

Cree, Inc. Product Change Notification

CREE-PCN-0858: Change of Wafer Diameter from 100mm to 150mm for 900V 10mΩ, 30mΩ and 65mΩ Gen3 Bare Die MOSFETs

Change

Cree will soon complete the qualification of Silicon Carbide (SiC) 900V bare die MOSFETs with nickel / gold (Ni/Au) back-metal manufactured on 150mm diameter wafers at its expanded semiconductor manufacturing facilities located in North Carolina, USA. Cree will begin the transition of bare die MOSFETs to 150mm wafers in 2019.

Change Description

Cree 3rd generation 900V MOSFETs also known as “C3M™” 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 to nickel / gold (Ni/Au). With 150mm transition, the layout of the 10mΩ bare die is being changed. There is no change in die dimension.

Part Description

The 900V 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)	Packaging	Back Metal	Voltage Rating	Junction temperature rating (°C)	Die Size (mm)
10	CPM3-0900-0010A-WP2	Waffle Pack	Ni/Au	900	175	4.36 x 7.26
	CPM3-0900-0010A-FE4	UV-tape				
30	CPM3-0900-0030A-WP2	Waffle Pack	Ni/Au	900	175	3.1 x 5.9
	CPM3-0900-0030A-FE4	UV-tape				
65	CPM3-0900-0065B-WP2	Waffle Pack	Ni/Ag	900	175	2.25 x 2.95
	CPM3-0900-0065B-FE4	UV-tape				
R_{DS(on)} (mΩ)	Updated Bare Die Product (150mm)	Packaging	Back Metal	Voltage Rating	Junction temperature rating (°C)	Die Size (mm)
10	CPM3-0900-0010A-WD6	Waffle Pack	Ni/Au	900	175	4.36 x 7.26
	CPM3-0900-0010A-FE6	UV-tape				
30	CPM3-0900-0030A-WD6	Waffle Pack	Ni/Au	900	175	3.1 x 5.9
	CPM3-0900-0030A-FE6	UV-tape				
65	CPM3-0900-0065A-WD6	Waffle Pack	Ni/Au	900	175	2.25 x 2.95
	CPM3-0900-0065A-FE6	UV-tape				

Impact of Change

The products will move from 100mm diameter wafers to 150mm wafers. All 150mm wafers are shipped with nickel/gold (Ni/Au) back metal. The change in 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 changes of the last letter of the part numbers has been summarized in the table above.

There is no change to reliability of the MOSFET chips. It should be noted that the 150mm wafer substrates will be manufactured in the expanded semiconductor facilities, by the same manufacturer as the currently qualified 100mm substrates.

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. The new layout for the 10mΩ die is shown below.

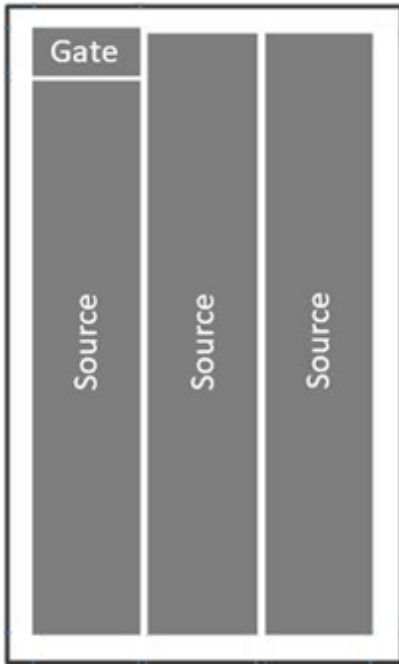


Figure 1: 100mm 900V 10mΩ die layout

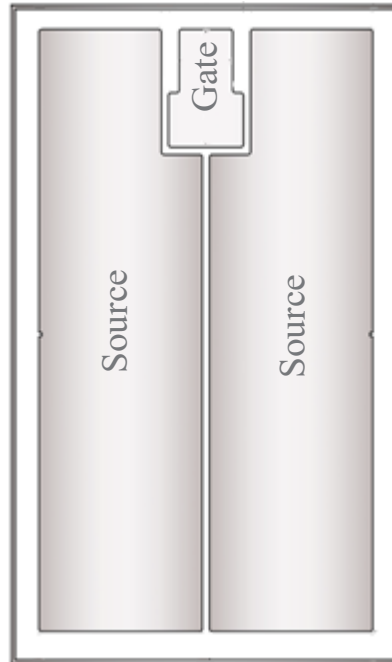


Figure 2: 150mm 900V 10mΩ die layout

*Figure 1 and 2 are not drawn to scale.

Datasheet revision history is summarized below:

Product	Previous Datasheet (100mm)	New Datasheet (150mm)
900V 10 mΩ MOSFET	CPM3-0900-0010A	CPM3-0900-0010A
900V 30 mΩ MOSFET	CPM3-0900-0030A	CPM3-0900-0030A
900V 65 mΩ MOSFET	CPM3-0900-0065B	CPM3-0900-0065A

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

- Late in 2019, Cree will begin the transition of 900V 10m Ω , 30m Ω and 65m Ω MOSFET Bare Die Products to production on 150mm wafers.
- Late 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 900V 10m Ω , 30m Ω and 65m Ω 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: Mikirtichev, A.

Title: Product Marketing, Cree Power Devices Bare Die Products

Issued: August 17, 2019

CREE-PCN-0858

Disclaimer:

If we do not receive any response within 30 days after the issued date, we consider this as the acceptance of the PCN.

CREE-PCN-0858 CUSTOMER APPROVAL FORM

Change of Wafer Diameter from 100mm to 150mm for 900V 10m Ω , 30m Ω and 65m 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 17, 2019

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