

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-C2 (ESP8684) 系列产品由芯片版本: v1.1 升级为芯片版本: v1.2**Upgrade ESP32-C2 (ESP8684) Series Products from Chip Revision v1.1 to Chip Revision v1.2**

PCN 编号 PCN No.	PCN20231102	提出日期 Issue Date of PCN	2024/01/23
变更日期 Proposed Date of Change	2024/02/23	预计变更后产品首次出货日期 Proposed Date of First Shipment After Change	2024/03/23
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**1) 芯片产品 / Chip Products:**

ESP8684H2, ESP8684H4

2) 模组产品 / Module Products:

产品名称/ Product Name	MPN	Chip on Board
ESP8684-MINI-1	ESP8684-MINI-1-H2	ESP8684H2
ESP8684-MINI-1	ESP8684-MINI-1-H4	ESP8684H4
ESP8684-MINI-1U	ESP8684-MINI-1U-H2	ESP8684H2
ESP8684-MINI-1U	ESP8684-MINI-1U-H4	ESP8684H4
ESP8684-WROOM-01C	ESP8684-WROOM-01C-H2	ESP8684H2
ESP8684-WROOM-01C	ESP8684-WROOM-01C-H4	ESP8684H4
ESP8684-WROOM-02C	ESP8684-WROOM-02C-N2	ESP8684H2
ESP8684-WROOM-02C	ESP8684-WROOM-02C-N4	ESP8684H4
ESP8684-WROOM-02C	ESP8684-WROOM-02C-H4	ESP8684H4
ESP8684-WROOM-02UC	ESP8684-WROOM-02UC-N2	ESP8684H2
ESP8684-WROOM-02UC	ESP8684-WROOM-02UC-N4	ESP8684H4
ESP8684-WROOM-02UC	ESP8684-WROOM-02UC-H2	ESP8684H2

ESP8684-WROOM-02UC	ESP8684-WROOM-02UC-H4	ESP8684H4
ESP8684-WROOM-03	ESP8684-WROOM-03-H2	ESP8684H2
ESP8684-WROOM-03	ESP8684-WROOM-03-H4	ESP8684H4
ESP8684-WROOM-04C	ESP8684-WROOM-04C-H2	ESP8684H2
ESP8684-WROOM-04C	ESP8684-WROOM-04C-H4	ESP8684H4
ESP8684-WROOM-05	ESP8684-WROOM-05-H2	ESP8684H2
ESP8684-WROOM-05	ESP8684-WROOM-05-H4	ESP8684H4
ESP8684-WROOM-06C	ESP8684-WROOM-06C-H2	ESP8684H2
ESP8684-WROOM-06C	ESP8684-WROOM-06C-H4	ESP8684H4
ESP8684-WROOM-07	ESP8684-WROOM-07-H2	ESP8684H2
ESP8684-WROOM-07	ESP8684-WROOM-07-H4	ESP8684H4

3) 开发板产品/ Develop Board Products:

产品名称/ Product Name	MPN
ESP8684-DevKitM-1	ESP8684-DevKitM-1-H4
	ESP8684-DevKitM-1U-H4

2. 变更原因/ Reason for Change

优化 ESP32-C2 (ESP8684) 系列芯片空闲信道评估 (Clear Channel Assessment, CCA) 相关硬件设计。降低低功耗蓝牙 (Bluetooth® LE) CCA 功能开启状态时的产品 CPU 占有率。段落 1 列出的模组和开发板中使用的主芯片为 ESP32-C2 (ESP8684) 系列芯片，因此段落 1 列出的模组和开发板产品也进行相应的更新。

Espressif upgraded the chip version of ESP32-C2 (ESP8684) to improve Clear Channel Assessment (CCA) related hardware design. When the Bluetooth® Low Energy (Bluetooth LE) CCA function is enabled, the CPU usage of the ESP32-C2 (ESP8684) series chips with upgraded chip revision v1.2 will experience a slight decrease. The main chips used in the modules and development boards listed in paragraph 1 are ESP32-C2 (ESP8684) chips, so these modules and development boards have also been updated accordingly.

3. 变更描述/ Description of Change

对芯片版本为 v1.1 的 ESP32-C2 (ESP8684) 芯片进行主晶圆金属层设计变更，从而将芯片版本升级为 v1.2。段落 1 列出的模组和开发板产品中使用的主芯片为 ESP32-C2 (ESP8684) 系列芯片，因此段落 1 列出的模组和开发板产品也进行相应的更新。

ESP32-C2 (ESP8684) chips revision v1.2 is a metal layer design change to the chip revision v1.1. The modules and development board listed in Para 1 are based on ESP32-C2 (ESP8684) series of chips, and thus will change accordingly.



4. 变更对比/ Change Comparison

请见附录 I：变更对比。

Please refer to Appendix I: Change comparison.

识别方式/Identification Method:

芯片产品通过 eFuse，产品丝印。

模组产品通过主芯片的 eFuse，产品丝印的产品规格标识位，或产品外箱标签中的 PW 号。

开发板产品通过主芯片的 eFuse，模组丝印的产品规格标识位，或产品外箱标签中的 PW 号。

Chip products: Identified by eFuse bits, chip marking.

Module products: Identified by the chip eFuse, module marking or PW No. on carton box.

Development board product: Identified by the chip eFuse, module marking or PW No. on carton box.

5. 变更影响/ Impact of Change

1) 品质和性能/ Quality & Performance:

无不良影响/No adverse impact.

在开启低功耗蓝牙 CCA 功能的情况下，芯片版本为 v1.2 的 ESP32-C2 (ESP8684) 系列芯片的 CPU 占有率会有一些降低。例如，CPU 运行频率为 120 MHz，当一个低功耗蓝牙连接间隔为 100 ms，每个连接间隔有一对收发包的情况下，芯片版本为 v1.2 的 ESP32-C2 (ESP8684) 系列芯片会减少约 0.015% 的 CPU 资源占用。

注意：当前 ESP-IDF 还未开放低功耗蓝牙 CCA 功能。芯片版本为 v1.2 的 ESP32-C2 (ESP8684) 系列芯片在开启低功耗蓝牙 CCA 功能时，CPU 占用与未开启低功耗蓝牙 CCA 时保持一致。

When the Bluetooth LE CCA feature is enabled, the CPU usage of ESP32-C2 (ESP8684) series chips with chip revision v1.2 will experience a slight decrease. For example, at a CPU operating frequency of 120 MHz, with the Bluetooth LE connection interval set to 100 ms and a pair of transmit and receive packets for each connection interval, the ESP32-C2 (ESP8684) series chips with chip revision v1.2 will reduce CPU resource usage by approximately 0.015%.

Note: ESP-IDF does not support the Bluetooth LE CCA feature yet. For ESP32-C2 (ESP8684) series chips with chip revision v1.2, when the Bluetooth LE CCA feature is enabled, CPU usage remains consistent with when Bluetooth LE CCA is not enabled.

2) 交期/ Delivery: 无影响/No impact

3) 生产料号/ Material Part Numbers (MPN):

客户可以继续使用原有的芯片产品订购型号下单；

段落 1 中列出的模组的 MPN 不变更，客户可以继续使用原有的模组 MPN 进行下单。

Customers can continue using the existing chip ordering codes to place orders.

There is no change to the MPN of the affected Espressif modules listed in para 1. Customers can continue to use existing MPN to place orders.

4) 认证/ Certification: 无影响/ No impact

5) 软件/ IDF:

ESP-IDF v5.0 为首次支持 ESP32-C2 系列芯片的 ESP-IDF 版本，该版本兼容变更后的 ESP32-C2 系列产品，客户可继续使用 ESP-IDF v5.0 及之后的 IDF 版本进行变更后产品的生产。

低功耗蓝牙 CCA 功能在 ESP-IDF 各版本上的支持状态，可参见[此处](#)。

ESP-IDF v5.0 is the first IDF version to support ESP32-C2 series products. This version is already compatible with the updated ESP32-C2 series products listed in Para 1, allowing customers to continue using ESP-IDF v5.0 and later versions for the updated products.

For the support status of the Bluetooth LE CCA feature across various ESP-IDF versions, please refer to [here](#).

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

FIFO

7. 相关报告/ Related Report(s):

☒ RF Performance Test Pass

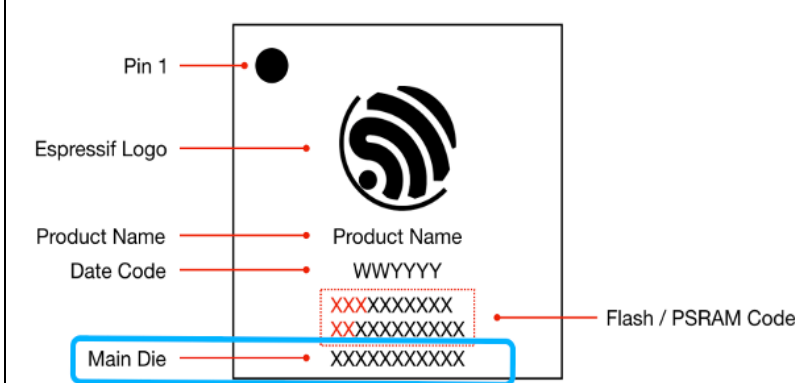
8. 给使用者的验证建议/ Verification Suggestion To Users

建议客户结合实际应用场景进行验证。

Suggest customer can do the verification with practical application scenarios.

Appendix I 变更对比/ Change Comparison

1. 产品基本信息/ Product Basic Information

No.	项目/ Item	变更前/ Before Change	变更后/ After Change
1	Chip Revision	v1.1	v1.2
2	ESP32-C2 Series Chip Marking (Main Die Line)		
		xBxxxxxxx	xCxxxxxxx
3	ESP32-C2 Series Module MPN	No change	
4	ESP32-C2 Series Module Marking (Specification Marking Line)		
		XBXXXX	MCXXXX

2. 芯片 eFuse 信息/ Chip eFuse Information

	eFuse Identification Bits eFuse 标识位	芯片版本/ Chip Revision			
		v0.0	v1.0	v1.1	v1.2
Major Number	EFUSE_BLK2_DATA1_REG[21]	0	0	0	0
	EFUSE_BLK2_DATA1_REG[20]	0	1	1	1
Minor Number	EFUSE_BLK2_DATA1_REG[19]	0	0	0	0
	EFUSE_BLK2_DATA1_REG[18]	0	0	0	0
	EFUSE_BLK2_DATA1_REG[17]	0	0	0	1
	EFUSE_BLK2_DATA1_REG[16]	0	0	1	0

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: