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Suite 500
Chicago, Illinois USA 60631

June 28th, 2022

PCN # ESW490-44 – Thyristor & Diode TO247_ISO247_PLUS247_ISOPLUS247 Packaging Location Transfer

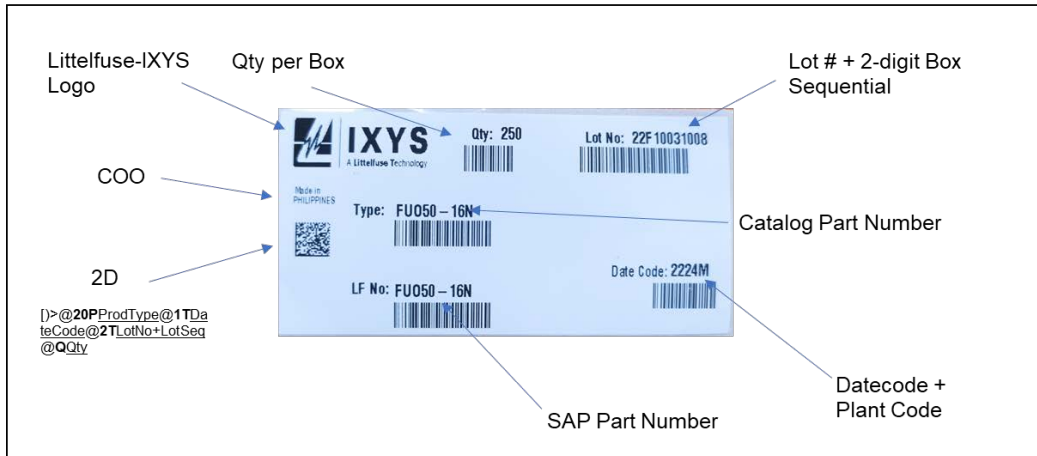
To our valued customers,

Littelfuse would like to notify you that we will transfer our backend assembly process of Thyristor & Diode products TO247 / ISO247 / PLUS247 / ISOPLUS247 Packages 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.

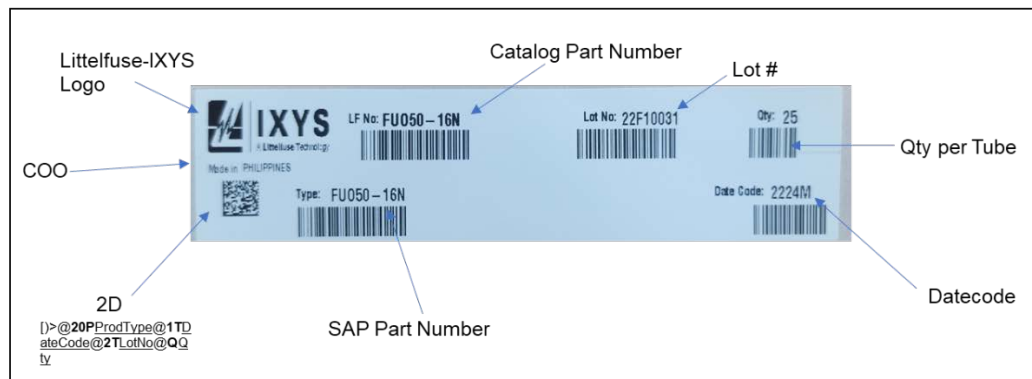
Below is the detail changes associate with this Assembly Location change:









- 1) **Silicon Die:** No change
- 2) **Backend Assembly Bill of Materials:** No change
- 3) **Backend Assembly Process Flow:** No change
- 4) **Backend Assembly Equipment:** Equal or better
- 5) **Marking & Labeling:** Yes. Changes pls refer to below details.

SBU - LIPA BOX LABEL



SBU - LIPA TUBE LABEL



DESCRIPTION	EXISTING LOCATION	SBU-LIPA	CHANGE (Y/N)	RISK	REMARKS
Unit Marking					
Logo			Y	LOW	Change to Littelfuse Logo
UL Sign	Yes	Yes	N	NR	No change
Trademark 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	L	M	Y	LOW	Site location code
Lot ID	FKT #	Lipa Lot ID format	Y	NR	SBU-Lipa uses global format
Box Label					
RoHS Label	e1 	e3 	Y	LOW	Both have printed RoHs compliance label
Logo			Y	NR	Change to Littelfuse Logo
Qty per Box	Yes	Yes	N	NR	No change
Part Number	Yes	Yes	N	NR	No change
Lot No	No	Yes	Y	LOW	Additional information from SBU-Lipa
Country of Origin	Yes	Yes	N	NR	No change
Code Type	Barcode	Barcode + 2D Code	Y	LOW	Additional scanning code to access information
Lot ID	FKT #	Lipa Lot ID format	Y	NR	SBU-Lipa uses global format
Date Code	Yes	Yes	N	NR	No change
Assy Line Code	L	M	Y	LOW	Site location code
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	Additional information from SBU-Lipa
Country of Origin	Yes	Yes	N	NR	No change
Code Type	Barcode	Barcode + 2D Code	Y	LOW	Additional scanning code to access information
Lot ID	FKT #	Lipa Lot ID format	Y	NR	SBU-Lipa uses global format
Date Code	Yes	Yes	N	NR	No change
Assy Line Code	L	M	Y	LOW	Site location code

Form, fit, function changes: None
Part number changes: None
Effective date: Sep 28th, 2022
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!

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#: ESW490-44 **Date:** June 28th, 2022

Product Identification:

Thyristor & Diode
TO247_ISO247_PLUS247_ISOPLUS247
Package Products

Implementation Date for Change:

Sep 28th , 2022

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 TO247_ISO247_PLUS247_ISOPLUS247 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: No change
- 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:

TO247 Thyristor available already while other packages types under qualification. 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 : June 28th, 2022
Products : Thyristor/Diode TO247_ISO247_PLUS247_ISOPLUS247 Package Products
Revision : A

1.0 Objective:

This qual report covers Thyristor/Diode TO247_ISO247_PLUS247_ISOPLUS247 Package Products Assembly location Transfer.

2.0 Applicable Products:

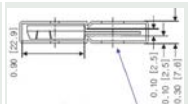
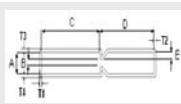
Thyristor/Diode TO247_ISO247_PLUS247_ISOPLUS247 Package Products.
Refer to Appendix A for detail part number list.

3.0 Qualification Report Available Timeline:

	Qual Report Available Y/N	Date
TO247 Thyristor	Yes	June'2022
TO247 Diode	No	July'2022
PLUS247 Thyristor	No	Sep'2022
ISO247 Thyristor/Diode	No	Sep'2022
ISOPLUS247 Thyristor/Diode	No	Aug'2022

4.0 Physical Differences/Changes:

Small change on Tube but not affect customer usage.

Point of Comparison	Existing Location	SBU-LIPA	GAP	RISK
Length, in	21	20.95 – 21.05	No gap	No risk
Width, in	1.79	1.79 -1.81	No gap	No risk
Height, in	0.3	0.28 - 0.33	With gap	Low risk. Gap is not significant. No unit jamming during actual use
Material Thickness, in	No data	0.03	No gap	No risk
Tube Opening, in	0.3 x 1.79	0.24 x 1.75	With gap	Low risk. Gap is not significant. No unit jamming during actual use
Quantity	30	30	No gap	No risk
Anti-static	No data	Yes	No gap	No risk
Design			With gap	Lipa designed was based on open tool



5.0 Qualification Test Result

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

DEVICE	REL - TEST	CONDITIONS	SAMPLE SIZE PER LOT, pc	1E21K43A2	2E21K43A3	1E21K43A3	RESULT
CLA50E1200HB	HTRB	1000hrs, 125°C, 840V AC mounted on heatsink	20	passed	passed	passed	Completed; Passed reliability
	AUTOCLAVE	96hrs, 121°C, 100%r.H; 48hrs recovery time @ RT	20	passed	passed	passed	Completed; Passed reliability
	T/C	100cycles, -40°C/150°C; EOL	20	passed	passed	passed	Completed; Passed reliability
	P/C	4000cycles, I_FAV=35A, I_FRMS=64A, P~62,3W, T_J=125°C, dT=80K, TH=45-75,1°C, t_off=65s	20	passed	passed	passed	Completed; Passed reliability
	Surge Current	650A, t = 10ms, 50Hz	3	passed	passed	passed	Completed; Passed reliability
	HAST	42VDC; 0hr;96hrs	30	passed	passed	passed	Completed; Passed reliability

DEVICE	REL - TEST	CONDITIONS	SAMPLE SIZE PER LOT, pc	1E21K43A2	RESULT
CLA100E1200HB	HTRB	1000hrs, 125°C, 840V AC mounted on heatsink	20	passed	Completed; Passed reliability
	AUTOCLAVE	96hrs, 121°C, 100%r.H; 48hrs recovery time @ RT	20	passed	Completed; Passed reliability
	T/C	100cycles, -40°C/150°C; EOL	20	passed	Completed; Passed reliability
	P/C	4000cycles, I_FAV=35A, I_FRMS=64A, P~62,3W, T_J=125°C, dT=80K, TH=45-75,1°C, t_off=65s	20	passed	Completed; Passed reliability
	Surge Current	650A, t = 10ms, 50Hz	3	passed	Completed; Passed reliability
	HAST	42VDC; 0hr;96hrs	30	passed	Completed; Passed reliability

6.0 Recommendations & Conclusions:

Base on the above qualification test results, Littelfuse/IXYS judged that SBU Lipa Assembly Location can pass the release criterion and ready to start mass production for affected products.

Appendix A: Detail Part Number list affected

Package Type	SAP Part Number	Qualification Status
TO247 Thyristor	CLA50E1200HB	Completed
TO247 Thyristor	CLA100E1200HB	Completed
TO247 Thyristor	CS20-16IO1	Completed
TO247 Thyristor	CS45-16IO1	Completed
TO247 Thyristor	CLA30E1200HB	Completed
TO247 Thyristor	CS30-16IO1	Completed
TO247 Thyristor	CMA80E1600HB	Completed
TO247 Thyristor	CS45-12IO1	Completed
TO247 Thyristor	CLA80MT1200NHB	Completed



TO247 Thyristor	CMA50E1600HB	Completed
TO247 Thyristor	CS30-14IO1-DIE-COA	Completed
TO247 Thyristor	CS45-08IO1	Completed
TO247 Thyristor	CS30-12IO1	Completed
TO247 Thyristor	CS20-14IO1-DIE-COA	Completed
TO247 Thyristor	CMA80MT1600NHB	Completed
TO247 Thyristor	CLA60MT1200NHB	Completed
TO247 Thyristor	CS20-12IO1	Completed
TO247 Thyristor	CS30-16IO1-DIE-COA	Completed
TO247 Thyristor	CS20-16IO1-DIE-COA	Completed
TO247 Thyristor	CLE40E1200HB	Completed
TO247 Thyristor	CS30-14IO1	Completed
TO247 Thyristor	CS20-14IO1	Completed
TO247 Diode	DPG60C300HB	Ongoing
TO247 Diode	DSEI30-06A	Ongoing
TO247 Diode	DSI45-12A	Ongoing
TO247 Diode	DSEI60-06A	Ongoing
TO247 Diode	DSP45-12A	Ongoing
TO247 Diode	DSEP30-06B	Ongoing
TO247 Diode	DSEP60-06A	Ongoing
TO247 Diode	DSEI30-10A	Ongoing
TO247 Diode	DSEC30-06A	Ongoing
TO247 Diode	DSEK60-06A	Ongoing
TO247 Diode	DPG30C400HB	Ongoing
TO247 Diode	DLA60I1200HA	Ongoing
TO247 Diode	DSEI60-10A	Ongoing
TO247 Diode	DPG60I400HA	Ongoing
TO247 Diode	DPG60C400HB	Ongoing
TO247 Diode	DSEP30-06A	Ongoing
TO247 Diode	DSA90C200HB	Ongoing
TO247 Diode	DSEI60-12A	Ongoing
TO247 Diode	DSEI30-12A	Ongoing
TO247 Diode	DSP25-12A	Ongoing
TO247 Diode	DSEP60-12A	Ongoing
TO247 Diode	DSEC60-06A	Ongoing
TO247 Diode	DSEP30-12B	Ongoing
TO247 Diode	DSSK60-015A	Ongoing
TO247 Diode	DSEI120-06A	Ongoing
TO247 Diode	DSI45-16A	Ongoing



TO247 Diode	DPG30C300HB	Ongoing
TO247 Diode	DSA70C200HB	Ongoing
TO247 Diode	DSP45-16A	Ongoing
TO247 Diode	DSEK60-02A	Ongoing
TO247 Diode	DPG80C400HB	Ongoing
TO247 Diode	DSSK60-02A	Ongoing
TO247 Diode	DSEP30-12A	Ongoing
TO247 Diode	DPG30I400HA	Ongoing
TO247 Diode	DSSK30-018A	Ongoing
TO247 Diode	DSEI60-02A	Ongoing
TO247 Diode	DSEI120-12A	Ongoing
TO247 Diode	DSP25-16A	Ongoing
TO247 Diode	DPG80C300HB	Ongoing
TO247 Diode	DSA70C150HB	Ongoing
TO247 Diode	DH60-18A	Ongoing
TO247 Diode	DSSK50-01A	Ongoing
TO247 Diode	DSSK70-008A	Ongoing
TO247 Diode	DSA60C60HB	Ongoing
TO247 Diode	DMA50P1600HB	Ongoing
TO247 Diode	DSEC60-12A	Ongoing
TO247 Diode	DSDI60-18A	Ongoing
TO247 Diode	DSSK80-0008D	Ongoing
TO247 Diode	DSSK80-006B	Ongoing
TO247 Diode	DSSK80-0045B	Ongoing
TO247 Diode	DH40-18A	Ongoing
TO247 Diode	DSS60-0045B	Ongoing
TO247 Diode	DHG30I600HA	Ongoing
TO247 Diode	DSA30C100HB	Ongoing
TO247 Diode	DSSK80-003B	Ongoing
TO247 Diode	DSA50C100HB	Ongoing
TO247 Diode	DPG30C200HB	Ongoing
TO247 Diode	DH20-18A	Ongoing
TO247 Diode	DSDI60-16A	Ongoing
TO247 Diode	DSA50C150HB	Ongoing
TO247 Diode	DSSK80-0025B	Ongoing
TO247 Diode	DPG60C200HB	Ongoing
TO247 Diode	DMA30E1800HA	Ongoing
TO247 Diode	DSEC30-12A	Ongoing
TO247 Diode	DSEK60-12A	Ongoing



TO247 Diode	DSEE30-12A	Ongoing
TO247 Diode	DSI45-08A	Ongoing
TO247 Diode	DMA80IM1600HB	Ongoing
TO247 Diode	DMA50P1200HB	Ongoing
TO247 Diode	DSEC30-06B	Ongoing
TO247 Diode	DSSK40-006B	Ongoing
TO247 Diode	DH60-16A	Ongoing
TO247 Diode	DPG60I300HA	Ongoing
TO247 Diode	DPF60C300HB	Ongoing
TO247 Diode	DPG30I300HA	Ongoing
TO247 Diode	DSA70C100HB	Ongoing
TO247 Diode	DHG30I1200HA	Ongoing
TO247 Diode	DHG40C1200HB	Ongoing
TO247 Diode	DMA30P1600HB	Ongoing
TO247 Diode	DHG60I1200HA	Ongoing
TO247 Diode	DSB80C45HB	Ongoing
TO247 Diode	DSSK40-008B	Ongoing
TO247 Diode	DPF60C200HB	Ongoing
TO247 Diode	DSSK30-01A	Ongoing
TO247 Diode	DSSK60-0045B	Ongoing
TO247 Diode	DSSK50-015A	Ongoing
TO247 Diode	DSSK70-0015B	Ongoing
TO247 Diode	DSP45-18A	Ongoing
TO247 Diode	DHG20I1200HA	Ongoing
TO247 Diode	DPF80C200HB	Ongoing
TO247 Diode	DSEC60-06B	Ongoing
TO247 Diode	DSA30C150HB	Ongoing
TO247 Diode	DSDI60-14A	Ongoing
TO247 Diode	DSA60C45HB	Ongoing
TO247 Diode	DSSK60-0045A	Ongoing
TO247 Diode	DSSK40-0015B	Ongoing
TO247 Diode	DPF60IM400HB	Ongoing
TO247 Diode	DHG40C600HB	Ongoing
TO247 Diode	DSEP60-12B	Ongoing
TO247 Diode	DMA50I1600HA	Ongoing
TO247 Diode	DMA50I1200HA	Ongoing
TO247 Diode	DMA50I800HA	Ongoing
TO247 Diode	DHG60C600HB	Ongoing
TO247 Diode	DH60-14A	Ongoing

TO247 Diode	DSS40-0008D	Ongoing
TO247 Diode	DFE60C600AHB	Ongoing
TO247 Diode	DHG60I600HA	Ongoing
TO247 Diode	DHG20I600HA	Ongoing
PLUS247 Thyristor	CS60-16IO1	Ongoing
PLUS247 Thyristor	CLA80E1200HF	Ongoing
PLUS247 Thyristor	CS60-14IO1-SMD	Ongoing
PLUS247 Thyristor	CS60-16IO1-SMD	Ongoing
PLUS247 Thyristor	CS60-12IO1	Ongoing
ISO247 Thyristor/Diode	CLA80MT1200NHR	Ongoing
ISO247 Thyristor/Diode	CMA60MT1600NHR	Ongoing
ISO247 Thyristor/Diode	CMA80MT1600NHR	Ongoing
ISO247 Thyristor/Diode	DMA10P1600HR	Ongoing
ISO247 Thyristor/Diode	DMA30P1600HR	Ongoing
ISO247 Thyristor/Diode	DMA50P1200HR	Ongoing
ISO247 Thyristor/Diode	DPF30P600HR	Ongoing
ISO247 Thyristor/Diode	DSP25-16AR	Ongoing
ISO247 Thyristor/Diode	DSEP60-12AR	Ongoing
ISO247 Thyristor/Diode	DSP45-16AR	Ongoing
ISO247 Thyristor/Diode	DSEP15-12CR	Ongoing
ISO247 Thyristor/Diode	DSI45-16AR	Ongoing
ISO247 Thyristor/Diode	CLA40E1200HR	Ongoing
ISO247 Thyristor/Diode	CLA60MT1200NHR	Ongoing
ISOPLUS247 Thyristor/Diode	DSI45-16AR	Ongoing
ISOPLUS247 Thyristor/Diode	DPG60C300HJ	Ongoing
ISOPLUS247 Thyristor/Diode	DPH30IS600HI	Ongoing
ISOPLUS247 Thyristor/Diode	DSEI30-10AR	Ongoing
ISOPLUS247 Thyristor/Diode	DSEK60-02AR	Ongoing
ISOPLUS247 Thyristor/Diode	DSEP30-06BR	Ongoing
ISOPLUS247 Thyristor/Diode	DSEP30-12AR	Ongoing
ISOPLUS247 Thyristor/Diode	DSEP30-12CR	Ongoing
ISOPLUS247 Thyristor/Diode	DSIK45-16AR	Ongoing
ISOPLUS247 Thyristor/Diode	DSS17-06CR	Ongoing
ISOPLUS247 Thyristor/Diode	DSSK60-015AR	Ongoing
ISOPLUS247 Thyristor/Diode	DSSK60-02AR	Ongoing
ISOPLUS247 Thyristor/Diode	DSSS35-008AR	Ongoing
ISOPLUS247 Thyristor/Diode	CS45-16IO1R	Ongoing