

Cree® Product Change Notification

PCN Number: CREE-PCN-1281

Date Issued:

April 20, 2021

Title

Change from 100-mm to 150-mm Wafers for the Manufacturing of 1200 V, 62 mm Power Module Portfolio

Description of the Change

Cree's 2nd generation 1200 V MOSFETs, also known as "C2M™", and Cree's CPW Schottky diodes have been historically manufactured on 100-mm-diameter wafers at Cree's fabrication facilities in North Carolina, USA. To increase the throughput to provide MOSFETs and Schottky diodes to Cree's customers within the standard delivery times, the change of wafer diameter from 100 mm to 150 mm has been recently implemented.

Along with the change to 150-mm wafers, the production line of Cree is also being expanded to increase its manufacturing capability. In addition, the back-metal stack for MOSFETs used in the parts identified in Table 1 will change from silver (Ag) to gold (Au). Nevertheless, there is no change to die or gate pad dimensions or the module design as a result of this transition.

Note that the current 5th generation (CPW5) Schottky diodes will be replaced with the 6th generation (CPW6) Schottky diodes as part of the 150-mm transition. The CPW6 diodes that were designed as a drop-in replacement part for the CPW5 diodes are being qualified. Therefore, end-user systems will not be impacted by use of the current CPW5 or equivalent CPW6 diodes in the part numbers discussed herein. Cree will supply the part numbers listed in Table 1 using both CPW5 diodes and CPW6 diodes until the CPW6 diodes are in full production.

Module date codes will be migrated from a 5-digit date code to the new 6-digit date code format to enable the date-code traceability as noted in the *Key Implementation Date* section below. The date-code format will be updated on the individual module laser marking, the individual unit labeling, and the shipping documentation.

Benefit of the Change

The qualification of 150-mm wafers is necessary for Cree to increase its production capacity to meet market demand and customer expectation.

Affected Products

Table 1 lists the products affected by this Courtesy PCN. Future deliveries of these products will include modules with the die qualified from Cree's 150-mm production line.

Table 1. Affected Products List.

Cree Part Number
CAS110M12BM2
CAS300M12BM2

Key Implementation Date

The 100-mm last time buy registration window is closed, per the Advance notification of CREE-PCN-1042 issued on September 25, 2020.

Customers may request sample units for the evaluation of performance impacts resulted from the 150-mm transition. Cree will implement the phased production ramp detailed above and target its production of the listed modules with full 150-mm die later this year.

To accommodate the above transition, Cree will execute the following date code plan to enable traceability of the wafer diameter of the following delivered units:

- Power modules with 100-mm MOSFETs and CPW5 Schottky diodes will continue utilizing the current 5-digit date code. Supply of this date code (e.g., H2142-A001) is expected to end in August 2021.
- Power modules with 150-mm MOSFETs and 100-mm CPW5 Schottky diodes will utilize the new standard 6-digit date code with its second letter set as a “change identifier” ranging from V to Z. Supply of this date code (e.g., HV2142-A001) is expected to begin in May 2021.
- Power modules with 150-mm MOSFETs and 150-mm CPW6 Schottky diodes will utilize the new standard 6-digit date code with its second letter set as a “change identifier” ranging from A to N. Supply of this date code (e.g., HA2142-A001) is expected to begin September 2021 or later.

Anticipated Impact

There is no expected change to reliability of the bare die devices as a result of this change. It should be noted that the 150-mm wafer substrates are manufactured at the expanded manufacturing facilities and by the same manufacturer as the currently qualified 100-mm substrates. Both of the 150-mm bare die devices and the modules have passed independently re-qualification to the same industrial standard applied to qualify the 100-mm bare die and modules for commercial release.

Along with the release of this PCN, new datasheets will be published for the affected part numbers to update the legacy performance information. The new datasheets will provide customers with the accurate dynamic and static behavior of the devices, which are characterized by utilizing the latest advances in test equipment. The overall performance of the 150-mm-based modules is proven to be the same as that of the 100-mm-based ones or slightly improved. Laboratory tests on the 150-mm-based modules demonstrate faster switching dynamics, and small adjustments of the external driver R_g may be needed, depending on the customer’s individual system implementation. As compared with previously published datasheets, the new datasheets reflect the adjustment of metrology techniques to utilize the latest Wolfspeed standards.

Contact Information

If you have any questions regarding this courtesy PCN, please refer to the contact information listed in Table 2.

Table 2. Contact Information.

Cree Contact:	Ty McNutt
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Location:	Fayetteville, AR, U.S.A.

Revision History

Date	Revision	Description
April 20, 2021	1.0	Initial release