



## SAR EVALUATION REPORT

IEEE Std 1528-2013

*For*

**The Infinea Tab M is a Payment Terminal with an integrated smart, magnetic stripe and contactless card reader**

**FCC ID: YRWITMC  
Model Name: Infinea Tab M**

**Report Number: 12422341-S1V1  
Issue Date: 6/17/2019**

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**Revision History**

Rev.	Date	Revisions	Revised By
V1	6/17/2019	Initial Issue	--

## Table of Contents

<b>1.</b>	<b>Attestation of Test Results .....</b>	<b>4</b>
<b>2.</b>	<b>Test Specification, Methods and Procedures.....</b>	<b>5</b>
<b>3.</b>	<b>Facilities and Accreditation.....</b>	<b>5</b>
<b>4.</b>	<b>SAR Measurement System &amp; Test Equipment .....</b>	<b>6</b>
4.1.	<i>SAR Measurement System.....</i>	6
4.2.	<i>SAR Scan Procedures.....</i>	7
4.3.	<i>Test Equipment.....</i>	9
<b>5.</b>	<b>Measurement Uncertainty.....</b>	<b>11</b>
<b>6.</b>	<b>Device Under Test (DUT) Information .....</b>	<b>11</b>
6.1.	<i>DUT Description .....</i>	11
6.2.	<i>Wireless Technologies.....</i>	12
6.3.	<i>General LTE SAR Test and Reporting Considerations.....</i>	13
<b>7.</b>	<b>RF Exposure Conditions (Test Configurations).....</b>	<b>13</b>
<b>8.</b>	<b>Dielectric Property Measurements &amp; System Check .....</b>	<b>14</b>
8.1.	<i>Dielectric Property Measurements .....</i>	14
8.2.	<i>System Check.....</i>	25
<b>9.</b>	<b>Conducted Output Power Measurements.....</b>	<b>29</b>
<b>10.</b>	<b>Measured and Reported (Scaled) SAR Results.....</b>	<b>30</b>
10.1.	<i>Measured and Reported SAR Results.....</i>	32
10.2.	<i>Bluetooth.....</i>	34
<b>11.</b>	<b>SAR Measurement Variability.....</b>	<b>35</b>
<b>12.</b>	<b>Simultaneous Transmission SAR Analysis.....</b>	<b>36</b>
12.1.	<i>Sum of the SAR for Host device .....</i>	36
<b>Appendixes .....</b>	<b>37</b>	
	<i>12422353-S1V1 Appendix A: SAR Setup Photos.....</i>	37
	<i>12422353-S1V1 Appendix B: System Check Plots.....</i>	37
	<i>12422353-S1V1 Appendix C: Highest SAR Test Plots .....</i>	37
	<i>12422353-S1V1 Appendix D: SAR Liquid Tissue Ingredients.....</i>	37
	<i>12422353-S1V1 Appendix E: SAR Probe Calibration Certificates .....</i>	37
	<i>12422353-S1V1 Appendix F: SAR Dipole Calibration Certificates.....</i>	37

# 1. Attestation of Test Results

Applicant Name	DATECS Ltd.			
FCC ID	YRWITMC			
Model Name	Infinea Tab M			
Applicable Standards	Published RF exposure KDB procedures IEEE Std 1528-2013			
Exposure Category	SAR Limits (W/Kg)			
	Peak spatial-average(1g of tissue)			
General population / Uncontrolled exposure	1.6			
RF Exposure Conditions	Equipment Class - Highest Reported SAR (W/kg)			
	PCE	DTS	NII	DSS
Head	1.017	1.057	0.563	0.162
Body-worn	0.964	1.284	1.110	0.101
Hotspot	0.964	1.284	1.110	N/A
Simultaneous TX	1.535	1.535	1.446	1.535
Date Tested	8/16/2018 to 5/24/2019			
Test Results	Pass			
<p>UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.</p> <p><b>Note:</b> The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.</p>				
Approved & Released By:		Prepared By:		
				
Devin Chang Senior Test Engineer UL Verification Services Inc.		AJ Newcomer Laboratory Engineer UL Verification Services Inc.		

## 2. Test Specification, Methods and Procedures

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

- 248227 D01 802.11 Wi-Fi SAR v02r02
- 447498 D01 General RF Exposure Guidance v06
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- 865664 D02 RF Exposure Reporting v01r02
- 941225 D01 3G SAR Procedures v03r01
- 941225 D05 SAR for LTE Devices v02r05
- 941225 D05A LTE Rel.10 KDB Inquiry Sheet v01r02
- 941225 D06 Hotspot Mode v02r01

In addition to the above, the following information was used:

- [TCB workshop](#) October 2014; RF Exposure Procedures (Other LTE Considerations)
- [TCB workshop](#) October 2016; RF Exposure Procedures (Bluetooth Duty Factor)
- [TCB workshop](#) October 2016; RF Exposure Procedures (DUT Holder Perturbations)
- [TCB workshop](#) May 2017; RF Exposure Procedures (Broadband Liquid Above 3 GHz)

## 3. Facilities and Accreditation

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

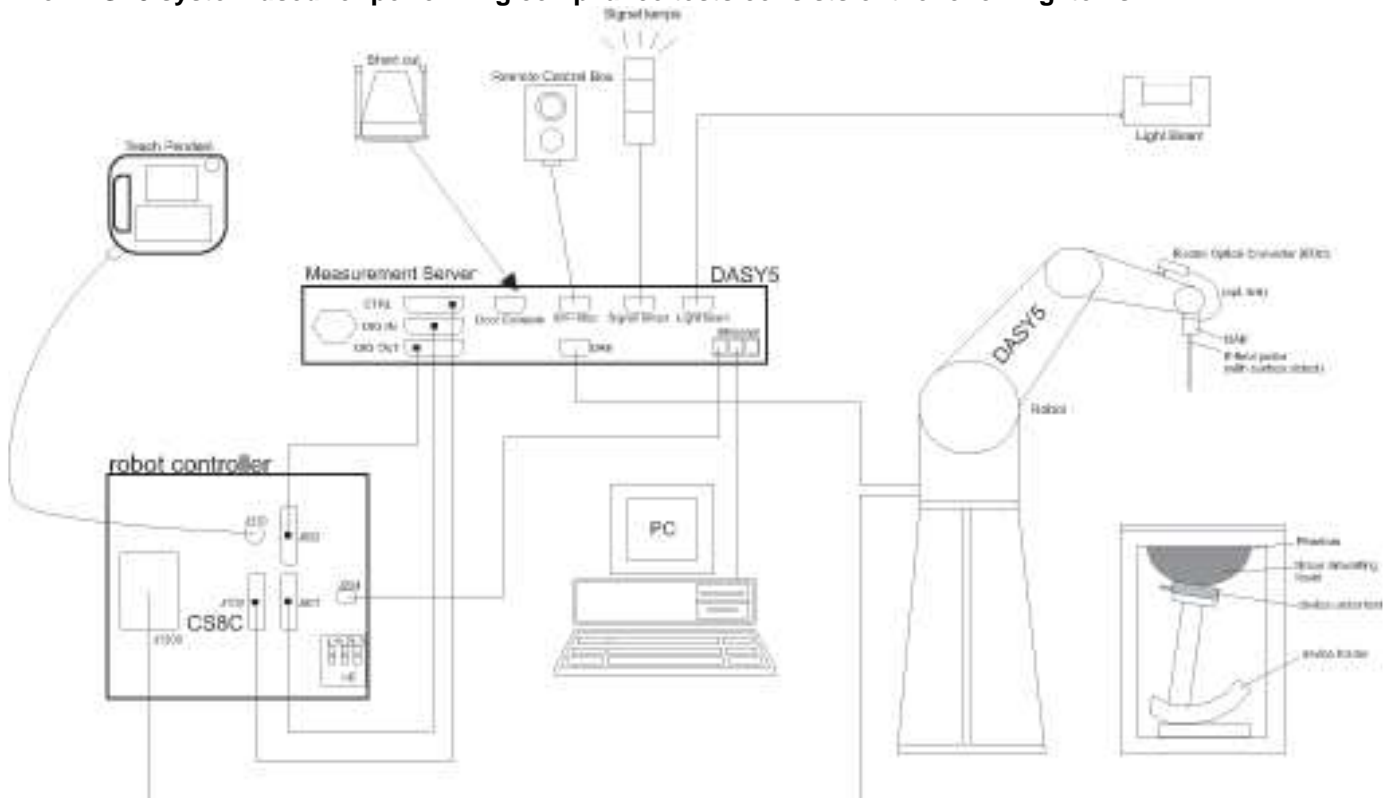
47173 Benicia Street	47266 Benicia Street
SAR Lab A	SAR Lab 1
SAR Lab B	SAR Lab 2
SAR Lab C	SAR Lab 3
SAR Lab D	SAR Lab 4
SAR Lab E	SAR Lab 5
SAR Lab F	
SAR Lab G	
SAR Lab H	

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

## 4. SAR Measurement System & Test Equipment

### 4.1. SAR Measurement System

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



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

## 4.2. SAR Scan Procedures

### Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

### Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

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

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

**Step 3: Zoom Scan**

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

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

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

**Step 4: Power drift measurement**

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

**Step 5: Z-Scan (FCC only)**

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



### 4.3. Test Equipment

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

#### Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
S-Parameter Network Analyzer	R & S	ZNLE6	PRE0181651	7/16/2019
Dielectric Probe kit	SPEAG	DAK-3.5	1103	2/6/2019
Shorting Block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	11/14/2018
Thermometer	Fisher Scientific	Traceable	140562250	11/7/2018

#### System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Synthesized Signal Generator*	Agilent	N5181A	MY50140630	5/25/2019
Power Meter*	Agilent	N1912A	MY50001018	10/17/2018
Power Sensor*	Agilent	N1921A	MY52270022	12/28/2018
Power Sensor*	Agilent	N1921A	MY52200012	10/27/2018
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1795092	N/A
Bi-directional coupler	Werlatone, Inc.	C8060-102	2141	N/A
DC Power Supply	HP	6296A	2841A-05955	N/A
Synthesized Signal Generator	Agilent	N5181A	MY50140610	6/7/2019
Power Meter	Agilent	N1912A	MY55196004	7/26/2019
Power Sensor*	Agilent	N1921A	MY52260009	1/8/2019
Power Sensor*	Agilent	N1921A	MY53020038	4/23/2019
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1622052	N/A
Bi-directional coupler	Werlatone, Inc.	C8060-102	2711	N/A
DC Power Supply	Sorensen Ametek	XT 15-4	1319A02780	N/A

#### Note(s):

\*Equipment not used past calibration due date.

**Lab Equipment**

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
E-Field Probe (SAR Lab A)	SPEAG	EX3DV4	3686	8/28/2019
E-Field Probe (SAR Lab A)	SPEAG	EX3DV4	3885	9/18/2019
E-Field Probe (SAR Lab C)*	SPEAG	EX3DV4	3773	4/23/2019
E-Field Probe (SAR Lab 4)*	SPEAG	EX3DV4	7500	5/4/2019
Data Acquisition Electronics (SAR Lab A)	SPEAG	DAE4	1380	8/21/2019
Data Acquisition Electronics (SAR Lab C)*	SPEAG	DAE4	1472	3/8/2019
Data Acquisition Electronics (SAR Lab 4)*	SPEAG	DAE4	1547	5/3/2019
System Validation Dipole*	SPEAG	D750V3	1071	11/21/2018
System Validation Dipole	SPEAG	D750V3	1071	11/28/2019
System Validation Dipole*	SPEAG	D835V2	4d142	10/12/2018
System Validation Dipole	SPEAG	D835V2	4d142	8/23/2019
System Validation Dipole	SPEAG	D835V2	4d002	11/28/2019
System Validation Dipole*	SPEAG	D835V2	4d117	5/16/2019
System Validation Dipole*	SPEAG	D1750V2	1050	4/10/2019
System Validation Dipole	SPEAG	D1750V2	1050	4/17/2020
System Validation Dipole*	SPEAG	D1750V2	1077	10/5/2018
System Validation Dipole	SPEAG	D1750V2	1077	10/16/2019
System Validation Dipole*	SPEAG	D1900V2	5d140	4/11/2019
System Validation Dipole	SPEAG	D1900V2	5d140	4/17/2020
System Validation Dipole*	SPEAG	D1900V2	5d163	10/5/2018
System Validation Dipole	SPEAG	D1900V2	5d163	10/16/2019
System Validation Dipole*	SPEAG	D2300V2	1002	3/16/2019
System Validation Dipole	SPEAG	D2300V2	1002	3/22/2020
System Validation Dipole*	SPEAG	D2300V2	1058	8/31/2018
System Validation Dipole	SPEAG	D2300V2	1058	10/2/2019
System Validation Dipole*	SPEAG	D2450V2	706	5/18/2019
System Validation Dipole*	SPEAG	D2450V2	748	2/14/2019
System Validation Dipole*	SPEAG	D2450V2	899	3/16/2019
System Validation Dipole	SPEAG	D2450V2	899	3/22/2020
System Validation Dipole*	SPEAG	D2600V2	1006	10/5/2018
System Validation Dipole	SPEAG	D2600V2	1006	10/16/2019
System Validation Dipole*	SPEAG	D2600V2	1036	3/16/2019
System Validation Dipole	SPEAG	D2600V2	1036	3/22/2020
System Validation Dipole*	SPEAG	D5GHzV2	1003	3/13/2019
System Validation Dipole	SPEAG	D5GHzV2	1003	2/19/2020
System Validation Dipole*	SPEAG	D5GHzV2	1138	10/26/2018
System Validation Dipole	SPEAG	D5GHzV2	1138	8/21/2019
Thermometer (SAR Lab A)	Fisher Sceintific	Traceable	160643167	2/26/2020
Thermometer (SAR Lab C)*	EXTECH	445703	CCS-281	2/2/2019
Thermometer (SAR Lab 4)*	Fisher Sceintific	Traceable	181062300	2/26/2019

**Note(s):**

\*Equipment not used past calibration due date.

**Other**

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Base Station Simulator*	R & S	CMW500	134852	2/16/2019
Base Station Simulator	R & S	CMW500	135384	2/16/2020

**Note(s):**

\*Equipment not used past calibration due date.

## 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 and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be  $\leq 30\%$ , for a confidence interval of  $k = 2$ . If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

Therefore, the measurement uncertainty is not required.

## 6. Device Under Test (DUT) Information

### 6.1. DUT Description

The Infinea Tab M is a Payment Terminal with an integrated smart, magnetic stripe and contactless card reader. Provides Bluetooth connectivity and barcode scanner. Infinea Tab M is designed to operate with Apple iPhone 8 Plus.

Device Dimension	Case Unit with barcode scanner: Overall (Length x Width x Thickness): 176 mm x 88 mm x 27 mm Overall Diagonal: 194 mm Display Diagonal: 140 mm		
Back Cover	The Back Cover is not removable		
Battery Options	The rechargeable battery is not user accessible.		
Test sample information	<b>S/N</b> 2618900001	<b>IMEI</b> N/A	<b>Notes</b> Sleeve Sample
Hardware Version	N/A		
Software Version	N/A		

## 6.2. Wireless Technologies

### Sleeve Device (Infinea Tab M)

Wireless technologies	Frequency bands	Operating mode	Duty Cycle used for SAR testing
Bluetooth	2.4 GHz	BR, EDR	N/A
RFID	13.56 MHz	ASK Type A (100%) or ASK Type B (10%)	N/A

### Host Device (FCC ID: BCG-E3174A)

Wireless technologies	Frequency bands	Operating mode		Duty Cycle used for SAR testing
GSM	850 1900	Voice (GMSK) GPRS (GMSK) EDGE (8PSK)	GSM Class : B Multi-Slot Class: Class 10 - 2 Up, 4 Down	GSM Voice: 12.5% (E)GPRS: 1 Slot: 12.5% 2 Slots: 25%
		Does this device support DTM (Dual Transfer Mode)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
W-CDMA (UMTS)	Band II Band IV Band V	UMTS Rel. 99 (Voice & Data) HSDPA (Rel. 5) HSUPA (Rel. 6) HSPA+ (Rel. 7) DC-HSDPA (Rel. 8)		100%
LTE	FDD Band 2 FDD Band 4 FDD Band 5 FDD Band 7 FDD Band 12 FDD Band 13 FDD Band 17 FDD Band 25 FDD Band 26 FDD Band 30 TDD Band 41 FDD Band 66	QPSK 16QAM 64QAM Rel. 11 Carrier Aggregation (2 Uplinks and 4 Downlinks)		100% (FDD) 63.3% (TDD) This device supports uplink-downlink configuration 0-6. The configuration with the highest duty cycle was used (config. 0 at 63.3%).
		Does this device support SV-LTE (1xRTT-LTE)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20)		100%
	5 GHz	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80)		100%
		Does this device support bands 5.60 ~ 5.65 GHz? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Does this device support Band gap channel(s)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Bluetooth	2.4 GHz	Version 5.0 LE		77.5% (DH5) <sup>1</sup>

#### Notes:

- The Bluetooth protocol is considered source-based averaging. Bluetooth EDR, GFSK (DH5) was verified to have the highest duty cycle of 77.5% and was considered and used for SAR Testing.

### **6.3. General LTE SAR Test and Reporting Considerations**

#### **Host Device**

All nominal and maximum output power measurements for WWAN and WLAN are documented in the original SAR report FCC ID: BCG-E3174A.

## **7. RF Exposure Conditions (Test Configurations)**

Refer to the original granted SAR report FCC ID: BCG-E3174A for test configurations used during testing of the host device. Baseline measurements were performed on the worst case positions for all bands on the host device and compared to the results reported in the original granted SAR report.

## 8. Dielectric Property Measurements & System Check

### 8.1. Dielectric Property Measurements

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

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

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

The dielectric constant ( $\epsilon_r$ ) and conductivity ( $\sigma$ ) of typical tissue-equivalent media recipes are expected to be within  $\pm 5\%$  of the required target values; but for SAR measurement systems that have implemented the SAR error compensation algorithms documented in IEEE Std 1528-2013, to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters, the tolerance for  $\epsilon_r$  and  $\sigma$  may be relaxed to  $\pm 10\%$ . This is limited to frequencies  $\leq 3$  GHz.

#### Tissue Dielectric Parameters

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

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

#### IEEE Std 1528-2013

Refer to Table 3 within the IEEE Std 1528-2013

**Dielectric Property Measurements Results:**

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity ( $\epsilon_r$ )			Conductivity ( $\sigma$ )		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
A	3/28/2019	835	Head	835	42.20	41.50	1.69	0.93	0.90	3.11
				805	42.29	41.68	1.46	0.92	0.90	2.12
				850	42.15	41.50	1.57	0.93	0.92	1.95
A	3/28/2019	835	Body	835	53.23	55.20	-3.57	1.01	0.97	3.81
				805	53.32	55.33	-3.64	1.00	0.97	3.00
				850	53.15	55.16	-3.64	1.01	0.99	2.52
A	3/28/2019	1750	Head	1750	40.45	40.08	0.91	1.36	1.37	-0.66
				1710	40.56	40.15	1.03	1.34	1.35	-0.85
				1755	40.42	40.08	0.86	1.36	1.37	-0.64
A	3/28/2019	1750	Body	1750	51.82	53.44	-3.03	1.49	1.49	0.12
				1710	51.92	53.54	-3.03	1.46	1.46	-0.17
				1755	51.80	53.43	-3.05	1.49	1.49	-0.08
A	3/28/2019	1900	Body	1900	51.39	53.30	-3.58	1.55	1.52	1.91
				1850	51.52	53.30	-3.34	1.55	1.52	1.91
				1920	51.44	53.30	-3.49	1.59	1.52	4.80
A	3/28/2019	2300	Head	2300	39.64	39.47	0.42	1.71	1.66	2.90
				2350	39.60	39.38	0.55	1.75	1.71	2.36
				2400	39.40	39.30	0.26	1.78	1.75	1.79
A	3/28/2019	2300	Body	2300	50.92	52.90	-3.75	1.89	1.80	4.74
				2350	50.88	52.84	-3.71	1.93	1.85	4.12
				2400	50.67	52.77	-3.98	1.97	1.90	3.95
A	3/28/2019	2450	Head	2450	39.38	39.20	0.46	1.83	1.80	1.56
				2400	39.40	39.30	0.26	1.78	1.75	1.79
				2480	39.38	39.16	0.56	1.85	1.83	0.74
A	3/28/2019	2600	Head	2600	39.16	39.01	0.38	1.96	1.96	-0.16
				2495	39.29	39.14	0.37	1.86	1.85	0.67
				2690	38.91	38.90	0.03	2.04	2.06	-1.19
A	3/28/2019	2600	Body	2600	50.58	52.51	-3.68	2.18	2.16	0.84
				2495	50.69	52.64	-3.71	2.07	2.01	2.92
				2690	50.35	52.40	-3.91	2.27	2.29	-0.63
A	3/28/2019	5250	Body	5250	47.64	48.95	-2.68	5.40	5.35	0.88
				5150	47.87	49.09	-2.48	5.25	5.24	0.28
				5350	47.37	48.82	-2.96	5.57	5.47	1.76
A	3/28/2019	5750	Body	5750	46.39	48.27	-3.91	6.15	5.94	3.61
				5700	46.53	48.34	-3.75	6.05	5.88	2.88
				5850	46.14	48.20	-4.27	6.28	6.00	4.63
A	4/2/2019	5250	Body	5250	48.17	48.95	-1.60	5.38	5.35	0.58
				5150	48.36	49.09	-1.48	5.25	5.24	0.20
				5350	47.91	48.82	-1.86	5.53	5.47	1.09
A	4/2/2019	5750	Body	5750	47.25	48.27	-2.12	6.11	5.94	2.98
				5700	47.35	48.34	-2.05	6.03	5.88	2.63
				5850	47.05	48.20	-2.39	6.25	6.00	4.13
A	4/2/2019	5250	Head	5250	36.28	35.93	0.97	4.49	4.70	-4.43
				5150	36.46	36.05	1.15	4.38	4.60	-4.80
				5350	36.10	35.82	0.78	4.61	4.80	-4.05
A	4/2/2019	5750	Head	5750	35.45	35.36	0.25	5.07	5.21	-2.78
				5700	35.56	35.42	0.40	5.00	5.16	-3.17
				5850	35.30	35.30	0.00	5.16	5.27	-2.01

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity ( $\epsilon_r$ )			Conductivity ( $\sigma$ )		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
A	4/16/2019	835	Head	835	41.64	41.50	0.34	0.90	0.90	0.20
				805	41.75	41.68	0.17	0.89	0.90	-0.80
				850	41.59	41.50	0.22	0.91	0.92	-0.84
A	4/16/2019	1750	Head	1750	40.00	40.08	-0.21	1.34	1.37	-2.34
				1710	40.03	40.15	-0.29	1.31	1.35	-2.63
				1755	39.99	40.08	-0.22	1.34	1.37	-2.32
A	4/16/2019	2300	Head	2300	39.21	39.47	-0.67	1.69	1.66	1.52
				2350	39.07	39.38	-0.80	1.72	1.71	0.95
				2400	38.97	39.30	-0.83	1.77	1.75	0.88
A	4/16/2019	2450	Head	2450	38.89	39.20	-0.79	1.81	1.80	0.33
				2400	38.97	39.30	-0.83	1.77	1.75	0.88
				2480	38.86	39.16	-0.77	1.83	1.83	-0.35
A	4/16/2019	2600	Head	2600	38.67	39.01	-0.87	1.94	1.96	-1.23
				2495	38.79	39.14	-0.90	1.84	1.85	-0.25
				2690	38.51	38.90	-1.00	2.02	2.06	-2.16
A	4/16/2019	835	Body	835	54.66	55.20	-0.98	0.98	0.97	1.35
				805	54.81	55.33	-0.95	0.97	0.97	0.39
				850	54.61	55.16	-0.99	0.99	0.99	0.12
A	4/16/2019	1750	Body	1750	53.31	53.44	-0.25	1.48	1.49	-0.48
				1710	53.34	53.54	-0.38	1.45	1.46	-0.72
				1755	53.30	53.43	-0.24	1.48	1.49	-0.49
A	4/16/2019	1900	Body	1900	53.08	53.30	-0.41	1.58	1.52	3.75
				1850	53.09	53.30	-0.39	1.55	1.52	1.71
				1920	53.07	53.30	-0.43	1.59	1.52	4.87
A	4/16/2019	2300	Body	2300	52.25	52.90	-1.24	1.89	1.80	4.80
				2350	52.14	52.84	-1.32	1.93	1.85	4.44
				2400	52.07	52.77	-1.33	1.98	1.90	4.32
A	4/16/2019	2600	Body	2600	51.75	52.51	-1.45	2.17	2.16	0.56
				2495	51.90	52.64	-1.41	2.07	2.01	2.87
				2690	51.60	52.40	-1.52	2.26	2.29	-1.24
A	4/23/2019	5250	Head	5250	35.59	35.93	-0.95	4.55	4.70	-3.32
				5150	35.77	36.05	-0.77	4.44	4.60	-3.56
				5350	35.41	35.82	-1.14	4.66	4.80	-2.94
A	4/23/2019	5750	Head	5800	34.66	35.30	-1.81	5.17	5.27	-1.94
				5700	34.83	35.42	-1.67	5.05	5.16	-2.18
				5850	34.58	35.30	-2.04	5.21	5.27	-1.10
A	4/23/2019	5250	Body	5250	48.62	48.95	-0.68	5.40	5.35	0.86
				5150	48.82	49.09	-0.54	5.26	5.24	0.49
				5350	48.43	48.82	-0.79	5.54	5.47	1.31
A	4/23/2019	5750	Body	5800	47.58	48.20	-1.29	6.19	6.00	3.12
				5700	47.77	48.34	-1.18	6.04	5.88	2.68
				5850	47.48	48.20	-1.49	6.25	6.00	4.18



SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity ( $\epsilon_r$ )			Conductivity ( $\sigma$ )		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
A	4/29/2019	835	Head	835	41.75	41.50	0.60	0.90	0.90	-0.54
				805	41.95	41.68	0.65	0.88	0.90	-1.68
				850	41.68	41.50	0.43	0.90	0.92	-1.44
A	4/29/2019	835	Body	835	53.08	55.20	-3.84	0.94	0.97	-3.37
				805	53.32	55.33	-3.64	0.92	0.97	-4.53
				850	53.00	55.16	-3.91	0.95	0.99	-4.23
A	4/30/2019	5250	Head	5250	37.36	35.93	3.97	4.56	4.70	-3.11
				5150	37.52	36.05	4.09	4.44	4.60	-3.45
				5350	37.17	35.82	3.77	4.68	4.80	-2.61
A	4/30/2019	5750	Head	5750	36.49	35.36	3.19	5.13	5.21	-1.53
				5700	36.59	35.42	3.30	5.07	5.16	-1.83
				5850	36.34	35.30	2.95	5.24	5.27	-0.63
A	4/30/2019	5250	Body	5250	48.11	48.95	-1.72	5.39	5.35	0.73
				5150	48.30	49.09	-1.60	5.25	5.24	0.22
				5350	47.91	48.82	-1.86	5.54	5.47	1.32
A	4/30/2019	5750	Body	5750	47.13	48.27	-2.37	6.12	5.94	3.08
				5700	47.23	48.34	-2.30	6.04	5.88	2.75
				5850	46.95	48.20	-2.59	6.26	6.00	4.30
A	5/3/2019	835	Head	835	42.44	41.50	2.27	0.90	0.90	-0.13
				805	42.57	41.68	2.14	0.89	0.90	-1.02
				850	42.37	41.50	2.10	0.90	0.92	-1.30
A	5/3/2019	2450	Head	2450	39.75	39.20	1.40	1.79	1.80	-0.44
				2400	39.82	39.30	1.33	1.75	1.75	-0.09
				2480	39.75	39.16	1.50	1.81	1.83	-1.17
A	5/7/2019	2450	Head	2450	38.29	39.20	-2.32	1.79	1.80	-0.33
				2400	38.33	39.30	-2.46	1.75	1.75	0.08
				2480	38.29	39.16	-2.23	1.81	1.83	-1.06
A	5/7/2019	5250	Head	5250	36.02	35.93	0.24	4.59	4.70	-2.43
				5150	36.21	36.05	0.45	4.47	4.60	-2.82
				5350	35.80	35.82	-0.05	4.74	4.80	-1.42
A	5/7/2019	5750	Head	5750	35.12	35.36	-0.69	5.26	5.21	0.91
				5700	35.26	35.42	-0.45	5.18	5.16	0.32
				5850	34.97	35.30	-0.93	5.39	5.27	2.22
A	5/10/2019	5250	Body	5250	47.34	48.95	-3.29	5.42	5.35	1.29
				5150	47.50	49.09	-3.23	5.28	5.24	0.74
				5350	47.16	48.82	-3.39	5.57	5.47	1.85
A	5/10/2019	5750	Body	5750	46.33	48.27	-4.03	6.14	5.94	3.39
				5700	46.46	48.34	-3.89	6.07	5.88	3.22
				5850	46.12	48.20	-4.32	6.27	6.00	4.47
A	5/14/2019	2450	Head	2450	37.43	39.20	-4.52	1.80	1.80	-0.06
				2400	37.49	39.30	-4.60	1.76	1.75	0.48
				2480	37.43	39.16	-4.42	1.82	1.83	-0.79
A	5/14/2019	2450	Body	2450	51.14	52.70	-2.96	2.00	1.95	2.41
				2400	51.21	52.77	-2.96	1.95	1.90	2.84
				2480	51.14	52.66	-2.89	2.02	1.99	1.40

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity (εr)			Conductivity (σ)		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
A	5/14/2019	2300	Head	2300	40.95	39.47	3.74	1.70	1.66	2.30
				2350	40.56	39.38	2.98	1.76	1.71	2.83
				2400	40.55	39.30	3.19	1.83	1.75	4.24
A	5/14/2019	2300	Body	2300	51.42	52.90	-2.81	1.87	1.80	3.41
				2350	51.32	52.84	-2.87	1.91	1.85	2.98
				2400	51.21	52.77	-2.96	1.95	1.90	2.84
A	5/14/2019	2600	Head	2600	37.34	39.01	-4.28	1.92	1.96	-2.35
				2495	37.51	39.14	-4.17	1.81	1.85	-2.09
				2690	37.17	38.90	-4.44	1.99	2.06	-3.37
A	5/14/2019	2600	Body	2600	50.95	52.51	-2.97	2.15	2.16	-0.59
				2495	51.08	52.64	-2.97	2.04	2.01	1.33
				2690	50.79	52.40	-3.07	2.24	2.29	-2.07
A	5/16/2019	835	Body	835	52.75	55.20	-4.44	1.01	0.97	4.12
				805	52.74	55.33	-4.69	1.00	0.97	3.11
				850	52.68	55.16	-4.49	1.02	0.99	3.02
A	5/16/2019	1750	Body	1750	50.87	53.44	-4.81	1.49	1.49	0.12
				1710	50.90	53.54	-4.94	1.46	1.46	-0.04
				1755	50.85	53.43	-4.83	1.49	1.49	0.12
A	5/16/2019	1900	Body	1900	52.38	53.30	-1.73	1.57	1.52	3.42
				1850	52.46	53.30	-1.58	1.54	1.52	1.32
				1920	52.39	53.30	-1.71	1.59	1.52	4.41
A	5/16/2019	1750	Head	1750	40.32	40.08	0.59	1.34	1.37	-2.19
				1710	40.35	40.15	0.51	1.32	1.35	-2.26
				1755	40.30	40.08	0.56	1.34	1.37	-2.17
A	5/19/2019	835	Head	835	39.80	41.50	-4.10	0.89	0.90	-0.66
				805	39.90	41.68	-4.27	0.88	0.90	-1.51
				850	39.74	41.50	-4.24	0.90	0.92	-1.75
A	5/19/2019	750	Head	750	43.83	41.96	4.45	0.90	0.89	1.16
				660	44.08	42.42	3.91	0.87	0.89	-1.39
				800	43.62	41.71	4.59	0.92	0.90	2.90
A	5/19/2019	750	Body	750	54.27	55.55	-2.30	0.97	0.96	1.19
				660	54.46	55.89	-2.56	0.94	0.96	-1.32
				800	54.07	55.35	-2.32	0.99	0.97	2.88
A	5/21/2019	1750	Head	1750	38.69	40.08	-3.48	1.33	1.37	-2.77
				1710	38.75	40.15	-3.48	1.31	1.35	-2.93
				1755	38.67	40.08	-3.51	1.33	1.37	-2.76
C	8/16/2018	2300	Head	2300	37.70	39.47	-4.49	1.70	1.66	2.42
				2350	37.63	39.38	-4.46	1.74	1.71	2.07
				2400	37.52	39.30	-4.52	1.78	1.75	1.85
C	8/16/2018	2600	Head	2600	37.25	39.01	-4.51	1.94	1.96	-1.33
				2495	37.37	39.14	-4.53	1.85	1.85	0.29
				2690	37.05	38.90	-4.75	2.01	2.06	-2.60
C	8/16/2018	1900	Head	1900	39.85	40.00	-0.37	1.45	1.40	3.36
				1850	39.93	40.00	-0.18	1.42	1.40	1.29
				1920	39.84	40.00	-0.40	1.46	1.40	4.21
C	8/17/2018	1750	Head	1750	40.15	40.08	0.16	1.36	1.37	-0.80
				1710	40.19	40.15	0.11	1.33	1.35	-0.92
				1755	40.13	40.08	0.13	1.36	1.37	-0.79

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity ( $\epsilon_r$ )			Conductivity ( $\sigma$ )		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
4	9/5/2018	835	Head	835	41.05	41.50	-1.08	0.92	0.90	2.22
				805	40.85	41.68	-1.99	0.91	0.90	1.58
				905	40.80	41.50	-1.69	0.94	0.97	-2.92
4	9/5/2018	835	Body	835	53.88	55.20	-2.39	1.00	0.97	3.30
				805	53.64	55.33	-3.06	0.99	0.97	2.67
				905	53.65	55.00	-2.45	1.03	1.05	-2.23
4	9/6/2018	750	Head	750	40.10	41.96	-4.44	0.89	0.89	-0.69
				695	40.26	42.24	-4.70	0.87	0.89	-2.49
				790	39.98	41.76	-4.25	0.90	0.90	0.48
4	9/6/2018	750	Body	750	54.97	55.55	-1.04	0.99	0.96	2.42
				695	55.30	55.76	-0.82	0.96	0.96	0.41
				790	54.89	55.39	-0.91	1.01	0.97	4.12
4	9/6/2018	1750	Head	1750	38.38	40.08	-4.25	1.32	1.37	-3.72
				1710	38.42	40.15	-4.30	1.30	1.35	-3.67
				1755	38.37	40.08	-4.26	1.32	1.37	-3.70
4	9/6/2018	1750	Body	1750	52.33	53.44	-2.08	1.55	1.49	4.43
				1710	52.39	53.54	-2.15	1.52	1.46	4.27
				1755	52.32	53.43	-2.07	1.56	1.49	4.48
4	9/6/2018	1900	Head	1900	38.11	40.00	-4.73	1.40	1.40	-0.21
				1850	38.18	40.00	-4.55	1.37	1.40	-1.93
				1920	38.13	40.00	-4.67	1.41	1.40	0.57
4	9/6/2018	1900	Body	1900	55.66	53.30	4.43	1.58	1.52	3.88
				1850	55.75	53.30	4.60	1.55	1.52	1.64
				1920	55.66	53.30	4.43	1.59	1.52	4.87
4	9/10/2018	835	Head	835	41.54	41.50	0.10	0.93	0.90	2.97
				805	41.61	41.68	-0.17	0.92	0.90	2.08
				905	41.31	41.50	-0.46	0.95	0.97	-2.40
4	9/10/2018	835	Body	835	54.15	55.20	-1.90	1.01	0.97	3.81
				805	54.26	55.33	-1.94	1.00	0.97	2.89
				905	53.95	55.00	-1.91	1.03	1.05	-1.95

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity ( $\epsilon_r$ )			Conductivity ( $\sigma$ )		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
4	9/10/2018	1750	Head	1750	39.86	40.08	-0.56	1.35	1.37	-1.75
				1710	39.87	40.15	-0.69	1.32	1.35	-1.81
				1755	39.85	40.08	-0.57	1.35	1.37	-1.73
4	9/10/2018	1750	Body	1750	52.72	53.44	-1.35	1.49	1.49	0.46
				1710	52.72	53.54	-1.54	1.47	1.46	0.24
				1755	52.71	53.43	-1.34	1.50	1.49	0.52
4	9/10/2018	1900	Head	1900	39.58	40.00	-1.05	1.44	1.40	2.50
				1850	39.67	40.00	-0.82	1.41	1.40	0.50
				1920	39.57	40.00	-1.08	1.45	1.40	3.43
4	9/10/2018	1900	Body	1900	54.47	53.30	2.20	1.57	1.52	3.55
				1850	54.55	53.30	2.35	1.54	1.52	1.38
				1920	54.47	53.30	2.20	1.59	1.52	4.61
4	9/10/2018	2600	Head	2600	38.30	39.01	-1.82	1.91	1.96	-2.51
				2495	38.43	39.14	-1.82	1.83	1.85	-1.06
				2690	38.09	38.90	-2.08	1.98	2.06	-3.71
4	9/10/2018	2600	Body	2600	50.64	52.51	-3.56	2.20	2.16	1.72
				2495	50.78	52.64	-3.54	2.10	2.01	4.11
				2690	50.40	52.40	-3.81	2.29	2.29	-0.01
4	9/13/2018	5250	Head	5250	36.87	35.93	2.61	4.52	4.70	-3.92
				5150	37.04	36.05	2.75	4.41	4.60	-4.13
				5350	36.72	35.82	2.52	4.62	4.80	-3.78
4	9/13/2018	5750	Head	5750	36.08	35.36	2.03	5.06	5.21	-3.03
				5700	36.16	35.42	2.09	5.00	5.16	-3.09
				5850	35.92	35.30	1.76	5.16	5.27	-2.05
4	9/13/2018	5250	Body	5250	47.12	48.95	-3.74	5.37	5.35	0.36
				5150	47.33	49.09	-3.58	5.24	5.24	-0.01
				5350	46.95	48.82	-3.82	5.50	5.47	0.63
4	9/13/2018	5750	Body	5750	46.18	48.27	-4.34	6.05	5.94	1.99
				5700	46.28	48.34	-4.27	5.99	5.88	1.96
				5850	45.99	48.20	-4.59	6.20	6.00	3.28
4	9/17/2018	2450	Head	2450	38.03	39.20	-2.98	1.85	1.80	2.56
				2400	38.07	39.30	-3.12	1.81	1.75	3.22
				2480	38.00	39.16	-2.97	1.86	1.83	1.50
4	9/17/2018	2450	Body	2450	55.02	52.70	4.40	2.01	1.95	3.08
				2400	55.05	52.77	4.32	1.96	1.90	3.48
				2480	55.00	52.66	4.44	2.03	1.99	2.10

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity ( $\epsilon_r$ )			Conductivity ( $\sigma$ )		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
4	9/24/2018	1750	Head	1750	40.01	40.08	-0.19	1.36	1.37	-0.44
				1710	40.04	40.15	-0.26	1.34	1.35	-0.48
				1755	39.99	40.08	-0.22	1.37	1.37	-0.35
4	9/24/2018	1750	Body	1750	52.64	53.44	-1.50	1.47	1.49	-1.09
				1710	52.67	53.54	-1.63	1.44	1.46	-1.27
				1755	52.63	53.43	-1.49	1.47	1.49	-1.02
4	9/24/2018	835	Head	835	41.44	41.50	-0.14	0.92	0.90	2.08
				805	41.48	41.68	-0.48	0.91	0.90	1.20
				850	41.40	41.50	-0.24	0.92	0.92	0.78
4	9/24/2018	835	Body	835	54.69	55.20	-0.92	0.99	0.97	2.08
				805	54.40	55.33	-1.69	0.98	0.97	1.46
				850	54.68	55.16	-0.87	0.99	0.99	0.76
4	9/24/2018	750	Head	750	41.65	41.96	-0.74	0.89	0.89	-0.90
				660	41.99	42.42	-1.02	0.86	0.89	-3.39
				800	41.50	41.71	-0.49	0.91	0.90	0.95
4	9/24/2018	750	Body	750	54.15	55.55	-2.51	0.96	0.96	-0.32
				660	54.79	55.89	-1.97	0.93	0.96	-3.20
				800	54.35	55.35	-1.81	0.98	0.97	1.31

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity ( $\epsilon_r$ )			Conductivity ( $\sigma$ )		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
4	9/27/2018	1900	Head	1900	39.86	40.00	-0.35	1.43	1.40	2.36
				1850	39.99	40.00	-0.03	1.40	1.40	0.29
				1920	39.86	40.00	-0.35	1.44	1.40	3.14
4	9/27/2018	1900	Body	1900	53.33	53.30	0.06	1.58	1.52	3.68
				1850	53.46	53.30	0.30	1.54	1.52	1.45
				1920	53.31	53.30	0.02	1.59	1.52	4.47
4	9/27/2018	2600	Head	2600	38.93	39.01	-0.21	1.93	1.96	-1.89
				2495	39.05	39.14	-0.24	1.84	1.85	-0.31
				2690	38.73	38.90	-0.43	2.00	2.06	-2.84
4	9/27/2018	2600	Body	2600	52.33	52.51	-0.34	2.17	2.16	0.33
				2495	52.46	52.64	-0.35	2.07	2.01	2.67
				2690	52.13	52.40	-0.51	2.26	2.29	-1.19
4	9/29/2018	2450	Head	2450	37.81	39.20	-3.55	1.84	1.80	2.00
				2400	37.86	39.30	-3.66	1.80	1.75	2.59
				2480	37.77	39.16	-3.55	1.85	1.83	0.79
4	9/29/2018	2450	Body	2450	51.77	52.70	-1.76	1.99	1.95	2.05
				2400	51.81	52.77	-1.82	1.95	1.90	2.58
				2480	51.74	52.66	-1.75	2.00	1.99	0.49
4	9/29/2018	2300	Head	2300	38.02	39.47	-3.68	1.73	1.66	3.80
				2350	37.94	39.38	-3.67	1.76	1.71	3.00
				2400	37.86	39.30	-3.66	1.80	1.75	2.59
4	9/29/2018	2300	Body	2300	51.95	52.90	-1.80	1.87	1.80	3.85
				2350	51.88	52.84	-1.81	1.90	1.85	2.88
				2400	51.81	52.77	-1.82	1.95	1.90	2.58
4	10/1/2018	5250	Head	5250	36.66	35.93	2.02	4.52	4.70	-3.98
				5150	36.82	36.05	2.14	4.41	4.60	-4.06
				5350	36.52	35.82	1.96	4.61	4.80	-4.01
4	10/1/2018	5750	Head	5750	35.91	35.36	1.55	5.03	5.21	-3.62
				5700	35.98	35.42	1.58	4.98	5.16	-3.61
				5850	35.76	35.30	1.30	5.13	5.27	-2.68
4	10/1/2018	5250	Body	5250	47.39	48.95	-3.19	5.36	5.35	0.09
				5150	47.57	49.09	-3.09	5.23	5.24	-0.14
				5350	47.23	48.82	-3.25	5.49	5.47	0.32
4	10/1/2018	5750	Body	5750	46.51	48.27	-3.66	6.04	5.94	1.79
				5700	46.61	48.34	-3.58	6.00	5.88	2.03
				5850	46.35	48.20	-3.84	6.19	6.00	3.12
4	10/3/2018	2450	Head	2450	39.33	39.20	0.33	1.83	1.80	1.61
				2400	39.42	39.30	0.31	1.79	1.75	2.13
				2480	39.30	39.16	0.35	1.85	1.83	0.74
4	10/3/2018	2450	Body	2450	51.48	52.70	-2.31	2.04	1.95	4.46
				2400	51.57	52.77	-2.28	1.99	1.90	4.58
				2480	51.46	52.66	-2.28	2.05	1.99	3.10

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity ( $\epsilon_r$ )			Conductivity ( $\sigma$ )		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
4	10/5/2018	2300	Body	2300	50.39	52.90	-4.75	1.87	1.80	3.85
				2350	50.31	52.84	-4.79	1.92	1.85	3.47
				2400	50.23	52.77	-4.82	1.96	1.90	3.37
4	10/5/2018	835	Head	835	41.01	41.50	-1.18	0.90	0.90	0.53
				805	40.99	41.68	-1.65	0.90	0.90	-0.23
				850	40.97	41.50	-1.28	0.91	0.92	-0.68
4	10/5/2018	750	Head	750	40.99	41.96	-2.32	0.88	0.89	-1.90
				660	41.08	42.42	-3.17	0.85	0.89	-4.11
				800	40.98	41.71	-1.74	0.89	0.90	-0.43
4	10/5/2018	2300	Head	2300	40.47	39.47	2.53	1.63	1.66	-2.33
				2350	40.39	39.38	2.55	1.66	1.71	-2.79
				2400	40.29	39.30	2.53	1.70	1.75	-3.01
4	10/6/2018	750	Body	750	54.70	55.55	-1.52	0.94	0.96	-2.21
				660	54.70	55.89	-2.13	0.91	0.96	-4.67
				800	54.48	55.35	-1.58	0.96	0.97	-0.72
4	10/6/2018	835	Body	835	54.36	55.20	-1.52	0.97	0.97	0.05
				805	54.46	55.33	-1.58	0.96	0.97	-0.59
				850	54.32	55.16	-1.52	0.98	0.99	-1.16
4	10/8/2018	2450	Head	2450	38.79	39.20	-1.05	1.81	1.80	0.67
				2400	37.99	39.30	-3.33	1.70	1.75	-2.78
				2480	38.97	39.16	-0.49	1.77	1.83	-3.35
4	10/8/2018	2450	Body	2450	52.47	52.70	-0.44	1.97	1.95	1.18
				2400	51.20	52.77	-2.98	1.84	1.90	-3.00
				2480	52.37	52.66	-0.55	1.91	1.99	-4.02
4	10/8/2018	2600	Body	2600	50.50	52.51	-3.83	2.06	2.16	-4.90
				2495	50.08	52.64	-4.87	1.93	2.01	-4.13
				2690	50.39	52.40	-3.83	2.23	2.29	-2.51
4	10/8/2018	1750	Body	1750	52.04	53.44	-2.62	1.45	1.49	-2.43
				1710	51.20	53.54	-4.38	1.41	1.46	-3.53
				1755	52.10	53.43	-2.49	1.45	1.49	-2.63
4	10/9/2018	2600	Head	2600	38.13	39.01	-2.26	1.93	1.96	-1.64
				2495	38.22	39.14	-2.36	1.85	1.85	0.18
				2690	37.96	38.90	-2.41	2.00	2.06	-2.94
4	10/9/2018	5200	Head	5200	35.01	35.99	-2.72	4.50	4.65	-3.31
				5150	35.07	36.05	-2.71	4.43	4.60	-3.74
				5350	34.75	35.82	-2.98	4.66	4.80	-3.09
4	10/11/2018	835	Head	835	40.22	41.50	-3.08	0.95	0.90	5.00
				805	40.29	41.68	-3.33	0.94	0.90	4.62
				850	40.16	41.50	-3.23	0.95	0.92	3.61
4	10/11/2018	835	Body	835	54.01	55.20	-2.16	1.00	0.97	3.40
				805	54.10	55.33	-2.23	0.99	0.97	2.82
				850	53.97	55.16	-2.15	1.01	0.99	1.81

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity ( $\epsilon_r$ )			Conductivity ( $\sigma$ )		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
4	10/12/2018	750	Head	750	40.46	41.96	-3.58	0.90	0.89	0.89
				660	40.68	42.42	-4.11	0.87	0.89	-1.46
				800	40.37	41.71	-3.20	0.92	0.90	2.18
4	10/12/2018	750	Body	750	53.37	55.55	-3.92	0.98	0.96	1.94
				660	53.54	55.89	-4.21	0.95	0.96	-0.38
				800	53.33	55.35	-3.66	1.00	0.97	3.52
4	10/15/2018	1750	Head	1750	38.76	40.08	-3.30	1.36	1.37	-0.58
				1710	38.83	40.15	-3.28	1.34	1.35	-0.62
				1755	38.74	40.08	-3.34	1.37	1.37	-0.50
4	10/15/2018	1900	Head	1900	38.48	40.00	-3.80	1.45	1.40	3.29
				1850	38.55	40.00	-3.63	1.42	1.40	1.36
				1920	38.49	40.00	-3.78	1.46	1.40	4.14
4	10/15/2018	1900	Body	1900	51.28	53.30	-3.79	1.58	1.52	4.08
				1850	51.36	53.30	-3.64	1.55	1.52	2.11
				1920	51.29	53.30	-3.77	1.60	1.52	4.93
4	10/16/2018	2300	Head	2300	38.23	39.47	-3.15	1.66	1.66	-0.40
				2350	38.13	39.38	-3.19	1.69	1.71	-0.98
				2400	38.07	39.30	-3.12	1.74	1.75	-0.89
4	10/16/2018	2300	Body	2300	51.51	52.90	-2.64	1.84	1.80	1.97
				2350	51.41	52.84	-2.70	1.89	1.85	1.96
				2400	51.39	52.77	-2.62	1.94	1.90	2.16



## 8.2. System Check

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

### System Performance Check Measurement Conditions:

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

### 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  $\pm$ 10% of the manufacturer calibrated dipole SAR target. Refer to Appendix B for the SAR System Check Plots.

SAR Lab	Date	Tissue Type	Dipole Type_Serial #	Dipole Cal. Due Data	Measured Results for 1g SAR				Measured Results for 10g SAR				Plot No.
					Zoom Scan to 100 mW	Normalize to 1W	Target (Ref. Value)	Delta ±10 %	Zoom Scan to 100 mW	Normalize to 1W	Target (Ref. Value)	Delta ±10 %	
A	3/28/2019	Head	D635V2 SN:4d117	5/16/2019	0.957	9.57	9.87	-3.04	0.628	6.28	6.40	-1.88	
A	3/28/2019	Body	D635V2 SN:4d117	5/16/2019	0.961	9.61	10.31	<b>-6.79</b>	0.633	6.33	6.84	-7.46	1,2
A	3/28/2019	Head	D1750V2 SN:1050	4/17/2020	3.590	35.90	35.40	1.41	1.910	19.10	18.60	2.69	
A	3/28/2019	Body	D1750V2 SN:1050	4/17/2020	3.630	36.30	36.40	-0.27	1.920	19.20	19.20	0.00	
A	3/28/2019	Body	D1900V2 SN:5d140	4/17/2020	4.260	42.60	40.40	<b>5.45</b>	2.200	22.00	21.30	3.29	3,4
A	3/28/2019	Head	D2300V2 SN:1058	10/2/2019	5.030	50.30	51.75	-2.80	2.390	23.90	24.52	-2.53	
A	3/28/2019	Body	D2300V2 SN:1058	10/2/2019	4.930	49.30	51.35	<b>-3.99</b>	2.330	23.30	24.44	-4.66	5,6
A	3/28/2019	Head	D2450V2 SN:706	5/18/2019	5.260	52.60	52.60	<b>0.00</b>	2.440	24.40	24.60	-0.81	7,8
A	3/28/2019	Head	D2600V2 SN:1006	10/16/2019	5.710	57.10	59.31	-3.73	2.560	25.60	26.43	-3.14	
A	3/28/2019	Body	D2600V2 SN:1006	10/16/2019	5.630	56.30	58.52	<b>-3.79</b>	2.490	24.90	26.15	-4.78	9,10
A	3/28/2019	Body	D5GHzV2 SN:1003 (5.25 GHz)	2/19/2020	7.480	74.80	74.40	0.54	2.090	20.90	20.80	0.48	
A	3/28/2019	Body	D5GHzV2 SN:1003 (5.75 GHz)	2/19/2020	7.670	76.70	76.20	0.66	2.130	21.30	21.40	-0.47	
A	4/2/2019	Body	D5GHzV2 SN:1003 (5.25 GHz)	2/19/2020	7.470	74.70	74.40	0.40	2.100	21.00	20.80	0.96	
A	4/2/2019	Body	D5GHzV2 SN:1003 (5.75 GHz)	2/19/2020	7.510	75.10	76.20	-1.44	2.080	20.80	21.40	-2.80	
A	4/2/2019	Head	D5GHzV2 SN:1003 (5.25 GHz)	2/19/2020	8.030	80.30	80.80	<b>-0.62</b>	2.300	23.00	23.30	-1.29	11,12
A	4/2/2019	Head	D5GHzV2 SN:1003 (5.75 GHz)	2/19/2020	7.470	74.70	80.70	<b>-7.43</b>	2.130	21.30	23.00	-7.39	13,14
A	4/16/2019	Head	D635V2 SN:4d002	11/28/2019	0.963	9.63	9.87	-2.43	0.634	6.34	6.36	-0.31	
A	4/16/2019	Head	D1750V2 SN:1077	10/16/2019	3.670	36.70	38.69	<b>-5.14</b>	1.960	19.60	20.46	-4.20	15,16
A	4/16/2019	Head	D2300V2 SN:1002	3/22/2020	5.230	52.30	48.30	<b>8.28</b>	2.480	24.80	23.30	6.44	17,18
A	4/16/2019	Head	D2450V2 SN:899	3/22/2020	5.510	55.10	51.60	<b>6.78</b>	2.550	25.50	24.10	5.81	19,20
A	4/16/2019	Head	D2600V2 SN:1036	3/22/2020	5.890	58.90	55.90	5.37	2.620	26.20	24.80	5.65	
A	4/16/2019	Body	D635V2 SN:4d002	11/28/2019	0.965	9.65	10.07	-4.17	0.632	6.32	6.56	-3.66	
A	4/16/2019	Body	D1750V2 SN:1077	10/16/2019	3.660	36.60	39.29	-6.85	1.930	19.30	21.05	-8.31	
A	4/16/2019	Body	D1900V2 SN:5d163	10/16/2019	4.320	43.20	42.59	1.43	2.230	22.30	22.17	0.59	
A	4/16/2019	Body	D2300V2 SN:1002	3/22/2020	4.560	45.60	46.80	-2.56	2.140	21.40	22.60	-5.31	
A	4/16/2019	Body	D2600V2 SN:1036	3/22/2020	5.110	51.10	53.90	-5.19	2.240	22.40	23.90	-6.28	
A	4/23/2019	Head	D5GHzV2 SN:1138 (5.25 GHz)	8/21/2019	7.790	77.90	82.60	<b>-5.69</b>	2.220	22.20	23.80	-6.72	21,22
A	4/23/2019	Head	D5GHzV2 SN:1138 (5.75 GHz)	8/21/2019	8.010	80.10	82.40	-2.79	2.280	22.80	23.60	-3.39	
A	4/23/2019	Body	D5GHzV2 SN:1138 (5.25 GHz)	8/21/2019	8.080	80.80	76.60	5.48	2.260	22.60	21.40	5.61	
A	4/23/2019	Body	D5GHzV2 SN:1138 (5.75 GHz)	8/21/2019	7.300	73.00	74.10	-1.48	2.020	20.20	20.60	-1.94	
A	4/29/2019	Head	D635V2 SN:4d002	11/28/2019	0.932	9.32	9.87	-5.57	0.611	6.11	6.36	-3.93	
A	4/29/2019	Body	D635V2 SN:4d002	11/28/2019	0.928	9.28	10.07	<b>-7.85</b>	0.614	6.14	6.56	-6.40	23,24
A	4/30/2019	Head	D5GHzV2 SN:1138 (5.25 GHz)	8/21/2019	8.700	87.00	82.60	5.33	2.490	24.90	23.80	4.62	
A	4/30/2019	Head	D5GHzV2 SN:1138 (5.75 GHz)	8/21/2019	8.230	82.30	82.40	-0.12	2.350	23.50	23.60	-0.42	
A	4/30/2019	Body	D5GHzV2 SN:1138 (5.25 GHz)	8/21/2019	7.500	75.00	76.60	-2.09	2.100	21.00	21.40	-1.87	
A	4/30/2019	Body	D5GHzV2 SN:1138 (5.75 GHz)	8/21/2019	7.810	78.10	74.10	5.40	2.170	21.70	20.60	5.34	
A	5/3/2019	Head	D635V2 SN:4d002	11/28/2019	0.955	9.55	9.87	-3.24	0.627	6.27	6.36	-1.42	
A	5/3/2019	Head	D2450V2 SN:899	3/22/2020	5.410	54.10	51.60	4.84	2.500	25.00	24.10	3.73	
A	5/7/2019	Head	D2450V2 SN:899	3/22/2020	5.330	53.30	51.60	3.29	2.480	24.80	24.10	2.90	
A	5/7/2019	Head	D5GHzV2 SN:1138 (5.25 GHz)	8/21/2019	7.920	79.20	82.60	-4.12	2.260	22.60	23.80	-5.04	
A	5/7/2019	Head	D5GHzV2 SN:1138 (5.75 GHz)	8/21/2019	8.430	84.30	82.40	2.31	2.400	24.00	23.60	1.69	
A	5/10/2019	Body	D5GHzV2 SN:1138 (5.25 GHz)	8/21/2019	8.020	80.20	76.60	4.70	2.240	22.40	21.40	4.67	
A	5/10/2019	Body	D5GHzV2 SN:1138 (5.75 GHz)	8/21/2019	7.820	78.20	74.10	<b>5.53</b>	2.170	21.70	20.60	5.34	25,26

SAR Lab	Date	Tissue Type	Dipole Type_Serial #	Dipole Cal. Due Data	Measured Results for 1g SAR				Measured Results for 10g SAR				Plot No.
					Zoom Scan to 100 mW	Normalize to 1W	Target (Ref. Value)	Delta $\pm 10\%$	Zoom Scan to 100 mW	Normalize to 1W	Target (Ref. Value)	Delta $\pm 10\%$	
A	5/14/2019	Head	D2450V2 SN:899	3/22/2020	5.490	54.90	51.60	6.40	2.550	25.50	24.10	5.81	
A	5/14/2019	Body	D2450V2 SN:899	3/22/2020	5.000	50.00	50.00	0.00	2.310	23.10	23.50	-1.70	
A	5/14/2019	Head	D2300V2 SN:1002	3/22/2020	5.040	50.40	48.30	4.35	2.400	24.00	23.30	3.00	
A	5/14/2019	Body	D2300V2 SN:1002	3/22/2020	4.670	46.70	46.80	-0.21	2.200	22.00	22.60	-2.65	
A	5/14/2019	Head	D2600V2 SN:1036	3/22/2020	5.770	57.70	55.90	3.22	2.580	25.80	24.80	4.03	
A	5/14/2019	Body	D2600V2 SN:1036	3/22/2020	5.790	57.90	53.90	<b>7.42</b>	2.540	25.40	23.90	6.28	27,28
A	5/17/2019	Body	D835V2 SN:4d142	8/23/2019	0.980	9.80	9.68	1.24	0.642	6.42	6.36	0.94	
A	5/17/2019	Body	D1750V2 SN:1050	4/17/2020	3.800	38.00	36.40	<b>4.40</b>	2.010	20.10	19.20	4.69	29,30
A	5/17/2019	Body	D1900V2 SN:5d140	4/17/2020	4.060	40.60	40.40	0.50	2.090	20.90	21.30	-1.88	
A	5/17/2019	Head	D1750V2 SN:1050	4/17/2020	3.800	38.00	35.40	7.34	2.010	20.10	18.60	8.06	
A	5/19/2019	Head	D835V2 SN:4d142	8/23/2019	0.931	9.31	9.48	<b>-1.79</b>	0.611	6.11	6.10	0.16	31,32
A	5/19/2019	Head	D750V3 SN:1071	11/28/2019	0.865	8.65	8.32	<b>3.97</b>	0.573	5.73	5.45	5.14	33,34
A	5/19/2019	Body	D750V3 SN:1071	11/28/2019	0.844	8.44	8.63	-2.20	0.557	5.57	5.65	-1.42	
A	5/21/2019	Head	D1750V2 SN:1050	4/17/2020	3.630	36.30	35.40	2.54	1.930	19.30	18.60	3.76	
C	8/16/2018	Head	D2300V2 SN:1058	8/31/2018	5.090	50.90	53.74	<b>-5.28</b>	2.440	24.40	25.31	-3.60	35,36
C	8/16/2018	Head	D2600V2 SN:1006	10/5/2018	5.590	55.90	55.73	<b>0.31</b>	2.500	25.00	25.08	-0.32	37,38
C	8/16/2018	Head	D1900V2 SN:5d140	4/11/2019	3.850	38.50	38.93	<b>-1.10</b>	1.990	19.90	20.14	-1.19	39,40
C	8/17/2018	Head	D1750V2 SN:1050	4/10/2019	3.610	36.10	36.50	<b>-1.10</b>	1.910	19.10	19.42	-1.65	41,42

SAR Lab	Date	Tissue Type	Dipole Type_Serial #	Dipole Cal. Due Data	Measured Results for 1g SAR				Measured Results for 10g SAR				Plot No.
					Zoom Scan to 100 mW	Normalize to 1W	Target (Ref. Value)	Delta ±10 %	Zoom Scan to 100 mW	Normalize to 1W	Target (Ref. Value)	Delta ±10 %	
4	9/5/2018	Head	D835V2 SN:4d117	5/16/2019	0.934	9.34	9.87	-5.37	0.603	6.03	6.40	3.66	
4	9/5/2018	Body	D835V2 SN:4d117	5/16/2019	0.954	9.54	10.31	-7.47	0.624	6.24	6.84	2.64	
4	9/6/2018	Head	D750V3 SN:1071	11/21/2018	0.912	9.12	8.59	6.17	0.594	5.94	5.73	0.31	
4	9/6/2018	Body	D750V3 SN:1071	11/21/2018	0.886	8.86	8.52	3.99	0.584	5.84	5.69	-2.90	
4	9/6/2018	Head	D1750V2 SN:1077	10/5/2018	3.410	34.10	36.26	<b>-5.96</b>	1.940	19.40	19.34	0.50	43,44
4	9/6/2018	Body	D1750V2 SN:1077	10/5/2018	3.670	36.70	37.34	-1.71	1.940	19.40	19.98	-0.32	
4	9/6/2018	Head	D1900V2 SN:5d163	10/5/2018	3.920	39.20	38.77	1.11	2.020	20.20	20.10	-3.13	
4	9/6/2018	Body	D1900V2 SN:5d163	10/5/2018	4.230	42.30	42.99	-1.61	2.190	21.90	21.97	-8.04	
4	9/10/2018	Head	D835V2 SN:4d117	5/16/2019	0.959	9.59	9.87	-2.84	0.620	6.20	6.40	-3.83	
4	9/10/2018	Body	D835V2 SN:4d117	5/16/2019	0.963	9.63	10.31	-6.60	0.629	6.29	6.84	-3.90	
4	9/10/2018	Head	D1750V2 SN:1077	10/5/2018	3.520	35.20	36.26	-2.92	1.860	18.60	19.34	3.98	
4	9/10/2018	Body	D1750V2 SN:1077	10/5/2018	3.640	36.40	37.34	-2.52	1.920	19.20	19.98	-1.68	
4	9/10/2018	Head	D1900V2 SN:5d163	10/5/2018	4.060	40.60	38.77	4.72	2.090	20.90	20.10	-2.28	
4	9/10/2018	Body	D1900V2 SN:5d163	10/5/2018	4.190	41.90	42.99	-2.54	2.160	21.60	21.97	-9.74	
4	9/10/2018	Head	D2600V2 SN:1036	3/16/2019	5.370	53.70	54.54	-1.54	2.400	24.00	24.56	-3.88	
4	9/10/2018	Body	D2600V2 SN:1036	3/16/2019	5.110	51.10	56.13	<b>-8.96</b>	2.260	22.60	25.04	7.21	45,46
4	9/13/2018	Head	D5GHzV2 SN:1003 (5.25 GHz)	3/13/2019	7.850	78.50	80.60	-2.61	2.230	22.30	23.20	8.78	
4	9/13/2018	Head	D5GHzV2 SN:1003 (5.75 GHz)	3/13/2019	8.340	83.40	78.40	6.38	2.380	23.80	22.20	1.46	
4	9/13/2018	Body	D5GHzV2 SN:1003 (5.25 GHz)	3/13/2019	7.850	78.50	73.60	<b>6.66</b>	2.230	22.30	20.50	4.13	47,48
4	9/13/2018	Body	D5GHzV2 SN:1003 (5.75 GHz)	3/13/2019	7.530	75.30	73.90	1.89	2.090	20.90	20.60	6.03	
4	9/17/2018	Head	D2450V2 SN:899	3/16/2019	5.450	54.50	51.75	5.31	2.520	25.20	24.20	2.38	
4	9/17/2018	Body	D2450V2 SN:899	3/16/2019	5.330	53.30	50.55	5.44	2.460	24.60	23.20	0.60	
4	9/24/2018	Head	D1750V2 SN:1077	10/5/2018	3.770	37.70	36.26	3.97	1.980	19.80	19.34	-5.47	
4	9/24/2018	Body	D1750V2 SN:1077	10/5/2018	3.830	38.30	37.34	2.57	2.010	20.10	19.98	0.80	
4	9/24/2018	Head	D835V2 SN:4d142	10/12/2018	0.908	9.08	9.64	<b>-5.81</b>	0.588	5.88	6.22	-3.61	49,50
4	9/24/2018	Body	D835V2 SN:4d142	10/12/2018	0.972	9.72	9.63	0.93	0.632	6.32	6.27	-0.63	

**System Check Results(Cont.)**

SAR Lab	Date	Tissue Type	Dipole Type_Serial #	Dipole Cal. Due Data	Measured Results for 1g SAR				Measured Results for 10g SAR				Plot No.
					Zoom Scan to 100 mW	Normalize to 1 W	Target (Ref. Value)	Delta ±10 %	Zoom Scan to 100 mW	Normalize to 1 W	Target (Ref. Value)	Delta ±10 %	
4	9/25/2018	Head	D750V3 SN:1071	11/21/2018	0.893	8.93	8.59	3.96	0.582	5.82	5.73	1.57	
4	9/25/2018	Body	D750V3 SN:1071	11/21/2018	0.889	8.89	8.52	4.34	0.584	5.84	5.69	2.64	
4	9/27/2018	Head	D1900V2 SN:5d163	10/5/2018	4.190	41.90	38.77	<b>8.07</b>	2.150	21.50	20.10	6.97	51,52
4	9/27/2018	Body	D1900V2 SN:5d163	10/5/2018	4.340	43.40	42.99	0.95	2.230	22.30	21.97	1.50	
4	9/27/2018	Head	D2600V2 SN:1036	3/16/2019	5.680	56.80	54.54	4.14	2.540	25.40	24.56	3.42	
4	9/27/2018	Body	D2600V2 SN:1036	3/16/2019	5.620	56.20	56.13	0.12	2.470	24.70	25.04	-1.36	
4	9/29/2018	Head	D2450V2 SN:706	5/18/2019	4.990	49.90	52.60	<b>-5.13</b>	2.300	23.00	24.60	-6.50	53,54
4	9/29/2018	Body	D2450V2 SN:706	5/18/2019	4.980	49.80	50.60	-1.58	2.280	22.80	23.70	-3.80	
4	9/29/2018	Head	D2300V2 SN:1002	3/16/2019	5.390	53.90	51.75	4.15	2.550	25.50	24.68	3.32	
4	9/29/2018	Body	D2300V2 SN:1002	3/16/2019	4.800	48.00	50.16	-4.31	2.250	22.50	23.72	-5.14	
4	10/1/2018	Head	D5GHzV2 SN:1003 (5.25 GHz)	3/13/2019	8.430	84.30	80.60	4.59	2.420	24.20	23.20	4.31	
4	10/1/2018	Head	D5GHzV2 SN:1003 (5.75 GHz)	3/13/2019	8.480	84.80	78.40	8.16	2.430	24.30	22.20	9.46	
4	10/1/2018	Body	D5GHzV2 SN:1003 (5.25 GHz)	3/13/2019	7.840	78.40	73.60	6.52	2.230	22.30	20.50	8.78	
4	10/1/2018	Body	D5GHzV2 SN:1003 (5.75 GHz)	3/13/2019	8.020	80.20	73.90	<b>8.53</b>	2.250	22.50	20.60	9.22	55,56
4	10/3/2018	Head	D2450V2 SN:748	2/14/2019	5.260	52.60	52.94	-0.64	2.420	24.20	24.60	-1.63	
4	10/3/2018	Body	D2450V2 SN:748	2/14/2019	5.020	50.20	50.95	<b>-1.47</b>	2.300	23.00	23.80	-3.36	57,58
4	10/5/2018	Body	D2300V2 SN:1002	3/16/2019	5.440	54.40	50.16	8.45	2.570	25.70	23.72	8.35	
4	10/5/2018	Head	D835V2 SN:4d117	5/16/2019	0.991	9.91	9.87	0.41	0.641	6.41	6.40	0.16	
4	10/5/2018	Head	D750V3 SN:1071	11/21/2018	0.836	8.36	8.59	-2.68	0.544	5.44	5.73	-5.06	
4	10/5/2018	Head	D2300V2 SN:1002	3/16/2019	4.850	48.50	51.75	-6.28	2.310	23.10	24.68	-6.40	
4	10/6/2018	Body	D750V3 SN:1071	11/21/2018	0.870	8.70	8.52	2.11	0.569	5.69	5.69	0.00	
4	10/6/2018	Body	D835V2 SN:4d117	5/16/2019	0.950	9.50	10.31	<b>-7.86</b>	0.616	6.16	6.84	-9.94	59,60
4	10/8/2018	Head	D2450V2 SN:899	3/16/2019	5.280	52.80	51.75	2.03	2.440	24.40	24.20	0.83	
4	10/8/2018	Body	D2450V2 SN:899	3/16/2019	5.400	54.00	50.55	<b>6.82</b>	2.490	24.90	23.20	7.33	61,62
4	10/8/2018	Body	D2600V2 SN:1036	3/16/2019	5.680	56.80	56.13	1.19	2.500	25.00	25.04	-0.16	
4	10/8/2018	Body	D1750V2 SN:1050	4/10/2019	3.930	39.30	37.18	<b>5.70</b>	2.060	20.60	19.74	4.36	63,64
4	10/9/2018	Head	D2600V2 SN:1036	3/16/2019	5.580	55.80	54.54	2.31	2.490	24.90	24.56	1.38	
4	10/9/2018	Head	D5GHzV2 SN:1138 (5.2 GHz)	10/26/2018	7.770	77.70	77.70	<b>0.00</b>	2.250	22.50	22.20	1.35	65,66
4	10/11/2018	Head	D835V2 SN:4d142	10/12/2018	0.926	9.26	9.64	-3.94	0.601	6.01	6.22	-3.38	
4	10/11/2018	Body	D835V2 SN:4d142	10/12/2018	1.010	10.10	9.63	4.88	0.654	6.54	6.27	4.37	
4	10/12/2018	Head	D750V3 SN:1071	11/21/2018	0.856	8.56	8.59	-0.35	0.559	5.59	5.73	-2.44	
4	10/12/2018	Body	D750V3 SN:1071	11/21/2018	0.908	9.08	8.52	<b>6.57</b>	0.592	5.92	5.69	4.04	67,68
4	10/15/2018	Head	D1750V2 SN:1050	4/10/2019	3.550	35.50	36.50	-2.74	1.870	18.70	19.42	-3.71	
4	10/15/2018	Head	D1900V2 SN:5d140	4/11/2019	4.240	42.40	38.93	<b>8.91</b>	2.180	21.80	20.14	8.24	69,70
4	10/15/2018	Body	D1900V2 SN:5d140	4/11/2019	4.430	44.30	41.00	8.05	2.270	22.70	21.05	7.84	
4	10/16/2018	Head	D2300V2 SN:1002	3/16/2019	4.830	48.30	51.75	-6.67	2.280	22.80	24.68	-7.62	
4	10/16/2018	Body	D2300V2 SN:1002	3/16/2019	5.460	54.60	50.16	<b>8.85</b>	2.560	25.60	23.72	7.93	71,72

**9. Conducted Output Power Measurements**

Please refer to Section 10.1 for the measured output power results of host device and 10.2 for sleeve Bluetooth power.

## 10. Measured and Reported (Scaled) SAR Results

### SAR Test Reduction criteria are as follows:

- Reported SAR(W/kg) for WWAN = Measured SAR \*Tune-up Scaling Factor
- Reported SAR(W/kg) for Wi-Fi and Bluetooth = Measured SAR \* Tune-up scaling factor \* Duty Cycle scaling factor
- Duty Cycle scaling factor = 1 / Duty cycle (%)

### 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:

- $\leq 0.8$  W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\leq 100$  MHz
- $\leq 0.6$  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
- $\leq 0.4$  W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\geq 200$  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:

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

### KDB 941225 D05 SAR for LTE Devices:

SAR test reduction is applied using the following criteria:

- Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel.
- When the reported SAR is  $> 0.8$  W/kg, testing for other Channels is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
- Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are  $> 0.8$  W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation  $< 1.45$  W/kg.
- Testing for 16-QAM modulation is not required because the reported SAR for QPSK is  $< 1.45$  W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
- Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is  $< 1.45$  W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.
- For LTE bands that do not support at least three non-overlapping channels in certain channel bandwidths, test the available non-overlapping channels instead. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing; therefore, the requirement for H, M and L channels may not fully apply.

### KDB 248227 D01 SAR meas for 802.11:

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

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

- $\leq 0.4$  W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.
- $> 0.4$  W/kg, SAR is repeated using the same wireless mode test configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the reported SAR is  $\leq 0.8$  W/kg or all required test positions are tested.
  - For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
  - When it is unclear, all equivalent conditions must be tested.
- For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is  $> 0.8$  W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is  $\leq 1.2$  W/kg or all required test channels are considered.
  - The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.
- When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is  $\leq 1.2$  W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.
- When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is  $\leq 1.2$  W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.

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

### 10.1. Measured and Reported SAR Results

Technology/ Band	Frequency	RF Exposure Conditions	Test Position	Antenna	Ch. No.	Mode	Test Distance (mm)		Original Reported Values				Baseline with Host Device (1897)			Scaled Baseline SAR vs Original Reported SAR	Host Device + Terminal		Adjusted SAR Reported 1g (W/kg)	Plot No.
							Baseline	Accessory	Tune-up Limit (dBm)	Measured Power (dBm)	Measured SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Measured Power (dBm)	Measured SAR 1g (W/kg)	Scaled SAR 1g (W/kg)		Measured SAR 1g (W/kg)	Scaled SAR 1g (W/kg)		
GSM 850	850	Head	Right Touch	UAT	190	GPRS 2 Slots	0mm	0mm	29.8	29.4	0.752	0.815	29.0	0.595	0.707	-13%	0.091	0.108	0.125	1
		Body & Hotspot	Front	UAT	190	GPRS 2 Slots	5mm	5mm	29.8	29.4	0.680	0.737	29.0	0.622	0.739	0%	0.024	0.029	0.029	
		Head	Left Touch	LAT	190	GPRS 2 Slots	0mm	0mm	32.3	32.3	0.247	0.247	32.3	0.260	0.260	5%	0.003	0.003	0.003	
		Body & Hotspot	Rear	LAT	251	GPRS 2 Slots	5mm	0mm	32.3	32.3	1.070	1.070	32.3	0.981	0.981	-8%	0.176	0.176	0.192	2
GSM 1900	1900	Head	Right Touch	UAT	661	GPRS 2 Slots	0mm	0mm	25.3	24.8	0.914	1.014	24.5	0.927	1.102	9%	0.556	0.661	0.661	3
		Body & Hotspot	Front	UAT	661	GPRS 2 Slots	5mm	5mm	26.8	26.7	0.811	0.820	26.2	0.763	0.870	6%	0.360	0.410	0.410	4
		Head	Right Touch	LAT	661	GPRS 2 Slots	0mm	0mm	30.3	30.3	0.299	0.299	30.3	0.325	0.325	9%	0.198	0.198	0.198	
		Body & Hotspot	Front	LAT	512	GPRS 2 Slots	5mm	5mm	27.5	27.5	1.070	1.070	27.3	1.060	1.110	4%	0.279	0.292	0.292	
WCDMA Band V	850	Head	Right Touch	UAT	4233	Rel. 99 RMC 12.2kbps	0mm	0mm	23.8	23.8	1.090	1.090	23.8	1.160	1.160	6%	0.981	0.981	0.981	5
		Body & Hotspot	Front	UAT	4183	Rel. 99 RMC 12.2kbps	5mm	5mm	23.8	23.8	0.531	0.531	23.8	0.548	0.548	3%	0.444	0.444	0.444	6
		Head	Left Touch	LAT	4183	Rel. 99 RMC 12.2kbps	0mm	0mm	24.8	24.8	0.433	0.433	24.5	0.379	0.410	-5%	0.066	0.071	0.075	
		Body & Hotspot	Rear	LAT	4233	Rel. 99 RMC 12.2kbps	5mm	0mm	24.8	24.8	1.020	1.020	24.5	1.030	1.099	8%	0.181	0.193	0.193	
WCDMA Band IV	1750	Head	Right Touch	UAT	1513	Rel. 99 RMC 12.2kbps	0mm	0mm	19.0	18.8	0.976	1.022	18.5	0.948	1.064	4%	0.422	0.473	0.473	7
		Hotspot	Edge 1	UAT	1413	Rel. 99 RMC 12.2kbps	5mm	5mm	21.0	21.0	0.700	0.700	20.4	0.666	0.774	11%	0.505	0.587	0.587	8
		Head	Left Touch	LAT	1413	Rel. 99 RMC 12.2kbps	0mm	0mm	25.2	24.4	0.525	0.631	23.8	0.431	0.602	-5%	0.049	0.068	0.072	
		Hotspot	Edge 3	LAT	1513	Rel. 99 RMC 12.2kbps	5mm	0mm	21.0	21.0	1.050	1.050	20.9	1.050	1.074	2%	0.144	0.147	0.147	
WCDMA Band II	1900	Head	Right Touch	UAT	9400	Rel. 99 RMC 12.2kbps	0mm	0mm	18.8	18.5	0.977	1.035	18.6	0.998	1.033	0%	0.618	0.640	0.641	9
		Body & Hotspot	Front	UAT	9538	Rel. 99 RMC 12.2kbps	5mm	5mm	20.3	20.3	0.881	0.881	20.3	0.939	0.939	7%	0.306	0.306	0.306	
		Head	Right Touch	LAT	9538	Rel. 99 RMC 12.2kbps	0mm	0mm	25.3	25.2	0.836	0.855	24.3	0.712	0.896	5%	0.309	0.389	0.389	
		Body & Hotspot	Rear	LAT	9538	Rel. 99 RMC 12.2kbps	5mm	0mm	20.8	20.6	1.040	1.089	20.7	1.100	1.118	3%	0.348	0.354	0.354	10
LTE Band 7	2500	Head	Right Touch	UAT	21350	QPSK RB 50,24 20MHz BW	0mm	0mm	18.0	17.6	0.985	1.080	17.1	0.908	1.117	3%	0.770	0.947	0.947	11
		Body & Hotspot	Rear	UAT	21100	QPSK RB 50,24 20MHz BW	5mm	0mm	19.8	19.4	0.724	0.785	18.7	0.702	0.894	14%	0.757	0.964	0.964	12
		Head	Left Touch	LAT	21350	QPSK RB 1,49 20MHz BW	0mm	0mm	24.8	24.5	0.886	0.949	23.7	0.697	0.898	-5%	0.015	0.019	0.020	
		Body & Hotspot	Front	LAT	21100	QPSK RB 50,24 20MHz BW	5mm	5mm	18.5	17.9	0.873	1.002	18.5	0.906	0.906	-10%	0.727	0.727	0.804	
LTE Band 12	750	Head	Right Touch	UAT	23095	QPSK RB 1,24 10MHz BW	0mm	0mm	23.3	23.3	0.715	0.715	23.1	0.586	0.614	-14%	0.260	0.272	0.317	13
		Body & Hotspot	Edge 2	UAT	23095	QPSK RB 1,24 10MHz BW	5mm	5mm	23.3	23.3	0.337	0.337	23.1	0.308	0.323	-4%	0.215	0.225	0.235	14
		Head	Left Touch	LAT	23095	QPSK RB 1,24 10MHz BW	0mm	0mm	24.8	24.7	0.268	0.274	24.6	0.267	0.283	3%	0.002	0.002	0.002	
		Hotspot	Edge 4	LAT	23095	QPSK RB 1,24 10MHz BW	5mm	5mm	24.8	24.7	0.667	0.683	24.6	0.592	0.627	-8%	0.024	0.026	0.028	
LTE Band 13	750	Head	Right Touch	UAT	23230	QPSK RB 1,24 10MHz BW	0mm	0mm	23.3	23.1	0.767	0.794	22.8	0.675	0.744	-6%	0.682	0.751	0.802	15
		Body & Hotspot	Rear	UAT	23230	QPSK RB 1,24 10MHz BW	5mm	0mm	23.3	23.1	0.484	0.501	22.8	0.458	0.508	1%	0.140	0.155	0.155	16
		Head	Left Touch	LAT	23230	QPSK RB 1,24 10MHz BW	0mm	0mm	24.8	24.5	0.334	0.358	24.5	0.312	0.334	-7%	0.002	0.003	0.003	
		Body & Hotspot	Rear	LAT	23230	QPSK RB 1,24 10MHz BW	5mm	0mm	24.8	24.5	0.927	0.993	24.5	0.888	0.952	-4%	0.042	0.045	0.047	
LTE Band 25	1900	Head	Right Touch	UAT	26365	QPSK RB 1,49 20MHz BW	0mm	0mm	18.8	18.8	1.060	1.060	18.4	1.030	1.116	5%	0.477	0.517	0.517	17
		Hotspot	Edge 4	UAT	26365	QPSK RB 1,49 20MHz BW	5mm	5mm	20.3	20.0	0.651	0.698	19.5	0.641	0.771	10%	0.114	0.137	0.137	
		Head	Right Touch	LAT	26365	QPSK RB 1,49 20MHz BW	0mm	0mm	24.8	24.8	0.670	0.670	24.0	0.527	0.634	-5%	0.304	0.365	0.386	
		Body & Hotspot	Front	LAT	26140	QPSK RB 1,49 20MHz BW	5mm	5mm	20.8	20.0	0.901	1.083	20.8	1.230	1.230	14%	0.397	0.397	0.397	18
LTE Band 26	850	Head	Right Touch	UAT	26865	QPSK RB 1,24 10MHz BW	0mm	0mm	23.3	23.3	1.080	1.080	23.3	0.975	0.964	-11%	0.918	0.907	1.017	19
		Body & Hotspot	Front	UAT	26865	QPSK RB 1,24 10MHz BW	5mm	5mm	23.3	23.3	0.487	0.487	23.3	0.458	0.453	-7%	0.395	0.390	0.420	20
		Head	Left Touch	LAT	26865	QPSK RB 1,24 10MHz BW	0mm	0mm	24.8	24.8	0.433	0.433	24.6	0.397	0.416	-4%	0.004	0.005	0.005	
		Hotspot	Edge 4	LAT	26865	QPSK RB 1,24 10MHz BW	5mm	5mm	24.8	24.8	0.801	0.801	24.6	0.656	0.687	-14%	0.022	0.023	0.027	



**Measured and Reported SAR Results (continued):**

Technology/ Band	Frequency	RF Exposure Conditions	Test Position	Antenna	Ch. No.	Mode	Test Distance (mm)			Original Reported Values			Baseline with Host Device (1897)			Scaled Baseline SAR vs Original Reported SAR	Host Device + Terminal		Adjusted SAR Reported 1g (W/kg)	Plot No.
							Baseline	Accessory	Tune-up Limit (dBm)	Measured Power (dBm)	Measured SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Measured Power (dBm)	Measured SAR 1g (W/kg)	Scaled SAR 1g (W/kg)		Measured SAR 1g (W/kg)	Scaled SAR 1g (W/kg)		
LTE Band 30	2300	Head	Right Touch	UAT	27710	QPSK RB 1,24 10MHz BW	0mm	0mm	17.3	16.9	0.897	0.972	17.2	0.915	0.930	-4%	0.663	0.674	0.705	21
		Body & Hotspot	Rear	UAT	27710	QPSK RB 1,24 10MHz BW	5mm	0mm	19.0	18.9	0.870	0.890	19.0	0.861	0.861	-3%	0.089	0.089	0.092	22
		Head	Left Touch	LAT	27710	QPSK RB 1,24 10MHz BW	0mm	0mm	23.0	23.0	0.287	0.287	23.0	0.255	0.255	-11%	<.0001	<.0001	<.0001	
		Body & Hotspot	Rear	LAT	27710	QPSK RB 1,24 10MHz BW	5mm	0mm	20.3	20.3	1.070	1.070	20.2	1.120	1.146	7%	0.007	0.007	0.007	
LTE Band 41	2600	Head	Right Touch	UAT	41490	QPSK RB 1,49 20MHz BW	0mm	0mm	18.3	18.3	1.080	1.080	18.1	0.927	0.960	-11%	0.348	0.360	0.405	23
		Body & Hotspot	Front	UAT	40620	QPSK RB 1,49 20MHz BW	5mm	5mm	20.8	20.8	0.520	0.520	20.4	0.538	0.583	12%	0.562	0.609	0.609	24
		Head	Left Touch	LAT	40620	QPSK RB 1,49 20MHz BW	0mm	0mm	24.5	24.5	0.561	0.561	23.7	0.421	0.506	-10%	0.029	0.035	0.039	
		Body & Hotspot	Front	LAT	40620	QPSK RB 1,49 20MHz BW	5mm	5mm	20.8	20.7	0.992	1.003	19.7	0.709	0.903	-10%	0.389	0.495	0.551	
LTE Band 66	1750	Head	Right Touch	UAT	132572	QPSK RB 50,24 20MHz BW	0mm	0mm	19.0	18.5	0.943	1.058	18.3	0.973	1.143	8%	0.562	0.660	0.660	25
		Body & Hotspot	Front	UAT	132322	QPSK RB 1,49 20MHz BW	5mm	5mm	20.8	20.7	0.700	0.708	20.4	0.739	0.801	13%	0.478	0.518	0.518	26
		Head	Left Touch	LAT	132322	QPSK RB 1,49 20MHz BW	0mm	0mm	24.8	24.8	0.611	0.611	24.0	0.580	0.697	14%	0.120	0.144	0.144	
		Hotspot	Edge 3	LAT	132572	QPSK RB 1,49 20MHz BW	5mm	0mm	21.0	21.0	1.050	1.050	20.8	0.923	0.966	-8%	0.071	0.075	0.081	
Wi-Fi 2.4GHz	2450	Head	Right Touch	Chain 0	6	802.11g Cell ON MIMO	0mm	0mm	12.0	12.0	0.284	0.284	11.3	0.273	0.321	13%	0.241	0.283	0.283	27
		Body & Hotspot	Rear	Chain 0	6	802.11b Cell ON SISO	5mm	0mm	16.5	16.5	0.532	0.532	16.3	0.533	0.558	5%	0.050	0.052	0.052	28
		Head	Right Touch	Chain 1	6	802.11b Cell ON SISO	0mm	0mm	17.3	17.3	0.177	0.177	16.8	0.136	0.153	-14%	0.094	0.106	0.123	
		Body & Hotspot	Rear	Chain 1	6	802.11b Cell ON SISO	5mm	0mm	13.5	13.5	0.333	0.333	12.8	0.282	0.331	-1%	0.017	0.020	0.020	
		Head	Right Touch	Chain 0	8	802.11g Cell OFF MIMO	0mm	0mm	17.3	17.3	1.180	1.180	16.6	0.862	1.013	-14%	0.772	0.907	1.057	29
		Body & Airplay	Front	Chain 0	11	802.11b Cell OFF SISO	5mm	5mm	19.8	19.7	1.050	1.074	18.8	0.915	1.152	7%	1.020	1.284	1.284	30
		Head	Right Touch	Chain 1	8	802.11g Cell OFF MIMO	0mm	0mm	21.0	20.0	0.311	0.392	20.1	0.305	0.375	-4%	0.051	0.063	0.065	
		Body & Airplay	Front	Chain 1	6	802.11g Cell OFF MIMO	5mm	5mm	18.8	18.8	1.190	1.190	18.6	1.130	1.183	-1%	0.477	0.499	0.502	
Wi-Fi 5GHz	5000	Head	Right Touch	Chain 0	155	802.11ac VHT80 SISO Cell ON	0mm	0mm	4.5	4.5	0.183	0.183	4.5	0.192	0.192	5%	0.204	0.204	0.204	
		Body & Airplay	Front	Chain 0	155	802.11ac VHT80 SISO Cell ON	5mm	5mm	11.8	11.8	0.446	0.446	10.8	0.369	0.465	4%	0.343	0.432	0.432	31
		Head	Right Touch	Chain 1	60	802.11a SISO Cell ON	0mm	30mm	19.0	0.233	0.233	0.233	18.5	0.221	0.248	6%	0.192	0.215	0.215	32
		Body & Airplay	Front	Chain 1	42	802.11ac VHT80 SISO Cell ON	5mm	5mm	10.0	10.0	0.247	0.247	9.1	0.213	0.262	6%	0.154	0.189	0.189	
		Head	Right Touch	Chain 0	42	802.11ac VHT80 SISO Cell OFF	0mm	0mm	13.8	13.8	1.170	1.170	13.8	1.010	1.010	-14%	0.486	0.486	0.563	33
		Body & Airplay	Front	Chain 0	151	802.11n HT40 MIMO Cell OFF	5mm	5mm	16.0	16.0	1.160	1.160	16.0	1.130	1.130	-3%	1.050	1.050	1.078	
		Head	Right Touch	Chain 1	38	802.11n HT40 MIMO Cell OFF	0mm	0mm	14.0	14.0	0.393	0.393	13.4	0.361	0.414	5%	0.256	0.294	0.294	
		Body & Airplay	Front	Chain 1	159	802.11n HT40 MIMO Cell OFF	5mm	5mm	18.8	18.8	1.140	1.140	18.3	1.030	1.156	1%	0.989	1.110	1.110	34
Bluetooth	2450	Head	Right Touch	Chain 0	39	GFSK, Phigh	0mm	0mm	12.0	12.0	0.228	0.228	11.9	0.228	0.233	2%	0.158	0.162	0.162	35
		Body	Rear	Chain 0	39	GFSK, Phigh	5mm	0mm	13.5	13.0	0.204	0.229	12.7	0.182	0.219	-4%	0.080	0.096	0.101	36
		Head	Right Touch	Chain 1	39	GFSK, Phigh	0mm	0mm	16.5	16.5	0.189	0.189	16.5	0.170	0.170	-10%	0.110	0.110	0.122	37
		Body	Front	Chain 1	39	GFSK, Phigh	5mm	5mm	13.5	12.5	0.190	0.239	13.5	0.244	0.244	2%	0.039	0.039	0.039	38

**Notes:**

1. When the *reported* SAR of the test sample measured without accessory (sleeve) attached is equal to or higher than the *reported* SAR of the same test configuration in the original equipment certification filing, the measured SAR of the test sample with accessory (sleeve) attached is used as the reported SAR result of the test configuration.
2. When the *reported* SAR of the test sample measured without accessory (sleeve) attached is lower than the *reported* SAR of the same test configuration in the original equipment certification filing, adjust the *reported* SAR of the test sample with accessory (sleeve) attached by the ratio of *reported* SAR in the original filing to the *reported* SAR of the test sample without the accessory (sleeve) attached as the SAR result of the test configuration.

## 10.2. Bluetooth

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:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ , for 1-g SAR and  $\leq 7.5$  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  $\leq 50$  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.

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:

- $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f_{(\text{GHz})}}/x] \text{ W/kg}$  for test separation distances  $\leq 50$  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.

RF Air interface	RF Exposure Conditions	Frequency (GHz)	Max. tune-up tolerance Power		Min. test separation distance (mm)	SAR test exclusion Result*	Estimated 1-g SAR (W/kg)
			(dBm)	(mW)			
Bluetooth	Head	2.480	3.8	2	5	0.6	0.084
	Body-worn & Hotspot	2.480	3.8	2	5	0.6	0.084

### Conclusion:

\*: The computed value is  $\leq 3$ ; therefore, this qualifies for Standalone SAR test exclusion.

## 11. SAR Measurement Variability

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

- 1) Repeated measurement is not required when the original highest measured SAR is  $< 0.8$  or  $2$  W/kg (1-g or 10-g respectively); steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is  $\geq 0.8$  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 when the original or repeated measurement is  $\geq 1.45$  or  $3.6$  W/kg ( $\sim 10\%$  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  $\geq 1.5$  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  $> 1.20$ .

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Antenna	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	First Repeated	
							Measured SAR (W/kg)	Largest to Smallest SAR Ratio
850	WCDMA Band V	Head	Right Touch	UAT	Yes	0.981	0.975	1.01
2400	Wi-Fi 802.11b/g/n	Body & Hotspot	Front	Chain 0	Yes	1.020	0.992	1.03
5800	Wi-Fi 802.11a/n/ac	Body & Hotspot	Front	Chain 0	Yes	1.05	1.01	1.04

### Note(s):

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

## 12. Simultaneous Transmission SAR Analysis

### 12.1. Sum of the SAR for Host device

#### UAT

RF Exposure conditions	Host Device with Sleeve Attached			Sleeve		
	① WWAN	② DTS	①+② WWAN+DTS	④ BT	①+②+④ WWAN+DTS+BT	
			∑ 1-g SAR (mW/g)		∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	1.083	0.368	1.451	0.084	1.535	No
Body-w orn & Hotspot	0.750	0.094	0.844	0.084	0.928	No

RF Exposure conditions	Host Device with Sleeve Attached			Sleeve		
	① WWAN	③ BT (P <sup>High</sup> )	①+③ WWAN+BT	④ BT	①+③+④ WWAN+BT+BT	
			∑ 1-g SAR (mW/g)		∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	1.083	0.181	1.264	0.084	1.348	No
Body-w orn & Hotspot	0.750	0.079	0.829	0.084	0.913	No

RF Exposure conditions	Host Device with Sleeve Attached				Sleeve		
	① WWAN	② U-NII (Cell on)	③ BT (P <sup>Low</sup> )	①+②+③ WWAN+U-NII+BT	④ BT	①+②+③+④ WWAN+U-NII+BT+BT	
				∑ 1-g SAR (mW/g)		∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	1.083	0.128	0.135	1.346	0.084	1.430	No
Body-w orn & Hotspot	0.750	0.439	0.042	1.231	0.084	1.315	No

#### LAT

RF Exposure conditions	Host Device with Sleeve Attached			Sleeve		
	① WWAN	② DTS	①+② WWAN+BT	④ BT	①+②+④ WWAN+DTS+BT	
			∑ 1-g SAR (mW/g)		∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	0.304	0.368	0.672	0.084	0.756	No
Body-w orn & Hotspot	0.881	0.094	0.975	0.084	1.059	No

RF Exposure conditions	Host Device with Sleeve Attached			Sleeve		
	① WWAN	③ BT (P <sup>High</sup> )	①+③ WWAN+BT	④ BT	①+③+④ WWAN+BT+BT	
			∑ 1-g SAR (mW/g)		∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	0.304	0.181	0.485	0.084	0.569	No
Body-w orn & Hotspot	0.881	0.079	0.960	0.084	1.044	No

RF Exposure conditions	Host Device with Sleeve Attached				Sleeve		
	① WWAN	② U-NII (Cell on)	③ BT (P <sup>Low</sup> )	①+②+③ WWAN+U-NII+BT	④ BT	①+②+③+④ WWAN+U-NII+BT+BT	
				∑ 1-g SAR (mW/g)		∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	0.304	0.128	0.135	0.567	0.084	0.651	No
Body-w orn & Hotspot	0.881	0.439	0.042	1.362	0.084	1.446	No

#### Note(s):

Combinations 1+2, 1+3, and 1+2+3 use the SAR results of only the Host device. Combinations 1+2+4, 1+2+3, and 1+2+3+4 use the SAR results of Host device + sleeve.

## **Appendixes**

**Refer to separated files for the following appendixes.**

**12422353-S1V1 Appendix A: SAR Setup Photos**

**12422353-S1V1 Appendix B: System Check Plots**

**12422353-S1V1 Appendix C: Highest SAR Test Plots**

**12422353-S1V1 Appendix D: SAR Liquid Tissue Ingredients**

**12422353-S1V1 Appendix E: SAR Probe Calibration Certificates**

**12422353-S1V1 Appendix F: SAR Dipole Calibration Certificates**

**END OF REPORT**