Cree, Inc. Product Change Notification

PCN-PW065: Change of Backside Metal Anneal Tool Platform

Change

Cree has commenced the qualification of a new anneal tool platform for the backside ohmic metal anneal for all MOSFET and some Schottky diode products manufactured at its Durham, North Carolina, USA facility. The purpose of this PCN is to provide a courtesy notice to our customers of the change.

Change Description

Cree SiC MOSFET and some Schottky diode devices require annealing of the backside ohmic contact metals to ensure consistent electrical performance. To increase throughput and have better vendor support, a change of the anneal tool platform was required. This new platform will increase production capacity and ensure Cree's continued ability to provide MOSFETs and Schottky diodes to our customers within our standard delivery times. In addition to the anneal process, the wafer ID scribing will also change to the new tool platform.

Part Description

All catalog bare die within all standard MOSFET and some Schottky diode product families will be transitioned to the new anneal tool platform. Cree "standard" MOSFET bare die products are defined as the CPM2 and CPM3 product families, and the affected Cree "standard" Schottky diode bare die products are defined as the 650V CPW5 product families. Refer to Table 1 for a full list of part numbers.

Impact of Change

There is no change to form, fit, function, or reliability of the MOSFET or Schottky diode. Only the appearance of the backside metallization will change due to the differences in annealing methodology of the new anneal tool platform compared to the existing tool platform. Comparative images are included below in Figure 1 to show the physical appearance change of the anneal pattern. There are no other changes to the metallization process. Comparative images for the wafer ID scribe are shown in Figure 2.

Part numbers will not change. Customers may continue to place orders using the same part numbers.

Reason for Change

The reason for this change is to increase production capacity and to ensure Cree's continued ability to provide MOSFETs and Schottky diodes to our customers within our standard delivery times.

Qualification

The qualification of the new anneal tool platform has been completed on MOSFET devices; Schottky diodes are qualified by similarity. Any negative impact of the new tool platform on device reliability is detectable through a Thermal Shock test. Therefore, Thermal Shock (TS) was performed on 4 lots total: 2 lots were processed using the new anneal tool platform and 2 lots were processed with the process-of-record (POR) anneal platform. Thirty (30) devices were selected from each lot, packaged internally, and submitted to 1000 cycles of TS testing from -55°C to 150°C. All 120 units passed after 1000 cycles. Refer to Table 2 for additional details.

Reason for Notification

The purpose of this notification is to provide notice to our customers in advance of receiving product.

Please respond to this PCN by indicating your acknowledgement of the change on the included form at the end of this PCN, sign it and return to your local sales representative by March 3, 2018 [issue date plus 30 days]. 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.

Effective Implementation Date

Cree will use a ramped implementation for the new anneal platform. Beginning March 2018, customers can expect to receive die which have been processed on the new platform.

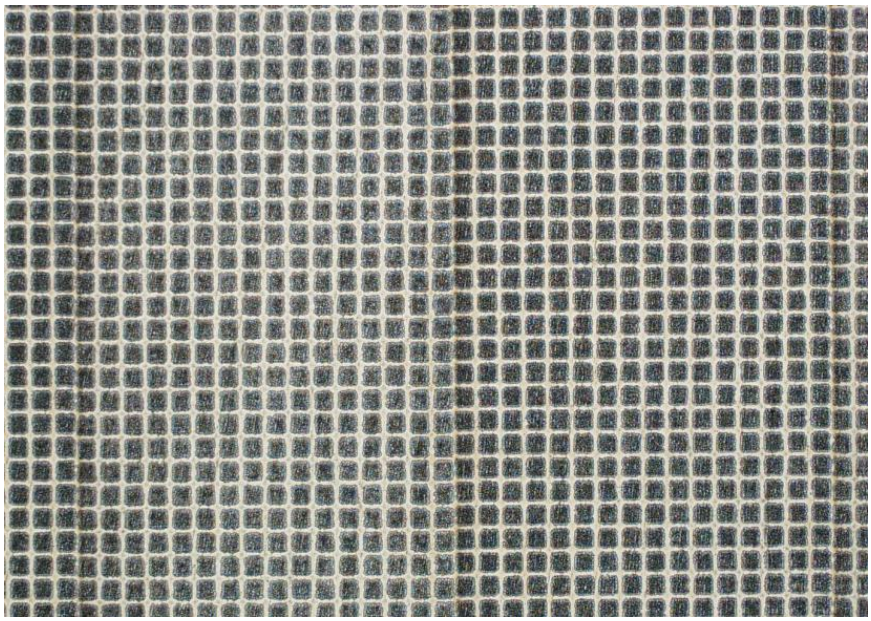
Contact

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: Young, J.
Title: Product Engineering Manager, Cree Power and RF Devices
Issued: 02/01/2018

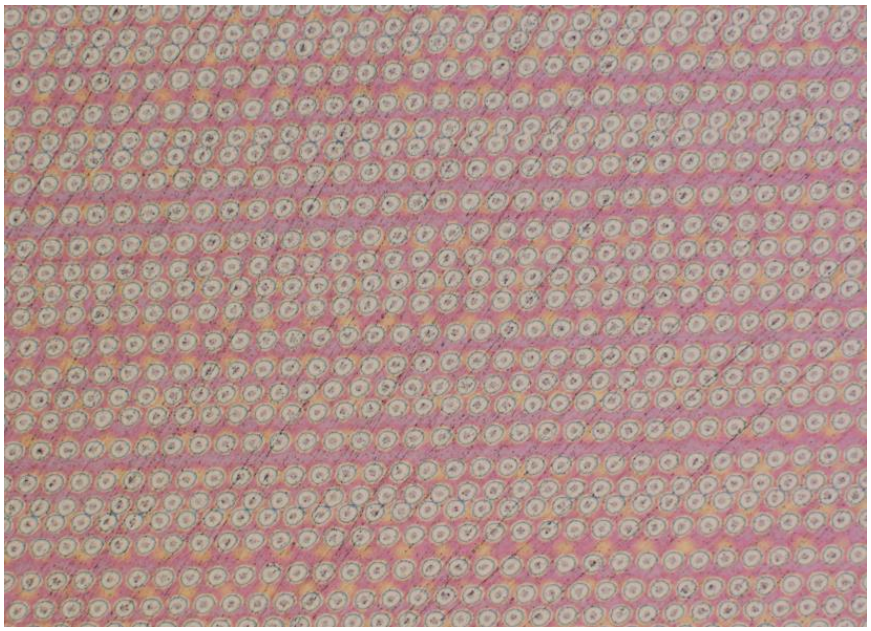
PCN-PW065

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



Visual appearance of annealed backmetal under current process

NEW ANNEAL TOOL PLATFORM



Visual appearance of annealed backmetal under new anneal tool

Figure 1: Optical Microscope images showing the change in appearance of wafer backmetal after conversion to the new anneal tool.

Current wafer ID scribe | Wafer ID scribe with new wafer scribe tool

Figure 2: Microscope images showing the appearance of wafer ID scribe after conversion to the new anneal tool.

Table 1: Cree Part Numbers Included in Conversion to New Anneal Tool

MOSFETS	Schottky Diodes
CPM3-0900-0010A	CPW5-0650-Z030B
CPM3-0900-0030A	CPW5-0650-Z050B
CPM3-0900-0065B	
CPM3-1000-0065B	
CPM2-1200-0025A	
CPM2-1200-0025B	
CPM2-1200-0040B	
CPM2-1200-0080B	
CPM2-1200-0160B	
CPM2-1700-0045B	
CPM2-1700-0080B	

Table 2: Thermal Shock Results for Qualification of New Anneal Tool

LOT ID	Anneal Process	Min Temp	Max Temp	Cycles	Pass	Fail
EXPW4	New Platform	-55°C	150°C	1000	30	0
EXPW6	New Platform	-55°C	150°C	1000	30	0
PORW3	POR	-55°C	150°C	1000	30	0
PORW5	POR	-55°C	150°C	1000	30	0

PCN-PW065 CUSTOMER RESPONSE FORM
Change of Backside Metal Anneal Tool Platform

Please check the appropriate boxes below:

☐ We acknowledge this proposed change and its schedule

Sender

Company: Name:
Address/Location: Email:

Primary Telephone: Fax:
Signature: Date:

Please return to your Sales Representative

Company: Name:
Address/Location: Email:

Primary Telephone: Fax: