

Suite 500 Chicago, Illinois USA 60631

July 26<sup>th</sup>, 2012

RE: PCN # ESW490-22 - Alternate backend location approval of TO92 WB and SOT223 packages

To our valued customers,

Littelfuse would like to notify you of a newly approved backend location for TO92 WB and SOT223 Thyristor products. The factory in the Philippines is fully approved for all assembly, test and packing operations. There are no changes to fit, form, 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 Part number changes: None Effective date: August 31, 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



800 E. Northwest Highway Des Plaines, IL 60016

# Product/Process Change Notice (PCN)

PCN#: ESW490-22 Date: 07/26/2012	Contact Information			
Product Identification:	Name: Daisy Wang			
Thyristor TO92 WB & SOT223 products	Title: Assistant Product Manager			
Implementation Date for Change:	Phone #: +86 510 85277753			
08/31/2012	Fax#: N/A			
	E-mail: dwang2@littelfuse.com			
Category of Change:	Description of Change:			
☐ Assembly Process	Approve an alternate backend assembly, test, and packing location for			
☐ Data Sheet	TO92 WB and SOT223 packages.			
☐ Technology	There are no changes to fit, form & function of the finished product. The			
☐ Discontinuance/Obsolescence	affected products have been fully qualified in accordance with all establishe			
☐ Equipment	criteria for performance and reliability.			
	All relevant detail is included in the supplemental pages			
Raw Material				
Testing				
Fabrication Process				
Other:				
Important Dates:				
Qualification Samples Available: ava	ilable upon request			
Final Qualification Data Available: 07	7/26/2012			
☐ Date of Final Product Shipment:				
Method of Distinguishing Changed Pro	oduct			
☐ Date Code,				
Other,				
Demonstrated or Anticipated Impact of	n Form, Fit, Function or Reliability:			
None				
LF Qualification Plan/Results:				
Customer Acknowledgement of Receip	pt: Littelfuse requests you acknowledge receipt of this PCN. In your acknowledgement, you can			
grant approval or request additional information. Lit	ttelfuse 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 # 26689

Requested By : Neil Solano, Outsource Senior Product Engineer

**Prepared By**: Sunny Shu, Wuxi Technical Center Engineer

**Date** : July 26, 2012 **Device** : TO92 WB Package

**Revision** : A

## 1.0 Objective:

The purpose of this project is to qualify a second/alternative source for TO92 WB package 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 Table 1-1

#### 3.0 Assembly, Process & Material Differences/Changes:

#### 3.1 Assembly and Process Changes

There are no known significant changes in the assembly and process methods except for die attach and wire bonding which the new site utilizes conductive epoxy and copper wire material.

## 3.2 Material Changes

Material	TO92-3L				
Material	Main Source	Alternative/2 <sup>nd</sup> Source	Changed?		
Leadframe	A194 (Ag Spot)	A194 (Ag Spot)	No		
Die Attach Material	Soft Solder, 95.5Pb 2Sn 2.5Ag	ABL 2600AT	Yes		
Au Wire	Au 1.5 mils, 99.99%	Cu 2 mils	Yes		
Molding Compound	GR640	G600	Yes		
Lead Finish	100% Sn	100% Sn	No		

#### 4.0 Packaging Method

There will be no changes in the packing method.

## 5.0 Physical Differences/Changes:

There is no change in mechanical specification or package outline dimension (POD).

# 6.0 Reliability Test Results Summary:



Test Items	Condition	Duration	Lot 1	Lot 2	Lot 3	Cum	Result
AC Blocking	Bias = Rated Voltage Ta = 125 ℃	168hrs	0/40	0/40	0/40	0/120	Pass
		504hrs	0/40	0/40	0/40	0/120	Pass
		1008hrs	0/40	0/40	0/40	0/120	Pass
Town are turn Cycle	T 40 T 470 T	50cyc	0/100	0/100	0/100	0/300	Pass
Temperature Cycle	Ta = $-40  \text{°C}$ to $+150  \text{°C}$	100cyc	0/100	0/100	0/100	0/300	Pass
		168hrs	0/77	0/77	0/77	0/231	Pass
Temperature/Humidity	Bias = 160VDC Ta = 85 °C, 85% RH	504hrs	0/77	0/77	0/77	0/231	Pass
		1008hrs	0/77	0/77	0/77	0/231	Pass
Thermal Shock	$Ta = 0 \ \mathbb{C}$ to $100 \ \mathbb{C}$	10сус	0/100	0/100	0/100	0/300	Pass
	Ta = 121 °C, 100%RH, 2ATM	48hrs	0/100	-	0/100	0/200	Pass
Autoclave		96hrs	0/100	-	0/100	0/200	Pass
		168hrs	0/100	-	0/100	0/200	Pass
	Ta = 150 ℃	168hrs	-	0/100	0/100	0/200	Pass
High Temperature Storage		504hrs	-	0/100	0/100	0/200	Pass
		1008hrs	-	0/100	0/100	0/200	Pass
	Ta = -40 ℃	168hrs	-	0/100	0/100	0/200	Pass
Low Temperature Storage		504hrs	-	0/100	0/100	0/200	Pass
		1008hrs	-	0/100	0/100	0/200	Pass
Resistance to Solder Heat	Solder Temperature 260 ℃	10 Sec	0/10	-	-	0/10	Pass
ITSM	I <sub>(peak)</sub> , Single Cycle-AC		0/30	-	0/30	0/60	Pass
Solderability	ANSI-J-STD 002 A-3		-	-	0/10	0/10	Pass
Thermal Resistance	Per Catalogue		0/5	-	0/5	0/10	Pass
Moisture Sensitivity Level (MSL)	Per Jedec J-STD-020D Level 1		0/11	-	-	0/11	Pass
Pre-Conditioning	Per JESD22-A113, Sensitivity Level 1		0/177	0/177	0/177	0/531	Pass
First Article	Per Catalogue Package Dimension		-	0/10	-	0/10	Pass

## 7.0 Electrical Characteristic Summary:

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

## 8.0 Changed Part Identification:

All TO92 WB products manufactured by the alternate backend site will bear a  $3^{rd}$  digit datecode of letter C which is symbolized in front of the package.

## 9.0 Recommendations & Conclusions:



Based on the test results, it is determined that the second/alternative backend location is qualified for production of Littelfuse TO92 WB package.

## 10.0 Approvals:

<u>Jifeng Zhou</u> Wuxi Technical Center Manager Littelfuse, Wuxi Neil Solano Outsource Senior Product Engineer Littelfuse, Wuxi

**Table 1-1: Affected Part Number** 



Standard Part Number		Special Part Number		
SCR	Triac	SCR	Triac	
S4X8ES	LX803DE	S887S6X8ESRP		
S4X8ESRP	LX803DERP			
S4X8ESAP	LX803DEAP			
S6X8ES	LX803ME			
S6X8ESRP	LX803MERP			
S6X8ESAP	LX803MEAP			
S8X8ES	LX807DE			
S8X8ESRP	LX807DERP			
S8X8ESAP	LX807DEAP			
S4X8ES1	LX807ME			
S4X8ES1RP	LX807MERP			
S4X8ES1AP	LX807MEAP			
S6X8ES1	L0103DE			
S6X8ES1RP	L0103DERP			
S6X8ES1AP	L0103DEAP			
S8X8ES1	L0103ME			
S8X8ES1RP	L0103MERP			
S8X8ES1AP	L0103MEAP			
S4X8ES2	L0103NE			
S4X8ES2RP	L0103NERP			
S4X8ES2AP	L0103NEAP			
S6X8ES2	L0107DE			
S6X8ES2RP	L0107DERP			
S6X8ES2AP	L0107DEAP			
S8X8ES2	L0107ME			
S8X8ES2RP	L0107MERP			
S8X8ES2AP	L0107MEAP			
S402ES	L0107NE			
S402ESRP	L0107NERP			
S402ESAP	L0107NEAP			
S602ES	L0109DE			
S602ESRP	L0109DERP			
S602ESAP	L0109DEAP			
	L0109ME			
	L0109MERP			
	L0109MEAP			
	L0109NE			
	L0109NERP			
	L0109NEAP			



# PCN Report ETR # 29645/34216

Requested By : Neil Solano, Outsource Senior Product Engineer

**Prepared By**: Sunny Shu, Wuxi Technical Center Engineer

Date : July 26, 2012 Device : SOT223 Package

**Revision** : C

### 1.0 Objective:

The purpose of this project is to qualify a second/alternative source for SOT223 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 Table 1-1

#### 3.0 Assembly, Process & Material Differences/Changes:

#### 3.1 Assembly and Process Changes

There are no known significant changes in the assembly and process methods except for die attach and wire bonding which the new site utilizes conductive epoxy and copper wire material.

## 3.2 Material Changes

Material	SOT223-3L				
Material	Main Source	Alternative/2 <sup>nd</sup> Source	Changed?		
Leadframe	A194 (Ag Spot)	A194 (Ag Spot)	No		
Die Attach Material	Soft Solder, 95.5Pb 2Sn 2.5Ag	ABL 2600AT	Yes		
Au Wire	Au 1.5 mils, 99.99%	Cu 2 mils	Yes		
Molding Compound	GR640	G600	Yes		
Lead Finish	100% Sn	100% Sn	No		

#### 4.0 Packaging Method

There will be no changes in the packing method.

#### 5.0 Physical Differences/Changes:

There is no change in mechanical specification or package outline dimension (POD).

# 6.0 Reliability Test Results Summary:



Test Items	Condition	Duration	Lot 1	Lot 2	Lot 3	Cum	Result
AC Blocking		168hrs	0/40	0/40	0/40	0/120	Pass
	Bias = Rated Voltage $Ta = 150  \text{C}$	504hrs	0/40	0/40	0/40	0/120	Pass
		1008hrs	0/40	0/40	0/40	0/120	Pass
Tommoroturo Cyalo	T 40 M 150 M	50cyc	0/100	0/100	0/100	0/300	Pass
Temperature Cycle	Ta = $-40  \text{C}$ to $+150  \text{C}$	100cyc	0/100	0/100	0/100	0/300	Pass
		168hrs	-	0/77	-	0/77	Pass
Temperature/Humidity	Bias = 160VDC Ta = 85 °C, 85% RH	504hrs	-	0/77	-	0/77	Pass
		1008hrs	-	0/77	-	0/77	Pass
Thermal Shock	$Ta = 0 \ \mathbb{C}$ to $100 \ \mathbb{C}$	10cyc	0/100	0/100	0/100	0/300	Pass
		48hrs	-	-	0/100	0/100	Pass
Autoclave	Ta = 121 °C, 100% RH, 2ATM	96hrs	-	-	0/100	0/100	Pass
		168hrs	-	-	0/100	0/100	Pass
	Ta = 150 ℃	168hrs	-	-	0/100	0/100	Pass
High Temperature Storage		504hrs	-	-	0/100	0/100	Pass
		1008hrs	-	-	0/100	0/100	Pass
		168hrs	0/100	-	-	0/100	Pass
Low Temperature Storage	Ta = -40 ℃	504hrs	0/100	-	-	0/100	Pass
		1008hrs	0/100	-	-	0/100	Pass
Resistance to Solder Heat	Solder Temperature 260 ℃	10 Sec	0/10	-	0/10	0/20	Pass
ITSM	I <sub>(peak),</sub> Single Cycle-AC		0/5	0/5	-	0/10	Pass
Solderability	ANSI-J-STD 002 A-3		-	-	0/10	0/10	Pass
Thermal Resistance	Per Catalogue		0/3	-	0/3	0/6	Pass
Moisture Sensitivity Level (MSL)	Per Jedec J-STD-020D Level 1		-	-	0/11	0/11	Pass
Pre-Conditioning	Per JESD22-A113, Sensitivity Level 1		0/100	0/177	0/100	0/377	Pass
First Article	Per Catalogue Package Dimension		-	0/10	-	0/10	Pass

## 7.0 Electrical Characteristic Summary:

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

## 8.0 Changed Part Identification:

All SOT223 manufactured by the alternate backend site will bear a  $3^{rd}$  digit datecode of letter C which is symbolized in front of the package.

## 9.0 Recommendations & Conclusions:



Based on the test results, it is determined that the second/alternative backend location is qualified for production of Littelfuse SOT223 package.

## 10.0 Approvals:

<u>Jifeng Zhou</u> Wuxi Technical Center Manager Littelfuse, Wuxi Neil Solano Outsource Senior Product Engineer Littelfuse, Wuxi

**Table 1-1: Affected Part Number** 



Standard Part Number		Special Part Number		
SCR	Triac	SCR	Triac	
S4X8TSRP	LX803DTRP	S940S6X8TSRP		
S6X8TSRP	LX803MTRP	S958S6X8TS2RP		
S8X8TSRP	LX807DTRP			
S4X8TS1RP	LX807MTRP			
S6X8TS1RP	L0103DTRP			
S8X8TS1RP	L0103MTRP			
S4X8TS2RP	L0103NTRP			
S6X8TS2RP	L0107DTRP			
S8X8TS2RP	L0107MTRP			
S402TSRP	L0107NTRP			
S602TSRP	L0109DTRP			
	L0109MTRP			
	L0109NTRP			

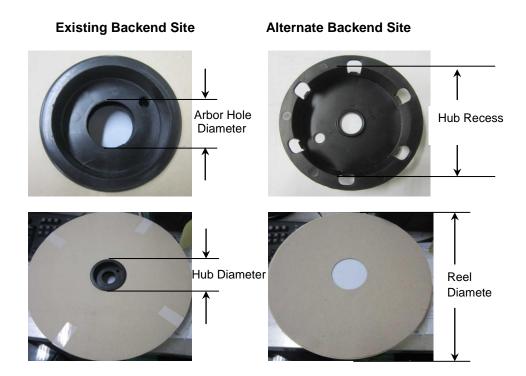
## ESW490-22 PCN Appendix

### To our valued customers:

There is a minor change of the TO92 WB product reel specification in the alternate backend site. Please see below for details. The change is in effect immediately.

Part numbers affected are those ended with "RP" under TO92 WB portion in the Affected Part Numbers list attached separately.

This notification is for your information. If you have any other questions or concerns, please contact Daisy Wang, Assistant Product Manager.



	Existing Backend Site	Alternate Backend Site	EIA-468 Spec Radial Reel Configuration
Reel Diameter	363.47 mm	355.6 mm	370 maximum
Hub Diameter	80mm	90mm	80 minimum
Hub Recess	65mm	74mm	Not defined
Arbor Hole Diameter	31.5mm	16mm	14-38mm