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

Jan 15th, 2015

RE: PCN # ESW490-24 -- TO-220(Isolated and Non-Isolated) and TO-263 (D^2Pak) Package Alternate Molding Compound Approval

To our valued customers,

Littelfuse would like to notify you of a newly approved molding compound for all TO-220(Isolated and Non-Isolated) and TO-263(D^2Pak) packaged Thyristor products. The new molding compound is fully approved internally. This change does not affect UL certification of electrical isolation applied to TO-220L package under file # E71639.There are no changes to fit, form, and function of the finished product.

Qualification efforts have been completed. Please see the attached documentation for change detail and affected part numbers.

All affected products have been fully qualified in accordance with established performance and reliability criteria. The attached pages summarize the qualification results. Full qualification data and/or samples will be available upon request.

Form, fit, function changes: None
Part number changes: None
Effective date: Jan 15th, 2015
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 Jia Zhu, Assistant Product Manager.

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

Best Regards,

Jia Zhu
Semiconductor Business Unit, Wuxi, China
+86 510 85277700 - 7966
jzhu3@littelfuse.com

800 E. Northwest Highway Des Plaines, IL 60016

Product/Process Change Notice (PCN)

PCN#: ESW490-24 Date: Jan 15, 2015

Product Identification:

All TO-220(Isolated and Non-Isolated) and TO-263 (D2Pak) Packaged Thyristor Products

Implementation Date for Change:

Apr 15, 2015

Contact Information

Name: Jia Zhu

Title: Assistant Product Manager

Phone #: +86 510 85277700 - 7966

Fax#: N/A

E-mail: jzhu3@littelfuse.com

Category of Change:

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

Description of Change:

Approve a new molding compound for all TO-220(Isolated and Non-Isolated) and TO-263(D2Pak) packaged thyristor products.

There are no changes to fit, form & function of the finished product. The affected products have been fully qualified in accordance with all established criteria for performance and reliability

All relevant detail is included in the supplemental pages..

Important Dates:

- ☒ Qualification Samples Available: Jan 15,2015, sample available upon request
- ☐ Last Time Buy:
- ☒ Final Qualification Data Available: Jan 15,2015
- ☐ Date of Final Product Shipment:

Method of Distinguishing Changed Product

- ☐ Product Mark,
- ☒ Date Code, Traceability data available upon request
- ☐ Other,

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

N/A

LF Qualification Plan/Results:

Attached….. full detail available upon request

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
ETR # 51402,51409,51413,60102,65963,59370,60100

Prepared By : Maggie Xu, Senior Product Engineer
Date : 12/26/2014
Device : TO-220/TO-263 Series Package Product
Revision : A

1.0 Objective:

The purpose of this project is to qualify a new molding compound as alternate source for Thyristor TO-220 (Isolated and Non-Isolated) and TO-263 (D^2Pak) Products.

2.0 Applicable Devices:

Thyristor TO-220 (Isolated and Non-Isolated) and TO-263 (D^2Pak) Product Series

3.0 Packing Method:

There will be no changes in the packing method.

4.0 Physical Differences/Changes:

There is no change in mechanical specification or package outline dimension (POD). There is slight change in surface texture which affects visual appearance of epoxy body and laser marking, but difference is visually negligible.

5.0 Reliability Test Results Summary:

Test Category	Description	Sample P/N	Sample Qty	Littelfuse test Ref#	Contents/Conditions	Result Summary
Parametric Test	Electrical Parameters	Q6016LH6	234	51402	1. Isolation test 2. IGT/VGT/IH/IDRM/IRRM	Meet datasheet spec
		S6025R	234	51409		
		HQ6025LH5	234	51413		
		S6010LS2	229	60102		
	High Temperature leakage test	Q6016LH6	10	51402	AC600Vpeak, 125°C	
		S6025R	10	51409		
		HQ6025LH5	10	51413		
		S6010LS2	5	60102	AC600Vpeak, 110°C	
	ITSM	Q6016LH6	5	51402	Full cycle, f = 50Hz; T_J(initial) = 25°C	
		S6025R	5	51409	Single half cycle; f = 50Hz; T_J(initial) = 25°C	
		HQ6025LH5	5	51413	Full cycle; f = 50Hz; T_J(initial) = 25°C	
		S6010LS2	5	60102	Single half cycle; f = 50Hz; T_J(initial) = 25°C	
Reliability Test	AC Blocking (HTRB)	Q6016LH6	77	65963	Ta:125°C, 1,008hr, Reverse biased at 600Vpeak AC	no failure at 1,008hr read point
		S6025R	77	51409		
		HQ6025LH5	77	59370	Ta:150°C, 1,008hr, Reverse biased at 600Vpeak AC	
		S6010LS2	77	60100	Ta:110°C, 1,008hr, Reverse biased at 600Vpeak AC	
	High Humidity High Temp. Reverse Bias (H3TRB)	Q6016LH6	40	51402	Ta: 85°C, RH: 85%, 1,008hr, Reverse biased at 160V_{DC}	no failure at 1,008 hr read point
		S6025R	40	51409		
		HQ6025LH5	40	65963		
		S6010LS2	40	60100		
	Temperature Cycling (TC)	Q6016LH6	40	51402	-40℃&150℃ (air to air), Dwell time 15mins,100 cycles	0 failure at 100cycle read point
		S6025R	40	51409		
		HQ6025LH5	40	51413		
		S6010LS2	40	60100		
	High Temperature Storage (HTSL)	Q6016LH6	40	51402	150°C, 1,008hrs	no failure at 1,008hr read point
		S6025R	40	51409		
		HQ6025LH5	40	51413		
		S6010LS2	40	60100		
	Resistance to Solder Heat (RSH)	Q6016LH6	22	51402	260°C, 10 seconds	0% failure after RSH
		S6025R	22	51409		
		HQ6025LH5	22	51413		
		S6010LS2	22	60100		

6.0 Electrical Characteristic Summary:

There is no change in electrical characteristics. Characterization data is available upon request.

7.0 Changed Part Identification:

There will be no changes in the part level identification.

8.0 Recommendations & Conclusions:

Based on the test results, it is determined that the new molding compound is qualified and certified for Thyristor TO-220 (Isolated and Non-Isolated) and TO-263 (D^2Pak) Product Series.

9.0 Approvals:

Maggie Xu
Thyristor Product Engineer
Littelfuse, WUXI

Zhiwei Wang
Product Engineer Manager
Littelfuse, WUXI