



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

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Oct 11<sup>th</sup>, 2016

RE: PCN # ESW490\_28 TO-220(Isolated & non-isolated) TO-263(D2Pak) & TO218(Isolated & non-isolated) Package Solder Paste Property Change

To our valued customers,

Littelfuse would like to notify you of a newly approved solder paste type Pb92.5Sn5Ag2.5 for all TO-220 Isolated/non-Isolated , TO-263(D2PAK), and TO218(Isolated & non-isolated) Thyristor products. The new solder paste type is fully approved internally. It will enable further improvement in quality enhancement, and process control.

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 11<sup>th</sup>, 2017

**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, Assistant Product Manager.

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

Best Regards,

Zhiwei Wang  
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800 E. Northwest Highway Des Plaines, IL 60016

## Product/Process Change Notice (PCN)

**PCN#:** ESW490-28    **Date:** Oct 11, 2016

**Product Identification:**

All TO-220(Isolated & non-isolated) TO-263(D2PAK) & TO218(Isolated & non-isolated)

**Implementation Date for Change:**

Jan 11, 2017

### Contact Information

**Name:** Zhiwei Wang

**Title:** Assistant Product 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:

Approve a new solder paste type Pb92.5Sn5Ag2.5 for all TO-220 Isolated/non-Isolated , TO-263(D2PAK) , and TO218(Isolated & non-isolated) Thyristor products

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: Oct 11, 2016, sample available upon request

Last Time Buy:

Final Qualification Data Available: Oct 11,2016

Date of Final Product Shipment:

### Method of Distinguishing Changed Product

- Product Mark,
- Date Code, Start from 7BXXX
- Other,

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

None

### 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 # 84716,

84718,84596,84490,84717,84719,84622,84491,84748,84750,84752,84754,84720,  
86002,86007,85999,86000

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**Prepared By** : Maggie Xu, Senior Product Engineer  
**Date** : Oct/11/2016  
**Device** : TO220/TO263/TO218 Series Package Product  
**Revision** : A

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## 1.0 Objective:

The purpose of this project is to qualify the use of Pb92.5Ag2.5Sn5 as a new solder paste material for Thyristor TO220 (Isolated and Non-Isolated), TO263 (D2Pak) and TO218 (Isolated and Non-Isolated) Products.

Package	Original Solder paste	New Solder Paste
TO220	Pb90Sn10	Pb92.5Ag2.5Sn5
TO263	Pb90Sn10	Pb92.5Ag2.5Sn5
TO218	Pb90Sn10	Pb92.5Ag2.5Sn5

## 2.0 Applicable Devices:

Thyristor TO220 (Isolated and Non-Isolated), TO263 (D2Pak) and TO218 (Isolated and Non-Isolated) 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 and package outline dimension (POD).

## 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	S4008LS2TP	271	84716	IGT/VGT/IH>IDRM/IRRM	Meet datasheet spec
		Q4010N5RP	271	84718		
		Q6016NH6RP	261	84596		
		Q8025LH5TP	271	84490		
		Q6040K7TP	271	86002		

		S8065KTP	271	86007			
		Q6025K6TP	271	86007			
	High Temperature leakage test		S4008LS2TP	5	84717	AC600Vpeak, 110°C	
			Q4010N5RP	5	84719	AC600Vpeak, 125°C	
			Q6016NH6RP	5	84622		
			Q8025LH5TP	5	84491		
			Q6040K7TP	5	86000		
			S8065KTP	5	86000		
			Q6025K6TP	5	86000		
	ITSM		S4008LS2TP	5	84748	Single half cycle; f = 50Hz; T <sub>J</sub> (initial) = 25°C	
			Q4010N5RP	5	84750		
			Q6016NH6RP	5	84752		
			Q8025LH5TP	5	84754		
			Q6040K7TP	5	86000		
			S8065KTP	5	86000		
			Q6025K6TP	5	86000		
	Thermal Resistance		S4008LS2TP	3	84717		
			Q4010N5RP	3	84719		
			Q6016NH6RP	3	84622		
			Q8025LH5TP	3	84491		
			Q6040K7TP	3	85999		
		Q6025K6TP	3	85999			
Reliability Test	AC Blocking			84716	Ta:110°C, 1,008hr, Reverse biased at 400Vpeak AC	no failure at 1,008hr read point	
			77				
				84718	Ta:125°C, 1,008hr, Reverse biased at 400Vpeak AC		
			77				
			77	84596	Ta:125°C, 1,008hr, Reverse biased at 600Vpeak AC		
			77	86007			
			77	86002			
		77	86007				
		77	84490				
	High Humidity High Temp. Reverse Bias (H3TRB)				84716	Ta: 85°C, RH: 85%, 1,008hr, Reverse biased at 160V <sub>DC</sub>	no failure at 1,008 hr read point
				77			
				84718			
				84596			
				84490			
			86002				
			86007				
		86007	Ta: 85°C, RH: 85%, 1,008hr, Reverse biased at				
		77	86007				

				320V <sub>DC</sub>		
Temperature Cycling (TC)	S4008LS2TP	77	84716	-40°C & 150°C (air to air), Dwell time 15mins, 100 cycles	0 failure at 100cycle read point	
	Q4010N5RP	77	84718			
	Q6016NH6RP	77	84596			
	Q8025LH5TP	77	84490			
	Q6040K7TP	77	86002			
	S8065KTP	77	86007			
	Q6025K6TP	77	86007			
Solderability	S4008LS2TP	10	84716	ANSI/J-STD-002, category 3, Test A	no failure after solderability	
	Q4010N5RP	10	84718			
	Q8025LH5TP	10	84490			
	Q6040K7TP	10	86002			
	S8065KTP	10	86007			
	Q6025K6TP	10	86007			
Resistance to Solder Heat (RSH)	S4008LS2TP	30	84716	260°C, 10 seconds	0% failure after RSH	
	Q4010N5RP	30	84718			
	Q6016NH6RP	30	84596			
	Q8025LH5TP	30	84490			
	Q6040K7TP	30	86002			
	S8065KTP	30	86007			
	Q6025K6TP	30	86007			

#### 6.0 Electrical Characteristic Summary:

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

#### 7.0 Changed Part Identification:

NA

#### 8.0 Recommendations & Conclusions:

Based on the test results, it is determined that Pb92.5Ag2.5Sn5 is qualified and certified for Thyristor TO220 (Isolated and Non-Isolated), TO263 (D2Pak) and TO218 (Isolated and Non-Isolated) Product Series.

#### 9.0 Approvals:

Maggie Xu  
Thyristor Product Engineer  
Littelfuse, WUXI

Zhiwei Wang  
Product Engineer Manager  
Littelfuse, WUXI