

MPE Evaluation Report

Applicant Espressif Systems (Shanghai) Co., Ltd.

FCC ID 2AC7Z-ESPC5MINI1

Product 2.4G&5G Wi-Fi & Bluetooth & zigbee &Thread IoT Module

Brand ESPRESSIF

Model ESP32-C5-MINI-1

Report No. EFTA26010030-IE-08-M1V1

Issue Date April 20, 2026

Eurofins TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC 47 CFR Part 1 §1.1310, §2.1091**. The test results show that the equipment tested can demonstrate compliance with the requirements as documented in this report.


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Version	Revision Description	Issue Date
Rev.0	Initial issue of report.	April 17, 2026
Rev.1	Updated information.	April 20, 2026
Note: This revised report (Report No.: EFTA26010030-IE-08-M1V1) supersedes and replaces the previously issued report (Report No.: EFTA26010030-IE-08-M1). Please discard or destroy the previously issued report and dispose of it accordingly.		

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1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **Eurofins TA Technology (Shanghai) Co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test Facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

Eurofins TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

1.3 Testing Location

Company: Eurofins TA Technology (Shanghai) Co., Ltd.
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1.4 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25°C
Relative humidity	Min. = 20%, Max. = 80%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

2 Description of Equipment Under Test

Client Information

Applicant	Espressif Systems (Shanghai) Co., Ltd.
Applicant address	1-7th Floor, Building 3, 235 Yubei Road, Pudong New Area, Shanghai, China
Manufacturer	Espressif Systems (Shanghai) Co., Ltd.
Manufacturer address	1-7th Floor, Building 3, 235 Yubei Road, Pudong New Area, Shanghai, China

General Technologies

EUT Description			
Model	ESP32-C5-MINI-1		
Lab Internal SN	260106-05-002		
Hardware Version	V1		
Software Version	V1		
Frequency	Band	TX (MHz)	RX (MHz)
	Wi-Fi 2.4GHz	2400 ~ 2483.5	2400 ~ 2483.5
	Wi-Fi 5G(U-NII-1)	5150 ~ 5250	5150 ~ 5250
	Wi-Fi 5G(U-NII-2A)	5250 ~ 5350	5250 ~ 5350
	Wi-Fi 5G(U-NII-2C)	5470 ~ 5725	5470 ~ 5725
	Wi-Fi 5G(U-NII-3)	5725~ 5850	5725~ 5850
	Bluetooth (Low Energy)	2400 ~ 2483.5	2400 ~ 2483.5
	Thread	2405 ~ 2480	2405 ~ 2480
	Zigbee	2405 ~ 2480	2405 ~ 2480
Date of Testing	January 12, 2026 ~ January 22, 2026		
Date of Sample Received	January 5, 2026		
Note: 1. The EUT is sent from the applicant to Eurofins TA and the information of the EUT is declared by the applicant. 2. All indications of Pass/Fail in this report are opinions expressed by Eurofins TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			

3 Maximum Tune up and Antenna Gain

The numeric gain (G) of the antenna with a gain specified in dB is determined by

$$\text{Numeric gain (G)} = 10^{(\text{antenna gain}/10)}$$

Band	Maximum Tune up Tolerance		Antenna Gain (dBi)	Numeric Gain
	(dBm)	(mW)		
Wi-Fi 2.4GHz	20.00	100.00	4.44	2.78
Wi-Fi 5G(U-NII-1)	19.00	79.43	2.08	1.61
Wi-Fi 5G(U-NII-2A)	19.00	79.43	2.08	1.61
Wi-Fi 5G(U-NII-2C)	19.00	79.43	2.18	1.65
Wi-Fi 5G(U-NII-3)	19.00	79.43	2.07	1.61
Bluetooth LE	22.00	158.49	4.44	2.78
Thread	20.00	100.00	4.44	2.78
Zigbee	20.00	100.00	4.44	2.78

4 MPE Limit

According to section 1.1310 of FCC 47 CFR Part 1, limits for maximum permissible exposure (MPE) are as following.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(i) 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
300-1,500			f/300	<6
1,500-100,000			5	<6
(ii) LIMITS FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f ²)	<30
30-300	27.5	0.073	0.2	<30
300-1,500			f/1500	<30
1,500-100,000			1.0	<30

*f = frequency in MHz. * = Plane-wave equivalent power density.*

Note1. Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational / controlled limits apply provided he or she is made aware of the potential for exposure.

Note2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

The maximum permissible exposure for 1500~100,000MHz is 1.0. So

Band	The Maximum Permissible Exposure (mW/cm ²)
Wi-Fi 2.4GHz	1.000
Wi-Fi 5GHz	1.000
Bluetooth LE	1.000
Thread	1.000
Zigbee	1.000

5 RF Exposure Evaluation Result

RF exposure evaluation method is based on KDB 447498 D01, this calculation is based on the conducted power, maximum power and antenna gain with provides the minimum separation distance. The formula shown below is from OET Bulletin 65 Edition 97-01 Per KDB 447498 D01:

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

Where: S = power density (in appropriate units, e.g. mW/cm²)

P = Time-average maximum tune up procedure (in appropriate units, e.g., mW)

G = the numeric gain of the antenna

R = distance to the center of radiation of the antenna (20 cm = limit for MPE)

Band	Maximum Tune up (dBm)	Antenna Gain (dBi)	Maximum EIRP (dBm)	PG (mW)	Result (mW/cm ²)	Limit Value (mW/cm ²)	The MPE Ratio
Wi-Fi 2.4GHz	20.000	4.440	24.440	277.971	0.055	1.000	0.055
Wi-Fi 5G(U-NII-1)	19.000	2.080	21.080	128.233	0.026	1.000	0.026
Wi-Fi 5G(U-NII-2A)	19.000	2.080	21.080	128.233	0.026	1.000	0.026
Wi-Fi 5G(U-NII-2C)	19.000	2.180	21.180	131.220	0.026	1.000	0.026
Wi-Fi 5G(U-NII-3)	19.000	2.070	21.070	127.938	0.025	1.000	0.025
Bluetooth LE	22.000	4.440	26.440	440.555	0.088	1.000	0.088
Thread	20.000	4.440	24.440	277.971	0.055	1.000	0.055
Zigbee	20.000	4.440	24.440	277.971	0.055	1.000	0.055
Note: R = 20cm $\pi = 3.1416$ The MPE Ratio = Mac Result÷Limit Value							

This device does not support transmit simultaneously.

Note: For this device, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.

ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.

*****END OF REPORT *****