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Chicago, Illinois USA 60631

Apr 13st, 2021

PCN # Alternate Assembly Location for Thyristor SOT23_SOT89_SOT223 package

To our valued customers,

Littelfuse would like to notify you that we qualified alternate assembly location of Thyristor SOT23, SOT89, SOT223 package products with BCP consideration. Detail affected product list please refer to attached file.

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: Slight dimension difference but all in JEDEC spec
Part number changes: None
Effective date: July 13th, 2021
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, Power Thyristor/Diode Discrete, Product Marketing Manager.

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

Thank you very much!

Best Regards,

Zhiwei Wang
Product Marketing Manager of Power Thyristor/Diode Discrete
Semiconductor Business Unit, Wuxi, China
+86 510 85277701 - 7927
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800 E. Northwest Highway Des Plaines, IL 60016

Product/Process Change Notice (PCN)

PCN#: ESW490-37 **Date:** Apr 13th, 2021

Product Identification:

All SOT23 & SOT89 & SOT223 package products of Thyristor.

Implementation Date for Change:

July 13th, 2021

Contact Information

Name: Zhiwei Wang

Title: Product Marketing 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:

Littelfuse would like to notify you that we qualified alternate assembly location of Thyristor SOT23, SOT89, SOT223 package products with BCP consideration. Detail affected product list please refer to attached file.

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.

Important Dates:

Qualification Samples Available: Apr 13th, 2021

Last Time Buy:

Final Qualification Data Available: Apr 13th, 2021

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:

Slight dimension difference but all in JEDEC spec

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

Prepared By : Light Zhang, Thyristor Product Engineer
Date : Mar 23rd, 2021
Products : 2nd Source Subcon Qualification
Revision : A

1.0 Objective:

This report covers dual manufacturing site qualification activities of Thyristor products include SOT89 SOT223 SOT23. Site qualify includes backend assembly, final test and packaging operations.

2.0 Applicable Products:

Thyristor products in package of SOT23, SOT223, SOT89
Please see the attached Appendix I for a full list of affected part numbers.

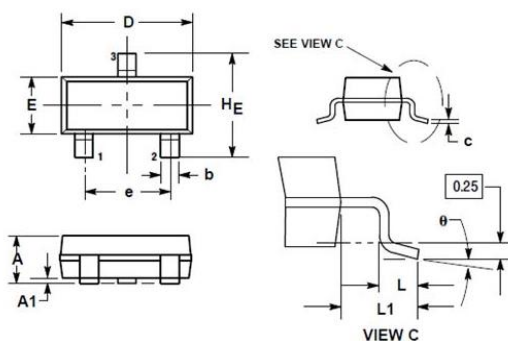
3.0 Physical Differences/Changes of Product:

There are no physical changes for 2nd source subcon made.

4.0 Comparison of Package Outline Dimensions Specifications:

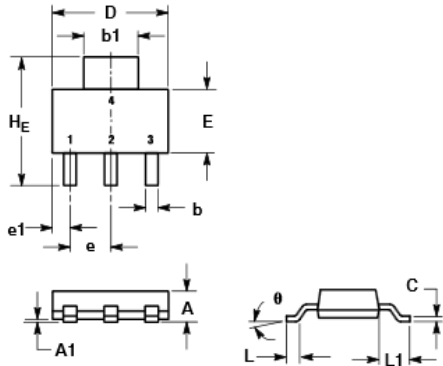
There are slight differences in package outline dimensions but all of new specifications are still within applicable JEDEC specifications.

- 4.1 SOT23 Outline
---Dimensions A1, D, L, H_E are different



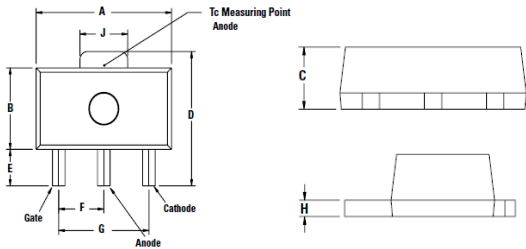
DIM	Present Sepcification			New Sepcification		
	Millimeters			Millimeters		
	Min	Nom	Max	Min	Nom	Max
A	0.89	1.03	1.17	0.89	1.03	1.17
A1	0.05	0.10	0.15	0.01	0.10	0.15
b	0.30	0.40	0.50	0.30	0.40	0.50
c	0.08	0.14	0.20	0.08	0.14	0.20
D	2.80	2.90	3.00	2.80	2.90	3.04
E	1.20	1.30	1.40	1.20	1.30	1.40
e	---	1.90	---	---	1.90	---
L	0.40	0.49	0.58	0.40	0.49	0.60
L1	0.46	0.55	0.64	0.46	0.55	0.64
H _E	2.10	2.30	2.49	2.10	2.30	2.64
θ	0°	-	10°	0°	-	10°

4.2 SOT223 Outline
 ---Dimension H_E is different.



DIM	Present Sepcification			New Sepcification		
	Millimeters			Millimeters		
	Min	Nom	Max	Min	Nom	Max
A	-	-	1.80	-	-	1.80
A1	0.02	0.07	0.13	0.02	0.07	0.13
b	0.66	0.75	0.84	0.66	0.75	0.84
b1	2.90	3.00	3.10	2.90	3.00	3.10
c	0.23	0.29	0.35	0.23	0.29	0.35
D	6.60	6.60	6.71	6.30	6.60	6.71
E	3.30	3.50	3.70	3.30	3.50	3.70
e	---	2.30	---	---	2.30	---
e1	0.75	0.95	1.15	0.75	0.95	1.15
L1	1.50	1.75	2.00	1.50	1.75	2.00
H _E	6.80	7.00	7.20	6.70	7.00	7.30
θ	0°	-	10°	0°	-	10°

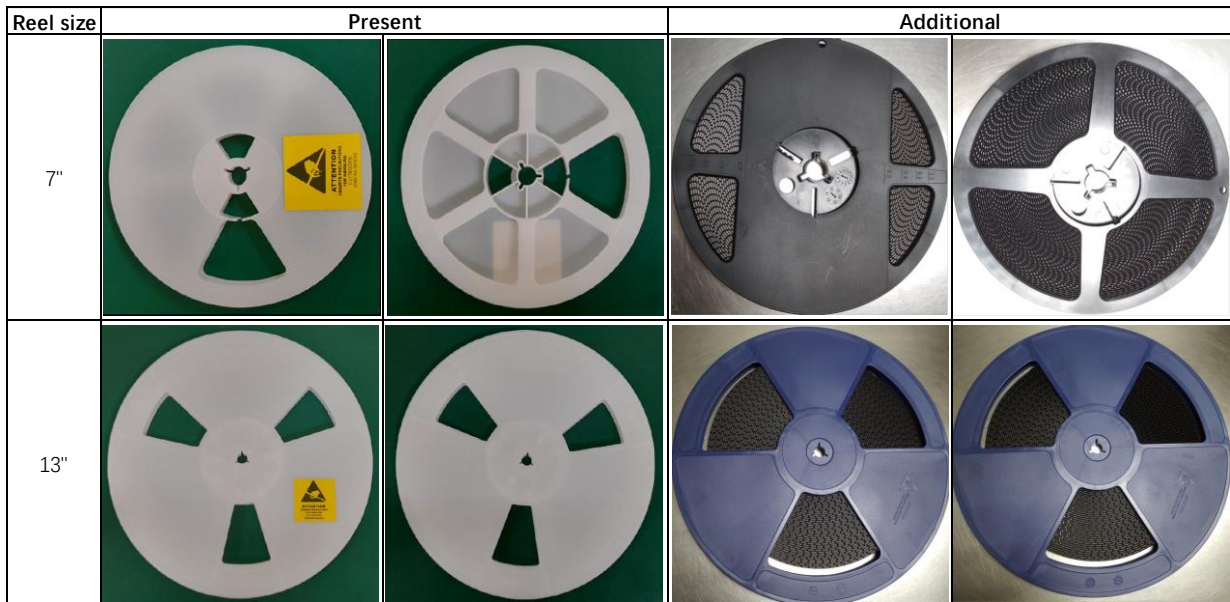
4.3 SOT 89 Outline
 ---Dimensions E F G J are different.



DIM	Present Sepcification			New Sepcification		
	Millimeters			Millimeters		
	Min	Nom	Max	Min	Nom	Max
A	4.40	-	4.60	4.40	-	4.60
B	2.29	-	2.60	2.29	-	2.60
C	1.40	-	1.60	1.40	-	1.60
D	3.94	-	4.25	3.94	-	4.25
E	0.89	-	1.20	0.81	-	1.20
F	1.42	-	1.57	-	1.50	-
G	2.92	-	3.07	-	3.00	-
H	0.35	-	0.44	0.35	-	0.44
J	1.62	-	1.83	-	1.65	-

5.0 **Physical Differences/Changes of Reel & Tape:**

- 5.1 There are no physical differences on tape
- 5.2 There are physical differences about the reel used in 2nd subcon.

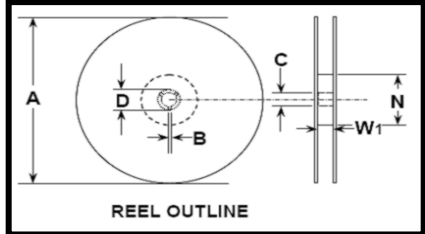


6.0 Comparison of Reel & Tape Outline Dimensions Specifications:

- 6.1 There is no change of the tape outline dimensions specification.
- 6.2 There are slight differences in Reel outline dimensions but all of new specifications are still within applicable EIA-481 standard.

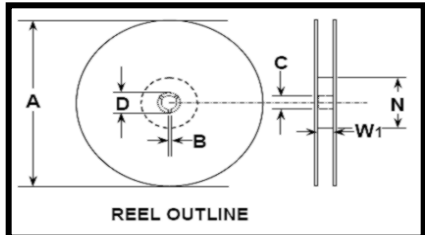
6.2.1 7" Reel outline dimensions specifications.

---7" reel for SOT89 & SOT223 outline, Dimension A, B, D, N are different.



ITEM	SYMBOL	Present		New	
		VALUE (MM)	TOLERANCE (MM)	VALUE (MM)	TOLERANCE (MM)
Reel Diameter	A	180.0	±1.5	178.0	±1.0
Drive Spoke Width	B	2.3	±0.2	2.1	±0.2
Arbor Hole Diameter	C	13.0	+0.5/-0.2	13.0	+0.5/-0.2
Drive Spoke Diameter	D	21.0	+0.3 / - 0	21.2	±0.3
Hub Diameter	N	60.0	±1.0	60.0	±0.5
Reel Inner ar Hub	W1	12.4	+2.0/-0.0	12.4	+2.0/-0.0

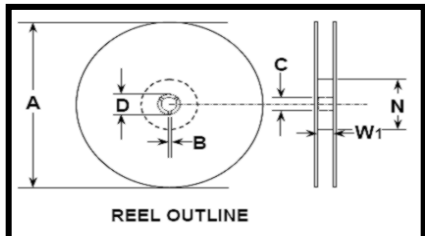
---7" reel for SOT23 outline, Dimension A, B, D, N are different.



ITEM	SYMBOL	Present		New	
		VALUE (MM)	TOLERANCE (MM)	VALUE (MM)	TOLERANCE (MM)
Reel Diameter	A	180.0	±1.5	178.0	±1.0
Drive Spoke Width	B	2.3	±0.2	2.1	±0.2
Arbor Hole Diameter	C	13.0	+0.5/-0.2	13.0	+0.5/-0.2
Drive Spoke Diameter	D	21.0	+0.3 / - 0	21.2	±0.3
Hub Diameter	N	60.0	±1.0	60.0	±0.5
Reel Inner ar Hub	W1	8.4	+1.5/-0.0	8.4	+1.5/-0.0

6.2.2 13" Reel outline dimensions specifications.

---13" reel for SOT89 & SOT223 outline, Dimension A, B, D, N are different.



ITEM	SYMBOL	Present		New	
		VALUE (MM)	TOLERANCE (MM)	VALUE (MM)	TOLERANCE (MM)
Reel Diameter	A	330.0	±1.5	330.0	±2.0
Drive Spoke Width	B	2.2	±0.2	2.0	±0.5
Arbor Hole Diameter	C	13.0	+0.5/-0.2	13.0	+0.5/-0.2
Drive Spoke Diameter	D	21.0	+0.3 / - 0	22.0	±0.5
Hub Diameter	N	100.0	±1.5	100.0	±1.0
Reel Inner ar Hub	W1	12.4	+2.0/-0.0	12.4	+2.0/-0.0



7.0 Qualification Test Result

All samples passed parametric and reliability test standard by Littelfuse.

7.1 Package SOT23 Reliability test result summary

Test Item	Sample P/N	Sample QTY	Littelfuse test Ref#	Contents/Conditions	Duration	Result Summary
ACBV (HTRB)	NYC0102BLT1G	77 x 2	143336	At T _J max, Reverse biased at 100%V _{DRM}	1,008hrs	0 failure
	S6X8BBSRP	77 x 2	149946			
Pre-conditioning	NYC0102BLT1G	77 x 8	143336	24hrs 125°C bake, 168hrs 85°C/85% humidity storage, 3 x IR reflow		0 failure
	S6X8BBSRP	77 x 8	149946			
H3TRB	NYC0102BLT1G	77 x 2	143336	T _A =85°C, RH=85%, Reverse biased (NYC0102BLT1G at 100V; S6X8BBSRP at 160V)	1,008hrs	0 failure
	S6X8BBSRP	77 x 2	149946			
TC	NYC0102BLT1G	77 x 2	143336	-55°C&150°C (air to air), Dwell time 15mins	1,000 cycles	0 failure
	S6X8BBSRP	77 x 2	149946			
UHASt	NYC0102BLT1G	77 x 2	143336	T _A =130°C, RH=85%	96hrs	0 failure
	S6X8BBSRP	77 x 2	149946			
IOL	NYC0102BLT1G	77 x 2	143336	T _A =25°C, T _J (ΔT _J)>=100°C)	15,000 cycles	0 failure
	S6X8BBSRP	77 x 2	149946			
RSH	NYC0102BLT1G	30 x 2	143336	260°C	10 secs	0 failure
	S6X8BBSRP	30 x 2	149946			
Solderability	NYC0102BLT1G	10 x 2	143336	245°C	10 secs	0 failure
	S6X8BBSRP	10 x 2	149946			
ESD	MCR08MT1G	30 x 2	143336	HBM 30KV, MM 8KV		0 failure
	NYC228STT1G	30 x 2	149946			

7.2 Package SOT223 Reliability test result summary

Test Item	Sample P/N	Sample QTY	Littelfuse test Ref#	Contents/Conditions	Duration	Result Summary
ACBV (HTRB)	S6002TSRP	77 x 1	144606	At T _J max, Reverse biased at 100%V _{DRM}	1,008hrs	0 failure
Pre-conditioning	S6002TSRP	77 x 4	144606	24hrs 125°C bake, 168hrs 85°C/85% humidity storage, 3 x IR reflow		0 failure
H3TRB	S6002TSRP	77 x 1	144606	T _A =85°C, RH=85%, Reverse biased at 160V _{DC}	1,008hrs	0 failure
TC	S6002TSRP	77 x 1	144606	-55°C&150°C (air to air), Dwell time 15mins	1,000 cycles	0 failure
UHASt	S6002TSRP	77 x 1	144606	T _A =130°C, RH=85%	96hrs	0 failure
IOL	S6002TSRP	77 x 1	144606	T _A =25°C, T _J (ΔT _J)>=100°C)	15,000 cycles	0 failure
RSH	S6002TSRP	30	144606	260°C	10 secs	0 failure
Solderability	S6002TSRP	10	144606	245°C	10 secs	0 failure
ESD	S6002TSRP	30	144606	HBM 30KV, MM 8KV		0 failure



7.3 Package SOT89 Reliability test result summary

Test Item	Sample P/N	Sample QTY	Littelfuse test Ref#	Contents/Conditions	Duration	Result Summary
ACBV (HTRB)	S602BSRP	77 x 2	144614	At T _J max, Reverse biased at 100%V _{DRM}	1,008hrs	0 failure
	LX807MBRP	77 x 1	147397			
Pre-conditioning	S602BSRP	77 x 8	144614	24hrs 125°C bake, 168hrs 85°C/85% humidity storage, 3 x IR reflow		0 failure
	LX807MBRP	77 x 4	147397			
H3TRB	S602BSRP	77 x 2	144614	T _A =85°C, RH=85%, Reverse biased (S602BSRP at 160V; LX807MBRP at 320V)	1,008hrs	0 failure
	LX807MBRP	77 x 1	147397			
TC	S602BSRP	77 x 2	144614	-55°C&150°C (air to air), Dwell time 15mins	1,000 cycles	0 failure
	LX807MBRP	77 x 1	147397			
UHASt	S602BSRP	77 x 2	144614	T _A =130°C, RH=85%	96hrs	0 failure
	LX807MBRP	77 x 1	147397			
IOL	S602BSRP	77 x 2	144614	T _A =25°C, T _J (ΔT _J)>=100°C	15,000 cycles	0 failure
	LX807MBRP	77 x 1	147397			
RSH	S602BSRP	30 x 2	144614	260°C	10 secs	0 failure
	LX807MBRP	30 x 1	147397			
Solderability	S602BSRP	10 x 2	144614	245°C	10 secs	0 failure
	LX807MBRP	10 x 1	147397			
ESD	S602BSRP	30 x 2	144614	HBM 30KV, MM 8KV		0 failure
	LX807MBRP	30 x 1	147397			

7.4 Parametric Test

There is no change in absolute ratings and parametric specifications

Test Item	Sample P/N	Sample Qty	Littelfuse test Ref#	Contents/Conditions	Result Summary
Electrical Parameters	NYC0102BLT1G	10 x 2	143357	IGT/VGT/IH/VT/IDRM/IRRM	Meet datasheet spec
	S6X8BBSRP	10 x 2	149948		
	S6002TSRP	10 x 1	144612		
	S602BSRP	10 x 2	144617		
	LX807MBRP	10 x 1	147398		
ITSM	NYC0102BLT1G	5 x 2	143357	f = 50Hz; T _J (initial) = 25°C	
	S6X8BBSRP	5 x 2	149948		
	S6002TSRP	5 x 1	144612		
	S602BSRP	5 x 2	144617		
	LX807MBRP	5 x 1	147398		
Thermal Resistance	NYC0102BLT1G	5 x 2	143357	Junction-to-Case R _{θJC}	
	S6X8BBSRP	5 x 2	149948		
	S6002TSRP	5 x 1	144612		
	S602BSRP	5 x 2	144617		
	LX807MBRP	5 x 1	147398		



8.0 Recommendations & Conclusions:

Base on the above qualification test results, Littelfuse judged that the 2nd source qualification have been successfully completed and results were verified by qualification tests.

Littelfuse released the 2nd source subcon manufacturing to production.

9.0 Approvals:

Light Zhang
Outsourced Product Engineer
Littelfuse, Inc.

Peter Liu
Aisa OSAT Product Engineering Manager
Littelfuse, Inc.

10.0

Appendix I – Affected part number list

NYC0102BLT1G	S4X8BSRP	LX807MBRP	S6X8TSRP	S940S6X8TSRP
SYC0102BLT1G	S6X8BSRP	LX803DTRP	S8X8TSRP	S958S6X8TS2RP
NYC0102BLT1P	S4X8BS1RP	LX803MTRP	S966S8X8TSRP	S971S6X8TSRP
S6X8BBSRP	S6X8BS1RP	LX807DTRP	S4X8TS1RP	S988S6X8TSRP
MCR08BT1G	S4X8BS2RP	LX807MTRP	S6X8TS1RP	Q1421L0103NTRP
MCR08MT1G	S6X8BS2RP	L0103DTRP	S8X8TS1RP	Q1427L0103MTRP
NYC222STT1G	S402BSRP	L0103MTRP	S4X8TS2RP	Q1428L0107MTRP
NYC226STT1G	S602BSRP	L0103NTRP	S6X8TS2RP	Q1429L0103NTRP
NYC228STT1G	S402BS1RP	L0107DTRP	S8X8TS2RP	Q1430L0107NTRP
MAC08BT1G	S602BS1RP	L0107MTRP	S402TSRP	
MAC08MT1G	S602BS2RP	L0107NTRP	S602TSRP	
Z0103MNT1G	S4X8BSRP1	L0109DTRP	S802TSRP	
Z0107MNT1G	S6X8BSRP1	L0109MTRP	S402TS1RP	
Z0109MNT1G	S885S6X8BSRP	L0109NTRP	S602TS1RP	
MCR08MT1G-L	S1002S6X8BSRP	S4X8TSRP	S6002TSRP	