



**FCC 47 CFR Parts 1 & 2
Published RF Exposure KDB Procedures
IEEE Std 1528-2003 and IEEE Std 1528a-2005**

(Class II Permissive Change)

SAR EVALUATION REPORT

For
**Cellular/PCS GSM/EDGE/CDMA/WCDMA/LTE Modem
(Tested inside of Panasonic Tablet PC CF-19)**

**Model: MC7355
FCC ID: N7NMC7355**

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Prepared for
**SIERRA WIRELESS INC.
13811 WIRELESS WAY
RICHMOND
BC V6V 3A4 CANADA**

Prepared by
**UL VERIFICATION SERVICES, INC
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888**



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--	8/7/2013	Initial Issue	--
A	8/22/2013	Section 4.1 – added missing dipole and corrected calibration dates Section 11 – Corrected dipole information	Dave Weaver
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1. Attestation of Test Results

Applicant	Sierra Wireless Inc.	
DUT description	Cellular/PCS GSM/EDGE/CDMA/WCDMA/LTE Modem (Tested inside of Panasonic PCCF-19)	
Model	MC7355	
Test device is	An identical prototype	
Device category	Portable	
Exposure category	General Population/Uncontrolled Exposure	
Date tested	6/13/2013 – 8/6/2013	
Applicable Standards		Test Results
FCC 47 CFR Parts 1 & 2 Published RF Exposure KDB Procedures, and TCB workshop updates IEEE Std 1528-2003 and IEEE Std 1528a-2005		Pass
UL Verification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services, Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report. Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services, Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services, Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.		
Approved & Released For UL Verification Services, Inc. By: 		Tested By: 
Dave Weaver Program Manager UL VERIFICATION SERVICES, INC		Jose Abadilla SAR Engineer UL VERIFICATION SERVICES, INC

1.1. Highest Reported SAR

Worst Case SAR data for each Frequency Band

RF Exposure Rule	Freq. Range	Highest Reported SAR	Limit
22 (LTE Band 5)	824-849 MHz	Body & Tablet: 1.328 W/kg (Edge 4 Tilt)	1.6 W/kg
24 (LTE band II)	1850-1910 MHz	Body & Tablet: 0.750 W/kg (Corner 1)	
27 (LTE Band 17)	704 – 716 MHz	Body & Tablet: 0.792. W/kg (Edge 4 tilt)	
27 (W-CDMA Band 4)	1710–1755 MHz	Body & Tablet 1.383 W/kg (Corner 1)	
Simultaneous transmission condition		1.496 W/kg (highest SAR across exposure conditions)	

LEGEND:

- Rear = Back
- Edge 1 = Top Edge
- Edge 2 = Right Edge
- Edge 3 = Bottom Edge
- Edge 4 = Left Edge

2. Test Methodology

The tests documented in this report were performed in accordance with FCC 47 CFR Parts 1 & 2, IEEE STD 1528-2003, IEEE Std 1528a-2005, the following FCC Published RF exposure KDB procedures, and TCB workshop updates:

- o 941225 D01 SAR test for 3G devices v02
- o 941225 D02 HSPA and 1x Advanced v02r02
- o 941225 D03 SAR Test Reduction GSM GPRS EDGE v01
- o 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01
- o 865664 D02 SAR Reporting v01r01
- o 447498 D01 General RF Exposure Guidance v05r01
- o 248227 D01 SAR Meas for 802 11abg v01r02
- o 616217 D04 SAR for laptop and tablets v01r1

3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL Verification Services, Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. Calibration and Uncertainty

4.1. Measuring Instrument Calibration

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards.

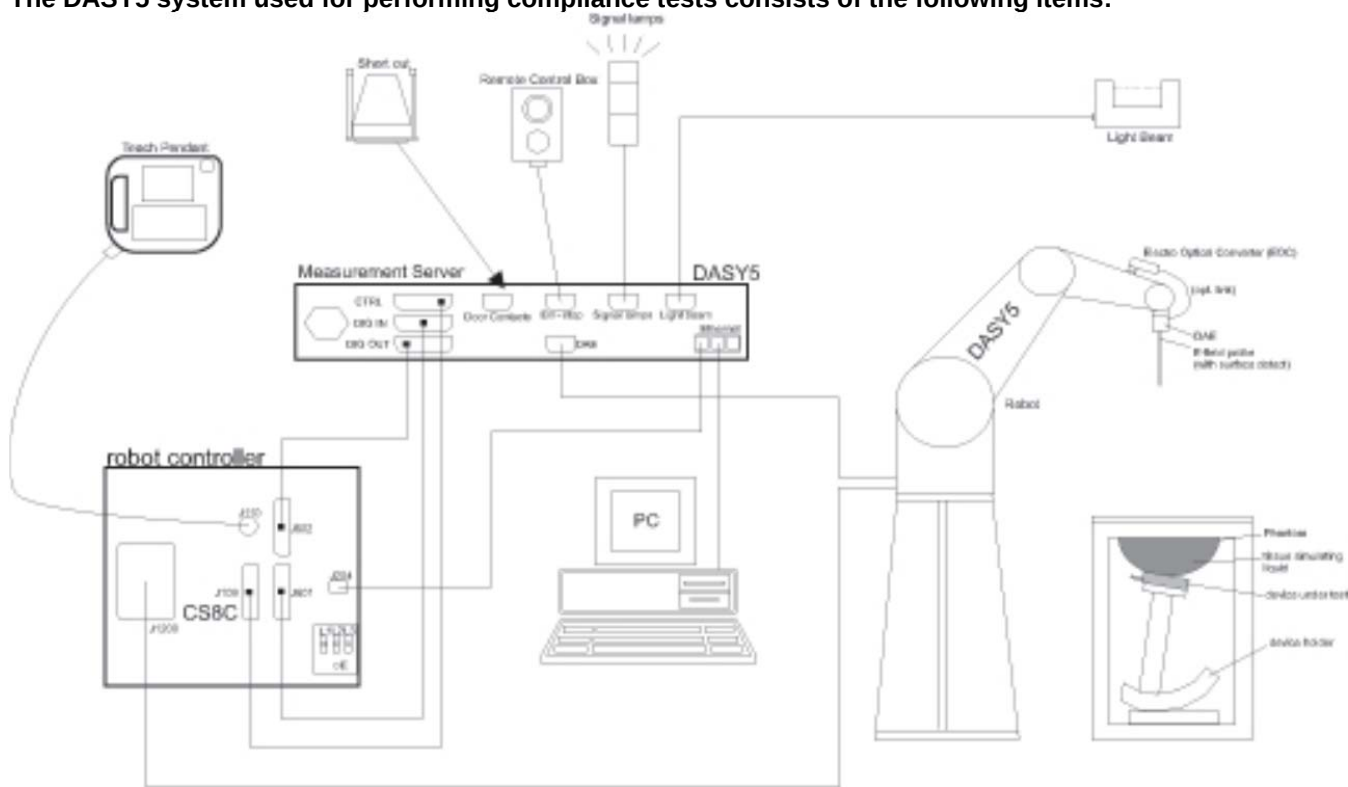
Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due date		
				MM	DD	Year
S-Parameter Network Analyzer	Agilent	8753ES	MY40000980	2	20	2014
Dielectronic Probe kit	SPEAG	SM DAK 040 CA	1082	9	18	2013
ENA Series Network Analyzer	Agilent	E5071B	MY42100131	2	21	2014
Dielectronic Probe kit	HP	85070E	594	N/A		
Synthesized Signal Generator	HP	8665B	3744A01084	5	7	2014
Power Meter	HP	438A	3513U04320	9	17	2013
Power Sensor A	HP	8481A	2237A31744	8	17	2013
Power Sensor B	HP	8481A	3318A95392	8	17	2013
Amplifier	MITEQ	4D00400600-50-30P	1622052	N/A		
Directional coupler	Werlatone	C8060-102	2149	N/A		
Synthesized Signal Generator	HP	8665B	3744A01084	3	26	2014
Power Meter	HP	438A	2822A05684	10	7	2013
Power Sensor A	HP	8481A	2702A66876	8	1	2013
Power Sensor B	HP	8482A	2349A08568	9	26	2013
Amplifier	MITEQ	4D00400600-50-30P	1620606	N/A		
Directional coupler	Werlatone	C8060-102	2141	N/A		
Base Station Simulator	R & S	CMU200	106291	8	8	2013
Base Station Simulator	R & S	CMW500	124594-HX	7	24	2014
Base Station Simulator	Agilent	8960	GB46160222	11	19	2013
Thermometer	TRACEABLE	4242	122529162	9	13	2014
E-Field Probe	SPEAG	EX3DV4	3902	2	24	2014
E-Field Probe	SPEAG	EX3DV4	3929	6	26	2014
E-Field Probe	SPEAG	EX3DV4	3773	4	7	2014
E-Field Probe	SPEAG	EX3DV4	1259	2	14	2014
Data Acquisition Electronics	SPEAG	DAE4	1359	2	5	2014
System Validation Dipole	SPEAG	D750V3	1019	3	5	2014
System Validation Dipole	SPEAG	D835V2	4d002	10	4	2013
System Validation Dipole	SPEAG	D835V2	4d142	10	20	2014
System Validation Dipole	SPEAG	D1750V2	1050	4	20	2014
System Validation Dipole	SPEAG	D1900V2	5d163	10	5	2013
System Validation Dipole	SPEAG	D1900V2	5d043	11	6	2013
System Validation Dipole	SPEAG	D2450V2	899	10	9	2013
System Validation Dipole	SPEAG	D5GHzV2	1138	10	6	2013

4.2. Measurement Uncertainty

Per KDB 865664, when no measured SAR values exceed 1.5 W/kg, measurement uncertainty analysis does not need to be provided in the test report.

5. Measurement System Description and Setup

The DASY5 system used for performing compliance tests consists of the following items:



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

6. SAR Measurement Procedure

6.1. Normal SAR Measurement Procedure

Step 1: 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. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: 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 locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) 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 KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01

	≤ 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	$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: Δx_{Area} , Δy_{Area}	≤ 2 GHz: ≤ 15 mm $2 - 3$ GHz: ≤ 12 mm	$3 - 4$ GHz: ≤ 12 mm $4 - 6$ GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose 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 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01 (Draft)

			$\leq 3 \text{ GHz}$	$> 3 \text{ GHz}$
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			$\leq 2 \text{ GHz: } \leq 8 \text{ mm}$ $2 - 3 \text{ GHz: } \leq 5 \text{ mm}^*$	$3 - 4 \text{ GHz: } \leq 5 \text{ mm}^*$ $4 - 6 \text{ GHz: } \leq 4 \text{ mm}^*$
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{\text{Zoom}}(n)$		$\leq 5 \text{ mm}$	$3 - 4 \text{ GHz: } \leq 4 \text{ mm}$ $4 - 5 \text{ GHz: } \leq 3 \text{ mm}$ $5 - 6 \text{ GHz: } \leq 2 \text{ mm}$
	graded grid	$\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	$\leq 4 \text{ mm}$	$3 - 4 \text{ GHz: } \leq 3 \text{ mm}$ $4 - 5 \text{ GHz: } \leq 2.5 \text{ mm}$ $5 - 6 \text{ GHz: } \leq 2 \text{ mm}$
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
Minimum zoom scan volume	x, y, z		$\geq 30 \text{ mm}$	$3 - 4 \text{ GHz: } \geq 28 \text{ mm}$ $4 - 5 \text{ GHz: } \geq 25 \text{ mm}$ $5 - 6 \text{ GHz: } \geq 22 \text{ mm}$
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 area scan based <i>1-g SAR estimation</i> procedures of KDB 447498 is $\leq 1.4 \text{ W/kg}$, $\leq 8 \text{ mm}$, $\leq 7 \text{ mm}$ and $\leq 5 \text{ mm}$ zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan (FCC only)

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be larger than the step size in Z-direction.

6.2. Volume Scan Procedures

Step 1: Repeat Step 1-4 in Section 6.1

Step 2: Volume Scan

Volume Scans are used to assess peak SAR and averaged SAR measurements in largely extended 3-dimensional volumes within any phantom. This measurement does not need any previous area scan. The grid can be anchored to a user specific point or to the current probe location.

Step 3: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

7. Device Under Test

Cellular/PCS GSM/EDGE/CDMA/WCDMA/LTE Modem (Tested inside of Panasonic Tablet PC CF-19) Model: MC7355	
Operating Configuration(s)	Tablet Mode
Exposure Condition(s)	The device is used in close proximity to the body. Specific details of the required test positions are provided in Section 8 "Summary of Test Configurations"
Accessory	None

7.1. Wireless Technologies

Wireless Mode and Frequency Bands	- GSM850: 824 - 849 MHz - GSM1900: 1850 - 1910 MHz - W-CDMA Band V: 824 - 849 MHz - W-CDMA Band IV: 1710 - 1755 MHz - W-CDMA Band II: 1850 - 1910 MHz - CDMA BC 0: 824 - 849 MHz - CDMA BC 1: 1850 - 1910 MHz - CDMA BC 10: 817.9 - 823.1 MHz - LTE Band 2: 1850 - 1910 MHz - LTE Band 4: 1710 - 1750 MHz - LTE Band 5: 824 - 849 MHz - LTE Band 13: 777 - 787 MHz - LTE Band 17: 704 - 716 MHz - LTE Band 25: 1850 - 1915 MHz 802.11ab/g/n: 2412 - 2462 MHz, b / g / HT20 / HT40 5150 - 5250 MHz, a / HT20 / HT40 5250 - 5350 MHz, a / HT20 / HT40 5500 - 5700 MHz, a / HT20 / HT40 5725 - 5850 MHz, a / HT20 / HT40 - Bluetooth: 2402 - 2480 MHz
GPRS Multi-Slot Class:	- GPRS: 10 - EGPRS: 12
GPRS Class:	B
Duty Cycle	- GPRS 2 Slots: 25% - W-CDMA: 100% - CDMA: 100% - LTE: 100%

7.2. Hotspot (Wireless Router) Exposure Condition

N/A

7.3. Simultaneous Transmission

WWAN + Wi-Fi 2.4 GHz SISO (1 Tx)

Usage Scenario	Modes	Mode of Operation	BAND	CDMA 1xRTT	CDMA 1xEV-DO	GPRS/EDGE	WCDMA	HSDPA	HSUPA	HSPA+	DC-HSPA	LTE	WiFi 2.4GHz Main	WiFi 2.4GHz Aux	WiFi 5 GHz Bands Main	WiFi 5 GHz Bands Aux	BT 2.4 GHz
Body SAR	WWAN + 2.4 GHz WLAN	CDMA 1xRTT	BC0	YES	No	No	No	No	No	No	No	No	YES	No	No	No	No
		CDMA 1xRTT	BC1	YES	No	No	No	No	No	No	No	No	YES	No	No	No	No
		CDMA 1xRTT	BC10	YES	No	No	No	No	No	No	No	No	YES	No	No	No	No
		CDMA 1xEVDO	BC0	No	YES	No	No	No	No	No	No	No	YES	No	No	No	No
		CDMA 1xEVDO	BC1	No	YES	No	No	No	No	No	No	No	YES	No	No	No	No
		CDMA 1xEVDO	BC10	No	YES	No	No	No	No	No	No	No	YES	No	No	No	No
		EDGE	850	No	No	YES	No	No	No	No	No	No	YES	No	No	No	No
		EDGE	1900	No	No	YES	No	No	No	No	No	No	YES	No	No	No	No
		W-CDMA	850	No	No	No	YES	No	No	No	No	No	YES	No	No	No	No
		W-CDMA	1700	No	No	No	YES	No	No	No	No	No	YES	No	No	No	No
		W-CDMA	1900	No	No	No	YES	No	No	No	No	No	YES	No	No	No	No
		HSDPA	850	No	No	No	No	YES	No	No	No	No	YES	No	No	No	No
		HSDPA	1700	No	No	No	No	YES	No	No	No	No	YES	No	No	No	No
		HSDPA	1900	No	No	No	No	YES	No	No	No	No	YES	No	No	No	No
		HSUPA	850	No	No	No	No	No	YES	No	No	No	YES	No	No	No	No
		HSUPA	1700	No	No	No	No	No	YES	No	No	No	YES	No	No	No	No
		HSUPA	1900	No	No	No	No	No	YES	No	No	No	YES	No	No	No	No
		HSPA+	850	No	No	No	No	No	No	YES	No	No	YES	No	No	No	No
		HSPA+	1700	No	No	No	No	No	No	YES	No	No	YES	No	No	No	No
		HSPA+	1900	No	No	No	No	No	No	YES	No	No	YES	No	No	No	No
		DC-HSDPA	850	No	No	No	No	No	No	No	YES	No	YES	No	No	No	No
		DC-HSDPA	1700	No	No	No	No	No	No	No	YES	No	YES	No	No	No	No
		DC-HSDPA	1900	No	No	No	No	No	No	No	YES	No	YES	No	No	No	No
		LTE	2	No	No	No	No	No	No	No	No	YES	YES	No	No	No	No
		LTE	4	No	No	No	No	No	No	No	No	YES	YES	No	No	No	No
		LTE	5	No	No	No	No	No	No	No	No	YES	YES	No	No	No	No
		LTE	13	No	No	No	No	No	No	No	No	YES	YES	No	No	No	No
		LTE	17	No	No	No	No	No	No	No	No	YES	YES	No	No	No	No
		LTE	25	No	No	No	No	No	No	No	No	YES	YES	No	No	No	No
		CDMA 1xRTT	BC0	YES	No	No	No	No	No	No	No	No	No	YES	No	No	No
		CDMA 1xRTT	BC1	YES	No	No	No	No	No	No	No	No	No	YES	No	No	No
		CDMA 1xRTT	BC10	YES	No	No	No	No	No	No	No	No	No	YES	No	No	No
		CDMA 1xEVDO	BC0	No	YES	No	No	No	No	No	No	No	No	YES	No	No	No
		CDMA 1xEVDO	BC1	No	YES	No	No	No	No	No	No	No	No	YES	No	No	No
		CDMA 1xEVDO	BC10	No	YES	No	No	No	No	No	No	No	No	YES	No	No	No
		EDGE	850	No	No	YES	No	No	No	No	No	No	No	YES	No	No	No
		EDGE	1900	No	No	YES	No	No	No	No	No	No	No	YES	No	No	No
		W-CDMA	850	No	No	No	YES	No	No	No	No	No	No	YES	No	No	No
		W-CDMA	1700	No	No	No	YES	No	No	No	No	No	No	YES	No	No	No
		W-CDMA	1900	No	No	No	YES	No	No	No	No	No	No	YES	No	No	No
		HSDPA	850	No	No	No	No	YES	No	No	No	No	No	YES	No	No	No
		HSDPA	1700	No	No	No	No	YES	No	No	No	No	No	YES	No	No	No
		HSDPA	1900	No	No	No	No	YES	No	No	No	No	No	YES	No	No	No
		HSUPA	850	No	No	No	No	No	YES	No	No	No	No	YES	No	No	No
		HSUPA	1700	No	No	No	No	No	YES	No	No	No	No	YES	No	No	No
		HSUPA	1900	No	No	No	No	No	YES	No	No	No	No	YES	No	No	No
		HSPA+	850	No	No	No	No	No	No	YES	No	No	No	YES	No	No	No
		HSPA+	1700	No	No	No	No	No	No	YES	No	No	No	YES	No	No	No
		HSPA+	1900	No	No	No	No	No	No	YES	No	No	No	YES	No	No	No
		DC-HSDPA	850	No	No	No	No	No	No	YES	No	No	No	YES	No	No	No
		DC-HSDPA	1700	No	No	No	No	No	No	YES	No	No	No	YES	No	No	No
		DC-HSDPA	1900	No	No	No	No	No	No	YES	No	No	No	YES	No	No	No
		LTE	2	No	No	No	No	No	No	No	No	YES	No	YES	No	No	No
		LTE	4	No	No	No	No	No	No	No	No	YES	No	YES	No	No	No
		LTE	5	No	No	No	No	No	No	No	No	YES	No	YES	No	No	No
		LTE	13	No	No	No	No	No	No	No	No	YES	No	YES	No	No	No
		LTE	17	No	No	No	No	No	No	No	No	YES	No	YES	No	No	No
		LTE	25	No	No	No	No	No	No	No	No	YES	No	YES	No	No	No

WWAN + Wi-Fi 5 GHz Bands SISO (1 Tx)

Usage Scenario	Modes	Mode of Operation	BAND	CDMA 1xRTT	CDMA 1xEV-DO	GPRS/EDGE	WCDMA	HSDPA	HSUPA	HSPA+	DC-HSPA	LTE	WiFi 2.4GHz Main	WiFi 2.4GHz Aux	WiFi 5 GHz Bands Main	WiFi 5 GHz Bands Aux	BT 2.4 GHz
Body SAR	WWAN + 5 GHz Bands WLAN	CDMA 1xRTT	BC0	YES	No	No	No	No	No	No	No	No	No	No	YES	No	No
		CDMA 1xRTT	BC1	YES	No	No	No	No	No	No	No	No	No	No	YES	No	No
		CDMA 1xRTT	BC10	YES	No	No	No	No	No	No	No	No	No	No	YES	No	No
		CDMA 1xEVDO	BC0	No	YES	No	No	No	No	No	No	No	No	No	YES	No	No
		CDMA 1xEVDO	BC1	No	YES	No	No	No	No	No	No	No	No	No	YES	No	No
		CDMA 1xEVDO	BC10	No	YES	No	No	No	No	No	No	No	No	No	YES	No	No
		EDGE	850	No	No	YES	No	No	No	No	No	No	No	No	YES	No	No
		EDGE	1900	No	No	YES	No	No	No	No	No	No	No	No	YES	No	No
		W-CDMA	850	No	No	No	YES	No	No	No	No	No	No	No	YES	No	No
		W-CDMA	1700	No	No	No	YES	No	No	No	No	No	No	No	YES	No	No
		W-CDMA	1900	No	No	No	YES	No	No	No	No	No	No	No	YES	No	No
		HSDPA	850	No	No	No	No	YES	No	No	No	No	No	No	YES	No	No
		HSDPA	1700	No	No	No	No	YES	No	No	No	No	No	No	YES	No	No
		HSDPA	1900	No	No	No	No	YES	No	No	No	No	No	No	YES	No	No
		HSUPA	850	No	No	No	No	No	YES	No	No	No	No	No	YES	No	No
		HSUPA	1700	No	No	No	No	No	YES	No	No	No	No	No	YES	No	No
		HSUPA	1900	No	No	No	No	No	YES	No	No	No	No	No	YES	No	No
		HSPA+	850	No	No	No	No	No	No	YES	No	No	No	No	YES	No	No
		HSPA+	1700	No	No	No	No	No	No	YES	No	No	No	No	YES	No	No
		HSPA+	1900	No	No	No	No	No	No	YES	No	No	No	No	YES	No	No
		DC-HSDPA	850	No	No	No	No	No	No	No	YES	No	No	No	YES	No	No
		DC-HSDPA	1700	No	No	No	No	No	No	No	YES	No	No	No	YES	No	No
		DC-HSDPA	1900	No	No	No	No	No	No	No	YES	No	No	No	YES	No	No
		LTE	2	No	No	No	No	No	No	No	No	YES	No	No	YES	No	No
		LTE	4	No	No	No	No	No	No	No	No	YES	No	No	YES	No	No
		LTE	5	No	No	No	No	No	No	No	No	YES	No	No	YES	No	No
		LTE	13	No	No	No	No	No	No	No	No	YES	No	No	YES	No	No
		LTE	17	No	No	No	No	No	No	No	No	YES	No	No	YES	No	No
		LTE	25	No	No	No	No	No	No	No	No	YES	No	No	YES	No	No
		CDMA 1xRTT	BC0	YES	No	No	No	No	No	No	No	No	No	No	No	YES	No
		CDMA 1xRTT	BC1	YES	No	No	No	No	No	No	No	No	No	No	No	YES	No
		CDMA 1xRTT	BC10	YES	No	No	No	No	No	No	No	No	No	No	No	YES	No
		CDMA 1xEVDO	BC0	No	YES	No	No	No	No	No	No	No	No	No	No	YES	No
		CDMA 1xEVDO	BC1	No	YES	No	No	No	No	No	No	No	No	No	No	YES	No
		CDMA 1xEVDO	BC10	No	YES	No	No	No	No	No	No	No	No	No	No	YES	No
		EDGE	850	No	No	YES	No	No	No	No	No	No	No	No	No	YES	No
		EDGE	1900	No	No	YES	No	No	No	No	No	No	No	No	No	YES	No
		W-CDMA	850	No	No	No	YES	No	No	No	No	No	No	No	No	YES	No
		W-CDMA	1700	No	No	No	YES	No	No	No	No	No	No	No	No	YES	No
		W-CDMA	1900	No	No	No	YES	No	No	No	No	No	No	No	No	YES	No
		HSDPA	850	No	No	No	No	YES	No	No	No	No	No	No	No	YES	No
		HSDPA	1700	No	No	No	No	YES	No	No	No	No	No	No	No	YES	No
		HSDPA	1900	No	No	No	No	YES	No	No	No	No	No	No	No	YES	No
		HSUPA	850	No	No	No	No	No	YES	No	No	No	No	No	No	YES	No
		HSUPA	1700	No	No	No	No	No	YES	No	No	No	No	No	No	YES	No
		HSUPA	1900	No	No	No	No	No	YES	No	No	No	No	No	No	YES	No
		HSPA+	850	No	No	No	No	No	No	YES	No	No	No	No	No	YES	No
		HSPA+	1700	No	No	No	No	No	No	YES	No	No	No	No	No	YES	No
		HSPA+	1900	No	No	No	No	No	No	YES	No	No	No	No	No	YES	No
		DC-HSDPA	850	No	No	No	No	No	No	No	YES	No	No	No	No	YES	No
		DC-HSDPA	1700	No	No	No	No	No	No	No	YES	No	No	No	No	YES	No
		DC-HSDPA	1900	No	No	No	No	No	No	No	YES	No	No	No	No	YES	No
		LTE	2	No	No	No	No	No	No	No	No	YES	No	No	No	YES	No
		LTE	4	No	No	No	No	No	No	No	No	YES	No	No	No	YES	No
		LTE	5	No	No	No	No	No	No	No	No	YES	No	No	No	YES	No
		LTE	13	No	No	No	No	No	No	No	No	YES	No	No	No	YES	No
		LTE	17	No	No	No	No	No	No	No	No	YES	No	No	No	YES	No
		LTE	25	No	No	No	No	No	No	No	No	YES	No	No	No	YES	No

WWAN + Bluetooth

Usage Scenario	Modes	Mode of Operation	BAND	CDMA 1xRTT	CDMA 1xEV-DO	GPRS/EDGE	WCDMA	HSDPA	HSUPA	HSPA+	DC-HSPA	LTE	WiFi 2.4GHz Main	WiFi 2.4GHz Aux	WiFi 5 GHz Bands Main	WiFi 5 GHz Bands Aux	BT 2.4 GHz
Body SAR	WWAN + BT	CDMA 1xRTT	BC0	YES	No	No	No	No	No	No	No	No	No	No	No	No	YES
		CDMA 1xRTT	BC1	YES	No	No	No	No	No	No	No	No	No	No	No	No	YES
		CDMA 1xRTT	BC10	YES	No	No	No	No	No	No	No	No	No	No	No	No	YES
		CDMA 1xEVDO	BC0	No	YES	No	No	No	No	No	No	No	No	No	No	No	YES
		CDMA 1xEVDO	BC1	No	YES	No	No	No	No	No	No	No	No	No	No	No	YES
		CDMA 1xEVDO	BC10	No	YES	No	No	No	No	No	No	No	No	No	No	No	YES
		EDGE	850	No	No	YES	No	No	No	No	No	No	No	No	No	No	YES
		EDGE	1900	No	No	YES	No	No	No	No	No	No	No	No	No	No	YES
		W-CDMA	850	No	No	No	YES	No	No	No	No	No	No	No	No	No	YES
		W-CDMA	1700	No	No	No	YES	No	No	No	No	No	No	No	No	No	YES
		W-CDMA	1900	No	No	No	YES	No	No	No	No	No	No	No	No	No	YES
		HSDPA	850	No	No	No	No	YES	No	No	No	No	No	No	No	No	YES
		HSDPA	1700	No	No	No	No	YES	No	No	No	No	No	No	No	No	YES
		HSDPA	1900	No	No	No	No	YES	No	No	No	No	No	No	No	No	YES
		HSUPA	850	No	No	No	No	No	YES	No	No	No	No	No	No	No	YES
		HSUPA	1700	No	No	No	No	No	YES	No	No	No	No	No	No	No	YES
		HSUPA	1900	No	No	No	No	No	YES	No	No	No	No	No	No	No	YES
		HSPA+	850	No	No	No	No	No	No	YES	No	No	No	No	No	No	YES
		HSPA+	1700	No	No	No	No	No	No	YES	No	No	No	No	No	No	YES
		HSPA+	1900	No	No	No	No	No	No	YES	No	No	No	No	No	No	YES
		DC-HSDPA	850	No	No	No	No	No	No	No	YES	No	No	No	No	No	YES
		DC-HSDPA	1700	No	No	No	No	No	No	No	YES	No	No	No	No	No	YES
		DC-HSDPA	1900	No	No	No	No	No	No	No	YES	No	No	No	No	No	YES
		LTE	2	No	No	No	No	No	No	No	No	YES	No	No	No	No	YES
		LTE	4	No	No	No	No	No	No	No	No	YES	No	No	No	No	YES
		LTE	5	No	No	No	No	No	No	No	No	YES	No	No	No	No	YES
		LTE	13	No	No	No	No	No	No	No	No	YES	No	No	No	No	YES
		LTE	17	No	No	No	No	No	No	No	No	YES	No	No	No	No	YES
		LTE	25	No	No	No	No	No	No	No	No	YES	No	No	No	No	YES

WWAN + Wi-Fi SISO (1 Tx) + Bluetooth

Usage Scenario	Modem	Mode of Operation	BAND	CDMA 1xRTT	CDMA 1xEV-DO	GPRS/EDGE	WCDMA	HSDPA	HSUPA	HSPA+	DC-HSPA	LTE	WiFi 2.4GHz Main	WiFi 2.4GHz Aux	WiFi 5 GHz Bands Main	WiFi 5 GHz Bands Aux	BT 2.4 GHz
Body SAR	WWAN + 2.4GHz WLAN MIMO (2 Tx on WLAN)	CDMA 1xRTT	BC0	YES	No	No	No	No	No	No	No	No	YES	No	No	No	YES
		CDMA 1xRTT	BC1	YES	No	No	No	No	No	No	No	No	YES	No	No	No	YES
		CDMA 1xRTT	BC10	YES	No	No	No	No	No	No	No	No	YES	No	No	No	YES
		CDMA 1xEVDO	BC0	No	YES	No	No	No	No	No	No	No	YES	No	No	No	YES
		CDMA 1xEVDO	BC1	No	YES	No	No	No	No	No	No	No	YES	No	No	No	YES
		CDMA 1xEVDO	BC10	No	YES	No	No	No	No	No	No	No	YES	No	No	No	YES
		EDGE	850	No	No	YES	No	No	No	No	No	No	YES	No	No	No	YES
		EDGE	1900	No	No	YES	No	No	No	No	No	No	YES	No	No	No	YES
		W-CDMA	850	No	No	No	YES	No	No	No	No	No	YES	No	No	No	YES
		W-CDMA	1700	No	No	No	YES	No	No	No	No	No	YES	No	No	No	YES
		W-CDMA	1900	No	No	No	YES	No	No	No	No	No	YES	No	No	No	YES
		HSDPA	850	No	No	No	No	YES	No	No	No	No	YES	No	No	No	YES
		HSDPA	1700	No	No	No	No	YES	No	No	No	No	YES	No	No	No	YES
		HSDPA	1900	No	No	No	No	YES	No	No	No	No	YES	No	No	No	YES
		HSUPA	850	No	No	No	No	No	YES	No	No	No	YES	No	No	No	YES
		HSUPA	1700	No	No	No	No	No	YES	No	No	No	YES	No	No	No	YES
		HSUPA	1900	No	No	No	No	No	YES	No	No	No	YES	No	No	No	YES
		DC-HSDPA	850	No	No	No	No	No	No	No	YES	No	YES	No	No	No	YES
		DC-HSDPA	1700	No	No	No	No	No	No	No	YES	No	YES	No	No	No	YES
		DC-HSDPA	1900	No	No	No	No	No	No	No	YES	No	YES	No	No	No	YES
	WWAN + 5 GHz Bands WLAN MIMO (2 Tx on WLAN)	LTE	2	No	No	No	No	No	No	No	No	YES	YES	No	No	No	YES
		LTE	4	No	No	No	No	No	No	No	No	YES	YES	No	No	No	YES
		LTE	5	No	No	No	No	No	No	No	No	YES	YES	No	No	No	YES
		LTE	13	No	No	No	No	No	No	No	No	YES	YES	No	No	No	YES
		LTE	17	No	No	No	No	No	No	No	No	YES	YES	No	No	No	YES
		LTE	25	No	No	No	No	No	No	No	No	YES	YES	No	No	No	YES
		CDMA 1xRTT	BC0	YES	No	No	No	No	No	No	No	No	No	No	YES	No	YES
		CDMA 1xRTT	BC1	YES	No	No	No	No	No	No	No	No	No	No	YES	No	YES
		CDMA 1xRTT	BC10	YES	No	No	No	No	No	No	No	No	No	No	YES	No	YES
		CDMA 1xEVDO	BC0	No	YES	No	No	No	No	No	No	No	No	No	YES	No	YES
		CDMA 1xEVDO	BC1	No	YES	No	No	No	No	No	No	No	No	No	YES	No	YES
		CDMA 1xEVDO	BC10	No	YES	No	No	No	No	No	No	No	No	No	YES	No	YES
		EDGE	850	No	No	YES	No	No	No	No	No	No	No	No	YES	No	YES
		EDGE	1900	No	No	YES	No	No	No	No	No	No	No	No	YES	No	YES
		W-CDMA	850	No	No	No	YES	No	No	No	No	No	No	No	YES	No	YES
		W-CDMA	1700	No	No	No	YES	No	No	No	No	No	No	No	YES	No	YES
		W-CDMA	1900	No	No	No	YES	No	No	No	No	No	No	No	YES	No	YES
		HSDPA	850	No	No	No	No	YES	No	No	No	No	No	No	YES	No	YES
		HSDPA	1700	No	No	No	No	YES	No	No	No	No	No	No	YES	No	YES
		HSDPA	1900	No	No	No	No	YES	No	No	No	No	No	No	YES	No	YES
		HSUPA	850	No	No	No	No	No	YES	No	No	No	No	No	YES	No	YES
		HSUPA	1700	No	No	No	No	No	YES	No	No	No	No	No	YES	No	YES
		HSUPA	1900	No	No	No	No	No	YES	No	No	No	No	No	YES	No	YES
		HSPA+	850	No	No	No	No	No	No	YES	No	No	No	No	YES	No	YES
		HSPA+	1700	No	No	No	No	No	No	YES	No	No	No	No	YES	No	YES
		HSPA+	1900	No	No	No	No	No	No	YES	No	No	No	No	YES	No	YES
		DC-HSDPA	850	No	No	No	No	No	No	No	YES	No	No	No	YES	No	YES
		DC-HSDPA	1700	No	No	No	No	No	No	No	YES	No	No	No	YES	No	YES
		DC-HSDPA	1900	No	No	No	No	No	No	No	YES	No	No	No	YES	No	YES
		LTE	2	No	No	No	No	No	No	No	No	YES	No	No	YES	No	YES
		LTE	4	No	No	No	No	No	No	No	No	YES	No	No	YES	No	YES
		LTE	5	No	No	No	No	No	No	No	No	YES	No	No	YES	No	YES
		LTE	13	No	No	No	No	No	No	No	No	YES	No	No	YES	No	YES
		LTE	17	No	No	No	No	No	No	No	No	YES	No	No	YES	No	YES
		LTE	25	No	No	No	No	No	No	No	No	YES	No	No	YES	No	YES

WWAN + Wi-Fi MIMO (2 Tx)

Usage Scenario	Modes	Mode of Operation	BAND	CDMA 1xRTT	CDMA 1xEV-DO	GPRS/EDGE	WCDMA	HSDPA	HSUPA	HSPA+	DC-HSPA	LTE	WiFi 2.4GHz Main	WiFi 2.4GHz Aux	WiFi 5 GHz Bands Main	WiFi 5 GHz Bands Aux	BT 2.4 GHz
Body SAR	WWAN + 2.4GHz WLAN + BT	CDMA 1xRTT	BC0	YES	No	No	No	No	No	No	No	No	YES	YES	No	No	No
		CDMA 1xRTT	BC1	YES	No	No	No	No	No	No	No	No	YES	YES	No	No	No
		CDMA 1xRTT	BC10	YES	No	No	No	No	No	No	No	No	YES	YES	No	No	No
		CDMA 1xEVDO	BC0	No	YES	No	No	No	No	No	No	No	YES	YES	No	No	No
		CDMA 1xEVDO	BC1	No	YES	No	No	No	No	No	No	No	YES	YES	No	No	No
		CDMA 1xEVDO	BC10	No	YES	No	No	No	No	No	No	No	YES	YES	No	No	No
		EDGE	850	No	No	YES	No	No	No	No	No	No	YES	YES	No	No	No
		EDGE	1900	No	No	YES	No	No	No	No	No	No	YES	YES	No	No	No
		W-CDMA	850	No	No	No	YES	No	No	No	No	No	YES	YES	No	No	No
		W-CDMA	1700	No	No	No	YES	No	No	No	No	No	YES	YES	No	No	No
		W-CDMA	1900	No	No	No	YES	No	No	No	No	No	YES	YES	No	No	No
		HSDPA	850	No	No	No	No	YES	No	No	No	No	YES	YES	No	No	No
		HSDPA	1700	No	No	No	No	YES	No	No	No	No	YES	YES	No	No	No
		HSDPA	1900	No	No	No	No	YES	No	No	No	No	YES	YES	No	No	No
		HSUPA	850	No	No	No	No	No	YES	No	No	No	YES	YES	No	No	No
		HSUPA	1700	No	No	No	No	No	YES	No	No	No	YES	YES	No	No	No
		HSUPA	1900	No	No	No	No	No	YES	No	No	No	YES	YES	No	No	No
		HSPA+	850	No	No	No	No	No	No	YES	No	No	YES	YES	No	No	No
		HSPA+	1700	No	No	No	No	No	No	YES	No	No	YES	YES	No	No	No
		HSPA+	1900	No	No	No	No	No	No	YES	No	No	YES	YES	No	No	No
	WWAN + 5 GHz Bands WLAN + BT	DC-HSDPA	850	No	No	No	No	No	No	No	YES	No	YES	YES	No	No	No
		DC-HSDPA	1700	No	No	No	No	No	No	No	YES	No	YES	YES	No	No	No
		DC-HSDPA	1900	No	No	No	No	No	No	No	YES	No	YES	YES	No	No	No
		LTE	2	No	No	No	No	No	No	No	No	YES	YES	YES	No	No	No
		LTE	4	No	No	No	No	No	No	No	No	YES	YES	YES	No	No	No
		LTE	5	No	No	No	No	No	No	No	No	YES	YES	YES	No	No	No
		LTE	13	No	No	No	No	No	No	No	No	YES	YES	YES	No	No	No
		LTE	17	No	No	No	No	No	No	No	No	YES	YES	YES	No	No	No
		LTE	25	No	No	No	No	No	No	No	No	YES	YES	YES	No	No	No
		CDMA 1xRTT	BC0	YES	No	No	No	No	No	No	No	No	No	No	YES	YES	No
		CDMA 1xRTT	BC1	YES	No	No	No	No	No	No	No	No	No	No	YES	YES	No
		CDMA 1xRTT	BC10	YES	No	No	No	No	No	No	No	No	No	No	YES	YES	No
		CDMA 1xEVDO	BC0	No	YES	No	No	No	No	No	No	No	No	No	YES	YES	No
		CDMA 1xEVDO	BC1	No	YES	No	No	No	No	No	No	No	No	No	YES	YES	No
		CDMA 1xEVDO	BC10	No	YES	No	No	No	No	No	No	No	No	No	YES	YES	No
		EDGE	850	No	No	YES	No	No	No	No	No	No	No	No	YES	YES	No
		EDGE	1900	No	No	YES	No	No	No	No	No	No	No	No	YES	YES	No
		W-CDMA	850	No	No	No	YES	No	No	No	No	No	No	No	YES	YES	No
		W-CDMA	1700	No	No	No	YES	No	No	No	No	No	No	No	YES	YES	No
		W-CDMA	1900	No	No	No	YES	No	No	No	No	No	No	No	YES	YES	No
		HSDPA	850	No	No	No	No	YES	No	No	No	No	No	No	YES	YES	No
		HSDPA	1700	No	No	No	No	YES	No	No	No	No	No	No	YES	YES	No
		HSDPA	1900	No	No	No	No	YES	No	No	No	No	No	No	YES	YES	No
		HSUPA	850	No	No	No	No	No	YES	No	No	No	No	No	YES	YES	No
		HSUPA	1700	No	No	No	No	No	YES	No	No	No	No	No	YES	YES	No
		HSUPA	1900	No	No	No	No	No	YES	No	No	No	No	No	YES	YES	No
		HSPA+	850	No	No	No	No	No	No	YES	No	No	No	No	YES	YES	No
		HSPA+	1700	No	No	No	No	No	No	YES	No	No	No	No	YES	YES	No
		HSPA+	1900	No	No	No	No	No	No	YES	No	No	No	No	YES	YES	No
		DC-HSDPA	850	No	No	No	No	No	No	No	YES	No	No	No	YES	YES	No
		DC-HSDPA	1700	No	No	No	No	No	No	No	YES	No	No	No	YES	YES	No
		DC-HSDPA	1900	No	No	No	No	No	No	No	YES	No	No	No	YES	YES	No
		LTE	2	No	No	No	No	No	No	No	No	YES	No	No	YES	YES	No
		LTE	4	No	No	No	No	No	No	No	No	YES	No	No	YES	YES	No
		LTE	5	No	No	No	No	No	No	No	No	YES	No	No	YES	YES	No
		LTE	13	No	No	No	No	No	No	No	No	YES	No	No	YES	YES	No
		LTE	17	No	No	No	No	No	No	No	No	YES	No	No	YES	YES	No
		LTE	25	No	No	No	No	No	No	No	No	YES	No	No	YES	YES	No

Notes:

1. Bluetooth transmits using the WLAN Aux Antenna
2. Bluetooth can transmit simultaneously with the WLAN Main Antenna, in either of the WLAN bands.
3. Bluetooth cannot transmit simultaneously with the WLAN Aux Antenna, in either of the WLAN bands; this also precludes the transmission of Bluetooth when WLAN is in MIMO mode.

7.4. LTE Parameters

#	Description	Information	
A	List the frequency range and channel bandwidths used in each LTE band; 2, 4, 5, 13, 17, 25 20 MHz, etc.	Band 2	
		Tx: 1850 - 1910 MHz	Rx: 1930 - 1990 MHz
		Band 4	
		Tx: 1710 – 1755 MHz	Rx: 2110 – 2155 MHz
		Band 5	
		Tx: 824 - 849 MHz	Rx: 869 - 894 MHz
		Band 13	
		Tx: 777 – 787 MHz	Rx: 746 – 756 MHz
		Band 17	
		Tx: 704 – 716 MHz	Rx: 734 – 746 MHz
		Band 25	
		Tx: 1850 - 1915 MHz	Rx: 1930 - 1995 MHz
		Channel Bandwidths for bands 2, 4, 5 and 25: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz	
		Channel Bandwidths for bands 13 and 17: 5MHz and 10MHz	

LTE Parameters continued

#	Description	Information						
B	Identify the high, middle and low (H, M, L) channel numbers and channel frequencies for each LTE bandwidth and frequency band	Band 2	Channel Bandwidth					
			20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
		Low	18700 /1860	18675/ 1857.5	18650/ 1855	18625/ 1852.5	18615/ 1851.5	18607/ 1850.7
		Mid	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880
		High	19100/ 1900	19125/ 1902.5	19150/ 1905	19175/ 1907.5	19184/ 1908.4	19192/ 1909.2
		Band 4	Channel Bandwidth					
			20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
		Low	20050/ 1720	20025/ 1717.5	20000/ 1715	19975/ 1712.5	19965/ 1711.5	19957/ 1710.7
		Mid	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5
		High	20300/ 1745	20325/ 1747.5	20350/ 1750	20375/ 1752.5	20384/ 1753.4	20392/ 1754.2
		Band 5	Channel Bandwidth					
			20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
		Low			20450/ 829	20425/ 826.5	20415/ 825.5	20407/ 824.7
		Mid			20525/ 836.5	20525/ 836.5	20525/ 836.5	20525/ 836.5
		High			20600/ 844	20625/ 846.5	20634/ 847.4	20642/ 848.2
		Band 13	Channel Bandwidth					
			20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
		Low				23205/ 779.5		
		Mid			23230/ 782	23230/ 782		
		High				23255/ 784.5		
		Band 17	Channel Bandwidth					
			20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
		Low			23780/ 709	23755/ 706.5		
		Mid			23790/ 710	23790/ 710		
		High			23800/ 711	23825/ 713.5		
		Band 25	Channel Bandwidth					
			20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
		Low	26140/ 1860	26115/ 1857.5	26090/ 1855	26065/ 1852.5	26055/ 1851.5	26047/ 1850.7
		Mid	26365/ 1882.5	26365/ 1882.5	26365/ 1882.5	26365/ 1882.5	26365/ 1882.5	26365/ 1882.5
		High	26590/ 1905	26615/ 1907.5	26640/ 1910	26665/ 1912.5	26674/ 1913.4	26682/ 1914.2
C	Descriptions of the LTE transmitter and antenna implementation, and identify if the transmitter operates independently of the other wireless transmitters in the device; i.e., whether the LTE hardware, components and/or antenna(s) are shared with other transmitters.	A single antenna (Main) is used for LTE and other wireless modes (GPRS/EGPRS/W-CDMA/CDMA) for both transmit and receive.						

#	Description	Information																																						
D	Identify the voice and data transmission requirements for all LTE operating modes and exposure conditions, for standalone and simultaneous transmission, with respect to the required head and body test configurations, antenna locations, handset flip or slide cover positions, antenna diversity requirements, etc.	Data Only Device Exposure Conditions: ▪ Laptop Mode, Bystander ○ Rear side of the display screen at 15 mm from the phantom																																						
E	Identify if Maximum Power Reduction (MPR) is implemented as an optional or permanent feature, i.e., built-in by design: 1. MPR may be considered during SAR testing only when the maximum output power is permanently limited by the MPR implemented within the device, according to the RB (resource block) configurations specified in 3GPP/LTE standards. 2. Regardless of network requirements, only those RB configurations allowed (see 3GPP standards) for the channel bandwidth and modulation combinations may be tested with MPR active. Configurations with RB allocations less than the RB thresholds required by 3GPP must be tested without MPR. 3. A-MPR (additional MPR) must be disabled during SAR testing.	As per 3GPP TS 36.101 v11.0.0 (2012-03) Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3 <table><tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th><th rowspan="2">MPR (dB)</th></tr><tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr><tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr></table> MPR is supported by design and is mandatory. A-MPR is supported by design, but is disabled for SAR testing. A-MPR is disabled, by using Network Setting value of NS_01.	Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)																																	
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz																																		
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1																																	
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1																																	
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																	
F	When power reduction is required for one or more LTE modes to satisfy SAR compliance for simultaneous transmission or other equipment certification and operating requirements, maximum average conducted output power measurement results for each power reduction mode applicable to the simultaneous voice/data transmission configurations for such wireless configurations and frequency bands are required.	Not applicable.																																						

8. RF Exposure Conditions

Refer to Section 18 “Antenna Dimensions and Separation Distances” for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

8.1. Body Exposure Conditions for WWAN

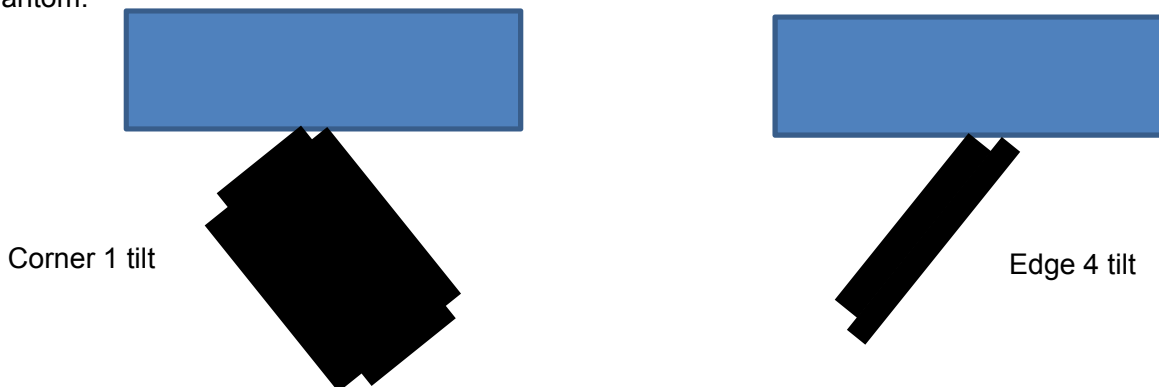
Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	38.2 mm	Yes	
Front	-	-	SAR is not required as this is not a typical use scenario
Edge 1	27.9 mm	Yes	
Edge 2	283 mm	No	Refer to section 13 for SAR exclusion justification
Edge 3	119.3 mm	No	Refer to section 13 for SAR exclusion justification
Edge 4	16.7 mm	Yes	

LEGEND:

- Bottom = Back
- Edge 1 = Top Edge
- Edge 2 = Right Edge
- Edge 3 = Bottom Edge
- Edge 4 = Left Edge

8.2. Additional Test Scenarios

Due to the extensions protruding from the screen section a KDB enquiry was made to discuss additional test scenarios. Additional testing was performed in two orientations with the DUT tilted against the flat phantom.



8.3. Test Configurations for WLAN

Wi-Fi 1-g SAR values were taken from results recorded in SAR report 13J15516-1, submitted under FCC ID ACJ9TGWL12A, or from the Corner 1 values in section 12 of this report

9. RF Output Power Measurement

9.1. GSM850

Target Power for GSM850 32 dBm

Tune-Up Tolerance: +1.0 dB/- 1.0 dB

Full Power

GPRS (GMSK) - Coding Scheme: CS1										
Band	Ch No.	f (MHz)	1 Slot Power (dBm)		2 Slot Power (dBm)		3 Slot Power (dBm)		4 Slot Power (dBm)	
			Burst Avg	Frame Avg	Burst Avg	Frame Avg	Burst Avg	Frame Avg	Burst Avg	Frame Avg
850	128	824.2	32.3	23.3	32.3	26.3				
	190	836.6	32.3	23.3	32.3	26.3				
	251	848.8	32.3	23.3	32.3	26.3				
EGPRS (8PSK) - Coding Scheme: MCS5										
Band	Ch No.	f (MHz)	1 Slot Power (dBm)		2 Slot Power (dBm)		3 Slot Power (dBm)		4 Slot Power (dBm)	
			Burst Avg	Frame Avg	Burst Avg	Frame Avg	Burst Avg	Frame Avg	Burst Avg	Frame Avg
850	128	824.2	27.1	18.1	27.0	21.0	26.9	22.6	26.6	23.6
	190	836.6	27.1	18.1	27.0	21.0	26.8	22.5	26.7	23.7
	251	848.8	27.1	18.1	27.0	21.0	26.8	22.5	26.7	23.7

Notes:

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

- Body: GMSK (GPRS) mode with 2 time slots, based on the output power measurements above
- SAR is not required for EGPRS (8PSK) Mode at full power because its output power is less than that of GPRS Mode at full power.

9.2. GSM1900

Target Power for GSM1900 29 dBm

Tune-Up Tolerance: +1.0 dB/- 1.0 dB

Full Power

GPRS (GMSK) - Coding Scheme: CS1										
Band	Ch No.	f (MHz)	1 Slot Power (dBm)		2 Slot Power (dBm)		3 Slot Power (dBm)		4 Slot Power (dBm)	
			Burst Avg	Frame Avg	Burst Avg	Frame Avg	Burst Avg	Frame Avg	Burst Avg	Frame Avg
1900	512	1850.2	29.5	20.5	29.4	23.4				
	661	1880	29.4	20.4	29.4	23.4				
	810	1909.8	29.4	20.4	29.5	23.5				
EGPRS (8PSK) - Coding Scheme: MCS5										
Band	Ch No.	f (MHz)	1 Slot Power (dBm)		2 Slot Power (dBm)		3 Slot Power (dBm)		4 Slot Power (dBm)	
			Burst Avg	Frame Avg	Burst Avg	Frame Avg	Burst Avg	Frame Avg	Burst Avg	Frame Avg
1900	512	1850.2	25.6	16.6	25.5	19.5	25.3	21.0	25.3	22.3
	661	1880	25.5	16.5	25.4	19.4	25.3	21.0	25.1	22.1
	810	1909.8	25.7	16.7	25.5	19.5	25.3	21.0	25.2	22.2

Notes:

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

- Body: GMSK (GPRS) mode with 2 time slots, based on the output power measurements above
- SAR is not required for EGPRS (8PSK) Mode at full power because its output power is less than that of GPRS Mode at either full power.

9.3. W-CDMA Band V

Target Power for W-CDMA Band V 23 dBm

Tune-Up Tolerance: +1.0 dB/- 1.0 dB

Release 99

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

Release 99 RMC Output Power Measurement Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
W-CDMA (UMTS) Band V	Rel 99 (RMC, 12.2 kbps)	4132	826.4	29.9
		4183	836.6	22.9
		4233	846.6	22.8

HSDPA

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
HSDPA Specific Settings	β_{hs}	4/15	24/15	30/15	30/15
	CM (dB)	0	0	0.5	0.5
	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	Ahs = β_{hs}/β_c	30/15			

HSDPA Output Power Measurement Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
W-CDMA (UMTS) Band V	Subtest 1	4132	826.4	21.9
		4183	836.6	21.8
		4233	846.6	21.9
	Subtest 2	4132	826.4	19.3
		4183	836.6	18.9
		4233	846.6	19.3
	Subtest 3	4132	826.4	17.8
		4183	836.6	17.3
		4233	846.6	17.4
	Subtest 4	4132	826.4	16.7
		4183	836.6	16.6
		4233	846.6	16.7

Note(s):

KDB 941225 D01 – Body SAR is not required for HSDPA when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is < 75% of the SAR limit.

HSPA (HSDPA & HSUPA)

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSPA	HSPA	HSPA	HSPA	HSPA	
	Subtest	1	2	3	4	5	
WCDMA General Settings	Loopback Mode	Test Mode 1					
	Rel99 RMC	12.2kbps RMC					
	HSDPA FRC	H-Set1					
	HSUPA Test	HSUPA Loopback					
	Power Control Algorithm	Algorithm2					
	β_c	11/15	6/15	15/15	2/15	15/15	
	β_d	15/15	15/15	9/15	15/15	15/15	
	β_{ec}	209/225	12/15	30/15	2/15	24/15	
	β_c/β_d	11/15	6/15	15/9	2/15	15/15	
	β_{hs}	22/15	12/15	30/15	4/15	30/15	
	β_{ed}	1309/225	94/75	47/15 47/15	56/75	134/15	
	CM (dB)	1.0	3.0	2.0	3.0	1.0	
MPR (dB)	0	2	1	2	0		
HSDPA Specific Settings	DACK	8					
	DNAK	8					
	DCQI	8					
	Ack-Nack repetition factor	3					
	CQI Feedback (Table 5.2B.4)	4ms					
	CQI Repetition Factor (Table 5.2B.4)	2					
	A _{hs} = β_{hs}/β_c	30/15					
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7	
	DHARQ	0	0	0	0	0	
	AG Index	20	12	15	17	21	
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81	
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9	
	Reference E_TFCIs	E-TFCI 11			E-TFCI 11		
		E-TFCI PO 4			E-TFCI PO 4		
		E-TFCI 67			E-TFCI 67		
		E-TFCI PO 18			E-TFCI PO 18		
		E-TFCI 71			E-TFCI 71		
E-TFCI PO 23		E-TFCI PO 23					
E-TFCI 75		E-TFCI 75					
E-TFCI PO 26	E-TFCI PO 26						
E-TFCI 81	E-TFCI 81						
E-TFCI PO 27	E-TFCI PO 27						

HSUPA Output Power Measurement Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
WCDMA (UMTS) Band V	Subtest 1	4132	826.4	21.4
		4183	836.6	21.4
		4233	846.6	21.6
	Subtest 2	4132	826.4	20.6
		4183	836.6	20.4
		4233	846.6	20.6
	Subtest 3	4132	826.4	20.6
		4183	836.6	20.5
		4233	846.6	20.5
	Subtest 4	4132	826.4	20.6
		4183	836.6	20.7
		4233	846.6	20.4
	Subtest 5	4132	826.4	21.8
		4183	836.6	21.6
		4233	846.6	21.8

Note(s):

- KDB 941225 D01 – Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit.

9.4. W-CDMA Band IV

Target Power for W-CDMA Band IV 23 dBm

Tune-Up Tolerance: +1.0 dB/- 1.0 dB

Release 99

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

Release 99 RMC Output Power Measurement Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
W-CDMA (UMTS) Band IV	Rel 99 (RMC, 12.2 kbps)	1312	1712.4	23.0
		1413	1732.6	23.0
		1513	1752.6	23.1

HSDPA

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
HSDPA Specific Settings	β_{hs}	4/15	24/15	30/15	30/15
	CM (dB)	0	0	0.5	0.5
	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

HSDPA Output Power Measurement Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
W-CDMA (UMTS) Band IV	Subtest 1	1312	1712.4	22.3
		1413	1732.6	22.3
		1513	1752.6	22.4
	Subtest 2	1312	1712.4	19.5
		1413	1732.6	19.6
		1513	1752.6	19.7
	Subtest 3	1312	1712.4	17.3
		1413	1732.6	17.2
		1513	1752.6	17.5
	Subtest 4	1312	1712.4	17.0
		1413	1732.6	16.9
		1513	1752.6	17.2

Note(s):

KDB 941225 D01 – Body SAR is not required for HSDPA when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is < 75% of the SAR limit.

HSPA (HSDPA & HSUPA)

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSPA	HSPA	HSPA	HSPA	HSPA	
	Subtest	1	2	3	4	5	
WCDMA General Settings	Loopback Mode	Test Mode 1					
	Rel99 RMC	12.2kbps RMC					
	HSDPA FRC	H-Set1					
	HSUPA Test	HSUPA Loopback					
	Power Control Algorithm	Algorithm2					
	β_c	11/15	6/15	15/15	2/15	15/15	
	β_d	15/15	15/15	9/15	15/15	15/15	
	β_{ec}	209/225	12/15	30/15	2/15	24/15	
	β_c/β_d	11/15	6/15	15/9	2/15	15/15	
	β_{hs}	22/15	12/15	30/15	4/15	30/15	
	β_{ed}	1309/225	94/75	47/15 47/15	56/75	134/15	
	CM (dB)	1.0	3.0	2.0	3.0	1.0	
MPR (dB)	0	2	1	2	0		
HSDPA Specific Settings	DACK	8					
	DNAK	8					
	DCQI	8					
	Ack-Nack repetition factor	3					
	CQI Feedback (Table 5.2B.4)	4ms					
	CQI Repetition Factor (Table 5.2B.4)	2					
	Ahs = β_{hs}/β_c	30/15					
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7	
	DHARQ	0	0	0	0	0	
	AG Index	20	12	15	17	21	
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81	
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9	
	Reference E_TFCIs	E-TFCI 11			E-TFCI 11		
		E-TFCI PO 4			E-TFCI PO 4		
		E-TFCI 67			E-TFCI 67		
		E-TFCI PO 18			E-TFCI PO 18		
		E-TFCI 71			E-TFCI 71		
E-TFCI PO 23		E-TFCI PO 23					
E-TFCI 75		E-TFCI 75					
E-TFCI PO 26	E-TFCI PO 26						
E-TFCI 81	E-TFCI 81						
E-TFCI PO 27	E-TFCI PO 27						

HSUPA Output Power Measurement Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
WCDMA (UMTS) Band IV	Subtest 1	1312	1712.4	22.15
		1413	1732.6	22.10
		1513	1752.6	22.30
	Subtest 2	1312	1712.4	20.71
		1413	1732.6	20.63
		1513	1752.6	20.70
	Subtest 3	1312	1712.4	20.90
		1413	1732.6	20.83
		1513	1752.6	21.00
	Subtest 4	1312	1712.4	20.55
		1413	1732.6	21.10
		1513	1752.6	21.53
	Subtest 5	1312	1712.4	22.33
		1413	1732.6	22.33
		1513	1752.6	22.20

Note(s):

- KDB 941225 D01 – Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit.

9.5. W-CDMA Band II

Target Power for W-CDMA Band II 23 dBm

Tune-Up Tolerance: +1.0 dB/- 1.0 dB

Release 99

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

Release 99 RMC Output Power Measurement Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
W-CDMA (UMTS) Band II	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	22.9
		9400	1880.0	22.9
		9538	1907.6	22.8

HSDPA

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
HSDPA Specific Settings	CM (dB)	0	0	0.5	0.5
	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

HSDPA Output Power Measurement Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
W-CDMA (UMTS) Band II	Subtest 1	9262	1852.4	22.1
		9400	1880.0	22.0
		9538	1907.6	22.0
	Subtest 2	9262	1852.4	19.1
		9400	1880.0	19.3
		9538	1907.6	19.5
	Subtest 3	9262	1852.4	17.4
		9400	1880.0	17.1
		9538	1907.6	17.5
	Subtest 4	9262	1852.4	15.9
		9400	1880.0	15.8
		9538	1907.6	15.8

Note(s):

KDB 941225 D01 – Body SAR is not required for HSDPA when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is < 75% of the SAR limit.

HSPA (HSDPA & HSUPA)

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSPA	HSPA	HSPA	HSPA	HSPA	
	Subtest	1	2	3	4	5	
WCDMA General Settings	Loopback Mode	Test Mode 1					
	Rel99 RMC	12.2kbps RMC					
	HSDPA FRC	H-Set1					
	HSUPA Test	HSUPA Loopback					
	Power Control Algorithm	Algorithm2					
	β_c	11/15	6/15	15/15	2/15	15/15	
	β_d	15/15	15/15	9/15	15/15	15/15	
	β_{ec}	209/225	12/15	30/15	2/15	24/15	
	β_c/β_d	11/15	6/15	15/9	2/15	15/15	
	β_{hs}	22/15	12/15	30/15	4/15	30/15	
	β_{ed}	1309/225	94/75	47/15 47/15	56/75	134/15	
	CM (dB)	1.0	3.0	2.0	3.0	1.0	
MPR (dB)	0	2	1	2	0		
HSDPA Specific Settings	DACK	8					
	DNAK	8					
	DCQI	8					
	Ack-Nack repetition factor	3					
	CQI Feedback (Table 5.2B.4)	4ms					
	CQI Repetition Factor (Table 5.2B.4)	2					
	A _{hs} = β_{hs}/β_c	30/15					
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7	
	DHARQ	0	0	0	0	0	
	AG Index	20	12	15	17	21	
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81	
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9	
	Reference E_TFCIs	E-TFCI 11			E-TFCI 11		
		E-TFCI PO 4			E-TFCI PO 4		
		E-TFCI 67			E-TFCI 67		
		E-TFCI PO 18			E-TFCI PO 18		
		E-TFCI 71			E-TFCI 71		
E-TFCI PO 23		E-TFCI PO 23					
E-TFCI 75		E-TFCI 75					
E-TFCI PO 26	E-TFCI PO 4	E-TFCI PO 26					
E-TFCI 81	E-TFCI 92	E-TFCI 81					
E-TFCI PO 27	E-TFCI PO 18	E-TFCI PO 27					

HSUPA Output Power Measurement Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
WCDMA (UMTS) Band II	Subtest 1	9262	1852.4	21.32
		9400	1880.0	21.62
		9538	1907.6	21.60
	Subtest 2	9262	1852.4	20.41
		9400	1880.0	20.38
		9538	1907.6	20.45
	Subtest 3	9262	1852.4	20.60
		9400	1880.0	20.80
		9538	1907.6	20.90
	Subtest 4	9262	1852.4	20.72
		9400	1880.0	20.76
		9538	1907.6	20.80
	Subtest 5	9262	1852.4	22.04
		9400	1880.0	22.04
		9538	1907.6	22.08

Note(s):

- KDB 941225 D01 – Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is $\leq 75\%$ of the SAR limit.

9.6. CDMA BC0

Target Power for CDMA BC0 24 dBm

Tune-Up Tolerance: +0.5 dB/- 1.0 dB

1xRTT Output Power Measurement Results

CDMA			Avg Pwr (dBm)		
			RC1 -	RC3 - SO55	RC3 -
Band	Ch	Freq. (MHz)	(Loopback)	(Loopback)	(+F-SCH)
BC 0	1013	824.70	23.9	24.0	24.0
	384	836.52	24.1	24.1	24.0
	777	848.31	23.9	24.0	23.9

1xEV-DO Rel. 0 Output Power Measurement Results

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Avg Pwr (dBm)
BC 0	307.2 kbps (2 slot, QPSK)	153.6 kbps	1013	824.70	23.8
			384	836.52	23.9
			777	848.31	23.9

1xEV-DO Rev. A Output Power Measurement Results

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	Avg Pwr (dBm)
BC 0	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.70	23.8
			384	836.52	23.8
			777	848.31	23.9

9.7. CDMA BC1

Target Power for CDMA BC1 24 dBm

Tune-Up Tolerance: +0.5 dB/- 1.0 dB

1xRTT Output Power Measurement Results

CDMA			Avg Pwr (dBm)		
			RC1 - SO55	RC3 - SO55	RC3 - SO32
Band	Ch	Freq. (MHz)	(Loopback)	(Loopback)	(+F-SCH)
BC 1	25	1851.25	24.1	24.1	24.2
	600	1880	23.8	23.9	24.0
	1175	1908.75	23.8	23.9	24.0

1xEV-DO Rel. 0 Output Power Measurement Results

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Avg Pwr (dBm)
BC 1	307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	23.8
			600	1880	23.9
			1175	1908.75	23.7

1xEV-DO Rev. A Output Power Measurement Results

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	Avg Pwr (dBm)
BC 1	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	23.8
			600	1880	23.7
			1175	1908.75	23.7

9.8. CDMA BC10

Target Power for CDMA BC10 24 dBm

Tune-Up Tolerance: +0.5 dB/- 1.0 dB

1xRTT Output Power Measurement Results

CDMA			Avg Pwr (dBm)		
Band	Ch	Freq. (MHz)	RC1 -	RC3 -	RC3 -
			(Loopback)	(Loopback)	(+F-SCH)
BC 10	476	817.90	23.7	23.7	23.7
	580	820.50	23.7	23.8	23.8
	684	823.10	23.8	23.7	23.8

1xEV-DO Rel. 0 Output Power Measurement Results

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Avg Pwr (dBm)
BC 10	307.2 kbps (2 slot, QPSK)	153.6 kbps	476	817.90	24.0
			580	820.50	23.9
			684	823.10	23.9

1xEV-DO Rev. A Output Power Measurement Results

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	Avg Pwr (dBm)
BC 10	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	476	817.90	23.9
			580	820.50	23.8
			684	823.10	23.8

9.9. LTE Band 2

Target Power for LTE Band 2, QPSK and 16QAM modulations

LTE Band 2	
All Bandwidths	23.0 dBm

Tune-Up Tolerance: +1.0 dB/- 1.0 dB

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

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

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10, 15, 20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

LTE Band 2, 20 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
20	18700	1860	QPSK	1	0	0	0	22.9
				1	49	0	0	22.9
				1	99	0	0	23.0
				50	0	1	1	21.8
				50	24	1	1	21.9
				50	49	1	1	21.9
				100	0	1	1	21.9
			16QAM	1	0	1	1	22.0
				1	49	1	1	21.9
				1	99	1	1	21.7
				50	0	2	2	20.9
				50	24	2	2	20.9
				50	49	2	2	20.9
				100	0	2	2	21.0
	18900	1880	QPSK	1	0	0	0	22.9
				1	49	0	0	23.0
				1	99	0	0	22.8
				50	0	1	1	21.9
				50	24	1	1	21.8
				50	49	1	1	21.8
				100	0	1	1	21.8
			16QAM	1	0	1	1	22.2
				1	49	1	1	22.3
				1	99	1	1	22.3
				50	0	2	2	20.8
				50	24	2	2	20.9
				50	49	2	2	20.8
				100	0	2	2	20.8
	19100	1900	QPSK	1	0	0	0	22.8
				1	49	0	0	22.8
				1	99	0	0	23.1
				50	0	1	1	21.8
				50	24	1	1	21.7
				50	49	1	1	21.8
				100	0	1	1	21.9
			16QAM	1	0	1	1	22.0
				1	49	1	1	21.9
				1	99	1	1	22.2
				50	0	2	2	20.9
				50	24	2	2	20.8
				50	49	2	2	20.9
				100	0	2	2	20.8

LTE Band 2, 15 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
15	18675	1857.5	QPSK	1	0	0	0	22.9
				1	37	0	0	23.0
				1	74	0	0	23.0
				38	0	1	1	21.6
				38	18	1	1	21.7
				38	37	1	1	21.6
				75	0	1	2	21.5
			16QAM	1	0	1	1	22.1
				1	37	1	1	22.0
				1	74	1	1	22.1
				38	0	2	2	20.7
				38	18	2	2	20.6
				38	37	2	2	20.7
				75	0	2	2	20.6
	18900	1880	QPSK	1	0	0	0	23.0
				1	37	0	0	23.0
				1	74	0	0	22.9
				38	0	1	1	21.8
				38	18	1	1	21.9
				38	37	1	1	21.8
				75	0	1	0	22.8
			16QAM	1	0	1	2	21.5
				1	37	1	1	22.1
				1	74	1	1	21.6
				38	0	2	3	20.5
				38	18	2	2	20.7
				38	37	2	3	20.4
				75	0	2	2	20.6
	19125	1902.5	QPSK	1	0	0	0	22.7
				1	37	0	0	22.6
				1	74	0	0	22.8
				38	0	1	1	21.7
				38	18	1	1	21.6
				38	37	1	1	21.6
				75	0	1	1	21.6
			16QAM	1	0	1	2	21.2
				1	37	1	2	21.3
				1	74	1	1	21.9
				38	0	2	2	20.7
				38	18	2	2	20.5
				38	37	2	2	20.6
				75	0	2	2	20.7

LTE Band 2, 10 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
10	18650	1855	QPSK	1	0	0	0	22.7
				1	24	0	0	22.8
				1	49	0	0	22.8
				25	0	1	1	21.8
				25	12	1	1	21.8
				25	24	1	1	21.8
				50	0	1	1	21.6
			16QAM	1	0	1	1	21.9
				1	24	1	1	21.6
				1	49	1	1	21.6
				25	0	2	2	20.9
				25	12	2	2	20.8
				25	24	2	2	20.9
				50	0	2	2	20.8
	18900	1880	QPSK	1	0	0	0	22.7
				1	24	0	0	22.9
				1	49	0	0	22.8
				25	0	1	1	21.7
				25	12	1	1	21.8
				25	24	1	1	21.8
				50	0	1	1	21.7
			16QAM	1	0	1	1	21.6
				1	24	1	1	21.6
				1	49	1	1	21.5
				25	0	2	2	20.8
				25	12	2	2	20.8
				25	24	2	2	20.8
				50	0	2	2	20.6
	19150	1905	QPSK	1	0	0	1	21.4
				1	24	0	0	22.4
				1	49	0	1	22.3
				25	0	1	1	21.8
				25	12	1	1	21.8
				25	24	1	1	21.9
				50	0	1	1	21.7
			16QAM	1	0	1	1	21.8
				1	24	1	1	21.5
				1	49	1	1	21.6
				25	0	2	2	20.9
				25	12	2	2	20.9
				25	24	2	2	21.0
				50	0	2	2	20.9

LTE Band 2, 5 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
5	18625	1852.5	QPSK	1	0	0	0	22.8
				1	12	0	0	23.0
				1	24	0	0	22.6
				12	0	1	1	21.8
				12	6	1	1	21.8
				12	11	1	1	21.9
				25	0	1	1	21.7
			16QAM	1	0	1	1	22.0
				1	12	1	1	21.9
				1	24	1	1	22.0
				12	0	2	2	20.9
				12	6	2	2	20.8
				12	11	2	2	20.9
				25	0	2	2	20.7
	18900	1880	QPSK	1	0	0	0	22.6
				1	12	0	0	22.9
				1	24	0	0	22.6
				12	0	1	1	21.7
				12	6	1	1	21.7
				12	11	1	1	21.7
				25	0	1	1	21.6
			16QAM	1	0	1	1	22.4
				1	12	1	1	22.3
				1	24	1	1	22.0
				12	0	2	2	20.7
				12	6	2	2	20.7
				12	11	2	2	20.7
				25	0	2	2	20.6
	19175	1907.5	QPSK	1	0	0	0	22.6
				1	12	0	0	22.9
				1	24	0	0	23.0
				12	0	1	1	21.8
				12	6	1	1	21.8
				12	11	1	1	21.7
				25	0	1	1	21.8
			16QAM	1	0	1	1	21.9
				1	12	1	1	22.0
				1	24	1	1	21.8
				12	0	2	2	20.9
				12	6	2	2	20.8
				12	11	2	2	20.8
				25	0	2	2	20.6

LTE Band 2, 3 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
3	18615	1851.5	QPSK	1	0	0	0	22.3
				1	7	0	0	22.7
				1	14	0	0	22.7
				8	0	1	1	21.9
				8	4	1	1	21.8
				8	7	1	1	21.8
				15	0	1	1	21.7
			16QAM	1	0	1	1	21.5
				1	7	1	1	21.7
				1	14	1	1	21.5
				8	0	2	2	20.8
				8	4	2	2	21.0
				8	7	2	2	20.9
				15	0	2	2	20.7
	18900	1880	QPSK	1	0	0	0	22.9
				1	7	0	0	22.7
				1	14	0	0	22.6
				8	0	1	1	21.7
				8	4	1	1	21.7
				8	7	1	1	21.7
				15	0	1	1	21.6
			16QAM	1	0	1	1	22.0
				1	7	1	1	21.9
				1	14	1	1	21.8
				8	0	2	2	20.6
				8	4	2	2	20.6
				8	7	2	2	20.5
				15	0	2	2	20.7
	19184	1908.4	QPSK	1	0	0	0	22.9
				1	7	0	0	22.8
				1	14	0	0	22.5
				8	0	1	1	21.8
				8	4	1	1	21.8
				8	7	1	1	21.9
				15	0	1	1	21.8
			16QAM	1	0	1	1	21.5
				1	7	1	1	21.5
				1	14	1	1	21.7
				8	0	2	2	20.8
				8	4	2	2	20.8
				8	7	2	2	20.9
				15	0	2	2	20.8

LTE Band 2, 1.4 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
1.4	18607	1850.7	QPSK	1	0	0	0	22.6
				1	2	0	0	22.5
				1	5	0	0	22.7
				8	0	1	1	21.9
				8	1	1	1	21.8
				8	2	1	1	21.7
				15	0	1	0	22.9
			16QAM	1	0	1	1	21.6
				1	2	1	2	21.3
				1	5	1	1	21.6
				8	0	2	2	21.1
				8	1	2	2	21.0
				8	2	2	2	21.1
				15	0	2	2	20.7
	18900	1880	QPSK	1	0	0	0	22.7
				1	2	0	0	22.8
				1	5	0	0	22.7
				8	0	1	1	21.8
				8	1	1	0	22.7
				8	2	1	0	22.6
				15	0	1	0	22.7
			16QAM	1	0	1	1	21.8
				1	2	1	1	21.5
				1	5	1	1	21.8
				8	0	2	2	20.9
				8	1	2	2	20.8
				8	2	2	2	20.9
				15	0	2	2	21.1
	19192	1909.2	QPSK	1	0	0	0	22.7
				1	2	0	0	22.9
				1	5	0	0	22.9
				8	0	1	0	22.7
				8	1	1	0	22.8
				8	2	1	0	22.7
				15	0	1	1	21.8
			16QAM	1	0	1	1	21.7
				1	2	1	1	21.7
				1	5	1	1	21.5
				8	0	2	1	21.9
				8	1	2	1	21.9
				8	2	2	1	22.0
				15	0	2	2	20.9

9.10. LTE Band 4

Target Power for LTE Band 4, QPSK and 16QAM modulations

LTE Band 4	
All Bandwidths	23.0 dBm

Tune-Up Tolerance: +1.0 dB/- 1.0 dB

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

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

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

LTE Band 4, 20 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
20	20050	1720	QPSK	1	0	0	1	22.4
				1	49	0	1	22.4
				1	99	0	0	23.2
				50	0	1	1	22.0
				50	24	1	1	21.9
				50	49	1	1	21.9
				100	0	1	1	22.0
			16QAM	1	0	1	1	21.9
				1	49	1	1	21.8
				1	99	1	1	22.0
				50	0	2	2	21.0
				50	24	2	2	20.9
				50	49	2	2	20.9
				100	0	2	2	21.0
	20175	1732.5	QPSK	1	0	0	0	23.2
				1	49	0	0	23.0
				1	99	0	0	22.9
				50	0	1	1	22.2
				50	24	1	1	22.2
				50	49	1	1	22.0
				100	0	1	1	22.0
			16QAM	1	0	1	1	22.4
				1	49	1	1	22.5
				1	99	1	1	22.4
				50	0	2	2	20.7
				50	24	2	2	20.9
				50	49	2	2	21.0
				100	0	2	2	20.9
	20300	1745	QPSK	1	0	0	1	22.6
				1	49	0	0	23.2
				1	99	0	0	22.8
				50	0	1	1	22.1
				50	24	1	1	22.0
				50	49	1	1	21.9
				100	0	1	1	22.0
			16QAM	1	0	1	1	22.5
				1	49	1	1	22.3
				1	99	1	0	22.8
				50	0	2	2	21.0
				50	24	2	2	20.8
				50	49	2	2	20.9
				100	0	2	2	20.9

LTE Band 4, 15 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
15	20025	1717.5	QPSK	1	0	0	0	22.9
				1	37	0	0	22.9
				1	74	0	0	22.9
				38	0	1	1	21.6
				38	18	1	1	21.7
				38	37	1	1	21.8
				75	0	1	1	21.7
			16QAM	1	0	1	1	22.3
				1	37	1	1	22.1
				1	74	1	1	22.2
				38	0	2	2	20.7
				38	18	2	2	20.6
				38	37	2	2	20.7
				75	0	2	2	20.6
	20175	1732.5	QPSK	1	0	0	0	22.9
				1	37	0	0	22.7
				1	74	0	0	22.9
				38	0	1	1	21.6
				38	18	1	1	21.7
				38	37	1	1	21.7
				75	0	1	1	21.6
			16QAM	1	0	1	1	22.3
				1	37	1	1	21.6
				1	74	1	0	22.5
				38	0	2	2	20.7
				38	18	2	2	20.7
				38	37	2	2	20.7
				75	0	2	2	20.6
	20325	1747.5	QPSK	1	0	0	0	22.9
				1	37	0	0	22.7
				1	74	0	0	22.8
				38	0	1	2	21.4
				38	18	1	1	21.5
				38	37	1	1	21.8
				75	0	1	1	21.8
			16QAM	1	0	1	1	21.9
				1	37	1	1	22.2
				1	74	1	1	22.2
				38	0	2	2	20.7
				38	18	2	2	20.7
				38	37	2	2	20.8
				75	0	2	2	20.7

LTE Band 4, 10 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
10	20000	1715	QPSK	1	0	0	0	23.0
				1	24	0	0	23.0
				1	49	0	0	22.8
				25	0	1	1	21.9
				25	12	1	1	21.9
				25	24	1	1	21.7
				50	0	1	1	21.6
			16QAM	1	0	1	1	21.9
				1	24	1	1	21.7
				1	49	1	2	21.4
				25	0	2	2	20.8
				25	12	2	2	20.8
				25	24	2	2	20.7
				50	0	2	2	20.7
	20175	1732.5	QPSK	1	0	0	0	23.0
				1	24	0	0	22.8
				1	49	0	0	22.8
				25	0	1	1	21.9
				25	12	1	1	21.8
				25	24	1	1	21.8
				50	0	1	1	21.8
			16QAM	1	0	1	1	22.2
				1	24	1	1	22.1
				1	49	1	1	22.0
				25	0	2	2	20.9
				25	12	2	2	20.8
				25	24	2	2	20.8
				50	0	2	2	20.7
	20350	1750	QPSK	1	0	0	0	22.9
				1	24	0	0	22.9
				1	49	0	0	22.5
				25	0	1	1	21.8
				25	12	1	1	22.0
				25	24	1	1	21.7
				50	0	1	1	21.6
			16QAM	1	0	1	2	21.4
				1	24	1	1	21.6
				1	49	1	1	21.6
				25	0	2	2	20.6
				25	12	2	2	20.8
				25	24	2	2	20.8
				50	0	2	2	20.7

LTE Band 4, 5 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
5	19975	1712.5	QPSK	1	0	0	0	22.9
				1	12	0	0	23.0
				1	24	0	0	23.0
				12	0	1	1	21.8
				12	6	1	1	21.9
				12	11	1	1	22.0
				25	0	1	1	21.8
			16QAM	1	0	1	1	22.4
				1	12	1	1	22.1
				1	24	1	1	22.3
				12	0	2	2	21.0
				12	6	2	2	20.9
				12	11	2	2	20.9
				25	0	2	2	20.9
	20175	1732.5	QPSK	1	0	0	0	22.8
				1	12	0	0	23.0
				1	24	0	0	22.9
				12	0	1	1	21.8
				12	6	1	1	21.9
				12	11	1	1	22.0
				25	0	1	1	21.8
			16QAM	1	0	1	1	22.1
				1	12	1	1	22.4
				1	24	1	1	22.5
				12	0	2	2	20.8
				12	6	2	2	20.9
				12	11	2	2	20.9
				25	0	2	2	20.7
	20375	1752.5	QPSK	1	0	0	0	22.9
				1	12	0	0	22.9
				1	24	0	0	22.9
				12	0	1	1	21.9
				12	6	1	1	21.8
				12	11	1	1	21.8
				25	0	1	1	21.7
			16QAM	1	0	1	1	21.9
				1	12	1	1	21.9
				1	24	1	1	21.6
				12	0	2	2	21.1
				12	6	2	2	20.9
				12	11	2	2	21.0
				25	0	2	2	20.7

LTE Band 4, 3 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
3	19965	1711.5	QPSK	1	0	0	0	23.0
				1	7	0	0	23.0
				1	14	0	1	22.2
				8	0	1	1	22.1
				8	4	1	1	22.0
				8	7	1	1	22.0
				15	0	1	1	21.9
			16QAM	1	0	1	1	22.1
				1	7	1	1	22.2
				1	14	1	1	22.2
				8	0	2	2	20.7
				8	4	2	2	21.0
				8	7	2	2	20.9
				15	0	2	2	21.0
	20175	1732.5	QPSK	1	0	0	0	22.8
				1	7	0	0	22.8
				1	14	0	0	22.9
				8	0	1	1	21.9
				8	4	1	1	21.9
				8	7	1	1	22.1
				15	0	1	1	21.8
			16QAM	1	0	1	1	21.6
				1	7	1	1	21.8
				1	14	1	1	21.8
				8	0	2	2	21.0
				8	4	2	2	21.0
				8	7	2	2	21.0
				15	0	2	2	20.7
	20384	1753.4	QPSK	1	0	0	0	23.0
				1	7	0	0	22.8
				1	14	0	0	22.6
				8	0	1	1	21.8
				8	4	1	1	21.8
				8	7	1	1	21.8
				15	0	1	1	21.7
			16QAM	1	0	1	0	22.9
				1	7	1	1	21.6
				1	14	1	1	21.5
				8	0	2	2	20.9
				8	4	2	2	21.0
				8	7	2	2	20.9
				15	0	2	2	20.8

LTE Band 4, 1.4 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
1.4	19957	1710.7	QPSK	1	0	0	0	22.7
				1	2	0	0	23.0
				1	5	0	0	22.9
				8	0	1	1	22.0
				8	1	1	1	22.0
				8	2	1	1	22.0
				15	0	1	1	22.1
			16QAM	1	0	1	1	21.6
				1	2	1	1	21.6
				1	5	1	1	21.8
				8	0	2	2	21.2
				8	1	2	1	22.2
				8	2	2	1	22.0
				15	0	2	2	21.2
	20175	1732.5	QPSK	1	0	0	0	22.7
				1	2	0	0	22.7
				1	5	0	0	22.9
				8	0	1	1	21.9
				8	1	1	1	22.0
				8	2	1	1	22.0
				15	0	1	1	22.0
			16QAM	1	0	1	1	22.1
				1	2	1	1	22.0
				1	5	1	1	22.1
				8	0	2	2	21.1
				8	1	2	1	22.0
				8	2	2	1	21.8
				15	0	2	2	21.2
	20392	1754.2	QPSK	1	0	0	0	22.9
				1	2	0	0	22.8
				1	5	0	0	22.9
				8	0	1	0	22.9
				8	1	1	0	22.9
				8	2	1	0	22.9
				15	0	1	1	21.9
			16QAM	1	0	1	1	22.1
				1	2	1	1	22.0
				1	5	1	1	22.1
				8	0	2	1	21.8
				8	1	2	1	21.9
				8	2	2	1	21.8
				15	0	2	2	20.8

9.11. LTE Band 5

Target Power for LTE Band 5, QPSK and 16QAM modulations

LTE Band 5	
All Bandwidths	23.0 dBm

Tune-Up Tolerance: +1.0 dB/- 1.0 dB

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

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

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

LTE Band 5, 10 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
10	20450	829	QPSK	1	0	0	0	22.9
				1	24	0	0	23.0
				1	49	0	0	23.0
				25	0	1	1	22.1
				25	12	1	1	22.1
				25	24	1	1	22.0
				50	0	1	1	21.9
			16QAM	1	0	1	1	21.6
				1	24	1	2	21.5
				1	49	1	2	21.5
				25	0	2	2	21.2
				25	12	2	2	21.1
				25	24	2	2	21.0
				50	0	2	2	21.1
	20525	836.5	QPSK	1	0	0	0	23.0
				1	24	0	0	23.0
				1	49	0	0	22.9
				25	0	1	1	22.1
				25	12	1	1	22.1
				25	24	1	1	22.2
				50	0	1	1	22.1
			16QAM	1	0	1	1	22.4
				1	24	1	1	22.4
				1	49	1	1	22.5
				25	0	2	2	21.1
				25	12	2	2	21.1
				25	24	2	2	21.2
				50	0	2	2	21.2
	20600	844	QPSK	1	0	0	0	23.0
				1	24	0	0	22.8
				1	49	0	1	22.2
				25	0	1	1	22.2
				25	12	1	1	22.2
				25	24	1	1	22.2
				50	0	1	1	22.1
			16QAM	1	0	1	1	22.1
				1	24	1	1	22.1
				1	49	1	1	21.7
				25	0	2	2	21.3
				25	12	2	2	21.2
				25	24	2	2	21.1
				50	0	2	2	21.1

LTE Band 5, 5 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
5	20425	826.5	QPSK	1	0	0	0	22.7
				1	12	0	0	22.9
				1	24	0	0	22.8
				12	0	1	1	21.7
				12	6	1	1	21.7
				12	11	1	1	21.7
				25	0	1	1	21.7
			16QAM	1	0	1	1	22.1
				1	12	1	1	22.1
				1	24	1	1	21.8
				12	0	2	2	20.8
				12	6	2	2	20.7
				12	11	2	2	20.7
				25	0	2	2	20.7
	20525	836.5	QPSK	1	0	0	1	22.3
				1	12	0	0	22.9
				1	24	0	1	22.4
				12	0	1	1	21.9
				12	6	1	1	21.9
				12	11	1	1	21.8
				25	0	1	1	21.8
			16QAM	1	0	1	1	22.3
				1	12	1	0	22.4
				1	24	1	1	22.0
				12	0	2	2	21.0
				12	6	2	2	20.8
				12	11	2	2	20.8
				25	0	2	2	20.8
	20625	846.5	QPSK	1	0	0	0	22.5
				1	12	0	0	22.8
				1	24	0	0	22.9
				12	0	1	1	22.1
				12	6	1	1	22.0
				12	11	1	1	21.9
				25	0	1	1	21.9
			16QAM	1	0	1	1	22.4
				1	12	1	1	22.2
				1	24	1	1	22.2
				12	0	2	2	21.0
				12	6	2	2	20.9
				12	11	2	2	20.8
				25	0	2	2	20.7

LTE Band 5, 3 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	
3	20415	825.5	QPSK	1	0	0	0	22.3
				1	7	0	0	22.7
				1	14	0	0	22.4
				8	0	1	1	21.7
				8	4	1	1	21.7
				8	7	1	1	21.8
				15	0	1	1	21.7
			16QAM	1	0	1	1	21.8
				1	7	1	1	21.7
				1	14	1	1	21.8
				8	0	2	2	20.6
				8	4	2	2	20.7
				8	7	2	2	20.6
				15	0	2	2	20.7
	20525	836.5	QPSK	1	0	0	0	22.4
				1	7	0	0	22.6
				1	14	0	0	22.5
				8	0	1	1	21.8
				8	4	1	1	21.8
				8	7	1	1	21.8
				15	0	1	1	21.8
			16QAM	1	0	1	1	21.4
				1	7	1	1	21.5
				1	14	1	1	21.5
				8	0	2	2	20.9
				8	4	2	2	20.7
				8	7	2	2	20.8
				15	0	2	2	20.6
	20634	847.4	QPSK	1	0	0	0	22.6
				1	7	0	0	22.6
				1	14	0	0	22.7
				8	0	1	1	21.8
				8	4	1	1	21.8
				8	7	1	1	21.8
				15	0	1	1	21.8
			16QAM	1	0	1	0	22.6
				1	7	1	1	21.3
				1	14	1	1	21.7
				8	0	2	2	20.8
				8	4	2	2	21.0
				8	7	2	2	21.0
				15	0	2	2	20.8

LTE Band 5, 1.4 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
1.4	20407	824.7	QPSK	1	0	0	0	22.3
				1	2	0	0	22.5
				1	5	0	0	22.6
				8	0	1	0	22.7
				8	1	1	0	22.5
				8	2	1	0	22.5
				15	0	1	1	21.7
			16QAM	1	0	1	1	21.7
				1	2	1	1	21.4
				1	5	1	1	21.8
				8	0	2	1	22.1
				8	1	2	0	22.3
				8	2	2	1	22.2
				15	0	2	2	20.8
	20525	836.5	QPSK	1	0	0	0	22.5
				1	2	0	0	22.5
				1	5	0	0	22.5
				8	0	1	0	22.4
				8	1	1	0	22.4
				8	2	1	0	22.4
				15	0	1	1	21.8
			16QAM	1	0	1	1	22.0
				1	2	1	1	21.9
				1	5	1	1	22.0
				8	0	2	1	21.7
				8	1	2	1	21.7
				8	2	2	1	21.7
				15	0	2	2	20.8
	20642	848.2	QPSK	1	0	0	0	22.7
				1	2	0	0	22.7
				1	5	0	0	22.6
				8	0	1	0	22.8
				8	1	1	0	22.7
				8	2	1	0	22.6
				15	0	1	1	21.9
			16QAM	1	0	1	1	21.9
				1	2	1	1	22.0
				1	5	1	1	21.9
				8	0	2	1	21.7
				8	1	2	1	21.8
				8	2	2	1	21.8
				15	0	2	2	20.7

9.12. LTE Band 13

Target Power for LTE Band 13, QPSK and 16QAM modulations

LTE Band 13	
All Bandwidths	23.0 dBm

Tune-Up Tolerance: +1.0 dB/- 1.0 dB

Target power indicated above is the nominal value. The measured value shall fall within +/- 1dB of this value.

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

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

The allowed A-MPR values specified below in Table 6.2.4-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10, 15, 20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

LTE Band 13, 10 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
10	23230	782	QPSK	1	0	0	0	23.0
				1	24	0	1	22.4
				1	49	0	0	23.0
				25	0	1	1	22.1
				25	12	1	1	22.0
				25	24	1	1	22.1
				50	0	1	1	22.0
			16QAM	1	0	1	1	22.3
				1	24	1	1	22.5
				1	49	1	1	22.4
				25	0	2	2	21.1
				25	12	2	2	21.0
				25	24	2	2	21.1
				50	0	2	2	20.7

Reduced Power (Proximity Sensor On)

LTE Band 13, 5 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
5	23205	779.5	QPSK	1	0	0	0	22.3
				1	12	0	0	22.4
				1	24	0	0	22.5
				12	0	1	1	21.7
				12	6	1	1	21.8
				12	11	1	1	21.7
				25	0	1	1	21.6
			16QAM	1	0	1	1	22.0
				1	12	1	1	21.8
				1	24	1	1	21.9
				12	0	2	2	20.5
				12	6	2	2	20.6
				12	11	2	2	20.5
				25	0	2	2	20.4
	23230	782	QPSK	1	0	0	0	22.5
				1	12	0	0	22.6
				1	24	0	0	22.8
				12	0	1	1	21.5
				12	6	1	1	21.6
				12	11	1	1	21.6
				25	0	1	1	21.6
			16QAM	1	0	1	2	21.2
				1	12	1	2	21.2
				1	24	1	1	21.5
				12	0	2	2	20.5
				12	6	2	2	20.5
				12	11	2	2	20.6
				25	0	2	2	20.6
	23255	784.5	QPSK	1	0	0	0	22.6
				1	12	0	0	22.6
				1	24	0	0	22.3
				12	0	1	1	21.8
				12	6	1	1	21.7
				12	11	1	1	21.8
				25	0	1	1	21.7
			16QAM	1	0	1	1	21.9
				1	12	1	1	22.1
				1	24	1	1	21.8
				12	0	2	2	20.7
				12	6	2	2	20.7
				12	11	2	2	20.9
				25	0	2	2	20.5

9.13. LTE Band 17

Target Power for LTE Band 17, QPSK and 16QAM modulations

LTE Band 17	
All Bandwidths	23.0 dBm

Tune-Up Tolerance: +1.0 dB/- 1.0 dB

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

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

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

LTE Band 17, 10 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
10	23780	709	QPSK	1	0	0	0	22.8
				1	24	0	0	23.0
				1	49	0	0	22.9
				25	0	1	1	22.1
				25	12	1	1	22.2
				25	24	1	1	22.0
				50	0	1	1	22.0
			16QAM	1	0	1	1	21.6
				1	24	1	1	22.0
				1	49	1	1	22.0
				25	0	2	2	21.2
				25	12	2	2	21.3
				25	24	2	2	21.2
				50	0	2	2	21.1
	23790	710	QPSK	1	0	0	0	23.0
				1	24	0	0	22.6
				1	49	0	0	23.0
				25	0	1	1	22.2
				25	12	1	1	22.1
				25	24	1	1	22.0
				50	0	1	1	22.0
			16QAM	1	0	1	1	22.2
				1	24	1	1	22.4
				1	49	1	1	22.1
				25	0	2	2	21.2
				25	12	2	2	21.3
				25	24	2	2	21.1
				50	0	2	2	21.0
	23800	711	QPSK	1	0	0	0	23.0
				1	24	0	0	22.8
				1	49	0	0	22.8
				25	0	1	1	22.1
				25	12	1	1	22.1
				25	24	1	1	21.9
				50	0	1	1	22.0
			16QAM	1	0	1	1	22.3
				1	24	1	1	22.3
				1	49	1	1	21.9
				25	0	2	2	21.3
				25	12	2	2	21.2
				25	24	2	2	21.2
				50	0	2	2	21.1

LTE Band 17, 5 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
5	23755	706.5	QPSK	1	0	0	0	22.4
				1	12	0	0	22.8
				1	24	0	0	22.7
				12	0	1	1	21.8
				12	6	1	1	21.8
				12	11	1	1	21.9
				25	0	1	1	21.8
			16QAM	1	0	1	1	22.0
				1	12	1	1	22.2
				1	24	1	1	22.3
				12	0	2	2	20.9
				12	6	2	2	20.8
				12	11	2	2	20.9
				25	0	2	2	20.6
	23790	710	QPSK	1	0	0	0	22.6
				1	12	0	0	22.4
				1	24	0	0	22.7
				12	0	1	1	21.9
				12	6	1	1	22.0
				12	11	1	1	21.9
				25	0	1	1	21.9
			16QAM	1	0	1	1	22.1
				1	12	1	1	22.2
				1	24	1	1	22.0
				12	0	2	2	20.8
				12	6	2	2	20.8
				12	11	2	2	20.9
				25	0	2	2	20.9
	23825	713.5	QPSK	1	0	0	0	22.7
				1	12	0	0	22.6
				1	24	0	0	22.5
				12	0	1	1	21.7
				12	6	1	1	21.8
				12	11	1	1	21.6
				25	0	1	1	21.7
			16QAM	1	0	1	1	22.1
				1	12	1	1	22.2
				1	24	1	1	21.5
				12	0	2	2	20.8
				12	6	2	2	20.7
				12	11	2	2	20.6
				25	0	2	2	20.6

9.14. LTE Band 25

Target Power for LTE Band 25, QPSK and 16QAM modulations

LTE Band 25	
All Bandwidths	23.0 dBm

Tune-Up Tolerance: +1.0 dB/- 1.0 dB

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

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

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

LTE Band 25, 20 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
20	26140	1860	QPSK	1	0	0	0	22.7
				1	49	0	0	22.8
				1	99	0	0	22.8
				50	0	1	1	21.7
				50	24	1	1	21.8
				50	49	1	1	21.7
				100	0	1	1	21.8
			16QAM	1	0	1	1	22.3
				1	49	1	1	22.4
				1	99	1	1	22.2
				50	0	2	2	20.8
				50	24	2	2	20.9
				50	49	2	2	20.7
				100	0	2	2	20.7
	26365	1882.5	QPSK	1	0	0	0	23.0
				1	49	0	0	22.9
				1	99	0	0	23.0
				50	0	1	1	21.7
				50	24	1	1	21.6
				50	49	1	1	21.6
				100	0	1	1	21.7
			16QAM	1	0	1	1	22.0
				1	49	1	1	22.0
				1	99	1	1	22.1
				50	0	2	2	20.6
				50	24	2	2	20.7
				50	49	2	2	20.7
				100	0	2	2	20.6
	26590	1905	QPSK	1	0	0	0	22.6
				1	49	0	0	22.7
				1	99	0	0	22.7
				50	0	1	1	21.7
				50	24	1	1	21.7
				50	49	1	1	21.7
				100	0	1	1	21.7
			16QAM	1	0	1	1	21.7
				1	49	1	1	21.7
				1	99	1	1	21.6
				50	0	2	2	20.8
				50	24	2	2	20.8
				50	49	2	2	20.8
				100	0	2	2	20.7

LTE Band 25, 15 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
15	26115	1857.5	QPSK	1	0	0	0	22.6
				1	37	0	0	22.7
				1	74	0	0	22.6
				38	0	1	1	21.3
				38	18	1	1	21.3
				38	37	1	1	21.4
				75	0	1	1	21.2
			16QAM	1	0	1	1	22.0
				1	37	1	1	21.7
				1	74	1	1	21.6
				38	0	2	2	20.4
				38	18	2	2	20.3
				38	37	2	2	20.5
				75	0	2	2	20.3
	26365	1882.5	QPSK	1	0	0	0	22.6
				1	37	0	0	22.5
				1	74	0	0	22.4
				38	0	1	1	21.3
				38	18	1	1	21.2
				38	37	1	2	21.2
				75	0	1	1	21.2
			16QAM	1	0	1	1	21.9
				1	37	1	1	21.7
				1	74	1	1	21.5
				38	0	2	2	20.3
				38	18	2	2	20.3
				38	37	2	2	20.3
				75	0	2	2	20.2
	26615	1907.5	QPSK	1	0	0	0	22.6
				1	37	0	0	22.4
				1	74	0	0	22.4
				38	0	1	1	21.3
				38	18	1	1	21.3
				38	37	1	1	21.4
				75	0	1	1	21.3
			16QAM	1	0	1	1	22.0
				1	37	1	1	21.9
				1	74	1	1	21.8
				38	0	2	2	20.3
				38	18	2	2	20.3
				38	37	2	2	20.2
				75	0	2	2	20.2

LTE Band 25, 10 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
10	26090	1855	QPSK	1	0	0	0	22.6
				1	24	0	0	22.7
				1	49	0	0	22.5
				25	0	1	1	21.4
				25	12	1	1	21.4
				25	24	1	1	21.4
				50	0	1	1	21.3
			16QAM	1	0	1	1	21.9
				1	24	1	1	21.9
				1	49	1	1	21.8
				25	0	2	2	20.4
				25	12	2	2	20.5
				25	24	2	2	20.4
				50	0	2	2	20.3
	26365	1882.5	QPSK	1	0	0	0	22.5
				1	24	0	0	22.3
				1	49	0	0	22.6
				25	0	1	1	21.2
				25	12	1	1	21.4
				25	24	1	1	21.3
				50	0	1	1	21.2
			16QAM	1	0	1	1	21.3
				1	24	1	2	21.1
				1	49	1	2	21.1
				25	0	2	2	20.2
				25	12	2	2	20.4
				25	24	2	2	20.3
				50	0	2	2	20.3
	26640	1910	QPSK	1	0	0	0	22.6
				1	24	0	0	22.4
				1	49	0	0	22.6
				25	0	1	1	21.4
				25	12	1	1	21.4
				25	24	1	1	21.4
				50	0	1	1	21.3
			16QAM	1	0	1	1	21.6
				1	24	1	1	21.7
				1	49	1	1	21.8
				25	0	2	2	20.4
				25	12	2	2	20.4
				25	24	2	2	20.5
				50	0	2	2	20.2

LTE Band 25, 5 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
5	26065	1852.5	QPSK	1	0	0	0	22.8
				1	12	0	0	22.9
				1	24	0	0	22.6
				12	0	1	1	21.6
				12	6	1	1	21.6
				12	11	1	1	21.4
				25	0	1	1	21.4
			16QAM	1	0	1	2	21.2
				1	12	1	1	22.0
				1	24	1	1	22.0
				12	0	2	2	20.7
				12	6	2	2	20.7
				12	11	2	2	20.6
				25	0	2	2	20.4
	26365	1882.5	QPSK	1	0	0	0	22.5
				1	12	0	0	22.4
				1	24	0	0	22.4
				12	0	1	2	21.3
				12	6	1	1	21.4
				12	11	1	1	21.4
				25	0	1	2	21.3
			16QAM	1	0	1	1	21.8
				1	12	1	1	21.9
				1	24	1	1	21.7
				12	0	2	3	20.3
				12	6	2	3	20.4
				12	11	2	3	20.3
				25	0	2	3	20.2
	26665	1912.5	QPSK	1	0	0	1	22.2
				1	12	0	0	22.6
				1	24	0	0	22.5
				12	0	1	1	21.5
				12	6	1	1	21.5
				12	11	1	1	21.5
				25	0	1	1	21.4
			16QAM	1	0	1	2	21.3
				1	12	1	2	21.3
				1	24	1	2	21.2
				12	0	2	2	20.5
				12	6	2	2	20.4
				12	11	2	2	20.6
				25	0	2	2	20.5

LTE Band 25, 3 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
3	26055	1851.5	QPSK	1	0	0	0	22.8
				1	7	0	0	22.8
				1	14	0	0	22.6
				8	0	1	0	22.6
				8	4	1	0	22.7
				8	7	1	0	22.6
				15	0	1	1	21.6
			16QAM	1	0	1	1	22.0
				1	7	1	1	22.2
				1	14	1	1	22.1
				8	0	2	1	21.6
				8	4	2	1	21.7
				8	7	2	1	21.5
				15	0	2	2	20.6
	26365	1882.5	QPSK	1	0	0	0	22.4
				1	7	0	0	22.5
				1	14	0	0	22.4
				8	0	1	1	22.3
				8	4	1	0	22.4
				8	7	1	0	22.4
				15	0	1	2	21.3
			16QAM	1	0	1	1	21.7
				1	7	1	1	21.7
				1	14	1	1	21.4
				8	0	2	2	21.2
				8	4	2	2	21.3
				8	7	2	1	21.3
				15	0	2	2	20.4
	26674	1913.4	QPSK	1	0	0	0	22.5
				1	7	0	0	22.6
				1	14	0	0	22.5
				8	0	1	1	21.5
				8	4	1	1	21.5
				8	7	1	1	21.6
				15	0	1	1	21.5
			16QAM	1	0	1	1	21.6
				1	7	1	1	21.8
				1	14	1	1	21.9
				8	0	2	2	20.4
				8	4	2	2	20.5
				8	7	2	2	20.3
				15	0	2	2	20.5

LTE Band 25, 1.4 MHz Bandwidth Output Power

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
1.4	26047	1850.7	QPSK	1	0	0	0	22.4
				1	2	0	1	22.4
				1	5	0	0	22.4
				8	0	1	0	22.7
				8	1	1	1	22.3
				8	2	1	0	22.4
				15	0	1	1	21.8
			16QAM	1	0	1	1	21.9
				1	2	1	2	21.3
				1	5	1	2	21.3
				8	0	2	1	21.8
				8	1	2	1	21.9
				8	2	2	1	22.0
				15	0	2	2	21.3
	26365	1882.5	QPSK	1	0	0	0	22.6
				1	2	0	0	22.6
				1	5	0	0	22.6
				8	0	1	0	22.6
				8	1	1	0	22.5
				8	2	1	0	22.5
				15	0	1	1	21.9
			16QAM	1	0	1	1	22.1
				1	2	1	1	21.5
				1	5	1	1	21.5
				8	0	2	1	21.7
				8	1	2	1	21.7
				8	2	2	1	21.7
				15	0	2	2	21.1
	26682	1914.2	QPSK	1	0	0	0	22.4
				1	2	0	0	22.4
				1	5	0	0	22.4
				8	0	1	0	22.8
				8	1	1	0	22.8
				8	2	1	0	22.9
				15	0	1	1	21.8
			16QAM	1	0	1	1	22.2
				1	2	1	2	21.3
				1	5	1	1	21.4
				8	0	2	1	22.0
				8	1	2	1	22.0
				8	2	2	1	22.0
				15	0	2	2	21.1

10. Tissue Dielectric Properties

IEEE Std 1528-2003 Table 2

Target Frequency (MHz)	Head	
	ϵ_r	σ (S/m)
300	45.3	0.87
450	43.5	0.87
835	41.5	0.90
900	41.5	0.97
1450	40.5	1.20
1800 – 2000	40.0	1.40
2450	39.2	1.80
2600	39.0	1.96
3000	38.5	2.40

KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01

Target Frequency (MHz)	Head		Body	
	ϵ_r	σ (S/m)	ϵ_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5000	36.2	4.45	49.3	5.07
5100	36.1	4.55	49.1	5.18
5200	36.0	4.66	49.0	5.30
5300	35.9	4.76	48.9	5.42
5400	35.8	4.86	48.7	5.53
5500	35.6	4.96	48.6	5.65
5600	35.5	5.07	48.5	5.77
5700	35.4	5.17	48.3	5.88
5800	35.3	5.27	48.2	6.00

10.1. Composition of Ingredients for the Tissue Material Used in the SAR Tests

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.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Salt: 99+% Pure Sodium Chloride

Sugar: 98+% Pure Sucrose

Water: De-ionized, 16 MΩ+ resistivity

HEC: Hydroxyethyl Cellulose

DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]

Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

Simulating Liquids for 5 GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	78
Mineral oil	11
Emulsifiers	9
Additives and Salt	2

10.2. Tissue Dielectric Parameter Check Results

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within $\pm 2^\circ\text{C}$ of the temperature when the tissue parameters are characterized.

The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.

Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.

Date		Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit $\pm$ (%)
6/13/2013	Body 1750	e'	51.3500	Relative Permittivity (ϵ_r):	51.35	53.44	-3.91	5
		e"	14.9800	Conductivity (σ):	1.46	1.49	-1.92	5
	Body 1710	e'	51.4500	Relative Permittivity (ϵ_r):	51.45	53.54	-3.91	5
		e"	14.8400	Conductivity (σ):	1.41	1.46	-3.46	5
	Body 1755	e'	51.3500	Relative Permittivity (ϵ_r):	51.35	53.43	-3.89	5
		e"	15.0000	Conductivity (σ):	1.46	1.49	-1.71	5
6/14/2013	Body 835	e'	53.2900	Relative Permittivity (ϵ_r):	53.29	55.20	-3.46	5
		e"	21.9000	Conductivity (σ):	1.02	0.97	4.82	5
	Body 820	e'	53.3200	Relative Permittivity (ϵ_r):	53.32	55.28	-3.54	5
		e"	22.1600	Conductivity (σ):	1.01	0.97	4.33	5
	Body 850	e'	53.2300	Relative Permittivity (ϵ_r):	53.23	55.16	-3.49	5
		e"	21.9000	Conductivity (σ):	1.04	0.99	4.85	5
6/16/2013	Body 1900	e'	50.9800	Relative Permittivity (ϵ_r):	50.98	53.30	-4.35	5
		e"	14.0700	Conductivity (σ):	1.49	1.52	-2.21	5
	Body 1850	e'	51.1500	Relative Permittivity (ϵ_r):	51.15	53.30	-4.03	5
		e"	14.0500	Conductivity (σ):	1.45	1.52	-4.92	5
	Body 1910	e'	50.8600	Relative Permittivity (ϵ_r):	50.86	53.30	-4.58	5
		e"	14.1000	Conductivity (σ):	1.50	1.52	-1.48	5
6/20/2013	Body 1900	e'	51.6000	Relative Permittivity (ϵ_r):	51.60	53.30	-3.19	5
		e"	14.4500	Conductivity (σ):	1.53	1.52	0.43	5
	Body 1850	e'	51.8000	Relative Permittivity (ϵ_r):	51.80	53.30	-2.81	5
		e"	14.3000	Conductivity (σ):	1.47	1.52	-3.22	5
	Body 1910	e'	51.5700	Relative Permittivity (ϵ_r):	51.57	53.30	-3.25	5
		e"	14.4600	Conductivity (σ):	1.54	1.52	1.03	5
6/22/2013	Body 750	e'	53.8100	Relative Permittivity (ϵ_r):	53.81	55.55	-3.13	5
		e"	23.3200	Conductivity (σ):	0.97	0.96	0.98	5
	Body 700	e'	54.3800	Relative Permittivity (ϵ_r):	54.38	55.74	-2.44	5
		e"	23.7700	Conductivity (σ):	0.93	0.96	-3.55	5
	Body 710	e'	54.2800	Relative Permittivity (ϵ_r):	54.28	55.70	-2.55	5
		e"	23.6700	Conductivity (σ):	0.93	0.96	-2.66	5
6/24/2013	Body 790	e'	53.3900	Relative Permittivity (ϵ_r):	53.39	55.39	-3.61	5
		e"	23.0100	Conductivity (σ):	1.01	0.97	4.62	5
	Body 835	e'	53.1500	Relative Permittivity (ϵ_r):	53.15	55.20	-3.71	5
		e"	21.3700	Conductivity (σ):	0.99	0.97	2.29	5
	Body 820	e'	53.2700	Relative Permittivity (ϵ_r):	53.27	55.28	-3.63	5
		e"	21.5600	Conductivity (σ):	0.98	0.97	1.50	5
Body 850	e'	52.9900	Relative Permittivity (ϵ_r):	52.99	55.16	-3.93	5	
	e"	21.3000	Conductivity (σ):	1.01	0.99	1.98	5	

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/11/2013	Body 835	e'	53.6500	Relative Permittivity (ε _r):	53.65	55.20	-2.81	5
		e"	21.8100	Conductivity (σ):	1.01	0.97	4.39	5
	Body 820	e'	53.7600	Relative Permittivity (ε _r):	53.76	55.28	-2.74	5
		e"	21.8800	Conductivity (σ):	1.00	0.97	3.01	5
	Body 850	e'	53.5100	Relative Permittivity (ε _r):	53.51	55.16	-2.99	5
		e"	21.7000	Conductivity (σ):	1.03	0.99	3.90	5
7/11/2013	Body 1900	e'	51.5900	Relative Permittivity (ε _r):	51.59	53.30	-3.21	5
		e"	14.1800	Conductivity (σ):	1.50	1.52	-1.44	5
	Body 1850	e'	51.8200	Relative Permittivity (ε _r):	51.82	53.30	-2.78	5
		e"	14.0700	Conductivity (σ):	1.45	1.52	-4.78	5
	Body 1910	e'	51.5600	Relative Permittivity (ε _r):	51.56	53.30	-3.26	5
		e"	14.2200	Conductivity (σ):	1.51	1.52	-0.65	5
7/13/2013	Body 750	e'	54.0300	Relative Permittivity (ε _r):	54.03	55.55	-2.73	5
		e"	23.5400	Conductivity (σ):	0.98	0.96	1.93	5
	Body 700	e'	54.5800	Relative Permittivity (ε _r):	54.58	55.74	-2.08	5
		e"	24.0000	Conductivity (σ):	0.93	0.96	-2.62	5
	Body 710	e'	54.4200	Relative Permittivity (ε _r):	54.42	55.70	-2.30	5
		e"	23.9300	Conductivity (σ):	0.94	0.96	-1.59	5
	Body 790	e'	56.6200	Relative Permittivity (ε _r):	56.62	55.39	2.22	5
		e"	23.0600	Conductivity (σ):	1.01	0.97	4.84	5
7/13/2013	Body 1750	e'	52.9200	Relative Permittivity (ε _r):	52.92	53.44	-0.97	5
		e"	14.7500	Conductivity (σ):	1.44	1.49	-3.42	5
	Body 1710	e'	53.0600	Relative Permittivity (ε _r):	53.06	53.54	-0.90	5
		e"	14.6800	Conductivity (σ):	1.40	1.46	-4.50	5
	Body 1755	e'	52.8800	Relative Permittivity (ε _r):	52.88	53.43	-1.03	5
		e"	14.7600	Conductivity (σ):	1.44	1.49	-3.28	5
7/16/2013	Body 1900	e'	53.3500	Relative Permittivity (ε _r):	53.35	53.30	0.09	5
		e"	14.5400	Conductivity (σ):	1.54	1.52	1.06	5
	Body 1850	e'	53.5700	Relative Permittivity (ε _r):	53.57	53.30	0.51	5
		e"	14.3300	Conductivity (σ):	1.47	1.52	-3.02	5
	Body 1910	e'	53.2900	Relative Permittivity (ε _r):	53.29	53.30	-0.02	5
		e"	14.6000	Conductivity (σ):	1.55	1.52	2.01	5
7/17/2013	Body 835	e'	52.8400	Relative Permittivity (ε _r):	52.84	55.20	-4.28	5
		e"	21.9300	Conductivity (σ):	1.02	0.97	4.97	5
	Body 820	e'	52.9600	Relative Permittivity (ε _r):	52.96	55.28	-4.19	5
		e"	22.0700	Conductivity (σ):	1.01	0.97	3.90	5
	Body 850	e'	52.7800	Relative Permittivity (ε _r):	52.78	55.16	-4.31	5
		e"	21.8800	Conductivity (σ):	1.03	0.99	4.76	5

Date	Freq. (MHz)		Liquid Parameters		Measured	Target	Delta (%)	Limit $\pm$ (%)
7/30/2013	Body 2450	e'	50.6900	Relative Permittivity (ϵ_r):	50.69	52.70	-3.81	5
		e"	13.9800	Conductivity (σ):	1.90	1.95	-2.34	5
	Body 2410	e'	50.8200	Relative Permittivity (ϵ_r):	50.82	52.76	-3.68	5
		e"	13.8300	Conductivity (σ):	1.85	1.91	-2.84	5
	Body 2475	e'	50.6100	Relative Permittivity (ϵ_r):	50.61	52.67	-3.91	5
		e"	14.0700	Conductivity (σ):	1.94	1.99	-2.46	5
7/31/2013	Body 5180	e'	50.4400	Relative Permittivity (ϵ_r):	50.44	49.05	2.84	5
		e"	17.7400	Conductivity (σ):	5.11	5.27	-3.07	5
	Body 5200	e'	50.4400	Relative Permittivity (ϵ_r):	50.44	49.02	2.90	5
		e"	17.7800	Conductivity (σ):	5.14	5.29	-2.91	5
	Body 5600	e'	49.8000	Relative Permittivity (ϵ_r):	49.80	48.48	2.73	5
		e"	18.1900	Conductivity (σ):	5.66	5.76	-1.68	5
	Body 5800	e'	49.4900	Relative Permittivity (ϵ_r):	49.49	48.20	2.68	5
		e"	18.4500	Conductivity (σ):	5.95	6.00	-0.83	5
	Body 5825	e'	49.4400	Relative Permittivity (ϵ_r):	49.44	48.20	2.57	5
		e"	18.4400	Conductivity (σ):	5.97	6.00	-0.46	5
8/5/2013	Body 2450	e'	50.8800	Relative Permittivity (ϵ_r):	50.88	52.70	-3.45	5
		e"	14.1900	Conductivity (σ):	1.93	1.95	-0.87	5
	Body 2410	e'	51.0000	Relative Permittivity (ϵ_r):	51.00	52.76	-3.33	5
		e"	14.0500	Conductivity (σ):	1.88	1.91	-1.30	5
	Body 2475	e'	50.8100	Relative Permittivity (ϵ_r):	50.81	52.67	-3.53	5
		e"	14.2900	Conductivity (σ):	1.97	1.99	-0.94	5

11. System Performance Check

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are remeasured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

11.1. System Performance Check Measurement Conditions

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ± 0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm ± 0.5 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm ± 0.5 cm for measurements > 3 GHz.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.
For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 (below 3 GHz) and/or 8x8x7 (above 3 GHz) fine cube was chosen for the cube.
- Distance between probe sensors and phantom surface was set to 3 mm.
For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was 100 mW.
- The results are normalized to 1 W input power.

11.2. Reference SAR Values for System Performance Check

The reference SAR values can be obtained from the calibration certificate of system validation dipoles

System Dipole	Serial No.	Cal. Date	Freq. (MHz)	Target SAR Values (mW/g)		
				1g/10g	Head	Body
D835v2	4d142	10/04/2012	835	1g	9.45	9.50
				10g	6.23	6.29
D835v2	4d002	10/24/2012	835	1g	9.58	9.48
				10g	6.28	6.26
D1900v2	5d043	11/06/2012	1900	1g	39.9	40.9
				10g	20.9	21.6
D1750v2	1050	8/15/2012	1750	1g	36.5	37.1
				10g	19.4	20.1
D1900v2	5d163	10/04/2012	1900	1g	39.4	39.6
				10g	20.7	21.1
D750v3	1019	3/5/2013	750	1g	8.5	8.68
				10g	5.59	5.75
D2450V2	899	10/05/2012	2.45GHz	1g	53.6	51.7
				10g	25	24.3
D5GHzV2	1138	10/09/2012	5.2GHz	1g	79.5	73.2
				10g	22.8	20.4
			5.5GHz	1g	83.6	77.9
				10g	23.8	21.7
			5.8GHz	1g	78.7	72.8
				10g	22.4	20.1

11.3. System Performance Check Results

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within 10% of the manufacturer calibrated dipole SAR target.

Date Tested	System Dipole		T.S. Liquid	Measured Results			Target (Ref. Value)	Delta ±10 %	Est./Zoom Ratio ±3 %	Plot No.	
	Type	Serial #		Area Scan	Zoom Scan	Normalize to 1 W					
6/13/2013	D1750V2	1050	Body	1g	3.51	3.44	34.4	37.1	-7.28	1.99	1,2
				10g	1.83	1.87	18.7	20.1	-6.97		
6/14/2013	D835V2	4d002	Body	1g	0.98	0.96	9.6	9.48	0.95	2.64	3,4
				10g	0.66	0.63	6.3	6.26	1.12		
6/16/2013	D1900V2	5d043	Body	1g	3.82	3.75	37.5	40.90	-8.31	1.83	5,6
				10g	1.93	1.99	19.9	21.60	-7.87		
6/20/2013	D835V2	4d002	Body	1g	4.02	4.01	40.1	40.9	-1.96	0.25	7,8
				10g	2.02	2.11	21.1	21.6	-2.31		
6/22/2013	D750V3	1019	Body	1g	0.82	0.81	8.1	8.68	-7.26	1.95	8,9
				10g	0.56	0.53	5.3	5.75	-7.13		
6/24/2013	D835V2	4d002	Body	1g	1.01	1.00	10.0	9.48	5.49	0.99	10,11
				10g	0.68	0.66	6.6	6.26	5.27		
6/24/2013	D1750V2	1050	Body	1g	3.73	3.71	37.1	37.1	0.00	0.54	12,13
				10g	1.95	2.00	20.0	20.1	-0.50		
7/11/2013	D1900V2	5d163	Body	1g	3.79	3.82	38.2	39.60	-3.54	-0.79	14,15
				10g	1.94	2.01	20.1	21.10	-4.74		
7/11/2013	D835V2	4d142	Body	1g	1.02	0.99	9.9	9.5	4.63	2.55	16,17
				10g	0.68	0.66	6.6	6.29	4.45		
7/13/2013	D750V3	1019	Body	1g	0.82	0.81	8.1	8.68	-6.68	1.58	18,19
				10g	0.56	0.54	5.4	5.75	-6.43		
7/13/2013	D1750V2	1050	Body	1g	3.64	3.63	36.3	37.1	-2.16	0.27	20,21
				10g	1.92	1.96	19.6	20.1	-2.49		
7/16/2013	D1900V2	5d043	Body	1g	3.81	3.78	37.80	40.90	-7.58	0.79	22,23
				10g	1.93	1.99	19.90	21.60	-7.87		
7/17/2013	D835V2	4d002	Body	1g	1.05	1.03	10.3	9.48	8.65	1.90	23,24
				10g	0.71	0.68	6.8	6.26	8.63		
7/30/2013	D2450V2	899	Body	1g	5.33	5.43	54.30	51.70	5.03	-1.88	25,26
				10g	2.30	2.54	25.40	24.30	4.53		
7/31/2013	D5GHzV2(5.2)	1138	Body	1g	7.48	7.73	77.3	73.2	5.60	-3.34	27,28
				10g	2.10	2.17	21.7	20.4	6.37		
7/31/2013	D5GHzV2(5.5)	1138	Body	1g	7.55	7.93	79.3	77.9	1.80	-5.03	29,30
				10g	2.10	2.23	22.3	21.7	2.76		
7/31/2013	D5GHzV2(5.8)	1138	Body	1g	7.93	6.85	68.5	72.80	-5.91	13.62	31,32
				10g	2.25	1.92	19.2	20.10	-4.48		
8/5/2013	D2450V2	899	Body	1g	5.42	5.48	54.80	51.70	6.00	-1.11	33,34
				10g	2.36	2.54	25.40	24.30	4.53		

12. SAR Test Results

12.1. Standalone SAR Test Exclusion Considerations

Standalone SAR test exclusion was based upon the following criteria:

1. According to KDB 447498 § 4.1.5 if the antenna is at close proximity to user then the outer surface of the DUT should be treated as the radiating surface. The test separation distance is then determined by the smallest distance between the outer surface of the device and the user. For the purposes of this report close proximity has been defined as closer than 50 mm. For antennas <50 mm from the rear or edge the separation distance used for the SAR exclusion calculations is 0mm.
2. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.
3. If the antenna to DUT adjacent edge or bottom separation distance is >50mm the actual antenna to user separation distance is used to determine SAR exclusion and estimated SAR value

12.1.1. SAR Test Exclusion Calculations for antennas <50mm to adjacent edges

Edges and rear

Antenna	Tx	Frequency (MHz)	Output power		Separation distances (mm)						Calculated Threshold Value					
			dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
3G Main	GSM	848.8	26.98	499	38.2	27.9	282	119.3	16.7		12.0	16.0	> 50 mm	> 50 mm	27.0	N/A
3G Main	GSM	1909.8	23.98	250	38.2	27.9	282	119.3	16.7		9.0	12.0	> 50 mm	> 50 mm	20.0	N/A
3G Main	WCDMA	846.6	24.0	251	38.2	27.9	282	119.3	16.7		6.0	8.0	> 50 mm	> 50 mm	14.0	N/A
3G Main	WCDMA	1752.6	24.0	251	38.2	27.9	282	119.3	16.7		9.0	12.0	> 50 mm	> 50 mm	20.0	N/A
3G Main	WCDMA	1907.6	24.0	251	38.2	27.9	282	119.3	16.7		9.0	12.0	> 50 mm	> 50 mm	20.0	N/A
3G Main	CDMA BC0	848.3	24.0	251	38.2	27.9	282	119.3	16.7		6.0	8.0	> 50 mm	> 50 mm	14.0	N/A
3G Main	CDMA BC1	1908.8	24.0	251	38.2	27.9	282	119.3	16.7		9.0	12.0	> 50 mm	> 50 mm	20.0	N/A
3G Main	CDMA BC10	822.75	24.0	251	38.2	27.9	282	119.3	16.7		6.0	8.0	> 50 mm	> 50 mm	13.0	N/A
3G Main	LTE 2	1909.2	24.0	251	38.2	27.9	282	119.3	16.7		9.0	12.0	> 50 mm	> 50 mm	20.0	N/A
3G Main	LTE 4	1754.2	24.0	251	38.2	27.9	282	119.3	16.7		9.0	12.0	> 50 mm	> 50 mm	20.0	N/A
3G Main	LTE 5	848.2	24.0	251	38.2	27.9	282	119.3	16.7		6.0	8.0	> 50 mm	> 50 mm	14.0	N/A
3G Main	LTE 13	784.5	24.0	251	38.2	27.9	282	119.3	16.7		6.0	8.0	> 50 mm	> 50 mm	13.0	N/A
3G Main	LTE 17	713.5	24.0	251	38.2	27.9	282	119.3	16.7		6.0	8.0	> 50 mm	> 50 mm	12.0	N/A
3G Main	LTE 25	1914.2	24.0	251	38.2	27.9	282	119.3	16.7		9.0	12.0	> 50 mm	> 50 mm	20.0	N/A

Corners and edge tilted

Antenna	Tx	Frequency (MHz)	Output power		Separation distances (mm)						Calculated Threshold Value					
			dBm	mW	Edge 4 tilt	Corner 1	Corner 2	Corner 3	Corner 4	Front	Edge 4 tilt	Corner 1	Corner 2	Corner 3	Corner 4	Front
3G Main	GSM	848.8	26.98	499	14.1	9.3	269	285	112		33.0	51.0	> 50 mm	> 50 mm	> 50 mm	N/A
3G Main	GSM	1909.8	23.98	250	14.1	9.3	269	285	112		25.0	38.0	> 50 mm	> 50 mm	> 50 mm	N/A
3G Main	WCDMA	846.6	24.0	251	14.1	9.3	269	285	112		16.0	26.0	> 50 mm	> 50 mm	> 50 mm	N/A
3G Main	WCDMA	1752.6	24.0	251	14.1	9.3	269	285	112		24.0	37.0	> 50 mm	> 50 mm	> 50 mm	N/A
3G Main	WCDMA	1907.6	24.0	251	14.1	9.3	269	285	112		25.0	39.0	> 50 mm	> 50 mm	> 50 mm	N/A
3G Main	CDMA BC0	848.3	24.0	251	14.1	9.3	269	285	112		17.0	26.0	> 50 mm	> 50 mm	> 50 mm	N/A
3G Main	CDMA BC1	1908.8	24.0	251	14.1	9.3	269	285	112		25.0	39.0	> 50 mm	> 50 mm	> 50 mm	N/A
3G Main	CDMA BC10	822.75	24.0	251	14.1	9.3	269	285	112		16.0	25.0	> 50 mm	> 50 mm	> 50 mm	N/A
3G Main	LTE 2	1909.2	24.0	251	14.1	9.3	269	285	112		25.0	39.0	> 50 mm	> 50 mm	> 50 mm	N/A
3G Main	LTE 4	1754.2	24.0	251	14.1	9.3	269	285	112		24.0	37.0	> 50 mm	> 50 mm	> 50 mm	N/A
3G Main	LTE 5	848.2	24.0	251	14.1	9.3	269	285	112		17.0	26.0	> 50 mm	> 50 mm	> 50 mm	N/A
3G Main	LTE 13	784.5	24.0	251	14.1	9.3	269	285	112		16.0	25.0	> 50 mm	> 50 mm	> 50 mm	N/A
3G Main	LTE 17	713.5	24.0	251	14.1	9.3	269	285	112		15.0	24.0	> 50 mm	> 50 mm	> 50 mm	N/A
3G Main	LTE 25	1914.2	24.0	251	14.1	9.3	269	285	112		25.0	39.0	> 50 mm	> 50 mm	> 50 mm	N/A

Note(s):

1. According to KDB 447498, if the calculated threshold value is >3 then SAR testing is required.

Conclusion:

As the calculated threshold value is >3 SAR testing is required for the Rear, Edge 1, Edge 4, Edge 4 tilt and corner 1.

12.1.2. SAR Test Exclusion Calculations for antennas >50mm to adjacent edges

Edges and rear

Antenna	Tx	Frequency (MHz)	Output power		Separation distances (mm)						Calculated Threshold Value					
			dBm	mW	Bottom	Edge 1	Edge 2	Edge 3	Edge 4	Front	Bottom	Edge 1	Edge 2	Edge 3	Edge 4	Front
3G Main	GSM	848.8	26.98	499	38.2	27.9	282	119.3	16.7		< 50 mm	< 50 mm	1476	555	< 50 mm	N/A
3G Main	GSM	1909.8	23.98	250	38.2	27.9	282	119.3	16.7		< 50 mm	< 50 mm	2429	802	< 50 mm	N/A
3G Main	WCDMA	846.6	24.00	251	38.2	27.9	282	119.3	16.7		< 50 mm	< 50 mm	1472	554	< 50 mm	N/A
3G Main	WCDMA	1752.6	24.00	251	38.2	27.9	282	119.3	16.7		< 50 mm	< 50 mm	2433	806	< 50 mm	N/A
3G Main	WCDMA	1907.6	24.00	251	38.2	27.9	282	119.3	16.7		< 50 mm	< 50 mm	2429	802	< 50 mm	N/A
3G Main	CDMA	848.3	24.50	282	38.2	27.9	282	119.3	16.7		< 50 mm	< 50 mm	1475	555	< 50 mm	N/A
3G Main	CDMA	1908.8	24.50	282	38.2	27.9	282	119.3	16.7		< 50 mm	< 50 mm	2429	802	< 50 mm	N/A
3G Main	CDMA	822.75	24.50	282	38.2	27.9	282	119.3	16.7		< 50 mm	< 50 mm	1438	545	< 50 mm	N/A
3G Main	LTE 2	1909.2	24.00	251	38.2	27.9	282	119.3	16.7		< 50 mm	< 50 mm	2429	802	< 50 mm	N/A
3G Main	LTE 4	1754.2	24.00	251	38.2	27.9	282	119.3	16.7		< 50 mm	< 50 mm	2433	806	< 50 mm	N/A
3G Main	LTE 5	848.2	24.00	251	38.2	27.9	282	119.3	16.7		< 50 mm	< 50 mm	1475	555	< 50 mm	N/A
3G Main	LTE 13	784.5	24.00	251	38.2	27.9	282	119.3	16.7		< 50 mm	< 50 mm	1383	532	< 50 mm	N/A
3G Main	LTE 17	713.5	24.00	251	38.2	27.9	282	119.3	16.7		< 50 mm	< 50 mm	1281	507	< 50 mm	N/A
3G Main	LTE 25	1914.2	24.00	251	38.2	27.9	282	119.3	16.7		< 50 mm	< 50 mm	2428	801	< 50 mm	N/A

Corners and edge tilted

Antenna	Tx	Frequency (MHz)	Output power		Separation distances (mm)						Calculated Threshold Value					
			dBm	mW	Edge 4 tilt	Corner 1	Corner 2	Corner 3	Corner 4	Front	Edge 4 tilt	Corner 1	Corner 2	Corner 3	Corner 4	Front
3G Main	GSM	848.8	26.98	499	14.1	9.3	269	285	112		< 50 mm	< 50 mm	1402	1493	513.7	N/A
3G Main	GSM	1909.8	23.98	250	14.1	9.3	269	285	112		< 50 mm	< 50 mm	2299	2459	728.5	N/A
3G Main	WCDMA	846.6	24.00	251	14.1	9.3	269	285	112		< 50 mm	< 50 mm	1399	1489	513.0	N/A
3G Main	WCDMA	1752.6	24.00	251	14.1	9.3	269	285	112		< 50 mm	< 50 mm	2303	2463	733.3	N/A
3G Main	WCDMA	1907.6	24.00	251	14.1	9.3	269	285	112		< 50 mm	< 50 mm	2299	2459	728.6	N/A
3G Main	CDMA	848.3	24.50	282	14.1	9.3	269	285	112		< 50 mm	< 50 mm	1401	1492	513.5	N/A
3G Main	CDMA	1908.8	24.50	282	14.1	9.3	269	285	112		< 50 mm	< 50 mm	2299	2459	728.6	N/A
3G Main	CDMA	822.75	24.50	282	14.1	9.3	269	285	112		< 50 mm	< 50 mm	1367	1454	505.4	N/A
3G Main	LTE 2	1909.2	24.00	251	14.1	9.3	269	285	112		< 50 mm	< 50 mm	2299	2459	728.6	N/A
3G Main	LTE 4	1754.2	24.00	251	14.1	9.3	269	285	112		< 50 mm	< 50 mm	2303	2463	733.3	N/A
3G Main	LTE 5	848.2	24.00	251	14.1	9.3	269	285	112		< 50 mm	< 50 mm	1401	1492	513.5	N/A
3G Main	LTE 13	784.5	24.00	251	14.1	9.3	269	285	112		< 50 mm	< 50 mm	1315	1398	493.6	N/A
3G Main	LTE 17	713.5	24.00	251	14.1	9.3	269	285	112		< 50 mm	< 50 mm	1219	1295	472.5	N/A
3G Main	LTE 25	1914.2	24.00	251	14.1	9.3	269	285	112		< 50 mm	< 50 mm	2298	2458	728.4	N/A

Note(s):

1. According to KDB 447498, if the calculated Power threshold is less than the output power then SAR testing is required.

Conclusion:

As the calculated Power Threshold is greater than the DUT output power for Edges 2 and 3, and Corners 2, 3 and 4 SAR testing is not required

12.2. Estimated SAR for Simultaneous Transmission SAR Analysis

Considerations for using estimated SAR values:

1. According to KDB 447498 § 4.1.5 if the antenna is at close proximity to user then the outer surface of the DUT should be treated as the radiating surface. The test separation distance is then determined by the smallest distance between the outer surface of the device and the user. For the purposes of this report close proximity has been defined as closer than 50 mm. For antennas <50 mm from the rear or edge the separation distance used for the estimated SAR calculations is 0mm.
2. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.
3. If the antenna to DUT adjacent edge or bottom separation distance is >50 mm the actual antenna to user separation distance is used to determine the estimated SAR value.
4. Output power is the maximum rated power (including tune-up or manufacturing tolerances) and includes source-based averaging.
5. If the antenna separation distance is > 50 mm then the estimated SAR value is the lesser of the estimated value at 50 mm or 0.4 W/Kg.
6. Formulas round separation distance to nearest mm and power to nearest mW before calculating estimated SAR

12.2.1. Estimated SAR for WWAN

Edges and rear

Antenna	Tx	Frequency (MHz)	Output power		Separation distances (mm)						Estimated SAR Value					
			dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
3G Main	GSM	848.8	26.98	499	38.2	27.9	282	119.3	16.7		Measure	Measure	>200 mm	0.400	Measure	N/A
3G Main	GSM	1909.8	23.98	250	38.2	27.9	282	119.3	16.7		Measure	Measure	>200 mm	0.400	Measure	N/A
3G Main	WCDMA	846.6	24.00	251	38.2	27.9	282	119.3	16.7		Measure	Measure	>200 mm	0.400	Measure	N/A
3G Main	WCDMA	1752.6	24.00	251	38.2	27.9	282	119.3	16.7		Measure	Measure	>200 mm	0.400	Measure	N/A
3G Main	WCDMA	1907.6	24.00	251	38.2	27.9	282	119.3	16.7		Measure	Measure	>200 mm	0.400	Measure	N/A
3G Main	CDMA	848.3	24.50	282	38.2	27.9	282	119.3	16.7		Measure	Measure	>200 mm	0.400	Measure	N/A
3G Main	CDMA	1908.8	24.50	282	38.2	27.9	282	119.3	16.7		Measure	Measure	>200 mm	0.400	Measure	N/A
3G Main	CDMA	822.75	24.50	282	38.2	27.9	282	119.3	16.7		Measure	Measure	>200 mm	0.400	Measure	N/A
3G Main	LTE 2	1909.2	24.00	251	38.2	27.9	282	119.3	16.7		Measure	Measure	>200 mm	0.400	Measure	N/A
3G Main	LTE 4	1754.2	24.00	251	38.2	27.9	282	119.3	16.7		Measure	Measure	>200 mm	0.400	Measure	N/A
3G Main	LTE 5	848.2	24.00	251	38.2	27.9	282	119.3	16.7		Measure	Measure	>200 mm	0.400	Measure	N/A
3G Main	LTE 13	784.5	24.00	251	38.2	27.9	282	119.3	16.7		Measure	Measure	>200 mm	0.400	Measure	N/A
3G Main	LTE 17	713.5	24.00	251	38.2	27.9	282	119.3	16.7		Measure	Measure	>200 mm	0.400	Measure	N/A
3G Main	LTE 25	1914.2	24.00	251	38.2	27.9	282	119.3	16.7		Measure	Measure	>200 mm	0.400	Measure	N/A

Corners and edge tilted

Antenna	Tx	Frequency (MHz)	Output power		Separation distances (mm)						Estimated SAR Value					
			dBm	mW	Edge 4 tilt	Corner 1	Corner 2	Corner 3	Corner 4	Front	Edge 4 tilt	Corner 1	Corner 2	Corner 3	Corner 4	Front
3G Main	GSM	848.8	26.98	499	14.1	9.3	269	285	112		Measure	Measure	>200 mm	>200 mm	0.400	N/A
3G Main	GSM	1909.8	23.98	250	14.1	9.3	269	285	112		Measure	Measure	>200 mm	>200 mm	0.400	N/A
3G Main	WCDMA	846.6	24.00	251	14.1	9.3	269	285	112		Measure	Measure	>200 mm	>200 mm	0.400	N/A
3G Main	WCDMA	1752.6	24.00	251	14.1	9.3	269	285	112		Measure	Measure	>200 mm	>200 mm	0.400	N/A
3G Main	WCDMA	1907.6	24.00	251	14.1	9.3	269	285	112		Measure	Measure	>200 mm	>200 mm	0.400	N/A
3G Main	CDMA	848.3	24.50	282	14.1	9.3	269	285	112		Measure	Measure	>200 mm	>200 mm	0.400	N/A
3G Main	CDMA	1908.8	24.50	282	14.1	9.3	269	285	112		Measure	Measure	>200 mm	>200 mm	0.400	N/A
3G Main	CDMA	822.75	24.50	282	14.1	9.3	269	285	112		Measure	Measure	>200 mm	>200 mm	0.400	N/A
3G Main	LTE 2	1909.2	24.00	251	14.1	9.3	269	285	112		Measure	Measure	>200 mm	>200 mm	0.400	N/A
3G Main	LTE 4	1754.2	24.00	251	14.1	9.3	269	285	112		Measure	Measure	>200 mm	>200 mm	0.400	N/A
3G Main	LTE 5	848.2	24.00	251	14.1	9.3	269	285	112		Measure	Measure	>200 mm	>200 mm	0.400	N/A
3G Main	LTE 13	784.5	24.00	251	14.1	9.3	269	285	112		Measure	Measure	>200 mm	>200 mm	0.400	N/A
3G Main	LTE 17	713.5	24.00	251	14.1	9.3	269	285	112		Measure	Measure	>200 mm	>200 mm	0.400	N/A
3G Main	LTE 25	1914.2	24.00	251	14.1	9.3	269	285	112		Measure	Measure	>200 mm	>200 mm	0.400	N/A

Notes:

- Situations that comprised only estimated values (i.e. edge 3) are not reported as they are inherently compliant. The maximum SAR value based on three estimated values would be 1.2 W/Kg. Situations that were justifiably omitted for simultaneous transmission SAR analysis include:
 - o Edge 3, for all combinations.
 - o Corners 2, 3 and 4.

12.3. GSM850

Test Position	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	0	GPRS 2 Slots	128	824.2	33.0	32.3				
			190	836.6	33.0	32.3	0.0840	0.099		1
			251	848.8	33.0	32.3				
Edge 1	0	GPRS 2 Slots	128	824.2	33.0	32.3				
			190	836.6	33.0	32.3	0.169	0.199		1
			251	848.8	33.0	32.3				
Edge 4	0	GPRS 2 Slots	128	824.2	33.0	32.3				
			190	836.6	33.0	32.3	0.588	0.691		1
			251	848.8	33.0	32.3				
Edge 4 Tilt	0	GPRS 2 Slots	128	824.2	33.0	32.3	0.882	1.036		1
			190	836.6	33.0	32.3	0.947	1.113		1
			251	848.8	33.0	32.3	1.130	1.328	1	1
Corner 1	0	GPRS 2 Slots	128	824.2	33.0	32.3				
			190	836.6	33.0	32.3	0.511	0.600		1
			251	848.8	33.0	32.3				

Note(s):

According to KDB 447498 D01 General RF Exposure Guidance v05, 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.

1. ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
2. ≤ 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
3. ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

12.4. GSM1900

Test Position	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	10	GPRS 2 Slots	128	1850.2	30.0	29.4				
			190	1880.0	30.0	29.4	0.048	0.055		1
			251	1909.8	30.0	29.5				
Edge 1	20	GPRS 2 Slots	128	1850.2	30.0	29.4				
			190	1880.0	30.0	29.4	0.219	0.251		1
			251	1909.8	30.0	29.5				
Edge 4	20	GPRS 2 Slots	128	1850.2	30.0	29.4				
			190	1880.0	30.0	29.4	0.451	0.518		1
			251	1909.8	30.0	29.5				
Edge 4 Tilt	0	GPRS 2 Slots	128	1850.2	30.0	29.4				
			190	1880.0	30.0	29.4	0.460	0.528		1
			251	1909.8	30.0	29.5				
Corner 1	0	GPRS 2 Slots	128	1850.2	30.0	29.4				
			190	1880.0	30.0	29.4	0.546	0.627	2	1
			251	1909.8	30.0	29.5				

Note(s):

According to KDB 447498 D01 General RF Exposure Guidance v05, 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.

1. ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
2. ≤ 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
3. ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

12.5. W-CDMA Band V

Test mode reduction considerations

Per KDB 941225 D01, Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit.

Test Position	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	0	Rel 99 RMC 12.2 kbps	4132	826.4	24.0	22.9				
			4183	836.6	24.0	22.9	0.048	0.061		1
			4233	846.6	24.0	22.8				
Edge 1	0	Rel 99 RMC 12.2 kbps	4132	826.4	24.0	22.9				
			4183	836.6	24.0	22.9	0.028	0.036		1
			4233	846.6	24.0	22.8				
Edge 4	0	Rel 99 RMC 12.2 kbps	4132	826.4	24.0	22.9				
			4183	836.6	24.0	22.9	0.426	0.544		1
			4233	846.6	24.0	22.8				
Edge 4 Tilt	0	Rel 99 RMC 12.2 kbps	4132	826.4	24.0	22.9				
			4183	836.6	24.0	22.9	0.434	0.554	3	1
			4233	846.6	24.0	22.8				
Corner 1	0	Rel 99 RMC 12.2 kbps	4132	826.4	24.0	22.9				
			4183	836.6	24.0	22.9	0.304	0.388		1
			4233	846.6	24.0	22.8				

Note(s):

According to KDB 447498 D01 General RF Exposure Guidance v05, 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.

1. ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
2. ≤ 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
3. ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

12.6. W-CDMA Band IV

Test mode reduction considerations

Per KDB 941225 D01, Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit

Test Position	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	10	Rel 99 RMC 12.2 kbps	1312	1712.4	24.0	23.20				
			1413	1732.6	24.0	23.20	0.0660	0.079		1
			1513	1752.6	24.0	23.30				
Edge 1	20	Rel 99 RMC 12.2 kbps	1312	1712.4	24.0	23.20				
			1413	1732.6	24.0	23.20	0.472	0.567		1
			1513	1752.6	24.0	23.30				
Edge 4	20	Rel 99 RMC 12.2 kbps	1312	1712.4	24.0	23.20				
			1413	1732.6	24.0	23.20	0.501	0.602		1
			1513	1752.6	24.0	23.30				
Edge 4 Tilt	0	Rel 99 RMC 12.2 kbps	1312	1712.4	24.0	23.20	0.500	0.601		
			1413	1732.6	24.0	23.20	0.623	0.749		
			1513	1752.6	24.0	23.30	0.714	0.839		
Corner 1	0	Rel 99 RMC 12.2 kbps	1312	1712.4	24.0	23.20	0.957	1.151		
			1413	1732.6	24.0	23.20	0.980	1.178	4	
			1513	1752.6	24.0	23.30	0.974	1.144		

Note(s):

According to KDB 447498 D01 General RF Exposure Guidance v05, 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.

1. ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
2. ≤ 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
3. ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

12.7. W-CDMA Band II

Test mode reduction considerations

Per KDB 941225 D01, Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit.

Test Position	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	0	Rel 99 RMC 12.2 kbps	9262	1852.4	24.0	23.0				
			9400	1880.0	24.0	23.0	0.061	0.077		1
			9538	1907.6	24.0	23.1				
Edge 1	0	Rel 99 RMC 12.2 kbps	9262	1852.4	24.0	23.0				
			9400	1880.0	24.0	23.0	0.077	0.097		1
			9538	1907.6	24.0	23.1				
Edge 4	0	Rel 99 RMC 12.2 kbps	9262	1852.4	24.0	23.0				
			9400	1880.0	24.0	23.0	0.491	0.617		1
			9538	1907.6	24.0	23.1				
Edge 4 Tilt	0	Rel 99 RMC 12.2 kbps	9262	1852.4	24.0	23.0				
			9400	1880.0	24.0	23.0	0.503	0.632		1
			9538	1907.6	24.0	23.1				
Corner 1	0	Rel 99 RMC 12.2 kbps	9262	1852.4	24.0	23.0				
			9400	1880.0	24.0	23.0	0.561	0.705	5	1
			9538	1907.6	24.0	23.1				

Note(s):

According to KDB 447498 D01 General RF Exposure Guidance v05, 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.

1. ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
2. ≤ 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
3. ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

12.8. CDMA BC0

Test mode reduction considerations

Per KDB 941225 D01, Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit.

Test Position	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-Up Limit	Meas.	Meas.	Scaled		
Rear	0	1xRTT (RC3 SO32)	1013	824.7	24.5	24.0				
			384	836.52	24.5	24.0	0.055	0.061		1
			777	848.31	24.5	23.9				
		1xEVDO Rel. 0	1013	824.7	24.5	23.8				
			384	836.52	24.5	23.8	0.049	0.058		1
			777	848.31	24.5	23.9				
Edge 1	0	1xRTT (RC3 SO32)	1013	824.7	24.5	24.0				
			384	836.52	24.5	24.0	0.125	0.139		1
			777	848.31	24.5	23.9				
		1xEVDO Rel. 0	1013	824.7	24.5	23.8				
			384	836.52	24.5	23.8	0.088	0.103		1
			777	848.31	24.5	23.9				
Edge 4	0	1xRTT (RC3 SO32)	1013	824.7	24.5	24.0				
			384	836.52	24.5	24.0	0.432	0.480		1
			777	848.31	24.5	23.9				
		1xEVDO Rel. 0	1013	824.7	24.5	23.8				
			384	836.52	24.5	23.8	0.504	0.592		1
			777	848.31	24.5	23.9				
Edge 4 Tilt	0	1xRTT (RC3 SO32)	1013	824.7	24.5	24.0				
			384	836.52	24.5	24.0	0.594	0.660		1
			777	848.31	24.5	23.9				
		1xEVDO Rel. 0	1013	824.7	24.5	23.8				
			384	836.52	24.5	23.8	0.615	0.723	6	1
			777	848.31	24.5	23.9				
Corner 1	0	1xRTT (RC3 SO32)	1013	824.7	24.5	24.0				
			384	836.52	24.5	24.0	0.295	0.328		1
			777	848.31	24.5	23.9				
		1xEVDO Rel. 0	1013	824.7	24.5	23.8				
			384	836.52	24.5	23.8	0.309	0.363		1
			777	848.31	24.5	23.9				

Note(s):

According to KDB 447498 D01 General RF Exposure Guidance v05, 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

12.9. CDMA BC1

Test mode reduction considerations

Per KDB 941225 D01, Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit.

Test Position	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-Up Limit	Meas.	Meas.	Scaled		
Rear	0	1xRTT (RC3 SO32)	25	1851.25	24.5	24.20				
			600	1880	24.5	24.00	0.108	0.121		1
			1175	1908.75	24.5	24.04				
		1xEVDO Rel. 0	25	1851.25	24.5	23.8				
			600	1880	24.5	23.9	0.071	0.081		1
			1175	1908.75	24.5	23.7				
Edge 1	0	1xRTT (RC3 SO32)	25	1851.25	24.5	24.20				
			600	1880	24.5	24.00	0.415	0.466		1
			1175	1908.75	24.5	24.04				
		1xEVDO Rel. 0	25	1851.25	24.5	23.8				
			600	1880	24.5	23.9	0.285	0.326		1
			1175	1908.75	24.5	23.7				
Edge 4	0	1xRTT (RC3 SO32)	25	1851.25	24.5	24.20				
			600	1880	24.5	24.00	0.596	0.669		1
			1175	1908.75	24.5	24.04				
		1xEVDO Rel. 0	25	1851.25	24.5	23.8				
			600	1880	24.5	23.9	0.540	0.617		1
			1175	1908.75	24.5	23.7				
Edge 4 Tilt	0	1xRTT (RC3 SO32)	25	1851.25	24.5	24.20				
			600	1880	24.5	24.00	0.588	0.660		1
			1175	1908.75	24.5	24.04				
		1xEVDO Rel. 0	25	1851.25	24.5	23.8				
			600	1880	24.5	23.9	0.601	0.687		1
			1175	1908.75	24.5	23.7				
Corner 1	0	1xRTT (RC3 SO32)	25	1851.25	24.5	24.20				
			600	1880	24.5	24.00	0.595	0.668		1
			1175	1908.75	24.5	24.04				
		1xEVDO Rel. 0	25	1851.25	24.5	23.8				
			600	1880	24.5	23.9	0.643	0.735	7	1
			1175	1908.75	24.5	23.7				

Note(s):

According to KDB 447498 D01 General RF Exposure Guidance v05, 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.

1. ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
2. ≤ 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
3. ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

12.10. CDMA BC10

Test mode reduction considerations

Per KDB 941225 D01, Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without

Test Position	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-Up Limit	Meas.	Meas.	Scaled		
Rear	0	1xRTT (RC3 SO32)	450	817.25	24.50	23.70				
			580	820.5	24.50	23.80	0.065	0.076		1
			670	822.75	24.50	23.80				
		1xEVDO Rel. 0	450	817.25	24.50	24.00				
			580	820.5	24.50	23.90	0.055	0.063		1
			670	822.75	24.50	23.90				
Edge 1	0	1xRTT (RC3 SO32)	450	817.25	24.50	23.70				
			580	820.5	24.50	23.80	0.170	0.200		1
			670	822.75	24.50	23.80				
		1xEVDO Rel. 0	450	817.25	24.50	24.00				
			580	820.5	24.50	23.90	0.074	0.085		1
			670	822.75	24.50	23.90				
Edge 4	0	1xRTT (RC3 SO32)	450	817.25	24.50	23.70				
			580	820.5	24.50	23.80	0.516	0.606		1
			670	822.75	24.50	23.80				
		1xEVDO Rel. 0	450	817.25	24.50	24.00				
			580	820.5	24.50	23.90	0.368	0.423		1
			670	822.75	24.50	23.90				
Edge 4 Tilt	0	1xRTT (RC3 SO32)	450	817.25	24.50	23.70				
			580	820.5	24.50	23.80	0.529	0.622	8	1
			670	822.75	24.50	23.80				
		1xEVDO Rel. 0	450	817.25	24.50	24.00				
			580	820.5	24.50	23.90	0.514	0.590		1
			670	822.75	24.50	23.90				
Corner 1	0	1xRTT (RC3 SO32)	450	817.25	24.50	23.70				
			580	820.5	24.50	23.80	0.372	0.437		1
			670	822.75	24.50	23.80				
		1xEVDO Rel. 0	450	817.25	24.50	24.00				
			580	820.5	24.50	23.90	0.371	0.426		1
			670	822.75	24.50	23.90				

Note(s):

According to KDB 447498 D01 General RF Exposure Guidance v05, 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

12.11. LTE Band 2

Test Position	Dist. (mm)	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
							Tune-up limit	Meas.	Meas.	Scaled		
Rear	0	QPSK	19100	1900	1	99	24.0	23.1	0.094	0.116		1
			18900	1880	1	0	24.0	23.0				
			18700	1860	1	99	24.0	23.0				
			19100	1900	50	49	24.0	21.9	0.058	0.095		1
			18900	1880	50	0	24.0	21.9				
			18700	1860	50	0	24.0	21.9				
			18900	1880	100	0	24.0	21.8				
Edge 1	0	QPSK	19100	1900	1	99	24.0	23.1	0.205	0.252		1
			18900	1880	1	0	24.0	23.0				
			18700	1860	1	99	24.0	23.0				
			19100	1900	50	49	24.0	21.9	0.160	0.259		1
			18900	1880	50	0	24.0	21.9				
			18700	1860	50	0	24.0	21.9				
			18900	1880	100	0	24.0	21.8				
Edge 4	0	QPSK	19100	1900	1	99	24.0	23.1	0.542	0.667		1
			18900	1880	1	0	24.0	23.0				
			18700	1860	1	99	24.0	23.0				
			19100	1900	50	49	24.0	21.9	0.383	0.621		1
			18900	1880	50	0	24.0	21.9				
			18700	1860	50	0	24.0	21.9				
			18900	1880	100	0	24.0	21.8				
Edge 4 Tilt	0	QPSK	19100	1900	1	99	24.0	23.1	0.555	0.683		1
			18900	1880	1	0	24.0	23.0				
			18700	1860	1	99	24.0	23.0				
			19100	1900	50	49	24.0	21.9	0.402	0.652		1
			18900	1880	50	0	24.0	21.9				
			18700	1860	50	0	24.0	21.9				
			18900	1880	100	0	24.0	21.8				
Corner 1	0	QPSK	19100	1900	1	99	24.0	23.1	0.610	0.750	9	1
			18900	1880	1	0	24.0	23.0				
			18700	1860	1	99	24.0	23.0				
			19100	1900	50	49	24.0	21.9	0.455	0.738		1
			18900	1880	50	0	24.0	21.9				
			18700	1860	50	0	24.0	21.9				
			18900	1880	100	0	24.0	21.8				

Note(s):

- Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
 - Beginning with QPSK modulation at the largest channel bandwidth, testing for 1 RB allocation configurations is initially performed for the channel/RB offset combination with the highest output power among 1 RB allocation configurations.
 - When the reported SAR for the initial measurement is < 0.8 W/kg, no further assessment is required for 1 RB allocation configurations.
 - When the reported SAR for the initial measurement is > 0.8 W/kg, the remaining channels are evaluated using the RB offset with the highest output power within the respective channels.
 - For all reported SAR that is > 1.45 W/kg, SAR is required for the remaining RB offset configurations of the same channel.
 - The same procedures apply to QPSK 50% RB allocation configurations at the largest channel bandwidth.
 - Testing for 100% RB allocation configurations at the largest channel bandwidth is performed for the channel, across low, mid and high, with the highest output power, when the highest reported SAR for either 1 RB or 50% RB is ≥ 0.8 W/kg, or when the maximum output power among 100% RB allocation configurations is greater than the maximum output power among either 1 RB or 50% RB allocation configurations.
 - Testing for the remaining channels in 100% RB allocation configurations is required only when reported SAR for the initial 100% RB allocation configuration is > 1.45 W/kg.

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- Testing for higher order modulations (16-QAM or 64-QAM) is required only when the highest reported SAR for QPSK is > 1.45 W/Kg or if its output power is more than 0.5 dB higher than that of QPSK.
 - Testing for the other channel bandwidths is required only when the highest reported SAR for the highest channel bandwidth is > 1.45 W/Kg or if its output power is more than 0.5 dB higher than that of the highest channel bandwidth.
2. Plot numbers correspond to the numbers found in the footnotes of Appendix 14.5 "SAR Test Plots for LTE"

12.12. LTE Band 4

Test Position	Dist. (mm)	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
							Tune-up limit	Meas.	Meas.	Scaled		
Rear	0	QPSK	20175	1732.5	1	0	24.0	23.2	0.0520	0.063		1
			20300	1745	1	49	24.0	23.2				
			20050	1720	1	99	24.0	23.2				
			20175	1732.5	50	0	24.0	22.2	0.0410	0.062		1
			20300	1745	50	0	24.0	22.2				
			20050	1720	50	0	24.0	22.0				
			20050	1720	100	0	24.0	22.1				
Edge 1	0	QPSK	20175	1732.5	1	0	24.0	23.2	0.468	0.563		1
			20300	1745	1	49	24.0	23.2				
			20050	1720	1	99	24.0	23.2				
			20175	1732.5	50	0	24.0	22.2	0.366	0.554		1
			20300	1745	50	0	24.0	22.2				
			20050	1720	50	0	24.0	22.0				
			20050	1720	100	0	24.0	22.1				
Edge 4	0	QPSK	20175	1732.5	1	0	24.0	23.2	0.463	0.557		1
			20300	1745	1	49	24.0	23.2				
			20050	1720	1	99	24.0	23.2				
			20175	1732.5	50	0	24.0	22.2	0.287	0.434		1
			20300	1745	50	0	24.0	22.2				
			20050	1720	50	0	24.0	22.0				
			20050	1720	100	0	24.0	22.1				
Edge 4 Tilt	0	QPSK	20175	1732.5	1	0	24.0	23.2	0.658	0.791		1
			20300	1745	1	49	24.0	23.2	0.724	0.870		
			20050	1720	1	99	24.0	23.2	0.721	0.867		
			20175	1732.5	50	0	24.0	22.2	0.522	0.790		1
			20300	1745	50	0	24.0	22.2	0.550	0.832		
			20050	1720	50	0	24.0	22.0	0.524	0.830		
			20050	1720	100	0	24.0	22.1	0.495	0.767		
Corner 1	0	QPSK	20175	1732.5	1	0	24.0	23.2	1.150	1.383	10	1
			20300	1745	1	49	24.0	23.2	1.070	1.286		
			20050	1720	1	99	24.0	23.2	1.100	1.322		
			20175	1732.5	50	0	24.0	22.2	0.897	1.358		1
			20300	1745	50	0	24.0	22.2	0.832	1.259		
			20050	1720	50	0	24.0	22.0	0.857	1.358		
			20050	1720	100	0	24.0	22.1	0.858	1.329		

Note(s):

- Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
 - Beginning with QPSK modulation at the largest channel bandwidth, testing for 1 RB allocation configurations is initially performed for the channel/RB offset combination with the highest output power among 1 RB allocation configurations.
 - When the reported SAR for the initial measurement is < 0.8 W/kg, no further assessment is required for 1 RB allocation configurations.
 - When the reported SAR for the initial measurement is > 0.8 W/kg, the remaining channels are evaluated using the RB offset with the highest output power within the respective channels.
 - For all reported SAR that is > 1.45 W/kg, SAR is required for the remaining RB offset configurations of the same channel.
 - The same procedures apply to QPSK 50% RB allocation configurations at the largest channel bandwidth.
 - Testing for 100% RB allocation configurations at the largest channel bandwidth is performed for the channel, across low, mid and high, with the highest output power, when the highest reported SAR for either 1 RB or 50% RB is ≥ 0.8 W/kg, or when the maximum output power among 100% RB allocation configurations is greater than the maximum output power among either 1 RB or 50% RB allocation configurations.
 - Testing for the remaining channels in 100% RB allocation configurations is required only when reported SAR for the initial 100% RB allocation configuration is > 1.45 W/kg.

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- Testing for higher order modulations (16-QAM or 64-QAM) is required only when the highest reported SAR for QPSK is > 1.45 W/Kg or if its output power is more than 0.5 dB higher than that of QPSK.
 - Testing for the other channel bandwidths is required only when the highest reported SAR for the highest channel bandwidth is > 1.45 W/Kg or if its output power is more than 0.5 dB higher than that of the highest channel bandwidth.
2. Plot numbers correspond to the numbers found in the footnotes of Appendix 14.5 "SAR Test Plots for LTE"

12.13. LTE Band 5

Test Position	Dist. (mm)	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
							Tune-up limit	Meas.	Meas.	Scaled		
Rear	0	QPSK	20600	844	1	0	24.0	23.0	0.051	0.064		1
			20525	836.5	1	0	24.0	23.0				
			20450	829	1	49	24.0	23.0				
			20600	844	25	0	24.0	22.2	0.037	0.056		1
			20525	836.5	25	24	24.0	22.2				
			20450	829	25	12	24.0	22.2				
			20600	844	50	0	24.0	21.9				
Edge 1	0	QPSK	20600	844	1	0	24.0	23.0	0.081	0.102		1
			20525	836.5	1	0	24.0	23.0				
			20450	829	1	49	24.0	23.0				
			20600	844	25	0	24.0	22.2	0.061	0.092		1
			20525	836.5	25	24	24.0	22.2				
			20450	829	25	12	24.0	22.2				
			20600	844	50	0	24.0	21.9				
Edge 4	0	QPSK	20600	844	1	0	24.0	23.0	0.390	0.491		1
			20525	836.5	1	0	24.0	23.0				
			20450	829	1	49	24.0	23.0				
			20600	844	25	0	24.0	22.2	0.288	0.436		1
			20525	836.5	25	24	24.0	22.2				
			20450	829	25	12	24.0	22.2				
			20600	844	50	0	24.0	21.9				
Edge 4 Tilt	0	QPSK	20600	844	1	0	24.0	23.0	0.500	0.629	11	1
			20525	836.5	1	0	24.0	23.0				
			20450	829	1	49	24.0	23.0				
			20600	844	25	0	24.0	22.2	0.390	0.590		1
			20525	836.5	25	24	24.0	22.2				
			20450	829	25	12	24.0	22.2				
			20600	844	50	0	24.0	21.9				
Corner 1	0	QPSK	20600	844	1	0	24.0	23.0	0.257	0.324		1
			20525	836.5	1	0	24.0	23.0				
			20450	829	1	49	24.0	23.0				
			20600	844	25	0	24.0	22.2	0.187	0.283		1
			20525	836.5	25	24	24.0	22.2				
			20450	829	25	12	24.0	22.2				
			20600	844	50	0	24.0	21.9				

Note(s):

- Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
 - Beginning with QPSK modulation at the largest channel bandwidth, testing for 1 RB allocation configurations is initially performed for the channel/RB offset combination with the highest output power among 1 RB allocation configurations.
 - When the reported SAR for the initial measurement is < 0.8 W/kg, no further assessment is required for 1 RB allocation configurations.
 - When the reported SAR for the initial measurement is > 0.8 W/kg, the remaining channels are evaluated using the RB offset with the highest output power within the respective channels.
 - For all reported SAR that is > 1.45 W/kg, SAR is required for the remaining RB offset configurations of the same channel.
 - The same procedures apply to QPSK 50% RB allocation configurations at the largest channel bandwidth.
 - Testing for 100% RB allocation configurations at the largest channel bandwidth is performed for the channel, across low, mid and high, with the highest output power, when the highest reported SAR for either 1 RB or 50% RB is ≥ 0.8 W/kg, or when the maximum output

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- power among 100% RB allocation configurations is greater than the maximum output power among either 1 RB or 50% RB allocation configurations.
 - o Testing for the remaining channels in 100% RB allocation configurations is required only when reported SAR for the initial 100% RB allocation configuration is $> 1.45 \text{ W/kg}$.
 - Testing for higher order modulations (16-QAM or 64-QAM) is required only when the highest reported SAR for QPSK is $> 1.45 \text{ W/Kg}$ or if its output power is more than 0.5 dB higher than that of QPSK.
 - Testing for the other channel bandwidths is required only when the highest reported SAR for the highest channel bandwidth is $> 1.45 \text{ W/Kg}$ or if its output power is more than 0.5 dB higher than that of the highest channel bandwidth.
2. Plot numbers correspond to the numbers found in the footnotes of Appendix 14.5 "SAR Test Plots for LTE"

12.14. LTE Band 13

Test Position	Dist. (mm)	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
							Tune-up limit	Meas.	Meas.	Scaled		
Rear	0	QPSK	23230	782	1	0	24.0	23.00	0.074	0.093		1
			23230	782	1	49	24.0	23.00				
			23230	782	1	24	24.0	22.40				
			23230	782	25	0	24.0	22.10	0.059	0.091		1
			23230	782	25	12	24.0	22.00				
			23230	782	25	24	24.0	22.10				
			23230	782	50	0	24.0	22.00				
Edge 1	0	QPSK	23230	782	1	0	24.0	23.00	0.061	0.077		1
			23230	782	1	49	24.0	23.00				
			23230	782	1	24	24.0	22.40				
			23230	782	25	0	24.0	22.10	0.027	0.042		1
			23230	782	25	12	24.0	22.00				
			23230	782	25	24	24.0	22.10				
			23230	782	50	0	24.0	22.00				
Edge 4	0	QPSK	23230	782	1	0	24.0	23.00	0.275	0.346		1
			23230	782	1	49	24.0	23.00				
			23230	782	1	24	24.0	22.40				
			23230	782	25	0	24.0	22.10	0.248	0.384		1
			23230	782	25	12	24.0	22.00				
			23230	782	25	24	24.0	22.10				
			23230	782	50	0	24.0	22.00				
Edge 4 Tilt	0	QPSK	23230	782	1	0	24.0	23.00	0.629	0.792	12	1
			23230	782	1	49	24.0	23.00				
			23230	782	1	24	24.0	22.40				
			23230	782	25	0	24.0	22.10	0.551	0.853		1
			23230	782	25	12	24.0	22.00				
			23230	782	25	24	24.0	22.10				
			23230	782	50	0	24.0	22.00				
Corner 1	0	QPSK	23230	782	1	0	24.0	23.00	0.203	0.256		1
			23230	782	1	49	24.0	23.00				
			23230	782	1	24	24.0	22.40				
			23230	782	25	0	24.0	22.10	0.170	0.263		1
			23230	782	25	12	24.0	22.00				
			23230	782	25	24	24.0	22.10				
			23230	782	50	0	24.0	22.00				

Note(s):

- Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
 - Beginning with QPSK modulation at the largest channel bandwidth, testing for 1 RB allocation configurations is initially performed for the channel/RB offset combination with the highest output power among 1 RB allocation configurations.
 - When the reported SAR for the initial measurement is < 0.8 W/kg, no further assessment is required for 1 RB allocation configurations.
 - When the reported SAR for the initial measurement is > 0.8 W/kg, the remaining channels are evaluated using the RB offset with the highest output power within the respective channels.
 - For all reported SAR that is > 1.45 W/kg, SAR is required for the remaining RB offset configurations of the same channel.
 - The same procedures apply to QPSK 50% RB allocation configurations at the largest channel bandwidth.
 - Testing for 100% RB allocation configurations at the largest channel bandwidth is performed for the channel, across low, mid and high, with the highest output power, when the highest reported SAR for either 1 RB or 50% RB is ≥ 0.8 W/kg, or when the maximum output

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- power among 100% RB allocation configurations is greater than the maximum output power among either 1 RB or 50% RB allocation configurations.
 - o Testing for the remaining channels in 100% RB allocation configurations is required only when reported SAR for the initial 100% RB allocation configuration is $> 1.45 \text{ W/kg}$.
 - Testing for higher order modulations (16-QAM or 64-QAM) is required only when the highest reported SAR for QPSK is $> 1.45 \text{ W/Kg}$ or if its output power is more than 0.5 dB higher than that of QPSK.
 - Testing for the other channel bandwidths is required only when the highest reported SAR for the highest channel bandwidth is $> 1.45 \text{ W/Kg}$ or if its output power is more than 0.5 dB higher than that of the highest channel bandwidth.
2. Plot numbers correspond to the numbers found in the footnotes of Appendix 14.5 "SAR Test Plots for LTE"

12.15. LTE Band 17

Test Position	Dist. (mm)	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
							Tune-up limit	Meas.	Meas.	Scaled		
Rear	0	QPSK	23790	710	1	0	24.0	23.0	0.029	0.037		1
			23780	709	1	0	24.0	23.0				
			23800	711	1	0	24.0	23.0				
			23790	710	25	0	24.0	22.2	0.053	0.080		1
			23780	709	25	12	24.0	22.2				
			23800	711	25	0	24.0	22.1				
			23790	710	50	0	24.0	22.0				
Edge 1	0	QPSK	23790	710	1	0	24.0	23.0	0.007	0.009		1
			23780	709	1	0	24.0	23.0				
			23800	711	1	0	24.0	23.0				
			23790	710	25	0	24.0	22.2	0.005	0.008		1
			23780	709	25	12	24.0	22.2				
			23800	711	25	0	24.0	22.1				
			23790	710	50	0	24.0	22.0				
Edge 4	0	QPSK	23790	710	1	0	24.0	23.0	0.225	0.283		1
			23780	709	1	0	24.0	23.0				
			23800	711	1	0	24.0	23.0				
			23790	710	25	0	24.0	22.2	0.182	0.275		1
			23780	709	25	12	24.0	22.2				
			23800	711	25	0	24.0	22.1				
			23790	710	50	0	24.0	22.0				
Edge 4 Tilt	0	QPSK	23790	710	1	0	24.0	23.0	0.218	0.274		1
			23780	709	1	0	24.0	23.0				
			23800	711	1	0	24.0	23.0				
			23790	710	25	0	24.0	22.2	0.217	0.328	13	1
			23780	709	25	12	24.0	22.2				
			23800	711	25	0	24.0	22.1				
			23790	710	50	0	24.0	22.0				
Corner 1	0	QPSK	23790	710	1	0	24.0	23.0	0.234	0.295		1
			23780	709	1	0	24.0	23.0				
			23800	711	1	0	24.0	23.0				
			23790	710	25	0	24.0	22.2	0.189	0.286		1
			23780	709	25	12	24.0	22.2				
			23800	711	25	0	24.0	22.1				
			23790	710	50	0	24.0	22.0				

Note(s):

- Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
 - Beginning with QPSK modulation at the largest channel bandwidth, testing for 1 RB allocation configurations is initially performed for the channel/RB offset combination with the highest output power among 1 RB allocation configurations.
 - When the reported SAR for the initial measurement is < 0.8 W/kg, no further assessment is required for 1 RB allocation configurations.
 - When the reported SAR for the initial measurement is > 0.8 W/kg, the remaining channels are evaluated using the RB offset with the highest output power within the respective channels.
 - For all reported SAR that is > 1.45 W/kg, SAR is required for the remaining RB offset configurations of the same channel.
 - The same procedures apply to QPSK 50% RB allocation configurations at the largest channel bandwidth.
 - Testing for 100% RB allocation configurations at the largest channel bandwidth is performed for the channel, across low, mid and high, with the highest output power, when the highest reported SAR for either 1 RB or 50% RB is ≥ 0.8 W/kg, or when the maximum output power among 100% RB allocation configurations is greater than the maximum output power among either 1 RB or 50% RB allocation configurations.

- o Testing for the remaining channels in 100% RB allocation configurations is required only when reported SAR for the initial 100% RB allocation configuration is > 1.45 W/kg.
 - Testing for higher order modulations (16-QAM or 64-QAM) is required only when the highest reported SAR for QPSK is > 1.45 W/Kg or if its output power is more than 0.5 dB higher than that of QPSK.
 - Testing for the other channel bandwidths is required only when the highest reported SAR for the highest channel bandwidth is > 1.45 W/Kg or if its output power is more than 0.5 dB higher than that of the highest channel bandwidth.
2. Plot numbers correspond to the numbers found in the footnotes of Appendix 14.5 "SAR Test Plots for LTE"

12.16. LTE Band 25

Test Position	Dist. (mm)	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
							Tune-up limit	Meas.	Meas.	Scaled		
Rear	6	QPSK	26365	1882.5	1	0	24.000	23.0	0.065	0.082		1
			26140	1860	1	0	24.000	22.8				
			26590	1905	1	99	24.000	22.9				
			26365	1882.5	50	0	24.000	21.8	0.050	0.083		1
			26140	1860	50	24	24.000	21.8				
			26590	1905	50	0	24.000	21.7				
			26590	1905	100	0	24.000	21.7				
Edge 1	20	QPSK	26365	1882.5	1	0	24.000	23.0	0.208	0.262		1
			26140	1860	1	0	24.000	23.0				
			26590	1905	1	99	24.000	22.9				
			26365	1882.5	50	0	24.000	21.8	0.155	0.257		1
			26140	1860	50	24	24.000	21.8				
			26590	1905	50	0	24.000	21.7				
			26590	1905	100	0	24.000	21.7				
Edge 4	20	QPSK	26365	1882.5	1	0	24.000	23.0	0.448	0.564		1
			26140	1860	1	0	24.000	23.0				
			26590	1905	1	99	24.000	22.9				
			26365	1882.5	50	0	24.000	21.8	0.340	0.564		1
			26140	1860	50	24	24.000	21.8				
			26590	1905	50	0	24.000	21.7				
			26590	1905	100	0	24.000	21.7				
Edge 4 Tilt	0	QPSK	26365	1882.5	1	0	24.000	23.0	0.488	0.614		1
			26140	1860	1	0	24.000	23.0				
			26590	1905	1	99	24.000	22.9				
			26365	1882.5	50	0	24.000	21.8	0.395	0.656		1
			26140	1860	50	24	24.000	21.8				
			26590	1905	50	0	24.000	21.7				
			26590	1905	100	0	24.000	21.7				
Corner 1	0	QPSK	26365	1882.5	1	0	24.000	23.0	0.622	0.783	14	1
			26140	1860	1	0	24.000	23.0				
			26590	1905	1	99	24.000	22.9				
			26365	1882.5	50	0	24.000	21.8	0.466	0.773		1
			26140	1860	50	24	24.000	21.8				
			26590	1905	50	0	24.000	21.7				
			26590	1905	100	0	24.000	21.7				

Note(s):

- Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
 - Beginning with QPSK modulation at the largest channel bandwidth, testing for 1 RB allocation configurations is initially performed for the channel/RB offset combination with the highest output power among 1 RB allocation configurations.
 - When the reported SAR for the initial measurement is < 0.8 W/kg, no further assessment is required for 1 RB allocation configurations.
 - When the reported SAR for the initial measurement is > 0.8 W/kg, the remaining channels are evaluated using the RB offset with the highest output power within the respective channels.
 - For all reported SAR that is > 1.45 W/kg, SAR is required for the remaining RB offset configurations of the same channel.
 - The same procedures apply to QPSK 50% RB allocation configurations at the largest channel bandwidth.
 - Testing for 100% RB allocation configurations at the largest channel bandwidth is performed for the channel, across low, mid and high, with the highest output power, when the highest reported SAR for either 1 RB or 50% RB is ≥ 0.8 W/kg, or when the maximum output power among 100% RB allocation configurations is greater than the maximum output power among either 1 RB or 50% RB allocation configurations.

- o Testing for the remaining channels in 100% RB allocation configurations is required only when reported SAR for the initial 100% RB allocation configuration is > 1.45 W/kg.
 - Testing for higher order modulations (16-QAM or 64-QAM) is required only when the highest reported SAR for QPSK is > 1.45 W/Kg or if its output power is more than 0.5 dB higher than that of QPSK.
 - Testing for the other channel bandwidths is required only when the highest reported SAR for the highest channel bandwidth is > 1.45 W/Kg or if its output power is more than 0.5 dB higher than that of the highest channel bandwidth.
2. Plot numbers correspond to the numbers found in the footnotes of Appendix 14.5 "SAR Test Plots for LTE"

12.17. Wi-Fi 2.4 GHz and 5 GHz Bands

Additional SAR measurements were performed on the WLAN Aux Antenna for each of the Wi-Fi bands and Bluetooth for the Corner 1 test position because the estimated SAR values were too conservative and would require simultaneous transmission SAR to be measured.

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Corner 1	802.11b	0	1	2412	15.0	15.5				
			6	2437	15.0	15.0	0.102	0.102		
			11	2462	15.0	15.5				
	802.11g		1	2412	15.5	15.5				
			6	2437	15.5	15.4	0.110	0.113	15	
			11	2462	15.5	15.5				
	802.11a		40	5200	15.0	15.0	0.085	0.085	16	
			48	5240	15.0	15.0				
			52	5260	15.0	15.0	0.033	0.033	17	
			60	5300	15.0	15.0				
			104	5500	15.0	15.0				
			116	5680	15.0	14.9	0.104	0.106	18	
			124	5600	15.0	15.0				
			136	5700	15.0	15.0				
			149	5745	15.0	15.0				
			157	5785	15.0	15.0	0.057	0.057	19	
			165	5825	15.0	15.0				
			Bluetooth	39	2441	7.5	7.5	0.012	0.012	20

12.18. Summary of Highest SAR Values

Results for the highest measured SAR values in each frequency band and mode

Technology Band	Test Configuration		Mode	Dist. (mm)	Freq. (MHz)	dBm	1g/SAR (w/KG)
	Exposure	Position					
GSM 850	Body	Edge 4 Tilt	GPRS 2 Slots	0	848.8	32.1	1.130
GSM 1900	Body	Corner 1	GPRS 2 Slots	0	1880	29.4	0.627
CDMA BC0	Body	Edge 4 Tilt	1xEVDO Rel. 0	0	836.52	23.8	0.615
CDMA BC1	Body	Corner 1	1xEVDO Rel. 0	0	1880	23.9	0.643
CDMA BC 10	Body	Edge 4 Tilt	1xRTT (RC 3 SO32)	0	820.5	23.8	0.529
W-CDMA Band V	Body	Edge 4 Tilt	Rel 99 RMC 12.2 kbps	0	836.6	22.9	0.434
W-CDMA Band IV	Body	Corner 1	Rel 99 RMC 12.2 kbps	0	1732.6	23.3	0.980
W-CDMA Band II	Body	Edge 4 Tilt	Rel 99 RMC 12.2 kbps	0	1880	23	0.561
LTE Band 2	Body	Corner 1	20 MHz(QPSK) RB 1/99	0	1900	23.1	0.610
LTE Band 4	Body	Corner 1	20 MHz(QPSK) RB 1/0	0	1732.5	23.2	1.150
LTE Band 5	Body	Edge 4 Tilt	10 MHz(QPSK) RB 1/0	0	844	23	0.500
LTE Band 13	Body	Edge 4 Tilt	10 MHz (QPSK) RB 1/0	0	782	23	0.629
LTE Band 17	Body	Corner 1	10 MHz(QPSK) RB 1/0	0	710	23	0.234
LTE Band 25	Body	Corner 1	20 MHz(QPSK) RB 1/0	0	1882.5	23	0.622

12.19. SAR Measurement Variability and Uncertainty

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz v01. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

- 1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
- 3) Perform a second repeated measurement only if the **ratio of largest to smallest SAR** for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).
- 4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

Wireless Technologies	Test Configuration		Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio	Plot No.
	Exposure	Position					Original	Repeated		
GPRS 850	Body	Edge 4 Tilt	GPRS 2 Slots	0	251	848.8	1.130	1.070	1.06	1
LTE Band 4	Body	Edge 4 Corner	20 MHz (QPSK) RB 1/0	0	20175	1732.5	1.15	1.07	1.07	2

Note(s):

- Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is not > 1.20 .

13. Simultaneous Transmission SAR Analysis

All Wi-Fi 1-g SAR values were taken from results recorded in SAR report 12J15516-1, submitted under FCC ID ACJ9TGWL12A.

All Simultaneous Transmission SAR analysis applies scaling in accordance with the scaled values documented in this report (for the WWAN radios) and the aforementioned SAR report (12J15516-1) with scaling applied (for the WLAN radios).

As there are only estimated SAR values for Edge 3 the sum of the estimated SAR cannot exceed 1.2 W/kg.

13.1. Sum of the SAR for GSM & Wi-Fi 2.4 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	GSM850	GSM1900	WiFi 2.4 GHz Main	WiFi 2.4 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.103		0.006		0.248	0.357
	0.103			0.025		0.128
		0.055	0.006		0.248	0.309
		0.055		0.025		0.080
Rear, Wi-Fi 2 Tx	0.103		0.006	0.025		0.134
		0.055	0.006	0.025		0.086
Edge 1, Wi-Fi 1 Tx	0.208		0.4		0.4	1.008
		0.251	0.4		0.4	1.051
	0.208			0.4		0.608
		0.251		0.4		0.651
Edge 1, Wi-Fi 2 Tx	0.208		0.4	0.4		1.008
		0.251	0.4	0.4		1.051
Edge 4, Wi-Fi 1 Tx	0.723				0.248	0.971
		0.518			0.248	0.766
	0.723			0.097		0.820
		0.518		0.097		0.615
Edge 4 Tilt	1.328			0.109		1.437
		0.528		0.109		0.637
	1.328				0.248	1.576
		0.528			0.248	0.776
Corner 1	0.629			0.113		0.742
		0.627		0.113		0.740
	0.629				0.012	0.641
		0.627			0.012	0.639

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

13.2. Sum of the SAR for W-CDMA band II and IV & Wi-Fi 2.4 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	W-CDMA Band II	W-CDMA Band IV	WiFi 2.4 GHz Main	WiFi 2.4 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.077		0.006		0.248	0.331
	0.077			0.025		0.102
		0.079	0.006		0.248	0.333
		0.079		0.025		0.104
Rear, Wi-Fi 2 Tx	0.077		0.006	0.025		0.108
		0.079	0.006	0.025		0.110
Edge 1, Wi-Fi 1 Tx	0.097		0.4		0.4	0.897
		0.567	0.4		0.4	1.367
	0.097			0.4		0.497
		0.567		0.4		0.967
Edge 1, Wi-Fi 2 Tx	0.097		0.4	0.4		0.897
		0.567	0.4	0.4		1.367
Edge 4, Wi-Fi 1 Tx	0.617				0.248	0.865
		0.602			0.248	0.850
	0.617			0.097		0.714
		0.602		0.097		0.699
Edge 4 Tilt	0.632			0.109		0.741
		0.839		0.109		0.948
	0.632				0.248	0.880
		0.839			0.248	1.087
Corner 1	0.705			0.113		0.818
		1.178		0.113		1.291
	0.705				0.012	0.717
		1.178			0.012	1.190

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

13.3. Sum of the SAR for W-CDMA Band V & Wi-Fi 2.4 GHz Band

Test Position	Data				Σ 1-g SAR (mW/g)
	W-CDMA Band V	WiFi 2.4 GHz Main	WiFi 2.4 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.061	0.006		0.248	0.315
	0.061		0.025		0.086
Rear, Wi-Fi 2 Tx	0.061	0.006	0.025		0.092
Edge 1, Wi-Fi 1 Tx	0.036	0.4		0.4	0.836
	0.036		0.4		0.436
Edge 1, Wi-Fi 2 Tx	0.036	0.4	0.4		0.836
Edge 4, Wi-Fi 1 Tx	0.544		0.097		0.641
	0.544			0.248	0.792
Edge 4 Tilt	0.554		0.109		0.663
	0.554			0.248	0.802
Corner 1	0.388		0.032		0.420
	0.388			0.012	0.400

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

13.4. Sum of the SAR for CDMA BC0 & Wi-Fi 2.4 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	1xRTT	EVDO	WiFi 2.4 GHz Main	WiFi 2.4 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.061		0.006		0.248	0.315
	0.061			0.025		0.086
		0.058	0.006		0.248	0.312
		0.058		0.025		0.083
Rear, Wi-Fi 2 Tx	0.139		0.006	0.025		0.170
		0.103	0.006	0.025		0.134
Edge 1, Wi-Fi 1 Tx	0.061		0.4		0.4	0.861
		0.058	0.4		0.4	0.858
	0.061			0.4		0.461
		0.058		0.4		0.458
Edge 1, Wi-Fi 2 Tx	0.139		0.4	0.4		0.939
		0.103	0.4	0.4		0.903
Edge 4, Wi-Fi 1 Tx	0.480				0.248	0.728
		0.592			0.248	0.840
	0.480			0.097		0.577
		0.592		0.097		0.689
Edge 4 Tilt	0.660			0.109		0.769
		0.723		0.109		0.832
	0.660				0.248	0.908
		0.723			0.248	0.971
Corner 1	0.328			0.113		0.441
		0.363		0.113		0.476
	0.328				0.012	0.340
		0.363			0.012	0.375

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

13.5. Sum of the SAR for CDMA BC1 & Wi-Fi 2.4 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	1xRTT	EVDO	WiFi 2.4 GHz Main	WiFi 2.4 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.121		0.006		0.248	0.375
	0.121			0.025		0.146
		0.081	0.006		0.248	0.335
		0.081		0.025		0.106
Rear, Wi-Fi 2 Tx	0.121		0.006	0.025		0.152
		0.081	0.006	0.025		0.112
Edge 1, Wi-Fi 1 Tx	0.415		0.4		0.4	1.215
		0.326	0.4		0.4	1.126
	0.415			0.4		0.815
		0.326		0.4		0.726
Edge 1, Wi-Fi 2 Tx	0.415		0.4	0.4		1.215
		0.326	0.4	0.4		1.126
Edge 4, Wi-Fi 1 Tx	0.669				0.248	0.917
		0.617			0.248	0.865
	0.669			0.097		0.766
		0.617		0.097		0.714
Edge 4 Tilt	0.660			0.109		0.769
		0.687		0.109		0.796
	0.660				0.248	0.908
		0.687			0.248	0.935
Corner 1	0.668			0.113		0.781
		0.735		0.113		0.848
	0.668				0.012	0.680
		0.735			0.012	0.747

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

13.6. Sum of the SAR for CDMA BC10 & WiFi 2.4 GHz Bands.

Test Position	Data					Σ 1-g SAR (mW/g)
	1xRTT	EVDO	WiFi 2.4 GHz Main	WiFi 2.4 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.076		0.006		0.248	0.330
	0.076			0.025		0.101
		0.063	0.006		0.248	0.317
		0.063		0.025		0.088
Rear, Wi-Fi 2 Tx	0.076		0.006	0.025		0.107
		0.063	0.006	0.025		0.094
Edge 1, Wi-Fi 1 Tx	0.200		0.4		0.4	1.000
		0.085	0.4		0.4	0.885
	0.200			0.4		0.600
		0.085		0.4		0.485
Edge 1, Wi-Fi 2 Tx	0.200		0.4	0.4		1.000
		0.085	0.4	0.4		0.885
Edge 4, Wi-Fi 1 Tx	0.606				0.248	0.854
		0.423			0.248	0.671
	0.606			0.097		0.703
		0.423		0.097		0.520
Edge 4 Tilt	0.622			0.109		0.731
		0.590		0.109		0.699
	0.622				0.248	0.870
		0.590			0.248	0.838
Corner 1	0.437			0.113		0.550
		0.426		0.113		0.539
	0.437				0.012	0.449
		0.426			0.012	0.438

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

13.7. Sum of the SAR for LTE Bands 2 and 4 & Wi-Fi 2.4 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	LTE Band 2	LTE Band 4	WiFi 2.4 GHz Main	WiFi 2.4 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.116		0.006		0.248	0.370
	0.116			0.025		0.141
		0.063	0.006		0.248	0.317
		0.063		0.025		0.088
Rear, Wi-Fi 2 Tx	0.116		0.006	0.025		0.147
		0.063	0.006	0.025		0.094
Edge 1, Wi-Fi 1 Tx	0.259		0.4		0.4	1.059
		0.563	0.4		0.4	1.363
	0.259			0.4		0.659
		0.563		0.4		0.963
Edge 1, Wi-Fi 2 Tx	0.259		0.4	0.4		1.059
		0.563	0.4	0.4		1.363
Edge 4, Wi-Fi 1 Tx	0.667				0.248	0.915
		0.557			0.248	0.805
	0.667			0.097		0.764
		0.557		0.097		0.654
Edge 4 Tilt	0.683			0.109		0.792
		0.870		0.109		0.979
	0.683				0.248	0.931
		0.870			0.248	1.118
Corner 1	0.750			0.113		0.863
		1.383		0.113		1.496
	0.750				0.012	0.762
		1.383			0.012	1.395

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

13.8. Sum of the SAR for LTE Bands 5 and 13 & Wi-Fi 2.4 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	LTE Band 5	LTE Band 13	WiFi 2.4 GHz Main	WiFi 2.4 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.064		0.006		0.248	0.318
	0.064			0.025		0.089
		0.093	0.006		0.248	0.347
		0.093		0.025		0.118
Rear, Wi-Fi 2 Tx	0.064		0.006	0.025		0.095
		0.093	0.006	0.025		0.124
Edge 1, Wi-Fi 1 Tx	0.102		0.4		0.4	0.902
		0.077	0.4		0.4	0.877
	0.102			0.4		0.502
		0.077		0.4		0.477
Edge 1, Wi-Fi 2 Tx	0.102		0.4	0.4		0.902
		0.077	0.4	0.4		0.877
Edge 4, Wi-Fi 1 Tx	0.491				0.248	0.739
		0.384			0.248	0.632
	0.491			0.097		0.588
		0.384		0.097		0.481
Edge 4 Tilt	0.629			0.109		0.738
		0.853		0.109		0.962
	0.629				0.248	0.877
		0.853			0.248	1.101
Corner 1	0.324			0.113		0.437
		0.263		0.113		0.376
	0.324				0.012	0.336
		0.263			0.012	0.275

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

13.9. Sum of the SAR for LTE Bands 17 and 25 & Wi-Fi 2.4 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	LTE Band 17	LTE Band 25	WiFi 2.4 GHz Main	WiFi 2.4 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.080		0.006		0.248	0.334
	0.080			0.025		0.105
		0.083	0.006		0.248	0.337
		0.083		0.025		0.108
Rear, Wi-Fi 2 Tx	0.080		0.006	0.025		0.111
		0.083	0.006	0.025		0.114
Edge 1, Wi-Fi 1 Tx	0.009		0.4		0.4	0.809
		0.262	0.4		0.4	1.062
	0.009			0.4		0.409
		0.262		0.4		0.662
Edge 1, Wi-Fi 2 Tx	0.009		0.4	0.4		0.809
		0.262	0.4	0.4		1.062
Edge 4, Wi-Fi 1 Tx	0.283				0.248	0.531
		0.564			0.248	0.812
	0.283			0.097		0.380
		0.564		0.097		0.661
Edge 4 Tilt	0.328			0.109		0.437
		0.656		0.109		0.765
	0.328				0.248	0.576
		0.656			0.248	0.904
Corner 1	0.295			0.113		0.408
		0.783		0.113		0.896
	0.295				0.012	0.307
		0.783			0.012	0.795

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

13.10. Sum of the SAR for GSM & Wi-Fi 5 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	GSM850	GSM1900	WiFi 5 GHz Main	WiFi 5 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.103		0.039		0.248	0.390
	0.103			0.012		0.115
		0.055	0.039		0.248	0.342
		0.055		0.012		0.067
Rear, Wi-Fi 2 Tx	0.103		0.039	0.012		0.154
		0.055	0.039	0.012		0.106
Edge 1, Wi-Fi 1 Tx	0.208		0.4		0.4	1.008
		0.251	0.4		0.4	1.051
	0.208			0.4		0.608
		0.251		0.4		0.651
Edge 1, Wi-Fi 2 Tx	0.208		0.4	0.4		1.008
		0.251	0.4	0.4		1.051
Edge 4, Wi-Fi 1 Tx	0.723				0.248	0.971
		0.518			0.248	0.766
	0.723			0.269		0.992
		0.518		0.269		0.787
Edge 4 Tilt	1.165			0.172		1.337
		0.528		0.172		0.700
	1.165				0.248	1.413
		0.528			0.248	0.776
Corner 1	0.629			0.106		0.735
		0.627		0.106		0.733
	0.629				0.012	0.641
		0.627			0.012	0.639

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

13.11. Sum of the SAR for W-CDMA Band II and IV & Wi-Fi 5 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	W-CDMA Band II	W-CDMA Band IV	WiFi 5 GHz Main	WiFi 5 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.077		0.039		0.248	0.364
	0.077			0.012		0.089
		0.079	0.039		0.248	0.366
		0.079		0.012		0.091
Rear, Wi-Fi 2 Tx	0.077		0.039	0.012		0.128
		0.079	0.039	0.012		0.130
Edge 1, Wi-Fi 1 Tx	0.097		0.4		0.4	0.897
		0.567	0.4		0.4	1.367
	0.097			0.4		0.497
		0.567		0.4		0.967
Edge 1, Wi-Fi 2 Tx	0.097		0.4	0.4		0.897
		0.567	0.4	0.4		1.367
Edge 4, Wi-Fi 1 Tx	0.617				0.248	0.865
		0.602			0.248	0.850
	0.617			0.269		0.886
		0.602		0.269		0.871
Edge 4 Tilt	0.632			0.172		0.804
		0.839		0.172		1.011
	0.632				0.248	0.880
		0.839			0.248	1.087
Corner 1	0.705			0.106		0.811
		1.178		0.106		1.284
	0.705				0.012	0.717
		1.178			0.012	1.190

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

13.12. Sum of the SAR for W-CDMA Band V & Wi-Fi 5 GHz Band

Test Position	Data				Σ 1-g SAR (mW/g)
	W-CDMA Band V	WiFi 5 GHz Main	WiFi 5 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.061	0.039		0.248	0.348
	0.061		0.012		0.073
Rear, Wi-Fi 2 Tx	0.061	0.039	0.012		0.112
Edge 1, Wi-Fi 1 Tx	0.036	0.4		0.4	0.836
	0.036		0.4		0.436
Edge 1, Wi-Fi 2 Tx	0.036	0.4	0.4		0.836
Edge 4, Wi-Fi 1 Tx	0.544		0.269		0.813
	0.544			0.248	0.792
Edge 4 Tilt	0.554		0.172		0.726
	0.554			0.248	0.802
Corner 1	0.388		0.106		0.494
	0.388			0.012	0.400

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation

13.13. Sum of the SAR for CDMA BC0 & WiFi 5 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	1xRTT	EVDO	WiFi 5 GHz Main	WiFi 5 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.061		0.039		0.248	0.348
	0.061			0.012		0.073
		0.058	0.039		0.248	0.345
		0.058		0.012		0.070
Rear, Wi-Fi 2 Tx	0.061		0.039	0.012		0.112
		0.103	0.039	0.012		0.154
Edge 1, Wi-Fi 1 Tx	0.139		0.4		0.4	0.939
		0.058	0.4		0.4	0.858
	0.139			0.4		0.539
		0.058		0.4		0.458
Edge 1, Wi-Fi 2 Tx	0.139		0.4	0.4		0.939
		0.103	0.4	0.4		0.903
Edge 4, Wi-Fi 1 Tx	0.480				0.248	0.728
		0.592			0.248	0.840
	0.480			0.269		0.749
		0.592		0.269		0.861
Edge 4 Tilt	0.660			0.172		0.832
		0.723		0.172		0.895
	0.660				0.248	0.908
		0.723			0.248	0.971
Corner 1	0.328			0.106		0.434
		0.363		0.106		0.469
	0.328				0.012	0.340
		0.363			0.012	0.375

1. Values shaded green are estimated SAR

13.14. Sum of the SAR for CDMA BC1 & WiFi5 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	1xRTT	EVDO	WiFi 5 GHz Main	WiFi 5 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.121		0.039		0.248	0.408
	0.121			0.012		0.133
		0.081	0.039		0.248	0.368
		0.081		0.012		0.093
Rear, Wi-Fi 2 Tx	0.121		0.039	0.012		0.172
		0.081	0.039	0.012		0.132
Edge 1, Wi-Fi 1 Tx	0.466		0.4		0.4	1.266
		0.326	0.4		0.4	1.126
	0.466			0.4		0.866
		0.326		0.4		0.726
Edge 1, Wi-Fi 2 Tx	0.466		0.4	0.4		1.266
		0.326	0.4	0.4		1.126
Edge 4, Wi-Fi 1 Tx	0.669				0.248	0.917
		0.617			0.248	0.865
	0.669			0.269		0.938
		0.617		0.269		0.886
Edge 4 Tilt	0.660			0.172		0.832
		0.687		0.172		0.859
	0.660				0.248	0.908
		0.687			0.248	0.935
Corner 1	0.668			0.106		0.774
		0.735		0.106		0.841
	0.668				0.012	0.680
		0.735			0.012	0.747

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

13.15. Sum of the SAR for CDMA BC10 & WiFi 5 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	1xRTT	EVDO	WiFi 5 GHz Main	WiFi 5 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.076		0.039		0.248	0.363
	0.076			0.012		0.088
		0.063	0.039		0.248	0.350
		0.063		0.012		0.075
Rear, Wi-Fi 2 Tx	0.076		0.039	0.012		0.127
		0.063	0.039	0.012		0.114
Edge 1, Wi-Fi 1 Tx	0.200		0.4		0.4	1.000
		0.085	0.4		0.4	0.885
	0.200			0.4		0.600
		0.085		0.4		0.485
Edge 1, Wi-Fi 2 Tx	0.200		0.4	0.4		1.000
		0.085	0.4	0.4		0.885
Edge 4, Wi-Fi 1 Tx	0.606				0.248	0.854
		0.423			0.248	0.671
	0.606			0.269		0.875
		0.423		0.269		0.692
Edge 4 Tilt	0.622			0.172		0.794
		0.590		0.172		0.762
	0.622				0.248	0.870
		0.590			0.248	0.838
Corner 1	0.437			0.106		0.543
		0.426		0.106		0.532
	0.437				0.012	0.449
		0.426			0.012	0.438

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation

13.16. Sum of the SAR for LTE Bands 2 and 4 & Wi-Fi 5.2 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	LTE Band 2	LTE Band 4	WiFi 5 GHz Main	WiFi 5 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.116		0.039		0.248	0.403
	0.116			0.012		0.128
		0.063	0.039		0.248	0.350
		0.063		0.012		0.075
Rear, Wi-Fi 2 Tx	0.116		0.039	0.012		0.167
		0.063	0.039	0.012		0.114
Edge 1, Wi-Fi 1 Tx	0.259		0.4		0.4	1.059
		0.563	0.4		0.4	1.363
	0.259			0.4		0.659
		0.563		0.4		0.963
Edge 1, Wi-Fi 2 Tx	0.259		0.4	0.4		1.059
		0.563	0.4	0.4		1.363
Edge 4, Wi-Fi 1 Tx	0.667				0.248	0.915
		0.557			0.248	0.805
	0.667			0.269		0.936
		0.557		0.269		0.826
Edge 4 Tilt	0.683			0.172		0.855
		0.870		0.172		1.042
	0.683				0.248	0.931
		0.870			0.248	1.118
Corner 1	0.750			0.106		0.856
		1.383		0.106		1.489
	0.75				0.012	0.762
		1.383			0.012	1.395

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

13.17. Sum of the SAR for LTE Bands 5 and 13 & Wi-Fi 5.2 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	LTE Band 5	LTE Band 13	WiFi 5 GHz Main	WiFi 5 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.064		0.039		0.248	0.351
	0.064			0.012		0.076
		0.093	0.039		0.248	0.380
		0.093		0.012		0.105
Rear, Wi-Fi 2 Tx	0.064		0.039	0.012		0.115
		0.093	0.039	0.012		0.144
Edge 1, Wi-Fi 1 Tx	0.102		0.4		0.4	0.902
		0.077	0.4		0.4	0.877
	0.102			0.4		0.502
		0.077		0.4		0.477
Edge 1, Wi-Fi 2 Tx	0.102		0.4	0.4		0.902
		0.077	0.4	0.4		0.877
Edge 4, Wi-Fi 1 Tx	0.491				0.248	0.739
		0.384			0.248	0.632
	0.491			0.269		0.760
		0.384		0.269		0.653
Edge 4 Tilt	0.629			0.172		0.801
		0.853		0.172		1.025
	0.629				0.248	0.877
		0.853			0.248	1.101
Corner 1	0.324			0.106		0.430
		0.263		0.106		0.369
	0.324				0.012	0.336
		0.263			0.012	0.275

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

13.18. Sum of the SAR for LTE Bands 17 and 25 & Wi-Fi 5.2 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	LTE Band 17	LTE Band 25	WiFi 5 GHz Main	WiFi 5 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.080		0.039		0.248	0.367
	0.080			0.012		0.092
		0.083	0.039		0.248	0.370
		0.083		0.012		0.095
Rear, Wi-Fi 2 Tx	0.080		0.039	0.012		0.131
		0.083	0.039	0.012		0.134
Edge 1, Wi-Fi 1 Tx	0.009		0.4		0.4	0.809
		0.262	0.4		0.4	1.062
	0.009			0.4		0.409
		0.262		0.4		0.662
Edge 1, Wi-Fi 2 Tx	0.009		0.4	0.4		0.809
		0.262	0.4	0.4		1.062
Edge 4, Wi-Fi 1 Tx	0.283				0.248	0.531
		0.564			0.248	0.812
	0.283			0.269		0.552
		0.564		0.269		0.833
Edge 4 Tilt	0.328			0.172		0.500
		0.656		0.172		0.828
	0.328				0.248	0.576
		0.656			0.248	0.904
Corner 1	0.295			0.106		0.401
		0.783		0.106		0.889
	0.295				0.012	0.307
		0.783			0.012	0.795

1. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

13.19. Edge 2 and Edge 4 for WWAN and WLAN 2 Tx (MIMO)

The WLAN aux and WWAN antennas are 281 mm from edge 2 and can be treated as mobile for simultaneous transmission analysis.

The WLAN main antenna is 281 mm from edge 4 and can be treated as mobile for simultaneous transmission analysis.

According to KDB 447498 §7.2 simultaneous transmission evaluations can be excluded when:

The $[\Sigma \text{ of (the highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance)} / 1.6 \text{ W/kg}] + [\Sigma \text{ of MPE ratios}] \leq 1.0$.

WLAN MPE calculations are taken from UL Verification Services, Inc. SAR report number 13J15516-1

13.19.1. MPE calculations for the WWAN antenna

MPE for WWAN Antenna at edge 2

Mode	Frequency (MHz)	Output power (dBm)	Gain (dBi)	Duty Cycle	EIRP (mW)	Distance (cm)	Power density (mW/cm ²)	FCC Limit (mW/cm ²)	% of limit
GSM850	824.2	33.0	-1.10	25%	387.2	28.1	0.0390	1.00	3.90%
GSM1900	1850.2	30.0	1.75	25%	374.1	28.1	0.0377	1.00	3.77%
WCDMA	826.4	24.0	-1.10	100%	195.0	28.1	0.0197	1.00	1.97%
WCDMA	1712.4	24.0	1.78	100%	378.4	28.1	0.0381	1.00	3.81%
WCDMA	1852.4	24.0	1.75	100%	375.8	28.1	0.0379	1.00	3.79%
CDMA	824.7	24.0	-1.10	100%	195.0	28.1	0.0197	1.00	1.97%
CDMA	1851.25	24.0	1.75	100%	375.8	28.1	0.0379	1.00	3.79%
CDMA	817.9	24.0	-1.10	100%	195.0	28.1	0.0197	1.00	1.97%
LTE B2	1850.7	24.0	1.75	100%	375.8	28.1	0.0379	1.00	3.79%
LTE B4	1710.7	24.0	1.78	100%	378.4	28.1	0.0381	1.00	3.81%
LTE B5	824.7	24.0	-1.10	100%	195.0	28.1	0.0197	1.00	1.97%
LTE B13	779.5	24.0	-1.10	100%	195.0	28.1	0.0197	1.00	1.97%
LTE B17	706.5	24.0	-1.94	100%	160.7	28.1	0.0162	1.00	1.62%
LTE B25	1850.7	24.0	1.75	100%	375.8	28.1	0.0379	1.00	3.79%

13.19.2. Edge 2 Simultaneous Transmission analysis

The maximum reported SAR for edge 2 is 0.659W/kg (WLAN main antenna)

The maximum MPE ratio of the limit for the WLAN aux antenna at edge 2 is 0.007

The maximum MPE ratio of the limit for the WWAN antenna at edge 2 is 0.039

$0.659/1.6 + (0.007+0.039) = 0.458$ which is ≤ 1.0

13.19.3. Edge 4 Simultaneous Transmission analysis

The maximum reported WLAN SAR for edge 4 is 0.269 W/kg (WLAN main antenna)

The maximum reported WWAN SAR for edge 4 is 0.659 W/kg (WLAN main antenna)

The maximum MPE ratio of the limit for WLAN main antenna at edge 4 is 0.003

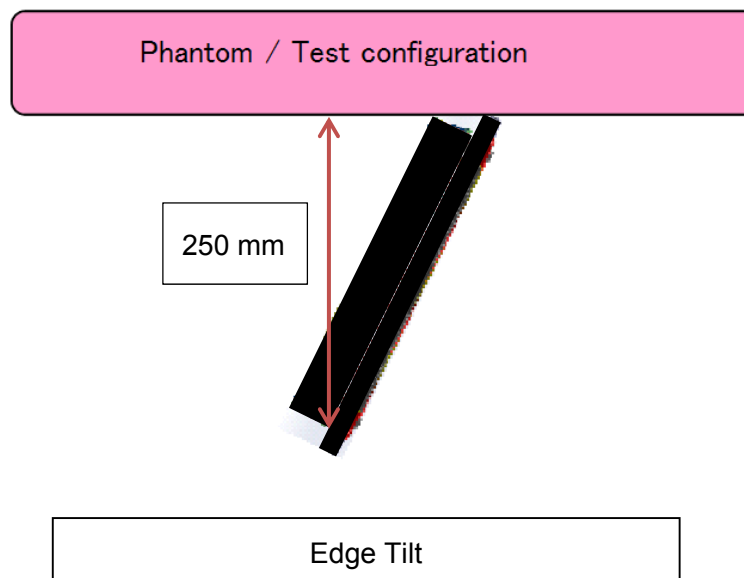
$((0.723+0.269)/1.6) + 0.003 = 0.623$ which is ≤ 1.0

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because either the sum of the 1-g SAR is < 1.6 W/kg or the sum of the ratios of the SAR and MPE ≤ 1.0 .

13.20. Edge 2 tilt and Edge 4 tilt for WWAN and WLAN 2 Tx (MIMO)

When tested in the tilt position the antennas on the opposite edge are closer to the phantom than when the DUT is vertical.



250 mm was used as the separation distance when calculating the MPE for tilt testing.

13.20.1. Edge 4 Tilt Simultaneous Transmission analysis

The maximum reported WLAN SAR for edge 4 tilt is 0.172 W/kg (WLAN main antenna)

The maximum reported WWAN SAR for edge 4 is 1.165 W/kg (WLAN main antenna)

The maximum MPE ratio of the limit for WLAN main antenna at edge 4 tilt is 0.003

$((1.165+0.269)/1.6) + 0.003 = 0.899$ which is ≤ 1.0

13.20.2. Edge 2 Tilt Simultaneous Transmission analysis

MPE for WWAN Antenna at edge 2 tilt

Mode	Frequency (MHz)	Output power (dBm)	Gain (dBi)	Duty Cycle	EIRP (mW)	Distance (cm)	Power density (mW/cm ²)	FCC Limit (mW/cm ²)	% of limit
GSM850	824.2	33.0	-1.10	25%	387.2	25	0.0493	1.00	4.93%
GSM1900	1850.2	30.0	1.75	25%	374.1	25	0.0476	1.00	4.76%
WCDMA	826.4	24.0	-1.10	100%	195.0	25	0.0248	1.00	2.48%
WCDMA	1712.4	24.0	1.78	100%	378.4	25	0.0482	1.00	4.82%
WCDMA	1852.4	24.0	1.75	100%	375.8	25	0.0479	1.00	4.79%
CDMA	824.7	24.0	-1.10	100%	195.0	25	0.0248	1.00	2.48%
CDMA	1851.25	24.0	1.75	100%	375.8	25	0.0479	1.00	4.79%
CDMA	817.9	24.0	-1.10	100%	195.0	25	0.0248	1.00	2.48%
LTE B2	1850.7	24.0	1.75	100%	375.8	25	0.0479	1.00	4.79%
LTE B4	1710.7	24.0	1.78	100%	378.4	25	0.0482	1.00	4.82%
LTE B5	824.7	24.0	-1.10	100%	195.0	25	0.0248	1.00	2.48%
LTE B13	779.5	24.0	-1.10	100%	195.0	25	0.0248	1.00	2.48%
LTE B17	706.5	24.0	-1.94	100%	160.7	25	0.0205	1.00	2.05%
LTE B25	1850.7	24.0	1.75	100%	375.8	25	0.0479	1.00	4.79%

13.20.3. Edge 2 Simultaneous Transmission analysis

The maximum reported SAR for edge 2 tilt is 0.586W/kg (WLAN main antenna)

The maximum MPE ratio of the limit for the WLAN aux antenna at edge 2 is 0.009

The maximum MPE ratio of the limit for the WWAN antenna at edge 2 tilt is 0.049

$0.586/1.6 + (0.009+0.049) = 0.424$ which is ≤ 1.0

14. Appendixes

Refer to separated files for the following appendixes.

- 14.1. System Performance Check Plots**
- 14.2. SAR Test Plots**
- 14.3. SAR Test Plots for Repeatability Tests**
- 14.4. Calibration Certificate for E-Field Probe EX3DV4 - SN 3902**
- 14.5. Calibration Certificate for E-Field Probe EX3DV4 - SN 3929**
- 14.6. Calibration Certificate for E-Field Probe EX3DV4 - SN 3773**
- 14.7. Calibration Certificate for D750V3 - SN 1019**
- 14.8. Calibration Certificate for D835V2 - SN 4d142**
- 14.9. Calibration Certificate for D835V2 - SN4d002**
- 14.10. Calibration Certificate for D1750V2 - SN 1050**
- 14.11. Calibration Certificate for D1900V2 - SN 5d163**
- 14.12. Calibration Certificate for D1900V2 - SN 5d043**
- 14.13. Calibration Certificate for D2450V2 - SN 899**
- 14.14. Calibration Certificate for D5GHzV2 - SN 1138**