



Espressif

Module Packaging Information



Version 1.4
Espressif Systems
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About This Document

This document describes the package and silk marking of Espressif modules.

Release Notes

Date	Version	Release Notes
2021.05	V1.0	Initial release
2022.01	V1.1	1. Added a note about carrier tape; 2. Updated description on module silk marking and specification identifier for mass production and NPI products
2022.03	V1.2	Updated the picture in Table 1-4 and Figure 2-1 to the latest
2022.07	V1.3	Updated convention for Product Status code in Table 2-2
2024.01	V1.4	Updated the picture in Table 1-4 and added MBM NO in the Firmware Version column

Documentation Change Notification

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Certification

Download certificates for Espressif products from <https://www.espressif.com/en/certificates>.

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1. Module Packaging

Espressif modules are packaged on tape and reel. Then the reel is packed in an aluminum moisture barrier bag (MBB) in vacuum state to protect modules from absorbing moisture during transportation and storage. At last, the MBB is packed into a pizza box.

1.1. Tape and Reel Specifications

1.1.1. Tape Specifications

Figure 1-1 and Table 1-1 show the carrier tape specifications of typical Espressif modules.

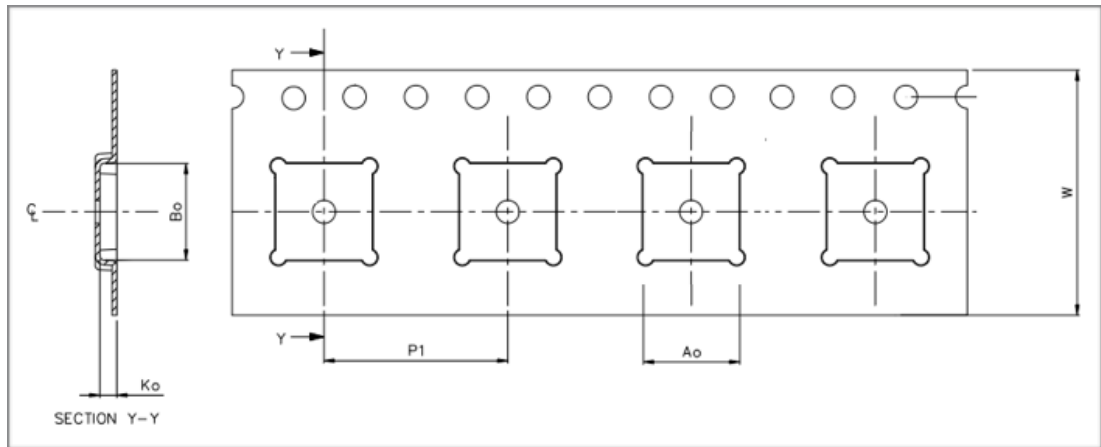


Figure 1-1. Carrier Tape Specifications

Table 1-1. Carrier Tape Specifications (Unit: mm)

Carrier Tape Width (W)	Cavity Pitch (P ₁)	Cavity Width (A ₀)	Cavity Length (B ₀)	Cavity Height (K ₀)
44.0 ± 0.30	24.0 ± 0.10	Module width + 0.5	Module length + 0.5	Module height + 0.5

Note:

1. The surface resistance of the carrier tape is $10^4 \sim 10^{11}$ ohms.
2. The cavity dimensions may differ from different modules.
3. The Figure 1-1 above is for illustration purposes only. Actual product may vary.



1.1.2. Reel Specifications

Figure 1-1 and Table 1-2 show the reel specifications of typical Espressif modules.



Figure 1-2. Reel Specifications

Table 1-2. Reel Specifications

Reel Size	Outer Diameter (mm)	Inner Diameter (mm)	Reel Width (W) (mm)
13''	330	100	44

 **Note:**

- The surface resistance of the reel is $10^4 \sim 10^{11}$ ohms.
- The quantity per tape of typical Espressif modules is 650, but can be different from modules.
For example,
 - ESP32-WROOM-32: 550.
 - ESP8089M16 and ESP-WROOM-5C: 1,300.

For details, please check [ESP-Product Selector](#).



1.2. MBB and Pizza Box Specifications

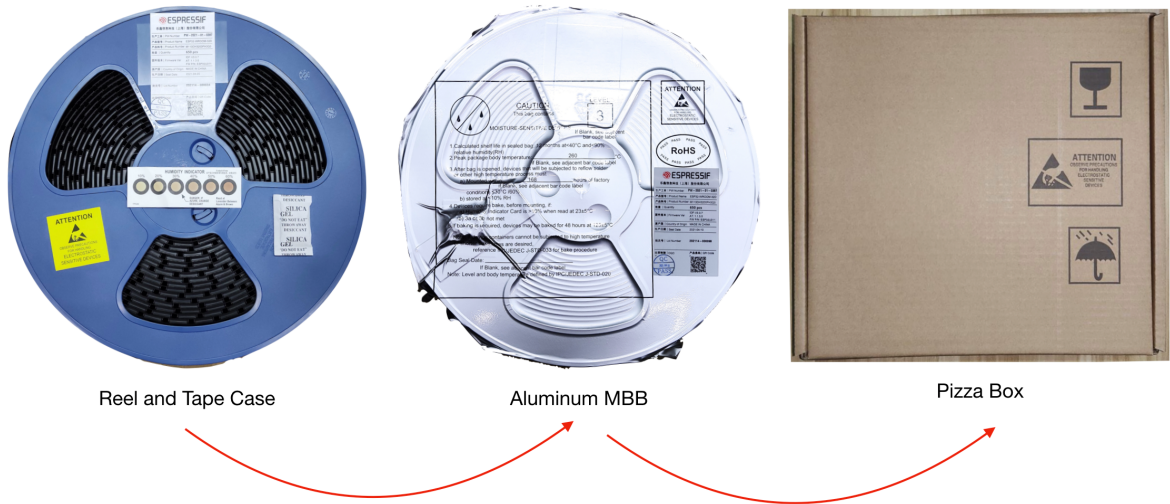


Figure 1-3. An Aluminum MBB and the Items inside of it

Inside of the pizza box of typical Espressif modules, the following items are also packed together with the tape and reel:

Table 1-3. Items and Labels inside the Moisture Barrier Bag

No.	Item	Description
1	ESD Precautions Label	50 mm × 50 mm
2	Humidity-indicator Card (HIC)	102 mm × 36 mm, a cobalt-free brown to azure HIC
3	Desiccant	3 g
4	Product Label	100 mm × 60 mm. See the detailed drawing and explanation in Section 1.2.1.



1.2.1. Product Label

A detailed drawing of a type Espressif product label is shown below:

Table 1-4. Espressif Product Label

Product Label	Item	Description
 The image shows a detailed drawing of an Espressif product label. It includes the Espressif logo and company name at the top. Below this is a table with fields for Production Order (PW Number), Product Name, Product Number, Quantity, Firmware Version, Country of Origin, Seal Date, Lot Number, and QC inspection status. At the bottom, there is a QR code and a circular QC PASS stamp.	PW Number	Espressif's order number at the module manufacturers
	Product Name	Module name
	Product Number	Espressif's MPN (internal use)
	Quantity	The quantity of modules per package
	Firmware Version	Indicates the firmware version downloaded to the modules: - No firmware: - IDF: N/A - AT: N/A - FW P/N: N/A - MBM NO: Specification Identifier, see Section 2.2 - Espressif default firmware: - IDF: IDF version - AT: AT version - FW P/N: firmware code - MBM NO: Specification Identifier, see Section 2.2 - Customized firmware: - IDF: Customized firmware version - AT: N/A - FW P/N: firmware code - MBM NO: Specification Identifier, see Section 2.2
	Country of Origin	MADE IN CHINA
	Seal Date	Date of packaging
	Lot Number	Used internally by Espressif for tracking production.
	OQC	Indicates the QC inspection is passed.
	OR code	Scanning this OR code returns you production information including product name, product number, lot number, quantity, production number, and Espressif internal code.



2. Module Marking

Each Espressif module has a silk marking on its shielding case, providing information such as module name, flash size, and operating temperature.

2.1. Module Marking Information

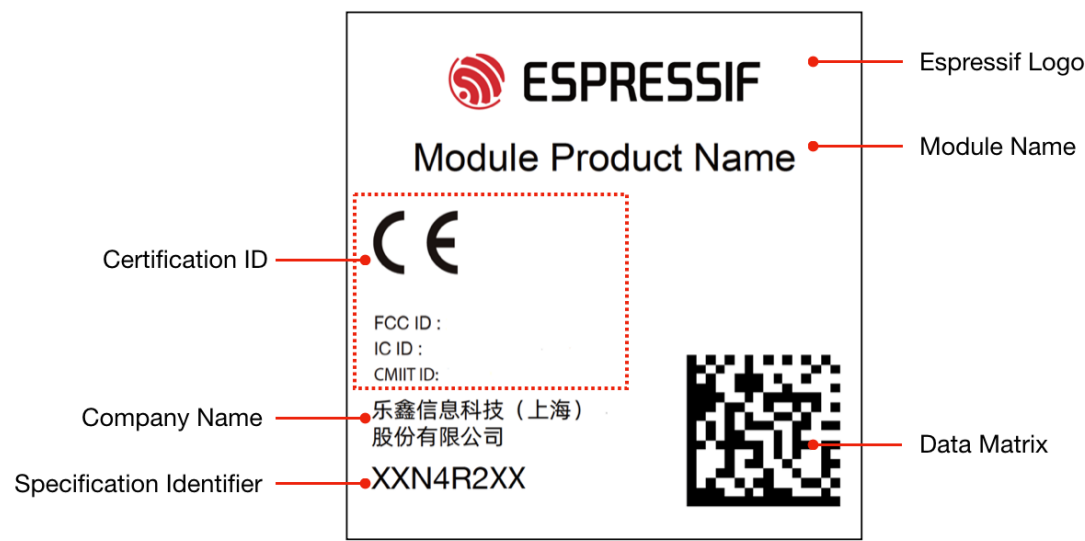


Figure 2-1. Espressif Module Marking

Table 2-1. Espressif Module Marking

No.	Item	Description
1	Company Logo	ESPRESSIF logo
2	Module Name	Espressif module name
3	Certification ID	Indicates the certification this module has passed
4	Company Name	Espressif Systems (Shanghai) Co., Ltd (in Chinese)
5	Specification Identifier	See Section 2.2 below
6	Data Matrix	See Section 2.3 below



2.2. Specification Identifier Convention

The Specification Identifier is defined by Espressif to indicate the product status, operating temperature, and the memory inside Espressif modules.

Figure 2-2 below demonstrates how to understand the Specification Identifier on module marking:

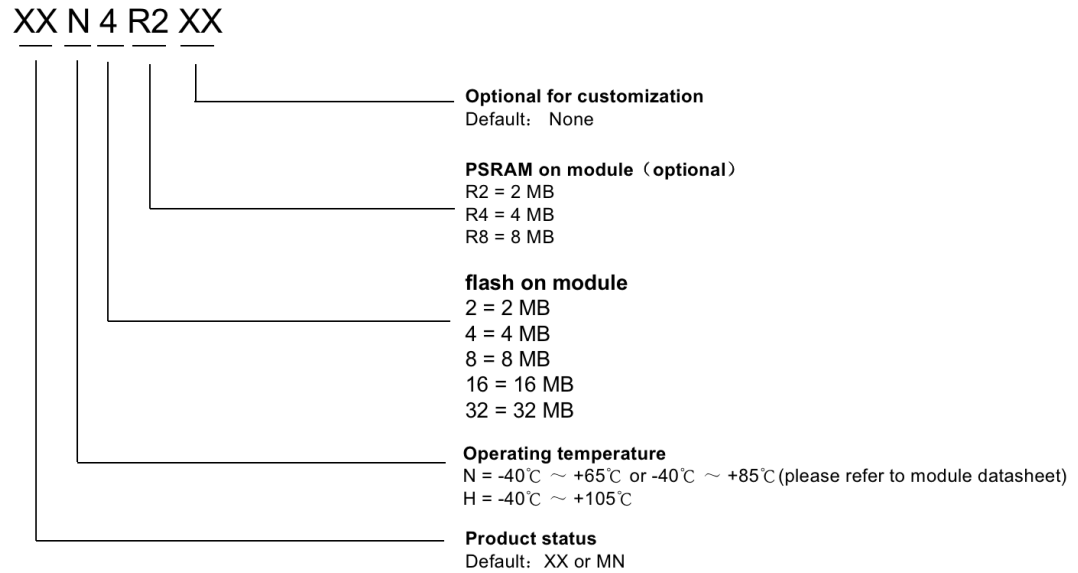


Table 2-2. Specification Identifier Convention

Field (from bottom up)	Description
Product Status	2 digits: - XX or MN: mass production - Others: NPI product See details in the Note below.
Temperature	1 digit: - N: 85°C/65°C - H: 105°C
Flash Size	1 digit or 2 digits: 2: 2 MB 4: 4 MB 8: 8 MB 16: 16 MB 32: 32 MB
PSRAM	1 digit: R: PSRAM inside
PSRAM Size	1 digit: 2: 2 MB 8: 8 MB



Field (from bottom up)	Description
Reserved	2 digits: for customized product
	0 digit: mass production product

 Note:

1. **Product Status:**

- Both XX and MN are used to indicate mass production products.
 - XX is used for products launched earlier;
 - MN is commonly used for newly launched products or products with new ECOs launched. For example, M0, M1 or MA, MB....
- Examples of other possible codes can be E1, D2, and P3, indicating this is an NPI product under development or in trail run.

2. The **PSRAM** and **PSRAM Size** fields only exist if this module comes with PSRAM. For example,

- *XXN4:* indicates the module comes with 4 MB flash and no PSRAM.
- *XXN4R2:* indicates the module comes with 4 MB flash and 2 MB PSRAM.

2.3. Data Matrix Convention

Scanning the Data Matrix on Espressif modules returns you a 18-digit code. The convention for this code is described below:

Table 2-4. Data Matrix Code Convention

Digit (from left to right)	Description
Digit 1 and Digit 2	Reserved for Espressif use
Digit 3 to Digit 6	The production Date Code (YYWW), indicating the WW week of YYYY year
Digit 7 to Digit 18	Module MAC ID



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