

文件编号 Document No.	ESP-07-2-007-03	文件名称 Document Name	产品/工艺变更通知 Product/Process Change Notice (PCN)
文件版本 Document Version	1.4	保存期限 Retention Period	5 年 5 years

ESP32 系列模组新增备选 4 MB flash 物料
Add Alternative 4 MB Flash Source for ESP32 Series of Modules

PCN 编号 PCN No.	PCN20241002	提出日期 Issue Date of PCN	2024/11/12
变更日期 Proposed Date of Change	2024/12/08	预计变更后产品首次出货日期 Proposed Date of First Shipment After Change	2025/01/08
PCN 类型 / PCN Category	☐ 客户需要批准/ Customer Approval Required ☒ 客户通知/ Customer Notification		

1. 影响产品名称/ Affected Product Name

Product Name	Product MPN	Ambient Temp. (°C)
ESP32-WROOM-32	ESP32-WROOM-32-N4 ESP32-WROOM-32(M103QH3200PH3Q0)	-40~85
ESP32-WROOM-32D	ESP32-WROOM-32D-N4 ESP32-WROOM-32D(M113DH3200PH3Q0)	-40~85
ESP32-WROOM-32U	ESP32-WROOM-32U-N4 ESP32-WROOM-32U(M113DH3200UH3Q0)	-40~85
ESP32-WROVER-B	ESP32-WROVER-B-N4R8 ESP32-WROVER-B(M213DH3264PH3Q0)	-40~85
ESP32-WROVER-IB	ESP32-WROVER-IB-N4R8 ESP32-WROVER-IB(M213DH3264UH3Q0)	-40~85
ESP32-WROVER-E	ESP32-WROVER-E-N4R8 ESP32-WROVER-E(M213EH3264PH3Q0)	-40~85
ESP32-WROVER-E	ESP32-WROVER-E-N4R2 ESP32-WROVER-E(M213EH6416PH3Q0)	-40~85
ESP32-WROVER-IE	ESP32-WROVER-IE-N4R8 ESP32-WROVER-IE(M213EH3264UH3Q0)	-40~85
ESP32-WROVER-IE	ESP32-WROVER-IE-N4R2	-40~85
ESP32-WROOM-32E	ESP32-WROOM-32E-N4 ESP32-WROOM-32E(M113EH3200PH3Q0)	-40~85
ESP32-WROOM-32E	ESP32-WROOM-32E-N4R2	-40~85
ESP32-WROOM-32UE	ESP32-WROOM-32UE-N4 ESP32-WROOM-32UE(M113EH3200UH3Q0)	-40~85

ESP32-SOLO-1C	ESP32-SOLO-1C-N4 ESP32-SOLO-1C(M113SH3200PH3D0)	-40~85
ESP32-WROOM-32	ESP32-WROOM-32-N4-DK	-40~85
ESP32-GR	ZM32GR300R00	-40~85
ESP32-WROOM-32E	ESP32-WROOM-32E-H4 ESP32-WROOM-32E(M113EH3200PS3Q0)	-40~105
ESP32-WROOM-32UE	ESP32-WROOM-32UE-H4 ESP32-WROOM-32UE(M113EH3200US3Q0)	-40~105
ESP32-WROOM-32D	ESP32-WROOM-32D-H4 ESP32-WROOM-32D(M113DH3200PS3Q0)	-40~105
ESP32-WROOM-32U	ESP32-WROOM-32U-H4 ESP32-WROOM-32U(M113DH3200US3Q0)	-40~105
ESP32-SOLO-1	ESP32-SOLO-1-H4 ESP32-SOLO-1(M113SH3200PS3Q0)	-40~105

2. 变更原因/ Reason for Change
 为提高供应稳定性，乐鑫完成了 XM25UH32D 系列 flash 在 ESP32 芯片平台的物料验证测试，测试通过，因此决定导入 XM25UH32D 系列 flash 作为段落 1 列出产品的备选 flash 物料。
 To ensure a robust and diversified module supply, Espressif has qualified XM25UH32D series flash as the new alternative source for products listed in Para 1.

3. 变更描述/ Description of Change
 导入 XM25UH32D 系列 flash 作为乐鑫 ESP32 系列 4 MB 模组的备选 flash 物料。
 Introduced XM25UH32D series flash as an alternative source for the Espressif modules listed in Para1.

4. 变更对比/ Change Comparison
 请见附录 I：变更对比。
 Please refer to Appendix I: Change comparison.

5. 变更影响/ Impact of Change

- 品质 and 性能/ Quality & Performance:**
 XM25UH32D 系列 flash 已经通过了物料验证测试，乐鑫确认该 flash 的品质和性能满足乐鑫的要求。
 XM25UH32D series flash has completed the qualification test. Espressif confirms it fully meets the Espressif's requirements for quality and performance.
- 交期/ Delivery:** 不影响/ No impact
- 生产料号/ Material Part Numbers (MPN):**
 如采购段落 1 中列出的产品，可使用原名称下单。
 If customer purchases the product listed in para 1, please place an order with the exist product name.
- 认证/ Certification:** 不影响/ No impact
- 软件/ Software:** 不影响/ No impact
- 技术规格书/ Datasheet:** 不影响且不需变更/ No impact and need no change

6. 变更前后产品处理/ How to Deal with Products

FIFO

7. 相关报告/ Related Report(s):☒ **Material Qualification Report**

编号 No.	测试项目 Test Item	测试结果 Test Result
1	运行模式测试 Operation Mode Test	Pass
2	Deep Sleep 唤醒测试 Wake up from Deep Sleep Test	Pass
3	掉电测试 Powerdown Test	Pass
4	模拟常规 OTA 测试 Simulated General OTA Test	Pass
5	高低温读写测试 High-Low Temp. Read/Write	Pass
6	高温批量读写测试 High Temp. Read/Write (Batch)	Pass

☒ **Environment Related Report (RoHS / REACH / HF etc.)**

更新后的产品符合 RoHS 标准和 REACH 标准。

Product after change meets the RoHS requirements and the REACH requirements.

Appendix I 变更对比/ Change Comparison

1. -40~85°C flash Information

Item	变更前 Before Change		变更后 After Change
Flash Part Number	Flash A	Flash B	Add XM25UH32DHIGT
Product Name/MPN (No Changes)	See Product List in Para 1	See Product List in Para 1	See Product List in Para 1
Flash Operating Voltage	2.3V ~ 3.6V	2.3V ~ 3.6V	2.7V ~ 3.6V
	All the affected modules should work at 3.0V ~ 3.6V, so all types of flash meet the requirements.		
Module Typical Power Supply Voltage (No Changes)	3.3V	3.3V	3.3V
Flash Capacity (No Changes)	4 MB	4 MB	4 MB
Flash Temperature Range (No Changes)	-40°C ~ 85 °C	-40°C ~ 85 °C	-40°C ~ 85 °C
Page Program Time (Typ. / Max)	0.5 ms/ 3 ms	0.5 ms/ 2 ms	0.25 ms/ 2 ms
Sector Erase Time (4KB) (Typ. / Max)	50 ms / 500 ms	30 ms / 400 ms	25 ms / 300 ms
Block Erase Time (32KB) (Typ. / Max)	0.15 s / 1.4 s	0.12 s / 0.8 s	0.1 s / 0.8 s
Block Erase Time (64KB) (Typ. / Max)	0.3 s / 1.8 s	0.24 s / 2 s	0.15 s / 1 s
Chip Erase Time (Typ. / Max)	20 s / 60 s	14 s / 50 s	5 s / 50 s

2. -40~105°C flash Information

Item	变更前 Before Change	变更后 After Change
Flash Part Number	flash C	Add XM25UH32DHPGT
Product Name/MPN (No Changes)	See Product List in Para 1	See Product List in Para 1
Flash Operating Voltage	2.3V ~ 3.6V	2.7V ~ 3.6V
	All the affected modules should work at 3.0V ~ 3.6V, so all types of flash meet the requirements.	
Module Typical Power Supply Voltage (No Changes)	3.3V	3.3V
Flash Capacity (No Changes)	4 MB	4 MB
Flash Temperature Range (No Changes)	-40°C ~ 105 °C	-40°C ~ 105 °C
Page Program Time (Typ. / Max)	0.5 ms / 5 ms	0.25 ms / 2 ms
Sector Erase Time (4KB) (Typ. / Max)	50 ms / 500 ms	25 ms / 300 ms
Block Erase Time (32KB) (Typ. / Max)	0.15 s / 1.4 s	0.1 s / 0.8 s
Block Erase Time (64KB) (Typ. / Max)	0.3 s / 1.8 s	0.15 s / 1 s
Chip Erase Time (Typ. / Max)	20 s / 60 s	5 s / 50 s

邮件订阅**Espressif Email Notifications**

乐鑫为注册用户提供电子邮件通知服务，用户可通过[乐鑫订阅系统](#)接收技术文档更新、新闻通讯、PCN 等邮件通知。

Espressif sends email notifications of technical documentation changes, along with newsletters, PCNs and other valuable information, to subscribed customers only. If you wish to stay updated on our products and services, please subscribe [here](#).

客户响应要求**Customer Response Requirements****需客户批准的变更/ Change Requiring Customer Approval:**

- a) 客户须在乐鑫发出 PCN 后的 30 天内告知乐鑫已收到 PCN。如客户未在接收到 PCN 后的 30 天内告知已收到，则视为客户收到变更。

Customers are requested to acknowledge receipt of the PCN within 30 calendar days from the date of issue of the PCN. Customers would be considered as notified 30 calendar days after issue of the PCN if no acknowledgement is received.

- b) 自发布 PCN 之日起 90 天内，客户没有任何其他反馈，则表示客户接受该 PCN。

The lack of any additional responses from customers within 90 calendar days from the date of issue of the PCN constitutes acceptance of the proposed changes.

客户通知/ Customer Notification:

- a) 客户需在乐鑫发出 PCN 后 14 天内通知乐鑫收到该 PCN。如客户未在接收到 PCN 14 日反馈乐鑫，则视为客户确认该 PCN。

Customers are requested to acknowledge receipt of the PCN within 14 calendar days from the date of issue of the PCN. Customers would be considered as having acknowledged the PCN if no response is received after 14 calendar days.

请反馈至 pcn@espressif.com。

Please send feedback to pcn@espressif.com.

客户批准/确认信息**Customer Approval/Acknowledgement and Remarks**

客户公司全称:

Customer' s Company Name:

PCN 评审结果/ PCN Review Result:

- ☐ 批准/确认 Accepted/Acknowledged
☐ 不批准/ Rejected
☐ 需要分析/ Further Analysis Required

客户意见/Comment:

公司代表人姓名
Representative' s Name:

公司代表人职责
Representative' s Job
Title:

公司代表人签名
Representative' s
Signature:

日期
Date: