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 系列产品的芯片版本升级

Upgrade Chip Revision of ESP32 Series Products

PCN 编号 PCN No.	PCN20220901	提出日期 Issue Date of PCN	2022/10/25
变更日期 Proposed Date of Change	2022/12/25	预计变更后产品首次出货日期 Proposed Date of First Shipment After Change	2023/01/25
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/ Affected Products

1) 分类 1：ESP32 原芯片版本为 v1.0 的芯片及对应的模组、开发板产品，具体产品清单参见附录 I。
Category 1: Products with ESP32 chip revision v1.0 before change, related product list see Appendix I.

2) 分类 2：ESP32 原芯片版本为 v3.0 及对应的模组、开发板产品，具体产品清单参见附录 I。
Category 2: Products with ESP32 chip revision v3.0 before change, related product list see Appendix I.

注：芯片版本说明参见《关于芯片版本 (Chip Revision) 编码方式的兼容性公告》
Note: For description of chip revision see *Compatibility Advisory for Chip Revision Numbering Scheme*

2. 变更原因/ Reason for Change

为进一步扩大 ESP32 系列产品的应用范围，适应更多复杂高温场景，升级 ESP32 系列产品的芯片版本，并同步调整 ESP32 高温 (–40 ℃ ~ 105 ℃) 模组产品上晶振的串联电阻规格。
To broaden the product application realm and ensure stable operating under more complicated and high temperature circumstances, the chip revision of ESP32 series of chips will be upgraded. The series resistance of the crystal on the ESP32 high temperature version (–40 ℃ ~ 105 ℃) modules will also be changed.

3. 变更描述/ Description of Change

升级 ESP32 系列产品的芯片版本，原芯片版本为 v1.0 的 ESP32 产品，由 v1.0 升级到 v1.1；原芯片版本为 v3.0 的 ESP32 产品，由 v3.0 升级到 v3.1。同时 ESP32 高温 (–40 ℃ ~ 105 ℃) 模组上晶振的串联电阻规格由 0 Ω 变更为 100 Ω。
Upgrade the chip revision v1.0 on the ESP32 series products to v1.1, and chip revision v3.0 to v3.1. Change the crystal's series resistance on the ESP32 high temperature version (–40 ℃ ~ 105 ℃) modules from 0 Ω to 100 Ω.

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 及产品丝印。

Chip products: Identified by eFuse bits and chip marking.

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。

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

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。

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

5. 变更影响/ Impact of Change

1) 品质和性能/ Quality & Performance：无影响/ No impact
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产品名称下单。

   Customers can continue using the existing product name to place orders.
4) 认证/ Certification：无影响/ No impact
5) 软件/ IDF：

   当前的乐鑫 IDF 版本兼容段落 1 列出的变更后的产品，客户可继续使用现有的软件版本进行变更后产品的生产。

   Changed products listed in Para 1 are compatible with the current version of ESP-IDF. Customers can still use the current version for the changed products.

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

FIFO

7. 相关报告/ Report(s) Attached:

☑Related ECN No. ECN-2022-005 & ECN-2022-015 & ECN-2022-036

☑射频性能验证/ RF Performance Verification: Pass

☑模组高温验证/ Module Verification: Pass

Appendix I 变更对比/ Change Comparison

一. 分类 1 的产品基本信息/ Category 1 Product Basic Information

1. 分类 1 的产品清单/ Category 1 Product List

1) 芯片产品/ Chip Products:

ESP32-D0WDQ6, ESP32-D0WD, ESP32-S0WD, ESP32-PICO-D4

2) 模组产品/ Module Products:

Product Name	MPN	Change Description
ESP32-WROOM-32	ESP32-WROOM-32-N4, ESP32-WROOM-32(M103QH3200PH3Q0)	Chip revision of ESP32 chip on the module upgraded to v1.1
	ESP32-WROOM-32-N8, ESP32-WROOM-32(M103QH6400PH3Q0)	
	ESP32-WROOM-32-N16, ESP32-WROOM-32(M103QH2800PH3Q0)	
ESP32-WROVER	ESP32-WROVER-N4R8, ESP32-WROVER(M203QL3264PH3Q0)	
	ESP32-WROVER-I-N4R8, ESP32-WROVER-I(M203QL3264UH3Q0)	
	ESP32-WROVER-N8R8, ESP32-WROVER(M203QL6464PH3Q0)	
	ESP32-WROVER-N16R8, ESP32-WROVER(M203QL2864PH3Q0)	
	ESP32-WROVER-I-N8R8, ESP32-WROVER-I(M203QL6464UH3Q0)	
	ESP32-WROVER-I-N16R8, ESP32-WROVER-I(M203QL2864UH3Q0)	
ESP32-WROVER-B	ESP32-WROVER-B-N4R8, ESP32-WROVER-B(M213DH3264PH3Q0)	
	ESP32-WROVER-B-N8R8, ESP32-WROVER-B(M213DH6464PH3Q0)	
	ESP32-WROVER-B-N16R8, ESP32-WROVER-B(M213DH2864PH3Q0)	
	ESP32-WROVER-IB-N4R8, ESP32-WROVER-IB(M213DH3264UH3Q0)	
	ESP32-WROVER-IB-N8R8, ESP32-WROVER-IB(M213DH6464UH3Q0)	
	ESP32-WROVER-IB-N16R8, ESP32-WROVER-IB(M213DH2864UH3Q0)	
ESP32-WROOM-32DC	ESP32-WROOM-32DC-N4, ESP32-WROOM-32DC(M113DH3200PH3D0)	
ESP32-WROOM-32UC	ESP32-WROOM-32UC-N4, ESP32-WROOM-32UC(M113DH3200UH3D0)	
ESP32-SOLO-1C	ESP32-SOLO-1C-N4, ESP32-SOLO-1C(M113SH3200PH3D0)	
ESP32-WROOM-32SE	ESP32-WROOM-32SE-N4, ESP32-WROOM-32SE(M123DH3200PH3Q0), ESP32-WROOM-32SE(M123DH3200PH3QC)	
	ESP32-WROOM-32SE-N8, ESP32-WROOM-32SE(M123DH6400PH3QC)	
	ESP32-WROOM-32SE-N16, ESP32-WROOM-32SE(M123DH2800PH3QC)	
ESP32-WATG-32D	ESP32-WATG-32D(ATG3DH6400PH3D0)	
	ESP32-WATG-32D(ATG3DH6400PH3D1)	

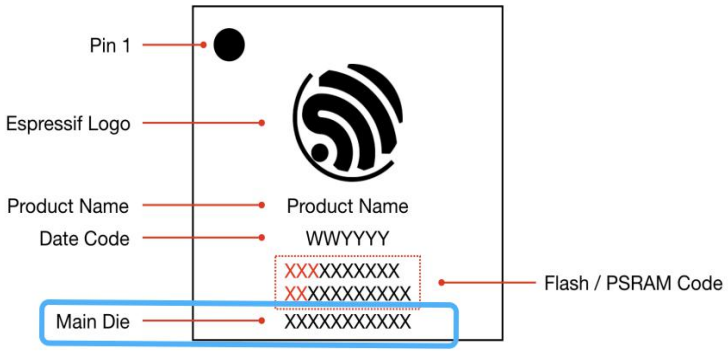
Product Name	MPN	Change Description
W1126188 series	W11261889	Chip revision of ESP32 chip on the module upgraded to v1.1
	W11261888	
ESP32-WROOM-32U	ESP32-WROOM-32U-N4, ESP32-WROOM-32U(M113DH3200UH3Q0)	Chip revision of ESP32 chip on the module upgraded to v1.1
	ESP32-WROOM-32U-N8, ESP32-WROOM-32U(M113DH6400UH3Q0)	
	ESP32-WROOM-32U-N16, ESP32-WROOM-32U(M113DH2800UH3Q0)	
	ESP32-WROOM-32U-H4, ESP32-WROOM-32U(M113DH3200US3Q0)	Chip revision of ESP32 chip on the module upgraded to v1.1; R2 on the module updated from 0 Ω to 100 Ω
ESP32-WROOM-32D	ESP32-WROOM-32D-N4, ESP32-WROOM-32D(M113DH3200PH3Q0)	Chip revision of ESP32 chip on the module upgraded to v1.1
	ESP32-WROOM-32D-N8, ESP32-WROOM-32D(M113DH6400PH3Q0)	
	ESP32-WROOM-32D-N16, ESP32-WROOM-32D(M113DH2800PH3Q0)	
	ESP32-WROOM-32D-H4, ESP32-WROOM-32D(M113DH3200PS3Q0)	Chip revision of ESP32 chip on the module upgraded to v1.1; R2 on the module updated from 0 Ω to 100 Ω
ESP32-SOLO-1	ESP32-SOLO-1-N4, ESP32-SOLO-1(M113SH3200PH3Q0)	Chip revision of ESP32 chip on the module upgraded to v1.1
	ESP32-SOLO-1-H4, ESP32-SOLO-1(M113SH3200PS3Q0)	Chip revision of ESP32 chip on the module upgraded to v1.1; R2 on the module updated from 0 Ω to 100 Ω

3) 开发板产品 / Development Board Products：

Product Name	MPN	Change Description
ESP32-DevKitC	ESP32-DevKitC-32D	Chip revision of ESP32 chip on the module upgraded to v1.1
	ESP32-DevKitC-32D64	
	ESP32-DevKitC-32U	
	ESP32-DevKitC-32U28	
	ESP32-DevKitC-S1	
	ESP32-DevKitC-VB	
	ESP32-DevKitC-VIB	
	ESP32-DevKitC-VIB64	
	ESP32-DevKitC-SE	
	ESP32-DevKitC-SE28	
ESP-WROVER-KIT	ESP-WROVER-KIT-VB	
	ESP-WROVER-KIT-RVB	
ESP32-MeshKit-Sense	ESP32-MeshKit-Sense	
ESP32-PICO-KIT	ESP32-PICO-KIT	
ESP-EYE	ESP-EYE	

Product Name	MPN	Change Description
ESP32-LyraTD-DSPG	ESP32-LyraTD-DSPG	Chip revision of ESP32 chip on the module upgraded to v1.1
ESP32-Ethernet-Kit	ESP32-Ethernet-Kit	
ESP32-Azure-IOT-Kit	ESP32-Azure-IOT-Kit	
ESP32-DK-Ethernet	ESP32-DK-Ethernet	

2. 分类 1 的产品变更对比/ Category 1 Product Change Comparison

<table>
<tr><th>No.</th><th colspan="2">项目/ Item</th><th>变更前/ Before Change</th><th>变更后/ After Change</th></tr>
<tr><td>1</td><td colspan="2">Chip Revision</td><td>v1.0</td><td>v1.1</td></tr>
<tr><td rowspan="5">2</td><td rowspan="5">Register Address in eFuse</td><td>EFUSE_BLK0_RDATA5[25]</td><td>0</td><td>0</td></tr>
<tr><td>EFUSE_BLK0_RDATA5[24]</td><td>0</td><td>1</td></tr>
<tr><td>APB_CTRL_DATA[31]</td><td>0</td><td>0</td></tr>
<tr><td>EFUSE_BLK0_RDATA5[20]</td><td>0</td><td>0</td></tr>
<tr><td>EFUSE_BLK0_RDATA3[15]</td><td>1</td><td>1</td></tr>
<tr><td rowspan="2">3</td><td colspan="2" rowspan="2">Chip Marking
(Main Die Line)</td><td colspan="2"> 
</td></tr>
<tr><td>xBxxxxxx</td><td>xFxxxxxx</td></tr>
<tr><td>4</td><td colspan="2">Module MPN</td><td colspan="2">No change</td></tr>
<tr><td rowspan="2">5</td><td colspan="2" rowspan="2">Module Marking
（Specification Marking Line）</td><td colspan="2"> 
</td></tr>
<tr><td>XXXXXX</td><td>MFXXXX</td></tr>
<tr><td>6</td><td colspan="2">The series resistance of the crystal on the ESP32 (–40 ℃ ~ 105 ℃) module</td><td>0 Ω</td><td>100 Ω</td></tr>
</table>

二. 分类 2 的产品基本信息/ Category 2 Product Basic Information

1. 分类 2 的产品清单/ Category 2 Product List

1) 芯片产品/ Chip Products：

ESP32-D0WD-V3, ESP32-D0WDQ6-V3, ESP32-U4WDH, ESP32-D0WDR2-V3,

ESP32-PICO-V3, ESP32-PICO-V3-02

2) 模组产品/ Module Products：

Product Name	MPN	Change Description
ESP32-WROVER-E	ESP32-WROVER-E-N4R8, ESP32-WROVER-E(M213EH3264PH3Q0)	Chip revision of ESP32 chip on the module upgraded to v3.1
	ESP32-WROVER-E-N8R2, ESP32-WROVER-E(M213EH6416PH3Q0)	
	ESP32-WROVER-E-N8R8, ESP32-WROVER-E(M213EH6464PH3Q0)	
	ESP32-WROVER-E-N16R8, ESP32-WROVER-E(M213EH2864PH3Q0)	
ESP32-WROVER-IE	ESP32-WROVER-IE-N4R8, ESP32-WROVER-IE(M213EH3264UH3Q0)	
	ESP32-WROVER-IE-N8R8, ESP32-WROVER-IE(M213EH6464UH3Q0)	
	ESP32-WROVER-IE-N16R8, ESP32-WROVER-IE(M213EH2864UH3Q0)	
ESP32-DU1906	ESP32-DU1906-N8R8, ESP32-DU1906(M403EH6464PH3Q0)	
	ESP32-DU1906-N16R8, ESP32-DU1906(M403EH2864PH3Q0)	
ESP32-DU1906-U	ESP32-DU1906-U-N8R8, ESP32-DU1906-U(M403EH6464UH3Q0)	
	ESP32-DU1906-U-N16R8, ESP32-DU1906-U(M403EH2864UH3Q0)	
ESP32-WROOM-DA	ESP32-WROOM-DA-N8	
	ESP32-WROOM-DA-N4	
	ESP32-WROOM-DA-N16	
ESP32-PICO-MINI-02	ESP32-PICO-MINI-02-N8R2	
ESP32-PICO-MINI-02U	ESP32-PICO-MINI-02U-N8R2	
ESP32-GR	ZM32GR300R00	
EK057	IC EK 057-D2-ID5511 A1	
EK058	EK058 MX8PS2	
ESP32-PICO-V3-ZERO	ESP32-PICO-V3-ZERO(P103AH0000PH3Q0)	
	ESP32-PICO-V3-ZERO(P103AH0000PH3Q1)	
ESP32-WROOM-32E	ESP32-WROOM-32E(M113EH3200PH3QF)	Chip revision of ESP32 chip on the module upgraded to v3.1
	ESP32-WROOM-32E-N4, ESP32-WROOM-32E(M113EH3200PH3Q0)	
	ESP32-WROOM-32E-N8, ESP32-WROOM-32E(M113EH6400PH3Q0)	
	ESP32-WROOM-32E-N16, ESP32-WROOM-32E(M113EH2800PH3Q0)	
	ESP32-WROOM-32E-H4, ESP32-WROOM-32E(M113EH3200PS3Q0)	Chip revision of ESP32 chip on the module upgraded to v3.1; R2 on the module updated from 0 Ω to 100 Ω
	ESP32-WROOM-32E-H8, ESP32-WROOM-32E(M113EH6400PS3Q0)	

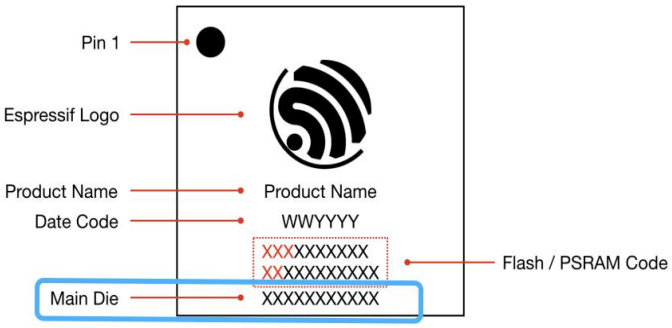
Product Name	MPN	Change Description
ESP32-WROOM-32UE	ESP32-WROOM-32UE-N4, ESP32-WROOM-32UE(M113EH3200UH3Q0)	Chip revision of ESP32 chip on the module upgraded to v3.1
	ESP32-WROOM-32UE-N8, ESP32-WROOM-32UE(M113EH6400UH3Q0)	
	ESP32-WROOM-32UE-N16, ESP32-WROOM-32UE(M113EH2800UH3Q0)	
	ESP32-WROOM-32UE-H4, ESP32-WROOM-32UE(M113EH3200US3Q0)	Chip revision of ESP32 chip on the module upgraded to v3.1; R2 on the module updated from 0 Ω to 100 Ω
	ESP32-WROOM-32UE-H8, ESP32-WROOM-32UE(M113EH6400US3Q0)	
ESP32-MINI-1	ESP32-MINI-1-N4	Chip revision of ESP32 chip on the module upgraded to v3.1
	ESP32-MINI-1-H4	Chip revision of ESP32 chip on the module upgraded to v3.1; R2 on the module updated from 0 Ω to 100 Ω
ESP32-MINI-1U	ESP32-MINI-1U-N4	Chip revision of ESP32 chip on the module upgraded to v3.1
	ESP32-MINI-1U-H4	Chip revision of ESP32 chip on the module upgraded to v3.1; R2 on the module updated from 0 Ω to 100 Ω
ESP32-SIG149	ESP32-SIG149	Chip revision of ESP32 chip on the module upgraded to v3.1; R4 on the module updated from 0 Ω to 100 Ω
ESP32-SIG1711P8	ESP32-SIG1711P8	

3) 开发板产品/ Development Board Products：

Product Name	MPN	Change Description
ESP32-DevKitC	ESP32-DevKitC-32E	Chip revision of ESP32 chip on the board upgraded to v3.1
	ESP32-DevKitC-32UE	
	ESP32-DevKitC-VE	
	ESP32-DevKitC-VIE	
	ESP32-DevKitC-32E28	
	ESP32-DevKitC-32UE28	
	ESP32-DevKitC-DA	
ESP32-LyraT	ESP32-LyraT	
ESP32-LyraTD-MSC	ESP32-LyraTD-MSC	
ESP32-WROVER-KIT	ESP32-WROVER-KIT-VE	
ESP32-LyraT-Mini	ESP32-LyraT-Mini	
ESP32-LyraTD-SYNA	ESP32-LyraTD-SYNA	
ESP32-Vaquita-DSPG	ESP32-Vaquita-DSPG	
ESP32-Korvo	ESP32-Korvo	
ESP32-Ethernet-Kit	ESP32-Ethernet-Kit-VE	
ESP32-PICO-KIT-1	ESP32-PICO-KIT-1	
ESP32-PICO-DevKitM-2	ESP32-PICO-DevKitM-2	
	ESP32-PICO-DevKitM-2U	

Product Name	MPN	Change Description
ESP32-DevKitM-1	ESP32-DevKitM-1	Chip revision of ESP32 chip on the board upgraded to v3.1
	ESP32-DevKitM-1U	
ESP32-PICO-V3-ZERO-DevKit	ESP32-PICO-V3-ZERO-DevKit	

2. 分类 2 的产品变更对比/ Category 2 Product Change Comparison

No.	项目/ Item		变更前/ Before Change	变更后/ After Change
1	Chip Revision		v3.0	v3.1
2	Register Address in eFuse	EFUSE_BLK0_RDATA5[25]	0	0
		EFUSE_BLK0_RDATA5[24]	0	1
		APB_CTRL_DATA[31]	1	1
		EFUSE_BLK0_RDATA5[20]	1	1
		EFUSE_BLK0_RDATA3[15]	1	1
3	Chip Marking (Main Die Line)			
			xExxxxxx	xGxxxxxx
4	Module MPN		No change	
5	Module Marking （Specification Marking Line）			
			XXXXXX	MGXXXX
6	The series resistance of the crystal on the ESP32 (–40 ℃ ~ 105 ℃) module		0 Ω	100 Ω

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:	