Element Materials Technology



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RF Exposure Part 0 Test Report

Applicant Name:

Apple, Inc. One Apple Park Way Cupertino, CA 95014 **Date of Testing:**

11/04/2024 - 11/26/2024 **Test Report Issue Date:**

01/30/2025

Test Site/Location:

Element, Morgan Hill, CA, USA

Document Serial No.: 1C2410210077-01.BCG

FCC ID:

BCGA3355

APPLICANT:

APPLE, INC.

Report Type:

Part 0 SAR Characterization

DUT Type:

Tablet Device

Model(s):

A3355, A3356

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.

Executive Vice President





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1 DEVICE UNDER TEST

1.1 Device Overview

This device uses the Qualcomm® Gen2 Smart Transmit feature to control and manage transmitting power in real time and to ensure the time-averaged RF exposure is in compliance with the FCC requirement at all times for 3G/4G/5G WWAN operations. Additionally, this device supports WLAN/BT/802.15.4/NB-UNII technologies, but the output power of these modems is not controlled by the Smart Transmit algorithm.

Band & Mode	Operating Modes	Tx Frequency
UMTS 850	Data	826.40 - 846.60 MHz
UMTS 1750	Data	1712.4 - 1752.6 MHz
UMTS 1900	Data	1852.4 - 1907.6 MHz
LTE Band 71	Data	665.5 - 695.5 MHz
LTE Band 12	Data	699.7 - 715.3 MHz
LTE Band 17	Data	706.5 - 713.5 MHz
LTE Band 13	Data	779.5 - 784.5 MHz
LTE Band 14	Data	790.5 - 795.5 MHz
LTE Band 26 (Cell)	Data	814.7 - 848.3 MHz
LTE Band 5 (Cell)	Data	824.7 - 848.3 MHz
LTE Band 66 (AWS)	Data	1710.7 - 1779.3 MHz
LTE Band 4 (AWS)	Data	1710.7 - 1754.3 MHz
LTE Band 25 (PCS)	Data	1850.7 - 1914.3 MHz
LTE Band 2 (PCS)	Data	1850.7 - 1909.3 MHz
LTE Band 30	Data	2307.5 - 2312.5 MHz
LTE Band 7	Data	2502.5 - 2567.5 MHz
LTE Band 41	Data	2498.5 - 2687.5 MHz
LTE Band 48	Data	3552.5 - 3697.5 MHz
NR Band n71	Data	665.5 - 695.5 MHz
NR Band n12	Data	701.5 - 713.5 MHz
NR Band n14	Data	790.5 - 795.5 MHz
NR Band n26 (Cell)	Data	816.5 - 846.5 MHz
NR Band n5 (Cell)	Data	826.5 - 846.5 MHz
NR Band n70	Data	1697.5 - 1707.5 MHz
NR Band n66 (AWS)	Data	1712.5 - 1777.5 MHz
NR Band n25 (PCS)	Data	1852.5 - 1912.5 MHz
NR Band n2 (PCS)	Data	1852.5 - 1907.5 MHz
NR Band n30	Data	2307.5 - 2312.5 MHz
NR Band n7	Data	2502.5 - 2567.5 MHz
NR Band n41	Data	2501.01 - 2685 MHz
NR Band n48	Data	3550 - 3700 MHz
NR Band n77 DoD	Data	3460.02 - 3540 MHz
NR Band n77	Data	3710.01 - 3969.99 MHz
2.4 GHz WIFI	Voice/Data	2412 - 2472 MHz
		U-NII-1: 5180 - 5240 MHz
5 GHz WIFI	Voice/Data	U-NII-2A: 5260 - 5320 MHz
5 GHZ WIFI	Voice/Data	U-NII-2C: 5500 - 5720 MHz
		U-NII-3: 5745 - 5825 MHz
2.4 GHz Bluetooth	Data	2402 - 2480 MHz

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1.2 Time-Averaging for SAR and Power Density

This device is enabled with Qualcomm® Gen2 Smart Transmit algorithm to control and manage transmitting power in real time and to ensure that the time-averaged RF exposure from 3G/4G/5G Sub-6 NR WWAN is in compliance with FCC requirements. This Part 0 report shows SAR characterization of WWAN radios for 3G/4G/5G Sub-6 NR. Characterization is achieved by determining P_{Limit} for 3G/4G/5G Sub-6 NR that corresponds to the exposure design targets after accounting for all device design related uncertainties, i.e., SAR_design_target (< FCC SAR limit) for sub-6 radio. The SAR characterization is denoted as SAR Char in this report. Section 1.3 includes a nomenclature of the specific terms used in this report.

The compliance test under the static transmission scenario and simultaneous transmission analysis are reported in Part 1 report. The validation of the time-averaging algorithm and compliance under the dynamic (time- varying) transmission scenario for WWAN technologies are reported in Part 2 report (report SN could be found in Section 1.4 – Bibliography).

1.3 Nomenclature for Part 0 Report

Technology	Term	Description
	P _{limit}	Power level that corresponds to the exposure design
20/40/50		target (SAR_design_target) after accounting for all device design related uncertainties
3G/4G/5G Sub-6 NR	P_{max}	Maximum tune up output power
Sub-0 INK	SAR_design_target	Target SAR level < FCC SAR limit after accounting for all
		device design related uncertainties
	SAR Char	Table containing <i>Plimit</i> for all technologies and bands

1.4 Bibliography

Report Type	Report Serial Number
RF Exposure Part 1 Test Report	1C2410210077-02.BCG
RF Exposure Part 2 Test Report	1C2410210077-03.BCG
RF Exposure Compliance Summary	1C2410210077-04.BCG

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2 SAR MEASUREMENTS

2.1 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 2-1).

Equation 2-1 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)

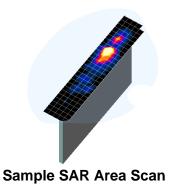
NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relation to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces,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

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2.2 SAR 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 2-1) 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 2-1) 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 . 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.

Table 2-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04*

Maximum Area Scan Maximum Zoom Scan Frequency Resolution (mm) Resolution (mm)		Maximum Zoom Scan Spatial Resolution (mm)			Minimum Zoom Scan	
Frequency	(Δx _{area} , Δy _{area})	(Δx _{200m} , Δy _{200m})	Uniform Grid	G	raded Grid	Volume (mm) (x,y,z)
			Δz _{zoom} (n)	Δz _{zoom} (1)*	Δz _{zoom} (n>1)*	
≤ 2 GHz	≤ 15	≤8	≤5	≤4	$\leq 1.5*\Delta z_{zoom}(n-1)$	≥ 30
2-3 GHz	≤12	≤5	≤5	≤4	$\leq 1.5*\Delta z_{zoom}(n-1)$	≥ 30
3-4 GHz	≤ 12	≤5	≤4	≤3	$\leq 1.5*\Delta z_{zoom}(n-1)$	≥ 28
4-5 GHz	≤10	≤ 4	≤3	≤2.5	$\leq 1.5*\Delta z_{zoom}(n-1)$	≥ 25
5-6 GHz	≤ 10	≤ 4	≤2	≤2	$\leq 1.5*\Delta z_{zoom}(n-1)$	≥ 22

^{*}Also compliant to IEEE 1528-2013 Table 6

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3 SAR CHARACTERIZATION

3.1 DSI and SAR Determination

This device uses different Device State Index (DSI) to configure different time averaged power levels based on certain exposure scenarios. Depending on the detection scheme implemented in the tablet, the worst-case SAR was determined by measurements for the relevant exposure conditions for that DSI. Detailed descriptions of the detection mechanisms are included in the operational description.

The device state index (DSI) conditions used in Table 3-1 represent different exposure scenarios.

Table 3-1
DSI and Corresponding Exposure Scenarios

Scenario	Description	SAR Test Cases
(DSI = 1)	Device on body	Tablet SAR per KDB
(DSI = 1)		Publication 616217 D04

3.2 SAR Design Target

SAR_design_target is determined by ensuring that it is less than FCC SAR limit after accounting for uncertainties specified by the manufacturer (see Table 3-2).

Table 3-2 SAR_design_target Calculations

1g SAR							
	(W/kg)						
Mode/Band/Antenna	Smart Tx Uncertainty	SAR_design_target	SAR_regulatory_limit				
UMTS 850 Ant 3b	0.7 dB	0.86 W/kg					
LTE Band 71 Ant 3b	0.7 dB	0.86 W/kg					
LTE Band 12 Ant 3b	0.7 dB	0.86 W/kg					
LTE Band 17 Ant 3b	0.7 dB	0.86 W/kg					
LTE Band 13 Ant 3b	0.7 dB	0.86 W/kg					
LTE Band 14 Ant 3b	0.7 dB	0.86 W/kg					
LTE Band 26 Ant 3b	0.7 dB	0.86 W/kg					
LTE Band 5 Ant 3b	0.7 dB	0.86 W/kg					
NR Band n71 Ant 3b	0.7 dB	0.86 W/kg					
NR Band n12 Ant 3b	0.7 dB	0.86 W/kg					
NR Band n14 Ant 3b	0.7 dB	0.86 W/kg					
NR Band n26 Ant 3b	0.7 dB	0.86 W/kg					
NR Band n5 Ant 3b	0.7 dB	0.86 W/kg					
UMTS 850 Ant 4	0.7 dB	0.86 W/kg	1.6 W/kg				
LTE Band 71 Ant 4	0.7 dB	0.86 W/kg	1.0 W/kg				
LTE Band 12 Ant 4	0.7 dB	0.86 W/kg					
LTE Band 17 Ant 4	0.7 dB	0.86 W/kg					
LTE Band 13 Ant 4	0.7 dB	0.86 W/kg					
LTE Band 14 Ant 4	0.7 dB	0.86 W/kg					
LTE Band 26 Ant 4	0.7 dB	0.86 W/kg					
LTE Band 5 Ant 4	0.7 dB	0.86 W/kg					
NR Band n71 Ant 4	0.7 dB	0.86 W/kg					
NR Band n12 Ant 4	0.7 dB	0.86 W/kg					
NR Band n14 Ant 4	0.7 dB	0.86 W/kg					
NR Band n26 Ant 4	0.7 dB	0.86 W/kg					
NR Band n5 Ant 4	0.7 dB	0.86 W/kg					
All other modes/bands/antennas not already specified above	1.0 dB	0.80 W/kg					

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3.3 SAR Char

SAR test results corresponding to *Pmax* for each antenna/technology/band/DSI can be found in FCC SAR Part 1 Report.

Plimit is calculated by linearly scaling with the measured SAR at the Ppart0 to correspond to the SAR_design_target. When Plimit < Pmax, Ppart0 was used as Plimit in the Smart Transmit EFS. When Plimit > Pmax and Ppart0=Pmax, calculated Plimit was used in the Smart Transmit EFS. All reported SAR obtained from the Ppart0 SAR tests was less than SAR_Design_target + Uncertainty. The final Plimit determination for each exposure scenario corresponding to SAR_design_target are shown in Table 3-3.

Table 3-3 PLimit Determination

Device State Index (DSI)	PLimit Determination Scenarios
1	The worst-case SAR exposure is determined as maximum SAR normalized to the limit among: 1. Tablet SAR measured at 0 mm for Back, Top, Bottom, Right, Left surfaces

Note:

For DSI = 1, P_{limit} is calculated by:

 P_{limit} corresponding to 1g Tablet SAR evaluation at 0 mm for back, top, bottom, left and right surfaces

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Table 3-4 SAR Characterizations

Americal production	Exposure Scenario:	Ant 1a	Ant 1a	Ant 1b	Ant 1b	Ant 2a	Ant 2a	Ant 2b	Ant 2b	Ant 3a	Ant 3a	Ant 3b	Ant 3b	Ant 4	Ant 4
Description	Averaging Volume:	1g	Maximum Tune-	1g	Maximum Tune	1g	Maximum Tune	1g	Maximum Tune	1g	Maximum Tune-	1g	Maximum Tune	1g	Maximum Tune-
Technology/Rand Pinnit corresponding to SMI design target Pi	Spacing:	0 mm		0 mm		0 mm		0 mm		0 mm		0 mm		0 mm	
	DSI:	1		1		1		1		1		1		1	
MITS 1700	Technology/Band		Pmax		Pmax		Pmax		Pmax		Pmax		Pmax		Pmax
LBT 5100	UMTS 850														
LTE Band 72															
LTE Band 12															
STE Band 12															
UF Band 13															
LTE Band 16	LTE Band 17		N/A								N/A	16.70	24.50	18.80	25.00
LTE Band 2 D NA	LTE Band 13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16.20	24.50	19.10	25.00
LTE Band 5 NA	LTE Band 14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16.20	24.50	19.10	25.00
LTE Band 5 MLCA NA	LTE Band 26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16.30	24.50	18.50	25.00
LTE Band 4	LTE Band 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16.30	24.50	18.50	25.00
LTE Band 56 NA NA 1140 24.00 NA NA 11200 25.00 12.00 12.00 NA NA 13.30 25.00 1.1 EBand 2 NA NA 113.00 22.00 NA NA NA 13.30 25.00 1.1 EBand 2 NA NA NA 13.30 25.00 NA NA NA 13.30 25.00 1.1 EBand 55 NA NA NA 113.00 22.00 NA NA NA 12.50 23.50 114.00 24.00 NA NA NA 13.30 25.00 1.1 EBand 30 NA NA NA 13.30 22.50 NA NA NA 13.50 22.50 NA NA NA 13.30 22.50 NA NA NA 13.20 22.00 NA NA NA 13.00 22.00 NA	LTE Band 5 ULCA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16.30	24.50	18.50	25.00
LTE Band 2 NN NN NN 1130 2300 NN NN NN 11250 2350 114.0 2400 NN NN NN 133.0 2500 LTE Band 30 NN NN NN 133.0 2300 NN NN NN NN 133.0 2250 NN	LTE Band 4	N/A	N/A	11.40	24.00	N/A	N/A	12.90	25.00	12.00	24.00	N/A	N/A	13.30	25.00
LTE Band 25 NNA NNA 11.30 22.00 NNA NNA 12.50 25.50 11.40 24.00 NNA NNA 13.00 25.00 LTE Band 7 NNA NNA 13.30 22.50 NNA NNA 13.50 25.00 LTE Band 7 NNA NNA NNA 13.30 22.50 NNA NNA NNA NNA NNA 13.00 25.00 LTE Band 7 NNA NNA NNA NNA NNA NNA NNA NNA NNA N	LTE Band 66	N/A	N/A	11.40	24.00	N/A	N/A	12.90	25.00	12.00	24.00	N/A	N/A	13.30	25.00
ITE Band 30	LTE Band 2	N/A	N/A	11.30	23.00	N/A	N/A	12.50	23.50	11.40	24.00	N/A	N/A	13.40	25.00
IT Band 7	LTE Band 25	N/A	N/A	11.30	23.00	N/A	N/A	12.50	23.50	11.40	24.00	N/A	N/A	13.40	25.00
LTE Band 4 PCT LTE Band 4 LTC NA NA 13.30 22.50 NA NA NA 13.30 22.50 NA NA NA 13.30 22.50 NA NA NA 13.30 22.30 NA NA NA NA NA NA NA N	LTE Band 30	N/A	N/A	13.30	22.50	N/A	N/A	13.50	23.50	11.60	21.00	N/A	N/A	10.60	20.90
LTE Band 41 (PC)] NA NA 13.00 23.00 NA NA 13.20 23.00 NA NA 10.70 23.00 LTE Band 41 (PC) LCA NA NA 13.00 23.00 NA NA 13.20 23.00 NA NA NA 10.70 23.00 LTE Band 41 (PC) LCA NA NA NA 13.00 22.00 NA NA NA 13.20 23.00 NA NA NA 10.70 23.00 LTE Band 41 (PC) LCA NA NA NA 13.00 22.00 NA NA NA 13.20 24.40 11.30 22.40 NA NA NA 10.70 22.40 LTE Band 41 (PC) LCA NA NA NA NA 13.00 22.00 NA NA NA 13.20 24.40 11.30 22.40 NA NA NA 10.70 23.40 LTE Band 42 (PC) LCA NA	LTE Band 7	N/A	N/A	13.30	22.50	N/A	N/A	13.30	23.50	11.00	24.00	N/A	N/A	10.80	25.00
LTE Band 41 (PC1) LECA NA NA 13.00 22.00 NA NA 13.00 22.00 NA NA 13.00 22.00 NA NA NA 10.70 22.00 LTE Band 41 (PC1) LECA NA NA 13.00 22.00 NA NA NA 15.00 22.00 NA NA NA 15.00 15.00 NA NA NA 15.00 15.00 NA NA NA 15.00 NA	LTE Band 7 ULCA	N/A	N/A	13.30	22.50	N/A	N/A	13.30	23.50	11.00	24.00	N/A	N/A	10.80	25.00
LTE Band 41 (PC) NA NA 13.00 22.90 NA NA 13.20 22.40 NA NA 10.70 22.40 LTE Band 41 (PC) U.CA NA NA 13.00 22.90 NA NA 13.00 22.90 NA NA NA 13.00 22.40 NA NA 10.70 22.40 LTE Band 48 10.10 18.20 NA NA 13.00 22.90 NA NA NA 13.20 24.40 113.30 22.40 NA NA NA 10.70 22.40 LTE Band 48 10.10 18.20 NA NA NA 9.00 17.10 NA NA NA NA NA NA 12.00 16.50 10.00 17.00 NR Band 671 NA	LTE Band 41 (PC3)	N/A	N/A	13.00	23.00	N/A	N/A	13.20	23.00	11.30	23.00	N/A	N/A	10.70	23.00
TF Band 41 PC UICA NA	LTE Band 41 (PC3) ULCA	N/A	N/A	13.00	23.00	N/A	N/A	13.20	23.00	11.30	23.00	N/A	N/A	10.70	23.00
LTE Band 48	LTE Band 41 (PC2)	N/A	N/A	13.00	22.90	N/A	N/A	13.20	24.40	11.30	22.40	N/A	N/A	10.70	23.40
LTE Band 48	LTE Band 41 (PC2) ULCA	N/A	N/A	13.00	22.90	N/A	N/A	13.20	24.40	11.30	22.40	N/A	N/A	10.70	23.40
LTE Band 48 LLCA 10.10 18.20 N/A N/A 9.00 17.10 N/A N/A N/A N/A 12.00 16.50 10.00 17.00 N/B Band r/D N/A	LTE Band 48		18.20	N/A	N/A	9.00	17.10	N/A	N/A	N/A	N/A		16.50	10.00	17.00
NR Band n12 NN	LTE Band 48 ULCA		18.20			9.00	17.10			N/A	N/A		16.50	10.00	17.00
NR Band n12 NA	NR Band n71	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17.40	24.50	19.70	25.00
NR Band n25 NN	NR Band n12		N/A				N/A			N/A	N/A		24.50		25.00
NR Band n26 NA	NR Band n14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16.20	24.50	19.10	25.00
NR Band n5 NA	NR Band n26		N/A							N/A			24.50		
NR Band n70 NA NA 11.40 24.00 NA NA 12.90 25.00 12.00 24.00 NA NA 13.30 25.00 NR Band n65 NA NA 11.40 24.00 NA NA 12.90 25.00 12.00 24.00 NA NA 13.30 25.00 NR Band n62 NA NA 11.40 24.00 NA NA 13.30 25.00 NR Band n62 NA NA NA 11.30 23.00 NA NA NA 12.50 25.00 11.40 24.00 NA NA NA 13.40 25.00 NR Band n50 NA NA NA 13.30 25.00 NA NA NA 13.40 25.00 NR Band n50 NA NA NA 13.30 22.50 NA NA NA 13.30 25.00 NR Band n61 NA NA NA 13.30 22.50 NA NA NA 13.00 25.00 NA NA NA 13.00 25.															
NR Band n56 NNA NNA 11.40 24.00 NNA NNA 12.90 25.00 12.00 24.00 NNA NNA 13.30 25.00 NR Band n2 NNA NNA 13.30 23.00 NNA NNA 12.50 23.50 11.40 24.00 NNA NNA 13.40 25.00 NR Band n25 NNA NNA NNA 13.30 22.50 NNA NNA 12.50 23.50 11.40 24.00 NNA NNA 13.40 25.00 NR Band n30 NNA NNA 13.30 22.50 NNA NNA 13.50 25.00 NNA NNA 13.50 25.00 NNA NNA 13.30 22.50 NNA NNA 13.50 23.50 11.60 24.00 NNA NNA 10.60 20.90 NR Band n7 NNA NNA 13.30 22.50 NNA NNA 13.30 22.50 NNA NNA 13.30 22.50 NNA NNA 13.30 23.50 NNA NNA 13.30 23.50 NNA NNA 13.30 23.50 NNA NNA 13.30 25.00 NNA NNA 10.70 27.00 NNA NNA 10.70 27.00 NNA NNA 10.70 27.00 NNA NNA 10.70 22.50 NNA NNA NNA NNA NNA NNA 10.70 22.50 NNA NNA 10.70 22.50 NNA NNA NNA NNA NNA NNA 10.70 22.70 NNA NNA 10.70 NNA NNA 10.70 NNA NNA 10.70 22.70 NNA NNA NNA NNA NNA NNA 10.70 NNA NN															
NR Band n2 NA NA 11.30 23.00 NA NA 12.50 23.50 11.40 24.00 NA NA 13.40 25.00 NR Band n5 NA NA 13.40 25.00 NR Band n5 NA															
NR 8and n25 NA NA 11.30 23.00 NA NA 12.50 23.50 11.40 24.00 NA NA 13.40 25.00 NR Band n30 NA NA 13.30 22.50 NA NA 13.50 25.50 11.60 21.00 NA NA 10.60 20.90 NR Band n31 NA NA 13.30 22.50 NA NA 13.50 25.50 11.60 21.00 NA NA NA 10.60 25.00 NR Band n41 (PC3) NA NA 13.30 22.50 NA NA 13.30 25.50 NA NA 13.30 25.50 NA NA 13.30 25.50 NA NA 13.30 25.50 NA NA 13.30 25.00 NA NA NA NA NA NA NA 13.30 25.00 NA NA 13.30 25.00 NA 13.30 25.00 NA															
NR Band nS0 NA NA 13.30 22.50 NA NA 13.50 22.50 116.0 21.00 NA NA 10.00 20.00 NR Band n7 NA NA 13.30 22.50 NA NA 13.30 22.50 NA NA 13.30 22.50 NA NA 13.30 23.50 11.00 24.00 NA NA 10.00 25.00 NR Band n4I (PC) NA NA 13.00 25.00 NA NA 13.20 25.00 NA NA 10.70 25.00 NR Band n4I (PC) NA NA NA 13.00 26.50 NA NA NA 13.20 25.00 11.30 25.00 NA NA NA 10.70 27.00 NR Band n4I (PC) NA NA NA NA 10.70 27.00 NR Band n4I (PC) NA NA NA NA NA 10.70 27.00 NR Band n4I (PC) NA NA NA NA NA NA NA NA 10.70 27.00 NR Band n4I (PC) NA															
NR Band n7 NA NA 13.30 22.50 NA NA 13.30 23.50 11.00 24.00 NA NA 10.80 25.00 NR Band n41 (PC) NA NA 13.00 25.00 NA NA 13.00 25.00 NA NA 10.70 25.00 NR Band n41 (PC) NA NA 13.00 25.00 NA NA 13.00 25.00 NA NA 10.70 25.00 NR Band n41 (PC) NA NA 13.00 25.00 NA NA 10.70 27.00 NR Band n77 (PC3) 9.80 22.50 NA NA 9.00 22.50 NA NA NA 11.90 24.70 9.80 24.70															
NR Band n41 (PC3) NA NA 13.00 25.00 NA NA 13.20 25.00 11.30 25.00 NA NA 10.70 25.00 NR Band n41 (PC7) NA NA 13.00 26.50 NA NA 13.20 26.00 11.30 26.00 NA NA 10.70 27.00 NR Band n77 (PC3) 9.80 22.50 NA NA NA 9.00 22.50 NA NA NA 13.20 26.00 NA NA NA 14.07 27.00 NR Band n77 (PC3) 9.80 22.50 NA NA NA 9.00 22.50 NA															
NR Band n4I (PCI) N/A N/A 13.00 26.50 N/A N/A 13.20 28.00 11.30 26.00 N/A N/A 10.70 27.00 N/R Band n/7 (PC3) 9.80 22.50 N/A N/A 9.00 22.50 N/A N/A N/A N/A N/A N/A 11.90 24.70 9.80 24.70							_					_			
NR Band n77 (PC3) 9.80 22.50 NA NA 9.00 22.50 NA NA 9.00 24.70 9.80 24.70															
	NR Band n77 (PC3)	9.80	22.50	N/A	N/A	9.00	22.50	N/A	N/A	N/A	N/A	11.90	26.50	9.80	25.50
NR SBIG IN (PC) 5.00 22.00 NA NA 9.00 19.10 NA NA NA NA NA NA NA NA 12.00 18.50 10.00 19.00															

Notes:

- 1. *Maximum tune up output power Pmax is used to configure EUT during RF tune up procedure. The maximum allowed output power is equal to maximum Tune up output power +0.7/-1.0 dB conducted power tolerance and +1.0/-1.0 dB conducted power tolerance for UHB.
- 2. All P_{limit} EFS and maximum tune up output power P_{max} levels entered in above Table correspond to average power levels after accounting for duty cycle in the case of TDD modulation schemes (for e.g., LTE TDD).

FCC ID: BCGA3355	RF Exposure Part 0 Test Report	Approved by: Technical Manager
DUT Type: Tablet Device		Page 9 of 11

11 EQUIPMENT LIST

For SAR measurements

Manufacturer Agilent						
Agilent	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
	E4404B	Spectrum Analyzer	N/A	N/A	N/A	MY45113242
Agilent	F4438C	ESG Vector Signal Generator	10/23/2024	Annual	10/23/2025	MY45093852
Agilent	F4438C	ESG Vector Signal Generator	3/25/2024	Annual	3/25/2025	MY47270002
Agilent	N5182A	MXG Vector Signal Generator	7/9/2024	Annual	7/9/2025	MY48180366
Agilent	N5182A	MXG Vector Signal Generator	3/7/2024	Annual	3/7/2025	MY47420603
Agilent	8753ES	S-Parameter Vector Network Analyzer	1/10/2024	Annual	1/10/2025	MY40001472
Agilent	8753ES	S-Parameter Vector Network Analyzer	9/25/2024	Annual	9/25/2025	MY40003841
Agilent	E5515C	Wireless Communications Test Set	CBT	N/A	CBT	GB46310798
Agilent	E5515C	Wireless Communications Test Set	CBT	N/A	CBT	US41140256
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433973
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433974
Amplifier Research	150A100C	Amplifier	CBT	N/A	CBT	350132
Anritsu	MN8110B	I/O Adaptor	CBT	N/A	CBT	6261747881
Anritsu	ML2496A	Power Meter	7/15/2024	Annual	7/15/2025	1138001
Anritsu	ML2496A	Power Meter	6/24/2024	Annual	6/24/2025	1840005
Anritsu	MA2411B	Pulse Power Sensor	9/5/2024	Annual	9/5/2025	1726262
Anritsu	MA2411B	Pulse Power Sensor	10/21/2024	Annual	10/21/2025	1027293
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	12/15/2023	Annual	12/15/2024	6200901190
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	5/15/2024	Annual	5/15/2025	6262150047
			0) 20) 202 .			
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	5/30/2024	Annual	5/30/2025	6262044715
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	4/26/2024	Annual	4/26/2025	6201381794
Anritsu	MA24106A	USB Power Sensor	7/10/2024	Annual	7/10/2025	1827530
Anritsu	MA24106A	USB Power Sensor	12/4/2023	Annual	12/4/2024	1520501
	PWR-4GHS					
Mini-Circuits		USB Power Sensor	6/12/2024	Annual	6/12/2025	12001070013
Control Company	4052	Long Stem Thermometer	2/27/2024	Biennial	2/27/2026	240174346
Control Company	4052	Long Stem Thermometer	2/27/2024	Biennial	2/27/2026	240171096
Control Company	4052	Long Stem Thermometer	2/27/2024	Biennial	2/27/2026	240171059
Control Company	4040	Therm./ Clock/ Humidity Monitor	4/15/2024	Biennial	4/15/2026	240310280
Control Company	4040	Therm./ Clock/ Humidity Monitor	4/15/2024	Biennial	4/15/2026	240310282
Control Company	S66279	Therm./ Clock/ Humidity Monitor	2/16/2024	Biennial	2/16/2026	240140051
Mitutoyo	500-196-30	CD-6"ASX 6Inch Digital Caliper	2/16/2022	Triennial	2/16/2025	A20238413
Keysight Technologies	N9020A	MXA Signal Analyzer	7/8/2024	Annual	7/8/2025	MY48010233
Agilent	N9020A	MXA Signal Analyzer	6/14/2024	Annual	6/14/2025	MY56470202
	VLF-6000+	Low Pass Filter DC to 6000 MHz	7/10/2024		7/10/2025	31634
Mini-Circuits			//10/2024	Annual		
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	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
Willia-Circuits	ZUDC10-83-S+		CBT	N/A	CBT	2050
Mini-Circuits		Directional Coupler				
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Seekonk	NC-100	Torque Wrench	CBT	N/A	CBT	22217
Seekonk	NC-100	Torque Wrench	4/2/2024	Biennial	4/2/2026	1262
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	1/10/2024	Annual	1/10/2025	131453
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	7/8/2024	Annual	7/8/2025	166818
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	8/7/2024	Annual	8/7/2025	1041
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	D750V3	750 MHz SAR Dipole	9/13/2023	Biennial	9/13/2025	1097
SPEAG	D750V3	750 MHz SAR Dipole	5/16/2022	Triennial	5/16/2025	1057
SPEAG	D835V2	835 MHz SAR Dipole	5/16/2022	Triennial	5/16/2025	460
SPEAG	D1750V2	1750 MHz SAR Dipole	5/10/2022	Triennial	5/10/2025	1083
SPEAG	D1750V2					1104
0.2.0			0/6/2022			
		1750 MHz SAR Dipole	9/6/2023	Biennial	9/6/2025	
SPEAG	D1900V2	1900 MHz SAR Dipole	10/23/2024	Annual	10/23/2025	5d131
SPEAG	D1900V2 D1900V2	1900 MHz SAR Dipole 1900 MHz SAR Dipole	10/23/2024 8/8/2023		10/23/2025 8/8/2025	5d131 5d180
	D1900V2	1900 MHz SAR Dipole	10/23/2024	Annual	10/23/2025	5d131
SPEAG	D1900V2 D1900V2	1900 MHz SAR Dipole 1900 MHz SAR Dipole	10/23/2024 8/8/2023	Annual Biennial	10/23/2025 8/8/2025	5d131 5d180
SPEAG SPEAG SPEAG	D1900V2 D1900V2 D2300V2 D2450V2	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2450 MHz SAR Dipole	10/23/2024 8/8/2023 3/11/2024 10/23/2024	Annual Biennial Annual Annual	10/23/2025 8/8/2025 3/11/2025 10/23/2025	5d131 5d180 1038 921
SPEAG SPEAG SPEAG SPEAG	D1900V2 D1900V2 D2300V2 D2450V2 D2450V2	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole	10/23/2024 8/8/2023 3/11/2024 10/23/2024 11/15/2022	Annual Biennial Annual Annual Triennial	10/23/2025 8/8/2025 3/11/2025 10/23/2025 11/15/2025	5d131 5d180 1038 921 855
SPEAG SPEAG SPEAG SPEAG SPEAG	D1900V2 D1900V2 D2300V2 D2450V2 D2450V2 D2450V2	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole	10/23/2024 8/8/2023 3/11/2024 10/23/2024 11/15/2022 5/11/2022	Annual Biennial Annual Annual Triennial Triennial	10/23/2025 8/8/2025 3/11/2025 10/23/2025 11/15/2025 5/11/2025	5d131 5d180 1038 921 855 750
SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG	D1900V2 D1900V2 D2300V2 D2450V2 D2450V2 D2450V2 D2450V2 D2600V2	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2300 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole	10/23/2024 8/8/2023 3/11/2024 10/23/2024 11/15/2022 5/11/2022 5/11/2022	Annual Biennial Annual Annual Triennial Triennial Triennial	10/23/2025 8/8/2025 3/11/2025 10/23/2025 11/15/2025 5/11/2025 5/11/2025	5d131 5d180 1038 921 855 750 1042
SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG	D1900V2 D1900V2 D2300V2 D2450V2 D2450V2 D2450V2 D2600V2 D2600V2	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole	10/23/2024 8/8/2023 3/11/2024 10/23/2024 11/15/2022 5/11/2022 5/11/2022 11/15/2022	Annual Biennial Annual Annual Triennial Triennial Triennial Triennial	10/23/2025 8/8/2025 3/11/2025 10/23/2025 11/15/2025 5/11/2025 5/11/2025 11/15/2025	5d131 5d180 1038 921 855 750 1042 1068
SPEAG	D1900V2 D1900V2 D2300V2 D2450V2 D2450V2 D2450V2 D250V2 D2600V2 D2600V2 D3500V2	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole	10/23/2024 8/8/2023 3/11/2024 10/23/2024 11/15/2022 5/11/2022 5/11/2022 11/15/2022 6/10/2024	Annual Biennial Annual Annual Triennial Triennial Triennial Triennial Annual	10/23/2025 8/8/2025 3/11/2025 10/23/2025 11/15/2025 5/11/2025 5/11/2025 11/15/2025 6/10/2025	5d131 5d180 1038 921 855 750 1042 1068 1126
SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG	D1900V2 D1900V2 D2300V2 D2450V2 D2450V2 D2450V2 D2600V2 D2600V2	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole	10/23/2024 8/8/2023 3/11/2024 10/23/2024 11/15/2022 5/11/2022 5/11/2022 11/15/2022	Annual Biennial Annual Annual Triennial Triennial Triennial Triennial	10/23/2025 8/8/2025 3/11/2025 10/23/2025 11/15/2025 5/11/2025 5/11/2025 11/15/2025	5d131 5d180 1038 921 855 750 1042 1068
SPEAG	D1900V2 D1900V2 D2300V2 D2450V2 D2450V2 D2450V2 D250V2 D2600V2 D2600V2 D3500V2	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole	10/23/2024 8/8/2023 3/11/2024 10/23/2024 11/15/2022 5/11/2022 5/11/2022 11/15/2022 6/10/2024	Annual Biennial Annual Annual Triennial Triennial Triennial Triennial Annual	10/23/2025 8/8/2025 3/11/2025 10/23/2025 11/15/2025 5/11/2025 5/11/2025 11/15/2025 6/10/2025	5d131 5d180 1038 921 855 750 1042 1068 1126
SPEAG	D1900V2 D1900V2 D1900V2 D2300V2 D2450V2 D2450V2 D2450V2 D2450V2 D2500V2 D2500V2 D3500V2 D3500V2 D3900V2 D3900V2	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2300 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole	10/23/2024 8/8/2023 3/11/2024 10/23/2024 11/15/2022 5/11/2022 5/11/2022 11/15/2022 6/10/2024 6/10/2024 10/19/2023	Annual Biennial Annual Annual Triennial Triennial Triennial Triennial Annual Annual Biennial	10/23/2025 8/8/2025 3/11/2025 10/23/2025 11/15/2025 5/11/2025 5/11/2025 11/15/2025 6/10/2025 6/10/2025 10/19/2025	5d131 5d180 1038 921 855 750 1042 1068 1126 1097
SPEAG	D1900V2 D1900V2 D2900V2 D2900V2 D2450V2 D2450V2 D2450V2 D2450V2 D2500V2 D2500V2 D3500V2 D3500V2 D3900V2 D3900V2 D3900V2 D560V2	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2400 MHz SAR Dipole 2405 MHz SAR Dipole 2405 MHz SAR Dipole 2405 MHz SAR Dipole 2405 MHz SAR Dipole 2400 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole 3500 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole	10/23/2024 8/8/2023 3/11/2024 10/23/2024 11/15/2022 5/11/2022 5/11/2022 11/15/2022 6/10/2024 6/10/2024 10/19/2023 3/12/2024	Annual Biennial Annual Annual Triennial Triennial Triennial Annual Annual Annual Annual Biennial Annual	10/23/2025 8/8/2025 3/11/2025 10/23/2025 11/15/2025 5/11/2025 5/11/2025 6/10/2025 6/10/2025 10/19/2025 3/12/2025	5d131 5d180 1038 921 855 750 1042 1068 1126 1097 1056 1123
SPEAG	D1900V2 D1900V2 D2900V2 D2300V2 D2450V2 D2450V2 D2450V2 D2600V2 D2600V2 D2600V2 D3900V2 D3900V2 D3900V2 D3900V2 D3900V2 D3900V2 D3900V2 D5900V2 D590V2	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2300 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 3600 MHz SAR Dipole 3600 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 5 GHz SAR Dipole	10/23/2024 8/8/2023 3/11/2024 10/23/2024 11/15/2022 5/11/2022 5/11/2022 6/10/2024 6/10/2024 10/19/2023 3/12/2024 6/12/2024	Annual Biennial Annual Triennial Triennial Triennial Triennial Annual Annual Annual Annual Annual Annual Annual Annual	10/23/2025 8/8/2025 3/11/2025 11/15/2025 5/11/2025 5/11/2025 5/11/2025 6/10/2025 6/10/2025 6/10/2025 6/10/2025 6/12/2025	5d131 5d180 1038 921 855 750 1042 1068 1126 1097 1056 1123 11123
SPEAG	D1900V2 D1900V2 D2900V2 D2500V2 D2450V2 D2450V2 D2450V2 D2450V2 D2500V2 D2500V2 D2500V2 D3500V2 D3500V2 D3500V2 D560HtV2 D560HtV2 DA64	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2300 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3300 MHz SAR Dipole 3300 MHz SAR Dipole 3500 MHz SAR Dipole 561 SAR Dipole	10/23/2024 8/8/2023 3/11/2024 10/23/2024 11/15/2022 5/11/2022 5/11/2022 6/10/2024 10/19/2023 3/12/2024 3/6/2024 3/6/2024	Annual Biennial Annual Annual Annual Triennial Triennial Triennial Annual Annual Annual Annual Annual Annual Annual Annual	10/23/2025 8/8/2025 8/8/2025 13/11/2025 10/23/2025 11/15/2025 5/11/2025 5/11/2025 6/10/2025 6/10/2025 10/19/2025 3/12/2025 3/12/2025 3/12/2025	5d131 5d180 1038 921 855 750 1042 1068 1126 1126 1127 1097 1056 1123 1163 534
SPEAG	D1900V2 D1900V2 D2900V2 D2300V2 D2450V2 D2450V2 D2450V2 D2600V2 D2600V2 D2600V2 D3900V2 D3900V2 D3900V2 D3900V2 D3900V2 D3900V2 D3900V2 D5900V2 D590V2	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2300 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 3600 MHz SAR Dipole 3600 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 5 GHz SAR Dipole	10/23/2024 8/8/2023 3/11/2024 10/23/2024 11/15/2022 5/11/2022 5/11/2022 6/10/2024 6/10/2024 10/19/2023 3/12/2024 6/12/2024	Annual Biennial Annual Triennial Triennial Triennial Triennial Annual Annual Annual Annual Annual Annual Annual Annual	10/23/2025 8/8/2025 3/11/2025 11/15/2025 5/11/2025 5/11/2025 5/11/2025 6/10/2025 6/10/2025 6/10/2025 6/10/2025 6/12/2025	5d131 5d180 1038 921 855 750 1042 1068 1126 1097 1056 1123 11123
SPEAG	D1900V2 D1900V2 D2900V2 D2500V2 D2450V2 D2450V2 D2450V2 D2450V2 D2500V2 D2500V2 D2500V2 D3500V2 D3500V2 D3500V2 D560HtV2 D560HtV2 DA64	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2300 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3300 MHz SAR Dipole 3300 MHz SAR Dipole 3500 MHz SAR Dipole 561 SAR Dipole	10/23/2024 8/8/2023 3/11/2024 10/23/2024 11/15/2022 5/11/2022 5/11/2022 6/10/2024 10/19/2023 3/12/2024 3/6/2024 3/6/2024	Annual Biennial Annual Annual Annual Triennial Triennial Triennial Annual Annual Annual Annual Annual Annual Annual Annual	10/23/2025 8/8/2025 8/8/2025 13/11/2025 10/23/2025 11/15/2025 5/11/2025 5/11/2025 6/10/2025 6/10/2025 10/19/2025 3/12/2025 3/12/2025 3/12/2025	5d131 5d180 1038 921 855 750 1042 1068 1126 1126 1127 1097 1056 1123 1163 534
SPEAG	D1900V2 D1900V2 D1900V2 D2900V2 D2900V2 D2450V2 D2450V2 D2450V2 D2500V2 D2500V2 D2500V2 D3500V2 D3500V2 D3500V2 D3500V2 D3500V2 D3500V2 D5GHtV2 D56HtV2 DA64 DA64 DA64 DA64	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2400 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3700 MHz SAR Dipole 5 SHz SAR Dipole 5 SHz SAR Dipole 5 SHz SAR Dipole Dasy Data Acquisition Electronics Dasy Data Acquisition Electronics Dasy Data Acquisition Electronics	10/23/2024 8/8/2023 3/11/2024 10/23/2024 11/15/2022 5/11/2022 5/11/2022 11/15/2022 11/15/2022 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024	Annual Biennial Biennial Annual Annual Triennial Triennial Triennial Annual	10/23/2025 8/8/2025 3/11/2025 10/23/2025 11/15/2025 11/15/2025 5/11/2025 5/11/2025 6/10/2025 6/10/2025 6/10/2025 6/12/2025 3/6/2025 4/9/2025	5d131 5d180 1038 921 855 750 1042 1068 11126 1097 1056 11123 1163 534 701 501
SPEAG	D1900V2 D1900V2 D2900V2 D2900V2 D2450V2 D2450V2 D2450V2 D2500V2 D2500V2 D2500V2 D3500V2 D3700V2 D3700V2 D3900V2 D56HtV2 DAE4 DAE4 DAE4 DAE4 DAE6	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2400 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3600 MHz SAR Dipole 3600 MHz SAR Dipole 3600 MHz SAR Dipole 3600 MHz SAR Dipole 5614 SAR Dipole 5614 SAR Dipole 5614 SAR Dipole Dasy Data Acquisition Bettronics	10/23/2024 8/8/2023 3/11/2024 10/23/2024 11/15/2022 5/11/2022 5/11/2022 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024 6/10/2024	Annual Biennial Biennial Annual Annual Triennial Triennial Triennial Triennial Annual	10/23/2025 8/8/2025 3/11/2025 10/23/2025 11/15/2025 11/15/2025 5/11/2025 6/10/2025	5d131 5d180 1038 921 855 750 1042 1126 1097 1056 1123 1163 534 701 582
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SPEAG	D1900V2 D1900V2 D1900V2 D2300V2 D2450V2 D2450V2 D2450V2 D2450V2 D2500V2 D2500V2 D3500V2 D3500V2 D3500V2 D3500V2 D3500V2 D3500V2 D3500V2 D3500V2 D350V2 D350V	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3600 MHz SAR Dipole 3900 MHz SAR Dipole 3900 MHz SAR Dipole 3900 MHz SAR Dipole 5 GHz SAR Dipole 5 GHz SAR Dipole Day Data Acquisition Electronics	10723/0024 8/8/2003 3/11/2004 102/3/2004 102/3/2004 11/15/2002 5/11/2002 5/11/2002 5/11/2002 11/15/2002 11/15/2002 11/15/2002 11/15/2002 6/10/2004 13/12/2004 4/12/2004 4/15/2004 4/15/2004 4/15/2004	Annual Blennial Annual Annual Annual Annual Triennial Triennial Triennial Triennial Triennial Annual	10/23/2025 8/8/2005 3/11/2025 3/11/2025 3/11/2025 3/11/2025 3/11/2025 5/11/2025	54131 54131 54131 54133 54133 1038 921 1038 921 1068 1126 1068 1127 1068 1128 1168 1067 1063 1063 1063 1063 1063 1063 1065 1066 1066 1066 1066 1066 1066 1066
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\$PEAG	D1900V2 D1900V2 D1900V2 D2300V2 D2350V2 D2450V2 D2450V2 D2450V2 D2500V2 D2500V2 D3500V2 D3500V	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2400 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3600 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 5 GHz SAR Dipole 5 GHz SAR Dipole Day Data Acquisition Bettronics	10723/2024 8/8/2023 9/11/2024 10/23/2024 11/15/2024	Annual Biennial Annual Annual Annual Triennial Triennial Triennial Triennial Triennial Annual	10/23/2025 88/8/2005 3/11/2025 3/11/2025 3/11/2025 3/11/2025 11/15/2025 5/11/2025 5/11/2025 5/11/2025 5/11/2025 5/11/2025 6/10/2025 11/15/2025 6/10/2025 3/12/2025 6/10/2025 5/8/2025	54131 54131
SPEAG	D1900V2 D1900V2 D1900V2 D2900V2 D2900V2 D2900V2 D2900V2 D2900V2 D2900V2 D2900V2 D2900V2 D3900V2 D3900V	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2400 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3600 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 5 GHz SAR Dipole 5 GHz SAR Dipole Day Data Acquisition Bettronics	10723/2024 8/8/2023 9/11/2024 10/23/2024 11/15/202 11/15/202 5/11/202 5/11/202 11/15/202 11/15/202 11/15/202 6/10/2024 10/15/202 3/6/2024 3/6/2024 4/9/2024	Annual Biennial Annual Annual Annual Triennial Triennial Triennial Triennial Triennial Triennial Annual	10/23/2025 88/8/2005 3/11/2025 3/11/2025 3/11/2025 3/11/2025 11/15/2025 5/11/2025 5/11/2025 5/11/2025 5/11/2025 5/11/2025 6/10/2025 11/15/2025 6/10/2025 3/12/2025 6/10/2025 3/12/2025 5/8/2025	54131 54131
SPEAG	D1900V2 D1900V2 D1900V2 D2900V2 D290V2 D290V2 D290V2 D290V2 D290V2 D2900V2 D2900V2 D2900V2 D3900V2 D3900V2 D3900V2 D3900V2 D3900V2 D3900V2 D3900V2 D3900V2 D3900V2 D5GHtV2 DA64 DA64 DA64 DA64 DA66 DA66 DA66 DA66	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 3600 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 5 GHz SAR Dipole 5 GHz SAR Dipole Dasy Data Acquisition Electronics Dasy Data Ac	10723/0024 883/2033 3/11/2024 10272/2024 11/15/802 5/11/2023 11/15/8022 11/15/8023	Annual Blennial Annual Annual Annual Annual Triennial Triennial Triennial Triennial Annual	10723/025 8/8/2005 3/11/2025 3/11/2025 3/11/2025 3/11/2025 3/11/2025 5/11/2025	54131 54130 54130 54130 54130 54130 921 1002 1008 921 1002 1008 1123 1009 1123 1153 1501 1001 1002 1008 1123 1153 1153 1153 1153 11582 11582 11582 11582 11582 11582 11583 115
SPEAG	D1900V2 D1900V2 D1900V2 D2900V2 D2900V2 D2900V2 D2900V2 D2900V2 D2900V2 D2900V2 D2900V2 D3900V2 D3900V	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2400 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3600 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 56 MHz SAR Dipole 56 MHz SAR Dipole Day Data Acquisition Electronics SAR Probe SAR Probe SAR Probe SAR Probe SAR Probe	10723/2024 8/8/2023 9/11/2024 10723/2024 11/15/2024	Annual Blennial Annual	10/21/025 88/2005 3/11/2005	5d131 5d180 1038 921 1038 921 1068 11126 1097 10068 11123 1163 1163 1661 1661 1665 1661 1665 1665
SPEAG	D1900V2 D1900V2 D1900V2 D2900V2 D2900V2 D2450V2 D2450V2 D2450V2 D2450V2 D2500V2 D2500V2 D3500V2 D3500V4 D3500V	1900 MHz SAR Upple 1900 MHz SAR Upple 2300 MHz SAR Upple 2400 MHz SAR Upple 2450 MHz SAR Upple 2500 MHz SAR Upple 3700 MHz SAR Upple 3700 MHz SAR Upple 3700 MHz SAR Upple 3700 MHz SAR Upple 5 GHz SAR Upple 5 GHz SAR Upple Day Data Acquisition Electronics Day Data Acqu	1072370024 8832003 3/11/2004 10272 20204 11/15/2002 5/11/2002 5/11/2002 11/15/2003 11/15/2003 11/15/2004 11/15/2004 11/15/2004 11/15/2004 11/15/2004 11/15/2004 11/15/2004 11/15/2004 11/15/2004	Annual Blennial Annual Annual Annual Annual Annual Triennial Triennial Triennial Triennial Annual	1072/2025 8/8/2005 3/11/2025 3/11/2025 3/11/2025 3/11/2025 5/11/2005 5/11/2005 5/11/2005 5/11/2005 5/11/2005 5/11/2005 3/11/2005 3/11/2005 4/10/2005 3/11/2005 4/10/2005 3/11/2005 4/10/2005 3/11/2005 4/10/2005 3/11/2005 4/10/2005 3/11/2005	54131 54130 54130 54130 54130 1038 921 1038 921 1042 1068 1126 1097 107 107 1083 11463 11683 1684 1696 1697 1697 1697 1697 1698 1752 1752 1752 1752 1752 1752 1755 1768
SPEAG	D1900V2 D1900V2 D1900V2 D2900V2 D2900V2 D2900V2 D2900V2 D2900V2 D2900V2 D2900V2 D2900V2 D3900V2 D3900V	1900 MHz SAR Dipole 1900 MHz SAR Dipole 2300 MHz SAR Dipole 2400 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3600 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 56 MHz SAR Dipole 56 MHz SAR Dipole Day Data Acquisition Electronics SAR Probe SAR Probe SAR Probe SAR Probe SAR Probe	10723/2024 8/8/2023 9/11/2024 10723/2024 11/15/2024	Annual Blennial Annual	10/21/025 88/2005 3/11/2005	5d131 5d180 1038 921 1038 921 1068 11126 1097 10068 11123 1163 1163 1661 1661 1665 1661 1665 1665

Note:

- 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.
- Each equipment item was used solely within its respective calibration period.

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12 MEASUREMENT UNCERTAINTIES

Applicable for SAR measurements < 6 GHz:

IEEE Tol. Prob. See Probe See See	а	b	С	d	e=	f	g	h =	i =	k
Uncertainty Component IEEE Tol. Frob. Log Log	α		Ü	"		'	9			K
Measurement System Probe Calibration E2.1 7 N 1 1 1 7.0 7.0 ∞ Axial Isotropy E2.2 0.25 N 1 0.7 0.7 0.2 0.2 ∞ Axial Isotropy E2.2 1.3 N 1 0.7 0.7 0.2 0.2 ∞ Axial Isotropy E2.2 1.3 N 1 0.7 0.7 0.2 0.2 ∞ Axial Isotropy E2.2 1.3 N 1 0.7 0.7 0.2 0.2 ∞ Axial Isotropy E2.2 1.3 N 1 0.7 0.7 0.7 0.2 0.2 ∞ Axial Isotropy E2.2 1.3 N 1 0.7 0.7 0.7 0.9 0.9 ∞ ∞ Oxidiate Oxidia					f(d,k)			c x f/e	c x g/e	
Measurement System Probe Calibration E2.1 7 N 1 1 1 7.0 7.0 ∞			Tol.	Prob.		\mathbf{c}_{i}	C _i	1gm	10gms	
Probe Calibration	Uncertainty Component		(± %)	Dist.	Div.	1gm	10 gms	\mathbf{u}_{i}	u _i	v _i
Probe Calibration								(± %)	(± %)	
Axial Isotropy E2.2	Measurement System									
Hemishperical Isotropy	Probe Calibration	E.2.1	7	N	1	1	1	7.0	7.0	8
Boundary Bfect	Axial Isotropy	E.2.2	0.25	N	1	0.7	0.7	0.2	0.2	∞
E2.4 0.3 N 1 1 1 0.3 0.3 ∞	Hemishperical Isotropy	E.2.2	1.3	N	1	0.7	0.7	0.9	0.9	8
System Detection Limits	Boundary Effect	E.2.3	2	R	1.732	1	1	1.2	1.2	8
Modulation Response E2.5 4.8 R 1.732 1 1 2.8 2.8 ∞	Linearity	E.2.4	0.3	N	1	1	1	0.3	0.3	8
Readout Hectronics	System Detection Limits	E.2.4	0.25	R	1.732	1	1	0.1	0.1	8
E2.7 0.8 R 1.732 1 1 0.5 0.5 ∞	Modulation Response	E.2.5	4.8	R	1.732	1	1	2.8	2.8	8
Integration Time	Readout Electronics	E.2.6	0.3	N	1	1	1	0.3	0.3	8
RF Ambient Conditions - Noise E6.1 3 R 1.732 1 1 1.7 1.7 ∞	Response Time	E.2.7	0.8	R	1.732	1	1	0.5	0.5	8
RF Ambient Conditions - Reflections	Integration Time	E.2.8	2.6	R	1.732	1	1	1.5	1.5	8
Probe Positioner Mechanical Tolerance	RF Ambient Conditions - Noise	E.6.1	3	R	1.732	1	1	1.7	1.7	8
Probe Positioning w/ respect to Phantom	RF Ambient Conditions - Reflections	E.6.1	3	R	1.732	1	1	1.7	1.7	8
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation Est Sample Related Test Sample Positioning E4.2 3.12 N 1 1 3.1 3.1 3.1 3.5 Device Holder Uncertainty E4.1 1.67 N 1 1 1 1.7 1.7 5.0 Output Power Variation - SAR drift measurement E2.9 5 R 1.732 1 1 2.9 2.9 ∞ SAR Scaling E6.5 0 R 1.732 1 1 0.0 0.0 ∞ Phantom & Tissue Parameters Phantom Uncertainty (Shape & Thickness tolerances) E3.1 7.6 R 1.73 1.0 1.0 4.4 4.4 ∞ Liquid Conductivity - measurement uncertainty E3.3 4.3 N 1 0.78 0.71 3.3 3.0 76 Liquid Permittivity - measurement uncertainty E3.4 3.4 R 1.732 0.23 0.26 1.0 1.1 75 Liquid Conductivity - Temperature Uncertainty E3.4 0.6 R 1.73 0.64 0.43 1.8 1.2 ∞ Liquid Conductivity - deviation from target values E3.2 5.0 R 1.73 0.64 0.43 1.8 1.2 ∞ Combined Standard Uncertainty (k=1) Expanded Uncertainty (k=2.0 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9	Probe Positioner Mechanical Tolerance	E.6.2	0.8	R	1.732	1	1	0.5	0.5	8
Test Sample Related Test Sample Positioning	Probe Positioning w/ respect to Phantom	E.6.3	6.7	R	1.732	1	1	3.9	3.9	8
Test Sample Positioning	Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	E5	4	R	1.732	1	1	2.3	2.3	8
Device Holder Uncertainty	Test Sample Related									
Output Power Variation - SAR drift measurement E2.9 5 R 1.732 1 1 2.9 2.9 ∞ SAR Scaling E6.5 0 R 1.732 1 1 0.0 0.0 ∞ Phantom & Tissue Parameters Phantom Uncertainty (Shape & Thickness tolerances) E3.1 7.6 R 1.73 1.0 1.0 4.4 4.4 ∞ Liquid Conductivity - measurement uncertainty E3.3 4.3 N 1 0.78 0.71 3.3 3.0 76 Liquid Permittivity - measurement uncertainty E3.3 4.2 N 1 0.23 0.26 1.0 1.1 75 Liquid Conductivity - Temperature Uncertainty E3.4 3.4 R 1.732 0.78 0.71 1.5 1.4 ∞ Liquid Permittivity - Temperature Uncertainty E3.4 0.6 R 1.732 0.23 0.26 0.1 0.1 ∞ Liquid Permittivity - deviation from target values E3.2 5.0 </td <td>Test Sample Positioning</td> <td>E.4.2</td> <td>3.12</td> <td>N</td> <td>1</td> <td>1</td> <td>1</td> <td>3.1</td> <td>3.1</td> <td>35</td>	Test Sample Positioning	E.4.2	3.12	N	1	1	1	3.1	3.1	35
E6.5 0 R 1.732 1 1 0.0 0.0 ∞	Device Holder Uncertainty	E.4.1	1.67	N	1	1	1	1.7	1.7	5
Phantom & Tissue Parameters Phantom Uncertainty (Shape & Thickness tolerances)	Output Power Variation - SAR drift measurement	E.2.9	5	R	1.732	1	1	2.9	2.9	∞
Phantom Uncertainty (Shape & Thickness tolerances)	SAR Scaling	E.6.5	0	R	1.732	1	1	0.0	0.0	8
Liquid Conductivity - measurement uncertainty	Phantom & Tissue Parameters									
Liquid Permittivity - measurement uncertainty	Phantom Uncertainty (Shape & Thickness tolerances)	E.3.1	7.6	R	1.73	1.0	1.0	4.4	4.4	8
Liquid Conductivity - Temperature Uncertainty E3.4 3.4 R 1.732 0.78 0.71 1.5 1.4 ∞ Liquid Permittivity - Temperature Unceritainty E3.4 0.6 R 1.732 0.23 0.26 0.1 0.1 ∞ Liquid Conductivity - deviation from target values E3.2 5.0 R 1.73 0.64 0.43 1.8 1.2 ∞ Liquid Permittivity - deviation from target values E3.2 5.0 R 1.73 0.60 0.49 1.7 1.4 ∞ Combined Standard Uncertainty (k=1) RSS 12.2 12.0 191 Expanded Uncertainty k=2 24.4 24.0	Liquid Conductivity - measurement uncertainty	E3.3	4.3	N	1	0.78	0.71	3.3	3.0	76
Liquid Permittivity - Temperature Unceritainty	Liquid Permittivity - measurement uncertainty	E3.3	4.2	N	1	0.23	0.26	1.0	1.1	75
Liquid Conductivity - deviation from target values E3.2 5.0 R 1.73 0.64 0.43 1.8 1.2 ∞ Liquid Permittivity - deviation from target values E3.2 5.0 R 1.73 0.60 0.49 1.7 1.4 ∞ Combined Standard Uncertainty (k=1) RSS 12.2 12.0 191 Expanded Uncertainty k=2 24.4 24.0	Liquid Conductivity - Temperature Uncertainty	E.3.4	3.4	R	1.732	0.78	0.71	1.5	1.4	∞
Liquid Conductivity - deviation from target values E3.2 5.0 R 1.73 0.64 0.43 1.8 1.2 ∞ Liquid Permittivity - deviation from target values E3.2 5.0 R 1.73 0.60 0.49 1.7 1.4 ∞ Combined Standard Uncertainty (k=1) RSS 12.2 12.0 191 Expanded Uncertainty k=2 24.4 24.0	Liquid Permittivity - Temperature Unceritainty	E.3.4	0.6	R	1.732	0.23	0.26	0.1	0.1	∞
Liquid Permittivity - deviation from target values E3.2 5.0 R 1.73 0.60 0.49 1.7 1.4 ∞ Combined Standard Uncertainty (k=1) RSS 12.2 12.0 191 Expanded Uncertainty k=2 24.4 24.0	Liquid Conductivity - deviation from target values	E3.2	5.0	R		0.64	0.43	1.8	1.2	-
Combined Standard Uncertainty (k=1) RSS 12.2 12.0 191 Expanded Uncertainty k=2 24.4 24.0	Liquid Permittivity - deviation from target values	E3.2	5.0	R		0.60	0.49	1.7	1.4	∞
Expanded Uncertainty k=2 24.4 24.0	Combined Standard Uncertainty (k=1)	1		RSS	ı		1	12.2	12.0	191
(95% CONFIDENCE LEVEL)	Expanded Uncertainty			k=2				24.4	24.0	
	(95% CONFIDENCE LEVEL)									

The above measurement uncertainties are according to IEEE Std. 1528-2013

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