



RF EXPOSURE TEST REPORT

Applicant Name:
Garmin International Inc.
1200 E. 151st Street
Olathe, Kansas
USA 66062

Date of Testing:
07/27/2026 – 08/10/2026
Test Site/Location:
Element, Columbia, MD, USA

Document Serial No.:
1M2608100072-09

FCC ID: IPH- 05242

APPLICANT: GARMIN INTERNATIONAL INC.

DUT Type: Watch
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model(s): A05242

Equipment Class	Band & Mode	Tx Frequency	SAR	SAR
			1g Head (W/kg)	10g Extremity (W/kg)
PCT	LTE-M Band 12	699.7 - 715.3 MHz	<0.1	<0.1
PCT	LTE-M Band 4	1710.7 - 1754.3 MHz	<0.1	0.17
PCT	LTE-M Band 2	1850.7 - 1909.3 MHz	<0.1	0.33
TNT	NTN Band 255	1626.6 -1660.4 MHz	N/A	0.16
TNT	NTN Band 23	2000 - 2020 MHz	N/A	0.36
DTS	2.4 GHz WIFI	2412 - 2472 MHz	N/A	0.11
DSS	2.4 GHz Bluetooth	2402 - 2480 MHz	<0.1	<0.1
DXX	NFC	13.6 MHz	N/A	<0.1
DTS	ANT/ANT+	2402-2480 MHz	N/A	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			<0.1	2.68

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 1.9 of this report; for North American frequency bands only.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. Test results reported herein relate only to the item(s) tested.



RJ Ortanez
VP - Connected Technologies



The SAR Tick is an initiative of the Mobile & Wireless Forum (MWF). While a product may be considered eligible, use of the SAR Tick logo requires an agreement with the MWF. Further details can be obtained by emailing: sartick@mwfi.info.

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Revision	Description	Issue Date	Revised by:
-	Initial Release	09-01-2026	WKR023918

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1 TEST LABORATORY INFORMATION

1.1 Introduction

This test report for device subject to testing at an accredited testing laboratory has been generated by the testing laboratory that tested the device. Detailed location and accredited information regarding the testing laboratories are provided below.

1.2 Test Laboratories Information

1.2.1 Testing Laboratory 1

Test Firm Name	ELEMENT MATERIALS TECHNOLOGY WASHINGTON DC LLC
Test Lab Location	7185 Oakland Mills Road, Columbia, MD 21046, United States Tel. +1.410.290.6652 / Fax +1.410.290.6654
Accreditation Info.	Lab Code. (ISED): 2451B
	CAB Identifier (NIST): US0110
	ISO/IEC 17025 (A2LA): CERT #2041.01
	 
Measurement system No.	L, G, M, O,

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2 DEVICE UNDER TEST

2.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
LTE-M Band 12	Voice/Data	699.7 - 715.3 MHz
LTE-M Band 4	Voice/Data	1710.7 - 1754.3 MHz
LTE-M Band 2	Voice/Data	1850.7 - 1909.3 MHz
NTN Band n255	Data	1626.6 - 1660.4 MHz
NTN Band n23	Data	2000 - 2020 MHz
2.4 GHz WIFI	Data	2412 - 2472 MHz
2.4 GHz Bluetooth	Voice/Data	2402 - 2480 MHz
NFC	Data	13.6 MHz
ANT/ANT+	Data	2402 - 2480 MHz

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2.2 Nominal and Maximum Output Power Specifications

There is no power reduction used for any band/mode implemented in this device for SAR purposes. This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D04v01.

2.2.1 LTE-M Output Power

Mode / Band	Antenna		Modulated Average Output Power (in dBm)
LTE-M Band 12	1	Max Allowed Power	24.5
		Nominal	22.5
LTE-M Band 4	1	Max Allowed Power	24.5
		Nominal	22.5
LTE-M Band 2	1	Max Allowed Power	24.5
		Nominal	22.5

2.2.2 NTN Output Power

Mode / Band	Antenna		Modulated Average Output Power (in dBm)
NTN Band n255	1	Max Allowed Power	24.0
		Nominal	22.0
NTN Band n23	1	Max Allowed Power	24.0
		Nominal	22.0

2.2.3 2.4 GHz WLAN Output Power

Band	IEEE 802.11 Modulated Output Power (in dBm)								
	Antenna 1								
	b			g			n		
Maximum / Nominal Power	Max		Nom.	Max		Nom.	Max		Nom.
2.4 GHz WLAN	ch. 1-2:	19.0	17.0	ch. 1:	16.5	14.5	ch. 1:	16.5	14.5
	ch. 3-8:	20.0	18.0	ch. 2-9:	17.0	18.0	ch. 2-9:	18.5	16.5
	ch. 9-10:	19.0	17.0	ch. 10:	17.0	15.0	ch. 10:	17.0	15.0
	ch. 11:	18.0	16.0	ch. 11:	16.0	14.0	ch. 11:	15.0	13.0
	ch. 12:	13.0	11.0	ch. 12:	12.5	10.5	ch. 12:	12.5	10.5
	ch. 13:	12.0	10.0	ch. 13:	12.0	10.0	ch. 13:	12.0	10.0

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2.2.4 2.4 GHz Maximum Bluetooth Output Power

Mode	Data Rate	Modulated Output Power (in dBm)	
		2.4 GHz Antenna	
		Antenna 1	
Maximum / Nominal Power		Max	Nom.
Bluetooth	1Mbps	12.0	10.0
Bluetooth EDR	2Mbps	12.0	10.0
Bluetooth EDR	3Mbps	12.0	10.0
Bluetooth LE	1Mbps	6.0	4.0
		ch 37: 3.0	1.0
		ch 36: 2.5	0.5
		ch 39: 2.0	0.0

2.2.5 ANT/ANT+ Maximum Output Power

Mode	Frequency	Modulated Output Power (in dBm)	
		2.4 GHz Antenna	
		Antenna 1	
Maximum / Nominal Power		Max	Nom.
ANT/ANT+	2402-2403	3.0	1.0
	2404-2478	6.0	4.0
	2479-2480	2.5	0.5

2.3 DUT Antenna Locations

A diagram showing the location of the device antennas and exact antenna dimensions and separation distances can be found in the Technical Descriptions in the FCC filing.

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2.4 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D04v01, transmitters are considered to be operating simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds.

This device contains multiple transmitters that operate simultaneously; therefore, simultaneous transmission analysis is required according to FCC KDB Publication 447498 D04v01 procedures.

No.	Capable Transmit Configuration	Head	Extremity
1	LTE-M + 2.4 GHz Bluetooth	Yes	Yes
2	LTE-M + 2.4 GHz ANT/ANT+	N/A	Yes
3	LTE-M + 2.4 GHz WIFI	N/A	Yes
4	LTE-M + 2.4 GHz Bluetooth + NFC	N/A	Yes
5	LTE-M + 2.4 GHz ANT/ANT+ + NFC	N/A	Yes
6	LTE-M + 2.4 GHz WIFI + NFC	N/A	Yes
7	NTN + 2.4 GHz Bluetooth	N/A	Yes
8	NTN + 2.4 GHz ANT/ANT+	N/A	Yes
9	2.4 GHz Bluetooth + NFC	N/A	Yes
10	2.4 GHz ANT/ANT+ + NFC	N/A	Yes
11	2.4 GHz WIFI + NFC	N/A	Yes

2.5 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D04v01 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- IEC 62479:2010
- SPEAG DASY6 System Handbook
- IEC/IEEE 63195-1:2022

2.6 Device Serial Numbers

Several samples with identical hardware were used to support SAR testing. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units. The serial numbers used for each test are indicated alongside the results in Section 10.

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3 INTRODUCTION

The FCC and Innovation, Science, and Economic Development Canada have adopted the guidelines for evaluating the environmental effects of radio frequency (RF) radiation in ET Docket 93-62 on Aug. 6, 1996 and Health Canada Safety Code 6 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices. [1]

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz [3] and Health Canada RF Exposure Guidelines Safety Code 6 [22]. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave [4] is used for guidance in measuring the Specific Absorption Rate (SAR) due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the International Committee for Non-Ionizing Radiation Protection (ICNIRP) in Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields,” Report No. Vol 74. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

3.1 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Equation 3-1).

Equation 3-1
SAR Mathematical Equation

$$SAR = \frac{d}{dt} \left(\frac{dU}{dm} \right) = \frac{d}{dt} \left(\frac{dU}{\rho dv} \right)$$

SAR is expressed in units of Watts per Kilogram (W/kg).

$$SAR = \frac{\sigma \cdot E^2}{\rho}$$

where:

- σ = conductivity of the tissue-simulating material (S/m)
- ρ = mass density of the tissue-simulating material (kg/m³)
- E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relation to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.[6]

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4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013:

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013.
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.
3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):
 - a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 4-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).
 - b. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.
 - c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

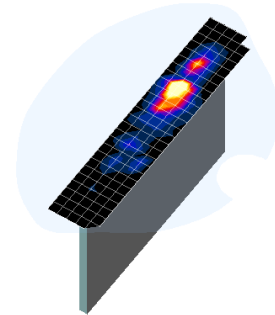


Figure 4-1
Sample SAR Area
Scan

Table 4-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04*

Frequency	Maximum Area Scan Resolution (mm) ($\Delta x_{\text{area}}, \Delta y_{\text{area}}$)	Maximum Zoom Scan Resolution (mm) ($\Delta x_{\text{zoom}}, \Delta y_{\text{zoom}}$)	Maximum Zoom Scan Spatial Resolution (mm)			Minimum Zoom Scan Volume (mm) (x,y,z)
			Uniform Grid	Graded Grid		
				$\Delta z_{\text{zoom}}(n)$	$\Delta z_{\text{zoom}}(1)^*$	
≤ 2 GHz	≤ 15	≤ 8	≤ 5	≤ 4	≤ 1.5* $\Delta z_{\text{zoom}}(n-1)$	≥ 30
2-3 GHz	≤ 12	≤ 5	≤ 5	≤ 4	≤ 1.5* $\Delta z_{\text{zoom}}(n-1)$	≥ 30
3-4 GHz	≤ 12	≤ 5	≤ 4	≤ 3	≤ 1.5* $\Delta z_{\text{zoom}}(n-1)$	≥ 28
4-5 GHz	≤ 10	≤ 4	≤ 3	≤ 2.5	≤ 1.5* $\Delta z_{\text{zoom}}(n-1)$	≥ 25
5-6 GHz	≤ 10	≤ 4	≤ 2	≤ 2	≤ 1.5* $\Delta z_{\text{zoom}}(n-1)$	≥ 22

*Also compliant to IEEE 1528-2013 Table 6

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5 TEST CONFIGURATION POSITIONS

5.1 Device Holder

The device holder is made out of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon = 3$ and loss tangent $\delta = 0.02$.

5.2 Positioning for Head

Devices that are designed to be worn on the wrist may operate in speaker mode for voice communication, with the device worn on the wrist and positioned next to the mouth. When next-to-mouth SAR evaluation is required, the device is positioned at 10 mm from a flat phantom filled with head tissue-equivalent medium.

5.3 Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions: i.e., hands, wrists, feet, and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. When extremity SAR evaluation is required, the device is evaluated with the back of the device touching the flat phantom, which is filled with head tissue-equivalent medium.

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6 RF EXPOSURE LIMITS

6.1 Uncontrolled Environment

UNCONTROLLED ENVIRONMENTS are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

6.2 Controlled Environment

CONTROLLED ENVIRONMENTS are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Table 6-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

HUMAN EXPOSURE LIMITS		
	UNCONTROLLED ENVIRONMENT <i>General Population</i> (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT <i>Occupational</i> (W/kg) or (mW/g)
Peak Spatial Average SAR Head	1.6	8.0
Whole Body SAR	0.08	0.4
Peak Spatial Average SAR Hands, Feet, Ankle, Wrists, etc.	4.0	20

1. The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
2. The Spatial Average value of the SAR averaged over the whole body.
3. The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

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7 FCC MEASUREMENT PROCEDURES

7.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D04v01, when SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as *reported* SAR. The highest *reported* SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

7.2 SAR Measurement Conditions for LTE

LTE modes are tested according to FCC KDB 941225 D05v02r04 publication. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The R&S CMW500 or Anritsu MT8820C simulators are used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

7.3 SAR Testing with 802.11 Transmitters

The normal network operating configurations of 802.11 transmitters are not suitable for SAR measurements. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 D01v02r02 for more details.

7.3.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters.

A periodic duty factor is required for current generation SAR systems to measure SAR. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR is scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

7.3.2 2.4 GHz SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either the fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

- 1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 2) When the reported SAR is > 0.8 W/kg, SAR is required for that position using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11 g/n OFDM are additionally evaluated for SAR if the highest reported SAR for 802.11b, adjusted by the ratio of the OFDM to DSSS specified maximum output power, is > 1.2 W/kg. When SAR is

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required for OFDM modes in 2.4 GHz band, the Initial Test Configuration Procedures should be followed. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

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8 RF CONDUCTED POWERS

8.1 LTE-M Conducted Powers

Table 8-1
LTE- M Band 12 Average RF Power – Ant 1

LTE Band 12 10 MHz Bandwidth						
Modulation	RB Size	RB Offset	NB Position	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
				23095.0 (707.5 MHz) Conducted Power [dBm]		
QPSK	1	0	1	22.87	0	0
	1	0	3	22.48		0
	1	5	6	22.77		0
	3	0	1	22.95		0
	3	0	3	22.84		0
	3	3	6	22.88		0
	6	0	1	21.85	0-1	1
	6	0	3	21.83		1
	6	0	6	21.62		1
	6	0	6	21.62		1
16QAM	1	0	1	23.36	0	0
	1	0	3	22.97		0
	1	5	6	23.25		0
	3	0	1	22.79		0
	3	0	3	22.67		0
	3	3	6	22.70		0
	5	0	1	21.76	0-1	1
	5	0	3	21.87		1
	5	1	6	21.67		1
	5	1	6	21.67		1

Table 8-2
LTE- M Band 4 Average RF Power – Ant 1

LTE Band 4 20 MHz Bandwidth						
Modulation	RB Size	RB Offset	NB Position	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
				20175.0 (1732.5 MHz) Conducted Power [dBm]		
QPSK	1	0	1	22.84	0	0
	1	0	7	22.73		0
	1	5	14	22.89		0
	3	0	1	22.92		0
	3	0	7	22.94		0
	3	3	14	22.98		0
	6	0	1	22.63	0-1	0
	6	0	7	22.85		0
	6	0	14	22.74		0
	6	0	14	22.74		0
16QAM	1	0	1	23.32	0-2	0
	1	0	7	23.22		0
	1	5	14	23.25		0
	3	0	1	22.71		0
	3	0	7	22.82		0
	3	3	14	22.85		0
	5	0	1	22.78	0-2	0
	5	0	7	22.87		0
	5	1	14	22.78		0
	5	1	14	22.78		0

Table 8-3
LTE- M Band 2 Average RF Power – Ant 1

LTE Band 2 20 MHz Bandwidth								
Modulation	RB Size	RB Offset	NB Position	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
				18700.0 (1860.0 MHz)	18900.0 (1880.0 MHz)	19100.0 (1900.0 MHz)		
				Conducted Power [dBm]				
QPSK	1	0	1	22.95	22.86	22.85	0	0
	1	0	7	22.95	22.83	22.86		0
	1	5	14	22.92	22.87	22.77		0
	3	0	1	23.08	23.01	22.79	0-1	0
	3	0	7	23.11	23.08	22.89		0
	3	3	14	23.16	22.81	22.91		0
	6	0	1	23.03	22.89	22.65		0
	6	0	7	23.04	23.05	22.64	0-1	0
	6	0	14	22.98	22.84	22.86		0
	1	0	1	23.36	23.08	23.30		0-2
1	0	7	23.32	23.14	23.18	0		
16QAM	1	5	14	23.32	23.10	23.13	0-2	
	3	0	1	22.93	23.06	23.01		0
	3	0	7	23.08	23.05	22.92		0
	3	3	14	22.98	22.91	22.93	0-2	0
	5	0	1	22.90	23.07	23.13		0
	5	0	7	23.19	23.05	22.94		0
	5	1	14	22.98	23.06	22.95		0
	5	1	14	22.98	23.06	22.95		0

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8.2 NTN Conducted Powers

Table 8-4
NTN Band n255 Maximum Average RF Power – Ant 1

SCS	SC Size	Tx Channel	Frequency [MHz]	Conducted Power [dBm]	
				BPSK	QPSK
3.75kHz	1SC0	261505	1626.6	22.19	22.20
	1SC24	261505	1626.6	22.35	22.36
	1SC47	261505	1626.6	22.13	22.14
15kHz	1SC0	261505	1626.6	22.35	22.29
	1SC6	261505	1626.6	22.40	22.38
	1SC11	261505	1626.6	22.29	22.27
	3SC0	261505	1626.6	N/A	22.15
	3SC6	261505	1626.6	N/A	22.33
	3SC9	261505	1626.6	N/A	22.16
	6SC0	261505	1626.6	N/A	21.39
	6SC6	261505	1626.6	N/A	21.40
	12SC0	261505	1626.6	N/A	20.33
3.75kHz	1SC0	261674	1643.5	22.24	22.21
	1SC24	261674	1643.5	22.38	22.37
	1SC47	261674	1643.5	22.15	22.25
15kHz	1SC0	261674	1643.5	22.37	22.36
	1SC6	261674	1643.5	22.35	22.48
	1SC11	261674	1643.5	22.31	22.35
	3SC0	261674	1643.5	N/A	21.69
	3SC6	261674	1643.5	N/A	21.83
	3SC9	261674	1643.5	N/A	21.72
	6SC0	261674	1643.5	N/A	21.44
	6SC6	261674	1643.5	N/A	21.46
	12SC0	261674	1643.5	N/A	20.41
3.75kHz	1SC0	261843	1660.4	21.86	21.88
	1SC24	261843	1660.4	22.05	22.03
	1SC47	261843	1660.4	21.82	21.92
15kHz	1SC0	261843	1660.4	21.95	22.01
	1SC6	261843	1660.4	22.20	22.10
	1SC11	261843	1660.4	22.00	22.07
	3SC0	261843	1660.4	N/A	21.82
	3SC6	261843	1660.4	N/A	21.92
	3SC9	261843	1660.4	N/A	21.80
	6SC0	261843	1660.4	N/A	21.06
	6SC6	261843	1660.4	N/A	21.07
	12SC0	261843	1660.4	N/A	20.04

Table 8-5
NTN Band n23 Maximum Average RF Power – Ant 1

SCS	SC Size	Channel	Frequency [MHz]	Conducted Power [dBm]	
				BPSK	QPSK
3.75kHz	1SC0	261070	2000.1	22.12	22.14
	1SC24	261070	2000.1	22.31	22.31
	1SC47	261070	2000.1	22.20	22.21
15kHz	1SC0	261070	2000.1	22.36	22.39
	1SC6	261070	2000.1	22.45	22.45
	1SC11	261070	2000.1	22.35	22.33
	3SC0	261070	2000.1	N/A	21.65
	3SC6	261070	2000.1	N/A	21.65
	3SC9	261070	2000.1	N/A	21.55
	6SC0	261070	2000.1	N/A	21.38
	6SC6	261070	2000.1	N/A	21.25
	12SC0	261070	2000.1	N/A	20.40
3.75kHz	1SC0	261169	2010	22.17	22.11
	1SC24	261169	2010	22.32	22.26
	1SC47	261169	2010	22.06	22.07
15kHz	1SC0	261169	2010	22.34	22.35
	1SC6	261169	2010	22.39	22.38
	1SC11	261169	2010	22.33	22.32
	3SC0	261169	2010	N/A	21.60
	3SC6	261169	2010	N/A	21.77
	3SC9	261169	2010	N/A	21.74
	6SC0	261169	2010	N/A	21.35
	6SC6	261169	2010	N/A	21.17
	12SC0	261169	2010	N/A	20.38
3.75kHz	1SC0	261268	2019.9	22.10	22.08
	1SC24	261268	2019.9	22.23	22.24
	1SC47	261268	2019.9	22.03	22.04
15kHz	1SC0	261268	2019.9	22.25	22.25
	1SC6	261268	2019.9	22.40	22.42
	1SC11	261268	2019.9	22.24	22.22
	3SC0	261268	2019.9	N/A	21.62
	3SC6	261268	2019.9	N/A	21.69
	3SC9	261268	2019.9	N/A	21.60
	6SC0	261268	2019.9	N/A	21.27
	6SC6	261268	2019.9	N/A	21.17
	12SC0	261268	2019.9	N/A	20.38

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8.3 WLAN Conducted Powers

Table 8-6
2.4 GHz WLAN Maximum Average RF Power – Ant 1

2.4GHz WIFI (20MHz 802.11b SISO ANT 1)		
Freq. [MHz]	Channel	Conducted Power [dBm]
2412	1	17.41
2417	2	17.55
2422	3	18.36
2437	6	18.07
2452	9	17.44
2457	10	17.16
2462	11	16.74
2467	12	11.41
2472	13	10.59
2.4GHz WIFI (20MHz 802.11g SISO ANT 1)		
Freq. [MHz]	Channel	Conducted Power [dBm]
2412	1	15.15
2417	2	17.57
2437	6	18.04
2452	9	17.27
2457	10	15.35
2462	11	14.11
2467	12	11.18
2472	13	10.18
2.4GHz WIFI (20MHz 802.11n SISO ANT 1)		
Freq. [MHz]	Channel	Conducted Power [dBm]
2412	1	15.13
2417	2	16.72
2437	6	17.03
2452	9	16.26
2457	10	15.41
2462	11	13.20
2467	12	11.21
2472	13	10.19

Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02:

- Power measurements were performed for the transmission mode configuration with the highest maximum output power specified for production units.
- For transmission modes with the same maximum output power specification, powers were measured for the largest channel bandwidth, lowest order modulation and lowest data rate.
- For transmission modes with identical maximum specified output power, channel bandwidth, modulation and data rates, power measurements were required for all identical configurations.
- For each transmission mode configuration, powers were measured for the highest and lowest channels; and at the mid-band channel(s) when there were at least 3 channels supported. For configurations with multiple mid-band channels, due to an even number of channels, both channels were measured.

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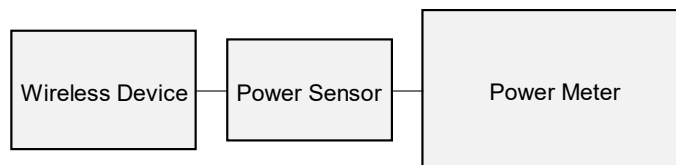


Figure 10-1
Power Measurement Setup

8.4 Bluetooth Conducted Powers

Table 8-7
Bluetooth Maximum Average RF Power– Ant 1

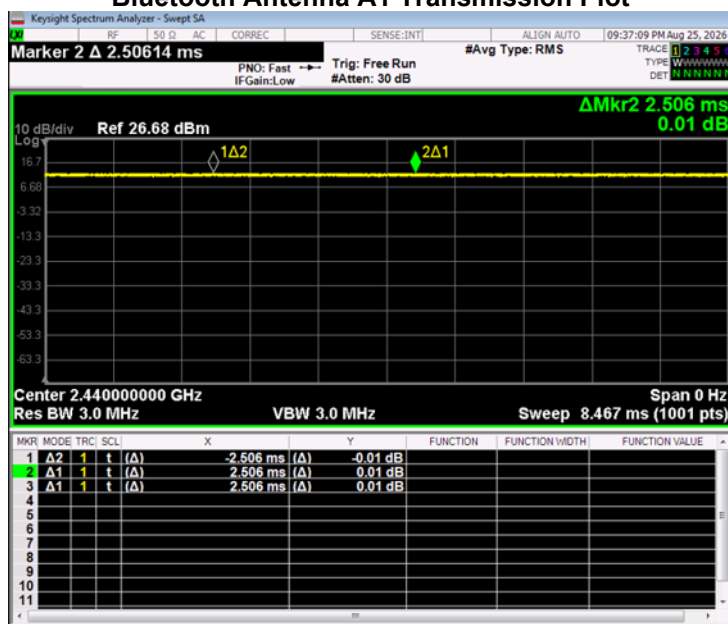
Frequency [MHz]	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
			[dBm]	[mW]
2402	1.0	0	10.37	10.880
2441	1.0	39	11.60	14.439
2480	1.0	78	10.49	11.202
2402	2.0	0	10.36	10.869
2441	2.0	39	10.59	11.458
2480	2.0	78	10.47	11.143
2402	3.0	0	10.28	10.673
2441	3.0	39	10.37	10.887
2480	3.0	78	10.03	10.065

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Figure 8-2
Bluetooth Antenna A1 Transmission Plot



Equation 8-1
Bluetooth Antenna A1 Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.506ms}{2.506ms} * 100\% = 100\%$$

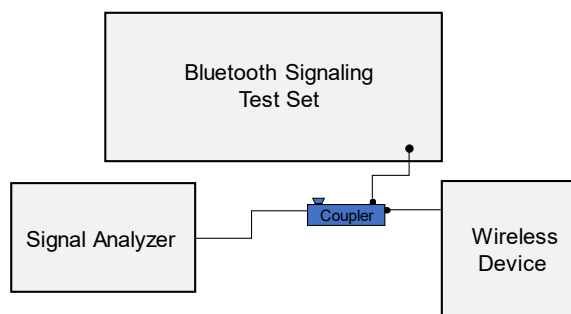


Figure 8-3
Power Measurement Setup

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9 SYSTEM VERIFICATION

9.1 Tissue Verification

Table 9-1
Measured Head Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ
07/28/2026	30 Head	20.2	12	0.769	56.838	0.750	55.000	2.53%	3.34%
			13	0.768	57.134	0.750	55.000	2.40%	3.88%
			14	0.768	57.445	0.750	55.000	2.40%	4.45%
08/10/2026	750 Head	23.5	680	0.895	43.275	0.888	42.305	0.79%	2.29%
			695	0.899	43.230	0.889	42.227	1.12%	2.38%
			700	0.901	43.206	0.889	42.201	1.35%	2.38%
			710	0.904	43.144	0.890	42.149	1.57%	2.36%
			725	0.908	43.110	0.891	42.071	1.91%	2.47%
			750	0.916	43.036	0.894	41.942	2.46%	2.61%
			770	0.923	43.021	0.895	41.838	3.13%	2.83%
			785	0.927	42.969	0.896	41.760	3.46%	2.90%
			800	0.931	42.900	0.897	41.682	3.79%	2.92%
			1600	1.252	40.514	1.286	40.280	-2.64%	0.58%
08/05/2026	1640 Head	21.5	1610	1.257	40.495	1.292	40.268	-2.71%	0.56%
			1620	1.263	40.481	1.297	40.256	-2.62%	0.56%
			1630	1.269	40.466	1.303	40.244	-2.61%	0.55%
			1640	1.275	40.452	1.308	40.232	-2.52%	0.55%
			1650	1.280	40.447	1.314	40.220	-2.59%	0.56%
			1660	1.286	40.441	1.320	40.208	-2.58%	0.58%
			1670	1.291	40.425	1.325	40.197	-2.57%	0.57%
08/10/2026	1750 Head	23.5	1700	1.286	41.382	1.343	40.145	-4.24%	3.08%
			1705	1.288	41.374	1.345	40.141	-4.24%	3.07%
			1710	1.290	41.372	1.348	40.136	-4.30%	3.08%
			1720	1.296	41.362	1.354	40.126	-4.28%	3.08%
			1745	1.309	41.341	1.368	40.087	-4.31%	3.13%
			1750	1.312	41.340	1.371	40.079	-4.30%	3.15%
			1770	1.321	41.315	1.383	40.047	-4.48%	3.17%
			1790	1.329	41.295	1.394	40.016	-4.66%	3.20%
08/05/2026	1900 Head	22.5	1850	1.384	39.682	1.400	40.000	-1.14%	-0.79%
			1860	1.390	39.672	1.400	40.000	-0.71%	-0.82%
			1880	1.402	39.656	1.400	40.000	0.14%	-0.86%
			1900	1.414	39.650	1.400	40.000	1.00%	-0.88%
			1905	1.417	39.647	1.400	40.000	1.21%	-0.88%
			1910	1.419	39.639	1.400	40.000	1.36%	-0.90%
			1920	1.425	39.619	1.400	40.000	1.79%	-0.95%
			1850	1.356	41.218	1.400	40.000	-3.14%	3.05%
			1860	1.361	41.218	1.400	40.000	-2.79%	3.05%
			1880	1.372	41.209	1.400	40.000	-2.00%	3.02%
08/10/2026	1900 Head	23.5	1900	1.383	41.196	1.400	40.000	-1.21%	2.99%
			1905	1.386	41.186	1.400	40.000	-1.00%	2.97%
			1910	1.388	41.181	1.400	40.000	-0.86%	2.95%
			1920	1.393	41.166	1.400	40.000	-0.50%	2.91%
			1990	1.357	40.764	1.391	40.020	-2.44%	1.86%
			2000	1.364	40.749	1.400	40.000	-2.57%	1.87%
			2010	1.369	40.737	1.409	39.980	-2.84%	1.89%
			2020	1.376	40.722	1.418	39.960	-2.96%	1.91%
			2030	1.382	40.704	1.427	39.940	-3.15%	1.91%
			2040	1.389	40.696	1.436	39.920	-3.27%	1.94%
08/06/2026	2100 Head	19.0	2050	1.395	40.686	1.445	39.900	-3.46%	1.97%
			2060	1.402	40.677	1.454	39.880	-3.58%	2.00%
			2070	1.409	40.667	1.463	39.860	-3.69%	2.02%
			2080	1.415	40.657	1.471	39.858	-3.81%	2.00%
			2090	1.421	40.648	1.480	39.840	-3.99%	2.03%
			2100	1.428	40.638	1.489	39.822	-4.10%	2.05%
			2110	1.435	40.626	1.498	39.804	-4.21%	2.07%
			2120	1.441	40.612	1.507	39.787	-4.38%	2.07%
			2130	1.447	40.598	1.516	39.769	-4.55%	2.08%
			2140	1.454	40.584	1.524	39.751	-4.59%	2.10%
			2150	1.461	40.573	1.533	39.733	-4.70%	2.11%
			2160	1.467	40.566	1.542	39.716	-4.86%	2.14%
			2170	1.474	40.555	1.551	39.698	-4.96%	2.16%
			2300	1.679	39.209	1.670	39.500	0.54%	-0.74%
			2310	1.686	39.195	1.679	39.480	0.42%	-0.72%
07/27/2026	2450 Head	21.8	2320	1.693	39.182	1.687	39.460	0.36%	-0.70%
			2400	1.750	39.053	1.756	39.289	-0.34%	-0.80%
			2450	1.788	38.984	1.800	39.200	-0.67%	-0.55%
			2480	1.811	38.929	1.833	39.162	-1.20%	-0.59%
			2500	1.826	38.893	1.855	39.136	-1.56%	-0.62%
			2510	1.833	38.874	1.866	39.123	-1.77%	-0.64%
			2535	1.853	38.828	1.893	39.092	-2.11%	-0.68%
			2550	1.865	38.805	1.909	39.073	-2.30%	-0.69%
			2560	1.874	38.788	1.920	39.060	-2.40%	-0.70%
			2600	1.904	38.730	1.964	39.009	-3.05%	-0.72%
			2650	1.942	38.613	2.018	38.945	-3.77%	-0.85%
			2680	1.968	38.569	2.051	38.907	-4.05%	-0.87%
			2700	1.983	38.556	2.073	38.882	-4.34%	-0.84%

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The above measured tissue parameters were used in the DASY software. The DASY software was used to perform interpolation to determine the dielectric parameters at the SAR test device frequencies (per KDB Publication 865664 D01v01r04 and IEEE 1528-2013 6.6.1.2. The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

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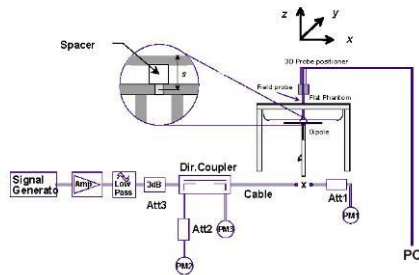
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9.2 Test System Verification

Prior to SAR assessment, the system is verified using the procedures and dipole sources as defined by IEEE 1528-2013. The system is verified to $\pm 10\%$ of the SAR measurement on the reference dipole at the time of calibration by the calibration facility. Full system validation status and result summary can be found in the SAR System Validation Appendix.

**Table 9-2
System Verification Results**

System Verification TARGET & MEASURED																	
SAR System	Tissue Frequency (MHz)	Tissue Type	Date	Amb. Temp. (C)	Liquid Temp. (C)	Input Power (W)	Source SN	Probe SN	DAE	Measured SAR 1g (W/kg)	1W Target SAR 1g (W/kg)	1W Normalized SAR 1g (W/kg)	Deviation 1g (%)	Measured SAR 10g (W/kg)	1W Target SAR 10g (W/kg)	1W Normalized SAR 10g (W/kg)	Deviation 10g (%)
G	13	Head	07/28/2026	22.2	20.2	1.00	1002	7570	859	0.501	0.503	0.501	-0.40%	0.312	0.316	0.312	-1.27%
O	750	Head	08/10/2026	22.0	21.8	0.20	1161	7488	1415	1.75	8.36	8.75	4.67%	1.17	5.41	5.85	8.13%
G	1640	Head	08/05/2026	21.2	21.4	0.10	321	7527	859	3.48	34.50	34.80	0.87%	1.91	18.80	19.10	1.60%
O	1750	Head	08/10/2026	22.0	21.8	0.10	1148	7488	1415	3.64	36.90	36.40	-1.36%	1.97	19.60	19.70	0.51%
L	1900	Head	08/05/2026	22.5	21.5	0.10	5d148	7539	1450	4.15	39.60	41.50	4.80%	2.16	20.90	21.60	3.35%
M	2100	Head	08/26/2026	20.3	19.5	0.10	1070	7406	1667	4.45	43.80	44.50	1.60%	2.24	22.60	22.40	-0.88%
L	2450	Head	07/27/2026	21.2	20.1	0.10	797	7539	1450	5.67	52.60	56.70	7.79%	2.68	24.80	26.80	8.06%



**Figure 9-1
System Verification Setup Diagram**



**Figure 9-2
System Verification Setup Photo**

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10 SAR DATA SUMMARY

10.1 LTE-M Band 12 Standalone SAR Data

Table 10-1

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Max Allowed Power [dBm]	Conducted Power [dBm]	RB Size	RB Offset	NB Position	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Reported 1g SAR [W/kg]	Plot #
Head	LTE-M Band 12	10	QPSK	1	3644224117	1:1	-0.19	707.50	23095	0.0	24.5	22.87	1	0	1	Front	10	0.001	1.455	0.001	
Head	LTE-M Band 12	10	QPSK	1	3644224117	1:1	0.03	707.50	23095	0.0	24.5	22.95	3	0	1	Front	10	0.002	1.429	0.003	A1
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																		Head 1.6 W/kg (mW/g) averaged over 1 gram			

Table 10-2

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Max Allowed Power [dBm]	Conducted Power [dBm]	RB Size	RB Offset	NB Position	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Power Scaling Factor	Reported 10g SAR [W/kg]	Plot #
Extremity	LTE-M Band 12	10	QPSK	1	3644224117	1:1	-0.05	707.50	23095	0.0	24.5	22.87	1	0	1	Back	0	0.037	1.455	0.054	A2
Extremity	LTE-M Band 12	10	QPSK	1	3644224117	1:1	0.04	707.50	23095	0.0	24.5	22.95	3	0	1	Back	0	0.037	1.429	0.053	
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																		Extremity 4.0 W/kg (mW/g) averaged over 10 grams			

10.2 LTE-M Band 4 Standalone SAR Data

Table 10-3

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Max Allowed Power [dBm]	Conducted Power [dBm]	RB Size	RB Offset	NB Position	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Reported 1g SAR [W/kg]	Plot #
Head	LTE-M Band 4	20	QPSK	1	3644224117	1:1	0.09	1732.50	1732500	0.0	24.5	22.89	1	5	14	Front	10	0.010		0.014	A3
Head	LTE-M Band 4	20	QPSK	1	3644224117	1:1	-0.07	1732.50	1732500	0.0	24.5	22.98	3	3	14	Front	10	0.010		0.014	
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																		Head 1.6 W/kg (mW/g) averaged over 1 gram			

Table 10-4

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Max Allowed Power [dBm]	Conducted Power [dBm]	RB Size	RB Offset	NB Position	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Power Scaling Factor	Reported 10g SAR [W/kg]	Plot #
Extremity	LTE-M Band 4	20	QPSK	1	3644224117	1:1	-0.02	1732.50	1732500	0.0	24.5	22.89	1	5	14	Back	0	0.116		0.168	
Extremity	LTE-M Band 4	20	QPSK	1	3644224117	1:1	-0.07	1732.50	1732500	0.0	24.5	22.98	3	3	14	Back	0	0.118		0.167	A4
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																		Extremity 4.0 W/kg (mW/g) averaged over 10 grams			

10.3 LTE-M Band 2 Standalone SAR Data

Table 10-5

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Max Allowed Power [dBm]	Conducted Power [dBm]	RB Size	RB Offset	NB Position	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Reported 1g SAR [W/kg]	Plot #
Head	LTE-M Band 2	20	QPSK	1	3644224117	1:1	0.01	1860.00	18700	0.0	24.5	22.95	1	0	1	Front	10	0.044	1.429	0.063	A5
Head	LTE-M Band 2	20	QPSK	1	3644224117	1:1	-0.04	1860.00	18700	0.0	24.5	23.16	3	3	14	Front	10	0.043	1.361	0.059	
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																		Head 1.6 W/kg (mW/g) averaged over 1 gram			

Table 10-6

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	MPR [dB]	Max Allowed Power [dBm]	Conducted Power [dBm]	RB Size	RB Offset	NB Position	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Power Scaling Factor	Reported 10g SAR [W/kg]	Plot #
Extremity	LTE-M Band 2	20	QPSK	1	3644224117	1:1	0.01	1860.00	18700	0.0	24.5	22.95	1	0	14	Back	0	0.234	1.429	0.334	
Extremity	LTE-M Band 2	20	QPSK	1	3644224117	1:1	0.04	1860.00	18700	0.0	24.5	23.16	3	0	14	Back	0	0.235	1.361	0.320	A6
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																		Extremity 4.0 W/kg (mW/g) averaged over 10 grams			

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10.4 NTN Band n255 Standalone SAR Data

Table 10-7

Exposure	Band / Mode	Bandwidth [kHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Max Allowed Power [dBm]	Conducted Power [dBm]	Tone	Tone Start	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Power Scaling Factor	Reported 10g SAR [W/kg]	Plot #
Extremity	NTN Band n255	200	QPSK	1	3644224118	1:1	0.02	1643.50	261674	24.0	22.48	1	6	Back	0	0.114	1.419	0.162	A7
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Extremity 4.0 W/kg (mW/g) averaged over 10 grams						

10.5 NTN Band n23 Standalone SAR Data

Table 10-8

Exposure	Band / Mode	Bandwidth [kHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle	Power Drift [dB]	Frequency [MHz]	Channel #	Max Allowed Power [dBm]	Conducted Power [dBm]	Tone	Tone Start	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Power Scaling Factor	Reported 10g SAR [W/kg]	Plot #
Extremity	NTN Band n23	200	QPSK	1	3644224118	1:1	0.13	2000.00	261070	24.0	22.45	1	6	Back	0	0.253	1.429	0.362	A8
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Extremity 4.0 W/kg (mW/g) averaged over 10 grams						

10.6 2.4 GHz WLAN Standalone SAR Data

Table 10-9

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 10g SAR [W/kg]	Plot #
Extremity	2.4 GHz WiFi / IEEE 802.11b	DSSS	1	3644224106	100.00	-0.17	2422.00	3	1.0	20.0	18.36	Back	0	0.074	1.459	1.000	0.108	A9
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Extremity 4.0 W/kg (mW/g) averaged over 10 grams					

10.7 Bluetooth Standalone SAR Data

Table 10-10

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 1g SAR [W/kg]	Plot #
Head	2.4 GHz Bluetooth	DSSS	1	3644224106	100.00	0.04	2441.00	39	1	12.0	11.60	Front	10	0.004	1.096	1.010	0.004	A10
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Head 1.6 W/kg (mW/g) averaged over 1 gram					

Table 10-11

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 10g SAR [W/kg]	Plot #
Extremity	2.4 GHz Bluetooth	DSSS	1	3644224106	100.00	0.04	2441.00	39	1	12.0	11.60	Back	0	0.015	1.096	1.010	0.017	A11
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Extremity 4.0 W/kg (mW/g) averaged over 10 grams					

10.8 NFC Standalone SAR Data

Table 10-12

Exposure	Band / Mode	Signal Type	Ant.	Serial Number	Power Drift [dB]	Frequency [MHz]	Test Position	Spacing [mm]	Measured 10g SAR [W/kg]	Plot #
Extremity	NFC	A	NFC	24067	0.01	13.60	Back	0	0.000	A13
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Extremity 4.0 W/kg (mW/g) averaged over 10 grams			

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10.9 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528:2020, and FCC KDB Publication 447498 D04v01.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D04v01.
6. Per FCC KDB Publication 865664 D01v01r04, variability SAR tests were not required since measured SAR results for all frequency bands were less than 0.8 W/kg.

LTE Notes:

1. LTE Cat M1 SAR test configurations were established using the general LTE SAR test and test reduction rules in FCC KDB Publication 941225 D05, as applicable, together with the Cat M1 uplink transmission configurations defined in 3GPP TS 36.101. Cat M1 operates within a 6 RB narrowband inside the supported LTE channel bandwidth.
2. The selected NB positions represent lower, middle, and upper narrowband locations within the applicable LTE channel bandwidth. RB offsets were selected to characterize the applicable portions of the 6-RB Cat M1 narrowband.
3. MPR was applied only to Cat M1 configurations permitted by 3GPP TS 36.101 for the applicable channel bandwidth, modulation, and RB allocation. A-MPR was disabled during SAR testing.

WLAN Notes:

1. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n) was required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 7.3.2 for more information.
2. When the maximum reported 1g averaged SAR is ≤ 0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg for 1g evaluations or all test channels were measured.
3. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. Procedures used to measure the duty factor are identical to that in the associated EMC test reports.

Bluetooth Notes

1. Bluetooth SAR was measured with the device connected to a call box with hopping disabled with DH5 operation and Tx Tests test mode type. Per October 2016 TCB Workshop Notes, the reported SAR was scaled to the 100% transmission duty factor for Bluetooth and 100% transmission duty factor for Bluetooth LE to determine compliance. See RF Conducted Power Section for the time domain plot and calculation for the duty factor of the device.
2. When the BT LE frame average target is equal to the BT BDR frame average target, a spotcheck for BT LE is run on the worst case position from BT BDR testing to ensure compliance of both modes

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11 SAR MEASUREMENT VARIABILITY

11.1 SAR Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, variability SAR tests were not required since measured SAR results for all frequency bands were less than 0.8 W/kg.

11.2 SAR Measurement Uncertainty

The measured SAR was <1.5 W/kg for 1g and <3.75 W/kg for 10g for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.

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12 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E4404B	Spectrum Analyzer	N/A	N/A	N/A	MY45113242
Agilent	E4438C	ESG Vector Signal Generator	11/2/2025	Annual	11/2/2026	MY45093852
Agilent	E4438C	ESG Vector Signal Generator	3/23/2026	Annual	3/23/2027	MY45092078
Agilent	N5182A	MXG Vector Signal Generator	4/13/2026	Annual	4/13/2027	MY48180366
Agilent	8753ES	S-Parameter Vector Network Analyzer	10/28/2025	Annual	10/28/2026	MY40003841
Agilent	8753ES	S-Parameter Vector Network Analyzer	10/27/2025	Annual	10/27/2026	US39170118
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433973
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433974
Amplifier Research	150A100C	Amplifier	CBT	N/A	CBT	350132
Insize	1108-150	Insize - Digital Caliper	1/7/2026	Annual	1/7/2027	1410255640
Anritsu	MA24106A	USB Power Sensor	2/20/2026	Annual	2/20/2027	1520501
Mini-Circuits	PWR-4GHS	9-KHz-4000MHz USB Power Sensor	1/28/2026	Annual	1/28/2027	11710030062
Anritsu	MA24106A	USB Power Sensor	12/12/2025	Annual	12/12/2026	1344554
Control Company	4352	Long Stem Thermometer	12/22/2025	Biennial	12/22/2027	250770121
Control Company	4352	Long Stem Thermometer	12/22/2025	Biennial	12/22/2027	250770096
Control Company	4040	Therm./ Clock/ Humidity Monitor	12/29/2025	Biennial	12/29/2027	250778120
Control Company	4040	Therm./ Clock/ Humidity Monitor	10/24/2025	Biennial	10/24/2027	250652331
Control Company	4040	Therm./ Clock/ Humidity Monitor	10/15/2024	Biennial	10/15/2026	240763503
Keysight Technologies	N9020A	MXA Signal Analyzer	7/7/2026	Annual	7/7/2027	MY48010233
Agilent	N9020A	MXA Signal Analyzer	7/7/2025	Biennial	7/7/2027	MY56470202
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
Mini-Circuits	VLF-6000+	Low Pass Filter DC to 6000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mini-Circuits	ZUDC10-83-S+	Directional Coupler	CBT	N/A	CBT	2050
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	NC-100	Torque Wrench	5/29/2025	Biennial	5/29/2027	N/A
SPEAG	DAK-3.5	Dielectric Assessment Kit	11/10/2025	Annual	11/10/2026	1277
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1237
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1331
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1390
SPEAG	DAK-12	Dielectric Assessment Kit (4MHz - 3GHz)	3/3/2026	Annual	3/3/2027	1102
SPEAG	CLA-13	Confined Loop Antenna	9/4/2025	Annual	9/4/2026	1002
SPEAG	D1640V2	1640 MHz SAR Dipole	11/3/2025	Annual	11/3/2026	321
SPEAG	D1750V2	1750 MHz SAR Dipole	1/13/2025	Biennial	1/13/2027	1148
SPEAG	D1900V2	1900 MHz SAR Dipole	2/7/2025	Biennial	2/7/2027	5d148
SPEAG	D2100V2	2100 MHz SAR Dipole	8/2/2024	Triennial	8/2/2027	1070
SPEAG	D2450V2	2450 MHz SAR Dipole	10/7/2025	Annual	10/7/2026	797
SPEAG	D750V2	750 MHz SAR Dipole	10/7/2024	Biennial	10/7/2026	1161
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/10/2026	Annual	3/10/2027	1450
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/5/2025	Annual	11/5/2026	1677
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2026	Annual	2/9/2027	859
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/9/2026	Annual	3/9/2027	1415
SPEAG	EX3DV4	SAR Probe	11/7/2025	Annual	11/7/2026	7406
SPEAG	EX3DV4	SAR Probe	10/14/2025	Annual	10/14/2026	7527
SPEAG	EX3DV4	SAR Probe	2/11/2026	Annual	2/11/2027	7570
SPEAG	EX3DV4	SAR Probe	3/11/2026	Annual	3/11/2027	7539
SPEAG	EX3DV4	SAR Probe	3/11/2026	Annual	3/11/2027	7488

Note: 1) All equipment was used solely within its respective calibration period. 2) CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.

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13 MEASUREMENT UNCERTAINTIES

Applicable for SAR measurements < 6GHz on a flat phantom:

SAR Uncertainty Budget based on IEEE 1528-2013 and SPEAG (0.3 GHz to 6 GHz)

a	b	c	d	e f(d,k)	f	g	h cxf/e	i exg/e	k
Uncertainty component	Reference	Tol. (± %)	Prob. dist.	Dvi.	ci (1g)	ci (10g)	1g ui (± %)	10g ui (± %)	vi
Measurement system									
Probe calibration	E.2.1	6.55	N	1	1	1	6.55	6.55	∞
Axial isotropy	E.2.2	0.25	N	1	0.707	0.707	0.18	0.18	∞
Hemispherical isotropy	E.2.2	1.30	N	1	0.707	0.707	0.92	0.92	∞
Boundary effect	E.2.3	2.00	R	1.73	1	1	1.15	1.15	∞
Linearity	E.2.4	0.30	R	1.73	1	1	0.17	0.17	∞
System detection limits	E.2.4	0.25	R	1.73	1	1	0.14	0.14	∞
Modulation response	E.2.5	4.80	R	1.73	1	1	2.77	2.77	∞
Readout electronics	E.2.6	0.30	N	1	1	1	0.30	0.30	∞
Response time	E.2.7	1.01	R	1.73	1	1	0.58	0.58	∞
Integration time	E.2.8	2.60	R	1.73	1	1	1.50	1.50	∞
RF ambient conditions - noise	E.6.1	3.00	R	1.73	1	1	1.73	1.73	∞
RF ambient conditions - reflections	E.6.1	3.00	R	1.73	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	E.6.2	0.04	R	1.73	1	1	0.02	0.02	∞
Probe positioning with respect to phantom shell	E.6.3	0.80	R	1.73	1	1	0.46	0.46	∞
Extrapolation, interpolation, and integration algorithms for max. SAR evaluation	E.5	4.00	R	1.73	1	1	2.31	2.31	∞
Test sample related									
Test sample positioning	E.4.2	3.12	N	1	1	1	3.12	3.12	35
Device holder uncertainty	E.4.1	1.67	N	1	1	1	1.67	1.67	5
Output power variation - SAR drift	E.2.9	5.00	R	1.73	1	1	2.89	2.89	∞
SAR scaling	E.6.5	0.00	R	1.73	1	1	0.00	0.00	∞
Phantom and tissue parameters									
Phantom shell uncertainty - shape, thickness and permittivity	E.3.1	7.60	R	1.73	1	1	4.39	4.39	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	E.3.2	0.00	N	1	1	1	0.00	0.00	∞
Liquid conductivity measurement	E.3.3	2.50	N	1	0.78	0.71	1.95	1.78	∞
Liquid permittivity measurement	E.3.3	2.50	N	1	0.23	0.26	0.58	0.65	∞
Liquid conductivity - temperature uncertainty	E.3.4	3.36	R	1.73	0.78	0.71	1.51	1.38	∞
Liquid permittivity - temperature uncertainty	E.3.4	0.77	R	1.73	0.23	0.26	0.10	0.12	∞
Liquid Conductivity - deviation from target values	E.3.2	5.00	R	1.73	0.64	0.43	1.85	1.24	∞
Liquid Permittivity - deviation from target values	E.3.2	5.00	R	1.73	0.60	0.49	1.73	1.41	∞
Combined standard uncertainty							11.0	10.8	40
Expanded uncertainty (95% confidence interval)							21.9	21.6	

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SAR Uncertainty Budget based on IEC/IEEE 62209-1528:2020 (4 MHz to 10 GHz)

Symbol	Input quantity X (source of uncertainty)	Ref.	Prob. Dist. PDFi	Unc. a(xi)	Div. qi	u(xi) = a(xi)/qi	ci (1g)	ci (10g)	u(y) = cixu(xi) 1g (± %)	u(y) = cixu(xi) 10g (± %)	vi
Measurement system errors											
CF	Probe calibration	8.4.1.1	N (k=2)	9.30	1	9.30	1	1	9.30	9.30	∞
CFdrift	Probe calibration drift	8.4.1.2	R	1.70	1.73	0.98	1	1	0.98	0.98	∞
LIN	Probe linearity and detection limit	8.4.1.3	R	4.70	1.73	2.71	1	1	2.71	2.71	∞
BBS	Broadband signal	8.4.1.4	R	2.80	1.73	1.62	1	1	1.62	1.62	∞
ISO	Probe isotropy	8.4.1.5	R	7.60	1.73	4.39	1	1	4.39	4.39	∞
DAE	Other probe and data acquisition errors	8.4.1.6	N	2.40	1	2.40	1	1	2.40	2.40	∞
AMB	RF ambient and noise	8.4.1.7	N	1.80	1	1.80	1	1	1.80	1.80	∞
Δxyz	Probe positioning errors	8.4.1.8	N	0.30	1	0.30	1	1	0.30	0.30	∞
DAT	Data processing errors	8.4.1.9	N	3.50	1.00	3.50	1	1	3.50	3.50	∞
Phantom and device (DUT or validation antenna) errors											
LIQ(σ)	Measurement of phantom conductivity	8.4.2.1	N	2.50	1	2.50	0.78	0.71	1.95	1.78	∞
LIQ(Tc)	Temperature effects (medium)	8.4.2.2	R	5.40	1.73	3.12	0.78	0.71	2.43	2.21	∞
EPS	Shell permittivity	8.4.2.3	R	14.00	1.73	8.08	0.5	0.5	4.04	4.04	∞
DIS	Distance between the radiating element of the DUT and the phantom medium	8.4.2.4	N	2.00	1	2.00	2	2	4.00	4.00	∞
Dxyz	Repeatability of positioning the DUT or source against the phantom	8.4.2.5	N	3.12	1	3.12	1	1	3.12	3.12	35
H	Device holder effects	8.4.2.6	N	1.67	1	1.67	1	1	1.67	1.67	5
MOD	Effect of operating mode on probe sensitivity	8.4.2.7	R	2.40	1.73	1.39	1	1	1.39	1.39	∞
TAS	Time-average SAR	8.4.2.8	R	1.73	1.73	1.00	1	1	1.00	1.00	∞
RFdrift	Variation in SAR due to drift in output power of DUT	8.4.2.9	N	2.50	1	2.50	1	1	2.50	2.50	∞
VAL	Validation antenna uncertainty (validation measurement only)	8.4.2.10	N	0.00	1	0.00	1	1	0.00	0.00	∞
Pin	Uncertainty in accepted power (validation measurement only)	8.4.2.11	N	0.00	1	0.00	1	1	0.00	0.00	∞
Corrections to the SAR result (if applied)											
C(ε,σ)	Phantom deviation from target	8.4.3.1	R	5.00	1.73	2.89	0.64	0.43	1.85	1.24	∞
C(R)	SAR scaling	8.4.3.2	R	0.00	1.73	0.00	1	1	0.00	0.00	∞
u(ASAR) Combined uncertainty									14.32	14.20	40
U Expanded uncertainty and effective degrees of freedom									28.65	28.40	

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14 CONCLUSION

14.1 Measurement Conclusion

The SAR evaluation indicates that the EUT complies with the RF radiation exposure limits of the FCC and Innovation, Science, and Economic Development Canada, with respect to all parameters subject to this test. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because various factors may interact with one another to vary the specific biological outcome of an exposure to electromagnetic fields, any protection guide should consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables. [3]

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