



8755 W. Higgins Road
Suite 500
Chicago, Illinois USA 60631

Feb-07th, 2023

PCN # ESW490-47 – Thyristor & Diode SOT-227 Packaging Location Transfer

To our valued customers,

Littelfuse would like to notify you that we will transfer our backend assembly process of Thyristor & Diode products SOT-227 Package to our new inhouse assembly factory in Lipa, Philippines. This brand-new assembly factory is to fulfill our strategy to invest in state-of-the-art power semiconductor assembly capabilities to dramatically improve our service levels to customers. Our target is to build this factory as a world class facility with automated, error proof processes to meet the highest quality standards. Contact our local Sales team in case you would like to understand more about this new factory.

Below is the detail changes associate with this Assembly Location change:

- 1) **Silicon Die:** No change
- 2) **Backend Assembly Bill of Materials:** No change
- 3) **Backend Assembly Process Flow:** Some part numbers change from Pad type to Padless type. Refer to PCN report.
- 4) **Backend Assembly Equipment:** Equal or better
- 5) **Marking & Labeling:** Yes. Changes pls refer to below details.

| DESCRIPTION | EXISTING LOCATION | SBU-LIPA | CHANGE (Y/N) | RISK | REMARKS |
|---------------------|---|---|--------------|------|--|
| Unit Marking | | | | | |
| Logo |  |  | Y | NR | Change to Littelfuse Logo |
| UL Sign | Yes | Yes | N | NR | No change |
| Product Name | Yes | Yes | N | NR | No change |
| Date Code | YYWW | YYWW | N | NR | No change |
| Assembly Line Code | G | M | Y | LOW | Site location code |
| Lot ID | Yes | Yes | N | NR | No Change |
| Tube Label | | | | | |
| Logo |  |  | Y | NR | Change to Littelfuse Logo |
| Qty per tube | Yes | Yes | N | NR | No change |
| Part Number | Yes | Yes | N | NR | No change |
| Lot No | No | Yes | Y | LOW | SBU-Lipa uses global format for product traceability |
| Country of Origin | No | Yes | Y | LOW | |
| Barcode + 2D Code | No | Yes | Y | LOW | |
| Date Code | Yes | Yes | N | NR | No change |
| Assy Line Code | G | M | Y | LOW | Site location code |
| Product code | Yes | No | Y | LOW | SBU-Lipa uses global format for product traceability |
| Box Label | | | | | |
| RoHS Label |  |  | Y | LOW | Both boxes having the notification of compliance with RoHS |
| Logo |  |  | Y | NR | Change to Littelfuse Logo |
| Qty per tube | Yes | Yes | N | NR | No change |
| Part Number | Yes | Yes | N | NR | No change |
| Lot No | No | Yes | Y | LOW | SBU-Lipa uses global format for product traceability |
| Country of Origin | No | Yes | Y | LOW | |
| Barcode + 2D Code | No | Yes | Y | LOW | |
| Date Code | Yes | Yes | N | NR | No change |
| Assy Line Code | G | M | Y | LOW | Site location code |
| Product code | Yes | No | Y | LOW | SBU-Lipa uses global format for product traceability |

Form, fit, function changes: None
Part number changes: None
Effective date: March-07th, 2023
Replacement products: N/A
Last time buy: N/A

This notification is for your information and acknowledgement. If you have any other questions or concerns, please contact your local sales team or Zhiwei Wang, Power Thyristor/Diode Discrete, Product Marketing Manager.

We value your business and look forward to assisting you whenever possible.

Thank you very much!

Zhiwei Wang

Best Regards,

Zhiwei Wang
Product Marketing Manager of Power Thyristor/Diode Discrete
Semiconductor Business Unit, Wuxi, China
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Littelfuse Phils, Inc. Lipa, Philippines



- Established since November 1997
- New Building 3 be opened in March 2020
- A two stories building (EBU & SBU)
- Total production space ~8400 m²
- 3400 m² used in phase 1
- Dedicated to semiconductor products





800 E. Northwest Highway Des Plaines, IL 60016

Product/Process Change Notice (PCN)

PCN#: ESW490-47 **Date:** Feb-07th, 2023

Product Identification:

Thyristor & Diode SOT-227 Package Products

Implementation Date for Change:

March-07th, 2023

Contact Information

Name: Zhiwei Wang

Title: Product Marketing Manager

Phone #: +86 510 85277701 - 7927

Fax#: N/A

E-mail: zwang@littelfuse.com

Category of Change:

- Assembly Process
- Data Sheet
- Technology
- Discontinuance/Obsolescence
- Equipment
- Manufacturing Site
- Raw Material
- Testing
- Fabrication Process
- Other: _____

Description of Change:

Littelfuse would like to notify you that we will transfer our backend assembly process of Thyristor/Diode SOT-227 Package Products to our inhouse new factory in Lipa, Philippines.

- 1) Silicon Die: No change
- 2) Backend Assembly Bill of Materials: No change
- 3) Backend Assembly Process Flow: Some part numbers change from Pad type to Padless type. Refer to PCN report.
- 4) Backend Assembly Equipment: Equal or better
- 5) Marking & Labeling: Yes. (refer to PCN letter)

Product form, fit, function changes: None

Part number changes: None

Important Dates:

- Qualification Samples Available: Last Time Buy:
- Final Qualification Data Available:
- Date of Final Product Shipment:

Method of Distinguishing Changed Product

- Product Mark,
- Date Code,
- Other,

Demonstrated or Anticipated Impact on Form, Fit, Function or Reliability:

None

LF Qualification Plan/Results:

Detail schedule refer to PCN report.

Customer Acknowledgement of Receipt: Littelfuse requests you acknowledge receipt of this PCN. In your acknowledgement, you can grant approval or request additional information. Littelfuse will assume the change is acceptable if no acknowledgement is received within 30 days of this notice. Lack of any additional response within 90 days of PCN issuance further constitutes acceptance of the change.

PCN Report

Prepared By : Zhiwei Wang, Product Marketing Manager
Date : Feb 07th, 2023
Products : Thyristor/Diode SOT-227 Package Products
Revision : B

1.0 Objective:

This qual report covers Thyristor/Diode SOT-227 Package Products Assembly location Transfer.

2.0 Applicable Products:

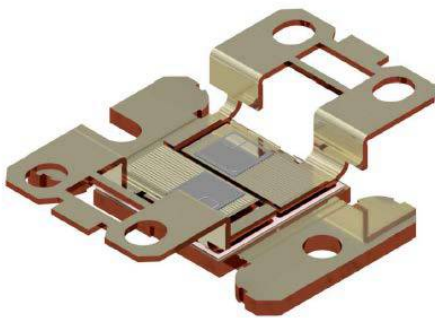
Thyristor/Diode SOT-227 Package Products.
Refer to Appendix A for detail affected part number list.

3.0 Physical Differences/Changes:

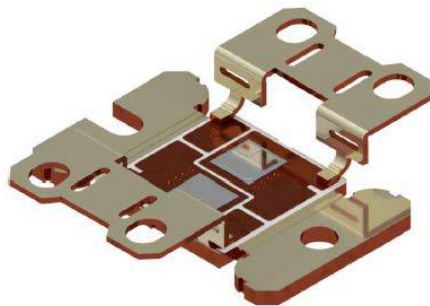
- 1) Small part numbers changed Assy process from Pad type to Padless type. Padless type is widely used for other SOT-227 package part numbers and is considered as a process improvement during the transfer.

Detail changed part numbers pls refer to Appendix B - Pad Type to Pad Less DCB Part List

Pad Type

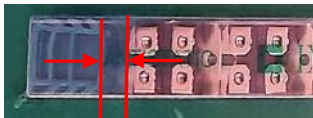


Padless type (DCB based Assy)



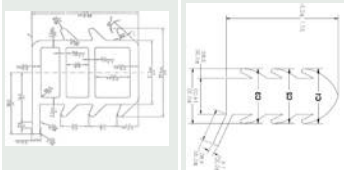
- 2) Small Tube dimension difference but do not impact customer application

Existing location Tube with gap:



SBU Lipa Tube without gap:



| Point of Comparison | EXISTING LOCATION | SBU-LIPA | GAP | RISK |
|------------------------|--|---------------|--------|---|
| Shipping Tube | | | | |
| Length, mm | 566 | 533 | Yes | Low risk. Both tubes have the same quantity of units but SBU-Lipa tube does not allow unit movement after placing the screws (enclosed in anti-static bag) and installing the end plugs. This is also standard to other OSAT |
| Width, mm | 28 | 28.45 | Yes | Low risk. Gap is not significant. SBU-Lipa tube not causing any jamming issue at DTFS and final test tube handlers |
| Height, mm | 15 | 15.24 | Yes | Low risk. Gap is not significant. SBU-Lipa tube not causing any jamming issue at DTFS and final test tube handlers |
| Material Thickness, mm | 0.81 | 0.89 | Yes | Low risk. Gap is not significant. |
| Tube Opening, mm | 26.68 x 13.23 | 26.67 x 13.46 | Yes | Low risk. Gap is not significant. SBU-Lipa tube not causing any jamming issue at DTFS and final test tube handlers |
| Quantity | 10 | 10 | No gap | No risk |
| Anti-static | Yes | Yes | No gap | No risk |
| End Plug | | | | |
| Length, mm | 26.3 | 27.10 | Yes | Low risk. No risk of falling unit due to end plug design. SBU-Lipa is using an open tool design and does not allow unit movement when installed |
| Width, mm | 21.2 | 24.50 | | |
| Height, mm | 12 | 14 | | |
| Design |  | | | |

4.0 Qualification Test Result

All samples passed parametric and reliability test standard by Littelfuse/IXYS.

| DEVICE | REL - TEST | CONDITIONS | SAMPLE SIZE PER LOT | STATUS | E22D14B1 | RESULT |
|--------------|------------------|------------------------|---------------------|----------|----------|-------------------------------|
| MMO74-12106Y | Autoclave/U-HAST | 168h, 85°C/85%r.H. | 20 | finished | passed | Completed; Passed reliability |
| | T/C | 100 cycles, -40/+150°C | 20 | finished | passed | Completed; Passed reliability |
| | ITSM | Datasheet | 3 | finished | passed | Completed; Passed reliability |

| DEVICE | REL - TEST | CONDITIONS | SAMPLE SIZE PER LOT | STATUS | E22H33B1 | E22H33B2 | E22H33B3 | RESULT |
|---------------|------------------|------------------------|---------------------|----------|----------|----------|----------|-------------------------------|
| DMA100A1600NB | Autoclave/U-HAST | 168h, 85°C/85%r.H. | 20 | finished | passed | passed | passed | Completed; Passed reliability |
| | T/C | 100 cycles, -40/+150°C | 20 | finished | passed | passed | passed | Completed; Passed reliability |
| | ITSM | Datasheet | 3 | finished | passed | passed | passed | Completed; Passed reliability |

| DEVICE | REL - TEST | CONDITIONS | SAMPLE SIZE PER LOT | STATUS | E22D13B4 | E22D13B5 | RESULT |
|---------------|------------------|--|---------------------|----------|----------|----------|-------------------------------|
| DPJ50XS1800NA | Autoclave/U-HAST | 168h, 85°C/85%r.H. | 20 | finished | passed | passed | Completed; Passed reliability |
| | T/C | 100 cycles, -40/+150°C | 20 | finished | passed | passed | Completed; Passed reliability |
| | ITSM | Datasheet | 3 | finished | passed | passed | Completed; Passed reliability |
| | HTRB | 1000h, 125/150 C, 70% VDRM /V RRM | 20 | finished | passed | passed | Completed; Passed reliability |
| | PC | delta T = 80°C, TjJ = 125°C, 1000 cycles | 20 | finished | passed | passed | Completed; Passed reliability |

| DEVICE | REL - TEST | CONDITIONS | SAMPLE SIZE PER LOT | STATUS | E22I38B1 | E22I38B2 | RESULT |
|---------------|------------------|------------------------|---------------------|----------|----------|----------|-------------------------------|
| DSEI2x101-12A | Autoclave/U-HAST | 168h, 85°C/85%r.H. | 20 | finished | passed | passed | Completed; Passed reliability |
| | T/C | 100 cycles, -40/+150°C | 20 | finished | passed | passed | Completed; Passed reliability |
| | ITSM | Datasheet | 3 | finished | passed | passed | Completed; Passed reliability |



5.0 Recommendations & Conclusions:

Based on the above qualification test results, Littelfuse concluded new Alternative Assembly Location can pass the release criterion and ready to start mass production for affected products.

Appendix A: Detail Part Number list affected

| | | |
|----------------|---------------|-------------------|
| CLA100PD1200NA | DSEI2X101-06A | DSS2X111-008A |
| CLA110MB1200NA | DSEI2X101-12A | DSS2X121-0045B |
| CLA60PD1200NA | DSEI2X121-02A | DSS2X160-0045A |
| CMA80PD1600NA | DSEI2X30-04C | DSS2X160-01A |
| DAA200X1800NA | DSEI2X30-06C | DSS2X41-01A |
| DAA200XA1800NA | DSEI2X30-10B | DSS2X61-0045A |
| DFE240X600NA | DSEI2X30-12B | DSS2X61-01A |
| DFE250X600NA | DSEI2X31-04C | DSS2X81-0045B |
| DH2X60-18A | DSEI2X31-06C | MCD40-12IO6 |
| DH2X61-18A | DSEI2X31-10B | MCD40-16IO6 |
| DHG100X1200NA | DSEI2X31-12B | MCO100-12IO1 |
| DHG100X600NA | DSEI2X60-04C | MCO100-16IO1 |
| DHG100X650NA | DSEI2X61-02A | MCO150-12IO1 |
| DHG50X1200NA | DSEI2X61-04C | MCO150-16IO1 |
| DHG50X650NA | DSEI2X61-06C | MCO25-12IO1 |
| DMA100A1600NB | DSEI2X61-10B | MCO25-16IO1 |
| DMA150E1600NA | DSEI2X61-12B | MCO50-12IO1 |
| DMA150YA1600NA | DSEK300-06A | MCO50-16IO1 |
| DMA150YC1600NA | DSEP2X101-04A | MCO75-12IO1 |
| DMA200X1600NA | DSEP2X25-12C | MCO75-16IO1 |
| DMA200XA1600NA | DSEP2X31-03A | MMO62-12IO6 |
| DMA200YA1600NA | DSEP2X31-06A | MMO62-16IO6 |
| DMA200YC1600NA | DSEP2X31-06B | MMO74-12IO6 |
| DMA240YA1600NA | DSEP2X31-12A | MMO74-16IO6 |
| DMA240YC1600NA | DSEP2X60-12A | MMO90-12IO6 |
| DNA90YA2200NA | DSEP2X61-03A | MMO90-14IO6 |
| DNA90YC2200NA | DSEP2X61-06A | MMO90-16IO6 |
| DPF240X200NA | DSEP2X61-12A | VBE60-06A |
| DPF240X400NA | DSEP2X61-12B | VBE60-12A |
| DPJ50XS1800NA | DSEP2X91-03A | VBO40-08NO6 |
| DSA240X150NA | DSEP2X91-06A | VBO40-12NO6 |
| DSA240X200NA | DSI2X55-12A | VBO40-16NO6 |
| DSA320A100NB | DSI2X55-16A | DSEI2X101-12A-REG |
| DSEC240-04A | DSS2X101-015A | DSEI2X121-02Y |
| DSEC240-06A | DSS2X101-02A | MMO74-12IO6Y |



PCN Report

Appendix B - Pad Type to Pad Less DCB Part List

| Part Numbers | From Connector | To Connector | | | |
|----------------|----------------|--------------|----------------|----------|---------|
| CLA110MB1200NA | Pad Type | Padless | DSS2X101-02A | Pad Type | Padless |
| DHG100X1200NA | Pad Type | Padless | DSS2X111-008A | Pad Type | Padless |
| DSEI2X101-06A | Pad Type | Padless | DSS2X121-0045B | Pad Type | Padless |
| DSEI2X101-12A | Pad Type | Padless | DSS2X41-01A | Pad Type | Padless |
| DSEI2X121-02A | Pad Type | Padless | DSS2X61-0045A | Pad Type | Padless |
| DSEI2X121-02Y | Pad Type | Padless | DSS2X61-01A | Pad Type | Padless |
| DSEI2X31-04C | Pad Type | Padless | DSS2X81-0045B | Pad Type | Padless |
| DSEI2X31-06C | Pad Type | Padless | MMO62-12IO6 | Pad Type | Padless |
| DSEI2X31-10B | Pad Type | Padless | MMO62-16IO6 | Pad Type | Padless |
| DSEI2X61-02A | Pad Type | Padless | MMO74-12IO6 | Pad Type | Padless |
| DSEI2X61-04C | Pad Type | Padless | MMO74-12IO6Y | Pad Type | Padless |
| DSEI2X61-06C | Pad Type | Padless | MMO74-16IO6 | Pad Type | Padless |
| DSEI2X61-12B | Pad Type | Padless | MMO90-12IO6 | Pad Type | Padless |
| DSEP2X101-04A | Pad Type | Padless | MMO90-14IO6 | Pad Type | Padless |
| DSEP2X31-03A | Pad Type | Padless | MMO90-16IO6 | Pad Type | Padless |
| DSEP2X31-06A | Pad Type | Padless | DH2X60-18A | Pad Type | Padless |
| DSEP2X31-12A | Pad Type | Padless | DSEI2X30-04C | Pad Type | Padless |
| DSEP2X60-12A | Pad Type | Padless | DSEI2X30-06C | Pad Type | Padless |
| DSEP2X61-03A | Pad Type | Padless | DSEI2X30-10B | Pad Type | Padless |
| DSEP2X61-06A | Pad Type | Padless | DSEI2X60-04C | Pad Type | Padless |
| DSEP2X61-12A | Pad Type | Padless | MCO100-12IO1 | Pad Type | Padless |
| DSEP2X91-03A | Pad Type | Padless | MCO100-16IO1 | Pad Type | Padless |
| DSEP2X91-06A | Pad Type | Padless | MCO150-12IO1 | Pad Type | Padless |
| DSI2X55-12A | Pad Type | Padless | MCO150-16IO1 | Pad Type | Padless |
| DSI2X55-16A | Pad Type | Padless | MCO50-12IO1 | Pad Type | Padless |
| DSS2X101-015A | Pad Type | Padless | MCO50-16IO1 | Pad Type | Padless |
| | | | MCO75-12IO1 | Pad Type | Padless |
| | | | MCO75-16IO1 | Pad Type | Padless |