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Suite 500  
Chicago, Illinois USA 60631

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October 23, 2012,

RE: PCN # ESW490-23 – Alternate Backend Location Approval of TO-251 and TO-252 (V-Pak & D-Pak) Packages

To our valued customers,

Littelfuse would like to notify you of a newly approved backend location for TO-251 and TO-252 (V-Pak & D-Pak) Thyristor products. The factory in Guangdong China is fully approved for all assembly, test, and packing operations. There are no changes to fit, form, and function of the finished product.

Qualification efforts are complete and the new factory is online for immediate shipments. Please see the attached documentation for change detail and affected part numbers.

**Form, fit, function changes:** None (reference PCN report for details)

**Part number changes:** None

**Effective date:** October 26, 2012

**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 Daisy Wang, Assistant Product Manager.

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

Best Regards,

Daisy Wang  
Semiconductor Business Unit, Wuxi, China  
+86 510 85277753  
[dwang2@littelfuse.com](mailto:dwang2@littelfuse.com)



800 E. Northwest Highway Des Plaines, IL 60016

## Product/Process Change Notice (PCN)

**PCN#:** ESW490-23    **Date:** 10/23/2012

**Product Identification:**

Thyristor TO-251(V-pak) and TO-252(D-pak) packages

**Implementation Date for Change:**

10/26/2012

### Contact Information

**Name:** Daisy Wang

**Title:** Assistant Product Manager

**Phone #:** +86 510 85277753

**Fax#:** N/A

**E-mail:** dwang2@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 an alternate backend assembly, test, and packing location for TO-251(V-pak) and TO-252(D-pak) packages.

There are no changes to fit, form, and 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: 10/26/2012

Last Time Buy:

Final Qualification Data Available: 10/16/2012

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:

Minor (non-impact) update in A & K datasheet dimensions.

### LF Qualification Plan/Results:

**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#41590/41637

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**Prepared By** : Walt Tian, Senior Product Engineer

**Date** : 10/16/2012  
**Device** : TO-251(V-pak) and TO-252(D-pak)  
**Revision** : A

## 1.0 Objective:

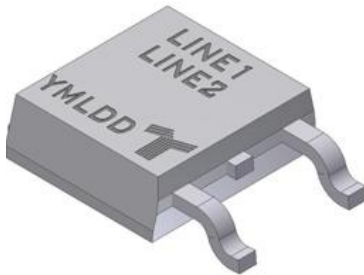
This PCN is to qualify a second/alternative source for TO-251(V-pak) and TO-252(D-pak) packages backend assembly, test, and packing operations. Succeeding pages summarize the physical, electrical and reliability test performed on qualification lots. There is no change to the die / wafer.

## 2.0 Applicable Devices:

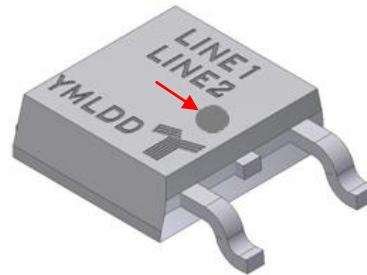
See List of Affected Part Numbers.

## 3.0 Physical Differences:

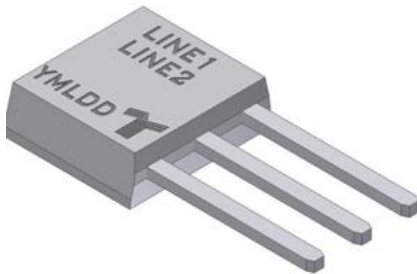
3.0.1 Visual difference: There is a mold eject pin mark on the new location package



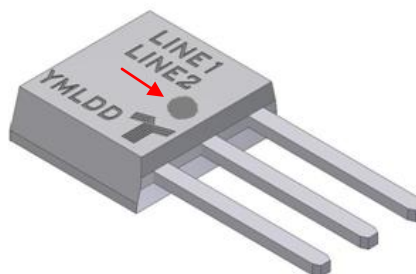
current D-pak



new location D-pak



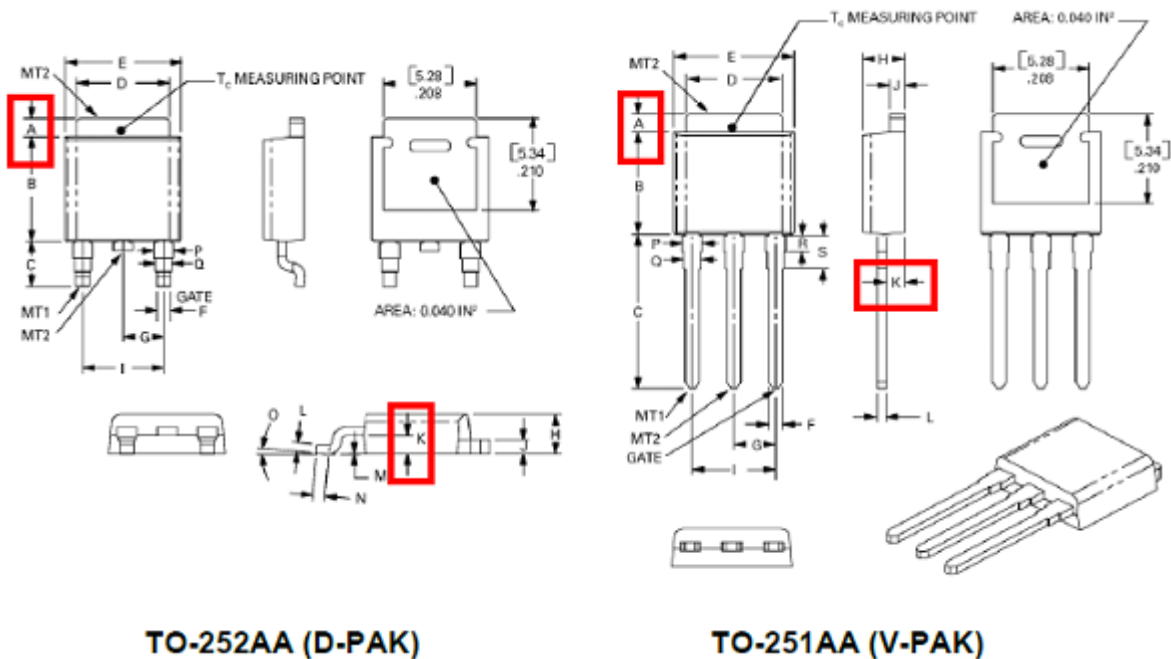
current V-pak



new location V-pak

### 3.0.2 Dimension difference

Dimension	Dimension A						Dimension K					
	Inches			Millimeters			Inches			Millimeters		
	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Current location	0.040	0.044	0.050	1.02	1.11	1.27	0.038	0.040	0.044	0.97	1.01	1.12
New location	0.037	0.040	0.043	0.94	1.01	1.09	0.035	0.037	0.039	0.90	0.95	1.00
JEDEC	0.035	---	0.050	0.90	---	1.27	0.035	---	0.045	0.90	---	1.02



#### 4.0 Material Differences:

D-pak and V-pak are converted to Halogen free by this location change.

#### 5.0 Packaging Method

N/A



## 6.0 Reliability Test Results Summary:

	Test item	Condition	ETR	Duration	S8008DRP	S8008VTP	S6004VS2TP	S8012DTP	S6012VTP	Result	
					Qual	Qual	Qual	Qual	Qual		
Reliability	AC blocking	rated VDRM ac peak at 125c	41590/ 41637	1008hr	0/80	0/80	0/80	0/80	0/80	Pass	
	LTSL	-40c		1008hr	0/80	0/80	0/80	0/80	0/80	Pass	
	HTSL	125c		1008hr	0/80	0/80	0/80	0/80	0/80	Pass	
	H3TRB	85%/85c with bias 320v		1008hr	0/80	0/80	0/80	0/80	0/80	Pass	
	TC	-40c~150c, 15min dwell time		100cycles	0/80	0/80	0/80	0/80	0/80	Pass	
	Autoclave	120c, 2ATM		96hr	0/80	0/80	0/80	0/80	0/80	Pass	
	MSL	168hr 85%/85c + 3x 260 reflow			0/10	0/10	0/10	0/10	0/10	Pass	
Characteristics	RSH	260c	41590/ 41637	10sec	0/22	0/22	0/22	0/22	0/22	Pass	
	Leadbend					0/5				Pass	
	Solderability	steam aging(1~8hr), 245c solder				0/15	0/15			Pass	
	Rth						0/5			Pass	
	Outline dimension					0/30	0/30			Pass	
	ITSM	50hz AC half cycle				0/10	0/10	0/10	0/10	0/10	Pass
											Pass

## 7.0 Electrical Characteristic Summary:

N/A

## 8.0 Changed Part Identification

The product from new location can be identified by the 3<sup>rd</sup> digit of date code marking. Digit "2" is used in current assembly/test location while letter "T" is used in the new assembly/test location.

## 9.0 Recommendations & Conclusions:

Products manufactured in the new backend location meet all established criteria for performance and reliability. It is therefore qualified for production of Littelfuse TO-251(V-pak) & TO-252(D-pak) product families.

## 10.0 Approvals:

**Lawrence Liu**  
Product Engineering Manager

**Honglim Lee**  
Product Engineering Director