SAR EVALUATION REPORT

FCC 47 CFR § 2.1093
IEEE Std. 1528-2013

For
Milo

FCC ID: 2A6M9-MV01

Model: M01

Report Number: 4790371944-SAR-2

Issue Date: May 25, 2022

Prepared for
Loose Cannon Systems, Inc.
PO Box 1447, Ross, CA. 94957 USA

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

Revision History

Rev.	Issue Date	Revisions	Revised By
V0	5/25/2022	Initial Issue	

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

Table of Contents

1. Attestation of Test Results

Applicant Name	Loose Cannon Systems, Inc.		
Address	PO Box 1447, Ross, CA. 94957 USA		
Manufacturer	Loose Cannon Systems, Inc.		
Address	PO Box 1447, Ross, CA. 94957 USA		
EUT Name	Milo		
Model	M01		
Sample Status	Normal		
Sample Received Date	April 20, 2022		
Date of Tested	May 18, 2022~May 24, 2022		
Applicable Standards	FCC 47 CFR § 2.1093 IEEE Std. 1528-2013 KDB publication		
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	NII	DSS
Body (1-g)	0.548	0.445	0.405
Simultaneous Transmission(1-g)	0.437		
Test Results	Pass		
Prepared By: Burt Hu Burt Hu Laboratory Engineer	Reviewed By: Shawn Wen Laboratory Leader	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 and the following FCC Published RF exposure KDB procedures:

- 248227 D01 802.11 Wi-Fi SAR
- 447498 D01 General RF exposure guidance
- 690783 D01 SAR Listings on Grants
- 865664 D01 SAR Measurement 100 MHz to 6 GHz
- 865664 D02 RF Exposure Reporting
- 941225 D07 UMPC mini tablet

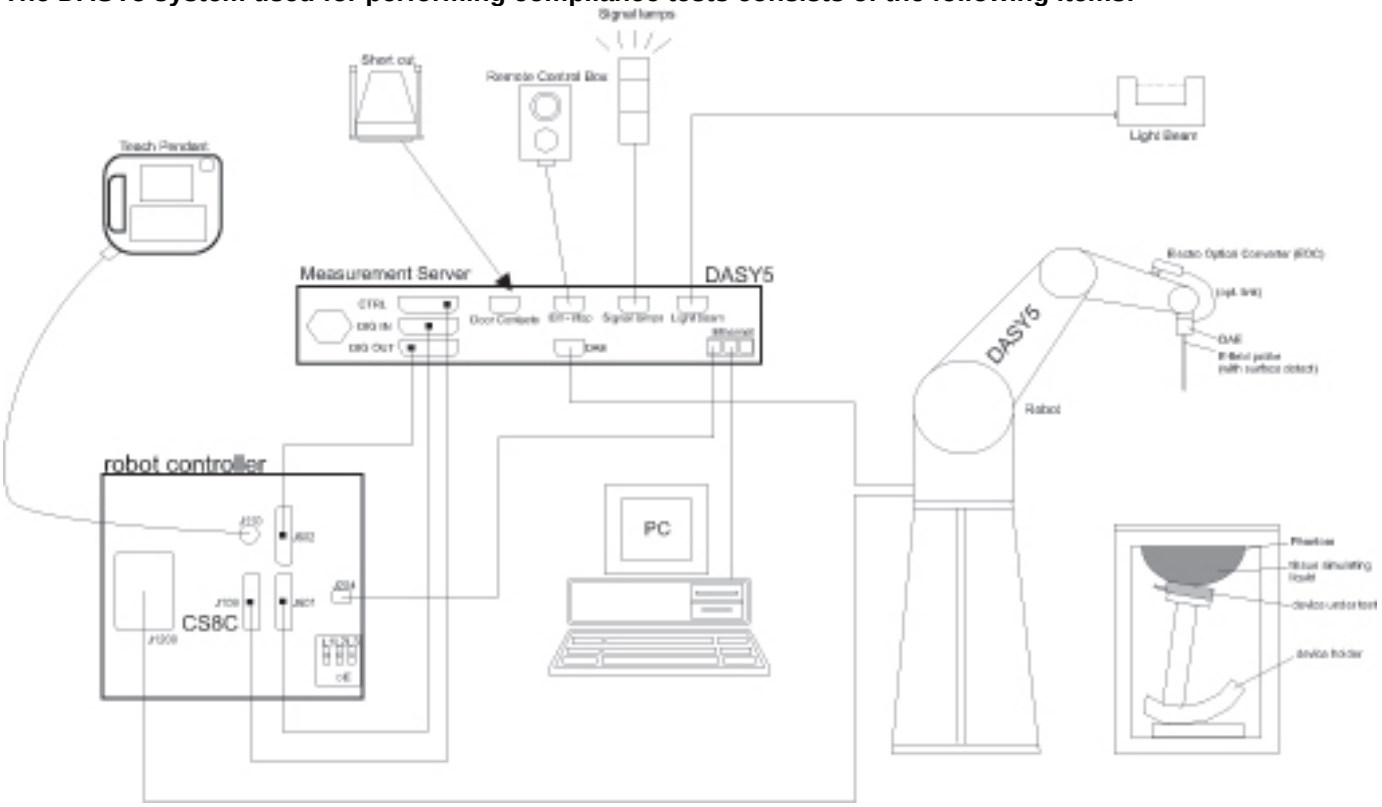
3. Facilities and Accreditation

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 **IC (Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch has been registered and fully described in a report filed with Industry Canada. The Company Number is 21320. **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 mm ± 1 mm	½·δ·ln(2) mm ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 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.	
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}	≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*

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

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$ mm	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

Step 4: Power drift measurement

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

Step 5: Z-Scan (FCC only)

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be 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	2022.10.29
Dielectric Probe kit	SPEAG	SM DAK 040 SA	1155	NCR
DC power supply	Keysight	E36103A	MY55350020	2022.10.29
Signal Generator	Rohde & Schwarz	SME06	837633\001	2022.10.29
BI-Directional Coupler	WERLATONE	C8060-102	3423	2022.10.29
Peak and Average Power Sensor	Keysight	E9323A	MY55440013	2022.10.29
Peak and Average Power Sensor	Keysight	E9323A	MY55420006	2022.10.29
Dual Channel PK Power Meter	Keysight	N1912A	MY55416024	2022.10.29
Amplifier	CORAD TECHNOLOGY LTD	AMF-4D-00400600-50-30P	1983561	NCR
Dosimetric E-Field Probe	SPEAG	EX3DV4	7383	2023.1.11
Data Acquisition Electronic	SPEAG	DAE3	427	2023.4.11
Dipole Kit 900 MHz	SPEAG	D900V2	1d190	2022.12.14
Dipole Kit 2450 MHz	SPEAG	D2450V2	977	2022.12.16
Dipole Kit 5 GHz	SPEAG	D5GHzV2	1231	2022.12.15
Software	SPEAG	DASY52	N/A	NCR
Twin Phantom	SPEAG	SAM V5.0	1805	NCR
Thermometer	/	GX-138	150709653	2022.10.29
Thermometer	VICTOR	ITHX-SD-5	18470005	2022.10.29

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

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std. 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

6. Device Under Test (DUT) Information

6.1. DUT Description

EUT is a wearable product that supports 2.4 / 5 GHz WiFi Bluetooth and SRD 915 MHz, SRD 2.4 GHz	
EUT Dimension	Overall (Length x Width x Height): 74.3mm x 65.2mm x 21mm

6.2. Wireless Technology

Wireless technology	Frequency band
Wi-Fi	2.4 GHz
Wi-Fi	5.2 GHz
Wi-Fi	5.8 GHz
Bluetooth	2.4 GHz
SRD	915 MHz
SRD	2.4 GHz

6.3. Antenna Gain

Antenna type	Band	Gain(dBi)
WiFi / BT Ant	2.4 GHz	0.422
	5 GHz	1.02
SRD Ant	915 MHz	-1.15
	2.4 GHz	2.65

7. Wi-Fi Test Configuration

For Wi-Fi SAR testing, a communication link is set up with the testing software for Wi-Fi mode test. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. The test procedures in KDB 248227D01 are applied.

7.1. Wireless Technology

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions.

A) 802.11b DSSS SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either a 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 (section 3.1 of KDB 248227D01) 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 exposure configuration 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.

B) 2.4GHz 802.11g/n OFDM SAR Test Exclusion Requirements

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3 of KDB 248227D01). SAR is not required for the following 2.4 GHz OFDM conditions.

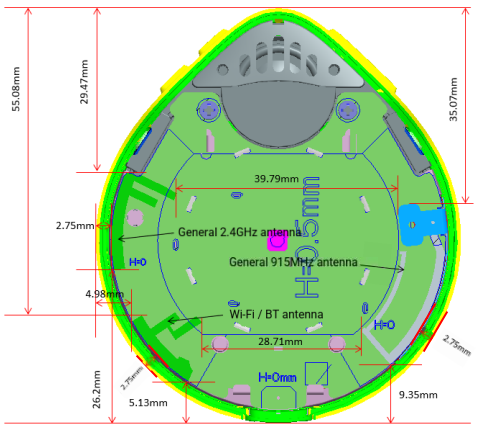
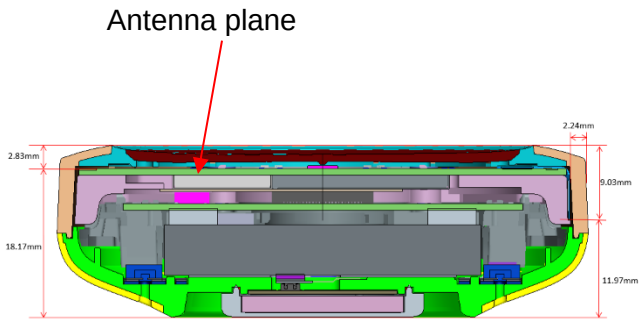
1) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
2) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

C) SAR Test Requirements for OFDM configurations

When SAR measurement is required for 802.11 g/n OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

8. RF Exposure Conditions

Refer to the diagram inside the device which attached below for the specific details of the antenna-to-edges distances. As per KDB 941225 D06, when the antenna to-edge-distance is greater than 2.5 cm, SAR evaluation is not required for the corresponding position.

Front Review	Bottom Review
	

Note:

1) On the left side of the EUT is the SRD 2.4GHz antenna
2) The lower left side of EUT is Bluetooth WiFi antenna
3) SRD 915 MHz antenna is at the lower right of EUT

	Test Position	antenna to-edge-distance	Test required
SRD 2.4 GHz Ant	Front Surface	<25 mm	Yes
	Back Surface	<25 mm	Yes
	Left side	<25 mm	Yes
	Right side	>25 mm	No
	Top side	>25 mm	No
	Bottom side	>25 mm	No

	Test Position	antenna to-edge-distance	Test required
SRD 915 MHz Ant	Front Surface	<25 mm	Yes
	Back Surface	<25 mm	Yes
	Left side	>25 mm	No
	Right side	<25 mm	Yes
	Top side	>25 mm	No
	Bottom side	<25 mm	Yes

	Test Position	antenna to-edge-distance	Test required
WiFi/BT Ant	Front Surface	<25 mm	Yes
	Back Surface	<25 mm	Yes
	Left side	<25 mm	Yes
	Right side	>25 mm	No
	Top side	>25 mm	No
	Bottom side	<25 mm	Yes

9. Dielectric Property Measurements & System Check

9.1. 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				Delta(%)		Limit (%)	Temp. (℃)	Test Date
		Measured		Target						
		ϵ_r	σ	ϵ_r	σ	ϵ_r	σ			
Head 915	900	41.56	0.98	41.50	0.97	0.14	1.03	±5	21.9	2022.5.19
	915	41.55	0.99	41.50	0.98	0.12	1.02			
	925	41.53	0.97	41.50	0.98	0.07	-1.02			
Head 915	900	41.61	0.95	41.50	0.97	0.27	-2.06	±5	22.2	2022.5.24
	915	41.63	0.96	41.50	0.98	0.31	-2.04			
Head 2450	2402	39.35	1.81	39.29	1.76	0.15	2.84	±5	22.3	2022.5.18
	2412	39.31	1.83	39.27	1.77	0.10	3.39			
	2450	39.29	1.85	39.20	1.80	0.23	2.78			
	2462	39.28	1.86	39.18	1.81	0.26	2.76			
	2480	39.26	1.89	39.16	1.83	0.26	3.28			
Head 2450	2442	39.32	1.82	39.22	1.79	0.25	1.68	±5	21.8	2022.5.23
	2450	39.35	1.84	39.20	1.80	0.38	2.22			
Head 5250	5180	36.16	4.78	36.01	4.63	0.42	3.24	±5	22.1	2022.5.18
	5250	36.08	4.83	35.93	4.71	0.42	2.55			
Head 5250	5180	36.39	4.72	36.01	4.63	1.06	1.94	±5	22.2	2022.5.24
	5250	36.01	4.76	35.93	4.71	0.22	1.06			
Head 5750	5750	35.46	5.29	35.36	5.22	0.28	1.34	±5	22.1	2022.5.18
	5825	35.36	5.33	35.27	5.30	0.26	0.57			
Head 5750	5750	35.41	5.25	35.36	5.22	0.14	0.57	±5	22.2	2022.5.24
	5825	35.64	5.39	35.27	5.30	1.05	1.70			

9.2. 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 10 mm (above 1GHZ) and 15 mm (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 10 mm in x- and y- dimension (4-6GHz).
- For zoom scan, Δx_{zoom}, Δy_{zoom} ≤ 2 GHz - ≤ 8 mm, 2-4 GHz - ≤ 5 mm and 4-6 GHz-≤ 4 mm; Δz_{zoom} ≤ 3 GHz - ≤ 5 mm, 3-4 GHz- ≤ 4 mm and 4-6 GHz-≤ 2 mm.
- Distance between probe sensors and phantom surface was set to 3 mm except for 5 GHz band. For 5 GHz 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 900	1-g	2.69	10.76	10.80	-0.37	±10	21.9	2022.5.19
	10-g	1.69	6.76	7.01	-3.57	±10		
Head 900	1-g	2.63	10.52	10.80	-2.59	±10	22.2	2022.5.24
	10-g	1.65	6.60	7.01	-5.85	±10		
Head 2450	1-g	12.70	50.80	53.20	-4.51	±10	22.3	2022.5.18
	10-g	5.90	23.60	24.20	-2.48	±10		
Head 2450	1-g	13.40	53.60	53.20	0.75	±10	21.9	2022.5.19
	10-g	6.14	24.56	24.20	1.49	±10		
Head 2450	1-g	12.80	51.20	53.20	-3.76	±10	21.6	2022.5.20
	10-g	5.94	23.76	24.20	-1.82	±10		
Head 2450	1-g	12.60	50.40	53.20	-5.26	±10	22.2	2022.5.24
	10-g	5.91	23.64	24.20	-2.31	±10		
Head 5250	1-g	8.11	81.10	77.90	4.11	±10	22.3	2022.5.18
	10-g	2.32	23.20	22.60	2.65	±10		
Head 5250	1-g	8.050	80.50	77.90	3.34	±10	22.2	2022.5.24
	10-g	2.320	23.20	22.60	2.65	±10		
Head 5750	1-g	8.19	81.90	78.30	4.60	±10	22.3	2022.5.18
	10-g	2.36	23.60	22.40	5.36	±10		
Head 5750	1-g	7.82	78.20	78.30	-0.13	±10	22.2	2022.5.24
	10-g	2.26	22.60	22.40	0.89	±10		

10.Measured and Reported (Scaled) SAR Results

As per KDB 447498 D01 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, 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.

KDB 248227 D01 v02r02 for Wi-Fi Devices:
For Wi-Fi SAR testing, a communication link is set up with the testing software for Wi-Fi mode test. During the test, at each test frequency channel, the EUT is operated at the RF continuous emission mode. The RF signal utilized in SAR measurement has 100% duty cycle and its crest factor is 1. The test procedures in KDB 248227 D01 v02r02 are applied. (Refer to KDB 248227D01 v02r02 for more details)

Initial Test Position Procedure
For exposure condition with multiple test position, such as handsets operating next to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all position in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4W/kg, no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8W/kg or all test position are measured. For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions /configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

Initial Test Configuration Procedure
An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. For configurations with the same specified or measured maximum output power, additional transmission mode and test channel selection procedures are required (see section 5.3.2 of KDB 248227D01 v02r02). SAR test reduction of subsequent highest output test channels is based on the reported SAR of the initial test configuration.
For next to the ear, hotspot mode and UMC mini-tablet exposure configurations where multiple test positions are required, the initial test position procedure is applied to minimize the number of test positions required for SAR measurement using the initial test configuration transmission mode. For fixed exposure conditions that do not have multiple SAR test positions, SAR is measured in the transmission mode determined by the initial test configuration.
When the reported SAR of the initial test configuration is > 0.8 W/kg, SAR measurement is required for the subsequent next highest measured output power channel(s) in the initial test configuration until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

Sub Test Configuration Procedure
SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units.
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.

Note:
The same procedure is applied to extremity SAR evaluation, and the corresponding limitation is 2.5 times of 1-g SAR.

10.1. SAR Test Results of 2.4GHz Wi-Fi.

Test Position (Body 5mm)	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Duty Cycle (%)	Scaled 1g (W/Kg)	Remarks
			Tune-up	Meas.	1g (W/Kg)				
Front Surface	11b	2412	17.50	17.35	0.371	-0.01	98.96	0.388	5mm
Back Surface	11b	2412	17.50	17.35	0.465	0.12	98.96	0.486	5mm
Left Side	11b	2412	17.50	17.35	0.294	0.04	98.96	0.308	5mm
Bottom Side	11b	2412	17.50	17.35	0.484	-0.10	98.96	0.506	5mm
Bottom Side	11b	2437	17.50	16.93	0.461	0.16	98.96	0.531	5mm
Bottom Side	11b	2462	17.50	16.93	0.476	-0.06	98.96	**0.548**	5mm
Parts									
Bottom Side	11b	2462	17.50	16.93	0.372	-0.09	98.96	0.429	5mm parts 1
Bottom Side	11b	2462	17.50	16.93	0.475	0.00	98.96	0.547	5mm parts 2
Bottom Side	11b	2462	17.50	16.93	0.475	-0.10	98.96	0.547	5mm parts 3
Bottom Side	11b	2462	17.50	16.93	0.386	-0.01	98.96	0.445	5mm parts 4
Bottom Side	11b	2462	17.50	16.93	0.435	0.01	98.96	0.501	5mm parts 5

Note：

1) According to the actual use of the product, for body-worn and limbs-worn scenario, an accessary is needed, the accessary provided at least 5mm separation distance from the human, so a separation distance of 5mm is selected to perform SAR evaluation for body-worn and limbs-worn scenario

OFDM mode SAR evaluation exclusion analysis

Mode	Tune-up (dBm)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11b	17.5	0.548	\	\
802.11g	17.2	\	0.511	Excluded
802.11n20	15.5	\	0.346	Excluded

Note:
The adjusted SAR of 802.11g is less than <1.2W/kg, so SAR test for 802.11g/n20 is not required.

10.2. SAR Test Results of 5GHz Wi-Fi.

Test Position (Body 5mm)	Test Mode	Channel/Frequency	Power (dBm)		SAR Value	Power Drift	Duty Cycle (%)	Scaled 1g (W/Kg)	Remarks
			Tune-up	Meas.	1g (W/Kg)				
U-NII-1									
Front Surface	11a	5180	15.00	14.54	0.152	-0.08	93.38	0.181	5mm
Back Surface	11a	5180	15.00	14.54	0.012	-0.04	93.38	0.015	5mm
Left Side	11a	5180	15.00	14.54	0.189	-0.04	93.38	**0.225**	5mm
Bottom Side	11a	5180	15.00	14.54	0.071	-0.01	93.38	0.085	5mm
Parts									
Left Side	11a	5180	15.00	14.54	0.149	-0.13	93.38	0.177	5mm parts 1
Left Side	11a	5180	15.00	14.54	0.169	-0.08	93.38	0.201	5mm parts 2
Left Side	11a	5180	15.00	14.54	0.165	-0.19	93.38	0.196	5mm parts 3
Left Side	11a	5180	15.00	14.54	0.127	-0.04	93.38	0.151	5mm parts 4
Left Side	11a	5180	15.00	14.54	0.131	-0.03	93.38	0.156	5mm parts 5
U-NII-3									
Front Surface	11a	5825	14.00	13.69	0.268	0.02	93.38	0.308	5mm
Back Surface	11a	5825	14.00	13.69	0.041	-0.08	93.38	0.047	5mm
Left Side	11a	5825	14.00	13.69	0.387	-0.08	93.38	**0.445**	5mm
Bottom Side	11a	5825	14.00	13.69	0.141	-0.08	93.38	0.162	5mm
Parts									
Left Side	11a	5825	14.00	13.69	0.212	0.19	93.38	0.244	5mm parts 1
Left Side	11a	5825	14.00	13.69	0.349	-0.04	93.38	0.401	5mm parts 2
Left Side	11a	5825	14.00	13.69	0.377	-0.15	93.38	0.434	5mm parts 3
Left Side	11a	5825	14.00	13.69	0.302	-0.14	93.38	0.403	5mm parts 4
Left Side	11a	5825	14.00	13.69	0.350	-0.01	93.38	0.347	5mm parts 5

Note：

1) According to the actual use of the product, for body-worn and limbs-worn scenario, an accessary is needed, the accessary provided at least 5mm separation distance from the human, so a separation distance of 5mm is selected to perform SAR evaluation for body-worn and limbs-worn scenario.

Subsequent test configuration SAR evaluation exclusion analysis for U-NII-1 band

Mode	Tune-up (dBm)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	15.0	0.225	\	\
802.11n 20M	14.5	\	0.201	Excluded
802.11ac 20M	14.5	\	0.201	Excluded
802.11n 40M	14.5	\	0.201	Excluded
802.11ac 40M	14.5	\	0.201	Excluded
802.11ac 80M	12.5	\	0.127	Excluded

Note:

1) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As the highest reported SAR for the initial test configuration 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 test for the other 802.11 modes are not required.

Subsequent test configuration SAR evaluation exclusion analysis for U-NII-3 band

Mode	Tune-up (dBm)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	14.0	0.445	\	\
802.11n 20M	13.5	\	0.397	Excluded
802.11ac 20M	13.5	\	0.397	Excluded
802.11n 40M	13.5	\	0.397	Excluded
802.11ac 40M	13.5	\	0.397	Excluded
802.11ac 80M	11.5	\	0.250	Excluded

Note:

1) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As the highest reported SAR for the initial test configuration 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 test for the other 802.11 modes are not required.

10.3.SAR Test Results of SRD 915MHz

Test Position (Body 5mm)	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Scaled 1g (W/Kg)	Remarks
			Tune-up	Meas.	1g (W/Kg)			
Front Surface	2GFSK-25 kbps	904.2	27.00	26.08	0.328	0.13	**0.405**	5mm
Back Surface	2GFSK-25 kbps	904.2	27.00	26.08	0.116	-0.01	0.143	5mm
Right Side	2GFSK-25 kbps	904.2	27.00	26.08	0.134	-0.01	0.166	5mm
Bottom Side	2GFSK-25 kbps	904.2	27.00	26.08	0.077	0.16	0.095	5mm
Front Surface	2GFSK-25 kbps	915	27.00	26.03	0.151	0.05	0.189	5mm
Front Surface	2GFSK-25 kbps	925.8	27.00	26.01	0.140	-0.16	0.176	5mm
Parts								
Front Surface	2GFSK-25 kbps	904.2	27.00	26.08	0.183	-0.04	0.226	5mm parts 1
Front Surface	2GFSK-25 kbps	904.2	27.00	26.08	0.236	-0.16	0.292	5mm parts 2
Front Surface	2GFSK-25 kbps	904.2	27.00	26.08	0.235	0.02	0.290	5mm parts 3
Front Surface	2GFSK-25 kbps	904.2	27.00	26.08	0.168	0.02	0.208	5mm parts 4
Front Surface	2GFSK-25 kbps	904.2	27.00	26.08	0.218	-0.19	0.269	5mm parts 5

Note：

1) According to the actual use of the product, for body-worn and limbs-worn scenario, an accessary is needed, the accessary provided at least 5mm separation distance from the human, so a separation distance of 5mm is selected to perform SAR evaluation for body-worn and limbs-worn scenario
2) Milo uses a timer and a TX byte counter to calculate duty cycle and then regulate transmission to prevent exceeding maximum duty cycle

Subsequent test configuration SAR evaluation exclusion analysis for 2GFSK band

Mode	Tune-up (dBm)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
2GFSK-25 kbps	27.00	0.405	\	\
2GFSK-250 kbps	26.00	\	0.322	Excluded
2GFSK-150 kbps	26.50	\	0.361	Excluded
2GFSK-75 kbps	26.50	\	0.361	Excluded

Note:

1) The 2GFSK-25 kbps mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As the highest reported SAR for the initial test configuration 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 test for the other 2GFSK modes are not required.

10.4.SAR Test Results of SRD 2.4G.

Test Position (Body 5mm)	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Scaled 1g (W/Kg)	Remarks
			Tune-up	Meas.	1g (W/Kg)			
Front Surface	2GFSK-250 kbps	2441.47	25.50	25.01	0.216	-0.02	0.242	5mm
Back Surface	2GFSK-250 kbps	2441.47	25.50	25.01	0.090	0.03	0.101	5mm
Left Side	2GFSK-250 kbps	2441.47	25.50	25.01	0.167	-0.05	0.187	5mm
Front Surface	2GFSK-250 kbps	2402.83	25.50	24.84	0.296	0.00	**0.345**	5mm
Front Surface	2GFSK-250 kbps	2480.11	25.50	24.82	0.261	-0.02	0.305	5mm
Parts								
Front Surface	2GFSK-250 kbps	2402.83	25.50	24.84	0.200	-0.08	0.233	5mm parts 1
Front Surface	2GFSK-250 kbps	2402.83	25.50	24.84	0.228	-0.10	0.265	5mm parts 2
Front Surface	2GFSK-250 kbps	2402.83	25.50	24.84	0.202	0.05	0.235	5mm parts 3
Front Surface	2GFSK-250 kbps	2402.83	25.50	24.84	0.191	-0.07	0.222	5mm parts 4
Front Surface	2GFSK-250 kbps	2402.83	25.50	24.84	0.230	-0.03	0.268	5mm parts 5

Note：

1) According to the actual use of the product, for body-worn and limbs-worn scenario, an accessary is needed, the accessary provided at least 5mm separation distance from the human, so a separation distance of 5mm is selected to perform SAR evaluation for body-worn and limbs-worn scenario
2) Milo uses a timer and a TX byte counter to calculate duty cycle and then regulate transmission to prevent exceeding maximum duty cycle

Subsequent test configuration SAR evaluation exclusion analysis for 2GFSK band

Mode	Tune-up (dBm)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
2GFSK-250 kbps	25.50	0.345	\	\
2GFSK-500 kbps	25.00	\	0.307	Excluded
2GFSK-400 kbps	25.00	\	0.307	Excluded
2GFSK-150 kbps	25.00	\	0.307	Excluded
2GFSK-75 kbps	25.00	\	0.307	Excluded

Note:

1) The 2GFSK-250 kbps mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As the highest reported SAR for the initial test configuration 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 test for the other 2GFSK modes are not required.

10.5.SAR Test Results of Bluetooth.

Test Position (Body 5mm)	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Duty Cycle (%)	Scaled 1g (W/Kg)	Remarks
			Tune-up	Meas.	1g (W/Kg)				
Front Surface	DH5	2402	8.00	7.94	0.024	-0.13	76.94	0.032	5mm
Back Surface	DH5	2402	8.00	7.94	0.026	-0.02	76.94	0.034	5mm
Left Side	DH5	2402	8.00	7.94	0.031	0.02	76.94	0.041	5mm
Bottom Side	DH5	2402	8.00	7.94	0.034	-0.04	76.94	0.045	5mm
Bottom Side	DH5	2441	8.00	7.01	0.016	0.01	76.94	0.026	5mm
Bottom Side	DH5	2480	8.00	7.12	0.039	-0.06	76.94	**0.063**	5mm
Parts									
Bottom Side	DH5	2480	8.00	7.12	0.026	-0.19	76.94	0.042	5mm parts 1
Bottom Side	DH5	2480	8.00	7.12	0.037	-0.06	76.94	0.059	5mm parts 2
Bottom Side	DH5	2480	8.00	7.12	0.039	0.10	76.94	0.062	5mm parts 3
Bottom Side	DH5	2480	8.00	7.12	0.022	-0.01	76.94	0.035	5mm parts 4
Bottom Side	DH5	2480	8.00	7.12	0.019	0.02	76.94	0.030	5mm parts 5

Note：

1) According to the actual use of the product, for body-worn and limbs-worn scenario, an accessary is needed, the accessary provided at least 5mm separation distance from the human, so a separation distance of 5mm is selected to perform SAR evaluation for body-worn and limbs-worn scenario
2) The mode with maximum tune-up is defined as primary mode and the rest mode is defined as secondary mode.
3) SAR measurement is not required for 3DH5 and BLE, when the secondary mode is ≤ 1/4 dB higher than the primary mode.

11.Multiple Transmission SAR Analysis

According to KDB447498 D01, when the sum of 1g SAR for all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration.

11.1.Multiple Transmission SAR calculation for 2.4G Wi-Fi

Synchronous transmission	
Function	Support
BT /BEL+ WLAN 2.4 GHz	×
BT/BLE + WLAN 5 GHz	×
WLAN 2.4 GHz + SRD 2.4 GHz	×
WLAN 5 GHz + SRD 2.4 GHz	×
WLAN 2.4 GHz + SRD 915 MHz	×
WLAN 5 GHz + SRD 915 MHz	×
SRD 2.4 GHz + SRD 915 MHz	×
WLAN 2.4 GHz + WLAN 5GHz	×
BT/BLE + SRD 2.4 GHz	×
BT/BLE + SRD 915 MHz	√
BT+BLE	×

Note:
"√" indicates exist, "×" indicates inexistence.

Test Position	**Simultaneous Tx Antenna Combination(W/kg)**		**∑SAR 1g (W/kg)**	**Limit(W/kg)**
	BT	**SRD 915MHz**		
Front Surface	0.032	**0.405**	0.437	1.6
Test Position	**Simultaneous Tx Antenna Combination(W/kg)**		**∑SAR 1g (W/kg)**	
	BT	**SRD 915MHz**		
Back Surface	0.034	0.143	0.177	1.6
Test Position	**Simultaneous Tx Antenna Combination(W/kg)**		**∑SAR 1g (W/kg)**	
	BT	**SRD 915MHz**		
Left Side	0.041	/	0.041	1.6
Test Position	**Simultaneous Tx Antenna Combination(W/kg)**		**∑SAR 1g (W/kg)**	
	BT	**SRD 915MHz**		
Right Side	/	0.166	0.166	1.6
Test Position	**Simultaneous Tx Antenna Combination(W/kg)**		**∑SAR 1g (W/kg)**	**Limit(W/kg)**
	BT	**SRD 915MHz**		
Bottom side	0.063	0.095	0.158	1.6

Note:
1) Because the maximum SUM 1-g SAR ≤ 1.6 W/Kg, so the SPLSR analysis is not required.

Appendixes

Refer to separated files for the following appendixes.

4790371944-SAR-2_APP A Conducted Power

4790371944-SAR-2_App B Photo

4790371944-SAR-2_App C System Check Plots

4790371944-SAR-2_App D Highest Test Plots

4790371944-SAR-2_App E Cal. Certificates

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