### ESP32-WROVER-E 和 ESP32-WROVER-IE 模组 PCB EPAD 为双面塞孔工艺

The PCB EPAD Vias are Changed to be Double-sided Plugged for ESP32-WROVER-E/IE

<table>
<thead>
<tr>
<th>PCN No.</th>
<th>PCN-2021-025</th>
<th>提出日期</th>
<th>Issue Date of PCN</th>
<th>2021/10/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>变更日期</td>
<td>2021/11/25</td>
<td>首次出货日期</td>
<td>Proposed Date of First Shipment</td>
<td>2021/12/25</td>
</tr>
</tbody>
</table>

1. **影响产品名称/Affected Product Name**
   - ESP32-WROVER-E, ESP32-WROVER-IE

2. **变更原因/Reason for Change**
   为提升 ESP32-WROVER-E 和 ESP32-WROVER-IE 模组在客户生产二次回流焊制程中的可靠性，
   模组 PCB EPAD 上的过孔由单面塞孔变更为双面塞孔。
   The vias on the PCB EPAD for ESP32-WROVER-E and ESP32-WROVER-IE are going to be double-sided plugged in order to improve reliability during customer reflow process.

3. **变更描述/Description of Change**
   ESP32-WROVER-E 和 ESP32-WROVER-IE PCB EPAD 上的过孔由 bottom 面塞孔变更为双面塞孔。
   The vias on the PCB EPAD for ESP32-WROVER-E and ESP32-WROVER-IE are going to be double-sided plugged instead of bottom-sided plugged.

4. **变更对比/Change Comparison**

<table>
<thead>
<tr>
<th>Products</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESP32-WROVER-E ESP32-WROVER-IE</td>
<td>仅 PCB EPAD bottom 面过孔塞孔，如下图。 Only vias of the EPAD on the bottom side of the PCB are plugged.</td>
<td>PCB EPAD bottom 面无变更，增加 PCB EPAD top 面过孔塞孔，如下图。 No change on bottom side of the PCB. Vias of the EPAD on top side of the PCB are plugged as well.</td>
</tr>
</tbody>
</table>
5. **Impact of Change**

1) **Quality & Performance:** No impact.
   a) Bonding test of the chip on double-sided plugged module shows there is no difference compared with the original module.
   b) The double-sided plugged module operating under different ambient temperature shows there is no difference on heat dissipation compared with the original module.

2) **Cost:** No impact.

3) **Delivery:** No impact.

4) **Material Part Numbers (MPN):**
   No impact. Customer can place orders with the same module part number.

5) **Certification:** No impact.

6. **How to Deal with Products**

   FIFO

7. **Report(s) Attached:**

   Related ECN No. ECN-2021-032
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，则表示客户接收该PCN。
   The lack of any additional responses from customers within 90 calendar days from date of issue of the PCN constitutes acceptance of the proposed changes.

客户通知/Customer Notification:
a) 客户须在乐鑫发出PCN后14天内通知乐鑫收到该PCN。如客户未在接收到PCN14天反馈乐鑫，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

<table>
<thead>
<tr>
<th>Customer's Company Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCN 评审结果/PCN Review Result:</td>
</tr>
<tr>
<td>□ 批准/确认 Accepted/Acknowledged</td>
</tr>
<tr>
<td>□ 不批准/Rejected</td>
</tr>
<tr>
<td>□ 需要分析/Further Analysis Required</td>
</tr>
</tbody>
</table>

客户意见/Comment:

<table>
<thead>
<tr>
<th>Company Representative’s Name:</th>
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<tbody>
<tr>
<td>Company Representative’s Job Title:</td>
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<table>
<thead>
<tr>
<th>Company Representative’s Signature:</th>
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<tbody>
<tr>
<td>Date:</td>
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