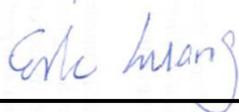


FCC SAR Test Report

APPLICANT : Sony Mobile Communications Inc.
BRAND NAME : Sony
FCC ID : PY7-PM0931
STANDARD : FCC 47 CFR Part 2 (2.1093)
ANSI/IEEE C95.1-1992
IEEE 1528-2013

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

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



Reviewed by: Eric Huang / Deputy Manager



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.)



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1. Statement of Compliance

Applicant Name	Sony Mobile Communications Inc.		
EUT Description	GSM/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac, and NFC		
Brand Name	Sony		
FCC ID	PY7-PM0931		
HW Version	A		
SW Version	34.0.A.0.534		
RF Exposure Conditions	Equipment Class		
	Licensed	DTS	U-NII
Head (1g SAR W/kg)	0.97	0.62	0.71
Body-Worn (1g SAR W/kg)	0.91	0.06	0.05
Wireless Router (1g SAR W/kg)	0.97	0.19	
Highest Simultaneous Transmission (1g SAR W/kg)	Head: 1.36 Body-worn: 1.16 Hotspot: 1.08	Head: 1.26 Body-worn: 0.97 Hotspot: 1.08	Head: 1.36 Body-worn: 1.16 Hotspot: NA
Date Tested	2016/03/11 ~ 2016/03/20		
Test Result	Pass		
Remark:			
<ol style="list-style-type: none"> This device 2.4GHz WLAN supports Hotspot operation, and 2.4GHz / 5.2GHz / 5.3GHz / 5.5GHz / 5.8GHz WLAN supports WiFi Direct. GSM1900, WCDMA B2 / B4, and LTE B4 / B2 / B7 / B41 power reduction is activated in hotspot mode. LTE Band 5 / 17 SAR test was covered by LTE Band 26 / 12, due to the output power level and have duplicate frequency range. 			

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.



2. Administration Data

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

Applicant	
Company Name	Sony Mobile Communications Inc.
Address	4-12-3 Higashi-Shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan

Manufacturer	
Company Name	Sony Mobile Communications Inc.
Address	4-12-3 Higashi-Shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan

3. Guidance Standard

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

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- 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



4. Equipment Under Test (EUT) Information

4.1 General Information

Wireless Technologies	Frequency	Operating Mode	
GSM	850 1900	<ul style="list-style-type: none"> · GSM Voice · GPRS (GMSK) · EDGE (8PSK) 	Multi-Slot Class: Class 33
	Does device support dual transfer mode? (Yes)		
W-CDMA (UMTS)	Band 2 Band 4 Band 5	<ul style="list-style-type: none"> · AMR / RMC 12.2Kbps · HSDPA · HSUPA · DC-HSDPA 	
LTE (FDD / TDD)	Band 2 Band 4 Band 5 Band 7 Band 12 Band 17 Band 26 Band 41	<ul style="list-style-type: none"> · QPSK · 16QAM · Rel 10 Carrier Aggregation Downlink only (the detail refer to page58) 	
WiFi	2.4GHz: 2412 MHz ~ 2472 MHz	<ul style="list-style-type: none"> · 11b · 11g · 11n (HT20) 	
	5GHz: 5.2GHz: 5180 MHz ~ 5240 MHz 5.3GHz: 5260 MHz ~ 5320 MHz 5.5GHz: 5500 MHz ~ 5720 MHz 5.8GHz: 5745 MHz ~ 5825 MHz	<ul style="list-style-type: none"> · 11a · 11n (HT20) · 11n (HT40) · 11ac (VHT20) · 11ac (VHT40) · 11ac (VHT80) 	
Bluetooth	2.4GHz	Version 4.2 with LE	
NFC	13.56MHz	ASK	



4.2 Device Serial Number

Exposure Position	SN
GSM	CB5129YTTX CB5129YTTC
UMTS	CB5129YTU3
LTE	CB5129YTU1 CB5129YTUA CB5129YTTY CB5129YTUT
For Hotspot Power Reduction	CB5129YTU7 CB5129YTTM
2.4GHz WLAN	CB5129YTSS CB5129YTT9
5GHz WLAN	CB5129YTSU CB5129YTVA
GSM Conducted	CB5129YK5S
UMTS Conducted	CB5129YK5S
LTE Conducted	CB5129YK5V
For Hotspot Power Reduction Conducted	CB5129YK4X
WiFi Conducted	CB5129YK5X

Note: Several samples were used with identical hardware to support SAR testing. The manufacturer has confirmed that the device tested gave the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.



5. RF Exposure Limits

5.1 Uncontrolled Environment

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

5.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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



6. Specific Absorption Rate (SAR)

6.1 Introduction

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

6.2 SAR Definition

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

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

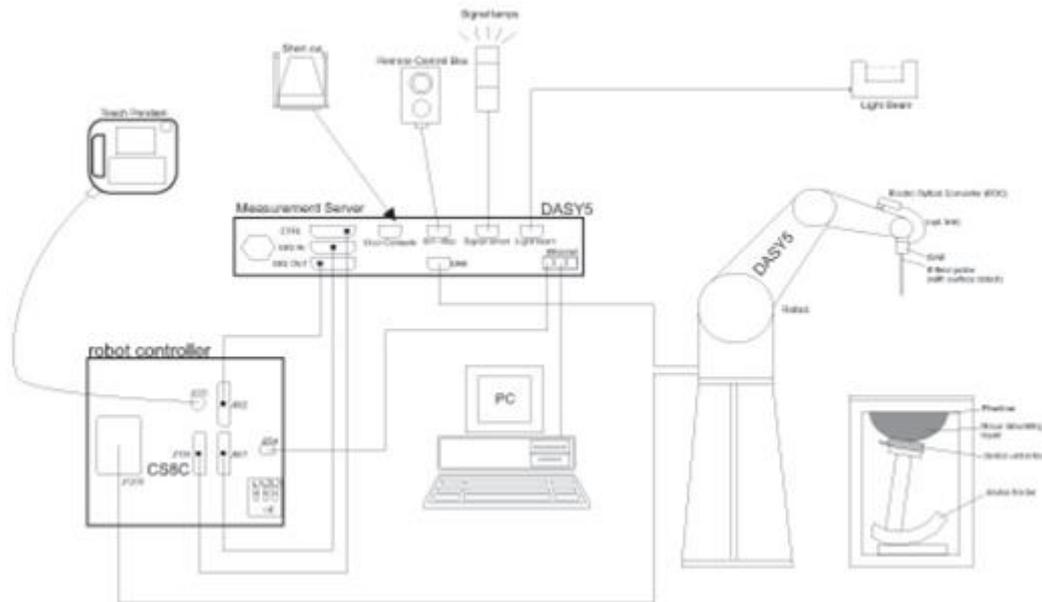
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

7. System Description and Setup

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



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

7.1 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.

<ES3DV3 Probe>

Construction	Symmetric design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – 4 GHz; Linearity: ± 0.2 dB (30 MHz – 4 GHz)	
Directivity	± 0.2 dB in TSL (rotation around probe axis) ± 0.3 dB in TSL (rotation normal to probe axis)	
Dynamic Range	5 μ W/g – >100 mW/g; Linearity: ± 0.2 dB	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 3.9 mm (body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm	

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – >6 GHz Linearity: ± 0.2 dB (30 MHz – 6 GHz)	
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 μ W/g – >100 mW/g Linearity: ± 0.2 dB (noise: typically <1 μ W/g)	
Dimensions	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	

7.2 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.



Fig 5.1 Photo of DAE

7.3 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	
Filling Volume	Approx. 25 liters	
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
Measurement Areas	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>

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

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

7.4 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

8. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

8.1 Spatial Peak SAR Evaluation

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

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

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

- (a) Extraction of the measured data (grid and values) from the Zoom Scan
- (b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
- (c) Generation of a high-resolution mesh within the measured volume
- (d) Interpolation of all measured values 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

8.2 Power Reference Measurement

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

8.3 Area Scan

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

Area scan parameters extracted from FCC KDB 865664 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.	

8.4 Zoom Scan

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

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

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

8.5 Volume Scan Procedures

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

8.6 Power Drift Monitoring

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



9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1012	May. 28, 2015	May. 27, 2016
SPEAG	835MHz System Validation Kit	D835V2	4d092	Jun. 23, 2015	Jun. 22, 2016
SPEAG	1750MHz System Validation Kit	D1750V2	1068	Nov. 23, 2015	Nov. 22, 2016
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Oct. 22, 2015	Oct. 21, 2016
SPEAG	2450MHz System Validation Kit	D2450V2	736	Aug. 20, 2015	Aug. 19, 2016
SPEAG	2600MHz System Validation Kit	D2600V2	1008	Aug. 19, 2015	Aug. 18, 2016
SPEAG	5GHz System Validation Kit	D5GHZV2	1006	Oct. 06, 2015	Oct. 05, 2016
SPEAG	Data Acquisition Electronics	DAE3	495	May. 22, 2015	May. 21, 2016
SPEAG	Data Acquisition Electronics	DAE4	778	Feb. 18, 2016	Feb. 17, 2017
SPEAG	Data Acquisition Electronics	DAE4	1399	Nov. 23, 2015	Nov. 22, 2016
SPEAG	Dosimetric E-Field Probe	EX3DV4	3925	May. 27, 2015	May. 26, 2016
SPEAG	Dosimetric E-Field Probe	ES3DV3	3270	Sep. 28, 2015	Sep. 27, 2016
SPEAG	Dosimetric E-Field Probe	EX3DV4	3955	Nov. 24, 2015	Nov. 23, 2016
WonDer	Thermometer	WD-5015	TM642	Oct. 16, 2015	Oct. 15, 2016
WonDer	Thermometer	WD-5015	TM281	Oct. 16, 2015	Oct. 15, 2016
Wisewind	Thermometer	HTC-1	TM560	Oct. 16, 2015	Oct. 15, 2016
Anritsu	Radio Communication Analyzer	MT8820C	6201341950	Dec. 18, 2015	Dec. 17, 2016
Agilent	Wireless Communication Test Set	E5515C	MY50266977	May. 14, 2015	May. 13, 2016
Agilent	Wireless Communication Test Set	E5515C	MY48360820	Jan. 11, 2016	Jan. 10, 2017
R&S	Radio communication Tester	CMW500	149638	Aug. 04, 2015	Aug. 03, 2016
SPEAG	Device Holder	N/A	N/A	N/A	N/A
R&S	Signal Generator	MG3710A	6201502524	Dec. 18, 2015	Dec. 17, 2016
Agilent	ENA Network Analyzer	E5071C	MY46316648	Jan. 12, 2016	Jan. 11, 2017
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Jul. 21, 2015	Jul. 20, 2016
LINE SEIKI	Digital Thermometer	LKMelectronic	DTM3000SPEZIAL/90900	Aug. 26, 2015	Aug. 25, 2016
Anritsu	Power Meter	ML2495A	1419002	May. 13, 2015	May. 12, 2016
Anritsu	Power Sensor	MA2411B	1339124	May. 13, 2015	May. 12, 2016
Agilent	Spectrum Analyzer	E4408B	MY44211028	Aug. 24, 2015	Aug. 23, 2016
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	
AR	Power Amplifier	5S1G4M2	0328767	Note 1	
Mini-Circuits	Power Amplifier	ZVE-3W	162601250	Note 1	

General Note:

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



10. System Verification

10.1 Tissue Verification

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

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

Simulating Liquid for 5GHz, Manufactured by SPEAG

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



<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ε _r)	Conductivity Target (σ)	Permittivity Target (ε _r)	Delta (σ) (%)	Delta (ε _r) (%)	Limit (%)	Date
750	HSL	22.3	0.901	42.700	0.89	41.90	1.24	1.91	±5	2016/3/18
750	MSL	22.5	0.975	56.684	0.96	55.50	1.56	2.13	±5	2016/3/20
835	HSL	22.5	0.875	40.786	0.90	41.50	-2.78	-1.72	±5	2016/3/15
835	HSL	22.3	0.895	41.400	0.90	41.50	-0.56	-0.24	±5	2016/3/18
835	MSL	22.5	0.985	56.903	0.97	55.20	1.55	3.09	±5	2016/3/17
835	MSL	22.6	0.979	56.194	0.97	55.20	0.93	1.80	±5	2016/3/18
1750	HSL	22.4	1.370	39.960	1.37	40.10	0.00	-0.35	±5	2016/3/15
1750	MSL	22.3	1.495	55.089	1.49	53.40	0.34	3.16	±5	2016/3/16
1750	MSL	22.5	1.485	54.938	1.49	53.40	-0.34	2.88	±5	2016/3/20
1900	HSL	22.2	1.434	38.774	1.40	40.00	2.43	-3.07	±5	2016/3/16
1900	MSL	22.3	1.566	53.529	1.52	53.30	3.03	0.43	±5	2016/3/16
1900	MSL	22.6	1.533	52.621	1.52	53.30	0.86	-1.27	±5	2016/3/19
2450	HSL	22.2	1.733	39.498	1.80	39.20	-3.72	0.76	±5	2016/3/11
2450	MSL	22.1	1.984	52.474	1.95	52.70	1.74	-0.43	±5	2016/3/12
2600	HSL	22.5	2.032	38.472	1.96	39.00	3.67	-1.35	±5	2016/3/15
2600	HSL	22.5	1.891	39.274	1.96	39.00	-3.52	0.70	±5	2016/3/20
2600	MSL	22.3	2.210	53.100	2.16	52.50	2.31	1.14	±5	2016/3/16
2600	MSL	22.6	2.157	53.088	2.16	52.50	-0.14	1.12	±5	2016/3/18
2600	MSL	22.3	2.189	52.868	2.16	52.50	1.34	0.70	±5	2016/3/19
5300	HSL	22.1	4.540	36.300	4.76	35.90	-4.62	1.11	±5	2016/3/12
5300	MSL	22.1	5.600	46.900	5.42	48.90	3.32	-4.09	±5	2016/3/11
5600	HSL	22.1	4.830	35.800	5.07	35.50	-4.73	0.85	±5	2016/3/12
5600	MSL	22.1	5.990	46.400	5.77	48.50	3.81	-4.33	±5	2016/3/11
5800	HSL	22.1	5.020	35.600	5.27	35.30	-4.74	0.85	±5	2016/3/12
5800	MSL	22.1	6.250	46.000	6.00	48.20	4.17	-4.56	±5	2016/3/11



10.2 System Performance Check Results

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

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2016/3/18	750	HSL	250	D750V3-1012	EX3DV4 - SN3955	DAE4 Sn1399	2.14	8.22	8.56	4.14
2016/3/20	750	MSL	250	D750V3-1012	ES3DV3 - SN3270	DAE4 Sn778	2.23	8.61	8.92	3.60
2016/3/15	835	HSL	250	D835V2-4d092	ES3DV3 - SN3270	DAE4 Sn778	2.42	9.26	9.68	4.54
2016/3/18	835	HSL	250	D835V2-4d092	EX3DV4 - SN3955	DAE4 Sn1399	2.25	9.26	9.00	-2.81
2016/3/17	835	MSL	250	D835V2-4d092	ES3DV3 - SN3270	DAE4 Sn778	2.43	9.40	9.72	3.40
2016/3/18	835	MSL	250	D835V2-4d092	ES3DV3 - SN3270	DAE4 Sn778	2.33	9.40	9.32	-0.85
2016/3/15	1750	HSL	250	D1750V2-1068	ES3DV3 - SN3270	DAE4 Sn778	8.62	36.80	34.48	-6.30
2016/3/16	1750	MSL	250	D1750V2-1068	ES3DV3 - SN3270	DAE4 Sn778	8.83	35.70	35.32	-1.06
2016/3/20	1750	MSL	250	D1750V2-1068	ES3DV3 - SN3270	DAE4 Sn778	8.67	35.70	34.68	-2.86
2016/3/16	1900	HSL	250	D1900V2-5d041	ES3DV3 - SN3270	DAE4 Sn778	10.20	39.80	40.80	2.51
2016/3/16	1900	MSL	250	D1900V2-5d041	ES3DV3 - SN3270	DAE4 Sn778	10.40	40.00	41.60	4.00
2016/3/19	1900	MSL	250	D1900V2-5d041	ES3DV3 - SN3270	DAE4 Sn778	10.60	40.00	42.40	6.00
2016/3/11	2450	HSL	250	D2450V2-736	ES3DV3 - SN3270	DAE4 Sn778	12.20	51.90	48.80	-5.97
2016/3/12	2450	MSL	250	D2450V2-736	ES3DV3 - SN3270	DAE4 Sn778	13.30	51.90	53.20	2.50
2016/3/15	2600	HSL	250	D2600V2-1008	ES3DV3 - SN3270	DAE4 Sn778	14.80	56.30	59.20	5.15
2016/3/20	2600	HSL	250	D2600V2-1008	ES3DV3 - SN3270	DAE4 Sn778	14.00	56.30	56.00	-0.53
2016/3/16	2600	MSL	250	D2600V2-1008	EX3DV4 - SN3925	DAE3 Sn495	14.00	55.80	56.00	0.36
2016/3/18	2600	MSL	250	D2600V2-1008	ES3DV3 - SN3270	DAE4 Sn778	14.90	55.80	59.60	6.81
2016/3/19	2600	MSL	250	D2600V2-1008	ES3DV3 - SN3270	DAE4 Sn778	13.30	55.80	53.20	-4.66
2016/3/12	5300	HSL	100	D5GHzV2-1006-5300	EX3DV4 - SN3925	DAE3 Sn495	8.26	84.50	82.60	-2.25
2016/3/11	5300	MSL	100	D5GHzV2-1006-5300	EX3DV4 - SN3925	DAE3 Sn495	8.10	79.50	81.00	1.89
2016/3/12	5600	HSL	100	D5GHzV2-1006-5600	EX3DV4 - SN3925	DAE3 Sn495	9.01	84.80	90.10	6.25
2016/3/11	5600	MSL	100	D5GHzV2-1006-5600	EX3DV4 - SN3925	DAE3 Sn495	8.72	82.30	87.20	5.95
2016/3/12	5800	HSL	100	D5GHzV2-1006-5800	EX3DV4 - SN3925	DAE3 Sn495	8.29	82.00	82.90	1.10
2016/3/11	5800	MSL	100	D5GHzV2-1006-5800	EX3DV4 - SN3925	DAE3 Sn495	7.87	79.00	78.70	-0.38

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 (%)
2016/3/18	750	HSL	250	D750V3-1012	EX3DV4 - SN3955	DAE4 Sn1399	1.45	5.41	5.80	7.21
2016/3/20	750	MSL	250	D750V3-1012	ES3DV3 - SN3270	DAE4 Sn778	1.51	5.72	6.04	5.59
2016/3/15	835	HSL	250	D835V2-4d092	ES3DV3 - SN3270	DAE4 Sn778	1.58	6.02	6.32	4.98
2016/3/18	835	HSL	250	D835V2-4d092	EX3DV4 - SN3955	DAE4 Sn1399	1.48	6.02	5.92	-1.66
2016/3/17	835	MSL	250	D835V2-4d092	ES3DV3 - SN3270	DAE4 Sn778	1.62	6.21	6.48	4.35
2016/3/18	835	MSL	250	D835V2-4d092	ES3DV3 - SN3270	DAE4 Sn778	1.56	6.21	6.24	0.48
2016/3/15	1750	HSL	250	D1750V2-1068	ES3DV3 - SN3270	DAE4 Sn778	4.57	19.30	18.28	-5.28
2016/3/16	1750	MSL	250	D1750V2-1068	ES3DV3 - SN3270	DAE4 Sn778	4.73	19.00	18.92	-0.42
2016/3/20	1750	MSL	250	D1750V2-1068	ES3DV3 - SN3270	DAE4 Sn778	5.04	19.00	20.16	6.11
2016/3/16	1900	HSL	250	D1900V2-5d041	ES3DV3 - SN3270	DAE4 Sn778	5.23	20.80	20.92	0.58
2016/3/16	1900	MSL	250	D1900V2-5d041	ES3DV3 - SN3270	DAE4 Sn778	5.46	21.20	21.84	3.02
2016/3/19	1900	MSL	250	D1900V2-5d041	ES3DV3 - SN3270	DAE4 Sn778	5.56	21.20	22.24	4.91
2016/3/11	2450	HSL	250	D2450V2-736	ES3DV3 - SN3270	DAE4 Sn778	5.75	24.20	23.00	-4.96
2016/3/12	2450	MSL	250	D2450V2-736	ES3DV3 - SN3270	DAE4 Sn778	6.14	24.20	24.56	1.49
2016/3/15	2600	HSL	250	D2600V2-1008	ES3DV3 - SN3270	DAE4 Sn778	6.63	25.60	26.52	3.59
2016/3/20	2600	HSL	250	D2600V2-1008	ES3DV3 - SN3270	DAE4 Sn778	6.20	25.60	24.80	-3.13
2016/3/16	2600	MSL	250	D2600V2-1008	EX3DV4 - SN3925	DAE3 Sn495	6.35	25.10	25.40	1.20
2016/3/18	2600	MSL	250	D2600V2-1008	ES3DV3 - SN3270	DAE4 Sn778	6.63	25.10	26.52	5.66
2016/3/19	2600	MSL	250	D2600V2-1008	ES3DV3 - SN3270	DAE4 Sn778	5.95	25.10	23.80	-5.18
2016/3/12	5300	HSL	100	D5GHzV2-1006-5300	EX3DV4 - SN3925	DAE3 Sn495	2.25	24.30	22.50	-7.41
2016/3/11	5300	MSL	100	D5GHzV2-1006-5300	EX3DV4 - SN3925	DAE3 Sn495	2.13	22.40	21.30	-4.91
2016/3/12	5600	HSL	100	D5GHzV2-1006-5600	EX3DV4 - SN3925	DAE3 Sn495	2.44	24.30	24.40	0.41
2016/3/11	5600	MSL	100	D5GHzV2-1006-5600	EX3DV4 - SN3925	DAE3 Sn495	2.29	23.00	22.90	-0.43
2016/3/12	5800	HSL	100	D5GHzV2-1006-5800	EX3DV4 - SN3925	DAE3 Sn495	2.24	23.30	22.40	-3.86
2016/3/11	5800	MSL	100	D5GHzV2-1006-5800	EX3DV4 - SN3925	DAE3 Sn495	2.04	21.90	20.40	-6.85

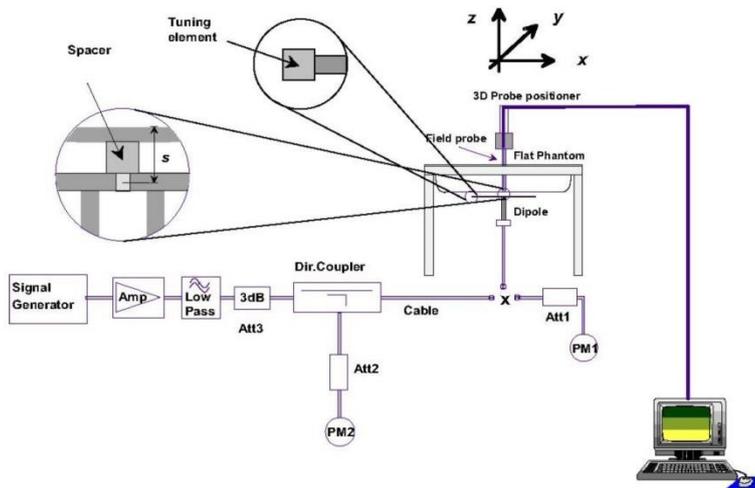


Fig 8.3.1 System Performance Check Setup



Fig 8.3.2 Setup Photo

11. RF Exposure Positions

11.1 Ear and handset reference point

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

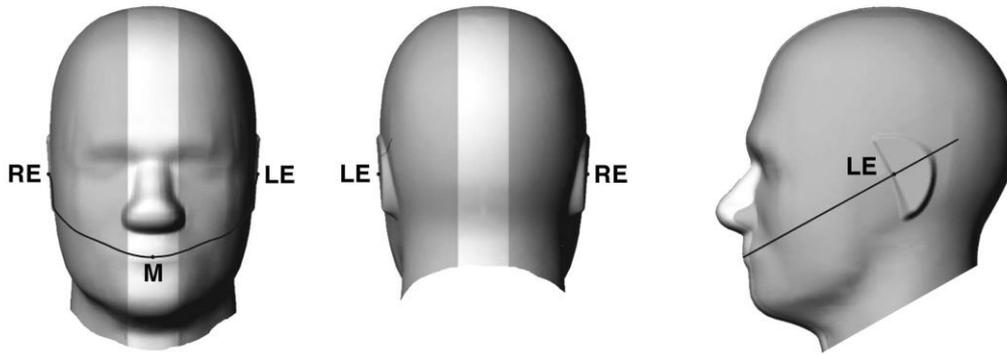


Fig 9.1.1 Front, back, and side views of SAM twin phantom

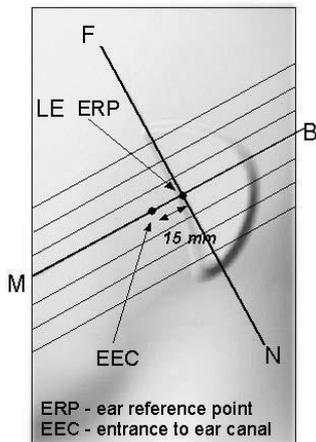


Fig 9.1.2 Close-up side view of phantom showing the ear region.

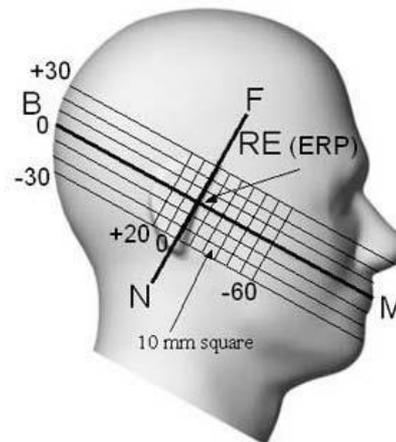


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

11.2 Definition of the cheek position

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

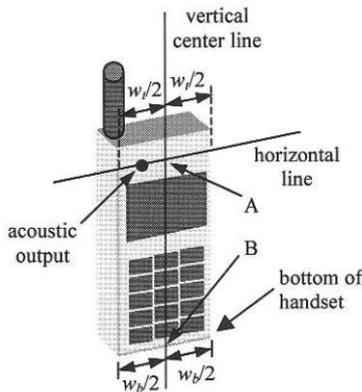


Fig 9.2.1 Handset vertical and horizontal reference lines—“fixed case”

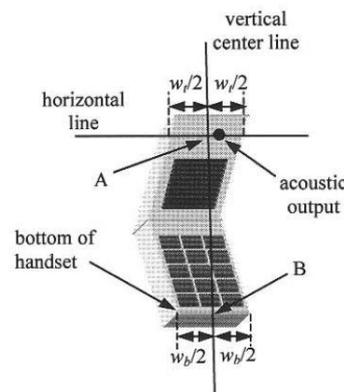


Fig 9.2.2 Handset vertical and horizontal reference lines—“clam-shell case”

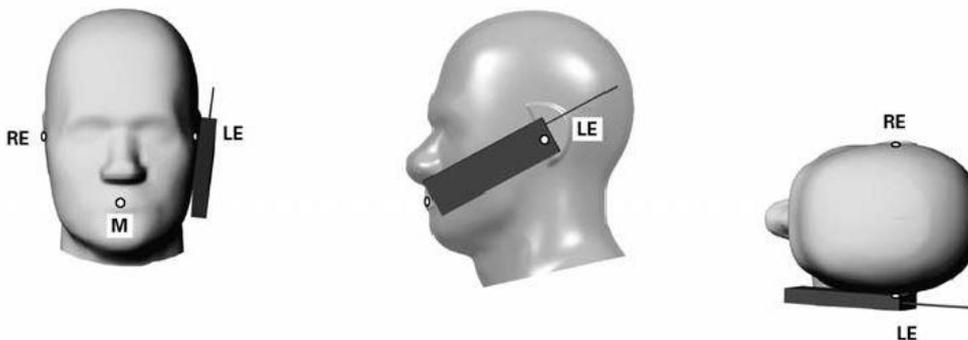


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

11.3 Definition of the tilt position

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

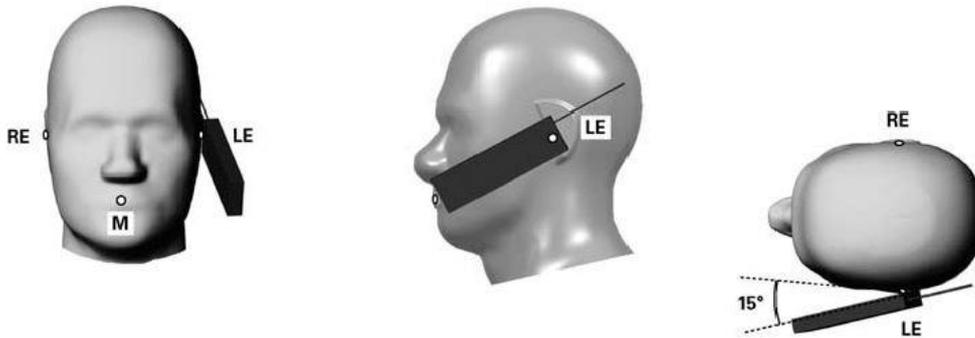


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

11.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 9.4). Per 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 D01v06 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 headset 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 test with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-chip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

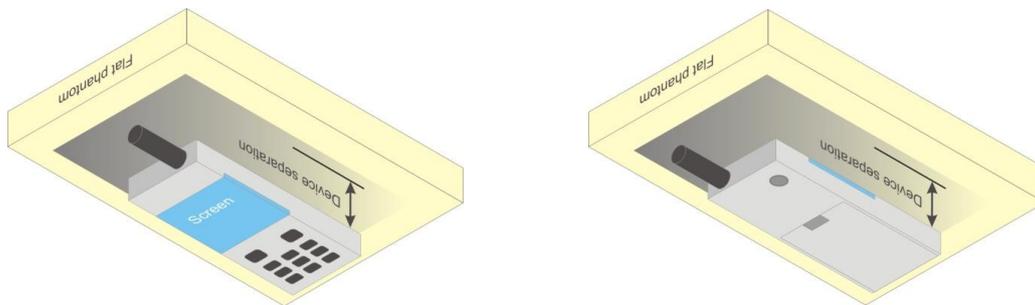


Fig 9.4 Body Worn Position

11.5 Wireless Router

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v02r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined 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 D01v06 publication procedures. The “Portable Hotspot” feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.



12. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

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

$$DTM \text{ frame average power (dBm)} = 10 * \log [\sum(\text{power of each slot, in mW})/8]$$

- Per KDB 447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
- Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE and DTM modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS (4Tx slots) for GSM850/GSM1900 is considered as the primary mode
- Other configurations of GSM/GPRS/EDGE and DTM 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

<Full Power Mode>

Band GSM850		Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel		128	189	251		128	189	251	
Frequency (MHz)		824.2	836.4	848.8		824.2	836.4	848.8	
GSM 1 Tx slot		32.32	32.50	32.55	33.80	23.32	23.50	23.55	24.80
GPRS 1 Tx slot		32.33	32.55	32.57	33.80	23.33	23.55	23.57	24.80
GPRS 2 Tx slots		31.40	31.45	31.58	32.80	25.40	25.45	25.58	26.80
GPRS 3 Tx slots		29.22	29.23	29.33	30.80	24.96	24.97	25.07	26.54
GPRS 4 Tx slots		28.17	28.23	28.25	29.80	25.17	25.23	25.25	26.80
EDGE 1 Tx slot		26.88	26.92	27.00	28.30	17.88	17.92	18.00	19.30
EDGE 2 Tx slots		25.38	25.46	25.52	26.80	19.38	19.46	19.52	20.80
EDGE 3 Tx slots		23.27	23.34	23.41	24.80	19.01	19.08	19.15	20.54
EDGE 4 Tx slots		22.19	22.25	22.29	23.80	19.19	19.25	19.29	20.80
DTM 5 (2Tx slots)	GSM 1 Tx slot	31.24	31.34	31.43	32.80	25.24	25.36	25.44	26.78
	GPRS 1 Tx slot	31.29	31.42	31.49	32.80				
DTM 9 (2Tx slots)	GSM 1 Tx slot	31.16	31.28	31.40	32.80	25.20	25.31	25.37	26.78
	GPRS 1 Tx slot	31.28	31.38	31.38	32.80				
DTM 11 (3Tx slots)	GSM 1 Tx slot	29.04	29.03	29.18	30.80	24.83	24.83	24.99	26.54
	GPRS 2 Tx slots	29.11	29.12	29.28	30.80				
DTM 5 (2Tx slots)	GSM 1 Tx slot	31.24	31.33	31.45	32.80	23.20	23.29	23.40	24.74
	EDGE 1 Tx slot	25.35	25.43	25.49	26.80				
DTM 9 (2Tx slots)	GSM 1 Tx slot	31.23	31.33	31.41	32.80	23.19	23.28	23.35	24.74
	EDGE 1 Tx slot	25.33	25.36	25.41	26.80				
DTM 11 (3Tx slots)	GSM 1 Tx slot	29.04	29.10	29.21	30.80	21.82	21.88	22.00	23.54
	EDGE 2 Tx slots	23.17	23.23	23.37	24.80				



Band GSM1900		Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel		512	661	810		512	661	810	
Frequency (MHz)		1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot		29.95	29.98	29.97	30.70	20.95	20.98	20.97	21.70
GPRS 1 Tx slot		29.96	29.99	29.97	30.70	20.96	20.99	20.97	21.70
GPRS 2 Tx slots		28.18	28.37	28.28	29.20	22.18	22.37	22.28	23.20
GPRS 3 Tx slots		26.32	26.49	26.38	27.20	22.06	22.23	22.12	22.94
GPRS 4 Tx slots		25.48	25.61	25.59	26.20	22.48	22.61	22.59	23.20
EDGE 1 Tx slot		25.75	25.83	25.77	27.00	16.75	16.83	16.77	18.00
EDGE 2 Tx slots		24.64	24.67	24.66	25.50	18.64	18.67	18.66	19.50
EDGE 3 Tx slots		22.56	22.70	22.59	23.50	18.30	18.44	18.33	19.24
EDGE 4 Tx slots		21.49	21.61	21.57	22.50	18.49	18.61	18.57	19.50
DTM 5 (2Tx slots)	GSM 1 Tx slot	28.13	28.19	28.11	29.20	22.12	22.21	22.14	23.18
	GPRS 1 Tx slot	28.15	28.27	28.22	29.20				
DTM 9 (2Tx slots)	GSM 1 Tx slot	28.12	28.13	28.06	29.20	22.07	22.15	22.09	23.18
	GPRS 1 Tx slot	28.07	28.21	28.16	29.20				
DTM 11 (3Tx slots)	GSM 1 Tx slot	26.20	26.38	26.31	27.20	21.98	22.13	22.09	22.94
	GPRS 2 Tx slots	26.26	26.40	26.37	27.20				
DTM 5 (2Tx slots)	GSM 1 Tx slot	28.15	28.32	28.26	29.20	20.69	20.82	20.77	21.71
	EDGE 1 Tx slot	24.55	24.58	24.55	25.50				
DTM 9 (2Tx slots)	GSM 1 Tx slot	28.12	28.30	28.24	29.20	20.64	20.80	20.75	21.71
	EDGE 1 Tx slot	24.44	24.55	24.54	25.50				
DTM 11 (3Tx slots)	GSM 1 Tx slot	26.25	26.35	26.31	27.20	19.88	19.97	19.91	20.85
	EDGE 2 Tx slots	22.50	22.59	22.51	23.50				

<Reduced Power Mode>

Band GSM1900		Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel		512	661	810		512	661	810	
Frequency (MHz)		1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot		27.36	27.55	27.37	28.70	18.36	18.55	18.37	19.70
GPRS 1 Tx slot		27.38	27.56	27.40	28.70	18.38	18.56	18.40	19.70
GPRS 2 Tx slots		25.75	25.93	25.91	27.20	19.75	19.93	19.91	21.20
GPRS 3 Tx slots		24.18	24.15	24.16	25.20	19.92	19.89	19.90	20.94
GPRS 4 Tx slots		23.15	23.35	23.42	24.20	20.15	20.35	20.42	21.20
EDGE 1 Tx slot		25.84	25.99	25.93	27.00	16.84	16.99	16.93	18.00
EDGE 2 Tx slots		24.80	24.87	24.82	25.50	18.80	18.87	18.82	19.50
EDGE 3 Tx slots		22.74	22.87	22.83	23.50	18.48	18.61	18.57	19.24
EDGE 4 Tx slots		21.39	21.52	21.49	22.50	18.39	18.52	18.49	19.50
DTM 5 (2Tx slots)	GSM 1 Tx slot	25.69	25.78	25.80	27.20	19.69	19.80	19.83	21.18
	GPRS 1 Tx slot	25.74	25.86	25.90	27.20				
DTM 9 (2Tx slots)	GSM 1 Tx slot	25.71	25.83	25.80	27.20	19.71	19.85	19.82	21.18
	GPRS 1 Tx slot	25.75	25.92	25.89	27.20				
DTM 11 (3Tx slots)	GSM 1 Tx slot	24.07	24.10	24.11	25.20	19.85	19.87	19.88	20.94
	GPRS 2 Tx slots	24.13	24.14	24.15	25.20				
DTM 5 (2Tx slots)	GSM 1 Tx slot	25.71	25.86	25.86	27.20	19.23	19.37	19.29	20.41
	EDGE 1 Tx slot	24.74	24.87	24.69	25.50				
DTM 9 (2Tx slots)	GSM 1 Tx slot	25.73	25.88	25.84	27.20	19.24	19.39	19.29	20.41
	EDGE 1 Tx slot	24.73	24.89	24.70	25.50				
DTM 11 (3Tx slots)	GSM 1 Tx slot	24.07	24.06	24.10	25.20	18.99	19.03	19.02	19.88
	EDGE 2 Tx slots	22.77	22.84	22.80	23.50				

<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 DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

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

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (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, Δ_{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 DPCCH, DPDCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ 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 (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
 - iii. Set Cell Power = -86 dBm
 - iv. Set Channel Type = 12.2k + HSPA
 - v. Set UE Target Power
 - vi. Power Ctrl Mode= Alternating bits
 - vii. Set and observe the E-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: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-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 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

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

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

Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$.

Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
 - i. Set RMC 12.2Kbps + HSDPA mode.
 - ii. Set Cell Power = -25 dBm
 - iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
 - iv. Select HSDPA Uplink Parameters
 - v. Set Gain Factors (β_c and β_d) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
 - a). Subtest 1: $\beta_c/\beta_d=2/15$
 - 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.		

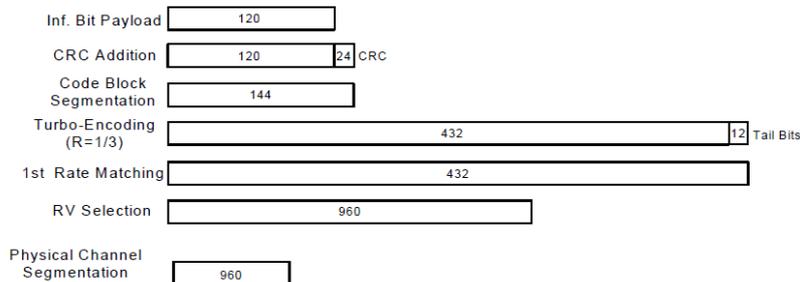


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration



<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. If the maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA 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 to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

<Full Power Mode>

Band		WCDMA V			Tune-up Limit (dBm)	WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)
TX Channel		4132	4182	4233		9262	9400	9538		1312	1413	1513	
Rx Channel		4357	4407	4458	9662	9800	9938	1537	1638	1738			
Frequency (MHz)		826.4	836.4	846.6	1852.4	1880	1907.6	1712.4	1732.6	1752.6			
3GPP Rel 99	AMR 12.2Kbps	24.14	24.45	24.26	25.00	24.20	24.32	24.26	24.50	23.29	23.48	23.20	23.50
3GPP Rel 99	RMC 12.2Kbps	24.16	24.47	24.28	25.00	24.21	24.33	24.27	24.50	23.30	23.49	23.21	23.50
3GPP Rel 6	HSDPA Subtest-1	23.22	23.50	23.30	24.30	23.22	23.36	23.28	24.00	22.60	22.70	22.59	23.00
3GPP Rel 6	HSDPA Subtest-2	23.20	23.48	23.29	24.30	23.19	23.33	23.25	24.00	22.59	22.68	22.57	23.00
3GPP Rel 6	HSDPA Subtest-3	22.75	22.90	22.82	23.80	22.71	22.87	22.75	23.50	22.09	22.17	22.07	22.50
3GPP Rel 6	HSDPA Subtest-4	22.76	22.88	22.80	23.80	22.70	22.85	22.73	23.50	22.08	22.15	22.05	22.50
3GPP Rel 8	DC-HSDPA Subtest-1	23.15	23.41	23.25	24.30	23.15	23.29	23.20	24.00	22.53	22.61	22.52	23.00
3GPP Rel 8	DC-HSDPA Subtest-2	23.11	23.39	23.22	24.30	23.14	23.28	23.18	24.00	22.56	22.59	22.51	23.00
3GPP Rel 8	DC-HSDPA Subtest-3	22.66	22.80	22.72	23.80	22.62	22.77	22.66	23.50	22.06	22.15	22.04	22.50
3GPP Rel 8	DC-HSDPA Subtest-4	22.67	22.77	22.70	23.80	22.60	22.75	22.63	23.50	22.02	22.13	22.02	22.50
3GPP Rel 6	HSUPA Subtest-1	22.95	23.10	23.00	23.80	23.15	23.20	23.18	23.50	22.26	22.39	22.18	22.50
3GPP Rel 6	HSUPA Subtest-2	21.46	21.73	21.55	22.30	21.55	21.66	21.58	22.00	20.68	20.83	20.59	21.00
3GPP Rel 6	HSUPA Subtest-3	22.19	22.42	22.33	23.30	22.53	22.66	22.56	23.00	21.58	21.66	21.52	22.00
3GPP Rel 6	HSUPA Subtest-4	21.44	21.62	21.50	22.30	21.54	21.61	21.53	22.00	20.80	20.95	20.86	21.00
3GPP Rel 6	HSUPA Subtest-5	22.94	23.10	23.02	23.80	23.20	23.28	23.25	23.50	22.27	22.48	22.20	22.50

<Reduced Power Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513	
Rx Channel		9662	9800	9938	1537	1638	1738		
Frequency (MHz)		1852.4	1880	1907.6	1712.4	1732.6	1752.6		
3GPP Rel 99	AMR 12.2Kbps	20.71	20.81	20.83	21.00	19.30	19.36	19.26	19.50
3GPP Rel 99	RMC 12.2Kbps	20.73	20.82	20.84	21.00	19.33	19.38	19.28	19.50
3GPP Rel 6	HSDPA Subtest-1	19.71	19.77	19.81	20.50	18.21	18.25	18.22	19.00
3GPP Rel 6	HSDPA Subtest-2	19.70	19.76	19.80	20.50	18.22	18.26	18.24	19.00
3GPP Rel 6	HSDPA Subtest-3	19.27	19.25	19.35	20.00	17.70	17.78	17.75	18.50
3GPP Rel 6	HSDPA Subtest-4	19.24	19.22	19.33	20.00	17.66	17.75	17.72	18.50
3GPP Rel 8	DC-HSDPA Subtest-1	19.61	19.64	19.71	20.50	18.11	18.20	18.18	19.00
3GPP Rel 8	DC-HSDPA Subtest-2	19.60	19.62	19.69	20.50	18.09	18.19	18.15	19.00
3GPP Rel 8	DC-HSDPA Subtest-3	19.20	19.22	19.28	20.00	17.68	17.70	17.72	18.50
3GPP Rel 8	DC-HSDPA Subtest-4	19.19	19.20	19.26	20.00	17.64	17.66	17.69	18.50
3GPP Rel 6	HSUPA Subtest-1	19.67	19.78	19.81	20.00	18.16	18.25	18.20	18.50
3GPP Rel 6	HSUPA Subtest-2	17.78	17.86	17.88	18.50	16.24	16.27	16.30	17.00
3GPP Rel 6	HSUPA Subtest-3	18.67	18.76	18.78	19.50	17.24	17.28	17.32	18.00
3GPP Rel 6	HSUPA Subtest-4	17.69	17.77	17.80	18.50	16.20	16.26	16.31	17.00
3GPP Rel 6	HSUPA Subtest-5	19.70	19.82	19.86	20.00	18.19	18.24	18.26	18.50

**<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 ≤ 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 ≤ 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 ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B12 / B4 / B26 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 band 5 / 17 SAR test was covered by Band 26 / 12; 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



<Full Power Mode>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				18700	18900	19100	
Frequency (MHz)				1860	1880	1900	
20	QPSK	1	0	23.12	23.03	23.03	24
20	QPSK	1	49	23.67	23.74	23.64	
20	QPSK	1	99	23.10	23.37	23.10	
20	QPSK	50	0	22.35	22.41	22.33	23
20	QPSK	50	24	22.37	22.48	22.36	
20	QPSK	50	50	22.35	22.54	22.28	
20	QPSK	100	0	22.41	22.53	22.32	23
20	16QAM	1	0	22.74	22.63	22.65	
20	16QAM	1	49	22.69	22.52	22.75	
20	16QAM	1	99	22.53	22.59	22.53	22
20	16QAM	50	0	21.42	21.27	21.28	
20	16QAM	50	24	21.23	21.44	21.33	
20	16QAM	50	50	21.42	21.40	21.22	22
20	16QAM	100	0	21.27	21.39	21.29	
Channel				18675	18900	19125	
Frequency (MHz)				1857.5	1880	1902.5	
15	QPSK	1	0	23.19	23.19	23.38	24
15	QPSK	1	37	23.52	23.39	23.61	
15	QPSK	1	74	23.16	23.40	23.20	
15	QPSK	36	0	22.25	22.32	22.29	23
15	QPSK	36	20	22.26	22.44	22.31	
15	QPSK	36	39	22.27	22.47	22.32	
15	QPSK	75	0	22.26	22.31	22.35	23
15	16QAM	1	0	22.66	22.52	22.66	
15	16QAM	1	37	22.37	22.41	22.64	
15	16QAM	1	74	22.47	22.60	22.58	22
15	16QAM	36	0	21.15	21.16	21.23	
15	16QAM	36	20	21.22	21.28	21.26	
15	16QAM	36	39	21.24	21.32	21.19	22
15	16QAM	75	0	21.32	21.26	21.26	
Channel				18650	18900	19150	
Frequency (MHz)				1855	1880	1905	
10	QPSK	1	0	23.11	22.95	23.02	24
10	QPSK	1	25	23.49	23.56	23.33	
10	QPSK	1	49	23.11	23.33	22.92	
10	QPSK	25	0	22.46	22.34	22.25	23
10	QPSK	25	12	22.36	22.38	22.33	
10	QPSK	25	25	22.38	22.47	22.37	
10	QPSK	50	0	22.43	22.55	22.29	23
10	16QAM	1	0	22.64	22.51	22.44	
10	16QAM	1	25	22.69	22.66	22.80	
10	16QAM	1	49	22.54	22.51	22.30	22
10	16QAM	25	0	21.61	21.40	21.31	
10	16QAM	25	12	21.35	21.32	21.19	
10	16QAM	25	25	21.24	21.38	21.53	22
10	16QAM	50	0	21.21	21.41	21.22	



Channel				18625	18900	19175	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	QPSK	1	0	23.00	22.81	23.02	24
5	QPSK	1	12	23.45	23.48	23.57	
5	QPSK	1	24	23.00	23.04	23.07	
5	QPSK	12	0	22.26	22.33	22.45	23
5	QPSK	12	7	22.38	22.37	22.49	
5	QPSK	12	13	22.22	22.43	22.38	
5	QPSK	25	0	22.30	22.30	22.42	23
5	16QAM	1	0	22.53	22.48	22.58	
5	16QAM	1	12	22.47	22.53	22.57	
5	16QAM	1	24	22.47	22.53	22.53	22
5	16QAM	12	0	21.12	21.16	21.17	
5	16QAM	12	7	21.35	21.42	21.16	
5	16QAM	12	13	21.20	21.49	21.29	22
5	16QAM	25	0	21.27	21.26	21.21	
Channel				18615	18900	19185	
Frequency (MHz)				1851.5	1880	1908.5	
3	QPSK	1	0	23.04	23.25	23.01	24
3	QPSK	1	8	23.26	23.17	23.10	
3	QPSK	1	14	23.25	23.22	22.99	
3	QPSK	8	0	22.36	22.30	22.40	23
3	QPSK	8	4	22.38	22.41	22.44	
3	QPSK	8	7	22.43	22.29	22.37	
3	QPSK	15	0	22.40	22.33	22.37	23
3	16QAM	1	0	22.63	22.52	22.72	
3	16QAM	1	8	22.63	22.46	22.72	
3	16QAM	1	14	22.63	22.68	22.62	22
3	16QAM	8	0	21.36	21.28	21.35	
3	16QAM	8	4	21.37	21.38	21.33	
3	16QAM	8	7	21.33	21.27	21.14	22
3	16QAM	15	0	21.27	21.20	21.31	
Channel				18607	18900	19193	
Frequency (MHz)				1850.7	1880	1909.3	
1.4	QPSK	1	0	23.18	23.01	23.10	24
1.4	QPSK	1	3	23.23	23.12	23.33	
1.4	QPSK	1	5	23.05	23.26	23.33	
1.4	QPSK	3	0	23.26	23.32	23.36	24
1.4	QPSK	3	1	23.45	23.38	23.62	
1.4	QPSK	3	3	23.41	23.45	23.48	
1.4	QPSK	6	0	22.23	22.22	22.37	23
1.4	16QAM	1	0	22.86	22.46	22.78	23
1.4	16QAM	1	3	22.62	22.61	22.50	
1.4	16QAM	1	5	22.41	22.39	22.77	
1.4	16QAM	3	0	22.64	22.59	22.83	23
1.4	16QAM	3	1	22.75	22.51	23.00	
1.4	16QAM	3	3	22.76	22.77	22.80	
1.4	16QAM	6	0	21.10	21.12	21.18	22



<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20050	20175	20300	
Frequency (MHz)				1720	1732.5	1745	
20	QPSK	1	0	22.28	22.25	22.23	23.5
20	QPSK	1	49	22.67	22.77	22.41	
20	QPSK	1	99	22.33	22.34	22.36	
20	QPSK	50	0	22.05	21.94	22.04	23
20	QPSK	50	24	22.15	22.06	22.17	
20	QPSK	50	50	21.88	22.03	22.12	
20	QPSK	100	0	21.96	22.09	22.14	
20	16QAM	1	0	22.15	22.19	21.89	23
20	16QAM	1	49	21.97	22.11	21.91	
20	16QAM	1	99	22.10	22.14	22.13	
20	16QAM	50	0	21.12	21.10	21.12	22
20	16QAM	50	24	21.23	21.13	21.23	
20	16QAM	50	50	21.15	21.10	21.29	
20	16QAM	100	0	21.13	21.16	21.11	
Channel				20025	20175	20325	
Frequency (MHz)				1717.5	1732.5	1747.5	
15	QPSK	1	0	22.36	22.30	22.44	23.5
15	QPSK	1	37	22.60	22.74	22.67	
15	QPSK	1	74	22.32	22.39	22.17	
15	QPSK	36	0	22.15	22.10	22.13	23
15	QPSK	36	20	22.14	22.11	22.10	
15	QPSK	36	39	21.96	21.87	22.18	
15	QPSK	75	0	21.93	21.98	22.10	
15	16QAM	1	0	21.96	22.00	22.01	23
15	16QAM	1	37	22.38	22.14	22.50	
15	16QAM	1	74	21.91	22.10	22.14	
15	16QAM	36	0	20.98	20.98	21.10	22
15	16QAM	36	20	21.21	21.11	21.13	
15	16QAM	36	39	21.01	20.90	21.14	
15	16QAM	75	0	20.99	21.00	21.16	
Channel				20000	20175	20350	
Frequency (MHz)				1715	1732.5	1750	
10	QPSK	1	0	22.18	22.06	22.13	23.5
10	QPSK	1	25	22.46	22.66	22.60	
10	QPSK	1	49	22.40	22.15	22.19	
10	QPSK	25	0	21.87	22.00	22.20	23
10	QPSK	25	12	22.21	22.10	22.23	
10	QPSK	25	25	22.21	21.94	22.00	
10	QPSK	50	0	22.10	22.00	22.17	
10	16QAM	1	0	22.03	21.88	22.01	23
10	16QAM	1	25	22.51	22.41	22.25	
10	16QAM	1	49	21.66	22.04	22.17	
10	16QAM	25	0	21.00	21.10	21.18	22
10	16QAM	25	12	21.19	21.23	21.24	
10	16QAM	25	25	21.36	20.90	21.01	
10	16QAM	50	0	21.03	21.00	21.13	



Channel				19975	20175	20375	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1732.5	1752.5	
5	QPSK	1	0	22.33	22.00	22.23	23.5
5	QPSK	1	12	22.40	22.60	22.70	
5	QPSK	1	24	22.40	22.14	22.31	
5	QPSK	12	0	22.12	22.11	22.11	23
5	QPSK	12	7	21.96	22.12	22.10	
5	QPSK	12	13	22.00	21.95	21.87	
5	QPSK	25	0	21.88	22.10	22.13	23
5	16QAM	1	0	22.10	21.94	22.29	
5	16QAM	1	12	22.13	21.82	22.00	
5	16QAM	1	24	22.10	21.98	21.77	22
5	16QAM	12	0	21.13	21.00	21.13	
5	16QAM	12	7	21.00	21.10	20.86	
5	16QAM	12	13	20.89	20.93	20.83	22
5	16QAM	25	0	20.96	21.03	21.14	
Channel				19965	20175	20385	
Frequency (MHz)				1711.5	1732.5	1753.5	
3	QPSK	1	0	22.49	22.32	22.60	23.5
3	QPSK	1	8	22.32	22.43	22.47	
3	QPSK	1	14	22.17	22.34	22.39	
3	QPSK	8	0	22.12	22.11	22.13	23
3	QPSK	8	4	21.94	22.10	21.96	
3	QPSK	8	7	22.10	22.00	21.99	
3	QPSK	15	0	22.12	21.99	21.99	23
3	16QAM	1	0	21.98	22.12	22.34	
3	16QAM	1	8	21.89	22.20	22.20	
3	16QAM	1	14	21.77	22.36	22.12	22
3	16QAM	8	0	21.15	21.13	21.12	
3	16QAM	8	4	21.11	21.17	21.11	
3	16QAM	8	7	20.98	21.11	21.10	22
3	16QAM	15	0	20.97	20.87	20.79	
Channel				19957	20175	20393	
Frequency (MHz)				1710.7	1732.5	1754.3	
1.4	QPSK	1	0	22.63	22.36	22.44	23.5
1.4	QPSK	1	3	22.40	22.41	22.60	
1.4	QPSK	1	5	22.46	22.25	22.42	
1.4	QPSK	3	0	22.67	22.60	22.46	
1.4	QPSK	3	1	22.66	22.50	22.50	
1.4	QPSK	3	3	22.60	22.47	22.46	
1.4	QPSK	6	0	22.10	22.00	21.97	23
1.4	16QAM	1	0	22.02	22.55	22.01	23
1.4	16QAM	1	3	22.10	22.35	22.44	
1.4	16QAM	1	5	22.01	22.13	22.03	
1.4	16QAM	3	0	22.24	22.36	22.10	
1.4	16QAM	3	1	22.31	22.40	22.22	
1.4	16QAM	3	3	22.29	22.35	22.16	
1.4	16QAM	6	0	20.87	21.01	20.72	22



<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20450	20525	20600	
Frequency (MHz)				829	836.5	844	
10	QPSK	1	0	23.50	23.40	23.32	24.5
10	QPSK	1	25	23.95	23.67	23.49	
10	QPSK	1	49	23.34	23.60	23.15	
10	QPSK	25	0	22.67	22.62	22.64	23.5
10	QPSK	25	12	22.78	22.65	22.75	
10	QPSK	25	25	22.68	22.64	22.47	
10	QPSK	50	0	22.69	22.63	22.60	
10	16QAM	1	0	22.97	23.15	23.22	23.7
10	16QAM	1	25	23.40	23.58	23.50	
10	16QAM	1	49	23.21	23.20	22.89	
10	16QAM	25	0	21.79	21.89	21.81	22.5
10	16QAM	25	12	21.75	21.60	21.80	
10	16QAM	25	25	21.63	21.69	21.60	
10	16QAM	50	0	21.64	21.70	21.66	
Channel				20425	20525	20625	
Frequency (MHz)				826.5	836.5	846.5	
5	QPSK	1	0	23.27	23.18	23.23	24.5
5	QPSK	1	12	23.49	23.74	23.45	
5	QPSK	1	24	23.32	23.44	23.24	
5	QPSK	12	0	22.41	22.64	22.50	23.5
5	QPSK	12	7	22.51	22.61	22.40	
5	QPSK	12	13	22.72	22.68	22.31	
5	QPSK	25	0	22.60	22.64	22.41	
5	16QAM	1	0	23.12	22.88	23.09	23.7
5	16QAM	1	12	23.25	23.50	23.01	
5	16QAM	1	24	23.11	23.05	22.69	
5	16QAM	12	0	21.60	21.67	21.42	22.5
5	16QAM	12	7	21.67	21.68	21.38	
5	16QAM	12	13	21.71	21.60	21.37	
5	16QAM	25	0	21.50	21.61	21.65	
Channel				20415	20525	20635	
Frequency (MHz)				825.5	836.5	847.5	
3	QPSK	1	0	23.32	23.46	23.37	24.5
3	QPSK	1	8	23.35	23.60	23.22	
3	QPSK	1	14	23.48	23.34	23.31	
3	QPSK	8	0	22.65	22.64	22.40	23.5
3	QPSK	8	4	22.60	22.67	22.41	
3	QPSK	8	7	22.62	22.63	22.44	
3	QPSK	15	0	22.60	22.68	22.47	
3	16QAM	1	0	23.23	23.13	22.92	23.7
3	16QAM	1	8	23.46	23.10	23.04	
3	16QAM	1	14	23.27	23.30	23.13	
3	16QAM	8	0	21.48	21.62	21.48	22.5
3	16QAM	8	4	21.60	21.76	21.46	
3	16QAM	8	7	21.64	21.72	21.50	
3	16QAM	15	0	21.44	21.44	21.44	



Channel				20407	20525	20643	Tune-up limit (dBm)
Frequency (MHz)				824.7	836.5	848.3	
1.4	QPSK	1	0	23.46	23.62	23.29	24.5
1.4	QPSK	1	3	23.60	23.75	23.44	
1.4	QPSK	1	5	23.46	23.69	23.40	
1.4	QPSK	3	0	23.47	23.85	23.45	
1.4	QPSK	3	1	23.60	23.80	23.49	
1.4	QPSK	3	3	23.59	23.74	23.46	
1.4	QPSK	6	0	22.38	22.60	22.33	23.5
1.4	16QAM	1	0	22.97	23.28	23.00	23.7
1.4	16QAM	1	3	23.10	23.39	23.12	
1.4	16QAM	1	5	23.02	23.33	23.01	
1.4	16QAM	3	0	23.00	23.20	23.02	
1.4	16QAM	3	1	22.79	23.26	23.09	
1.4	16QAM	3	3	23.10	23.23	22.98	
1.4	16QAM	6	0	21.30	21.46	21.45	22.5



<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20850	21100	21350	
Frequency (MHz)				2510	2535	2560	
20	QPSK	1	0	23.14	22.79	22.81	24.0
20	QPSK	1	49	23.38	23.46	23.43	
20	QPSK	1	99	23.27	22.95	22.76	
20	QPSK	50	0	22.87	22.75	22.70	23.5
20	QPSK	50	24	22.81	22.80	22.76	
20	QPSK	50	50	22.90	22.78	22.67	
20	QPSK	100	0	22.82	22.87	22.78	
20	16QAM	1	0	22.73	22.38	22.29	23.5
20	16QAM	1	49	22.65	22.47	22.44	
20	16QAM	1	99	22.66	22.38	22.25	
20	16QAM	50	0	21.99	21.80	21.87	22.5
20	16QAM	50	24	21.80	21.96	21.84	
20	16QAM	50	50	21.95	21.82	21.75	
20	16QAM	100	0	21.86	21.82	21.83	
Channel				20825	21100	21375	
Frequency (MHz)				2507.5	2535	2562.5	
15	QPSK	1	0	23.28	23.16	23.13	24.0
15	QPSK	1	37	23.51	23.51	23.37	
15	QPSK	1	74	23.33	23.25	23.08	
15	QPSK	36	0	22.85	22.90	22.79	23.5
15	QPSK	36	20	22.75	22.86	22.79	
15	QPSK	36	39	22.83	22.87	22.70	
15	QPSK	75	0	22.83	22.85	22.71	
15	16QAM	1	0	22.87	22.46	22.31	23.5
15	16QAM	1	37	22.61	22.53	22.53	
15	16QAM	1	74	22.78	22.39	22.31	
15	16QAM	36	0	21.97	21.84	21.82	22.5
15	16QAM	36	20	21.76	21.86	21.85	
15	16QAM	36	39	21.87	21.61	21.67	
15	16QAM	75	0	21.87	21.90	21.82	
Channel				20800	21100	21400	
Frequency (MHz)				2505	2535	2565	
10	QPSK	1	0	23.29	22.94	22.83	24.0
10	QPSK	1	25	23.34	23.34	23.29	
10	QPSK	1	49	23.12	22.99	22.71	
10	QPSK	25	0	22.96	22.87	22.67	23.5
10	QPSK	25	12	22.95	22.79	22.61	
10	QPSK	25	25	22.78	22.78	22.61	
10	QPSK	50	0	22.93	22.76	22.60	
10	16QAM	1	0	22.84	22.26	22.30	23.5
10	16QAM	1	25	22.66	22.42	22.42	
10	16QAM	1	49	22.53	22.27	22.15	
10	16QAM	25	0	22.00	21.89	21.75	22.5
10	16QAM	25	12	21.95	21.96	21.69	
10	16QAM	25	25	21.85	21.73	21.61	
10	16QAM	50	0	21.89	21.82	21.79	



Channel				20775	21100	21425	Tune-up limit (dBm)
Frequency (MHz)				2502.5	2535	2567.5	
5	QPSK	1	0	23.14	23.01	22.72	24.0
5	QPSK	1	12	23.67	23.35	22.80	
5	QPSK	1	24	23.25	22.77	22.62	
5	QPSK	12	0	23.00	22.88	22.66	23.5
5	QPSK	12	7	22.98	22.87	22.66	
5	QPSK	12	13	22.93	22.77	22.54	
5	QPSK	25	0	22.92	22.72	22.57	
5	16QAM	1	0	22.85	22.12	22.34	23.5
5	16QAM	1	12	22.64	22.34	22.36	
5	16QAM	1	24	22.52	22.09	22.28	
5	16QAM	12	0	21.99	21.74	21.86	22.5
5	16QAM	12	7	21.92	21.87	21.66	
5	16QAM	12	13	21.98	21.73	21.50	
5	16QAM	25	0	22.00	21.77	21.59	



<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				23060	23095	23130	
Frequency (MHz)				704	707.5	711	
10	QPSK	1	0	23.12	23.22	23.16	24.5
10	QPSK	1	25	23.72	23.75	23.75	
10	QPSK	1	49	23.39	23.46	23.46	
10	QPSK	25	0	22.30	22.46	22.69	23.5
10	QPSK	25	12	22.50	22.43	22.70	
10	QPSK	25	25	22.60	22.75	22.42	
10	QPSK	50	0	22.49	22.68	22.48	
10	16QAM	1	0	22.62	22.65	22.60	23.5
10	16QAM	1	25	23.07	22.90	23.14	
10	16QAM	1	49	22.88	22.85	22.50	
10	16QAM	25	0	21.35	21.68	21.60	22.5
10	16QAM	25	12	21.65	21.60	21.61	
10	16QAM	25	25	21.63	21.92	21.32	
10	16QAM	50	0	21.66	21.67	21.37	
Channel				23035	23095	23155	Tune-up limit (dBm)
Frequency (MHz)				701.5	707.5	713.5	
5	QPSK	1	0	23.15	23.15	23.19	24.5
5	QPSK	1	12	23.81	23.73	23.69	
5	QPSK	1	24	23.20	23.39	23.22	
5	QPSK	12	0	22.60	22.63	22.42	23.5
5	QPSK	12	7	22.48	22.65	22.60	
5	QPSK	12	13	22.44	22.71	22.27	
5	QPSK	25	0	22.50	22.42	22.33	
5	16QAM	1	0	22.63	22.83	22.67	23.5
5	16QAM	1	12	22.71	22.75	22.60	
5	16QAM	1	24	22.96	23.04	22.65	
5	16QAM	12	0	21.65	21.62	21.68	22.5
5	16QAM	12	7	21.63	21.62	21.66	
5	16QAM	12	13	21.61	21.66	21.61	
5	16QAM	25	0	21.64	21.61	21.60	
Channel				23025	23095	23165	Tune-up limit (dBm)
Frequency (MHz)				700.5	707.5	714.5	
3	QPSK	1	0	23.33	23.49	23.11	24.5
3	QPSK	1	8	23.26	23.35	23.06	
3	QPSK	1	14	23.45	23.50	22.96	
3	QPSK	8	0	22.63	22.50	22.49	23.5
3	QPSK	8	4	22.45	22.46	22.41	
3	QPSK	8	7	22.60	22.65	22.40	
3	QPSK	15	0	22.48	22.62	22.30	
3	16QAM	1	0	22.60	22.69	22.65	23.5
3	16QAM	1	8	22.60	22.82	22.63	
3	16QAM	1	14	22.62	23.08	22.83	
3	16QAM	8	0	21.60	21.68	21.39	22.5
3	16QAM	8	4	21.24	21.74	21.28	
3	16QAM	8	7	21.60	21.66	21.34	
3	16QAM	15	0	21.64	21.64	21.14	



Channel				23017	23095	23173	Tune-up limit (dBm)
Frequency (MHz)				699.7	707.5	715.3	
1.4	QPSK	1	0	23.46	23.42	23.31	24.5
1.4	QPSK	1	3	23.69	23.60	23.25	
1.4	QPSK	1	5	23.66	23.68	23.29	
1.4	QPSK	3	0	23.62	23.68	23.62	
1.4	QPSK	3	1	23.62	23.66	23.60	
1.4	QPSK	3	3	23.68	23.61	23.25	
1.4	QPSK	6	0	22.49	22.38	22.38	23.5
1.4	16QAM	1	0	22.62	22.88	22.60	23.5
1.4	16QAM	1	3	22.68	23.06	22.63	
1.4	16QAM	1	5	22.83	22.98	22.61	
1.4	16QAM	3	0	23.05	22.72	22.69	
1.4	16QAM	3	1	23.15	22.88	22.81	
1.4	16QAM	3	3	23.19	22.91	22.61	
1.4	16QAM	6	0	21.62	21.32	21.20	22.5



<LTE Band 17>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				23780	23790	23800	
Frequency (MHz)				709	710	711	
10	QPSK	1	0	23.05	23.01	22.94	24.5
10	QPSK	1	25	23.60	23.71	23.75	
10	QPSK	1	49	23.62	23.63	23.79	
10	QPSK	25	0	22.48	22.51	22.61	23.5
10	QPSK	25	12	22.67	22.60	22.68	
10	QPSK	25	25	22.68	22.61	22.80	
10	QPSK	50	0	22.49	22.60	22.68	
10	16QAM	1	0	22.39	22.39	22.85	23.5
10	16QAM	1	25	22.75	22.80	23.23	
10	16QAM	1	49	23.18	22.65	23.49	
10	16QAM	25	0	21.60	21.70	21.69	22.5
10	16QAM	25	12	21.65	21.37	21.45	
10	16QAM	25	25	21.64	21.45	21.87	
10	16QAM	50	0	21.60	21.65	21.67	
Channel				23755	23790	23825	Tune-up limit (dBm)
Frequency (MHz)				706.5	710	713.5	
5	QPSK	1	0	23.02	23.40	23.42	24.5
5	QPSK	1	12	23.62	23.86	23.77	
5	QPSK	1	24	23.18	23.60	23.47	
5	QPSK	12	0	22.29	22.43	22.41	23.5
5	QPSK	12	7	22.39	22.65	22.67	
5	QPSK	12	13	22.64	22.43	22.65	
5	QPSK	25	0	22.35	22.61	22.60	
5	16QAM	1	0	22.60	22.63	22.63	23.5
5	16QAM	1	12	22.91	22.75	22.85	
5	16QAM	1	24	22.84	22.62	22.86	
5	16QAM	12	0	21.02	21.61	21.36	22.5
5	16QAM	12	7	21.60	21.68	21.62	
5	16QAM	12	13	21.37	21.61	21.62	
5	16QAM	12	13	21.37	21.61	21.62	
5	16QAM	25	0	21.45	21.70	21.66	



<LTE Band 26>

BW [MHz]	Modulation	RB Size	RB Offset		Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					26865	26965	
Frequency (MHz)					831.5	841.5	
15	QPSK	1	0		23.25	23.26	24.5
15	QPSK	1	37		23.65	23.44	
15	QPSK	1	74		23.28	23.47	
15	QPSK	36	0		22.35	22.42	23.5
15	QPSK	36	20		22.40	22.33	
15	QPSK	36	39		22.47	22.46	
15	QPSK	75	0		22.38	22.49	
15	16QAM	1	0		22.66	22.63	23.5
15	16QAM	1	37		22.69	22.72	
15	16QAM	1	74		22.64	22.83	
15	16QAM	36	0		21.21	21.63	22.5
15	16QAM	36	20		21.69	21.39	
15	16QAM	36	39		21.65	21.42	
15	16QAM	75	0		21.63	21.64	
Channel				26740	26865	26990	Tune-up limit (dBm)
Frequency (MHz)				819	831.5	844	
10	QPSK	1	0	23.65	23.20	23.23	24.5
10	QPSK	1	25	23.45	23.50	23.68	
10	QPSK	1	49	23.46	23.64	23.50	
10	QPSK	25	0	22.71	22.39	22.36	23.5
10	QPSK	25	12	22.45	22.66	22.63	
10	QPSK	25	25	22.37	22.63	22.64	
10	QPSK	50	0	22.64	22.70	22.75	
10	16QAM	1	0	22.92	22.67	22.66	23.5
10	16QAM	1	25	22.92	23.02	22.77	
10	16QAM	1	49	22.83	22.66	22.79	
10	16QAM	25	0	21.76	21.46	21.50	22.5
10	16QAM	25	12	21.73	21.63	21.73	
10	16QAM	25	25	21.70	21.65	21.68	
10	16QAM	50	0	21.66	21.64	21.63	
Channel				26715	26865	27015	Tune-up limit (dBm)
Frequency (MHz)				816.5	831.5	846.5	
5	QPSK	1	0	23.63	23.18	23.64	24.5
5	QPSK	1	12	23.94	23.78	24.03	
5	QPSK	1	24	23.65	23.17	23.68	
5	QPSK	12	0	22.64	22.36	22.72	23.5
5	QPSK	12	7	22.76	22.44	22.74	
5	QPSK	12	13	22.78	22.48	22.83	
5	QPSK	25	0	22.82	22.63	22.75	
5	16QAM	1	0	22.97	22.66	22.92	23.5
5	16QAM	1	12	23.02	22.76	23.16	
5	16QAM	1	24	22.80	22.71	23.11	
5	16QAM	12	0	21.72	21.41	21.96	22.5
5	16QAM	12	7	22.05	21.63	21.90	
5	16QAM	12	13	21.78	21.65	21.98	
5	16QAM	25	0	21.88	21.67	21.69	



Channel				26705	26865	27025	Tune-up limit (dBm)
Frequency (MHz)				815.5	831.5	847.5	
3	QPSK	1	0	23.63	23.23	23.49	24.5
3	QPSK	1	8	23.64	23.32	23.81	
3	QPSK	1	14	23.65	23.63	23.86	
3	QPSK	8	0	22.80	22.63	22.80	23.5
3	QPSK	8	4	22.75	22.63	22.86	
3	QPSK	8	7	22.71	22.63	22.88	
3	QPSK	15	0	22.66	22.65	22.88	
3	16QAM	1	0	22.81	22.67	23.07	23.5
3	16QAM	1	8	22.89	22.63	23.20	
3	16QAM	1	14	23.07	22.83	23.27	
3	16QAM	8	0	21.71	21.37	21.67	22.5
3	16QAM	8	4	21.84	21.78	21.60	
3	16QAM	8	7	21.73	21.67	21.95	
3	16QAM	15	0	21.74	21.67	21.93	
3	16QAM	15	0	21.74	21.67	21.93	
Channel				26697	26865	27033	Tune-up limit (dBm)
Frequency (MHz)				814.7	831.5	848.3	
1.4	QPSK	1	0	23.77	23.48	23.75	24.5
1.4	QPSK	1	3	23.93	23.68	23.60	
1.4	QPSK	1	5	23.70	23.50	23.83	
1.4	QPSK	3	0	23.73	23.48	23.83	
1.4	QPSK	3	1	23.70	23.63	24.05	
1.4	QPSK	3	3	23.75	23.50	23.72	
1.4	QPSK	6	0	22.63	22.41	22.77	23.5
1.4	16QAM	1	0	22.73	22.73	23.19	23.5
1.4	16QAM	1	3	22.93	22.91	23.27	
1.4	16QAM	1	5	22.93	22.65	23.18	
1.4	16QAM	3	0	22.85	22.75	23.40	
1.4	16QAM	3	1	22.81	22.71	23.32	
1.4	16QAM	3	3	22.79	22.74	23.08	
1.4	16QAM	6	0	21.65	21.25	21.63	



<Reduced Power Mode>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				18700	18900	19100	
Frequency (MHz)				1860	1880	1900	
20	QPSK	1	0	20.00	19.73	19.98	21
20	QPSK	1	49	20.35	20.72	20.54	
20	QPSK	1	99	19.81	20.21	19.96	
20	QPSK	50	0	20.20	20.36	20.31	21
20	QPSK	50	24	20.12	20.35	20.20	
20	QPSK	50	50	20.03	20.31	20.27	
20	QPSK	100	0	20.26	20.34	20.29	21
20	16QAM	1	0	19.61	19.89	20.01	
20	16QAM	1	49	20.06	20.20	20.16	
20	16QAM	1	99	19.69	19.93	19.92	21
20	16QAM	50	0	20.22	20.37	20.46	
20	16QAM	50	24	20.19	20.40	20.28	
20	16QAM	50	50	20.01	20.35	20.19	21
20	16QAM	100	0	20.32	20.35	20.19	
Channel				18675	18900	19125	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	QPSK	1	0	20.03	19.94	19.84	21
15	QPSK	1	37	20.16	20.64	20.40	
15	QPSK	1	74	20.08	20.40	20.08	
15	QPSK	36	0	20.27	20.32	20.42	21
15	QPSK	36	20	20.28	20.41	20.29	
15	QPSK	36	39	20.09	20.32	20.15	
15	QPSK	75	0	20.28	20.28	20.27	21
15	16QAM	1	0	20.12	19.84	20.00	
15	16QAM	1	37	20.08	20.22	20.34	
15	16QAM	1	74	19.85	20.01	20.00	21
15	16QAM	36	0	20.26	20.36	20.36	
15	16QAM	36	20	20.25	20.32	20.31	
15	16QAM	36	39	20.07	20.28	20.09	21
15	16QAM	75	0	20.34	20.31	20.36	
Channel				18650	18900	19150	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	QPSK	1	0	20.02	19.91	19.98	21
10	QPSK	1	25	20.50	20.58	20.45	
10	QPSK	1	49	19.90	20.29	20.05	
10	QPSK	25	0	20.34	20.31	20.22	21
10	QPSK	25	12	20.28	20.29	20.20	
10	QPSK	25	25	20.19	20.32	20.39	
10	QPSK	50	0	20.20	20.30	20.27	21
10	16QAM	1	0	20.04	19.97	19.99	
10	16QAM	1	25	20.31	20.18	20.06	
10	16QAM	1	49	19.94	20.05	19.99	21
10	16QAM	25	0	20.50	20.46	20.25	
10	16QAM	25	12	20.25	20.46	20.22	
10	16QAM	25	25	20.12	20.33	20.33	21
10	16QAM	50	0	20.28	20.42	20.23	



Channel				18625	18900	19175	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	QPSK	1	0	19.87	19.99	20.02	21
5	QPSK	1	12	20.43	20.48	20.56	
5	QPSK	1	24	19.82	19.90	20.02	
5	QPSK	12	0	20.30	20.27	20.39	21
5	QPSK	12	7	20.31	20.34	20.33	
5	QPSK	12	13	20.25	20.30	20.30	
5	QPSK	25	0	20.25	20.32	20.37	21
5	16QAM	1	0	20.00	19.96	19.87	
5	16QAM	1	12	20.07	20.54	20.20	
5	16QAM	1	24	19.88	19.81	20.00	21
5	16QAM	12	0	20.18	20.26	20.08	
5	16QAM	12	7	20.30	20.50	20.17	
5	16QAM	12	13	20.32	20.56	20.36	21
5	16QAM	25	0	20.22	20.45	20.47	
Channel				18615	18900	19185	
Frequency (MHz)				1851.5	1880	1908.5	
3	QPSK	1	0	19.92	20.17	20.09	21
3	QPSK	1	8	20.07	20.51	20.24	
3	QPSK	1	14	19.87	20.33	20.05	
3	QPSK	8	0	20.19	20.32	20.29	21
3	QPSK	8	4	20.27	20.31	20.32	
3	QPSK	8	7	20.27	20.37	20.22	
3	QPSK	15	0	20.18	20.35	20.25	21
3	16QAM	1	0	20.07	19.98	20.13	
3	16QAM	1	8	20.27	20.18	20.13	
3	16QAM	1	14	20.06	20.02	20.11	21
3	16QAM	8	0	20.23	20.33	20.20	
3	16QAM	8	4	20.21	20.51	20.45	
3	16QAM	8	7	20.37	20.37	20.41	21
3	16QAM	8	0	20.17	20.29	20.09	
Channel				18607	18900	19193	
Frequency (MHz)				1850.7	1880	1909.3	
1.4	QPSK	1	0	19.99	20.25	20.26	21
1.4	QPSK	1	3	20.19	20.33	20.31	
1.4	QPSK	1	5	20.25	20.28	20.12	
1.4	QPSK	3	0	20.27	20.47	20.28	21
1.4	QPSK	3	1	20.32	20.53	20.32	
1.4	QPSK	3	3	20.31	20.54	20.41	
1.4	QPSK	6	0	20.09	20.35	20.32	21
1.4	16QAM	1	0	19.97	20.13	20.24	21
1.4	16QAM	1	3	19.97	20.12	20.20	
1.4	16QAM	1	5	20.02	20.18	20.16	
1.4	16QAM	3	0	20.06	20.40	20.02	21
1.4	16QAM	3	1	20.11	20.39	20.26	
1.4	16QAM	3	3	20.07	20.51	20.25	
1.4	16QAM	6	0	20.13	20.21	20.27	21



<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20050	20175	20300	
Frequency (MHz)				1720	1732.5	1745	
20	QPSK	1	0	18.49	18.39	18.24	19.5
20	QPSK	1	49	18.86	18.72	18.75	
20	QPSK	1	99	18.29	18.50	18.44	
20	QPSK	50	0	18.74	18.54	18.46	19.5
20	QPSK	50	24	18.72	18.52	18.59	
20	QPSK	50	50	18.57	18.39	18.58	
20	QPSK	100	0	18.69	18.48	18.54	
20	16QAM	1	0	18.31	18.46	18.15	19.5
20	16QAM	1	49	18.65	18.49	18.53	
20	16QAM	1	99	18.23	18.21	18.44	
20	16QAM	50	0	18.87	18.61	18.57	19.5
20	16QAM	50	24	18.73	18.62	18.51	
20	16QAM	50	50	18.62	18.39	18.56	
20	16QAM	100	0	18.74	18.56	18.54	
Channel				20025	20175	20325	
Frequency (MHz)				1717.5	1732.5	1747.5	
15	QPSK	1	0	18.48	18.52	18.10	19.5
15	QPSK	1	37	18.77	18.72	18.45	
15	QPSK	1	74	18.50	18.34	18.34	
15	QPSK	36	0	18.69	18.54	18.56	19.5
15	QPSK	36	20	18.74	18.45	18.65	
15	QPSK	36	39	18.59	18.50	18.57	
15	QPSK	75	0	18.66	18.44	18.59	
15	16QAM	1	0	18.27	18.41	17.97	19.5
15	16QAM	1	37	18.72	18.32	18.57	
15	16QAM	1	74	18.45	18.14	18.05	
15	16QAM	36	0	18.77	18.56	18.55	19.5
15	16QAM	36	20	18.82	18.53	18.58	
15	16QAM	36	39	18.66	18.49	18.58	
15	16QAM	75	0	18.73	18.42	18.59	
Channel				20000	20175	20350	
Frequency (MHz)				1715	1732.5	1750	
10	QPSK	1	0	18.40	18.26	18.13	19.5
10	QPSK	1	25	18.84	18.60	18.50	
10	QPSK	1	49	18.59	18.36	18.29	
10	QPSK	25	0	18.75	18.58	18.60	19.5
10	QPSK	25	12	18.71	18.46	18.60	
10	QPSK	25	25	18.75	18.42	18.57	
10	QPSK	50	0	18.82	18.44	18.66	
10	16QAM	1	0	18.31	18.26	18.36	19.5
10	16QAM	1	25	18.68	18.68	18.64	
10	16QAM	1	49	18.63	18.21	18.25	
10	16QAM	25	0	18.85	18.62	18.79	19.5
10	16QAM	25	12	18.78	18.45	18.82	
10	16QAM	25	25	18.72	18.51	18.56	
10	16QAM	50	0	18.72	18.43	18.66	



Channel				19975	20175	20375	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1732.5	1752.5	
5	QPSK	1	0	18.35	18.13	18.26	19.5
5	QPSK	1	12	18.71	18.65	18.87	
5	QPSK	1	24	18.42	18.07	18.31	
5	QPSK	12	0	18.68	18.52	18.69	19.5
5	QPSK	12	7	18.73	18.51	18.54	
5	QPSK	12	13	18.67	18.45	18.60	
5	QPSK	25	0	18.66	18.45	18.55	
5	16QAM	1	0	18.21	18.27	18.43	19.5
5	16QAM	1	12	18.56	18.23	18.48	
5	16QAM	1	24	18.17	18.32	18.65	
5	16QAM	12	0	18.57	18.41	18.50	19.5
5	16QAM	12	7	18.57	18.39	18.54	
5	16QAM	12	13	18.51	18.45	18.65	
5	16QAM	25	0	18.64	18.44	18.67	
5	16QAM	25	0	18.64	18.44	18.67	
Channel				19965	20175	20385	Tune-up limit (dBm)
Frequency (MHz)				1711.5	1732.5	1753.5	
3	QPSK	1	0	18.62	18.36	18.47	19.5
3	QPSK	1	8	18.89	18.49	18.74	
3	QPSK	1	14	18.69	18.34	18.77	
3	QPSK	8	0	18.74	18.51	18.76	19.5
3	QPSK	8	4	18.68	18.50	18.71	
3	QPSK	8	7	18.73	18.54	18.66	
3	QPSK	15	0	18.67	18.43	18.68	
3	16QAM	1	0	18.20	18.40	18.39	
3	16QAM	1	8	18.49	18.54	18.80	19.5
3	16QAM	1	14	18.19	18.37	18.55	
3	16QAM	8	0	18.48	18.45	18.49	
3	16QAM	8	4	18.52	18.42	18.52	19.5
3	16QAM	8	7	18.49	18.38	18.51	
3	16QAM	15	0	18.74	18.43	18.71	
3	16QAM	15	0	18.74	18.43	18.71	
Channel				19957	20175	20393	Tune-up limit (dBm)
Frequency (MHz)				1710.7	1732.5	1754.3	
1.4	QPSK	1	0	18.55	18.47	18.57	19.5
1.4	QPSK	1	3	18.62	18.54	18.77	
1.4	QPSK	1	5	18.56	18.49	18.76	
1.4	QPSK	3	0	18.64	18.58	18.90	
1.4	QPSK	3	1	18.69	18.54	19.05	
1.4	QPSK	3	3	18.70	18.54	18.91	
1.4	QPSK	6	0	18.80	18.49	18.81	19.5
1.4	16QAM	1	0	18.60	18.42	18.74	19.5
1.4	16QAM	1	3	18.61	18.46	18.61	
1.4	16QAM	1	5	18.57	18.24	18.58	
1.4	16QAM	3	0	18.48	18.50	18.55	
1.4	16QAM	3	1	18.45	18.44	18.82	
1.4	16QAM	3	3	18.41	18.55	18.96	
1.4	16QAM	6	0	18.54	18.44	18.79	



<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20850	21100	21350	
Frequency (MHz)				2510	2535	2560	
20	QPSK	1	0	20.89	20.67	20.60	21.5
20	QPSK	1	49	21.12	21.33	21.44	
20	QPSK	1	99	21.06	20.75	20.79	
20	QPSK	50	0	21.13	21.12	21.26	21.5
20	QPSK	50	24	21.21	21.14	21.31	
20	QPSK	50	50	21.03	21.07	21.23	
20	QPSK	100	0	21.18	21.21	21.23	
20	16QAM	1	0	20.97	20.63	20.71	21.5
20	16QAM	1	49	21.02	20.95	21.49	
20	16QAM	1	99	20.75	20.61	20.72	
20	16QAM	50	0	21.32	21.07	21.26	21.5
20	16QAM	50	24	21.25	21.20	21.26	
20	16QAM	50	50	21.14	21.09	21.31	
20	16QAM	100	0	21.16	21.15	21.21	
Channel				20825	21100	21375	
Frequency (MHz)				2507.5	2535	2562.5	
15	QPSK	1	0	21.04	20.94	21.04	21.5
15	QPSK	1	37	21.49	21.36	21.34	
15	QPSK	1	74	21.13	20.98	21.01	
15	QPSK	36	0	21.32	21.14	21.15	21.5
15	QPSK	36	20	21.34	21.24	21.15	
15	QPSK	36	39	21.26	21.03	21.28	
15	QPSK	75	0	21.30	21.16	21.14	
15	16QAM	1	0	21.12	20.79	20.72	21.5
15	16QAM	1	37	20.87	21.18	20.91	
15	16QAM	1	74	20.90	20.62	20.68	
15	16QAM	36	0	21.29	21.06	21.20	21.5
15	16QAM	36	20	21.25	21.17	21.21	
15	16QAM	36	39	21.24	20.88	21.23	
15	16QAM	75	0	21.29	21.19	21.29	
Channel				20800	21100	21400	
Frequency (MHz)				2505	2535	2565	
10	QPSK	1	0	21.04	20.93	20.95	21.5
10	QPSK	1	25	21.11	21.18	21.31	
10	QPSK	1	49	20.93	20.68	20.92	
10	QPSK	25	0	21.31	21.11	21.27	21.5
10	QPSK	25	12	21.22	21.23	21.29	
10	QPSK	25	25	21.27	21.22	21.15	
10	QPSK	50	0	21.31	21.11	21.23	
10	16QAM	1	0	20.80	20.65	20.75	21.5
10	16QAM	1	25	21.03	21.35	21.30	
10	16QAM	1	49	21.02	20.62	20.62	
10	16QAM	25	0	21.33	21.16	21.30	21.5
10	16QAM	25	12	21.35	21.28	21.23	
10	16QAM	25	25	21.30	21.17	21.23	
10	16QAM	50	0	21.30	21.04	21.32	



Channel				20775	21100	21425	Tune-up limit (dBm)
Frequency (MHz)				2502.5	2535	2567.5	
5	QPSK	1	0	21.04	20.93	20.95	21.5
5	QPSK	1	12	21.11	21.18	21.31	
5	QPSK	1	24	20.93	20.68	20.92	
5	QPSK	12	0	21.31	21.11	21.27	21.5
5	QPSK	12	7	21.22	21.23	21.29	
5	QPSK	12	13	21.27	21.22	21.15	
5	QPSK	25	0	21.31	21.11	21.23	
5	16QAM	1	0	20.80	20.65	20.75	21.5
5	16QAM	1	12	21.03	21.35	21.30	
5	16QAM	1	24	21.02	20.62	20.63	
5	16QAM	12	0	21.33	21.16	21.30	21.5
5	16QAM	12	7	21.35	21.28	21.23	
5	16QAM	12	13	21.30	21.17	21.23	
5	16QAM	25	0	21.30	21.04	21.32	

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

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

- a. 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations
- b. "special subframe S" contains both uplink and downlink transmissions, it has been taken into consideration to determine the transmission duty factor according to the worst case uplink and downlink cyclic prefix requirements for UpPTS
- c. Establishing connections with base station simulators ensure a consistent means for testing SAR and recommended for evaluating SAR. The Anritsu MT8820C (firmware: #22.52#004) was used for LTE output power measurements and SAR testing.

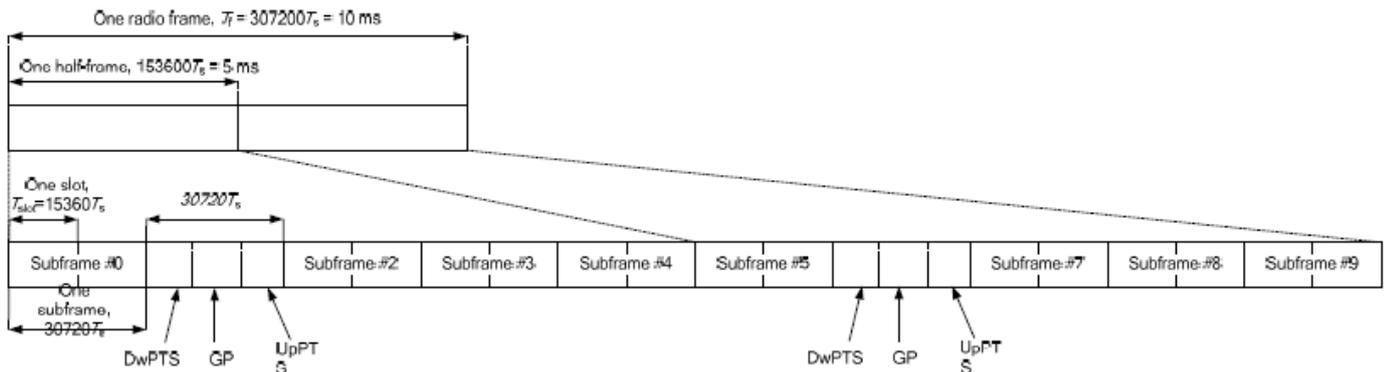


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

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

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

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

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

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

The highest duty factor is resulted from:

- i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subframes, uplink operation is in 3 uplink subframes and 1 special subframe.
- ii. special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink
- iii. for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(3+0.167)/5 = 63.3\%$
- iv. for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(3+0.143)/5 = 62.9\%$
- v. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix $63.3\%/62.9\% = 1.006$ is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.



<Full Power Mode>

<LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				39750	40185	40620	41055	41490	
Frequency (MHz)				2506	2549.5	2593	2636.5	2680	
20	QPSK	1	0	23.61	23.06	23.39	23.22	23.18	24.5
20	QPSK	1	49	23.38	23.49	23.62	23.42	23.17	
20	QPSK	1	99	23.12	23.38	23.16	23.13	23.06	
20	QPSK	50	0	22.61	22.19	22.43	22.37	22.34	23.5
20	QPSK	50	24	22.42	22.36	22.45	22.63	22.34	
20	QPSK	50	50	22.41	22.33	22.28	22.41	22.36	
20	QPSK	100	0	22.37	22.27	22.34	22.38	22.27	23.5
20	16QAM	1	0	22.78	22.23	22.47	22.30	22.37	
20	16QAM	1	49	22.94	22.61	22.63	22.85	22.65	
20	16QAM	1	99	22.35	22.60	22.42	22.49	22.43	22.5
20	16QAM	50	0	21.34	21.22	21.46	21.40	21.38	
20	16QAM	50	24	21.44	21.29	21.49	21.60	21.16	
20	16QAM	50	50	21.25	21.37	21.42	21.45	21.40	22.5
20	16QAM	100	0	21.40	21.30	21.38	21.42	21.31	
Channel				39725	40173	40620	41068	41515	
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5	
15	QPSK	1	0	23.75	23.09	23.35	23.35	23.14	24.5
15	QPSK	1	37	23.83	23.49	23.68	23.72	23.44	
15	QPSK	1	74	23.33	23.35	23.24	23.24	23.17	
15	QPSK	36	0	22.60	22.20	22.34	22.30	22.27	23.5
15	QPSK	36	20	22.44	22.22	22.33	22.48	22.28	
15	QPSK	36	39	22.37	22.33	22.29	22.33	22.36	
15	QPSK	75	0	22.37	22.23	22.28	22.44	22.29	23.5
15	16QAM	1	0	22.83	22.19	22.47	22.50	22.39	
15	16QAM	1	37	22.62	22.29	22.61	22.61	22.44	
15	16QAM	1	74	22.42	22.45	22.44	22.34	22.38	22.5
15	16QAM	36	0	21.40	21.08	21.22	21.22	21.24	
15	16QAM	36	20	21.32	21.21	21.32	21.48	21.18	
15	16QAM	36	39	21.26	21.21	21.22	21.38	21.27	22.5
15	16QAM	75	0	21.30	21.16	21.42	21.38	21.23	
Channel				39700	40160	40620	41080	41540	
Frequency (MHz)				2501	2547	2593	2639	2685	
10	QPSK	1	0	23.47	23.07	23.15	23.14	23.24	24.5
10	QPSK	1	25	23.32	23.32	23.30	23.27	23.41	
10	QPSK	1	49	23.25	23.12	23.12	23.13	23.10	
10	QPSK	25	0	22.62	22.23	22.36	22.37	22.28	23.5
10	QPSK	25	12	22.39	22.27	22.34	22.49	22.36	
10	QPSK	25	25	22.39	22.29	22.30	22.27	22.29	
10	QPSK	50	0	22.65	22.26	22.29	22.40	22.35	23.5
10	16QAM	1	0	22.99	22.33	22.35	22.48	22.43	
10	16QAM	1	25	22.83	22.61	22.82	22.84	22.68	
10	16QAM	1	49	22.67	22.38	22.38	22.39	22.45	22.5
10	16QAM	25	0	21.64	21.36	21.61	21.60	21.46	
10	16QAM	25	12	21.62	21.23	21.60	21.61	21.43	
10	16QAM	25	25	21.45	21.35	21.60	21.63	21.64	22.5
10	16QAM	50	0	21.62	21.09	21.28	21.44	21.39	



Channel				39675	40148	40620	41093	41565	Tune-up limit (dBm)
Frequency (MHz)				2498.5	2545.8	2593	2640.30	2687.5	
5	QPSK	1	0	23.47	22.82	23.03	23.12	23.13	24.5
5	QPSK	1	12	23.72	23.42	23.41	23.43	23.32	
5	QPSK	1	24	23.31	22.83	23.18	23.04	23.09	
5	QPSK	12	0	22.67	22.25	22.32	22.32	22.35	23.5
5	QPSK	12	7	22.65	22.24	22.36	22.46	22.37	
5	QPSK	12	13	22.66	22.21	22.40	22.45	22.39	
5	QPSK	25	0	22.46	22.22	22.28	22.33	22.37	
5	16QAM	1	0	22.86	22.24	22.43	22.45	22.37	23.5
5	16QAM	1	12	22.80	22.27	22.62	22.69	22.61	
5	16QAM	1	24	22.68	22.13	22.45	22.48	22.36	
5	16QAM	12	0	21.45	21.13	21.37	21.37	21.19	22.5
5	16QAM	12	7	21.46	21.16	21.39	21.36	21.23	
5	16QAM	12	13	21.60	21.14	21.33	21.44	21.22	
5	16QAM	12	13	21.60	21.14	21.33	21.44	21.22	
5	16QAM	25	0	21.73	21.09	21.45	21.66	21.64	



<Reduced Power Mode>

<LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				39750	40185	40620	41055	41490	
Frequency (MHz)				2506	2549.5	2593	2636.5	2680	
20	QPSK	1	0	22.91	22.83	22.79	22.46	22.67	23.5
20	QPSK	1	49	22.86	22.81	22.93	23.00	23.05	
20	QPSK	1	99	23.02	22.73	22.37	22.62	22.87	
20	QPSK	50	0	23.06	22.86	22.95	22.73	22.99	23.5
20	QPSK	50	24	23.15	22.99	22.91	22.98	23.06	
20	QPSK	50	50	23.08	22.98	22.66	22.85	23.07	
20	QPSK	100	0	23.10	22.91	22.85	22.83	22.97	23.5
20	16QAM	1	0	22.56	22.41	22.38	22.03	22.24	
20	16QAM	1	49	22.95	22.68	22.60	22.66	22.79	
20	16QAM	1	99	22.67	22.49	22.17	22.24	22.71	22.5
20	16QAM	50	0	22.21	22.00	22.19	21.97	22.02	
20	16QAM	50	24	22.19	22.23	22.17	22.13	22.11	
20	16QAM	50	50	22.36	22.13	21.92	22.00	22.33	22.5
20	16QAM	100	0	22.34	22.06	21.99	21.98	22.12	
Channel				39725	40173	40620	41068	41515	
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5	
15	QPSK	1	0	22.82	22.81	22.70	22.38	22.63	23.5
15	QPSK	1	37	23.22	22.97	22.90	23.12	23.22	
15	QPSK	1	74	22.89	22.84	22.48	22.60	23.03	
15	QPSK	36	0	23.07	22.88	22.97	22.82	23.08	23.5
15	QPSK	36	20	23.13	23.06	22.97	22.94	23.15	
15	QPSK	36	39	22.97	22.89	22.73	22.82	23.08	
15	QPSK	75	0	23.03	22.85	22.76	22.84	23.15	23.5
15	16QAM	1	0	22.61	22.39	22.40	22.19	22.47	
15	16QAM	1	37	22.69	22.54	22.58	22.56	22.64	
15	16QAM	1	74	22.56	22.55	22.27	22.36	22.71	22.5
15	16QAM	36	0	22.16	22.08	22.15	21.92	22.17	
15	16QAM	36	20	22.21	22.26	21.97	22.03	22.25	
15	16QAM	36	39	22.18	22.12	21.85	22.05	22.31	22.5
15	16QAM	75	0	22.29	22.10	22.01	22.09	22.20	
Channel				39700	40160	40620	41080	41540	
Frequency (MHz)				2501	2547	2593	2639	2685	
10	QPSK	1	0	22.92	22.63	22.62	22.65	22.87	23.5
10	QPSK	1	25	23.11	22.69	22.64	23.06	23.08	
10	QPSK	1	49	22.92	22.67	22.39	22.64	22.84	
10	QPSK	25	0	23.11	22.91	22.77	22.87	23.05	23.5
10	QPSK	25	12	23.05	23.00	22.90	22.97	23.20	
10	QPSK	25	25	23.00	22.88	22.77	22.85	23.05	
10	QPSK	50	0	23.07	22.89	22.76	22.86	23.09	23.5
10	16QAM	1	0	22.74	22.45	22.47	22.52	22.60	
10	16QAM	1	25	22.87	22.65	22.57	22.81	22.92	
10	16QAM	1	49	22.84	22.43	22.24	22.50	22.74	22.5
10	16QAM	25	0	22.29	22.14	22.34	22.16	22.31	
10	16QAM	25	12	22.47	22.38	22.25	22.23	22.46	
10	16QAM	25	25	22.46	22.14	22.15	22.39	22.50	22.5
10	16QAM	50	0	22.19	22.23	22.12	22.10	22.24	



Channel				39675	40148	40620	41093	41565	Tune-up limit (dBm)
Frequency (MHz)				2498.5	2545.8	2593	2640.30	2687.5	
5	QPSK	1	0	22.90	22.49	22.41	22.38	22.83	23.5
5	QPSK	1	12	23.08	22.97	22.87	22.90	23.21	
5	QPSK	1	24	22.83	22.49	22.38	22.38	23.03	
5	QPSK	12	0	23.10	22.87	22.84	22.86	23.16	23.5
5	QPSK	12	7	23.05	23.05	22.94	22.97	23.18	
5	QPSK	12	13	23.00	22.95	22.93	22.99	23.23	
5	QPSK	25	0	23.04	22.85	22.82	22.87	23.09	
5	16QAM	1	0	22.70	22.44	22.30	22.39	22.66	23.5
5	16QAM	1	12	22.81	22.52	22.52	22.55	22.75	
5	16QAM	1	24	22.76	22.54	22.34	22.42	22.68	
5	16QAM	12	0	22.13	22.10	21.98	22.01	22.21	22.5
5	16QAM	12	7	22.20	22.08	21.98	22.11	22.23	
5	16QAM	12	13	22.23	22.08	21.97	22.03	22.36	
5	16QAM	25	0	22.12	22.03	21.90	22.31	22.37	

<LTE Carrier Aggregation Combination>

Inter-Band Combination						Intra-Band Combination							
PCC		SCC		PCC		SCC		Contiguous			Non-Contiguous		
LTE B5	+	LTE B7	LTE B7	+	LTE B5	PCC	+	SCC	PCC	+	SCC		
BW (MHz)	+	BW (MHz)	BW (MHz)	+	BW (MHz)	LTE B7	+	LTE B7	LTE B7	+	LTE B7		
10	+	20	20	+	10	BW (MHz)	+	BW (MHz)	BW (MHz)	+	BW (MHz)		
10	+	15	20	+	5	20	+	20	20	+	20		
10	+	10	20	+	3	20	+	15	15	+	20		
5	+	20	20	+	1.4	20	+	10	15	+	15		
5	+	15	15	+	10	15	+	20	10	+	15		
5	+	10	15	+	5	15	+	15	10	+	10		
3	+	20	15	+	3	10	+	20	5	+	15		
3	+	15	15	+	1.4				20	+	15		
3	+	10	10	+	10				15	+	10		
1.4	+	20	10	+	5				15	+	5		
1.4	+	15	10	+	3								
1.4	+	10	10	+	1.4								

General Note:

- i. This device supports LTE Carrier Aggregation (CA) in the downlink only.



<LTE Carrier Aggregation Conducted Power>

General Note:

- i. According to KDB941225 D05A v01, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.
- ii. Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.
- iii. The device only supports downlink carrier aggregation. Uplink carrier aggregation is not supported. Power measurements were performed with two DL carriers for the Release 8 configuration that had the highest output power across all bandwidths, channels and RB configuration for each band.
- iv. During the carrier aggregation conducted power measurements we have attention to throughput traffic to make sure all the power measurement is corrected.

<Full Power Mode>

Configure		PCC					SCC				Power		
		LTE Band	BW (MHz)	Freq. (MHz)	Channel	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL# Freq. (MHz)	DL# Channel	LTE Rel 10 Tx.Power(dBm)	LTE Rel 8 Tx.Power(dBm)
Inter-Band	Band 5	10M	829	20450	1	0	Band 7	20M	2655	3100	23.48	23.50	
	Band 5	10M	836.5	20525	1	0	Band 7	20M	2655	3100	23.38	23.40	
	Band 5	10M	844	20600	1	0	Band 7	20M	2655	3100	23.30	23.32	
	Band 7	20M	2510	20850	1	0	Band 5	10M	881.5	2525	23.13	23.14	
	Band 7	20M	2535	21100	1	0	Band 5	10M	881.5	2525	22.75	22.79	
Intra-Band	Contiguous	Band 7	20M	2510	20850	1	0	Band 5	10M	881.5	2525	22.80	22.81
		Band 7	20M	2510	20850	1	0	Band 7	20M	2650	3050	23.11	23.14
		Band 7	20M	2535	21100	1	0	Band 7	20M	2635	2900	22.76	22.79
		Band 7	20M	2535	21100	1	0	Band 7	20M	2675	3300	22.77	22.79
	Non-Contiguous	Band 7	20M	2560	21350	1	0	Band 7	20M	2660	3150	22.79	22.81
		Band 7	20M	2510	20850	1	0	Band 7	20M	2680	3350	23.12	23.14
		Band 7	20M	2535	21100	1	0	Band 7	20M	2680	3350	22.77	22.79
		Band 7	20M	2560	21350	1	0	Band 7	20M	2630	2850	22.79	22.81
		Band 7	20M	2560	21350	1	0	Band 7	20M	2655	3100	22.78	22.81
		Band 7	20M	2560	21350	1	0	Band 7	20M	2655	3100	22.78	22.81

<Reduced Power Mode>

Configure		PCC					SCC				Power		
		LTE Band	BW (MHz)	Freq. (MHz)	Channel	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL# Freq. (MHz)	DL# Channel	LTE Rel 10 Tx.Power(dBm)	LTE Rel 8 Tx.Power(dBm)
Inter-Band	Band 7	20M	2510	20850	1	0	Band 5	10M	881.5	2525	20.85	20.89	
	Band 7	20M	2535	21100	1	0	Band 5	10M	881.5	2525	20.65	20.67	
	Band 7	20M	2560	21350	1	0	Band 5	10M	881.5	2525	20.58	20.60	
Intra-Band	Contiguous	Band 7	20M	2510	20850	1	0	Band 7	20M	2650	3050	20.88	20.89
		Band 7	20M	2535	21100	1	0	Band 7	20M	2635	2900	20.66	20.67
		Band 7	20M	2535	21100	1	0	Band 7	20M	2675	3300	20.65	20.67
		Band 7	20M	2560	21350	1	0	Band 7	20M	2660	3150	20.59	20.60
	Non-Contiguous	Band 7	20M	2510	20850	1	0	Band 7	20M	2680	3350	20.85	20.89
		Band 7	20M	2535	21100	1	0	Band 7	20M	2680	3350	20.61	20.67
		Band 7	20M	2560	21350	1	0	Band 7	20M	2630	2850	20.58	20.60
		Band 7	20M	2560	21350	1	0	Band 7	20M	2655	3100	20.57	20.60
		Band 7	20M	2560	21350	1	0	Band 7	20M	2655	3100	20.57	20.60
		Band 7	20M	2560	21350	1	0	Band 7	20M	2655	3100	20.57	20.60



<WLAN Conducted Power>

General Note:

1. 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.
2. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
3. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
4. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
 - a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
 - b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
 - c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

<2.4GHz WLAN>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b	CH 01	2412	1Mbps	14.37	15.50	100.00
		CH 06	2437		14.54	15.50	
		CH 11	2462		14.25	15.50	
		CH 12	2467		14.44	15.50	
		CH 13	2472		12.26	13.07	
	802.11g	CH 01	2412	6Mbps	14.51	15.50	98.11
		CH 06	2437		14.46	15.50	
		CH 11	2462		14.53	15.50	
		CH 12	2467		10.81	11.64	
		CH 13	2472		4.29	5.14	
	802.11n-HT20	CH 01	2412	MCS0	14.89	15.50	98.64
		CH 06	2437		14.70	15.50	
		CH 11	2462		14.59	15.50	
		CH 12	2467		8.75	9.63	
		CH 13	2472		3.65	4.13	



<5GHz WLAN>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a	CH 36	5180	6Mbps	12.75	13.50	98.73
		CH 40	5200		12.82	13.50	
		CH 44	5220		12.97	13.50	
		CH 48	5240		12.37	13.50	
	802.11n-HT20	CH 36	5180	MCS0	12.48	13.50	98.64
		CH 40	5200		12.53	13.50	
		CH 44	5220		12.84	13.50	
		CH 48	5240		12.81	13.50	
	802.11n-HT40	CH 38	5190	MCS0	12.79	13.50	97.93
		CH 46	5230		13.32	13.50	
	802.11ac-VHT20	CH 36	5180	MCS0	12.96	13.50	98.65
		CH 40	5200		12.88	13.50	
		CH 44	5220		12.82	13.50	
		CH 48	5240		12.80	13.50	
	802.11ac-VHT40	CH 38	5190	MCS0	12.73	13.50	98.62
		CH 46	5230		12.76	13.50	
802.11ac-VHT80	CH 42	5210	MCS0	11.11	11.47	97.14	

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a	CH 52	5260	6Mbps	12.38	13.50	98.73
		CH 56	5280		12.55	13.50	
		CH 60	5300		12.82	13.50	
		CH 64	5320		12.70	13.50	
	802.11n-HT20	CH 52	5260	MCS0	12.48	13.50	98.64
		CH 56	5280		12.50	13.50	
		CH 60	5300		12.14	13.50	
		CH 64	5320		12.60	13.50	
	802.11n-HT40	CH 54	5270	MCS0	12.77	13.50	97.93
		CH 62	5310		12.80	13.50	
	802.11ac-VHT20	CH 52	5260	MCS0	13.02	13.50	98.65
		CH 56	5280		12.87	13.50	
		CH 60	5300		12.63	13.50	
		CH 64	5320		12.59	13.50	
	802.11ac-VHT40	CH 54	5270	MCS0	12.71	13.50	98.62
		CH 62	5310		12.77	13.50	
802.11ac-VHT80	CH 58	5290	MCS0	11.36	12.05	97.14	



	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a	CH 100	5500	6Mbps	12.82	13.50	98.73
		CH 116	5580		12.80	13.50	
		CH 124	5620		12.72	13.50	
		CH 132	5660		12.53	13.50	
		CH 144	5720		12.27	13.50	
	802.11n-HT20	CH 100	5500	MCS0	12.74	13.50	98.64
		CH 116	5580		12.64	13.50	
		CH 124	5620		12.55	13.50	
		CH 132	5660		12.62	13.50	
		CH 144	5720		12.14	13.50	
	802.11n-HT40	CH 102	5510	MCS0	12.59	13.50	97.93
		CH 110	5550		12.68	13.50	
		CH 126	5630		12.51	13.50	
		CH 134	5670		12.48	13.50	
		CH 142	5710		12.37	13.50	
	802.11ac-VHT20	CH 100	5500	MCS0	12.46	13.50	98.65
		CH 116	5580		12.65	13.50	
		CH 124	5620		12.58	13.50	
		CH 132	5660		12.44	13.50	
		CH 144	5720		12.39	13.50	
802.11ac-VHT40	CH 102	5510	MCS0	12.56	13.50	98.62	
	CH 110	5550		12.55	13.50		
	CH 126	5630		12.51	13.50		
	CH 134	5670		12.40	13.50		
	CH 142	5710		12.49	13.50		
802.11ac-VHT80	CH 106	5530	MCS0	13.26	13.50	97.14	
	CH 122	5610		12.87	13.50		
	CH 138	5690		12.47	13.50		

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a	CH 149	5745	MCS0	12.66	13.50	98.73
		CH 157	5785		12.94	13.50	
		CH 165	5825		12.29	13.50	
	802.11n-HT20	CH 149	5745	MCS0	12.42	13.50	98.64
		CH 157	5785		12.55	13.50	
		CH 165	5825		12.23	13.50	
	802.11n-HT40	CH 151	5755	MCS0	12.25	13.50	97.93
		CH 159	5795		12.67	13.50	
	802.11ac-VHT20	CH 149	5745	MCS0	12.39	13.50	98.65
		CH 157	5785		12.51	13.50	
		CH 165	5825		12.20	13.50	
	802.11ac-VHT40	CH 151	5755	MCS0	12.76	13.50	98.62
		CH 159	5795		12.58	13.50	
802.11ac-VHT80	CH 155	5775	MCS0	12.90	13.46	97.14	

13. Bluetooth Exclusions Applied

Mode Band	Average power(dBm)		
	BR	EDR	LE
2.4GHz Bluetooth Version 4.2 with LE	11.38	8.5	8.14

Note:

- Per KDB 447498 D01v06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$$
 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
 - f(GHz) is the RF channel transmit frequency in GHz
 - Power and distance are rounded to the nearest mW and mm before calculation
 - The result is rounded to one decimal place for comparison

Bluetooth Max Power (dBm)	Separation Distance (mm)	Frequency (GHz)	exclusion thresholds
11.38	15mm	2.48	1.47

Note:

Per KDB 447498 D01v06, The test exclusion threshold is 1.47 which is ≤ 3, SAR testing is not required.

14. RF Exposure Conditions

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

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

General Note:

- Referring to KDB 941225 D06 v02r01, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge
- The detail antenna location please refers to Appendix D.



15. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, 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 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: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
 - e. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg) * Tune-up Scaling Factor * scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. When hotspot mode is enabled, power reduction will be activated to limit the maximum power of GSM1900 band, UMTS band 2 and 4, LTE band 2, 4, 7 and 41.
4. Per KDB 648474 D04v01r03, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.

GSM Note:

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE and DTM modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS (4Tx slots) for GSM850/GSM1900 is considered as the primary mode
2. Other configurations of GSM/GPRS/EDGE and DTM 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

UMTS 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. If the maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA 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 to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

**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 ≤ 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 ≤ 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 ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / B12 / B26 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 band 5 / 17 SAR test was covered by Band 26 / 12; according to 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 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 ≤ 1.2 W/kg.
2. Per KDB 248227 D01v02r02, for U-NII-1 SAR testing is not required when the U-NII-2A band highest reported SAR for a test configuration is ≤ 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 ≤ 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 ≤ 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

<GSM SAR>

Plot No.	Band	Modulation	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	GSM850	GMSK	GPRS (4 Tx slots)	Right Cheek	0mm	251	848.8	28.25	29.80	1.429	0.115	0.345	0.493	0.263	0.376
	GSM850	GMSK	GPRS (4 Tx slots)	Right Tilted	0mm	251	848.8	28.25	29.80	1.429	0.126	0.208	0.297	0.160	0.229
01	GSM850	GMSK	GPRS (4 Tx slots)	Left Cheek	0mm	251	848.8	28.25	29.80	1.429	-0.137	0.452	0.646	0.341	0.487
	GSM850	GMSK	GPRS (4 Tx slots)	Left Cheek	0mm	128	824.2	28.17	29.80	1.455	-0.109	0.277	0.403	0.212	0.309
	GSM850	GMSK	GPRS (4 Tx slots)	Left Cheek	0mm	189	824.2	28.23	29.80	1.435	-0.109	0.381	0.547	0.288	0.413
	GSM850	GMSK	GPRS (4 Tx slots)	Left Tilted	0mm	251	848.8	28.25	29.80	1.429	0.061	0.223	0.319	0.170	0.243
	GSM1900	GMSK	GPRS (4 Tx slots)	Right Cheek	0mm	661	1880	25.61	26.20	1.146	-0.01	0.132	0.151	0.086	0.099
02	GSM1900	GMSK	GPRS (4 Tx slots)	Right Cheek	0mm	512	1850.2	25.48	26.20	1.180	-0.02	0.170	0.201	0.110	0.130
	GSM1900	GMSK	GPRS (4 Tx slots)	Right Cheek	0mm	810	1909.8	25.59	26.20	1.151	0.19	0.095	0.109	0.061	0.070
	GSM1900	GMSK	GPRS (4 Tx slots)	Right Tilted	0mm	661	1880	25.61	26.20	1.146	0.13	0.027	0.031	0.017	0.019
	GSM1900	GMSK	GPRS (4 Tx slots)	Left Cheek	0mm	661	1880	25.61	26.20	1.146	0.05	0.109	0.125	0.068	0.078
	GSM1900	GMSK	GPRS (4 Tx slots)	Left Tilted	0mm	661	1880	25.61	26.20	1.146	0.19	0.037	0.042	0.022	0.025

<WCDMA SAR>

Plot No.	Band	Modulation	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WCDMA II	QPSK	RMC 12.2Kbps	Right Cheek	0mm	9400	1880	24.33	24.50	1.040	-0.02	0.155	0.161	0.098	0.102
	WCDMA II	QPSK	RMC 12.2Kbps	Right Tilted	0mm	9400	1880	24.33	24.50	1.040	0.07	0.039	0.041	0.024	0.025
	WCDMA II	QPSK	RMC 12.2Kbps	Left Cheek	0mm	9400	1880	24.33	24.50	1.040	0.09	0.188	0.196	0.117	0.122
03	WCDMA II	QPSK	RMC 12.2Kbps	Left Cheek	0mm	9262	1852.4	24.21	24.50	1.069	0.03	0.204	0.218	0.128	0.137
	WCDMA II	QPSK	RMC 12.2Kbps	Left Cheek	0mm	9538	1907.6	24.27	24.50	1.054	0.04	0.147	0.155	0.091	0.096
	WCDMA II	QPSK	RMC 12.2Kbps	Left Tilted	0mm	9400	1880	24.33	24.50	1.040	0.18	0.054	0.056	0.032	0.033
	WCDMA IV	QPSK	RMC 12.2Kbps	Right Cheek	0mm	1413	1732.6	23.49	23.50	1.002	-0.1	0.184	0.184	0.120	0.120
	WCDMA IV	QPSK	RMC 12.2Kbps	Right Cheek	0mm	1312	1712.4	23.30	23.50	1.047	0.12	0.173	0.181	0.113	0.118
04	WCDMA IV	QPSK	RMC 12.2Kbps	Right Cheek	0mm	1513	1752.6	23.21	23.50	1.069	0.06	0.193	0.206	0.126	0.135
	WCDMA IV	QPSK	RMC 12.2Kbps	Right Tilted	0mm	1413	1732.6	23.49	23.50	1.002	0.15	0.047	0.047	0.027	0.027
	WCDMA IV	QPSK	RMC 12.2Kbps	Left Cheek	0mm	1413	1732.6	23.49	23.50	1.002	0.09	0.152	0.152	0.098	0.098
	WCDMA IV	QPSK	RMC 12.2Kbps	Left Tilted	0mm	1413	1732.6	23.49	23.50	1.002	0.14	0.052	0.052	0.030	0.030
	WCDMA V	QPSK	RMC 12.2Kbps	Right Cheek	0mm	4182	836.4	24.47	25.00	1.130	-0.05	0.232	0.262	0.176	0.199
	WCDMA V	QPSK	RMC 12.2Kbps	Right Tilted	0mm	4182	836.4	24.47	25.00	1.130	0.11	0.124	0.140	0.096	0.108
	WCDMA V	QPSK	RMC 12.2Kbps	Left Cheek	0mm	4182	836.4	24.47	25.00	1.130	-0.03	0.275	0.311	0.208	0.235
	WCDMA V	QPSK	RMC 12.2Kbps	Left Cheek	0mm	4132	826.4	24.16	25.00	1.213	0.07	0.241	0.292	0.183	0.222
05	WCDMA V	QPSK	RMC 12.2Kbps	Left Cheek	0mm	4233	846.6	24.28	25.00	1.180	0.02	0.286	0.338	0.215	0.254
	WCDMA V	QPSK	RMC 12.2Kbps	Left Tilted	0mm	4182	836.4	24.47	25.00	1.130	0.03	0.134	0.151	0.103	0.116



<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
06	LTE Band 2	20M	QPSK	1	49	Right Cheek	0mm	18900	1880	23.74	24.00	1.062	0.1	0.164	0.174	0.106	0.113
	LTE Band 2	20M	QPSK	1	49	Right Cheek	0mm	18700	1860	23.67	24.00	1.079	0.19	0.175	0.189	0.111	0.120
	LTE Band 2	20M	QPSK	1	49	Right Cheek	0mm	19100	1900	23.64	24.00	1.086	-0.09	0.138	0.150	0.087	0.095
	LTE Band 2	20M	QPSK	50	50	Right Cheek	0mm	18900	1880	22.54	23.00	1.112	0.02	0.127	0.141	0.082	0.091
	LTE Band 2	20M	QPSK	1	49	Right Tilted	0mm	18900	1880	23.74	24.00	1.062	0.15	0.041	0.044	0.024	0.025
	LTE Band 2	20M	QPSK	50	50	Right Tilted	0mm	18900	1880	22.54	23.00	1.112	0.14	0.031	0.034	0.018	0.020
	LTE Band 2	20M	QPSK	1	49	Left Cheek	0mm	18900	1880	23.74	24.00	1.062	-0.1	0.153	0.162	0.096	0.102
	LTE Band 2	20M	QPSK	50	50	Left Cheek	0mm	18900	1880	22.54	23.00	1.112	0.07	0.118	0.131	0.074	0.082
	LTE Band 2	20M	QPSK	1	49	Left Tilted	0mm	18900	1880	23.74	24.00	1.062	0.1	0.052	0.055	0.031	0.033
	LTE Band 2	20M	QPSK	50	50	Left Tilted	0mm	18900	1880	22.54	23.00	1.112	0.11	0.036	0.040	0.022	0.024
07	LTE Band 4	20M	QPSK	1	49	Right Cheek	0mm	20175	1732.5	22.77	23.50	1.183	0.09	0.119	0.141	0.079	0.093
	LTE Band 4	20M	QPSK	50	24	Right Cheek	0mm	20175	1732.5	22.06	23.00	1.242	0.11	0.116	0.144	0.076	0.094
	LTE Band 4	20M	QPSK	1	49	Right Tilted	0mm	20175	1732.5	22.77	23.50	1.183	0	0.019	0.022	0.013	0.015
	LTE Band 4	20M	QPSK	50	24	Right Tilted	0mm	20175	1732.5	22.06	23.00	1.242	0.03	0.019	0.024	0.013	0.016
	LTE Band 4	20M	QPSK	1	49	Left Cheek	0mm	20175	1745	22.77	23.50	1.183	0.17	0.081	0.096	0.052	0.062
	LTE Band 4	20M	QPSK	50	24	Left Cheek	0mm	20175	1732.5	22.06	23.00	1.242	0.17	0.080	0.099	0.051	0.063
	LTE Band 4	20M	QPSK	1	49	Left Tilted	0mm	20175	1732.5	22.77	23.50	1.183	0.07	0.017	0.020	0.010	0.012
	LTE Band 4	20M	QPSK	50	24	Left Tilted	0mm	20175	1732.5	22.06	23.00	1.242	0.12	0.017	0.021	0.010	0.012
08	LTE Band 7	20M	QPSK	1	49	Right Cheek	0mm	21100	2535	23.46	24.00	1.132	-0.1	0.776	0.879	0.441	0.499
	LTE Band 7	20M	QPSK	1	49	Right Cheek	0mm	20850	2510	23.38	24.00	1.153	0.06	0.617	0.712	0.354	0.408
	LTE Band 7	20M	QPSK	1	49	Right Cheek	0mm	21350	2560	23.43	24.00	1.140	-0.16	0.853	0.973	0.488	0.556
	LTE Band 7	20M	QPSK	50	50	Right Cheek	0mm	20850	2510	22.90	23.50	1.148	-0.15	0.510	0.586	0.290	0.333
	LTE Band 7	20M	QPSK	100	0	Right Cheek	0mm	21100	2535	22.87	23.50	1.156	-0.1	0.679	0.785	0.387	0.447
	LTE Band 7	20M	QPSK	1	49	Right Tilted	0mm	21100	2535	23.46	24.00	1.132	-0.14	0.225	0.255	0.120	0.136
	LTE Band 7	20M	QPSK	50	50	Right Tilted	0mm	20850	2510	22.90	23.50	1.148	-0.04	0.141	0.162	0.076	0.087
	LTE Band 7	20M	QPSK	1	49	Left Cheek	0mm	21100	2535	23.46	24.00	1.132	0.15	0.435	0.493	0.255	0.289
	LTE Band 7	20M	QPSK	50	50	Left Cheek	0mm	21100	2535	22.90	23.50	1.148	-0.1	0.282	0.324	0.165	0.189
	LTE Band 7	20M	QPSK	1	49	Left Tilted	0mm	21100	2535	23.46	24.00	1.132	-0.14	0.202	0.229	0.105	0.119
09	LTE Band 7	20M	QPSK	50	50	Left Tilted	0mm	20850	2510	22.90	23.50	1.148	0.07	0.162	0.186	0.084	0.096
	LTE Band 12	10M	QPSK	1	25	Right Cheek	0mm	23095	707.5	23.75	24.50	1.189	0.094	0.034	0.040	0.023	0.027
	LTE Band 12	10M	QPSK	25	25	Right Cheek	0mm	23095	707.5	22.75	23.50	1.189	0.085	0.025	0.030	0.019	0.023
	LTE Band 12	10M	QPSK	1	25	Right Tilted	0mm	23095	707.5	23.75	24.50	1.189	-0.151	0.016	0.019	0.011	0.013
	LTE Band 12	10M	QPSK	25	25	Right Tilted	0mm	23095	707.5	22.75	23.50	1.189	0.023	0.013	0.015	0.008	0.010
	LTE Band 12	10M	QPSK	1	25	Left Cheek	0mm	23095	707.5	23.75	24.50	1.189	-0.07	0.046	0.055	0.035	0.042
	LTE Band 12	10M	QPSK	25	25	Left Cheek	0mm	23095	707.5	22.75	23.50	1.189	-0.018	0.036	0.043	0.028	0.033
	LTE Band 12	10M	QPSK	1	25	Left Tilted	0mm	23095	707.5	23.75	24.50	1.189	-0.022	0.017	0.020	0.012	0.014
LTE Band 12	10M	QPSK	25	25	Left Tilted	0mm	23095	707.5	22.75	23.50	1.189	-0.043	0.012	0.014	0.008	0.010	



Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 26	15M	QPSK	1	37	Right Cheek	0mm	26865	831.5	23.65	24.50	1.216	0.173	0.179	0.218	0.125	0.152
	LTE Band 26	15M	QPSK	36	39	Right Cheek	0mm	26865	831.5	22.47	23.50	1.268	0.168	0.118	0.150	0.084	0.106
	LTE Band 26	15M	QPSK	1	37	Right Tilted	0mm	26865	831.5	23.65	24.50	1.216	0.07	0.090	0.109	0.069	0.084
	LTE Band 26	15M	QPSK	36	39	Right Tilted	0mm	26865	831.5	22.47	23.50	1.268	-0.002	0.067	0.085	0.051	0.065
10	LTE Band 26	15M	QPSK	1	37	Left Cheek	0mm	26865	831.5	23.65	24.50	1.216	-0.079	0.197	0.240	0.138	0.168
	LTE Band 26	15M	QPSK	36	39	Left Cheek	0mm	26865	831.5	22.47	23.50	1.268	-0.141	0.144	0.183	0.108	0.137
	LTE Band 26	15M	QPSK	1	37	Left Tilted	0mm	26865	831.5	23.65	24.50	1.216	0.033	0.114	0.139	0.080	0.097
	LTE Band 26	15M	QPSK	36	39	Left Tilted	0mm	26865	831.5	22.47	23.50	1.268	-0.188	0.083	0.105	0.063	0.080

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 41	20M	QPSK	1	49	Right Cheek	0mm	40620	2593	23.62	24.50	1.225	62.9	1.006	-0.04	0.298	0.367	0.167	0.206
	LTE Band 41	20M	QPSK	1	0	Right Cheek	0mm	39750	2506	23.61	24.50	1.227	62.9	1.006	-0.04	0.299	0.369	0.168	0.207
11	LTE Band 41	20M	QPSK	1	49	Right Cheek	0mm	40185	2549.5	23.49	24.50	1.262	62.9	1.006	-0.1	0.508	0.645	0.285	0.362
	LTE Band 41	20M	QPSK	1	49	Right Cheek	0mm	41055	2636.5	23.42	24.50	1.282	62.9	1.006	0.1	0.221	0.285	0.124	0.160
	LTE Band 41	20M	QPSK	1	0	Right Cheek	0mm	41490	2680	23.18	24.50	1.355	62.9	1.006	-0.11	0.164	0.224	0.091	0.124
	LTE Band 41	20M	QPSK	50	24	Right Cheek	0mm	41055	2636.5	22.63	23.50	1.222	62.9	1.006	-0.03	0.185	0.227	0.103	0.127
	LTE Band 41	20M	QPSK	100	0	Right Cheek	0mm	41055	2636.5	22.38	23.50	1.294	62.9	1.006	0.05	0.168	0.219	0.087	0.113
	LTE Band 41	20M	QPSK	1	49	Right Tilted	0mm	40620	2593	23.62	24.50	1.225	62.9	1.006	0.18	0.074	0.091	0.040	0.049
	LTE Band 41	20M	QPSK	50	24	Right Tilted	0mm	41055	2636.5	22.63	23.50	1.222	62.9	1.006	0.11	0.026	0.032	0.014	0.017
	LTE Band 41	20M	QPSK	1	49	Left Cheek	0mm	40620	2593	23.62	24.50	1.225	62.9	1.006	0.05	0.152	0.187	0.088	0.108
	LTE Band 41	20M	QPSK	50	24	Left Cheek	0mm	41055	2636.5	22.63	23.50	1.222	62.9	1.006	0.02	0.071	0.087	0.039	0.048
	LTE Band 41	20M	QPSK	1	49	Left Tilted	0mm	40620	2593	23.62	24.50	1.225	62.9	1.006	0.18	0.112	0.138	0.055	0.068
	LTE Band 41	20M	QPSK	50	24	Left Tilted	0mm	41055	2636.5	22.63	23.50	1.222	62.9	1.006	0.1	0.042	0.052	0.021	0.026



<WLAN SAR>

Plot No.	Band	Modulation	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WLAN2.4GHz	DSSS	802.11b 1Mbps	Right Cheek	0mm	6	2437	14.54	15.50	1.247	100	1.000	-0.06	0.117	0.146	0.056	0.070
	WLAN2.4GHz	DSSS	802.11b 1Mbps	Right Tilted	0mm	6	2437	14.54	15.50	1.247	100	1.000	0.17	0.043	0.054	0.023	0.029
	WLAN2.4GHz	DSSS	802.11b 1Mbps	Left Cheek	0mm	6	2437	14.54	15.50	1.247	100	1.000	0.08	0.334	0.417	0.153	0.191
12	WLAN2.4GHz	DSSS	802.11b 1Mbps	Left Cheek	0mm	1	2412	14.37	15.50	1.297	100	1.000	-0.07	0.474	0.615	0.216	0.280
	WLAN2.4GHz	DSSS	802.11b 1Mbps	Left Cheek	0mm	11	2462	14.25	15.50	1.334	100	1.000	0.04	0.310	0.413	0.138	0.184
	WLAN2.4GHz	DSSS	802.11b 1Mbps	Left Cheek	0mm	13	2472	12.26	13.07	1.205	100	1.000	0.07	0.156	0.188	0.069	0.083
	WLAN2.4GHz	DSSS	802.11b 1Mbps	Left Tilted	0mm	6	2437	14.54	15.50	1.247	100	1.000	0.02	0.080	0.100	0.042	0.052
	WLAN5GHz	OFDM	802.11n-HT40	Right Cheek	0mm	62	5310	12.80	13.50	1.175	97.93	1.021	0.164	0.154	0.185	0.033	0.040
	WLAN5GHz	OFDM	802.11n-HT40	Right Tilted	0mm	62	5310	12.80	13.50	1.175	97.93	1.021	0.169	0.034	0.041	0.010	0.012
13	WLAN5GHz	OFDM	802.11n-HT40	Left Cheek	0mm	62	5310	12.80	13.50	1.175	97.93	1.021	0.162	0.592	0.710	0.112	0.134
	WLAN5GHz	OFDM	802.11n-HT40	Left Cheek	0mm	54	5270	12.77	13.50	1.183	97.93	1.021	0.166	0.506	0.611	0.099	0.120
	WLAN5GHz	OFDM	802.11n-HT40	Left Tilted	0mm	62	5310	12.80	13.50	1.175	97.93	1.021	0.117	0.058	0.070	0.011	0.013
	WLAN5GHz	OFDM	802.11ac-VHT80 MCS0	Right Cheek	0mm	106	5530	13.26	13.50	1.058	97.14	1.029	0.045	0.094	0.102	0.020	0.022
	WLAN5GHz	OFDM	802.11ac-VHT80 MCS0	Right Tilted	0mm	106	5530	13.26	13.50	1.058	97.14	1.029	0.034	0.016	0.017	0.005	0.005
	WLAN5GHz	OFDM	802.11ac-VHT80 MCS0	Left Cheek	0mm	106	5530	13.26	13.50	1.058	97.14	1.029	0.162	0.385	0.419	0.068	0.074
14	WLAN5GHz	OFDM	802.11ac-VHT80 MCS0	Left Cheek	0mm	138	5690	12.47	13.50	1.267	97.14	1.029	0.039	0.327	0.426	0.058	0.076
	WLAN5GHz	OFDM	802.11ac-VHT80 MCS0	Left Tilted	0mm	106	5530	13.26	13.50	1.058	97.14	1.029	0.014	0.034	0.037	0.009	0.010
	WLAN5GHz	OFDM	802.11n-HT40	Right Cheek	0mm	159	5795	12.67	13.50	1.210	97.93	1.021	0.003	0.079	0.098	0.016	0.020
	WLAN5GHz	OFDM	802.11n-HT40	Right Tilted	0mm	159	5795	12.67	13.50	1.210	97.93	1.021	0.087	0.015	0.019	0.005	0.006
15	WLAN5GHz	OFDM	802.11n-HT40	Left Cheek	0mm	159	5795	12.67	13.50	1.210	97.93	1.021	0.058	0.371	0.458	0.066	0.082
	WLAN5GHz	OFDM	802.11n-HT40	Left Cheek	0mm	151	5755	12.25	13.50	1.333	97.93	1.021	-0.014	0.309	0.421	0.053	0.072
	WLAN5GHz	OFDM	802.11n-HT40	Left Tilted	0mm	159	5795	12.67	13.50	1.210	97.93	1.021	0.141	0.038	0.047	0.011	0.014



15.2 Hotspot SAR

<GSM SAR>

Plot No.	Band	Modulation	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	GSM850	GMSK	GPRS (4 Tx slots)	Front	10mm	OFF	251	848.8	28.25	29.80	1.429	0.11	0.535	0.764	0.408	0.583
	GSM850	GMSK	GPRS (4 Tx slots)	Back	10mm	OFF	251	848.8	28.25	29.80	1.429	0.13	0.437	0.624	0.331	0.473
	GSM850	GMSK	GPRS (4 Tx slots)	Left Side	10mm	OFF	251	848.8	28.25	29.80	1.429	0.09	0.586	0.837	0.385	0.550
	GSM850	GMSK	GPRS (4 Tx slots)	Left Side	10mm	OFF	128	824.2	28.17	29.80	1.455	0.13	0.488	0.710	0.335	0.488
16	GSM850	GMSK	GPRS (4 Tx slots)	Left Side	10mm	OFF	189	836.4	28.23	29.80	1.435	0.14	0.638	0.916	0.438	0.629
	GSM850	GMSK	GPRS (4 Tx slots)	Right Side	10mm	OFF	251	848.8	28.25	29.80	1.429	0.07	0.386	0.552	0.262	0.374
	GSM850	GMSK	GPRS (4 Tx slots)	Bottom Side	10mm	OFF	251	848.8	28.25	29.80	1.429	0.15	0.336	0.480	0.188	0.269
	GSM1900	GMSK	GPRS (4 Tx slots)	Front	10mm	ON	810	1909.8	23.42	24.20	1.197	-0.16	0.470	0.562	0.233	0.279
17	GSM1900	GMSK	GPRS (4 Tx slots)	Front	10mm	ON	512	1850.2	23.15	24.20	1.274	-0.19	0.760	0.968	0.381	0.485
	GSM1900	GMSK	GPRS (4 Tx slots)	Front	10mm	ON	661	1880	23.35	24.20	1.216	0.16	0.712	0.866	0.354	0.431
	GSM1900	GMSK	GPRS (4 Tx slots)	Back	10mm	ON	810	1909.8	23.42	24.20	1.197	0.07	0.135	0.162	0.077	0.092
	GSM1900	GMSK	GPRS (4 Tx slots)	Left Side	10mm	ON	810	1909.8	23.42	24.20	1.197	0.14	0.061	0.073	0.034	0.041
	GSM1900	GMSK	GPRS (4 Tx slots)	Right Side	10mm	ON	810	1909.8	23.42	24.20	1.197	0.06	0.039	0.047	0.023	0.028
	GSM1900	GMSK	GPRS (4 Tx slots)	Bottom Side	10mm	ON	810	1909.8	23.42	24.20	1.197	-0.16	0.465	0.556	0.224	0.268

<WCDMA SAR>

Plot No.	Band	Modulation	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WCDMA II	QPSK	RMC 12.2Kbps	Front	10mm	ON	9538	1907.6	20.84	21.00	1.038	-0.05	0.613	0.636	0.299	0.310
18	WCDMA II	QPSK	RMC 12.2Kbps	Front	10mm	ON	9262	1852.4	20.73	21.00	1.064	0.05	0.868	0.924	0.434	0.462
	WCDMA II	QPSK	RMC 12.2Kbps	Front	10mm	ON	9400	1880	20.82	21.00	1.042	0.02	0.668	0.696	0.330	0.344
	WCDMA II	QPSK	RMC 12.2Kbps	Back	10mm	ON	9538	1907.6	20.84	21.00	1.038	-0.06	0.174	0.181	0.099	0.103
	WCDMA II	QPSK	RMC 12.2Kbps	Left Side	10mm	ON	9538	1907.6	20.84	21.00	1.038	0.07	0.070	0.073	0.038	0.039
	WCDMA II	QPSK	RMC 12.2Kbps	Right Side	10mm	ON	9538	1907.6	20.84	21.00	1.038	0.06	0.039	0.040	0.024	0.025
	WCDMA II	QPSK	RMC 12.2Kbps	Bottom Side	10mm	ON	9538	1907.6	20.84	21.00	1.038	-0.05	0.501	0.520	0.245	0.254
	WCDMA IV	QPSK	RMC 12.2Kbps	Front	10mm	ON	1413	1732.6	19.38	19.50	1.028	0.04	0.607	0.624	0.305	0.314
	WCDMA IV	QPSK	RMC 12.2Kbps	Front	10mm	ON	1312	1712.4	19.33	19.50	1.040	0.06	0.568	0.591	0.288	0.299
19	WCDMA IV	QPSK	RMC 12.2Kbps	Front	10mm	ON	1513	1752.6	19.28	19.50	1.052	0.07	0.674	0.709	0.341	0.359
	WCDMA IV	QPSK	RMC 12.2Kbps	Back	10mm	ON	1413	1732.6	19.38	19.50	1.028	-0.04	0.213	0.219	0.118	0.121
	WCDMA IV	QPSK	RMC 12.2Kbps	Left Side	10mm	ON	1413	1732.6	19.38	19.50	1.028	0.04	0.151	0.155	0.078	0.080
	WCDMA IV	QPSK	RMC 12.2Kbps	Right Side	10mm	ON	1413	1732.6	19.38	19.50	1.028	0.01	0.027	0.028	0.017	0.017
	WCDMA IV	QPSK	RMC 12.2Kbps	Bottom Side	10mm	ON	1413	1732.6	19.38	19.50	1.028	-0.03	0.532	0.547	0.267	0.274
	WCDMA V	QPSK	RMC 12.2Kbps	Front	10mm	OFF	4182	836.4	24.47	25.00	1.130	-0.04	0.397	0.449	0.305	0.345
	WCDMA V	QPSK	RMC 12.2Kbps	Back	10mm	OFF	4182	836.4	24.47	25.00	1.130	0	0.300	0.339	0.232	0.262
	WCDMA V	QPSK	RMC 12.2Kbps	Left Side	10mm	OFF	4182	836.4	24.47	25.00	1.130	0.04	0.473	0.534	0.324	0.366
	WCDMA V	QPSK	RMC 12.2Kbps	Left Side	10mm	OFF	4132	826.4	24.16	25.00	1.213	0.02	0.457	0.555	0.313	0.380
20	WCDMA V	QPSK	RMC 12.2Kbps	Left Side	10mm	OFF	4233	846.6	24.28	25.00	1.180	-0.04	0.516	0.609	0.353	0.417
	WCDMA V	QPSK	RMC 12.2Kbps	Right Side	10mm	OFF	4182	836.4	24.47	25.00	1.130	0.03	0.244	0.276	0.168	0.190
	WCDMA V	QPSK	RMC 12.2Kbps	Bottom Side	10mm	OFF	4182	836.4	24.47	25.00	1.130	0.03	0.205	0.232	0.118	0.133



<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	49	Front	10mm	ON	18900	1880	20.72	21.00	1.067	0.15	0.644	0.687	0.323	0.345
	LTE Band 2	20M	QPSK	50	0	Front	10mm	ON	18900	1880	20.36	21.00	1.159	0.15	0.740	0.857	0.372	0.431
	LTE Band 2	20M	QPSK	50	0	Front	10mm	ON	18700	1860	20.20	21.00	1.202	0.12	0.744	0.894	0.365	0.439
	LTE Band 2	20M	QPSK	50	0	Front	10mm	ON	19100	1900	20.31	21.00	1.172	0.17	0.692	0.811	0.345	0.404
	LTE Band 2	20M	QPSK	100	0	Front	10mm	ON	18900	1880	20.34	21.00	1.164	0.15	0.724	0.843	0.363	0.423
	LTE Band 2	20M	QPSK	1	49	Back	10mm	ON	18900	1880	20.72	21.00	1.067	0.01	0.191	0.204	0.119	0.127
	LTE Band 2	20M	QPSK	50	0	Back	10mm	ON	18900	1880	20.36	21.00	1.159	-0.09	0.217	0.251	0.125	0.145
	LTE Band 2	20M	QPSK	1	49	Left Side	10mm	ON	18900	1880	20.72	21.00	1.067	-0.04	0.117	0.125	0.063	0.067
	LTE Band 2	20M	QPSK	50	0	Left Side	10mm	ON	18900	1880	20.36	21.00	1.159	0.04	0.122	0.141	0.065	0.075
	LTE Band 2	20M	QPSK	1	49	Right Side	10mm	ON	18900	1880	20.72	21.00	1.067	0.04	0.049	0.052	0.030	0.032
	LTE Band 2	20M	QPSK	50	0	Right Side	10mm	ON	18900	1880	20.36	21.00	1.159	-0.03	0.050	0.058	0.030	0.035
	LTE Band 2	20M	QPSK	1	49	Bottom Side	10mm	ON	18900	1880	20.72	21.00	1.067	0.12	0.681	0.726	0.331	0.353
	LTE Band 2	20M	QPSK	50	0	Bottom Side	10mm	ON	18900	1880	20.36	21.00	1.159	-0.15	0.702	0.813	0.340	0.394
21	LTE Band 2	20M	QPSK	50	0	Bottom Side	10mm	ON	18700	1860	20.20	21.00	1.202	0	0.755	0.908	0.366	0.440
	LTE Band 2	20M	QPSK	50	0	Bottom Side	10mm	ON	19100	1900	20.31	21.00	1.172	-0.05	0.589	0.690	0.283	0.332
	LTE Band 2	20M	QPSK	100	0	Bottom Side	10mm	ON	18900	1880	20.34	21.00	1.164	-0.01	0.675	0.786	0.326	0.380
	LTE Band 4	20M	QPSK	1	49	Front	10mm	ON	20175	1732.5	18.72	19.50	1.197	0.07	0.491	0.588	0.249	0.298
22	LTE Band 4	20M	QPSK	50	0	Front	10mm	ON	20175	1732.5	18.54	19.50	1.247	0.18	0.484	0.604	0.245	0.306
	LTE Band 4	20M	QPSK	1	49	Back	10mm	ON	20175	1732.5	18.72	19.50	1.197	0.07	0.144	0.172	0.081	0.097
	LTE Band 4	20M	QPSK	50	0	Back	10mm	ON	20175	1732.5	18.54	19.50	1.247	0.04	0.139	0.173	0.079	0.099
	LTE Band 4	20M	QPSK	1	49	Left Side	10mm	ON	20175	1732.5	18.72	19.50	1.197	0.07	0.138	0.165	0.071	0.085
	LTE Band 4	20M	QPSK	50	0	Left Side	10mm	ON	20175	1732.5	18.54	19.50	1.247	0.07	0.136	0.170	0.070	0.087
	LTE Band 4	20M	QPSK	1	49	Right Side	10mm	ON	20175	1732.5	18.72	19.50	1.197	0.05	0.025	0.030	0.016	0.019
	LTE Band 4	20M	QPSK	50	0	Right Side	10mm	ON	20175	1732.5	18.54	19.50	1.247	0.16	0.024	0.030	0.015	0.019
	LTE Band 4	20M	QPSK	1	49	Bottom Side	10mm	ON	20175	1732.5	18.72	19.50	1.197	-0.07	0.491	0.588	0.246	0.294
	LTE Band 4	20M	QPSK	50	0	Bottom Side	10mm	ON	20175	1732.5	18.54	19.50	1.247	-0.06	0.463	0.578	0.232	0.289
23	LTE Band 7	20M	QPSK	1	49	Front	10mm	ON	21350	2560	21.44	21.50	1.014	-0.01	0.945	0.958	0.446	0.452
	LTE Band 7	20M	QPSK	1	49	Front	10mm	ON	20850	2510	21.12	21.50	1.091	-0.04	0.587	0.641	0.281	0.307
	LTE Band 7	20M	QPSK	1	49	Front	10mm	ON	21100	2535	21.33	21.50	1.040	-0.1	0.787	0.818	0.374	0.389
	LTE Band 7	20M	QPSK	50	24	Front	10mm	ON	21350	2560	21.31	21.50	1.045	-0.08	0.893	0.933	0.424	0.443
	LTE Band 7	20M	QPSK	50	24	Front	10mm	ON	20850	2510	21.21	21.50	1.069	-0.03	0.587	0.628	0.281	0.300
	LTE Band 7	20M	QPSK	50	24	Front	10mm	ON	21100	2535	21.14	21.50	1.086	-0.02	0.794	0.863	0.377	0.410
	LTE Band 7	20M	QPSK	100	0	Front	10mm	ON	21350	2560	21.23	21.50	1.064	-0.05	0.891	0.948	0.423	0.450
	LTE Band 7	20M	QPSK	1	49	Back	10mm	ON	21350	2560	21.44	21.50	1.014	0.07	0.359	0.364	0.193	0.196
	LTE Band 7	20M	QPSK	50	24	Back	10mm	ON	21350	2560	21.31	21.50	1.045	-0.19	0.352	0.368	0.190	0.198
	LTE Band 7	20M	QPSK	1	49	Left Side	10mm	ON	21350	2560	21.44	21.50	1.014	0.09	0.074	0.075	0.044	0.045
	LTE Band 7	20M	QPSK	50	24	Left Side	10mm	ON	21350	2560	21.31	21.50	1.045	0.06	0.073	0.076	0.043	0.045
	LTE Band 7	20M	QPSK	1	49	Right Side	10mm	ON	21350	2560	21.44	21.50	1.014	0.1	0.213	0.216	0.112	0.114
	LTE Band 7	20M	QPSK	50	24	Right Side	10mm	ON	21350	2560	21.31	21.50	1.045	0.04	0.196	0.205	0.103	0.108
	LTE Band 7	20M	QPSK	1	49	Bottom Side	10mm	ON	21350	2560	21.44	21.50	1.014	-0.15	0.544	0.552	0.243	0.246
	LTE Band 7	20M	QPSK	50	24	Bottom Side	10mm	ON	21350	2560	21.31	21.50	1.045	0.01	0.529	0.553	0.234	0.244



Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 12	10M	QPSK	1	25	Front	10mm	OFF	23095	707.5	23.75	24.50	1.189	-0.14	0.075	0.089	0.058	0.069
	LTE Band 12	10M	QPSK	25	25	Front	10mm	OFF	23095	707.5	22.75	23.50	1.189	0.06	0.061	0.072	0.048	0.057
	LTE Band 12	10M	QPSK	1	25	Back	10mm	OFF	23095	707.5	23.75	24.50	1.189	0.17	0.051	0.061	0.040	0.048
	LTE Band 12	10M	QPSK	25	25	Back	10mm	OFF	23095	707.5	22.75	23.50	1.189	0.08	0.042	0.050	0.033	0.039
24	LTE Band 12	10M	QPSK	1	25	Left Side	10mm	OFF	23095	707.5	23.75	24.50	1.189	0.11	0.118	0.140	0.083	0.099
	LTE Band 12	10M	QPSK	25	25	Left Side	10mm	OFF	23095	707.5	22.75	23.50	1.189	0	0.092	0.109	0.065	0.077
	LTE Band 12	10M	QPSK	1	25	Right Side	10mm	OFF	23095	707.5	23.75	24.50	1.189	0.03	0.043	0.051	0.030	0.036
	LTE Band 12	10M	QPSK	25	25	Right Side	10mm	OFF	23095	707.5	22.75	23.50	1.189	0.15	0.034	0.040	0.024	0.029
	LTE Band 12	10M	QPSK	1	25	Bottom Side	10mm	OFF	23095	707.5	23.75	24.50	1.189	-0.02	0.038	0.045	0.019	0.023
	LTE Band 12	10M	QPSK	25	25	Bottom Side	10mm	OFF	23095	707.5	22.75	23.50	1.189	0.12	0.030	0.036	0.015	0.018
	LTE Band 26	15M	QPSK	1	37	Front	10mm	OFF	26865	831.5	23.65	24.50	1.216	0.19	0.267	0.325	0.202	0.246
	LTE Band 26	15M	QPSK	36	39	Front	10mm	OFF	26865	831.5	22.47	23.50	1.268	0.16	0.194	0.246	0.149	0.189
	LTE Band 26	15M	QPSK	1	37	Back	10mm	OFF	26865	831.5	23.65	24.50	1.216	0.08	0.198	0.241	0.151	0.184
	LTE Band 26	15M	QPSK	36	39	Back	10mm	OFF	26865	831.5	22.47	23.50	1.268	0.04	0.151	0.191	0.118	0.150
25	LTE Band 26	15M	QPSK	1	37	Left Side	10mm	OFF	26865	831.5	23.65	24.50	1.216	0.18	0.355	0.432	0.243	0.296
	LTE Band 26	15M	QPSK	36	39	Left Side	10mm	OFF	26865	831.5	22.47	23.50	1.268	0.04	0.291	0.369	0.199	0.252
	LTE Band 26	15M	QPSK	1	37	Right Side	10mm	OFF	26865	831.5	23.65	24.50	1.216	0.06	0.191	0.232	0.133	0.162
	LTE Band 26	15M	QPSK	36	39	Right Side	10mm	OFF	26865	831.5	22.47	23.50	1.268	-0.04	0.163	0.207	0.111	0.141
	LTE Band 26	15M	QPSK	1	37	Bottom Side	10mm	OFF	26865	831.5	23.65	24.50	1.216	0	0.146	0.178	0.083	0.101
	LTE Band 26	15M	QPSK	36	39	Bottom Side	10mm	OFF	26865	831.5	22.47	23.50	1.268	0.02	0.126	0.160	0.071	0.090

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 41	20M	QPSK	1	49	Front	10mm	ON	41490	2680	23.05	23.50	1.109	62.9	1.006	-0.07	0.269	0.300	0.120	0.134
	LTE Band 41	20M	QPSK	50	24	Front	10mm	ON	39750	2506	23.15	23.50	1.084	62.9	1.006	-0.08	0.600	0.654	0.292	0.318
26	LTE Band 41	20M	QPSK	50	24	Front	10mm	ON	40185	2549.5	22.99	23.50	1.125	62.9	1.006	0.04	0.735	0.832	0.354	0.400
	LTE Band 41	20M	QPSK	50	0	Front	10mm	ON	40620	2593	22.95	23.50	1.135	62.9	1.006	0.11	0.537	0.613	0.256	0.292
	LTE Band 41	20M	QPSK	50	24	Front	10mm	ON	41055	2636.5	22.98	23.50	1.127	62.9	1.006	-0.13	0.322	0.365	0.147	0.167
	LTE Band 41	20M	QPSK	50	50	Front	10mm	ON	41490	2680	23.07	23.50	1.104	62.9	1.006	0.01	0.250	0.278	0.112	0.124
	LTE Band 41	20M	QPSK	100	0	Front	10mm	ON	39790	2510	23.13	23.50	1.089	62.9	1.006	-0.01	0.626	0.686	0.306	0.335
	LTE Band 41	20M	QPSK	1	49	Back	10mm	ON	41490	2680	23.05	23.50	1.109	62.9	1.006	0.09	0.186	0.208	0.062	0.069
	LTE Band 41	20M	QPSK	50	24	Back	10mm	ON	39750	2506	23.15	23.50	1.084	62.9	1.006	-0.05	0.362	0.395	0.200	0.218
	LTE Band 41	20M	QPSK	1	49	Left Side	10mm	ON	41490	2680	23.05	23.50	1.109	62.9	1.006	0.11	0.025	0.028	0.014	0.016
	LTE Band 41	20M	QPSK	50	24	Left Side	10mm	ON	39750	2506	23.15	23.50	1.084	62.9	1.006	0.08	0.049	0.053	0.027	0.029
	LTE Band 41	20M	QPSK	1	49	Right Side	10mm	ON	41490	2680	23.05	23.50	1.109	62.9	1.006	0.07	0.077	0.086	0.039	0.044
	LTE Band 41	20M	QPSK	50	24	Right Side	10mm	ON	39750	2506	23.15	23.50	1.084	62.9	1.006	0.06	0.149	0.162	0.078	0.085
	LTE Band 41	20M	QPSK	1	49	Bottom Side	10mm	ON	41490	2680	23.05	23.50	1.109	62.9	1.006	-0.04	0.224	0.250	0.095	0.106
	LTE Band 41	20M	QPSK	50	24	Bottom Side	10mm	ON	39750	2506	23.15	23.50	1.084	62.9	1.006	0.11	0.346	0.377	0.154	0.168

<WLAN SAR>

Plot No.	Band	Modulation	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WLAN2.4GHz	DSSS	802.11b 1Mbps	Front	10mm	6	2437	14.54	15.50	1.247	100	1.000	-0.11	0.091	0.114	0.043	0.054
	WLAN2.4GHz	DSSS	802.11b 1Mbps	Back	10mm	6	2437	14.54	15.50	1.247	100	1.000	0.04	0.058	0.072	0.027	0.034
	WLAN2.4GHz	DSSS	802.11b 1Mbps	Right Side	10mm	6	2437	14.54	15.50	1.247	100	1.000	0.16	0.123	0.153	0.056	0.070
27	WLAN2.4GHz	DSSS	802.11b 1Mbps	Right Side	10mm	1	2412	14.37	15.50	1.297	100	1.000	-0.01	0.144	0.187	0.066	0.086
	WLAN2.4GHz	DSSS	802.11b 1Mbps	Right Side	10mm	11	2462	14.25	15.50	1.334	100	1.000	-0.12	0.099	0.132	0.045	0.060
	WLAN2.4GHz	DSSS	802.11b 1Mbps	Right Side	10mm	13	2472	12.26	13.07	1.205	100	1.000	0.08	0.047	0.057	0.021	0.025

15.3 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Band	Modulation	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
28	GSM850	GMSK	GPRS (4 Tx slots)	Front	15mm	251	848.8	28.25	29.80	1.429	-0.04	0.466	0.666	0.353	0.504
	GSM850	GMSK	GPRS (4 Tx slots)	Front	15mm	128	824.2	28.17	29.80	1.455	0.02	0.317	0.461	0.241	0.351
	GSM850	GMSK	GPRS (4 Tx slots)	Front	15mm	189	836.4	28.23	29.80	1.435	0.07	0.434	0.623	0.329	0.472
	GSM850	GMSK	GPRS (4 Tx slots)	Back	15mm	251	848.8	28.25	29.80	1.429	0.06	0.438	0.626	0.326	0.466
	GSM1900	GMSK	GPRS (4 Tx slots)	Front	15mm	661	1880	25.61	26.20	1.146	0.08	0.537	0.615	0.296	0.339
29	GSM1900	GMSK	GPRS (4 Tx slots)	Front	15mm	512	1850.2	25.48	26.20	1.180	-0.09	0.618	0.729	0.343	0.405
	GSM1900	GMSK	GPRS (4 Tx slots)	Front	15mm	810	1909.8	25.59	26.20	1.151	-0.02	0.377	0.434	0.197	0.227
	GSM1900	GMSK	GPRS (4 Tx slots)	Back	15mm	661	1880	25.61	26.20	1.146	0	0.208	0.238	0.132	0.151

<WCDMA SAR>

Plot No.	Band	Modulation	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WCDMA II	QPSK	RMC 12.2Kbps	Front	15mm	9400	1880	24.33	24.50	1.040	0.1	0.720	0.749	0.393	0.409
30	WCDMA II	QPSK	RMC 12.2Kbps	Front	15mm	9262	1852.4	24.21	24.50	1.069	0.04	0.854	0.913	0.473	0.506
	WCDMA II	QPSK	RMC 12.2Kbps	Front	15mm	9538	1907.6	24.27	24.50	1.054	-0.01	0.511	0.539	0.277	0.292
	WCDMA II	QPSK	RMC 12.2Kbps	Back	15mm	9400	1880	24.33	24.50	1.040	0.04	0.277	0.288	0.176	0.183
	WCDMA IV	QPSK	RMC 12.2Kbps	Front	15mm	1413	1732.6	23.49	23.50	1.002	0.03	0.805	0.807	0.451	0.452
	WCDMA IV	QPSK	RMC 12.2Kbps	Front	15mm	1312	1712.4	23.30	23.50	1.047	0.09	0.723	0.757	0.406	0.425
31	WCDMA IV	QPSK	RMC 12.2Kbps	Front	15mm	1513	1752.6	23.21	23.50	1.069	0.06	0.836	0.894	0.467	0.499
	WCDMA IV	QPSK	RMC 12.2Kbps	Back	15mm	1413	1732.6	23.49	23.50	1.002	0	0.262	0.263	0.167	0.167
	WCDMA V	QPSK	RMC 12.2Kbps	Front	15mm	4182	836.4	24.47	25.00	1.130	0.08	0.346	0.391	0.265	0.299
	WCDMA V	QPSK	RMC 12.2Kbps	Front	15mm	4132	826.4	24.16	25.00	1.213	0.09	0.308	0.374	0.236	0.286
32	WCDMA V	QPSK	RMC 12.2Kbps	Front	15mm	4233	846.6	24.28	25.00	1.180	0.01	0.346	0.408	0.264	0.312
	WCDMA V	QPSK	RMC 12.2Kbps	Back	15mm	4182	836.4	24.47	25.00	1.130	0.07	0.312	0.352	0.240	0.271



<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	49	Front	15mm	18900	1880	23.74	24.00	1.062	-0.09	0.678	0.720	0.372	0.395
33	LTE Band 2	20M	QPSK	1	49	Front	15mm	18700	1860	23.67	24.00	1.079	-0.05	0.738	0.796	0.418	0.451
	LTE Band 2	20M	QPSK	1	49	Front	15mm	19100	1900	23.64	24.00	1.086	-0.12	0.582	0.632	0.313	0.340
	LTE Band 2	20M	QPSK	50	50	Front	15mm	18900	1880	22.54	23.00	1.112	-0.06	0.537	0.597	0.293	0.326
	LTE Band 2	20M	QPSK	1	49	Back	15mm	18900	1880	23.74	24.00	1.062	-0.13	0.225	0.239	0.142	0.151
	LTE Band 2	20M	QPSK	50	50	Back	15mm	18900	1880	22.54	23.00	1.112	0.07	0.180	0.200	0.114	0.127
34	LTE Band 4	20M	QPSK	1	49	Front	15mm	20175	1732.5	22.77	23.50	1.183	0	0.550	0.651	0.306	0.362
	LTE Band 4	20M	QPSK	50	24	Front	15mm	20175	1732.5	22.06	23.00	1.242	0.08	0.504	0.626	0.280	0.348
	LTE Band 4	20M	QPSK	1	49	Back	15mm	20175	1732.5	22.77	23.50	1.183	0.07	0.179	0.212	0.107	0.127
	LTE Band 4	20M	QPSK	50	24	Back	15mm	20175	1732.5	22.06	23.00	1.242	0.04	0.163	0.202	0.097	0.120
	LTE Band 7	20M	QPSK	1	49	Front	15mm	21100	2535	23.46	24.00	1.132	-0.11	0.574	0.650	0.303	0.343
	LTE Band 7	20M	QPSK	1	49	Front	15mm	20850	2510	23.38	24.00	1.153	0.095	0.441	0.509	0.239	0.276
35	LTE Band 7	20M	QPSK	1	49	Front	15mm	21350	2560	23.43	24.00	1.140	-0.164	0.674	0.769	0.351	0.400
	LTE Band 7	20M	QPSK	50	50	Front	15mm	20850	2510	22.90	23.50	1.148	0.073	0.408	0.468	0.219	0.251
	LTE Band 7	20M	QPSK	1	49	Back	15mm	21100	2535	23.46	24.00	1.132	-0.104	0.364	0.412	0.199	0.225
	LTE Band 7	20M	QPSK	50	50	Back	15mm	20850	2510	22.90	23.50	1.148	0.057	0.282	0.324	0.155	0.178
36	LTE Band 12	10M	QPSK	1	25	Front	15mm	23095	707.5	23.75	24.50	1.189	-0.1	0.060	0.071	0.046	0.055
	LTE Band 12	10M	QPSK	25	25	Front	15mm	23095	707.5	23.75	24.50	1.189	0.04	0.049	0.058	0.038	0.045
	LTE Band 12	10M	QPSK	1	25	Back	15mm	23095	707.5	23.75	24.50	1.189	0	0.045	0.053	0.035	0.042
	LTE Band 12	10M	QPSK	25	25	Back	15mm	23095	707.5	23.75	24.50	1.189	0.13	0.037	0.044	0.029	0.034
37	LTE Band 26	15M	QPSK	1	37	Front	15mm	26865	831.5	23.65	24.50	1.216	-0.18	0.246	0.299	0.186	0.226
	LTE Band 26	15M	QPSK	36	39	Front	15mm	26865	831.5	22.47	23.50	1.268	0.1	0.178	0.226	0.136	0.172
	LTE Band 26	15M	QPSK	1	37	Back	15mm	26865	831.5	23.65	24.50	1.216	0.1	0.227	0.276	0.172	0.209
	LTE Band 26	15M	QPSK	36	39	Back	15mm	26865	831.5	22.47	23.50	1.268	0.15	0.161	0.204	0.123	0.156

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 41	20M	QPSK	1	49	Front	15mm	40620	2593	23.62	24.50	1.225	62.9	1.006	-0.13	0.250	0.308	0.135	0.166
	LTE Band 41	20M	QPSK	1	0	Front	15mm	39750	2506	23.61	24.50	1.227	62.9	1.006	0.05	0.298	0.368	0.151	0.186
38	LTE Band 41	20M	QPSK	1	49	Front	15mm	40185	2549.5	23.49	24.50	1.262	62.9	1.006	0.03	0.353	0.448	0.187	0.237
	LTE Band 41	20M	QPSK	1	49	Front	15mm	41055	2636.5	23.42	24.50	1.282	62.9	1.006	-0.12	0.198	0.255	0.099	0.128
	LTE Band 41	20M	QPSK	1	0	Front	15mm	41490	2680	23.18	24.50	1.355	62.9	1.006	0.03	0.144	0.196	0.072	0.098
	LTE Band 41	20M	QPSK	50	24	Front	15mm	41055	2636.5	22.63	23.50	1.222	62.9	1.006	-0.03	0.150	0.184	0.075	0.092
	LTE Band 41	20M	QPSK	1	49	Back	15mm	40620	2593	23.62	24.50	1.225	62.9	1.006	-0.04	0.179	0.221	0.102	0.126
	LTE Band 41	20M	QPSK	50	24	Back	15mm	41055	2636.5	22.63	23.50	1.222	62.9	1.006	0.01	0.079	0.097	0.044	0.054



<WLAN SAR>

Plot No.	Band	Modulation	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WLAN2.4GHz	DSSS	802.11b 1Mbps	Front	15mm	6	2437	14.54	15.50	1.247	100	1.000	-0.02	0.040	0.050	0.020	0.025
39	WLAN2.4GHz	DSSS	802.11b 1Mbps	Front	15mm	1	2412	14.37	15.50	1.297	100	1.000	-0.01	0.044	0.057	0.022	0.029
	WLAN2.4GHz	DSSS	802.11b 1Mbps	Front	15mm	11	2462	14.25	15.50	1.334	100	1.000	0.12	0.029	0.039	0.014	0.019
	WLAN2.4GHz	DSSS	802.11b 1Mbps	Front	15mm	13	2472	12.26	13.07	1.205	100	1.000	0.01	0.012	0.014	0.005	0.006
	WLAN2.4GHz	DSSS	802.11b 1Mbps	Back	15mm	6	2437	14.54	15.50	1.247	100	1.000	0.01	0.028	0.035	0.014	0.017
	WLAN5GHz	OFDM	802.11n-HT40	Front	15mm	62	5310	12.80	13.50	1.175	97.93	1.021	-0.113	0.039	0.047	0.013	0.016
40	WLAN5GHz	OFDM	802.11n-HT40	Front	15mm	54	5270	12.77	13.50	1.183	97.93	1.021	0.083	0.040	0.048	0.014	0.017
	WLAN5GHz	OFDM	802.11n-HT40	Back	15mm	62	5310	12.80	13.50	1.175	97.93	1.021	0.161	0.015	0.017	0.003	0.004
	WLAN5GHz	OFDM	802.11ac-VHT80 MCS0	Front	15mm	106	5530	13.26	13.50	1.058	97.14	1.029	-0.07	0.031	0.034	0.010	0.010
41	WLAN5GHz	OFDM	802.11ac-VHT80 MCS0	Front	15mm	138	5690	12.47	13.50	1.267	97.14	1.029	-0.062	0.035	0.046	0.008	0.011
	WLAN5GHz	OFDM	802.11ac-VHT80 MCS0	Back	15mm	106	5530	13.26	13.50	1.058	97.14	1.029	0.152	0.013	0.014	0.002	0.002
	WLAN5GHz	OFDM	802.11n-HT40	Front	15mm	159	5795	12.67	13.50	1.210	97.93	1.021	-0.111	0.022	0.027	0.004	0.005
42	WLAN5GHz	OFDM	802.11n-HT40	Front	15mm	151	5755	12.25	13.50	1.333	97.93	1.021	-0.165	0.021	0.029	0.004	0.005
	WLAN5GHz	OFDM	802.11n-HT40	Back	15mm	159	5795	12.67	13.50	1.210	97.93	1.021	0	0.001	0.001	0.001	0.001

15.4 Repeated SAR Measurement

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WCDMA II	-	QPSK	-	-	RMC 12.2Kbps	Front	10mm	ON	9262	1852.4	20.73	21.00	1.064	0.05	0.868	-	0.924
2nd	WCDMA II	-	QPSK	-	-	RMC 12.2Kbps	Front	10mm	ON	9262	1852.4	20.73	21.00	1.064	-0.09	0.786	1.11	0.836
1st	WCDMA IV	-	QPSK	-	-	RMC 12.2Kbps	Front	15mm	OFF	1513	1752.6	23.21	23.50	1.069	0.06	0.836	-	0.894
2nd	WCDMA IV	-	QPSK	-	-	RMC 12.2Kbps	Front	15mm	OFF	1513	1752.6	23.21	23.50	1.069	0	0.827	1.01	0.884
1st	LTE Band 7	20M	QPSK	1	49	-	Front	10mm	ON	21350	2560	21.44	21.50	1.014	-0.01	0.945	-	0.958
2nd	LTE Band 7	20M	QPSK	1	49	-	Front	10mm	ON	21350	2560	21.44	21.50	1.014	-0.03	0.860	1.10	0.872

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥ 0.8 W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR < 1.45 W/kg, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured* SAR.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

16. Simultaneous Transmission Analysis

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

General Note:

- This device 2.4GHz WLAN supports Hotspot operation, and 2.4GHz / 5.2GHz / 5.3GHz / 5.5GHz / 5.8GHz WLAN supports WiFi Direct.
- The worst case WLAN reported SAR for each configuration was used for SAR summation. Therefore, the following summations represent the absolute worst cases for simultaneous transmission with WLAN.
- EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
- The Scaled SAR summation is calculated based on the same configuration and test position.
- Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
 - Scalar SAR summation < 1.6W/kg.
 - $SPLSR = (SAR1 + SAR2)^{1.5} / (\text{min. separation distance, mm})$, 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.
 - If $SPLSR \leq 0.04$, simultaneously transmission SAR measurement is not necessary.
 - Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.
- For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01v06 based on the formula below.
 - $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f(\text{GHz})}] \cdot x \text{ W/kg}$ for test separation distances $\leq 50 \text{ mm}$; where $x = 7.5$ for 1-g SAR, and $x = 18.75$ for 10-g SAR.
 - When the minimum separation distance is < 5mm, the distance is used 5mm to determine SAR test exclusion.
 - 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is > 50 mm.

Bluetooth Max Power	Exposure Position	Body worn
	Test separation	15 mm
11.38 dBm	Estimated 1g SAR (W/kg)	0.196 W/kg



16.1 Head Exposure Conditions

WWAN Band		Exposure Position	1	2	3	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)
			WWAN 1g SAR (W/kg)	2.4GHz WLAN 1g SAR (W/kg)	5GHz WLAN 1g SAR (W/kg)		
GSM	GSM850	Right Cheek	0.493	0.146	0.185	0.64	0.68
		Right Tilted	0.297	0.054	0.041	0.35	0.34
		Left Cheek	0.646	0.615	0.710	1.26	1.36
		Left Tilted	0.319	0.100	0.070	0.42	0.39
	GSM1900	Right Cheek	0.201	0.146	0.185	0.35	0.39
		Right Tilted	0.031	0.054	0.041	0.09	0.07
		Left Cheek	0.125	0.615	0.710	0.74	0.84
		Left Tilted	0.042	0.100	0.070	0.14	0.11
WCDMA	WCDMA II	Right Cheek	0.161	0.146	0.185	0.31	0.35
		Right Tilted	0.041	0.054	0.041	0.10	0.08
		Left Cheek	0.218	0.615	0.710	0.83	0.93
		Left Tilted	0.056	0.100	0.070	0.16	0.13
	WCDMA IV	Right Cheek	0.206	0.146	0.185	0.35	0.39
		Right Tilted	0.047	0.054	0.041	0.10	0.09
		Left Cheek	0.152	0.615	0.710	0.77	0.86
		Left Tilted	0.052	0.100	0.070	0.15	0.12
	WCDMA V	Right Cheek	0.262	0.146	0.185	0.41	0.45
		Right Tilted	0.140	0.054	0.041	0.19	0.18
		Left Cheek	0.338	0.615	0.710	0.95	1.05
		Left Tilted	0.151	0.100	0.070	0.25	0.22
LTE	LTE Band 2	Right Cheek	0.189	0.146	0.185	0.34	0.37
		Right Tilted	0.044	0.054	0.041	0.10	0.09
		Left Cheek	0.162	0.615	0.710	0.78	0.87
		Left Tilted	0.055	0.100	0.070	0.16	0.13
	LTE Band 4	Right Cheek	0.144	0.146	0.185	0.29	0.33
		Right Tilted	0.024	0.054	0.041	0.08	0.07
		Left Cheek	0.099	0.615	0.710	0.71	0.81
		Left Tilted	0.021	0.100	0.070	0.12	0.09
	LTE Band 7	Right Cheek	0.973	0.146	0.185	1.12	1.16
		Right Tilted	0.255	0.054	0.041	0.31	0.30
		Left Cheek	0.493	0.615	0.710	1.11	1.20
		Left Tilted	0.229	0.100	0.070	0.33	0.30
	LTE Band 12	Right Cheek	0.040	0.146	0.185	0.19	0.23
		Right Tilted	0.019	0.054	0.041	0.07	0.06
		Left Cheek	0.055	0.615	0.710	0.67	0.77
		Left Tilted	0.020	0.100	0.070	0.12	0.09
	LTE Band 26	Right Cheek	0.218	0.146	0.185	0.36	0.40
		Right Tilted	0.109	0.054	0.041	0.16	0.15
		Left Cheek	0.240	0.615	0.710	0.86	0.95
		Left Tilted	0.139	0.100	0.070	0.24	0.21
	LTE Band 41	Right Cheek	0.645	0.146	0.185	0.79	0.83
		Right Tilted	0.091	0.054	0.041	0.15	0.13
		Left Cheek	0.187	0.615	0.710	0.80	0.90
		Left Tilted	0.138	0.100	0.070	0.24	0.21



WWAN Band		Exposure Position	1	2	3	1+2 Summed 10g SAR (W/kg)	1+3 Summed 10g SAR (W/kg)
			WWAN	2.4GHz WLAN	5GHz WLAN		
			10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)		
GSM	GSM850	Right Cheek	0.376	0.070	0.040	0.45	0.42
		Right Tilted	0.229	0.029	0.012	0.26	0.24
		Left Cheek	0.487	0.280	0.134	0.77	0.62
		Left Tilted	0.243	0.052	0.014	0.30	0.26
	GSM1900	Right Cheek	0.130	0.070	0.040	0.20	0.17
		Right Tilted	0.019	0.029	0.012	0.05	0.03
		Left Cheek	0.078	0.280	0.134	0.36	0.21
		Left Tilted	0.025	0.052	0.014	0.08	0.04
WCDMA	WCDMA II	Right Cheek	0.102	0.070	0.040	0.17	0.14
		Right Tilted	0.025	0.029	0.012	0.05	0.04
		Left Cheek	0.137	0.280	0.134	0.42	0.27
		Left Tilted	0.033	0.052	0.014	0.09	0.05
	WCDMA IV	Right Cheek	0.135	0.070	0.040	0.21	0.18
		Right Tilted	0.027	0.029	0.012	0.06	0.04
		Left Cheek	0.098	0.280	0.134	0.38	0.23
		Left Tilted	0.030	0.052	0.014	0.08	0.04
	WCDMA V	Right Cheek	0.199	0.070	0.040	0.27	0.24
		Right Tilted	0.108	0.029	0.012	0.14	0.12
		Left Cheek	0.254	0.280	0.134	0.53	0.39
		Left Tilted	0.116	0.052	0.014	0.17	0.13
LTE	LTE Band 2	Right Cheek	0.120	0.070	0.040	0.19	0.16
		Right Tilted	0.025	0.029	0.012	0.05	0.04
		Left Cheek	0.102	0.280	0.134	0.38	0.24
		Left Tilted	0.033	0.052	0.014	0.09	0.05
	LTE Band 4	Right Cheek	0.094	0.070	0.040	0.16	0.13
		Right Tilted	0.016	0.029	0.012	0.05	0.03
		Left Cheek	0.063	0.280	0.134	0.34	0.20
		Left Tilted	0.012	0.052	0.014	0.06	0.03
	LTE Band 7	Right Cheek	0.556	0.070	0.040	0.63	0.60
		Right Tilted	0.136	0.029	0.012	0.17	0.15
		Left Cheek	0.289	0.280	0.134	0.57	0.42
		Left Tilted	0.119	0.052	0.014	0.17	0.13
	LTE Band 12	Right Cheek	0.027	0.070	0.040	0.10	0.07
		Right Tilted	0.013	0.029	0.012	0.04	0.03
		Left Cheek	0.042	0.280	0.134	0.32	0.18
		Left Tilted	0.014	0.052	0.014	0.07	0.03
	LTE Band 26	Right Cheek	0.152	0.070	0.040	0.22	0.19
		Right Tilted	0.084	0.029	0.012	0.11	0.10
		Left Cheek	0.168	0.280	0.134	0.45	0.30
		Left Tilted	0.097	0.052	0.014	0.15	0.11
LTE Band 41	Right Cheek	0.362	0.070	0.040	0.43	0.40	
	Right Tilted	0.049	0.029	0.012	0.08	0.06	
	Left Cheek	0.108	0.280	0.134	0.39	0.24	
	Left Tilted	0.068	0.052	0.014	0.12	0.08	

16.2 Hotspot Exposure Conditions

WWAN Band		Exposure Position	1	2	1+2 Summed 1g SAR (W/kg)
			WWAN 1g SAR (W/kg)	2.4GHz WLAN 1g SAR (W/kg)	
GSM	GSM850	Front	0.764	0.114	0.88
		Back	0.624	0.072	0.70
		Left side	0.916		0.92
		Right side	0.552	0.187	0.74
		Bottom side	0.480		0.48
	GSM1900	Front	0.968	0.114	1.08
		Back	0.162	0.072	0.23
		Left side	0.073		0.07
		Right side	0.047	0.187	0.23
		Bottom side	0.556		0.56
WCDMA	WCDMA II	Front	0.924	0.114	1.04
		Back	0.181	0.072	0.25
		Left side	0.073		0.07
		Right side	0.040	0.187	0.23
		Bottom side	0.520		0.52
	WCDMA IV	Front	0.709	0.114	0.82
		Back	0.219	0.072	0.29
		Left side	0.155		0.16
		Right side	0.028	0.187	0.22
		Bottom side	0.547		0.55
	WCDMA V	Front	0.449	0.114	0.56
		Back	0.339	0.072	0.41
		Left side	0.609		0.61
		Right side	0.276	0.187	0.46
		Bottom side	0.232		0.23

WWAN Band		Exposure Position	1	2	1+2 Summed 1g SAR (W/kg)
			WWAN 1g SAR (W/kg)	2.4GHz WLAN 1g SAR (W/kg)	
LTE	LTE Band 2	Front	0.894	0.114	1.01
		Back	0.251	0.072	0.32
		Left side	0.141		0.14
		Right side	0.058	0.187	0.25
		Bottom side	0.908		0.91
	LTE Band 4	Front	0.604	0.114	0.72
		Back	0.173	0.072	0.25
		Left side	0.170		0.17
		Right side	0.030	0.187	0.22
		Bottom side	0.588		0.59
	LTE Band 7	Front	0.958	0.114	1.07
		Back	0.368	0.072	0.44
		Left side	0.076		0.08
		Right side	0.216	0.187	0.40
		Bottom side	0.553		0.55
	LTE Band 12	Front	0.089	0.114	0.20
		Back	0.061	0.072	0.13
		Left side	0.140		0.14
		Right side	0.051	0.187	0.24
		Bottom side	0.045		0.05
	LTE Band 26	Front	0.325	0.114	0.44
		Back	0.241	0.072	0.31
		Left side	0.432		0.43
		Right side	0.232	0.187	0.42
		Bottom side	0.178		0.18
	LTE Band 41	Front	0.832	0.114	0.95
		Back	0.395	0.072	0.47
		Left side	0.053		0.05
Right side		0.162	0.187	0.35	
Bottom side		0.377		0.38	



WWAN Band		Exposure Position	1	2	1+2 Summed 10g SAR (W/kg)
			WWAN	2.4GHz WLAN	
			10g SAR (W/kg)	10g SAR (W/kg)	
GSM	GSM850	Front	0.583	0.054	0.64
		Back	0.473	0.034	0.51
		Left side	0.629		0.63
		Right side	0.374	0.086	0.46
		Bottom side	0.269		0.27
	GSM1900	Front	0.485	0.054	0.54
		Back	0.092	0.034	0.13
		Left side	0.041		0.04
		Right side	0.028	0.086	0.11
		Bottom side	0.268		0.27
WCDMA	WCDMA II	Front	0.462	0.054	0.52
		Back	0.103	0.034	0.14
		Left side	0.039		0.04
		Right side	0.025	0.086	0.11
		Bottom side	0.254		0.25
	WCDMA IV	Front	0.359	0.054	0.41
		Back	0.121	0.034	0.16
		Left side	0.080		0.08
		Right side	0.017	0.086	0.10
		Bottom side	0.274		0.27
	WCDMA V	Front	0.345	0.054	0.40
		Back	0.262	0.034	0.30
		Left side	0.417		0.42
		Right side	0.190	0.086	0.28
		Bottom side	0.133		0.13



WWAN Band		Exposure Position	1	2	1+2 Summed 10g SAR (W/kg)
			WWAN 10g SAR (W/kg)	2.4GHz WLAN 10g SAR (W/kg)	
LTE	LTE Band 2	Front	0.439	0.054	0.49
		Back	0.145	0.034	0.18
		Left side	0.075		0.08
		Right side	0.035	0.086	0.12
		Bottom side	0.440		0.44
	LTE Band 4	Front	0.306	0.054	0.36
		Back	0.099	0.034	0.13
		Left side	0.087		0.09
		Right side	0.019	0.086	0.11
		Bottom side	0.294		0.29
	LTE Band 7	Front	0.452	0.054	0.51
		Back	0.198	0.034	0.23
		Left side	0.045		0.05
		Right side	0.114	0.086	0.20
		Bottom side	0.246		0.25
	LTE Band 12	Front	0.069	0.054	0.12
		Back	0.048	0.034	0.08
		Left side	0.099		0.10
		Right side	0.036	0.086	0.12
		Bottom side	0.023		0.02
	LTE Band 26	Front	0.246	0.054	0.30
		Back	0.184	0.034	0.22
		Left side	0.296		0.30
		Right side	0.162	0.086	0.25
		Bottom side	0.101		0.10
	LTE Band 41	Front	0.400	0.054	0.45
		Back	0.218	0.034	0.25
		Left side	0.029		0.03
Right side		0.085	0.086	0.17	
Bottom side		0.168		0.17	



16.3 Body-Worn Accessory Exposure Conditions

WWAN Band		Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)
			WWAN 1g SAR (W/kg)	2.4GHz WLAN 1g SAR (W/kg)	5GHz WLAN 1g SAR (W/kg)	Bluetooth 1g SAR (W/kg)				
GSM	GSM850	Front	0.666	0.057	0.048	0.196	0.72	0.71	0.86	0.91
		Back	0.626	0.035	0.017	0.196	0.66	0.64	0.82	0.84
	GSM1900	Front	0.729	0.057	0.048	0.196	0.79	0.78	0.93	0.97
		Back	0.238	0.035	0.017	0.196	0.27	0.26	0.43	0.45
WCDMA	WCDMA II	Front	0.913	0.057	0.048	0.196	0.97	0.96	1.11	1.16
		Back	0.288	0.035	0.017	0.196	0.32	0.31	0.48	0.50
	WCDMA IV	Front	0.894	0.057	0.048	0.196	0.95	0.94	1.09	1.14
		Back	0.263	0.035	0.017	0.196	0.30	0.28	0.46	0.48
	WCDMA V	Front	0.408	0.057	0.048	0.196	0.47	0.46	0.60	0.65
		Back	0.352	0.035	0.017	0.196	0.39	0.37	0.55	0.57
LTE	LTE Band 2	Front	0.796	0.057	0.048	0.196	0.85	0.84	0.99	1.04
		Back	0.239	0.035	0.017	0.196	0.27	0.26	0.44	0.45
	LTE Band 4	Front	0.651	0.057	0.048	0.196	0.71	0.70	0.85	0.90
		Back	0.212	0.035	0.017	0.196	0.25	0.23	0.41	0.43
	LTE Band 7	Front	0.769	0.057	0.048	0.196	0.83	0.82	0.97	1.01
		Back	0.412	0.035	0.017	0.196	0.45	0.43	0.61	0.63
	LTE Band 12	Front	0.071	0.057	0.048	0.196	0.13	0.12	0.27	0.32
		Back	0.053	0.035	0.017	0.196	0.09	0.07	0.25	0.27
	LTE Band 26	Front	0.299	0.057	0.048	0.196	0.36	0.35	0.50	0.54
		Back	0.276	0.035	0.017	0.196	0.31	0.29	0.47	0.49
	LTE Band 41	Front	0.448	0.057	0.048	0.196	0.51	0.50	0.64	0.69
		Back	0.221	0.035	0.017	0.196	0.26	0.24	0.42	0.43



WWAN Band		Exposure Position	1	2	3	1+2 Summed 10g SAR (W/kg)	1+3 Summed 10g SAR (W/kg)
			WWAN 10g SAR (W/kg)	2.4GHz WLAN 10g SAR (W/kg)	5GHz WLAN 10g SAR (W/kg)		
GSM	GSM850	Front	0.504	0.029	0.017	0.53	0.52
		Back	0.466	0.017	0.004	0.48	0.47
	GSM1900	Front	0.405	0.029	0.017	0.43	0.42
		Back	0.151	0.017	0.004	0.17	0.16
WCDMA	WCDMA II	Front	0.506	0.029	0.017	0.54	0.52
		Back	0.183	0.017	0.004	0.20	0.19
	WCDMA IV	Front	0.499	0.029	0.017	0.53	0.52
		Back	0.167	0.017	0.004	0.18	0.17
	WCDMA V	Front	0.312	0.029	0.017	0.34	0.33
		Back	0.271	0.017	0.004	0.29	0.28
LTE	LTE Band 2	Front	0.451	0.029	0.017	0.48	0.47
		Back	0.151	0.017	0.004	0.17	0.16
	LTE Band 4	Front	0.362	0.029	0.017	0.39	0.38
		Back	0.127	0.017	0.004	0.14	0.13
	LTE Band 7	Front	0.400	0.029	0.017	0.43	0.42
		Back	0.225	0.017	0.004	0.24	0.23
	LTE Band 12	Front	0.055	0.029	0.017	0.08	0.07
		Back	0.042	0.017	0.004	0.06	0.05
	LTE Band 26	Front	0.226	0.029	0.017	0.26	0.24
		Back	0.209	0.017	0.004	0.23	0.21
	LTE Band 41	Front	0.237	0.029	0.017	0.27	0.25
		Back	0.126	0.017	0.004	0.14	0.13

Test Engineer : Aaron Chen Frank Wu Tom Jiang Iran Wang Lawrence Chen Domo Hsiao Tommy Chen Poa Pan and Steven Chang

17. Uncertainty Assessment

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

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

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

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

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

(b) κ is the coverage factor

Table 17.1. Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual “root-sum-squares” (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.



Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	6.0	N	1	1	1	6.0	6.0
Axial Isotropy	4.7	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.6	R	1.732	0.7	0.7	3.9	3.9
Boundary Effects	1.0	R	1.732	1	1	0.6	0.6
Linearity	4.7	R	1.732	1	1	2.7	2.7
System Detection Limits	1.0	R	1.732	1	1	0.6	0.6
Modulation Response	3.2	R	1.732	1	1	1.8	1.8
Readout Electronics	0.3	N	1	1	1	0.3	0.3
Response Time	0.0	R	1.732	1	1	0.0	0.0
Integration Time	2.6	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.0	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.0	R	1.732	1	1	1.7	1.7
Probe Positioner	0.4	R	1.732	1	1	0.2	0.2
Probe Positioning	2.9	R	1.732	1	1	1.7	1.7
Max. SAR Eval.	2.0	R	1.732	1	1	1.2	1.2
Test Sample Related							
Device Positioning	3.0	N	1	1	1	3.0	3.0
Device Holder	3.6	N	1	1	1	3.6	3.6
Power Drift	5.0	R	1.732	1	1	2.9	2.9
Power Scaling	0.0	R	1.732	1	1	0.0	0.0
Phantom and Setup							
Phantom Uncertainty	6.1	R	1.732	1	1	3.5	3.5
SAR correction	0.0	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.2	N	1	0.78	0.71	0.1	0.1
Liquid Conductivity (target)	5.0	R	1.732	0.78	0.71	2.3	2.0
Liquid Conductivity (mea.)	2.5	R	1.732	0.78	0.71	1.1	1.0
Temp. unc. - Conductivity	3.4	R	1.732	0.78	0.71	1.5	1.4
Liquid Permittivity Repeatability	0.15	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.0	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.5	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.83	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						11.4%	11.4%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						22.9%	22.7%

Table 17.2. Uncertainty Budget for frequency range 300 MHz to 3 GHz



Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	7.0	N	1	1	1	7.0	7.0
Axial Isotropy	4.7	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.6	R	1.732	0.7	0.7	3.9	3.9
Boundary Effects	2.0	R	1.732	1	1	1.2	1.2
Linearity	4.7	R	1.732	1	1	2.7	2.7
System Detection Limits	1.0	R	1.732	1	1	0.6	0.6
Modulation Response	3.2	R	1.732	1	1	1.8	1.8
Readout Electronics	0.3	N	1	1	1	0.3	0.3
Response Time	0.0	R	1.732	1	1	0.0	0.0
Integration Time	2.6	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.0	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.0	R	1.732	1	1	1.7	1.7
Probe Positioner	0.4	R	1.732	1	1	0.2	0.2
Probe Positioning	6.7	R	1.732	1	1	3.9	3.9
Max. SAR Eval.	4.0	R	1.732	1	1	2.3	2.3
Test Sample Related							
Device Positioning	3.0	N	1	1	1	3.0	3.0
Device Holder	3.6	N	1	1	1	3.6	3.6
Power Drift	5.0	R	1.732	1	1	2.9	2.9
Power Scaling	0.0	R	1.732	1	1	0.0	0.0
Phantom and Setup							
Phantom Uncertainty	6.6	R	1.732	1	1	3.8	3.8
SAR correction	0.0	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.2	N	1	0.78	0.71	0.1	0.1
Liquid Conductivity (target)	5.0	R	1.732	0.78	0.71	2.3	2.0
Liquid Conductivity (mea.)	2.5	R	1.732	0.78	0.71	1.1	1.0
Temp. unc. - Conductivity	3.4	R	1.732	0.78	0.71	1.5	1.4
Liquid Permittivity Repeatability	0.15	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.0	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.5	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.83	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						12.8%	12.7%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						25.5%	25.4%

Table 17.3. Uncertainty Budget for frequency range 3 GHz to 6 GHz



18. References

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- [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.
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