SAR EVALUATION REPORT

FCC 47 CFR § 2.1093
IEEE Std. 1528-2013
RSS-102 Issue 5
IEC 62209-1528:2020

For
CHARGING CASE

FCC ID: APITOURPRO2C
IC: 6132A-TOURPRO2C

Model: TOUR PRO 2C

Report Number: 4790663258-SAR-2

Issue Date: Nov. 29, 2022

Prepared for
Harman International Industries, Inc.
8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

Prepared by
UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch
Building 10, Innovation Technology Park, No. 1, Li Bin Road, Song Shan Lake Hi-Tech Development Zone Dongguan, People's Republic of China

Tel: +86 769 22038881
Fax: +86 769 33244054
Website: www.ul.com

Revision History

Rev.	Date	Revisions	Revised By
V1.0	Nov. 29, 2022	Initial Issue	\

Note:

1. The Measurement result for the sample received is<Pass> according to < IEEE Std. 1528-2013> < RSS-102 Issue 5> when <Accuracy Method> decision rule is applied.
2. This report is only published to and used by the applicant, and it is not for evidence purpose in China.

Table of Contents

1. Attestation of Test Results

Applicant Name	Harman International Industries, Inc.	
Address	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES	
Manufacturer	Harman International Industries, Inc.	
Address	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES	
EUT Name	CHARGING CASE	
Model	TOUR PRO 2C	
Sample Status	Normal	
Sample Received Date	Nov. 18, 2022	
Date of Tested	Nov. 22, 2022	
Applicable Standards	FCC 47 CFR § 2.1093 IEEE Std. 1528-2013 KDB publication RSS-102 Issue 5 IEC 62209-1528:2020	
SAR Limits (W/Kg)		
Exposure Category	Peak spatial-average (1g of tissue)	Extremities (hands, wrists, ankles, etc.) (10g of tissue)
General population / Uncontrolled exposure	1.6	4
The Highest Reported SAR (W/kg)		
RF Exposure Conditions	Equipment Class	
	DTS	
Body (1-g)	<0.01	
Simultaneous Transmission (1-g)	/	
Test Results	Pass	
Prepared By: Burt Hu Laboratory Engineer	Reviewed By: Denny Huang Senior Project Engineer	Approved By: Stephen Guo Laboratory Manager

2. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with IEEE Std.1528-2013, RSS-102 Issue 5, IEC 62209-1528:2020the following FCC Published RF exposure KDB procedures:

- 447498 D01 General RF Exposure Guidance
- 447498 D04 Interim General RF Exposure Guidance v01
- 690783 D01 SAR Listings on Grants
- 865664 D01 SAR measurement 100 MHz to 6 GHz
- 865664 D02 RF Exposure Reporting

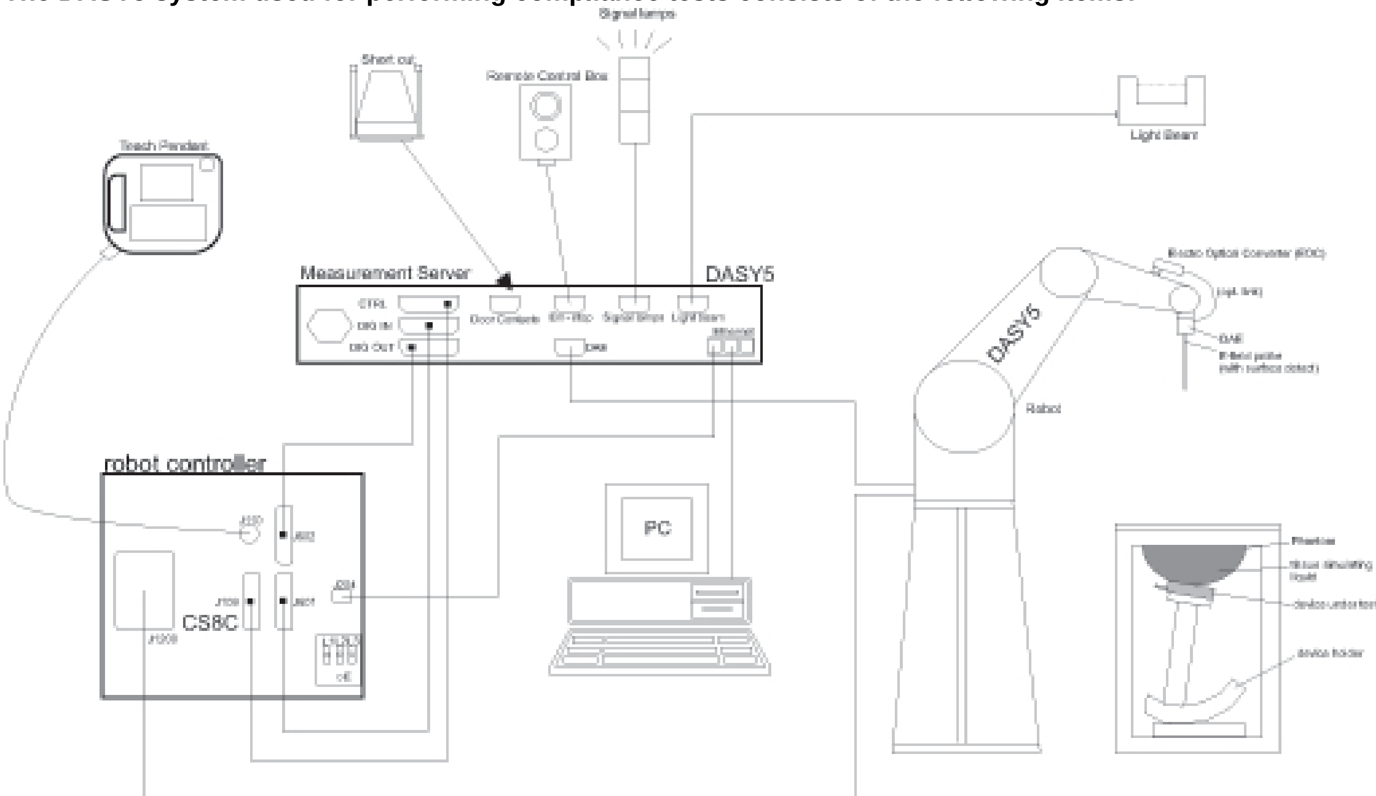
3. Facilities and Accreditation

Test Location	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.
Address	Building 10, Innovation Technology Park, Song Shan Lake Hi-tech Development Zone, Dongguan, 523808, China
Accreditation Certificate	**A2LA (Certificate No.: 4102.01)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch has been assessed and proved to be in compliance with A2LA. **FCC (FCC Recognized No.: CN1187)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules **ISED (Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320 and the test lab Conformity Assessment Body Identifier (CABID) is CN0046. **VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011
Description	All measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi-tech Development Zone, Dongguan, 523808, China

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

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



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win7 and the DASY52 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

4.2. SAR Scan Procedures

Step 1: Power Reference Measurement

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

Step 2: Area Scan

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

Area Scan Parameters extracted from KDB 865664 D01 v01r04 SAR Measurement 100 MHz to 6 GHz

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

Step 3: Zoom Scan

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

Zoom Scan Parameters extracted from KDB 865664 D01 v01r04 SAR Measurement 100 MHz to 6 GHz

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

Step 4: Power drift measurement

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

Step 5: Z-Scan (FCC only)

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

4.3. Test Equipment

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

Name of equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
ENA Network Analyzer	Keysight	E5080A	MY55100583	2023.10.16
Dielectric Probe kit	SPEAG	SM DAK 040 SA	1155	2025.02.27
DC power supply	Keysight	E36103A	MY55350020	2023.10.16
Signal Generator	Rohde & Schwarz	SME06	837633\001	2023.08.14
BI-Directional Coupler	KRYTAR	1850	54733	2023.10.16
Peak and Average Power Sensor	Keysight	E9325A	MY62220002	2023.10.25
Peak and Average Power Sensor	Keysight	E9325A	MY62220003	2023.10.25
Dual Channel PK Power Meter	Keysight	N1912A	MY55416024	2023.10.16
Amplifier	CORAD TECHNOLOGY LTD	AMF-4D-00400600-50-30P	1983561	NCR
Dosimetric E-Field Probe	SPEAG	EX3DV4	7383	2023.01.11
Data Acquisition Electronic	SPEAG	DAE3	427	2023.04.11
Dipole Kit 2450 MHz	SPEAG	D2450V2	977	2024.12.16
Software	SPEAG	DASY52	N/A	NCR
Twin Phantom	SPEAG	SAM V5.0	1805	NCR
Thermometer	/	GX-138	150709653	2023.10.21
Thermometer	VICTOR	ITHX-SD-5	18470005	2023.10.21

Note:

1) Per KDB865664D01 v01r04 requirements for dipole calibration, the test laboratory has adopted three-year extended calibration interval. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.

a) There is no physical damage on the dipole;

b) System check with specific dipole is within 10% of calibrated value;

c) The most recent return-loss result, measured at least annually, deviates by no more than 20% from the previous measurement.

d) The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 5Ω from the previous measurement.

2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.

5. Measurement Uncertainty

5.1. Uncertainty budget list (30MHz to 3GHz).

Uncertainty component	Tol. (±%)	Prob. Dist.	Div.	C_i (1g)	C_i (10g)	U_i, 1g (±%)	U_i, 10g (±%)
Measurement system							
Probe Calibration	6.1	N	1	1	1	6.1	6.1
Axial Isotropy	4.7	R	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	1.9	1.9
Hemispherical Isotropy	9.6	R	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	3.9	3.9
Boundary Effects	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Linearity	4.7	R	$\sqrt{3}$	1	1	2.7	2.7
System Detection Limits	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Modulation Response^{m}	2.4	R	$\sqrt{3}$	1	1	1.4	1.4
Readout Electronics	0.3	N	1	1	1	0.3	0.3
Response Time	0.8	R	$\sqrt{3}$	1	1	0.5	0.5
Integration Time	2.6	R	$\sqrt{3}$	1	1	1.5	1.5
RF Ambient Noise	3.0	R	$\sqrt{3}$	1	1	1.7	1.7
RF Ambient Reflections	3.0	R	$\sqrt{3}$	1	1	1.7	1.7
Probe Positioner	0.4	R	$\sqrt{3}$	1	1	0.2	0.2
Probe Positioning	2.9	R	$\sqrt{3}$	1	1	1.7	1.7
Max. SAR Eval.	2.0	R	$\sqrt{3}$	1	1	1.2	1.2
Test sample related							
Device Positioning	2.9	N	1	1	1	2.9	2.9
Device Holder	3.6	N	1	1	1	3.6	3.6
Power Drift	5.0	R	$\sqrt{3}$	1	1	2.9	2.9
Power Scaling	0	R	$\sqrt{3}$	1	1		
Phantom and set-up							
Phantom Uncertainty	6.1	R	$\sqrt{3}$	1	1	3.5	3.5
SAR correction	1.9	R	$\sqrt{3}$	1	0.84	1.1	0.9
Liquid Conductivity (mea.)	2.5	R	$\sqrt{3}$	0.78	0.71	1.1	1.0
Liquid Permittivity (mea.)	2.5	R	$\sqrt{3}$	0.26	0.26	0.4	0.4
Temp. unc. - Conductivity	3.4	R	$\sqrt{3}$	0.23	0.26	0.5	0.5
Temp. unc. - Permittivity	0.4	R	$\sqrt{3}$	0.78	0.71	0.2	0.2
Combined standard uncertainty						10.58	10.54
Expanded uncertainty (95% confidence interval) k=2						21.27	21.20

5.2. Uncertainty budget list (3GHz to 6GHz).

Uncertainty component	Tol. (±%)	Prob. Dist.	Div.	C_i (1g)	C_i (10g)	U_i, 1g (±%)	U_i, 10g (±%)
Measurement system							
Probe Calibration	6.65	N	1	1	1	6.65	6.65
Axial Isotropy	4.7	R	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	1.9	1.9
Hemispherical Isotropy	9.6	R	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	3.9	3.9
Boundary Effects	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Linearity	4.7	R	$\sqrt{3}$	1	1	2.7	2.7
System Detection Limits	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Modulation Response	2.4	R	$\sqrt{3}$	1	1	1.4	1.4
Readout Electronics	0.3	N	1	1	1	0.3	0.3
Response Time	0.8	R	$\sqrt{3}$	1	1	0.5	0.5
Integration Time	2.6	R	$\sqrt{3}$	1	1	1.5	1.5
RF Ambient Noise	3.0	R	$\sqrt{3}$	1	1	1.7	1.7
RF Ambient Reflections	3.0	R	$\sqrt{3}$	1	1	1.7	1.7
Probe Positioner	0.4	R	$\sqrt{3}$	1	1	0.2	0.2
Probe Positioning	6.7	R	$\sqrt{3}$	1	1	3.9	3.9
Max. SAR Eval.	4.0	R	$\sqrt{3}$	1	1	2.3	2.3
Test sample related							
Device Positioning	2.9	N	1	1	1	2.9	2.9
Device Holder	3.6	N	1	1	1	3.6	3.6
Power Drift	5.0	R	$\sqrt{3}$	1	1	2.9	2.9
Power Scaling	0	R	$\sqrt{3}$	1	1	0.0	0.0
Phantom and set-up							
Phantom Uncertainty	6.1	R	$\sqrt{3}$	1	1	3.5	3.5
SAR correction	1.9	R	$\sqrt{3}$	1	0.84	1.1	0.9
Liquid Conductivity (mea.)	2.5	R	$\sqrt{3}$	0.78	0.71	1.1	1.0
Liquid Permittivity (mea.)	2.5	R	$\sqrt{3}$	0.26	0.26	0.4	0.4
Temp. unc. - Conductivity	3.4	R	$\sqrt{3}$	0.23	0.26	0.5	0.5
Temp. unc. - Permittivity	0.4	R	$\sqrt{3}$	0.78	0.71	0.2	0.2
Combined standard uncertainty						11.62	11.58
Expanded uncertainty (95% confidence interval) k=2						23.35	23.28

6. Device Under Test (DUT) Information

6.1. DUT Description

The DUT is a charging case for charging headphones that uses 2.4GHz BT wireless technology	
DUT Dimension	Overall (Length x Width x Height): 58.2mm x 56.9mm x 27.2mm

6.2. Wireless Technology

Wireless technology	Frequency band
BT	2.4GHz

7. Conducted Output Power Measurement and tune-up tolerance

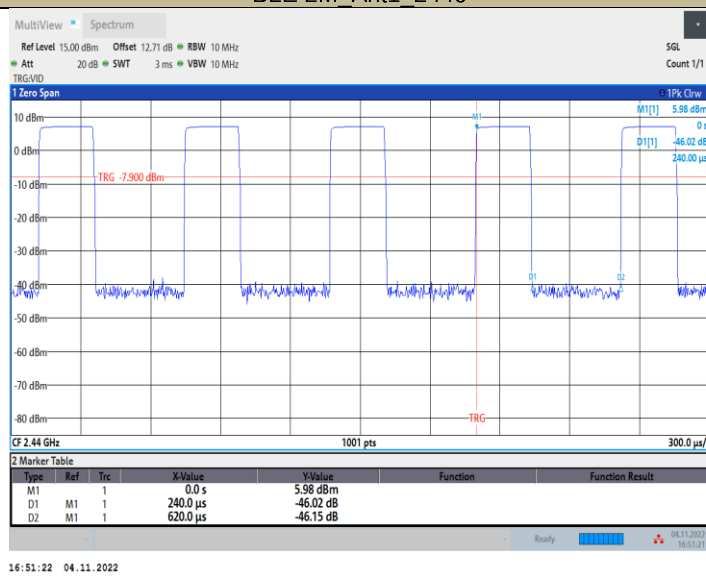
7.1. Power measurement result of BT.

Mode	Average Conducted Power (dBm)			Tune-up	Duty Cycle
	2402MHz	2440MHz	2480MHz		
BLE 1M	6.65	6.59	6.77	7.0	Not required
BLE 2M	6.65	6.61	6.78	7.0	38.71

Note:
1) The output power of the device was set to transmit at maximum power for all tests.
2) The mode with the highest conducted power is selected to perform SAR evaluation.

Duty cycle:

BLE 2M_Ant1_2440



7.2. Antenna Gain

Antenna type	Band	Gain(dBi)
Chip antenna	BT 2.4GHz	1.72

8. RF Exposure Conditions

8.1. Exemption Limits for Routine Evaluation

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of 30 mm	At separation distance of 35 mm	At separation distance of 40 mm	At separation distance of 45 mm	At separation distance of ≥50 mm
≤300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

9. SAR Test Configuration

The EUT is a headphone charging case that can be used very close to the human body, so consider a 1 g body SAR(0mm) assessment.

10. Dielectric Property Measurements & System Check

10.1. Dielectric Property Measurements

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized.

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

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

Tissue Dielectric Parameters

FCC KDB 865664 D01 v01r04 SAR Measurement 100 MHz to 6 GHz

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

IEEE Std 1528-2013
Refer to Table 3 within the IEEE Std 1528-2013

Dielectric Property Measurements Results:

Liquid	Freq.	Liquid Parameters				Deviation(%)		Limit (%)	Temp. (℃)	Test Date
		Measured		Target						
		ϵ_r	σ	ϵ_r	σ	ϵ_r	σ			
Head 2450	2402	38.90	1.80	39.29	1.76	-0.99	2.33	±5	22.5	Nov 22, 2022
	2440	38.92	1.85	39.22	1.79	-0.76	3.58			
	2450	38.89	1.86	39.20	1.80	-0.79	3.22			
	2480	38.66	1.88	39.16	1.83	-1.28	2.51			

10.2. System Check

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

System Performance Check Measurement Conditions:

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ±0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm for measurements > 3 GHz.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10mm (above 1GHZ) and 15mm (below 1GHz) from dipole center to the simulating liquid surface.
- For area scan, standard grid spacing for head measurements is 15 mm in x- and y- dimension(≤2GHz), 12 mm in x- and y-dimension(2-4 GHz) and 10mm in x- and y- dimension(4-6GHz).
- For zoom scan, Δx_{zoom}, Δy_{zoom}≤ 2GHz - ≤8mm, 2-4GHz - ≤5 mm and 4-6 GHz-≤4mm; Δz_{zoom} ≤3GHz - ≤5 mm, 3-4 GHz- ≤4mm and 4-6GHz-≤2mm.
- Distance between probe sensors and phantom surface was set to 3 mm except for 5 GHz band. For 5GHz band, Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was set to 100 mW or 250 mW depend on the certificate of the dipoles.
- The results are normalized to 1 W input power.

System Check Results

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within 10% of the manufacturer calibrated dipole SAR target.

T.S. Liquid		Measured Results		Target (Ref. value)	Delta (%)	Limit (%)	Temp. (℃)	Test Date
		Zoom Scan (W/Kg)	Normalize to 1W (W/Kg)					
Head 2450	1-g	13.200	52.80	53.20	-0.75	±10	22.5	Nov 22, 2022
	10-g	6.110	24.44	24.20	0.99			

11. Measured and Reported (Scaled) SAR Results

As per KDB 447498 sec.4.1.e), When SAR or MPE is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as reported.

Scaled SAR calculation formula:

Scaled SAR = Tune-up in mW / Conducted power in mW * (100 / Duty cycle (if available)) * SAR value

SAR Test Reduction criteria are as follows:

KDB 447498 D01 General RF Exposure Guidance:
A）Per KDB447498 D01 v06, all SAR measurement results are scaled to the maximum tune-up tolerance limit to demonstrate SAR compliance.
B）Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

- ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz.
- ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
- ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz.

Per KDB865664 D01 v01r04:

For each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/Kg; if the deviation among the repeated measurement is ≤ 20%, and the measured SAR <1.45W/Kg, only one repeated measurement is required.

When the highest reported SAR for the initial test configuration, according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.

11.1. SAR Test Results.

Test Positon (Body 0mm)	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)	Limit (W/Kg)
			Tune-up	Meas.	1-g (Zoom Scan)				
Front surface	BLE 2M	2480	7.00	6.78	<0.01	0.20	38.71	<0.01	1.60
Back surface	BLE 2M	2480	7.00	6.78	<0.01	0.07	38.71	<0.01	1.60
Left Edge	BLE 2M	2480	7.00	6.78	<0.01	0.00	38.71	<0.01	1.60
Right Edge	BLE 2M	2480	7.00	6.78	<0.01	0.00	38.71	<0.01	1.60
Top Edge	BLE 2M	2480	7.00	6.78	<0.01	0.00	38.71	<0.01	1.60
Bottom Edge	BLE 2M	2480	7.00	6.78	<0.01	0.00	38.71	<0.01	1.60
Back surface	BLE 2M	2402	7.00	6.65	<0.01	0.07	38.71	<0.01	1.60
Back surface	BLE 2M	2440	7.00	6.61	<0.01	0.00	38.71	<0.01	1.60

Note:
The SAR testing was set to transmit at maximum power for all tests.

12. Simultaneous Transmission SAR Analysis

Per KDB 447498D01, SAR compliance for simultaneous transmission must be considered when the maximum duration of overlapping transmissions, including network hand-offs, is greater than 30 seconds. This device could not contain multiple transmitters that may operate simultaneously, and therefore no requires a simultaneous transmission analysis.

Appendixes

<u>Refer to separated files for the following appendixes.</u>

4790663258-SAR-2_App A Photo

4790663258-SAR-2_App B System Check Plots

4790663258-SAR-2_App C Highest Test Plots

4790663258-SAR-2_App D Cal. Certificates

---------End of Report---------