

SAR TEST EXCLUSION EVALUATION REPORT

Product Name: Bluetooth voice remote control
Trade Mark: msi
Model No. / HVIN: F23G30MNT2
Add. Model No. / HVIN: N/A
Report Number: 24122415416RFC-2
Test Standards: FCC 47 CFR Part 2.1093
RSS-102 Issue 6
FCC ID: I4L-F23G30MNT2
IC: 3715A- F23G30MNT2
Test Result: PASS
Date of Issue: January 8, 2025

Prepared for:

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UTTR-RF-RSS102-V1.1

Version

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1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	Micro-Star Int'l Co., Ltd.
Address of Applicant:	No. 69, Lide St., Zhonghe Dist., New Taipei City 235, Taiwan
Manufacturer:	Micro-Star Int'l Co., Ltd.
Address of Manufacturer:	No. 69, Lide St., Zhonghe Dist., New Taipei City 235, Taiwan

1.2 EUT INFORMATION

Product Name:	Bluetooth voice remote control	
Model No. / HVIN:	F23G30MNT2	
Add. Model No. / HVIN:	N/A	
Trade Mark:	msi	
DUT Stage:	Identical Prototype	
EUT Supports Function: (Provided by the customer)	2.4 GHz ISM Band:	Bluetooth V5.2
Software Version:	V1.2.1 (Provided by the customer)	
Hardware Version:	V1.1 (Provided by the customer)	
Sample Received Date:	December 24, 2024	
Sample Tested Date:	December 28, 2024 to December 30, 2024	

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

For BT_LE	
Frequency Band:	2400 MHz to 2483.5 MHz
Frequency Range:	2402 MHz to 2480 MHz
Bluetooth Version:	Bluetooth LE
Type of Modulation:	GFSK
Number of Channels:	40
Channel Separation:	2 MHz
Antenna Type:	PCB Antenna
Antenna Gain: (Provided by the customer)	+3.59 dBi
Maximum Peak Power:	1.62 dBm

1.4 OTHER INFORMATION

Test channels for BT_LE				
Type of Modulation	Tx/Rx Frequency	Test RF Channel Lists		
GFSK	2402 MHz to 2480 MHz	Lowest(L)	Middle(M)	Highest(H)
		Channel 0	Channel 19	Channel 39
		2402 MHz	2440 MHz	2480 MHz

1.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

FCC 47 CFR Part 2.1093
RSS-102 Issue 6

All test items have been performed and recorded as per the above standards

1.6 DEVIATION FROM STANDARDS

None.

1.7 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

2. EQUIPMENT LIST

Please refer to the RF test report.

3. SAR TEST EXCLUSION EVALUATION

3.1 REFERENCE DOCUMENTS FOR EVALUATION

No.	Identity	Document Title
1	FCC 47 CFR Part 2.1093	Radiofrequency radiation exposure evaluation: portable devices.
2	RSS-102 Issue 6	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
3	KDB 447498 D04 Interim General RF Exposure Guidance v01	RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices

3.2 EXEMPTION LIMITS FOR ROUTINE EVALUATION – SAR EVALUATION

3.2.1 SAR Test Exclusion Threshold

3.2.1.1 KDB 447498 D04 v01

According to KDB 447498 D04, SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time-averaged power or maximum time-averaged ERP, whichever is greater.

The separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. In the case of mobile or portable devices, the separation distance is from the outer housing of the device where it is closest to the antenna.

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula (B.2).

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B.2})$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1).

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)									
	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

3.2.1.2 RSS-102 Issue 6

**Table 11: Power limits for exemption from routine SAR evaluation
based on the separation distance**

Frequency (MHz)	≤ 5 mm (mW)	10 mm (mW)	15 mm (mW)	20 mm (mW)	25 mm (mW)	30 mm (mW)	35 mm (mW)	40 mm (mW)	45 mm (mW)	> 50 mm (mW)
≤ 300	45	116	139	163	189	216	246	280	319	362
450	32	71	87	104	124	147	175	208	248	296
835	21	32	41	54	72	96	129	172	228	298
1900	6	10	18	33	57	92	138	194	257	323
2450	3	7	16	32	56	89	128	170	209	245
3500	2	6	15	29	50	72	94	114	134	158
5800	1	5	13	23	32	41	54	74	102	128

3.2.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3.3 MPE CALCULATION RESULTS

Note: For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

3.3.1 For BT

For BT_LE function, operating at 2402MHz to 2480 MHz for GFSK

3.3.1.1 Antenna Type: PCB Antenna

3.3.1.2 Antenna Gain: +3.59 dBi

3.3.1.3 Results for FCC 47 CFR Part 2.1093

Operating Mode	Frequency	Tune-up Power (Average)	Tolerance	Antenna Gain	Maximum EIRP		Separation Distance	SAR Test Exclusion Threshold
	(MHz)	(dBm)	(dBm)	(dBi)	(dBm)	(mW)	(mm)	(mW)
LE	2402-2480	-0.5	1	3.59	4.09	2.56	5	3

So the transmitter complies with the RF exposure requirements and the SAR is not required.

3.3.1.4 Results for RSS-102 Issue 6

Operating Mode	Frequency	Tune-up Power (Average)	Tolerance	Antenna Gain	Maximum EIRP		Separation Distance	SAR Test Exclusion Threshold
	(MHz)	(dBm)	(dBm)	(dBi)	(dBm)	(mW)	(mm)	(mW)
LE	2402-2480	-0.5	1	3.59	4.09	2.56	5	3

So the transmitter complies with the RF exposure requirements and the SAR is not required.

APPENDIX 1 PHOTOS OF TEST SETUP

N/A

APPENDIX 1 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal Photos.

*** End of Report ***

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