



I2PLCTR Errata

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1 Revisions

Revision	Release Date	Changes
4	December 19, 2023	<ul style="list-style-type: none"> • additional information regarding the impact • additional information regarding the workaround <ul style="list-style-type: none"> ○ adapted drying process information ○ added reflow process
3	October 18, 2023	<ul style="list-style-type: none"> • additional information regarding the root cause • additional information regarding humidity settings and floor time • introduction of I2PLCTR-2 Revision 6
2	June 19, 2023	adaptations regarding the workaround drying process
1	June 16, 2023	initial release

2 Transformer Failures

2.1 Affected Products

Please note that the errata document contains specific information regarding products I2PLCTR-1 Rev. 4 and I2PLCTR-2 Rev. 4. The described issues and solutions are applicable only to these two products. Please ensure that you correctly identify the respective products and implement the measures outlined in the errata document accordingly.

2.2 Description

We have encountered an issue where the ring core of the transformer is pushing out from the housing, despite following the manufacturing specifications. After investigating the root cause of the failures, it has been determined that the accumulation of moisture behind the potting compound is causing the problem. This error occurs because the surface of the plastic housing corrodes due to the influence of air. Specifically, the surface was smoothed, which prevented the potting compound from adhering properly and allowed moisture to enter the interstitial space. Despite taking precautions, the moisture tends to accumulate and vaporize during the soldering process, leading to the observed failures.

2.3 Impact

The problem of the ring core pushing out from the housing and improper soldering of the transformer's pins has a significant impact on the functionality and reliability of the components. It can lead to operational disruptions, system failures, and compromised long-term performance. **The probability of occurrence is known to be in the lower 1-digit percentage range according to gathered data from costumers or our own investigations.**

2.4 Workaround

To mitigate the issue of the ring core displacement during the soldering process, a workaround solution has been identified. The recommended workaround involves the drying of the component to eliminate the presence of moisture behind the potting compound **and adaptations to the reflow process to minimize the explosive expansion of moisture.**

2.4.1 Drying Process

The drying process should be performed at the customer's EMS (Electronics Manufacturing Services) facility. After careful evaluation, it has been determined that the most efficient and reliable approach is to subject the components to a controlled drying procedure using the drying cabinet at an elevated temperature of 40°C for a duration of 48 hours and a maximum residual humidity in the air of the drying cabinet of <5% (better <1%). The temperature must not exceed 40°C due to the maximum temperature resistance of the plastic reels on which the transformers are shipped.

2.4.2 Reflow Process

Please make an effort to minimize the temperature rise before ramp-up, while ensuring adherence to standard specifications. Through our comprehensive investigations and testing, we have identified a modification in the delta T over time for both soak time (t_s) and time to peak as depicted in the figure below, reduces the failure rates to an absolute minimum. Put more simply. Try to extend the time to peak temperature T_p as long as possible to ensure slow heating and avoid sudden expansion of water.

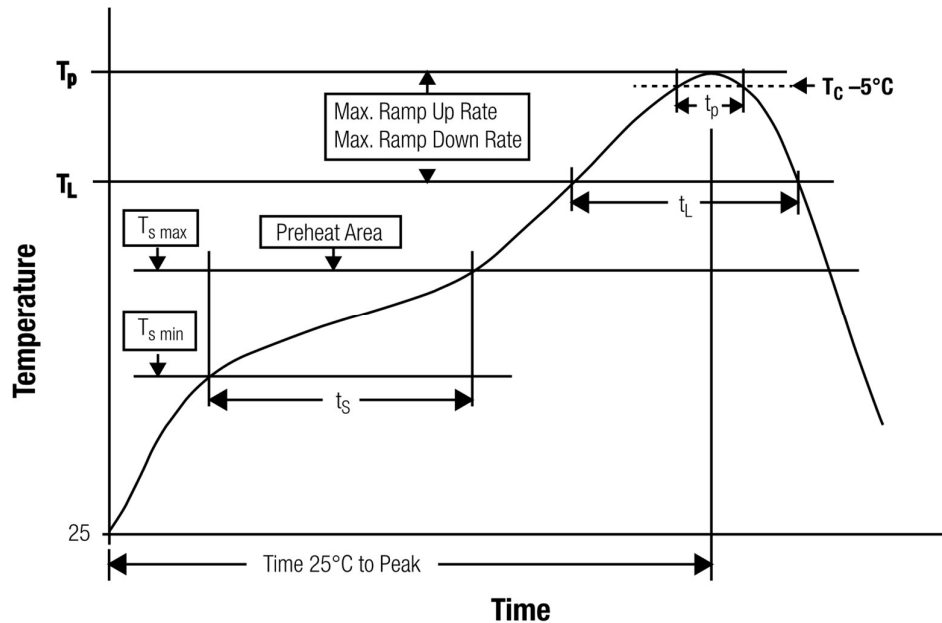


Figure 2 Reflow Profile

This setting has considerable potential for improving drying quality and avoiding problems caused by the rapid expansion of moisture in the components. If you allow sufficient time during the preheating phase, the moisture in the parts should dissipate completely. We recommend that you integrate these improvements into your processes.

2.5 Fix plan

To address the issue of ring core displacement and ensure reliable soldering of the transformer leads to the PCB pads, a fix plan has been developed. This plan includes a treatment of the plastic housing by plasma. The revised design and implementation will be effective starting with Revision 6 of the transformers. The plasma treated housings will help prevent the displacement of the ring core during the soldering process, ensuring a secure and stable connection between the transformer and the PCB. The plasma treatment, which takes place immediately before the potting compound is applied, roughens the surface so that the potting compound can adhere properly. This modification has been thoroughly tested and validated to provide a reliable solution. We recommend implementing the fix plan by transitioning to Revision 6 or newer versions of the transformers. This will ensure that the improved design is applied to future production units. Please note that the fix plan is not applicable to previous revisions of the transformers. However, we have taken proactive steps to address the issue through the recommended workaround of component drying, as described in our previous communication.

We appreciate your understanding and cooperation in implementing the fix plan to resolve this issue. If you have any further questions or require additional support, please do not hesitate to contact our technical team.