

Wolfspeed® Product/Process Change Notification

PCN Number: PCN-00017

PCN Issue Date: 06/21/2022

PCN Type: Major

PCN Title

Change from 100-mm to 150-mm Wafers for the Manufacturing of 1700 V SiC MOSFET Devices

Description of the Changes

1. Die Size and Metallization:

1700 V SiC MOSFET devices are currently manufactured on 100-mm diameter SiC wafers. A change of wafer diameter from 100 mm to 150 mm will take place as part of the transition and improvement at Wolfspeed.

Along with the change to 150-mm wafers, the back-side metal will be changed from silver (Ag) to gold (Au) as shown in Figure 1. The top-side metal will be changed from aluminum (Al) to an aluminum-copper (Al-Cu) alloy as shown in Figure 2.



Figure 1. (a) 100-mm Wafer Back-Side Metal Design; (b) 150-mm Wafer Back-Side Metal Design.



Figure 2. (a) 100-mm Wafer Top-Side Metal Design; (b) 150-mm Wafer Top-Side Metal Design.

2. Change to Package Bill of Material:

A change to the package mold compound and gate/kelvin wire-bond dimension will be introduced as part of this PCN. The changes to the package are summarized in Table 1 and Table 2. The selection of the improved mold compound and the larger gate/Kelvin wire dimensions improve the devices thermo-mechanical ruggedness during temperature cycling events.

Table 1. New Package BOM.

Part Number	Wire Bond	Mold Compound
C2M0045170D	Source: 10 mil Al Gate: 8 mil Al	Sumitomo
C2M0045170P	Source: 10 mil Al Gate: 8 mil Al Kelvin: 10 mil Al	Sumitomo (no change)

Table 2. Old Package BOM.

Part Number	Wire Bond	Mold Compound
C2M0045170D	Source: 10 mil Al Gate: 5 mil Al	Henkel
C2M0045170P	Source: 10 mil Al Gate: 5 mil Al Kelvin: 5 mil Al	Sumitomo

3. Change to Datasheets:

A full product characterization and datasheet update accompanies this PCN. The datasheet revision history is summarized in Table 3 below.

Table 3. Datasheet Revision.

Part Number	Existing Datasheet Revision	New Datasheet Revision
C2M0045170D	Rev. - 06-2016	Rev. 1 May 2022
C2M0045170P	Rev. - 04-2018	Rev. 2 May 2022

The summary of datasheet changes is listed below.

Thermal Impedance (R_{th}):

- Thermal impedance is re-measured using the latest measurement equipment and technique to provide improved measurement accuracy.
- Max R_{th} = updated to 0.37 °C/W (from 0.24 °C/W).

Maximum Power Dissipation (P_D):

- P_D value depends on the measured maximum thermal impedance.
- P_D = Updated to 338 W from 520 W.

Typical Internal Gate Resistance (R_{gint}):

- Updated to 1.3 Ω (from 1.7 Ω). Slight change is due to 150-mm wafer diameter change.

Benefit of the Change

The qualification of 150-mm wafers is necessary for Wolfspeed to increase its production capacity to meet market demand and customer expectation. The changes to the package BOM improve package robustness.

Affected Products

Table 4 lists the expected products affected by this Major PCN on the date this PCN is issued. The list may be altered due to market dynamics or technological innovations. Updates on Table 4 can be provided by your Wolfspeed contact.

Table 4. Affected Product list.

Part Number
C2M0045170D
C2M0045170P

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Qualification Status and Plan

All processes at Wolfspeed's facilities are qualified through the internal Process Change Review Board (PCRB). The tests for the affected products included in Table 4 have been performed to meet or exceed the test parameters listed in the existing qualification reports.

Anticipated Impact

There is no change to the electrical function or reliability of the listed products. An updated product datasheet is generated as part of the release.

Key Implementation Date

Table 5 provides the estimated dates for key PCN milestones based on the information available on the date this PCN is issued. Any updates to these dates can be provided by your Wolfspeed contact.

Table 5. Estimated Key PCN dates

Task	Date*
Qualification Report Date	June 30 th 2022
Sample Availability	June 15 th 2022
First Ship Date	August 15 2022

* Specific product schedules should be discussed with Wolfspeed sales and marketing representatives.

Customer Acknowledgement

Customer is requested to acknowledge this notification within 30 days from its issue date by signing this PCN, scanning it into a pdf file, and emailing the file and any feedback to Wolfspeed at PCN@wolfspeed.com. Note that Wolfspeed references the JEDEC J-STD-046 guidelines for its PCNs. In accordance with J-STD-046, this change is deemed acceptable to the customer if no acknowledgement is received within 30 days from the PCN issue date.

Name: _____ Title: _____

Phone: _____ Email: _____

Customer Comment: _____

Customer Signature: _____ Date: _____

Contact Information

If you have any questions regarding this Major PCN, please refer to the contact information listed in Table 6.

Table 6. PCN Contact.

Wolfspeed Contact:	PCN Admin
Wolfspeed Contact E-Mail:	PCN@wolfspeed.com
Wolfspeed Contact Phone	1.844.200.WOLF
Address:	4425 Silicon Dr. Durham, NC 27703 - USA

Revision History

Date	Revision	Description
June 21, 2022	0	Initial release