Prüfbericht-Nr.: *Test Report No.:*	31954754.001	**Auftrags-Nr.:** *Order No.:*	165381	Seite 1 von 52 *Page 1 of 52*
Kunden Referenz-Nr.: Client Reference No.:	50026977	**Auftragsdatum:** *Order date:*	August 19, 2019	
Auftraggeber: *Client:*	Satellite Tracking of People LLC (STOP LLC) 5353 W Sam Houston Parkway N Suite 190 Houston, TX 77041-5186 USA			
Prüfgegenstand: *Test item:*	BLUtag V8			
Bezeichnung / Typ-Nr.: *Identification / Type No.:*	BLUtag V8			
Auftrags-Inhalt: *Order content:*	SAR according to FCC and ISED measurement guidance.			
Prüfgrundlage: *Test specification:*	See section 4.1 for applicable specifications.			
Wareneingangsdatum: *Date of receipt:*	August 26, 2019			
Prüfmuster-Nr.: *Test sample No.:*	A000004192-00x			
Prüfzeitraum: *Testing period:*	September 23, 2019 – October 15, 2019			
Ort der Prüfung: *Place of testing:*	Fremont, CA, USA			
Prüflaboratorium: *Testing laboratory:*	TUV Rheinland of North America, Inc.			
Prüfergebnis: *Test results:*	PASS			

Geprüft von *Tested by:*

Kontrolliert von *Reviewed by:*

Datum	Name / Stellung	Unterschrift	Datum	Name / Stellung	Unterschrift
Date (mm-dd-yyyy)	*Name / Position*	*Signature*	*Date (mm-dd-yyyy)*	*Name / Position*	*Signature*
October 29, 2019	Josie Sabado / Senior Test Engineer		October 29, 2019	Richard Decker / EMC/Wireless Lab Manager	

Sontiges / *Other:*

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Statement of Compliance

Manufacturer:	Satellite Tracking of People LLC (STOP LLC) 5353 W Sam Houston Parkway N Suite 190 Houston, TX 77041-5186 USA
Name of Equipment:	BLUtag V8
Model Number:	BLUtag V8
FCC ID:	S5EBTV81018
IC ID:	9086A-BTV81018
Test Dates:	September 23 – October 15, 2019

Guidance Documents:

FCC Code of Federal Regulations Title 47, Various FCC KDBs,

RSS-102, Safety Code 6

Test Methods:

IEEE 1528-2013, IEC 62209-2:2010, Various FCC KDBs

The RF exposure test and documented data described in this report has been performed and recorded by TÜV Rheinland, in accordance with the standards and procedures listed herein. As the responsible authorized agent of the EMC laboratory, I hereby declare that the equipment described above has been shown to be compliant with the RF exposure requirements of the stated regulations and standards based on these results. If any special accessories and/or modifications were required for compliance, they are listed in this report.

This report must not be used to claim product endorsement by A2LA or any agency of the U.S. Government. This report shall not be reproduced except in full, without the written authorization of TÜV Rheinland of North America.

Test Cert. # 3331.02

1 Executive Summary

1.1 Scope

This report is intended to document the status of conformance with the applicable RF exposure requirements based on the results of testing performed on September 23 – October 15, 2019 on the BLUtag V8 manufactured by Satellite Tracking of People LLC (STOP LLC). This report only applies to the specific samples tested under the stated test conditions. It is the responsibility of the manufacturer to assure that production units of this model are manufactured with identical or equivalent electrical and mechanical components. This report is further intended to document changes and modifications to the EUT throughout its life cycle. All documentation will be included as a supplement.

1.2 Purpose

Testing was performed to evaluate the SAR levels of the EUT in accordance with the applicable requirements, procedures, and criteria defined in the application of regulations and application of standards listed in this report.

1.3 Summary of Test Results

Equipment Class	Exposure Condition	Maximum Scaled 10g SAR (W/kg)	Result
PCT	Limb	1.81	Complies
DTS	Limb	0.130	Complies

1.4 Equipment Modifications

No modifications were found to be necessary in order to achieve compliance.

1.5 Deviations from the Specifications

None

2 Laboratory Information

2.1 Accreditations & Endorsements

2.1.1 NIST / A2LA

TUV Rheinland of North America is accredited by the National Voluntary Laboratory Accreditation Program, which is administered under the auspices of the National Institute of Standards and Technology. The laboratory has been assessed and accredited in accordance with ISO Guide 17025:2017. The scope of laboratory accreditation includes emission and immunity testing. The accreditation is updated every 2 years.

2.1.2 US Federal Communications Commission

TUV Rheinland of North America at 5015 Brandin Court, Fremont, CA 94538, is accredited by the commission for performing testing services for the general public on a fee basis. These laboratory test facilities have been fully described in reports submitted to and accepted by the FCC. The laboratory scope of accreditation includes: Title 47 CFR Parts 15, 18, 22, 24, 27, and 90. The accreditation is updated every 2 years.

2.1.3 Innovation, Science and Economic Development Canada

TUV Rheinland of North America at the 5015 Brandin Court, Fremont, CA 94538 address is accredited by Industry Canada for performing testing services for the general public on a fee basis. This laboratory test facility has been fully described in reports submitted to and accepted by Industry Canada (File Number 2932D). The accreditation is updated every 3 years.

2.1.4 Acceptance by Mutual Recognition Arrangement

The United States has an established agreement with specific countries under the Asia Pacific Laboratory Accreditation Corporation (APLAC) Mutual Recognition Arrangement. Under this agreement, all TUV Rheinland at 5015 Brandin Court, Fremont, CA 94538 test results and test reports within the scope of the laboratory NIST / A2LA accreditation will be accepted by each member country.

2.2 Test Facilities

All of the test facilities are located at 1279 Quarry Lane, Ste. A, Pleasanton, California 94566, USA. The 5015 Brandin Court, Fremont, CA 94538, USA location is considered a Pleasanton annex.

3 Product Information

3.1 Product Description

Tracking Device

3.2 Equipment Under Test (EUT)

EUT Specification	
EUT Dimensions	77.8 x 65.9 x 33.11 mm
Power Input	3.7 VDC Li-ion battery pack
Exposure Type	☒ General Population / Uncontrolled ☐ Occupational / Controlled
Exposure Condition	☐ Next to the Ear ☐ Head Worn ☐ Body Worn ☐ Next to the Body ☒ Limb ☐ Personal Wireless Router (Hotspot)
Hardware Version	PG22
Software Version	12.X.X
Power Reduction Modes	None

3.3 Air Interfaces

Air Interface	Supported Capabilities	Modulation	Maximum Duty Cycle	Band	Frequency Range (MHz)	Maximum Output Power Including Tolerance (dBm)
WCDMA	• Rel. 99 UMTS • Rel. 5 HSDPA, Cat. 24 • Rel. 6 HSUPA • Rel. 7 HSPA+ • MPR Supported • Power Class 3	• QPSK • 16QAM	100%	FDD II	1850 – 1910	24
				FDD IV	1710 – 1755	24
				FDD V	824 – 149	24
LTE - FDD	• Rel. 10 • UE Category 3 • MPR Supported • Power Class 3	• QPSK • 16QAM	100%	Band 2	1850 – 1910	23.5
				Band 4	1710 - 1755	23.5
				Band 5	824 – 849	23.5
				Band 12	699 – 716	23.5
				Band 13	777 – 787	23.5
				Band 14	790 - 796	23.5

Air Interface	Supported Capabilities	Modulation	Maximum Duty Cycle	Band	Frequency Range (MHz)	Maximum Output Power Including Tolerance (dBm)
				Band 66	1710 – 1780	23.5
				Band 71	665 - 696	23.5
WLAN: 802.11 b/g/n	• b/g mode • n mode, HT20	• BPSK • QPSK • 16QAM • 64QAM	100%	N/A	2400 – 2483.5	19
Bluetooth	• Low Energy	• GFSK	LE: 62.4%	N/A	2400 – 2483.5	10
LoRa	-	• CSS	100%	US902-928	902 – 928	17

3.4 Antenna Information

Antenna	Internal / External	Antenna Type	Frequency Range (MHz)
Cellular	Internal	Printed micro strip	600 – 2000
WLAN / Bluetooth	Internal	Printed micro strip	2400 – 2483.5
LoRa	Internal	Printed micro strip	902 - 928

3.5 Simultaneous Transmission Configurations

No simultaneous transmission configurations. The customer had declared that no combination of radios is able to transmit simultaneously.

3.6 Equipment Configuration

The wings of the EUT was cut off so that the rear side of the DUT could be placed flat against the phantom. The part of the enclosure that was removed did not have any metallic content.

Test software for the cellular radio was used to enable the radio, select the SIM slot, and send AT commands.

Test software for the Wi-Fi, Bluetooth, and LoRa radios was used to set the radio to transmit at maximum output power at a given channel and modulation.

3.7 Description of Sample used for Testing

Device	Serial Number	Configuration	Used For
EUT	PG22000035	Conducted	Cellular, Wi-Fi, and Bluetooth conducted measurements
EUT	PG22000002	Conducted	LoRa conducted measurements
EUT	PG22000037	Radiated	SAR measurements

3.8 Description of Sample Accessories used for Testing

No accessories were used for testing.

3.9 Support Equipment used for Testing

No support equipment was used during testing.

4 SAR Measurement Information

4.1 Test Specifications

The following specifications were used during the course of testing and are referenced in this test report.

Specification Number	Title	Version
IEEE 1528	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques	2013
FCC KDB 447498, D01	RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices	v06
FCC KDB 865664, D01	SAR Measurement Requirements for 100 MHz to 6 GHz	v01r04
FCC KDB 941225, D01	3G SAR Measurement Procedures	v03r01
FCC KDB 941225, D05	SAR Evaluation Considerations for LTE Devices	v02r05
FCC KDB 248227, D01	SAR Guidance for IEEE 802.11 (Wi-Fi) Transmitters	v02r02
FCC KDB 616217, D04	SAR Evaluation Considerations for Laptop, Notebook, Netbook, and Tablet Computers	v01r02
RSS-102	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)	Issue 5 March 2015
IEC 62209-2	Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures – Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)	Ed. 1.0 2010

4.2 SAR Limit

The following SAR limits have been applied in this test report to evaluate the compliance of the EUT against regulatory requirements.

Reference	Exposure Condition	Limit (W/kg)	Average Mass (g)
FCC §1.1310 & §2.1093	Extremity	4.0	10
RSS-102 Safety Code 6	Limbs	4.0	10

4.3 Environmental Conditions

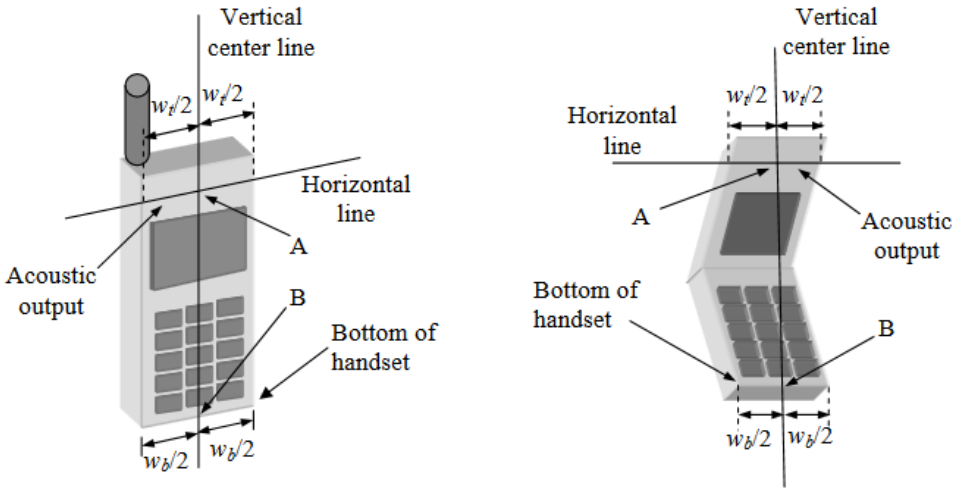
The ambient and liquid temperature is measured throughout the course of SAR measurements and is maintained between 18 °C to 25 °C. The temperature drift of the liquid is ≤ 2 °C

4.4 Device Test Positions

Head Positions

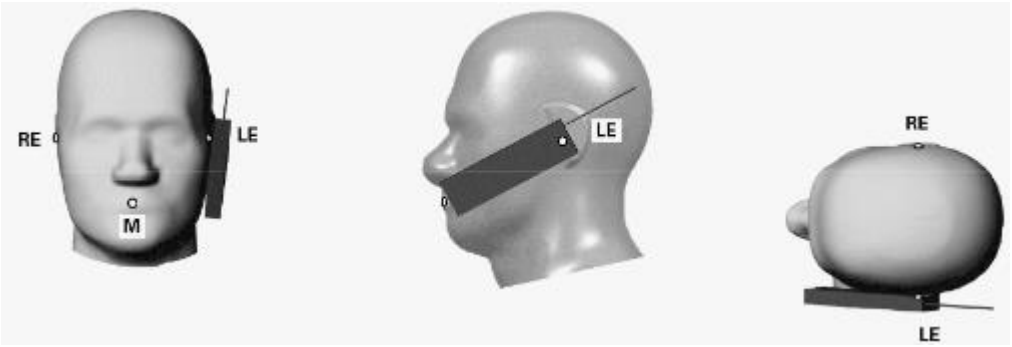
Reference lines are drawn on the handset to accurately position the handset against the SAM phantom. The vertical center line bisects the width of the handset into two equal halves. The horizontal line is perpendicular to the vertical center line and passes through the center of the acoustic output. The

intersection point of the vertical center line and the horizontal line is the ear reference point. The following figure illustrates the position of the vertical center line and the horizontal line.



There are four head positions: right touch, right tilt, left touch, and left tilt. Left and right indicate the side of the head.

In touch positions the handset makes contact with the head at two points. The first contact point is where the ear reference point of the handset makes contact with the ear pinna of the SAM phantom. The second contact point is where the handset makes contact with the cheek of the SAM phantom. The following figure is an example of the left touch position.



In tilt positions the handset is tilted at a 15° angle from the ear. The top edge of the handset makes contact with the SAM phantom. The ear reference point of the handset is centered on the ear pinna of the SAM phantom. The following figure is an example of the left tilt position.

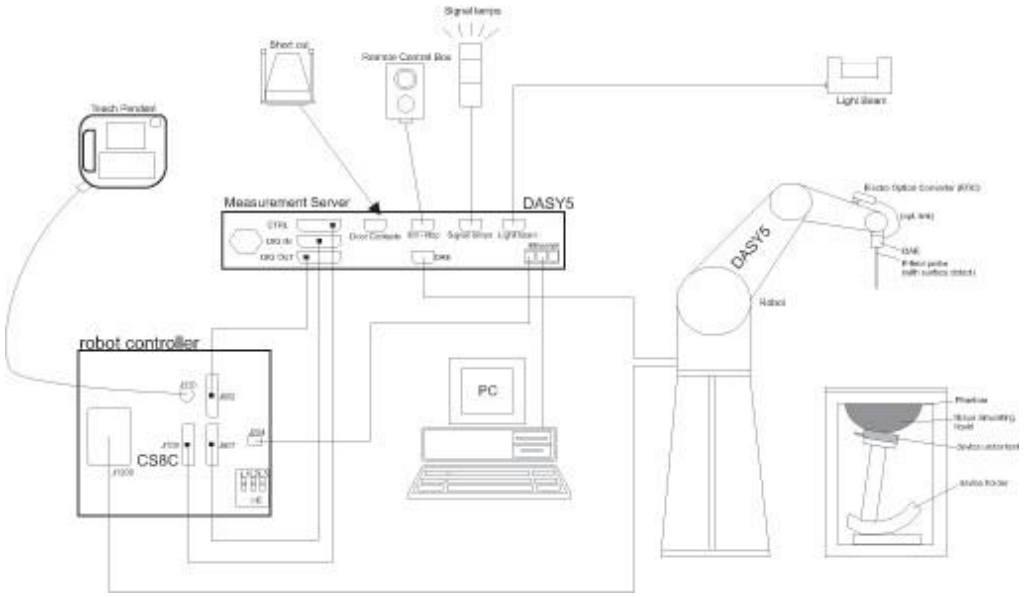
Body Positions

Body SAR measurements are done for the surfaces of the EUT that would face the user during normal operation. The center of the EUT surface is centered on the surface of the flat phantom. If applicable, a separation distance specified by the manufacturer is used between the EUT and the phantom.

For EUTs that do not fit completely within the measurement area of the phantom, pretest measurements are done to find the hot spot. Once the hot spot is found, the EUT is placed so that the hot spot is at the center of the flat phantom.

4.5 SPEAG DASY5 Measurement System

4.5.1 System Overview



The SPEAG DASY5 measurement system consists of the following items:

- A standard high precision 6-axis robot (Stäubli TX/RX family) 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 Win7 professional operating system 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.

4.5.2 Robot

The Stäubli TX60L robot is a high precision, high reliability industrial robot. The placement precision repeatability is within ±0.02 mm. It uses a brushless synchronous motor with low ELF interference. The robot is controlled by the Stäubli CS8c robot controller.

4.5.3 Data Acquisition Electronics

The data acquisition electronics consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of both the DAE4 as well as of the DAE3 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

4.5.4 Probe

The EX3DV4 dosimetric SAR probe are specially designed and calibrated for use in liquids with high permittivities. The enclosure of the probe is made of PEEK material. The probe is calibrated by SPEAG according to ISO/IEC 17025. See the appendix for the probe calibration report including specifications of probe parameters.

4.5.5 Phantoms

The SAM twin phantom is a fiberglass shell phantom with 2 mm ± 0.2 mm shell thickness (except the ear region, where shell thickness increases to 6 mm ± 0.2 mm). The phantom has three measurement areas:

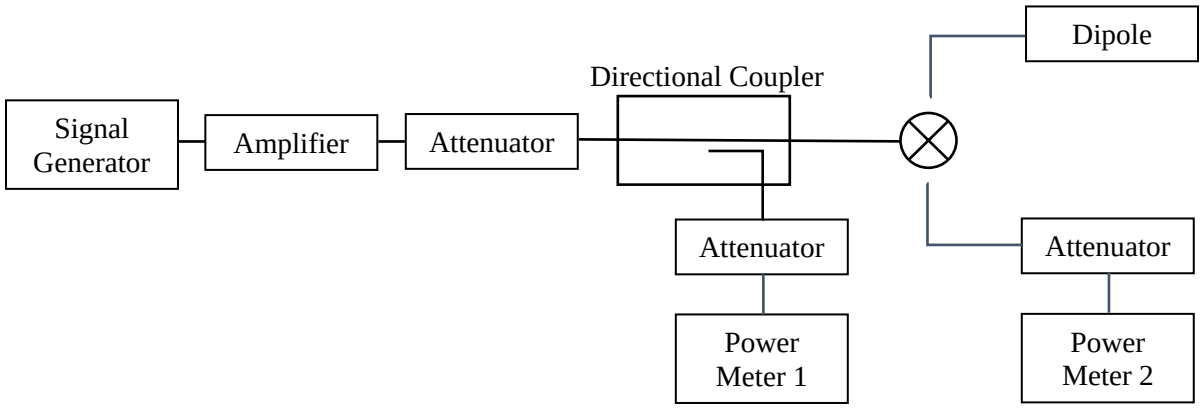
- Left hand
- Right hand
- Flat phantom

The shape of the left hand and right hand phantoms are according to IEEE 1528 and IEC 62209-1. The relative permittivity of the shell is 3.5 ± 0.5. The loss tangent is ≤ 0.05.

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices. It is fully compatible with IEC 62209-2. The flat bottom surface is an elliptical shape measuring 600 mm in length and 400 mm in width. The shell thickness is 2 mm ± 0.2 mm. The relative permittivity is 4 ± 1 and the loss tangent is ≤ 0.05.

4.5.6 System Check Procedure

The purpose of the system check is to verify that a specific SAR measurement system operates within its specifications at the device test frequencies. It is done within 24 hours before SAR measurements. The setup for system check is as follows



1. An unmodulated continuous wave signal is generated at the frequency to be tested.
2. The power at the input to the dipole is measured using power meter 2 while the forward power at the directional coupler is measured using power meter 1. The output power of the signal generator is varied until 20 dBm is measured at power meter 2.
3. Power meter 2 is disconnected and the dipole is connected. The output power of the signal generator is varied until power meter 1 measures the same forward power as when 20 dBm was measured with power meter 2.
4. A SAR measurement is performed using the dipole with the same area scan and zoom scan parameters required for a SAR measurement on the EUT.
5. The 1g and 10g SAR result is compared to the 1g and 10g SAR value in the dipole's calibration certificate.

4.5.7 SAR Measurement Procedure

Power Reference Measurement

A single point SAR measurement is measured above the center of the radiating structure. This power reference measurement is compared to the power drift measurement after the zoom scan to ensure the output power of the EUT does not drift during the SAR measurement.

Area Scan

The area scan is done in the x-y plane. The measurement grid is larger than the area of the EUT surface under test with the following characteristics:

	≤ 3 GHz	**> 3 GHz**
Maximum distance from the closest measurement point (geometric center of probe sensors) to phantom surface	5 mm ± 1 mm	$\delta \cdot \ln(2)/2$ mm ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15mm 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.	
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium.		

Zoom Scan

Once the hot spot is found in the area scan, a zoom scan measurement is done above the hot spot. A uniform measurement grid is done in the x, y, and z direction in the form of a cube. The following characteristics are used:

	≤ 3 GHz	**> 3 GHz**
Maximum zoom scan spatial resolution: Δx_{zoom}, Δy_{zoom}	≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm	3 – 4 GHz: ≤ 5 mm 4 – 6 GHz: ≤ 4 mm
Maximum zoom scan spatial resolution, normal to phantom surface: Δz_{zoom}	≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
Minimum zoom scan volume: x, y, z	≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Power Drift Measurement

A second single point SAR measurement is done at the same location as the power reference measurement. The delta between the power reference measurement and the power drift measurement shall not be more than ± 5%

4.5.8 Measurement Uncertainty

4.5.8.1 IEEE 1528-2013, 300 MHz - 3 GHz

Error Description	Uncertainty Value	Probability Distribution	Divisor	(c_i) 1g	(c_i) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	± 6.0%	N	1	1	1	± 6.0%	± 6.0%	∞
Axial Isotropy	± 4.7%	R	√3	0.7	0.7	± 1.9%	± 1.9%	∞
Hemispherical Isotropy	± 9.6%	R	√3	0.7	0.7	± 3.9%	± 3.9%	∞
Boundary Effects	± 1.0%	R	√3	1	1	± 0.6%	± 0.6%	∞
Linearity	± 4.7%	R	√3	1	1	± 2.7%	± 2.7%	∞
System Detection Limits	± 1.0%	R	√3	1	1	± 0.6%	± 0.6%	∞
Modulation Response	± 2.4%	R	√3	1	1	± 1.4%	± 1.4%	∞
Readout Electronics	± 0.3%	N	1	1	1	± 0.3%	± 0.3%	∞
Response Time	± 0.8%	R	√3	1	1	± 0.5%	± 0.5%	∞
Integration Time	± 2.6%	R	√3	1	1	± 1.5%	± 1.5%	∞
RF Ambient Noise	± 3.0%	R	√3	1	1	± 1.7%	± 1.7%	∞
RF Ambient Reflections	± 3.0%	R	√3	1	1	± 1.7%	± 1.7%	∞
Probe Positioner	± 0.4%	R	√3	1	1	± 0.2%	± 0.2%	∞
Probe Positioning	± 2.9%	R	√3	1	1	± 1.7%	± 1.7%	∞
Max. SAR Evaluation	± 2.0%	R	√3	1	1	± 1.2%	± 1.2%	∞
Test Sample Related								
Device Positioning	± 2.9%	N	1	1	1	± 2.9%	± 2.9%	145
Device Holder	± 3.6%	N	1	1	1	± 3.6%	± 3.6%	5
Power Drift	± 5.0%	R	√3	1	1	± 2.9%	± 2.9%	∞
Power Scaling	± 0%	R	√3	1	1	± 0.0%	± 0.0%	∞
Phantom and Setup								
Phantom Uncertainty	± 6.1%	R	√3	1	1	± 3.5%	± 3.5%	∞
SAR correction	± 1.9%	R	√3	1	0.84	± 1.1%	± 0.9%	∞
Liquid Conductivity (mea.)^{DAK}	± 2.5%	R	√3	0.78	0.71	± 1.1%	± 1.0%	∞
Liquid Permittivity (mea.)^{DAK}	± 2.5%	R	√3	0.26	0.26	± 0.3%	± 0.4%	∞
Temp. unc. - Conductivity	± 3.4%	R	√3	0.78	0.71	± 1.5%	± 1.4%	∞
Temp. unc. - Permittivity	± 0.4%	R	√3	0.23	0.26	± 0.1%	± 0.1%	∞
Combined Std. Uncertainty						± 11.2%	± 11.1%	361
Expanded STD Uncertainty						**± 22.3%**	**± 22.2%**	

4.5.8.2 IEEE 1528-2013, 3 GHz – 6 GHz

Error Description	Uncertainty Value	Probability Distribution	Divisor	(c_i) 1g	(c_i) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	± 6.55%	N	1	1	1	± 6.55%	± 6.55%	∞
Axial Isotropy	± 4.7%	R	√3	0.7	0.7	± 1.9%	± 1.9%	∞
Hemispherical Isotropy	± 9.6%	R	√3	0.7	0.7	± 3.9%	± 3.9%	∞
Boundary Effects	± 2.0%	R	√3	1	1	± 1.2%	± 1.2%	∞
Linearity	± 4.7%	R	√3	1	1	± 2.7%	± 2.7%	∞
System Detection Limits	± 1.0%	R	√3	1	1	± 0.6%	± 0.6%	∞
Modulation Response	± 2.4%	R	√3	1	1	± 1.4%	± 1.4%	∞
Readout Electronics	± 0.3%	N	1	1	1	± 0.3%	± 0.3%	∞
Response Time	± 0.8%	R	√3	1	1	± 0.5%	± 0.5%	∞
Integration Time	± 2.6%	R	√3	1	1	± 1.5%	± 1.5%	∞
RF Ambient Noise	± 3.0%	R	√3	1	1	± 1.7%	± 1.7%	∞
RF Ambient Reflections	± 3.0%	R	√3	1	1	± 1.7%	± 1.7%	∞
Probe Positioner	± 0.8%	R	√3	1	1	± 0.5%	± 0.5%	∞
Probe Positioning	± 6.7%	R	√3	1	1	± 3.9%	± 3.9%	∞
Max. SAR Evaluation	± 4.0%	R	√3	1	1	± 2.3%	± 2.3%	∞
Test Sample Related								
Device Positioning	± 2.9%	N	1	1	1	± 2.9%	± 2.9%	145
Device Holder	± 3.6%	N	1	1	1	± 3.6%	± 3.6%	5
Power Drift	± 5.0%	R	√3	1	1	± 2.9%	± 2.9%	∞
Power Scaling	± 0%	R	√3	1	1	± 0.0%	± 0.0%	∞
Phantom and Setup								
Phantom Uncertainty	± 6.6%	R	√3	1	1	± 3.8%	± 3.8%	∞
SAR correction	± 1.9%	R	√3	1	0.84	± 1.1%	± 0.9%	∞
Liquid Conductivity (mea.)^{DAK}	± 2.5%	R	√3	0.78	0.71	± 1.1%	± 1.0%	∞
Liquid Permittivity (mea.)^{DAK}	± 2.5%	R	√3	0.26	0.26	± 0.3%	± 0.4%	∞
Temp. unc. - Conductivity	± 3.4%	R	√3	0.78	0.71	± 1.5%	± 1.4%	∞
Temp. unc. - Permittivity	± 0.4%	R	√3	0.23	0.26	± 0.1%	± 0.1%	∞
Combined Std. Uncertainty						± 12.3%	± 12.2%	748
Expanded STD Uncertainty						**± 24.6%**	**± 24.5%**	

4.5.8.3 IEC 62209-1/2, 30 MHz – 6 GHz

Error Description	Uncertainty Value	Probability Distribution	Divisor	(c_i) 1g	(c_i) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	± 6.55%	N	1	1	1	± 6.55%	± 6.55%	∞
Axial Isotropy	± 4.70%	R	√3	0.7	0.7	± 1.9%	± 1.9%	∞
Hemispherical Isotropy	± 9.60%	R	√3	0.7	0.7	± 3.9%	± 3.9%	∞
Boundary Effects	± 2.00%	R	√3	1	1	± 1.2%	± 1.2%	∞
Linearity	± 4.70%	R	√3	1	1	± 2.7%	± 2.7%	∞
System Detection Limits	± 1.00%	R	√3	1	1	± 0.6%	± 0.6%	∞
Modulation Response	± 2.40%	R	√3	1	1	± 1.4%	± 1.4%	∞
Readout Electronics	± 0.30%	N	1	1	1	± 0.3%	± 0.3%	∞
Response Time	± 0.80%	R	√3	1	1	± 0.5%	± 0.5%	∞
Integration Time	± 2.60%	R	√3	1	1	± 1.5%	± 1.5%	∞
RF Ambient Noise	± 3.00%	R	√3	1	1	± 1.7%	± 1.7%	∞
RF Ambient Reflections	± 3.00%	R	√3	1	1	± 1.7%	± 1.7%	∞
Probe Positioner	± 0.80%	R	√3	1	1	± 0.5%	± 0.5%	∞
Probe Positioning	± 6.70%	R	√3	1	1	± 3.9%	± 3.9%	∞
Post-processing	± 4.00%	R	√3	1	1	± 2.3%	± 2.3%	∞
Test Sample Related								
Device Positioning	± 2.90%	N	1	1	1	± 2.9%	± 2.9%	145
Device Holder	± 3.60%	N	1	1	1	± 3.6%	± 3.6%	5
Power Drift	± 5.00%	R	√3	1	1	± 2.9%	± 2.9%	∞
Power Scaling	± 0%	R	√3	1	1	± 0.0%	± 0.0%	∞
Phantom and Setup								
Phantom Uncertainty	± 7.90%	R	√3	1	1	± 4.6%	± 4.6%	∞
SAR correction	± 1.90%	R	√3	1	0.84	± 1.1%	± 0.9%	∞
Liquid Conductivity (mea.)^{DAK}	± 2.50%	R	√3	0.78	0.71	± 1.1%	± 1.0%	∞
Liquid Permittivity (mea.)^{DAK}	± 2.50%	R	√3	0.26	0.26	± 0.4%	± 0.4%	∞
Temp. unc. - Conductivity	± 3.40%	R	√3	0.78	0.71	± 1.5%	± 1.4%	∞
Temp. unc. - Permittivity	± 0.40%	R	√3	0.23	0.26	± 0.1%	± 0.1%	∞
Combined Std. Uncertainty						± 12.5%	± 12.5%	748
Expanded STD Uncertainty						± **25.1%**	± **25.0%**	

4.6 SAR Scaling (Reported SAR)

Measured 1g and 10g SAR values are scaled up to the maximum output power including tolerance of the EUT as declared by the manufacturer. Conducted output power measurements are performed to ensure the output power of the EUT is close to the maximum power. After SAR measurements are performed, the measured SAR is scaled up by the delta between the measured output power and the manufacturer's declared maximum output power including tolerance.

The SAR scaling factor is calculated as

$$SAR\ Scaling\ Factor = \frac{Maximum\ Output\ Power\ Including\ Tolerance,\ mW}{Measured\ Output\ Power,\ mW}$$

The reported SAR is

$$Reported\ SAR = Measured\ SAR\ \times SAR\ Scaling\ Factor$$

For Example:

Measured SAR: 1.0 W/kg

Measured output power: 250 mW

Maximum output power including tolerance: 300 mW

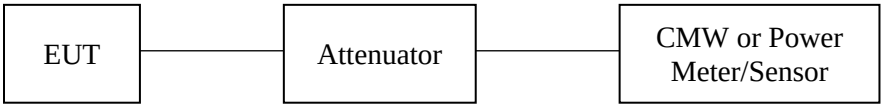
SAR scaling factor = 1.2

Reported SAR = 1.2 W/kg

5 Conducted Output Power Measurements

Conducted output power measurements are performed to verify the EUT is transmitting at maximum output power. The power measurements are compared to the manufacturer's declared output power including tolerance.

The following set up is used for conducted output power measurements



The following path losses were used during conducted measurements

Frequency (MHz)	Path Loss (dB)
600 MHz – 2.5 GHz	0.5

For cellular bands, the EUT integrates a Telit LE910C1-NF module. According to Telit's LE910Cx HW User Guide Rev. 13, the output power including tolerance is 23.5 dBm ± 0.5 dB for 3G bands and 23 dBm ± 0.5 dB for 4G bands.

For WLAN and Bluetooth, the EUT integrates a Murata Type 1LD module. According to Murata's data sheet preliminary specification number SP-PA1LD-L the maximum output power including tolerance is 17 dBm ± 2 dB for WLAN and 10 dBm for Bluetooth LE. The customer has declared Bluetooth classic is not supported by the EUT.

For LoRa, the EUT integrates a Semtech SX1272 chipset. According to Semtech's SX1272 data sheet Rev. 4 – January 2019 section 2.5.4, the output power including tolerance is 14 dBm ± 3 dB when PA Boost is not utilized. The customer has declared PA Boost is not utilized.

5.1 WCDMA

WCDMA, Rel. 99

Output power is measured using a CMW 500.

Band	Channel	Frequency (MHz)	12.2 kbps RMC	
			Measured Burst Avg. Power (dBm)	Max Output Power Including Tolerance (dBm)
FDD II	9262	1852.4	23.24	24
	9400	1880	22.75	
	9538	1907.6	22.58	
FDD IV	1312	1712.4	22.54	24
	1413	1732.6	22.45	
	1513	1752.6	22.52	
FDD V	4132	826.4	23.43	24
	4183	836.6	23.43	
	4233	846.6	23.26	

HSDPA, Rel. 5

Output power is measured using a CMW 500.

Band	Channel	Frequency (MHz)	Measured Average Power (dBm)			
			Sub-Test 1	Sub-Test 2	Sub-Test 3	Sub-Test 4
FDD II	9262	1852.4	22.32	22.34	21.8	21.83
	9400	1880	22.36	22.4	21.79	21.85
	9538	1907.6	22.32	22.29	21.57	21.58
FDD IV	1312	1712.4	22.01	22.04	21.53	21.41
	1413	1732.6	22.03	22.06	21.5	21.46
	1513	1752.6	21.96	21.81	21.49	21.47
FDD V	4132	826.4	22.76	22.67	22.33	22.28
	4183	836.6	22.79	22.68	22.3	22.27
	4233	846.6	22.7	22.61	22.26	22.3
Expected MPR (dB)			0.0	0.0	0.5	0.5

HSPA, Rel. 6

Output power is measured using a CMW 500.

Band	Channel	Frequency (MHz)	Measured Average Power (dBm)				
			Sub-Test 1	Sub-Test 2	Sub-Test 3	Sub-Test 4	Sub-Test 5
FDD II	9262	1852.4	21.93	20.64	21.26	20.67	22.22
	9400	1880	22.02	20.76	21.27	20.69	22.1
	9538	1907.6	22.06	20.68	21.47	20.7	22.05
FDD IV	1312	1712.4	21.89	20.59	21.31	20.62	21.92
	1413	1732.6	21.85	20.66	21.27	20.62	21.89
	1513	1752.6	21.92	20.62	21.33	20.58	21.91
FDD V	4132	826.4	22.36	20.88	21.43	20.93	22.37
	4183	836.6	22.45	20.89	21.3	20.86	22.39
	4233	846.6	22.44	20.83	21.67	20.9	22.34
Expected MPR (dB)			0.0	2.0	1.0	2.0	0.0

5.2 LTE

Output power is measured using a CMW 500. The maximum output power includes the tolerance as declared by the manufacturer.

Output power measurements are performed with 1, 50%, and 100% resource blocks allocated at the low, mid, and high positions in the channel bandwidth. The following table specifies the offset of the first resource block for each position.

		RB offset from first position		
Channel Bandwidth	**# of RB allocated**	**Low Position**	**Mid Position**	**High Position**
20	1	0	49	99
	50% / 50	0	25	50
	100% / 100	0		
15	1	0	37	74
	50% / 38	0	19	37
	100% / 75	0		
10	1	0	24	49
	50% / 25	0	13	25
	100% / 50	0		
5	1	0	12	24
	50% / 12	0	7	13
	100% / 25	0		
3	1	0	7	14
	50% / 8	0	4	7
	100% / 15	0		
1.4	1	0	3	5
	50% / 3	0	2	3
	100% / 6	0		

LTE Band 2

16QAM conducted power was not done because the declared maximum output power including power tolerance is less than QPSK.

			QPSK						
			1 RB			50% RB			100%
			Low	Mid	High	Low	Mid	High	RB
20 MHz Bandwidth	Ch. 18700 / 1860 MHz	Meas. Avg. Power (dBm)	22.181	22.497	22.539	21.981	21.866	21.742	22.309
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 18900 / 1880 MHz	Meas. Avg. Power (dBm)	22.523	22.855	22.077	21.652	21.586	21.461	21.622
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 19100 / 1900 MHz	Meas. Avg. Power (dBm)	22.456	22.279	21.819	21.122	20.951	20.839	21.055
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
15 MHz Bandwidth	Ch. 18675 / 1857.5 MHz	Meas. Avg. Power (dBm)	22.242	22.379	22.318	21.214	21.342	21.308	21.257
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 18900 / 1880 MHz	Meas. Avg. Power (dBm)	22.381	22.34	22.119	21.562	21.467	21.361	21.413
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 19125 / 1902.5 MHz	Meas. Avg. Power (dBm)	22.024	21.671	21.576	20.868	20.809	20.611	20.811
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5

LTE Band 2 Continued

			QPSK						
			1 RB			50% RB			100%
			Low	Mid	High	Low	Mid	High	RB
10 MHz Bandwidth	Ch. 18650 / 1855 MHz	Meas. Avg. Power (dBm)	22.212	22.155	22.22	21.316	21.283	21.29	21.2
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 18900 / 1880 MHz	Meas. Avg. Power (dBm)	22.53	22.802	22.341	21.547	21.504	21.336	21.435
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 19150 / 1905 MHz	Meas. Avg. Power (dBm)	21.901	21.538	21.549	20.766	20.632	20.502	20.7
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
5 MHz Bandwidth	Ch. 18625 / 1852.5 MHz	Meas. Avg. Power (dBm)	22.044	22.257	22.047	21.283	21.295	21.296	21.276
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 18900 / 1880 MHz	Meas. Avg. Power (dBm)	22.542	22.759	22.365	21.439	21.534	21.454	21.403
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 19175 / 1907.5 MHz	Meas. Avg. Power (dBm)	21.595	21.651	21.536	20.582	20.571	20.565	20.544
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5

LTE Band 2 Continued

			QPSK						
			1 RB			50% RB			100%
			Low	Mid	High	Low	Mid	High	RB
3 MHz Bandwidth	Ch. 18615 / 1851.5 MHz	Meas. Avg. Power (dBm)	22.203	22.238	22.164	21.238	21.201	21.206	21.248
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 18900 / 1880 MHz	Meas. Avg. Power (dBm)	22.498	22.466	22.298	21.464	21.432	21.533	21.377
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 19185 / 1908.5 MHz	Meas. Avg. Power (dBm)	21.561	21.558	21.57	20.505	20.556	20.552	20.516
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
1.4 MHz Bandwidth	Ch. 18607 / 1850.7 MHz	Meas. Avg. Power (dBm)	22.153	22.247	22.2	22.16	22.15	22.147	21.116
		Max Output Power (dBm)	23.5	23.5	23.5	23.5	23.5	23.5	22.5
	Ch. 18900 / 1880 MHz	Meas. Avg. Power (dBm)	22.529	22.676	22.357	22.594	22.621	22.501	21.445
		Max Output Power (dBm)	23.5	23.5	23.5	23.5	23.5	23.5	22.5
	Ch. 19193 / 1909.3 MHz	Meas. Avg. Power (dBm)	21.57	21.585	21.568	21.57	21.564	21.544	20.588
		Max Output Power (dBm)	23.5	23.5	23.5	23.5	23.5	23.5	22.5

LTE Band 4

16QAM conducted power was not done because the declared maximum output power including power tolerance is less than QPSK.

			QPSK						
			1 RB			50% RB			100%
			Low	Mid	High	Low	Mid	High	RB
20 MHz Bandwidth	Ch. 20050 / 1720 MHz	Meas. Avg. Power (dBm)	23.03	22.805	22.776	22.456	22.326	22.176	22.282
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20175 / 1732.5 MHz	Meas. Avg. Power (dBm)	22.591	22.741	22.605	21.654	21.884	21.662	21.826
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20300 / 1745 MHz	Meas. Avg. Power (dBm)	22.753	22.843	22.693	21.856	21.818	21.673	21.818
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
15 MHz Bandwidth	Ch. 20025 / 1717.5 MHz	Meas. Avg. Power (dBm)	22.535	22.333	22.164	21.627	21.502	21.402	21.372
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20175 / 1732.5 MHz	Meas. Avg. Power (dBm)	22.147	22.254	22.259	21.25	21.264	21.199	21.253
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20325 / 1747.5 MHz	Meas. Avg. Power (dBm)	22.483	22.557	22.474	21.601	21.645	21.516	21.605
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5

LTE Band 4 Continued

			QPSK						
			1 RB			50% RB			100%
			Low	Mid	High	Low	Mid	High	RB
10 MHz Bandwidth	Ch. 20000 / 1715 MHz	Meas. Avg. Power (dBm)	22.447	22.205	21.999	21.475	21.359	21.24	21.277
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20175 / 1732.5 MHz	Meas. Avg. Power (dBm)	22.043	22.088	22.073	21.185	21.217	21.143	21.153
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20350 / 1750 MHz	Meas. Avg. Power (dBm)	22.447	22.495	22.174	21.516	21.515	21.442	21.523
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
5 MHz Bandwidth	Ch. 19975 / 1712.5 MHz	Meas. Avg. Power (dBm)	22.078	22.194	22.035	21.424	21.303	21.221	21.381
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20175 / 1732.5 MHz	Meas. Avg. Power (dBm)	22.065	22.702	21.965	20.976	21.075	21.122	21.04
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20375 / 1752.5 MHz	Meas. Avg. Power (dBm)	22.202	22.752	22.219	21.37	21.346	21.278	21.328
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5

LTE Band 4 Continued

			QPSK						
			1 RB			50% RB			100%
			Low	Mid	High	Low	Mid	High	RB
3 MHz Bandwidth	Ch. 19965 / 1711.5 MHz	Meas. Avg. Power (dBm)	22.507	22.441	22.138	21.308	21.235	21.234	21.327
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20175 / 1732.5 MHz	Meas. Avg. Power (dBm)	22.005	22.169	22.226	20.962	21.023	21.048	20.889
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20385 / 1753.5 MHz	Meas. Avg. Power (dBm)	22.104	22.07	22.115	21.202	21.189	21.139	21.166
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
1.4 MHz Bandwidth	Ch. 19957 / 1710.7 MHz	Meas. Avg. Power (dBm)	21.983	22.252	22.044	22.036	22.081	22.042	21.224
		Max Output Power (dBm)	23.5	23.5	23.5	23.5	23.5	23.5	22.5
	Ch. 20175 / 1732.5 MHz	Meas. Avg. Power (dBm)	21.936	22.194	22.01	21.914	21.983	21.885	20.868
		Max Output Power (dBm)	23.5	23.5	23.5	23.5	23.5	23.5	22.5
	Ch. 20393 / 1754.3 MHz	Meas. Avg. Power (dBm)	22.115	22.188	22.14	21.996	22.049	21.945	21.084
		Max Output Power (dBm)	23.5	23.5	23.5	23.5	23.5	23.5	22.5

LTE Band 5

16QAM conducted power was not done because the declared maximum output power including power tolerance is less than QPSK.

			QPSK						
			1 RB			50% RB			100% RB
			Low	Mid	High	Low	Mid	High	
10 MHz Bandwidth	Ch. 20450 / 829 MHz	Meas. Avg. Power (dBm)	23.438	23.492	23.296	22.482	22.434	22.492	22.437
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20525 / 836.5 MHz	Meas. Avg. Power (dBm)	23.305	23.45	23.423	22.424	22.464	22.464	22.487
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20600 / 844 MHz	Meas. Avg. Power (dBm)	23.466	23.482	23.431	22.432	22.459	22.42	22.48
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
5 MHz Bandwidth	Ch. 20425 / 826.5 MHz	Meas. Avg. Power (dBm)	23.143	23.397	23.327	22.327	22.403	22.467	22.381
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20525 / 836.5 MHz	Meas. Avg. Power (dBm)	23.462	23.47	23.414	22.462	22.481	22.477	22.438
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20625 / 846.5 MHz	Meas. Avg. Power (dBm)	23.44	23.491	23.445	22.473	22.406	22.499	22.474
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5

LTE Band 5 Continued

			QPSK						
			1 RB			50% RB			100%
			Low	Mid	High	Low	Mid	High	RB
3 MHz Bandwidth	Ch. 20415 / 825.5 MHz	Meas. Avg. Power (dBm)	23.265	23.442	23.404	22.237	22.297	22.376	22.39
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20525 / 836.5 MHz	Meas. Avg. Power (dBm)	23.355	23.439	23.345	22.438	22.473	22.444	22.47
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 20635 / 847.5 MHz	Meas. Avg. Power (dBm)	23.471	23.435	23.423	22.419	22.415	22.499	22.419
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
1.4 MHz Bandwidth	Ch. 20407 / 824.7 MHz	Meas. Avg. Power (dBm)	23.193	23.211	23.217	23.192	23.324	23.282	22.18
		Max Output Power (dBm)	23.5	23.5	23.5	23.5	23.5	23.5	22.5
	Ch. 20525 / 836.5 MHz	Meas. Avg. Power (dBm)	23.281	23.441	23.313	23.243	23.441	23.446	22.432
		Max Output Power (dBm)	23.5	23.5	23.5	23.5	23.5	23.5	22.5
	Ch. 20643 / 848.3 MHz	Meas. Avg. Power (dBm)	23.438	23.498	23.499	23.428	23.493	23.498	22.413
		Max Output Power (dBm)	23.5	23.5	23.5	23.5	23.5	23.5	22.5

LTE Band 12

16QAM conducted power was not done because the declared maximum output power including power tolerance is less than QPSK.

			QPSK						
			1 RB			50% RB			100%
			Low	Mid	High	Low	Mid	High	RB
10 MHz Bandwidth	Ch. 23060 / 704 MHz	Meas. Avg. Power (dBm)	22.276	22.774	22.97	22.036	22.085	22.253	22.364
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 23095 / 707.5 MHz	Meas. Avg. Power (dBm)	22.284	23.076	23.101	21.706	22.085	22.207	22.137
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 23130 / 711 MHz	Meas. Avg. Power (dBm)	22.821	23.036	22.992	22.177	22.167	22.238	22.22
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
5 MHz Bandwidth	Ch. 23035 / 701.5 MHz	Meas. Avg. Power (dBm)	21.567	21.917	22.535	20.754	21.109	21.106	20.931
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 23095 / 707.5 MHz	Meas. Avg. Power (dBm)	22.805	23.243	22.924	21.92	22.139	22.133	22.075
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 23155 / 713.5 MHz	Meas. Avg. Power (dBm)	22.994	23.499	23.103	22.24	22.285	22.277	22.267
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5

LTE Band 12 Continued

			QPSK						
			1 RB			50% RB			100%
			Low	Mid	High	Low	Mid	High	RB
3 MHz Bandwidth	Ch. 23025 / 700.5 MHz	Meas. Avg. Power (dBm)	21.595	22.08	22.051	20.684	20.922	20.835	20.838
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 23095 / 707.5 MHz	Meas. Avg. Power (dBm)	22.813	23.071	22.999	21.921	22.084	22.083	22.097
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 23165 / 714.5 MHz	Meas. Avg. Power (dBm)	23.342	23.492	23.242	22.28	22.306	22.304	22.311
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
1.4 MHz Bandwidth	Ch. 23017 / 699.7 MHz	Meas. Avg. Power (dBm)	21.517	21.633	21.71	21.628	21.752	21.738	20.64
		Max Output Power (dBm)	23.5	23.5	23.5	23.5	23.5	23.5	22.5
	Ch. 23095 / 707.5 MHz	Meas. Avg. Power (dBm)	23.209	23.313	23.188	23.213	23.296	23.17	22.162
		Max Output Power (dBm)	23.5	23.5	23.5	23.5	23.5	23.5	22.5
	Ch. 23173 / 715.3 MHz	Meas. Avg. Power (dBm)	23.252	23.285	23.244	23.152	23.186	23.178	22.243
		Max Output Power (dBm)	23.5	23.5	23.5	23.5	23.5	23.5	22.5

LTE Band 13

16QAM conducted power was not done because the declared maximum output power including power tolerance is less than QPSK.

			QPSK						
			1 RB			50% RB			100% RB
			Low	Mid	High	Low	Mid	High	
10 MHz Bandwidth	Ch. 23230 / 782 MHz	Meas. Avg. Power (dBm)	22.771	23.47	23.243	22.163	22.464	22.441	22.342
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
5 MHz Bandwidth	Ch. 23205 / 779.5 MHz	Meas. Avg. Power (dBm)	22.488	23.18	23.459	21.832	22.165	22.152	22.11
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 23230 / 782 MHz	Meas. Avg. Power (dBm)	23.163	23.408	23.409	22.483	22.402	22.441	22.446
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 23255 / 784.5 MHz	Meas. Avg. Power (dBm)	23.484	23.483	23.366	22.412	22.456	22.468	22.451
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5

LTE Band 14

16QAM conducted power was not done because the declared maximum output power including power tolerance is less than QPSK.

			QPSK						
			1 RB			50% RB			100% RB
			Low	Mid	High	Low	Mid	High	
10 MHz Bandwidth	Ch. 23330 / 793 MHz	Meas. Avg. Power (dBm)	23.36	23.374	23.373	22.449	22.476	22.457	22.449
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
5 MHz Bandwidth	Ch. 23305 / 790.5 MHz	Meas. Avg. Power (dBm)	23.326	23.483	23.428	22.451	22.494	22.495	22.427
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 23330 / 793 MHz	Meas. Avg. Power (dBm)	23.451	23.41	23.431	22.434	22.46	22.466	22.472
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 23355 / 795.5 MHz	Meas. Avg. Power (dBm)	23.402	23.432	23.49	22.404	22.489	22.473	22.422
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5

LTE Band 66

16QAM conducted power was not done because the declared maximum output power including power tolerance is less than QPSK.

			QPSK						
			1 RB			50% RB			100%
			Low	Mid	High	Low	Mid	High	RB
20 MHz Bandwidth	Ch. 132072 / 1720 MHz	Meas. Avg. Power (dBm)	21.593	21.803	21.728	20.89	20.882	20.759	22.227
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 132322 / 1745 MHz	Meas. Avg. Power (dBm)	21.851	22.353	22.299	20.995	20.975	20.972	20.924
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 132572 / 1770 MHz	Meas. Avg. Power (dBm)	21.914	21.944	21.553	20.96	20.866	20.669	20.939
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
15 MHz Bandwidth	Ch. 132047 / 1717.5 MHz	Meas. Avg. Power (dBm)	21.646	21.683	21.503	20.814	20.912	20.653	20.868
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 132322 / 1745 MHz	Meas. Avg. Power (dBm)	21.638	21.783	21.68	20.85	20.958	20.836	20.756
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 132597 / 1772.5 MHz	Meas. Avg. Power (dBm)	21.783	21.659	21.621	20.877	20.86	20.737	20.844
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5

LTE Band 66 Continued

			QPSK						
			1 RB			50% RB			100%
			Low	Mid	High	Low	Mid	High	RB
10 MHz Bandwidth	Ch. 132022 / 1715 MHz	Meas. Avg. Power (dBm)	21.726	21.801	21.635	20.827	20.853	20.752	20.72
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 132322 / 1745 MHz	Meas. Avg. Power (dBm)	22.119	22.213	22.212	20.865	20.958	20.918	20.822
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 132622 / 1775 MHz	Meas. Avg. Power (dBm)	21.838	21.934	21.653	20.887	20.841	20.754	20.933
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
5 MHz Bandwidth	Ch. 131997 / 1712.5 MHz	Meas. Avg. Power (dBm)	21.541	21.582	21.598	20.872	20.838	20.846	20.809
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 132322 / 1745 MHz	Meas. Avg. Power (dBm)	21.868	22.039	21.818	20.932	20.963	20.972	20.921
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 132647 / 1777.5 MHz	Meas. Avg. Power (dBm)	21.781	22.215	21.539	20.771	20.908	20.896	20.919
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5

LTE Band 66 Continued

			QPSK						
			1 RB			50% RB			100%
			Low	Mid	High	Low	Mid	High	RB
3 MHz Bandwidth	Ch. 131987 / 1711.5	Meas. Avg. Power (dBm)	21.707	21.996	21.876	20.866	20.926	20.925	20.898
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 132322 / 1745 MHz	Meas. Avg. Power (dBm)	21.823	21.899	21.917	20.914	20.954	20.961	20.9
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 132657 / 1778.5	Meas. Avg. Power (dBm)	21.89	21.693	21.538	20.939	20.872	20.862	20.96
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
1.4 MHz Bandwidth	Ch. 131979 / 1710.7 MHz	Meas. Avg. Power (dBm)	21.743	21.662	21.653	21.874	21.848	21.769	20.819
		Max Output Power (dBm)	23.5	23.5	23.5	23.5	23.5	23.5	22.5
	Ch. 132322 / 1745 MHz	Meas. Avg. Power (dBm)	21.995	22.231	21.855	21.888	21.931	21.936	20.885
		Max Output Power (dBm)	23.5	23.5	23.5	23.5	23.5	23.5	22.5
	Ch. 132665/ 1779.3 MHz	Meas. Avg. Power (dBm)	21.701	21.784	21.591	21.766	21.885	21.722	20.798
		Max Output Power (dBm)	23.5	23.5	23.5	23.5	23.5	23.5	22.5

LTE Band 71

16QAM conducted power was not done because the declared maximum output power including power tolerance is less than QPSK.

			QPSK						
			1 RB			50% RB			100% RB
			Low	Mid	High	Low	Mid	High	
20 MHz Bandwidth	Ch. 133222 / 673 MHz	Meas. Avg. Power (dBm)	23.359	23.389	23.242	22.476	22.418	22.336	22.374
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 133297 / 680.5	Meas. Avg. Power (dBm)	23.192	23.461	23.178	22.482	22.375	22.275	22.417
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 133372 / 688 MHz	Meas. Avg. Power (dBm)	23.445	23.493	23.497	22.266	22.309	22.375	22.242
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
15 MHz Bandwidth	Ch. 133197 / 670.5 MHz	Meas. Avg. Power (dBm)	23.464	23.396	23.407	22.499	22.463	22.491	22.412
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 133297 / 680.5 MHz	Meas. Avg. Power (dBm)	23.337	23.274	23.394	22.458	22.351	22.359	22.36
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 133397 / 690.5 MHz	Meas. Avg. Power (dBm)	23.375	23.478	23.479	22.284	22.429	22.491	22.277
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5

LTE Band 71 Continued

			QPSK						
			1 RB			50% RB			100%
			Low	Mid	High	Low	Mid	High	RB
10 MHz Bandwidth	Ch. 133172 / 668 MHz	Meas. Avg. Power (dBm)	23.492	23.42	23.485	22.426	22.423	22.414	22.445
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 133297 / 680.5 MHz	Meas. Avg. Power (dBm)	23.492	23.371	23.415	22.451	22.49	22.45	22.432
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 133422 / 693 MHz	Meas. Avg. Power (dBm)	23.428	23.498	23.499	22.497	22.442	22.436	22.423
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
5 MHz Bandwidth	Ch. 133147 / 665.5 MHz	Meas. Avg. Power (dBm)	23.494	23.454	23.493	22.439	22.426	22.484	22.429
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch. 133297 / 680.5 MHz	Meas. Avg. Power (dBm)	23.458	23.477	23.434	22.417	22.46	22.424	22.457
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5
	Ch.133447 / 695.5 MHz	Meas. Avg. Power (dBm)	23.357	23.45	23.257	22.44	22.396	22.359	22.374
		Max Output Power (dBm)	23.5	23.5	23.5	22.5	22.5	22.5	22.5

5.3 WLAN

Output power is measured using a power meter.

2.4 GHz WLAN – 802.11 b/g/n

		802.11b	802.11g	802.11n, HT20
Duty Cycle		99.36%	97.15%	96.81%
Ch. 1 / 2412 MHz	**Measured Burst Avg. Power (dBm)**	18.48	18.86	18.72
	Max Output Power Including Tolerance (dBm)	19	19	19
Ch. 6 / 2437 MHz	**Measured Burst Avg. Power (dBm)**	18.34	18.85	18.67
	Max Output Power Including Tolerance (dBm)	19	19	19
Ch. 11 / 2462 MHz	**Measured Burst Avg. Power (dBm)**	18.35	18.76	18.7
	Max Output Power Including Tolerance (dBm)	19	19	19

5.4 Bluetooth

Output power is measured using a power meter

Bluetooth v4.0 – Low Energy

		GFSK
Duty Cycle		62.40%
Ch. 0 / 2402 MHz	**Measured Burst Avg. Power (dBm)**	9.1
	Max Output Power Including Tolerance (dBm)	10
Ch. 19 / 2440 MHz	**Measured Burst Avg. Power (dBm)**	8.9
	Max Output Power Including Tolerance (dBm)	10
Ch. 39 / 2480 MHz	**Measured Burst Avg. Power (dBm)**	8.9
	Max Output Power Including Tolerance (dBm)	10

5.5 LoRa

Output power is measured using a power meter

At the time of testing, mid channel was not an available test mode. Low and high channels have been tested.

		GFSK
Duty Cycle		100%
Ch. 0 / 902.3 MHz	**Measured Burst Avg. Power (dBm)**	15
	Max Output Power Including Tolerance (dBm)	17
Ch. 63 / 914.9 MHz	**Measured Burst Avg. Power (dBm)**	15
	Max Output Power Including Tolerance (dBm)	17

6 SAR Measurement Results

6.1 SAR Evaluation Exclusions

6.1.1 KDB 941225 Secondary Operating Modes Exclusions

According to KDB 941225, some "secondary" operating modes can be excluded under the following conditions:

1. Both primary and secondary modes must be in the same frequency band.
2. The maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ 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 10g SAR is ≤ 3 W/kg.

WCDMA HSDPA and HSPA modes and LTE 16QAM are not required for SAR testing because the 10g SAR value in WCDMA RMC and LTE QPSK is less than 3 W/kg.

6.1.2 KDB 248227 Exclusions

According to KDB 248227, SAR testing for 802.11g/n can be excluded when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 3 W/kg.

Maximum Power for 802.11b: 19 dBm

Maximum Power for 802.11g/n: 19 dBm

Highest Reported SAR for 802.11b: 0.130 W/kg

Adjust 802.11g/n SAR: 0.130 W/kg

SAR testing for 802.11 g/n is not required.

6.2 Liquid Measurements

Liquid measurements are within +/-10% of the target value. The DASY52 software corrects the measured SAR value to the target conductivity and permittivity only when the SAR value will be higher after correction.

Liquid	Date	Frequency	Measured		% Delta	
			Permittivity	Conductivity	Permittivity	Conductivity
HBBL 600-6000V6	September 26, 2019	1880	38.8096	1.46363	-2.97588	4.54483
		1900	38.7569	1.47564	-3.1078	5.40314
	September 27, 2019	680	40.86	0.914115	-3.41602	2.94988
		685	40.8133	0.915701	-3.46724	3.08334
		705	40.6337	0.922175	-3.65521	3.63024
		710	40.5907	0.923816	-3.69789	3.76926
		750	40.2735	0.937056	-3.9771	4.88929
		780	40.0663	0.947251	-4.11474	5.75367
		785	40.0343	0.948979	-4.13194	5.90051
		790	40.0028	0.95072	-4.14752	6.04878
		795	39.9721	0.952474	-4.16148	6.19823
	September 30, 2019	835	40.874	0.968949	-1.63781	6.42066
		840	40.8599	0.970716	-1.62861	6.39412
		1730	38.91	1.37856	-2.99298	1.40408
		1735	38.9052	1.38131	-2.98584	1.39052
		1745	38.8959	1.38684	-2.97087	1.3657
		1750	38.8914	1.38964	-2.96298	1.3555
		2440	37.8948	1.84	-3.37347	2.72969
		2450	37.8781	1.84728	-3.37219	2.62679
	October 7, 2019	2435	37.6039	1.83371	-4.13695	2.63307
		2440	37.5953	1.83733	-4.13719	2.58067
		2450	37.578	1.84457	-4.13772	2.47607
	October 15, 2019	900	40.8825	0.987729	-1.4879	1.82773
		905	40.8698	0.989555	-1.50299	1.76007
		910	40.8569	0.991386	-1.51867	1.69325
		915	40.8437	0.993215	-1.53495	1.62658

6.3 System Check

System check is performed within 24 hours before the SAR measurement on the EUT. A SAR measurement is done with a calibrated reference dipole. The measured SAR is normalized to 1 W and compared to the 1 W reference SAR value provided in the calibration report for the dipole. The system check is verified to be within ±10% of the reference SAR value.

Frequency (MHz)	Liquid Type	Date	Dipole Input Power (mW)	1 W Normalized 10g SAR (W/kg)	1 W Reference 10g SAR (W/kg)	Difference
750	HSL	September 27, 2019	100	6.06	5.54	9.4%
835	HSL	September 30, 2019	100	6.26	6.34	-1.2%
900	HSL	October 15, 2019	100	6.91	7.02	-1.6%
1750	HSL	September 30, 2019	100	19.29	19.4	-0.6%
1900	HSL	September 26, 2019	100	22.88	22.1	3.5%
2450	HSL	September 30, 2019	100	26.58	24.9	6.7%
2450	HSL	October 7, 2019	100	27.06	24.9	8.7%

6.4 Test Configurations

The following configurations were tested for SAR.

Configuration #	Exposure Condition	Accessories	Position	Distance
L1	Limb / Extremity	None	Rear Side	0 mm

6.5 Body SAR Results

Only worst-case plots for each band is shown in Appendix A.

WCDMA FDD Band 2

Channel	Frequency (MHz)	Config. #	Power Drift (dB)	Measured 10g SAR (W/kg)	SAR Scaling Factor	Reported 10g SAR (W/kg)	Plot #
9400	1880	L1	0.05	1.3	1.33	1.734	-
9262	1852.4	L1	0.01	1.11	1.19	1.322	-
9538	1907.6	L1	0.01	1.36	1.33	1.814	1

WCDMA FDD Band 4

Channel	Frequency (MHz)	Config. #	Power Drift (dB)	Measured 10g SAR (W/kg)	SAR Scaling Factor	Reported 10g SAR (W/kg)	Plot #
1413	1732.6	L1	-0.15	0.8	1.43	1.143	2

WCDMA FDD Band 5

Channel	Frequency (MHz)	Config. #	Power Drift (dB)	Measured 10g SAR (W/kg)	SAR Scaling Factor	Reported 10g SAR (W/kg)	Plot #
4183	836.6	L1	-0.02	0.079	1.14	0.090	3

LTE Band 2

Channel	Frequency (MHz)	# RB	RB Offset	Config. #	Power Drift (dB)	Measured 10g SAR (W/kg)	SAR Scaling Factor	Reported 10g SAR (W/kg)	Plot #
18900	1880	1	49	L1	-0.04	1.04	1.16	1.207	4
18900	1880	50	0	L1	-0.03	0.817	1.22	0.993	-

LTE Band 4

Channel	Frequency (MHz)	# RB	RB Offset	Config. #	Power Drift (dB)	Measured 10g SAR (W/kg)	SAR Scaling Factor	Reported 10g SAR (W/kg)	Plot #
20175	1732.5	1	49	L1	0	0.662	1.19	0.788	5
20175	1732.5	50	25	L1	-0.04	0.476	1.15	0.549	-

LTE Band 5

Channel	Frequency (MHz)	# RB	RB Offset	Config. #	Power Drift (dB)	Measured 10g SAR (W/kg)	SAR Scaling Factor	Reported 10g SAR (W/kg)	Plot #
20525	836.5	1	24	L1	-0.18	0.0985	1.01	0.100	6
20525	836.5	25	25	L1	-0.06	0.0719	1.01	0.072	-

LTE Band 12

Channel	Frequency (MHz)	# RB	RB Offset	Config. #	Power Drift (dB)	Measured 10g SAR (W/kg)	SAR Scaling Factor	Reported 10g SAR (W/kg)	Plot #
23095	707.5	1	49	L1	0.09	0.087	1.10	0.095	7
23095	707.5	25	13	L1	-0.03	0.063	1.07	0.067	-

LTE Band 13

Channel	Frequency (MHz)	# RB	RB Offset	Config. #	Power Drift (dB)	Measured 10g SAR (W/kg)	SAR Scaling Factor	Reported 10g SAR (W/kg)	Plot #
23230	782	1	24	L1	0.03	0.112	1.01	0.113	8
23230	782	25	13	L1	-0.03	0.0089	1.01	0.009	-

LTE Band 14

Channel	Frequency (MHz)	# RB	RB Offset	Config. #	Power Drift (dB)	Measured 10g SAR (W/kg)	SAR Scaling Factor	Reported 10g SAR (W/kg)	Plot #
23330	793	1	24	L1	-0.09	0.104	1.03	0.107	9
23330	793	25	13	L1	-0.01	0.075	1.01	0.075	-

LTE Band 66

Channel	Frequency (MHz)	# RB	RB Offset	Config. #	Power Drift (dB)	Measured 10g SAR (W/kg)	SAR Scaling Factor	Reported 10g SAR (W/kg)	Plot #
132322	1745	1	49	L1	0.02	0.613	1.30	0.798	10
132322	1745	50	0	L1	0.02	0.474	1.41	0.670	-

LTE Band 71

Channel	Frequency (MHz)	# RB	RB Offset	Config. #	Power Drift (dB)	Measured 10g SAR (W/kg)	SAR Scaling Factor	Reported 10g SAR (W/kg)	Plot #
133297	680.5	1	49	L1	-0.06	0.071	1.01	0.072	11
133297	680.5	50	25	L1	0.07	0.058	1.00	0.058	-

802.11b

Channel	Frequency (MHz)	Config. #	Power Drift (dB)	Measured 10g SAR (W/kg)	SAR Scaling Factor	Reported 10g SAR (W/kg)	Plot #
6	2437	L1	-0.08	0.112	1.17	0.130	12

Bluetooth LE

Channel	Frequency (MHz)	Config. #	Power Drift (dB)	Measured 10g SAR (W/kg)	SAR Scaling Factor	Reported 10g SAR (W/kg)	Plot #
19	2440	L1	0.06	0.00523	2.06	0.007	13

LoRa

At the time of testing, mid channel was not an available test mode. Low and high channels have been tested.

Channel	Frequency (MHz)	Config. #	Power Drift (dB)	Measured 10g SAR (W/kg)	SAR Scaling Factor	Reported 10g SAR (W/kg)	Plot #
0	902.3	L1	0.2	0.00829	1.58	0.0131	-
63	914.9	L1	0.15	0.0126	1.58	0.0200	14

6.6 Measurement Variability

According to FCC KDB 865664, When the highest measured 10-g SAR within a frequency band is < 3.75 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. SAR measurement variability is assessed for each frequency band for the tissue simulating liquid with the highest measured SAR and using the highest measured SAR configuration. The following procedure is used to assess measurement variability:

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

Measurement variability is not required because the highest measured 10g SAR value is 1.36 W/kg.

7 Test Equipment List

Equipment	Manufacturer	Model #	Serial/Inst #	Last Cal mm/dd/yyyy	Next Cal mm/dd/yyyy
750 MHz Dipole	IMST	diSARA750	0702102	10/15/2018	10/15/2019
835 MHz Dipole	IMST	diSARA835	0802101	10/15/2018	10/15/2019
900 MHz Dipole	IMST	diSARA900	0902101	10/15/2018	10/15/2019
1750 MHz Dipole	IMST	diSARA1750	1702101	10/15/2018	10/15/2019
1900 MHz Dipole	IMST	diSARA1900	1902103	10/16/2018	10/16/2019
2450 MHz Dipole	IMST	diSARA2450	2402103	10/16/2018	10/16/2019
DASY5 Robot	Staubli	TX60L	F13/5R4XC1/A/01	N/A	N/A
DASY5 Robot Controller	Staubli	CS8Cspeag-TX60	F13/5R4XC1/C/01	N/A	N/A
DASY5 Measurement Server	SPEAG	SE UMS 011 DA	1398	N/A	N/A
Data Acquisition Electronics	SPEAG	DAE4	1419	02/01/2019	02/01/2020
SAR Probe	SPEAG	EX3DV4	3957	03/28/2019	03/28/2020
SAM Phantom	SPEAG	QD 000P40 CD	1806	N/A	N/A
ELI Phantom	SPEAG	QD OVA 002 AA	2154	N/A	N/A
Head Liquid 600 MHz – 6 GHz	SPEAG	HBBL	161114-1	N/A	N/A
Dielectric Assessment Kit	SPEAG	DAKS-3.5	1079	02/12/2019	02/12/2020
Submersible Digital Thermometer	LKM Electronic	DTM 3000	3641	06/12/2019	06/12/2020
Temperature Sensor	Control Company	4184	170255262	03/16/2017	03/16/2020

8 Revision History

The latest revision replaces all previous versions

Revision No.	Date	Reason for change	Author
0	October 29, 2019	Original	JS