



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

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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](mailto:dwang2@littelfuse.com)





# 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		
	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 °C	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
Temperature Cycle	Ta = -40 °C to +150 °C	50cyc	0/100	0/100	0/100	0/300	Pass
		100cyc	0/100	0/100	0/100	0/300	Pass
Temperature/Humidity	Bias = 160VDC Ta = 85 °C, 85% RH	168hrs	0/77	0/77	0/77	0/231	Pass
		504hrs	0/77	0/77	0/77	0/231	Pass
		1008hrs	0/77	0/77	0/77	0/231	Pass
Thermal Shock	Ta = 0 °C to 100 °C	10cyc	0/100	0/100	0/100	0/300	Pass
Autoclave	Ta = 121 °C, 100%RH, 2ATM	48hrs	0/100	-	0/100	0/200	Pass
		96hrs	0/100	-	0/100	0/200	Pass
		168hrs	0/100	-	0/100	0/200	Pass
High Temperature Storage	Ta = 150 °C	168hrs	-	0/100	0/100	0/200	Pass
		504hrs	-	0/100	0/100	0/200	Pass
		1008hrs	-	0/100	0/100	0/200	Pass
Low Temperature Storage	Ta = -40 °C	168hrs	-	0/100	0/100	0/200	Pass
		504hrs	-	0/100	0/100	0/200	Pass
		1008hrs	-	0/100	0/100	0/200	Pass
Resistance to Solder Heat	Solder Temperature 260 °C	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<sup>rd</sup> 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:**

**Jifeng Zhou**  
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		
	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 = 150 °C	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
Temperature Cycle	Ta = -40 °C to +150 °C	50cyc	0/100	0/100	0/100	0/300	Pass
		100cyc	0/100	0/100	0/100	0/300	Pass
Temperature/Humidity	Bias = 160VDC Ta = 85 °C, 85% RH	168hrs	-	0/77	-	0/77	Pass
		504hrs	-	0/77	-	0/77	Pass
		1008hrs	-	0/77	-	0/77	Pass
Thermal Shock	Ta = 0 °C to 100 °C	10cyc	0/100	0/100	0/100	0/300	Pass
Autoclave	Ta = 121 °C, 100%RH, 2ATM	48hrs	-	-	0/100	0/100	Pass
		96hrs	-	-	0/100	0/100	Pass
		168hrs	-	-	0/100	0/100	Pass
High Temperature Storage	Ta = 150 °C	168hrs	-	-	0/100	0/100	Pass
		504hrs	-	-	0/100	0/100	Pass
		1008hrs	-	-	0/100	0/100	Pass
Low Temperature Storage	Ta = -40 °C	168hrs	0/100	-	-	0/100	Pass
		504hrs	0/100	-	-	0/100	Pass
		1008hrs	0/100	-	-	0/100	Pass
Resistance to Solder Heat	Solder Temperature 260 °C	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<sup>rd</sup> 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:**

**Jifeng Zhou**  
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		

Jan 21<sup>st</sup>, 2013

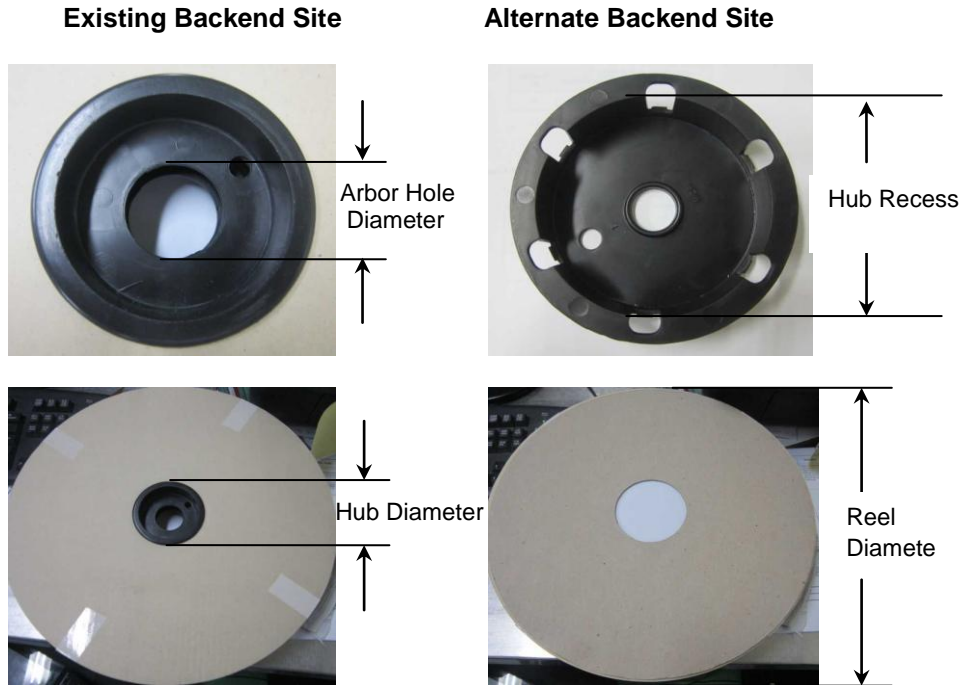
**ESW490-22 PCN Appendix**

**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.



	<b>Existing Backend Site</b>	<b>Alternate Backend Site</b>	<b>EIA-468 Spec Radial Reel Configuration</b>
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