

## Wolfspeed® Product/Process Change Notification

PCN Number: PCN-00099  
PCN Type: Informational

PCN Issue Date: March 22, 2024

### PCN Title

Adding Process Control Monitors (PCMs) to All Wolfspeed North Carolina Facility (NCF) and Mohawk Valley Facility (MVF) Schottky Die Wafers

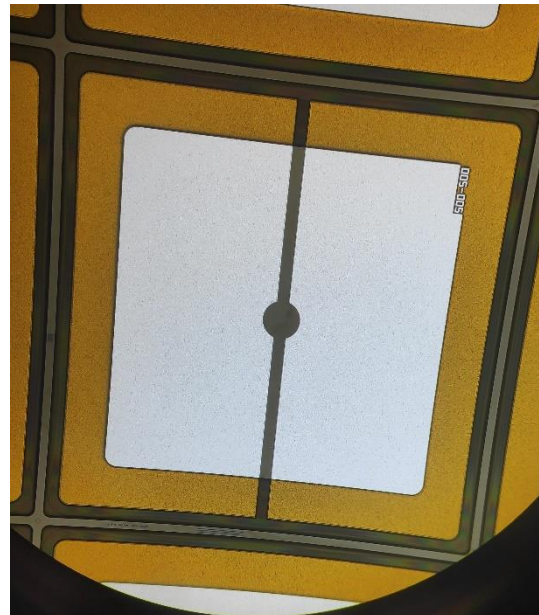
### Description of the Change

As Wolfspeed expands its Schottky products portfolio, this Informational notification is to inform Wolfspeed’s customers that Process Control Monitors (PCMs) will be added to all North Carolina and Mohawk Valley Facilities Schottky wafers. All product die will be unchanged. This document simply raises awareness that the wafer layout and appearance of fiducial/PCM die will shift, which may cause issues to the automated equipment calibrated to previous fiducial die locations.

Previously, every Schottky wafer contained five nonsellable fiducial die as shown in Figure 1 (a). Fiducials with a “target” symbol were at the center of the die and used for alignment purposes, particularly at the final probe step. With this change, the nonsellable fiducials will be converted to nonsellable PCMs. The general layout of a PCM die is shown in Figure 1 (b). It will vary between products because, as die size changes, the test structures will be rearranged for the best use of space. Wafers will continue to have five PCM sites per wafer, but these sites may be shifted slightly from the previous fiducial locations and may contain up to 4 die per site.

Please note this PCN is a revision to PCN-00099 issued on February 28, 2024 (see Revision History Table below).

(a)



(b)

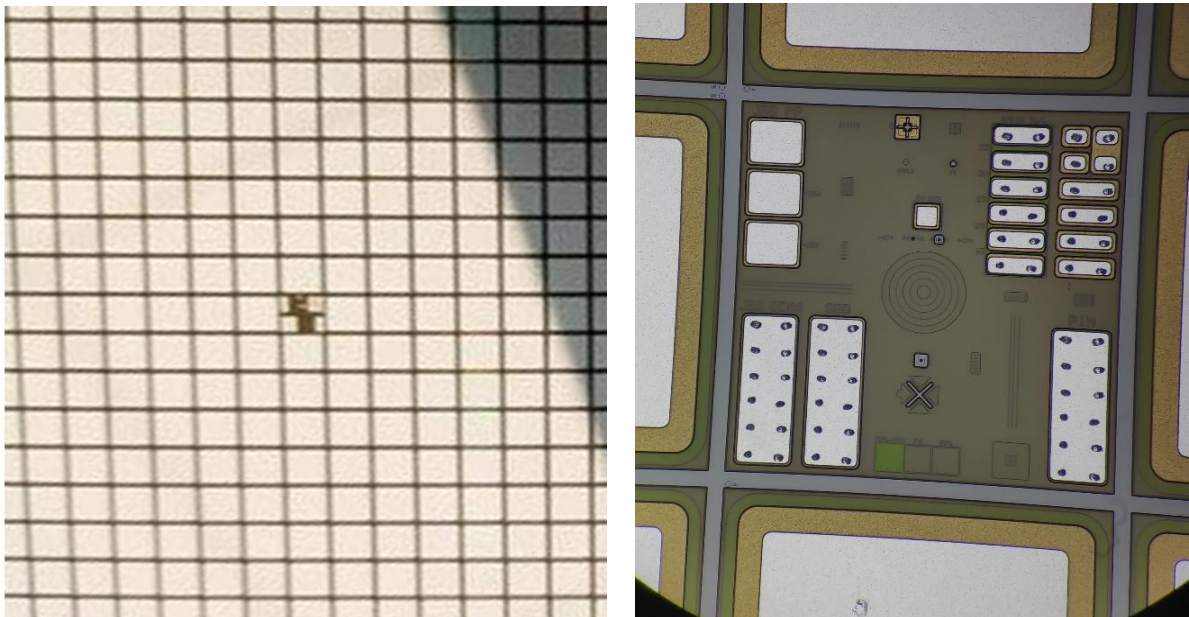
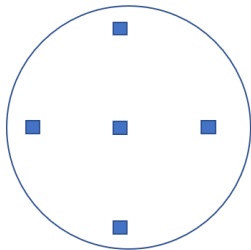


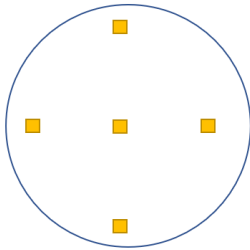
Figure 1. Examples of (a) a Current Fiducial Die and (b) a PCM Die.

The only Wolfspeed process difference for wafers with PCMs is that photolithography and metrology tools are aligned to the structures printed in the PCM die rather than at the streets as done previously. For products with one PCM die at each PCM site, the PCMs will have the same test structures and always look identical (see Figure 2). For products with more than one PCM die at each site, they will have different test structures from each other. PCM sites will be identical in their orientation and color among all wafers and all batches of the same product. PCMs may or may not have probe marks within the electrical test structures (the large rectangles) or probe marks across the center like a product die. In the photo, probe marks are in the electrical structures.

**Product with 1 PCM die per PCM site** – Every PCM on every wafer is identical. No change in color or orientation between wafers of the same product



**Other product with 1 PCM die per PCM site** – Every PCM on every wafer is identical. No change in color or orientation between wafers of the same product



**Product with 3 PCM die per PCM site** – PCM die of different colors in the cartoon contain different structures and may differ in color or orientation. PCM die of the same color in the cartoon are identical, with no change in color or orientation between wafers

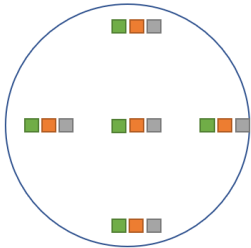


Figure 2. Examples of Identical PCM Die and Different PCM Die.

## Benefit of the Change

The change supports Wolfspeed's continuous improvement of the quality and reliability of products. This PCM enhancement will result in increased visibility into the layers of the device to assist with troubleshooting electrical behavior. In addition, Critical Dimensions (CDs) are not currently taken on any Schottky devices, and the introduction of a dedicated structure would enable this new data stream.

## Affected Products

Table 1 lists the products affected by this Informational PCN. Additional parts will be included for this change later, and the updated PCN document will be provided to customers.

**Table 1. Affected Products List.**

| Wolfspeed Part Number |                     |                     |
|-----------------------|---------------------|---------------------|
| Gen 2                 | Gen 3               | Gen 4               |
| CPW2-0600-S006B       | CPW3-0600-S004B     | CPW4-1200-S010B     |
| CPW2-0600-S006B-FA6   | CPW3-0600-S004B-FA6 | CPW4-1200-S010B-FA6 |
| CPW2-0600-S006B-FR6   | CPW3-0600-S004B-FR6 | CPW4-1200-S010B-FR6 |
| CPW2-0650-S006B       | CPW3-0650-S004B     | CPW4-1200-S015B     |
| CPW2-0650-S006B-FA6   | CPW3-0650-S004B-FA6 | CPW4-1200-S015B-FA6 |
| CPW2-0650-S006B-FR6   | CPW3-0650-S004B-FR6 | CPW4-1200-S015B-FR6 |
| CPW2-0600-S008B       |                     | CPW4-1200-S020B     |
| CPW2-0600-S008B-FA6   |                     | CPW4-1200-S020B-FA6 |
| CPW2-0600-S008B-FR6   |                     | CPW4-1200-S020B-FR6 |
| CPW2-0650-S008B       |                     |                     |
| CPW2-0650-S008B-FA6   |                     |                     |
| CPW2-0650-S008B-FR6   |                     |                     |
| CPW2-0600-S010B       |                     |                     |
| CPW2-0600-S010B-FA6   |                     |                     |
| CPW2-0600-S010B-FR6   |                     |                     |
| CPW2-0650-S010B       |                     |                     |
| CPW2-0650-S010B-FA6   |                     |                     |
| CPW2-0650-S010B-FR6   |                     |                     |

## Anticipated Impact

No customer action is required. There is no change to product form, fit, function, or reliability. For those customers who have relied on fiducial locations in the past for tool alignment, please take notes of the wafer layout changes for each product listed in Table 2.

**Table 2.** Change in Coordinates from Current Fiducial Die to PCM Die.

| Wolfspeed Part Numbers   | Current Fiducial Coordinates |    | New PCM Coordinates |    |
|--|------------------------------|----|---------------------|----|
|  | X                            | Y  | X                   | Y  |
| CPW2-0600-S006B<br>CPW2-0600-S006B-FA6<br>CPW2-0600-S006B-FR6<br>CPW2-0650-S006B<br>CPW2-0650-S006B-FA6<br>CPW2-0650-S006B-FR6 | 4                            | 45 | 12                  | 44 |
|  |                              |    | 13                  | 44 |
|  |                              |    | 14                  | 44 |
|  | 47                           | 4  | 48                  | 13 |
|  |                              |    | 49                  | 13 |
|  |                              |    | 50                  | 13 |
|  | 47                           | 45 | 48                  | 44 |
|  |                              |    | 49                  | 44 |
|  |                              |    | 50                  | 44 |
|  | 47                           | 88 | 48                  | 85 |
|  |                              |    | 49                  | 85 |
|  |                              |    | 50                  | 85 |
|  | 91                           | 45 | 72                  | 44 |
|  |                              |    | 73                  | 44 |
|  |                              |    | 74                  | 44 |
| CPW2-0600-S008B<br>CPW2-0600-S008B-FA6<br>CPW2-0600-S008B-FR6<br>CPW2-0650-S008B<br>CPW2-0650-S008B-FA6<br>CPW2-0650-S008B-FR6 | 3                            | 40 | 15                  | 39 |
|  |                              |    | 16                  | 39 |
|  | 41                           | 4  | 37                  | 8  |
|  |                              |    | 38                  | 8  |
|  | 41                           | 40 | 37                  | 39 |
|  |                              |    | 38                  | 39 |
|  | 41                           | 78 | 37                  | 70 |
|  |                              |    | 38                  | 70 |
|  | 80                           | 40 | 70                  | 39 |
|  |                              |    | 71                  | 39 |
| CPW2-0600-S010B<br>CPW2-0600-S010B-FA6<br>CPW2-0600-S010B-FR6<br>CPW2-0650-S010B<br>CPW2-0650-S010B-FA6<br>CPW2-0650-S010B-FR6 | 3                            | 37 | 9                   | 37 |
|  | 38                           | 3  | 33                  | 12 |
|  | 38                           | 37 | 33                  | 37 |
|  | 38                           | 72 | 33                  | 62 |
|  | 74                           | 37 | 57                  | 37 |
|  |                              |    |                     |    |

| Wolfspeed Part Numbers   | Current Fiducial Coordinates |     | New PCM Coordinates |     |
|--|------------------------------|-----|---------------------|-----|
|  | X                            | Y   | X                   | Y   |
| CPW3-0600-S004B<br>CPW3-0600-S004B-FA6<br>CPW3-0600-S004B-FR6<br>CPW3-0650-S004B<br>CPW3-0650-S004B-FA6<br>CPW3-0650-S004B-FR6 | 3                            | 62  | 17                  | 61  |
|  |                              |     | 18                  | 61  |
|  |                              |     | 19                  | 61  |
|  |                              |     | 20                  | 61  |
|  | 64                           | 4   | 65                  | 12  |
|  |                              |     | 66                  | 12  |
|  |                              |     | 67                  | 12  |
|  |                              |     | 68                  | 12  |
|  | 64                           | 62  | 65                  | 61  |
|  |                              |     | 66                  | 61  |
|  |                              |     | 67                  | 61  |
|  |                              |     | 68                  | 61  |
|  | 64                           | 123 | 65                  | 110 |
|  |                              |     | 66                  | 110 |
|  |                              |     | 67                  | 110 |
|  |                              |     | 68                  | 110 |
|  | 126                          | 62  | 113                 | 61  |
|  |                              |     | 114                 | 61  |
|  |                              |     | 115                 | 61  |
|  |                              |     | 116                 | 61  |
| CPW4-1200-S010B<br>CPW4-1200-S010B-FA6<br>CPW4-1200-S010B-FR6  | 4                            | 32  | 6                   | 32  |
|  | 33                           | 4   | 30                  | 7   |
|  | 33                           | 32  | 30                  | 32  |
|  | 33                           | 61  | 30                  | 57  |
|  | 63                           | 32  | 54                  | 32  |
| CPW4-1200-S015B<br>CPW4-1200-S015B-FA6<br>CPW4-1200-S015B-FR6  | 2                            | 27  | 7                   | 27  |
|  | 27                           | 3   | 28                  | 8   |
|  | 27                           | 27  | 28                  | 27  |
|  | 27                           | 52  | 28                  | 46  |
|  | 53                           | 27  | 49                  | 27  |
| CPW4-1200-S020B<br>CPW4-1200-S020B-FA6<br>CPW4-1200-S020B-FR6  | 3                            | 24  | 10                  | 23  |
|  | 24                           | 3   | 22                  | 6   |
|  | 24                           | 24  | 22                  | 23  |
|  | 24                           | 45  | 22                  | 40  |
|  | 46                           | 24  | 40                  | 23  |

## Implementation Date

Table 3 provides the estimated dates for key PCN milestones based on the information available on the date this PCN is issued. Customers are requested to acknowledge this PCN notification within 30 days from its issue date by sending an email or any feedback to Wolfspeed at [PCN@wolfspeed.com](mailto:PCN@wolfspeed.com). Note that after the first projected ship date, customers will no longer receive older parts and will only receive what is currently available listed in Table 1 (any update to these dates can be provided by your Wolfspeed contact).

**Table 3.** *Estimated Key PCN Dates.*

| Task                      | Date      |
|---------------------------|-----------|
| Qualification Report      | 2/28/2024 |
| Projected First Ship Date | 6/1/2024  |

## Contact Information

If you have any questions regarding this Informational PCN, please refer to the contact information listed in Table 4.

**Table 4.** *PCN Contact.*

|                                 |  |
|---------------------------------|--|
| <b>Wolfspeed Contact</b>        | Anri Mikirtichev   |
| <b>Wolfspeed Contact E-Mail</b> | <a href="mailto:Anri.Mikirtichev@wolfspeed.com">Anri.Mikirtichev@wolfspeed.com</a> |
| <b>Wolfspeed Contact Phone</b>  | 1.844.200.WOLF   |
| <b>Address</b>                  | 4600 Silicon Drive<br>Durham, NC 27703<br>U.S.A.                                   |

## Revision History

| Date              | Revision | Description   |
|-------------------|----------|---|
| February 28, 2024 | 0        | Initial release   |
| March 22, 2024    | 1        | Additional clarity around PCM structures, adjusted implementation dates, added images of the PCM structures, and the examples of coordinate changes (Table 2) |