

# Cree, Inc. Product Change Notification

## *PCN-PW063: Change of Delivery Tape & Ring for All MOSFET Bare Die Products*

### **Change**

Cree has commenced the qualification of a new delivery tape and ring for bare die SiC MOSFETs manufactured on 100mm and forthcoming 150mm wafers at its Research Triangle Park, North Carolina, USA facility. The purpose of this PCN is to provide advanced notice to our customers of the conversion schedule, so they may prepare for the change.

### **Change Description**

Cree bare die SiC MOSFETs are currently delivered to customers and distributors as 10x10 KGD (known good die) arrays on sheets of Nitto SWT-10+R tape, with option to mount on plastic rings. The Nitto SWT-10+R tape is being replaced with exposed Adwill D-485H UV tape. All die sheets will be mounted to a single 150mm plastic frame, ePAK part number eOP0319-eM-59-BLK\*. This frame supports all existing customer requirements. Cree will discontinue the option to receive die sheets mounted to all other types of rings. Cree is also using this opportunity to increase the size of the die array, resulting in a greater number of die per sheet. Cree will continue to ship only KGD for all MOSFET bare die products.

### **Part Description**

All catalog bare die within standard MOSFET product families will be transitioned. Cree “standard” MOSFET bare die products are defined as the CPM2 and CPM3 product families. Variations of these part numbers with the suffix “-ST2” and “-FR2” are included in this change. Refer to Table 1 for a full list of ordering part numbers.

Customers who receive their MOSFET die in waffle packs by using the suffix “-WP2” are not impacted by this change. MOSFET die ordered with a suffix of “-WP2” will continue to be shipped in waffle packs.

### **Impact of Change**

The impact of the change is to the wafer delivery platform and ordering part number only. **There is no change to form, fit, function, or reliability of the MOSFET.**

This change may impact how the customer processes the incoming die sheet. UV tape must be exposed using specialized equipment before the die can be picked from the tape. Cree will perform this exposure process prior to shipment of the die sheets to the customer. Although no specialized processing is required to adapt to the change to UV tape, pick forces and associated processing parameters may need to be adjusted to account for the reduced tack of the exposed UV tape. A vendor datasheet for Adwill D-485H UV tape is provided with this PCN. Please consult your local sales representative for further questions regarding handling or storage of D-485H UV tape.

The ePAK eOP0319-eM-59-BLK\* is a plastic frame that is comparable to the FF-070 metal frame. It was selected due its common usage and versatility to 100mm and 150mm wafers, and is expected to be compatible with customer and distributor processing equipment, requiring minimal cost for system upgrades. Note that after conversion is complete, Cree will discontinue delivery of MOSFET die sheets on eOP0209 red plastic rings. A technical drawing of the ePAK eOP0319-eM-59-BLK\* frame is provided with this PCN.

\*Frame manufacturer also uses alternate part number mOP0319-eM-59-BLK for this frame

The size of the die array included on a single sheet is being increased in conjunction with the change to Adwill D-485H UV tape and ePAK eOP0319-eM-59-BLK frame. Refer to Table 1 for the new array size for each part number. Cree will continue with the current protocol of only using a single wafer source for each die sheet; multiple wafers will not be mixed within individual die sheets. This can result in the new, larger array not being completely filled within a die sheet.

This change is being rolled out on all 100mm MOSFET bare die products with ordering part numbers that end in “-FR2”, “-ST2”, and “-FM2”, and this change will be rolled out on all 150mm MOSFET bare die products once released. After conversion of the new platform is complete, all ordering part numbers that end in “-ST2” and “-FM2” will be eliminated. Only the part numbers ending in “-FR2” will be retained, and these part numbers will be used to order MOSFET die on UV tape with black eOP0319-eM-59-BLK frame, sourced from 100mm wafers.

There will be no change to ordering part numbers ending in “-WP2”, and customers may continue to use these part numbers to order die in waffle packs.

### **Reason for Change**

As demand for Cree’s SiC products has continued to grow, it has become necessary to simplify and streamline our backend processes to improve final quality and to ensure Cree’s continued ability to provide MOSFETs to our customers within our standard delivery times. Additionally, these changes are also driven by customer request. The reduced tack of Adwill D-485H UV tape as compared to the current Nitto SWT-10+R tape will aid customers’ pick-and-place process through easier lift-off, reduced occurrence of mis-picks and tape residue on die backside. Increasing the size of the die array will permit Cree to ship a greater number of die per sheet, reducing the number of die sheets required to fill customer orders and time spent by customers to switch out consumed die sheets.

### **Reason for Notification**

The purpose of this notification is to provide advanced notice to our customers who will need to modify their processes, as well as perform their own qualification or verification, thereby enabling them to prepare for the change in advance, and minimize disruption to their manufacturing lines.

Transition to the new tape and ring is scheduled to occur on or after June 15, 2018. Samples are currently available upon request.

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 by April 12, 2018. If you have any concerns or questions, or if you require any assistance in preparing for these changes, 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.

Your prompt reply will help ensure a smooth and well executed transition.

## **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](mailto:CreePower_sales@cree.com).

PCN Originator:

Name: Barbieri, T.

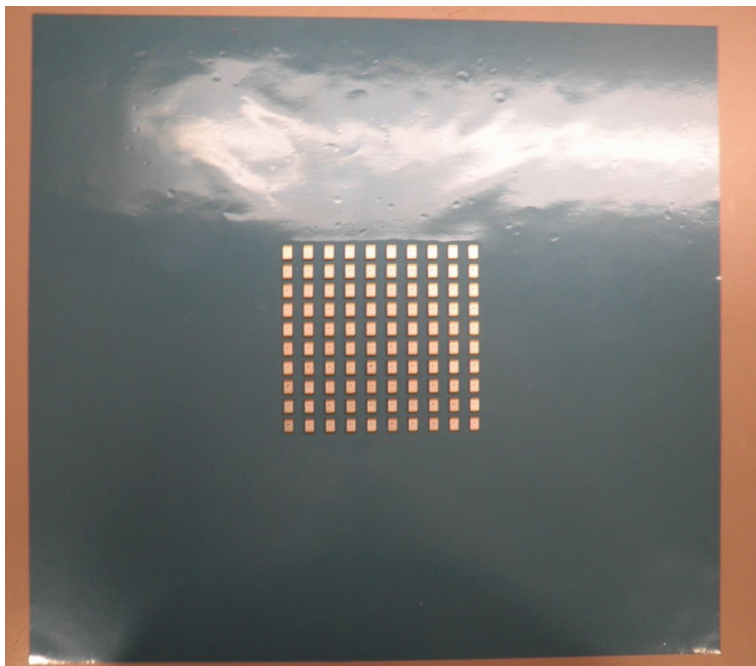
Title: Product Marketing Engineer, Cree Power Devices

Issued: 03/12/2018

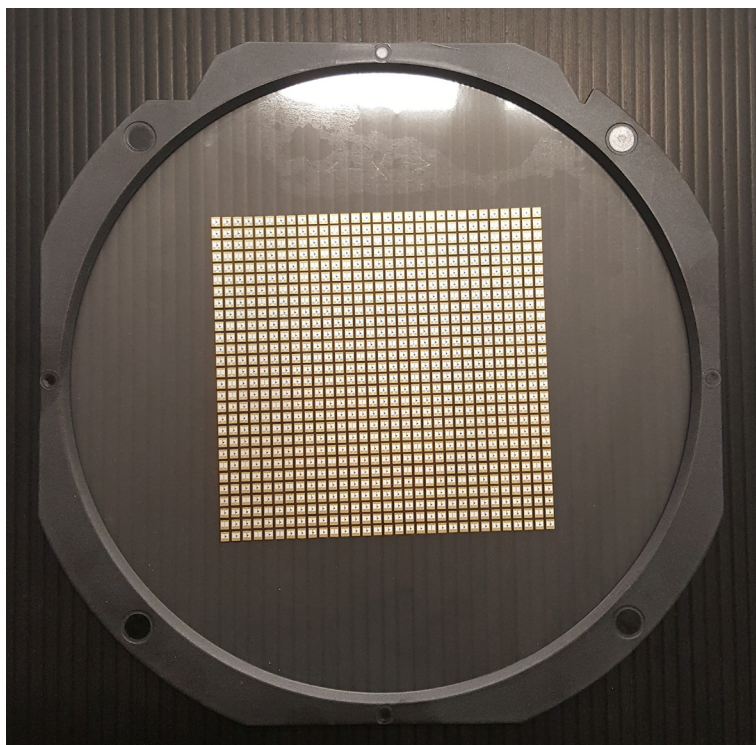
# PCN-PW063

Disclaimer:

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



**Figure 1(a):** Image of current delivery platform, showing 10x10 array of CPM2-1200-0025B MOSFET die on Nitto SWT-10+R blue tape, no frame.



**Figure 1(b):** Image of new delivery platform, showing increased array size of 31x25 CPM2-1200-0080B MOSFET die on UV tape, mounted to ePAK eOP0319-eM-59-BLK frame.

**Table 1: Cree SiC MOSFET Part Numbers Transitioning to New Delivery Platform**

Current Cree Ordering P/N	Current Description	New Ordering P/N	New Array Size
CPM2-1200-0025B-FR2	1200V 25mΩ MOSFET die on tape with red ring	no change	27x20
CPM2-1200-0025B-ST2	1200V 25mΩ MOSFET die on tape only	CPM2-1200-0025B-FR2	27x20
CPM2-1200-0040B-FR2	1200V 40mΩ MOSFET die on tape with red ring	no change	31x20
CPM2-1200-0040B-ST2	1200V 40mΩ MOSFET die on tape only	CPM2-1200-0040B-FR2	31x20
CPM2-1200-0080B-FR2	1200V 80mΩ MOSFET die on tape with red ring	no change	31x28
CPM2-1200-0080B-ST2	1200V 80mΩ MOSFET -die on tape only	CPM2-1200-0080B-FR2	31x28
CPM2-1200-0160B-FR2	1200V 160mΩ MOSFET die on tape with red ring	no change	35x34
CPM2-1200-0160B-ST2	1200V 160mΩ MOSFET die on tape only	CPM2-1200-0160B-FR2	35x34
CPM2-1700-0045B-FR2	1700V 45mΩ MOSFET die on tape with red ring	no change	27x18
CPM2-1700-0045B-ST2	1700V 45mΩ MOSFET die on tape only	CPM2-1700-0045B-FR2	27x18
CPM3-0900-0065B-FM2	900V 65mΩ MOSFET die on tape on 10" stainless steel ring	CPM3-0900-0065B-FR2	36x32
CPM3-0900-0065B-FR2	900V 65mΩ MOSFET die on tape with red ring	no change	36x32
CPM3-0900-0065B-ST2	900V 65mΩ MOSFET die on tape only	CPM3-0900-0065B-FR2	36x32
CPM3-0900-0010A-FR2	900V 10mΩ MOSFET die on tape with red ring	CPM3-0900-0010A-FR2	26x18
CPM3-0900-0010A-ST2	900V 10mΩ MOSFET die on tape only	CPM3-0900-0010A-FR2	26x18
CPM3-0900-0030A-ST2	900V 30mΩ MOSFET die on tape only	CPM3-0900-0030A-FR2	27x31

## PCN-PW063 CUSTOMER APPROVAL FORM Change of Delivery Tape & Ring for All MOSFET Bare Die Products

**Please check the appropriate boxes below:**

We agree with this proposed change and its schedule

We require assistance\* with:

Adwill D-485H UV tape

ePAK eOP0319-eM-59-BLK frames

*\*A Cree engineer will contact your designated representative to follow up on your request for assistance*

### **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: