

Cree, Inc. Product Change Notification

CREE-PCN-0850: Wafer Diameter Change from 100mm to 150mm for 1200V 25mΩ, 40mΩ and 80mΩ Gen2 Bare Die MOSFETs

Change

Cree will soon 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. Cree will begin the transition of bare die MOSFETs to 150mm wafers in 2019.

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 and to ensure Cree’s continued ability 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
R_{DS(on)} (mΩ)	Updated Bare Die Product (150mm)	Back Metal	Voltage Rating	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

Description of change

Along with 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 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.

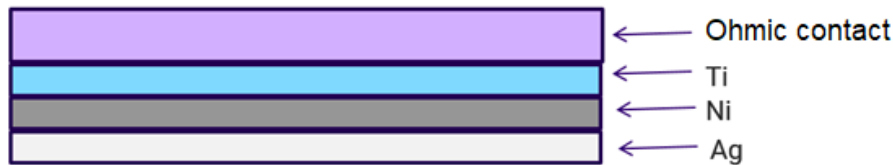


Figure 1: 100mm wafer back metal with Ag

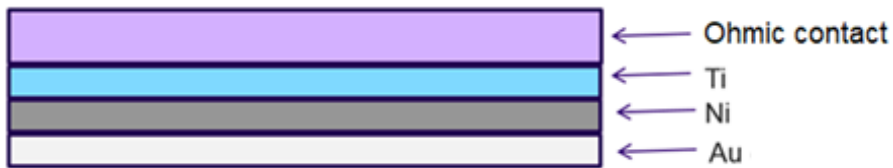


Figure 2: 150mm wafer back metal with Au

Impact of Change

There is no change to form or reliability of the MOSFET chips. 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 with sintering.

Along with the release of this PCN new datasheets for the new product numbers will be released, with update to the legacy product datasheets and spice models. The new datasheets provide customers with a more accurate dynamic and static behavior of the devices and utilizes 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.

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-FE6 CPM2-1200-0025A-WD6
1200V 40 mΩ MOSFET	CPM2-1200-0040B	CPM2-1200-0040A-FE6 CPM2-1200-0040A-WD6
1200V 80 mΩ MOSFET	CPM2-1200-0080B	CPM2-1200-0080A-FE6 CPM2-1200-0080A-WD6

Reason for Change

The reason for this change is to increase production capacity and improve manufacturability. This change is necessary to ensure Cree's continued ability 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

- Later in 2019, Cree will begin the transition of 1200V 25mΩ, 40mΩ and 80mΩ MOSFET Bare Die Products to production on 150mm wafers.
- Later in 2019, Cree will begin sampling 150mm SiC MOSFETs with backside Au which customers can use for evaluation purposes.
- Late in 2019, Cree will ramp production of 150mm SiC MOSFETs with backside Au.
- Starting in January 2020 Cree may choose to no longer produce 1200V 25mΩ, 40mΩ and 80mΩ MOSFET Bare Die Products on 100mm wafers.

Please respond to this PCN by indicating your approval on the included approval form at the end of this PCN, sign it and return to your local sales representative. If you have any concerns or questions, please notify your local sales representative. In accordance with JEDEC Standard JESD46D, lack of acknowledgement of the PCN within 30 days constitutes acceptance of the change.

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.

PCN Originator:

Name: Zhao, M.

Title: Product Manager, Cree Power Devices Bare Die Products

Issued: August 22, 2019

CREE-PCN-0850

Disclaimer:

If we do not receive any response by the date in the PCN above we consider this as the acceptance of the PCN.

CREE-PCN-0850 CUSTOMER APPROVAL FORM

Change of Wafer Diameter from 100mm to 150mm for 1200V 25m Ω , 40m Ω and 80m Ω C3M MOSFET Bare Die Products

Please check the appropriate boxes below:

We agree with this proposed change and its schedule

We need samples:

Sender

Company:

Address/Location:

Name:

Email:

Primary Telephone:

Signature:

Fax:

Date:

Please return to your Sales Representative

Company: Cree

Address/Location:

Name:

Email:

Primary Telephone:

Fax:

Issued: August 10, 2019

Disclaimer:

If we do not receive any response by the date in the PCN above we consider this as the acceptance of the PCN.