



**FCC OET BULLETIN 65 SUPPLEMENT C 01-01
IEEE Std 1528-2003 and IEEE Std 1528a-2005**

SAR EVALUATION REPORT

For
**Multi-band Radio Module
(Tested inside of Panasonic Tablet PC FZ-G1)**

**Model: WW12E2
FCC ID: ACJ9TGWW12E2**

**Report Number: 12J14676-1C
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Prepared for
**PANASONIC CORPORATION OF NORTH AMERICA
ONE PANASONIC WAY, 4B-8
SECAUCUS, NJ 07094**

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



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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	3/25/2013	Initial Issue	--
A	3/27/2013	- Section 4 – Added calibration information for probe SN3751 - Section 9.2 – Corrected typo error in tune-up limit table - Section 14 and appendixes – Added calibration certificate for probe SN3751 and SAR plots for Wi-Fi.	Ray Su
B	3/28/2013	- Section 9 – Added statement to clarify the relationship between target power and the stated tolerance values - Section 13 – Fixed typo errors in simultaneous transmission analysis tables for CDMA BC0 and CDMA BC1	Dave Weaver
C	3/29/2013	- Section 9.1 – Removed misplaced statements regarding required test modes for GSM.	Ray Su

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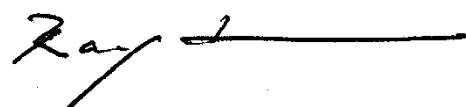
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1. Attestation of Test Results

Applicant	Panasonic Corporation of North America	
DUT description	Multi-band Radio Module (Tested inside of Panasonic Tablet PC FZ-G1)	
Model	WW12E2	
Test device is	An identical prototype	
Device category	Portable	
Exposure category	General Population/Uncontrolled Exposure	
Date tested	12/13/2012 – 3/12/2013	
	Applicable Standards	Test Results
	Published RF exposure KDB procedures, TCB workshop updates and OET Bulletin 65 Supplement C, IEEE Std 1528-2003 and IEEE Std 1528a-2005	Pass
<p>UL CCS 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 CCS 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.</p> <p>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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS 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.</p>		
Approved & Released For UL CCS By:		Tested By:
		
Dave Weaver Program Manager UL CCS		Ray Su SAR Engineer UL CCS

1.1. Summary of Highest 1g SAR Results

Worst Case SAR data for each Frequency Band

RF Exposure Rule	Freq. Range	Highest Reported SAR	Limit
22	824-849 MHz	Body: 1.37 W/kg (Edge 1)	1.6 W/kg
24	1850-1910 MHz	Body: 1.39 W/kg (Edge 1)	
27	1710–1755 MHz	Body: 1.38 W/kg (Edge 1)	
Simultaneous transmission condition		1.59 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 OET Bulletin 65 Supplement C Edition 01-01, IEEE STD 1528-2003, IEEE Std 1528a-2005 and the following published RF exposure KDB procedures:

- 941225 D01 SAR test for 3G devices v02
- 941225 D02 Guidance for 3GPP R6 and R7 HSPA v02v01
- 941225 D03 SAR Test Reduction GSM GPRS EDGE v01
- 865664 D01 SAR Measurement 100 MHz to 6 GHz v01
- 865664 D02 SAR Reporting v01
- 447498 D01 General RF Exposure Guidance v05
- 248227 D01 SAR Meas for 802 11abg v01r02
- 616217 D04 SAR for laptop and tablets v01

3. Accreditation

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

UL CCS 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.

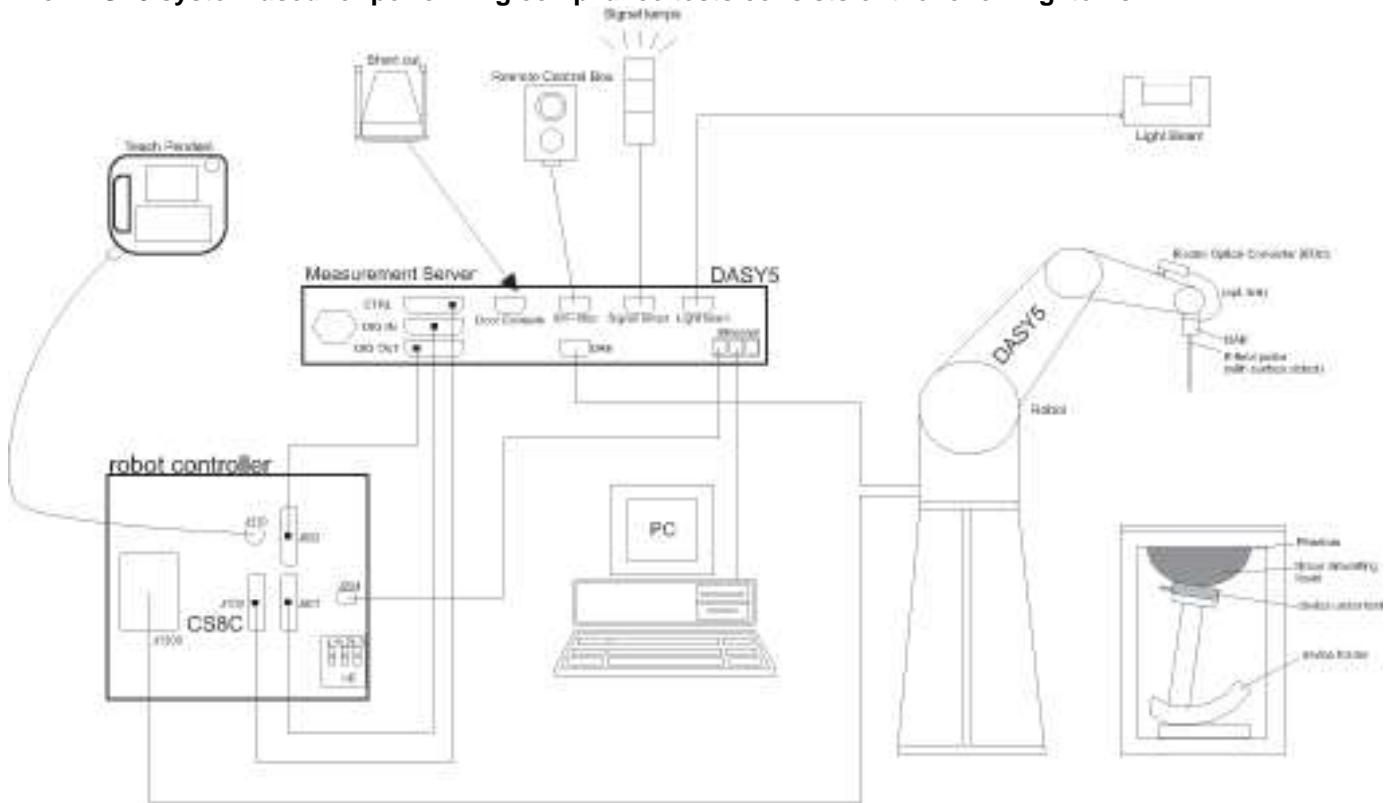
Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due date		
				MM	DD	Year
S-Parameter Network Analyzer	Agilent	8753ES	MY40001647	6	27	2013
Dielectronic Probe kit	SPEAG	SM DAK 040 CA	1082	9	18	2013
ENA Series Network Analyzer	Agilent	E5071B	MY42100131	2	11	2013
Dielectronic Probe kit	HP	85070E	594	N/A		
Synthesized Signal Generator	HP	8665B	3438A00633	2	22	2013
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	5	3	2013
Power Meter	HP	438A	2822A05684	10	7	2013
Power Sensor A	HP	8481A	2702A66876	8	1	2013
Power Sensor B	HP	8482A	2349A08568	4	14	2013
Amplifier	MITEQ	4D00400600-50-30P	1620606	N/A		
Directional coupler	Werlatone	C8060-102	2141	N/A		
Base Station Simulator	R & S	CMU200	106301	6	6	2013
Base Station Simulator	R & S	CMU200	118339	5	20	2013
Base Station Simulator	R & S	CMW500	124593	7	1	2013
Base Station Simulator	Agilent	8960	GB42361452	4	4	2013
Thermometer	ERTCO	639-1S	8350	7	30	2013
E-Field Probe	SPEAG	EX3DV4	3686	2	16	2013
E-Field Probe	SPEAG	EX3DV4	3749	1	15	2014
E-Field Probe	SPEAG	EX3DV4	3751	11	15	2013
E-Field Probe	SPEAG	EX3DV4	3871	8	20	2013
E-Field Probe	SPEAG	EX3DV4	3885	10	9	2013
Data Acquisition Electronics	SPEAG	DAE4	1258	3	8	2013
Data Acquisition Electronics	SPEAG	DAE4	1259	2	13	2013
Data Acquisition Electronics	SPEAG	DAE4	1343	8	20	2013
Data Acquisition Electronics	SPEAG	DAE3	427	1	9	2014
Data Acquisition Electronics	SPEAG	DAE4	1352	10	8	2013
System Validation Dipole	SPEAG	D835V2	4d002	10	24	2013
System Validation Dipole	SPEAG	D835V2	4d117	4	10	2013
System Validation Dipole	SPEAG	D1750V2	1053	8	15	2013
System Validation Dipole	SPEAG	D1750V2	1077	10	3	2013
System Validation Dipole	SPEAG	D1900V2	5d140	4	18	2013
System Validation Dipole	SPEAG	D2450V2	706	11	6	2013
System Validation Dipole	SPEAG	D5GHzV2	1003	9	18	2013
Power Meter	R & S	NRP	100673	5	5	2013
Power Sensor	R & S	NRP - Z23	100168	5	5	2013
Power Meter	Agilent	N1912A	MY52310061	7	5	2013
Power Sensor Ch A	Agilent	N1921A	MY52260009	7	5	2013
Power Sensor Ch B	Agilent	N1921A	MY52270022	7	21	2013
Power Meter	Agilent	N1912A	MY50001018	8	10	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° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area} , Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

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)

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

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.

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

Multi-band Radio Module (Tested inside of Panasonic Tablet PC FZ-G1) Model: WW12E1	
Operating Configuration(s)	<ul style="list-style-type: none"> Tablet Mode
Exposure Condition(s)	<ul style="list-style-type: none"> The device is used in close proximity to the body. Specific details of the required test positions are provided in Section 8 "Exposure Conditions"
Accessory	<ul style="list-style-type: none"> None

7.1. Band and Air Interfaces

Wireless Mode and Frequency Bands	<ul style="list-style-type: none"> 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 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:	10
GPRS Class:	B
Duty Cycle	<ul style="list-style-type: none"> GPRS 2 Slots: 25% W-CDMA: 100% CDMA: 100%

7.2. Hotspot (Wireless Router) Exposure Condition

N/A

7.3. Simultaneous Transmission

Usage Scenario	Modes	Mode of Operation	BAND	CDMA 1xRTT	CDMA 1xEV-DO	GPRS/EDGE	WCDMA	HSDPA	HSUPA	HSPA+	DC-HSPA	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	CDMA 1xRTT	BC0	YES	No	No	No	No	No	No	No	YES	No	No	No	No		
		CDMA 1xRTT	BC1	YES	No	No	No	No	No	No	No	YES	No	No	No	No	No	
		CDMA 1xEVDO	BC0	No	YES	No	No	No	No	No	No	YES	No	No	No	No	No	
		CDMA 1xEVDO	BC1	No	YES	No	No	No	No	No	No	YES	No	No	No	No	No	
		EDGE	850	No	No	YES	No	No	No	No	No	YES	No	No	No	No	No	
		EDGE	1900	No	No	YES	No	No	No	No	No	YES	No	No	No	No	No	
		W-CDMA	850	No	No	No	YES	No	No	No	No	YES	No	No	No	No	No	
		W-CDMA	1700	No	No	No	YES	No	No	No	No	YES	No	No	No	No	No	
		W-CDMA	1900	No	No	No	YES	No	No	No	No	YES	No	No	No	No	No	
		HSDPA	850	No	No	No	No	YES	No	No	No	YES	No	No	No	No	No	
		HSDPA	1700	No	No	No	No	YES	No	No	No	YES	No	No	No	No	No	
		HSDPA	1900	No	No	No	No	YES	No	No	No	YES	No	No	No	No	No	
		HSUPA	850	No	No	No	No	No	YES	No	No	YES	No	No	No	No	No	
		HSUPA	1700	No	No	No	No	No	YES	No	No	YES	No	No	No	No	No	
		HSUPA	1900	No	No	No	No	No	YES	No	No	YES	No	No	No	No	No	
		HSPA+	850	No	No	No	No	No	No	YES	No	YES	No	No	No	No	No	
		HSPA+	1700	No	No	No	No	No	No	YES	No	YES	No	No	No	No	No	
		HSPA+	1900	No	No	No	No	No	No	YES	No	YES	No	No	No	No	No	
		DC-HSDPA	850	No	No	No	No	No	No	No	YES	YES	YES	No	No	No	No	
		DC-HSDPA	1700	No	No	No	No	No	No	No	YES	YES	YES	No	No	No	No	
		DC-HSDPA	1900	No	No	No	No	No	No	No	YES	YES	YES	No	No	No	No	
		CDMA 1xRTT	BC0	YES	No	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	No	YES	No	No	No	No
		CDMA 1xEVDO	BC0	No	YES	No	No	No	No	No	No	No	No	YES	No	No	No	No
		CDMA 1xEVDO	BC1	No	YES	No	No	No	No	No	No	No	No	YES	No	No	No	No
		EDGE	850	No	No	YES	No	No	No	No	No	No	No	YES	No	No	No	No
		EDGE	1900	No	No	YES	No	No	No	No	No	No	No	YES	No	No	No	No
		W-CDMA	850	No	No	No	YES	No	No	No	No	No	No	YES	No	No	No	No
		W-CDMA	1700	No	No	No	YES	No	No	No	No	No	No	YES	No	No	No	No
		W-CDMA	1900	No	No	No	YES	No	No	No	No	No	No	YES	No	No	No	No
		HSDPA	850	No	No	No	No	YES	No	No	No	YES	No	YES	No	No	No	No
		HSDPA	1700	No	No	No	No	YES	No	No	No	YES	No	YES	No	No	No	No
		HSDPA	1900	No	No	No	No	YES	No	No	No	YES	No	YES	No	No	No	No
		HSUPA	850	No	No	No	No	No	YES	No	No	YES	No	YES	No	No	No	No
		HSUPA	1700	No	No	No	No	No	YES	No	No	YES	No	YES	No	No	No	No
		HSUPA	1900	No	No	No	No	No	YES	No	No	YES	No	YES	No	No	No	No
		HSPA+	850	No	No	No	No	No	No	YES	No	YES	No	YES	No	No	No	No
		HSPA+	1700	No	No	No	No	No	No	YES	No	YES	No	YES	No	No	No	No
		HSPA+	1900	No	No	No	No	No	No	YES	No	YES	No	YES	No	No	No	No
		DC-HSDPA	850	No	No	No	No	No	No	No	YES	YES	YES	YES	No	No	No	No
		DC-HSDPA	1700	No	No	No	No	No	No	No	YES	YES	YES	YES	No	No	No	No
		DC-HSDPA	1900	No	No	No	No	No	No	No	YES	YES	YES	YES	No	No	No	No
Body SAR	WWAN + 5 GHz Bands WLAN	CDMA 1xRTT	BC0	YES	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 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	
		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	YES	No	No	YES	No	No	
		HSPA+	1700	No	No	No	No	No	No	YES	No	YES	No	No	YES	No	No	
		HSPA+	1900	No	No	No	No	No	No	YES	No	YES	No	No	YES	No	No	
DC-HSDPA	850	No	No	No	No	No	No	No	YES	YES	YES	YES	YES	No	No			
DC-HSDPA	1700	No	No	No	No	No	No	No	YES	YES	YES	YES	YES	No	No			
DC-HSDPA	1900	No	No	No	No	No	No	No	YES	YES	YES	YES	YES	No	No			

Simultaneous Transmission continued

Usage Scenario	Modes	Mode of Operation	BAND	CDMA 1xRTT	CDMA 1xEVDO	GPRS/EDGE	WCDMA	HSDPA	HSUPA	HSPA+	DC-HSPA	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		
		CDMA 1xRTT	BC1	YES	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	YES	No		
		CDMA 1xEVDO	BC1	No	YES	No	No	No	No	No	No	No	No	No	YES	No		
		EDGE	850	No	No	YES	No	No	No	No	No	No	No	No	YES	No		
		EDGE	1900	No	No	YES	No	No	No	No	No	No	No	No	YES	No		
		W-CDMA	850	No	No	No	YES	No	No	No	No	No	No	No	YES	No		
		W-CDMA	1700	No	No	No	YES	No	No	No	No	No	No	No	YES	No		
		W-CDMA	1900	No	No	No	YES	No	No	No	No	No	No	No	YES	No		
		HSDPA	850	No	No	No	No	YES	No	No	No	No	No	No	YES	No		
		HSDPA	1700	No	No	No	No	YES	No	No	No	No	No	No	YES	No		
		HSDPA	1900	No	No	No	No	YES	No	No	No	No	No	No	YES	No		
		HSUPA	850	No	No	No	No	No	YES	No	No	No	No	No	YES	No		
		HSUPA	1700	No	No	No	No	No	YES	No	No	No	No	No	YES	No		
		HSUPA	1900	No	No	No	No	No	YES	No	No	No	No	No	YES	No		
		HSPA+	850	No	No	No	No	No	No	YES	No	No	No	No	YES	No		
		HSPA+	1700	No	No	No	No	No	No	YES	No	No	No	No	YES	No		
		HSPA+	1900	No	No	No	No	No	No	YES	No	No	No	No	YES	No		
		DC-HSDPA	850	No	No	No	No	No	No	No	YES	No	No	No	YES	No		
		DC-HSDPA	1700	No	No	No	No	No	No	No	YES	No	No	No	YES	No		
		DC-HSDPA	1900	No	No	No	No	No	No	No	YES	No	No	No	YES	No		
		Body SAR	WWAN + BT	CDMA 1xRTT	BC0	YES	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	YES
				CDMA 1xEVDO	BC0	No	YES	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	YES
				EDGE	850	No	No	YES	No	No	No	No	No	No	No	No	No	YES
				EDGE	1900	No	No	YES	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	YES
				W-CDMA	1700	No	No	No	YES	No	No	No	No	No	No	No	No	YES
				W-CDMA	1900	No	No	No	YES	No	No	No	No	No	No	No	No	YES
				HSDPA	850	No	No	No	No	YES	No	No	No	No	No	No	No	YES
				HSDPA	1700	No	No	No	No	YES	No	No	No	No	No	No	No	YES
				HSDPA	1900	No	No	No	No	YES	No	No	No	No	No	No	No	YES
				HSUPA	850	No	No	No	No	No	YES	No	No	No	No	No	No	YES
				HSUPA	1700	No	No	No	No	No	YES	No	No	No	No	No	No	YES
				HSUPA	1900	No	No	No	No	No	YES	No	No	No	No	No	No	YES
				HSPA+	850	No	No	No	No	No	No	YES	No	No	No	No	No	YES
				HSPA+	1700	No	No	No	No	No	No	YES	No	No	No	No	No	YES
				HSPA+	1900	No	No	No	No	No	No	YES	No	No	No	No	No	YES
				DC-HSDPA	850	No	No	No	No	No	No	No	YES	No	No	No	No	YES
				DC-HSDPA	1700	No	No	No	No	No	No	No	YES	No	No	No	No	YES
				DC-HSDPA	1900	No	No	No	No	No	No	No	YES	No	No	No	No	YES
Body SAR	WWAN + 2.4 GHz WLAN + BT			CDMA 1xRTT	BC0	YES	No	No	No	No	No	No	No	YES	No	No	No	YES
				CDMA 1xRTT	BC1	YES	No	No	No	No	No	No	No	YES	No	No	No	YES
				CDMA 1xEVDO	BC0	No	YES	No	No	No	No	No	No	YES	No	No	No	YES
				CDMA 1xEVDO	BC1	No	YES	No	No	No	No	No	No	YES	No	No	No	YES
				EDGE	850	No	No	YES	No	No	No	No	No	YES	No	No	No	YES
				EDGE	1900	No	No	YES	No	No	No	No	No	YES	No	No	No	YES
				W-CDMA	850	No	No	No	YES	No	No	No	No	YES	No	No	No	YES
				W-CDMA	1700	No	No	No	YES	No	No	No	No	YES	No	No	No	YES
				W-CDMA	1900	No	No	No	YES	No	No	No	No	YES	No	No	No	YES
				HSDPA	850	No	No	No	No	YES	No	No	No	YES	No	No	No	YES
				HSDPA	1700	No	No	No	No	YES	No	No	No	YES	No	No	No	YES
				HSDPA	1900	No	No	No	No	YES	No	No	No	YES	No	No	No	YES
				HSUPA	850	No	No	No	No	No	YES	No	No	YES	No	No	No	YES
				HSUPA	1700	No	No	No	No	No	YES	No	No	YES	No	No	No	YES
				HSUPA	1900	No	No	No	No	No	YES	No	No	YES	No	No	No	YES
				HSPA+	850	No	No	No	No	No	No	YES	No	YES	No	No	No	YES
				HSPA+	1700	No	No	No	No	No	No	YES	No	YES	No	No	No	YES
				HSPA+	1900	No	No	No	No	No	No	YES	No	YES	No	No	No	YES
				DC-HSDPA	850	No	No	No	No	No	No	No	YES	YES	No	No	No	YES
				DC-HSDPA	1700	No	No	No	No	No	No	No	YES	YES	No	No	No	YES
				DC-HSDPA	1900	No	No	No	No	No	No	No	YES	YES	No	No	No	YES

Simultaneous Transmission continued

Usage Scenario	Modes	Mode of Operation	BAND	CDMA 1xRTT	CDMA 1xEVDO	GPRS/EDGE	WCDMA	HSDPA	HSUPA	HSPA+	DC-HSPA	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 + 5GHz Bands WLAN + BT	CDMA 1xRTT	BC0	YES	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	YES	No	YES		
		CDMA 1xEVDO	BC0	No	YES	No	No	No	No	No	No	No	No	YES	No	YES		
		CDMA 1xEVDO	BC1	No	YES	No	No	No	No	No	No	No	No	YES	No	YES		
		EDGE	850	No	No	YES	No	No	No	No	No	No	No	YES	No	YES		
		EDGE	1900	No	No	YES	No	No	No	No	No	No	No	YES	No	YES		
		W-CDMA	850	No	No	No	YES	No	No	No	No	No	No	YES	No	YES		
		W-CDMA	1700	No	No	No	YES	No	No	No	No	No	No	YES	No	YES		
		W-CDMA	1900	No	No	No	YES	No	No	No	No	No	No	YES	No	YES		
		HSDPA	850	No	No	No	No	YES	No	No	No	No	No	YES	No	YES		
		HSDPA	1700	No	No	No	No	YES	No	No	No	No	No	YES	No	YES		
		HSDPA	1900	No	No	No	No	YES	No	No	No	No	No	YES	No	YES		
		HSUPA	850	No	No	No	No	No	YES	No	No	No	No	YES	No	YES		
		HSUPA	1700	No	No	No	No	No	YES	No	No	No	No	YES	No	YES		
		HSUPA	1900	No	No	No	No	No	YES	No	No	No	No	YES	No	YES		
		HSPA+	850	No	No	No	No	No	No	YES	No	No	No	YES	No	YES		
		HSPA+	1700	No	No	No	No	No	No	YES	No	No	No	YES	No	YES		
		HSPA+	1900	No	No	No	No	No	No	YES	No	No	No	YES	No	YES		
		DC-HSDPA	850	No	No	No	No	No	No	No	YES	No	YES	No	YES	No	YES	
		DC-HSDPA	1700	No	No	No	No	No	No	No	YES	No	YES	No	YES	No	YES	
		DC-HSDPA	1900	No	No	No	No	No	No	No	YES	No	YES	No	YES	No	YES	
		WWAN + 2.4GHz WLAN MIMO (2 Tx on WLAN)	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 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
			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	
	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	
	WWAN + 5 GHz Bands WLAN MIMO (2 Tx on WLAN)		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 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
			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	YES	No	YES	YES	No	
		DC-HSDPA	1700	No	No	No	No	No	No	No	YES	No	YES	No	YES	YES	No	
	DC-HSDPA	1900	No	No	No	No	No	No	No	YES	No	YES	No	YES	YES	No		

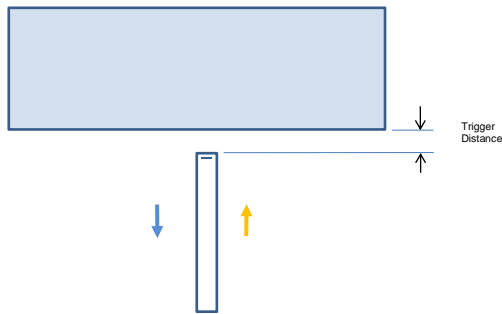
Notes:

- Bluetooth transmits using the WLAN Aux Antenna
- Bluetooth can transmit simultaneously with the WLAN Main Antenna, in either of the WLAN bands.
- 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.
- With a maximum output power of 4.47 mW, Bluetooth qualifies for Standalone SAR test exclusion based on the formula for Standalone SAR test exclusion considerations outlined in KDB 447498 D01 . For the exact value that this formula yields, please refer to **Section 14 "Simultaneous Transmission SAR Analysis"** of this report.

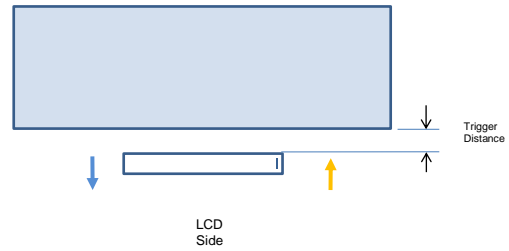
7.4. Proximity Sensor Triggering distance (KDB 616217 §6.2)

Edge 1 of the DUT was placed directly below the flat phantom. The DUT was moved toward the phantom in accordance with the steps outlined in KDB 616217 §6.2 to determine the trigger distance for enabling power reduction. The DUT was moved away from the phantom to determine the trigger distance for resuming full power.

The measurement was then repeated for the Rear surface.



Proximity Sensor Trigger Distance Assessment
 KDB 616217 §6.2, **Edge 1**



Proximity Sensor Trigger Distance Assessment
 KDB 616217 §6.2, **Rear**

LEGEND

- Direction of DUT travel for determination of full power resumption triggering point
- Direction of DUT travel for determination of power reduction triggering point

Summary of Trigger Distances

Tissue simulating liquid	Trigger distance - Edge 1		Trigger distance - Rear	
	Moving toward phantom	Moving from phantom	Moving toward phantom	Moving from phantom
850 muscle	23 mm	25 mm	11 mm	17 mm
1750 muscle	21 mm	26 mm	12 mm	15 mm
1900 muscle	21 mm	26 mm	11 mm	15 mm

Full power testing for Edge 1 was performed at 1mm less than the smallest measured trigger distance in accordance with KDB 616217.

Full power testing for the rear was performed at 6mm at the request of the client. This is more conservative than required by KDB 616217.

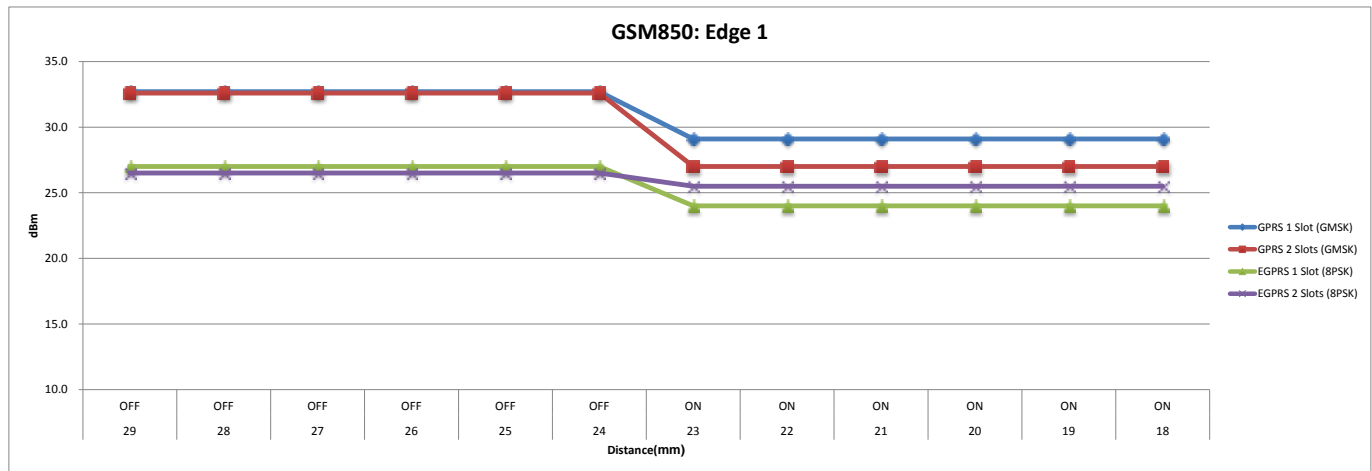
7.5. Triggering Distances and Power Levels

7.5.1. DUT moving toward the phantom

GSM850

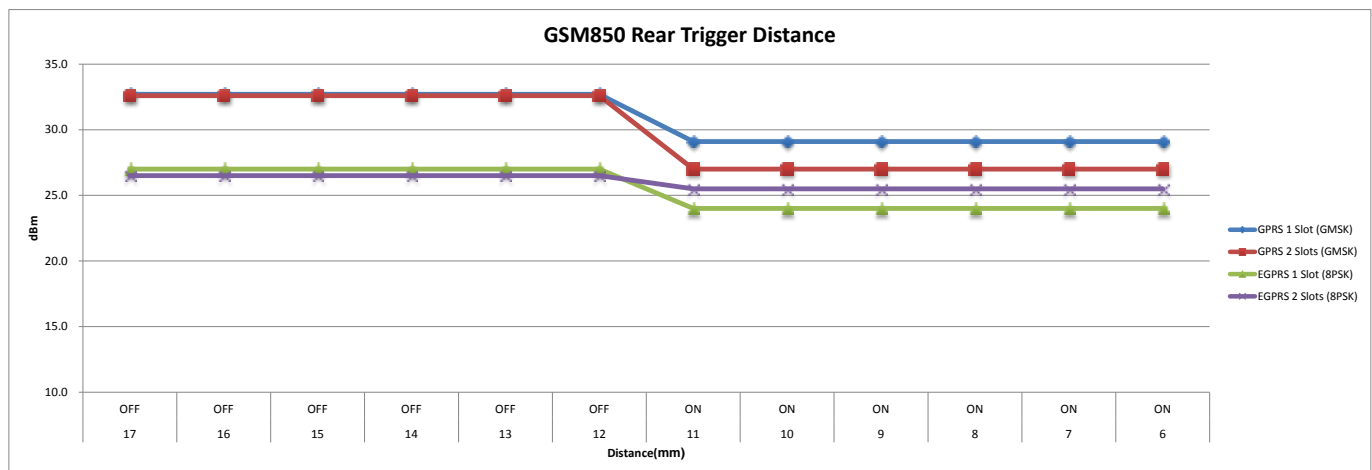
Edge 1

Edge 1, (GSM850)												
Distance (mm):	29	28	27	26	25	24	23	22	21	20	19	18
Proximity sensor with reduced power activation:	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON
GPRS 1 Slot (GMSK)	32.7	32.7	32.7	32.7	32.7	32.7	29.1	29.1	29.1	29.1	29.1	29.1
GPRS 2 Slots (GMSK)	32.6	32.6	32.6	32.6	32.6	32.6	27.0	27.0	27.0	27.0	27.0	27.0
EGPRS 1 Slot (8PSK)	27.0	27.0	27.0	27.0	27.0	27.0	24.0	24.0	24.0	24.0	24.0	24.0
EGPRS 2 Slots (8PSK)	26.6	26.6	26.6	26.6	26.6	26.6	25.5	25.5	25.5	25.5	25.5	25.5



Rear

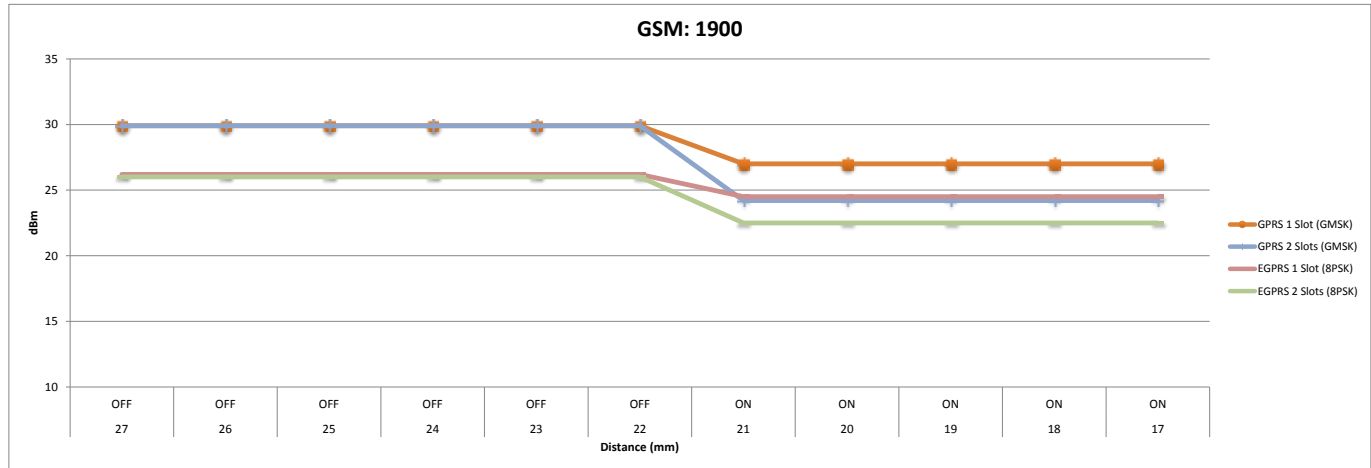
Rear, (GSM850)												
Distance (mm):	17	16	15	14	13	12	11	10	9	8	7	6
Proximity sensor with reduced power activation:	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON
GPRS 1 Slot (GMSK)	32.7	32.7	32.7	32.7	32.7	32.7	29.1	29.1	29.1	29.1	29.1	29.1
GPRS 2 Slots (GMSK)	32.6	32.6	32.6	32.6	32.6	32.6	27.0	27.0	27.0	27.0	27.0	27.0
EGPRS 1 Slot (8PSK)	27.0	27.0	27.0	27.0	27.0	27.0	24.0	24.0	24.0	24.0	24.0	24.0
EGPRS 2 Slots (8PSK)	26.6	26.6	26.6	26.6	26.6	26.6	25.5	25.5	25.5	25.5	25.5	25.5



GSM1900

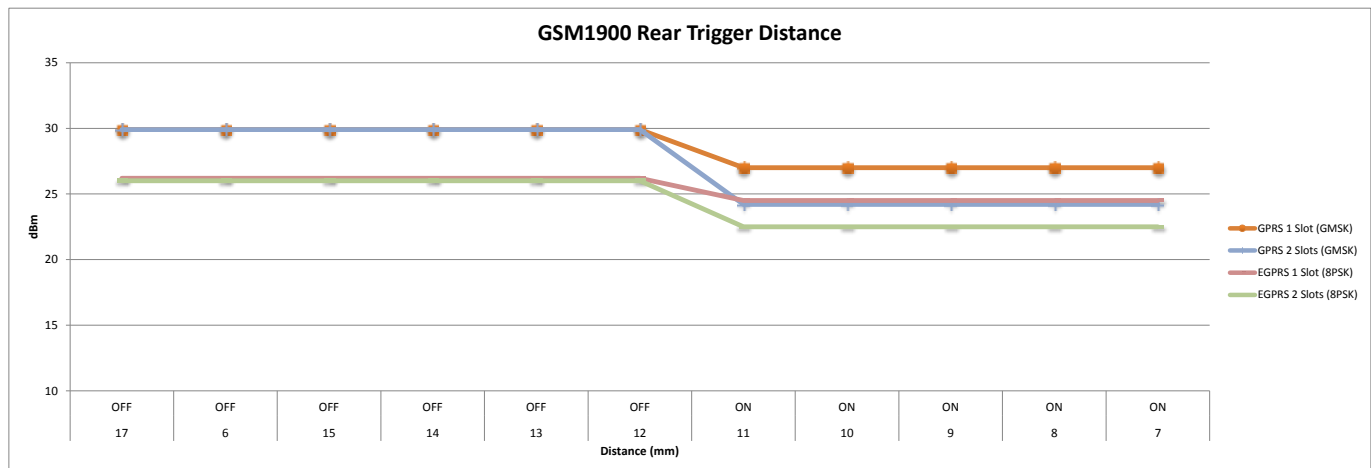
Edge 1

Edge 1, (GSM1900)												
Distance (mm):	27	26	25	24	23	22	21	20	19	18	17	16
Proximity sensor with reduced power activation:	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON
GPRS 1 Slot (GMSK)	29.9	29.9	29.9	29.9	29.9	29.9	27.0	27.0	27.0	27.0	27.0	27.0
GPRS 2 Slots (GMSK)	29.9	29.9	29.9	29.9	29.9	29.9	24.2	24.2	24.2	24.2	24.2	24.2
EGPRS 1 Slot (8PSK)	26.2	26.2	26.2	26.2	26.2	26.2	24.5	24.5	24.5	24.5	24.5	24.5
EGPRS 2 Slots (8PSK)	26.0	26.0	26.0	26.0	26.0	26.0	22.5	22.5	22.5	22.5	22.5	22.5



Rear

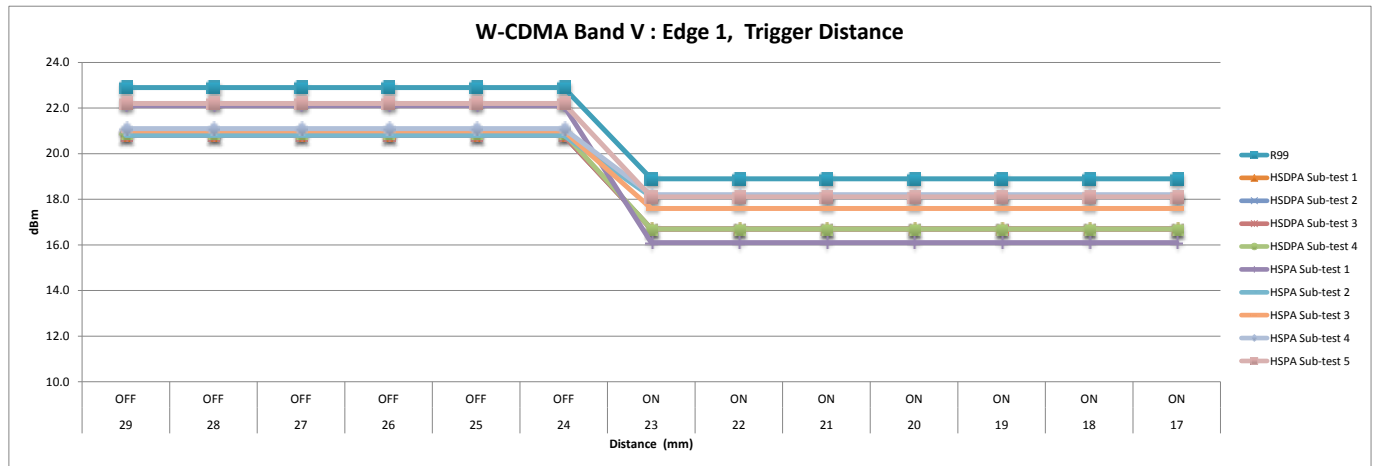
Rear, (GSM1900)												
Distance (mm):	17	6	15	14	13	12	11	10	9	8	7	6
Proximity sensor with reduced power activation:	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON
GPRS 1 Slot (GMSK)	29.9	29.9	29.9	29.9	29.9	29.9	27.0	27.0	27.0	27.0	27.0	27.0
GPRS 2 Slots (GMSK)	29.9	29.9	29.9	29.9	29.9	29.9	24.2	24.2	24.2	24.2	24.2	24.2
EGPRS 1 Slot (8PSK)	26.2	26.2	26.2	26.2	26.2	26.2	24.5	24.5	24.5	24.5	24.5	24.5
EGPRS 2 Slots (8PSK)	26.0	26.0	26.0	26.0	26.0	26.0	22.5	22.5	22.5	22.5	22.5	22.5



W-CDMA Band V

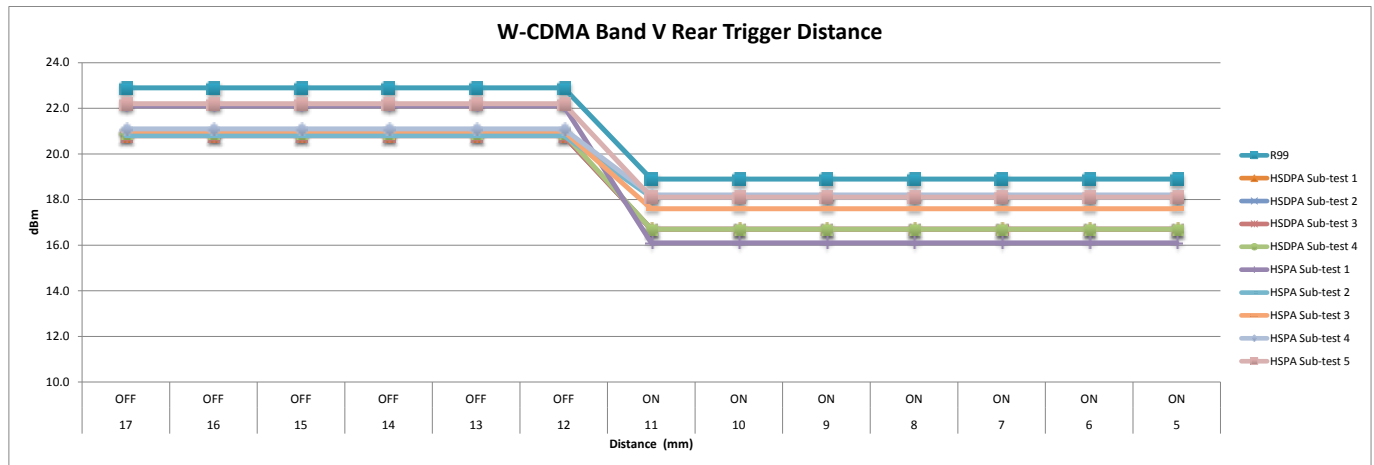
Edge 1

Edge 1, W-CDMA Band V													
Distance (mm):	29	28	27	26	25	24	23	22	21	20	19	18	17
Proximity sensor with reduced power activation:	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON
R99	22.9	22.9	22.9	22.9	22.9	22.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9
HSDPA Sub-test 1	20.8	20.8	20.8	20.8	20.8	20.8	16.7	16.7	16.7	16.7	16.7	16.7	16.7
HSDPA Sub-test 2	20.8	20.8	20.8	20.8	20.8	20.8	16.7	16.7	16.7	16.7	16.7	16.7	16.7
HSDPA Sub-test 3	20.8	20.8	20.8	20.8	20.8	20.8	16.7	16.7	16.7	16.7	16.7	16.7	16.7
HSDPA Sub-test 4	20.9	20.9	20.9	20.9	20.9	20.9	16.7	16.7	16.7	16.7	16.7	16.7	16.7
HSPA Sub-test 1	22.1	22.1	22.1	22.1	22.1	22.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1
HSPA Sub-test 2	20.8	20.8	20.8	20.8	20.8	20.8	18.1	18.1	18.1	18.1	18.1	18.1	18.1
HSPA Sub-test 3	21.0	21.0	21.0	21.0	21.0	21.0	17.6	17.6	17.6	17.6	17.6	17.6	17.6
HSPA Sub-test 4	21.1	21.1	21.1	21.1	21.1	21.1	18.2	18.2	18.2	18.2	18.2	18.2	18.2
HSPA Sub-test 5	22.2	22.2	22.2	22.2	22.2	22.2	18.1	18.1	18.1	18.1	18.1	18.1	18.1



Rear

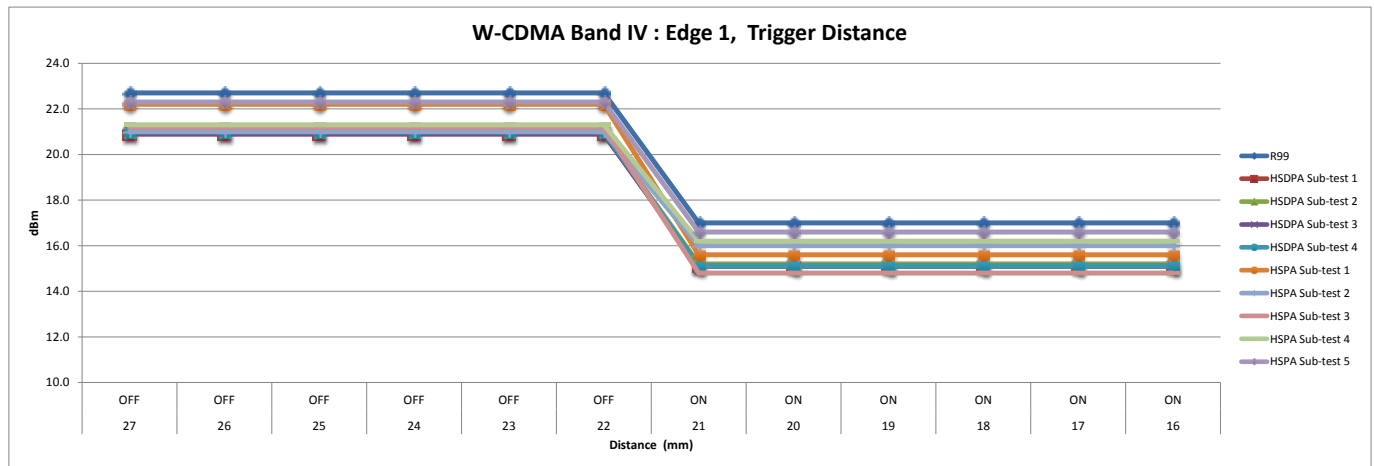
Rear, W-CDMA Band V													
Distance (mm):	17	16	15	14	13	12	11	10	9	8	7	6	5
Proximity sensor with reduced power activation:	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON
R99	22.9	22.9	22.9	22.9	22.9	22.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9
HSDPA Sub-test 1	20.8	20.8	20.8	20.8	20.8	20.8	16.7	16.7	16.7	16.7	16.7	16.7	16.7
HSDPA Sub-test 2	20.8	20.8	20.8	20.8	20.8	20.8	16.7	16.7	16.7	16.7	16.7	16.7	16.7
HSDPA Sub-test 3	20.8	20.8	20.8	20.8	20.8	20.8	16.7	16.7	16.7	16.7	16.7	16.7	16.7
HSDPA Sub-test 4	20.9	20.9	20.9	20.9	20.9	20.9	16.7	16.7	16.7	16.7	16.7	16.7	16.7
HSPA Sub-test 1	22.1	22.1	22.1	22.1	22.1	22.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1
HSPA Sub-test 2	20.8	20.8	20.8	20.8	20.8	20.8	18.1	18.1	18.1	18.1	18.1	18.1	18.1
HSPA Sub-test 3	21.0	21.0	21.0	21.0	21.0	21.0	17.6	17.6	17.6	17.6	17.6	17.6	17.6
HSPA Sub-test 4	21.1	21.1	21.1	21.1	21.1	21.1	18.2	18.2	18.2	18.2	18.2	18.2	18.2
HSPA Sub-test 5	22.2	22.2	22.2	22.2	22.2	22.2	18.1	18.1	18.1	18.1	18.1	18.1	18.1



W-CDMA Band IV

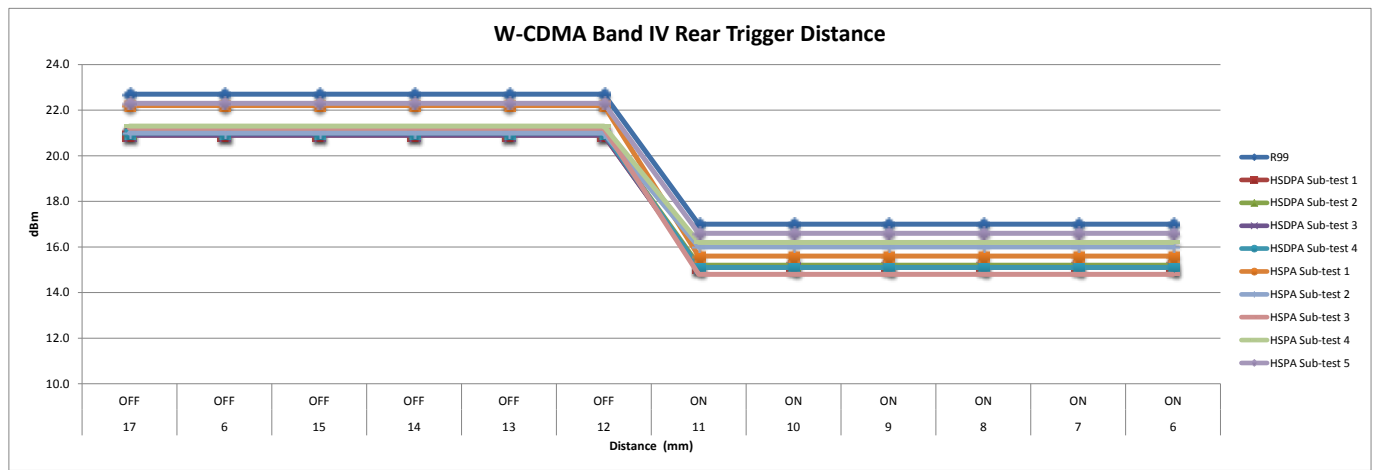
Edge 1

Edge 1, W-CDMA Band IV												
Distance (mm):	27	26	25	24	23	22	21	20	19	18	17	16
Proximity sensor with reduced power activation:	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON
R99	22.7	22.7	22.7	22.7	22.7	22.7	18.1	18.1	18.1	18.1	18.1	18.1
HSDPA Sub-test 1	20.7	20.7	20.7	20.7	20.7	20.7	16.0	16.0	16.0	16.0	16.0	16.0
HSDPA Sub-test 2	20.8	20.8	20.8	20.8	20.8	20.8	16.1	16.1	16.1	16.1	16.1	16.1
HSDPA Sub-test 3	20.7	20.7	20.7	20.7	20.7	20.7	16.1	16.1	16.1	16.1	16.1	16.1
HSDPA Sub-test 4	20.7	20.7	20.7	20.7	20.7	20.7	16.2	16.2	16.2	16.2	16.2	16.2
HSPA Sub-test 1	21.8	21.8	21.8	21.8	21.8	21.8	15.6	15.6	15.6	15.6	15.6	15.6
HSPA Sub-test 2	20.6	20.6	20.6	20.6	20.6	20.6	17.2	17.2	17.2	17.2	17.2	17.2
HSPA Sub-test 3	20.9	20.9	20.9	20.9	20.9	20.9	17.0	17.0	17.0	17.0	17.0	17.0
HSPA Sub-test 4	21.2	21.2	21.2	21.2	21.2	21.2	17.1	17.1	17.1	17.1	17.1	17.1
HSPA Sub-test 5	22.2	22.2	22.2	22.2	22.2	22.2	17.5	17.5	17.5	17.5	17.5	17.5



Rear

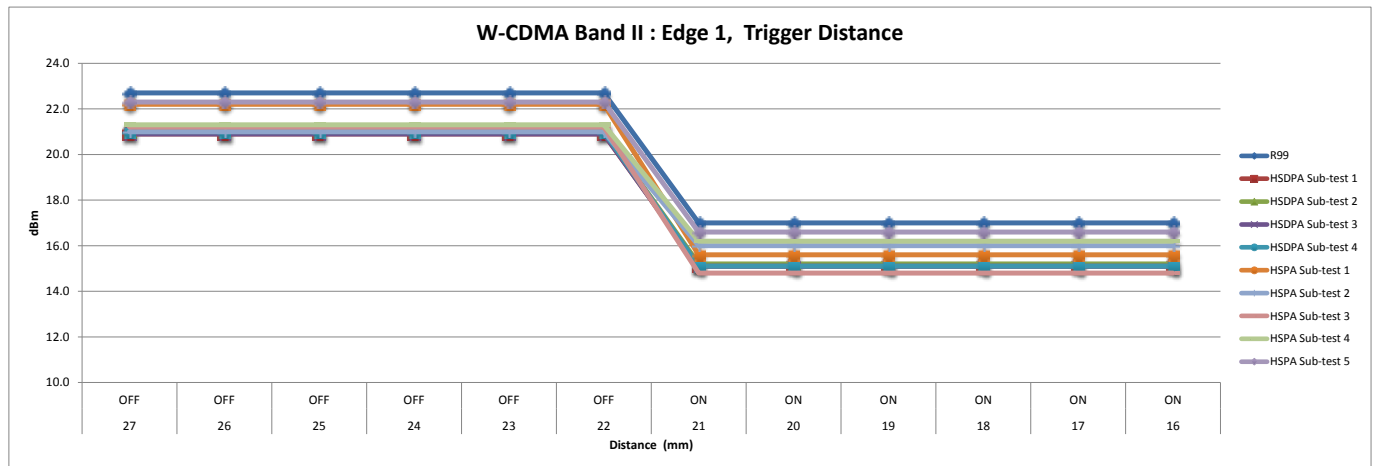
Rear, W-CDMA Band IV												
Distance (mm):	18	17	16	15	14	13	12	11	10	9	8	7
Proximity sensor with reduced power activation:	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON
R99	22.7	22.7	22.7	22.7	22.7	22.7	18.1	18.1	18.1	18.1	18.1	18.1
HSDPA Sub-test 1	20.7	20.7	20.7	20.7	20.7	20.7	16.0	16.0	16.0	16.0	16.0	16.0
HSDPA Sub-test 2	20.8	20.8	20.8	20.8	20.8	20.8	16.1	16.1	16.1	16.1	16.1	16.1
HSDPA Sub-test 3	20.7	20.7	20.7	20.7	20.7	20.7	16.1	16.1	16.1	16.1	16.1	16.1
HSDPA Sub-test 4	20.7	20.7	20.7	20.7	20.7	20.7	16.2	16.2	16.2	16.2	16.2	16.2
HSPA Sub-test 1	21.8	21.8	21.8	21.8	21.8	21.8	15.6	15.6	15.6	15.6	15.6	15.6
HSPA Sub-test 2	20.6	20.6	20.6	20.6	20.6	20.6	17.2	17.2	17.2	17.2	17.2	17.2
HSPA Sub-test 3	20.9	20.9	20.9	20.9	20.9	20.9	17.0	17.0	17.0	17.0	17.0	17.0
HSPA Sub-test 4	21.2	21.2	21.2	21.2	21.2	21.2	17.1	17.1	17.1	17.1	17.1	17.1
HSPA Sub-test 5	22.2	22.2	22.2	22.2	22.2	22.2	17.5	17.5	17.5	17.5	17.5	17.5



W-CDMA Band II

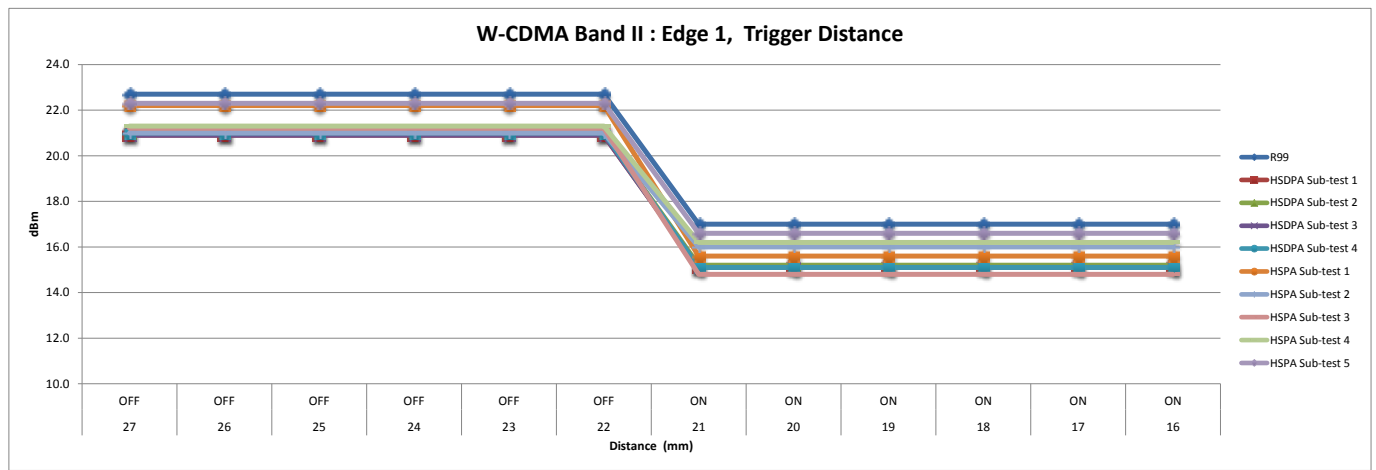
Edge 1

Edge 1, W-CDMA Band II												
Distance (mm):	27	26	25	24	23	22	21	20	19	18	17	16
Proximity sensor with reduced power activation:	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON
R99	22.7	22.7	22.7	22.7	22.7	22.7	17.0	17.0	17.0	17.0	17.0	17.0
HSDPA Sub-test 1	20.9	20.9	20.9	20.9	20.9	20.9	15.1	15.1	15.1	15.1	15.1	15.1
HSDPA Sub-test 2	21.0	21.0	21.0	21.0	21.0	21.0	15.2	15.2	15.2	15.2	15.2	15.2
HSDPA Sub-test 3	20.9	20.9	20.9	20.9	20.9	20.9	15.1	15.1	15.1	15.1	15.1	15.1
HSDPA Sub-test 4	21.0	21.0	21.0	21.0	21.0	21.0	15.1	15.1	15.1	15.1	15.1	15.1
HSPA Sub-test 1	22.2	22.2	22.2	22.2	22.2	22.2	15.6	15.6	15.6	15.6	15.6	15.6
HSPA Sub-test 2	21.0	21.0	21.0	21.0	21.0	21.0	16.0	16.0	16.0	16.0	16.0	16.0
HSPA Sub-test 3	21.2	21.2	21.2	21.2	21.2	21.2	14.8	14.8	14.8	14.8	14.8	14.8
HSPA Sub-test 4	21.3	21.3	21.3	21.3	21.3	21.3	16.2	16.2	16.2	16.2	16.2	16.2
HSPA Sub-test 5	22.3	22.3	22.3	22.3	22.3	22.3	16.6	16.6	16.6	16.6	16.6	16.6



Rear

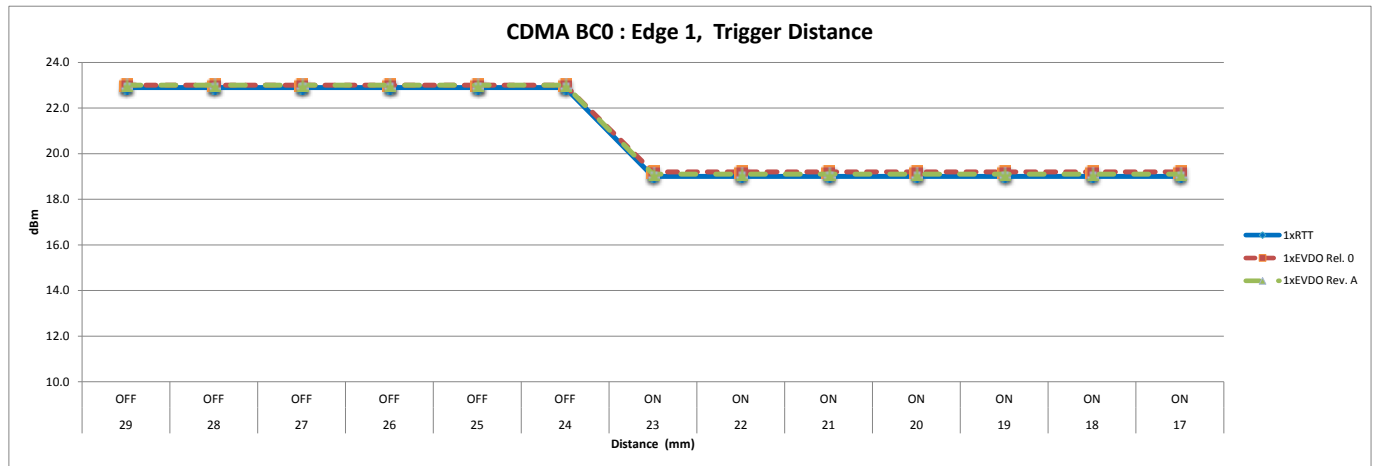
Rear, W-CDMA Band II												
Distance (mm):	17	6	15	14	13	12	11	10	9	8	7	6
Proximity sensor with reduced power activation:	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON
R99	22.7	22.7	22.7	22.7	22.7	22.7	17.0	17.0	17.0	17.0	17.0	17.0
HSDPA Sub-test 1	20.9	20.9	20.9	20.9	20.9	20.9	15.1	15.1	15.1	15.1	15.1	15.1
HSDPA Sub-test 2	21.0	21.0	21.0	21.0	21.0	21.0	15.2	15.2	15.2	15.2	15.2	15.2
HSDPA Sub-test 3	20.9	20.9	20.9	20.9	20.9	20.9	15.1	15.1	15.1	15.1	15.1	15.1
HSDPA Sub-test 4	21.0	21.0	21.0	21.0	21.0	21.0	15.1	15.1	15.1	15.1	15.1	15.1
HSPA Sub-test 1	22.2	22.2	22.2	22.2	22.2	22.2	15.6	15.6	15.6	15.6	15.6	15.6
HSPA Sub-test 2	21.0	21.0	21.0	21.0	21.0	21.0	16.0	16.0	16.0	16.0	16.0	16.0
HSPA Sub-test 3	21.2	21.2	21.2	21.2	21.2	21.2	14.8	14.8	14.8	14.8	14.8	14.8
HSPA Sub-test 4	21.3	21.3	21.3	21.3	21.3	21.3	16.2	16.2	16.2	16.2	16.2	16.2
HSPA Sub-test 5	22.3	22.3	22.3	22.3	22.3	22.3	16.6	16.6	16.6	16.6	16.6	16.6



CDMA BC0

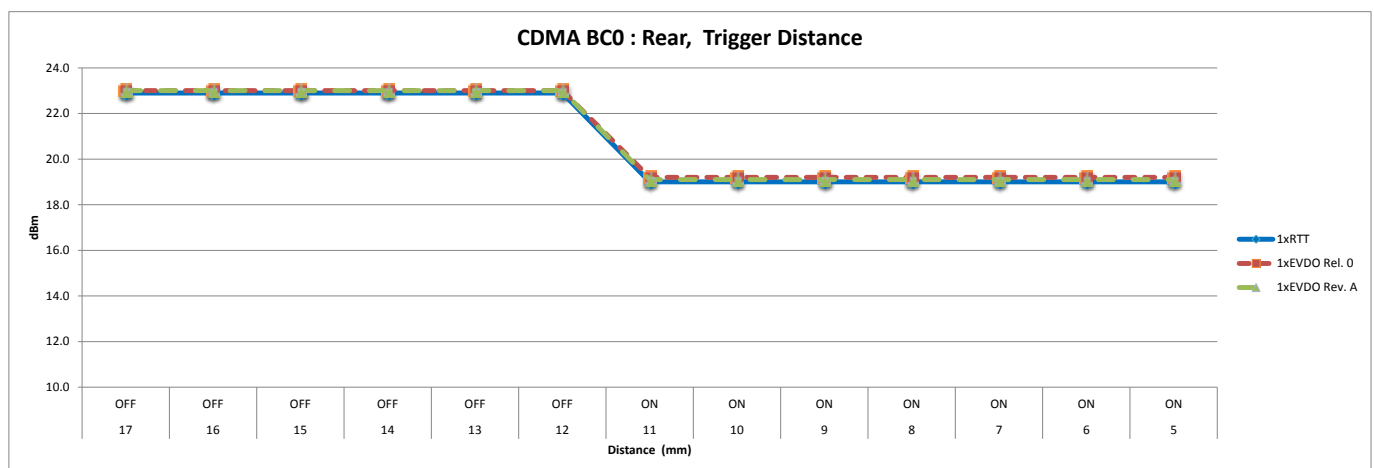
Edge 1

Edge 1, CDMA BC0													
Distance (mm):	29	28	27	26	25	24	23	22	21	20	19	18	17
Proximity sensor with reduced power activation:	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON
1xRTT	22.9	22.9	22.9	22.9	22.9	22.9	19.0	19.0	19.0	19.0	19.0	19.0	19.0
1xEVDO Rel. 0	23.0	23.0	23.0	23.0	23.0	23.0	19.2	19.2	19.2	19.2	19.2	19.2	19.2
1xEVDO Rev. A	23.0	23.0	23.0	23.0	23.0	23.0	19.1	19.1	19.1	19.1	19.1	19.1	19.1



Rear

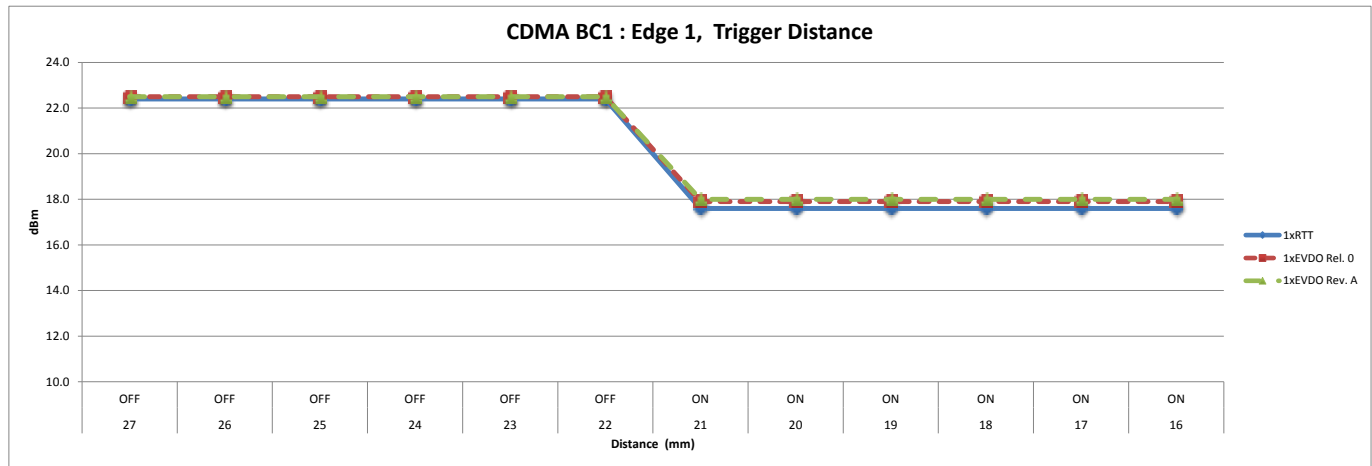
CDMA BC0													
Distance (mm):	17	16	15	14	13	12	11	10	9	8	7	6	5
Proximity sensor with reduced power activation:	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON
1xRTT	22.9	22.9	22.9	22.9	22.9	22.9	19.0	19.0	19.0	19.0	19.0	19.0	19.0
1xEVDO Rel. 0	23.0	23.0	23.0	23.0	23.0	23.0	19.2	19.2	19.2	19.2	19.2	19.2	19.2
1xEVDO Rev. A	23.0	23.0	23.0	23.0	23.0	23.0	19.1	19.1	19.1	19.1	19.1	19.1	19.1



CDMA BC1

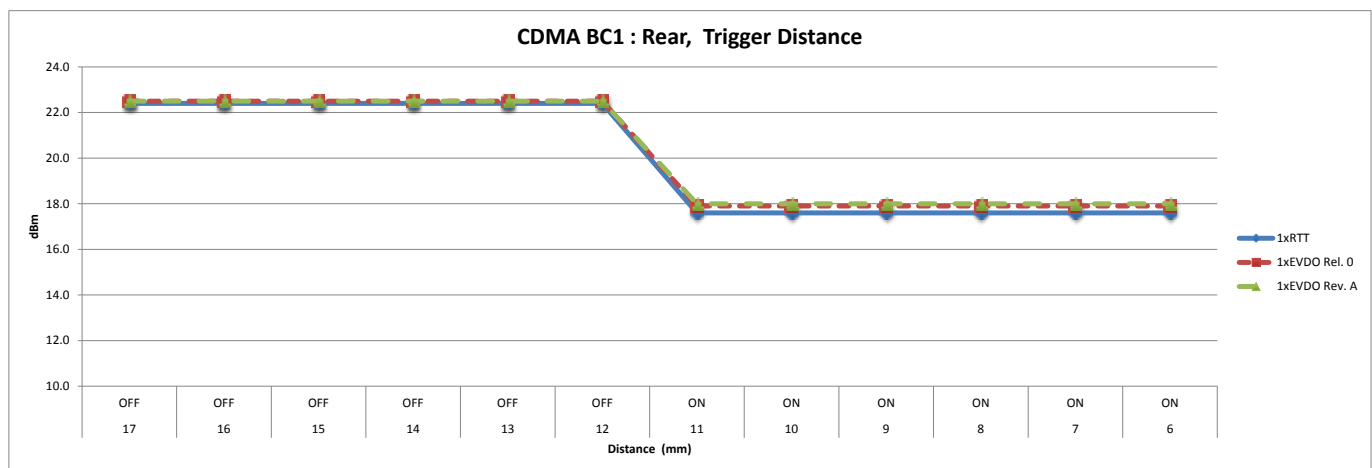
Edge 1

Edge 1, CDMA BC1												
Distance (mm):	27	26	25	24	23	22	21	20	19	18	17	16
Proximity sensor with reduced power activation:	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON
1xRTT	22.4	22.4	22.4	22.4	22.4	22.4	17.6	17.6	17.6	17.6	17.6	17.6
1xEVDO Rel. 0	22.5	22.5	22.5	22.5	22.5	22.5	17.9	17.9	17.9	17.9	17.9	17.9
1xEVDO Rev. A	22.5	22.5	22.5	22.5	22.5	22.5	18.0	18.0	18.0	18.0	18.0	18.0



Rear

CDMA BC1												
Distance (mm):	17	16	15	14	13	12	11	10	9	8	7	6
Proximity sensor with reduced power activation:	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON
1xRTT	22.4	22.4	22.4	22.4	22.4	22.4	17.6	17.6	17.6	17.6	17.6	17.6
1xEVDO Rel. 0	22.5	22.5	22.5	22.5	22.5	22.5	17.9	17.9	17.9	17.9	17.9	17.9
1xEVDO Rev. A	22.5	22.5	22.5	22.5	22.5	22.5	18.0	18.0	18.0	18.0	18.0	18.0

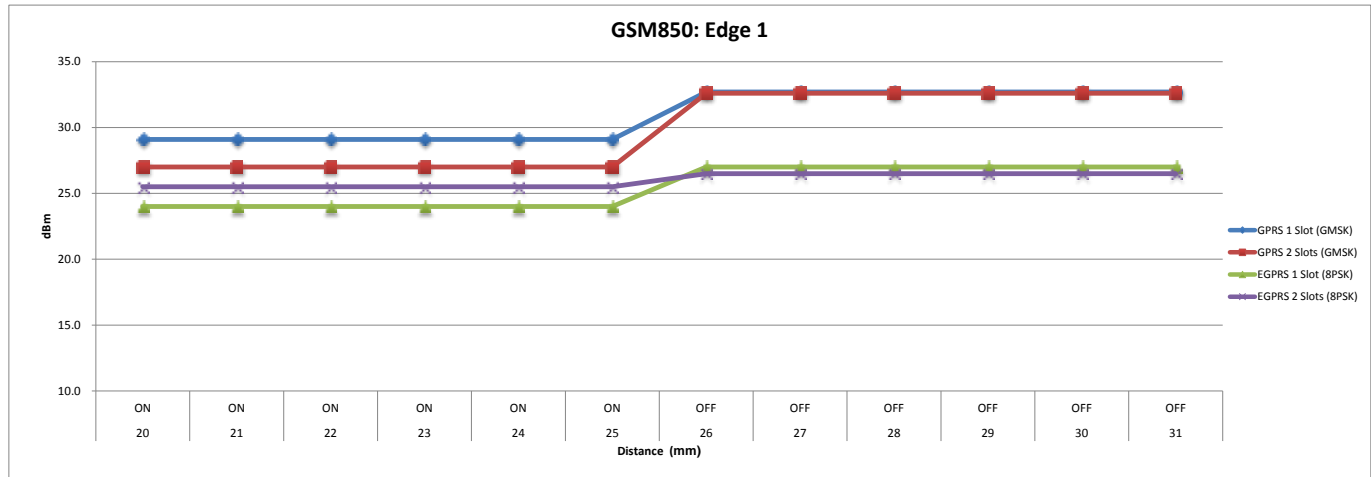


7.5.2. DUT moving away from the phantom

GSM850

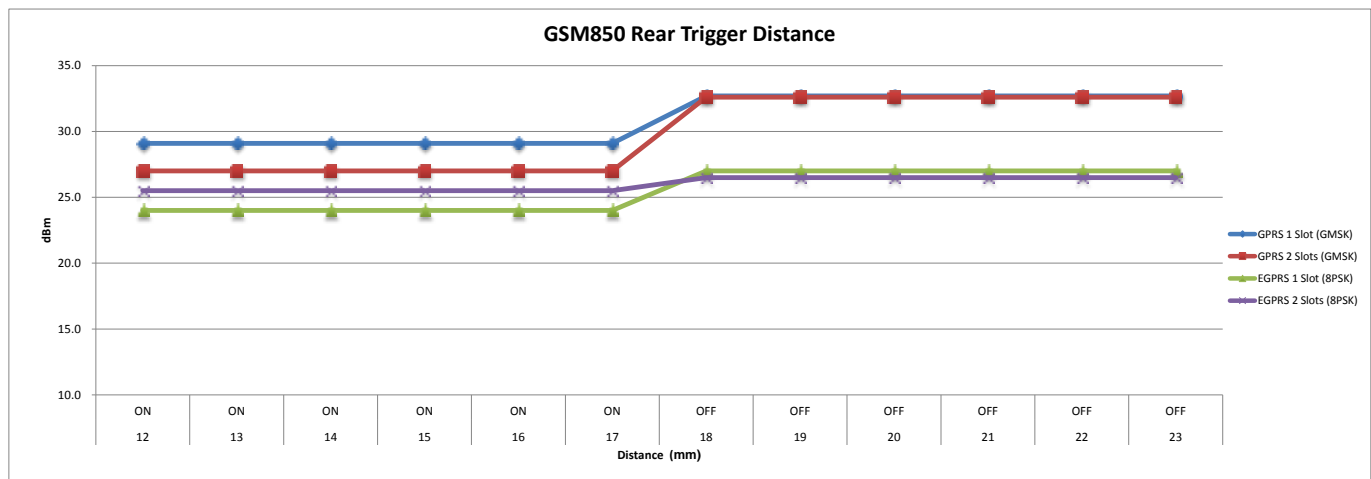
Edge 1

Edge 1,GSM850)												
Distance (mm):	20	21	22	23	24	25	26	27	28	29	30	31
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
GPRS 1 Slot (GMSK)	29.1	29.1	29.1	29.1	29.1	29.1	32.7	32.7	32.7	32.7	32.7	32.7
GPRS 2 Slots (GMSK)	27.0	27.0	27.0	27.0	27.0	27.0	32.6	32.6	32.6	32.6	32.6	32.6
EGPRS 1 Slot (8PSK)	24.0	24.0	24.0	24.0	24.0	24.0	27.0	27.0	27.0	27.0	27.0	27.0
EGPRS 2 Slots (8PSK)	25.5	25.5	25.5	25.5	25.5	25.5	26.6	26.6	26.6	26.6	26.6	26.6



Rear

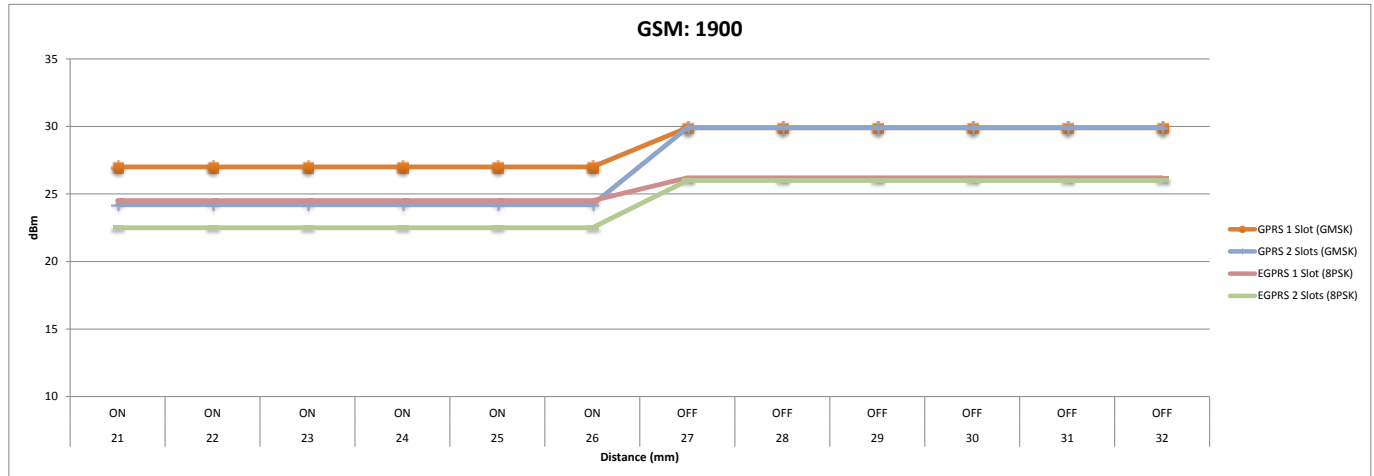
Rear, GSM850												
Distance (mm):	12	13	14	15	16	17	18	19	20	21	22	23
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
GPRS 1 Slot (GMSK)	29.1	29.1	29.1	29.1	29.1	29.1	32.7	32.7	32.7	32.7	32.7	32.7
GPRS 2 Slots (GMSK)	27.0	27.0	27.0	27.0	27.0	27.0	32.6	32.6	32.6	32.6	32.6	32.6
EGPRS 1 Slot (8PSK)	24.0	24.0	24.0	24.0	24.0	24.0	27.0	27.0	27.0	27.0	27.0	27.0
EGPRS 2 Slots (8PSK)	25.5	25.5	25.5	25.5	25.5	25.5	26.6	26.6	26.6	26.6	26.6	26.6



GSM1900

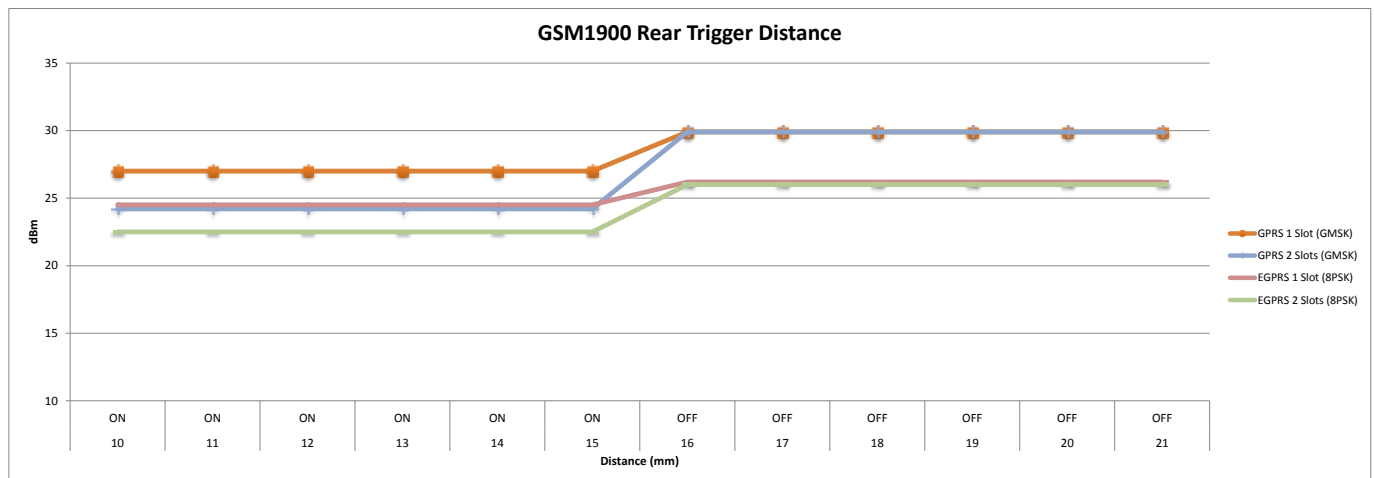
Edge 1

Edge 1 (GSM1900)												
Distance (mm):	21	22	23	24	25	26	27	28	29	30	31	32
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
GPRS 1 Slot (GMSK)	27.0	27.0	27.0	27.0	27.0	27.0	29.9	29.9	29.9	29.9	29.9	29.9
GPRS 2 Slots (GMSK)	24.2	24.2	24.2	24.2	24.2	24.2	29.9	29.9	29.9	29.9	29.9	29.9
EGPRS 1 Slot (8PSK)	24.5	24.5	24.5	24.5	24.5	24.5	26.2	26.2	26.2	26.2	26.2	26.2
EGPRS 2 Slots (8PSK)	22.5	22.5	22.5	22.5	22.5	22.5	26.0	26.0	26.0	26.0	26.0	26.0



Rear

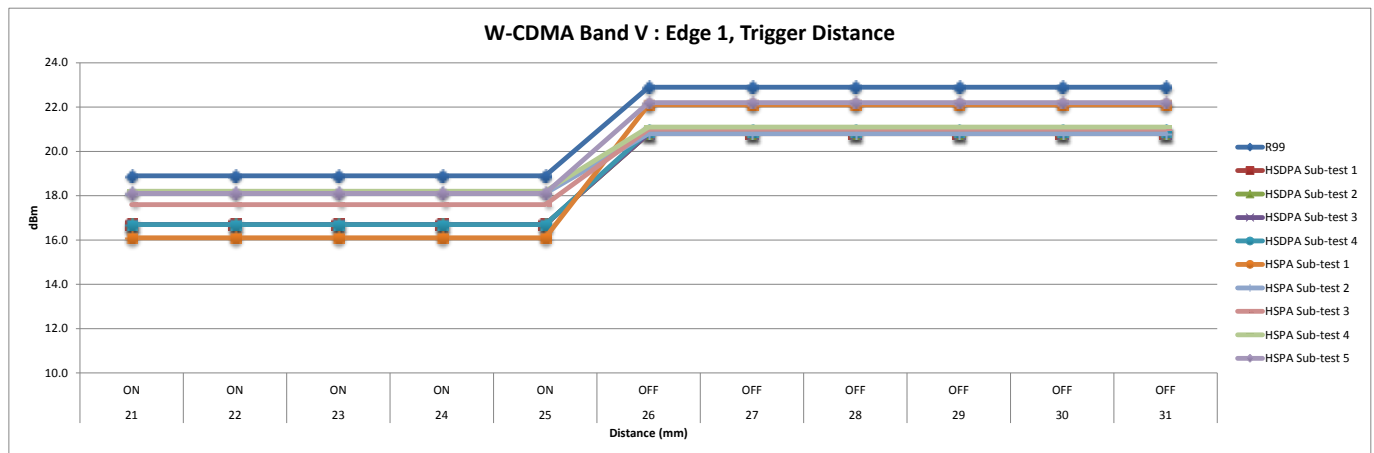
Rear, GSM1900												
Distance (mm):	10	11	12	13	14	15	16	17	18	19	20	21
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
GPRS 1 Slot (GMSK)	27.0	27.0	27.0	27.0	27.0	27.0	29.9	29.9	29.9	29.9	29.9	29.9
GPRS 2 Slots (GMSK)	24.2	24.2	24.2	24.2	24.2	24.2	29.9	29.9	29.9	29.9	29.9	29.9
EGPRS 1 Slot (8PSK)	24.5	24.5	24.5	24.5	24.5	24.5	26.2	26.2	26.2	26.2	26.2	26.2
EGPRS 2 Slots (8PSK)	22.5	22.5	22.5	22.5	22.5	22.5	26.0	26.0	26.0	26.0	26.0	26.0



W-CDMA Band V

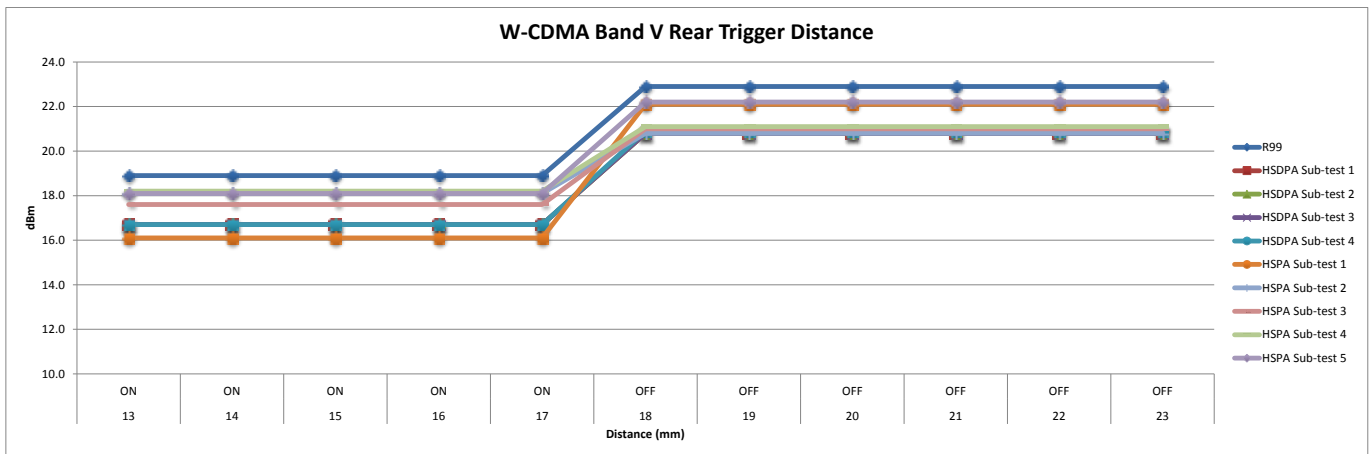
Edge 1

Edge 1, W-CDMA Band V											
Distance (mm):	21	22	23	24	25	26	27	28	29	30	31
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
R99	18.9	18.9	18.9	18.9	18.9	22.9	22.9	22.9	22.9	22.9	22.9
HSDPA Sub-test 1	16.7	16.7	16.7	16.7	16.7	20.8	20.8	20.8	20.8	20.8	20.8
HSDPA Sub-test 2	16.7	16.7	16.7	16.7	16.7	20.8	20.8	20.8	20.8	20.8	20.8
HSDPA Sub-test 3	16.7	16.7	16.7	16.7	16.7	20.8	20.8	20.8	20.8	20.8	20.8
HSDPA Sub-test 4	16.7	16.7	16.7	16.7	16.7	20.9	20.9	20.9	20.9	20.9	20.9
HSPA Sub-test 1	16.1	16.1	16.1	16.1	16.1	22.1	22.1	22.1	22.1	22.1	22.1
HSPA Sub-test 2	18.1	18.1	18.1	18.1	18.1	20.8	20.8	20.8	20.8	20.8	20.8
HSPA Sub-test 3	17.6	17.6	17.6	17.6	17.6	21.0	21.0	21.0	21.0	21.0	21.0
HSPA Sub-test 4	18.2	18.2	18.2	18.2	18.2	21.1	21.1	21.1	21.1	21.1	21.1
HSPA Sub-test 5	18.1	18.1	18.1	18.1	18.1	22.2	22.2	22.2	22.2	22.2	22.2



Rear

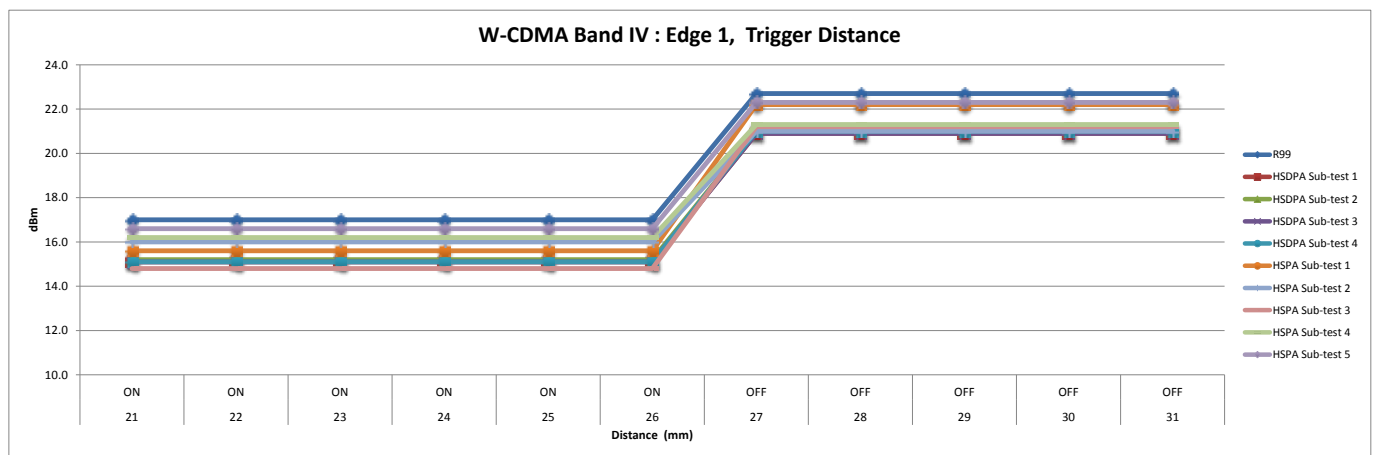
Rear, W-CDMA Band V											
Distance (mm):	13	14	15	16	17	18	19	20	21	22	23
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
R99	18.9	18.9	18.9	18.9	18.9	22.9	22.9	22.9	22.9	22.9	22.9
HSDPA Sub-test 1	16.7	16.7	16.7	16.7	16.7	20.8	20.8	20.8	20.8	20.8	20.8
HSDPA Sub-test 2	16.7	16.7	16.7	16.7	16.7	20.8	20.8	20.8	20.8	20.8	20.8
HSDPA Sub-test 3	16.7	16.7	16.7	16.7	16.7	20.8	20.8	20.8	20.8	20.8	20.8
HSDPA Sub-test 4	16.7	16.7	16.7	16.7	16.7	20.9	20.9	20.9	20.9	20.9	20.9
HSPA Sub-test 1	16.1	16.1	16.1	16.1	16.1	22.1	22.1	22.1	22.1	22.1	22.1
HSPA Sub-test 2	18.1	18.1	18.1	18.1	18.1	20.8	20.8	20.8	20.8	20.8	20.8
HSPA Sub-test 3	17.6	17.6	17.6	17.6	17.6	21.0	21.0	21.0	21.0	21.0	21.0
HSPA Sub-test 4	18.2	18.2	18.2	18.2	18.2	21.1	21.1	21.1	21.1	21.1	21.1
HSPA Sub-test 5	18.1	18.1	18.1	18.1	18.1	22.2	22.2	22.2	22.2	22.2	22.2



W-CDMA Band IV

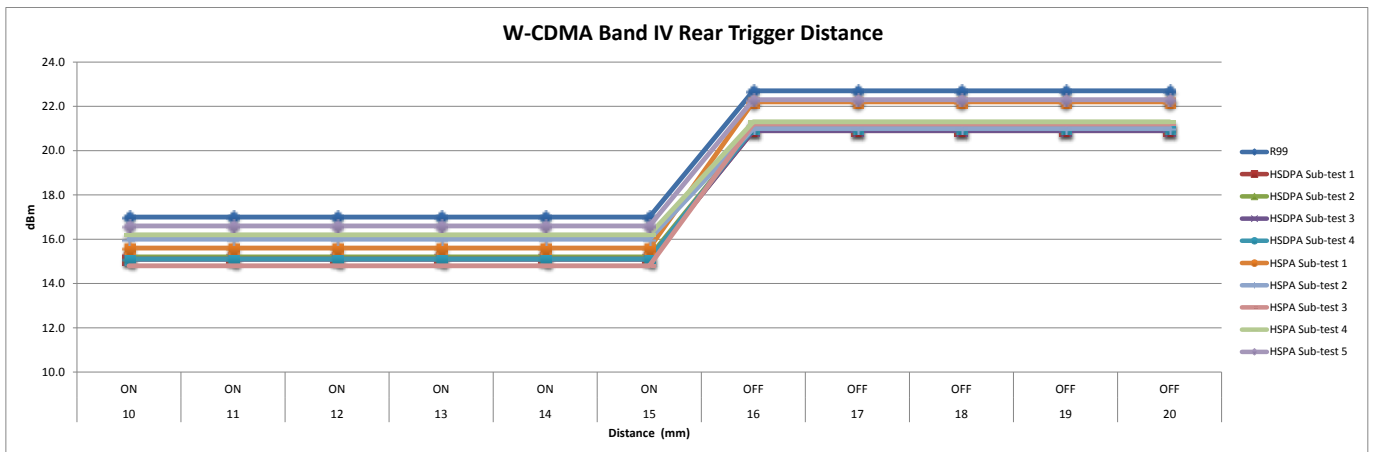
Edge 1

Edge 1, W-CDMA Band IV												
Distance (mm):	21	22	23	24	25	26	27	28	29	30	31	
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	
R99	18.1	18.1	18.1	18.1	18.1	18.1	22.7	22.7	22.7	22.7	22.7	
HSDPA Sub-test 1	16.0	16.0	16.0	16.0	16.0	16.0	20.7	20.7	20.7	20.7	20.7	
HSDPA Sub-test 2	16.1	16.1	16.1	16.1	16.1	16.1	20.8	20.8	20.8	20.8	20.8	
HSDPA Sub-test 3	16.1	16.1	16.1	16.1	16.1	16.1	20.7	20.7	20.7	20.7	20.7	
HSDPA Sub-test 4	16.2	16.2	16.2	16.2	16.2	16.2	20.7	20.7	20.7	20.7	20.7	
HSPA Sub-test 1	15.6	15.6	15.6	15.6	15.6	15.6	21.8	21.8	21.8	21.8	21.8	
HSPA Sub-test 2	17.2	17.2	17.2	17.2	17.2	17.2	20.6	20.6	20.6	20.6	20.6	
HSPA Sub-test 3	17.0	17.0	17.0	17.0	17.0	17.0	20.9	20.9	20.9	20.9	20.9	
HSPA Sub-test 4	17.1	17.1	17.1	17.1	17.1	17.1	21.2	21.2	21.2	21.2	21.2	
HSPA Sub-test 5	17.5	17.5	17.5	17.5	17.5	17.5	22.2	22.2	22.2	22.2	22.2	



Rear

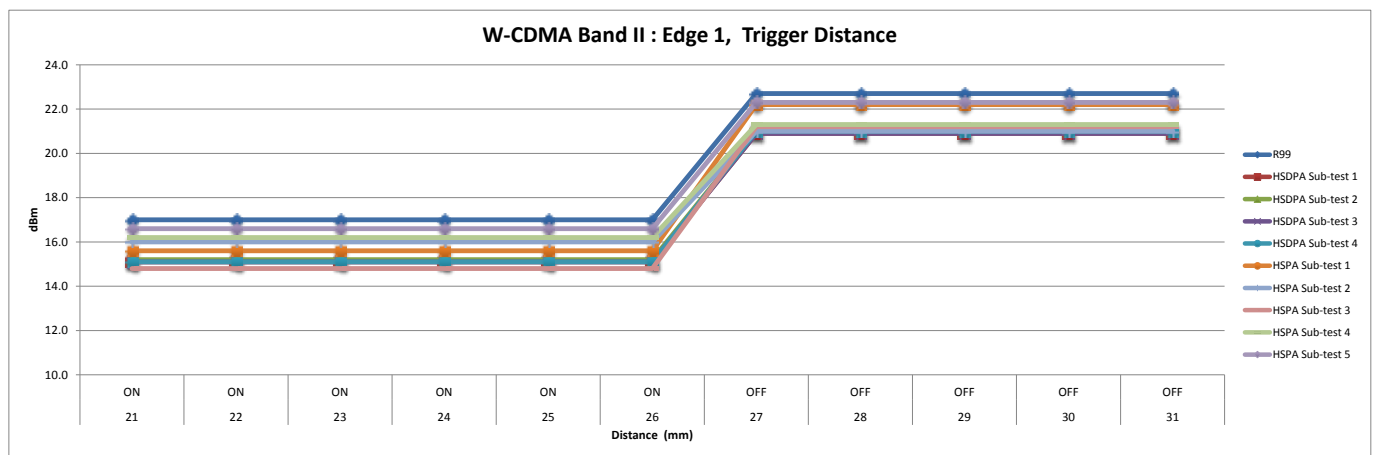
Rear, W-CDMA Band IV											
Distance (mm):	10	11	12	13	14	15	16	17	18	19	20
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
R99	18.1	18.1	18.1	18.1	18.1	18.1	22.7	22.7	22.7	22.7	22.7
HSDPA Sub-test 1	16.0	16.0	16.0	16.0	16.0	16.0	20.7	20.7	20.7	20.7	20.7
HSDPA Sub-test 2	16.1	16.1	16.1	16.1	16.1	16.1	20.8	20.8	20.8	20.8	20.8
HSDPA Sub-test 3	16.1	16.1	16.1	16.1	16.1	16.1	20.7	20.7	20.7	20.7	20.7
HSDPA Sub-test 4	16.2	16.2	16.2	16.2	16.2	16.2	20.7	20.7	20.7	20.7	20.7
HSPA Sub-test 1	15.6	15.6	15.6	15.6	15.6	15.6	21.8	21.8	21.8	21.8	21.8
HSPA Sub-test 2	17.2	17.2	17.2	17.2	17.2	17.2	20.6	20.6	20.6	20.6	20.6
HSPA Sub-test 3	17.0	17.0	17.0	17.0	17.0	17.0	20.9	20.9	20.9	20.9	20.9
HSPA Sub-test 4	17.1	17.1	17.1	17.1	17.1	17.1	21.2	21.2	21.2	21.2	21.2
HSPA Sub-test 5	17.5	17.5	17.5	17.5	17.5	17.5	22.2	22.2	22.2	22.2	22.2



W-CDMA Band II

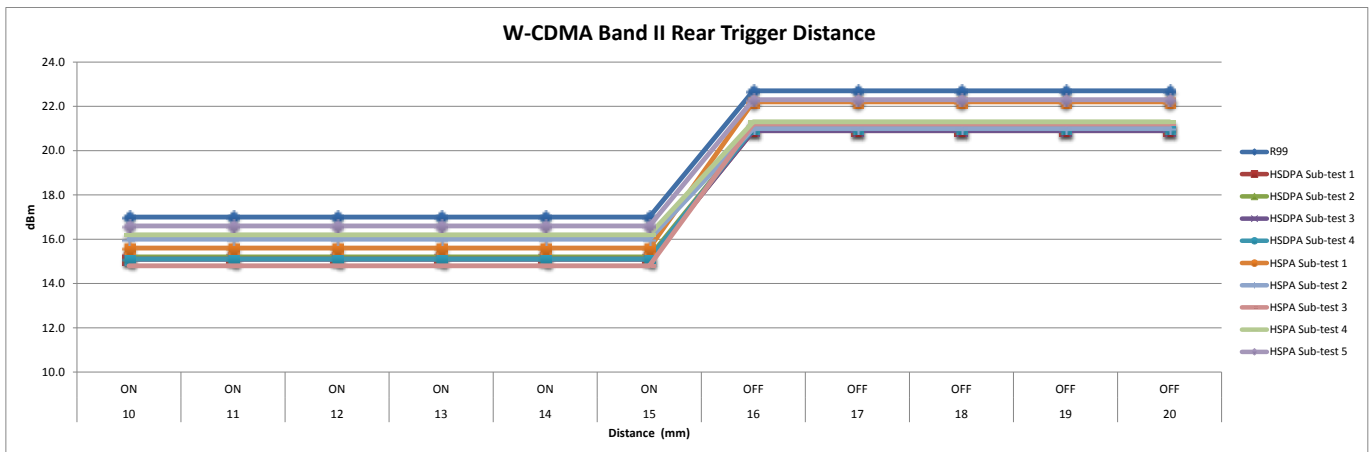
Edge 1

Edge 1, W-CDMA Band II												
Distance (mm):	21	22	23	24	25	26	27	28	29	30	31	
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	
R99	17.0	17.0	17.0	17.0	17.0	17.0	22.7	22.7	22.7	22.7	22.7	
HSDPA Sub-test 1	15.1	15.1	15.1	15.1	15.1	15.1	20.9	20.9	20.9	20.9	20.9	
HSDPA Sub-test 2	15.2	15.2	15.2	15.2	15.2	15.2	21.0	21.0	21.0	21.0	21.0	
HSDPA Sub-test 3	15.1	15.1	15.1	15.1	15.1	15.1	20.9	20.9	20.9	20.9	20.9	
HSDPA Sub-test 4	15.1	15.1	15.1	15.1	15.1	15.1	21.0	21.0	21.0	21.0	21.0	
HSPA Sub-test 1	15.6	15.6	15.6	15.6	15.6	15.6	22.2	22.2	22.2	22.2	22.2	
HSPA Sub-test 2	16.0	16.0	16.0	16.0	16.0	16.0	21.0	21.0	21.0	21.0	21.0	
HSPA Sub-test 3	14.8	14.8	14.8	14.8	14.8	14.8	21.2	21.2	21.2	21.2	21.2	
HSPA Sub-test 4	16.2	16.2	16.2	16.2	16.2	16.2	21.3	21.3	21.3	21.3	21.3	
HSPA Sub-test 5	16.6	16.6	16.6	16.6	16.6	16.6	22.3	22.3	22.3	22.3	22.3	



Rear

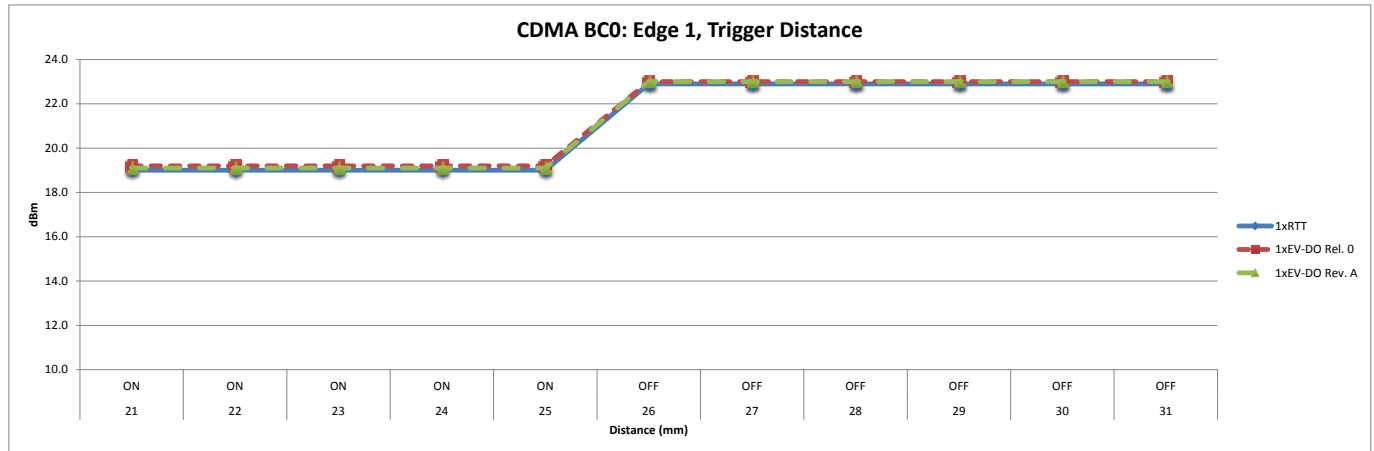
Rear, W-CDMA Band II											
Distance (mm):	10	11	12	13	14	15	16	17	18	19	20
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
R99	17.0	17.0	17.0	17.0	17.0	17.0	22.7	22.7	22.7	22.7	22.7
HSDPA Sub-test 1	15.1	15.1	15.1	15.1	15.1	15.1	20.9	20.9	20.9	20.9	20.9
HSDPA Sub-test 2	15.2	15.2	15.2	15.2	15.2	15.2	21.0	21.0	21.0	21.0	21.0
HSDPA Sub-test 3	15.1	15.1	15.1	15.1	15.1	15.1	20.9	20.9	20.9	20.9	20.9
HSDPA Sub-test 4	15.1	15.1	15.1	15.1	15.1	15.1	21.0	21.0	21.0	21.0	21.0
HSPA Sub-test 1	15.6	15.6	15.6	15.6	15.6	15.6	22.2	22.2	22.2	22.2	22.2
HSPA Sub-test 2	16.0	16.0	16.0	16.0	16.0	16.0	21.0	21.0	21.0	21.0	21.0
HSPA Sub-test 3	14.8	14.8	14.8	14.8	14.8	14.8	21.2	21.2	21.2	21.2	21.2
HSPA Sub-test 4	16.2	16.2	16.2	16.2	16.2	16.2	21.3	21.3	21.3	21.3	21.3
HSPA Sub-test 5	16.6	16.6	16.6	16.6	16.6	16.6	22.3	22.3	22.3	22.3	22.3



CDMA BC0

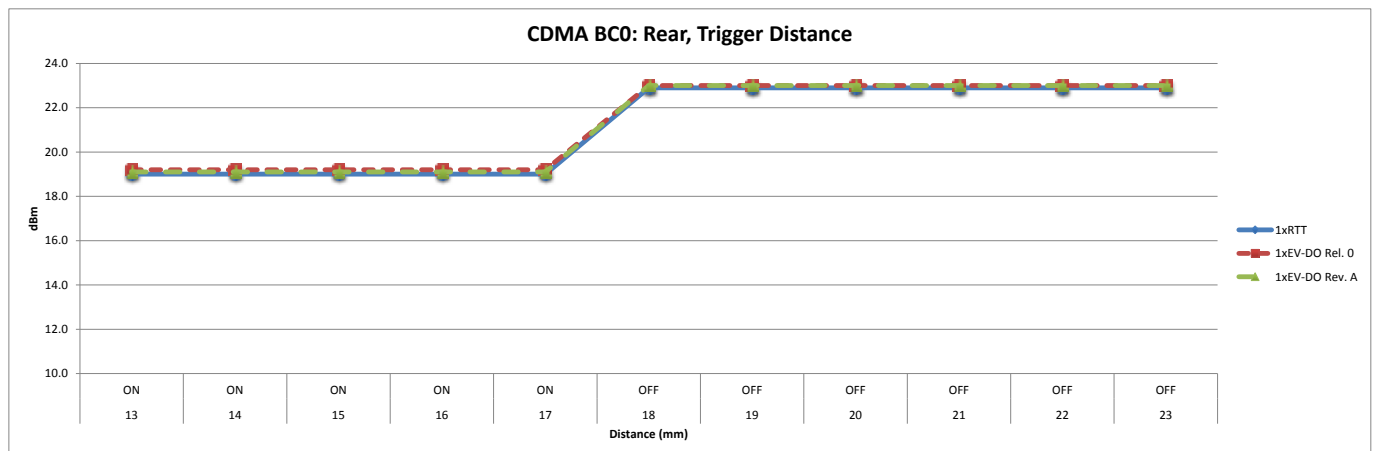
Edge 1

Edge 1, CDMA BC0											
Distance (mm):	21	22	23	24	25	26	27	28	29	30	31
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
1xRTT	19.0	19.0	19.0	19.0	19.0	22.9	22.9	22.9	22.9	22.9	22.9
1xEV-DO Rel. 0	19.2	19.2	19.2	19.2	19.2	23.0	23.0	23.0	23.0	23.0	23.0
1xEV-DO Rev. A	19.1	19.1	19.1	19.1	19.1	23.0	23.0	23.0	23.0	23.0	23.0



Rear

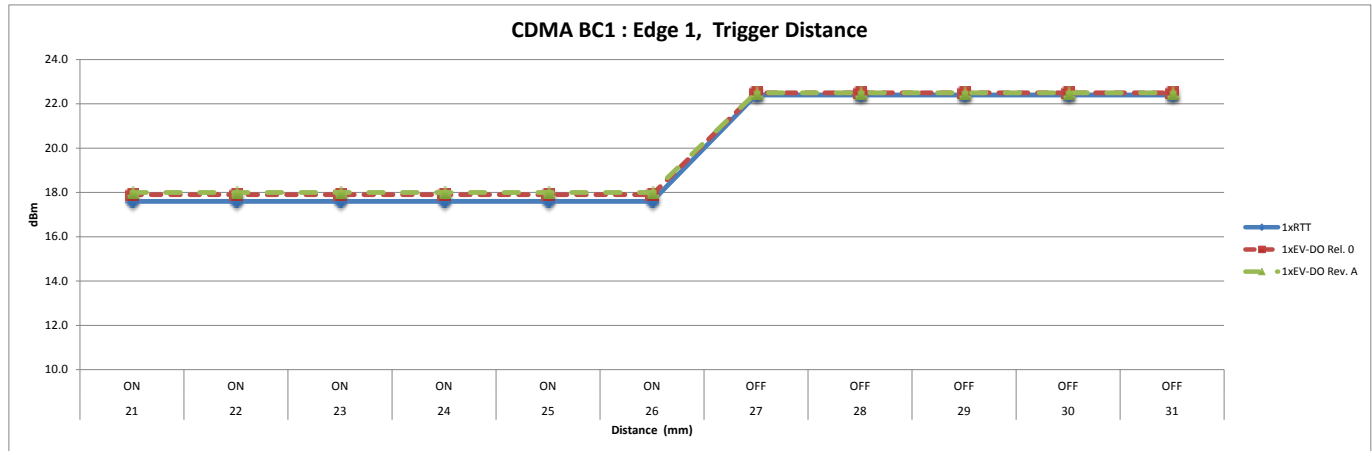
CDMA BC0											
Distance (mm):	13	14	15	16	17	18	19	20	21	22	23
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
1xRTT	19.0	19.0	19.0	19.0	19.0	22.9	22.9	22.9	22.9	22.9	22.9
1xEV-DO Rel. 0	19.2	19.2	19.2	19.2	19.2	23.0	23.0	23.0	23.0	23.0	23.0
1xEV-DO Rev. A	19.1	19.1	19.1	19.1	19.1	23.0	23.0	23.0	23.0	23.0	23.0



CDMA BC1

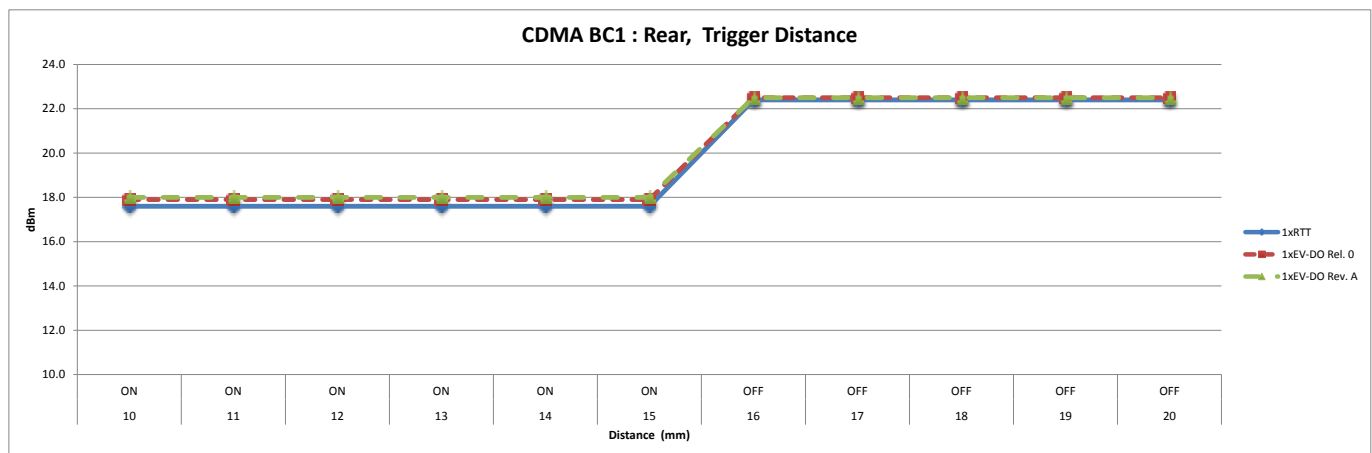
Edge 1

Edge 1, CDMA BC1											
Distance (mm):	21	22	23	24	25	26	27	28	29	30	31
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
1xRTT	17.6	17.6	17.6	17.6	17.6	17.6	22.4	22.4	22.4	22.4	22.4
1xEV-DO Rel. 0	17.9	17.9	17.9	17.9	17.9	17.9	22.5	22.5	22.5	22.5	22.5
1xEV-DO Rev. A	18.0	18.0	18.0	18.0	18.0	18.0	22.5	22.5	22.5	22.5	22.5



Rear

CDMA BC1											
Distance (mm):	10	11	12	13	14	15	16	17	18	19	20
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
1xRTT	17.6	17.6	17.6	17.6	17.6	17.6	22.4	22.4	22.4	22.4	22.4
1xEV-DO Rel. 0	17.9	17.9	17.9	17.9	17.9	17.9	22.5	22.5	22.5	22.5	22.5
1xEV-DO Rev. A	18.0	18.0	18.0	18.0	18.0	18.0	22.5	22.5	22.5	22.5	22.5



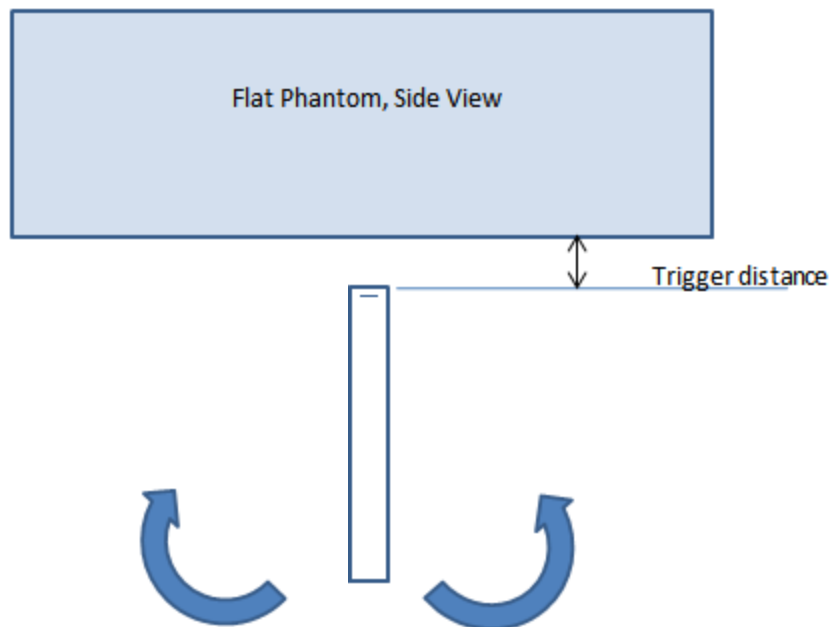
7.6. Proximity Sensor Coverage (KDB 616217 §6.3)

As there is no spatial offset between the antenna and the proximity sensor element, except on the display side of the antenna, proximity sensor coverage did not need to be assessed.

7.7. Proximity Sensor Tilt Angle (KDB 616217 §6.3)

The DUT was positioned directly below the flat phantom at the minimum measured trigger distance with edge 1 parallel to the base of the flat phantom. The DUT was rotated in both directions about edge 1.

The proximity sensor remained triggered with the DUT positioned 21mm from the phantom for all angles up to 45°.



8. 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. Test Configurations for WWAN

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	7.5 mm	YES	
Front	-	No	SAR is not required as this is not a typical use scenario
Edge 1	3.3 mm	YES	
Edge 2	167.6 mm	No	Refer to section 13 for SAR exclusion justification
Edge 3	176.0 mm	No	Refer to section 13 for SAR exclusion justification
Edge 4	47.0 mm	YES	

LEGEND:

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

8.2. Special test considerations

The DUT is a ruggedized tablet computer. A feature of the ruggedization is the inclusion of prominent bumpers at each corner. The antennas are located close to the corners of the DUT. Testing the edges or base against the flat phantom with the bumpers in place did not represent the most conservative usage scenarios. Testing of the base was performed with the bumpers removed. Testing of the edges was also performed with the bumpers removed. Additionally the faceplate in the area of the bumpers was ground down so that the spacers adjacent to the WWAN antenna could be in direct contact with the flat phantom.

8.3. Test Configurations for WLAN

All Wi-Fi 1-g SAR values were taken from results recorded in SAR report 12J14673-1F, submitted under FCC ID ACJ9TGWL12A or from the MIMO values in section 12 of this report.

9. RF Output Power Measurement

As this device implements proximity sensor-triggered power reduction for SAR compliance, conducted output power was measured for the two different operating power levels. The following serves to clarify and establish the relation between power level and proximity sensor status:

- Full Power = Proximity Sensor Off
- Reduced Power = Proximity Sensor On

Each operating power level has its own set of target power and tune-up limits, and the scaling of SAR values is applied according to the corresponding target for the given operating power level

9.1. GSM850

Target Power for GSM850

GSM850	Full Power	Reduced Power
GPRS 1 Slot (GMSK)	31.7 dBm	28.2 dBm
GPRS 2 Slots (GMSK)	31.7 dBm	26.0 dBm
EGPRS 1 Slot (8PSK)	27.0 dBm	24.5 dBm
EGPRS 2 Slots (8PSK)	27.0 dBm	24.5 dBm

Tune-Up Tolerance: +1.0 dB/- 1.5 dB

Target power indicated above is the nominal value. The measured value shall fall within +1dB / -1.5dB of this value.

Full Power

GPRS (GMSK) - Coding Scheme: CS1						
Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
850	128	824.2	32.7	23.7	32.6	26.6
	190	836.6	32.7	23.7	32.6	26.6
	251	848.8	32.7	23.7	32.6	26.6
EGPRS (8PSK) - Coding Scheme: MCS5						
Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
850	128	824.2	27.0	18.0	26.6	20.6
	190	836.6	27.0	18.0	26.5	20.5
	251	848.8	27.0	18.0	26.5	20.5

Reduced Power

GPRS (GMSK) - Coding Scheme: CS1						
Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
850	128	824.2	29.1	20.1	27.0	21.0
	190	836.6	29.0	20.0	27.0	21.0
	251	848.8	29.0	20.0	27.0	21.0
EGPRS (8PSK) - Coding Scheme: MCS5						
Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
850	128	824.2	24.0	15.0	25.5	19.5
	190	836.6	23.8	14.8	25.5	19.4
	251	848.8	24.0	15.0	25.4	19.3

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 or reduced power because its output power is less than that of GPRS Mode at either full power or reduced power

9.2. GSM1900

Target Power for GSM1900

GSM1900	Full Power	Reduced Power
GPRS 1 Slot (GMSK)	29.3 dBm	26.0 dBm
GPRS 2 Slots (GMSK)	29.3 dBm	23.8 dBm
EGPRS 1 Slot (8PSK)	26.5 dBm	23.8 dBm
EGPRS 2 Slots (8PSK)	26.5 dBm	21.8 dBm

Tune-Up Tolerance: +1.0 dB/- 1.5 dB

Target power indicated above is the nominal value. The measured value shall fall within +1dB / -1.5dB of this value.

Full Power

GPRS (GMSK) - Coding Scheme: CS1						
Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
1900	512	1850.2	29.9	20.9	29.9	23.9
	661	1880.0	29.9	20.9	29.8	23.8
	810	1909.8	29.8	20.8	29.7	23.7
EGPRS (8PSK) - Coding Scheme: MCS5						
Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
1900	512	1850.2	26.2	17.2	26.0	20.0
	661	1880.0	26.2	17.2	26.0	20.0
	810	1909.8	26.2	17.2	26.0	20.0

Reduced Power

GPRS (GMSK) - Coding Scheme: CS1						
Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
1900	512	1850.2	27.0	18.0	24.2	18.2
	661	1880.0	27.0	18.0	24.2	18.2
	810	1909.8	27.0	18.0	24.2	18.2
EGPRS (8PSK) - Coding Scheme: MCS5						
Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
1900	512	1850.2	24.5	15.5	22.5	16.5
	661	1880.0	24.5	15.5	22.5	16.5
	810	1909.8	24.5	15.5	22.5	16.5

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 or reduced power because its output power is less than that of GPRS Mode at either full power or reduced power

9.3. W-CDMA Band V

Target Power for W-CDMA Band V

W-CDMA Band V	Full Power	Reduced Power
Release 99 RMC	23.2 dBm	18.3 dBm
HSDPA	21.2 dBm	17.3 dBm
HSUPA	21.2 dBm	17.3 dBm

Tune-Up Tolerance: +1.0 dB/- 1.5 dB

Target power indicated above is the nominal value. The measured value shall fall within +1dB / -1.5dB of this value.

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)	
				Full Power	Reduced Power
W-CDMA (UMTS) Band V	Rel 99 (RMC, 12.2 kbps)	4132	826.4	22.9	18.9
		4183	836.6	22.9	18.8
		4233	846.6	22.8	18.8

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
CM (dB)	0	1	1.5	1.5
HSDPA Specific Settings	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} = β_{hs}/β_c				
30/15				

HSDPA Output Power Measurement Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)	
				Full Power	Reduced Power
W-CDMA (UMTS) Band V	Subtest 1	4132	826.4	20.8	16.7
		4183	836.6	20.8	16.7
		4233	846.6	20.8	16.6
	Subtest 2	4132	826.4	20.8	16.7
		4183	836.6	20.8	16.6
		4233	846.6	20.8	16.6
	Subtest 3	4132	826.4	20.8	16.7
		4183	836.6	20.8	16.7
		4233	846.6	20.8	16.7
	Subtest 4	4132	826.4	20.8	16.7
		4183	836.6	20.9	16.7
		4233	846.6	20.7	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	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
	ETFCl (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 11
		E-TFCI PO 4		E-TFCI PO 4		E-TFCI PO 4
		E-TFCI 67		E-TFCI 67		E-TFCI 67
		E-TFCI PO 18		E-TFCI PO 18		E-TFCI PO 18
		E-TFCI 71		E-TFCI 71		E-TFCI 71
E-TFCI PO 23		E-TFCI PO 23		E-TFCI PO 23		
E-TFCI 75		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)	
				Full Power	Reduced Power
WCDMA (UMTS) Band V	Subtest 1	4132	826.4	21.9	16.0
		4183	836.6	22.1	16.1
		4233	846.6	21.6	16.0
	Subtest 2	4132	826.4	20.6	18.0
		4183	836.6	20.8	18.1
		4233	846.6	20.7	17.9
	Subtest 3	4132	826.4	20.9	17.4
		4183	836.6	21.0	17.5
		4233	846.6	20.6	17.6
	Subtest 4	4132	826.4	21.1	18.0
		4183	836.6	21.1	18.2
		4233	846.6	21.0	18.0
	Subtest 5	4132	826.4	22.2	18.1
		4183	836.6	22.2	18.1
		4233	846.6	22.1	18.0

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

W-CDMA Band IV	Full Power	Reduced Power
Release 99 RMC	21.9 dBm	17.8 dBm
HSDPA	21.2 dBm	16.8 dBm
HSUPA	21.2 dBm	16.8 dBm

Tune-Up Tolerance: +1.0 dB/- 1.5 dB

Target power indicated above is the nominal value. The measured value shall fall within +1dB / -1.5dB of this value.

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)	
				Full Power	w/ Power Reduction
W-CDMA (UMTS) Band IV	Rel 99 (RMC, 12.2 kbps)	1312	1712.4	22.7	18.1
		1413	1732.6	22.7	18.0
		1513	1752.6	22.7	18.0

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
CM (dB)	0	1	1.5	1.5
HSDPA Specific Settings	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} = β_{hs}/β_c				
30/15				

HSDPA Output Power Measurement Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)	
				Full Power	w/ Power Reductoin
W-CDMA (UMTS) Band IV	Subtest 1	1312	1712.4	20.7	16.0
		1413	1732.6	20.7	16.0
		1513	1752.6	20.6	16.0
	Subtest 2	1312	1712.4	20.8	16.1
		1413	1732.6	20.7	16.1
		1513	1752.6	20.6	16.0
	Subtest 3	1312	1712.4	20.6	16.1
		1413	1732.6	20.7	16.0
		1513	1752.6	20.5	16.0
	Subtest 4	1312	1712.4	20.6	16.2
		1413	1732.6	20.7	16.0
		1513	1752.6	20.5	15.9

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	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						
$A_{hs} = \beta_{hs}/\beta_c$						
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 PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18		E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27

HSUPA Output Power Measurement Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)	
				Full Power	w/ Power Reductoin
WCDMA (UMTS) Band IV	Subtest 1	1312	1712.4	21.8	15.5
		1413	1732.6	21.8	15.6
		1513	1752.6	21.6	15.4
	Subtest 2	1312	1712.4	20.6	17.2
		1413	1732.6	20.5	17.2
		1513	1752.6	20.4	17.0
	Subtest 3	1312	1712.4	20.9	17.0
		1413	1732.6	20.8	17.0
		1513	1752.6	20.6	16.8
	Subtest 4	1312	1712.4	21.2	17.1
		1413	1732.6	21.0	17.0
		1513	1752.6	20.9	17.0
	Subtest 5	1312	1712.4	22.2	17.5
		1413	1732.6	22.2	17.5
		1513	1752.6	21.9	17.3

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

W-CDMA Band II	Full Power	Reduced Power
Release 99 RMC	21.9 dBm	16.0 dBm
HSDPA	21.7 dBm	15.5 dBm
HSUPA	21.7 dBm	15.5 dBm

Tune-Up Tolerance: +1.0 dB/- 1.5 dB

Target power indicated above is the nominal value. The measured value shall fall within +1dB / -1.5dB of this value.

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)	
				Full Power	w/ Power Reduction
W-CDMA (UMTS) Band II	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	22.4	17.0
		9400	1880.0	22.7	17.0
		9538	1907.6	22.6	17.0

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
CM (dB)	0	1	1.5	1.5	
HSDPA Specific Settings	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)	
				Full Power	w/ Power Reductoin
W-CDMA (UMTS) Band II	Subtest 1	9262	1852.4	20.9	15.0
		9400	1880.0	20.9	15.1
		9538	1907.6	20.5	14.8
	Subtest 2	9262	1852.4	20.9	15.1
		9400	1880.0	21.0	15.2
		9538	1907.6	20.6	14.7
	Subtest 3	9262	1852.4	20.9	15.0
		9400	1880.0	20.9	15.1
		9538	1907.6	20.5	14.8
	Subtest 4	9262	1852.4	21.0	15.1
		9400	1880.0	21.0	15.1
		9538	1907.6	20.5	14.7

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 PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18		E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27

HSUPA Output Power Measurement Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)	
				Full Power	w/ Power Reductoin
WCDMA (UMTS) Band II	Subtest 1	9262	1852.4	22.2	15.6
		9400	1880.0	22.2	15.6
		9538	1907.6	21.8	15.1
	Subtest 2	9262	1852.4	21.0	16.0
		9400	1880.0	21.0	16.0
		9538	1907.6	20.6	15.8
	Subtest 3	9262	1852.4	21.2	14.8
		9400	1880.0	21.2	14.8
		9538	1907.6	20.8	14.4
	Subtest 4	9262	1852.4	21.3	16.2
		9400	1880.0	21.2	16.2
		9538	1907.6	21.0	15.7
	Subtest 5	9262	1852.4	22.3	16.6
		9400	1880.0	22.3	16.6
		9538	1907.6	21.9	16.2

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.

9.1. CDMA BC0

Target Power for CDMA BC0

CDMA BC0	Full Power	Reduced Power
1xRTT	23.0 dBm	18.6 dBm
1xEV-DO	23.0 dBm	18.5 dBm

Tune-Up Tolerance: +1.0 dB/- 1.5 dB

Target power indicated above is the nominal value. The measured value shall fall within +1dB / -1.5dB of this value.

1xRTT Output Power Measurement Results

CDMA			Avg Pwr (dBm)					
Band	Ch	Freq. (MHz)	RC1 - SO55		RC3 - SO55		RC3 - SO32	
			(Loopback)		(Loopback)		(+F-SCH)	
			Full Power	Reduced Power	Full Power	Reduced Power	Full Power	Reduced Power
BC 0	1013	824.7	22.8	18.9	22.8	19.0	22.8	19.0
	384	836.52	22.7	18.9	22.8	18.7	22.9	18.7
	777	848.31	22.5	18.7	22.5	18.7	22.5	18.6

1xEV-DO Rel. 0 Output Power Measurement Results

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Avg Pwr (dBm)	
					Full Power	Reduced Power
BC 0	307.2 kbps (2 slot, QPSK)	153.6 kbps	1013	824.7	22.9	19.2
			384	836.52	23.0	19.1
			777	848.31	22.6	18.8

1xEV-DO Rev. A Output Power Measurement Results

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	Avg Pwr (dBm)	
					Full Power	Reduced Power
BC 0	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.7	23.0	19.1
			384	836.52	22.8	18.9
			777	848.31	22.6	18.9

9.1. CDMA BC1

Target Power for CDMA BC1

CDMA BC1	Full Power	Reduced Power
1xRTT	21.4 dBm	16.8 dBm
1xEV-DO	21.5 dBm	17.1 dBm

Tune-Up Tolerance: +1.0 dB/- 1.5 dB

Target power indicated above is the nominal value. The measured value shall fall within +1dB / -1.5dB of this value.

1xRTT Output Power Measurement Results

CDMA			Avg Pwr (dBm)					
Band	Ch	Freq. (MHz)	RC1 - SO55		RC3 - SO55		RC3 - SO32	
			(Loopback)		(Loopback)		(+F-SCH)	
			Full Power	Reduced Power	Full Power	Reduced Power	Full Power	Reduced Power
BC 1	25	1851.25	22.3	17.5	22.4	17.6	22.4	17.6
	600	1880	22.2	17.5	22.3	17.5	22.3	17.6
	1175	1908.75	22.2	17.6	22.1	17.4	22.0	17.5

1xEV-DO Rel. 0 Output Power Measurement Results

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Avg Pwr (dBm)	
					Full Power	Reduced Power
BC 1	307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	22.5	17.9
			600	1880	22.4	17.8
			1175	1908.75	22.3	17.8

1xEV-DO Rev. A Output Power Measurement Results

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	Avg Pwr (dBm)	
					Full Power	Reduced Power
BC 1	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	22.5	18.0
			600	1880	22.5	17.8
			1175	1908.75	22.4	17.7

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

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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 ± 2°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 ±(%)	
12/12/2012	Body 1900	e'	52.8700	Relative Permittivity (ϵ_r):	52.87	53.30	-0.81	5
		e"	14.2300	Conductivity (σ):	1.50	1.52	-1.10	5
	Body 1850	e'	53.0600	Relative Permittivity (ϵ_r):	53.06	53.30	-0.45	5
		e"	14.1700	Conductivity (σ):	1.46	1.52	-4.10	5
	Body 1910	e'	52.8500	Relative Permittivity (ϵ_r):	52.85	53.30	-0.84	5
		e"	14.2600	Conductivity (σ):	1.51	1.52	-0.37	5
1/17/2013	Body 1750	e'	52.7700	Relative Permittivity (ϵ_r):	52.77	53.44	-1.26	5
		e"	15.0600	Conductivity (σ):	1.47	1.49	-1.40	5
	Body 1710	e'	52.9600	Relative Permittivity (ϵ_r):	52.96	53.54	-1.09	5
		e"	14.9700	Conductivity (σ):	1.42	1.46	-2.61	5
	Body 1755	e'	52.7400	Relative Permittivity (ϵ_r):	52.74	53.43	-1.29	5
		e"	15.0800	Conductivity (σ):	1.47	1.49	-1.19	5
1/18/2013	Body 1900	e'	50.6600	Relative Permittivity (ϵ_r):	50.66	53.30	-4.95	5
		e"	14.2400	Conductivity (σ):	1.50	1.52	-1.03	5
	Body 1850	e'	50.8800	Relative Permittivity (ϵ_r):	50.88	53.30	-4.54	5
		e"	14.0700	Conductivity (σ):	1.45	1.52	-4.78	5
	Body 1910	e'	50.6400	Relative Permittivity (ϵ_r):	50.64	53.30	-4.99	5
		e"	14.2400	Conductivity (σ):	1.51	1.52	-0.51	5
1/22/2013	Body 1750	e'	52.0100	Relative Permittivity (ϵ_r):	52.01	53.44	-2.68	5
		e"	15.6800	Conductivity (σ):	1.53	1.49	2.66	5
	Body 1710	e'	52.1000	Relative Permittivity (ϵ_r):	52.10	53.54	-2.70	5
		e"	15.5600	Conductivity (σ):	1.48	1.46	1.23	5
	Body 1755	e'	52.0100	Relative Permittivity (ϵ_r):	52.01	53.43	-2.65	5
		e"	15.7100	Conductivity (σ):	1.53	1.49	2.94	5
1/28/2013	Body 835	e'	54.0900	Relative Permittivity (ϵ_r):	54.09	55.20	-2.01	5
		e"	21.9000	Conductivity (σ):	1.02	0.97	4.82	5
	Body 820	e'	54.2100	Relative Permittivity (ϵ_r):	54.21	55.28	-1.93	5
		e"	21.9900	Conductivity (σ):	1.00	0.97	3.53	5
	Body 850	e'	53.9400	Relative Permittivity (ϵ_r):	53.94	55.16	-2.21	5
		e"	21.8700	Conductivity (σ):	1.03	0.99	4.71	5
2/5/2013	Body 1900	e'	53.2200	Relative Permittivity (ϵ_r):	53.22	53.30	-0.15	5
		e"	14.1900	Conductivity (σ):	1.50	1.52	-1.37	5
	Body 1850	e'	53.3900	Relative Permittivity (ϵ_r):	53.39	53.30	0.17	5
		e"	14.0800	Conductivity (σ):	1.45	1.52	-4.71	5
	Body 1910	e'	53.1800	Relative Permittivity (ϵ_r):	53.18	53.30	-0.23	5
		e"	14.2300	Conductivity (σ):	1.51	1.52	-0.58	5
2/5/2013	Body 835	e'	54.7979	Relative Permittivity (ϵ_r):	54.80	55.20	-0.73	5
		e"	21.4363	Conductivity (σ):	1.00	0.97	2.60	5
	Body 820	e'	55.0063	Relative Permittivity (ϵ_r):	55.01	55.28	-0.49	5
		e"	21.4947	Conductivity (σ):	0.98	0.97	1.20	5
	Body 850	e'	54.6164	Relative Permittivity (ϵ_r):	54.62	55.16	-0.98	5
		e"	21.3817	Conductivity (σ):	1.01	0.99	2.37	5

Tissue Dielectric Parameter Check Results (continued)

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit \pm (%)	
1/30/2013	Body 750	e'	53.2600	Relative Permittivity (ϵ_r):	53.26	55.55	-4.12	5
		e"	23.1400	Conductivity (σ):	0.96	0.96	0.20	5
	Body 700	e'	53.7400	Relative Permittivity (ϵ_r):	53.74	55.74	-3.59	5
		e"	23.6000	Conductivity (σ):	0.92	0.96	-4.24	5
	Body 790	e'	52.7700	Relative Permittivity (ϵ_r):	52.77	55.39	-4.73	5
		e"	22.8300	Conductivity (σ):	1.00	0.97	3.80	5
1/30/2013	Body 750	e'	53.6500	Relative Permittivity (ϵ_r):	53.65	55.55	-3.41	5
		e"	23.1800	Conductivity (σ):	0.97	0.96	0.37	5
	Body 710	e'	54.0400	Relative Permittivity (ϵ_r):	54.04	55.70	-2.98	5
		e"	23.5300	Conductivity (σ):	0.93	0.96	-3.24	5
	Body 790	e'	53.1800	Relative Permittivity (ϵ_r):	53.18	55.39	-3.99	5
		e"	22.8300	Conductivity (σ):	1.00	0.97	3.80	5
2/4/2013	Body 835	e'	54.0882	Relative Permittivity (ϵ_r):	54.09	55.20	-2.01	5
		e"	21.2718	Conductivity (σ):	0.99	0.97	1.82	5
	Body 820	e'	54.2666	Relative Permittivity (ϵ_r):	54.27	55.28	-1.83	5
		e"	21.3455	Conductivity (σ):	0.97	0.97	0.49	5
	Body 850	e'	53.9407	Relative Permittivity (ϵ_r):	53.94	55.16	-2.21	5
		e"	21.2049	Conductivity (σ):	1.00	0.99	1.53	5
2/4/2013	Body 1900	e'	51.3600	Relative Permittivity (ϵ_r):	51.36	53.30	-3.64	5
		e"	14.8300	Conductivity (σ):	1.57	1.52	3.07	5
	Body 1850	e'	51.5500	Relative Permittivity (ϵ_r):	51.55	53.30	-3.28	5
		e"	14.6800	Conductivity (σ):	1.51	1.52	-0.65	5
	Body 1910	e'	51.3100	Relative Permittivity (ϵ_r):	51.31	53.30	-3.73	5
		e"	14.8800	Conductivity (σ):	1.58	1.52	3.97	5
2/5/2013	Body 835	e'	54.7979	Relative Permittivity (ϵ_r):	54.80	55.20	-0.73	5
		e"	21.4363	Conductivity (σ):	1.00	0.97	2.60	5
	Body 820	e'	55.0063	Relative Permittivity (ϵ_r):	55.01	55.28	-0.49	5
		e"	21.4947	Conductivity (σ):	0.98	0.97	1.20	5
	Body 850	e'	54.6164	Relative Permittivity (ϵ_r):	54.62	55.16	-0.98	5
		e"	21.3817	Conductivity (σ):	1.01	0.99	2.37	5
2/5/2013	Body 1900	e'	53.2200	Relative Permittivity (ϵ_r):	53.22	53.30	-0.15	5
		e"	14.1900	Conductivity (σ):	1.50	1.52	-1.37	5
	Body 1850	e'	53.3900	Relative Permittivity (ϵ_r):	53.39	53.30	0.17	5
		e"	14.0800	Conductivity (σ):	1.45	1.52	-4.71	5
	Body 1910	e'	53.1800	Relative Permittivity (ϵ_r):	53.18	53.30	-0.23	5
		e"	14.2300	Conductivity (σ):	1.51	1.52	-0.58	5
2/18/2013	Body 835	e'	52.7700	Relative Permittivity (ϵ_r):	52.77	55.20	-4.40	5
		e"	21.8600	Conductivity (σ):	1.01	0.97	4.63	5
	Body 820	e'	52.9500	Relative Permittivity (ϵ_r):	52.95	55.28	-4.21	5
		e"	21.9400	Conductivity (σ):	1.00	0.97	3.29	5
	Body 850	e'	52.5600	Relative Permittivity (ϵ_r):	52.56	55.16	-4.71	5
		e"	21.8100	Conductivity (σ):	1.03	0.99	4.42	5
2/18/2013	Body 1900	e'	51.1300	Relative Permittivity (ϵ_r):	51.13	53.30	-4.07	5
		e"	14.6600	Conductivity (σ):	1.55	1.52	1.89	5
	Body 1850	e'	51.3200	Relative Permittivity (ϵ_r):	51.32	53.30	-3.71	5
		e"	14.4600	Conductivity (σ):	1.49	1.52	-2.14	5
	Body 1910	e'	51.0900	Relative Permittivity (ϵ_r):	51.09	53.30	-4.15	5
		e"	14.7200	Conductivity (σ):	1.56	1.52	2.85	5

Tissue Dielectric Parameter Check Results (continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
2/22/2013	Body 835	e'	52.9000	Relative Permittivity (ϵ_r):	52.90	55.20	-4.17	5
		e"	21.8400	Conductivity (σ):	1.01	0.97	4.54	5
	Body 820	e'	53.0800	Relative Permittivity (ϵ_r):	53.08	55.28	-3.97	5
		e"	21.9000	Conductivity (σ):	1.00	0.97	3.10	5
	Body 850	e'	52.7300	Relative Permittivity (ϵ_r):	52.73	55.16	-4.40	5
		e"	21.7500	Conductivity (σ):	1.03	0.99	4.14	5
2/22/2013	Body 1900	e'	51.1800	Relative Permittivity (ϵ_r):	51.18	53.30	-3.98	5
		e"	14.1800	Conductivity (σ):	1.50	1.52	-1.44	5
	Body 1850	e'	51.4700	Relative Permittivity (ϵ_r):	51.47	53.30	-3.43	5
		e"	14.0800	Conductivity (σ):	1.45	1.52	-4.71	5
	Body 1910	e'	51.1500	Relative Permittivity (ϵ_r):	51.15	53.30	-4.03	5
		e"	14.2100	Conductivity (σ):	1.51	1.52	-0.72	5
3/4/2013	Body 2450	e'	50.6900	Relative Permittivity (ϵ_r):	50.69	52.70	-3.81	5
		e"	13.9300	Conductivity (σ):	1.90	1.95	-2.68	5
	Body 2410	e'	50.8000	Relative Permittivity (ϵ_r):	50.80	52.76	-3.71	5
		e"	13.7900	Conductivity (σ):	1.85	1.91	-3.12	5
	Body 2475	e'	50.5900	Relative Permittivity (ϵ_r):	50.59	52.67	-3.95	5
		e"	14.0000	Conductivity (σ):	1.93	1.99	-2.95	5
3/4/2013	Body 5180	e'	47.9500	Relative Permittivity (ϵ_r):	47.95	49.05	-2.24	10
		e"	17.7600	Conductivity (σ):	5.12	5.27	-2.96	5
	Body 5200	e'	47.9100	Relative Permittivity (ϵ_r):	47.91	49.02	-2.26	10
		e"	17.7700	Conductivity (σ):	5.14	5.29	-2.96	5
	Body 5600	e'	47.3500	Relative Permittivity (ϵ_r):	47.35	48.48	-2.33	10
		e"	18.1200	Conductivity (σ):	5.64	5.76	-2.06	5
	Body 5800	e'	47.0600	Relative Permittivity (ϵ_r):	47.06	48.20	-2.37	10
		e"	18.3200	Conductivity (σ):	5.91	6.00	-1.53	5
	Body 5825	e'	47.0100	Relative Permittivity (ϵ_r):	47.01	48.20	-2.47	10
		e"	18.3200	Conductivity (σ):	5.93	6.00	-1.11	5
3/5/2013	Body 2450	e'	50.4200	Relative Permittivity (ϵ_r):	50.42	52.70	-4.33	5
		e"	14.3800	Conductivity (σ):	1.96	1.95	0.46	5
	Body 2410	e'	50.5400	Relative Permittivity (ϵ_r):	50.54	52.76	-4.21	5
		e"	14.1900	Conductivity (σ):	1.90	1.91	-0.31	5
	Body 2475	e'	50.3100	Relative Permittivity (ϵ_r):	50.31	52.67	-4.48	5
		e"	14.4700	Conductivity (σ):	1.99	1.99	0.31	5
3/11/2013	Body 835	e'	55.3400	Relative Permittivity (ϵ_r):	55.34	55.20	0.25	5
		e"	21.9300	Conductivity (σ):	1.02	0.97	4.97	5
	Body 820	e'	55.4700	Relative Permittivity (ϵ_r):	55.47	55.28	0.35	5
		e"	22.0400	Conductivity (σ):	1.00	0.97	3.76	5
	Body 850	e'	55.2000	Relative Permittivity (ϵ_r):	55.20	55.16	0.08	5
		e"	21.8400	Conductivity (σ):	1.03	0.99	4.57	5
3/11/2013	Body 1900	e'	50.8100	Relative Permittivity (ϵ_r):	50.81	53.30	-4.67	5
		e"	14.4200	Conductivity (σ):	1.52	1.52	0.22	5
	Body 1850	e'	51.0200	Relative Permittivity (ϵ_r):	51.02	53.30	-4.28	5
		e"	14.2400	Conductivity (σ):	1.46	1.52	-3.63	5
	Body 1910	e'	50.7600	Relative Permittivity (ϵ_r):	50.76	53.30	-4.77	5
		e"	14.4400	Conductivity (σ):	1.53	1.52	0.89	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	4d002	10/24/12	835	1g	9.58	9.48
				10g	6.28	6.26
D835V2	4d117	4/10/12	835	1g	9.38	9.52
				10g	6.15	6.31
D1750V2	1053	8/15/12	1750	1g	35.9	37.5
				10g	19.1	20.2
D1750V2	1077	10/3/2012	1750	1g	36.1	37.7
				10g	19.3	20.3
D1900V2	5d140	4/12/12	1900	1g	39.8	40.2
				10g	20.8	21.3
D1900V2	5d043	11/06/12	1900	1g	39.9	40.9
				10g	20.9	21.6
D2450V2	706	4/11/2012	2450	1g	51.2	49.6
				10g	23.9	23.4

Reference SAR Values for System Performance Check

System Dipole	Serial No.	Cal. Date	Freq. (MHz)	Target SAR Values (mW/g)		
				1g/10g	Head	Body
D5GHV2	1003	9/18/2012	5.2GHz	1g	76.5	74.8
				10g	21.9	20.9
			5.6GHz	1g	82.8	79.0
				10g	23.6	22.0
			5.8GHz	1g	76.9	77.0
				10g	22.0	21.4

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 %	
	Type	Serial #		Area Scan	Zoom Scan	Normalize to 1 W				
12/12/2012	D1900V2	5d140	Body	1g	4.01	3.98	39.8	40.2	-1.00	0.75
				10g	2.03	2.09	20.9	21.3	-1.88	
1/17/2013	D1750V2	1077	Body	1g	3.68	3.63	36.3	37.7	-3.71	1.36
				10g	1.91	1.95	19.5	20.3	-3.94	
1/18/2013	D1900V2	5d140	Body	1g	3.99	3.93	39.3	41.2	-4.61	1.50
				10g	2.03	2.06	20.6	20.3	1.48	
1/22/2013	D1900V2	5d140	Body	1g	4.18	4.07	40.7	40.2	1.24	2.63
				10g	2.13	2.11	21.1	21.3	-0.94	
1/23/2013	D1750V2	1053	Body	1g	3.69	3.65	36.5	37.5	-2.67	1.08
				10g	1.91	1.95	19.5	20.2	-3.47	
1/28/2013	D835V2	4d117	Body	1g	1.04	1.01	10.10	9.52	6.09	2.88
				10g	0.692	0.663	6.63	6.31	5.07	
2/4/2013	D835V2	4d117	Body	1g	0.987	0.958	9.58	9.52	0.63	2.94
				10g	0.661	0.633	6.33	6.31	0.32	
2/4/2013	D1900V2	5d140	Body	1g	4.12	3.96	39.6	41.2	-3.88	3.88
				10g	2.13	2.08	20.80	21.3	-2.35	
2/18/2013	D835V2	4d117	Body	1g	1.14	0.997	10.0	9.52	4.73	12.54
				10g	0.757	0.654	6.54	6.31	3.65	
2/18/2013	D1750V2	1077	Body	1g	3.75	3.68	36.8	37.7	-2.39	1.87
				10g	1.98	1.97	19.7	20.3	-2.96	
2/18/2013	D1900V2	5d043	Body	1g	4.38	4.33	43.3	40.9	5.87	1.14
				10g	2.22	2.26	22.6	21.6	4.63	
2/22/2013	D835V2	4d117	Body	1g	1.02	1	10.0	9.52	5.04	1.96
				10g	0.685	0.661	6.61	6.31	4.75	
2/22/2013	D1900V2	5d140	Body	1g	4.12	4.08	40.8	41.2	-0.97	0.97
				10g	2.07	2.14	21.40	21.3	0.47	
3/4/2013	D2450V2	706	Body	1g	5.31	5.33	53.3	49.6	7.46	-0.38
				10g	2.3	2.46	24.6	23.4	5.13	
3/4/2013	D5GHzV2 5.2 GHz	1003	Body	1g	7.75	8.12	81.2	74.8	8.56	-4.77
				10g	2.15	2.27	22.7	20.9	8.61	
3/4/2013	D5GHzV2 5.6 GHz	1003	Body	1g	7.99	8.42	84.2	79.0	6.58	-5.38
				10g	2.19	2.34	23.4	22.0	6.36	
3/4/2013	D5GHzV2 5.8 GHz	1003	Body	1g	7.51	7.57	75.7	77.0	-1.69	-0.80
				10g	2.06	2.12	21.2	21.4	-0.93	
3/6/2013	D2450V2	706	Body	1g	5.5	5.45	54.5	49.6	9.88	0.91
				10g	2.43	2.49	24.9	23.4	6.41	
3/11/2013	D835V2	4d002	Body	1g	1.05	1.02	10.20	9.48	7.59	2.86
				10g	0.702	0.671	6.71	6.26	7.19	
3/11/2013	D1900V2	5d043	Body	1g	4.20	4.18	41.8	40.9	2.20	0.48
				10g	2.1	2.2	22.0	21.6	1.85	

12. SAR Test Results

12.1. Standalone SAR Test Exclusion Considerations

Standalone SAR test exclusion was based upon the following criteria:

1. If the antenna to DUT adjacent edge or bottom separation distance is < 50mm a distance of 5mm is used to determine SAR exclusion and estimated SAR value
2. 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
3. Reduced power does not apply for edges 2, 3 and 4.

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

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
Full Power 3G - distances include sensor triggering distance for rear (6mm) and edge 1 (20mm)																
3G Main	GSM	848.8	26.68	466	6	20	167.6	176	0		72.0	21.0	> 50 mm	> 50 mm	86.0	N/A
3G Main	GSM	1909.8	24.28	268	6	20	167.6	176	0		62.0	19.0	> 50 mm	> 50 mm	74.0	N/A
3G Main	WCDMA	846.6	24.20	263	6	20	167.6	176	0		40.0	12.0	> 50 mm	> 50 mm	48.0	N/A
3G Main	WCDMA	1752.6	22.90	195	6	20	167.6	176	0		43.0	13.0	> 50 mm	> 50 mm	52.0	N/A
3G Main	WCDMA	1907.6	22.90	195	6	20	167.6	176	0		45.0	13.0	> 50 mm	> 50 mm	54.0	N/A
3G Main	CDMA BC0	848.3	24.00	251	6	20	167.6	176	0		39.0	12.0	> 50 mm	> 50 mm	46.0	N/A
3G Main	CDMA BC1	1908.8	22.50	178	6	20	167.6	176	0		41.0	12.0	> 50 mm	> 50 mm	49.0	N/A
Reduced Power 3G - distances are for device in contact with phantom for right edge and rear face																
3G Main	GSM	848.8	22.98	199	0	0					37.0	37.0	N/A	N/A	N/A	N/A
3G Main	GSM	1909.8	20.98	125	0	0					35.0	35.0	N/A	N/A	N/A	N/A
3G Main	WCDMA	846.6	19.30	85	0	0					16.0	16.0	N/A	N/A	N/A	N/A
3G Main	WCDMA	1752.6	18.80	76	0	0					20.0	20.0	N/A	N/A	N/A	N/A
3G Main	WCDMA	1907.6	17.00	50	0	0					14.0	14.0	N/A	N/A	N/A	N/A
3G Main	CDMA BC0	848.3	19.60	91	0	0					17.0	17.0	N/A	N/A	N/A	N/A
3G Main	CDMA BC1	1908.8	18.10	65	0	0					18.0	18.0	N/A	N/A	N/A	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 Power Threshold is greater than the DUT output power for Edge 2 and 3 SAR testing is not required for these configurations

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

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
Full Power 3G - distances include sensor triggering distance for rear (6mm) and edge 1 (20mm)																
3G Main	GSM	848.8	26.68	466	6	20	167.6	176	0		< 50 mm	< 50 mm	828	876	< 50 mm	N/A
3G Main	GSM	1909.8	24.28	268	6	20	167.6	176	0		< 50 mm	< 50 mm	1285	1369	< 50 mm	N/A
3G Main	WCDMA	846.6	24.20	263	6	20	167.6	176	0		< 50 mm	< 50 mm	827	874	< 50 mm	N/A
3G Main	WCDMA	1752.6	22.90	195	6	20	167.6	176	0		< 50 mm	< 50 mm	1289	1373	< 50 mm	N/A
3G Main	WCDMA	1907.6	22.90	195	6	20	167.6	176	0		< 50 mm	< 50 mm	1285	1369	< 50 mm	N/A
3G Main	CDMA BC0	848.3	24.00	251	6	20	167.6	176	0		< 50 mm	< 50 mm	828	875	< 50 mm	N/A
3G Main	CDMA BC1	1908.8	22.50	178	6	20	167.6	176	0		< 50 mm	< 50 mm	1285	1369	< 50 mm	N/A
Reduced Power 3G - distances are for device in contact with phantom for right edge and rear face																
3G Main	GSM	848.8	22.98	199	0	0					< 50 mm	< 50 mm	N/A	N/A	N/A	N/A
3G Main	GSM	1909.8	20.98	125	0	0					< 50 mm	< 50 mm	N/A	N/A	N/A	N/A
3G Main	WCDMA	846.6	19.30	85	0	0					< 50 mm	< 50 mm	N/A	N/A	N/A	N/A
3G Main	WCDMA	1752.6	18.80	76	0	0					< 50 mm	< 50 mm	N/A	N/A	N/A	N/A
3G Main	WCDMA	1907.6	17.00	50	0	0					< 50 mm	< 50 mm	N/A	N/A	N/A	N/A
3G Main	CDMA BC0	848.3	19.60	91	0	0					< 50 mm	< 50 mm	N/A	N/A	N/A	N/A
3G Main	CDMA BC1	1908.8	18.10	65	0	0					< 50 mm	< 50 mm	N/A	N/A	N/A	N/A

Note(s):

- 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 Edge2 and 3 SAR testing is not required for these configurations

12.2. Estimated SAR for Simultaneous Transmission SAR Analysis

Considerations for using estimated SAR values:

1. If the antenna to DUT adjacent edge or bottom separation distance is < 50mm a distance of 5mm is used to determine SAR estimated SAR value.
2. 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 estimated SAR value.
3. Output power is the maximum rated power (including tune-up or manufacturing tolerances) and includes source-based averaging.
4. If the antenna separation distance is > 50mm then the estimated SAR value is the lesser of the estimated value at 50mm or 0.4 W/Kg.
5. Formulas round separation distance to nearest mm and power to nearest mW before calculating estimated SAR

12.2.1. Estimated SAR for WWAN

Antenna	Tx	Frequency (MHz)	Output power		Separation distances (mm)						Estimated SAR Value					
			dBm	mW	Bottom	Edge 1	Edge 2	Edge 3	Edge 4	Front	Bottom	Edge 1	Edge 2	Edge 3	Edge 4	Front
Full Power 3G - distances include sensor triggering distance for rear (6mm) and edge 1 (20mm)																
3G Main	GSM	848.8	26.68	466	6	20	167.6	176	0		Measure	Measure	0.400	0.400	Measure	N/A
3G Main	GSM	1909.8	24.28	268	6	20	167.6	176	0		Measure	Measure	0.400	0.400	Measure	N/A
3G Main	WCDMA	846.6	24.20	263	6	20	167.6	176	0		Measure	Measure	0.400	0.400	Measure	N/A
3G Main	WCDMA	1752.6	22.90	195	6	20	167.6	176	0		Measure	Measure	0.400	0.400	Measure	N/A
3G Main	WCDMA	1907.6	22.90	195	6	20	167.6	176	0		Measure	Measure	0.400	0.400	Measure	N/A
3G Main	CDMA BC0	848.3	24.00	251	6	20	167.6	176	0		Measure	Measure	0.400	0.400	Measure	N/A
3G Main	CDMA BC1	1908.8	22.50	178	6	20	167.6	176	0		Measure	Measure	0.400	0.400	Measure	N/A
Reduced Power 3G - distances are for device in contact with phantom for right edge and rear face																
3G Main	GSM	848.8	22.98	199	0	0					Measure	Measure	N/A	N/A	N/A	N/A
3G Main	GSM	1909.8	20.98	125	0	0					Measure	Measure	N/A	N/A	N/A	N/A
3G Main	WCDMA	846.6	19.30	85	0	0					Measure	Measure	N/A	N/A	N/A	N/A
3G Main	WCDMA	1752.6	18.80	76	0	0					Measure	Measure	N/A	N/A	N/A	N/A
3G Main	WCDMA	1907.6	17.00	50	0	0					Measure	Measure	N/A	N/A	N/A	N/A
3G Main	CDMA BC0	848.3	19.60	91	0	0					Measure	Measure	N/A	N/A	N/A	N/A
3G Main	CDMA BC1	1908.8	18.10	65	0	0					Measure	Measure	N/A	N/A	N/A	N/A

Notes:

- Situations that comprised only estimated values (i.e. edge 2) 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:
 - a. Rear, Wi-Fi 1 Tx on Aux: This is WWAN + WLAN Aux and is effectively covered by the Wi-Fi 2 Tx scenario that adds the SAR of WLAN Main to the summation.
 - b. Edge 2, for all combinations.
 - c. Edge 3, WWAN + Wi-Fi 1 Tx on Main: This is WWAN + WLAN Main + Bluetooth, all of which qualify for standalone SAR test exclusion under this test position.
 - d. Edge4: WWAN + Wi-Fi 1 Tx on Aux: This is WWAN + WLAN Aux and is effectively covered by WWAN + Wi-Fi 2 Tx, which adds the SAR of WLAN Main at its most conservative edge to this combination.

12.2.2. Estimated SAR for Wi-Fi 2 Tx (MIMO)

UL CCS Report number 12J14673-1F does not contain estimated SAR values for Wi-Fi 2Tx (MIMO). For the purpose of the simultaneous transmission analysis Wi-Fi 2Tx (MIMO) has been calculated here using power and separation distances from report number 12J14673-1F. These values have been used for the Edge 1 and Edge 3 WWAN and Wi-Fi 2Tx (MIMO) simultaneous transmission analysis.

Antenna	Tx	Frequency (MHz)	Output power		Separation distances (mm)						Estimated SAR Value					
			dBm	mW	Bottom	Edge 1	Edge 2	Edge 3	Edge 4	Front	Bottom	Edge 1	Edge 2	Edge 3	Edge 4	Front
WiFi - Main Antenna																
WLAN Main	WiFi	2412	12.50	18	5	5	265.5	139	5		Measure	Measure	0.075	0.075	Measure	N/A
WLAN Main	WiFi	5180	12.00	16	5	5	265.5	139	5		Measure	Measure	0.097	0.097	Measure	N/A
WLAN Main	WiFi	5260	12.40	17	5	5	265.5	139	5		Measure	Measure	0.104	0.104	Measure	N/A
WLAN Main	WiFi	5500	12.50	18	5	5	265.5	139	5		Measure	Measure	0.113	0.113	Measure	N/A
WLAN Main	WiFi	5745	12.00	16	5	5	265.5	139	5		Measure	Measure	0.102	0.102	Measure	N/A
Bluetooth / WiFi - Aux Antenna																
WLAN Aux	WiFi	2412	12.50	18	5	184.5	228.3	5	5		Measure	0.075	0.075	Measure	Measure	N/A
WLAN Aux	WiFi	5180	12.00	16	5	184.5	228.3	5	5		Measure	0.097	0.097	Measure	Measure	N/A
WLAN Aux	WiFi	5260	12.30	17	5	184.5	228.3	5	5		Measure	0.104	0.104	Measure	Measure	N/A
WLAN Aux	WiFi	5500	12.50	18	5	184.5	228.3	5	5		Measure	0.113	0.113	Measure	Measure	N/A
WLAN Aux	WiFi	5745	12.00	16	5	184.5	228.3	5	5		Measure	0.102	0.102	Measure	Measure	N/A
WLAN Aux	Bluetooth	2402	6.50	4	5	184.5	228.3	5	5		0.165	0.017	0.017	0.165	0.165	N/A

Notes:

- Situations that comprised only estimated values (i.e. edge 2) are not reported as they are inherently compliant. The maximum SAR value based on two estimated values would be 0.8 W/Kg, well below the highest stand-alone SAR value for Edges 3 and 4 and therefore not the most conservative exposure condition for simultaneous transmission analysis. Situations that were justifiably omitted for simultaneous transmission SAR analysis include:
 - Rear, Wi-Fi 1 Tx on Aux: This is WWAN + WLAN Aux and is effectively covered by the Wi-Fi 2 Tx scenario that
 - Edge 2, for all combinations.
 - Edge 3, WWAN + Wi-Fi 1 Tx on Main: This is WWAN + WLAN Main + Bluetooth, all of which qualify for standalone SAR test exclusion under this test position.
 - Edge4: WWAN + Wi-Fi 1 Tx on Aux: This is WWAN + WLAN Aux and is effectively covered by WWAN + Wi-Fi 2 Tx, which adds the SAR of WLAN Main at its most conservative edge to this combination.
- Wherever appropriate, measured or estimated Wi-Fi 1 Tx (SISO) SAR values were used to represent those of Wi-Fi 2 Tx (MIMO); if compliance can be shown with the more conservative Wi-Fi 1 Tx values, then there is no need to perform separate assessment for Wi-Fi 2 Tx.
- However, where estimated Wi-Fi 1 Tx SAR values are overly conservative, then estimated or measured Wi-Fi 2 Tx (MIMO) values are used.

12.3. GSM850

Usage Scenario: Proximity Sensor Activated, Reduced Power Operation

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	27.0	27.0				1
			190	836.6	27.0	27.0	0.324	0.324	1	
			251	848.8	27.0	27.0				1
Edge 1	0	GPRS 2 Slots	128	824.2	27.0	27.0	1.140	1.140	2	
			190	836.6	27.0	27.0	1.190	1.190	3	
			251	848.8	27.0	27.0	1.370	1.370	4	

Usage Scenario: Proximity Sensor Deactivated, Full Power Operation

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	6	GPRS 2 Slots	128	824.2	32.7	32.6	0.948	0.970	5	
			190	836.6	32.7	32.6	1.050	1.074	6	
			251	848.8	32.7	32.6	0.937	0.959	7	
Edge 1	20	GPRS 2 Slots	128	824.2	32.7	32.6				1
			190	836.6	32.7	32.6	0.385	0.394	8	
			251	848.8	32.7	32.6				1
Edge 4	0	GPRS 2 Slots	128	824.2	32.7	32.6				1
			190	836.6	32.7	32.6	0.324	0.332	9	
			251	848.8	32.7	32.6				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

12.4. GSM1900

Usage Scenario: Proximity Sensor Activated, Reduced Power Operation

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	512	1850.2	24.8	24.2				1
			661	1880.0	24.8	24.2	0.178	0.204	1	
			810	1909.8	24.8	24.2				1
Edge 1	0	GPRS 2 Slots	512	1850.2	24.8	24.2	0.859	0.986	2	
			661	1880.0	24.8	24.2	1.080	1.240	3	
			810	1909.8	24.8	24.2	1.210	1.389	4	

Usage Scenario: Proximity Sensor Deactivated, Full Power Operation

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	6	GPRS 2 Slots	128	1850.2	30.3	29.9	1.190	1.305	5	
			190	1880.0	30.3	29.8	1.180	1.324	6	
			251	1909.8	30.3	29.7	0.832	0.955	7	
Edge 1	20	GPRS 2 Slots	128	1850.2	30.3	29.9				1
			190	1880.0	30.3	29.8	0.255	0.286	8	
			251	1909.8	30.3	29.7				1
Edge 4	0	GPRS 2 Slots	128	1850.2	30.3	29.9				1
			190	1880.0	30.3	29.8	0.352	0.395	9	
			251	1909.8	30.3	29.7				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

12.5. 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.

Usage Scenario: Proximity Sensor Activated, Reduced Power Operation

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	19.3	18.9				1
			4183	836.6	19.3	18.8	0.318	0.357	1	
			4233	846.6	19.3	18.8				1
Edge 1	0	Rel 99 RMC 12.2 kbps	4132	826.4	19.3	18.9	1.020	1.129	2	
			4183	836.6	19.3	18.8	0.993	1.114	3	
			4233	846.6	19.3	18.8	1.090	1.234	4	

Usage Scenario: Proximity Sensor Deactivated, Full Power Operation

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	6	Rel 99 RMC 12.2 kbps	4132	826.4	24.2	22.9				1
			4183	836.6	24.2	22.9	0.500	0.681	5	
			4233	846.6	24.2	22.8				1
Edge 1	20	Rel 99 RMC 12.2 kbps	4132	826.4	24.2	22.9				1
			4183	836.6	24.2	22.9	0.231	0.314	6	
			4233	846.6	24.2	22.8				1
Edge 4	0	Rel 99 RMC 12.2 kbps	4132	826.4	24.2	22.9				1
			4183	836.6	24.2	22.9	0.188	0.256	7	
			4233	846.6	24.2	22.8				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.

- ≤ 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

12.7. 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.

Usage Scenario: Proximity Sensor Activated, Reduced Power Operation

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	1312	1712.4	18.8	18.1				1
			1413	1732.6	18.8	18.0	0.515	0.619	1	
			1513	1752.6	18.8	18.0				1
Edge 1	0	Rel 99 RMC 12.2 kbps	1312	1712.4	18.8	18.1	0.925	1.094	2	
			1413	1732.6	18.8	18.0	1.150	1.383	3	
			1513	1752.6	18.8	18.0	1.130	1.349	4	

Usage Scenario: Proximity Sensor Deactivated, Full Power Operation

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	6	Rel 99 RMC 12.2 kbps	1312	1712.4	22.9	22.7				1
			1413	1732.6	22.9	22.7	0.397	0.420	5	
			1513	1752.6	22.9	22.7				1
Edge 1	20	Rel 99 RMC 12.2 kbps	1312	1712.4	22.9	22.7				1
			1413	1732.6	22.9	22.7	0.380	0.402	6	
			1513	1752.6	22.9	22.7				1
Edge 4	0	Rel 99 RMC 12.2 kbps	1312	1712.4	22.9	22.7				1
			1413	1732.6	22.9	22.7	0.367	0.388	7	
			1513	1752.6	22.9	22.7				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.

- ≤ 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

12.8. 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.

Usage Scenario: Proximity Sensor Activated, Reduced Power Operation

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	17.0	17.0				1
			9400	1880.0	17.0	17.0	0.320	0.320	1	
			9538	1907.6	17.0	17.0				1
Edge 1	0	Rel 99 RMC 12.2 kbps	9262	1852.4	17.0	17.0	1.050	1.050	2	
			9400	1880.0	17.0	17.0	1.180	1.180	3	
			9538	1907.6	17.0	17.0	1.360	1.360	4	
	0	HSUPA Subtest 5	9262	1852.4	17.0	16.6	0.887	0.973	5	
			9400	1880.0	17.0	16.6	1.040	1.140	6	
			9538	1907.6	17.0	16.2	1.190	1.431	7	

Usage Scenario: Proximity Sensor Deactivated, Full Power Operation

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	6	Rel 99 RMC 12.2 kbps	9262	1852.4	22.9	22.4	0.853	0.953	8	
			9400	1880.0	22.9	22.7	0.929	0.966	9	
			9538	1907.6	22.9	22.6	0.951	1.012	10	
Edge 1	20	Rel 99 RMC 12.2 kbps	9262	1852.4	22.9	22.4				1
			9400	1880.0	22.9	22.7	0.248	0.258	11	
			9538	1907.6	22.9	22.6				1
Edge 4	0	Rel 99 RMC 12.2 kbps	9262	1852.4	22.9	22.4				1
			9400	1880.0	22.9	22.7	0.369	0.384	12	
			9538	1907.6	22.9	22.6				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

12.9. CDMA BC0

Usage Scenario: Proximity Sensor Activated, Reduced Power Operation

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	19.6	19.0				1
			384	836.5	19.6	18.7	0.293	0.359	1	
			777	848.3	19.6	18.6				1
Edge 1	0	1xRTT (RC3 SO32)	1013	824.7	19.6	19.0	0.962	1.117	2	
			384	836.5	19.6	18.7	0.967	1.184	3	
			777	848.3	19.6	18.6	1.080	1.360	4	
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	1xEVDO (Rel. 0)	1013	824.7	19.5	19.2				1
			384	836.5	19.5	19.1	0.232	0.254	5	
			777	848.3	19.5	18.8				1
Edge 1	0	1xEVDO (Rel. 0)	1013	824.7	19.5	19.2	1.000	1.084	6	
			384	836.5	19.5	19.1	1.010	1.107	7	
			777	848.3	19.5	18.8	1.160	1.379	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

CDMA BC0 continued

Usage Scenario: Proximity Sensor Deactivated, Full Power Operation

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	6	1xRTT (RC3 SO32)	1013	824.7	24.0	22.8				1
			384	836.5	24.0	22.9	0.291	0.377	9	
			777	848.3	24.0	22.5				1
Edge 1	20	1xRTT (RC3 SO32)	1013	824.7	24.0	22.8				1
			384	836.5	24.0	22.9	0.181	0.234	10	
			777	848.3	24.0	22.5				1
Edge 4	0	1xRTT (RC3 SO32)	1013	824.7	24.0	22.8				1
			384	836.5	24.0	22.9	0.210	0.272	11	
			777	848.3	24.0	22.5				1
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	6	1xEVDO (Rel. 0)	1013	824.7	24.0	22.9				1
			384	836.5	24.0	23.0	0.319	0.406	12	
			777	848.3	24.0	22.6				1
Edge 1	20	1xEVDO (Rel. 0)	1013	824.7	24.0	22.9				1
			384	836.5	24.0	23.0	0.287	0.365	13	
			777	848.3	24.0	22.6				1
Edge 4	0	1xEVDO (Rel. 0)	1013	824.7	24.0	22.9				1
			384	836.5	24.0	23.0	0.121	0.154	14	
			777	848.3	24.0	22.6				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

12.10. CDMA BC1

Usage Scenario: Proximity Sensor Activated, Reduced Power Operation

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	17.8	17.6				1
			600	1880.0	17.8	17.6	0.489	0.516	1	
			1175	1908.75	17.8	17.5				1
Edge 1	0	1xRTT (RC3 SO32)	25	1851.25	17.8	17.6	1.040	1.087	2	
			600	1880.0	17.8	17.6	1.090	1.149	3	
			1175	1908.75	17.8	17.5	1.290	1.382	4	
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	1xEVDO (Rel. 0)	25	1851.25	18.1	17.9				1
			600	1880.0	18.1	17.8	0.492	0.527	5	
			1175	1908.75	18.1	17.8				1
Edge 1	0	1xEVDO (Rel. 0)	25	1851.25	18.1	17.9	1.190	1.246	6	
			600	1880.0	18.1	17.8	1.210	1.297	7	
			1175	1908.75	18.1	17.8	1.280	1.372	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.

4. ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
5. ≤ 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
6. ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

CDMA BC1 continued

Usage Scenario: Proximity Sensor Deactivated, Full Power Operation

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	6	1xRTT (RC3 SO32)	25	1851.25	22.4	22.4				1
			600	1880.0	22.4	22.3	0.582	0.596	9	
			1175	1908.75	22.4	22.0				1
Edge 1	20	1xRTT (RC3 SO32)	25	1851.25	22.4	22.4				1
			600	1880.0	22.4	22.3	0.280	0.287	10	
			1175	1908.75	22.4	22.0				1
Edge 4	0	1xRTT (RC3 SO32)	25	1851.25	22.4	22.4				1
			600	1880.0	22.4	22.3	0.381	0.390	11	
			1175	1908.75	22.4	22.0				1
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	6	1xEVDO (Rel. 0)	25	1851.25	22.5	22.5				1
			600	1880.0	22.5	22.4	0.469	0.480	12	
			1175	1908.75	22.5	22.3				1
Edge 1	20	1xEVDO (Rel. 0)	25	1851.25	22.5	22.5				1
			600	1880.0	22.5	22.4	0.318	0.325	13	
			1175	1908.75	22.5	22.3				1
Edge 4	0	1xEVDO (Rel. 0)	25	1851.25	22.5	22.5				1
			600	1880.0	22.5	22.4	0.384	0.393	14	
			1175	1908.75	22.5	22.3				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

12.11. Wi-Fi 2.4 GHz and 5 GHz Bands

Additional SAR measurements were performed on the WLAN Main Antenna for each of the Wi-Fi bands under the Edge 4 test position using MIMO (Wi-Fi 2 Tx) transmit mode because the SISO (Wi-Fi 1 Tx) SAR values for WLAN Main were determined to be unnecessarily high to represent the WWAN + WLAN MIMO transmit scenario under this test position and would require simultaneous transmission SAR to be measured.

Although both WLAN antennas were transmitting simultaneously during MIMO mode, additional SAR measurements targeted only the WLAN Main Antenna, as it was the greatest contributor to the SAR summation on Edge 4; SAR measurement for WLAN Aux was not considered because it is covered by its more conservative SISO mode counterpart.

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Edge 4	802.11n, HT20 MIMO	0	1	2412	11.5	11.3	0.585	0.613	1	
			6	2437	12.5	12.2	0.789	0.845	2	
			11	2462	10.5	10.4	0.475	0.486	3	
			40	5200	12.0	11.8	0.363	0.380	4	
			48	5240	12.0	11.8	0.495	0.518	5	
			52	5260	12.0	11.7	0.422	0.452	6	
			64	5320	12.0	11.7	0.545	0.584	7	
			100	5500	12.5	12.4	0.338	0.346	8	
			120	5600	12.5	11.9	0.468	0.537	9	
			140	5700	12.4	12.0	0.190	0.208	10	
			149	5745	12.0	12.0	0.185	0.185	11	
			157	5785	12.0	11.9	0.210	0.215	12	
			165	5825	12.0	11.9	0.205	0.210	13	

12.12. Summary of Highest SAR Values

Results for highest SAR values for each frequency band and mode

Technology/Band	Test configuration		Mode	Dist. (mm)	Freq. (Mhz)	Power (dBm)	1g SAR (W/kg)
	Exposure	Position					
GSM850	Body	Edge 1 Prox. On	GPRS 2 slots	0	848.8	27.0	1.37
GSM1900	Body	Edge 1 Prox. On	GPRS 2 slots	0	1909.8	24.2	1.21
W-CDMA Band V	Body	Edge 1 Prox. On	Rel 99 RMC 12.2kbps	0	846.6	18.8	1.09
W-CDMA Band IV	Body	Edge 1 Prox. On	Rel 99 RMC 12.2kbps	0	1732.6	18.0	1.15
W-CDMA Band II	Body	Edge 1 Prox. On	Rel 99 RMC 12.2kbps	0	1907.6	17.0	1.36
CDMA BC0	Body	Edge 1 Prox. On	1xRTT (RC3, SO32)	0	848.3	18.6	1.08
CDMA BC0	Body	Edge 1 Prox. On	1xEVDO (Rel.0)	0	848.3	18.8	1.16
CDMA BC1	Body	Edge 1 Prox. On	1xRTT (RC3, SO32)	0	1908.75	17.5	1.29
CDMA BC1	Body	Edge 1 Prox. On	1xEVDO (Rel.0)	0	1908.75	17.8	1.28

12.13. 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 (~ 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		
GSM850	Body	Edge 1 Prox. On	GPRS 2 Slots	0	251	848.80	1.37	1.170	1.17	1
W-CDMA Band IV	Body	Edge 1 Prox. On	Rel 99 RMC 12.2kbps	0	1413	1732.60	1.15	1.04	1.11	2
W-CDMA Band II	Body	Edge 1 Prox. On	Rel 99 RMC 12.2kbps	0	9538	1907.6	1.36	1.24	1.10	3

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.

12.14. SAR Plots (from Summary of Highest Measured SAR Values)

Test Laboratory: UL CCS SAR Lab B Date: 1/29/2013

GSM850

Frequency: 848.8 MHz; Duty Cycle: 1:4.00037; Room Ambient Temperature: 23.0°C; Liquid Temperature: 22.0°C
Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 1.031$ S/m; $\epsilon_r = 53.927$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Area Scan Setting: Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV4 - SN3686; ConvF(8.73, 8.73, 8.73); Calibrated: 2/16/2012;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 (A); Type: QDOVA001BB; Serial: 1120

Edge 1 Prox. On/GPRS 2 Slots Ch 251/Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.39 W/kg

Edge 1 Prox. On/GPRS 2 Slots Ch 251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

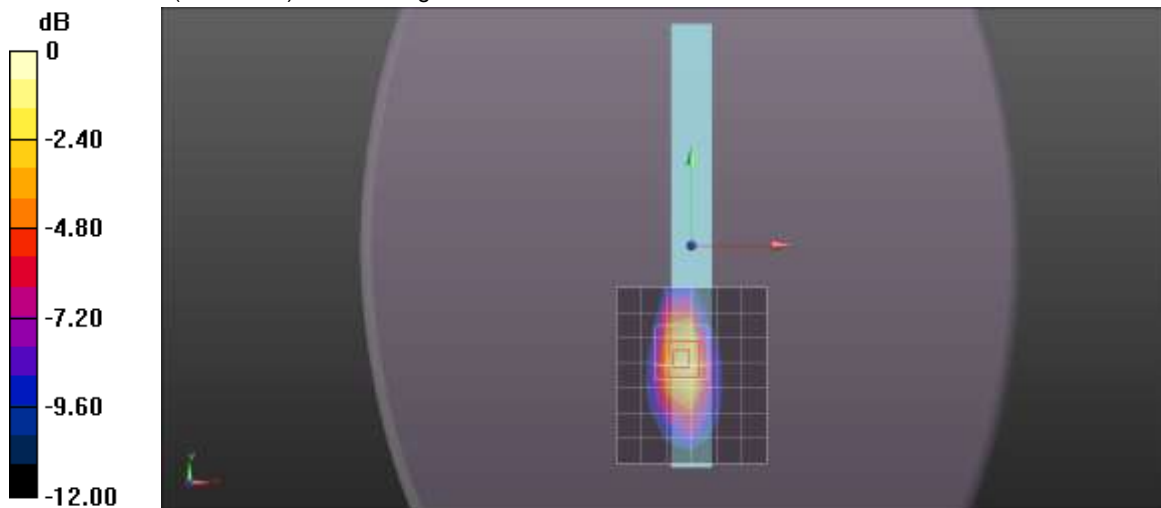
Reference Value = 36.870 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 2.47 W/kg

SAR(1 g) = 1.37 W/kg; SAR(10 g) = 0.754 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.82 W/kg



0 dB = 1.82 W/kg = 2.60 dBW/kg

Test Laboratory: UL CCS SAR Lab B Date: 1/20/2013

GSM1900

Frequency: 1909.8 MHz; Duty Cycle: 1:4.00037; Room Ambient Temperature: 23.0°C; Liquid Temperature: 22.0°C
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.517$ S/m; $\epsilon_r = 50.636$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Area Scan Setting: Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV4 - SN3686; ConvF(7.04, 7.04, 7.04); Calibrated: 2/16/2012;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1099

Edge 1 Prox. On/GPRS 2 Slots Ch 810/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.37 W/kg

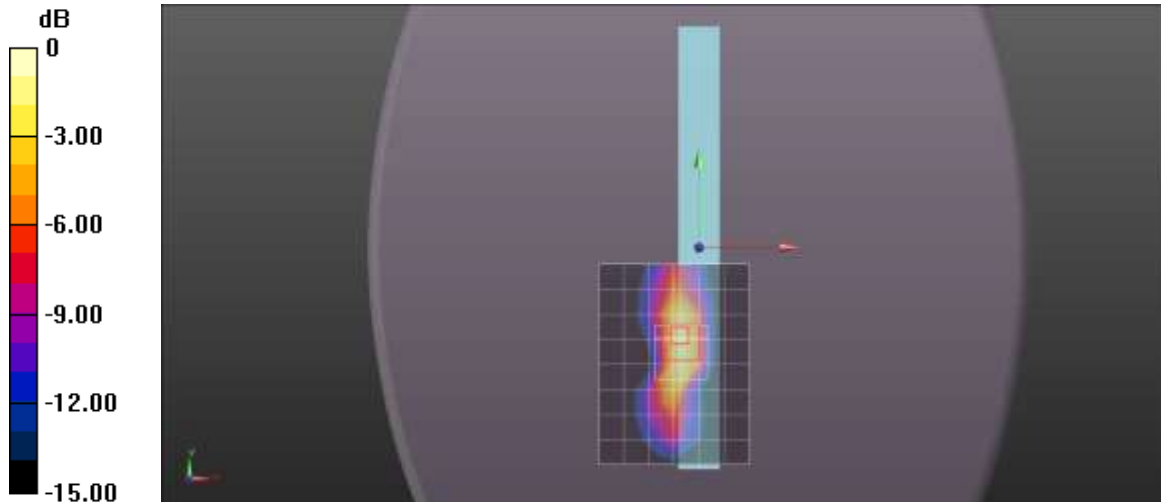
Edge 1 Prox. On/GPRS 2 Slots Ch 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.389 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 2.31 W/kg

SAR(1 g) = 1.21 W/kg; SAR(10 g) = 0.609 W/kg

Maximum value of SAR (measured) = 1.63 W/kg



0 dB = 1.63 W/kg = 2.12 dBW/kg

Test Laboratory: UL CCS SAR Lab B Date: 1/29/2013

W-CDMA Band V

Frequency: 846.6 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 23.0°C; Liquid Temperature: 22.0°C
Medium parameters used (interpolated): $f = 846.6$ MHz; $\sigma = 1.029$ S/m; $\epsilon_r = 53.976$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Area Scan Setting: Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV4 - SN3686; ConvF(8.73, 8.73, 8.73); Calibrated: 2/16/2012;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 (A); Type: QDOVA001BB; Serial: 1120

Edge 1 Prox. On/R99 RMC Ch 4233/Area Scan (7x11x1):

Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.23 W/kg

Edge 1 Prox. On/R99 RMC Ch 4233/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

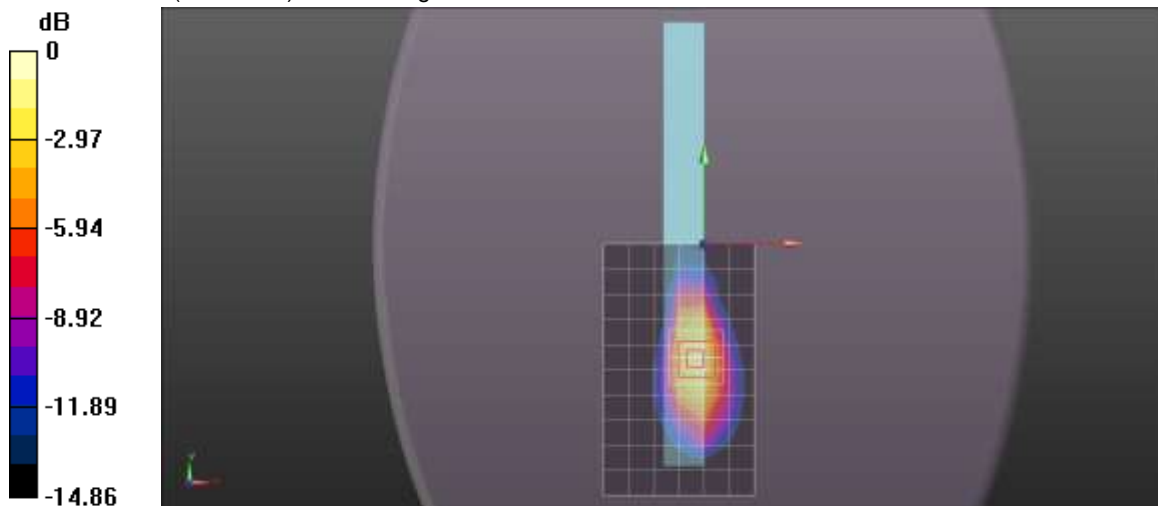
Reference Value = 33.581 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 1.95 W/kg

SAR(1 g) = 1.09 W/kg; SAR(10 g) = 0.591 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.45 W/kg



0 dB = 1.45 W/kg = 1.61 dBW/kg

Test Laboratory: UL CCS SAR Lab B Date: 1/19/2013

W-CDMA Band IV

Frequency: 1732.6 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 23.0°C; Liquid Temperature: 22.0°C
Medium parameters used (interpolated): $f = 1732.6$ MHz; $\sigma = 1.523$ S/m; $\epsilon_r = 52.395$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Area Scan Setting: Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV4 - SN3686; ConvF(7.44, 7.44, 7.44); Calibrated: 2/16/2012;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 (A); Type: QDOVA001BB; Serial: 1120

Edge 1 Prox. On/R99 RMC Ch 1413/Area Scan (7x11x1):

Measurement grid: dx=15mm, dy=15mm
[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.38 W/kg

Edge 1 Prox. On/R99 RMC Ch 1413/Zoom Scan (5x5x7)/Cube 0:

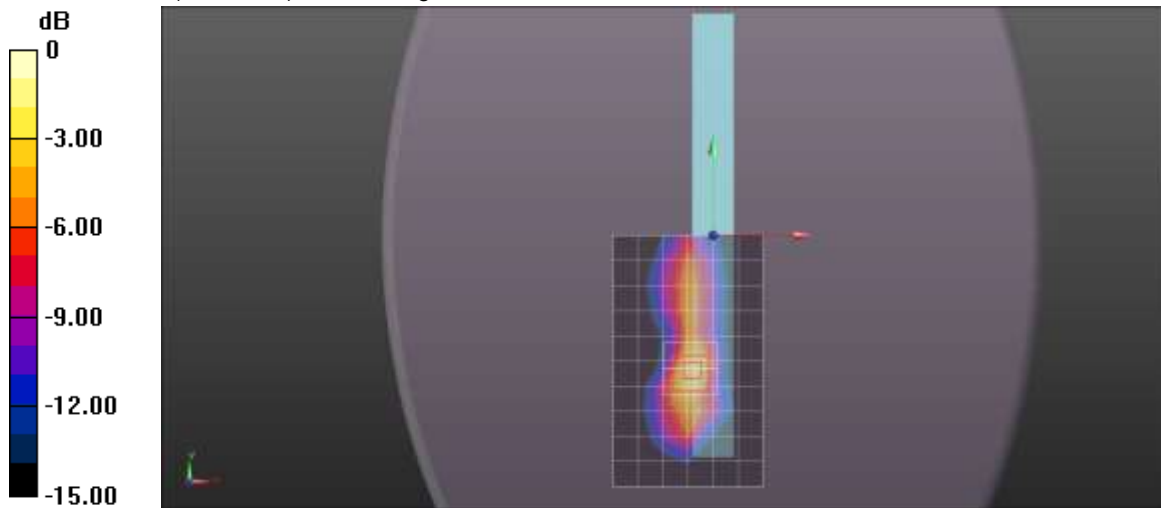
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.817 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 2.28 W/kg

SAR(1 g) = 1.15 W/kg; SAR(10 g) = 0.519 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.71 W/kg



0 dB = 1.71 W/kg = 2.33 dBW/kg

Test Laboratory: UL CCS SAR Lab E Date: 2/23/2013

W-CDMA Band II

Frequency: 1907.6 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 23.0°C; Liquid Temperature: 22.0°C
Medium parameters used (interpolated): $f = 1907.6$ MHz; $\sigma = 1.54$ S/m; $\epsilon_r = 51.125$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Area Scan Setting: Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn1343; Calibrated: 20/08/2012
- Probe: EX3DV4 - SN3871; ConvF(7.83, 7.83, 7.83); Calibrated: 20/08/2012;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 A; Type: QDOVA002AA; Serial: 1180

Edge 1 Prox. On/R99 RMC Ch 9538/Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.32 W/kg

Edge 1 Prox. On/R99 RMC Ch 9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

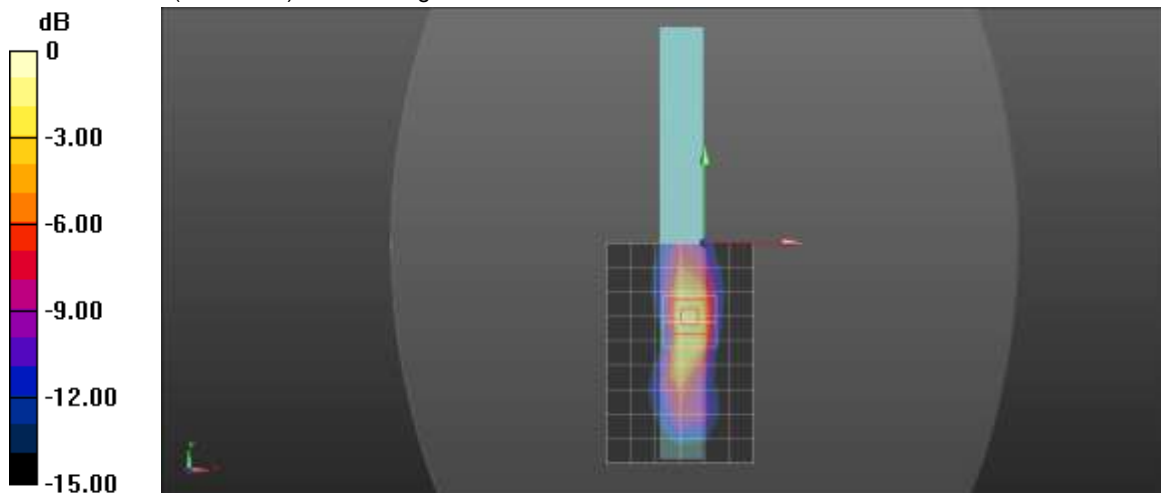
Reference Value = 29.721 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 2.45 W/kg

SAR(1 g) = 1.36 W/kg; SAR(10 g) = 0.675 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.82 W/kg



0 dB = 1.82 W/kg = 2.60 dBW/kg

Test Laboratory: UL CCS SAR Lab E Date: 2/6/2013

CDMA BC0

Frequency: 848.31 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 23.0°C; Liquid Temperature: 22.0°C
Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 1.009$ S/m; $\epsilon_r = 54.636$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Area Scan Setting: Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn1343; Calibrated: 8/20/2012
- Probe: EX3DV4 - SN3871; ConvF(9.68, 9.68, 9.68); Calibrated: 8/20/2012;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 A; Type: QDOVA002AA; Serial: 1180

Edge 1 Prox. On/1xRTT RC3 SO32 Ch 777/Area Scan (6x14x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.35 W/kg

Edge 1 Prox. On/1xRTT RC3 SO32 Ch 777/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

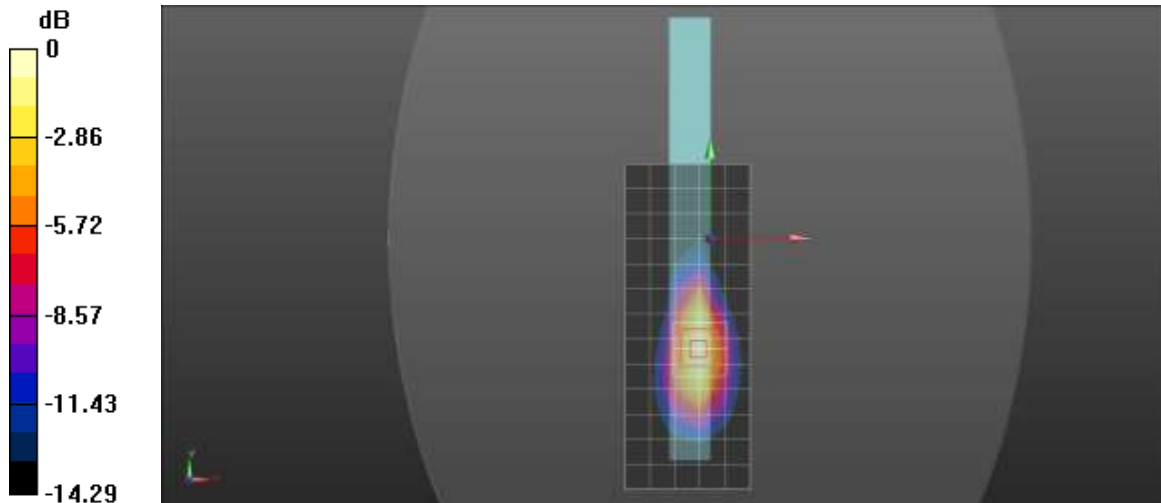
Reference Value = 37.155 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.98 W/kg

SAR(1 g) = 1.08 W/kg; SAR(10 g) = 0.593 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.42 W/kg



0 dB = 1.42 W/kg = 1.52 dBW/kg

Test Laboratory: UL CCS SAR Lab E Date: 2/7/2013

CDMA BC0

Frequency: 848.31 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 23.0°C; Liquid Temperature: 22.0°C
Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 1.009$ S/m; $\epsilon_r = 54.636$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Area Scan Setting: Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn1343; Calibrated: 8/20/2012
- Probe: EX3DV4 - SN3871; ConvF(9.68, 9.68, 9.68); Calibrated: 8/20/2012;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 A; Type: QDOVA002AA; Serial: 1180

Edge 1 Prox. On/1xEVDO Rel. 0 Ch 777/Area Scan (6x14x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.38 W/kg

Edge 1 Prox. On/1xEVDO Rel. 0 Ch 777/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

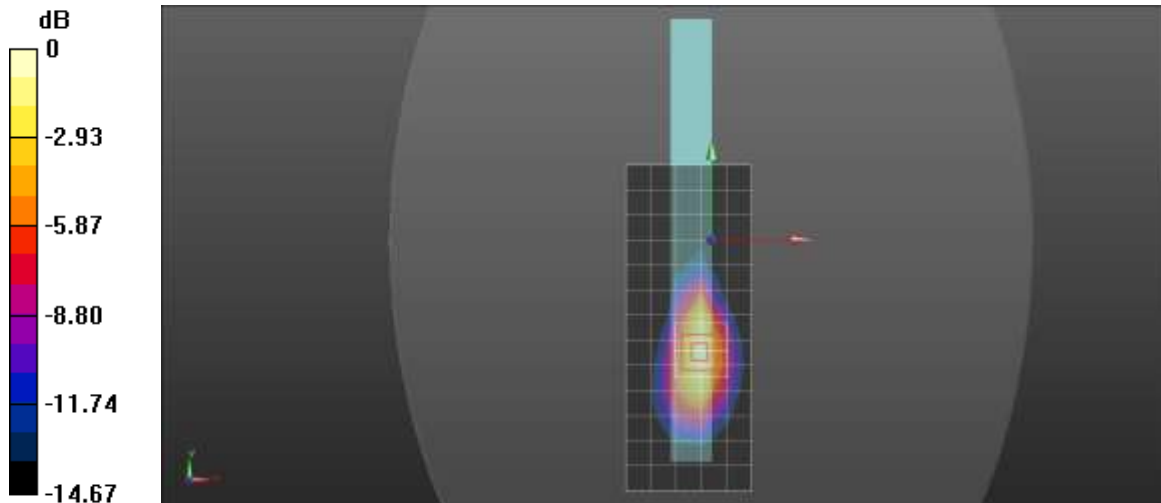
Reference Value = 38.106 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 2.07 W/kg

SAR(1 g) = 1.16 W/kg; SAR(10 g) = 0.636 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.53 W/kg



0 dB = 1.53 W/kg = 1.85 dBW/kg

Test Laboratory: UL CCS SAR Lab B Date: 2/6/2013

CDMA BC1

Frequency: 1908.75 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 23.0°C; Liquid Temperature: 22.0°C
Medium parameters used (interpolated): $f = 1908.75$ MHz; $\sigma = 1.58$ S/m; $\epsilon_r = 51.32$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Area Scan Setting: Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/9/2013
- Probe: EX3DV4 - SN3686; ConvF(7.04, 7.04, 7.04); Calibrated: 2/16/2012;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1118

Edge 1 Prox. On/1xRTT RC3 SO32 Ch 1175/Area Scan (6x14x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.73 W/kg

Edge 1 Prox. On/1xRTT RC3 SO32 Ch 1175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

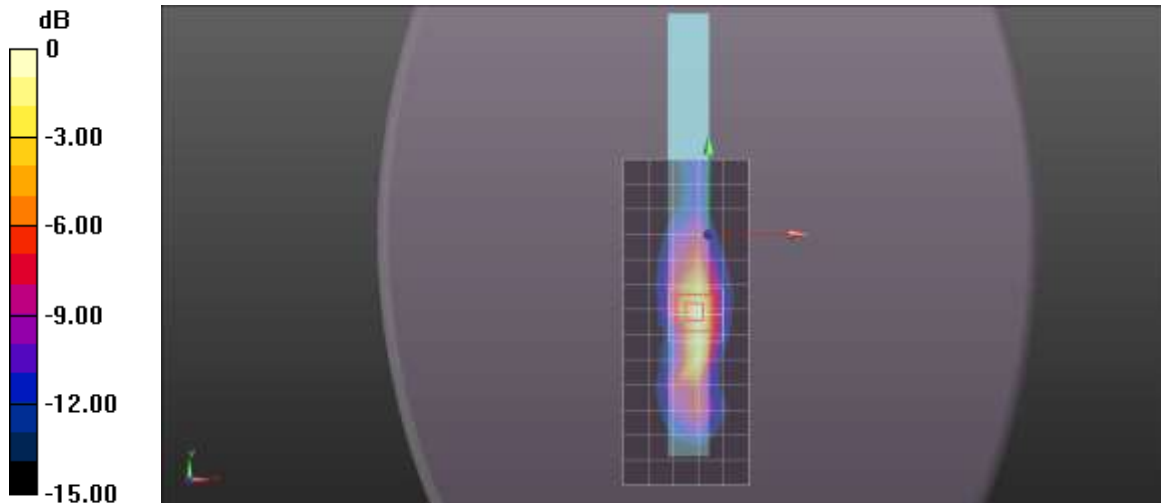
Reference Value = 32.895 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 2.35 W/kg

SAR(1 g) = 1.29 W/kg; SAR(10 g) = 0.634 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.74 W/kg



0 dB = 1.74 W/kg = 2.41 dBW/kg

Test Laboratory: UL CCS SAR Lab B Date: 2/6/2013

CDMA BC1

Frequency: 1908.75 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 23.0°C; Liquid Temperature: 22.0°C
Medium parameters used (interpolated): $f = 1908.75$ MHz; $\sigma = 1.58$ S/m; $\epsilon_r = 51.32$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Area Scan Setting: Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/9/2013
- Probe: EX3DV4 - SN3686; ConvF(7.04, 7.04, 7.04); Calibrated: 2/16/2012;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1118

Edge 1 Prox. On/1xEVDO Rel. 0 Ch 1175/Area Scan (6x14x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.31 W/kg

Edge 1 Prox. On/1xEVDO Rel. 0 Ch 1175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

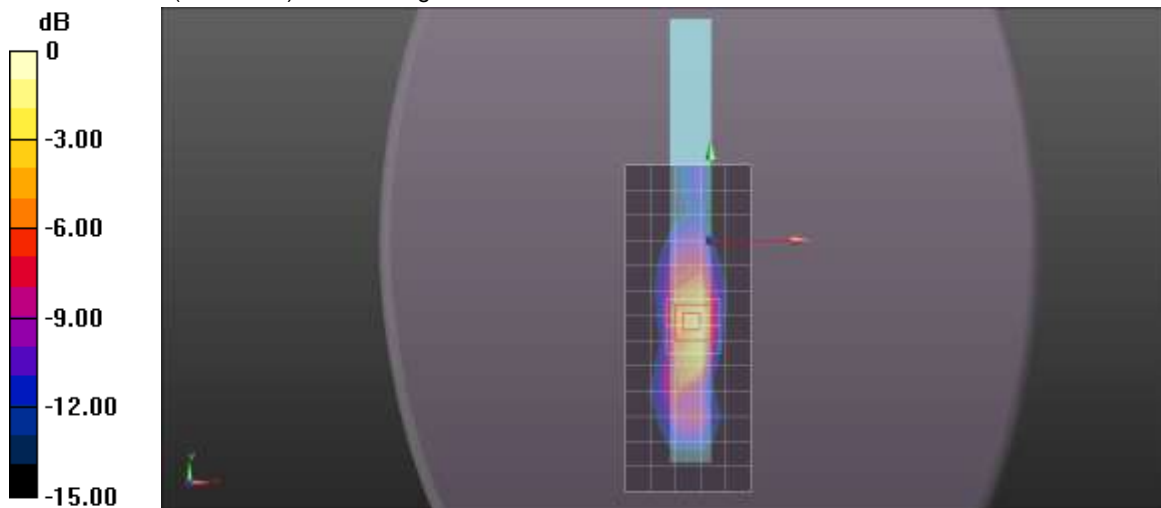
Reference Value = 29.035 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 2.30 W/kg

SAR(1 g) = 1.28 W/kg; SAR(10 g) = 0.629 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.72 W/kg



0 dB = 1.72 W/kg = 2.36 dBW/kg

13. Simultaneous Transmission SAR Analysis

All Wi-Fi 1-g SAR values were taken from results recorded in SAR report 12J14673-1F, submitted under FCC ID ACJ9TGWL12A or from the MIMO estimated values in section 12.2.2 of this report.

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 (12J14673-1F) with scaling applied (for the WLAN radios).

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	1.074		0.196		0.165	1.435
	1.074			0.062		1.136
		1.324	0.196		0.165	1.685
		1.324		0.062		1.386
Rear, Wi-Fi 2 Tx	1.074		0.196	0.062		1.332
		1.324	0.196	0.062		1.582
Edge 1, Wi-Fi 1 Tx	1.37		0.084		0.017	1.471
	1.37			0.133		1.503
		1.389	0.084		0.017	1.490
		1.389		0.133		1.522
Edge 1, Wi-Fi 2 Tx	1.37		0.084	0.075		1.529
		1.389	0.084	0.075		1.548
Edge 3, Wi-Fi 2 Tx	0.400		0.075	0.418		0.893
		0.400	0.075	0.418		0.893
Edge 4, Wi-Fi 1 Tx	0.332		1.093		0.0089	1.434
		0.395	1.093		0.0089	1.497
Edge 4, Wi-Fi 2 Tx	0.332		0.845	0.126		1.303
		0.395	0.845	0.126		1.366

- As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
- Values shaded green are estimated SAR

SAR to Peak Location Separation Ratio (SPLSR)

Case #	Test Position	Worst-case combination			Σ 1-g SAR (mW/g)	Calculated distance (mm)	SPLSR	Figure
		GSM1900	WiFi 2.4 GHz Main	WiFi 2.4 GHz Aux				
1	Rear, Wi-Fi 1 Tx	1.324	0.196	0.165	1.685			
		1.324	0.196		1.520	62.7	0.030	1
		1.324		0.165	1.489	178.4	0.010	1
			0.196	0.165	0.361	134.3	0.002	1

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 & Wi-Fi 2.4 GHz Band

Test Position	Data						Σ 1-g SAR (mW/g)
	W-CDMA Band V	W-CDMA Band IV	W-CDMA Band II	WiFi 2.4 GHz Main	WiFi 2.4 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.681			0.196		0.165	1.042
	0.681				0.062		0.743
		0.619		0.196		0.165	0.980
		0.619			0.062		0.681
			1.012	0.196		0.165	1.373
			1.012		0.062		1.074
Rear, Wi-Fi 2 Tx	0.681			0.196	0.062		0.939
		0.619		0.196	0.062		0.877
			1.012	0.196	0.062		1.270
Edge 1, Wi-Fi 1 Tx	1.234			0.084		0.017	1.335
	1.234				0.133		1.367
		1.383		0.084		0.017	1.484
		1.383			0.133		1.516
			1.36	0.084		0.017	1.461
			1.36		0.133		1.493
Edge 1, Wi-Fi 2 Tx	1.234			0.084	0.075		1.393
		1.383		0.084	0.075		1.542
			1.36	0.084	0.075		1.519
Edge 3, Wi-Fi 2 Tx	0.400			0.075	0.418		0.893
		0.400		0.075	0.418		0.893
			0.400	0.075	0.418		0.893
Edge 4, Wi-Fi 1 Tx	0.256			1.093		0.0089	1.358
		0.388		1.093		0.0089	1.490
			0.384	1.093		0.0089	1.486
Edge 4, Wi-Fi 2 Tx	0.256			0.845	0.126		1.227
		0.388		0.845	0.126		1.359
			0.384	0.845	0.126		1.355

1. As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
2. 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 CDMA BC0 & Wi-Fi 2.4 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC0 1xEVDO	WiFi 2.4 GHz Main	WiFi 2.4 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.377		0.196		0.165	0.738
		0.406	0.196		0.165	0.767
Rear, Wi-Fi 2 Tx	0.377		0.196	0.062		0.635
		0.406	0.196	0.062		0.664
Edge 1, Wi-Fi 1 Tx	1.36		0.084		0.017	1.461
	1.36			0.133		1.493
		1.379	0.084		0.017	1.480
		1.379		0.133		1.512
Edge 1, Wi-Fi 2 Tx	1.36		0.084	0.075		1.519
		1.379	0.084	0.075		1.538
Edge 3, Wi-Fi 2 Tx	0.400		0.075	0.418		0.893
		0.400	0.075	0.418		0.893
Edge 4, Wi-Fi 1 Tx	0.272		1.093		0.0089	1.374
		0.154	1.093		0.0089	1.256
Edge 4, Wi-Fi 2 Tx	0.272		0.845	0.126		1.243
		0.154	0.845	0.126		1.125

1. As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
2. 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 BC1 & Wi-Fi 2.4 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	CDMA BC1 1xRTT	CDMA BC1 1xEVDO	WiFi 2.4 GHz Main	WiFi 2.4 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.596		0.196		0.165	0.957
		0.527	0.196		0.165	0.888
Rear, Wi-Fi 2 Tx	0.596		0.196	0.062		0.854
		0.527	0.196	0.062		0.785
Edge 1, Wi-Fi 1 Tx	1.382		0.084		0.017	1.483
	1.382			0.133		1.515
		1.372	0.084		0.017	1.473
		1.372		0.133		1.505
Edge 1, Wi-Fi 2 Tx	1.382		0.084	0.075		1.541
		1.372	0.084	0.075		1.531
Edge 3, Wi-Fi 2 Tx	0.400		0.075	0.418		0.893
		0.400	0.075	0.418		0.893
Edge 4, Wi-Fi 1 Tx	0.390		1.093		0.0089	1.492
		0.393	1.093		0.0089	1.495
Edge 4, Wi-Fi 2 Tx	0.390		0.845	0.126		1.361
		0.393	0.845	0.126		1.364

1. As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
2. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because 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 GSM & Wi-Fi 5.2 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	GSM850	GSM1900	WiFi 5.2 GHz Main	WiFi 5.2 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	1.074		0.136		0.165	1.375
	1.074			0.149		1.223
		1.324	0.136		0.165	1.625
		1.324		0.149		1.473
Rear, Wi-Fi 2 Tx	1.074		0.136	0.149		1.359
		1.324	0.136	0.149		1.609
Edge 1, Wi-Fi 1 Tx	1.37		0.061		0.017	1.448
	1.37			0.194		1.564
		1.389	0.061		0.017	1.467
		1.389		0.194		1.583
Edge 1, Wi-Fi 2 Tx	1.37		0.061	0.097		1.528
		1.389	0.061	0.097		1.547
Edge 3, Wi-Fi 2 Tx	0.400		0.097	0.545		1.042
		0.400	0.097	0.545		1.042
Edge 4, Wi-Fi 1 Tx	0.332		0.797		0.0089	1.138
		0.395	0.797		0.0089	1.201
Edge 4, Wi-Fi 2 Tx	0.332		0.518	0.057		0.907
		0.395	0.518	0.057		0.970

- As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
- Values shaded green are estimated SAR

SAR to Peak Location Separation Ratio (SPLSR)

Case #	Test Position	Worst-case combination				Σ 1-g SAR (mW/g)	Calculated distance (mm)	SPLSR	Figure
		GSM1900	WiFi 5.2 GHz Main	WiFi 5.2 GHz Aux	Bluetooth				
2	Rear, Wi-Fi 1 Tx	1.324	0.136		0.165	1.625			
		1.324	0.136			1.460	64.5	0.027	2
		1.324			0.165	1.489	178.4	0.010	2
			0.136		0.165	0.301	128.6	0.001	2
3	Rear, Wi-Fi 2 Tx	1.324	0.136	0.149		1.609			
		1.324	0.136			1.460	64.5	0.027	3
		1.324		0.149		1.473	187.6	0.010	3
			0.136	0.149		0.285	150.8	0.001	3

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 W-CDMA & Wi-Fi 5.2 GHz Band

Test Position	Data						Σ 1-g SAR (mW/g)
	W-CDMA Band V	W-CDMA Band IV	W-CDMA Band II	WiFi 5.2 GHz Main	WiFi 5.2 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.681			0.136		0.165	0.982
	0.681				0.149		0.830
		0.619		0.136		0.165	0.920
		0.619			0.149		0.768
			1.012	0.136		0.165	1.313
			1.012		0.149		1.161
Rear, Wi-Fi 2 Tx	0.681			0.136	0.149		0.966
		0.619		0.136	0.149		0.904
			1.012	0.136	0.149		1.297
Edge 1, Wi-Fi 1 Tx	1.234			0.061		0.017	1.312
	1.234				0.194		1.428
		1.383		0.061		0.017	1.461
		1.383			0.194		1.577
			1.36	0.061		0.017	1.438
			1.36		0.194		1.554
Edge 1, Wi-Fi 2 Tx	1.234			0.061	0.097		1.392
		1.383		0.061	0.097		1.541
			1.36	0.061	0.097		1.518
Edge 3, Wi-Fi 2 Tx	0.400			0.097	0.545		1.042
		0.400		0.097	0.545		1.042
			0.400	0.097	0.545		1.042
Edge 4, Wi-Fi 1 Tx	0.256			0.797		0.0089	1.062
		0.388		0.797		0.0089	1.194
			0.384	0.797		0.0089	1.190
Edge 4, Wi-Fi 2 Tx	0.256			0.518	0.057		0.831
		0.388		0.518	0.057		0.963
			0.384	0.518	0.057		0.959

- As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
- 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 CDMA BC0 & Wi-Fi 5.2 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC0 1xEVDO	WiFi 5.2 GHz Main	WiFi 5.2 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.377		0.136		0.165	0.678
		0.406	0.136		0.165	0.707
Rear, Wi-Fi 2 Tx	0.377		0.136	0.149		0.662
		0.406	0.136	0.149		0.691
Edge 1, Wi-Fi 1 Tx	1.36		0.061		0.017	1.438
	1.36			0.194		1.554
		1.379	0.061		0.017	1.457
		1.379		0.194		1.573
Edge 1, Wi-Fi 2 Tx	1.36		0.061	0.097		1.518
		1.379	0.061	0.097		1.537
Edge 3, Wi-Fi 2 Tx	0.400		0.097	0.545		1.042
		0.400	0.097	0.545		1.042
Edge 4, Wi-Fi 1 Tx	0.272		0.797		0.0089	1.078
		0.154	0.797		0.0089	0.960
Edge 4, Wi-Fi 2 Tx	0.272		0.518	0.057		0.847
		0.154	0.518	0.057		0.729

1. As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
2. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because 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 CDMA BC1 & Wi-Fi 5.2 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	CDMA BC1 1xRTT	CDMA BC1 1xEVDO	WiFi 5.2 GHz Main	WiFi 5.2 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.596		0.136		0.165	0.897
		0.527	0.136		0.165	0.828
Rear, Wi-Fi 2 Tx	0.596		0.136	0.149		0.881
		0.527	0.136	0.149		0.812
Edge 1, Wi-Fi 1 Tx	1.382		0.061		0.017	1.460
	1.382			0.194		1.576
		1.372	0.061		0.017	1.450
		1.372		0.194		1.566
Edge 1, Wi-Fi 2 Tx	1.382		0.061	0.097		1.540
		1.372	0.061	0.097		1.530
Edge 3, Wi-Fi 2 Tx	0.400		0.097	0.545		1.042
		0.400	0.097	0.545		1.042
Edge 4, Wi-Fi 1 Tx	0.390		0.797		0.0089	1.196
		0.393	0.797		0.0089	1.199
Edge 4, Wi-Fi 2 Tx	0.390		0.518	0.057		0.965
		0.393	0.518	0.057		0.968

1. As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
2. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because 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 GSM & Wi-Fi 5.3 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	GSM850	GSM1900	WiFi 5.3 GHz Main	WiFi 5.3 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	1.074		0.206		0.165	1.445
	1.074			0.254		1.328
		1.324	0.206		0.165	1.695
		1.324		0.254		1.578
Rear, Wi-Fi 2 Tx	1.074		0.206	0.254		1.534
		1.324	0.206	0.254		1.784
Edge 1, Wi-Fi 1 Tx	1.37		0.138		0.017	1.525
	1.37			0.196		1.566
		1.389	0.138		0.017	1.544
		1.389		0.196		1.585
Edge 1, Wi-Fi 2 Tx	1.37		0.138	0.104		1.612
		1.389	0.138	0.104		1.631
Edge 3, Wi-Fi 2 Tx	0.400		0.104	0.938		1.442
		0.400	0.104	0.938		1.442
Edge 4, Wi-Fi 1 Tx	0.332		1.19		0.0089	1.531
		0.395	1.19		0.0089	1.594
Edge 4, Wi-Fi 2 Tx	0.332		0.584	0.124		1.040
		0.395	0.584	0.124		1.103

1. As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
2. Values shaded green are estimated SAR

SAR to Peak Location Separation Ratio (SPLSR)

Case #	Test Position	Worst-case combination					Σ 1-g SAR (mW/g)	Calculated distance (mm)	SPLSR	Figure
		GSM850	GSM1900	WiFi 5.3 GHz Main	WiFi 5.3 GHz Aux	Bluetooth				
4	Rear, Wi-Fi 1 Tx		1.324	0.206		0.165	1.695			
			1.324	0.206			1.530	66.2	0.029	4
			1.324			0.165	1.489	178.4	0.010	4
				0.206		0.165	0.371	127.3	0.002	4
5	Rear, Wi-Fi 2 Tx		1.324	0.206	0.254		1.784			
			1.324	0.206			1.530	66.2	0.029	5
			1.324		0.254		1.578	187.5	0.011	5
				0.206	0.254		0.460	149.5	0.002	5
6	Edge 1 Wi-Fi 2 Tx	1.370		0.138	0.104		1.612			
		1.370		0.138			1.508	49.1	0.038	6
		1.370			0.104		1.474	181.0	0.010	7
				0.138	0.104		0.242	176.1	0.001	8
7	Edge 1 Wi-Fi 2 Tx		1.389	0.138	0.104		1.631			
			1.389	0.138			1.527	48.8	0.039	9
			1.389		0.104		1.493	180.9	0.010	10
				0.138	0.104		0.242	176.1	0.001	8

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 W-CDMA & Wi-Fi 5.3 GHz Band

Test Position	Data						Σ 1-g SAR (mW/g)
	W-CDMA Band V	W-CDMA Band IV	W-CDMA Band II	WiFi 5.3 GHz Main	WiFi 5.3 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.681			0.206		0.165	1.052
	0.681				0.254		0.935
		0.619		0.206		0.165	0.990
		0.619			0.254		0.873
			1.012	0.206		0.165	1.383
			1.012		0.254		1.266
Rear, Wi-Fi 2 Tx	0.681			0.206	0.254		1.141
		0.619		0.206	0.254		1.079
			1.012	0.206	0.254		1.472
Edge 1, Wi-Fi 1 Tx	1.234			0.138		0.017	1.389
	1.234				0.196		1.430
		1.383		0.138		0.017	1.538
		1.383			0.196		1.579
			1.36	0.138		0.017	1.515
			1.36		0.196		1.556
Edge 1, Wi-Fi 2 Tx	1.234			0.138	0.104		1.476
		1.383		0.138	0.104		1.625
			1.36	0.138	0.104		1.602
Edge 3, Wi-Fi 2 Tx	0.400			0.104	0.938		1.442
		0.400		0.104	0.938		1.442
			0.400	0.104	0.938		1.442
Edge 4, Wi-Fi 1 Tx	0.256			1.19		0.0089	1.455
		0.388		1.19		0.0089	1.587
			0.384	1.19		0.0089	1.583
Edge 4, Wi-Fi 2 Tx	0.256			0.584	0.124		0.964
		0.388		0.584	0.124		1.096
			0.384	0.584	0.124		1.092

1. As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
2. Values shaded green are estimated SAR

SAR to Peak Location Separation Ratio (SPLSR)

Case #	Test Position	Worst-case combination				Σ 1-g SAR (mW/g)	Calculated distance (mm)	SPLSR	Figure
		W-CDMA Band IV	W-CDMA Band II	WiFi 5.3 GHz Main	WiFi 5.3 GHz Aux				
8	Edge 1, Wi-Fi 2 Tx	1.383		0.138	0.104	1.625			
		1.383		0.138		1.521	50.8	0.037	11
		1.383			0.104	1.487	181.1	0.010	12
				0.138	0.104	0.242	176.1	0.001	8
9	Edge 1, Wi-Fi 2 Tx		1.360	0.138	0.104	1.602			
			1.360	0.138		1.498	47.3	0.039	13
			1.360		0.104	1.464	180.6	0.010	14
				0.138	0.104	0.242	176.1	0.001	8

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 CDMA BC0 & Wi-Fi 5.3 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC0 1xEVDO	WiFi 5.3 GHz Main	WiFi 5.3 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.377		0.206		0.165	0.748
		0.406	0.206		0.165	0.777
Rear, Wi-Fi 2 Tx	0.377		0.206	0.254		0.837
		0.406	0.206	0.254		0.866
Edge 1, Wi-Fi 1 Tx	1.36		0.138		0.017	1.515
	1.36			0.196		1.556
		1.379	0.138		0.017	1.534
		1.379		0.196		1.575
Edge 1, Wi-Fi 2 Tx	1.36		0.138	0.104		1.602
		1.379	0.138	0.104		1.621
Edge 3, Wi-Fi 2 Tx	0.400		0.104	0.938		1.442
		0.400	0.104	0.938		1.442
Edge 4, Wi-Fi 1 Tx	0.272		1.19		0.0089	1.471
		0.154	1.19		0.0089	1.353
Edge 4, Wi-Fi 2 Tx	0.272		0.584	0.124		0.980
		0.154	0.584	0.124		0.862

- As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
- Values shaded green are estimated SAR

SAR to Peak Location Separation Ratio (SPLSR)

Case #	Test Position	Worst-case combination				Σ 1-g SAR (mW/g)	Calculated distance (mm)	SPLSR	Figure
		CDMA BC0 1xRTT	CDMA BC0 1xEVDO	WiFi 5.3 GHz Main	WiFi 5.3 GHz Aux				
10	Edge 1, Wi-Fi 2 Tx	1.360		0.138	0.104	1.602			
		1.360		0.138		1.498	49.1	0.037	15
		1.360			0.104	1.464	180.9	0.010	16
				0.138	0.104	0.242	176.1	0.001	8
11	Edge 1, Wi-Fi 2 Tx		1.379	0.138	0.104	1.621			
			1.379	0.138		1.517	49.4	0.038	17
			1.379		0.104	1.483	181.0	0.010	18
				0.138	0.104	0.242	176.1	0.001	8

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because 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 CDMA BC1 & Wi-Fi 5.3 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	CDMA BC1 1xRTT	CDMA BC1 1xEVDO	WiFi 5.3 GHz Main	WiFi 5.3 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.596		0.206		0.165	0.967
		0.527	0.206		0.165	0.898
Rear, Wi-Fi 2 Tx	0.596		0.206	0.254		1.056
		0.527	0.206	0.254		0.987
Edge 1, Wi-Fi 1 Tx	1.382		0.138		0.017	1.537
	1.382			0.196		1.578
		1.372	0.138		0.017	1.527
		1.372		0.196		1.568
Edge 1, Wi-Fi 2 Tx	1.382		0.138	0.104		1.624
		1.372	0.138	0.104		1.614
Edge 3, Wi-Fi 2 Tx	0.400		0.104	0.938		1.442
		0.400	0.104	0.938		1.442
Edge 4, Wi-Fi 1 Tx	0.390		1.190		0.0089	1.589
		0.393	1.190		0.0089	1.592
Edge 4, Wi-Fi 2 Tx	0.390		0.584	0.124		1.098
		0.393	0.584	0.124		1.101

- As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
- Values shaded green are estimated SAR

SAR to Peak Location Separation Ratio (SPLSR)

Case #	Test Position	Worst-case combination				Σ 1-g SAR (mW/g)	Calculated distance (mm)	SPLSR	Figure
		CDMA BC1 1xRTT	CDMA BC1 1xEVDO	WiFi 5.3 GHz Main	WiFi 5.3 GHz Aux				
12	Edge 1, Wi-Fi 2 Tx	1.382		0.138	0.104	1.624			
		1.382		0.138		1.520	50.2	0.037	19
		1.382			0.104	1.486	182.2	0.010	20
				0.138	0.104	0.242	176.1	0.001	8
13	Edge 1, Wi-Fi 2 Tx		1.372	0.138	0.104	1.614			
			1.372	0.138		1.510	48.8	0.038	21
			1.372		0.104	1.476	180.9	0.010	22
				0.138	0.104	0.242	176.1	0.001	8

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because 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.

13.14. Sum of the SAR for GSM & Wi-Fi 5.5 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	GSM850	GSM1900	WiFi 5.5 GHz Main	WiFi 5.5 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	1.074		0.220		0.165	1.459
	1.074			0.229		1.303
		1.324	0.220		0.165	1.709
		1.324		0.229		1.553
Rear, Wi-Fi 2 Tx	1.074		0.220	0.229		1.523
		1.324	0.220	0.229		1.773
Edge 1, Wi-Fi 1 Tx	1.37		0.082		0.017	1.469
	1.37			0.200		1.570
		1.389	0.082		0.017	1.488
		1.389		0.200		1.589
Edge 1, Wi-Fi 2 Tx	1.37		0.082	0.113		1.565
		1.389	0.082	0.113		1.584
Edge 3, Wi-Fi 2 Tx	0.400		0.113	1.030		1.543
		0.400	0.113	1.030		1.543
Edge 4, Wi-Fi 1 Tx	0.332		1.099		0.0089	1.440
		0.395	1.099		0.0089	1.503
Edge 4, Wi-Fi 2 Tx	0.332		0.537	0.094		0.963
		0.395	0.537	0.094		1.026

- As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
- Values shaded green are estimated SAR

SAR to Peak Location Separation Ratio (SPLSR)

Case #	Test Position	Worst-case combination				Σ 1-g SAR (mW/g)	Calculated distance (mm)	SPLSR	Figure
		GSM1900	WiFi 5.5 GHz Main	WiFi 5.5 GHz Aux	Bluetooth				
14	Rear, Wi-Fi 1 Tx	1.324	0.220		0.165	1.709			
		1.324	0.220			1.544	62.3	0.031	23
		1.324			0.165	1.489	178.4	0.010	23
			0.220		0.165	0.385	141.6	0.002	23
15	Rear, Wi-Fi 2 Tx	1.324	0.220	0.229		1.773			
		1.324	0.220			1.544	62.3	0.031	24
		1.324		0.229		1.553	176.1	0.011	24
			0.220	0.229		0.449	150.4	0.002	24

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 W-CDMA & Wi-Fi 5.5 GHz Band

Test Position	Data						Σ 1-g SAR (mW/g)
	W-CDMA Band V	W-CDMA Band IV	W-CDMA Band II	WiFi 5.5 GHz Main	WiFi 5.5 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.681			0.220		0.165	1.066
	0.681				0.229		0.910
		0.619		0.220		0.165	1.004
		0.619			0.229		0.848
			1.012	0.220		0.165	1.397
			1.012		0.229		1.241
Rear, Wi-Fi 2 Tx	0.681			0.220	0.229		1.130
		0.619		0.220	0.229		1.068
			1.012	0.220	0.229		1.461
Edge 1, Wi-Fi 1 Tx	1.234			0.082		0.017	1.333
	1.234				0.200		1.434
		1.383		0.082		0.017	1.482
		1.383			0.200		1.583
			1.36	0.082		0.017	1.459
			1.36		0.200		1.560
Edge 1, Wi-Fi 2 Tx	1.234			0.082	0.113		1.429
		1.383		0.082	0.113		1.578
			1.36	0.082	0.113		1.555
Edge 3, Wi-Fi 2 Tx	0.400			0.113	1.03		1.543
		0.400		0.113	1.03		1.543
			0.400	0.113	1.03		1.543
Edge 4, Wi-Fi 1 Tx	0.256			1.099		0.0089	1.364
		0.388		1.099		0.0089	1.496
			0.384	1.099		0.0089	1.492
Edge 4, Wi-Fi 2 Tx	0.256			0.537	0.094		0.887
		0.388		0.537	0.094		1.019
			0.384	0.537	0.094		1.015

- As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
- 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 CDMA BC0 & Wi-Fi 5.5 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC0 1xEVDO	WiFi 5.5 GHz Main	WiFi 5.5 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.377		0.220		0.165	0.762
		0.406	0.220		0.165	0.791
Rear, Wi-Fi 2 Tx	0.377		0.220	0.229		0.826
		0.406	0.220	0.229		0.855
Edge 1, Wi-Fi 1 Tx	1.36		0.082		0.017	1.459
	1.36			0.200		1.560
		1.379	0.082		0.017	1.478
		1.379		0.200		1.579
Edge 1, Wi-Fi 2 Tx	1.36		0.082	0.113		1.555
		1.379	0.082	0.113		1.574
Edge 3, Wi-Fi 2 Tx	0.400		0.113	1.030		1.543
		0.400	0.113	1.030		1.543
Edge 4, Wi-Fi 1 Tx	0.272		1.099		0.0089	1.380
		0.154	1.099		0.0089	1.262
Edge 4, Wi-Fi 2 Tx	0.272		0.537	0.094		0.903
		0.154	0.537	0.094		0.785

1. As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
2. 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 CDMA BC1 & Wi-Fi 5.5 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	CDMA BC1 1xRTT	CDMA BC1 1xEVDO	WiFi 5.5 GHz Main	WiFi 5.5 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.596		0.220		0.165	0.981
		0.527	0.220		0.165	0.912
Rear, Wi-Fi 2 Tx	0.596		0.220	0.229		1.045
		0.527	0.220	0.229		0.976
Edge 1, Wi-Fi 1 Tx	1.382		0.082		0.017	1.481
	1.382			0.200		1.582
		1.372	0.082		0.017	1.471
		1.372		0.200		1.572
Edge 1, Wi-Fi 2 Tx	1.382		0.082	0.113		1.577
		1.372	0.082	0.113		1.567
Edge 3, Wi-Fi 2 Tx	0.400		0.113	1.030		1.543
		0.400	0.113	1.030		1.543
Edge 4, Wi-Fi 1 Tx	0.390		1.099		0.0089	1.498
		0.393	1.099		0.0089	1.501
Edge 4, Wi-Fi 2 Tx	0.390		0.537	0.094		1.021
		0.393	0.537	0.094		1.024

1. As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
2. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because 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 GSM & Wi-Fi 5.8 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	GSM850	GSM1900	WiFi 5.8 GHz Main	WiFi 5.8 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	1.074		0.090		0.165	1.329
	1.074			0.148		1.222
		1.324	0.090		0.165	1.579
		1.324		0.148		1.472
Rear, Wi-Fi 2 Tx	1.074		0.090	0.148		1.312
		1.324	0.090	0.148		1.562
Edge 1, Wi-Fi 1 Tx	1.37		0.038		0.017	1.425
	1.37			0.205		1.575
		1.389	0.038		0.017	1.444
		1.389		0.205		1.594
Edge 1, Wi-Fi 2 Tx	1.37		0.038	0.102		1.510
		1.389	0.038	0.102		1.529
Edge 3, Wi-Fi 2 Tx	0.400		0.102	0.754		1.256
		0.400	0.102	0.754		1.256
Edge 4, Wi-Fi 1 Tx	0.332		0.414		0.0089	0.755
		0.395	0.414		0.0089	0.818
Edge 4, Wi-Fi 2 Tx	0.332		0.215	0.043		0.590
		0.395	0.215	0.043		0.653

1. As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
2. 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. Sum of the SAR for W-CDMA & Wi-Fi 5.8 GHz Band

Test Position	Data						Σ 1-g SAR (mW/g)
	W-CDMA Band V	W-CDMA Band IV	W-CDMA Band II	WiFi 5.8 GHz Main	WiFi 5.8 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.681			0.090		0.165	0.936
	0.681				0.148		0.829
		0.619		0.090		0.165	0.874
		0.619			0.148		0.767
			1.012	0.090		0.165	1.267
			1.012		0.148		1.160
Rear, Wi-Fi 2 Tx	0.681			0.090	0.148		0.919
		0.619		0.090	0.148		0.857
			1.012	0.090	0.148		1.250
Edge 1, Wi-Fi 1 Tx	1.234			0.038		0.017	1.289
	1.234				0.205		1.439
		1.383		0.038		0.017	1.438
		1.383			0.205		1.588
			1.36	0.038		0.017	1.415
			1.36		0.205		1.565
Edge 1, Wi-Fi 2 Tx	1.234			0.038	0.102		1.374
		1.383		0.038	0.102		1.523
			1.36	0.038	0.102		1.500
Edge 3, Wi-Fi 2 Tx	0.400			0.102	0.754		1.256
		0.400		0.102	0.754		1.256
			0.400	0.102	0.754		1.256
Edge 4, Wi-Fi 1 Tx	0.256			0.414		0.0089	0.679
		0.388		0.414		0.0089	0.811
			0.384	0.414		0.0089	0.807
Edge 4, Wi-Fi 2 Tx	0.256			0.215	0.043		0.514
		0.388		0.215	0.043		0.646
			0.384	0.215	0.043		0.642

1. As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
2. 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.

13.20. Sum of the SAR for CDMA BC0 & Wi-Fi 5.8 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC0 1xEVDO	WiFi 5.8 GHz Main	WiFi 5.8 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.377		0.090		0.165	0.632
		0.406	0.090		0.165	0.661
Rear, Wi-Fi 2 Tx	0.377		0.090	0.148		0.615
		0.406	0.090	0.148		0.644
Edge 1, Wi-Fi 1 Tx	1.36		0.038		0.017	1.415
	1.36			0.205		1.565
		1.379	0.038		0.017	1.434
		1.379		0.205		1.584
Edge 1, Wi-Fi 2 Tx	1.36		0.038	0.102		1.500
		1.379	0.038	0.102		1.519
Edge 3, Wi-Fi 2 Tx	0.400		0.102	0.754		1.256
		0.400	0.102	0.754		1.256
Edge 4, Wi-Fi 1 Tx	0.272		0.414		0.0089	0.695
		0.154	0.414		0.0089	0.577
Edge 4, Wi-Fi 2 Tx	0.272		0.215	0.043		0.530
		0.154	0.215	0.043		0.412

1. As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
2. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because 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.

13.21. Sum of the SAR for CDMA BC1 & Wi-Fi 5.8 GHz Band

Test Position	Data					Σ 1-g SAR (mW/g)
	CDMA BC1 1xRTT	CDMA BC1 1xEVDO	WiFi 5.8 GHz Main	WiFi 5.8 GHz Aux	Bluetooth	
Rear, Wi-Fi 1 Tx	0.596		0.090		0.165	0.851
		0.527	0.090		0.165	0.782
Rear, Wi-Fi 2 Tx	0.596		0.090	0.148		0.834
		0.527	0.090	0.148		0.765
Edge 1, Wi-Fi 1 Tx	1.382		0.038		0.017	1.437
	1.382			0.205		1.587
		1.372	0.038		0.017	1.427
		1.372		0.205		1.577
Edge 1, Wi-Fi 2 Tx	1.382		0.038	0.102		1.522
		1.372	0.038	0.102		1.512
Edge 3, Wi-Fi 2 Tx	0.400		0.102	0.754		1.256
		0.400	0.102	0.754		1.256
Edge 4, Wi-Fi 1 Tx	0.390		0.414		0.0089	0.813
		0.393	0.414		0.0089	0.816
Edge 4, Wi-Fi 2 Tx	0.390		0.215	0.043		0.648
		0.393	0.215	0.043		0.651

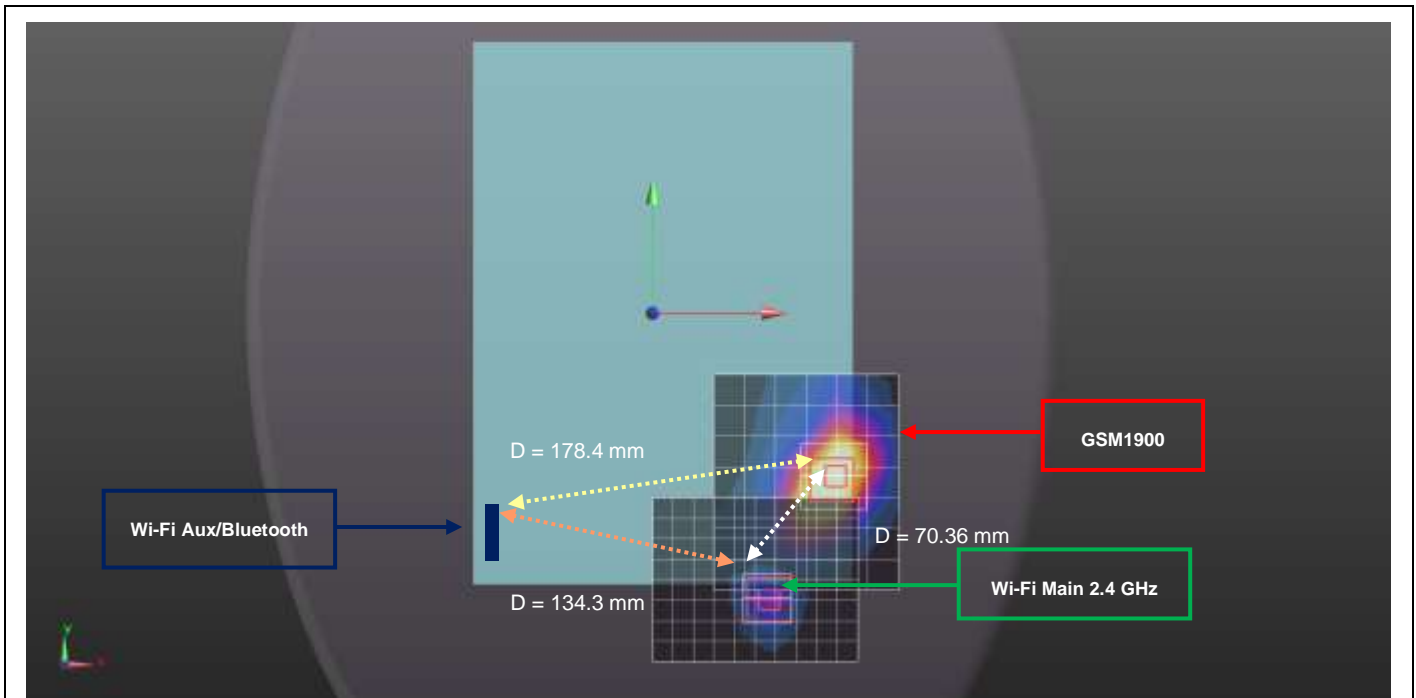
1. As there were only estimated values for edge 2 it was not assessed as it is inherently compliant
2. Values shaded green are estimated SAR

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because 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.

13.23. Separation Distance Calculations and Figures

Figure (1)



Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	0.341	0.0932	-0.0884	-0.182
Wi-Fi Main 2.4 GHz	0.395	0.0502	-0.134	-0.183

d: Calculated distance (mm)				
62.7				

Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	0.341	0.0932	-0.0884	-0.182
Wi-Fi Aux/Bluetooth		-0.083	-0.1166	-0.182

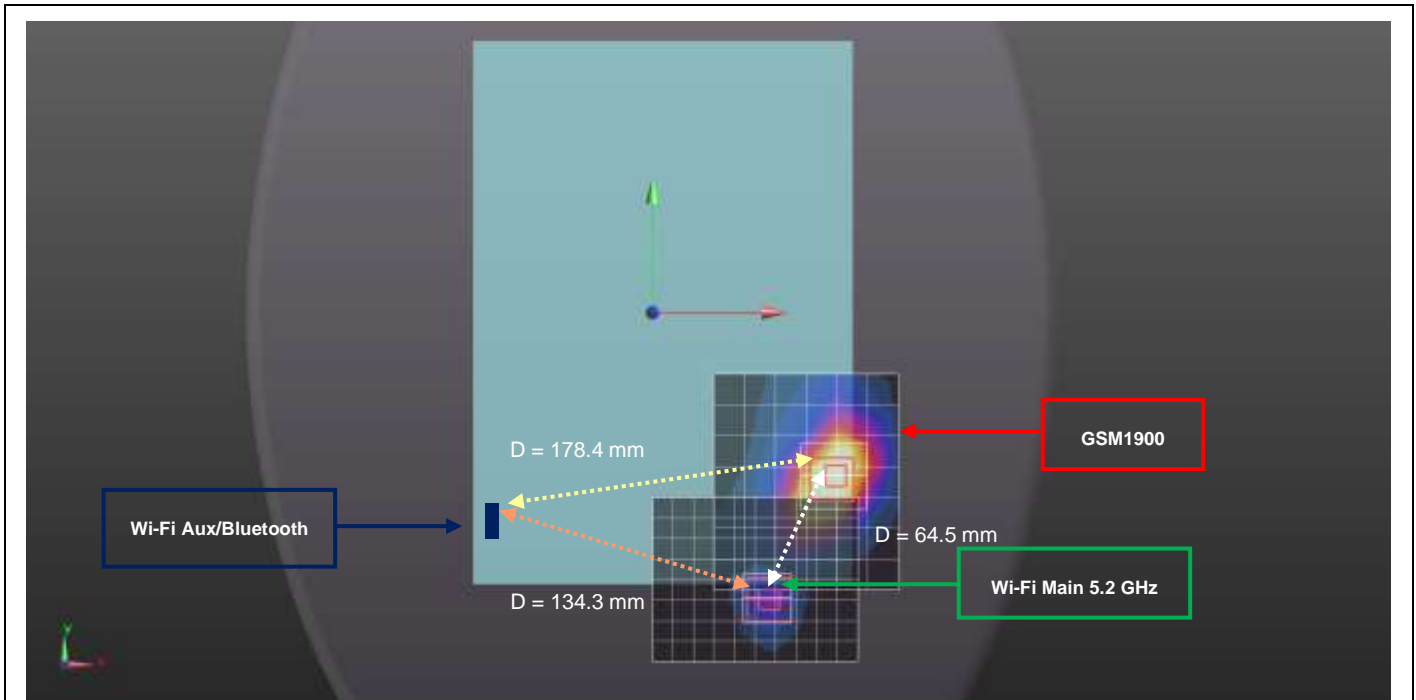
d: Calculated distance (mm)				
178.4				

Mode	Peak SAR mW/g	X m	Y m	Z m
Wi-Fi Main 2.4 GHz	0.395	0.0502	-0.134	-0.183
Wi-Fi Aux/Bluetooth		-0.083	-0.1166	-0.182

d: Calculated distance (mm)				
134.3				

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (2)



Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	0.341	0.0932	-0.0884	-0.182
Wi-Fi Main 5.2 GHz	0.441	0.0448	-0.131	-0.182

d: Calculated distance (mm)				
64.5				

Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	0.341	0.0932	-0.0884	-0.182
Wi-Fi Aux/Bluetooth		-0.083	-0.1166	-0.182

d: Calculated distance (mm)				
178.4				

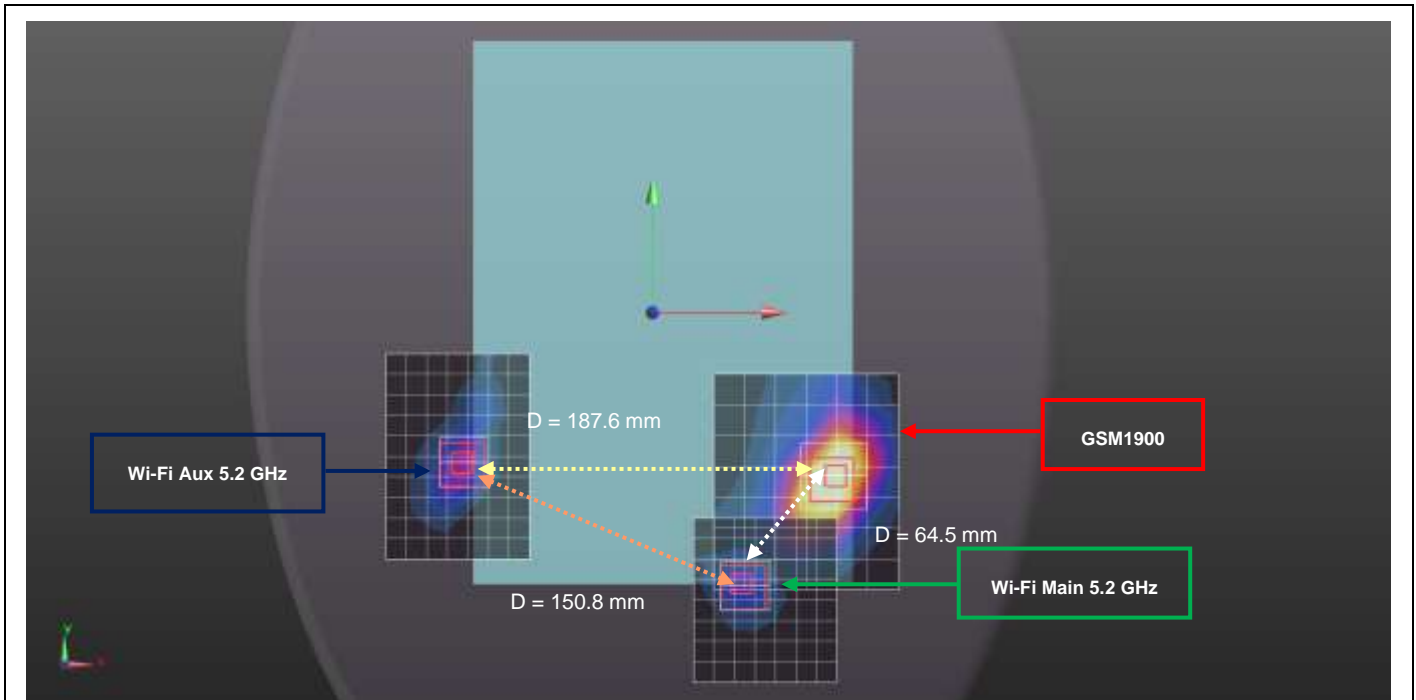
Mode	Peak SAR mW/g	X m	Y m	Z m
Wi-Fi Main 5.2 GHz	0.441	0.0448	-0.131	-0.182
Wi-Fi Aux/Bluetooth		-0.083	-0.1166	-0.182

d: Calculated distance (mm)				
128.6				

The Peak Location Separation Distance is computed by using the formula below:

$$\text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$$

Figure (3)



Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	0.341	0.0932	-0.0884	-0.182
Wi-Fi Main 5.2 GHz	0.441	0.0448	-0.131	-0.182

d: Calculated distance (mm)
64.5

Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	0.341	0.0932	-0.0884	-0.182
Wi-Fi Aux 5.2 GHz	0.501	-0.0936	-0.0712	-0.182

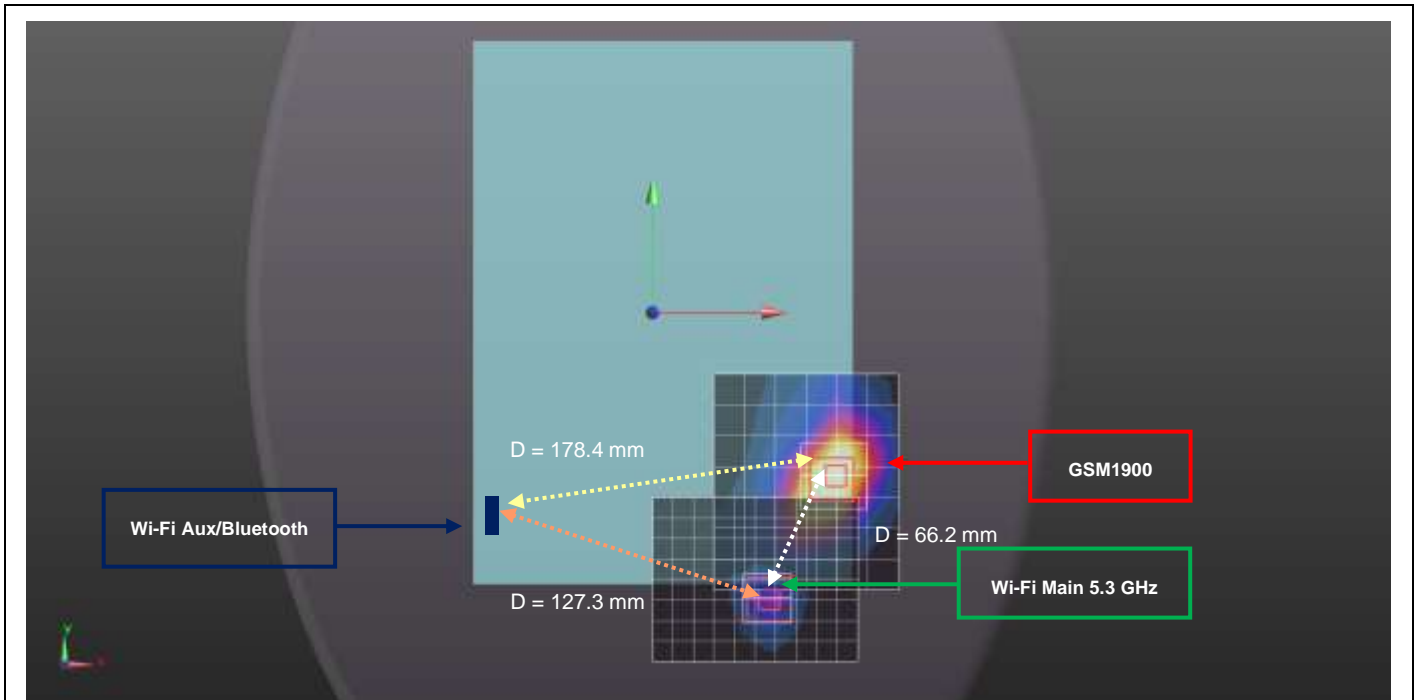
d: Calculated distance (mm)
187.6

Mode	Peak SAR mW/g	X m	Y m	Z m
Wi-Fi Main 5.2 GHz	0.441	0.0448	-0.131	-0.182
Wi-Fi Aux 5.2 GHz	0.501	-0.0936	-0.0712	-0.182

d: Calculated distance (mm)
150.8

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (4)



Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	0.341	0.0932	-0.0884	-0.182
Wi-Fi Main 5.3 GHz	0.75	0.0434	-0.132	-0.182

d: Calculated distance (mm)
66.2

Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	0.341	0.0932	-0.0884	-0.182
Wi-Fi Aux/Bluetooth		-0.083	-0.1166	-0.182

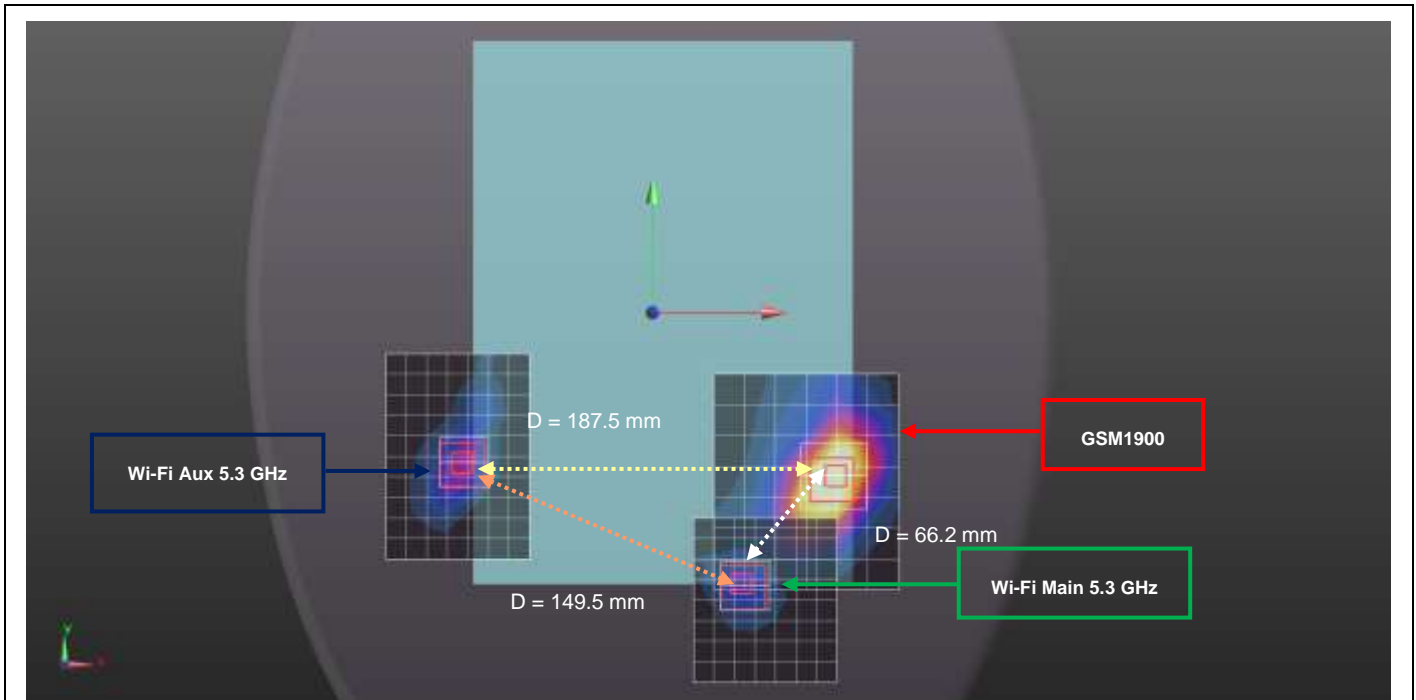
d: Calculated distance (mm)
178.4

Mode	Peak SAR mW/g	X m	Y m	Z m
Wi-Fi Main 5.3 GHz	0.75	0.0434	-0.132	-0.182
Wi-Fi Aux/Bluetooth		-0.083	-0.1166	-0.182

d: Calculated distance (mm)
127.3

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (5)



Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	0.341	0.0932	-0.0884	-0.182
Wi-Fi Main 5.3 GHz	0.75	0.0434	-0.132	-0.182

d: Calculated distance (mm)	
66.2	

Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	0.341	0.0932	-0.0884	-0.182
Wi-Fi Aux 5.3 GHz	0.854	-0.0936	-0.0722	-0.182

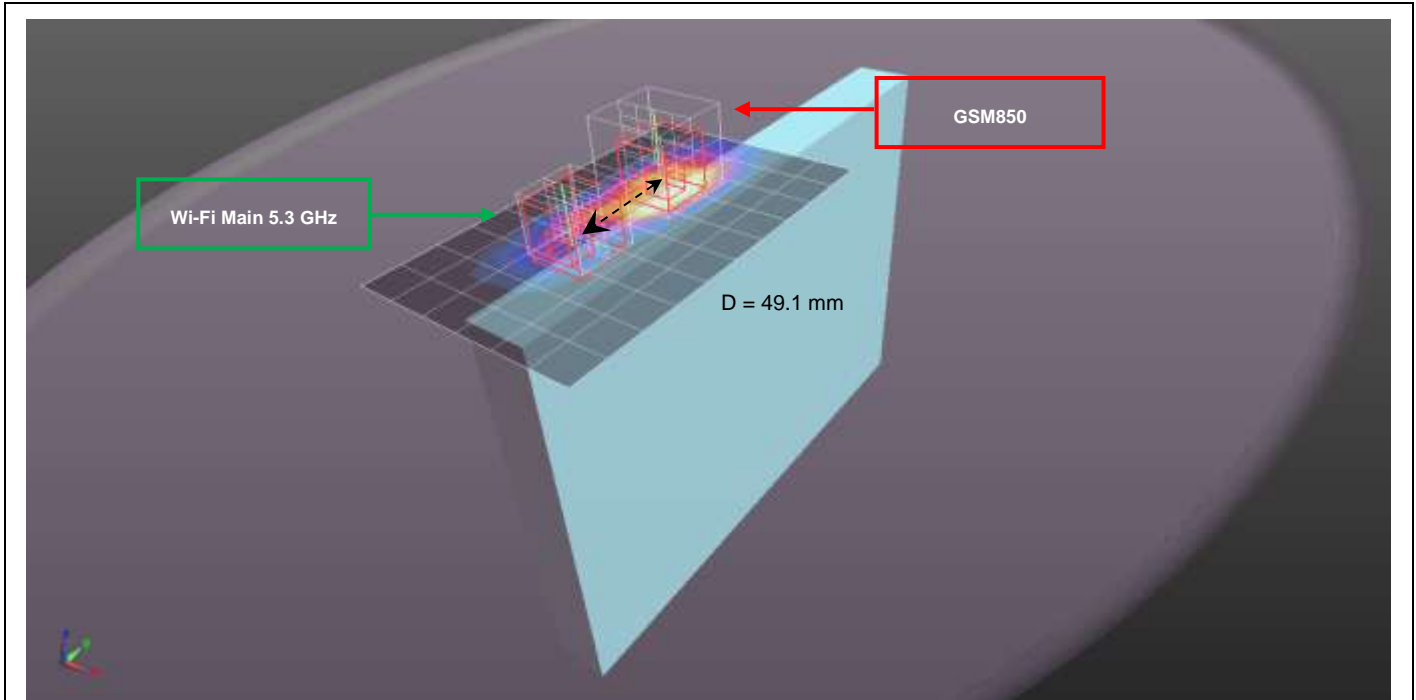
d: Calculated distance (mm)	
187.5	

Mode	Peak SAR mW/g	X m	Y m	Z m
Wi-Fi Main 5.3 GHz	0.75	0.0434	-0.132	-0.182
Wi-Fi Aux 5.3 GHz	0.854	-0.0936	-0.0722	-0.182

d: Calculated distance (mm)	
149.5	

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (6)

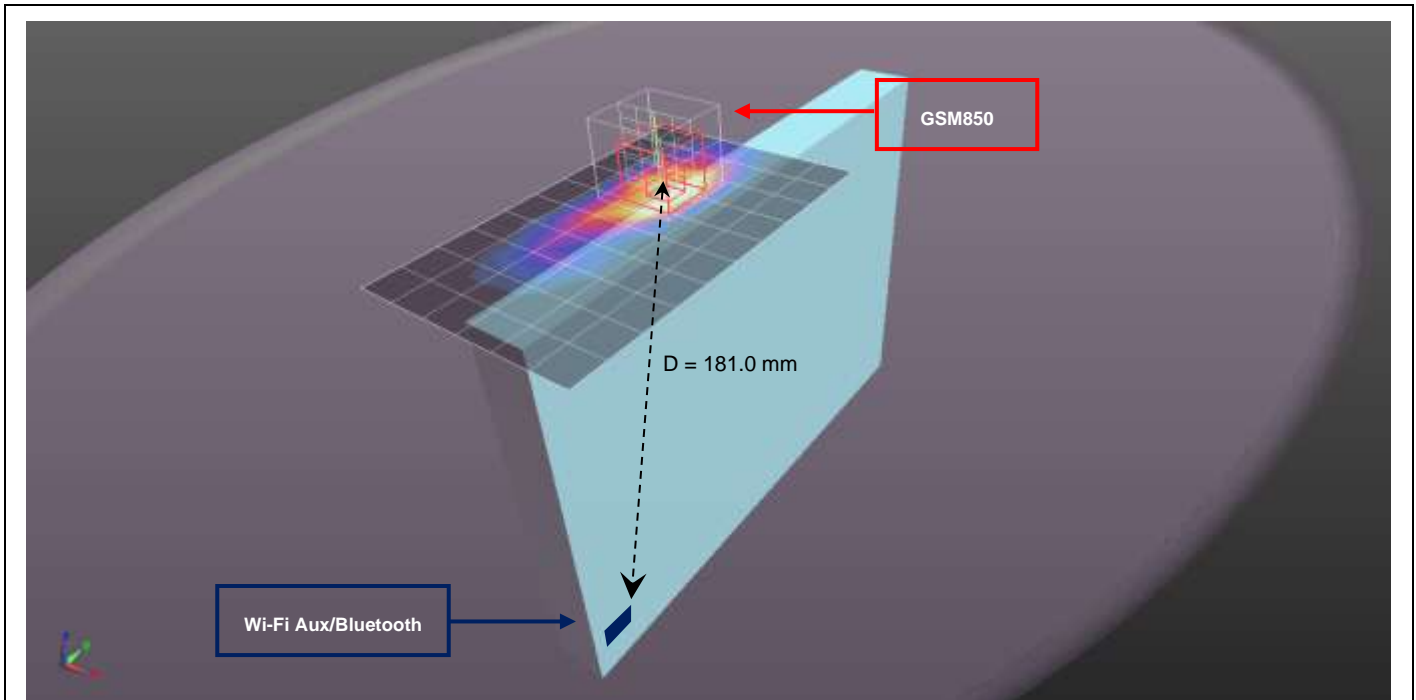


Mode	Peak SAR mW/g	X m	Y m	Z m
GSM850	2.21	-0.0121	-0.0475	-0.184
Wi-Fi Main 5.3 GHz	0.458	-0.0104	-0.0966	-0.183

d: Calculated distance (mm)	
49.1	

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (7)

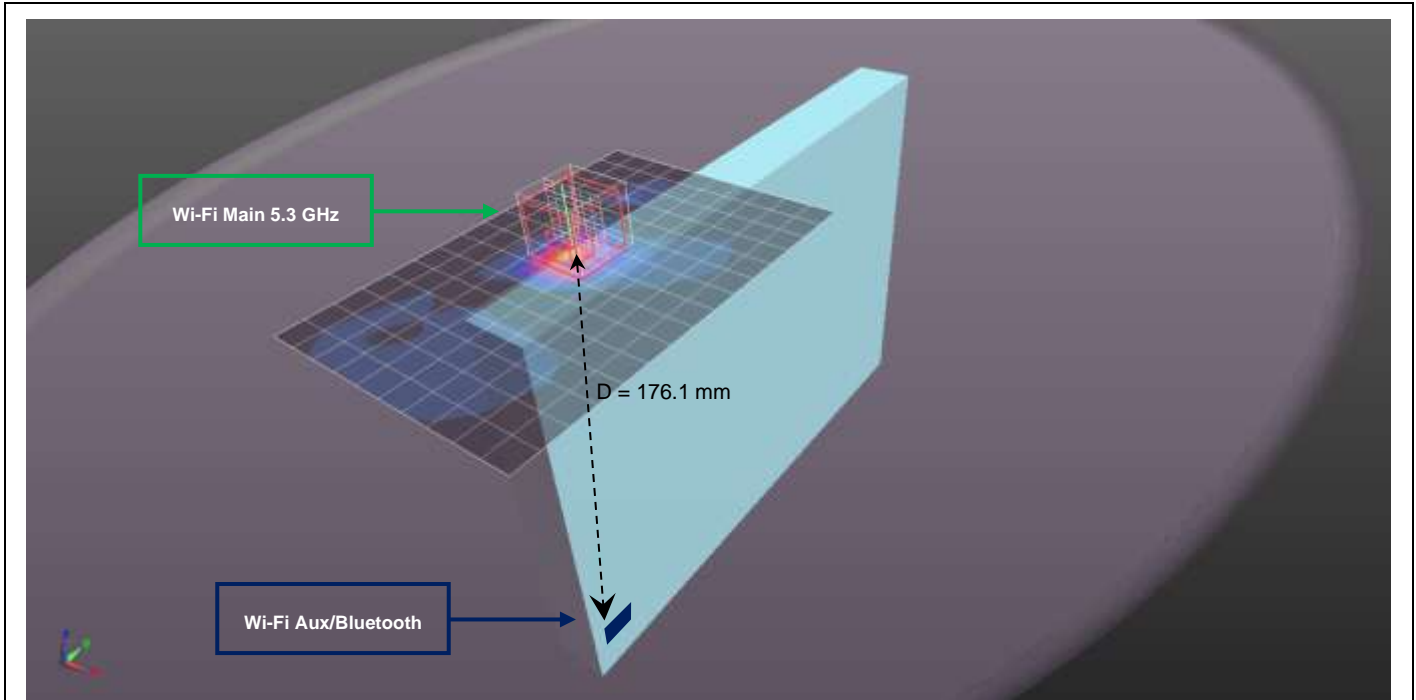


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
GSM850	2.21	-0.0121	-0.0475	-0.184
Wi-Fi Aux/Bluetooth		-0.0062	-0.0933	-0.359

d: Calculated distance (mm)	
181.0	

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (8)

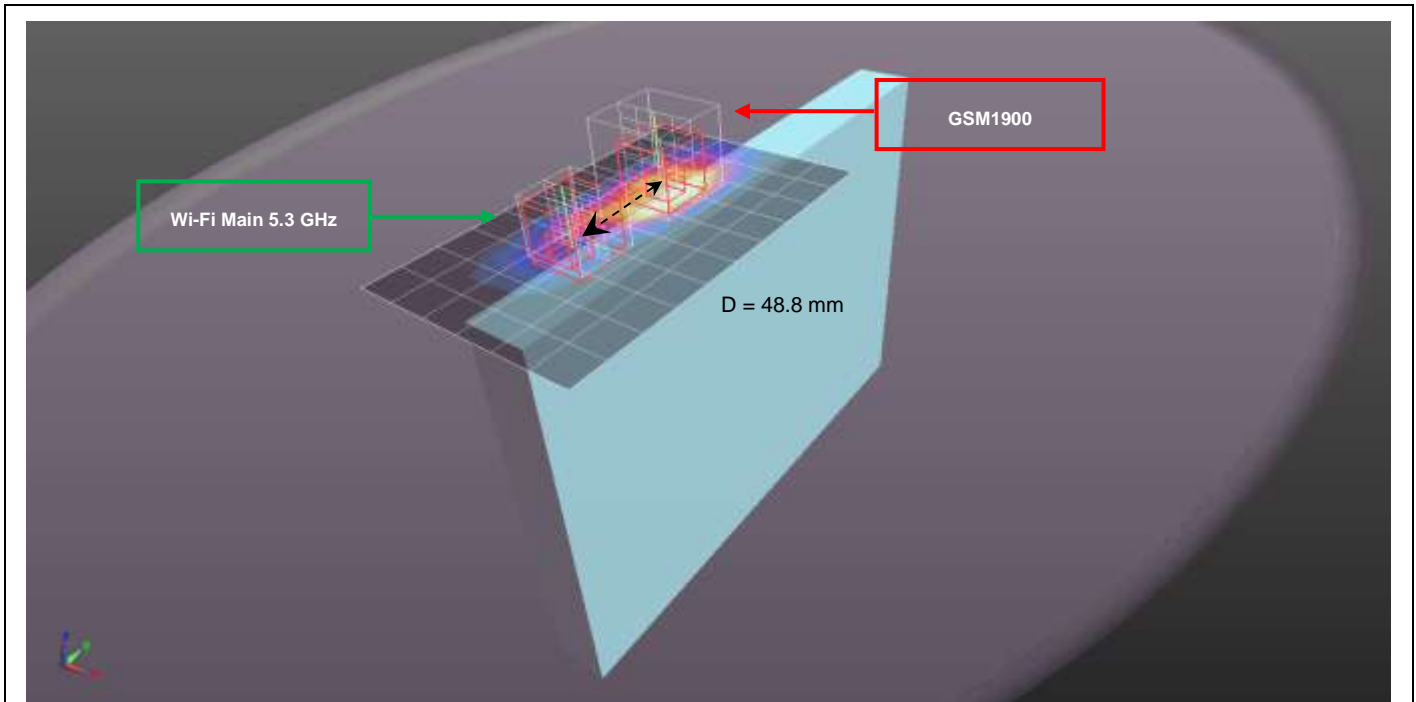


Mode	Peak SAR mW/g	X m	Y m	Z m
Wi-Fi Main 5.3 GHz	0.458	-0.0104	-0.0966	-0.183
Wi-Fi Aux/Bluetooth		-0.0062	-0.0933	-0.359

d: Calculated distance (mm)
176.1

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (9)

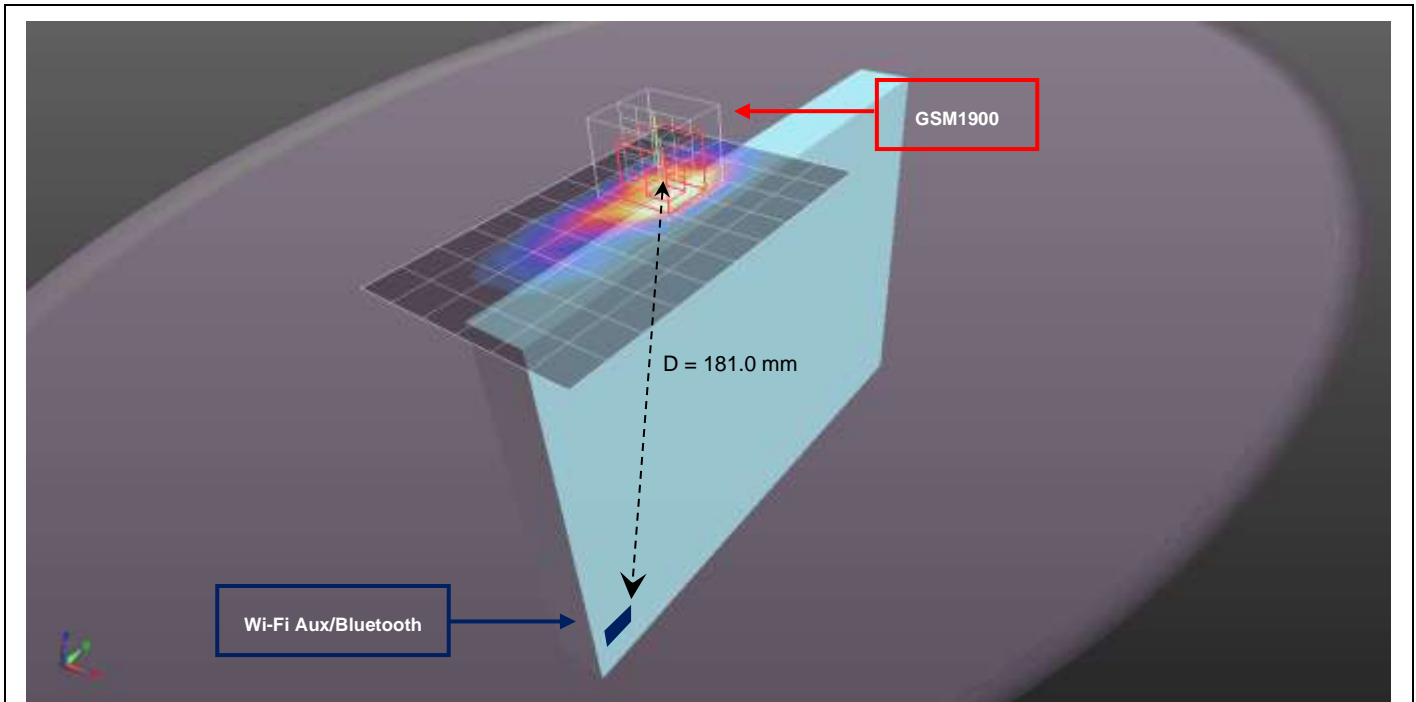


Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	1.98	-0.0106	-0.0478	-0.184
Wi-Fi Main 5.3 GHz	0.458	-0.0104	-0.0966	-0.183

d: Calculated distance (mm)
48.8

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (10)

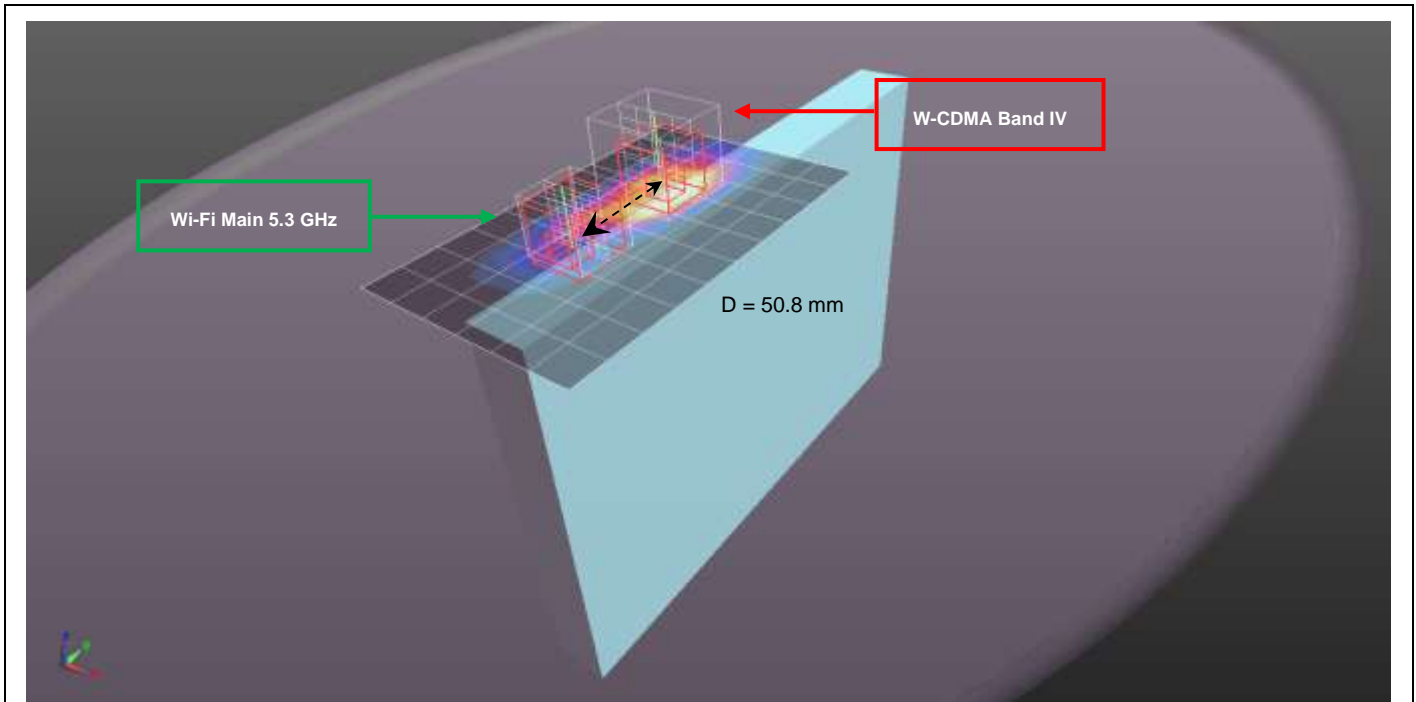


Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	1.98	-0.0106	-0.0478	-0.184
Wi-Fi Aux/Bluetooth		-0.0062	-0.0933	-0.359

d: Calculated distance (mm)	
180.9	

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (11)

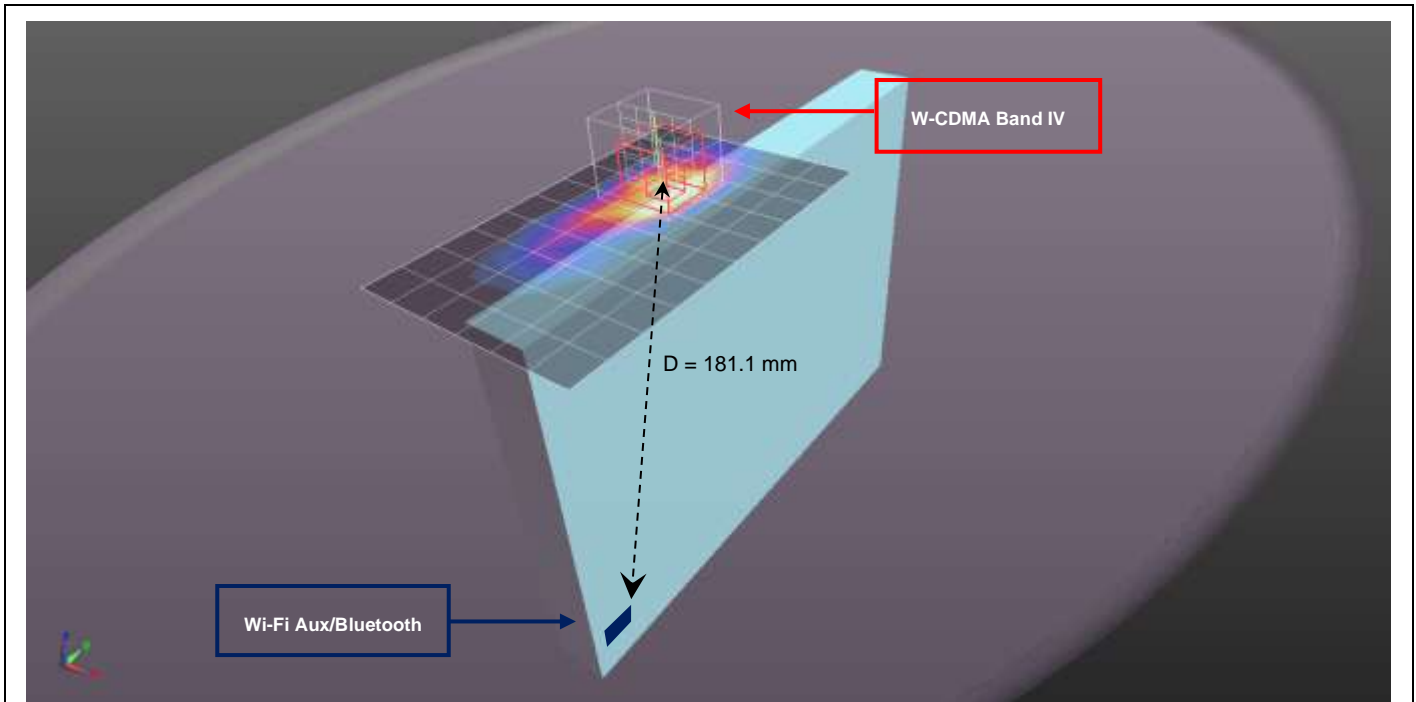


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
W-CDMA Band IV	0.257	0.0025	-0.0475	-0.184
Wi-Fi Main 5.3 GHz	0.458	-0.0104	-0.0966	-0.183

d: Calculated distance (mm)
50.8

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (12)

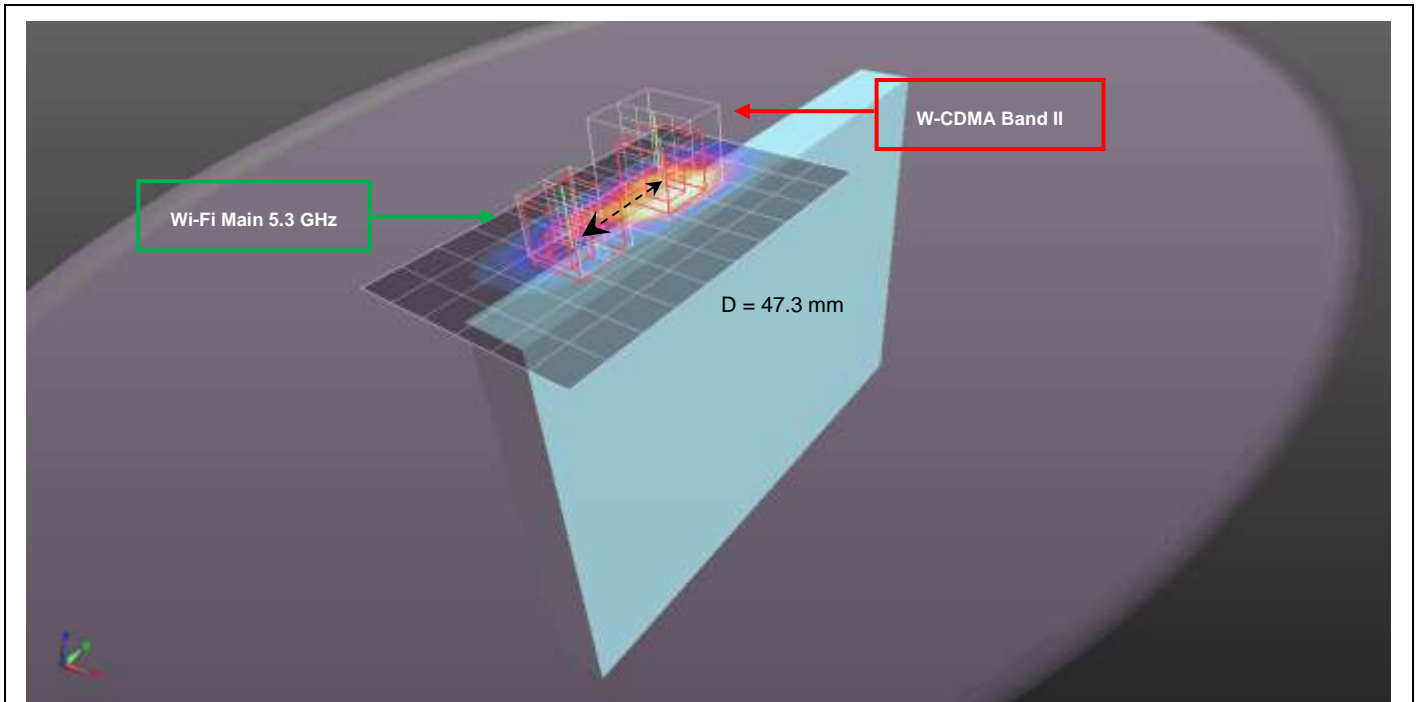


Mode	Peak SAR mW/g	X m	Y m	Z m
W-CDMA Band IV	0.257	0.0025	-0.0475	-0.184
Wi-Fi Aux/Bluetooth		-0.0062	-0.0933	-0.359

d: Calculated distance (mm)	
181.1	

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (13)



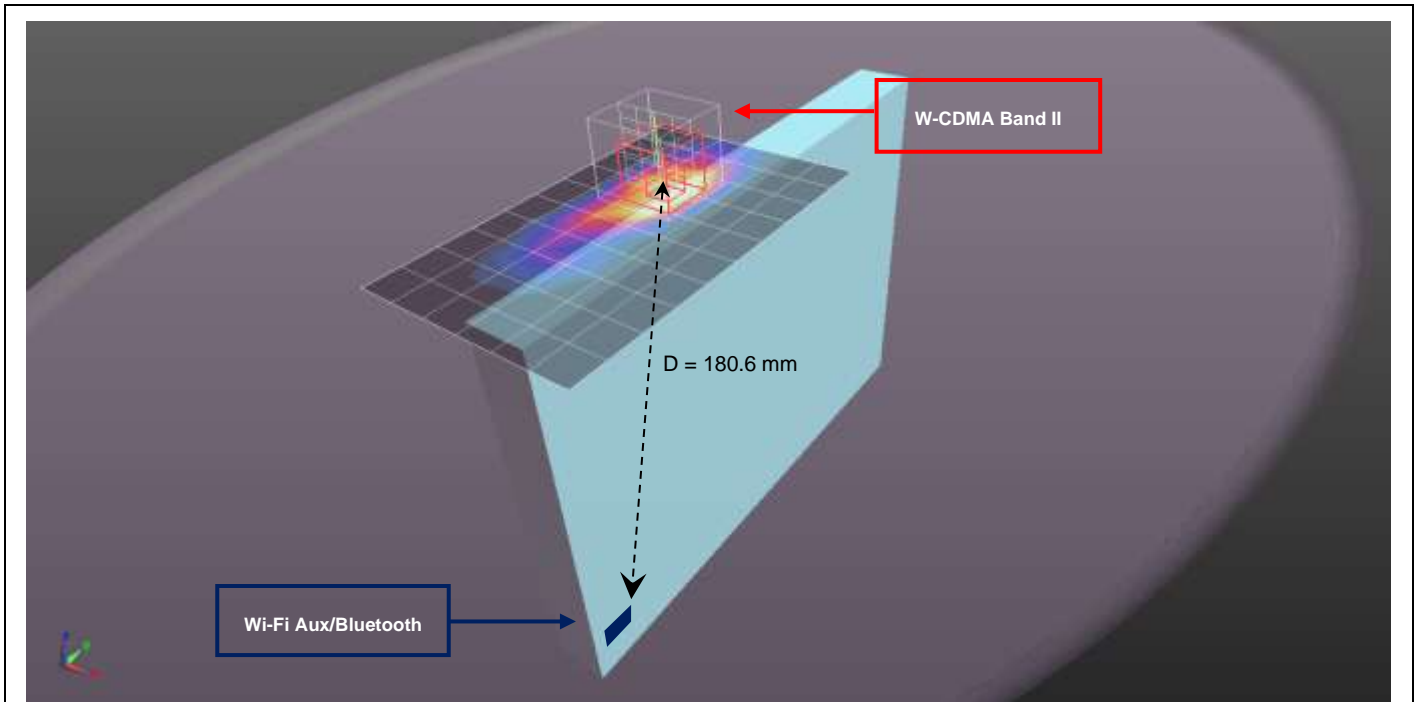
Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
W-CDMA Band II	1.74	-0.0136	-0.0494	-0.184
Wi-Fi Main 5.3 GHz	0.458	-0.0104	-0.0966	-0.183

d: Calculated distance (mm)	
47.3	

The Peak Location Separation Distance is computed by using the formula below:

$$\text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$$

Figure (14)

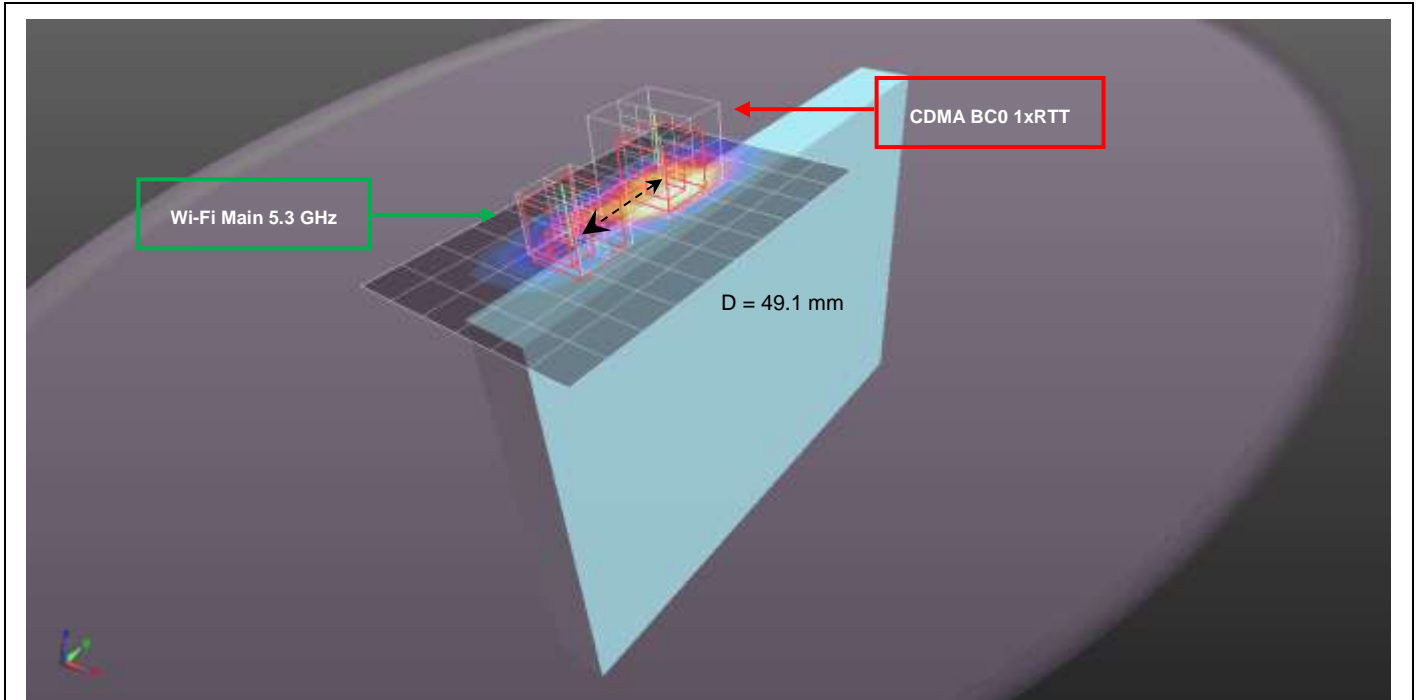


Mode	Peak SAR mW/g	X m	Y m	Z m
W-CDMA Band II	1.74	-0.0136	-0.0494	-0.184
Wi-Fi Aux/Bluetooth		-0.0062	-0.0933	-0.359

d: Calculated distance (mm)
180.6

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (15)

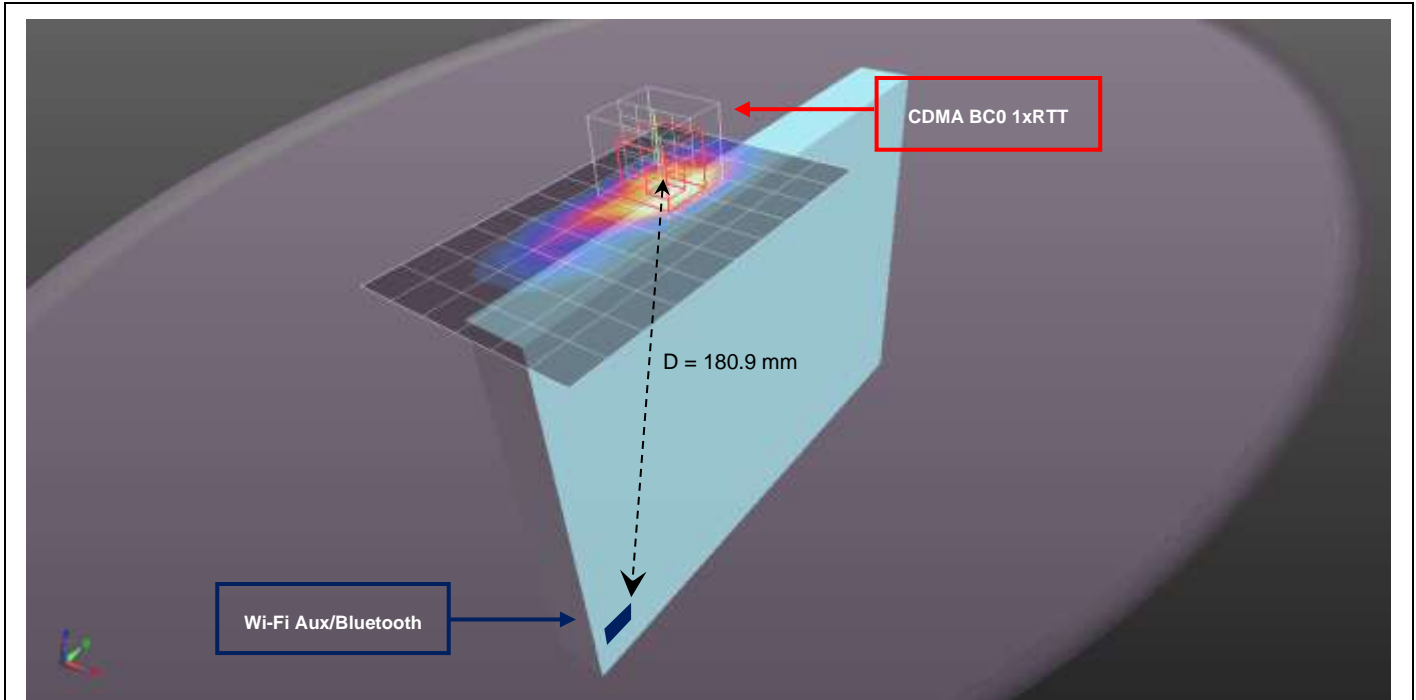


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
CDMA BC0 1xRTT	1.98	-0.0076	-0.0476	-0.184
Wi-Fi Main 5.3 GHz	0.458	-0.0104	-0.0966	-0.183

d: Calculated distance (mm)
49.1

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (16)

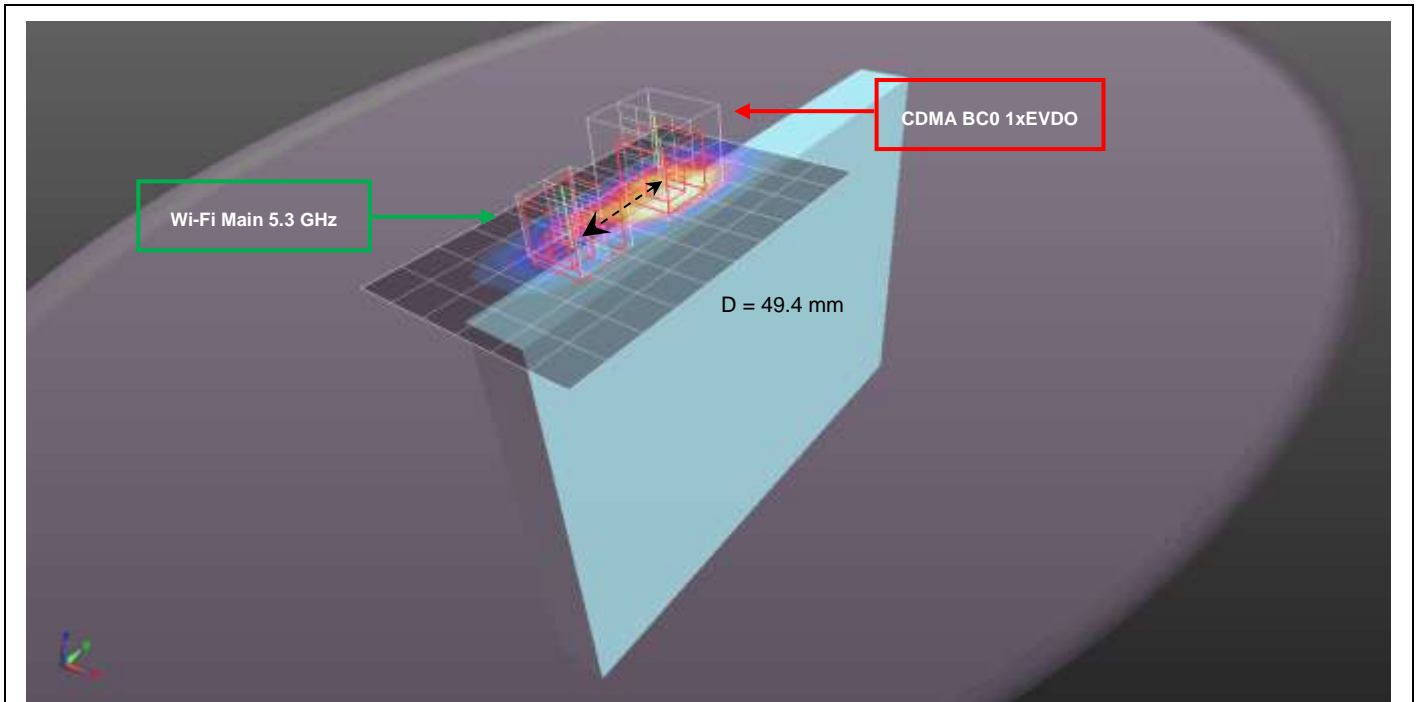


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
CDMA BC0 1xRTT	1.98	-0.0076	-0.0476	-0.184
Wi-Fi Aux/Bluetooth		-0.0062	-0.0933	-0.359

d: Calculated distance (mm)	
180.9	

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (17)

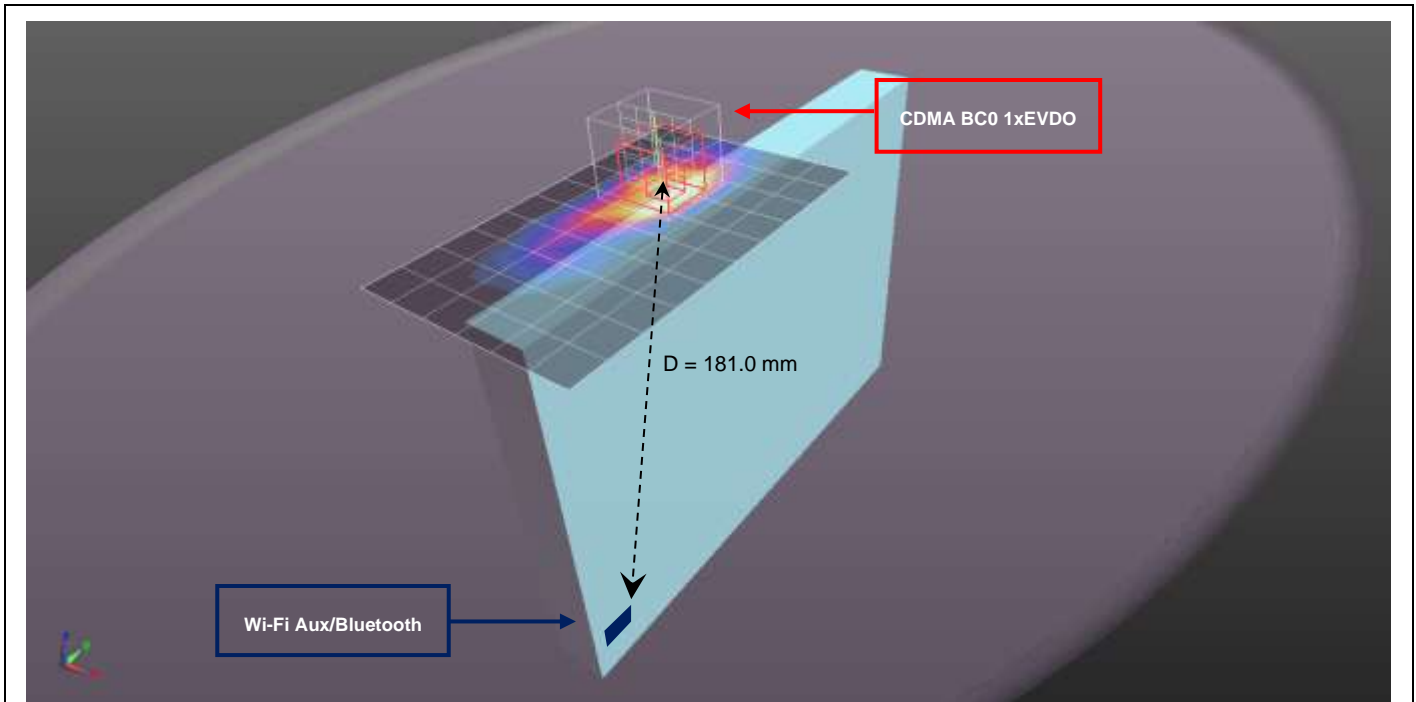


Mode	Peak SAR mW/g	X m	Y m	Z m
CDMA BC0 1xEVDO	1.98	-0.0076	-0.0473	-0.184
Wi-Fi Main 5.3 GHz	0.458	-0.0104	-0.0966	-0.183

d: Calculated distance (mm)
49.4

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (18)

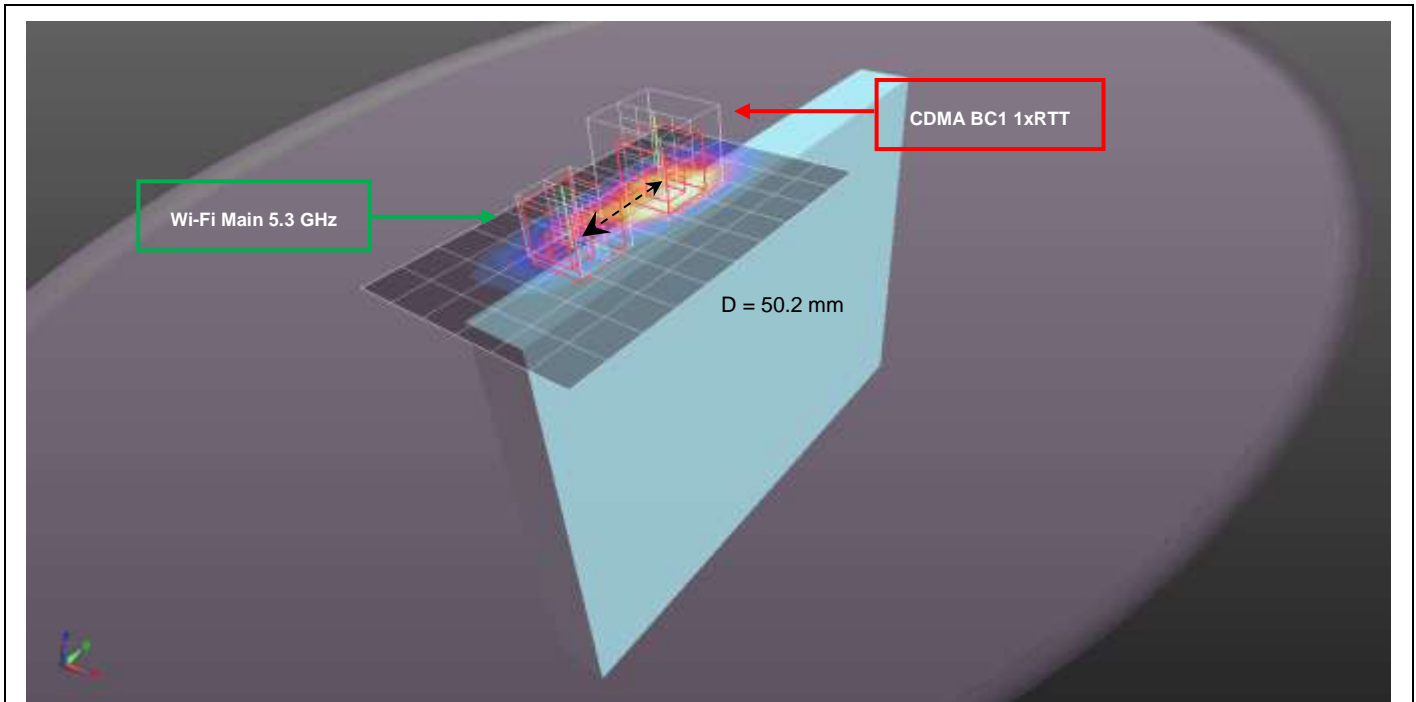


Mode	Peak SAR mW/g	X m	Y m	Z m
CDMA BC0 1xEVDO	1.98	-0.0076	-0.0473	-0.184
Wi-Fi Aux/Bluetooth		-0.0062	-0.0933	-0.359

d: Calculated distance (mm)
181.0

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (19)



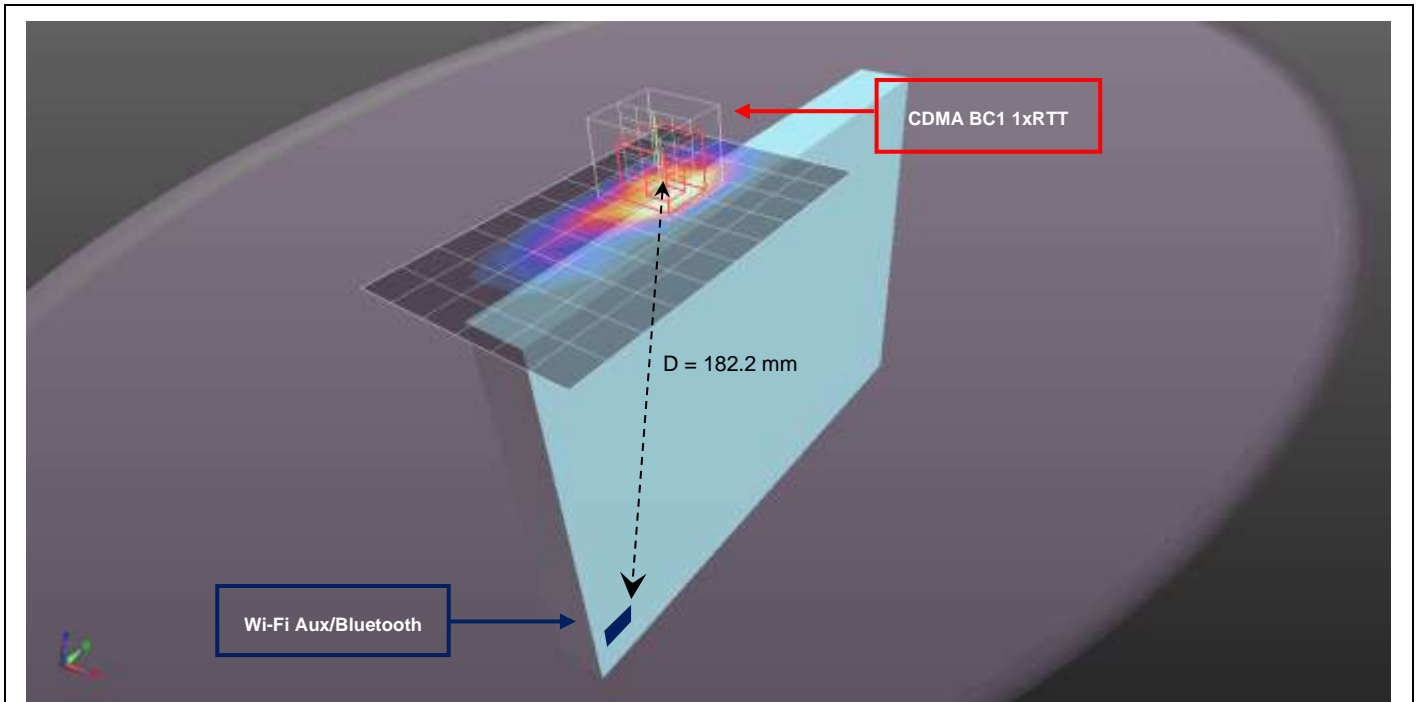
Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
CDMA BC1 1xRTT	2.35	-0.0091	-0.0464	-0.183
Wi-Fi Main 5.3 GHz	0.458	-0.0104	-0.0966	-0.183

d: Calculated distance (mm)
50.2

The Peak Location Separation Distance is computed by using the formula below:

$$\text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$$

Figure (20)

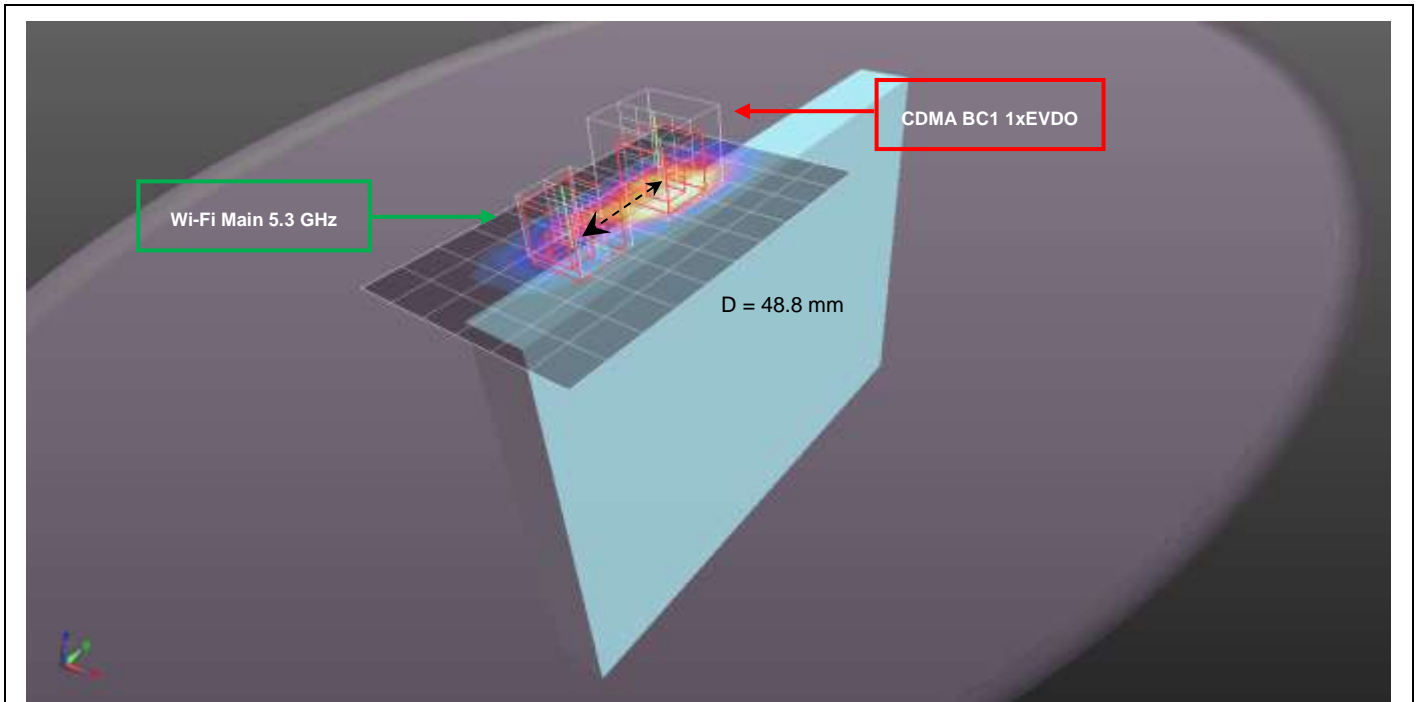


Mode	Peak SAR mW/g	X m	Y m	Z m
CDMA BC1 1xRTT	2.35	-0.0091	-0.0464	-0.183
Wi-Fi Aux/Bluetooth		-0.0062	-0.0933	-0.359

d: Calculated distance (mm)	
182.2	

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (21)



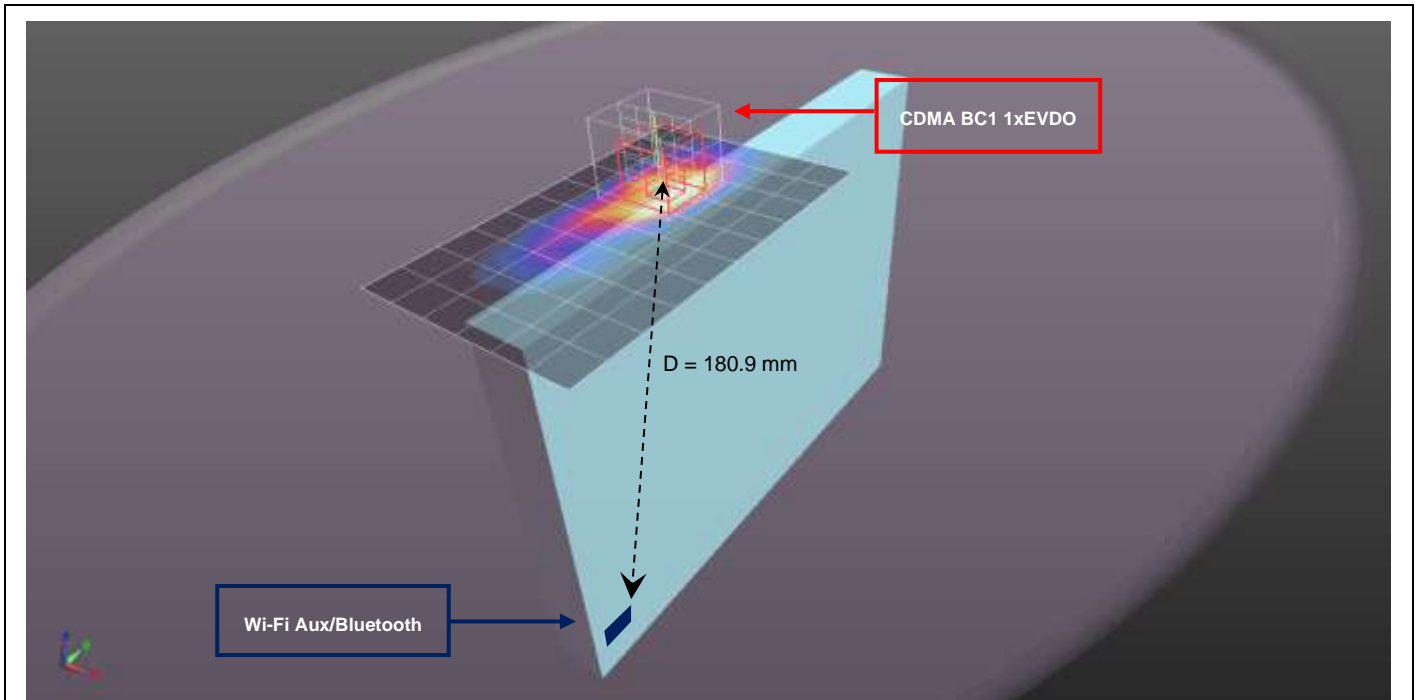
Mode	Peak SAR mW/g	X m	Y m	Z m
CDMA BC1 1xEVDO	2.3	-0.0121	-0.0478	-0.184
Wi-Fi Main 5.3 GHz	0.458	-0.0104	-0.0966	-0.183

d: Calculated distance (mm)
48.8

The Peak Location Separation Distance is computed by using the formula below:

$$\text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$$

Figure (22)

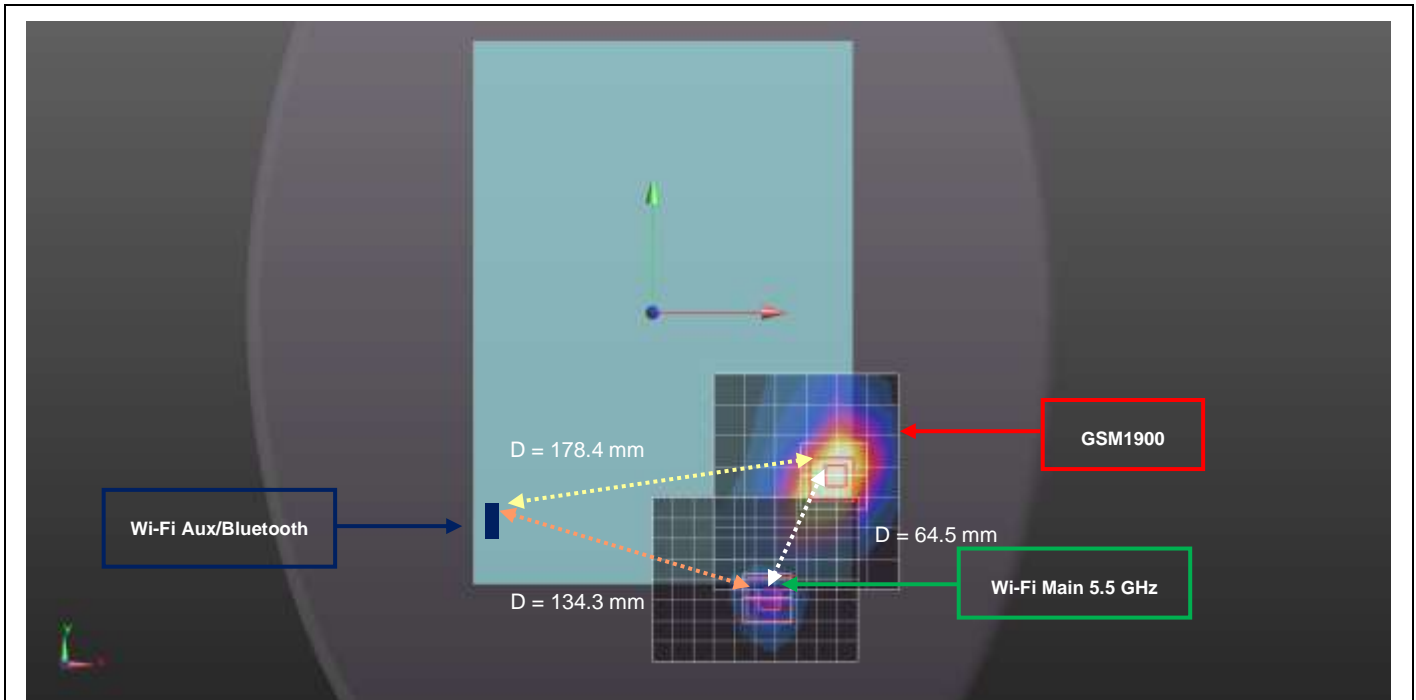


Mode	Peak SAR mW/g	X m	Y m	Z m
CDMA BC1 1xEVDO	2.3	-0.0121	-0.0478	-0.184
Wi-Fi Aux/Bluetooth		-0.0062	-0.0933	-0.359

d: Calculated distance (mm)	
180.9	

The Peak Location Separation Distance is computed by using the formula below:
 $SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (23)



Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	0.341	0.0932	-0.0884	-0.182
Wi-Fi Main 5.5 GHz	0.792	0.0568	-0.139	-0.181

d: Calculated distance (mm)
62.3

Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	0.341	0.0932	-0.0884	-0.182
Wi-Fi Aux/Bluetooth		-0.083	-0.1166	-0.182

d: Calculated distance (mm)
178.4

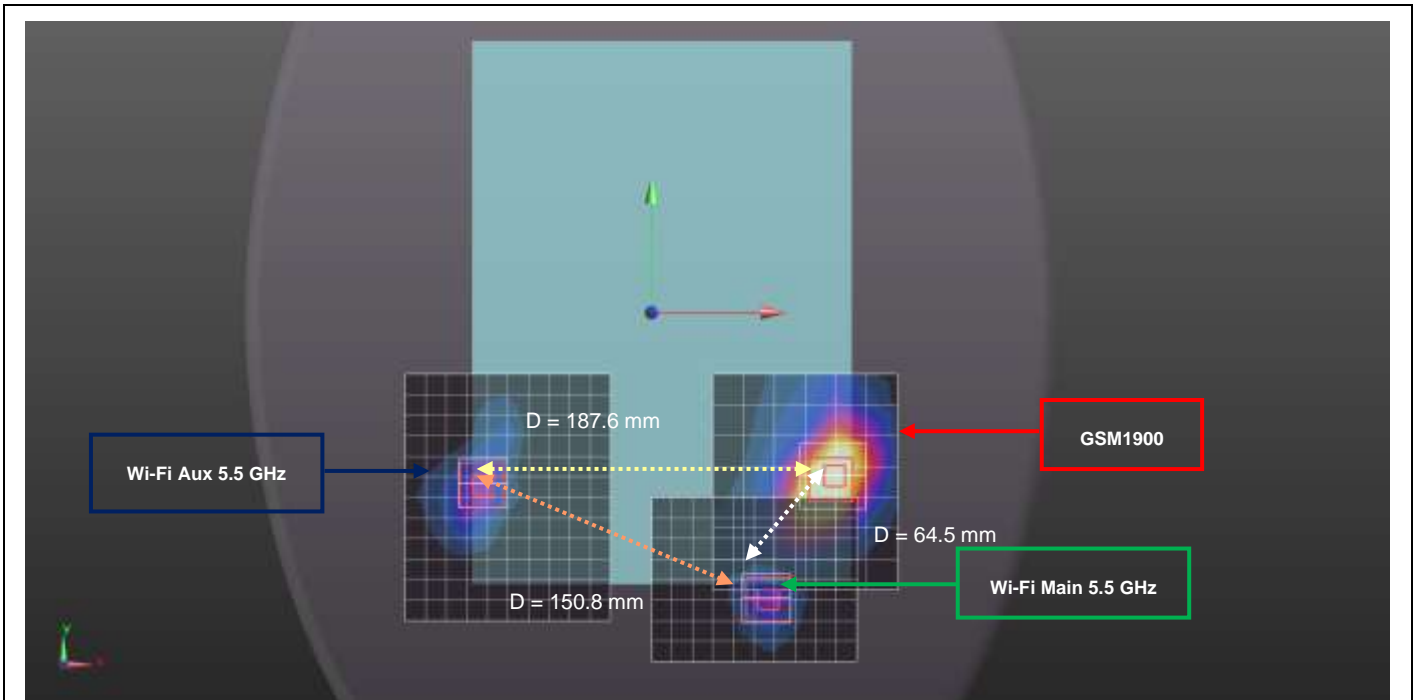
Mode	Peak SAR mW/g	X m	Y m	Z m
Wi-Fi Main 5.5 GHz	0.792	0.0568	-0.139	-0.181
Wi-Fi Aux/Bluetooth		-0.083	-0.1166	-0.182

d: Calculated distance (mm)
141.6

The Peak Location Separation Distance is computed by using the formula below:

$$\text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$$

Figure (24)



Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	0.341	0.0932	-0.0884	-0.182
Wi-Fi Main 5.5 GHz	0.792	0.0568	-0.139	-0.181

d: Calculated distance (mm)				
62.3				

Mode	Peak SAR mW/g	X m	Y m	Z m
GSM1900	0.341	0.0932	-0.0884	-0.182
Wi-Fi Aux 5.5 GHz	0.791	-0.0828	-0.083	-0.182

d: Calculated distance (mm)				
176.1				

Mode	Peak SAR mW/g	X m	Y m	Z m
Wi-Fi Main 5.5 GHz	0.792	0.0568	-0.139	-0.181
Wi-Fi Aux 5.5 GHz	0.791	-0.0828	-0.083	-0.182

d: Calculated distance (mm)				
150.4				

The Peak Location Separation Distance is computed by using the formula below:

$$\text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$$

14. Appendixes

Refer to separated files for the following appendixes.

- 14.1. System Performance Check Plots**
- 14.2. SAR Test Plots for GSM850**
- 14.3. SAR Test Plots for GSM1900**
- 14.4. SAR Test Plots for W-CDMA Band V**
- 14.5. SAR Test Plots for W-CDMA Band IV**
- 14.6. SAR Test Plots for W-CDMA Band II**
- 14.7. SAR Test Plots for CDMA BC0**
- 14.8. SAR Test Plots for CDMA BC1**
- 14.9. SAR Test Plots for Wi-Fi 2.4 GHz and 5 GHz Bands**
- 14.10. SAR Test Plots for Repeated Test**
- 14.11. Calibration Certificate for E-Field Probe EX3DV4 - SN 3686**
- 14.12. Calibration Certificate for E-Field Probe EX3DV4 - SN 3749**
- 14.13. Calibration Certificate for E-Field Probe EX3DV4 - SN 3751**
- 14.14. Calibration Certificate for E-Field Probe EX3DV4 - SN 3871**
- 14.15. Calibration Certificate for E-Field Probe EX3DV4 - SN 3885**
- 14.16. Calibration Certificate for D835V2 - SN 4d117**
- 14.17. Calibration Certificate for D835V2 - SN 4d002**
- 14.18. Calibration Certificate for D1750V2 - SN 1053**
- 14.19. Calibration Certificate for D1750V2 - SN 1077**
- 14.20. Calibration Certificate for D1900V2 - SN 5d043**
- 14.21. Calibration Certificate for D1900V2 - SN 5d140**
- 14.22. Calibration Certificate for D2450V2 - SN 706**
- 14.23. Calibration Certificate for D5GHzV2 - SN 1003**