5	Open	24.53	25.00	1.114	0.09	0.098	0.109	
	LTE Band 12	10M	QPSK	25	0	-	Right Cheek	0mm	Reduced	23095	707.5	Open	23.63	24.00	1.089	0.01	0.161	0.175	
	LTE Band 12	10M	QPSK	25	0	-	Right Tilted	0mm	Reduced	23095	707.5	Open	23.63	24.00	1.089	-0.18	0.083	0.090	
	LTE Band 12	10M	QPSK	25	0	-	Left Cheek	0mm	Reduced	23095	707.5	Open	23.63	24.00	1.089	0.15	0.154	0.168	
	LTE Band 12	10M	QPSK	25	0	-	Left Tilted	0mm	Reduced	23095	707.5	Open	23.63	24.00	1.089	0.17	0.081	0.088	
02	LTE Band 14	10M	QPSK	1	0	-	Right Cheek	0mm	Reduced	23330	793	Open	24.26	25.00	1.186	0.12	0.281	<b>0.333</b>	
	LTE Band 14	10M	QPSK	1	0	-	Right Tilted	0mm	Reduced	23330	793	Open	24.26	25.00	1.186	-0.01	0.161	0.191	
	LTE Band 14	10M	QPSK	1	0	-	Left Cheek	0mm	Reduced	23330	793	Open	24.26	25.00	1.186	0.09	0.267	0.317	
	LTE Band 14	10M	QPSK	1	0	-	Left Tilted	0mm	Reduced	23330	793	Open	24.26	25.00	1.186	0.07	0.148	0.175	
	LTE Band 14	10M	QPSK	25	0	-	Right Cheek	0mm	Reduced	23330	793	Open	23.29	24.00	1.178	0.15	0.233	0.274	
	LTE Band 14	10M	QPSK	25	0	-	Right Tilted	0mm	Reduced	23330	793	Open	23.29	24.00	1.178	0.08	0.138	0.163	
	LTE Band 14	10M	QPSK	25	0	-	Left Cheek	0mm	Reduced	23330	793	Open	23.29	24.00	1.178	0.01	0.226	0.266	
	LTE Band 14	10M	QPSK	25	0	-	Left Tilted	0mm	Reduced	23330	793	Open	23.29	24.00	1.178	0.08	0.125	0.147	
03	LTE Band 71	20M	QPSK	1	0	-	Right Cheek	0mm	Reduced	133297	680.5	Open	24.23	25.00	1.194	0.02	0.154	<b>0.184</b>	
	LTE Band 71	20M	QPSK	1	0	-	Right Tilted	0mm	Reduced	133297	680.5	Open	24.23	25.00	1.194	0.09	0.071	0.085	
	LTE Band 71	20M	QPSK	1	0	-	Left Cheek	0mm	Reduced	133297	680.5	Open	24.23	25.00	1.194	0.07	0.148	0.177	
	LTE Band 71	20M	QPSK	1	0	-	Left Tilted	0mm	Reduced	133297	680.5	Open	24.23	25.00	1.194	0.02	0.068	0.081	
	LTE Band 71	20M	QPSK	50	0	-	Right Cheek	0mm	Reduced	133297	680.5	Open	23.15	24.00	1.216	-0.06	0.129	0.157	
	LTE Band 71	20M	QPSK	50	0	-	Right Tilted	0mm	Reduced	133297	680.5	Open	23.15	24.00	1.216	0.17	0.064	0.078	
	LTE Band 71	20M	QPSK	50	0	-	Left Cheek	0mm	Reduced	133297	680.5	Open	23.15	24.00	1.216	-0.07	0.120	0.146	
	LTE Band 71	20M	QPSK	50	0	-	Left Tilted	0mm	Reduced	133297	680.5	Open	23.15	24.00	1.216	0.08	0.054	0.066	
<b>835MHz</b>																			
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Right Cheek	0mm	Reduced	189	836.4	Open	28.41	29.50	1.285	-0.01	0.433	0.557	
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Right Tilted	0mm	Reduced	189	836.4	Open	28.41	29.50	1.285	0.1	0.248	0.319	
04	GSM850	-	-	-	-	GPRS( 4Tx slots)	Left Cheek	0mm	Reduced	189	836.4	Open	28.41	29.50	1.285	-0.02	0.475	<b>0.611</b>	
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Left Tilted	0mm	Reduced	189	836.4	Open	28.41	29.50	1.285	0.01	0.248	0.319	
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Reduced	4182	836.4	Open	23.18	24.50	1.355	0.15	0.321	0.435	
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Reduced	4182	836.4	Open	23.18	24.50	1.355	0.09	0.198	0.268	
05	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Reduced	4182	836.4	Open	23.18	24.50	1.355	0.07	0.411	<b>0.557</b>	
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Reduced	4182	836.4	Open	23.18	24.50	1.355	0.07	0.205	0.278	
	LTE Band 5	10M	QPSK	1	0	-	Right Cheek	0mm	Reduced	20525	836.5	Open	24.28	25.00	1.180	0.04	0.332	0.392	
	LTE Band 5	10M	QPSK	1	0	-	Right Tilted	0mm	Reduced	20525	836.5	Open	24.28	25.00	1.180	-0.05	0.193	0.228	
06	LTE Band 5	10M	QPSK	1	0	-	Left Cheek	0mm	Reduced	20525	836.5	Open	24.28	25.00	1.180	0.1	0.367	<b>0.433</b>	
	LTE Band 5	10M	QPSK	1	0	-	Left Tilted	0mm	Reduced	20525	836.5	Open	24.28	25.00	1.180	0.04	0.202	0.238	
	LTE Band 5	10M	QPSK	25	0	-	Right Cheek	0mm	Reduced	20525	836.5	Open	23.32	24.00	1.169	-0.16	0.284	0.332	
	LTE Band 5	10M	QPSK	25	0	-	Right Tilted	0mm	Reduced	20525	836.5	Open	23.32	24.00	1.169	-0.05	0.168	0.196	
	LTE Band 5	10M	QPSK	25	0	-	Left Cheek	0mm	Reduced	20525	836.5	Open	23.32	24.00	1.169	-0.07	0.302	0.353	
	LTE Band 5	10M	QPSK	25	0	-	Left Tilted	0mm	Reduced	20525	836.5	Open	23.32	24.00	1.169	-0.17	0.175	0.205	
<b>1750MHz</b>																			
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Reduced	1413	1732.6	Open	23.65	24.50	1.216	0.08	0.215	0.261	
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Reduced	1413	1732.6	Open	23.65	24.50	1.216	0.03	0.177	0.215	
07	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Reduced	1413	1732.6	Open	23.65	24.50	1.216	-0.05	0.308	<b>0.375</b>	
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Reduced	1413	1732.6	Open	23.65	24.50	1.216	-0.01	0.203	0.247	
	LTE Band 66	20M	QPSK	1	0	-	Right Cheek	0mm	Reduced	132322	1745	Open	24.35	25.00	1.161	0.04	0.237	0.275	
	LTE Band 66	20M	QPSK	1	0	-	Right Tilted	0mm	Reduced	132322	1745	Open	24.35	25.00	1.161	-0.13	0.177	0.206	
08	LTE Band 66	20M	QPSK	1	0	-	Left Cheek	0mm	Reduced	132322	1745	Open	24.35	25.00	1.161	0.06	0.275	<b>0.319</b>	
	LTE Band 66	20M	QPSK	1	0	-	Left Tilted	0mm	Reduced	132322	1745	Open	24.35	25.00	1.161	0.13	0.213	0.247	



	LTE Band 66	20M	QPSK	50	0	-	Right Cheek	0mm	Reduced	132322	1745	Open	23.35	24.00	1.161	0.04	0.189	0.220	
	LTE Band 66	20M	QPSK	50	0	-	Right Tilted	0mm	Reduced	132322	1745	Open	23.35	24.00	1.161	-0.03	0.140	0.163	
	LTE Band 66	20M	QPSK	50	0	-	Left Cheek	0mm	Reduced	132322	1745	Open	23.35	24.00	1.161	-0.06	0.259	0.301	
	LTE Band 66	20M	QPSK	50	0	-	Left Tilted	0mm	Reduced	132322	1745	Open	23.35	24.00	1.161	-0.1	0.152	0.177	
<b>1900MHz</b>																			
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Right Cheek	0mm	Reduced	661	1880	Open	29.02	30.00	1.253	0.14	0.168	0.211	
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Right Tilted	0mm	Reduced	661	1880	Open	29.02	30.00	1.253	0.03	0.052	0.065	
09	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Left Cheek	0mm	Reduced	661	1880	Open	29.02	30.00	1.253	-0.1	0.176	<b>0.221</b>	
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Left Tilted	0mm	Reduced	661	1880	Open	29.02	30.00	1.253	-0.18	0.063	0.079	
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Reduced	9400	1880	Open	23.68	24.50	1.208	-0.07	0.140	0.169	
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Reduced	9400	1880	Open	23.68	24.50	1.208	-0.07	0.079	0.095	
10	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Reduced	9400	1880	Open	23.68	24.50	1.208	-0.06	0.168	<b>0.203</b>	
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Reduced	9400	1880	Open	23.68	24.50	1.208	-0.16	0.079	0.095	
	LTE Band 2	20M	QPSK	1	0	-	Right Cheek	0mm	Reduced	18900	1880	Open	24.56	25.00	1.107	0.07	0.245	0.271	
	LTE Band 2	20M	QPSK	1	0	-	Right Tilted	0mm	Reduced	18900	1880	Open	24.56	25.00	1.107	0.09	0.122	0.135	
11	LTE Band 2	20M	QPSK	1	0	-	Left Cheek	0mm	Reduced	18900	1880	Open	24.56	25.00	1.107	0.01	0.346	<b>0.383</b>	
	LTE Band 2	20M	QPSK	1	0	-	Left Tilted	0mm	Reduced	18900	1880	Open	24.56	25.00	1.107	-0.14	0.130	0.144	
	LTE Band 2	20M	QPSK	50	0	-	Right Cheek	0mm	Reduced	18900	1880	Open	23.51	24.00	1.119	0.16	0.141	0.158	
	LTE Band 2	20M	QPSK	50	0	-	Right Tilted	0mm	Reduced	18900	1880	Open	23.51	24.00	1.119	-0.08	0.057	0.064	
	LTE Band 2	20M	QPSK	50	0	-	Left Cheek	0mm	Reduced	18900	1880	Open	23.51	24.00	1.119	0.12	0.165	0.185	
	LTE Band 2	20M	QPSK	50	0	-	Left Tilted	0mm	Reduced	18900	1880	Open	23.51	24.00	1.119	0.07	0.063	0.071	
<b>2300MHz</b>																			
12	LTE Band 30	10M	QPSK	1	0	-	Right Cheek	0mm	Reduced	27710	2310	Open	23.35	24.50	1.303	-0.12	0.282	<b>0.367</b>	
	LTE Band 30	10M	QPSK	1	0	-	Right Tilted	0mm	Reduced	27710	2310	Open	23.35	24.50	1.303	0.07	0.163	0.212	
	LTE Band 30	10M	QPSK	1	0	-	Left Cheek	0mm	Reduced	27710	2310	Open	23.35	24.50	1.303	-0.06	0.183	0.238	
	LTE Band 30	10M	QPSK	1	0	-	Left Tilted	0mm	Reduced	27710	2310	Open	23.35	24.50	1.303	-0.05	0.150	0.195	
	LTE Band 30	10M	QPSK	25	0	-	Right Cheek	0mm	Reduced	27710	2310	Open	22.27	23.50	1.327	0.12	0.270	0.358	
	LTE Band 30	10M	QPSK	25	0	-	Right Tilted	0mm	Reduced	27710	2310	Open	22.27	23.50	1.327	-0.01	0.139	0.185	
	LTE Band 30	10M	QPSK	25	0	-	Left Cheek	0mm	Reduced	27710	2310	Open	22.27	23.50	1.327	-0.09	0.154	0.204	
	LTE Band 30	10M	QPSK	25	0	-	Left Tilted	0mm	Reduced	27710	2310	Open	22.27	23.50	1.327	0.1	0.122	0.162	

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	EUT Flip State	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
<b>2450MHz</b>																
	Bluetooth	DH5 1Mbps	Right Cheek	0mm	Full	39	2441	Open	7.20	9.00	1.514	76.94	1.300	0.01	0.011	0.022
	Bluetooth	DH5 1Mbps	Right Tilted	0mm	Full	39	2441	Open	7.20	9.00	1.514	76.94	1.300	-	n/a	n/a
13	Bluetooth	DH5 1Mbps	Left Cheek	0mm	Full	39	2441	Open	7.20	9.00	1.514	76.94	1.300	0.05	0.017	<b>0.033</b>
	Bluetooth	DH5 1Mbps	Left Tilted	0mm	Full	39	2441	Open	7.20	9.00	1.514	76.94	1.300	-	n/a	n/a
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Full	6	2437	Open	20.80	21.00	1.047	100	1.000	-0.07	0.225	0.236
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Full	6	2437	Open	20.80	21.00	1.047	100	1.000	0.002	0.051	0.053
14	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Full	6	2437	Open	20.80	21.00	1.047	100	1.000	0.12	0.447	<b>0.468</b>
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Full	6	2437	Open	20.80	21.00	1.047	100	1.000	0.07	0.073	0.076



15.2 Hotspot SAR

Table with columns: Plot No., Band, BW (MHz), Modulation, RB Size, RB offset, Mode, Test Position, Gap (mm), Antenna, Power Reduction, Ch., Freq. (MHz), EUT Flip State, Average Power (dBm), Tune-Up Limit (dBm), Tune-up Scaling Factor, Power Drift (dB), Measured 1g SAR (W/kg), Reported 1g SAR (W/kg). Includes a 750MHz section and rows for LTE Bands 12, 14, and 71.



17	LTE Band 71	20M	QPSK	1	0	-	Back	10mm	Ant 0	Reduced	133297	680.5	Close	24.23	25.00	1.194	-0.09	0.424	0.506	
	LTE Band 71	20M	QPSK	1	0	-	Left Side	10mm	Ant 0	Reduced	133297	680.5	Close	24.23	25.00	1.194	-0.11	0.182	0.217	
	LTE Band 71	20M	QPSK	1	0	-	Right Side	10mm	Ant 0	Reduced	133297	680.5	Close	24.23	25.00	1.194	-0.01	0.135	0.161	
	LTE Band 71	20M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	Reduced	133297	680.5	Close	24.23	25.00	1.194	-0.01	0.203	0.242	
	LTE Band 71	20M	QPSK	50	0	-	Front	10mm	Ant 0	Reduced	133297	680.5	Close	23.15	24.00	1.216	-0.04	0.112	0.136	
	LTE Band 71	20M	QPSK	50	0	-	Back	10mm	Ant 0	Reduced	133297	680.5	Close	23.15	24.00	1.216	0.05	0.413	0.502	
	LTE Band 71	20M	QPSK	50	0	-	Left Side	10mm	Ant 0	Reduced	133297	680.5	Close	23.15	24.00	1.216	0.03	0.169	0.206	
	LTE Band 71	20M	QPSK	50	0	-	Right Side	10mm	Ant 0	Reduced	133297	680.5	Close	23.15	24.00	1.216	-0.1	0.120	0.146	
	LTE Band 71	20M	QPSK	50	0	-	Bottom Side	10mm	Ant 0	Reduced	133297	680.5	Close	23.15	24.00	1.216	0.04	0.191	0.232	
<b>835MHz</b>																				
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Front	10mm	Ant 0	Reduced	189	836.4	Open	28.41	29.50	1.285	-0.13	0.519	0.667	
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Back	10mm	Ant 0	Reduced	189	836.4	Open	28.41	29.50	1.285	-0.11	0.608	0.781	
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Left Side	10mm	Ant 0	Reduced	189	836.4	Open	28.41	29.50	1.285	-0.11	0.345	0.443	
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Right Side	10mm	Ant 0	Reduced	189	836.4	Open	28.41	29.50	1.285	0.15	0.151	0.194	
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Bottom Side	10mm	Ant 0	Reduced	189	836.4	Open	28.41	29.50	1.285	-0.08	0.179	0.230	
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Front	10mm	Ant 0	Reduced	189	836.4	Close	28.41	29.50	1.285	-0.08	0.185	0.238	
18	GSM850	-	-	-	-	GPRS( 4Tx slots)	Back	10mm	Ant 0	Reduced	189	836.4	Close	28.41	29.50	1.285	-0.15	0.812	1.044	
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Back	10mm	Ant 0	Reduced	189	836.4	Close	28.41	29.50	1.285	0.08	0.784	1.008	
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Left Side	10mm	Ant 0	Reduced	189	836.4	Close	28.41	29.50	1.285	-0.17	0.442	0.568	
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Right Side	10mm	Ant 0	Reduced	189	836.4	Close	28.41	29.50	1.285	0.11	0.263	0.338	
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Bottom Side	10mm	Ant 0	Reduced	189	836.4	Close	28.41	29.50	1.285	-0.06	0.146	0.188	
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Back	10mm	Ant 0	Reduced	128	824.2	Close	28.33	29.50	1.309	-0.16	0.712	0.932	
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Back	10mm	Ant 0	Reduced	251	848.8	Close	28.38	29.50	1.294	0.18	0.736	0.953	
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 0	Reduced	4182	836.4	Open	23.18	24.50	1.355	0.11	0.398	0.539	
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	Reduced	4182	836.4	Open	23.18	24.50	1.355	-0.04	0.487	0.660	
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 0	Reduced	4182	836.4	Open	23.18	24.50	1.355	0.15	0.290	0.393	
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 0	Reduced	4182	836.4	Open	23.18	24.50	1.355	0.07	0.148	0.201	
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 0	Reduced	4182	836.4	Open	23.18	24.50	1.355	-0.09	0.205	0.278	
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 0	Reduced	4182	836.4	Close	23.18	24.50	1.355	0.01	0.145	0.197	
19	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	Reduced	4182	836.4	Close	23.18	24.50	1.355	-0.06	0.676	0.916	
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 0	Reduced	4182	836.4	Close	23.18	24.50	1.355	0.06	0.346	0.469	
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 0	Reduced	4182	836.4	Close	23.18	24.50	1.355	0.06	0.307	0.416	
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 0	Reduced	4182	836.4	Close	23.18	24.50	1.355	0.15	0.096	0.130	
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	Reduced	4132	826.4	Close	23.16	24.50	1.361	0.09	0.634	0.863	
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	Reduced	4233	846.6	Close	23.16	24.50	1.361	0.17	0.656	0.893	
	LTE Band 5	10M	QPSK	1	0	-	Front	10mm	Ant 0	Reduced	20525	836.5	Open	24.28	25.00	1.180	0.18	0.395	0.466	
	LTE Band 5	10M	QPSK	1	0	-	Back	10mm	Ant 0	Reduced	20525	836.5	Open	24.28	25.00	1.180	-0.09	0.422	0.498	
	LTE Band 5	10M	QPSK	1	0	-	Left Side	10mm	Ant 0	Reduced	20525	836.5	Open	24.28	25.00	1.180	-0.1	0.275	0.325	
	LTE Band 5	10M	QPSK	1	0	-	Right Side	10mm	Ant 0	Reduced	20525	836.5	Open	24.28	25.00	1.180	-0.02	0.141	0.166	
	LTE Band 5	10M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	Reduced	20525	836.5	Open	24.28	25.00	1.180	-0.06	0.117	0.138	
	LTE Band 5	10M	QPSK	25	0	-	Front	10mm	Ant 0	Reduced	20525	836.5	Open	23.32	24.00	1.169	-0.17	0.331	0.387	
	LTE Band 5	10M	QPSK	25	0	-	Back	10mm	Ant 0	Reduced	20525	836.5	Open	23.32	24.00	1.169	-0.04	0.343	0.401	
	LTE Band 5	10M	QPSK	25	0	-	Left Side	10mm	Ant 0	Reduced	20525	836.5	Open	23.32	24.00	1.169	0.13	0.227	0.265	
	LTE Band 5	10M	QPSK	25	0	-	Right Side	10mm	Ant 0	Reduced	20525	836.5	Open	23.32	24.00	1.169	0.03	0.115	0.134	
	LTE Band 5	10M	QPSK	25	0	-	Bottom Side	10mm	Ant 0	Reduced	20525	836.5	Open	23.32	24.00	1.169	-0.18	0.105	0.123	
	LTE Band 5	10M	QPSK	1	0	-	Front	10mm	Ant 0	Reduced	20525	836.5	Close	24.28	25.00	1.180	-0.15	0.247	0.292	
20	LTE Band 5	10M	QPSK	1	0	-	Back	10mm	Ant 0	Reduced	20525	836.5	Close	24.28	25.00	1.180	-0.16	0.712	0.840	
	LTE Band 5	10M	QPSK	1	0	-	Left Side	10mm	Ant 0	Reduced	20525	836.5	Close	24.28	25.00	1.180	0.12	0.477	0.563	
	LTE Band 5	10M	QPSK	1	0	-	Right Side	10mm	Ant 0	Reduced	20525	836.5	Close	24.28	25.00	1.180	-0.13	0.410	0.484	
	LTE Band 5	10M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	Reduced	20525	836.5	Close	24.28	25.00	1.180	-0.15	0.115	0.136	
	LTE Band 5	10M	QPSK	25	0	-	Front	10mm	Ant 0	Reduced	20525	836.5	Close	23.32	24.00	1.169	0.01	0.110	0.129	
	LTE Band 5	10M	QPSK	25	0	-	Back	10mm	Ant 0	Reduced	20525	836.5	Close	23.32	24.00	1.169	-0.16	0.471	0.551	
	LTE Band 5	10M	QPSK	25	0	-	Left Side	10mm	Ant 0	Reduced	20525	836.5	Close	23.32	24.00	1.169	0.12	0.275	0.322	
	LTE Band 5	10M	QPSK	25	0	-	Right Side	10mm	Ant 0	Reduced	20525	836.5	Close	23.32	24.00	1.169	-0.11	0.241	0.282	
	LTE Band 5	10M	QPSK	25	0	-	Bottom Side	10mm	Ant 0	Reduced	20525	836.5	Close	23.32	24.00	1.169	0.15	0.091	0.106	
	LTE Band 5	10M	QPSK	50	0	-	Back	10mm	Ant 0	Reduced	20525	836.5	Close	23.35	24.00	1.161	0.06	0.452	0.525	



1750MHz																			
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 0	Reduced	1413	1732.6	Open	20.63	21.50	1.222	0.08	0.416	0.508
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	Reduced	1413	1732.6	Open	20.63	21.50	1.222	-0.18	0.523	0.639
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 0	Reduced	1413	1732.6	Open	20.63	21.50	1.222	0.12	0.188	0.230
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 0	Reduced	1413	1732.6	Open	20.63	21.50	1.222	0.06	0.127	0.155
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 0	Reduced	1413	1732.6	Open	20.63	21.50	1.222	0.1	0.184	0.225
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 0	Reduced	1413	1732.6	Close	20.63	21.50	1.222	-0.09	0.117	0.143
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	Reduced	1413	1732.6	Close	20.63	21.50	1.222	0.17	0.752	0.919
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 0	Reduced	1413	1732.6	Close	20.63	21.50	1.222	-0.09	0.131	0.160
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 0	Reduced	1413	1732.6	Close	20.63	21.50	1.222	0.11	0.134	0.164
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 0	Reduced	1413	1732.6	Close	20.63	21.50	1.222	0.09	0.214	0.261
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	Reduced	1312	1712.4	Close	20.56	21.50	1.242	-0.04	0.712	0.884
21	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	Reduced	1513	1752.6	Close	20.53	21.50	1.250	-0.06	0.828	1.035
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	Reduced	1513	1752.6	Close	20.53	21.50	1.250	-0.06	0.813	1.016
	LTE Band 66	20M	QPSK	1	0	-	Front	10mm	Ant 0	Reduced	132322	1745	Open	20.50	21.00	1.122	0.07	0.373	0.419
	LTE Band 66	20M	QPSK	1	0	-	Back	10mm	Ant 0	Reduced	132322	1745	Open	20.50	21.00	1.122	-0.12	0.422	0.473
	LTE Band 66	20M	QPSK	1	0	-	Left Side	10mm	Ant 0	Reduced	132322	1745	Open	20.50	21.00	1.122	0.08	0.152	0.171
	LTE Band 66	20M	QPSK	1	0	-	Right Side	10mm	Ant 0	Reduced	132322	1745	Open	20.50	21.00	1.122	0.11	0.097	0.109
	LTE Band 66	20M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	Reduced	132322	1745	Open	20.50	21.00	1.122	-0.09	0.161	0.181
	LTE Band 66	20M	QPSK	50	0	-	Front	10mm	Ant 0	Reduced	132322	1745	Open	20.44	21.00	1.138	0.01	0.368	0.419
	LTE Band 66	20M	QPSK	50	0	-	Back	10mm	Ant 0	Reduced	132322	1745	Open	20.44	21.00	1.138	-0.1	0.408	0.464
	LTE Band 66	20M	QPSK	50	0	-	Left Side	10mm	Ant 0	Reduced	132322	1745	Open	20.44	21.00	1.138	-0.02	0.166	0.189
	LTE Band 66	20M	QPSK	50	0	-	Right Side	10mm	Ant 0	Reduced	132322	1745	Open	20.44	21.00	1.138	0.1	0.096	0.109
	LTE Band 66	20M	QPSK	50	0	-	Bottom Side	10mm	Ant 0	Reduced	132322	1745	Open	20.44	21.00	1.138	0.04	0.151	0.172
	LTE Band 66	20M	QPSK	1	0	-	Front	10mm	Ant 0	Reduced	132322	1745	Close	20.50	21.00	1.122	0.18	0.093	0.104
22	LTE Band 66	20M	QPSK	1	0	-	Back	10mm	Ant 0	Reduced	132322	1745	Close	20.50	21.00	1.122	0.12	0.597	0.670
	LTE Band 66	20M	QPSK	1	0	-	Left Side	10mm	Ant 0	Reduced	132322	1745	Close	20.50	21.00	1.122	0.04	0.120	0.135
	LTE Band 66	20M	QPSK	1	0	-	Right Side	10mm	Ant 0	Reduced	132322	1745	Close	20.50	21.00	1.122	-0.17	0.105	0.118
	LTE Band 66	20M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	Reduced	132322	1745	Close	20.50	21.00	1.122	-0.18	0.173	0.194
	LTE Band 66	20M	QPSK	50	0	-	Front	10mm	Ant 0	Reduced	132322	1745	Close	20.44	21.00	1.138	0.01	0.080	0.091
	LTE Band 66	20M	QPSK	50	0	-	Back	10mm	Ant 0	Reduced	132322	1745	Close	20.44	21.00	1.138	0.15	0.563	0.640
	LTE Band 66	20M	QPSK	50	0	-	Left Side	10mm	Ant 0	Reduced	132322	1745	Close	20.44	21.00	1.138	0.16	0.120	0.137
	LTE Band 66	20M	QPSK	50	0	-	Right Side	10mm	Ant 0	Reduced	132322	1745	Close	20.44	21.00	1.138	0.09	0.117	0.133
	LTE Band 66	20M	QPSK	50	0	-	Bottom Side	10mm	Ant 0	Reduced	132322	1745	Close	20.44	21.00	1.138	-0.15	0.169	0.192
1900MHz																			
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Front	10mm	Ant 0	Reduced	661	1880	Open	24.43	26.00	1.435	-0.03	0.248	0.356
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Back	10mm	Ant 0	Reduced	661	1880	Open	24.43	26.00	1.435	-0.03	0.452	0.649
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Left Side	10mm	Ant 0	Reduced	661	1880	Open	24.43	26.00	1.435	0.1	0.126	0.181
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Right Side	10mm	Ant 0	Reduced	661	1880	Open	24.43	26.00	1.435	0.04	0.069	0.099
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Bottom Side	10mm	Ant 0	Reduced	661	1880	Open	24.43	26.00	1.435	-0.05	0.191	0.274
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Front	10mm	Ant 0	Reduced	661	1880	Close	24.43	26.00	1.435	-0.02	0.076	0.109
23	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Back	10mm	Ant 0	Reduced	661	1880	Close	24.43	26.00	1.435	0.18	0.508	0.729
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Left Side	10mm	Ant 0	Reduced	661	1880	Close	24.43	26.00	1.435	-0.06	0.097	0.139
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Right Side	10mm	Ant 0	Reduced	661	1880	Close	24.43	26.00	1.435	-0.1	0.109	0.156
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Bottom Side	10mm	Ant 0	Reduced	661	1880	Close	24.43	26.00	1.435	0.04	0.192	0.276
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 0	Reduced	9400	1880	Open	19.61	20.50	1.227	0.18	0.383	0.470
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	Reduced	9400	1880	Open	19.61	20.50	1.227	-0.03	0.617	0.757
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 0	Reduced	9400	1880	Open	19.61	20.50	1.227	0.1	0.162	0.199
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 0	Reduced	9400	1880	Open	19.61	20.50	1.227	0.1	0.118	0.145
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 0	Reduced	9400	1880	Open	19.61	20.50	1.227	-0.06	0.271	0.333
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 0	Reduced	9400	1880	Close	19.61	20.50	1.227	-0.16	0.095	0.117
24	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	Reduced	9400	1880	Close	19.61	20.50	1.227	-0.06	0.696	0.854
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 0	Reduced	9400	1880	Close	19.61	20.50	1.227	-0.09	0.112	0.137
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 0	Reduced	9400	1880	Close	19.61	20.50	1.227	-0.06	0.171	0.210
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 0	Reduced	9400	1880	Close	19.61	20.50	1.227	0.13	0.284	0.349
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	Reduced	9262	1852.4	Close	19.53	20.50	1.250	0.16	0.613	0.766



	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	Reduced	9538	1907.6	Close	19.35	20.50	1.303	-0.17	0.584	0.761	
	LTE Band 2	20M	QPSK	1	0	-	Front	10mm	Ant 0	Reduced	18900	1880	Open	20.48	21.00	1.127	0.04	0.409	0.461	
	LTE Band 2	20M	QPSK	1	0	-	Back	10mm	Ant 0	Reduced	18900	1880	Open	20.48	21.00	1.127	0.09	0.565	0.637	
	LTE Band 2	20M	QPSK	1	0	-	Left Side	10mm	Ant 0	Reduced	18900	1880	Open	20.48	21.00	1.127	0.02	0.170	0.192	
	LTE Band 2	20M	QPSK	1	0	-	Right Side	10mm	Ant 0	Reduced	18900	1880	Open	20.48	21.00	1.127	-0.04	0.109	0.123	
	LTE Band 2	20M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	Reduced	18900	1880	Open	20.48	21.00	1.127	-0.14	0.258	0.291	
	LTE Band 2	20M	QPSK	50	0	-	Front	10mm	Ant 0	Reduced	18900	1880	Open	20.46	21.00	1.132	0.01	0.414	0.469	
	LTE Band 2	20M	QPSK	50	0	-	Back	10mm	Ant 0	Reduced	18900	1880	Open	20.46	21.00	1.132	-0.17	0.635	0.719	
	LTE Band 2	20M	QPSK	50	0	-	Left Side	10mm	Ant 0	Reduced	18900	1880	Open	20.46	21.00	1.132	-0.08	0.181	0.205	
	LTE Band 2	20M	QPSK	50	0	-	Right Side	10mm	Ant 0	Reduced	18900	1880	Open	20.46	21.00	1.132	-0.14	0.127	0.144	
	LTE Band 2	20M	QPSK	50	0	-	Bottom Side	10mm	Ant 0	Reduced	18900	1880	Open	20.46	21.00	1.132	-0.04	0.290	0.328	
	LTE Band 2	20M	QPSK	1	0	-	Front	10mm	Ant 0	Reduced	18900	1880	Close	20.48	21.00	1.127	-0.12	0.107	0.121	
	LTE Band 2	20M	QPSK	1	0	-	Back	10mm	Ant 0	Reduced	18900	1880	Close	20.48	21.00	1.127	0.04	0.602	0.679	
	LTE Band 2	20M	QPSK	1	0	-	Left Side	10mm	Ant 0	Reduced	18900	1880	Close	20.48	21.00	1.127	-0.1	0.119	0.134	
	LTE Band 2	20M	QPSK	1	0	-	Right Side	10mm	Ant 0	Reduced	18900	1880	Close	20.48	21.00	1.127	0.17	0.162	0.183	
	LTE Band 2	20M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	Reduced	18900	1880	Close	20.48	21.00	1.127	-0.14	0.260	0.293	
	LTE Band 2	20M	QPSK	50	0	-	Front	10mm	Ant 0	Reduced	18900	1880	Close	20.46	21.00	1.132	0.1	0.105	0.119	
25	LTE Band 2	20M	QPSK	50	0	-	Back	10mm	Ant 0	Reduced	18900	1880	Close	20.46	21.00	1.132	-0.04	0.684	0.775	
	LTE Band 2	20M	QPSK	50	0	-	Left Side	10mm	Ant 0	Reduced	18900	1880	Close	20.46	21.00	1.132	0.16	0.122	0.138	
	LTE Band 2	20M	QPSK	50	0	-	Right Side	10mm	Ant 0	Reduced	18900	1880	Close	20.46	21.00	1.132	-0.18	0.185	0.209	
	LTE Band 2	20M	QPSK	50	0	-	Bottom Side	10mm	Ant 0	Reduced	18900	1880	Close	20.46	21.00	1.132	0.12	0.287	0.325	
<b>2300MHz</b>																				
	LTE Band 30	10M	QPSK	1	0	-	Front	10mm	Ant 0	Reduced	27710	2310	Open	21.68	22.50	1.208	-0.14	0.850	1.027	
	LTE Band 30	10M	QPSK	1	0	-	Back	10mm	Ant 0	Reduced	27710	2310	Open	21.68	22.50	1.208	0.11	1.080	1.304	
	LTE Band 30	10M	QPSK	1	0	-	Left Side	10mm	Ant 0	Reduced	27710	2310	Open	21.68	22.50	1.208	0.11	0.087	0.105	
	LTE Band 30	10M	QPSK	1	0	-	Right Side	10mm	Ant 0	Reduced	27710	2310	Open	21.68	22.50	1.208	-0.05	0.457	0.552	
	LTE Band 30	10M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	Reduced	27710	2310	Open	21.68	22.50	1.208	0.05	0.418	0.505	
	LTE Band 30	10M	QPSK	25	0	-	Front	10mm	Ant 0	Reduced	27710	2310	Open	21.58	22.50	1.236	0.14	0.854	1.055	
26	LTE Band 30	10M	QPSK	25	0	-	Back	10mm	Ant 0	Reduced	27710	2310	Open	21.58	22.50	1.236	-0.05	1.100	1.360	
	LTE Band 30	10M	QPSK	25	0	-	Back	10mm	Ant 0	Reduced	27710	2310	Open	21.58	22.50	1.236	-0.08	1.030	1.273	
	LTE Band 30	10M	QPSK	25	0	-	Left Side	10mm	Ant 0	Reduced	27710	2310	Open	21.58	22.50	1.236	0.16	0.042	0.052	
	LTE Band 30	10M	QPSK	25	0	-	Right Side	10mm	Ant 0	Reduced	27710	2310	Open	21.58	22.50	1.236	0.16	0.459	0.567	
	LTE Band 30	10M	QPSK	25	0	-	Bottom Side	10mm	Ant 0	Reduced	27710	2310	Open	21.58	22.50	1.236	-0.11	0.414	0.512	
	LTE Band 30	10M	QPSK	50	0	-	Front	10mm	Ant 0	Reduced	27710	2310	Open	21.52	22.50	1.253	0.06	0.828	1.038	
	LTE Band 30	10M	QPSK	50	0	-	Back	10mm	Ant 0	Reduced	27710	2310	Open	21.52	22.50	1.253	0.05	0.958	1.201	
	LTE Band 30	10M	QPSK	1	0	-	Front	10mm	Ant 0	Reduced	27710	2310	Close	21.68	22.50	1.208	-0.11	0.144	0.174	
	LTE Band 30	10M	QPSK	1	0	-	Back	10mm	Ant 0	Reduced	27710	2310	Close	21.68	22.50	1.208	0.11	1.080	1.304	
	LTE Band 30	10M	QPSK	1	0	-	Left Side	10mm	Ant 0	Reduced	27710	2310	Close	21.68	22.50	1.208	-0.09	0.132	0.159	
	LTE Band 30	10M	QPSK	1	0	-	Right Side	10mm	Ant 0	Reduced	27710	2310	Close	21.68	22.50	1.208	-0.11	0.411	0.496	
	LTE Band 30	10M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	Reduced	27710	2310	Close	21.68	22.50	1.208	0.03	0.259	0.313	
	LTE Band 30	10M	QPSK	25	0	-	Front	10mm	Ant 0	Reduced	27710	2310	Close	21.58	22.50	1.236	-0.11	0.135	0.167	
	LTE Band 30	10M	QPSK	25	0	-	Back	10mm	Ant 0	Reduced	27710	2310	Close	21.58	22.50	1.236	-0.11	0.858	1.060	
	LTE Band 30	10M	QPSK	25	0	-	Left Side	10mm	Ant 0	Reduced	27710	2310	Close	21.58	22.50	1.236	0.12	0.118	0.146	
	LTE Band 30	10M	QPSK	25	0	-	Right Side	10mm	Ant 0	Reduced	27710	2310	Close	21.58	22.50	1.236	0.09	0.398	0.492	
	LTE Band 30	10M	QPSK	25	0	-	Bottom Side	10mm	Ant 0	Reduced	27710	2310	Close	21.58	22.50	1.236	-0.17	0.245	0.303	
	LTE Band 30	10M	QPSK	50	0	-	Back	10mm	Ant 0	Reduced	27710	2310	Close	21.52	22.50	1.253	0.09	0.956	1.198	



Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch	Freq. (MHz)	EUT Flip State	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	
<b>2450MHz</b>																		
	Bluetooth	DH5 1Mbps	Front	10mm	Ant 3	Full	39	2441	Open	7.20	9.00	1.514	76.94	1.300	-0.03	0.039	0.077	
27	Bluetooth	DH5 1Mbps	Back	10mm	Ant 3	Full	39	2441	Open	7.20	9.00	1.514	76.94	1.300	0.08	0.042	<b>0.082</b>	
	Bluetooth	DH5 1Mbps	Left Side	10mm	Ant 3	Full	39	2441	Open	7.20	9.00	1.514	76.94	1.300	0.00	0.040	0.079	
	Bluetooth	DH5 1Mbps	Right Side	10mm	Ant 3	Full	39	2441	Open	7.20	9.00	1.514	76.94	1.300	-	n/a	n/a	
	Bluetooth	DH5 1Mbps	Top Side	10mm	Ant 3	Full	39	2441	Open	7.20	9.00	1.514	76.94	1.300	0.16	0.006	0.012	
	Bluetooth	DH5 1Mbps	Front	10mm	Ant 3	Full	39	2441	Close	7.20	9.00	1.514	76.94	1.300	0.11	0.011	0.022	
	Bluetooth	DH5 1Mbps	Back	10mm	Ant 3	Full	39	2441	Close	7.20	9.00	1.514	76.94	1.300	-0.11	0.035	0.069	
	Bluetooth	DH5 1Mbps	Left Side	10mm	Ant 3	Full	39	2441	Close	7.20	9.00	1.514	76.94	1.300	0.18	0.020	0.039	
	Bluetooth	DH5 1Mbps	Right Side	10mm	Ant 3	Full	39	2441	Close	7.20	9.00	1.514	76.94	1.300	0.13	0.004	0.008	
	Bluetooth	DH5 1Mbps	Top Side	10mm	Ant 3	Full	39	2441	Close	7.20	9.00	1.514	76.94	1.300	0.13	0.003	0.006	
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Ant 3	Full	6	2437	Open	20.80	21.00	1.047	100	1.000	0.02	0.424	0.444	
28	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Ant 3	Full	6	2437	Open	20.80	21.00	1.047	100	1.000	0.16	0.646	<b>0.676</b>	
	WLAN2.4GHz	802.11b 1Mbps	Left Side	10mm	Ant 3	Full	6	2437	Open	20.80	21.00	1.047	100	1.000	0.09	0.518	0.542	
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Ant 3	Full	6	2437	Open	20.80	21.00	1.047	100	1.000	0.08	0.068	0.071	
	WLAN2.4GHz	802.11b 1Mbps	Top Side	10mm	Ant 3	Full	6	2437	Open	20.80	21.00	1.047	100	1.000	0.18	0.034	0.036	
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Ant 3	Full	6	2437	Close	20.80	21.00	1.047	100	1.000	0.01	0.134	0.140	
	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Ant 3	Full	6	2437	Close	20.80	21.00	1.047	100	1.000	0.05	0.396	0.415	
	WLAN2.4GHz	802.11b 1Mbps	Left Side	10mm	Ant 3	Full	6	2437	Close	20.80	21.00	1.047	100	1.000	0.05	0.252	0.264	
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Ant 3	Full	6	2437	Close	20.80	21.00	1.047	100	1.000	0.07	0.087	0.091	
	WLAN2.4GHz	802.11b 1Mbps	Top Side	10mm	Ant 3	Full	6	2437	Close	20.80	21.00	1.047	100	1.000	0.05	0.117	0.123	





15.3 Body Worn Accessory SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	EUT Flip State	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
<b>750MHz</b>																			
	LTE Band 12	10M	QPSK	1	0	-	Front	15mm	Ant 0	Full	23095	707.5	Closed	24.53	25.00	1.114	-0.18	0.107	0.119
29	LTE Band 12	10M	QPSK	1	0	-	Back	15mm	Ant 0	Full	23095	707.5	Closed	24.53	25.00	1.114	-0.02	0.352	<b>0.392</b>
	LTE Band 12	10M	QPSK	25	0	-	Front	15mm	Ant 0	Full	23095	707.5	Closed	23.63	24.00	1.089	0.16	0.090	0.098
	LTE Band 12	10M	QPSK	25	0	-	Back	15mm	Ant 0	Full	23095	707.5	Closed	23.63	24.00	1.089	0.18	0.330	0.359
	LTE Band 14	10M	QPSK	1	0	-	Front	15mm	Ant 0	Full	23330	793	Closed	24.26	25.00	1.186	0.01	0.110	0.130
30	LTE Band 14	10M	QPSK	1	0	-	Back	15mm	Ant 0	Full	23330	793	Closed	24.26	25.00	1.186	-0.05	0.370	<b>0.439</b>
	LTE Band 14	10M	QPSK	25	0	-	Front	15mm	Ant 0	Full	23330	793	Closed	23.29	24.00	1.178	0.04	0.090	0.106
	LTE Band 14	10M	QPSK	25	0	-	Back	15mm	Ant 0	Full	23330	793	Closed	23.29	24.00	1.178	0.06	0.317	0.373
	LTE Band 71	20M	QPSK	1	0	-	Front	15mm	Ant 0	Full	133297	680.5	Closed	24.23	25.00	1.194	-0.16	0.086	0.103
31	LTE Band 71	20M	QPSK	1	0	-	Back	15mm	Ant 0	Full	133297	680.5	Closed	24.23	25.00	1.194	-0.07	0.252	<b>0.301</b>
	LTE Band 71	20M	QPSK	50	0	-	Front	15mm	Ant 0	Full	133297	680.5	Closed	23.15	24.00	1.216	0.15	0.078	0.095
	LTE Band 71	20M	QPSK	50	0	-	Back	15mm	Ant 0	Full	133297	680.5	Closed	23.15	24.00	1.216	0.01	0.233	0.283
<b>835MHz</b>																			
	GSM850	-	-	-	-	GPRS( 4Tx slots)	Front	15mm	Ant 0	Full	189	836.4	Closed	28.41	29.50	1.285	0.03	0.146	0.188
32	GSM850	-	-	-	-	GPRS( 4Tx slots)	Back	15mm	Ant 0	Full	189	836.4	Closed	28.41	29.50	1.285	-0.19	0.590	<b>0.758</b>
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 0	Full	4182	836.4	Closed	23.18	24.50	1.355	0.07	0.118	0.160
33	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 0	Full	4182	836.4	Closed	23.18	24.50	1.355	-0.08	0.412	<b>0.558</b>
	LTE Band 5	10M	QPSK	1	0	-	Front	15mm	Ant 0	Full	20525	836.5	Closed	24.28	25.00	1.180	-0.01	0.132	0.156
34	LTE Band 5	10M	QPSK	1	0	-	Back	15mm	Ant 0	Full	20525	836.5	Closed	24.28	25.00	1.180	0.06	0.557	<b>0.657</b>
	LTE Band 5	10M	QPSK	25	0	-	Front	15mm	Ant 0	Full	20525	836.5	Closed	23.32	24.00	1.169	-0.01	0.094	0.110
	LTE Band 5	10M	QPSK	25	0	-	Back	15mm	Ant 0	Full	20525	836.5	Closed	23.32	24.00	1.169	-0.1	0.430	0.503
<b>1750MHz</b>																			
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 0	Full	1413	1732.6	Closed	23.65	24.50	1.216	-0.13	0.157	0.191
35	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 0	Reduced	1413	1732.6	Closed	20.63	21.50	1.222	-0.02	0.627	<b>0.766</b>
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	27mm	Ant 0	Full	1413	1732.6	Closed	23.65	24.50	1.216	0.03	0.192	0.234
	LTE Band 66	20M	QPSK	1	0	-	Front	15mm	Ant 0	Full	132322	1745	Closed	24.35	25.00	1.161	-0.08	0.142	0.165
	LTE Band 66	20M	QPSK	1	0	-	Back	15mm	Ant 0	Reduced	132322	1745	Closed	21.45	22.00	1.135	0.16	0.568	0.645
	LTE Band 66	20M	QPSK	1	0	-	Back	27mm	Ant 0	Full	132322	1745	Closed	24.35	25.00	1.161	0.03	0.205	0.238
	LTE Band 66	20M	QPSK	50	0	-	Front	15mm	Ant 0	Full	132322	1745	Closed	23.35	24.00	1.161	-0.08	0.170	0.197
36	LTE Band 66	20M	QPSK	50	0	-	Back	15mm	Ant 0	Reduced	132322	1745	Closed	21.44	22.00	1.138	-0.12	0.577	<b>0.656</b>
	LTE Band 66	20M	QPSK	50	0	-	Back	27mm	Ant 0	Full	132322	1745	Closed	23.35	24.00	1.161	0.08	0.174	0.202
<b>1900MHz</b>																			
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Front	15mm	Ant 0	Full	661	1880	Closed	29.02	30.00	1.253	-0.05	0.103	0.129
37	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Back	15mm	Ant 0	Reduced	661	1880	Closed	25.24	27.00	1.500	0.13	0.575	<b>0.862</b>
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Back	15mm	Ant 0	Reduced	512	1850.2	Closed	25.22	27.00	1.507	0.02	0.558	0.841
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Back	15mm	Ant 0	Reduced	810	1909.8	Closed	25.21	27.00	1.510	-0.05	0.541	0.817
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Back	27mm	Ant 0	Full	661	1880	Closed	29.02	30.00	1.253	0.03	0.223	0.279
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 0	Full	9400	1880	Closed	23.68	24.50	1.208	0.18	0.164	0.198
38	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 0	Reduced	9400	1880	Closed	20.45	21.50	1.274	0.05	0.762	<b>0.970</b>
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 0	Reduced	9262	1852.4	Closed	20.44	21.50	1.276	0.07	0.725	0.925
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 0	Reduced	9538	1907.6	Closed	20.43	21.50	1.279	0.15	0.718	0.919
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	27mm	Ant 0	Full	9400	1880	Closed	23.68	24.50	1.208	0.03	0.208	0.251
	LTE Band 2	20M	QPSK	1	0	-	Front	15mm	Ant 0	Full	18900	1880	Closed	24.56	25.00	1.107	-0.18	0.154	0.170
	LTE Band 2	20M	QPSK	1	0	-	Back	15mm	Ant 0	Reduced	18900	1880	Closed	21.55	22.00	1.109	-0.05	0.577	0.640
	LTE Band 2	20M	QPSK	1	0	-	Back	27mm	Ant 0	Full	18900	1880	Closed	24.56	25.00	1.107	0.02	0.188	0.208
	LTE Band 2	20M	QPSK	50	0	-	Front	15mm	Ant 0	Full	18900	1880	Closed	23.51	24.00	1.119	-0.03	0.179	0.200
39	LTE Band 2	20M	QPSK	50	0	-	Back	15mm	Ant 0	Reduced	18900	1880	Closed	21.48	22.00	1.127	0.04	0.607	<b>0.684</b>
	LTE Band 2	20M	QPSK	50	0	-	Back	27mm	Ant 0	Full	18900	1880	Closed	23.51	24.00	1.119	0.15	0.167	0.187
<b>2300MHz</b>																			
	LTE Band 30	10M	QPSK	1	0	-	Front	15mm	Ant 0	Full	27710	2310	Closed	23.35	24.50	1.303	-0.02	0.139	0.181
	LTE Band 30	10M	QPSK	1	0	-	Back	15mm	Ant 0	Reduced	27710	2310	Closed	20.32	21.50	1.312	-0.17	0.457	0.600



	LTE Band 30	10M	QPSK	1	0	-	Back	27mm	Ant 0	Full	27710	2310	Closed	23.35	24.50	1.303	0.11	0.327	0.426
	LTE Band 30	10M	QPSK	25	0	-	Front	15mm	Ant 0	Full	27710	2310	Closed	22.27	24.50	1.671	-0.06	0.149	0.249
40	LTE Band 30	10M	QPSK	25	0	-	Back	15mm	Ant 0	Reduced	27710	2310	Closed	20.30	21.50	1.318	-0.03	0.469	0.618
	LTE Band 30	10M	QPSK	25	0	-	Back	27mm	Ant 0	Full	27710	2310	Closed	22.27	23.50	1.327	0.09	0.267	0.354

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	EUT Flip State	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
<b>2450MHz</b>																	
	Bluetooth	DH5 1Mbps	Front	15mm	Ant 3	Full	39	2441	Closed	7.20	9.00	1.514	76.94	1.300	0.05	0.004	0.008
41	Bluetooth	DH5 1Mbps	Back	15mm	Ant 3	Full	39	2441	Closed	7.20	9.00	1.514	76.94	1.300	0.09	0.011	0.022
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Ant 3	Full	6	2437	Closed	20.80	21.00	1.047	100	1.000	-0.12	0.039	0.041
42	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 3	Full	6	2437	Closed	20.80	21.00	1.047	100	1.000	0.05	0.303	0.317

15.4 Product specific 10g SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	EUT Flip State	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
<b>1750MHz</b>																			
43	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	Reduced	1413	1732.6	Open	20.63	21.50	1.222	0.05	1.960	2.395
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	Reduced	1312	1712.4	Open	20.56	21.50	1.242	-0.11	1.910	2.372
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	Reduced	1513	1752.6	Open	20.53	21.50	1.250	0.03	1.850	2.313
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	29mm	Ant 0	Full	1413	1732.6	Open	23.65	24.50	1.216	0.06	0.164	0.199
<b>1900MHz</b>																			
44	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Back	0mm	Ant 0	Reduced	661	1880	Open	25.24	27.00	1.500	0.16	1.870	2.804
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Back	0mm	Ant 0	Reduced	512	1850.2	Open	25.22	27.00	1.507	0.18	1.840	2.772
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Back	0mm	Ant 0	Reduced	810	1909.8	Open	25.21	27.00	1.510	-0.06	1.680	2.537
	GSM1900	-	-	-	-	GPRS( 2Tx slots)	Back	29mm	Ant 0	Full	661	1880	Open	29.02	30.00	1.253	0.09	0.030	0.038
45	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	Reduced	9400	1880	Open	20.45	21.50	1.274	0.07	2.530	3.222
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	Reduced	9262	1852.4	Open	20.44	21.50	1.276	-0.04	2.370	3.025
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	Reduced	9538	1907.6	Open	20.43	21.50	1.279	-0.14	2.450	3.134
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	29mm	Ant 0	Full	9400	1880	Open	23.68	24.50	1.208	0.11	0.125	0.151
46	LTE Band 2	20M	QPSK	1	0	-	Back	0mm	Ant 0	Reduced	18900	1880	Open	21.55	22.00	1.109	-0.12	2.400	2.662
	LTE Band 2	20M	QPSK	1	0	-	Back	0mm	Ant 0	Reduced	18700	1860	Open	21.47	22.00	1.130	-0.05	2.250	2.542
	LTE Band 2	20M	QPSK	1	0	-	Back	0mm	Ant 0	Reduced	19100	1900	Open	21.53	22.00	1.114	-0.11	2.310	2.574
	LTE Band 2	20M	QPSK	1	0	-	Back	29mm	Ant 0	Full	18900	1880	Open	24.56	25.00	1.107	0.03	0.056	0.062
	LTE Band 2	20M	QPSK	50	0	-	Back	0mm	Ant 0	Reduced	18900	1880	Open	21.48	22.00	1.127	-0.05	2.330	2.626
	LTE Band 2	20M	QPSK	50	0	-	Back	0mm	Ant 0	Reduced	18700	1860	Open	21.40	22.00	1.148	-0.09	2.190	2.514
	LTE Band 2	20M	QPSK	50	0	-	Back	0mm	Ant 0	Reduced	19100	1900	Open	21.46	22.00	1.132	-0.11	2.220	2.514
	LTE Band 2	20M	QPSK	100	0	-	Back	0mm	Ant 0	Reduced	18900	1880	Open	21.44	22.00	1.138	0.03	2.190	2.491
<b>2300MHz</b>																			
	LTE Band 30	10M	QPSK	1	0	-	Front	0mm	Ant 0	Reduced	27710	2310	Open	20.32	21.50	1.312	-0.1	1.450	1.903
47	LTE Band 30	10M	QPSK	1	0	-	Back	0mm	Ant 0	Reduced	27710	2310	Open	20.32	21.50	1.312	0.09	1.850	2.428
	LTE Band 30	10M	QPSK	1	0	-	Front	18mm	Ant 0	Full	27710	2310	Open	23.35	24.50	1.303	0.02	0.232	0.302
	LTE Band 30	10M	QPSK	1	0	-	Back	29mm	Ant 0	Full	27710	2310	Open	23.35	24.50	1.303	0.02	0.071	0.093
	LTE Band 30	10M	QPSK	25	0	-	Front	0mm	Ant 0	Reduced	27710	2310	Open	20.30	21.50	1.318	-0.15	1.430	1.885
	LTE Band 30	10M	QPSK	25	0	-	Back	0mm	Ant 0	Reduced	27710	2310	Open	20.30	21.50	1.318	0.03	1.790	2.360
	LTE Band 30	10M	QPSK	50	0	-	Back	0mm	Ant 0	Reduced	27710	2310	Open	20.20	21.50	1.349	0.09	1.720	2.320

**15.1 Repeated SAR Measurement**

<1g>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	EUT Flip State	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	GSM850	-	-	-	-	GPRS( 4Tx slots)	Back	10mm	Ant 0	Reduced	189	836.4	Close	28.41	29.50	1.285	-0.15	0.812	1	1.044
2nd	GSM850	-	-	-	-	GPRS( 4Tx slots)	Back	10mm	Ant 0	Reduced	189	836.4	Close	28.41	29.50	1.285	0.08	0.784	1.036	1.008
1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	Reduced	1513	1752.6	Close	20.53	21.50	1.250	-0.06	0.828	1	1.035
2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 0	Reduced	1513	1752.6	Close	20.53	21.50	1.250	-0.06	0.813	1.019	1.016
1st	LTE Band 30	10M	QPSK	25	0	-	Back	10mm	Ant 0	Reduced	27710	2310	Open	21.58	22.50	1.236	-0.05	1.100	1	1.360
2nd	LTE Band 30	10M	QPSK	25	0	-	Back	10mm	Ant 0	Reduced	27710	2310	Open	21.58	22.50	1.236	-0.08	1.030	1.068	1.273

<10g>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	EUT Flip State	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Ratio	Reported 10g SAR (W/kg)
1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	Reduced	9400	1880	Open	20.45	21.50	1.274	-	-	0.07	2.530	1	3.222
2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	Reduced	9400	1880	Open	20.45	21.50	1.274	-	-	0.08	2.460	1.028	3.133

**General Note:**

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is  $\geq 0.8$ W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is  $\leq 1.2$  and the measured SAR  $< 1.45$ W/kg, only one repeated measurement is required.
3. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. The ratio is the difference in percentage between original and repeated *measured* SAR.
5. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

## 16. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	Portable Handset			
		Head	Body-worn	Hotspot	Product specific 10g SAR
1.	WWAN + 2.4GHz WLAN	Yes	Yes	Yes	Yes
2.	WWAN + Bluetooth	Yes	Yes	Yes	Yes

### General Note:

1. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), and LTE supports VoLTE function.
2. EUT will choose each GSM, WCDMA, and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
3. This device WLAN 2.4GHz supports hotspot operation and Bluetooth support tethering applications.
4. WLAN 2.4GHz and Bluetooth share the same antenna, and cannot transmit simultaneously.
5. For distance SAR and non-distance SAR always chose higher SAR to do co-located analysis.
6. The reported SAR summation is calculated based on the same configuration and test position
7. Per KDB 447498 D01, simultaneous transmission SAR is compliant if,
  - i) 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/kg.
  - ii)  $SPLSR = (SAR1 + SAR2)^{1.5} / (\text{min. separation distance, mm})$ , and the peak separation distance is determined from the square root of  $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$ , where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
  - iii) If  $SPLSR \leq 0.04$  for 1g SAR and  $SPLSR \leq 0.10$  for 10g SAR, simultaneously transmission SAR measurement is not necessary.
  - iv) Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg and 10g SAR < 4.0W/kg.
  - v) The SPLSR calculated results please refer to section 16.5.

**16.1 Head Exposure Conditions**

WWAN Band		Exposure Position	1	3	17	1+3	1+17
			WWAN	WLAN2.4GHz	Bluetooth	Summed	Summed
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
GSM	GSM850	Right Cheek	0.557	0.236	0.022	0.79	0.58
		Right Tilted	0.319	0.053		0.37	0.32
		Left Cheek	0.611	0.468	0.033	1.08	0.64
		Left Tilted	0.319	0.076		0.40	0.32
	GSM1900	Right Cheek	0.211	0.236	0.022	0.45	0.23
		Right Tilted	0.065	0.053		0.12	0.07
		Left Cheek	0.221	0.468	0.033	0.69	0.25
		Left Tilted	0.079	0.076		0.16	0.08
WCDMA	WCDMA II	Right Cheek	0.169	0.236	0.022	0.41	0.19
		Right Tilted	0.095	0.053		0.15	0.10
		Left Cheek	0.203	0.468	0.033	0.67	0.24
		Left Tilted	0.095	0.076		0.17	0.10
	WCDMA IV	Right Cheek	0.261	0.236	0.022	0.50	0.28
		Right Tilted	0.215	0.053		0.27	0.22
		Left Cheek	0.375	0.468	0.033	0.84	0.41
		Left Tilted	0.247	0.076		0.32	0.25
	WCDMA V	Right Cheek	0.435	0.236	0.022	0.67	0.46
		Right Tilted	0.268	0.053		0.32	0.27
		Left Cheek	0.557	0.468	0.033	1.03	0.59
		Left Tilted	0.278	0.076		0.35	0.28
LTE	LTE Band 2	Right Cheek	0.271	0.236	0.022	0.51	0.29
		Right Tilted	0.135	0.053		0.19	0.14
		Left Cheek	0.383	0.468	0.033	0.85	0.42
		Left Tilted	0.144	0.076		0.22	0.14
	LTE Band 5	Right Cheek	0.392	0.236	0.022	0.63	0.41
		Right Tilted	0.228	0.053		0.28	0.23
		Left Cheek	0.433	0.468	0.033	0.90	0.47
		Left Tilted	0.238	0.076		0.31	0.24
	LTE Band 12	Right Cheek	0.283	0.236	0.022	0.52	0.31
		Right Tilted	0.110	0.053		0.16	0.11
		Left Cheek	0.197	0.468	0.033	0.67	0.23
		Left Tilted	0.109	0.076		0.19	0.11
	LTE Band 14	Right Cheek	0.333	0.236	0.022	0.57	0.36
		Right Tilted	0.191	0.053		0.24	0.19
		Left Cheek	0.317	0.468	0.033	0.79	0.35
		Left Tilted	0.175	0.076		0.25	0.18
	LTE Band 30	Right Cheek	0.367	0.236	0.022	0.60	0.39
		Right Tilted	0.212	0.053		0.27	0.21
		Left Cheek	0.238	0.468	0.033	0.71	0.27
		Left Tilted	0.195	0.076		0.27	0.20
	LTE Band 66	Right Cheek	0.275	0.236	0.022	0.51	0.30
		Right Tilted	0.206	0.053		0.26	0.21
		Left Cheek	0.319	0.468	0.033	0.79	0.35
		Left Tilted	0.247	0.076		0.32	0.25
	LTE Band 71	Right Cheek	0.184	0.236	0.022	0.42	0.21
		Right Tilted	0.085	0.053		0.14	0.09
		Left Cheek	0.177	0.468	0.033	0.65	0.21
		Left Tilted	0.081	0.076		0.16	0.08



16.2 Hotspot Exposure Conditions

<Flip Opened>

WWAN Band		Exposure Position	1	3	17	1+3	1+17	Case No
			WWAN	WLAN2.4GHz	Bluetooth	Summed	Summed	
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
GSM	GSM850	Front	0.667	0.444	0.077	1.11	0.74	
		Back	0.781	0.676	0.082	1.46	0.86	
		Left side	0.443	0.542	0.079	0.99	0.52	
		Right side	0.194	0.071		0.27	0.19	
		Top side		0.036	0.012	0.04	0.01	
		Bottom side	0.230			0.23	0.23	
	GSM1900	Front	0.356	0.444	0.077	0.80	0.43	
		Back	0.649	0.676	0.082	1.33	0.73	
		Left side	0.181	0.542	0.079	0.72	0.26	
		Right side	0.099	0.071		0.17	0.10	
		Top side		0.036	0.012	0.04	0.01	
		Bottom side	0.274			0.27	0.27	
WCDMA	WCDMA II	Front	0.470	0.444	0.077	0.91	0.55	
		Back	0.757	0.676	0.082	1.43	0.84	
		Left side	0.199	0.542	0.079	0.74	0.28	
		Right side	0.145	0.071		0.22	0.15	
		Top side		0.036	0.012	0.04	0.01	
		Bottom side	0.333			0.33	0.33	
	WCDMA IV	Front	0.508	0.444	0.077	0.95	0.59	
		Back	0.639	0.676	0.082	1.32	0.72	
		Left side	0.230	0.542	0.079	0.77	0.31	
		Right side	0.155	0.071		0.23	0.16	
		Top side		0.036	0.012	0.04	0.01	
		Bottom side	0.225			0.23	0.23	
	WCDMA V	Front	0.539	0.444	0.077	0.98	0.62	
		Back	0.660	0.676	0.082	1.34	0.74	
		Left side	0.393	0.542	0.079	0.94	0.47	
		Right side	0.201	0.071		0.27	0.20	
		Top side		0.036	0.012	0.04	0.01	
		Bottom side	0.278			0.28	0.28	
LTE	LTE Band 2	Front	0.469	0.444	0.077	0.91	0.55	
		Back	0.719	0.676	0.082	1.40	0.80	
		Left side	0.205	0.542	0.079	0.75	0.28	
		Right side	0.144	0.071		0.22	0.14	
		Top side		0.036	0.012	0.04	0.01	
		Bottom side	0.328			0.33	0.33	
	LTE Band 5	Front	0.466	0.444	0.077	0.91	0.54	
		Back	0.498	0.676	0.082	1.17	0.58	
		Left side	0.325	0.542	0.079	0.87	0.40	
		Right side	0.166	0.071		0.24	0.17	
		Top side		0.036	0.012	0.04	0.01	
		Bottom side	0.138			0.14	0.14	
	LTE Band 12	Front	0.608	0.444	0.077	1.05	0.69	
		Back	0.630	0.676	0.082	1.31	0.71	
		Left side	0.357	0.542	0.079	0.90	0.44	
		Right side	0.178	0.071		0.25	0.18	
		Top side		0.036	0.012	0.04	0.01	
		Bottom side	0.109			0.11	0.11	
	LTE Band 14	Front	0.436	0.444	0.077	0.88	0.51	
		Back	0.509	0.676	0.082	1.19	0.59	

		Left side	0.261	0.542	0.079	0.80	0.34	
		Right side	0.125	0.071		0.20	0.13	
		Top side		0.036	0.012	0.04	0.01	
		Bottom side	0.128			0.13	0.13	
	LTE Band 30	Front	1.055	0.444	0.077	1.50	1.13	
		Back	1.360	0.676	0.082	2.04	1.44	Case 1
		Left side	0.105	0.542	0.079	0.65	0.18	
		Right side	0.567	0.071		0.64	0.57	
		Top side		0.036	0.012	0.04	0.01	
		Bottom side	0.512			0.51	0.51	
	LTE Band 66	Front	0.419	0.444	0.077	0.86	0.50	
		Back	0.473	0.676	0.082	1.15	0.56	
		Left side	0.189	0.542	0.079	0.73	0.27	
		Right side	0.109	0.071		0.18	0.11	
		Top side		0.036	0.012	0.04	0.01	
		Bottom side	0.181			0.18	0.18	
	LTE Band 71	Front	0.444	0.444	0.077	0.89	0.52	
		Back	0.501	0.676	0.082	1.18	0.58	
		Left side	0.300	0.542	0.079	0.84	0.38	
		Right side	0.170	0.071		0.24	0.17	
		Top side		0.036	0.012	0.04	0.01	
Bottom side		0.146			0.15	0.15		



<Flip Closed>

WWAN Band	Exposure Position	1	3	17	1+3	1+17	Case No
		WWAN	WLAN2.4GHz	Bluetooth	Summed	Summed	
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
GSM850	Front	0.238	0.140	0.022	0.38	0.26	
	Back	1.044	0.415	0.069	1.46	1.11	
	Left side	0.568	0.264	0.039	0.83	0.61	
	Right side	0.338	0.091	0.008	0.43	0.35	
	Top side		0.123	0.006	0.12	0.01	
	Bottom side	0.188			0.19	0.19	
GSM1900	Front	0.109	0.140	0.022	0.25	0.13	
	Back	0.729	0.415	0.069	1.14	0.80	
	Left side	0.139	0.264	0.039	0.40	0.18	
	Right side	0.156	0.091	0.008	0.25	0.16	
	Top side		0.123	0.006	0.12	0.01	
	Bottom side	0.276			0.28	0.28	
WCDMA II	Front	0.117	0.140	0.022	0.26	0.14	
	Back	0.854	0.415	0.069	1.27	0.92	
	Left side	0.137	0.264	0.039	0.40	0.18	
	Right side	0.210	0.091	0.008	0.30	0.22	
	Top side		0.123	0.006	0.12	0.01	
	Bottom side	0.349			0.35	0.35	
WCDMA IV	Front	0.143	0.140	0.022	0.28	0.17	
	Back	1.035	0.415	0.069	1.45	1.10	
	Left side	0.160	0.264	0.039	0.42	0.20	
	Right side	0.164	0.091	0.008	0.26	0.17	
	Top side		0.123	0.006	0.12	0.01	
	Bottom side	0.261			0.26	0.26	
WCDMA V	Front	0.197	0.140	0.022	0.34	0.22	
	Back	0.916	0.415	0.069	1.33	0.99	
	Left side	0.469	0.264	0.039	0.73	0.51	
	Right side	0.416	0.091	0.008	0.51	0.42	
	Top side		0.123	0.006	0.12	0.01	
	Bottom side	0.130			0.13	0.13	
LTE Band 2	Front	0.121	0.140	0.022	0.26	0.14	
	Back	0.775	0.415	0.069	1.19	0.84	
	Left side	0.138	0.264	0.039	0.40	0.18	
	Right side	0.209	0.091	0.008	0.30	0.22	
	Top side		0.123	0.006	0.12	0.01	
	Bottom side	0.325			0.33	0.33	
LTE Band 5	Front	0.292	0.140	0.022	0.43	0.31	
	Back	0.840	0.415	0.069	1.26	0.91	
	Left side	0.563	0.264	0.039	0.83	0.60	





	Right side	0.484	0.091	0.008	0.58	0.49	
	Top side		0.123	0.006	0.12	0.01	
	Bottom side	0.136			0.14	0.14	
LTE Band 12	Front	0.168	0.140	0.022	0.31	0.19	
	Back	0.644	0.415	0.069	1.06	0.71	
	Left side	0.263	0.264	0.039	0.53	0.30	
	Right side	0.224	0.091	0.008	0.32	0.23	
	Top side		0.123	0.006	0.12	0.01	
	Bottom side	0.193			0.19	0.19	
LTE Band 14	Front	0.342	0.140	0.022	0.48	0.36	
	Back	0.700	0.415	0.069	1.12	0.77	
	Left side	0.470	0.264	0.039	0.73	0.51	
	Right side	0.332	0.091	0.008	0.42	0.34	
	Top side		0.123	0.006	0.12	0.01	
	Bottom side	0.326			0.33	0.33	
LTE Band 30	Front	0.174	0.140	0.022	0.31	0.20	
	Back	1.304	0.415	0.069	1.72	1.37	Case 2
	Left side	0.159	0.264	0.039	0.42	0.20	
	Right side	0.496	0.091	0.008	0.59	0.50	
	Top side		0.123	0.006	0.12	0.01	
	Bottom side	0.313			0.31	0.31	
LTE Band 66	Front	0.104	0.140	0.022	0.24	0.13	
	Back	0.670	0.415	0.069	1.09	0.74	
	Left side	0.137	0.264	0.039	0.40	0.18	
	Right side	0.133	0.091	0.008	0.22	0.14	
	Top side		0.123	0.006	0.12	0.01	
	Bottom side	0.194			0.19	0.19	
LTE Band 71	Front	0.143	0.140	0.022	0.28	0.17	
	Back	0.506	0.415	0.069	0.92	0.58	
	Left side	0.217	0.264	0.039	0.48	0.26	
	Right side	0.161	0.091	0.008	0.25	0.17	
	Top side		0.123	0.006	0.12	0.01	
	Bottom side	0.242			0.24	0.24	

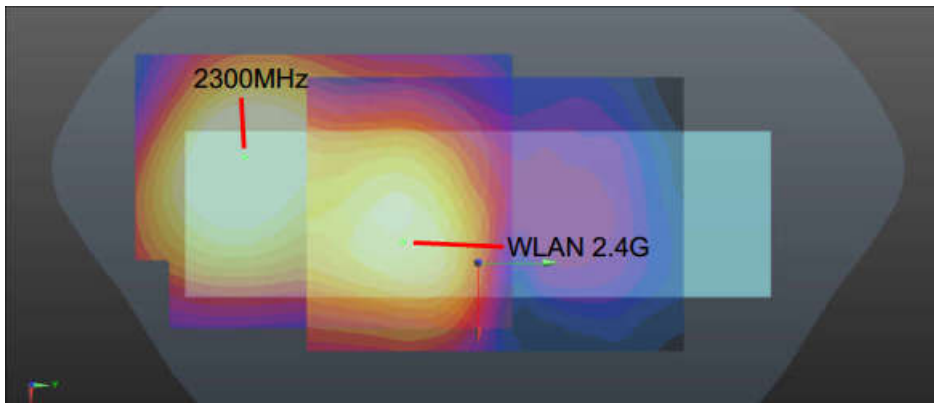
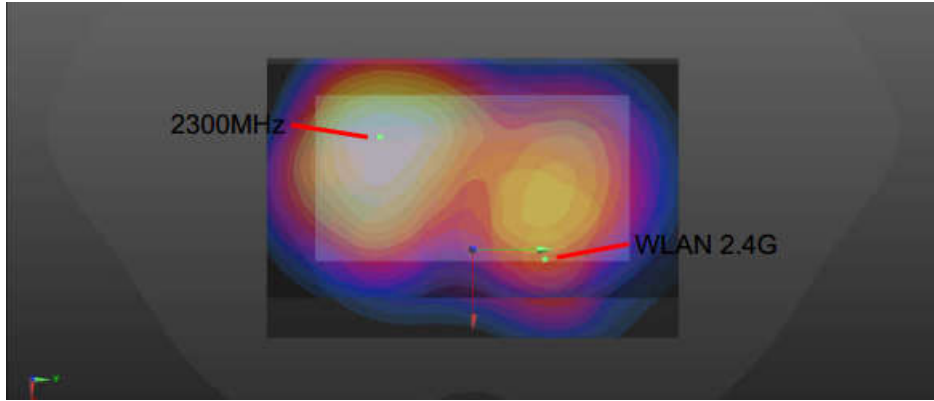
**16.3 Body-Worn Accessory Exposure Conditions**

WWAN Band		Exposure Position	1	3	17	1+3	1+17
			WWAN	WLAN2.4GHz	Bluetooth	Summed	Summed
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
GSM	GSM850	Front	0.188	0.041	0.008	0.23	0.20
		Back	0.758	0.317	0.022	1.08	0.76
	GSM1900	Front	0.129	0.041	0.008	0.17	0.13
		Back	0.862	0.317	0.022	1.18	0.86
WCDMA	WCDMA II	Front	0.198	0.041	0.008	0.24	0.20
		Back	0.970	0.317	0.022	1.29	0.97
	WCDMA IV	Front	0.191	0.041	0.008	0.23	0.19
		Back	0.766	0.317	0.022	1.08	0.77
	WCDMA V	Front	0.160	0.041	0.008	0.20	0.16
		Back	0.558	0.317	0.022	0.88	0.56
LTE	LTE Band 2	Front	0.200	0.041	0.008	0.24	0.20
		Back	0.684	0.317	0.022	1.00	0.68
	LTE Band 5	Front	0.156	0.041	0.008	0.20	0.16
		Back	0.657	0.317	0.022	0.97	0.66
	LTE Band 12	Front	0.119	0.041	0.008	0.16	0.12
		Back	0.392	0.317	0.022	0.71	0.39
	LTE Band 14	Front	0.130	0.041	0.008	0.17	0.13
		Back	0.439	0.317	0.022	0.76	0.44
	LTE Band 30	Front	0.249	0.041	0.008	0.29	0.25
		Back	0.618	0.317	0.022	0.94	0.62
	LTE Band 66	Front	0.197	0.041	0.008	0.24	0.20
		Back	0.656	0.317	0.022	0.97	0.66
	LTE Band 71	Front	0.103	0.041	0.008	0.14	0.10
		Back	0.301	0.317	0.022	0.62	0.30

**16.4 SPLSR Evaluation and Analysis**

**General Note:**

- When standalone SAR is measured for both antennas in the pair, the peak location separation distance is computed by the square root of  $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$ , where  $(x1, y1, z1)$  and  $(x2, y2, z2)$  are the coordinates in the area scans or extrapolated peak SAR locations in the zoom scans, as appropriate.
- $SPLSR = (SAR1 + SAR2)1.5 / (\text{min. separation distance, mm})$ . If  $SPLSR \leq 0.04$  for 1g SAR, simultaneously transmission SAR measurement is not necessary.



**<Flip Opened>**

Case No	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 1	LTE Band 30	Back	1.36	10mm	-0.0266	-0.0336	-0.207	102.9	2.04	0.03	Not required
	WLAN2.4GHz		0.676	10mm	0.058	0.025	-0.207				

**<Flip Closed>**

Case No	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 2	LTE Band 30	Back	1.304	10mm	-0.0394	-0.0252	-0.208	66.1	1.72	0.03	Not required
	WLAN2.4GHz		0.415	10mm	-0.0016	0.029	-0.207				

**Test Engineer :** Hank Huang, Kevin Xu, David Dai, Bin He



## **17. Uncertainty Assessment**

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is  $< 1.5$  W/kg and the measured 10-g SAR within a frequency band is  $< 3.75$  W/kg. The expanded SAR measurement uncertainty must be  $\leq 30\%$ , for a confidence interval of  $k = 2$ . If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg and highest measured 10-g SAR is less 3.75W/kg. Therefore, the measurement uncertainty table is not required in this report.

## **18. References**

- [1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”
- [2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992
- [3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013
- [4] SPEAG DASY System Handbook
- [5] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.
- [6] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015.
- [7] FCC KDB 648474 D04 v01r03, “SAR Evaluation Considerations for Wireless Handsets”, Oct 2015.
- [8] FCC KDB 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, Oct 2015
- [9] FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015
- [10] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.
- [11] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.
- [12] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.
- [13] FCC KDB 616217 D04 v01r02, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, Oct 2015

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