

RF Exposure Evaluation
For
CTHINGS.CO sp. z o.o.
CTCC-MGM240P-SM2-SWN
Test Model: CTCC-MGM240P-SM2-SWN

Prepared for : CTHINGS.CO sp. z o.o.
Address : Aleja Niepodleglosci 18, 02-653 Warsaw, Poland

Prepared by : Guangzhou LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : July 22, 2025
Number of tested samples : 2
Sample No. : A250721143-1, A250721143-2
Serial number : Prototype
Date of Test : July 22, 2025 ~ October 15, 2025
Date of Report : October 16, 2025



RF Exposure Evaluation	
Report Reference No.	LCSC07215006EC
Date of Issue	October 16, 2025
Testing Laboratory Name	Guangzhou LCS Compliance Testing Laboratory Ltd.
Address	No.44-1, Qianfeng North Road, Shiqi, Panyu District, Guangzhou, Guangdong, China
Testing Location/ Procedure	Full application of Harmonised standards ☒ Partial application of Harmonised standards ☐ Other standard testing method ☐
Applicant's Name	CTHINGS.CO sp. z o.o.
Address	Aleja Niepodleglosci 18, 02-653 Warsaw, Poland
Test Specification	
Standard	FCC KDB publication 447498 D01 General RF Exposure Guidance v06 FCC CFR 47 part1 1.1310 FCC CFR 47 part2 2.1091
Test Report Form No.	TRF-4-E-215 A/0
TRF Originator	Guangzhou LCS Compliance Testing Laboratory Ltd.
Master TRF	Dated 2011-03
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Test Item Description	CTCC-MGM240P-SM2-SWN
Trade Mark	N/A
Test Model	CTCC-MGM240P-SM2-SWN
Ratings	Please Refer to Page 6
Result	PASS

Compiled by:

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Supervised by:

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Justin Zhu/ Technique Director

Approved by:

Gavin Liang

Gavin Liang/ Manager



RF Exposure Evaluation

Test Report No. : LCSC07215006EC	<u>October 16, 2025</u> Date of issue
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EUT.....	: CTCC-MGM240P-SM2-SWN
Test Model.....	: CTCC-MGM240P-SM2-SWN
Applicant.....	: CTHINGS.CO sp. z o.o.
Address.....	: Aleja Niepodleglosci 18, 02-653 Warsaw, Poland
Telephone.....	: /
Fax.....	: /
Manufacturer.....	: CTHINGS.CO sp. z o.o.
Address.....	: Aleja Niepodleglosci 18, 02-653 Warsaw, Poland
Telephone.....	: /
Fax.....	: /
Factory.....	: KDTech Sp. z o.o.
Address.....	: Braniborska 7/2 Street; 53-680 Wrocław, Polska
Telephone.....	: /
Fax.....	: /

Test Result	PASS
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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.

Revision History

Guangzhou LCS Compliance Testing Laboratory Ltd.

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Report Version	Issue Date	Revision Content	Revised By
000	October 16, 2025	Initial Issue	---

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1. Product Information

EUT	: CTCC-MGM240P-SM2-SWN
Test Model	: CTCC-MGM240P-SM2-SWN
Rating	: Input: DC 3.3V, 200mA, 0.66W
Hardware Version	: REV B1-FC
Software Version	: /
Bluetooth	:
Frequency Range	: 2402MHz-2480MHz
Bluetooth Channel Number	: 40 channels for Bluetooth V5.0 (DTS)
Bluetooth Channel Spacing	: 2MHz for Bluetooth V5.0 (DTS)
Bluetooth Modulation Type	: GFSK for Bluetooth V5.0 (DTS)
Bluetooth Version	: V5.0
Antenna Description	: Dipole Antenna, 2.48dBi for AGP-I240501SMR, 5.23dBi for GW.51.5153 (Max.)
Zigbee	:
Frequency Range	: 2405MHz-2480MHz
Channel Spacing	: 5MHz
Channel Number	: 16 Channels
Modulation Type	: O-QPSK
Antenna Description	: Dipole Antenna, 2.48dBi for AGP-I240501SMR, 5.23dBi for GW.51.5153 (Max.)
Exposure category	: General population/uncontrolled environment
EUT Type	: Production Unit
Device Type	: Mobile 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

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modelled or measured field strengths or power density, is ≤ 1.0 . The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

3. Limit

3. 1 Refer Evaluation Method

[ANSI C95.1–2019](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz

[FCC KDB publication 447498 D01 General 1 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 2.1091](#): Radiofrequency radiation exposure evaluation: mobile devices.

3. 2 Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	6
3.0 – 30	1842/f	4.89/f	(900/f ²)*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Uncontrolled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 30	824/f	2.19/f	(180/f ²)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	/	/	f/1500	30
1500 – 100,000	/	/	1.0	30

F=frequency in MHz

*=Plane-wave equivalent power density

4. MPE Calculation Method

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=PG/4\pi R^2$$

Where: S=power density

P=power input to antenna

G=power gain of the antenna in the direction of interest relative to an isotropic radiator

R=distance to the center of radiation of the antenna

5. Antenna Information

EUT can only use antennas certificated as follows provided by manufacturer:

Internal/External Identification	Antenna type and antenna number	Operate frequency band	Maximum antenna gain	Notes
External	Dipole Antenna	2400-2500 MHz	2.48dBi for AGP-I240501SMR, 5.23dBi for GW.51.5153	BT/ Zigbee Antenna

6. Conducted Power

[BLE 1M]

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
GFSK	0	2402	18.08
	19	2440	18.05
	39	2480	9.99

[BLE 2M]

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
GFSK	0	2402	18.11
	19	2440	18.07
	39	2480	10.03

[Zigbee]

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
O-QPSK	0	2405	18.50
	7	2440	18.62
	15	2480	4.94

7. Manufacturing Tolerance

[BLE 1M]

GFSK(Peak)			
Channel	Channel 0	Channel 19	Channel 39
Target (dBm)	19.0	19.0	9.0
Tolerance ± (dB)	1.0	1.0	1.0

[BLE 2M]

GFSK(Peak)			
Channel	Channel 0	Channel 19	Channel 39
Target (dBm)	19.0	19.0	10.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0

[Zigbee]

O-QPSK (Peak)			
Channel	Channel 0	Channel 7	Channel 15
Target (dBm)	19.0	19.0	4.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0

8. Measurement Results

8.1 Standalone MPE Evaluation

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, $r = 20\text{cm}$, as well as the gain of the used antenna refer to antenna information, the RF power density can be obtained.

[BT LE]

Modulation Type		Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
		dBm	mW				
BLE 1M	GFSK	20.0	100.0000	5.23	3.3343	0.0663	1.0000
BLE 2M	GFSK	20.0	100.0000	5.23	3.3343	0.0663	1.0000

[Zigbee]

Modulation Type		Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
		dBm	mW				
O-QPSK		20.0	100.0000	5.23	3.3343	0.0663	1.0000

Remark:

1. Output power including tune-up tolerance;
2. Output power was adjust to duty cycle at 100% if measured duty cycle less than 98%;
3. MPE evaluate distance is 20cm from user manual provide by manufacturer.

8.2 Simultaneous Transmission MPE Evaluation

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

9. Conclusion

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

10. Description of Test Facility

CNAS Registration Number is L11555
A2LA Certificate Number: 5099.01
FCC Designation Number is CN1379
Test Firm Registration Number: 729882

11. Measurement Uncertainty

BLE/Zigbee:

Test Item	Frequency Range	Uncertainty	Note
Output power	1GHz-40GHz	$\pm 0.57\text{dB}$	(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-----