



SAR EVALUATION REPORT

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

For
GSM/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac, ANT+ & NFC

**Model: SM-G8508S
FCC ID: A3LSMG8508S**

**Report Number: 14U18322-S8A
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Prepared for
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REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
--	8/7/2014	Initial Issue	--
A	8/18/2014	Section 6.2: Update Bluetooth Information Section 6.7: Update Antenna Specifications Section 14.1: Added WiFi Antenna 2	Coltyce Sanders

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1. Attestation of Test Results

Applicant Name	SAMSUNG ELECTRONICS			
Application Purpose	☒ Original Grant ☐ Class II Permissive Change			
FCC ID	A3LSMG8508S			
DUT Description	GSM/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac, ANT+ & NFC			
Exposure Category	General Population/Uncontrolled Exposure (1g SAR limit: 1.6 W/kg)			
The highest reported SAR	RF Exposure Conditions	Equipment Class		
		Licensed	DTS	UNII
	Head	0.610 W/kg	0.430 W/kg	0.476 W/kg
	Body-worn Accessory	0.624 W/kg	0.368 W/kg	0.094 W/kg
	Wireless Router (Hotspot)	1.065 W/kg		
	Simultaneous Transmission	Head: 1.011 W/kg Body: 1.002 W/kg	Head: 0.997 W/kg Body: 1.002 W/kg	Head: 1.011 W/kg Body: 0.706 W/kg
Highest SAR across exposure conditions	1.065 W/kg			
Applicable Standards	FCC 47 CFR § 2.1093 KDB publication IEEE Std 1528-2013			
Test Results	Pass			
Date tested	07/18/2014 – 07/31/2014			
UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report. Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.				
Approved & Released 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 1528-2003 & 2013, the following FCC Published RF exposure KDB procedures, and TCB workshop updates:

- 447498 D01 General RF Exposure Guidance v05r02
- 648474 D04 Handset SAR v01r02
- 941225 D01 SAR test for 3G devices v02
- 941225 D02 HSPA and 1x Advanced v02r02
- 941225 D03 SAR Test Reduction GSM GPRS EDGE v01
- 941225 D04 SAR for GSM E GPRS Dual Xfer Mode v01
- 941225 D05 SAR for LTE Devices v02r03
- 941225 D06 Hotspot Mode SAR v01r01
- 248227 D01 SAR Meas for 802 11abg v01r02
- 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03
- 865664 D02 SAR Reporting v01r01
- 690783 D01 SAR Listings on Grants v01r03

3. Facilities and Accreditation

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

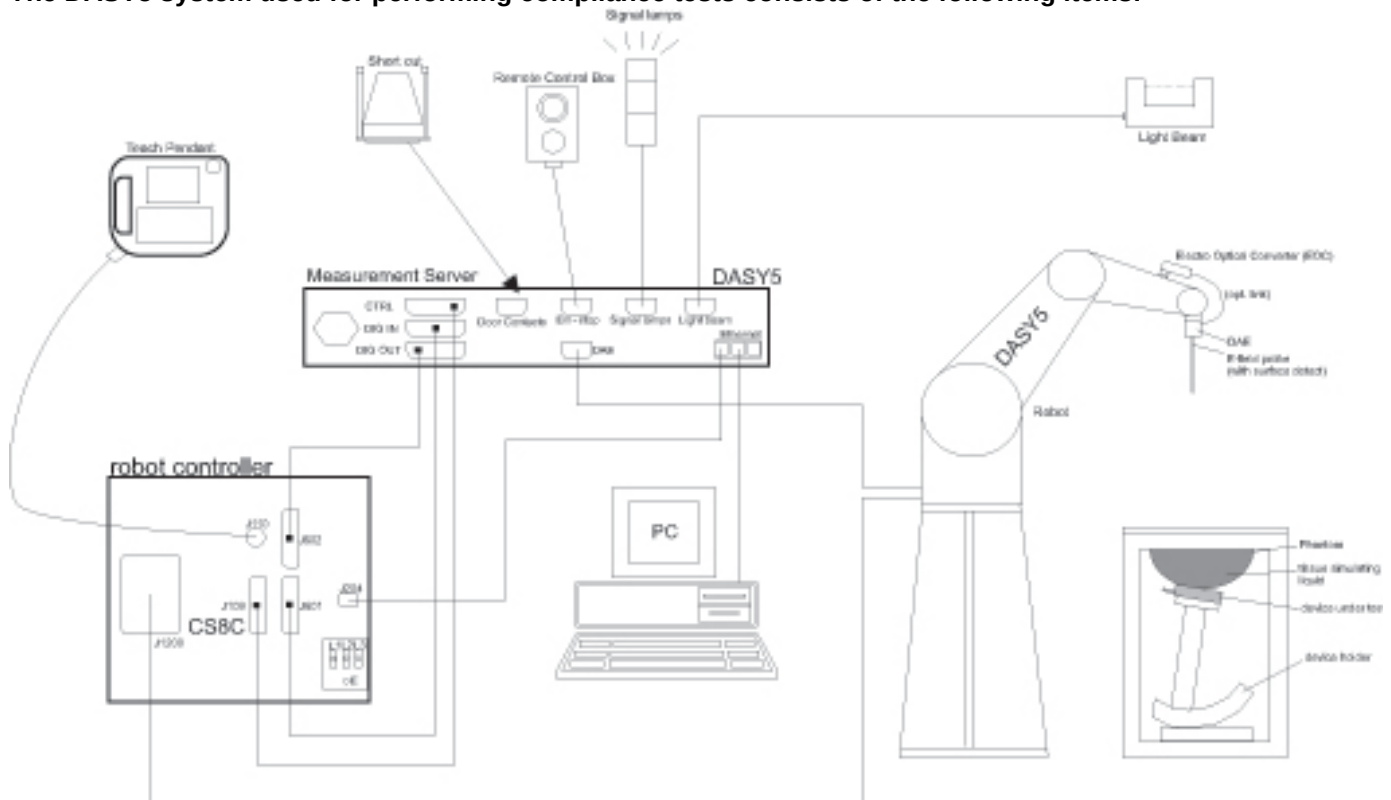
47173 Benicia Street	47266 Benicia Street
SAR Lab A	SAR Lab 1
SAR Lab B	SAR Lab 2
SAR Lab C	SAR Lab 3
SAR Lab D	SAR Lab 4
SAR Lab E	SAR Lab 5
SAR Lab F	
SAR Lab G	
SAR Lab H	

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

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. 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	ENA Series/E5071B	MY42100131	2/24/2015
Dielectronic Probe kit	SPEAG	DAK-3.5	1087	11/13/2014
Dielectronic Probe kit	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	Control Company	4242	122529163	9/19/2014
Thermometer	EXTECH	445703	CCS-200	3/24/2015

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	3125U16345	6/16/2015
Power Meter	HP	437B	3125U09516	9/30/2014
Power Sensor	Agilent	8481A	2237A31744	10/2/2014
Power Sensor	Agilent	8481A	2349A36506	9/30/2014
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1808939	N/A
Bi-directional coupler	Werlatone, Inc.	C8060-102	2710	N/A
DC Power Supply	Sorensen Ametek	XT15-4	1319A02778	N/A
HP Signal Generator	HP	8665B	3438A00633	7/10/2015
Power Meter	HP	438A	3513U04320	10/2/2014
Power Sensor	Agilent	8481A	2702A66876	9/30/2014
Power Sensor	Agilent	8481A	3318A95392	9/30/2014
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1622052	N/A
Bi-directional coupler	Werlatone, Inc.	C8060-102	2711	N/A
DC Power Supply	HP	6296A	2841A-05955	N/A
E-Field Probe (SAR 4)	SPEAG	EX3DV4	3929	5/9/2015
E-Field Probe (SAR 5)	SPEAG	EX3DV4	3991	5/6/2015
Data Acquisition Electronics (SAR 4)	SPEAG	DAE4	1352	9/11/2014
Data Acquisition Electronics (SAR 5)	SPEAG	DAE4	1439	5/14/2015
System Validation Dipole	SPEAG	D835V2	4d002	11/15/2015
System Validation Dipole	SPEAG	D1900V2	5d043	11/12/2015
System Validation Dipole	SPEAG	D2450V2	899	9/10/2014
System Validation Dipole	SPEAG	D2600V2	1006	9/11/2014
System Validation Dipole	SPEAG	D5GHzV2	1138	11/19/2014
Thermometer (SAR Lab 4)	EXTECH	445703	CCS-238	6/3/2015
Thermometer (SAR Lab 5)	EXTECH	445703	CCS-239	6/3/2015

Others

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Power Sensor	Agilent	N1921A	MY52200012	9/25/2014
Power Meter	Agilent	N1911A	MY53060016	8/3/2014
Base Station Simulator	R & S	CMW500	125236-es	5/29/2015
Base Station Simulator	R & S	CMW500	127733-cy	6/2/2015

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 1528-2003 & 2013 is not required in SAR reports submitted for equipment approval.

6. Device Under Test (DUT) Information

6.1. DUT Description

Model: SM-G8508S	
Device Dimension	Overall (Length x Width): 133 mm x 67 mm Overall Diagonal: 143 mm Display Diagonal: 118 mm
Battery Back Cover	☒ Normal Battery Cover ☐ Normal Battery Cover with NFC ☐ Wireless Charger Battery Cover ☐ Wireless Charger Battery Cover with NFC.
Battery Options	☒ Standard – Lithium-ion battery, Rating 3.85Vdc, 7.16Wh ☐ Extended (large capacity)
Accessory	☒ Headset
Wireless Router (Hotspot)	Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices. ☒ Mobile Hotspot (Wi-Fi 2.4 GHz) ☐ Mobile Hotspot (Wi-Fi 5 GHz)
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other ☒ Wi-Fi Direct (Wi-Fi 2.4 GHz) ☒ Wi-Fi Direct (Wi-Fi 5 GHz) (FCC: Ch.149 ~ Ch.165)
SIM Information	☒ Single SIM ☐ Dual SIM

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)	GSM Voice: 12.5%; GPRS/EGPRS: 1 Slot: 12.5%; 2 Slots: 25%, 3 Slots: 37.5%, 4 Slots: 50%,
	GPRS Multi-Slot Class: ☐ Class 8 - One Up ☐ Class 10 - Two Up ☐ Class 12 - Four Up ☒ Class 33 - Four Up DTM (Dual Transfer Mode): Not support VoIP (GPRS): Supported		
W-CDMA (UMTS)	Band V and II	UMTS Rel. 99 (Voice & Data) HSDPA (Rel. 7, CAT 14) HSUPA (Rel. 6, CAT 6) DC-HSDPA (Rel. 8, CAT 24) HSPA+ (Rel. 6, CAT 6)	100%
LTE (TDD)	Band 41	QPSK, 16QAM (Rel. 10) Do not support Carrier Aggregation (CA).	63.3%
	Does this device SV-LTE (1xRTT-LTE)? ☐ Yes ☒ No		
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20) Wi-Fi MIMO: Supported	100%
	5 GHz	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80) Wi-Fi MIMO: Supported	100%
Bluetooth	2.4 GHz	Version 4.0 LE + EDR	32.25% (DH1), 66.68% (DH3), 77.52% (DH5)

6.3. Nominal and Maximum Output Power

Upper limit (dB): 0.5 ~ -1.5		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
GSM850	Voice	32.5	33.0
	GPRS 1 slot	32.5	33.0
	GPRS 2 slots	30.5	31.0
	GPRS 3 slots	29.0	29.5
	GPRS 4 slots	28.0	28.5
	EGPRS 1 slot	27.0	27.5
	EGPRS 2 slots	26.5	27.0
	EGPRS 3 slots	24.0	24.5
	EGPRS 4 slots	24.0	24.5
GSM1900	Voice	29.5	30.0
	GPRS 1 slot	29.5	30.0
	GPRS 2 slots	27.0	27.5
	GPRS 3 slots	25.5	26.0
	GPRS 4 slots	24.0	24.5
	EGPRS 1 slot	26.0	26.5
	EGPRS 2 slots	26.0	26.5
	EGPRS 3 slots	23.5	24.0
	EGPRS 4 slots	23.5	24.0
W-CDMA Band V	R99	23.0	23.5
	HSDPA	22.0	22.5
	HSUPA	22.0	22.5
	DC-DSPA	22.0	22.5
W-CDMA Band II	R99	23.0	23.5
	HSDPA	22.5	23.0
	HSUPA	22.5	23.0
	DC-DSPA	22.5	23.0
LTE Band 41	QPSK	23.0	23.5

Upper limit (dB): 0.5		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
WiFi 2.4 GHz	802.11b	17.0	17.5
	802.11g	14.0	14.5
	802.11n HT20	12.0	12.5
WiFi 5 GHz	802.11a	12.0	12.5
	802.11n HT20	12.0	12.5
	802.11n HT40	12.0	12.5
	802.11ac 20MHz	10.0	10.5
	802.11ac 40MHz	10.0	10.5
	802.11ac 80MHz	10.0	10.5
Bluetooth		8.0	8.5
Bluetooth LE		8.0	8.5

6.4. Simultaneous Transmission Condition

RF Exposure Condition	Capable Transmit Configurations
Head	1. GSM 850/1900 Voice + Wi-Fi 2.4/5GHz 2. GSM 850/1900 (GPRS/EDGE) + Wi-Fi 2.4/5GHz (VoIP) 3. WCDMA Band 2/5 + Wi-Fi 2.4/5GHz 4. LTE B 41 + Wi-Fi 2.4/5GHz
Body-worn Accessory	1. GSM 850/1900 Voice + Wi-Fi 2.4/5GHz 2. GSM 850/1900 Voice + BT 3. GSM 850/1900 Voice + Wi-Fi 5GHz + BT 4. GSM 850/1900 (GPRS/EDGE) + Wi-Fi 2.4/5GHz (VoIP) 5. GSM 850/1900 (GPRS/EDGE) + BT(VoIP) 6. GSM 850/1900 (GPRS/EDGE) + Wi-Fi 5GHz + BT(VoIP) 7. WCDMA Band 2/5 + Wi-Fi 2.4/5GHz 8. WCDMA Band 2/5 + BT 9. WCDMA Band 2/5 + Wi-Fi 5GHz + BT 10. LTE B 41 + Wi-Fi 2.4/5GHz 11. LTE B 41 + BT 12. LTE B 41 + Wi-Fi 5GHz + BT
Wireless Router (Hotspot) and Wi-Fi- Direct	1. GSM 850/1900 (GPRS/EDGE) + Wi-Fi 2.4/5.8GHz 2. WCDMA Band 2/5 + Wi-Fi 2.4/5.8GHz 3. LTE B 41 + Wi-Fi 2.4/5.8GHz
"Notes: 1. Wi-Fi 2.4GHz supports Hotspot and Wi-Fi Direct. 2. Wi-Fi 5.8GHz supports Wi-Fi Direct. 3. Wi-Fi 2.4/5GHz supports MIMO 4. GPRS/EDGE, WCDMA, and LTE support Hotspot. 5. VoIP is support in GPRS/EDGE, WCDMA, and LTE. 6. Wi-Fi 2.4 GHz Radio cannot transmit simultaneously with Bluetooth Radio. 7. Wi-Fi 5 GHz Radio can transmit simultaneously with Bluetooth Radio.	

6.5. General LTE SAR Test and Reporting Considerations

Item	Description																																												
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 41	Frequency range: 2496 - 2690 MHz																																											
		Channel Bandwidth																																											
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																						
	Low	39750/ 2506.0	39725/ 2503.5	39700/ 2501	39675/ 2498.5																																								
	Low-Mid	40185/ 2549.5	40173/ 2548.3	40160/ 2547.0	40148/ 2545.8																																								
	Mid	40620/ 2593.0	40620/ 2593.0	40620/ 2593.0	40620/ 2593.0																																								
	Mid-High	41055/ 2636.5	41068/ 2547.8	41080/ 2639.0	41093/ 2640.3																																								
	High	41490/ 2680.0	41515/ 2682.5	41540/ 2685.0	41565/ 2687.5																																								
LTE transmitter and antenna implementation	LTE has one (1) TX/RX antennas and two (2) RX antennas Refer to Appendix 14.1. Photos and Antenna Locations.																																												
Maximum power reduction (MPR)	Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3 <table border="1"> <thead> <tr> <th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th><th rowspan="2">MPR (dB)</th></tr> <tr> <th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr> </thead> <tbody> <tr> <td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr> <tr> <td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr> <tr> <td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr> </tbody> </table> MPR Built-in by design A-MPR (additional MPR) was disabled during SAR testing							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	64 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																																						
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																						
Power reduction	No																																												
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.																																												

6.6. LTE (TDD) Considerations

According to KDB 941225 D05 SAR for LTE Devices v02r02, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

SAR was tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7.

LTE TDD Band 41 supports 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

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

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

Table 4.2-2: Uplink-downlink configurations.

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

Calculated Duty Cycle

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33

Calculated Duty Cycle = Extended cyclic prefix in uplink $\times (T_s) \times \# \text{ of S} + \# \text{ of U}$

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:

Calculated Duty Cycle = $5120 \times [1/(15000 \times 2048)] \times 2 + 6 \text{ ms} = 63.33\%$

where

$T_s = 1/(15000 \times 2048)$ seconds

7. RF Exposure Conditions (Test Configurations)

Refer to Appendix 14.1.Photos and Antenna Locations for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

7.1. Head

For WWAN, LTE and Wi-Fi

Test Configurations	SAR Required	Note
Left Touch	Yes	
Left Tilt (15°)	Yes	
Right Touch	Yes	
Right Tilt (15°)	Yes	

7.2. Body-worn Accessory

For WWAN and LTE

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	1 mm	Yes	
Front	4 mm	Yes	

For Wi-Fi

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	1 mm	Yes	
Front	4 mm	Yes	

7.3. Wireless Router (Hotspot) and Wi-Fi Direct

For WWAN and LTE

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	1 mm	Yes	
Front	4 mm	Yes	
Edge 1 (Top)	118 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR
Edge 2 (Right)	20 mm	Yes	
Edge 3 (Bottom)	2 mm	Yes	
Edge 4 (Left)	2 mm	Yes	

For Wi-Fi Antenna 1 (for 2.4 GHz and 5.8 GHz only)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	1 mm	Yes	
Front	4 mm	Yes	
Edge 1 (Top)	2 mm	Yes	
Edge 2 (Right)	55 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR
Edge 3 (Bottom)	120 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR
Edge 4 (Left)	2 mm	Yes	

For Wi-Fi Antenna 2 (for 2.4 GHz and 5.8 GHz only)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	1 mm	Yes	
Front	4 mm	Yes	
Edge 1 (Top)	2 mm	Yes	
Edge 2 (Right)	2 mm	Yes	
Edge 3 (Bottom)	120 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR
Edge 4 (Left)	55 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR

8. Conducted Output Power Measurements

8.1. GSM850 and GSM1900

GSM850 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Burst Pwr (dBm)	Frame Pwr (dBm)
850	GSM (Voice)	CS1	1	128	824.2	32.6	23.6
				190	836.6	33.0	24.0
				251	848.8	32.8	23.8
	GPRS (GMSK)	CS1	1	128	824.2	32.6	23.6
				190	836.6	33.0	24.0
				251	848.8	32.8	23.8
			2	128	824.2	30.4	24.4
				190	836.6	30.5	24.5
				251	848.8	30.2	24.2
			3	128	824.2	28.8	24.5
				190	836.6	28.9	24.6
				251	848.8	28.6	24.3
			4	128	824.2	27.7	24.7
				190	836.6	27.7	24.7
				251	848.8	27.5	24.5
	EGPRS (8PSK)	MCS5	1	128	824.2	27.2	18.2
				190	836.6	27.1	18.1
				251	848.8	27.0	18.0
			2	128	824.2	26.9	20.9
				190	836.6	26.8	20.8
				251	848.8	26.8	20.8
			3	128	824.2	24.4	20.1
				190	836.6	24.3	20.0
				251	848.8	24.1	19.8
			4	128	824.2	24.1	21.1
				190	836.6	24.2	21.2
				251	848.8	23.9	20.9

Notes:

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

- Head & Body-worn Accessory: GMSK Voice Mode
- Hotspot mode: GMSK (GPRS) mode with 4 time slots, 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)	Burst Pwr (dBm)	Frame Pwr (dBm)
1900	GSM (Voice)	CS1	1	512	1850.2	29.8	20.8
				661	1880.0	29.7	20.7
				810	1909.8	29.5	20.5
	GPRS (GMSK)	CS1	1	512	1850.2	29.8	20.8
				661	1880.0	29.6	20.6
				810	1909.8	29.5	20.5
			2	512	1850.2	27.5	21.5
				661	1880.0	27.4	21.4
				810	1909.8	27.4	21.4
			3	512	1850.2	25.4	21.1
				661	1880.0	25.3	21.0
				810	1909.8	25.2	20.9
			4	512	1850.2	24.2	21.2
				661	1880.0	24.1	21.1
				810	1909.8	24.0	21.0
	EGPRS (8PSK)	MCS5	1	512	1850.2	26.3	17.3
				661	1880.0	26.2	17.2
				810	1909.8	26.2	17.2
			2	512	1850.2	26.3	20.3
				661	1880.0	26.1	20.1
				810	1909.8	26.2	20.2
			3	512	1850.2	23.7	19.4
				661	1880.0	23.5	19.2
				810	1909.8	23.6	19.3
			4	512	1850.2	23.6	20.6
				661	1880.0	23.4	20.4
				810	1909.8	23.5	20.5

Notes:

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

- Head & Body-worn Accessory: GMSK Voice Mode
- Hotspot mode: GMSK (GPRS) mode with 3 time slots, 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

8.2. W-CDMA Band V and II

Release 99

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

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

Measured Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
W-CDMA Band V	Rel 99 (RMC, 12.2 kbps)	4132	826.4	22.9
		4183	836.6	22.9
		4233	846.6	22.8
W-CDMA Band II	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	23.2
		9400	1880.0	23.1
		9538	1907.6	23.1

HSDPA

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-Set1			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
HSDPA Specific Settings	MPR (dB)	0	1	1.5	1.5
	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

Measured Results

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band V	Subtest 1	4132	826.4	0	21.5
		4183	836.6	0	21.3
		4233	846.6	0	21.4
	Subtest 2	4132	826.4	0	21.1
		4183	836.6	0	21.0
		4233	846.6	0	21.0
	Subtest 3	4132	826.4	0.5	21.0
		4183	836.6	0.5	21.0
		4233	846.6	0.5	21.0
	Subtest 4	4132	826.4	0.5	21.1
		4183	836.6	0.5	21.0
		4233	846.6	0.5	21.0
W-CDMA Band II	Subtest 1	9262	1852.4	0	22.5
		9400	1880.0	0	22.7
		9538	1907.6	0	22.4
	Subtest 2	9262	1852.4	0	22.1
		9400	1880.0	0	22.2
		9538	1907.6	0	22.1
	Subtest 3	9262	1852.4	0.5	22.1
		9400	1880.0	0.5	22.2
		9538	1907.6	0.5	21.9
	Subtest 4	9262	1852.4	0.5	22.0
		9400	1880.0	0.5	22.1
		9538	1907.6	0.5	21.9

Maximum output power levels that are possible for all subtests reported.

HSPA (HSDPA & HSUPA)

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

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

Measured Results

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band V	Subtest 1	4132	826.4	0	21.0
		4183	836.6	0	21.4
		4233	846.6	0	21.0
	Subtest 2	4132	826.4	2	20.4
		4183	836.6	2	20.5
		4233	846.6	2	19.8
	Subtest 3	4132	826.4	1	19.7
		4183	836.6	1	19.7
		4233	846.6	1	20.2
	Subtest 4	4132	826.4	2	20.3
		4183	836.6	2	20.2
		4233	846.6	2	20.2
	Subtest 5	4132	826.4	0	21.6
		4183	836.6	0	21.5
		4233	846.6	0	21.4
W-CDMA Band II	Subtest 1	9262	1852.4	0	22.5
		9400	1880.0	0	22.7
		9538	1907.6	0	22.4
	Subtest 2	9262	1852.4	2	20.5
		9400	1880.0	2	20.6
		9538	1907.6	2	20.5
	Subtest 3	9262	1852.4	1	20.5
		9400	1880.0	1	20.5
		9538	1907.6	1	20.0
	Subtest 4	9262	1852.4	2	21.0
		9400	1880.0	2	21.0
		9538	1907.6	2	21.0
	Subtest 5	9262	1852.4	0	22.5
		9400	1880.0	0	22.7
		9538	1907.6	0	22.4

DC-HSDPA

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

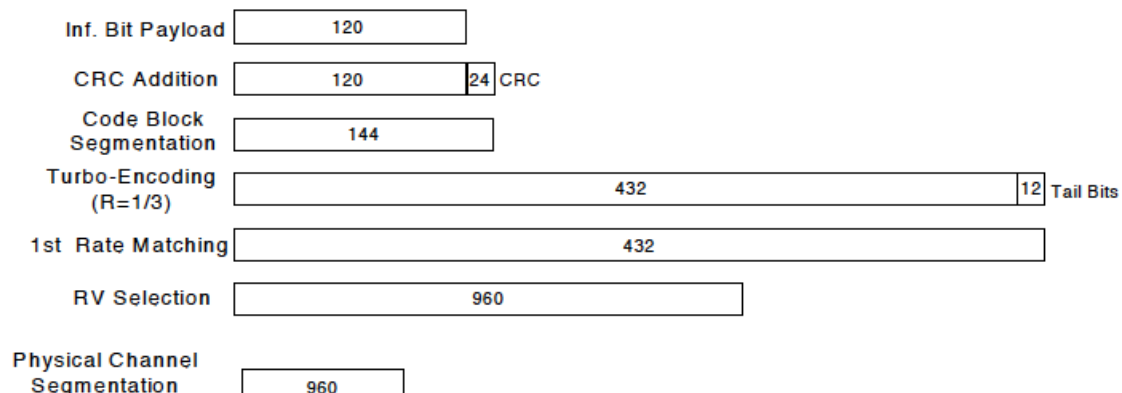


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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-Set1			
	Power Control Algorithm	Algorithm2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
HSDPA Specific Settings	MPR (dB)	0	0	0.5	0.5
	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

Up commands are set continuously to set the UE to Max power.

Measured Results

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band V	Subtest 1	4132	826.4	0	21.3
		4183	836.6	0	21.2
		4233	846.6	0	21.1
	Subtest 2	4132	826.4	0	20.8
		4183	836.6	0	21.2
		4233	846.6	0	21.0
	Subtest 3	4132	826.4	0.5	20.8
		4183	836.6	0.5	20.8
		4233	846.6	0.5	20.6
	Subtest 4	4132	826.4	0.5	20.8
		4183	836.6	0.5	20.8
		4233	846.6	0.5	20.6
W-CDMA Band II	Subtest 1	9262	1852.4	0	21.7
		9400	1880.0	0	22.4
		9538	1907.6	0	21.8
	Subtest 2	9262	1852.4	0	21.7
		9400	1880.0	0	22.0
		9538	1907.6	0	21.7
	Subtest 3	9262	1852.4	0.5	21.2
		9400	1880.0	0.5	21.9
		9538	1907.6	0.5	21.2
	Subtest 4	9262	1852.4	0.5	21.2
		9400	1880.0	0.5	21.9
		9538	1907.6	0.5	21.3

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.

8.3. LTE Band 41

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 41 Measured Results**Procedure used to establish SAR test signal for LTE TDD Band 41**

Set to CMW-500 with following parameters:

- Turn the LTE Signaling off using “ON | OFF” key
- Operating Band: Select Band 41 and TDD
- Go to “Config...”

LTE Signaling 1 - X3.2.10.6

Connection Status

Cell: OFF

Packet Switched: OFF

RRC State: Idle

Event Log

- 03:21:26 State 'Cell Off'
- 03:21:17 State 'Cell On'
- 03:21:16 Signaling Failure
- 03:21:13 Network Originated Detach
- 03:21:02 State 'Connection Established'
- 03:21:02 EPS Dedicated Bearer Established
- 03:20:57 State 'Attached'
- 03:20:57 EPS Default Bearer Established

UE Info

IMEI: ---

IMSI: ---

UE IPv4 Address [0]: ---

UE IPv6 Prefix [0]: ---

Connection Setup

Scheduling: **RMC**

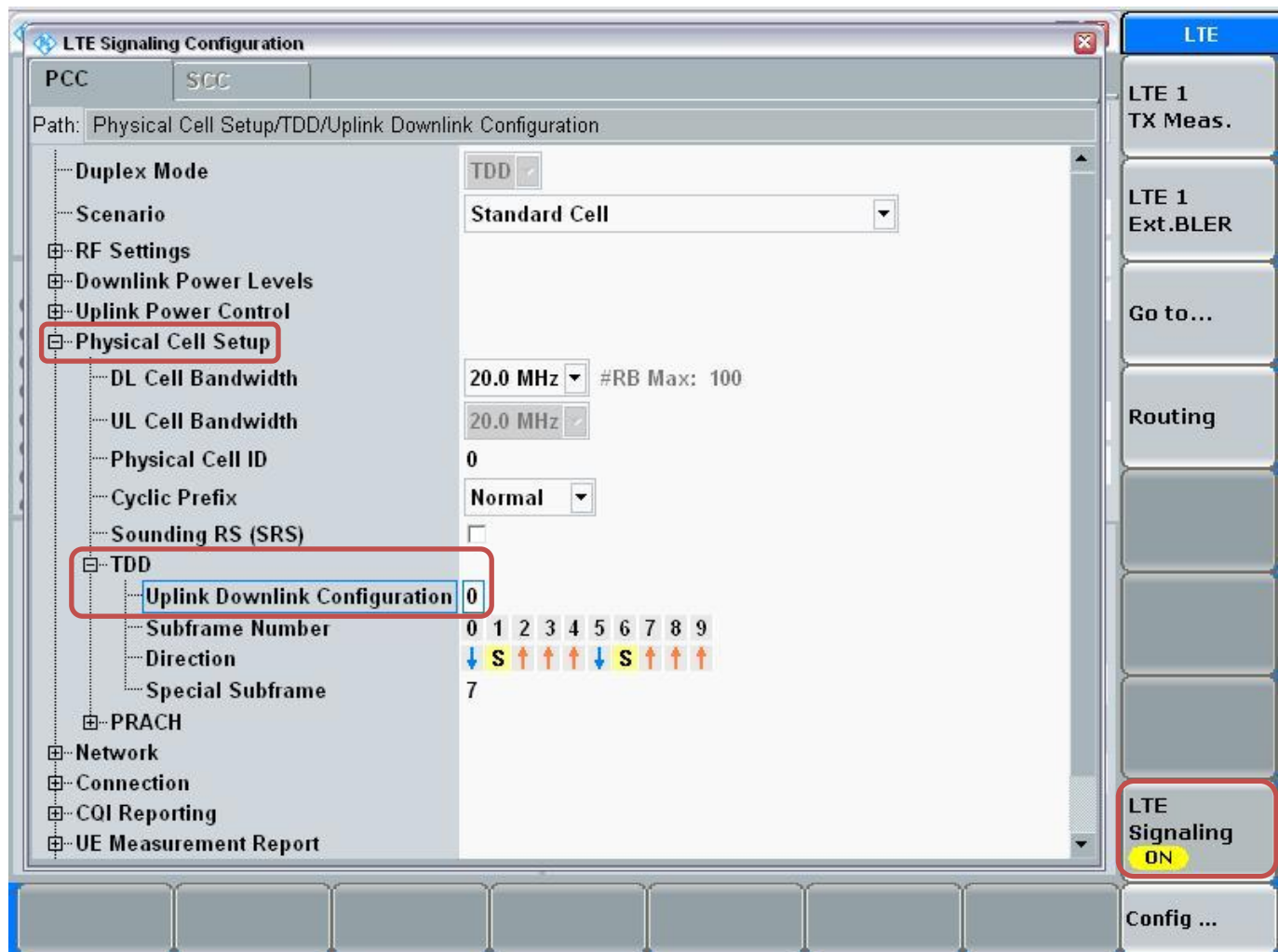
	Downlink	Uplink
Operating Band	Band 41	TDD
Channel	40620 Ch	40620 Ch
Frequency	2593.0 MHz	2593.0 MHz
Cell Bandwidth	20.0 MHz	20.0 MHz
RS EPRE	-85.8 dBm/15kHz	
Full Cell BW Pow.	-55.0 dBm	
PUSCH Open Loop Nom.Power		23 dBm
PUSCH Closed Loop Target Power		23.0 dBm
# RB	100	100
RB Pos./Start RB	low	low
Modulation	QPSK	QPSK
TBS Idx / Value	5 / 8760	2 / 4584
Throughput	3.970 Mbit/s	1.834 Mbit/s

LTE Signaling
OFF

Config ...

Go to "Physical Cell Setup"

- Select "TDD" and Set "Uplink Downlink Configuration" to "0"
- Turn the cell on using "ON | OFF" key



Connect to EUT

- Turn the cell on using "ON | OFF" key
- After EUT is Attached
- Select "Connect"

LTE Signaling 1 - X3.2.10.6

Connection Status

Cell 

Packet Switched 

RRC State 

Attached

Event Log

03:31:31 State 'Attached'

03:31:31 EPS Default Bearer Established

03:31:31 RRC Connection Established

03:31:02 State 'Cell On'

03:31:00 State 'Cell Off'

03:30:23 State 'Cell On'

03:30:22 Signaling Failure

03:30:19 Network Originated Detach

UE Info

IMEI 001027009999998

IMSI 001010123456789

UE IPv4 Address [0] 192.168.48.129

UE IPv6 Prefix [0] fc01:abab:cdcd:efe0::

PCC

Operating Band **Band 41** TDD

Channel **40620 Ch** **40620 Ch**

Frequency **2593.0 MHz** **2593.0 MHz**

Cell Bandwidth **20.0 MHz** **20.0 MHz**

RS EPRE **-85.8 dBm/15kHz**

Full Cell BW Pow. **-55.0 dBm**

PUSCH Open Loop Nom.Power **23 dBm**

PUSCH Closed Loop Target Power **23.0 dBm**

Connection Setup

Scheduling **RMC**

RB **100** **100**

RB Pos./Start RB **low** 0 **low** 0

Modulation **QPSK** **QPSK**

TBS Idx / Value **5** 8760 **2** 4584

Throughput **3.970 Mbit/s** **1.834 Mbit/s**

LTE

LTE 1 TX Meas.

LTE 1 Ext.BLER

Go to...

Routing

LTE Signaling ON

Detach **Connect** **Send SMS** **Handover ...** **Config ...**

Max Power Setting

- Select "LTE 1 TX Meas."
- Press "RESTART | STOP" Soft key

LTE Signaling 1 - X3.2.10.6

Connection Status

Cell: Connection Established

Packet Switched: Connection Established

RRC State: Connected

Event Log

03:33:07 [i] State 'Connection Established'

03:33:07 [i] EPS Dedicated Bearer Established

03:31:31 [i] State 'Attached'

03:31:31 [i] EPS Default Bearer Established

03:31:31 [i] RRC Connection Established

03:31:02 [i] State 'Cell On'

03:31:00 [i] State 'Cell Off'

03:30:23 [i] State 'Cell On'

UE Info

IMEI: 001027009999998

IMSI: 001010123456789

UE IPv4 Address [0]: 192.168.48.129

UE IPv6 Prefix [0]: fc01:abab:cdcd:efe0::

Connection Setup

Scheduling: RMC

Operating Band: Band 41 **TDD**

Channel: 40620 Ch **Downlink** 40620 Ch **Uplink**

Frequency: 2593.0 MHz **Downlink** 2593.0 MHz **Uplink**

Cell Bandwidth: 20.0 MHz **Downlink** 20.0 MHz **Uplink**

RS EPRE: -85.8 dBm/15kHz

Full Cell BW Pow.: -55.0 dBm

PUSCH Open Loop Nom.Power: 23 dBm

PUSCH Closed Loop Target Power: 23.0 dBm

RB: 100 **Downlink** 100 **Uplink**

RB Pos./Start RB: low 0 low 0

Modulation: QPSK QPSK

TBS Idx / Value: 5 8760 2 4584

Throughput: 3.970 Mbit/s 1.834 Mbit/s

LTE 1 TX Meas.

LTE 1 Ext.BLER

Go to...

Routing

LTE Signaling ON

Detach **Disconnect** **Send SMS** **Handover ...** **Config ...**

Select "Signaling Parameter"

- Select "TX Power Control (TPC)" > Select "Active TPC Setup" to "Max Power" > Set "Closed Loop Target Power" to "23 dBm"

The screenshot displays the 'LTE Measurement - X3.2.10.6 - TX Measurement' software interface. The main window shows various measurement plots: EVM, Inband Emissions, Equalizer Spectrum Flatness, Spectrum ACLR, and Spectrum. A 'Signaling TPC' dialog box is open, showing the 'TX Power Control (TPC)' settings. The 'Active TPC Setup' is set to 'Max Power', and the 'Closed Loop Target Power' is set to '23.0 dBm'. The 'Signaling Parameter' button is highlighted in blue. The interface also includes a 'Multi Evaluation' button, 'PRACH' and 'SRS' tabs, and a 'LTE' button. The bottom status bar shows 'Cell Setup ...', 'Connection Setup ...', 'DL Error Insertion ...', 'TPC ...', 'Power ...', 'Enable ...', and 'Config ...'.

Mode: TDD Freq.: 2593.0 MHz Ref. Level: 44.80 dBm Bandwidth: 20.0 MHz Cyclic Prefix: Normal Meas Subfr.: 0

Multi Evaluation RUN

RF Settings

Trigger

Display

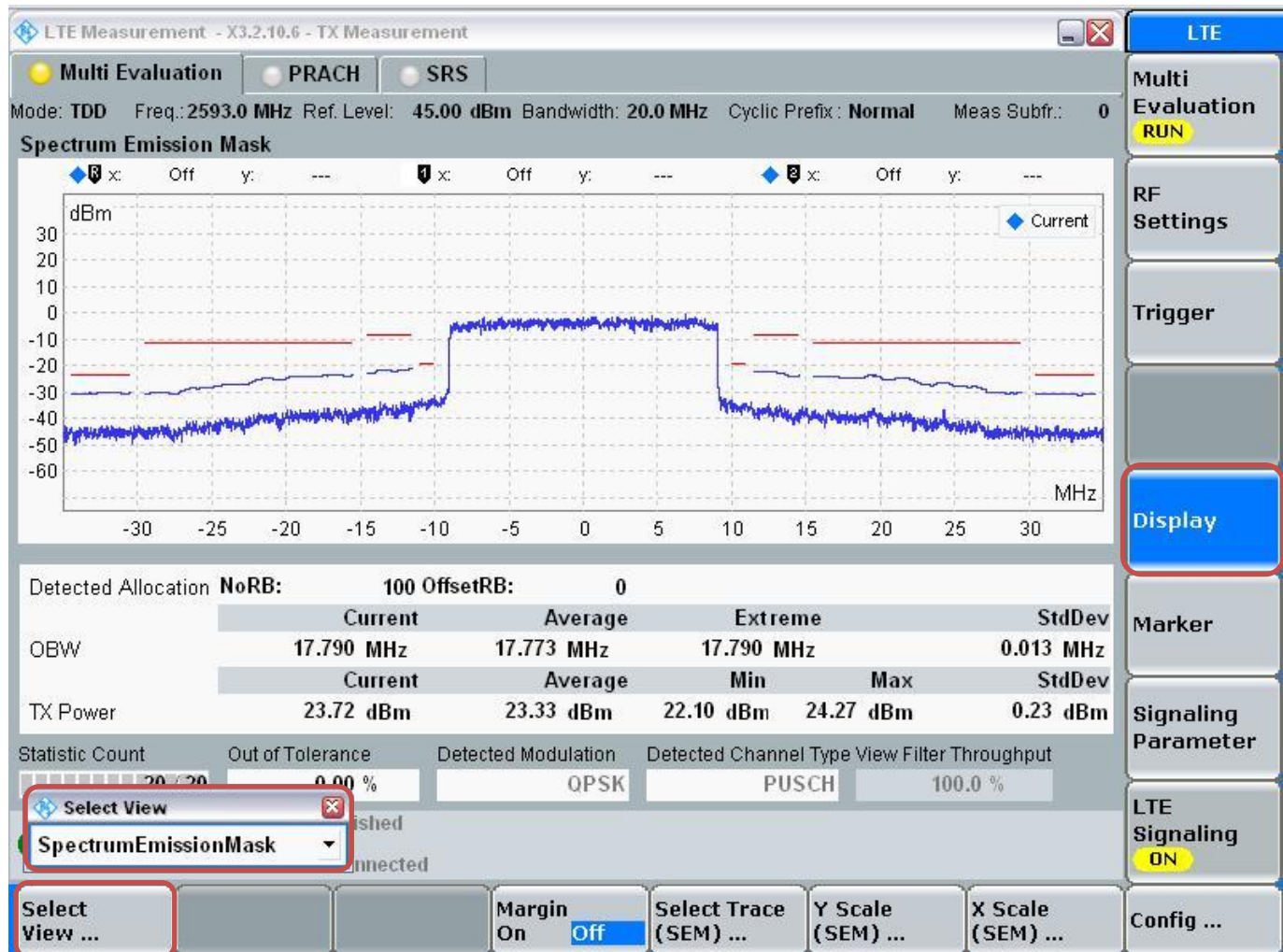
Signaling Parameter

LTE Signaling ON

Cell Setup ... Connection Setup ... DL Error Insertion ... TPC ... Power ... Enable ... Config ...

View TX Power

- Go to "Display"
- Select "Select View..."
- Select "Spectrum Emission Mask"



LTE Band 41 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)				
							2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz
LTE Band 41	20	QPSK	1	0	0	0	23.1	22.9	23.0	23.0	22.9
			1	49	0	0	23.0	23.0	23.0	22.9	22.8
			1	99	0	0	22.9	22.9	23.1	23.0	22.8
			50	0	1	1	22.2	22.1	22.1	22.2	22.1
			50	24	1	1	22.1	22.1	22.1	22.1	22.0
			50	50	1	1	22.0	22.0	22.2	22.1	21.9
			100	0	1	1	22.1	22.1	22.1	22.2	22.1
		16QAM	1	0	1	1	21.9	21.8	22.2	21.8	21.8
			1	49	1	1	21.9	21.8	22.2	21.8	21.7
			1	99	1	1	21.7	21.7	22.2	21.9	21.6
			50	0	2	2	21.3	21.1	21.1	21.2	21.2
			50	24	2	2	21.2	21.2	21.1	21.1	20.9
			50	50	2	2	21.1	21.4	21.2	21.1	20.9
			100	0	2	2	21.1	21.1	21.1	21.2	20.9
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)				
							2503.5 MHz	2548.3 MHz	2593 MHz	2637.8 MHz	2682.5 MHz
LTE Band 41	15	QPSK	1	0	0	0	23.2	22.9	23.0	23.1	22.8
			1	36	0	0	23.2	22.9	23.1	23.1	22.8
			1	74	0	0	23.1	22.8	23.1	23.1	22.8
			36	0	1	1	22.1	22.1	22.0	22.1	22.1
			36	18	1	1	22.1	22.1	22.1	22.2	22.0
			36	37	1	1	22.0	22.2	22.2	22.2	22.0
			75	0	1	1	22.1	22.2	22.1	22.2	22.1
		16QAM	1	0	1	1	22.1	21.9	22.3	22.4	22.0
			1	36	1	1	22.0	22.0	22.3	22.4	21.9
			1	74	1	1	21.9	21.9	22.4	22.5	21.9
			36	0	2	2	21.1	21.2	21.0	21.1	21.0
			36	18	2	2	21.1	21.2	21.1	21.1	21.0
			36	37	2	2	21.0	21.2	21.1	21.1	21.0
			75	0	2	2	21.1	21.2	21.2	21.1	21.0
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)				
							2501 MHz	2547 MHz	2593 MHz	2639 MHz	2685 MHz
LTE Band 41	10	QPSK	1	0	0	0	22.8	23.2	23.0	22.7	23.2
			1	25	0	0	22.8	23.2	23.0	22.8	23.2
			1	49	0	0	22.8	23.2	23.0	22.7	23.2
			25	0	1	1	22.1	22.1	22.1	22.1	22.0
			25	12	1	1	22.2	22.0	22.1	22.1	22.1
			25	25	1	1	22.2	22.1	22.1	22.2	22.1
			50	0	1	1	22.2	22.2	22.1	22.2	22.0
		16QAM	1	0	1	1	21.9	22.4	22.3	21.9	22.4
			1	25	1	1	22.0	22.4	22.4	21.9	22.3
			1	49	1	1	21.9	22.4	22.4	21.9	22.3
			25	0	2	2	21.2	21.2	21.0	21.0	21.0
			25	12	2	2	21.1	21.1	21.2	21.0	21.0
			25	25	2	2	21.2	21.2	21.1	21.0	21.0
			50	0	2	2	21.2	21.2	21.1	21.1	21.0

LTE Band 41 Measured Results (Cont.)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)				
							2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz
LTE Band 41	5	QPSK	1	0	0	0	23.2	23.2	23.1	23.1	23.1
			1	12	0	0	23.1	23.1	23.1	23.0	23.1
			1	24	0	0	23.2	23.2	23.2	23.0	23.1
			12	0	1	1	22.2	22.1	22.1	22.1	22.0
			12	6	1	1	22.1	22.0	22.0	22.1	22.1
			12	13	1	1	22.1	22.0	22.1	22.1	22.0
			25	0	1	1	22.1	22.1	22.1	22.1	22.1
		16QAM	1	0	1	1	22.4	21.8	22.3	22.4	21.8
			1	12	1	1	22.4	21.7	22.3	22.4	21.7
			1	24	1	1	22.5	21.8	22.3	22.4	21.8
			12	0	2	2	21.1	21.2	21.2	21.1	21.1
			12	6	2	2	21.1	21.2	21.2	21.0	21.1
			12	13	2	2	21.1	21.2	21.2	21.0	21.1
			25	0	2	2	21.2	21.1	21.1	21.1	21.0

8.4. Wi-Fi (2.4 GHz Band)

Required Test Channels per KDB 248227 D01

Mode	Band	GHz	Channel	"Default Test Channels"	
				802.11b	802.11g
802.11b/g	2.4 GHz	2.412	1 [#]	√	▽
		2.437	6	√	▽
		2.462	11 [#]	√	▽

Notes:

√ = "default test channels"

▽ = possible 802.11g channels with maximum average output $\frac{1}{4}$ dB $\geq$ the "default test channels"

[#] = when output power is reduced for channel 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested.

Measured Results

Band (GHz)	Mode	Mode	No. of Transmitters	Ch #	Freq. (MHz)	Avg Pwr (dBm)		SAR Test (Yes/No)
						ANT 1	ANT 2	
2.4 (DTS)	802.11b	1 Mbps	1 Tx	1	2412	16.7	17.5	Yes
				6	2437	17.5	17.0	
				11	2462	17.0	17.2	
			2 Tx	1	2412	17.2	16.5	Yes
				6	2437	16.0	17.1	
				11	2462	17.3	16.2	
	802.11g	6 Mbps	1 Tx	1	2412	14.4	14.0	No
				6	2437	14.5	14.5	
				11	2462	13.8	14.3	
			2 Tx	1	2412	14.5	14.2	No
				6	2437	13.9	14.5	
				11	2462	13.9	13.5	
	802.11n (HT20)	MCS0	1 Tx	1	2412	12.3	12.0	No
				6	2437	12.5	12.4	
				11	2462	12.5	12.3	
			2 Tx	1	2412	12.1	11.9	No
				6	2437	11.5	12.3	
				11	2462	12.3	12.0	

Note(s):

- Per KDB 248227 D01, SAR is not required for 802.11g/HT20 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels.

Power measurements to determine worst-case data rates

Mode	Ch #	Freq. (MHz)	No. of Transmitters	Data Rate	Avg Pwr (dBm)		SAR test (Yes/No)
					ANT 1	ANT 2	
802.11b	6	2437	2 Tx	1 Mbps	17.5	17.0	Yes
				2 Mbps	17.5	16.9	No
				5.5 Mbps	17.1	16.6	No
				11 Mbps	17.1	16.5	No

8.5. Wi-Fi (5 GHz Bands)

Required Test Channels per KDB 248227 D01

Mode		Band	GHz	Channel	"Default Test Channels"	
					802.11a	
802.11a	UNII (15.407)	5.2 GHz	5.180	36	√	
			5.200	40		*
			2.220	44		*
			5.240	48	√	
		5.3 GHz	5.260	52	√	
			5.280	56		*
			5.300	60		*
			5.320	64	√	
		5.5 GHz	5.500	100		
			5.520	104	√	
			5.540	108		*
			5.560	112		*
			5.580	116	√	
			5.600	120		*
			5.620	124	√	
			5.640	128		*
			5.660	132		*
			5.680	136	√	
			5.700	140		*
	DTS (15.247)	5.8 GHz	5.745	149	√	
			5.765	153		*
			5.785	157	√	
			5.805	161		*
			5.825	165	√	

√ = "default test channels"

* = possible 802.11a channels with maximum average output > the "default test channels"

= when output power is reduced for channel 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested.

Wi-Fi (5 GHz Bands) Measured Results

Band (GHz)	Mode	Mode	No. of Transmitters	Ch #	Freq. (MHz)	Avg Pwr (dBm)		SAR Test (Yes/No)
						ANT 1	ANT 2	
5.2 (UNII)	802.11a	6 Mbps	1 Tx	36	5180	12.0	11.8	Yes
				40	5200	12.0	11.8	
				44	5220	12.0	11.9	
				48	5240	12.1	12.0	
			2 Tx	36	5180	11.8	10.5	Yes
				40	5200	11.8	10.5	
				44	5220	11.8	10.5	
				48	5240	11.9	10.6	
	802.11n (HT20)	MCS0	1 Tx	36	5180	11.7	12.5	No
				40	5200	11.8	12.5	
				48	5240	11.8	11.9	
			2 Tx	36	5180	12.4	10.8	No
				40	5200	12.5	10.8	
				48	5240	12.5	11.0	
	802.11n (HT40)	MCS0	1 Tx	38	5190	12.1	12.0	No
				46	5230	12.1	12.1	
			2 Tx	38	5190	12.5	11.0	No
				46	5230	12.5	11.3	
	802.11ac (20MHz)	MCS0	1 Tx	36	5180	10.0	9.7	Yes
				40	5200	10.1	9.7	
				48	5240	10.1	9.8	
			2 Tx	36	5180	9.9	8.6	Yes
				40	5200	9.8	8.6	
				48	5240	10.0	8.6	
	802.11ac (40MHz)	MCS0	1 Tx	38	5190	10.3	9.9	No
				46	5230	10.3	10.0	
			2 Tx	38	5190	10.1	8.7	No
				46	5230	10.2	8.9	
	802.11ac (80MHz)	MCS0	1 Tx	42	5210	10.0	9.9	No
			2 Tx	42	5210	10.2	9.1	No

Wi-Fi (5 GHz Bands) Measured Results (continued)

Band (GHz)	Mode	Mode	No. of Transmitters	Ch #	Freq. (MHz)	Avg Pwr (dBm)		SAR Test (Yes/No)
						ANT 1	ANT 2	
5.3 (UNII)	802.11a	6 Mbps	1 Tx	52	5260	12.0	12.4	Yes
				56	5280	11.9	12.2	
				60	5300	11.9	12.2	
				64	5320	11.9	12.3	
			2 Tx	52	5260	11.9	11.2	Yes
				56	5280	11.9	11.2	
				60	5300	11.8	11.3	
				64	5320	11.8	11.2	
	802.11n (HT20)	MCS0	1 Tx	52	5260	11.9	12.2	No
				60	5300	11.8	12.2	
				64	5320	11.8	12.2	
			2 Tx	52	5260	12.5	12.0	No
				60	5300	12.4	11.9	
				64	5320	12.4	11.8	
	802.11n (HT40)	MCS0	1 Tx	54	5270	12.1	12.5	No
				62	5310	12.2	12.5	
			2 Tx	54	5270	11.6	11.0	No
				62	5310	12.5	12.0	
	802.11ac (20MHz)	MCS0	1 Tx	52	5260	9.8	10.5	Yes
				60	5300	9.8	10.4	
				64	5320	9.7	10.4	
			2 Tx	52	5260	9.8	9.1	Yes
				60	5300	9.7	9.2	
				64	5320	9.7	9.3	
	802.11ac (40MHz)	MCS0	1 Tx	54	5270	10.0	10.5	No
				62	5310	10.0	10.5	
			2 Tx	54	5270	9.9	9.5	No
				62	5310	9.9	9.4	
	802.11ac (80MHz)	MCS0	1 Tx	58	5290	9.9	10.2	No
			2 Tx	58	5290	10.2	9.5	No

Wi-Fi (5 GHz Bands) Measured Results (continued)

Band (GHz)	Mode	Mode	No. of Transmitters	Ch #	Freq. (MHz)	Avg Pwr (dBm)		SAR Test (Yes/No)
						ANT 1	ANT 2	
5.5 (UNII)	802.11a	6 Mbps	1 Tx	100	5500	12.0	11.9	Yes
				104	5520	11.9	11.9	
				108	5540	11.9	11.8	
				112	5560	11.8	11.7	
				116	5580	11.8	11.7	
				132	5660	12.5	12.5	
				136	5680	12.2	12.3	
				140	5700	12.0	12.1	
			2 Tx	100	5500	12.0	12.0	Yes
				104	5520	11.8	11.8	
				108	5540	11.7	11.7	
				112	5560	11.7	11.6	
				116	5580	11.7	11.6	
				132	5660	12.3	12.4	
				136	5680	12.0	12.2	
				140	5700	11.8	12.2	
	802.11n (HT20)	MCS0	1 Tx	100	5500	11.9	11.8	No
				116	5580	12.5	12.5	
				140	5700	12.0	12.1	
			2 Tx	100	5500	11.6	11.6	No
				116	5580	12.2	12.2	
				140	5700	11.6	11.8	
	802.11n (HT40)	MCS0	1 Tx	102	5510	12.2	12.2	No
				110	5550	12.1	12.0	
				134	5670	12.5	12.5	
			2 Tx	102	5510	11.5	11.7	No
				110	5550	12.4	12.5	
				134	5670	11.9	12.1	
	802.11ac (20MHz)	MCS0	1 Tx	100	5500	9.8	10.0	Yes
				116	5580	9.8	9.7	
				144	5720	10.0	10.1	
			2 Tx	100	5500	9.8	10.0	Yes
				116	5580	9.8	9.7	
				144	5720	10.0	10.2	
	802.11ac (40MHz)	MCS0	1 Tx	102	5510	10.3	10.2	No
				110	5550	10.1	10.1	
				142	5710	10.2	10.5	
			2 Tx	102	5510	10.1	10.2	No
				110	5550	9.9	10.0	
				142	5710	10.1	10.3	
	802.11ac (80MHz)	MCS0	1 Tx	106	5530	10.0	9.8	No
				138	5690	10.2	10.2	
			2 Tx	106	5530	10.3	10.2	No
				138	5690	10.4	10.5	

Wi-Fi (5 GHz Bands) Measured Results (continued)

Band (GHz)	Mode	Mode	No. of Transmitters	Ch #	Freq. (MHz)	Avg Pwr (dBm)		SAR Test (Yes/No)
						ANT 1	ANT 2	
5.8 (UNII)	802.11a	6 Mbps	1 Tx	149	5745	12.5	12.3	Yes
				153	5765	12.3	12.1	
				157	5785	12.1	12.0	
				161	5805	11.9	12.0	
				165	5825	11.7	11.8	
			2 Tx	149	5745	11.5	12.2	Yes
				153	5765	11.4	12.1	
				157	5785	11.2	12.0	
				161	5805	10.9	11.9	
				165	5825	10.8	11.8	
	802.11n (HT20)	MCS0	1 Tx	149	5745	12.4	12.0	No
				157	5785	12.0	12.0	
				161	5805	11.8	11.8	
			2 Tx	149	5745	11.2	11.7	No
				157	5785	11.7	12.5	
				161	5805	11.5	12.5	
	802.11n (HT40)	MCS0	1 Tx	151	5755	11.7	12.4	No
				159	5795	12.4	12.3	
			2 Tx	151	5755	11.2	12.0	No
				159	5795	10.9	11.8	
	802.11ac (20MHz)	MCS0	1 Tx	149	5745	10.4	10.2	Yes
				157	5785	10.1	10.0	
				165	5825	9.8	9.9	
			2 Tx	149	5745	9.4	10.1	Yes
				157	5785	9.0	10.0	
				165	5825	8.7	9.8	
	802.11ac (40MHz)	MCS0	1 Tx	151	5755	9.7	10.5	No
				159	5795	10.4	10.3	
			2 Tx	151	5755	9.7	10.5	No
				159	5795	9.2	10.3	
	802.11ac (80MHz)	MCS0	1 Tx	155	5775	10.4	10.1	No
			2 Tx	155	5775	9.7	10.3	No

Note(s):

Per KDB 248227, SAR is not required for 802.11n HT20/HT40 and 802.11ac VHT40/VHT80 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a channels.

Power measurements to determine worst-case data rates

Band	No. of Transmitters	Ch #	Freq. (MHz)	Data Rate	Avg Pwr (dBm)		SAR test (Yes/No)
					ANT 1	ANT 2	
5.2 GHz (UNII)	2 Tx	36	5180	6 Mbps	12.0	11.8	Yes
				9 Mbps	11.7	11.5	No
				12 Mbps	11.6	11.4	No
				18 Mbps	11.3	11.1	No
				24 Mbps	11.3	11.0	No
				36 Mbps	10.8	10.6	No
				48 Mbps	10.6	10.5	No
				54 Mbps	10.4	10.2	No
5.3 GHz (UNII)	2 Tx	56	5280	6 Mbps	12.0	12.4	Yes
				9 Mbps	11.8	12.1	No
				12 Mbps	11.7	12.0	No
				18 Mbps	11.4	11.7	No
				24 Mbps	11.4	11.7	No
				36 Mbps	11.0	11.4	No
				48 Mbps	10.7	11.0	No
				54 Mbps	10.5	10.9	No
5.5 GHz (UNII)	2 Tx	116	5580	6 Mbps	12.0	11.9	Yes
				9 Mbps	11.7	11.6	No
				12 Mbps	11.7	11.5	No
				18 Mbps	11.4	11.2	No
				24 Mbps	11.3	11.2	No
				36 Mbps	10.9	10.8	No
				48 Mbps	10.6	10.5	No
				54 Mbps	10.5	10.4	No
5.8 GHz (UNII)	2 Tx	149	5745	6 Mbps	12.5	12.3	Yes
				9 Mbps	12.4	11.9	No
				12 Mbps	12.3	11.8	No
				18 Mbps	12.1	11.6	No
				24 Mbps	12.0	11.5	No
				36 Mbps	11.6	11.1	No
				48 Mbps	11.2	10.9	No
				54 Mbps	11.0	10.7	No

8.6. Bluetooth

Maximum tune-up tolerance limit is 8.5 dBm from the rated nominal maximum output power. This power level qualifies for exclusion of SAR testing.

9. 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.

9.1. 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

9.2. Dielectric Property Measurements Results

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

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

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

SAR Lab 4

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit $\pm$ (%)
7/24/2014	Head 2600	e'	38.5500	Relative Permittivity (ϵ_r):	38.55	39.01	-1.18	5
		e''	13.3400	Conductivity (σ):	1.93	1.96	-1.71	5
	Head 2500	e'	38.8400	Relative Permittivity (ϵ_r):	38.84	39.14	-0.76	5
		e''	13.0500	Conductivity (σ):	1.81	1.85	-2.16	5
	Head 2700	e'	38.2100	Relative Permittivity (ϵ_r):	38.21	38.88	-1.74	5
		e''	13.6000	Conductivity (σ):	2.04	2.07	-1.38	5
7/24/2014	Body 2600	e'	50.1400	Relative Permittivity (ϵ_r):	50.14	52.51	-4.51	5
		e''	14.7700	Conductivity (σ):	2.14	2.16	-1.18	5
	Body 2500	e'	50.3600	Relative Permittivity (ϵ_r):	50.36	52.64	-4.33	5
		e''	14.4700	Conductivity (σ):	2.01	2.02	-0.44	5
	Body 2700	e'	49.8400	Relative Permittivity (ϵ_r):	49.84	52.38	-4.86	5
		e''	15.0200	Conductivity (σ):	2.25	2.30	-2.02	5

SAR Lab 5

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/18/2014	Head 835	e'	41.9500	Relative Permittivity (ε _r):	41.95	41.50	1.08	5
		e"	19.9100	Conductivity (σ):	0.92	0.90	2.71	5
	Head 820	e'	42.0900	Relative Permittivity (ε _r):	42.09	41.60	1.17	5
		e"	19.9600	Conductivity (σ):	0.91	0.90	1.29	5
	Head 850	e'	41.7900	Relative Permittivity (ε _r):	41.79	41.50	0.70	5
		e"	19.8600	Conductivity (σ):	0.94	0.92	2.58	5
7/18/2014	Body 835	e'	53.5600	Relative Permittivity (ε _r):	53.56	55.20	-2.97	5
		e"	21.8700	Conductivity (σ):	1.02	0.97	4.68	5
	Body 820	e'	53.7200	Relative Permittivity (ε _r):	53.72	55.28	-2.82	5
		e"	21.9400	Conductivity (σ):	1.00	0.97	3.29	5
	Body 850	e'	53.4000	Relative Permittivity (ε _r):	53.40	55.16	-3.19	5
		e"	21.8000	Conductivity (σ):	1.03	0.99	4.37	5
7/18/2014	Body 1900	e'	51.2400	Relative Permittivity (ε _r):	51.24	53.30	-3.86	5
		e"	14.5500	Conductivity (σ):	1.54	1.52	1.13	5
	Body 1850	e'	51.4000	Relative Permittivity (ε _r):	51.40	53.30	-3.56	5
		e"	14.4600	Conductivity (σ):	1.49	1.52	-2.14	5
	Body 1910	e'	51.2100	Relative Permittivity (ε _r):	51.21	53.30	-3.92	5
		e"	14.5700	Conductivity (σ):	1.55	1.52	1.80	5
7/18/2014	Head 1900	e'	38.9900	Relative Permittivity (ε _r):	38.99	40.00	-2.53	5
		e"	13.4000	Conductivity (σ):	1.42	1.40	1.12	5
	Head 1850	e'	39.1800	Relative Permittivity (ε _r):	39.18	40.00	-2.05	5
		e"	13.3200	Conductivity (σ):	1.37	1.40	-2.13	5
	Head 1910	e'	38.9500	Relative Permittivity (ε _r):	38.95	40.00	-2.62	5
		e"	13.4200	Conductivity (σ):	1.43	1.40	1.80	5

SAR Lab 5 (continued)

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
7/21/2014	Body 1900	e'	52.1900	Relative Permittivity (ϵ_r):	52.19	53.30	-2.08	5
		e''	14.2100	Conductivity (σ):	1.50	1.52	-1.23	5
	Body 1850	e'	52.3200	Relative Permittivity (ϵ_r):	52.32	53.30	-1.84	5
		e''	14.0700	Conductivity (σ):	1.45	1.52	-4.78	5
	Body 1910	e'	52.1400	Relative Permittivity (ϵ_r):	52.14	53.30	-2.18	5
		e''	14.2200	Conductivity (σ):	1.51	1.52	-0.65	5
7/21/2014	Body 2450	e'	50.3500	Relative Permittivity (ϵ_r):	50.35	52.70	-4.46	5
		e''	14.5500	Conductivity (σ):	1.98	1.95	1.65	5
	Body 2410	e'	50.4600	Relative Permittivity (ϵ_r):	50.46	52.76	-4.36	5
		e''	14.4800	Conductivity (σ):	1.94	1.91	1.72	5
	Body 2475	e'	50.2900	Relative Permittivity (ϵ_r):	50.29	52.67	-4.52	5
		e''	14.6100	Conductivity (σ):	2.01	1.99	1.28	5
7/22/2014	Head 2450	e'	38.3400	Relative Permittivity (ϵ_r):	38.34	39.20	-2.19	5
		e''	12.8800	Conductivity (σ):	1.75	1.80	-2.52	5
	Head 2410	e'	38.5100	Relative Permittivity (ϵ_r):	38.51	39.28	-1.96	5
		e''	12.7700	Conductivity (σ):	1.71	1.76	-2.80	5
	Head 2475	e'	38.2600	Relative Permittivity (ϵ_r):	38.26	39.17	-2.32	5
		e''	12.9500	Conductivity (σ):	1.78	1.83	-2.46	5
7/23/2014	Head 5180	e'	37.0500	Relative Permittivity (ϵ_r):	37.05	36.01	2.88	5
		e''	15.5700	Conductivity (σ):	4.48	4.63	-3.15	5
	Head 5200	e'	37.0300	Relative Permittivity (ϵ_r):	37.03	35.99	2.89	5
		e''	15.5800	Conductivity (σ):	4.50	4.65	-3.14	5
	Head 5600	e'	36.3500	Relative Permittivity (ϵ_r):	36.35	35.53	2.30	5
		e''	15.7100	Conductivity (σ):	4.89	5.06	-3.33	5
	Head 5800	e'	35.9800	Relative Permittivity (ϵ_r):	35.98	35.30	1.93	5
		e''	15.8800	Conductivity (σ):	5.12	5.27	-2.82	5
	Head 5825	e'	35.9200	Relative Permittivity (ϵ_r):	35.92	35.30	1.76	5
		e''	15.9000	Conductivity (σ):	5.15	5.27	-2.28	5
7/23/2014	Body 5180	e'	47.6900	Relative Permittivity (ϵ_r):	47.69	49.05	-2.77	5
		e''	17.8900	Conductivity (σ):	5.15	5.27	-2.25	5
	Body 5200	e'	47.6600	Relative Permittivity (ϵ_r):	47.66	49.02	-2.77	5
		e''	17.9100	Conductivity (σ):	5.18	5.29	-2.20	5
	Body 5600	e'	46.9800	Relative Permittivity (ϵ_r):	46.98	48.48	-3.09	5
		e''	18.2400	Conductivity (σ):	5.68	5.76	-1.41	5
	Body 5800	e'	46.6000	Relative Permittivity (ϵ_r):	46.60	48.20	-3.32	5
		e''	18.4800	Conductivity (σ):	5.96	6.00	-0.67	5
	Body 5825	e'	46.5400	Relative Permittivity (ϵ_r):	46.54	48.20	-3.44	5
		e''	18.5100	Conductivity (σ):	6.00	6.00	-0.08	5
7/29/2014	Head 5180	e'	36.7300	Relative Permittivity (ϵ_r):	36.73	36.01	1.99	5
		e''	16.0300	Conductivity (σ):	4.62	4.63	-0.29	5
	Head 5200	e'	36.6800	Relative Permittivity (ϵ_r):	36.68	35.99	1.92	5
		e''	16.0400	Conductivity (σ):	4.64	4.65	-0.28	5
	Head 5600	e'	36.1000	Relative Permittivity (ϵ_r):	36.10	35.53	1.59	5
		e''	16.1200	Conductivity (σ):	5.02	5.06	-0.81	5
	Head 5800	e'	35.8200	Relative Permittivity (ϵ_r):	35.82	35.30	1.47	5
		e''	16.2000	Conductivity (σ):	5.22	5.27	-0.86	5
	Head 5825	e'	35.7900	Relative Permittivity (ϵ_r):	35.79	35.30	1.39	5
		e''	16.2100	Conductivity (σ):	5.25	5.27	-0.38	5

SAR Lab 5 (continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/29/2014	Body 5180	e'	47.3200	Relative Permittivity (ϵ_r):	47.32	49.05	-3.52	5
		e"	18.7100	Conductivity (σ):	5.39	5.27	2.23	5
	Body 5200	e'	47.2800	Relative Permittivity (ϵ_r):	47.28	49.02	-3.55	5
		e"	18.7300	Conductivity (σ):	5.42	5.29	2.28	5
	Body 5600	e'	46.6000	Relative Permittivity (ϵ_r):	46.60	48.48	-3.87	5
		e"	18.9300	Conductivity (σ):	5.89	5.76	2.31	5
	Body 5800	e'	46.2800	Relative Permittivity (ϵ_r):	46.28	48.20	-3.98	5
		e"	19.0800	Conductivity (σ):	6.15	6.00	2.55	5
	Body 5825	e'	46.2800	Relative Permittivity (ϵ_r):	46.28	48.20	-3.98	5
		e"	19.1500	Conductivity (σ):	6.20	6.00	3.37	5

10. 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 remeasured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

10.1. 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	4d002	9/15/2013	835	1g	9.49	9.43
				10g	6.18	6.21
D1900V2	5d043	11/12/2013	1900	1g	40.1	39.0
				10g	21.1	20.8
D2450V2	899	9/10/2013	2450	1g	51.3	49.7
				10g	23.9	23.3
D2600V2	1006	9/11/2013	2600	1g	56.5	55.7
				10g	25.2	24.8
D5GHzV2	1138	11/19/2013	5200	1g	78.5	72.9
				10g	22.5	20.4
			5600	1g	82.7	78.3
				10g	23.5	21.7
			5800	1g	78.3	72.8
				10g	22.4	20.1

10.2. 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 4

Date Tested	System Dipole		T.S. Liquid	Measured Results			Target (Ref. Value)	Delta $\pm 10\%$	Est./Zoom Ratio	Plot No.
	Type	Serial #		Area Scan	Zoom Scan	Normalize to 1 W				
7/24/2014	D2600V2	1006	Head	1g	5.89	5.72	57.2	56.50	1.24	2.89
				10g	2.64	2.54	25.4	25.20	0.79	
7/24/2014	D2600V2	1006	Body	1g	5.82	5.61	56.1	55.70	0.72	3.61
				10g	2.52	2.47	24.7	24.80	-0.40	

SAR Lab 5

Date Tested	System Dipole		T.S. Liquid	Measured Results			Target (Ref. Value)	Delta $\pm 10\%$	Est./Zoom Ratio	Plot No.
	Type	Serial #		Area Scan	Zoom Scan	Normalize to 1 W				
7/18/2014	D835V2	4d002	Head	1g	0.94	0.91	9.1	9.49	-3.79	2.67
				10g	0.62	0.57	5.7	6.18	-8.41	
7/18/2014	D835V2	4d002	Body	1g	0.98	0.93	9.3	9.43	-0.95	4.40
				10g	0.63	0.58	5.8	6.21	-6.28	
7/18/2014	D1900V2	5d043	Head	1g	3.77	3.76	37.6	40.10	-6.23	0.27
				10g	1.98	1.96	19.6	21.10	-7.11	
7/18/2014	D1900V2	5d043	Body	1g	4.21	4.18	41.8	39.00	7.18	0.71
				10g	2.13	2.18	21.8	20.80	4.81	
7/22/2014	D1900V2	5d043	Body	1g	4.27	4.25	42.5	39.00	8.97	0.47
				10g	2.13	2.22	22.2	20.80	6.73	
7/21/2014	D2450V2	899	Body	1g	5.24	5.24	52.4	49.70	5.43	0.00
				10g	2.26	2.41	24.1	23.30	3.43	
7/22/2014	D2450V2	899	Head	1g	5.45	5.32	53.2	51.30	3.70	2.39
				10g	2.35	2.42	24.2	23.90	1.26	
7/23/2014	D5GHzV2 (5200)	1138	Head	1g	7.61	8.23	82.3	78.50	4.84	-8.15
				10g	2.20	2.37	23.7	22.50	5.33	
7/23/2014	D5GHzV2 (5200)	1138	Body	1g	7.79	7.92	79.2	72.90	8.64	-1.67
				10g	2.14	2.24	22.4	20.40	9.80	
7/23/2014	D5GHzV2 (5600)	1138	Head	1g	8.19	8.70	87.0	82.70	5.20	-6.23
				10g	2.30	2.49	24.9	23.50	5.96	
7/23/2014	D5GHzV2 (5600)	1138	Body	1g	7.95	8.30	83.0	78.30	6.00	-4.40
				10g	2.19	2.30	23.0	21.70	5.99	
7/23/2014	D5GHzV2 (5800)	1138	Head	1g	7.18	7.83	78.3	78.30	0.00	-9.05
				10g	2.04	2.23	22.3	22.40	-0.45	
7/23/2014	D5GHzV2 (5800)	1138	Body	1g	6.66	6.98	69.8	72.80	-4.12	-4.80
				10g	1.84	1.96	19.6	20.10	-2.49	
7/29/2014	D5GHzV2 (5200)	1138	Body	1g	7.49	7.75	77.5	72.9	6.31	-3.47
				10g	2.06	2.18	21.8	20.4	6.86	
7/29/2014	D5GHzV2 (5200)	1138	Head	1g	7.63	8.25	82.5	78.30	5.36	-8.13
				10g	2.19	2.37	23.7	22.40	5.80	
7/29/2014	D5GHzV2 (5600)	1138	Body	1g	8.09	8.34	83.4	78.3	6.51	-3.09
				10g	2.20	2.31	23.1	21.7	6.45	
7/29/2014	D5GHzV2 (5600)	1138	Head	1g	8.14	8.86	88.6	82.7	7.13	-8.85
				10g	2.29	2.52	25.2	23.5	7.23	
7/29/2014	D5GHzV2 (5800)	1138	Body	1g	6.78	7.18	71.8	72.8	-1.37	-5.90
				10g	1.84	2.00	20.0	20.1	-0.50	
7/29/2014	D5GHzV2 (5800)	1138	Head	1g	7.24	7.95	79.5	78.3	1.53	-9.81
				10g	2.04	2.26	22.6	22.4	0.89	

11. 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 648474 D04 Handset SAR:

With headset attached, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

KDB 941225 D01 SAR test for 3G devices:

Body SAR is also measured for HSPA when the maximum average output of each RF channel with HSPA active is at least $\frac{1}{4}$ dB higher than that measured without HSPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is above 75% of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2.

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 Measurements Procedures for 802.11 a/b/g Transmitters v01r02 (pg.6):

Each channel should be tested at the lowest data rate in each a-b/g mode or 4.9 GHz channel BW configuration.

When the extrapolated maximum peak SAR for the maximum output channel is ≤ 1.6 W/kg and the 1-g averaged SAR is ≤ 0.8 W/kg, testing of other channels in the "default test channels" or "required test channels" configuration is optional.

April 2013 TCB Workshop Updates:

Apply usual 802.11 test exclusion considerations, but include 802.11ac SAR for highest 802.11a configuration in each frequency band and each exposure condition.

11.1. GSM850

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Voice	0	Left Touch	190	836.6	33.0	33.0	0.177	0.177	1
			Left Tilt	190	836.6	33.0	33.0	0.094	0.094	
			Right Touch	190	836.6	33.0	33.0	0.136	0.136	
			Right Tilt	190	836.6	33.0	33.0	0.070	0.070	
Head VoIP	GPRS 4 Slots	0	Left Touch	190	836.6	28.5	27.7	0.209	0.251	2
			Left Tilt	190	836.6	28.5	27.7	0.121	0.145	
			Right Touch	190	836.6	28.5	27.7	0.167	0.201	
			Right Tilt	190	836.6	28.5	27.7	0.092	0.111	
Body-worn	Voice	10	Rear	190	836.6	33.0	33.0	0.317	0.317	3
			Front	190	836.6	33.0	33.0	0.302	0.302	
Body-worn(VoIP) & Hotspot	GPRS 4 Slots	10	Rear	190	836.6	28.5	27.7	0.471	0.566	
Front			190	836.6	28.5	27.7	0.485	0.583	4	
Hotspot			Edge 2	190	836.6	28.5	27.7	0.202	0.243	
			Edge 3	190	836.6	28.5	27.7	0.304	0.365	
			Edge 4	190	836.6	28.5	27.7	0.279	0.335	

11.2. GSM1900

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Voice	0	Left Touch	661	1880.0	30.0	29.7	0.226	0.242	
			Left Tilt	661	1880.0	30.0	29.7	0.264	0.283	5
			Right Touch	661	1880.0	30.0	29.7	0.205	0.220	
			Right Tilt	661	1880.0	30.0	29.7	0.204	0.219	
Head VoIP	GPRS 3 Slots	0	Left Touch	661	1880.0	26.0	25.3	0.241	0.283	
			Left Tilt	661	1880.0	26.0	25.3	0.276	0.324	
			Right Touch	661	1880.0	26.0	25.3	0.317	0.372	6
			Right Tilt	661	1880.0	26.0	25.3	0.273	0.321	
Body-worn	Voice	10	Rear	661	1880.0	30.0	29.7	0.299	0.320	
			Front	661	1880.0	30.0	29.7	0.325	0.348	7
Body-worn(VoIP) & Hotspot	GPRS 3 Slots	10	Rear	661	1880.0	26.0	25.3	0.381	0.448	
Front			661	1880.0	26.0	25.3	0.387	0.455		
Hotspot			Edge 2	661	1880.0	26.0	25.3	0.068	0.080	
			Edge 3	512	1850.2	26.0	25.4	0.625	0.718	
				661	1880.0	26.0	25.3	0.643	0.755	
				810	1909.8	26.0	25.2	0.668	0.803	8
			Edge 4	661	1880.0	26.0	25.3	0.083	0.098	

11.3. W-CDMA Band V

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Rel 99 RMC	0	Left Touch	4183	836.6	23.5	22.9	0.124	0.142	9
			Left Tilt	4183	836.6	23.5	22.9	0.070	0.080	
			Right Touch	4183	836.6	23.5	22.9	0.113	0.130	
			Right Tilt	4183	836.6	23.5	22.9	0.071	0.082	
Body-worn & Hotspot	Rel 99 RMC	10	Rear	4183	836.6	23.5	22.9	0.304	0.349	10
			Front	4183	836.6	23.5	22.9	0.303	0.348	
Hotspot	Rel 99 RMC	10	Edge 2	4183	836.6	23.5	22.9	0.190	0.218	
			Edge 3	4183	836.6	23.5	22.9	0.060	0.069	
			Edge 4	4183	836.6	23.5	22.9	0.255	0.293	

11.4. W-CDMA Band II

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Rel 99 RMC	0	Left Touch	9400	1880.0	23.5	23.1	0.432	0.474	11
			Left Tilt	9400	1880.0	23.5	23.1	0.556	0.610	
			Right Touch	9400	1880.0	23.5	23.1	0.421	0.462	
			Right Tilt	9400	1880.0	23.5	23.1	0.465	0.510	
Body-worn & Hotspot	Rel 99 RMC	10	Rear	9400	1880.0	23.5	23.1	0.569	0.624	12
			Front	9400	1880.0	23.5	23.1	0.376	0.412	
Hotspot	Rel 99 RMC	10	Edge 2	9400	1880.0	23.5	23.1	0.101	0.111	13
			Edge 3	9262	1852.4	23.5	23.2	0.926	0.992	
				9400	1880.0	23.5	23.1	0.971	1.065	
				9538	1907.6	23.5	23.1	0.877	0.962	
			Edge 4	9400	1880.0	23.5	23.1	0.142	0.156	

11.5. LTE Band 41 (20MHz Bandwidth)

RF Exposure Conditions	Mode	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	
Head	QPSK	0	Left Touch	40620	2593.0	1	99	23.5	23.1	0.473	0.519	14
						50	50	22.5	22.2	0.439	0.470	
			Left Tilt	40620	2593.0	1	99	23.5	23.1	0.339	0.372	
						50	50	22.5	22.2	0.307	0.329	
			Right Touch	40620	2593.0	1	99	23.5	23.1	0.288	0.316	
						50	50	22.5	22.2	0.248	0.266	
			Right Tilt	40620	2593.0	1	99	23.5	23.1	0.103	0.113	
						50	50	22.5	22.2	0.094	0.101	
Body-worn & Hotspot	QPSK	10	Rear	40620	2593.0	1	99	23.5	23.1	0.153	0.168	
						50	50	22.5	22.2	0.133	0.143	
			Front	40620	2593.0	1	99	23.5	23.1	0.179	0.196	15
						50	50	22.5	22.2	0.155	0.166	
Hotspot	QPSK	10	Edge 2	40620	2593.0	1	99	23.5	23.1	0.089	0.098	
						50	50	22.5	22.2	0.079	0.085	
			Edge 3	40620	2593.0	1	99	23.5	23.1	0.048	0.053	
						50	50	22.5	22.2	0.044	0.047	
			Edge 4	40620	2593.0	1	99	23.5	23.1	0.019	0.021	
						50	50	22.5	22.2	0.019	0.020	

11.6. Wi-Fi (DTS Band)

Frequency Band	RF Exposure Conditions	Mode	Dist. (mm)	Antenna	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
2.4 GHz	Head	802.11b 1 Mbps	0	1	Left Touch	6	2437	17.5	17.5	0.048	0.048	
					Left Tilt	6	2437	17.5	17.5	0.028	0.028	
					Right Touch	6	2437	17.5	17.5	0.09	0.090	
					Right Tilt	6	2437	17.5	17.5	0.072	0.072	
				2	Left Touch	6	2437	17.5	17.0	0.383	0.430	16
					Left Tilt	6	2437	17.5	17.0	0.162	0.182	
					Right Touch	6	2437	17.5	17.0	0.264	0.296	
					Right Tilt	6	2437	17.5	17.0	0.123	0.138	
	Body-worn & Hotspot	802.11b 1 Mbps	10	1	Rear	6	2437	17.5	17.5	0.010	0.010	
					Front	6	2437	17.5	17.5	0.012	0.012	
				2	Rear	6	2437	17.5	17.0	0.328	0.368	17
					Front	6	2437	17.5	17.0	0.081	0.091	
	Hotspot	802.11b 1 Mbps	10	1	Edge 1	6	2437	17.5	17.5	0.013	0.013	
					Edge 4	6	2437	17.5	17.5	0.003	0.003	
				2	Edge 1	6	2437	17.5	17.0	0.058	0.065	
					Edge 2	6	2437	17.5	17.0	0.046	0.052	

11.7. Wi-Fi (UNII Band)

Frequency Band	RF Exposure Conditions	Mode	Dist. (mm)	Antenna	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
5.2 GHz (U-NII-1)	Head	802.11a 6 Mbps	0	1	Left Touch	36	5180.0	12.5	12.0	0.149	0.167	18
					Left Tilt	36	5180.0	12.5	12.0	0.145	0.163	
					Right Touch	36	5180.0	12.5	12.0	0.424	0.476	
					Right Tilt	36	5180.0	12.5	12.0	0.326	0.366	
				2	Left Touch	36	5180.0	12.5	11.8	0.017	0.020	
					Left Tilt	36	5180.0	12.5	11.8	0.023	0.027	
					Right Touch	36	5180.0	12.5	11.8	0.012	0.014	
					Right Tilt	36	5180.0	12.5	11.8	0.014	0.016	
	Body-worn	802.11a 6 Mbps	10	1	Rear	36	5180.0	12.5	12.0	0.016	0.018	19
					Front	36	5180.0	12.5	12.0	0.084	0.094	
				2	Rear	36	5180.0	12.5	11.8	0.023	0.027	
					Front	36	5180.0	12.5	11.8	<0.001	<0.001	
	Head	802.11ac MCS0 HT20	0	1	Right Touch	36	5180.0	10.5	10.0	0.322	0.361	
	Body-worn		10		Front	36	5180.0	10.5	10.0	0.026	0.029	
	Head	802.11ac MCS0 HT20	0	2	Left Tilt	36	5180.0	10.5	9.7	0.009	0.011	
	Body-worn		10		Rear	36	5180.0	10.5	9.7	0.021	0.025	
Frequency Band	RF Exposure Conditions	Mode	Dist. (mm)	Antenna	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
5.3 GHz (U-NII-2A)	Head	802.11a 6 Mbps	0	1	Left Touch	52	5260.0	12.5	12.0	0.127	0.142	20
					Left Tilt	52	5260.0	12.5	12.0	0.091	0.102	
					Right Touch	52	5260.0	12.5	12.0	0.309	0.347	
					Right Tilt	52	5260.0	12.5	12.0	0.215	0.241	
				2	Left Touch	52	5260.0	12.5	12.4	0.024	0.025	
					Left Tilt	52	5260.0	12.5	12.4	0.027	0.028	
					Right Touch	52	5260.0	12.5	12.4	0.012	0.012	
					Right Tilt	52	5260.0	12.5	12.4	0.017	0.017	
	Body-worn	802.11a 6 Mbps	10	1	Rear	52	5260.0	12.5	12.0	0.012	0.013	21
					Front	52	5260.0	12.5	12.0	0.069	0.077	
				2	Rear	52	5260.0	12.5	12.4	0.031	0.032	
					Front	52	5260.0	12.5	12.4	<0.001	<0.001	
	Head	802.11ac MCS0 HT20	0	1	Right Touch	52	5260.0	10.5	9.8	0.281	0.330	
	Body-worn		10		Front	52	5260.0	10.5	9.8	0.018	0.021	
	Head	802.11ac MCS0 HT20	0	2	Left Tilt	52	5260.0	10.5	10.5	0.015	0.015	
	Body-worn		10		Rear	52	5260.0	10.5	10.5	0.018	0.018	
Frequency Band	RF Exposure Conditions	Mode	Dist. (mm)	Antenna	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
5.6 GHz (U-NII-2C)	Head	802.11a 6 Mbps	0	1	Left Touch	132	5660.0	12.5	12.5	0.089	0.089	22
					Left Tilt	132	5660.0	12.5	12.5	0.055	0.055	
					Right Touch	132	5660.0	12.5	12.5	0.324	0.324	
					Right Tilt	132	5660.0	12.5	12.5	0.273	0.273	
				2	Left Touch	132	5660.0	12.5	12.5	0.086	0.086	
					Left Tilt	132	5660.0	12.5	12.5	0.119	0.119	
					Right Touch	132	5660.0	12.5	12.5	0.059	0.059	
					Right Tilt	132	5660.0	12.5	12.5	0.070	0.070	
	Body-worn	802.11a 6 Mbps	10	1	Rear	132	5660.0	12.5	12.5	0.024	0.024	23
					Front	132	5660.0	12.5	12.5	0.014	0.014	
				2	Rear	132	5660.0	12.5	12.5	0.046	0.046	
					Front	132	5660.0	12.5	12.5	<0.001	<0.001	
	Head	802.11ac MCS0 HT20	0	1	Right Touch	132	5660.0	10.5	10.0	0.219	0.246	
	Body-worn		10		Front	132	5660.0	10.5	10.0	0.001	0.001	
	Head	802.11ac MCS0 HT20	0	2	Left Tilt	144	5720.0	10.5	10.1	0.068	0.075	
	Body-worn		10		Rear	144	5720.0	10.5	10.1	0.032	0.035	

Wi-Fi (UNII Band) (continued)

Frequency Band	RF Exposure Conditions	Mode	Dist. (mm)	Antenna	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
5.8 GHz (U-NII-3)	Head	802.11a 6 Mbps	0	1	Left Touch	157	5785.0	12.5	12.3	0.042	0.044	
					Left Tilt	157	5785.0	12.5	12.3	0.054	0.056	
					Right Touch	157	5785.0	12.5	12.3	0.173	0.181	
					Right Tilt	157	5785.0	12.5	12.3	0.163	0.171	
				2	Left Touch	157	5785.0	12.5	12.1	0.124	0.136	
					Left Tilt	157	5785.0	12.5	12.1	0.209	0.229	24
					Right Touch	157	5785.0	12.5	12.1	0.067	0.073	
					Right Tilt	157	5785.0	12.5	12.1	0.084	0.092	
	Body-worn & Wi-Fi Direct	802.11a 6 Mbps	10	1	Rear	157	5785.0	12.5	12.3	0.034	0.036	
					Front	157	5785.0	12.5	12.3	0.010	0.010	
					Edge 1	157	5785.0	12.5	12.3	0.009	0.010	
					Edge 4	157	5785.0	12.5	12.3	<0.001	<0.001	
				2	Rear	157	5785.0	12.5	12.1	0.035	0.038	25
					Front	157	5785.0	12.5	12.1	0.007	0.008	
					Edge 1	157	5785.0	12.5	12.1	0.023	0.025	
					Edge 2	157	5785.0	12.5	12.1	0.007	0.007	
	Head	802.11ac MCS0 HT20	0	1	Right Touch	157	5785.0	10.5	10.1	0.118	0.129	
	Body-worn & Wi-Fi Direct		10		Front	157	5785.0	10.5	10.1	0.011	0.012	
	Head	802.11ac MCS0 HT20	0	2	Left Tilt	157	5785.0	10.5	10.0	0.093	0.104	
	Body-worn & Wi-Fi Direct		10		Rear	157	5785.0	10.5	10.0	0.031	0.035	

11.8. Bluetooth

11.8.1. Standalone SAR Test Exclusion Considerations

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$, for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f_{(\text{GHz})}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Body-worn Accessory Exposure Conditions

Max. tune-up tolerance limit		Min. test separation distance (mm)	Frequency (GHz)	Result
(dBm)	(mW)			
8.5	7	10	2.480	1.1

Conclusion:

The computed value is < 3 ; therefore, Bluetooth qualifies for Standalone SAR test exclusion.

11.8.2. Estimated SAR

When the standalone SAR test exclusion is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

- $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f_{(\text{GHz})}}/x]$ W/kg for test separation distances ≤ 50 mm; where $x = 7.5$ for 1-g SAR, and $x = 18.75$ for 10-g SAR.
- 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is > 50 mm.

Estimated SAR Result for Body-worn Accessory Conditions:

Test Configuration	Max. tune-up tolerance limit (mW)	Min. test separation distance (mm)	Frequency (GHz)	Estimated 1-g SAR (W/kg)
Rear/Front	7	10	2.480	0.147

12. SAR Measurement Variability

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

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

12.1. The Highest Measured SAR Configuration in Each Frequency Band

Frequency Band (MHz)	Air Interface	Head (W/kg)	Body-worn Accessory (W/kg)	Wireless Router (Hotspot) and Wi-Fi Direct (W/kg)	Repeated SAR (Yes/No)
850	GSM 850		0.485		No
	WCDMA Band V				
1900	GSM 1900				
	WCDMA Band II			0.971	Yes
2400	Wi-Fi 802.11b/g/n	0.383			No
2600	LTE Band 41	0.473			No
5200	Wi-Fi 802.11a/n/ac	0.424			No
5300	Wi-Fi 802.11a/n/ac	0.309			No
5600	Wi-Fi 802.11a/n/ac	0.324			No
5800	Wi-Fi 802.11a/n/ac	0.209			No

12.2. Repeated Measurement Results

Wireless Router (Hotspot)

Frequency band	Test Position	Mode	Ch #.	Freq. (MHz)	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio	Note
					Original	Repeated		
WCDMA Band II	Edge 3	Rel.99 RMC	9400	1880.0	0.971	0.920	1.06	1

Note(s):

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

13. Simultaneous Transmission SAR Analysis

KDB 447498 D01 General RF Exposure Guidance v05 introduces a new formula for calculating the SAR to Peak Location Ratio (SPLSR) between pairs of simultaneously transmitting antennas:

$$SPLSR = (SAR_1 + SAR_2)^{1.5} / Ri$$

Where:

SAR₁ is the highest measured or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

SAR₂ is the highest measured or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

Ri is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of $[(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2]$

A new threshold of 0.04 is also introduced in the draft KDB. Thus, in order for a pair of simultaneous transmitting antennas with the sum of 1-g SAR > 1.6 W/kg to qualify for exemption from Simultaneous Transmission SAR measurements, it has to satisfy the condition of:

$$(SAR_1 + SAR_2)^{1.5} / Ri < 0.04$$

13.1. Sum of the SAR for GSM850 & Wi-Fi & BT

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario						Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			① GSM 850	② Wi-Fi 1 (DTS)	③ Wi-Fi 2 (DTS)	④ Wi-Fi 1 (UNII)	⑤ Wi-Fi 2 (UNII)	⑥ Bluetooth		
Head	Left Touch	① + ② + ③	0.251	0.048	0.430				0.729	No
		① + ④ + ⑤	0.251			0.167	0.136		0.554	No
	Left Tilt	① + ② + ③	0.145	0.028	0.182				0.355	No
		① + ④ + ⑤	0.145			0.163	0.229		0.537	No
	Right Touch	① + ② + ③	0.201	0.090	0.296				0.587	No
		① + ④ + ⑤	0.201			0.476	0.073		0.750	No
	Right Tilt	① + ② + ③	0.111	0.072	0.138				0.321	No
		① + ④ + ⑤	0.111			0.366	0.092		0.569	No
Body-worn Accessory & Hotspot	Rear	① + ② + ③	0.566	0.010	0.368				0.944	No
		① + ④ + ⑤	0.566			0.036	0.046		0.648	No
		① + ④ + ⑤ + ⑥	0.566			0.036	0.046	0.147	0.795	No
	Front	① + ② + ③	0.583	0.012	0.091				0.686	No
		① + ④ + ⑤	0.583			0.094	0.000		0.677	No
		① + ④ + ⑤ + ⑥	0.583			0.094	0.000	0.147	0.824	No
Hotspot	Edge 1	① + ② + ③		0.013	0.065				0.078	No
		① + ④ + ⑤				0.010	0.025		0.035	No
	Edge 2	① + ③	0.243		0.052				0.295	No
		① + ⑤	0.243				0.007		0.250	No
	Edge 3	①	0.365						0.365	No
		①	0.365						0.365	No
	Edge 4	① + ②	0.335	0.003					0.338	No
		① + ⑤	0.335			0.000			0.335	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

13.2. Sum of the SAR for GSM1900 & Wi-Fi & BT

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario						Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			① GSM 1900	② Wi-Fi 1 (DTS)	③ Wi-Fi 2 (DTS)	④ Wi-Fi 1 (UNII)	⑤ Wi-Fi 2 (UNII)	⑥ Bluetooth		
Head	Left Touch	① + ② + ③	0.283	0.048	0.430				0.761	No
		① + ④ + ⑤	0.283			0.167	0.136		0.586	No
	Left Tilt	① + ② + ③	0.324	0.028	0.182				0.534	No
		① + ④ + ⑤	0.324			0.163	0.229		0.716	No
	Right Touch	① + ② + ③	0.372	0.090	0.296				0.758	No
		① + ④ + ⑤	0.372			0.476	0.073		0.921	No
	Right Tilt	① + ② + ③	0.321	0.072	0.138				0.531	No
		① + ④ + ⑤	0.321			0.366	0.092		0.779	No
Body-worn Accessory & Hotspot	Rear	① + ② + ③	0.448	0.010	0.368				0.826	No
		① + ④ + ⑤	0.448			0.036	0.046		0.530	No
		① + ④ + ⑤ + ⑥	0.448			0.036	0.046	0.147	0.677	No
	Front	① + ② + ③	0.455	0.012	0.091				0.558	No
		① + ④ + ⑤	0.455			0.094	0.000		0.549	No
		① + ④ + ⑤ + ⑥	0.455			0.094	0.000	0.147	0.696	No
	Hotspot	Edge 1	① + ② + ③		0.013	0.065				0.078
① + ④ + ⑤						0.010	0.025		0.035	No
Edge 2		① + ③	0.080		0.052				0.132	No
		① + ⑤	0.080				0.007		0.087	No
Edge 3		①	0.803						0.803	No
		①	0.803						0.803	No
Edge 4		① + ②	0.098	0.003					0.101	No
		① + ⑤	0.098			0.000			0.098	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

13.3. Sum of the SAR for WCDMA Band V & Wi-Fi & BT

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario						Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			① WCDMA Band V	② Wi-Fi 1 (DTS)	③ Wi-Fi 2 (DTS)	④ Wi-Fi 1 (UNII)	⑤ Wi-Fi 2 (UNII)	⑥ Bluetooth		
Head	Left Touch	① + ② + ③	0.142	0.048	0.430				0.620	No
		① + ④ + ⑤	0.142			0.167	0.136		0.445	No
	Left Tilt	① + ② + ③	0.080	0.028	0.182				0.290	No
		① + ④ + ⑤	0.080			0.163	0.229		0.472	No
	Right Touch	① + ② + ③	0.130	0.090	0.296				0.516	No
		① + ④ + ⑤	0.130			0.476	0.073		0.679	No
Body-worn Accessory & Hotspot	Rear	① + ② + ③	0.349	0.010	0.368				0.727	No
		① + ④ + ⑤	0.349			0.036	0.046		0.431	No
		① + ④ + ⑤ + ⑥	0.349			0.036	0.046	0.147	0.578	No
	Front	① + ② + ③	0.348	0.012	0.091				0.451	No
		① + ④ + ⑤	0.348			0.094	0.000		0.442	No
		① + ④ + ⑤ + ⑥	0.348			0.094	0.000	0.147	0.589	No
Hotspot	Edge 1	① + ② + ③		0.013	0.065				0.078	No
		① + ④ + ⑤				0.010	0.025		0.035	No
	Edge 2	① + ③	0.218		0.052				0.270	No
		① + ⑤	0.218				0.007		0.225	No
	Edge 3	①	0.069						0.069	No
		①	0.069						0.069	No
	Edge 4	① + ②	0.293	0.003					0.296	No
		① + ⑤	0.293			0.000			0.293	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

13.4. Sum of the SAR for WCDMA Band II & Wi-Fi & BT

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario						Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			① WCDMA Band II	② Wi-Fi 1 (DTS)	③ Wi-Fi 2 (DTS)	④ Wi-Fi 1 (UNII)	⑤ Wi-Fi 2 (UNII)	⑥ Bluetooth		
Head	Left Touch	① + ② + ③	0.474	0.048	0.430				0.952	No
		① + ④ + ⑤	0.474			0.167	0.136		0.777	No
	Left Tilt	① + ② + ③	0.610	0.028	0.182				0.820	No
		① + ④ + ⑤	0.610			0.163	0.229		1.002	No
	Right Touch	① + ② + ③	0.462	0.090	0.296				0.848	No
		① + ④ + ⑤	0.462			0.476	0.073		1.011	No
Body-worn Accessory & Hotspot	Rear	① + ② + ③	0.510	0.072	0.138				0.720	No
		① + ④ + ⑤	0.510			0.366	0.092		0.968	No
		① + ② + ③ + ⑥	0.624	0.010	0.368				1.002	No
	Front	① + ④ + ⑤	0.624			0.036	0.046		0.706	No
		① + ② + ③	0.624			0.036	0.046	0.147	0.853	No
		① + ④ + ⑤ + ⑥	0.412	0.012	0.091				0.515	No
Hotspot	Edge 1	① + ② + ③	0.412	0.012	0.091				0.515	No
		① + ④ + ⑤	0.412			0.094	0.000		0.506	No
	Edge 2	① + ② + ③	0.412			0.094	0.000	0.147	0.653	No
		① + ④ + ⑤ + ⑥	0.412			0.094	0.000			No
	Edge 3	① + ② + ③	0.111	0.013	0.065				0.078	No
		① + ④ + ⑤	0.111			0.010	0.025		0.035	No
	Edge 4	① + ③	0.111		0.052				0.163	No
		① + ⑤	0.111				0.007		0.118	No
Hotspot	Edge 3	①	1.065						1.065	No
		①	1.065						1.065	No
	Edge 4	① + ②	0.156	0.003					0.159	No
		① + ⑤	0.156			0.000			0.156	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

13.5. Sum of the SAR for LTE Band 41 & Wi-Fi & BT

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario						Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			① LTE Band 41	② Wi-Fi 1 (DTS)	③ Wi-Fi 2 (DTS)	④ Wi-Fi 1 (UNII)	⑤ Wi-Fi 2 (UNII)	⑥ Bluetooth		
Head	Left Touch	① + ② + ③	0.519	0.048	0.430				0.997	No
		① + ④ + ⑤	0.519			0.167	0.136		0.822	No
	Left Tilt	① + ② + ③	0.372	0.028	0.182				0.582	No
		① + ④ + ⑤	0.372			0.163	0.229		0.764	No
	Right Touch	① + ② + ③	0.316	0.090	0.296				0.702	No
		① + ④ + ⑤	0.316			0.476	0.073		0.865	No
	Right Tilt	① + ② + ③	0.113	0.072	0.138				0.323	No
		① + ④ + ⑤	0.113			0.366	0.092		0.571	No
Body-worn Accessory & Hotspot	Rear	① + ② + ③	0.168	0.010	0.368				0.546	No
		① + ④ + ⑤	0.168			0.036	0.046		0.250	No
		① + ④ + ⑤ + ⑥	0.168			0.036	0.046	0.147	0.397	No
	Front	① + ② + ③	0.196	0.012	0.091				0.299	No
		① + ④ + ⑤	0.196			0.094	0.000		0.290	No
		① + ④ + ⑤ + ⑥	0.196			0.094	0.000	0.147	0.437	No
	Hotspot	Edge 1	① + ② + ③		0.013	0.065			0.078	No
			① + ④ + ⑤			0.010	0.025		0.035	No
		Edge 2	① + ③	0.098		0.052			0.150	No
			① + ⑤	0.098			0.007		0.105	No
		Edge 3	①	0.053					0.053	No
			①	0.053					0.053	No
		Edge 4	① + ②	0.021	0.003				0.024	No
			① + ⑤	0.021		0.000			0.021	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14. Appendixes

Refer to separated files for the following appendixes.

- 14.1. Photos and Antenna Locations
- 14.2. System Performance Check Plots
- 14.3. Highest SAR Test Plots
- 14.4. Calibration Certificate for E-Field Probe EX3DV4 - SN 3929
- 14.5. Calibration Certificate for E-Field Probe EX3DV4 - SN 3991
- 14.6. Calibration Certificate for D835V2 - SN 4d002
- 14.7. Calibration Certificate for D1900V2- SN 5d043
- 14.8. Calibration Certificate for D2450V2 - SN 899
- 14.9. Calibration Certificate for D2600V2 - SN 1006
- 14.10. Calibration Certificate for D5GHzV2 - SN 1138

END OF REPORT