



## RF Exposure Evaluation

For

Man &amp; Machine Inc.

Cmouse wireless

Test Model: CM/BTWI/W5

Prepared for : Man & Machine Inc.  
Address : 3706 West Street, Landover, MD 20785 USA

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd  
Address : 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei,  
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Date of receipt of test sample : October 10, 2024  
Number of tested samples : 2  
Sample No. : A250326018-1, A250326018-2  
Sample number : Prototype  
Date of Test : October 10, 2024 ~ April 10, 2025  
Date of Report : April 11, 2025



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**RF Exposure Evaluation****Report Reference No.** ..... : **LCSA01225021EC****Date of Issue**..... : April 11, 2025**Testing Laboratory Name** ..... : **Shenzhen LCS Compliance Testing Laboratory Ltd.****Address**..... : 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei,  
Shajing Street, Baoan District, Shenzhen, 518000, China**Testing Location/ Procedure** ..... : Full application of Harmonised standards ■  
Partial application of Harmonised standards □  
Other standard testing method □**Applicant's Name**..... : **Man & Machine Inc.****Address**..... : 3706 West Street, Landover, MD 20785 USA**Test Specification****Standard** ..... : FCC KDB publication 447498 D01 General RF Exposure Guidance  
v06

FCC CFR 47 part1 1.1310

FCC CFR 47 part2 2.1093

**Test Report Form No.**..... : TRF-4-E-215 A/0**TRF Originator** ..... : Shenzhen LCS Compliance Testing Laboratory Ltd.**Master TRF** ..... : Dated 2011-03**Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.**

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**Test Item Description**..... : **Cmouse wireless****Trade Mark** ..... : N/A**Test Model**..... : CM/BTWI/W5**Ratings**..... : Input: DC 5V  
DC 3.7V by Rechargeable Li-ion Battery, 500mAh**Result** ..... : **Positive****Compiled by:**

Jack Liu/Administrator

**Supervised by:**

Cary Luo/ Technique principal

**Approved by:**

Gavin Liang/ Manager



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## RF Exposure Evaluation

<b>Test Report No. :</b>	<b>LCSA01225021EC</b>	<u>April 11, 2025</u> Date of issue
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Test Model.....	: CM/BTWIW5
EUT.....	: Cmouse wireless
<b>Applicant.....</b>	<b>: Man &amp; Machine Inc.</b>
Address.....	: 3706 West Street, Landover, MD 20785 USA
Telephone.....	: /
Fax.....	: /
<b>Manufacturer.....</b>	<b>: DONGGUAN NEWMEN ELECTRONICS TECHNOLOGY CO.,LTD</b>
Address.....	: No.5 Xifa Road, Lin Village, Tangxia Town, Dongguan City, Guangdong Province 523710, P.R.China
Telephone.....	: /
Fax.....	: /
<b>Factory.....</b>	<b>: DONGGUAN NEWMEN ELECTRONICS TECHNOLOGY CO.,LTD</b>
Address.....	: No.5 Xifa Road, Lin Village, Tangxia Town, Dongguan City, Guangdong Province 523710, P.R.China
Telephone.....	: /
Fax.....	: /

<b>Test Result</b>	<b>Positive</b>
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



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## Revision History

Report Version	Issue Date	Revision Content	Revised By
000	April 11, 2025	Initial Issue	--
At the customer's request, the revised report was submitted to LCSA01225021EC applicant by quoting the test data of RF Exposure Evaluation_FCC original report. The Product PCB has changed, and the AC Power line conducted emissions and Radiation parts were re-tested.			





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## 1. Product Information

Product name	:	Cmouse wireless
Test Model	:	CM/BTWI/W5
Ratings	:	Input: DC 5V DC 3.7V by Rechargeable Li-ion Battery, 500mAh
Hardware Version	:	V1.1
Software Version	:	V1.1
Bluetooth	:	2402MHz ~ 2480MHz
Channel Number	:	40 channels for Bluetooth V5.2 (DTS)
Channel Spacing	:	2MHz for Bluetooth V5.2(DTS)
Modulation Type	:	GFSK for Bluetooth V5.2 (DTS)
Bluetooth Version	:	V5.2
Antenna Type	:	PCB Antenna
Antenna Gain	:	-1.66dBi
2.4G	:	
Frequency Range	:	2403MHz-2480MHz
Channel Number	:	16 channels
Modulation Type	:	GFSK
Antenna Description	:	PCB Antenna, -1.66dBi(Max.)
Exposure category	:	General population/uncontrolled environment
EUT Type	:	Production Unit
Device Type	:	Portable Device

Note: For a more detailed antenna description, please refer to the antenna specifications or the antenna report provided by the customer.







## 2. Evaluation method and Limit

According to KDB447498 D01 General RF Exposure Guidance v06 Section 4.3.1 Standalone SAR test exclusion considerations: "Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander (see 5) of section 4.1). To qualify for SAR test exclusion, the test separation distances applied must be fully explained and justified by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, typically in the SAR measurement or SAR analysis report, according to the required published RF exposure KDB procedures. When no other RF exposure testing or reporting is required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for the SAR test exclusion. When required, the device specific conditions described in the other published RF exposure KDB procedures must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops & tablets etc."

$$\left[ \frac{(\text{max. power of channel, including tune-up tolerance, mW})}{(\text{min. test separation distance, mm})} \cdot \sqrt{f \text{ (GHz)}} \right] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where:}$$

- f (GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm according to f) in section 4.1 is applied to determine SAR test exclusion.

When one of the following test exclusion conditions is satisfied for all combinations of simultaneous transmission configurations, further equipment approval is not required to incorporate transmitter modules in host devices that operate in the mixed mobile and portable host platform exposure conditions. The grantee is responsible for documenting this according to Class I permissive change requirements. Antennas that qualify for standalone SAR test exclusion must apply the estimated standalone SAR to determine simultaneous transmission test exclusion.

- a) The  $\left[ \sum \text{of (the highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance)} / 1.6 \text{ W/kg} \right] + \left[ \sum \text{of MPE ratios} \right]$  is  $\leq 1.0$ .
- b) The SAR to peak location separation ratios of all simultaneously transmitting antenna pairs operating in portable device exposure conditions are all  $\leq 0.04$ , and the  $\left[ \sum \text{of MPE ratios} \right]$  is  $\leq 1.0$ .

## 3. Refer Evaluation Method

[ANSI C95.1–1999](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

[FCC KDB publication 447498 D01 General RF Exposure Guidance v06](#): Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

[FCC CFR 47 part1 1.1310](#): Radiofrequency radiation exposure limits.

[FCC CFR 47 part2 2.1093](#): Radiofrequency radiation exposure evaluation: portable devices



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#### 4. Conducted Power Results

##### <BLE 1M>

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
GFSK	0	2402	0.16
	19	2440	0.68
	39	2480	-0.53

##### <BLE 2M>

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
GFSK	0	2402	-0.32
	19	2440	0.49
	39	2480	-0.6

#### Test Procedure

TX frequency range: 2403MHz

Device category: Portable device (Distance: 5mm) Max.

Field Strength: 83.60dBuV/m @3m

EIRP=E-104.8+20logD=83.60-104.8+20log3=-11.66dBm

Maximum Conducted Output Power: -11.66dBm

Turn-up: -11±1

#### 5. Manufacturing Tolerance

##### < BLE 1M >

GFSK (Peak)			
Channel	Channel 0	Channel 19	Channel 39
Target (dBm)	0	0	-1.0
Tolerance ±(dB)	1.0	1.0	1.0

##### < BLE 2M >

GFSK (Peak)			
Channel	Channel 0	Channel 19	Channel 39
Target (dBm)	0	0	-1.0
Tolerance ±(dB)	1.0	1.0	1.0



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## 6. Evaluation Results

### 6.1 Standalone Evaluation

Band/Mode		f (GHz)	Antenna Distance (mm)	RF output power		SAR Test Exclusion Threshold	SAR Test Exclusion
				dBm	mW		
BLE 1M	GFSK	2.440	5	1.0	1.2589	0.3933< 3.0	Yes
BLE 2M	GFSK	2.440	5	1.0	1.2589	0.3933< 3.0	Yes
2.4G	GFSK	2.403	5	-10.0	0.1000	0.0310< 3.0	Yes

Remark:

1. Output power including tune up tolerance;
2. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to f) in section 4.1 is applied to determine SAR test exclusion.

### 6.2 Simultaneous Transmission for SAR Exclusion

The sample support one antenna. No need consider simultaneous transmission.

## 7. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v06.

## 8. Description of Test Facility

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

Test Firm Registration Number: 254912.

## 9. Measurement Uncertainty

BLE/2.4G:

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	±3.10dB	(1)
	:	30MHz~200MHz	±2.96dB	(1)
	:	200MHz~1000MHz	±3.10dB	(1)
	:	1GHz~26.5GHz	±3.80dB	(1)
	:	26.5GHz~40GHz	±3.90dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	±1.63dB	(1)
Power disturbance	:	30MHz~300MHz	±1.60dB	(1)
Output power	:	1GHz-40GHz	±0.57dB	(1)
Occupied Channel Bandwidth	:	1GHz-40GHz	±5%	(1)

- (1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

.....THE END OF REPORT.....



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