



FCC RF EXPOSURE REPORT

Applicant	: IGRS Engineering Lab (Shenzhen) Ltd
Address	: 6F, Block A3,Cyber-tech Zone,Gaoxin Ave.7th.S.Hi-Tech Industrial Park, Nanshan District, Shenzhen, China
Equipment	: Wireless module
Model No.	: MW50A
Trade Name	: N/A
FCC ID.	: 2A3LP-MW50A

I HEREBY CERTIFY THAT :

The sample was received on Sept. 27, 2021 and the testing was completed on Oct. 26, 2021 at Cerpass Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Leevin Li /Supervisor



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History of this test report

☒ Original

☐ Additional attachment as following record:

Attachment No.	Issue Date	Description
DEFJ2109065	Oct. 26, 2021	Original



1. Test Configuration of Equipment under Test

1.1 Feature of Equipment

Equipment	Wireless module
Model Name	MW50A
Model Discrepancy	N/A
Frequency Range	BT/BLE/ WIFI 2.4G: 2400MHz-2483.5MHz WIFI 5G: 5150MHz-5350MHz, 5470-5725MHz, 5725MHz -5850MHz
Modulation Type	BT: GFSK, $\pi/4$ -DQPSK, 8DPSK BLE: GFSK 802.11b: CCK, DQPSK, DBPSK 802.11a/g: 64-QAM,16-QAM, QPSK, BPSK 802.11n: 64-QAM,16-QAM, QPSK, BPSK 802.11ac: 256-QAM,64-QAM,16-QAM, QPSK, BPSK
Data Rate	BT: GFSK:1Mbps, $\pi/4$ -DQPSK: 2Mbps, 8DPSK:3Mbps BLE: GFSK: 1Mbps&2Mbps WIFI 2.4G: 802.11b: 1, 2 ,5.5,11Mbps 802.11g: 6,9,12,18,24,36,48,54Mbps 802.11n: HT20 reach up to 144.4Mbps, HT40 reach up to 300Mbps WIFI 5G: 802.11a: 6,9,12,18,24,36,48,54Mbps 802.11n: HT20 reach up to 144.4Mbps, HT40 reach up to300Mbps 802.11ac: VHT20 reach up to 173.3Mbps, VHT40 reach up to 400Mbps, VHT80 reach up to 866.7Mbps
Antenna Type	BT/BLE: PIFA Antenna WIFI 2.4G/5G: PIFA Antenna
Operating Voltage	5 V $\pm$ 10%

Note: For more details, please refer to the User's manual of the EUT.



1.2 General Information of Test

Test Site	Cerpass Technology Corporation(Cerpass Laboratory) Address: Room 102, No. 5, Xing'an Road, Chang'an Town, Dongguan City, Guangdong Province Tel: +86-769-8547-1212 Fax: +86-769-8547-1912
FCC Designation No.:	CN1288



2. Radio Frequency Exposure

Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation)
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm ²) ☒ General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☒ Tx/Rx diversity
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

TEST RESULTS

No non-compliance noted.

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where E = Field strength in Volts / meter
 P = Power in Watts
 G = Numeric antenna gain
 d = Distance in meters
 S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770d^2}$$

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm
 P = Power in mW
 G = Numeric antenna gain
 S = Power density in mW / cm²

**Maximum Permissible Exposure**
Bluetooth

Mode	Channel Frequency (MHz)	Max. Conducted output power (dBm)	Max. Tune up power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)
Bluetooth EDR	2402-2480	7.69	8.69	4.78	20	0.004
Bluetooth LE	2402-2480	7.98	8.98	4.78	20	0.005

Wlan**SISO**

Channel Frequency (MHz)	Max. Conducted output power (dBm)	Max. Tune up power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)
2412-2462	22.32	23.32	4.60	20	0.123
5150-5250	14.13	15.13	4.94	20	0.020
5250-5350	14.02	15.02	5.05	20	0.020
5470-5725	14.88	15.88	4.88	20	0.024
5725-5850	12.81	13.81	4.53	20	0.014

MIMO**ANT A**

Channel Frequency (MHz)	Max. Conducted output power (dBm)	Max. Tune up power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)
2412-2462	22.21	23.21	4.60	20	0.120
5150-5250	13.57	14.57	5.35	20	0.020
5250-5350	14.02	15.02	5.05	20	0.020
5470-5725	14.29	15.29	5.57	20	0.024
5725-5850	11.63	12.63	5.59	20	0.013

ANT B

Channel Frequency (MHz)	Max. Conducted output power (dBm)	Max. Tune up power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)
2412-2462	21.83	22.83	4.10	20	0.098
5150-5250	14.13	15.13	4.94	20	0.020
5250-5350	11.34	12.34	4.68	20	0.010
5470-5725	14.88	15.88	4.88	20	0.024
5725-5850	12.81	13.81	4.53	20	0.014

The sum of the ratios of the spatially averaged results to the applicable frequency dependent MPE limits :

Simultaneous transmission mode	The sum of the ratios	Result
ANT A+ANT B	0.120/1+0.098/1	0.218 < 1

Maximum Permissible Exposure (Co-location)

the sum of the ratios of the spatially averaged results to the applicable frequency dependent MPE limits :

Simultaneous transmission mode	The sum of the ratios	Result
Bluetooth +WLAN	0.005/1+0.120/1+0.098/1	0.223 < 1

Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

-----End of the report -----