

## SAR EVALUATION REPORT

(CLASS II PERMISSIVE CHANGE)

FCC 47 CFR § 2.1093 IEEE Std 1528-2013

*For* Wi-Fi 2.4GHz + Bluetooth Smart Watch

Model: LG-W110, W110, LGW110 FCC ID: ZNFW110

Report Number: 14U18512-S1B Issue Date: 9/19/2014

Prepared for LG ELECTRONICS MOBILECOMM U.S.A., INC. 1000 SYLVAN AVE. ENGLEWOOD CLIFFS, NJ 07632

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Report No.: 14U18512-S1B

### **REVISION HISTORY**

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	9/9/2014	Initial Issue	
А	9/10/2014	Section 4.2: Updated Probe Serial Number	Tony Soares
В	9/19/2014	Section 4.2: Updated test equipment Section 8.1: Eliminated unnecessary footnote Section 9.2: Included additional Liquid Parameters Section 10.1: Included additional Dipole Section 10.2: Included additional System Results Section 11.1: Included additional channels to satisfy IC Notice DRS1203	Coltyce Sanders

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## 1. Attestation of Test Results

Applicant Name	LG ELECTRONICS MOBILECOMM U.S.A., INC.			
Application Purpose	🗌 🗌 Original Grant 🖂 Class II Pe	ermissive Change		
FCC ID	ZNFW110			
DUT Description	Wi-Fi 2.4GHz + Bluetooth Smar	t Watch		
Exposure Category	General Population/Uncontrolled	Exposure (1g / 10g SAR limit: 1.6 / 4 W/kg, respectively)		
The Highest Reported	RF Exposure Conditions	Equipment Class		
SAR		DTS		
	Extremity (Wrist)	<mark>0.600</mark> W/kg (10g)		
	Next-to-Mouth	<mark>0.063</mark> W/kg (1g)		
Applicable Standards	FCC 47 CFR § 2.1093			
KDB publication				
IEEE Std 1528-2013				
Test Results	Pass			
Dates tested	09/02/2014 - 09/11/2014			

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:Additional and the second sec

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# 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:

- o 447498 D01 General RF Exposure Guidance v05r02
- o 248227 D01 SAR Meas for 802 11abg v01r02
- 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03
- o 865664 D02 SAR Reporting v01r01
- o 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 <u>http://ts.nist.gov/standards/scopes/2000650.htm</u>.

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# 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, ADconversion, 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.

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## 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.

<b>Dielectric Property Measurements</b>	<u>s</u>			
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

Power Sensor

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Agilent Signal Generator	Agilent	8665B	3438A0063	7/10/2015
Power Meter	HP	438A	2822A05684	10/10/2014
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	3546A00784	6/23/2015
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 1)	SPEAG	EX3DV4	3902	5/19/2015
E-Field Probe (SAR 2)	SPEAG	EX3DV3	3531	11/21/2014
Data Acquisition Electronics (SAR 1)	SPEAG	DAE3	427	1/14/2015
Data Acquisition Electronics (SAR 2)	SPEAG	DAE4	1359	2/17/2015
System Validation Dipole	SPEAG	D2450V2	899	9/10/2014
System Validation Dipole	SPEAG	D2450V2	706	5/20/2015
Thermometer (SAR Lab 1)	EXTECH	445703	CCS-205	3/24/2015
Thermometer (SAR Lab 2)	EXTECH	445703	CCS-203	3/28/2015
Others				
Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Power Meter	Agilent	N1912A	MY53040015	7/10/2015

N1921A

Agilent

MY52020011

5/6/2015

### 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: LG-W110	
Intended Use	This device should be restricted to wrist-worn and no other operation configuration should be used
Device Dimension	Overall (Length x Width): 56 mm x 49 mm (excluding strap)
	Overall Diagonal: 60 mm
	Display Diagonal: 35 mm
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other
	⊠ Wi-Fi Direct (Wi-Fi 2.4 GHz)
	U Wi-Fi Direct (Wi-Fi 5 GHz)

## 6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode	Duty Cycle used for SAR testing
Wi-Fi	2.4 GHz	802.11b	100%
		802.11g	
		802.11n (HT20)	
Bluetooth	2.4 GHz	Version 4.0 LE	N/A

## 6.3. Nominal and Maximum Output Power

Upper limit (dB):	1.0	RF Output Pow er (dBm)		
RF Air interface	Mode	Target	Max. tune-up tolerance limit	
	802.11b	17.0	18.0	
WiFi 2.4 GHz	802.11g	14.0	15.0	
	802.11n HT20	13.0	14.0	
Upper limit (dB): 1.5		RF Output Pow er (dBm)		
RF Air interface Mode		Target	Max. tune-up tolerance limit	
Bluetooth		8.5	10.0	
Bluetooth LE		7.5	9.0	

# 6.4. Simultaneous Transmission Condition

Simultaneous transmission is not supported

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# 7. RF Exposure Conditions (Test Configurations)

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

## 7.1. Extremity (Hand/Wrist/Ankle)

	Antenna-to-	SAR	
Test Configurations	edge/surface	Required	Note
Rear	< 25 mm	Yes	

## 7.2. Next to the Mouth Exposure

Test Configurations	Antenna-to- edge/surface	SAR Required	Note
Rear	< 25 mm	Yes	
Front	< 25 mm	Yes	

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## 8. Conducted Output Power Measurements

## 8.1. Wi-Fi (2.4 GHz Band)

Required Test Channels per KDB 248227 D01

Mada		CH-	Channel	"Default Test Channels"		
Mode Band	Danu	612	Channel	802.11b	802.11g	
802.11b/g		2.412	1#	$\checkmark$	$\nabla$	
	2.4 GHz	2.437	6	$\checkmark$	$\nabla$	
		2.462	11#	V	$\nabla$	

Notes:

 $\sqrt{}$  = "default test channels"

 $\nabla$  = possible 802.11g channels with maximum average output 1⁄4 dB  $\geq$  the "default test channels"

<sup>#</sup> = 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	Data Rate	Ch #	Freq. (MHz)	Avg Pwr (dBm)	SAR Test (Yes/No)
			1	2412	17.4	
	802.11b	1 Mbps	6	2437	16.5	Yes
			11	2462	16.7	
	802.11g		1	2412	14.6	
2.4 (DTS)		6 Mbps	6	2437	13.9	No
(013)			11	2462	14.0	
			1	2412	13.5	
	802.11h (HT20)	MCS0	6	2437	12.8	No
	(1120)		11	2462	12.9	

#### Note(s):

1. 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)	Data Rate	Avg Pwr (dBm)	SAR test (Yes/No)
			1 Mbps	17.4	Yes
802 11b	1	2412	2 Mbps	17.3	No
002.110	1		5.5 Mbps	17.3	No
			11 Mbps	17.2	No

### 8.2. Bluetooth

Maximum tune-up tolerance limit is 10.0 dBm (10.0 mW). This power level qualifies for exclusion of SAR testing. Refer to Standalone SAR Test Exclusion Considerations Section 9.2.

# 9. Dielectric Property Measurements

The temperature of the tissue-equivalent medium used during measurement must also be within  $18^{\circ}$ C to  $25^{\circ}$ C and within  $\pm 2^{\circ}$ 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)	Н	ead	Bo	ody
raiger requeitcy (Mirz)	٤ <sub>r</sub>	σ (S/m)	ε <sub>r</sub>	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 in IEEE Std 1528-2013

## 9.2. Dielectric Property Measurements Results

The temperature of the tissue-equivalent medium used during measurement must also be within  $18^{\circ}$ C to  $25^{\circ}$ C and within  $\pm 2^{\circ}$ 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 1

	Freq. (MHz)		Liq	uid Parameters	Measured	Target	Delta (%)	Limit ±(%)
	Body 2450	e'	52.4400	Relative Permittivity (c <sub>r</sub> ):	52.44	52.70	-0.49	5
	B00y 2430	e"	14.9900	Conductivity (σ):	2.04	1.95	4.72	5
0/2/2014	Rody 2410	e'	52.6400	Relative Permittivity ( $\varepsilon_r$ ):	52.64	52.76	-0.23	5
9/2/2014	B00y 2410	e"	14.8100	Conductivity ( $\sigma$ ):	1.98	1.91	4.04	5
	Body 2475	e'	52.3500	Relative Permittivity ( $\varepsilon_r$ ):	52.35	52.67	-0.60	5
	Body 2475	e"	15.0900	Conductivity (σ):	2.08	1.99	4.61	5
	Hood 2450	e'	39.1100	Relative Permittivity ( $\varepsilon_r$ ):	39.11	39.20	-0.23	5
	Head 2450	e"	13.5700	Conductivity (σ):	1.85	1.80	2.70	5
9/2/2014	Head 2410	e'	39.2500	Relative Permittivity (c <sub>r</sub> ):	39.25	39.28	-0.07	5
5/2/2014	Tieau 2410	e"	13.4200	Conductivity (σ):	1.80	1.76	2.15	5
	Head 2475	e'	39.0100	Relative Permittivity ( $\varepsilon_r$ ):	39.01	39.17	-0.40	5
	Head 2475	e"	13.6200	Conductivity (o):	1.87	1.83	2.59	5

#### SAR Lab 2

Date	Freq. (MHz)		Liq	uid Parameters	Measured	Target	Delta (%)	Limit ±(%)
	Rody 2450		50.9100	Relative Permittivity ( $\varepsilon_r$ ):	50.91	52.70	-3.40	5
	B00y 2430	e"	14.7200	Conductivity ( $\sigma$ ):	2.01	1.95	2.83	5
0/0/2014	9/9/2014 Body 2410	e'	51.0200	Relative Permittivity ( $\varepsilon_r$ ):	51.02	52.76	-3.30	5
9/9/2014		e"	14.6400	Conductivity ( $\sigma$ ):	1.96	1.91	2.85	5
	Pody 2475	e'	50.8500	Relative Permittivity ( $\varepsilon_r$ ):	50.85	52.67	-3.45	5
	Body 2475	e"	14.7700	Conductivity (σ):	2.03	1.99	2.39	5

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## 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 Dipolo	Sorial No.	Cal Data	Frog (MHz)	Target SAR Values (W/kg)			
System Dipole Senarino.		Cal. Date		1g/10g	Head	Body	
D2450\/2	800	0/10/2012	2450	1g	51.3	49.7	
D2450V2 899	099	9/10/2013	2430	10g	23.9	23.3	
D2450\/2 706		E/20/2014	2450	1g	53	50.20	
D2430V2	700	5/20/2014	2430	10g	24.5	23.4	

### **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 1** 

	System	Dipole	то	<b>、</b>	М	Measured Results			Dalta	Eat /Zaam	Dist
Date Tested	Туре	Serial #	Liqu	s. iid	Area Scan	Zoom Scan	Normalize to 1 W	(Ref. Value)	±10 %	Ratio	No.
0/3/2014	D2450\/2	800	Head	1g	5.68	5.54	55.4	51.30	7.99	2.46	
9/3/2014	D2430V2	035	Tieau	10g	2.46	2.50	25.0	23.90	4.60		
0/2/2014	D2450\/2	800	Body	1g	5.39	5.45	54.5	49.70	9.66	-1.11	1.2
9/3/2014	D2430V2	099	Bouy	10g	2.35	2.52	25.2	23.30	8.15		1,2

### SAR Lab 2

	System	Dipole	тс	`	M	easured Results		Target	Delte	Eat /Zaam	Diet
Date Tested	Туре	Serial #	Liqu	s. Iid	Area Scan	Zoom Scan	Normalize to 1 W	(Ref. Value)	±10 %	Ratio	No.
0/0/2014	D2450\/2	706	Body	1g	4.95	5.06	50.6	50.20	0.80	-2.22	34
3/3/2014	DZ430VZ	100	DOUY	10g	2.15	2.50	25.0	23.40	6.84		3,4

# 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 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  $\leq$  1.6 W/kg and the 1-g averaged SAR is  $\leq$  0.8 W/kg, testing of other channels in the "default test channels" or "required test channels" configuration is optional.

## 11.1.Wi-Fi (DTS Band)

Froquopov			Diet			Frog	Power	Power (dBm)		R (W/kg)	Plot
Band	Conditions	Mode	(mm)	Test Position	Ch #.	(MHz)	Tune-up limit	Meas.	Meas.	Scaled	No.
		902 11h			1	2412.0	18.0	17.4	0.304	0.349	
2.4 GHz	Extremity	1 Mbns	0	Rear	6	2437.0	18.0	16.5	0.425	0.600	1
		т мөрэ			11	2462.0	18.0	16.7	0.350	0.472	
2.4 GHz	Extremity	802.11n MCS0	0	Rear	1	2412.0	14.0	13.5	0.127	0.142	2
Frequency			Diet			Frog	Power	(dBm)	1-g SAF	R (W/kg)	Plot
Band	Conditions	Mode	(mm)	Test Position	Ch #.	(MHz)	Tune-up limit	Meas.	Meas.	Scaled	No.
2.4 GHz	Next-to-Mouth	802.11b 1 Mbps	10	Front	1	2412.0	18.0	17.4	0.033	0.038	3
2.4 GHz	Next-to-Mouth	802.11n MCS0	10	Front	1	2412.0	14.0	13.5	0.056	0.063	4

### 11.2. Bluetooth

### 11.2.1. 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  $\leq$  50 mm are determined by:

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

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

The test exclusions are applicable only when the minimum test separation distance is  $\leq$  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.

#### **Extremity Exposure Conditions**

Max. ti toleran	une-up ice limit	Min. test separation	Frequency	Result
(dBm)	(mW)		(GHz)	
10.0	10	5	2.480	3.1

#### **Next-to-Mouth Exposure Conditions**

Max. tu toleran	une-up ce limit	Min. test separation	Frequency	Result
(dBm)	(mW)	distance (mm)	(GHz)	
10.0	10	10	2.480	1.6

#### **Conclusion:**

• The computed extremity value is < 7.5; therefore, Bluetooth qualifies for Standalone SAR test exclusion for the extremity condition.

• The computed next-to-mouth value is < 3; therefore, Bluetooth qualifies for Standalone SAR test exclusion. for the next-to-mouth condition.

# 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 <1.6 or 2 W/kg (1-g or 10-g respectively); steps 2) through 4) do not apply.
- When the original highest measured SAR is ≥ 1.6 or 2 W/kg (1-g or 10-g respectively), 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 3 (1-g or 10-g respectively) or when the original or repeated measurement is ≥ 1.45 or 3.6 W/kg (~ 10% from the 1-g or 10-g respective SAR limit).
- 4) Perform a third repeated measurement only if the original, first, or second repeated measurement is ≥ 1.5 or 3.75 W/kg (1-g or 10-g respectively) and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 or 3 (1-g or 10-g respectively).

### 12.1. The Highest Measured SAR Configuration in Each Frequency Band

Frequency Band	Air Interface	Extremity	Repeated SAR
(MHz)		(W/kg)	(Yes/No)
2400	Wi-Fi 802.11b/g/n	0.425	No
Frequency Band	Air Interface	Next-to-Mouth	Repeated SAR
(MHz)		(W/kg)	(Yes/No)

# **13.** Simultaneous Transmission SAR Analysis

Simultaneous transmission is not supported.

### 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 3902
- 14.5. Calibration Certificate for E-Field Probe EX3DV4 SN 3531
- 14.6. Calibration Certificate for D2450V2 SN 899
- 14.7. Calibration Certificate for D2450V2 SN 706

END OF REPORT