



Product / Process Change Notification (PCN)

- ☒ Major change
☐ Minor change

PCN #: PCN_WPME-FIMM_20230817

Affected Series: WPME-FIMM, 1769205132

PCN Date: May 19, 2023

Effective Date: August 17, 2023

Change Category:

- ☐ Equipment / Location
☒ General Data
☐ Material
☒ Process
☐ Product Design
☐ Shipping / Packaging
☐ Supplier
☐ Software

Contact: Product Management

Phone: +49 (0) 7942 - 945 5001

Fax: +49 (0) 7942 - 945 5179

E-Mail: pcn.eisos@we-online.com

Data Sheet Change:

- ☒ Yes ☐ No

Attachment:

- ☒ Yes ☐ No

Description and purpose of change:

To improve the processability, Würth Elektronik has expanded the reflow solder profile to align with the JEDEC J-STD020E industry standard for reflow soldering.

There will be no change in form, fit, function or reliability of the product.

All date codes will be affected by this change.

Detail of Change:

The reflow solder profile peak temperature has been increased to 250°C to meet the JEDEC J-STD020E standard's recommendation for the given package volume and thickness. (Page 28)

Before

HANDLING RECOMMENDATIONS

- The power module is classified as MSL3 (JEDEC Moisture Sensitivity Level 3) and requires special handling due to moisture sensitivity (JEDEC J-STD033).
- The parts are delivered in a sealed bag (Moisture Barrier Bag = MBB) and should be processed within one year.
- When opening the moisture barrier bag, check the Humidity Indicator Card (HIC) for color status. Bake parts prior to soldering in case indicator color has changed according to the notes on the card.
- Parts must be processed after 168 hour (7 days) of floor life. Once this time has been exceeded, bake parts prior to soldering per JEDEC J-STD033 recommendation.

SOLDER PROFILE

- Measure the peak reflow temperature of the MagPiC power module in the middle of the top view.
- Ensure that the peak reflow temperature does not exceed $235^\circ\text{C} \pm 5^\circ\text{C}$.
- The reflow time period during peak temperature of $235^\circ\text{C} \pm 5^\circ\text{C}$ must not exceed 30 seconds.
- Reflow time above liquidus (217°C) must not exceed 150 seconds.
- Maximum ramp up is rate 3K per second
- Maximum ramp down rate is 3K per second
- Reflow time from room (25°C) to peak must not exceed 8 minutes as per JEDEC J-STD020.
- Maximum numbers of reflow cycles is two.
- For minimum risk, solder the module in the last reflow cycle of the PCB production.
- For soldering process please consider lead material copper (Cu) and lead finish tin (Sn).
- For solder paste use a standard SAC Alloy such as SAC 305, type 3 or higher.
- Below profile is valid for convection reflow only
- Other soldering methods (e.g. vapor phase) are not verified and have to be validated by the customer on his own risk

Temperature [$^\circ\text{C}$]

Peak

Ramp Up Rate
Max $3^\circ\text{C}/\text{sec}$

Liquidus

Ramp Down Rate
Max $3^\circ\text{C}/\text{sec}$

Preheat

Max 20 sec

Max 90 sec
Min 60 sec

Max 3 solder cycles !

Time [sec]

After

20 HANDLING RECOMMENDATIONS

- The power module is classified as MSL3 (JEDEC Moisture Sensitivity Level 3) and requires special handling due to moisture sensitivity (JEDEC J-STD033D).
- The parts are delivered in a sealed bag (Moisture Barrier Bag = MBB) and should be processed within one year.
- When opening the moisture barrier bag, check the Humidity Indicator Card (HIC) for the color status. Bake parts prior to soldering in case indicator color has changed according to the notes on the card.
- Parts must be processed after 168 hour (7 days) of floor life. Once this time has been exceeded, bake parts prior to soldering per JEDEC J-STD033D recommendation.
- Maximum number of soldering cycles is two.
- For minimum risk, solder the module in the last solder cycle of the PCB production.
- The component lead material is copper (Cu) and the lead finish is ENEPIG (NiPdAu).
- For solder paste use a standard SAC Alloy such as SAC 305, type 3 or higher.
- The profile below is valid for convection reflow only.
- Other soldering methods (e.g. vapor phase) are not verified and have to be validated by the customer at their own risk.

20.1 Soldering Profile

Table 13: Reflow solder profile.

Profile Feature	Symbol	Value
Preheat temperature minimum	$T_{d,pre}$	150°C
Preheat temperature maximum	$T_{d,max}$	200°C
Preheat time from $T_{d,pre}$ to $T_{d,max}$	t_d	60-120 seconds
Liquidus temperature	T_L	217°C
Time maintained above T_L	t_L	60-90 seconds
Classification temperature	T_C	250°C
Peak package body temperature	T_p	$T_p \leq T_C$
Time within $T_C \pm 5^\circ\text{C}$ and T_C	t_p	$t_p \leq 30$ seconds
Ramp-up Rate (T_L to T_p)		$3^\circ\text{C}/\text{second}$ maximum
Ramp-down rate (T_p to T_L)		$6^\circ\text{C}/\text{second}$ maximum
Time 25°C to peak temperature		8 minutes maximum

Please refer to JEDEC J-STD020 for further information pertaining to reflow soldering of electronic components.

Temperature in $^\circ\text{C}$

Max Ramp Up Rate
Max Ramp Down Rate

Preheat time

$T_{d,pre}$

$T_{d,max}$

T_L

$T_C \pm 5^\circ\text{C}$

T_p

Time 25°C to Peak

Time in seconds

Use T_p & T_C

Figure 20: Soldering profile.

Reliability / Qualification Summary:

Components were subjected to five reflow soldering cycles with the new, higher temperature reflow profile. Intermittent and post-stress electrical tests were performed. All components passed all the electrical tests.