



## Product Change Notification / CAAN-21CAKH543

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### Date:

23-Jun-2023

### Product Category:

Power Discrete Components

### PCN Type:

Manufacturing Change

### Notification Subject:

CCB 6198 Initial Notice: Qualification Microchip Technology Colorado – Fab 5 (MCSO) as an additional fabrication site for selected 700V, 1200V and 1700V SiC MOSFET products of MSC0xxSMAxx070xx, MSC0xxSMAxx120xx, MSC0xxSMAxx170xx, MSC180SMA120B, MSC360SMA120B and MSC750SMA170xx device families available in die sales products and 3L/4L TO-247 package.

### Affected CPNs:

[CAAN-21CAKH543\\_Affected\\_CPN\\_06232023.pdf](#)

[CAAN-21CAKH543\\_Affected\\_CPN\\_06232023.csv](#)

### Notification Text:

**PCN Status:**Initial Notification

**PCN Type:**Manufacturing Change

**Microchip Parts Affected:**Please open one of the files found in the Affected CPNs section.

Note: For your convenience Microchip includes identical files in two formats (.pdf and .xls)

**Description of Change:**Qualification Microchip Technology Colorado – Fab 5 (MCSO) as an additional fabrication site for selected 700V, 1200V and 1700V SiC MOSFET products of MSC0xxSMAxx070xx, MSC0xxSMAxx120xx, MSC0xxSMAxx170xx, MSC180SMA120B, MSC360SMA120B and MSC750SMA170xx device families available in die sales products and 3L/4L TO-247 product.

### Pre and Post Change Summary:



Date												
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**Method to Identify Change:**Traceability code

**Qualification Plan:**Please open the attachments included with this PCN labeled as PCN\_#\_Qual\_Plan.

**Revision History:**June 23, 2023: Issued initial notification.

The change described in this PCN does not alter Microchip's current regulatory compliance regarding the material content of the applicable products.

## Attachments:

[PCN\\_CAAN-21CAKH543\\_Qualification Plan.pdf](#)

Please contact your local [Microchip sales office](#) with questions or concerns regarding this notification.

## Terms and Conditions:

If you wish to receive Microchip PCNs via email please register for our PCN email service at our [PCN home page](#) select register then fill in the required fields. You will find instructions about registering for Microchips PCN email service in the [PCN FAQ](#) section.

If you wish to change your PCN profile, including opt out, please go to the [PCN home page](#) select login and sign into your myMicrochip account. Select a profile option from the left navigation bar and make the applicable selections.

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Affected Catalog Part Numbers (CPN)

MSC035SMA070B  
MSC035SMA070B4  
MSC035SMA170B  
MSC035SMA170B4  
MSC040SMA120B  
MSC040SMA120B4  
MSC060SMA070B  
MSC060SMA070B4  
MSC080SMA120B  
MSC080SMA120B4  
MSC090SMA070B  
MSC180SMA120B  
MSC360SMA120B  
MSC750SMA170B  
MSC750SMA170B4



## **QUALIFICATION PLAN SUMMARY**

**PCN #: CAAN-21CAKH543**

**Date:  
March 11, 2023**

**Qualification Microchip Technology Colorado – Fab 5 (MCSO) as an additional fabrication site for selected 700V, 1200V and 1700V SiC MOSFET products of MSC0xxSMAxx070xx, MSC0xxSMAxx120xx, MSC0xxSMAxx170xx, MSC180SMA120B, MSC360SMA120B and MSC750SMA170xx device families available in die sales products and 3L/4L TO-247 package.**

**Purpose:** Qualification Microchip Technology Colorado – Fab 5 (MCSO) as an additional fabrication site for selected 700V, 1200V and 1700V SiC MOSFET products of MSC0xxSMAxx070xx, MSC0xxSMAxx120xx, MSC0xxSMAxx170xx, MSC180SMA120B, MSC360SMA120B and MSC750SMA170xx device families available in die sales products and 3L/4L TO-247 package.

**CCB No. :** 6198

**Package:**

**Type:** \_\_\_\_\_ 3L TO-247 and 4L TO-247

**Width or Size:** \_\_\_\_\_ 12 mm x 14 mm

**Leadframe:**

**Part Number:** \_\_\_\_\_ 1-01-0011-0009 (3L) 1-01-0011-0010 (4L)

**Paddle Size:** \_\_\_\_\_ 0.74168 cm x 1.25 cm

**Material:** \_\_\_\_\_ Cu

**Pad Plating:** \_\_\_\_\_ Bare Cu

**Process:** \_\_\_\_\_ Stamped

**Lead-lock (Y/N):** \_\_\_\_\_ Groove

**Lead Finish:** \_\_\_\_\_ Matte Tin

**LF Thickness:** \_\_\_\_\_ 0.4953 cm

**Wire:**

**Material:** \_\_\_\_\_ 99.99% Aluminum

**Die Attach Epoxy:**

**Part Number** \_\_\_\_\_ 1-06-9999-0001

**Conductive:** \_\_\_\_\_ Yes

**Mold Compound:** \_\_\_\_\_ G780C

**Reliability Test plan:** \_\_\_\_\_ Q101 Rev E Reliability Test plan:

## Test Group A: Accelerated Environment Stress Tests

Test	Stress Name	Spec Reference	Conditions	Devices Per Lot	Read Points/Notes
A2	HAST [Highly Accelerated Stress Test]	JESD22-A-110	Time: 96 Hours Ta: 130 °C, Rhumidity: 85%, P: 33.3 PSIA Vds: 42 V DC ET must Occur within 96 Hours	3x80	DC ET at: Pre and Post
A3	UHAST [Unbiased HAST]	JESD22-A-102	Time: 96 Hours Ta: 130 °C Rhumidity: 85% P: 33.3 PSIA DC ET must Occur within 96 Hours	3x80	DC ET at: Pre and Post
A4	TC [Temperature Cycle]	JESD22-A-104 Appendix Six	Number of Cycles: 400 Ta Range: -55°C to 175°C Ramp: 16°C/Min	3x80	DC ET at: Pre and Post
A4a	TCHT [Temperature Cycling Hot Test]	JESD22-A-104 Appendix Six J-STD-035	125°C Test after TC followed by de-cap Wire pull on all wires from five devices	3x80	
A5	IOL [Intermittent Operational Life]	MIL-STD-750 Method 1037.2	Number of Cycles: 4650 Duty Cycle: 180 s Powered, 210 s Cooling ΔTj: 125°C DC ET must Occur within 96 Hours	3x80	DC ET at: Pre and Post

## Test Group B: Accelerated lifetime Simulation Tests

Test	Stress Name	Spec Reference	Conditions	Devices Per Lot	Read Points/Notes
B1	HTRB [High Temp Reverse Bias]	MIL-STD-750-1 M1039.4 2.2.1 Condition A	Vds: 100% Rated Tj: 175°C Duration: 1000 hours Bias must be maintained until Ta is 35°C DC ET must occur within 24 hours of bias removal	3x84	DC ET at: ● Pre ● 1000 Hours

## Test Group C: Package Assembly Integrity Tests

Test	Stress Name	Spec Reference	Conditions	Devices Per Lot	Read Points/Notes
C1	DPA [Destructive Physical Analysis]	AEC-Q101-004 Section Four	Random sample of parts that have successfully completed HAST, and TC		2 Per Stress Per package
C2	PD [Physical Dimensions]	JESD22-B-100		30 per package	All parts from stresses
C3	WBPS [Wire Bond Pull Strength]	MIL-STD-750 Method 2037	Condition C or D	10 Bonds, from a min of 5 parts	One Lot Per Package
C4	WBSS [Wire Bond Shear Strength]	AEC Q101-003 JESD22 B116		10 Bonds, from a min of 5 parts	One Lot Per Package
C5	DS [Die Shear]	MIL-STD-750 Method 2017		5 Per Package	One Lot Per Subcon
C6	TS [Terminal Strength]	MIL-STD-750-2 Method 2037	Evaluate lead integrity of through-hole leaded parts only.	30 per package	One Lot Per Subcon
C8	RSH [Resistance to Solder Heat]	JESD22-A-11 JESD22-B-106			
C9	TR [Thermal Resistance]	JESD24-3 JESD24-4 JESD24-6	Pre/Post Process Change	10	One Lot Per Subcon per package
C10	SD [Solderability]	STD-002 JESD22-B-102	Magnification 50X Method A for through-hole Method B and D For SMD	10	One Lot Per Subcon per package
C11	WG [Whisker Growth Evaluation]	AEC-Q005	For whisker requirements. Test to be done on a family basis		Already Completed by Fastech

## Device Reliability: Additional Parametric shift Requirements

- Parts not remaining within  $\pm 20\%$  of the initial reading of each test after completion of environmental testing. For leakages below 100nA, tester accuracy may prevent a post stress analysis to initial reading.
- For IOL, PTC and TC tests on products with  $R_{DSon} \leq 2.5 \text{ mOhm max}$ , the allowed value for the shift of  $R_{DSon}$  is  $\leq 0.5 \text{ mOhm}$ .
- For breakdown voltage only, a shift of  $>20\%$  of the initial measured value is a failure only if the final reading is within 20% of the datasheet maximum value.
- The allowed leakage limits which are not to exceed 10 times the initial value for moisture tests and 5 times the initial value for all others.
- For MOSFETs only, for 0h test values  $<10\text{nA}$  (IGSS and IDSS), the allowed value after stressing is 100nA for moisture tests and 50nA for other tests.



## Primary Qual Stress Allocation

MSL and Voltage	Part Number	Lot Number	IOL	TC	HAST	UHAST
MSL: 3681 1700 V	MSC035SMA170 Lot 1	SC2311	80	80	80	80
	MSC035SMA170 Lot 2	SC2331	80	80	80	80
	MSC035SMA170 Lot 3	SC2332	80	80	80	80