



SAR EVALUATION REPORT

**FCC 47 CFR § 2.1093
IEEE Std 1528-2013**

For

GSM/WCDMA/LTE Tablet + Bluetooth, DTS/UNII a/b/g/n & ANT+

**FCC ID: A3LSMP555
Model Name: SM-P555**

**Report Number: 15119961-S1A
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Prepared for

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NVLAP LAB CODE 200065-0

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--	3/3/2015	Initial Issue	--
A	3/10/2015	Updated Section 6.2	Coltyce Sanders

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1. Attestation of Test Results

Applicant Name	SAMSUNG ELECTRONICS CO., LTD.			
FCC ID	A3LSMP555			
Model Name	SM-P555			
Applicable Standards	FCC 47 CFR § 2.1093 Published RF exposure KDB procedures IEEE Std 1528-2013			
SAR Limits (W/Kg)				
Exposure Category	Peak spatial-average(1g of tissue)			
General population / Uncontrolled exposure	1.6			
The Highest Reported SAR (W/kg)				
RF Exposure Conditions	Equipment Class			
	Licensed	DTS	U-NII	DSS (BT)
Standalone	1.087	0.969	0.893	0.469
Simultaneous Tx	1.471	1.471	1.280	0.971
Date Tested	2/5/2015 to 2/20/2015			
Test Results	Pass			
<p>UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.</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 Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.</p>				
Approved & Released By:		Prepared By:		
				
Devin Chang Senior Engineer UL Verification Services Inc.		Coltyce Sanders Laboratory Engineer UL Verification Services Inc.		

2. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE STD 1528-2013, the following FCC Published RF exposure [KDB](#) procedures:

- 248227 D01 SAR meas for 802.11 v02
- 447498 D01 General RF Exposure Guidance v05r02
- 447498 D03 Supplement C Cross-Reference
- 616217 D04 SAR for laptop and tablets v01r01
- 690783 D01 SAR Listings on Grants v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03
- 865664 D02 RF Exposure Reporting v01r01
- 941225 D01 3G SAR Procedures v03
- 941225 D05 SAR for LTE Devices v02r03
- 941225 D06 Hotspot Mode v02

3. Facilities and Accreditation

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

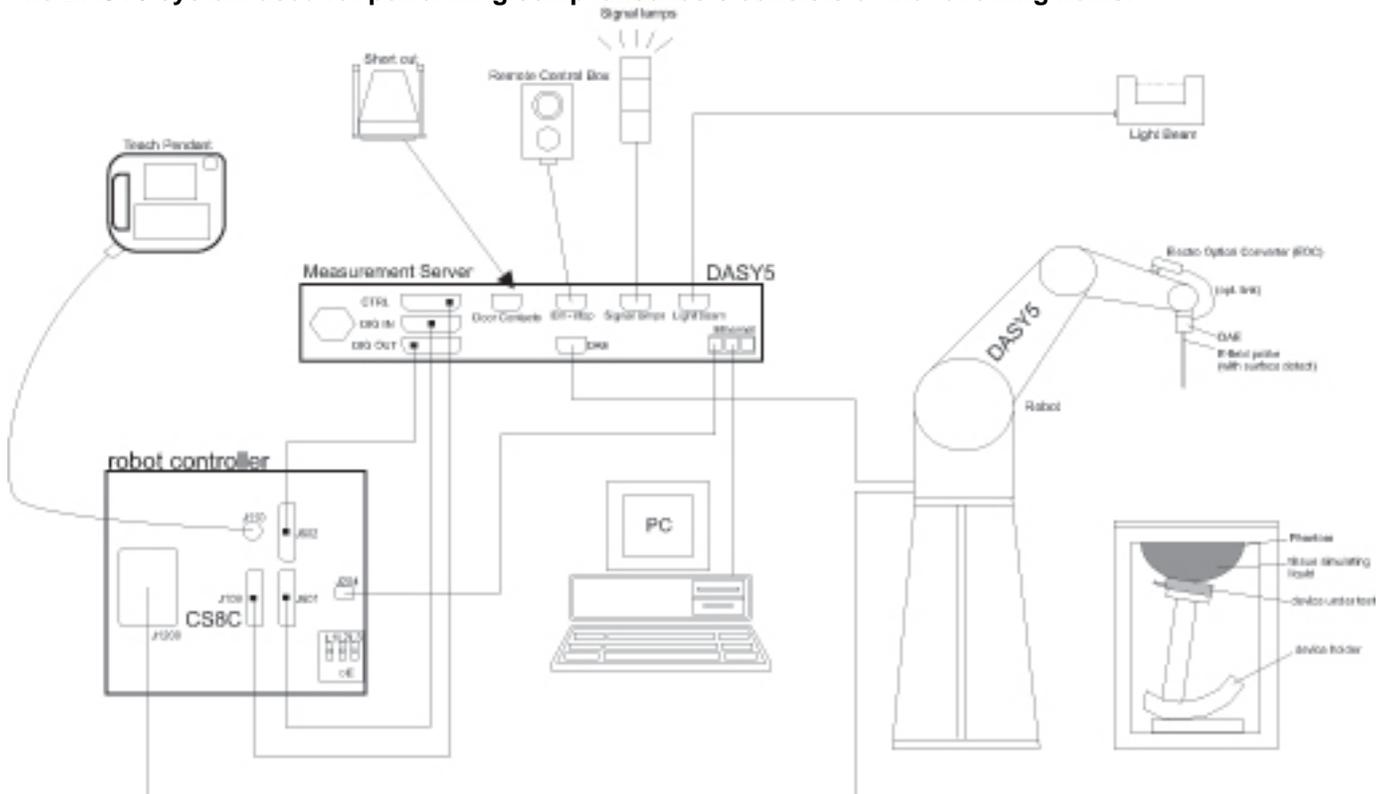
47173 Benicia Street	47266 Benicia Street
SAR Lab A	SAR Lab 1
SAR Lab B	SAR Lab 2
SAR Lab C	SAR Lab 3
SAR Lab D	SAR Lab 4
SAR Lab E	SAR Lab 5
SAR Lab F	
SAR Lab G	
SAR Lab H	

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

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



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

4.2. SAR Scan Procedures

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

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

Step 3: Zoom Scan

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

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

		≤ 3 GHz	> 3 GHz	
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$		≤ 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: $\Delta z_{\text{Zoom}}(n)$	≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm	
	graded grid	$\Delta z_{\text{Zoom}}(1)$: 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
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
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.

Step 5: Z-Scan (FCC only)

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

4.3. Test Equipment

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

Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Network Analyzer	Agilent	E753ES	MY40000980	4/7/2015
Dielectronic Probe kit	SPEAG	DAK-3.5	1082	9/16/2015
Dielectronic Probe kit	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	Control Company	Traceable	122529163	10/8/2015

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
HP Signal Generator	HP	8665B	3546A00784	6/23/2015
Power Meter	HP	437B	3125U09516	10/6/2015
Power Meter	Agilent	N1911A	MY53060016	8/7/2015
Power Sensor	Agilent	E9323A	MY53070003	5/1/2015
Power Sensor	Agilent	8481A	3318A95392	10/6/2015
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1622052	N/A
Bi-directional coupler	Werlatone, Inc.	C8060-102	2711	N/A
DC Power Supply	Sorensen Ametek	XT20-3	1318A00530	N/A
Synthesized Signal Generator	Agilent	8665B	3438A00633	7/10/2015
Power Meter	HP	437B	3125U11347	8/27/2015
Power Meter	HP	437B	3125U16345	6/16/2015
Power Sensor	HP	8481A	2702A60780	6/16/2015
Power Sensor	HP	8481A	1926A16917	10/10/2015
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1808938	N/A
Bi-directional coupler	Werlatone, Inc.	C8060-102	2710	N/A
DC Power Supply	HP	6296A	2841A-05955	N/A
E-Field Probe (SAR Lab 1)	SPEAG	EX3DV4	3902	5/19/2015
E-Field Probe (SAR Lab 3)	SPEAG	EX3DV4	3773	4/22/2015
E-Field Probe (SAR Lab 4)	SPEAG	EX3DV4	3929	5/9/2015
E-Field Probe (SAR Lab 5)	SPEAG	EX3DV4	3749	1/26/2016
Data Acquisition Electronics (SAR Lab 1)	SPEAG	DAE4	1352	11/7/2015
Data Acquisition Electronics (SAR Lab 3)	SPEAG	DAE4	1380	7/23/2015
Data Acquisition Electronics (SAR Lab 4)	SPEAG	DAE4	1377	8/27/2015
Data Acquisition Electronics (SAR Lab 5)	SPEAG	DAE4	1439	5/14/2015
System Validation Dipole	SPEAG	D835V2	4d142	9/9/2015
System Validation Dipole	SPEAG	D1900V2	5d163	9/11/2015
System Validation Dipole	SPEAG	D2450V2	748	2/18/2015
System Validation Dipole	SPEAG	D2450V2	899	9/10/2015
System Validation Dipole	SPEAG	D5GHzV2	1003	2/26/2015
System Validation Dipole	SPEAG	D5GHzV2	1138	9/18/2015
Thermometer (SAR Lab 1)	EXTECH	445703	CCS-205	3/24/2015
Thermometer (SAR Lab 3)	EXTECH	445703	CCS-237	6/3/2015
Thermometer (SAR Lab 4)	EXTECH	445703	CCS-238	6/3/2015
Thermometer (SAR Lab 5)	EXTECH	445703	CCS-239	6/3/2015

Other

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Power Meter	Agilent	N1912A	MY53060016	8/7/2015
Power Sensor	Agilent	N1921A	MY52270022	12/12/2015
Base Station Simulator	R & S	CMW500	132910-cp	4/25/2015

5. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

6. Device Under Test (DUT) Information

6.1. DUT Description

Device Dimension	Overall (Length x Width): 243 mm x 166.5 mm Overall Diagonal: 285.52 mm Display Diagonal: 246.38 mm
Battery Back Cover	<input checked="" type="checkbox"/> The rechargeable battery is not user accessible.
Battery Options	<input checked="" type="checkbox"/> The rechargeable battery is not user accessible.
Wireless Router (Hotspot)	Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices. <input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 2.4 GHz) <input type="checkbox"/> Mobile Hotspot (Wi-Fi 5 GHz)
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other <input checked="" type="checkbox"/> Wi-Fi Direct (Wi-Fi 2.4 GHz) <input checked="" type="checkbox"/> Wi-Fi Direct (Limited to Wi-Fi 5.2 and 5.8 GHz)

6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode		Duty Cycle used for SAR testing
GSM	850 1900	Voice (GMSK) GPRS (GMSK) EGPRS (8PSK)	GPRS Multi-Slot Class: <input type="checkbox"/> Class 8 - One Up <input type="checkbox"/> Class 10 - Two Up <input type="checkbox"/> Class 12 - Four Up <input checked="" type="checkbox"/> Class 33 - Four Up	GSM Voice: 12.5% (E)GPRS: 1 Slot: 12.5% 2 Slots: 25% 3 Slots: 37.5% 4 Slots: 50%
		Does this device support DTM (Dual Transfer Mode)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
W-CDMA (UMTS)	Band II Band V	UMTS Rel. 99 (Voice & Data) HSDPA (Rel. 5) HSUPA (Rel. 6) DC-HSDPA (Rel. 8) HSPA+ (Rel. 6)		100%
LTE (FDD)	Band 5	QPSK 16QAM (Rel. 10) <input checked="" type="checkbox"/> Does not support Carrier Aggregation (CA).		100%
		Does this device support SV-LTE (1xRTT-LTE)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20)		100%
	5 GHz	802.11a 802.11n (HT20) 802.11n (HT40)		100%
	Does this device support bands 5.60 ~ 5.65 GHz? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
	Does this device support Band gap channel? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Bluetooth	2.4 GHz	Version 4.1 LE		77.5% (DH5)

6.3. Nominal and Maximum Output Power

KDB 447498 sec.4.1.(3) at the maximum rated output power and within the tune-up tolerance range specified for the product, but not more than 2 dB lower than the maximum tune-up tolerance limit

Upper limit (dB): -1.5 ~ 0.5		Max. RF Output Power (dBm)		Reduced RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit	Target	Max. tune-up tolerance limit
GSM850	Voice	33.0	33.5	30.5	31.0
	GPRS 1 slot	33.0	33.5	30.5	31.0
	GPRS 2 slots	30.0	30.5	26.5	27.0
	GPRS 3 slots	29.0	29.5	23.0	23.5
	GPRS 4 slots	26.5	27.0	22.5	23.0
	EGPRS 1 slot	26.0	26.5	26.0	26.5
	EGPRS 2 slots	25.0	25.5	25.0	25.5
	EGPRS 3 slots	24.0	24.5	24.0	24.5
	EGPRS 4 slots	23.0	23.5	23.0	23.5
GSM1900	Voice	30.0	30.5	24.5	25.0
	GPRS 1 slot	30.0	30.5	24.5	25.0
	GPRS 2 slots	27.5	28.0	18.5	19.0
	GPRS 3 slots	25.5	26.0	16.5	17.0
	GPRS 4 slots	24.5	25.0	15.5	16.0
	EGPRS 1 slot	25.0	25.5	21.0	21.5
	EGPRS 2 slots	24.0	24.5	20.0	20.5
	EGPRS 3 slots	23.0	23.5	19.0	19.5
	EGPRS 4 slots	22.0	22.5	18.0	18.5
W-CDMA Band V	R99	22.5	23.0	20.5	21.0
	HSDPA	22.0	22.5	20.0	20.5
	HSUPA	22.5	23.0	20.5	21.0
	DC-HSDPA	22.0	22.5	20.0	20.5
W-CDMA Band II	R99	21.5	22.0	15.5	16.0
	HSDPA	21.0	21.5	15.5	16.0
	HSUPA	21.5	22.0	15.5	16.0
	DC-HSDPA	21.0	21.5	15.5	16.0
LTE Band 5	QPSK	23.0	23.5	20.0	20.5
Upper limit (dB): 0.5		Max. RF Output Power (dBm)		Reduced RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit	Target	Max. tune-up tolerance limit
WiFi 2.4 GHz	802.11b	17.0	17.5	12.0	12.5
	802.11g	12.0	12.5	12.0	12.5
	802.11n HT20	13.0	13.5	12.0	12.5
WiFi 5 GHz	802.11a	12.0	12.5	8.0	8.5
	802.11n HT20	12.0	12.5	8.0	8.5
	802.11n HT40	10.0	10.5	8.0	8.5
Bluetooth		9.5	10.0	N/A	
Bluetooth LE		1.0	1.5	N/A	

6.4. General LTE SAR Test and Reporting Considerations

Item	Description																																												
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 5	Frequency range: 824 - 849 MHz																																											
		Channel Bandwidth																																											
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																						
	Low			20450/ 829	20425/ 826.5	20415/ 825.5	20407/ 824.7																																						
	Mid			20525/ 836.5	20525/ 836.5	20525/ 836.5	20525/ 836.5																																						
High			20600/ 844	20625/ 846.5	20635/ 847.5	20643/ 848.3																																							
LTE transmitter and antenna implementation	LTE has one (1) Tx/Rx antennas and one (1) Rx antennas Refer to Appendix A.																																												
Maximum power reduction (MPR)	<p style="text-align: center;">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="background-color: #d9ead3;">Modulation</th> <th colspan="6" style="background-color: #d9ead3;">Channel bandwidth / Transmission bandwidth (RB)</th> <th rowspan="2" style="background-color: #d9ead3;">MPR (dB)</th> </tr> <tr> <th style="background-color: #d9ead3;">1.4 MHz</th> <th style="background-color: #d9ead3;">3.0 MHz</th> <th style="background-color: #d9ead3;">5 MHz</th> <th style="background-color: #d9ead3;">10 MHz</th> <th style="background-color: #d9ead3;">15 MHz</th> <th style="background-color: #d9ead3;">20 MHz</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d9ead3;">QPSK</td> <td style="background-color: #d9ead3;">>5</td> <td style="background-color: #d9ead3;">>4</td> <td style="background-color: #d9ead3;">>8</td> <td style="background-color: #d9ead3;">>12</td> <td style="background-color: #d9ead3;">>16</td> <td style="background-color: #d9ead3;">>18</td> <td style="background-color: #d9ead3;">≤ 1</td> </tr> <tr> <td style="background-color: #d9ead3;">16 QAM</td> <td style="background-color: #d9ead3;">≤ 5</td> <td style="background-color: #d9ead3;">≤ 4</td> <td style="background-color: #d9ead3;">≤ 8</td> <td style="background-color: #d9ead3;">≤ 12</td> <td style="background-color: #d9ead3;">≤ 16</td> <td style="background-color: #d9ead3;">≤ 18</td> <td style="background-color: #d9ead3;">≤ 1</td> </tr> <tr> <td style="background-color: #d9ead3;">16 QAM</td> <td style="background-color: #d9ead3;">>5</td> <td style="background-color: #d9ead3;">>4</td> <td style="background-color: #d9ead3;">>8</td> <td style="background-color: #d9ead3;">>12</td> <td style="background-color: #d9ead3;">>16</td> <td style="background-color: #d9ead3;">>18</td> <td style="background-color: #d9ead3;">≤ 2</td> </tr> </tbody> </table> <p>MPR Built-in by design A-MPR (additional MPR) was disabled during SAR testing</p>							Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	>5	>4	>8	>12	>16	>18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	>5	>4	>8	>12	>16	>18	≤ 2
Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)																																						
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz																																							
QPSK	>5	>4	>8	>12	>16	>18	≤ 1																																						
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1																																						
16 QAM	>5	>4	>8	>12	>16	>18	≤ 2																																						
Power reduction	Yes. This device uses a capacitive proximity sensor that is same metallic component as the transmitting antenna to facilitate triggering in typical user interactivity with the device.																																												
Spectrum plots for RB configurations	A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																												

6.5. Power Reduction by Proximity Sensing

Due to the operating configurations and exposure conditions required by tablets, proximity sensors are used in this device to reduce the maximum output power in specific wireless and operating modes to ensure SAR compliance. This device uses a capacitive proximity sensor that is same metallic component as the transmitting antenna to facilitate triggering in typical user interactivity with the device.

6.5.1. Proximity Sensor Triggering Distance (KDB 616217 §6.2)

Rear 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 surface of Edge 3.

The DUT featured a visual indicator on its display that showed the status of the proximity sensor (Triggered or not triggered). This was used to determine the status of the sensor during the proximity sensor assessment as monitoring the output power directly was not practical without affecting the measurement.

It was confirmed separately that the output power was altered according to the proximity sensor status indication. This was achieved by observing the proximity sensor status at the same time as monitoring the conducted power. Section 9 contains both the full and reduced conducted power measurements.



Proximity Sensor Trigger Distance Assessment
KDB 616217 §6.2, **Edge 3**

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

LEGEND

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

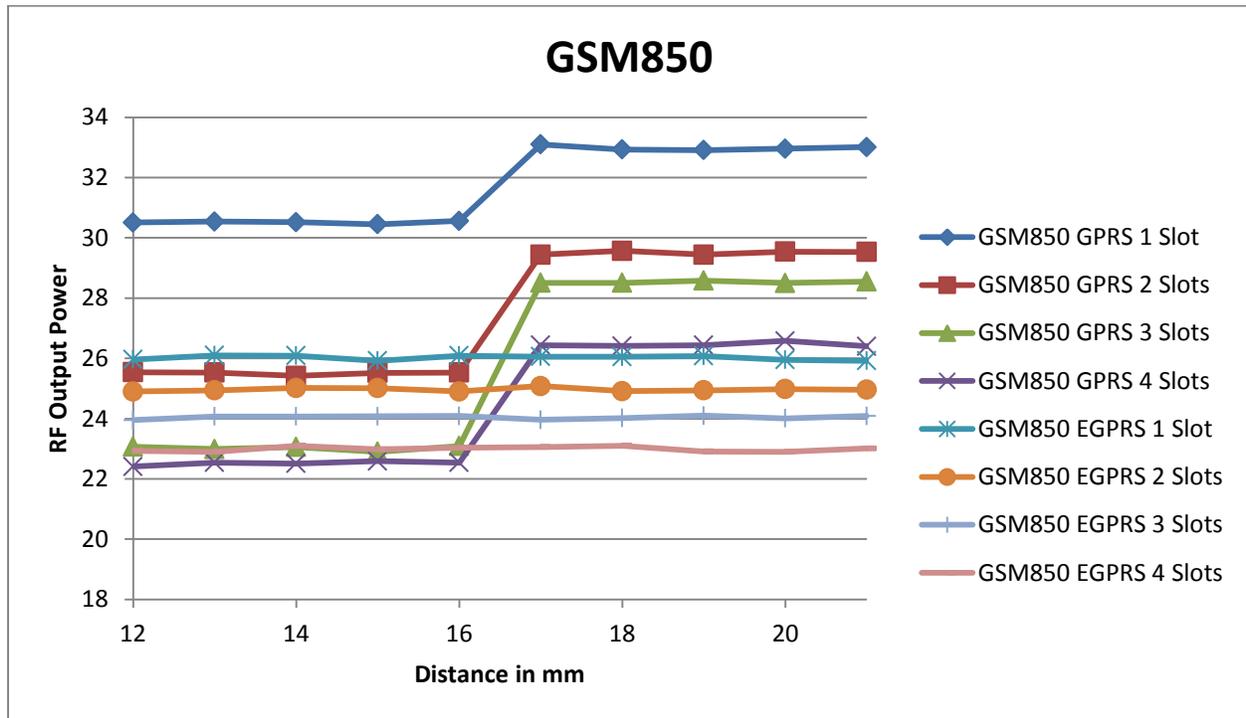
Summary of Trigger Distances

Tissue simulating liquid	Trigger distance - Edge 3		Trigger distance - Rear	
	Moving toward phantom	Moving from phantom	Moving toward phantom	Moving from phantom
850 muscle	6mm	6mm	16mm	16mm
1900 muscle	6mm	6mm	16mm	16mm
2450 muscle	N/A	N/A	6mm	6mm
5000 muscle	N/A	N/A	6mm	6mm

6.5.2. Proximity Sensor Triggering Distance Measurement Results

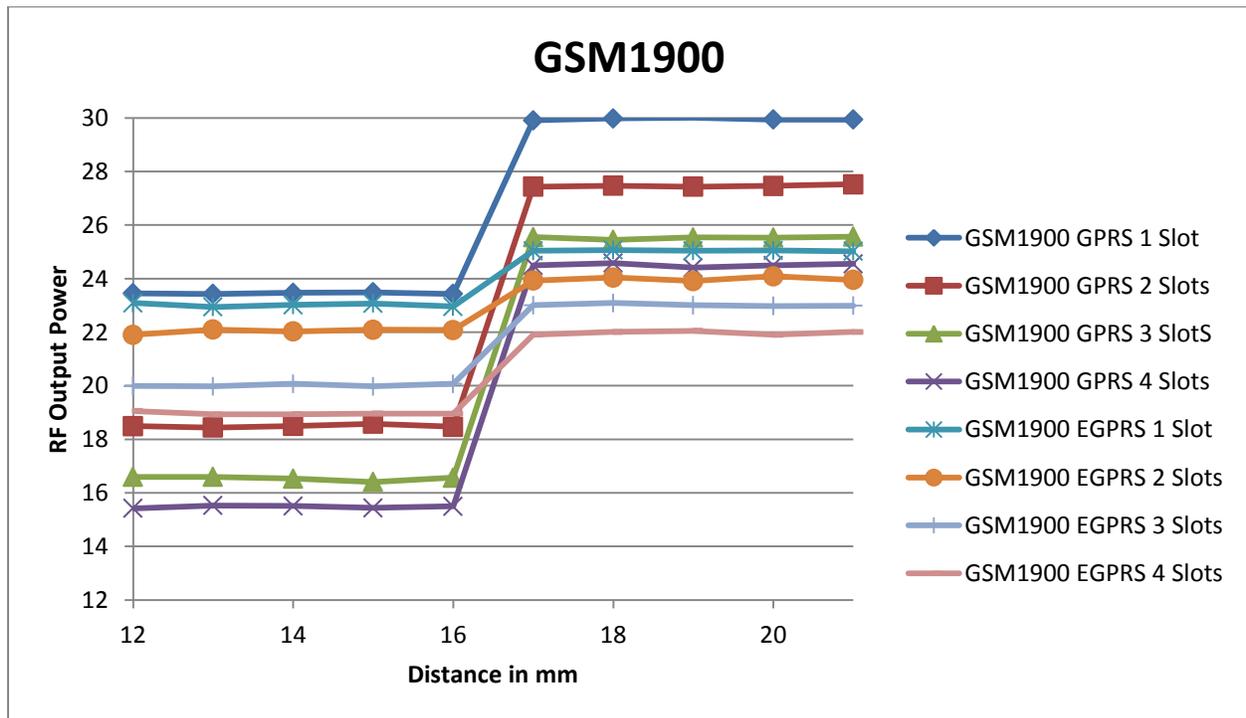
GSM850

Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



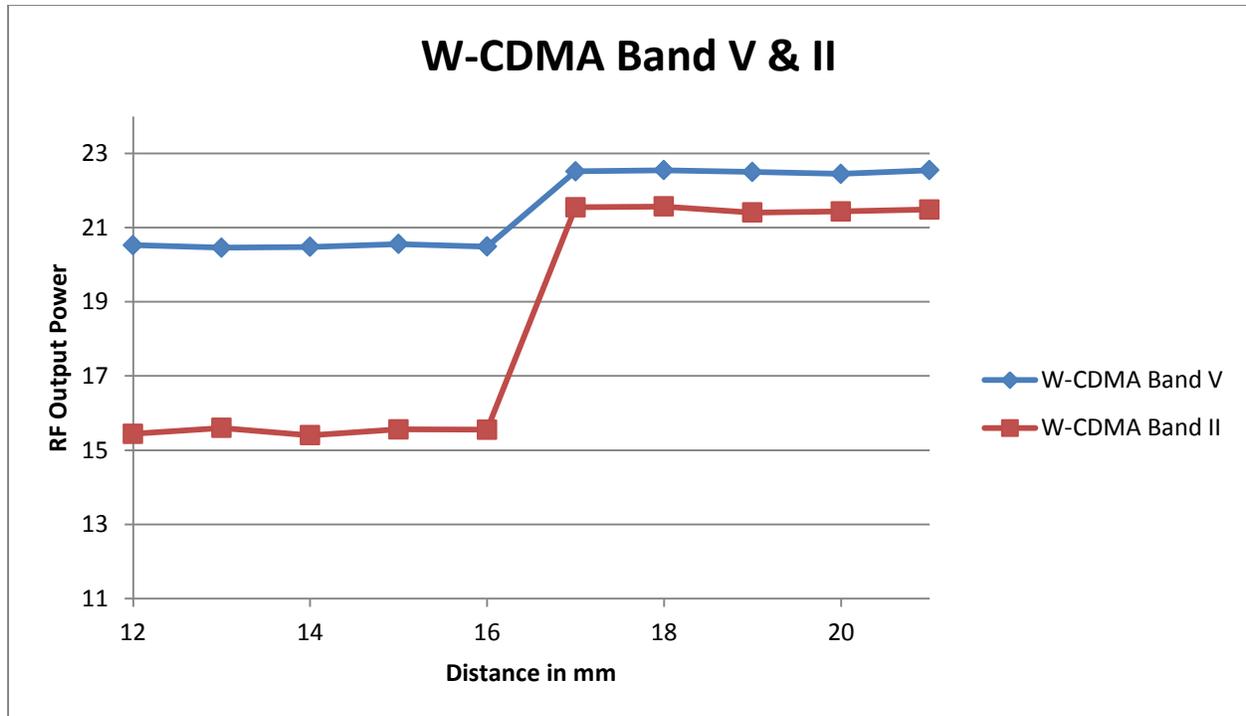
GSM1900

Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



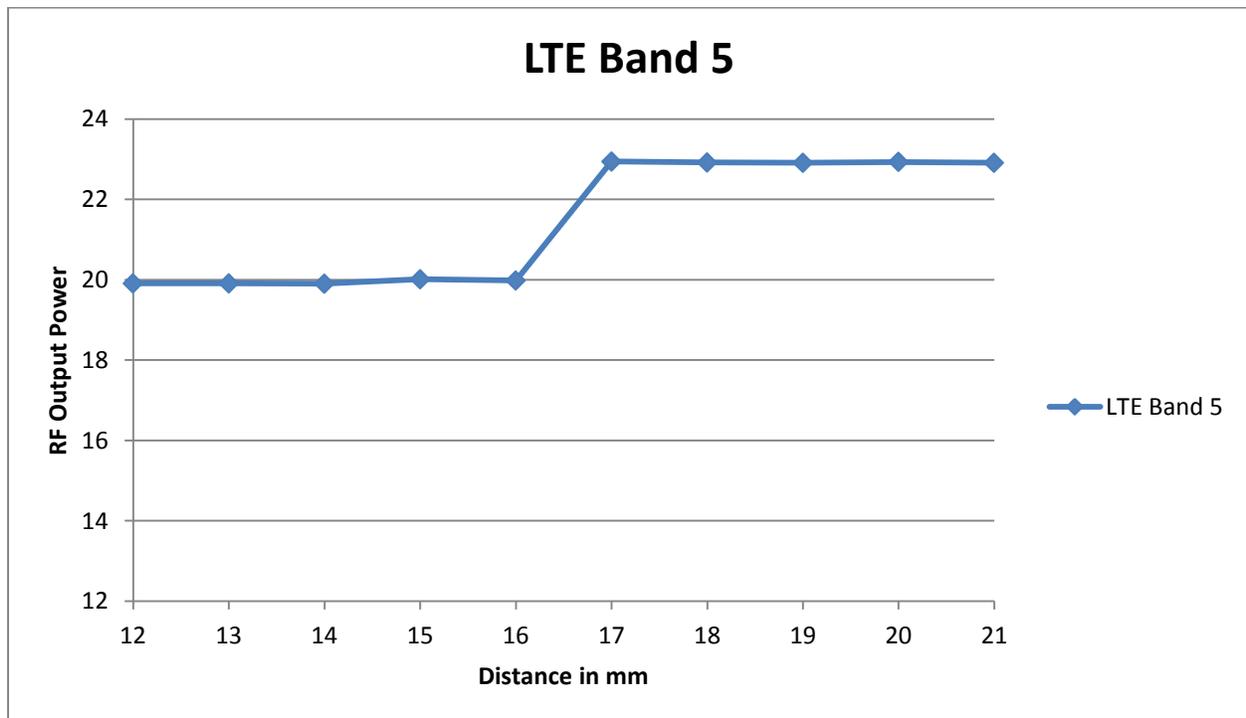
WCDMA Bands V & II

Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



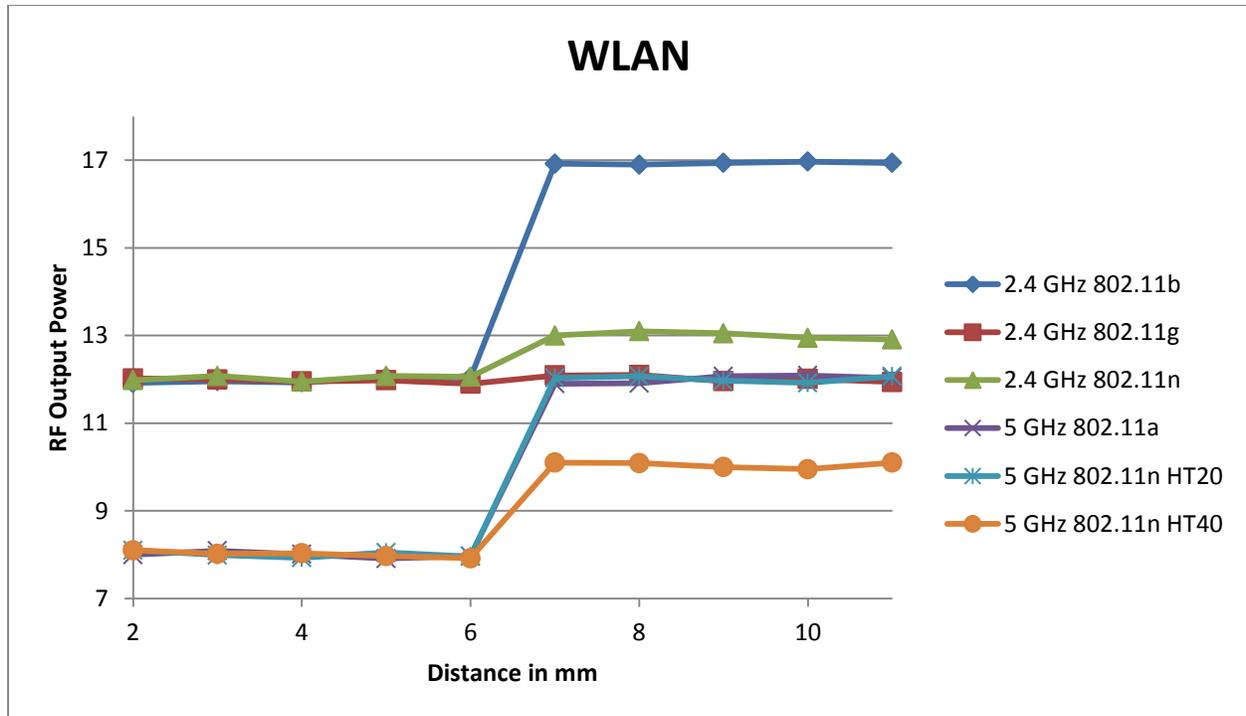
LTE Band 5

Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



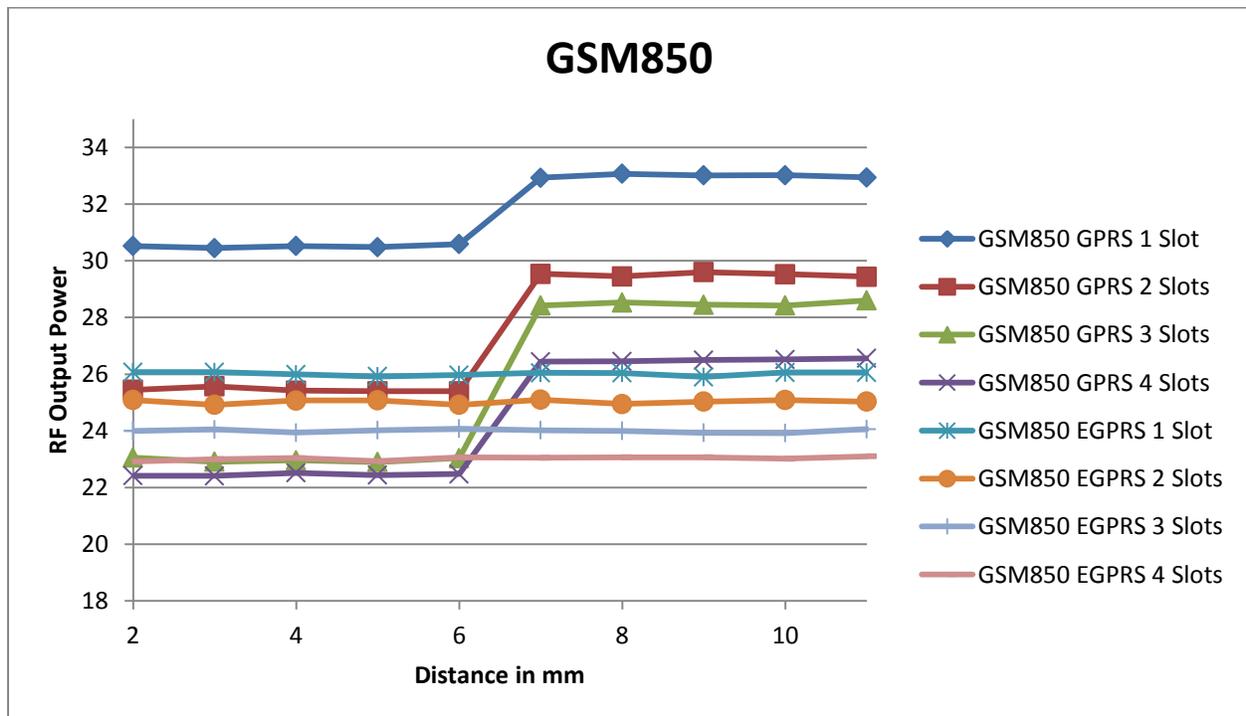
Wi-Fi 2.4GHz and 5GHz

Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



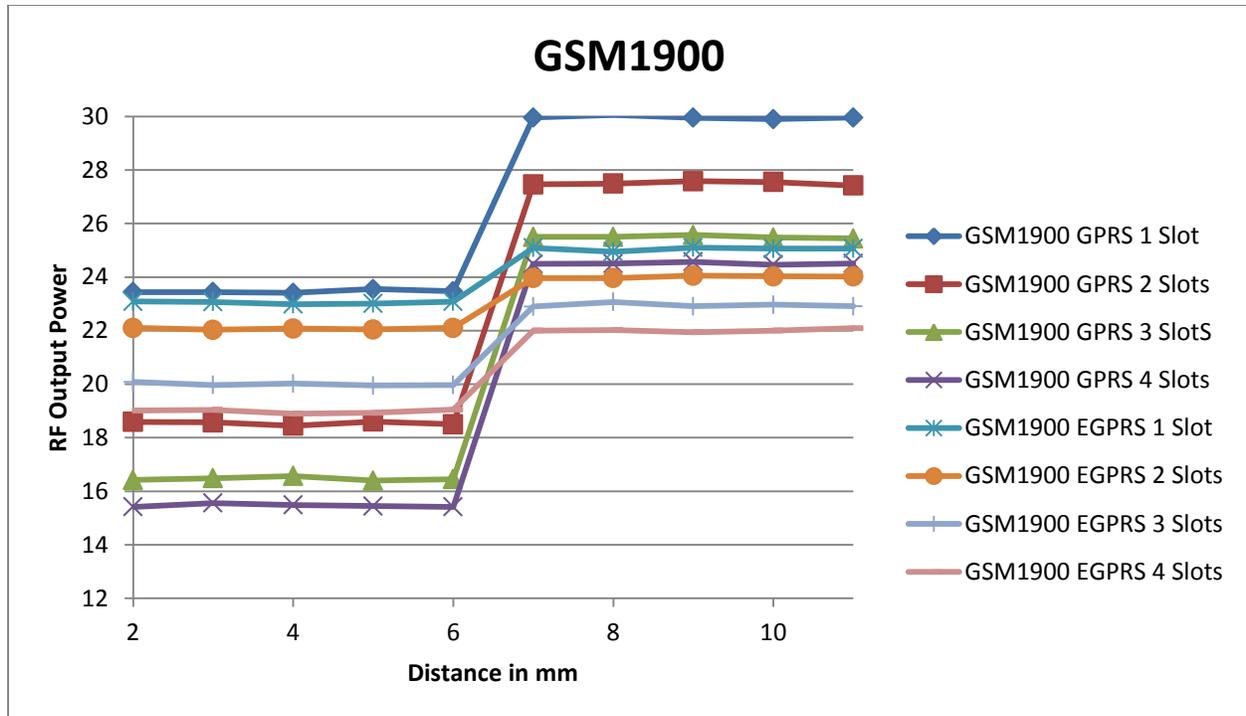
GSM850

Edge 3, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



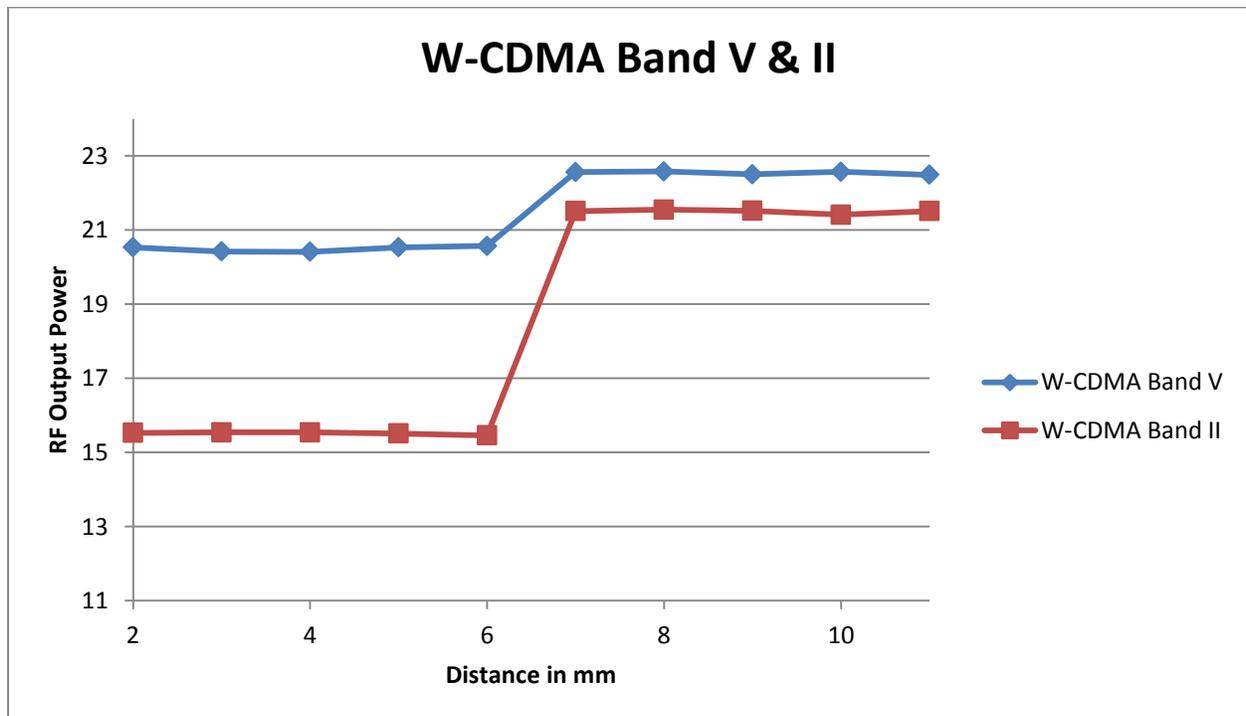
GSM1900

Edge 3, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



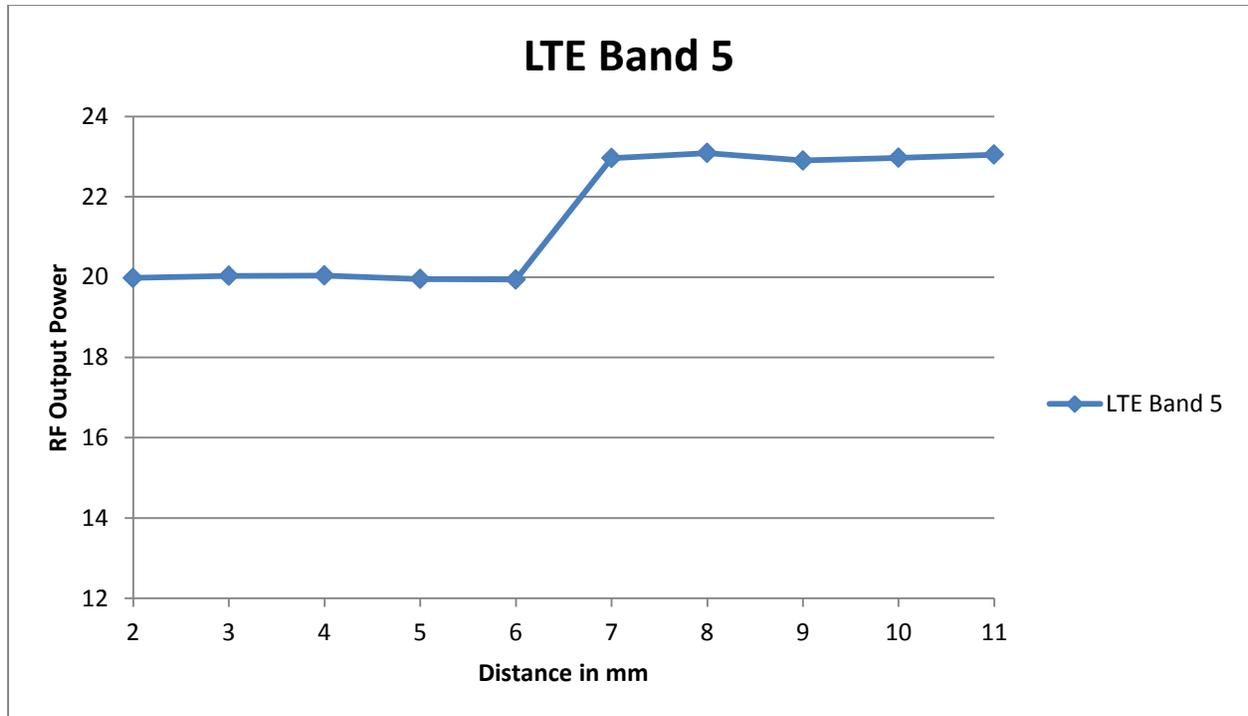
W-CDMA Band V & II

Edge 3, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



LTE Band 5

Edge 3, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



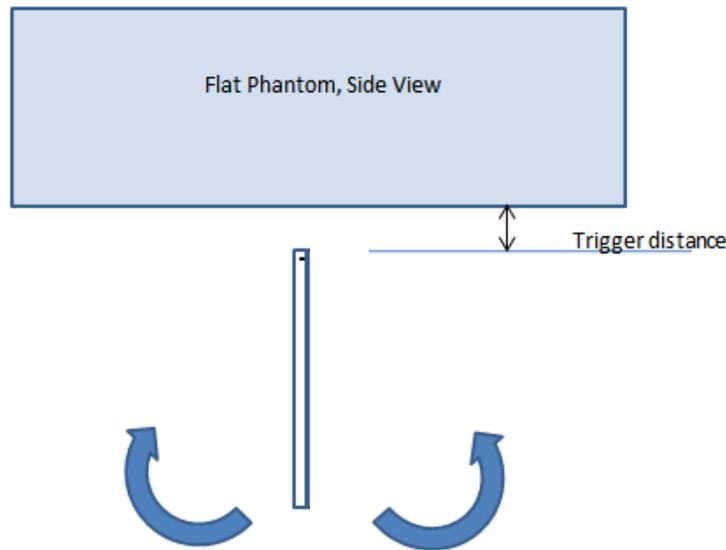
6.5.3. Proximity Sensor Coverage (KDB 616217 §6.3)

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

6.5.4. Proximity Sensor Tilt Angle Assessment (KDB 616217 §6.4)

The DUT was positioned directly below the flat phantom at the minimum measured trigger distance with Edge 3 parallel to the base of the flat phantom for each band.

The EUT was rotated about Edge 3 for angles up to +/- 45°. If the output power increased during the rotation the DUT was moved 1mm toward the phantom and the rotation repeated. This procedure was repeated until the power remained reduced for all angles up to +/- 45°.



Proximity sensor tilt angle assessment (Edge 3) KDB 616217 §6.4

Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering for Edge 3

Band (MHz)	Minimum trigger distance measured according to KDB 616217 §6.2	Minimum distance at which power reduction was maintained over +/-45°	Power reduction status										
			-45°	-40°	-30°	-20°	-10°	0°	10°	20°	30°	40°	45°
850	6 mm	6 mm	On	On	On	On	On	On	On	On	On	On	On
1900	6 mm	6 mm	On	On	On	On	On	On	On	On	On	On	On

6.5.5. Resulting test positions for SAR measurements

Wireless technologies	Position	§6.2 Triggering Distance	§6.3 Coverage	§6.4 Tilt Angle	Worst case distance for SAR
WWAN	Rear	16 mm	N/A	N/A	15 mm
	Edge 3	6 mm	N/A	6 mm	5 mm
WLAN	Rear	6 mm	N/A	N/A	5 mm

7. RF Exposure Conditions (Test Configurations)

Refer to “SAR Photos and Ant locations” Appendix for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

7.1. Standalone SAR Test Exclusion Considerations

Since the *Dedicated Host Approach* is applied, the standalone SAR test exclusion procedure in KDB 447498 § 4.3.1 is applied in conjunction with KDB 616217 § 4.3 to determine the minimum test separation distance:

- When the separation distance from the antenna to an adjacent edge is ≤ 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.
- When the separation distance from the antenna to an adjacent edge is > 5 mm, the actual antenna-to-edge separation distance is applied to determine SAR test exclusion.

SAR Test Exclusion Calculations for WWAN

Antennas < 50mm to adjacent edges

Antenna	Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Calculated Threshold Value					
			dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Full Power, Proximity Sensor Off																
Cellular	GPRS 3 Slots	848.8	29.50	334	1.28	204.95	6.37	5.75	102.37		615 -MEASURE-	> 50 mm	513 -MEASURE-	513 -MEASURE-	> 50 mm	
Cellular	GPRS 4 Slots	1909.8	25.00	158	1.28	204.95	6.37	5.75	102.37		43.7 -MEASURE-	> 50 mm	36.4 -MEASURE-	36.4 -MEASURE-	> 50 mm	
Cellular	W-CDMA 2	1907.6	22.00	158	1.28	204.95	6.37	5.75	102.37		43.6 -MEASURE-	> 50 mm	36.4 -MEASURE-	36.4 -MEASURE-	> 50 mm	
Cellular	W-CDMA 5	846.6	23.00	200	1.28	204.95	6.37	5.75	102.37		36.8 -MEASURE-	> 50 mm	30.7 -MEASURE-	30.7 -MEASURE-	> 50 mm	
Cellular	LTE Band 5	844	23.50	224	1.28	204.95	6.37	5.75	102.37		412 -MEASURE-	> 50 mm	34.3 -MEASURE-	34.3 -MEASURE-	> 50 mm	
Power Back-off, Proximity Sensor On																
Cellular	GPRS 1 Slots	848.8	31.00	157	1.28	204.95	6.37	5.75	102.37		28.9 -MEASURE-	> 50 mm	24.1 -MEASURE-	24.1 -MEASURE-	> 50 mm	
Cellular	GPRS 1 Slots	1909.8	25.00	40	1.28	204.95	6.37	5.75	102.37		11.1 -MEASURE-	> 50 mm	9.2 -MEASURE-	9.2 -MEASURE-	> 50 mm	
Cellular	W-CDMA 2	1907.6	16.00	40	1.28	204.95	6.37	5.75	102.37		11 -MEASURE-	> 50 mm	9.2 -MEASURE-	9.2 -MEASURE-	> 50 mm	
Cellular	W-CDMA 5	846.6	21.00	126	1.28	204.95	6.37	5.75	102.37		23.2 -MEASURE-	> 50 mm	19.3 -MEASURE-	19.3 -MEASURE-	> 50 mm	
Cellular	LTE Band 5	844	20.50	112	1.28	204.95	6.37	5.75	102.37		20.6 -MEASURE-	> 50 mm	17.1 -MEASURE-	17.1 -MEASURE-	> 50 mm	

Note(s):

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

Antennas > 50mm to adjacent edges

Antenna	Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Calculated Threshold Value					
			dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Full Power, Proximity Sensor Off																
Cellular	GPRS 3 Slots	848.8	29.50	334	1.28	204.95	6.37	5.75	102.37		< 50 mm	1039.6 mW -EXEMPT-	< 50 mm	< 50 mm	459.2 mW -EXEMPT-	
Cellular	GPRS 4 Slots	1909.8	25.00	158	1.28	204.95	6.37	5.75	102.37		< 50 mm	658 mW -EXEMPT-	< 50 mm	< 50 mm	632.2 mW -EXEMPT-	
Cellular	W-CDMA 2	1907.6	22.00	158	1.28	204.95	6.37	5.75	102.37		< 50 mm	658.1mW -EXEMPT-	< 50 mm	< 50 mm	632.3 mW -EXEMPT-	
Cellular	W-CDMA 5	846.6	23.00	200	1.28	204.95	6.37	5.75	102.37		< 50 mm	1037.6 mW -EXEMPT-	< 50 mm	< 50 mm	458.6 mW -EXEMPT-	
Cellular	LTE Band 5	844	23.50	224	1.28	204.95	6.37	5.75	102.37		< 50 mm	1035.1mW -EXEMPT-	< 50 mm	< 50 mm	457.9 mW -EXEMPT-	
Power Back-off, Proximity Sensor On																
Cellular	GPRS 1 Slots	848.8	31.00	157	1.28	204.95	6.37	5.75	102.37		< 50 mm	1039.6 mW -EXEMPT-	< 50 mm	< 50 mm	459.2 mW -EXEMPT-	
Cellular	GPRS 1 Slots	1909.8	25.00	40	1.28	204.95	6.37	5.75	102.37		< 50 mm	658 mW -EXEMPT-	< 50 mm	< 50 mm	632.2 mW -EXEMPT-	
Cellular	W-CDMA 2	1907.6	16.00	40	1.28	204.95	6.37	5.75	102.37		< 50 mm	658.1mW -EXEMPT-	< 50 mm	< 50 mm	632.3 mW -EXEMPT-	
Cellular	W-CDMA 5	846.6	21.00	126	1.28	204.95	6.37	5.75	102.37		< 50 mm	1037.6 mW -EXEMPT-	< 50 mm	< 50 mm	458.6 mW -EXEMPT-	
Cellular	LTE Band 5	844	20.50	112	1.28	204.95	6.37	5.75	102.37		< 50 mm	1035.1mW -EXEMPT-	< 50 mm	< 50 mm	457.9 mW -EXEMPT-	

Note(s):

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

SAR Test Exclusion Calculations for WLAN

Antennas < 50mm to adjacent edges

Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Calculated Threshold Value					
		dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Full Power, Proximity Sensor Off															
Wi-Fi 2.4 GHz	2462	17.50	56	1.28	6.42	121.64	226.54	14.19		17.6	14.6	> 50 mm	> 50 mm	6.3	
Wi-Fi 2.4 GHz	2462	17.50	56	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	> 50 mm	> 50 mm	-MEASURE-	
Wi-Fi 5.2 GHz	5240	12.50	18	1.28	6.42	121.64	226.54	14.19		8.2	6.9	> 50 mm	> 50 mm	2.9	
Wi-Fi 5.2 GHz	5240	12.50	18	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	> 50 mm	> 50 mm	-EXEMPT-	
Wi-Fi 5.3 GHz	5320	12.50	18	1.28	6.42	121.64	226.54	14.19		8.3	6.9	> 50 mm	> 50 mm	3	
Wi-Fi 5.3 GHz	5320	12.50	18	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	> 50 mm	> 50 mm	-EXEMPT-	
Wi-Fi 5.5 GHz	5700	12.50	18	1.28	6.42	121.64	226.54	14.19		8.6	7.2	> 50 mm	> 50 mm	3.1	
Wi-Fi 5.5 GHz	5700	12.50	18	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	> 50 mm	> 50 mm	-MEASURE-	
Wi-Fi 5.8 GHz	5825	12.50	18	1.28	6.42	121.64	226.54	14.19		8.7	7.2	> 50 mm	> 50 mm	3.1	
Wi-Fi 5.8 GHz	5825	12.50	18	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	> 50 mm	> 50 mm	-MEASURE-	
Bluetooth	2480	10.50	11	1.28	6.42	121.64	226.54	14.19		3.5	2.9	> 50 mm	> 50 mm	12	
Bluetooth	2480	10.50	11	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-EXEMPT-	> 50 mm	> 50 mm	-EXEMPT-	
Power Back-off, Proximity Sensor On															
Wi-Fi 2.4 GHz	2462	12.50	18	1.28	6.42	121.64	226.54	14.19		5.6	4.7	> 50 mm	> 50 mm	2	
Wi-Fi 2.4 GHz	2462	12.50	18	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	> 50 mm	> 50 mm	-EXEMPT-	
Wi-Fi 5.2 GHz	5240	8.50	7	1.28	6.42	121.64	226.54	14.19		3.2	2.7	> 50 mm	> 50 mm	11	
Wi-Fi 5.2 GHz	5240	8.50	7	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-EXEMPT-	> 50 mm	> 50 mm	-EXEMPT-	
Wi-Fi 5.3 GHz	5320	8.50	7	1.28	6.42	121.64	226.54	14.19		3.2	2.7	> 50 mm	> 50 mm	12	
Wi-Fi 5.3 GHz	5320	8.50	7	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-EXEMPT-	> 50 mm	> 50 mm	-EXEMPT-	
Wi-Fi 5.5 GHz	5700	8.50	7	1.28	6.42	121.64	226.54	14.19		3.3	2.8	> 50 mm	> 50 mm	12	
Wi-Fi 5.5 GHz	5700	8.50	7	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-EXEMPT-	> 50 mm	> 50 mm	-EXEMPT-	
Wi-Fi 5.8 GHz	5825	8.50	7	1.28	6.42	121.64	226.54	14.19		3.4	2.8	> 50 mm	> 50 mm	12	
Wi-Fi 5.8 GHz	5825	8.50	7	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-EXEMPT-	> 50 mm	> 50 mm	-EXEMPT-	

Note(s):

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

Antennas > 50mm to adjacent edges

Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Calculated Threshold Value					
		dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Full Power, Proximity Sensor Off															
Wi-Fi 2.4 GHz	2462	17.50	56	1.28	6.42	121.64	226.54	14.19		< 50 mm	< 50 mm	812 mW	861 mW	< 50 mm	
Wi-Fi 2.4 GHz	2462	17.50	56	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-	
Wi-Fi 5.2 GHz	5240	12.50	18	1.28	6.42	121.64	226.54	14.19		< 50 mm	< 50 mm	7819 mW	830.9 mW	< 50 mm	
Wi-Fi 5.2 GHz	5240	12.50	18	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-	
Wi-Fi 5.3 GHz	5320	12.50	18	1.28	6.42	121.64	226.54	14.19		< 50 mm	< 50 mm	7814 mW	830.4 mW	< 50 mm	
Wi-Fi 5.3 GHz	5320	12.50	18	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-	
Wi-Fi 5.5 GHz	5700	12.50	18	1.28	6.42	121.64	226.54	14.19		< 50 mm	< 50 mm	779.2 mW	828.2 mW	< 50 mm	
Wi-Fi 5.5 GHz	5700	12.50	18	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-	
Wi-Fi 5.8 GHz	5825	12.50	18	1.28	6.42	121.64	226.54	14.19		< 50 mm	< 50 mm	778.6 mW	827.6 mW	< 50 mm	
Wi-Fi 5.8 GHz	5825	12.50	18	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-	
Bluetooth	2480	10.50	11	1.28	6.42	121.64	226.54	14.19		< 50 mm	< 50 mm	8117 mW	860.7 mW	< 50 mm	
Bluetooth	2480	10.50	11	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-	
Power Back-off, Proximity Sensor On															
Wi-Fi 2.4 GHz	2462	12.50	18	1.28	6.42	121.64	226.54	14.19		< 50 mm	< 50 mm	812 mW	861 mW	< 50 mm	
Wi-Fi 2.4 GHz	2462	12.50	18	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-	
Wi-Fi 5.2 GHz	5240	8.50	7	1.28	6.42	121.64	226.54	14.19		< 50 mm	< 50 mm	7819 mW	830.9 mW	< 50 mm	
Wi-Fi 5.2 GHz	5240	8.50	7	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-	
Wi-Fi 5.3 GHz	5320	8.50	7	1.28	6.42	121.64	226.54	14.19		< 50 mm	< 50 mm	7814 mW	830.4 mW	< 50 mm	
Wi-Fi 5.3 GHz	5320	8.50	7	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-	
Wi-Fi 5.5 GHz	5700	8.50	7	1.28	6.42	121.64	226.54	14.19		< 50 mm	< 50 mm	779.2 mW	828.2 mW	< 50 mm	
Wi-Fi 5.5 GHz	5700	8.50	7	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-	
Wi-Fi 5.8 GHz	5825	8.50	7	1.28	6.42	121.64	226.54	14.19		< 50 mm	< 50 mm	778.6 mW	827.6 mW	< 50 mm	
Wi-Fi 5.8 GHz	5825	8.50	7	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-	

Note(s):

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

7.2. Required Test Configurations

The table below identifies the standalone test configurations required for this device according to the findings in Section 7.1:

Test Configurations	Rear	Edge 1	Edge 2	Edge 3	Edge 4
		(Top Edge)	(Right Edge)	(Bottom Edge)	(Left Edge)
GSM850 Full Pow er	Yes	No	Yes	Yes	No
GSM850 w / Pow er Reduction	Yes	No	Yes	Yes	No
GSM1900 Full Pow er	Yes	No	Yes	Yes	No
GSM1900 w / Pow er Reduction	Yes	No	Yes	Yes	No
W-CDMA Band 2 Full Pow er	Yes	No	Yes	Yes	No
W-CDMA Band 2 w / Pow er Reduction	Yes	No	Yes	Yes	No
W-CDMA Band 5 Full Pow er	Yes	No	Yes	Yes	No
W-CDMA Band 5 w / Pow er Reduction	Yes	No	Yes	Yes	No
LTE Band 5 Full Pow er	Yes	No	Yes	Yes	No
LTE Band 5 w / Pow er Reduction	Yes	No	Yes	Yes	No
Wi-Fi 2.4 GHz Full Pow er	Yes	Yes	No	No	Yes
Wi-Fi 2.4 GHz w / Pow er Reduction	Yes	Yes	No	No	No
Wi-Fi 5.2 GHz Full Pow er	Yes	Yes	No	No	No
Wi-Fi 5.2 GHz w / Pow er Reduction	Yes	No	No	No	No
Wi-Fi 5.3 GHz Full Pow er	Yes	Yes	No	No	No
Wi-Fi 5.3 GHz w / Pow er Reduction	Yes	No	No	No	No
Wi-Fi 5.5 GHz Full Pow er	Yes	Yes	No	No	Yes
Wi-Fi 5.5 GHz w / Pow er Reduction	Yes	No	No	No	No
Wi-Fi 5.8 GHz Full Pow er	Yes	Yes	No	No	Yes
Wi-Fi 5.8 GHz w / Pow er Reduction	Yes	No	No	No	No
Bluetooth	Yes	No	No	No	No

Note(s):

1. Yes = Testing is required.
2. No = Testing is not required.

8. Dielectric Property Measurements & System Check

8.1. Dielectric Property Measurements

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

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

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

Tissue Dielectric Parameters

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

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

IEEE Std 1528-2013

Refer to Table 3 within the IEEE Std 1528-2013

Dielectric Property Measurements Results:

SAR Lab 1

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)		
2/2/2015	Body 2450	e'	50.6100	Relative Permittivity (ϵ_r):	50.61	52.70	-3.97	5	
		e"	14.9100	Conductivity (σ):	2.03	1.95	4.16	5	
	Body 2410	e'	50.8200	Relative Permittivity (ϵ_r):	50.82	52.76	-3.68	5	
		e"	14.8400	Conductivity (σ):	1.99	1.91	4.25	5	
	Body 2475	e'	50.5400	Relative Permittivity (ϵ_r):	50.54	52.67	-4.04	5	
		e"	15.0200	Conductivity (σ):	2.07	1.99	4.12	5	
2/9/2015	Body 5180	e'	47.0800	Relative Permittivity (ϵ_r):	47.08	49.05	-4.01	5	
		e"	18.4300	Conductivity (σ):	5.31	5.27	0.70	5	
	Body 5200	e'	47.1700	Relative Permittivity (ϵ_r):	47.17	49.02	-3.77	5	
		e"	18.5800	Conductivity (σ):	5.37	5.29	1.46	5	
	Body 5600	e'	46.5800	Relative Permittivity (ϵ_r):	46.58	48.48	-3.91	5	
		e"	18.8100	Conductivity (σ):	5.86	5.76	1.67	5	
	Body 5800	e'	46.2700	Relative Permittivity (ϵ_r):	46.27	48.20	-4.00	5	
		e"	19.1500	Conductivity (σ):	6.18	6.00	2.93	5	
	Body 5825	e'	46.1900	Relative Permittivity (ϵ_r):	46.19	48.20	-4.17	5	
		e"	19.0800	Conductivity (σ):	6.18	6.00	3.00	5	
	2/12/2015	Body 2450	e'	50.7500	Relative Permittivity (ϵ_r):	50.75	52.70	-3.70	5
			e"	14.6900	Conductivity (σ):	2.00	1.95	2.62	5
Body 2410		e'	50.6600	Relative Permittivity (ϵ_r):	50.66	52.76	-3.98	5	
		e"	14.4800	Conductivity (σ):	1.94	1.91	1.72	5	
Body 2475		e'	50.6200	Relative Permittivity (ϵ_r):	50.62	52.67	-3.89	5	
		e"	14.6800	Conductivity (σ):	2.02	1.99	1.77	5	
2/16/2015	Body 5180	e'	48.9400	Relative Permittivity (ϵ_r):	48.94	49.05	-0.22	5	
		e"	18.5200	Conductivity (σ):	5.33	5.27	1.19	5	
	Body 5200	e'	49.1300	Relative Permittivity (ϵ_r):	49.13	49.02	0.23	5	
		e"	18.5700	Conductivity (σ):	5.37	5.29	1.41	5	
	Body 5600	e'	48.7100	Relative Permittivity (ϵ_r):	48.71	48.48	0.48	5	
		e"	18.5000	Conductivity (σ):	5.76	5.76	-0.01	5	
	Body 5800	e'	48.0300	Relative Permittivity (ϵ_r):	48.03	48.20	-0.35	5	
		e"	18.8600	Conductivity (σ):	6.08	6.00	1.37	5	
	Body 5825	e'	48.1600	Relative Permittivity (ϵ_r):	48.16	48.20	-0.08	5	
		e"	19.0700	Conductivity (σ):	6.18	6.00	2.94	5	
	2/19/2015	Body 2450	e'	50.9300	Relative Permittivity (ϵ_r):	50.93	52.70	-3.36	5
			e"	14.6400	Conductivity (σ):	1.99	1.95	2.28	5
Body 2410		e'	51.0900	Relative Permittivity (ϵ_r):	51.09	52.76	-3.16	5	
		e"	14.5500	Conductivity (σ):	1.95	1.91	2.22	5	
Body 2475		e'	50.8400	Relative Permittivity (ϵ_r):	50.84	52.67	-3.47	5	
		e"	14.7400	Conductivity (σ):	2.03	1.99	2.18	5	

SAR Lab 3

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
2/19/2015	Body 835	e'	53.1000	Relative Permittivity (ϵ_r):	53.10	55.20	-3.80	5
		e"	21.4500	Conductivity (σ):	1.00	0.97	2.67	5
	Body 820	e'	53.2200	Relative Permittivity (ϵ_r):	53.22	55.28	-3.72	5
		e"	21.5600	Conductivity (σ):	0.98	0.97	1.50	5
	Body 850	e'	52.9300	Relative Permittivity (ϵ_r):	52.93	55.16	-4.04	5
		e"	21.4800	Conductivity (σ):	1.02	0.99	2.84	5

SAR Lab 4

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
2/5/2015	Body 1900	e'	52.1200	Relative Permittivity (ϵ_r):	52.12	53.30	-2.21	5
		e"	14.2000	Conductivity (σ):	1.50	1.52	-1.30	5
	Body 1850	e'	52.2000	Relative Permittivity (ϵ_r):	52.20	53.30	-2.06	5
		e"	14.0700	Conductivity (σ):	1.45	1.52	-4.78	5
	Body 1910	e'	52.0500	Relative Permittivity (ϵ_r):	52.05	53.30	-2.35	5
		e"	14.2100	Conductivity (σ):	1.51	1.52	-0.72	5
2/9/2015	Body 1900	e'	51.3400	Relative Permittivity (ϵ_r):	51.34	53.30	-3.68	5
		e"	14.3800	Conductivity (σ):	1.52	1.52	-0.05	5
	Body 1850	e'	51.5600	Relative Permittivity (ϵ_r):	51.56	53.30	-3.26	5
		e"	14.2700	Conductivity (σ):	1.47	1.52	-3.43	5
	Body 1910	e'	51.3400	Relative Permittivity (ϵ_r):	51.34	53.30	-3.68	5
		e"	14.4500	Conductivity (σ):	1.53	1.52	0.96	5

SAR Lab 5

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
2/4/2015	Body 835	e'	53.3900	Relative Permittivity (ϵ_r):	53.39	55.20	-3.28	5
		e"	21.1300	Conductivity (σ):	0.98	0.97	1.14	5
	Body 820	e'	53.5700	Relative Permittivity (ϵ_r):	53.57	55.28	-3.09	5
		e"	21.2800	Conductivity (σ):	0.97	0.97	0.18	5
	Body 850	e'	53.2000	Relative Permittivity (ϵ_r):	53.20	55.16	-3.55	5
		e"	21.0500	Conductivity (σ):	0.99	0.99	0.78	5
2/9/2015	Body 835	e'	53.4300	Relative Permittivity (ϵ_r):	53.43	55.20	-3.21	5
		e"	21.5300	Conductivity (σ):	1.00	0.97	3.05	5
	Body 820	e'	53.6200	Relative Permittivity (ϵ_r):	53.62	55.28	-3.00	5
		e"	21.6400	Conductivity (σ):	0.99	0.97	1.88	5
	Body 850	e'	53.2900	Relative Permittivity (ϵ_r):	53.29	55.16	-3.39	5
		e"	21.5500	Conductivity (σ):	1.02	0.99	3.18	5

8.2. System 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 re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

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 for SAR measurements ≤ 3 GHz and ≥ 10.0 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.

Reference Target SAR Values

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 (W/kg)		
				1g/10g	Head	Body
D835V2	4d142	9/9/2014	835	1g	8.91	9.22
				10g	5.77	6.05
D1900V2	5d163	9/11/2014	1900	1g	40.8	40.6
				10g	21.2	21.4
D2450V2	748	2/18/2014	2450	1g	51.6	50.7
				10g	24.0	23.7
D2450V2	899	9/10/2014	2450	1g	52.3	50.5
				10g	24.3	23.5
D5GHzV2	1003	2/26/2014	5200	1g	77.7	73.5
				10g	22.2	20.5
			5600	1g	81.8	79.6
				10g	23.2	22.1
5800	1g	78.3	73.8			
	10g	22.1	20.4			
D5GHzV2	1138	9/18/2014	5200	1g	81.4	75.4
				10g	23.3	21.0
			5600	1g	85.1	81.9
				10g	24.2	22.6
			5800	1g	80.6	75.2
				10g	23.0	20.8

System 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.

SAR Lab 1

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
2/2/2015	D2450V2	748	Body	1g	5.38	53.8	50.70	6.11	1,2
				10g	2.46	24.6	23.7	3.80	
2/9/2015	D5GHzV2 (5.2GHz)	1003	Body	1g	7.74	77.4	73.50	6.11	
				10g	2.19	21.9	20.50	3.80	
2/9/2015	D5GHzV2 (5.6GHz)	1003	Body	1g	8.58	85.8	79.60	5.31	
				10g	2.41	24.1	22.10	6.83	
2/9/2015	D5GHzV2 (5.8GHz)	1003	Body	1g	7.39	73.9	73.80	7.79	3,4
				10g	2.08	20.8	20.40	9.05	
2/12/2015	D2450V2	899	Body	1g	5.49	54.9	50.5	0.14	
				10g	2.53	25.3	23.5	1.96	
2/16/2015	D5GHzV2 (5.2 GHz)	1138	Body	1g	7.78	77.8	75.40	3.18	
				10g	2.23	22.3	21.00	6.19	
2/16/2015	D5GHzV2 (5.6 GHz)	1138	Body	1g	7.85	78.5	81.90	-4.15	
				10g	2.21	22.1	22.60	-2.21	
2/16/2015	D5GHzV2 (5.8 GHz)	1138	Body	1g	6.91	69.1	75.20	-8.11	5,6
				10g	1.95	19.5	20.80	-6.25	
2/19/2015	D2450V2	899	Body	1g	5.51	55.1	50.5	9.11	7,8
				10g	2.54	25.4	23.5	8.09	

SAR Lab 3

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
2/19/2015	D835V2	4d142	Body	1g	0.89	8.9	9.22	-4.01	9,10
				10g	0.58	5.8	6.05	-4.13	

SAR Lab 4

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
2/5/2015	1900	5d163	Body	1g	3.93	39.3	40.60	-3.20	11,12
				10g	2.06	20.6	21.40	-3.74	
2/9/2015	1900	5d163	Body	1g	3.98	39.8	40.60	-1.97	
				10g	2.06	20.6	21.40	-3.74	

SAR Lab 5

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
2/4/2015	D835V2	4d142	Body	1g	0.92	9.2	9.22	0.11	
				10g	0.61	6.1	6.05	0.83	
2/9/2015	D835V2	4d142	Body	1g	0.97	9.7	9.22	5.64	13,14
				10g	0.64	6.4	6.05	6.28	

9. Conducted Output Power Measurements

9.1. GSM

GSM850 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Max. Power		with Pwr Back-off	
						Burst Pwr (dBm)	Frame Pwr (dBm)	Burst Pwr (dBm)	Frame Pwr (dBm)
850	GSM (Voice)	CS1	1	128	824.2	33.2	24.2	30.7	21.7
				190	836.6	33.0	24.0	30.6	21.6
				251	848.8	33.0	24.0	30.6	21.6
	GPRS (GMSK)	CS1	1	128	824.2	33.2	24.2	30.7	21.7
				190	836.6	33.0	24.0	30.6	21.6
				251	848.8	33.0	24.0	30.6	21.6
			2	128	824.2	30.1	24.1	26.7	20.7
				190	836.6	30.2	24.2	26.9	20.9
				251	848.8	30.3	24.3	26.9	20.9
			3	128	824.2	29.1	24.8	22.8	18.5
				190	836.6	29.3	25.0	23.1	18.8
				251	848.8	29.3	25.0	23.2	18.9
			4	128	824.2	26.7	23.7	22.5	19.5
				190	836.6	27.0	24.0	22.8	19.8
				251	848.8	26.9	23.9	22.8	19.8
	EGPRS (8PSK)	MCS5	1	128	824.2	26.1	17.1	25.8	16.8
				190	836.6	26.2	17.2	26.0	17.0
				251	848.8	26.2	17.2	26.0	17.0
			2	128	824.2	25.2	19.2	24.9	18.9
				190	836.6	25.3	19.3	25.1	19.1
				251	848.8	25.3	19.3	25.1	19.1
			3	128	824.2	24.3	20.0	24.0	19.7
				190	836.6	24.4	20.1	24.2	19.9
				251	848.8	24.4	20.1	24.2	19.9
4			128	824.2	23.3	20.3	23.1	20.1	
			190	836.6	23.4	20.4	23.2	20.2	
			251	848.8	23.5	20.5	23.3	20.3	

Notes:

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

- Standalone: GMSK (GPRS) mode with 3 time slots for Max power and 1 time slot for Reduced power, based on the output power measurements above
- SAR is not required for EGPRS (8PSK) mode because its output power is less than that of GPRS Mode

GSM1900 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Max. Power		with Pwr Back-off		
						Burst Pwr (dBm)	Frame Pwr (dBm)	Burst Pwr (dBm)	Frame Pwr (dBm)	
1900	GSM (Voice)	CS1	1	512	1850.2	30.0	21.0	23.9	14.9	
				661	1880.0	30.0	21.0	23.9	14.9	
				810	1909.8	29.9	20.9	23.9	14.9	
	GPRS (GMSK)	CS1	1	1	512	1850.2	30.0	21.0	23.9	14.9
					661	1880.0	30.0	21.0	23.9	14.9
					810	1909.8	29.9	20.9	23.9	14.9
			2	1	512	1850.2	27.6	21.6	18.9	12.9
					661	1880.0	27.5	21.5	18.6	12.6
					810	1909.8	27.8	21.8	18.8	12.8
			3	1	512	1850.2	25.8	21.5	16.6	12.3
					661	1880.0	25.8	21.5	16.3	12.0
					810	1909.8	25.8	21.5	16.5	12.2
			4	1	512	1850.2	24.8	21.8	15.6	12.6
					661	1880.0	24.7	21.7	15.4	12.4
					810	1909.8	24.8	21.8	15.4	12.4
	EGPRS (8PSK)	MCS5	1	1	512	1850.2	25.3	16.3	21.3	12.3
					661	1880.0	25.3	16.3	21.3	12.3
					810	1909.8	25.3	16.3	21.3	12.3
			2	1	512	1850.2	24.3	18.3	20.3	14.3
					661	1880.0	24.3	18.3	20.1	14.1
					810	1909.8	24.3	18.3	20.2	14.2
			3	1	512	1850.2	23.2	18.9	19.4	15.1
					661	1880.0	23.2	18.9	19.1	14.8
					810	1909.8	23.2	18.9	19.2	14.9
4			1	512	1850.2	22.1	19.1	18.5	15.5	
				661	1880.0	22.1	19.1	18.2	15.2	
				810	1909.8	22.1	19.1	18.3	15.3	

Notes:

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

- Standalone: GMSK (GPRS) mode with 4 time slots for Max power and 1 time slot for Reduced power, based on the output power measurements above
- SAR is not required for EGPRS (8PSK) mode because its output power is less than that of GPRS Mode

9.2. W-CDMA

Release 99 Setup Procedures used to establish the test signals

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 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

HSDPA Setup Procedures used to establish the test signals

The following 4 Sub-tests were completed according to Release 7 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-Set 1			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	11/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	11/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
MPR (dB)	0	0	0.5	0.5	
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				

HSPA (HSDPA & HSUPA) Setup Procedures used to establish the test signals

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				
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2 kbps RMC				
	HSDPA FRC	H-Set 1				
	HSUPA Test	HSPA				
	Power Control Algorithm	Algorithm 2				Algorithm 1
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	0
	β_{ec}	209/225	12/15	30/15	2/15	5/15
	β_c/β_d	11/15	6/15	15/9	2/15	15/1
	β_{hs}	22/15	12/15	30/15	4/15	5/15
	β_{ed}	1309/225	94/75	47/15	56/75	47/15
CM (dB)	1	3	2	3	1	
MPR (dB)	0	2	1	2	0	
HSDPA Specific Settings	DACK	8				0
	DNAK	8				0
	DCQI	8				0
	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	E-DPDCCH	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	5	5	2	5	1
	Reference E-TFCI	11	11	11	11	67
	Reference E-TFCI PO	4	4	4	4	18
	Reference E-TFCI	67	67	92	67	67
	Reference E-TFCI PO	18	18	18	18	18
	Reference E-TFCI	71	71	71	71	71
	Reference E-TFCI PO	23	23	23	23	23
	Reference E-TFCI	75	75	75	75	75
	Reference E-TFCI PO	26	26	26	26	26
	Reference E-TFCI	81	81	81	81	81
Reference E-TFCI PO	27	27	27	27	27	
Maximum Channelization Codes	2xSF2				SF4	

DC-HSDPA Setup Procedures used to establish the test signals

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

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

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

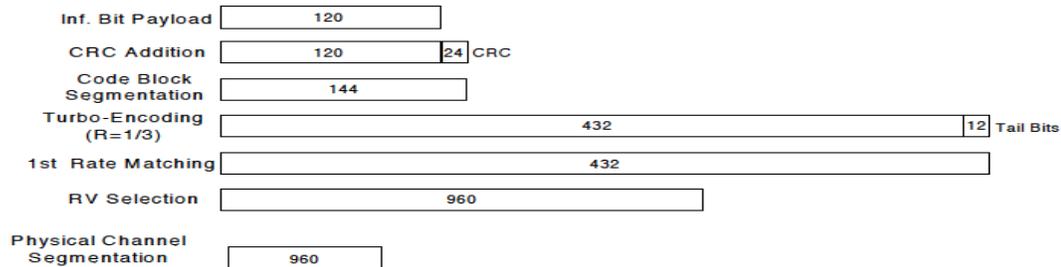


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 8 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm2			
	β_c	2/15	11/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c/β_d	2/15	11/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
MPR (dB)	0	0	0.5	0.5	
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	A _{hs} = β_{hs}/β_c	30/15			

HSPA+

Since 16QAM is not used for uplink, the uplink Category and release is same as HSUPA, i.e., CAT 6 Rel 6. Therefore, the RF conducted power is not measured.

Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Avg Pwr (dBm)	
						Max	Pwr Back-off
W-CDMA Band II	Rel 99	RMC, 12.2 kbps	9262	1852.4	N/A	22.0	16.0
			9400	1880.0	N/A	22.0	15.9
			9538	1907.6	N/A	22.0	16.0
	HSDPA	Subtest 1	9262	1852.4	0	21.5	16.0
			9400	1880.0	0	21.5	15.9
			9538	1907.6	0	21.5	15.9
		Subtest 2	9262	1852.4	0	21.5	16.0
			9400	1880.0	0	21.5	15.8
			9538	1907.6	0	21.5	15.9
		Subtest 3	9262	1852.4	0.5	20.7	14.5
			9400	1880.0	0.5	20.5	14.4
			9538	1907.6	0.5	20.6	14.3
		Subtest 4	9262	1852.4	0.5	20.7	14.3
			9400	1880.0	0.5	20.5	14.4
			9538	1907.6	0.5	20.6	14.3
	HSUPA	Subtest 1	9262	1852.4	0	21.5	15.5
			9400	1880.0	0	21.5	15.0
			9538	1907.6	0	21.5	14.7
		Subtest 2	9262	1852.4	2	19.5	13.8
			9400	1880.0	2	19.4	13.8
			9538	1907.6	2	19.5	13.7
		Subtest 3	9262	1852.4	1	19.2	14.2
			9400	1880.0	1	19.2	14.3
			9538	1907.6	1	19.6	14.2
		Subtest 4	9262	1852.4	2	20.0	14.0
			9400	1880.0	2	19.7	14.0
			9538	1907.6	2	20.0	14.0
		Subtest 5	9262	1852.4	0	22.0	16.0
			9400	1880.0	0	22.0	15.9
			9538	1907.6	0	21.9	16.0
	DC-HSPA	Subtest 1	9262	1852.4	0	21.5	16.0
			9400	1880.0	0	21.5	15.9
			9538	1907.6	0	21.5	15.9
		Subtest 2	9262	1852.4	0	21.5	16.0
			9400	1880.0	0	21.5	15.8
			9538	1907.6	0	21.5	15.9
		Subtest 3	9262	1852.4	0.5	20.7	14.5
			9400	1880.0	0.5	20.5	14.4
			9538	1907.6	0.5	20.6	14.3
		Subtest 4	9262	1852.4	0.5	20.7	14.3
			9400	1880.0	0.5	20.5	14.4
			9538	1907.6	0.5	20.6	14.3

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Avg Pwr (dBm)	
						Max	Pwr Back-off
W-CDMA Band V	Rel 99	RMC, 12.2 kbps	4132	826.4	N/A	22.5	20.6
			4183	836.6	N/A	22.4	20.5
			4233	846.6	N/A	22.5	20.6
	HSDPA	Subtest 1	4132	826.4	0	22.5	20.5
			4183	836.6	0	22.4	20.5
			4233	846.6	0	22.3	20.5
		Subtest 2	4132	826.4	0	22.5	20.5
			4183	836.6	0	22.3	20.5
			4233	846.6	0	22.4	20.5
		Subtest 3	4132	826.4	0.5	21.1	19.1
			4183	836.6	0.5	20.9	18.9
			4233	846.6	0.5	20.9	19.0
		Subtest 4	4132	826.4	0.5	21.1	19.1
			4183	836.6	0.5	20.9	18.9
			4233	846.6	0.5	20.9	19.0
	HSUPA	Subtest 1	4132	826.4	0	22.0	20.1
			4183	836.6	0	22.0	20.2
			4233	846.6	0	21.5	19.9
		Subtest 2	4132	826.4	2	20.4	18.4
			4183	836.6	2	20.4	17.8
			4233	846.6	2	19.8	17.8
		Subtest 3	4132	826.4	1	20.4	18.2
			4183	836.6	1	20.2	18.0
			4233	846.6	1	20.3	18.0
		Subtest 4	4132	826.4	2	21.0	19.0
			4183	836.6	2	21.0	18.8
			4233	846.6	2	21.0	18.9
		Subtest 5	4132	826.4	0	22.5	20.7
			4183	836.6	0	22.5	20.5
			4233	846.6	0	22.5	20.5
	DC-HSPA	Subtest 1	4132	826.4	0	22.5	20.5
			4183	836.6	0	22.4	20.5
			4233	846.6	0	22.3	20.5
		Subtest 2	4132	826.4	0	22.5	20.5
			4183	836.6	0	22.3	20.5
			4233	846.6	0	22.4	20.5
		Subtest 3	4132	826.4	0.5	21.1	19.1
			4183	836.6	0.5	20.9	18.9
			4233	846.6	0.5	20.9	19.0
		Subtest 4	4132	826.4	0.5	21.1	19.1
			4183	836.6	0.5	20.9	18.9
			4233	846.6	0.5	20.9	19.0

9.3. LTE

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

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

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

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

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

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

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

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

LTE Band 5 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)						
							Max. Power			with Pwr Back-off			
							829 MHz	836.5 MHz	844 MHz	829 MHz	836.5 MHz	844 MHz	
LTE Band 5	10	QPSK	1	0	0	0	22.6	22.7	22.6	20.5	20.5	20.4	
			1	25	0	0	22.7	22.7	22.7	20.4	20.5	20.3	
			1	49	0	0	22.6	22.6	22.7	20.4	20.5	20.3	
			25	0	1	1	21.7	21.8	21.8	19.0	18.9	18.9	
			25	12	1	1	21.7	21.7	21.8	19.0	18.9	19.0	
			25	25	1	1	21.6	21.7	21.7	18.9	19.0	19.0	
		16QAM	50	0	1	1	21.6	21.7	21.8	19.0	19.0	19.0	
			1	0	1	1	22.0	21.7	21.8	19.5	19.5	19.4	
			1	25	1	1	22.0	21.8	22.0	19.4	19.5	19.5	
			1	49	1	0	22.0	22.4	22.0	19.2	19.1	19.5	
			25	0	2	2	20.7	20.7	21.1	17.5	17.5	17.6	
			25	12	2	2	20.8	20.8	20.8	17.5	17.5	17.6	
16QAM	25	25	2	2	20.6	20.7	20.9	17.5	17.6	17.6			
	50	0	2	2	20.6	20.7	20.8	17.6	17.5	17.5			
	LTE Band 5	5	QPSK	1	0	0	1	22.5	22.7	22.6	20.4	20.5	20.5
				1	12	0	0	22.5	23.5	23.0	20.5	20.5	20.5
				1	24	0	1	22.5	22.7	22.7	20.2	20.4	20.4
				12	0	1	2	21.6	21.6	21.7	18.9	18.8	19.0
12				7	1	2	21.5	21.6	21.7	18.9	19.0	19.0	
12				13	1	2	21.6	21.6	21.6	18.9	19.0	19.0	
16QAM			25	0	1	2	21.6	21.7	21.7	18.9	18.9	19.0	
			1	0	1	2	21.7	21.5	22.0	19.0	19.0	19.2	
			1	12	1	1	21.6	21.8	22.1	19.2	19.2	19.5	
			1	24	1	1	22.3	21.6	22.1	19.0	19.1	19.5	
			12	0	2	3	20.6	20.7	20.9	17.5	17.5	17.6	
			12	7	2	3	20.5	21.0	20.7	17.5	17.5	17.5	
16QAM	12	13	2	3	20.6	20.8	20.8	17.5	17.5	17.5			
	25	0	2	3	21.0	20.5	20.7	17.6	17.5	17.5			
	LTE Band 5	3	QPSK	1	0	0	1	22.8	22.8	22.6	20.5	20.4	20.3
				1	8	0	0	22.5	23.3	22.7	20.5	20.5	20.4
				1	14	0	0	22.5	22.5	22.5	20.3	20.5	20.2
				8	0	1	2	21.6	21.6	21.7	19.1	18.8	19.0
8				4	1	2	21.6	21.7	21.6	19.0	18.9	19.0	
8				7	1	2	21.5	21.7	21.6	18.9	18.9	18.9	
16QAM			15	0	1	2	21.6	21.6	21.7	19.0	18.9	19.0	
			1	0	1	1	21.6	22.3	22.2	19.5	19.2	18.7	
			1	8	1	1	22.4	21.8	21.5	19.3	19.0	19.4	
			1	14	1	2	21.7	21.8	21.5	18.9	18.9	19.0	
			8	0	2	2	21.0	20.5	20.9	17.5	17.7	17.7	
			8	4	2	2	20.5	20.5	20.9	17.5	17.6	17.6	
16QAM	8	7	2	2	20.5	20.6	20.9	17.5	17.6	17.6			
	15	0	2	3	20.8	20.8	20.6	17.5	17.6	17.5			
	LTE Band 5	1.4	QPSK	1	0	0	0	22.5	22.7	22.5	20.5	20.5	20.1
				1	3	0	0	22.6	22.8	22.6	20.5	20.5	20.3
				1	5	0	0	22.5	22.7	22.5	20.5	20.4	20.1
				3	0	0	0	22.7	22.6	22.7	20.5	20.4	20.3
3				1	0	0	22.7	22.7	22.7	20.5	20.5	20.5	
3				3	0	0	22.6	22.7	22.6	20.5	20.5	20.4	
16QAM			6	0	1	1	21.6	21.7	21.7	19.5	19.4	19.4	
			1	0	1	1	21.9	22.0	21.5	19.4	19.0	19.5	
			1	3	1	1	21.9	22.0	21.5	19.5	19.4	18.9	
			1	5	1	1	21.8	22.0	21.5	19.1	19.0	19.5	
			3	0	1	1	21.5	21.5	21.9	19.1	18.8	19.2	
			3	1	1	1	21.5	21.5	21.5	18.7	18.7	19.4	
16QAM	3	3	1	1	21.7	21.5	22.3	19.2	19.1	18.9			
	6	0	2	2	21.0	20.7	20.7	18.5	18.5	18.5			

9.4. Wi-Fi 2.4GHz

Max Power

Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Note(s)
2.4	802.11b	1 Mbps	1	2412	17.1	17.5	Yes	
			6	2437	17.2			
			11	2462	17.1			
	802.11g	6 Mbps	1	2412	Not Required	14.5	No	1
			6	2437				
			11	2462				
	802.11n (HT20)	6.5 Mbps	1	2412	Not Required	13.5	No	1
			6	2437				
			11	2462				

With Power Back-Off

Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Note(s)
2.4	802.11b	1 Mbps	1	2412	11.9	12.5	Yes	
			6	2437	12.5			
			11	2462	11.9			
	802.11g	6 Mbps	1	2412	Not Required	12.5	No	1
			6	2437				
			11	2462				
	802.11n (HT20)	6.5 Mbps	1	2412	Not Required	12.5	No	1
			6	2437				
			11	2462				

Note(s):

- Output Power and SAR is not required for 802.11g/n HT20 channels when the highest *reported* SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

9.5. Wi-Fi 5GHz

Max Power

Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Note(s)
5.2 (U-NII 1)	802.11a	6 Mbps	36	5180	12.1	12.5	No	3
			40	5200	12.0			
			44	5220	12.2			
			48	5240	12.2			
	802.11n (HT20)	6.5 Mbps	36	5180	12.3	12.5	No	
			40	5200	12.1			
			48	5240	12.2			
802.11n (HT40)	13.5 Mbps	38-46	5190 - 5230	Not Required	10.5	No		
5.3 (U-NII 2A)	802.11a	6 Mbps	52	5260	12.2	12.5	Yes	2, 3
			56	5280	12.1			
			60	5300	12.3			
			64	5320	12.0			
	802.11n (HT20)	6.5 Mbps	52	5260	12.0	12.5	No	
			60	5300	12.2			
			64	5320	12.0			
802.11n (HT40)	13.5 Mbps	54-62	5270 - 5310	Not Required	10.5	No	1	
5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500	12.1	12.5	Yes	2
			116	5580	12.2			
			140	5700	12.3			
	802.11n (HT20)	6.5 Mbps	100	5500	12.0	12.5	No	4
			116	5580	12.2			
			140	5700	12.3			
	802.11n (HT40)	13.5 Mbps	102-134	5510-5670	Not Required	10.5	No	1
5.8 (U-NII 3)	802.11a	6 Mbps	149	5745	12.1	12.5	Yes	2
			157	5785	12.1			
			165	5825	11.9			
	802.11n (HT20)	6.5 Mbps	149	5745	12.0	12.5	No	
			157	5785	11.9			
			165	5825	12.1			
	802.11n (HT40)	13.5 Mbps	151-159	5755-5795	Not Required	10.5	No	1

Note(s):

- Output Power and SAR is not required for 802.11n HT20/HT40 channels when the specified tune-up tolerances for 802.11n HT20/HT40 are lower than 802.11a by more than ½ dB and the measured SAR is ≤ 1.2 W/Kg.
- When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n then ac) is selected.
- When the specified maximum output power is the same for both UNII band I and UNII band 2A, begin SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is
 - ≤ 1.2 W/kg, SAR is not required for UNII band I
 - > 1.2 W/kg, both bands should be tested independently for SAR.

With Power Back-Off

Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Note(s)
5.2 (U-NII 1)	802.11a	6 Mbps	36-48	5180-5240	Not Required	8.5	No	1
	802.11n (HT20)	6.5 Mbps	36-48	5180 - 5240		8.5	No	1
	802.11n (HT40)	13.5 Mbps	38	5190	8.5	8.5	No	2
			46	5230	8.5			
5.3 (U-NII 2A)	802.11a	6 Mbps	52-64	5260-5320	Not required	8.5	No	1
	802.11n (HT20)	6.5 Mbps	52-64	5260 - 5320		8.5	No	1
	802.11n (HT40)	13.5 Mbps	54	5270	8.3	8.5	Yes	2
			62	5310	8.5			
5.5 (U-NII 2C)	802.11a	6 Mbps	100-140	5500-5700	Not Required	8.5	No	1
	802.11n (HT20)	6.5 Mbps	100-140	5500-5700		8.5	No	1
	802.11n (HT40)	13.5 Mbps	102	5510	8.2	8.5	Yes	
			110	5550	8.5			
			134	5670	8.5			
5.8 (U-NII 3)	802.11a	6 Mbps	149-165	5745-5825	Not Required	8.5	No	1
	802.11n (HT20)	6.5 Mbps	149-165	5745-5825		8.5	No	1
	802.11n (HT40)	13.5 Mbps	151	5755	8.5	8.5	Yes	
			159	5795	8.5			

Note(s):

1. Output Power and SAR is not required for 802.11a and 802.11n HT20 channels because the specified tune-up tolerances for 802.11a and 802.11n HT20 are lower than or equal to 802.11n HT40 and the measured SAR is ≤ 1.2 W/Kg.
2. When the specified maximum output power is the same for both UNII band I and UNII band 2A, begin SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is
 - a. ≤ 1.2 W/kg, SAR is not required for UNII band I
 - b. > 1.2 W/kg, both bands should be tested independently for SAR.

9.6. Bluetooth

Band (GHz)	Mode	Ch #	Freq. (MHz)	Conducted Avg Power	
				(dBm)	(mW)
2.4	V3.0 + EDR, GFSK	0	2402	9.9	9.77
		39	2441	9.6	9.12
		78	2480	7.6	5.75
	V3.0 + EDR, $\pi/4$ DQPSK	0	2402	8.9	7.76
		39	2441	8.7	7.41
		78	2480	7.7	5.89
	V3.0 + EDR, 8-DPSK	0	2402	8.9	7.76
		39	2441	8.7	7.41
		78	2480	7.7	5.89
	V4.1 LE, GFSK	0	2402	1.1	1.30
		19	2440	1.1	1.28
		39	2480	0.2	1.04

10. Measured and Reported (Scaled) SAR Results

SAR Test Reduction criteria are as follows:

KDB 447498 D01 General RF Exposure Guidance:

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

KDB 941225 D01 SAR test for 3G devices:

When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode

KDB 941225 D05 SAR for LTE Devices:

SAR test reduction is applied using the following criteria:

- Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel.
- When the reported SAR is > 0.8 W/kg, testing for other Channels is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
- Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are > 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
- Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
- Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

KDB 248227 D01 SAR meas for 802.11 v02:

SAR test reduction for 802.11 Wi-Fi transmission mode configurations are considered separately for DSSS and OFDM. An initial test position is determined to reduce the number of tests required for certain exposure configurations with multiple test positions. An initial test configuration is determined for each frequency band and aggregated band according to maximum output power, channel bandwidth, wireless mode configurations and other operating parameters to streamline the measurement requirements. For 2.4 GHz DSSS, either the initial test position or DSSS procedure is applied to reduce the number of SAR tests; these are mutually exclusive. For OFDM, an initial test position is only applicable to next to the ear, UMPC mini-tablet and hotspot mode configurations, which is tested using the initial test configuration to facilitate test reduction. For other exposure conditions with a fixed test position, SAR test reduction is determined using only the initial test configuration.

The multiple test positions require SAR measurements in head, hotspot mode or UMPC mini-tablet configurations may be reduced according to the highest reported SAR determined using the initial test position(s) by applying the DSSS or OFDM SAR measurement procedures in the required wireless mode test configuration(s). The initial test position(s) is measured using the highest measured maximum output power channel in the required wireless mode test configuration(s). When the reported SAR for the initial test position is:

- ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.
- > 0.4 W/kg, SAR is repeated using the same wireless mode test configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions are tested.
 - For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
 - When it is unclear, all equivalent conditions must be tested.

- For all positions/configurations tested using the *initial test position* and subsequent test positions, when the *reported* SAR is > 0.8 W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the *reported* SAR is ≤ 1.2 W/kg or all required test channels are considered.
 - The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.
- When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is ≤ 1.2 W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.
- When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is ≤ 1.2 W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.

To determine the *initial test position*, Area Scans were performed to determine the position with the *Maximum Value of SAR (measured)*. The position that produced the highest *Maximum Value of SAR* is considered the worst case position; thus used as the *initial test position*.

10.1. GSM850

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
GPRS 1 Slots	ON	0	Rear	190	836.6	31.0	30.6	0.353	0.387	
			Edge 2	190	836.6	31.0	30.6	0.214	0.235	
			Edge 3	190	836.6	31.0	30.6	0.147	0.161	
GPRS 3 Slots	OFF	15	Rear	190	836.6	29.5	29.3	0.135	0.141	
		0	Edge 2	190	836.6	29.5	29.3	0.405	0.424	1
		5	Edge 3	190	836.6	29.5	29.3	0.158	0.165	

10.2. GSM1900

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
GPRS 1 Slots	ON	0	Rear	661	1880.0	25.0	23.9	0.604	0.778	2
			Edge 2	661	1880.0	25.0	23.9	0.057	0.073	
			Edge 3	661	1880.0	25.0	23.9	0.200	0.258	
GPRS 4 Slots	OFF	15	Rear	661	1880.0	25.0	24.7	0.374	0.401	
		0	Edge 2	661	1880.0	25.0	24.7	0.265	0.284	
		5	Edge 3	661	1880.0	25.0	24.7	0.430	0.461	

10.3. W-CDMA Band V

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Rel 99 RMC	ON	0	Rear	4183	836.6	21.0	20.5	0.301	0.338	
			Edge 2	4183	836.6	21.0	20.5	0.185	0.208	
			Edge 3	4183	836.6	21.0	20.5	0.125	0.140	
Rel 99 RMC	OFF	15	Rear	4183	836.6	23.0	22.4	0.098	0.113	
		0	Edge 2	4183	836.6	23.0	22.4	0.311	0.357	3
		5	Edge 3	4183	836.6	23.0	22.4	0.110	0.126	

10.4. W-CDMA Band II

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Rel 99 RMC	ON	0	Rear	9262	1852.4	21.0	20.6	0.991	1.087	4
				9400	1880.0	21.0	20.5	0.895	1.004	
				9538	1907.6	21.0	20.6	0.888	0.974	
			Edge 2	9400	1880.0	21.0	20.5	0.074	0.083	
			Edge 3	9400	1880.0	21.0	20.5	0.232	0.260	
Rel 99 RMC	OFF	15	Rear	9400	1880.0	23.0	22.4	0.437	0.502	
		0	Edge 2	9400	1880.0	23.0	22.4	0.300	0.344	
		5	Edge 3	9400	1880.0	23.0	22.4	0.526	0.604	

10.5. LTE Band 5 (10MHz Bandwidth)

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
QPSK	ON	0	Rear	20525	836.5	1	0	20.5	20.5	0.327	0.327	
						25	25	19.5	19.0	0.225	0.252	
			Edge 2	20525	836.5	1	0	20.5	20.5	0.159	0.159	
						25	25	19.5	19.0	0.105	0.118	
			Edge 3	20525	836.5	1	0	20.5	20.5	0.144	0.144	
						25	25	19.5	19.0	0.101	0.113	
QPSK	OFF	15	Rear	20525	836.5	1	0	23.5	22.7	0.096	0.115	
						25	25	22.5	21.8	0.074	0.087	
		0	Edge 2	20525	836.5	1	0	23.5	22.7	0.287	0.345	5
						25	25	22.5	21.8	0.240	0.282	
		5	Edge 3	20525	836.5	1	0	23.5	22.7	0.118	0.142	
						25	25	22.5	21.8	0.092	0.108	

10.6. Wi-Fi (DTS Band)

Frequency Band	Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Notes	Plot No.
								Tune-up limit	Meas.	Meas.	Scaled		
2.4GHz	802.11b 1 Mbps	ON	0	Rear	1	2412.0		12.5	11.9	0.686	0.788	3	
					6	2437.0	0.885	12.5	12.5	0.849	0.849		
				Edge 1	6	2437.0	0.201	12.5	12.5	0.152	0.152	2	
		OFF	6	Rear	6	2437.0	1.190	17.5	17.2	0.904	0.969		6
					11	2462.0		17.5	17.1	0.737	0.808	3	
			0	Edge 1	6	2437.0	0.606	17.5	17.2	0.468	0.501	2	
			0	Edge 4	6	2437.0	0.074	17.5	17.2	0.059	0.063		

Note(s):

- Highest reported SAR is ≤ 0.4 W/kg. Therefore, further SAR measurements within this exposure condition are not required.
- Highest reported SAR is > 0.4 W/kg. Due to the highest reported SAR for this test position, other test positions in Head exposure condition were evaluated until a SAR ≤ 0.8 W/kg was reported.
- Testing for a second channel was required because the reported SAR for this test position was >0.8 W/kg.
- Additional testing required in order satisfying FCC simultaneous transmission limit criteria.

10.7. Wi-Fi (U-NII Band)

Frequency Band	Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Notes	Plot No.
								Tune-up limit	Meas.	Meas.	Scaled		
5.3 GHz U-NII 2A	802.11n (HT40)	ON	0	Rear	62	5310.0	0.890	8.5	8.5	0.469	0.469	2	7
	802.11a 6 Mbps	OFF	6	Rear	60	5300.0	0.254	12.5	12.3	0.240	0.251	1	
			0	Edge 1	60	5300.0	0.155						
5.5 GHz U-NII 2C	802.11n (HT40)	ON	0	Rear	134	5670.0	1.150	8.5	8.5	0.689	0.689	2	8
	802.11a 6 Mbps	OFF	6	Rear	140	5700.0	0.245	12.5	12.3	0.210	0.220	1	
			0	Edge 1	140	5700.0	0.216						
			0	Edge 4	140	5700.0	0.044						
5.8 GHz U-NII 3	802.11n (HT40)	ON	0	Rear	151	5755.0		8.5	8.5	0.812	0.812	3	
					159	5795.0	1.550	8.5	8.5	0.893	0.893		9
	802.11a 6 Mbps	OFF	6	Rear	157	5785.0	0.262	12.5	12.1	0.179	0.196	1	
			0	Edge 1	157	5785.0	0.256						
			0	Edge 4	157	5785.0	0.052						

Note(s):

- Highest reported SAR is ≤ 0.4 W/kg. Therefore, further SAR measurements within this exposure condition are not required.
- Highest reported SAR is > 0.4 W/kg. Due to the highest reported SAR for this test position, other test positions in Head exposure condition were evaluated until a SAR ≤ 0.8 W/kg was reported.
- Testing for a second channel was required because the reported SAR for this test position was > 0.8 W/kg.

10.8. Bluetooth

Measured SAR

Frequency Band	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
2.4 GHz	GFSK	0	Rear	0	2402.0	10.5	10.5	0.469	0.469	10

11. SAR Measurement Variability

In accordance with published RF Exposure KDB 865664 D01 SAR measurement 100 MHz to 6 GHz. 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 .

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	Repeated Measured SAR (W/kg)	Largest to Smallest SAR Ratio
850	GSM 850	Standalone	Edge 2	No	0.405	N/A	N/A
	WCDMA Band V	Standalone	Edge 2	No	0.311	N/A	N/A
	LTE Band 5	Standalone	Rear	No	0.327	N/A	N/A
1900	GSM 1900	Standalone	Rear	No	0.604	N/A	N/A
	WCDMA Band II	Standalone	Rear	Yes	0.991	0.854	1.16
2400	Wi-Fi 802.11b/g/n	Standalone	Rear	Yes	0.904	0.802	1.13
	Bluetooth	Standalone	Rear	No	0.469	N/A	N/A
5300	Wi-Fi 802.11a/n/ac	Standalone	Rear	No	0.469	N/A	N/A
5500	Wi-Fi 802.11a/n/ac	Standalone	Rear	No	0.689	N/A	N/A
5800	Wi-Fi 802.11a/n/ac	Standalone	Rear	Yes	0.893	0.823	1.09

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. Simultaneous Transmission SAR Analysis

Simultaneous Transmission Condition

RF Exposure Condition	Item	Capable Transmit Configurations
Standalone	1	GSM(GPRS/EDGE) + DTS
	2	GSM(GPRS/EDGE) + U-NII
	3	GSM(GPRS/EDGE) + BT
	4	W-CDMA + DTS
	5	W-CDMA + U-NII
	6	W-CDMA + BT
	7	LTE + DTS
	8	LTE + U-NII
	9	LTE + BT

Notes:

1. Only DTS supports Hotspot.
2. GPRS/EDGE, W-CDMA, and LTE support Hotspot.
3. VoIP is supported in GPRS/EDGE, W-CDMA, and LTE.
4. DTS Radio cannot transmit simultaneously with Bluetooth Radio.
5. U-NII Radio cannot transmit simultaneously with Bluetooth Radio.
6. Wi-Fi 2.4/5.2/5.8 GHz Supports Wi-Fi Direct

Estimated SAR for Simultaneous Transmission SAR Analysis

Considerations for SAR estimation

1. When standalone SAR test exclusion applies, standalone SAR must also be estimated to determine simultaneous transmission SAR test exclusion.
2. Dedicated Host Approach criteria for SAR test exclusion is likewise applied to SAR estimation, with certain distinctions between test exclusion and SAR estimation:
 - o When the separation distance from the antenna to an adjacent edge is ≤ 5 mm, a distance of 5 mm is applied for SAR estimation; this is the same between test exclusion and SAR estimation calculations.
 - o When the separation distance from the antenna to an adjacent edge is > 5 mm but ≤ 50 mm, the actual antenna-to-edge separation distance is applied for SAR estimation.
 - o When the minimum test separation distance is > 50 mm, the estimated SAR value is 0.4 W/kg
3. Please refer to Estimated SAR Tables to see which test positions are inherently compliant as they consist of only estimated SAR values for all applicable transmitters and consequently will always have sum of SAR values < 1.2 W/kg. Simultaneous transmission SAR analysis was therefore not performed for these test positions.

Estimated SAR for WWAN

Antenna	Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Estimated 1-g SAR Value (W/kg)					
			dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Full Power, Proximity Sensor Off																
Cellular	GPRS 3 Slots	848.8	29.50	334	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	GPRS 4 Slots	1909.8	25.00	158	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	W-CDMA 2	1907.6	22.00	158	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	W-CDMA 5	846.6	23.00	200	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	LTE Band 5	844	23.50	224	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Power Back-off, Proximity Sensor On																
Cellular	GPRS 1 Slots	848.8	31.00	157	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	GPRS 1 Slots	1909.8	25.00	40	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	W-CDMA 2	1907.6	16.00	40	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	W-CDMA 5	846.6	21.00	126	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	LTE Band 5	844	20.50	112	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	

Estimated SAR for WLAN

Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Estimated 1-g SAR Value (W/kg)						
		dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	
Full Power, Proximity Sensor Off																
Wi-Fi 2.4 GHz	2462	17.50	56	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-		
Wi-Fi 5.2 GHz	5240	12.50	18	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	0.400	0.400	0.392		
Wi-Fi 5.3 GHz	5320	12.50	18	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	0.400	0.400	0.395		
Wi-Fi 5.5 GHz	5700	12.50	18	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-		
Wi-Fi 5.8 GHz	5825	12.50	18	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-		
Bluetooth	2480	10.50	11	1.28	6.42	121.64	226.54	14.19		-MEASURE-	0.385	0.400	0.400	0.165		
Power Back-off, Proximity Sensor On																
Wi-Fi 2.4 GHz	2462	12.50	18	1.28	6.42	121.64	226.54	14.19		-MEASURE-	-MEASURE-	0.400	0.400	0.269		
Wi-Fi 5.2 GHz	5240	8.50	7	1.28	6.42	121.64	226.54	14.19		-MEASURE-	0.356	0.400	0.400	0.153		
Wi-Fi 5.3 GHz	5320	8.50	7	1.28	6.42	121.64	226.54	14.19		-MEASURE-	0.359	0.400	0.400	0.154		
Wi-Fi 5.5 GHz	5700	8.50	7	1.28	6.42	121.64	226.54	14.19		-MEASURE-	0.371	0.400	0.400	0.159		
Wi-Fi 5.8 GHz	5825	8.50	7	1.28	6.42	121.64	226.54	14.19		-MEASURE-	0.375	0.400	0.400	0.161		

12.1. Sum of the SAR for GSM 850, Wi-Fi & BT

RF Exposure conditions	Pwr Back-off	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+④ WWAN +BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Rear	ON	0.387	0.849	0.893		1236	No	1.280	No		
Edge 1		0.400	0.452	0.375		0.552	No	0.775	No		
Edge 2		0.235	0.400	0.400		0.635	No	0.635	No		
Edge 3		0.161	0.400	0.400		0.561	No	0.561	No		
Edge 4		0.400	0.269	0.161		0.669	No	0.561	No		
Rear	OFF	0.141	0.969	0.251	0.469	1.110	No	0.392	No	0.610	No
Edge 1		0.400	0.501	0.400	0.385	0.901	No	0.800	No	0.785	No
Edge 2		0.424	0.400	0.400	0.400	0.824	No	0.824	No	0.824	No
Edge 3		0.165	0.400	0.400	0.400	0.565	No	0.565	No	0.565	No
Edge 4		0.400	0.063	0.400	0.165	0.463	No	0.800	No	0.565	No

12.2. Sum of the SAR for GSM 1900, Wi-Fi & BT

RF Exposure conditions	Pwr Back-off	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+④ WWAN +BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Rear	ON	0.778	0.849	0.893		1627	Yes	1671	Yes		
Edge 1		0.400	0.452	0.375		0.552	No	0.775	No		
Edge 2		0.073	0.400	0.400		0.473	No	0.473	No		
Edge 3		0.258	0.400	0.400		0.658	No	0.658	No		
Edge 4		0.400	0.269	0.161		0.669	No	0.561	No		
Rear	OFF	0.401	0.969	0.251	0.469	1.370	No	0.652	No	0.870	No
Edge 1		0.400	0.501	0.400	0.385	0.901	No	0.800	No	0.785	No
Edge 2		0.284	0.400	0.400	0.400	0.684	No	0.684	No	0.684	No
Edge 3		0.461	0.400	0.400	0.400	0.861	No	0.861	No	0.861	No
Edge 4		0.400	0.063	0.400	0.165	0.463	No	0.800	No	0.565	No

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Worst-case combination			∑ 1-g SAR (mW/g)	Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure	
	① WWAN	② DTS	③ U-NII						
Rear	0.778	0.849		① + ②	1.627	245.6	0.008	No	1
	0.778		0.893	① + ③	1.671	247.4	0.009	No	2

Figure (1)

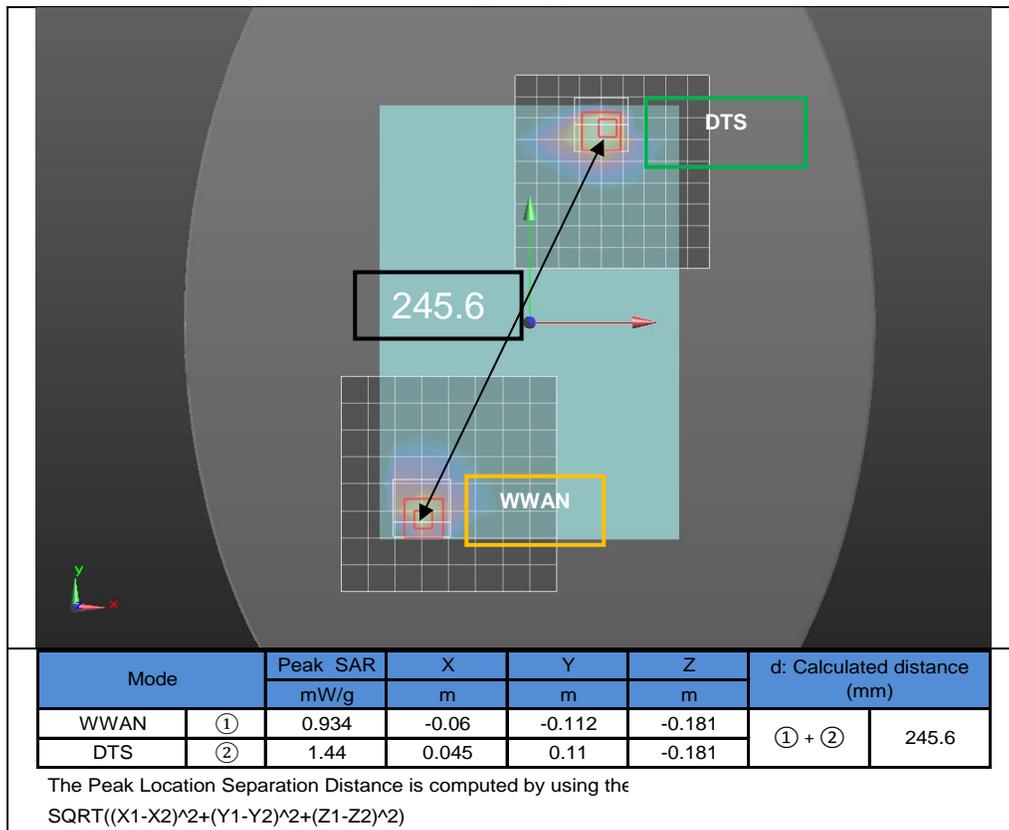
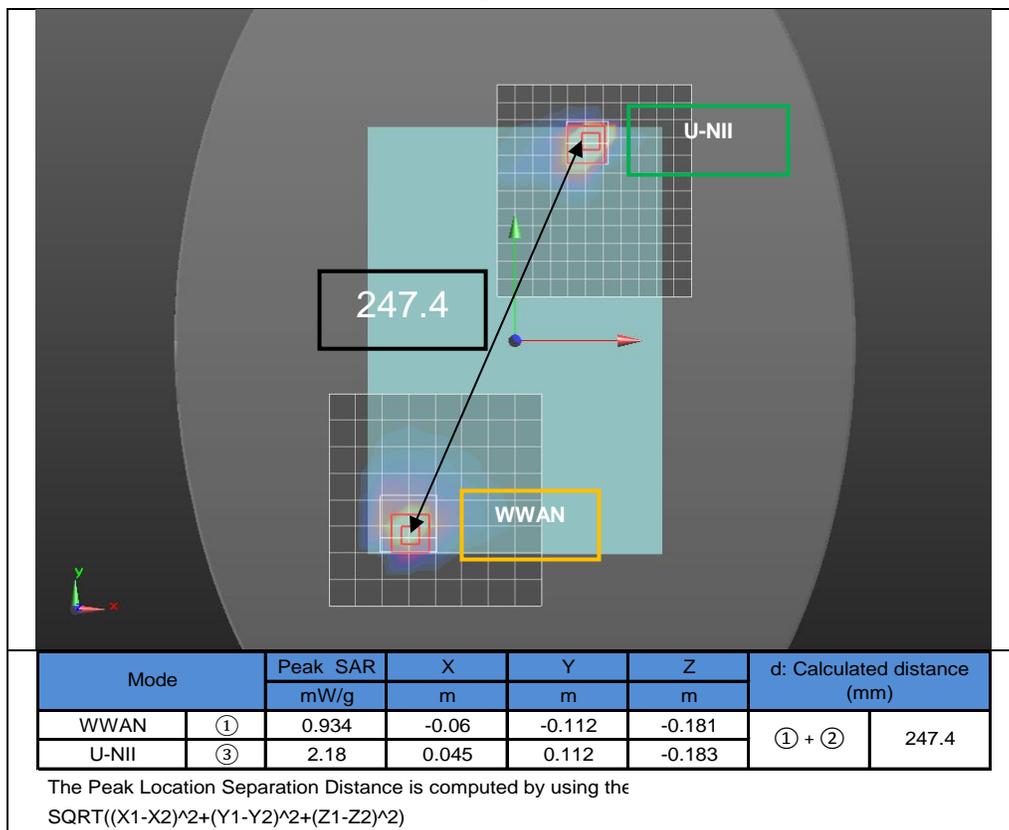


Figure (2)



12.3. Sum of the SAR for W-CDMA Band V, Wi-Fi & BT

RF Exposure conditions	Pwr Back-off	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN+DTS		①+③ WWAN+U-NII		①+④ WWAN+BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Rear	ON	0.338	0.849	0.893		1.187	No	1.231	No		
Edge 1		0.400	0.152	0.375		0.552	No	0.775	No		
Edge 2		0.208	0.400	0.400		0.608	No	0.608	No		
Edge 3		0.140	0.400	0.400		0.540	No	0.540	No		
Edge 4		0.400	0.269	0.161		0.669	No	0.561	No		
Rear	OFF	0.113	0.969	0.251	0.469	1.082	No	0.364	No	0.582	No
Edge 1		0.400	0.501	0.400	0.385	0.901	No	0.800	No	0.785	No
Edge 2		0.357	0.400	0.400	0.400	0.757	No	0.757	No	0.757	No
Edge 3		0.126	0.400	0.400	0.400	0.526	No	0.526	No	0.526	No
Edge 4		0.400	0.063	0.400	0.165	0.463	No	0.800	No	0.565	No

12.4. Sum of the SAR for W-CDMA Band II, Wi-Fi & BT

RF Exposure conditions	Pwr Back-off	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN+DTS		①+③ WWAN+U-NII		①+④ WWAN+BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Rear	ON	1.087	0.849	0.893		1.936	Yes	1.980	Yes		
Edge 1		0.400	0.152	0.375		0.552	No	0.775	No		
Edge 2		0.083	0.400	0.400		0.483	No	0.483	No		
Edge 3		0.260	0.400	0.400		0.660	No	0.660	No		
Edge 4		0.400	0.269	0.161		0.669	No	0.561	No		
Rear	OFF	0.502	0.969	0.251	0.469	1.471	No	0.753	No	0.971	No
Edge 1		0.400	0.501	0.400	0.385	0.901	No	0.800	No	0.785	No
Edge 2		0.344	0.400	0.400	0.400	0.744	No	0.744	No	0.744	No
Edge 3		0.604	0.400	0.400	0.400	1.004	No	1.004	No	1.004	No
Edge 4		0.400	0.063	0.400	0.165	0.463	No	0.800	No	0.565	No

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Worst-case combination			∑ 1-g SAR (mW/g)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② DTS	③ U-NII	① + ②	① + ③				
Rear	1.087	0.849		① + ②	1.936	247.4	0.011	No	3
	1.087		0.893	① + ③	1.980	249.2	0.011	No	4

Figure (3)

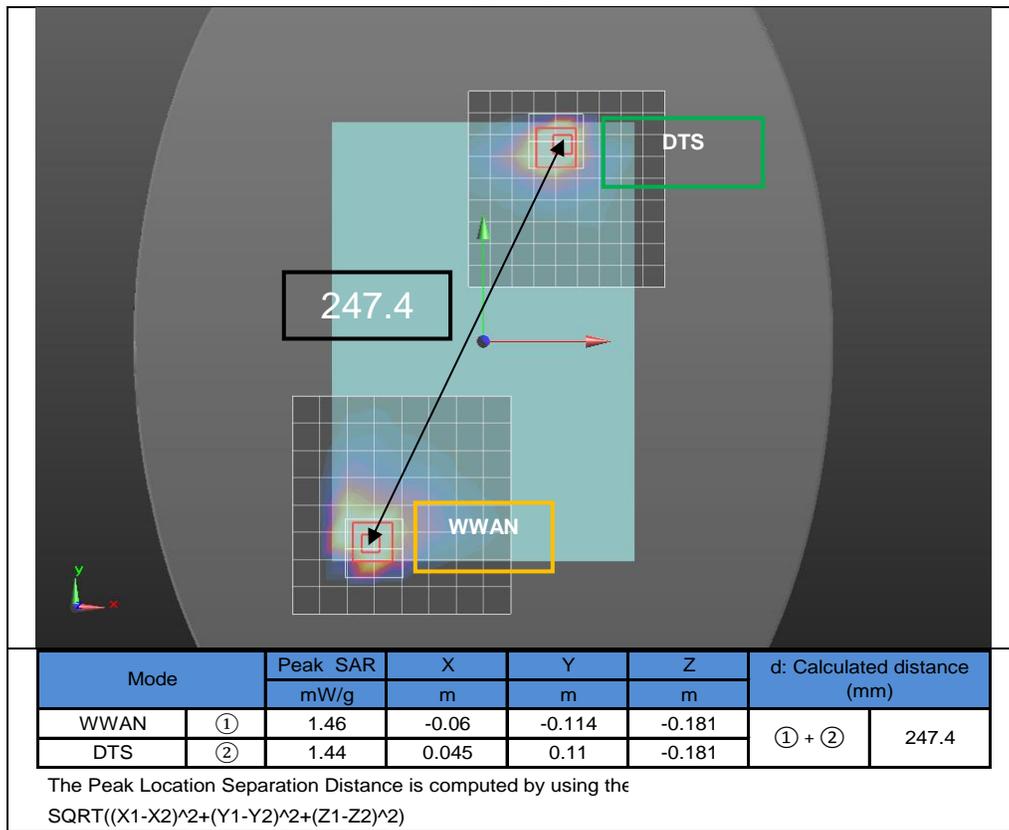
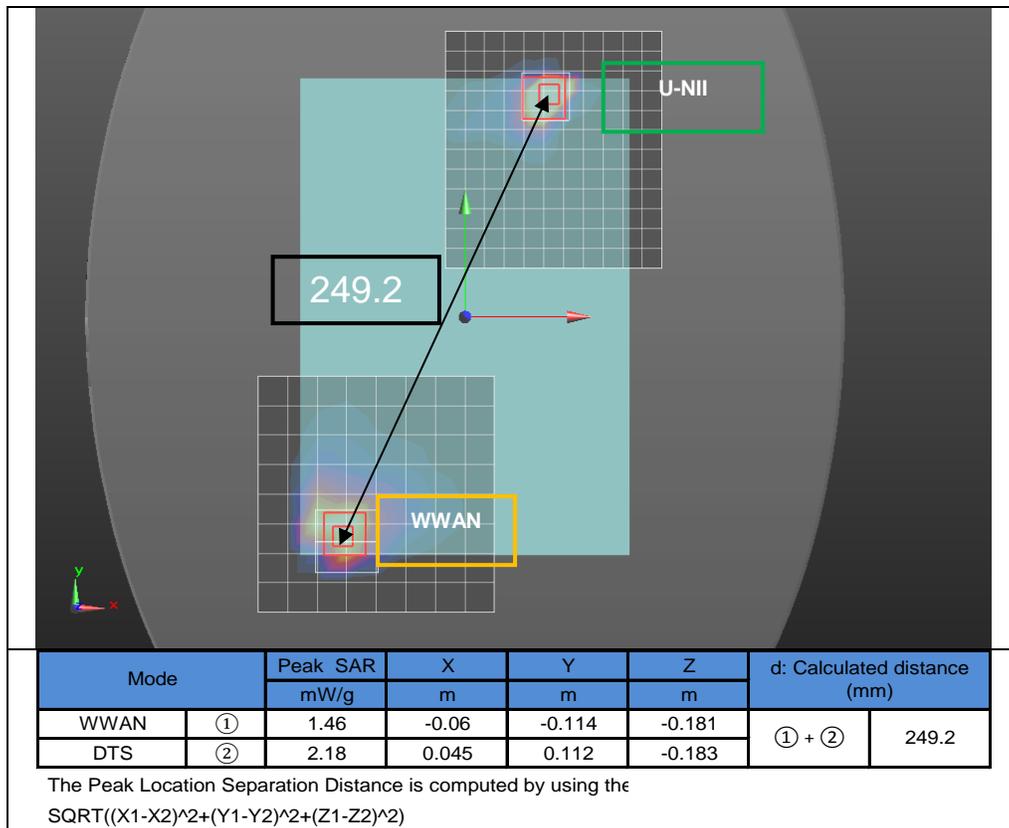


Figure (4)



12.5. Sum of the SAR for LTE Band 5, Wi-Fi & BT

RF Exposure conditions	Pwr Back-off	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+④ WWAN +BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
						Rear	ON	0.327	0.849	0.893	
Edge 1	0.400	0.152	0.375		0.552	No		0.775	No		
Edge 2	0.159	0.400	0.400		0.559	No		0.559	No		
Edge 3	0.144	0.400	0.400		0.544	No		0.544	No		
Edge 4	0.400	0.269	0.161		0.669	No		0.561	No		
Rear	OFF	0.115	0.969	0.251	0.469	1.084	No	0.366	No	0.584	No
Edge 1		0.400	0.501	0.400	0.385	0.901	No	0.800	No	0.785	No
Edge 2		0.345	0.400	0.400	0.400	0.745	No	0.745	No	0.745	No
Edge 3		0.142	0.400	0.400	0.400	0.542	No	0.542	No	0.542	No
Edge 4		0.400	0.063	0.400	0.165	0.463	No	0.800	No	0.565	No

Conclusion:

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

Appendixes

Refer to separated files for the following appendixes.

A_15I19961v0 SAR Photos & Ant. Locations

B_15I19961v0 SAR Highest Test Plots

C_15I19961v0 SAR System Check Plots

D_15I19961v0 SAR Tissue Ingredients

E_15I19961v0 SAR Probe Cal. Certificates

F_15I19961v0 SAR Dipole Cal. Certificates

END OF REPORT