

MPE Evaluation Report

Applicant Espressif Systems (Shanghai)Co.,Ltd.
FCC ID 2AC7Z-ESPC3MINII
Product Wi-Fi & Bluetooth Internet of Things Module
Brand ESPRESSIF
Model ESP32-C3-MINI-1U
Report No. EFTA26030197-IE-03-M1
Issue Date April 22, 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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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	Suite 204, Block 2, 690 Bibo Road, Zhang Jiang Hi-Tech Park, Shanghai, China
Manufacturer	Espressif Systems (Shanghai) Co., Ltd.
Manufacturer address	Suite 204, Block 2, 690 Bibo Road, Zhang Jiang Hi-Tech Park, Shanghai, China

General Technologies

EUT Description			
Model	ESP32-C3-MINI-1U		
Lab Internal SN	260206-19-007		
Hardware Version	V1.2		
Software Version	V1.1.3.0		
Frequency	Band	TX (MHz)	RX (MHz)
	Wi-Fi 2.4G	2400 ~ 2483.5	2400 ~ 2483.5
	Bluetooth (Low Energy)	2400 ~ 2483.5	2400 ~ 2483.5
Date of Testing	March 24, 2026 ~ April 3, 2026		
Date of Sample Received	March 16, 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.			

ESP32-C3-MINI-1U (Report No.: EFTA26030197-IE-03-M1) is a variant model of ESP32-C3-MINI-1U (Report No.: R2107A0598-M1V1).

This report only adds two antennas.

	Antenna type	Antenna model NO.	Max gain
original	monopole antenna	TFPD08H10060011	2.33 dBi
new added 1	FPC antenna	3A-CDZXX-019	4.90 dBi
new added 2	FPC antenna	160180-0203	4.12 dBi

According to customer requirements the detailed standard upgrade please refers to following Table:

Old Standard(s)	New Standard(s)
FCC 47 CFR Part 1 1.1310	FCC 47 CFR Part 1 §1.1310, §2.1091

The detailed product change description please refers to the Difference Declaration Letter.

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 2.4G Antenna 160180-02031	19.00	79.43	4.12	2.58
Wi-Fi 2.4G Antenna 3A-CDZXX-019	19.00	79.43	4.90	3.09
Bluetooth LE Antenna 160180-02031	8.00	6.31	4.12	2.58
Bluetooth LE Antenna 3A-CDZXX-019	8.00	6.31	4.90	3.09

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
Bluetooth LE	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	19.000	4.900	23.900	245.471	0.049	1.000	0.049
Bluetooth LE	8.000	4.900	12.900	19.498	0.004	1.000	0.004
Note: R = 20cm π= 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 *****