# Cree, Inc. Product Change Notification

*CREE-PCN-1165: Wafer Diameter Change from 100mm to 150mm for 1200V 25mΩ, 40mΩ, 80mΩ and 160mΩ Gen2 Bare Die MOSFETs*

**Change**

Cree will complete the qualification of Silicon Carbide (SiC) 1200V MOSFETs with Gold (Au) back-metal manufactured on 150mm diameter wafers at its facility in North Carolina, USA and begin the transition of bare die MOSFETs to 150mm wafers by end of 2020.

**Change Description**

Cree 2nd generation 1200V MOSFETs also known as "C2M™" are currently manufactured on 100mm diameter wafers at Cree's fabrication facility in North Carolina, USA. A change of wafer diameter from 100mm to 150mm is planned to increase production capacity, which, in turn, will assist Cree in our efforts to provide MOSFETs to our customers within our standard delivery times. Along with the change to 150mm wafers, the production line is being expanded to include additional manufacturing capability at Cree's fabrication facilities in North Carolina, USA. The back-metal stack will change from Silver (Ag) to Gold (Au). There is no change on die dimension and gate pad dimension.

**Part Description**

The 1200V MOSFETs in bare die part numbers affected by this change are listed in the table below.

| $R_{DS(on)}$ (mΩ) | Current Bare Die Product (100mm) | Back Metal | Voltage Rating (V) | Junction temperature rating (°C) | Die Size (mm) |
|---|---|---|---|---|---|
| 25 | CPM2-1200-0025B | Ni:Ag | 1200 | 175 | 4.04 x 6.44 |
| 40 | CPM2-1200-0040B | Ni:Ag | 1200 | 175 | 3.1 x 5.9 |
| 80 | CPM2-1200-0080B | Ni:Ag | 1200 | 175 | 3.1 x 3.36 |
| 160 | CPM2-1200-0160B | Ni:Ag | 1200 | 175 | 2.39 x 2.63 |
| **$R_{DS(on)}$ (mΩ)** | **Updated Bare Die Product (150mm)** | **Back Metal** | **Voltage Rating (V)** | **Junction temperature rating (°C)** | **Die Size (mm)** |
| 25 | CPM2-1200-0025A | Ni:Au | 1200 | 175 | 4.04 x 6.44 |
| 40 | CPM2-1200-0040A | Ni:Au | 1200 | 175 | 3.1 x 5.9 |
| 80 | CPM2-1200-0080A | Ni:Au | 1200 | 175 | 3.1 x 3.36 |
| 160 | CPM2-1200-0160A | Ni:Au | 1200 | 175 | 2.39 x 2.63 |

## Description of change

As a result of this change the product will move from 100mm diameter wafers to 150mm wafers. All 150mm wafers are shipped with gold (Au) back metal as shown in Figure 2. The change to gold (Au) back metal improves the ability of the product to withstand harsh environments, such as high humidity. The new back metal is also compatible with solder or some of the new sintering die attach methods. The last letter of the part number will change from "B" to "A" to denote the backside final metal change from Ag to Au. New datasheet will be issued with the new product part numbers.


**Figure 1: 100mm wafer back metal with Ag**

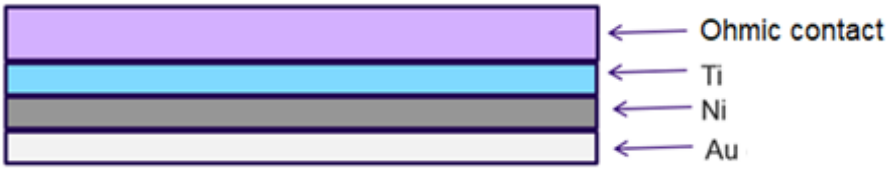


**Figure 2: 150mm wafer back metal with Au**

## Impact of Change

Along with the release of this PCN new datasheets for the new product numbers will be released, with update to the existing product datasheets and spice models. The new datasheets provide customers with dynamic and static behavior of the devices utilizing many of the latest advances in characterization test equipment. There is no change to any Min/Max specifications however the datasheet contains all new graphs along with updated typical values.

It should be noted that the 150mm wafer substrates are manufactured in the expanded manufacturing facilities and by the same manufacturer as the currently qualified 100mm substrates. Part numbers will change as described above. The change in back metal enhances the die stability, for example die attach.

Table below is the summary of current part number (100mm) and new part number (150mm).

| Product | Current Part Number (100mm) | New Part Number with suffix (150mm) |
|---|---|---|
| 1200V 25 mΩ MOSFET | CPM2-1200-0025B | CPM2-1200-0025A-FY6<br>CPM2-1200-0025A-WX6 |
| 1200V 40 mΩ MOSFET | CPM2-1200-0040B | CPM2-1200-0040A-FY6<br>CPM2-1200-0040A-WX6 |
| 1200V 80 mΩ MOSFET | CPM2-1200-0080B | CPM2-1200-0080A-FY6<br>CPM2-1200-0080A-WX6 |
| 1200V 160 mΩ MOSFET | CPM2-1200-0160B | CPM2-1200-0160A-FY6<br>CPM2-1200-0160A-WX6 |

## Reason for Change

The reason for this change is to increase production capacity and improve manufacturability. This change will assist Cree in our efforts to provide MOSFETs to our customers within our standard delivery times.

## Qualification Plan

All parts will be qualified to all tests listed in the existing qualification reports for each respective part number. All tests will be performed to parameters that meet or exceed the test parameters listed in the existing qualification report.

The results of the qualification testing will be summarized and provided in a separate qualification report.

## Implementation Date

This PCN is effective immediately. Customer will have 60 days to place orders for the affected products on 100mm wafer manufacturing line, starting with the issue of this PCN. Cree recommends that you place new orders for products described in this notice with the new part numbers (i.e., the 150 mm parts).

If you have any concerns or questions, please notify your local sales representative.

## Contact

Any questions or requests for additional information should be directed to your sales representative or by contacting Cree, Inc. directly at 919-287-7888, or via email at CreePower_sales@cree.com .

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Issued: September 21, 2020

# CREE-PCN-1165

**CREE-PCN-1165 CUSTOMER RESPONSE FORM**
**Change of Wafer Diameter from 100mm to 150mm for 1200V 25mΩ, 40mΩ, 80mΩ and 160mΩ C3M MOSFET Bare Die Products**

**Please check the appropriate boxes below:**

☐ We acknowledge the receipt of this proposed change and its schedule

☐ We need samples:

**Sender**

Company: Name:
Address/Location: Email:

Primary Telephone: Fax:
Signature: Date:

**Please return to your Sales Representative**

Company: Cree Name:
Address/Location: Email:

Primary Telephone: Fax:

Issued: September 21, 2020