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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 PICO 系列产品更新

Upgrade of ESP32 PICO Series Product

PCN 编号 PCN No.	PCN20221001	提出日期 Issue Date of PCN	2022/11/28
变更日期 Proposed Date of Change	2023/01/28	预计变更后产品首次出货日期 Proposed Date of First Shipment After Change	2023/02/28
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：ESP32-PICO-D4，ESP32-PICO-V3

2）模组产品/ Module Products：ESP32-PICO-V3-ZERO

3）开发板产品/ Develop Board Product: ESP32-PICO-KIT, ESP32-PICO-KIT-1, ESP32-PICO-V3-ZERO-DevKit

2. 变更原因/ Reason for Change

1）我司使用的 GD25QXXC 系列 flash 的生产工艺为 65nm，供应商优化生产工艺为 55nm ，产品系列为 GD25QXXE。为保证产品供应，乐鑫完成了料号为 GD25Q32EGIG 的 flash 的物料验证，且测试结果符合乐鑫要求，因此决定引入该 flash 作为段落 1 列出芯片产品的叠封物料。由于段落 1 中列出的模组和开发板产品的主芯片为段落 1 列出的芯片产品，因此段落 1 中模组和开发板产品也发生相应变更。

Espressif's supplier for GD25QXXC series of flash (which uses the 65nm process technology), has launched GD25QXXE series of flash (which uses the more advanced 55nm process technology). Under this background, to ensure a robust supply, Espressif has qualified flash Part Number: GD25Q32EGIG as the new embedded flash source for chip products listed in Para 1. The modules and develop board products listed in Para 1 are based on chip products listed in Para 1, and thus will change accordingly.

2）为响应客户对模组产品的环保需求，变更 ESP32-PICO-V3-ZERO 模组的 PCB 板材使其符合无卤素标准。

In response to customers' environmental requirements for module products, the PCB boards of the module in Para 1 will be changed in order to comply with halogen free standard.

3. 变更描述/ Description of Change

1）段落 1 列出芯片产品的叠封 flash 的生产工艺由 65 nm 工艺升级为 55 nm。由于段落 1 中列出的模组和开发板产品的主芯片为段落 1 列出的芯片产品，因此段落 1 中的模组和开发板产品也发生相应变更。

The manufacture process technology of embedded flash material in chip products listed in Para 1 will change from 65 nm to 55 nm. The modules and develop board products listed in Para 1 are based on chip

products listed in Para 1, and thus will change accordingly.

2） ESP32-PICO-ZERO 的模组背面丝印增加无卤 HF 标识，模组 PCB 版本号升级。

'HF' marking is added on the bottom side of ESP32-PICO-ZERO and PCB version of ESP32-PICO-ZERO is upgraded in comparison with halogen modules.

注：涉及产品的变更说明详见附录 I‑1. 产品变更说明。

Note：Product Change Description please refers to Appendix I‑1. Product Change Description.

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

1） 品质和性能/ Quality & Performance:

变更后产品已经过乐鑫测试验证，确认性能和品质符合乐鑫要求。

Changed products have been tested by Espressif and confirmed to have met the performance and quality requirement.

2） 交期/ Delivery: 无影响/ No impact

3） 生产料号/ Manufacturer Part Number (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.

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.

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-2022-032 & ECN-2022-041

☑   Flash 物料验证信息/ Flash Material Qualification Information：

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	Pass

	Powerdown Test	
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

☑ 芯片可靠性测试/ Chip Reliability Test: Pass

测试项目 Rel. Item	测试条件 Rel. condition	测试样品量 S/S	结果 Result
PRE3	Bake24h+Soak192h(30/60)+Reflow*3	154	PASS
TCT200	– 65℃～150℃,soak mode 3,30min/cycle	77	PASS
TCT500	– 65℃～150℃,soak mode 3,30min/cycle	77	PASS
Uhast96	130℃ 85%RH	77	PASS
HTST168	150℃	77	PASS
HTST500	150℃	77	PASS
LTST168	-40℃	77	PASS
LTST500	-40℃	77	PASS

☑ 性能测试/ Performance Test: Pass

射频性能测试合格。

RF performance test pass.

☑ 环境测试报告/ Environment Related Report (RoHS/REACH/HF etc.)：

更新后的芯片产品、模组产品符合 RoHS，REACH，HF 标准。

Chip products and module products after change meet the RoHS, REACH and HF requirements.

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. 产品变更说明/ Product Change Description

产品类型 Product Type	产品名称 Product Name	MPN MPN	变更描述 Change Description
Chip	ESP32-PICO-D4		Embedded flash process technology change
	ESP32-PICO-V3		Embedded flash process technology change
Module	ESP32-PICO-V3-ZERO	ESP32-PICO-V3-ZERO(P103AH0000PH3Q0)	1. Embedded flash of ESP32 chip process technology change 2. PCB of ESP32-PICO-V3-ZERO change to HF PCB
		ESP32-PICO-V3-ZERO(P103AH0000PH3Q1)	1. Embedded flash of ESP32 chip process technology change 2. PCB of ESP32-PICO-V3-ZERO change to HF PCB
Develop Board	ESP32-PICO-KIT-1	ESP32-PICO-KIT-1	1. Embedded flash of ESP32 chip process technology change 2. PCB of ESP32-PICO-V3-ZERO change to HF PCB
	ESP32-PICO-V3-ZERO-DevKit	ESP32-PICO-V3-ZERO-DevKit	1. Embedded flash of ESP32 chip process technology change 2. PCB of ESP32-PICO-V3-ZERO change to HF PCB
	ESP32-PICO-KIT	ESP32-PICO-KIT	Embedded flash of ESP32 chip process technology change

2. Embedded Flash Change Comparison

Item	变更前/ Before Change	变更后/ After Change
Description	NA	Embedded flash will change in Espressif chip products listed in Para 1 because of flash manufacture process technology improvement. The modules and develop board products listed in Para 1 are based on chip products listed in Para 1, and thus will change accordingly.
Product Name (No Changes)	See Product List in Para 1	See Product List in Para 1
Embedded Flash PN	GD25Q32CW	GD25Q32EGIG
Flash Operating Voltage (No Changes)	2.7V ~ 3.6V	2.7V ~ 3.6V
	Note: All affected products should work at 3.0V ~ 3.6V, so this flash meets the requirement.	
Chip&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℃ ~ 85 ℃	-40℃ ~ 85 ℃
Sector Erase Time (4KB) (Typ. / Max)	50 ms / 300 ms	45 ms / 300 ms
Block Erase Time (32KB) (Typ. / Max)	0.15 s / 1.6 s	0.15 s / 1.2 s
Block Erase Time (64KB) (Typ. / Max)	0.25 s / 2.0 s	0.25 s / 1.6 s
Chip Erase Time (Typ. / Max)	15 s / 30 s	12 s / 30 s

2. PCB of ESP32-PICO-V3-ZERO Change Comparison

模组名称 Module Name	变更前 Before Change	变更后 After Change
PCB of ESP32-PICO-V3-ZERO	Not halogen free	Halogen free
PCB Bottom Marking of ESP32-PICO-V3-ZERO		
PCB Version of ESP32-PICO-V3-ZERO	V1.0	V1.1

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:	