



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

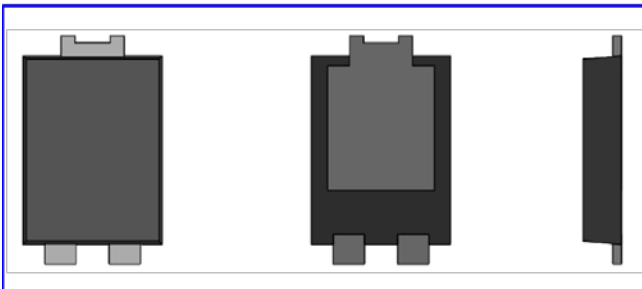
May 31st, 2022

PCN # ESW490-43 – TO-277 Package Outline Change

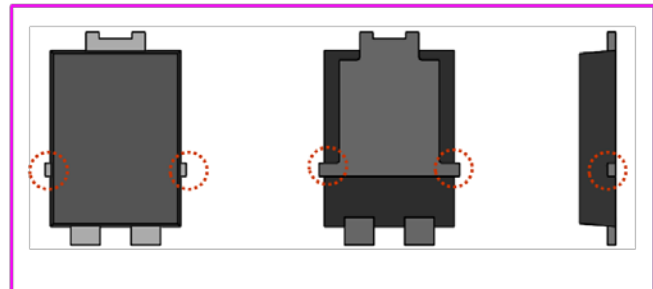
To our valued customers,

Littelfuse would like to notify you that we will slightly change the outline of TO-277 package, which will optimize the backend assembly efficiency and output which in the end increase the total capacity of Littelfuse TO-277 package to support customer increased demand in future.

**Current TO-277
outline**



**New TO-277
outline**



Form, fit, function changes: small outline change but no footprint update needed (refer to qual report)
Part number changes: None
Effective date: Aug 31st, 2022
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
zwang@littelfuse.com



800 E. Northwest Highway Des Plaines, IL 60016

Product/Process Change Notice (PCN)

PCN#: ESW490-43 **Date:** May 31st, 2022

Product Identification:

TO-277 Package Outline Change

Implementation Date for Change:

Aug 31st, 2022

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 will slightly change the outline of TO-277 package, which will optimize the backend assembly efficiency and output which in the end increase the total capacity of Littelfuse TO-277 package to support customer increased demand in future.

Form, fit, function changes: small outline change but no footprint update needed (refer to qual report)

Part number changes: None

Effective date: Aug 31st, 2022

Replacement products: N/A

Last time buy: N/A

Important Dates:

- Qualification Samples Available: Last Time Buy:
- Final Qualification Data Available:
- Date of Final Product Shipment:

Method of Distinguishing Changed Product

- Product Mark,
- Date Code, WW36, 2022
- Other,

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

Small outline change but no footprint update needed (refer to qual report)

LF Qualification Plan/Results:

Available

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.



Expertise Applied | Answers Delivered

Littelfuse, Wuxi
East 3# Zhen Fa 6 Road
Shuo Fang Industrial Park
Wuxi, Jiangsu 214142

Product Qualification Report

To: Those who may concern

From: Glisten Xu, Product Engineer, Littelfuse, Wuxi
Yali Wang, Product Engineer, Littelfuse, Wuxi

Date: May 31st, 2022 – Rev. B

Subject: **Qualification test result of TO-277 series product outline change**

Purpose:

This report is to inform the successful qualification test results of TO-277 series product outline change.

Conclusion:

According to the qualification result, Littelfuse concluded that TO-277 series product outline change had been successfully completed and will be released to mass production.

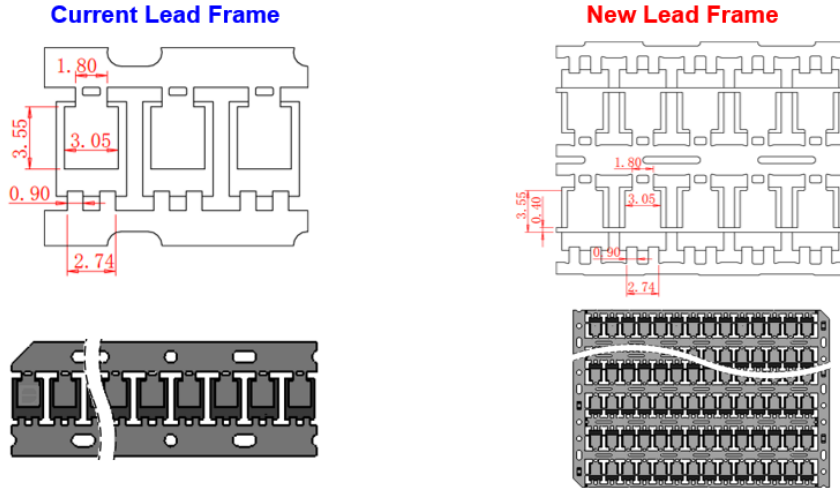
Best Regards,

Glisten Xu

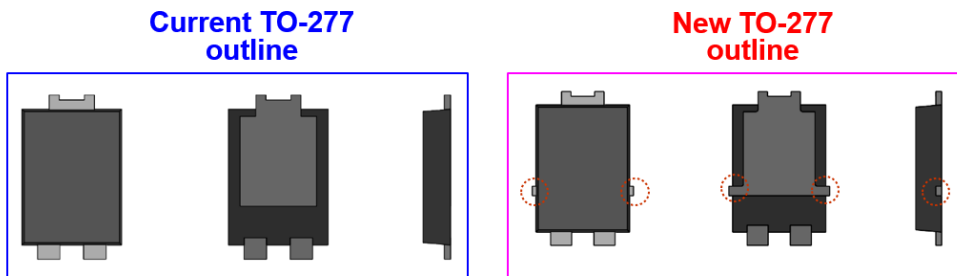
Product Engineer
Littelfuse Semiconductor

1. Change Description

1.1 Re-design TO-277 series lead frame outline to increase lead Frame qty/piece from 40 pcs/piece to 226 pcs/piece.



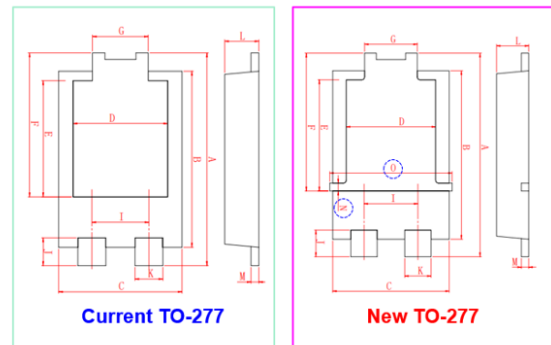
1.2 Re-design TO-277 series lead frame outline to solve the overflow issue through add new parts on both sides, it can make mold easy to flatten the surface of a material at molding process.



1.3 Dimension change description:

The "A" ~ "M" dimensions of the new TO-277 are the same as current TO-277, with new TO-277 add dimensions of "N" and "O".

Dim	Spec. (mm)	Old TO-277 Actual (mm)			Judge	New TO-277 Actual (mm)			Judge
		1	2	3		1	2	3	
A	6.50 ± 0.20	6.496	6.503	6.498	Pass	6.501	6.503	6.502	Pass
B	5.38 ± 0.10	5.381	5.382	5.380	Pass	5.381	5.385	5.382	Pass
C	3.98 ± 0.10	3.975	3.980	3.978	Pass	3.981	3.980	3.979	Pass
D	3.05 ± 0.15	3.093	3.082	3.084	Pass	3.054	3.051	3.052	Pass
E	3.55 ± 0.15	3.537	3.531	3.541	Pass	3.559	3.561	3.555	Pass
F	4.40 ± 0.20	4.367	4.443	4.449	Pass	4.449	4.451	4.448	Pass
G	1.80 ± 0.10	1.808	1.798	1.801	Pass	1.794	1.801	1.798	Pass
I	1.84 ± 0.10	1.845	1.851	1.858	Pass	1.841	1.842	1.845	Pass
J	0.85 ± 0.20	0.853	0.855	0.861	Pass	0.843	0.842	0.845	Pass
K	0.90 ± 0.05	0.901	0.902	0.899	Pass	0.902	0.902	0.900	Pass
L	1.10 ± 0.15	1.099	1.098	1.099	Pass	1.098	1.102	1.108	Pass
M	0.25 ± 0.05	0.251	0.249	0.248	Pass	0.249	0.251	0.250	Pass
N	0.40 ± 0.15	-	-	-	-	0.408	0.412	0.415	Pass
O	< 4.25	-	-	-	-	4.035	4.058	4.081	Pass



1.4 Molding Process Change:

Due to the new matrix frame is used, the molding mold is larger, so the process parameters need to adjust as below.

Parameter Item	Current TO-277 Molding Parameter		New TO-277 Molding Parameter	
	Spec	Actual	Spec	Actual
On Mold temperature	170 ± 10°C	172°C	170 ± 10°C	173°C
Off Mold temperature	170 ± 10°C	173°C	170 ± 10°C	171°C
Turn-in Pressure	30 ± 10kg/cm ²	32kg/cm ²	40 ± 10kg/cm ²	43kg/cm ²
Turn-in Time	30 ± 5sec	30sec	30 ± 5sec	30sec
Heating Time	30 ± 5sec	30sec	30 ± 5sec	30sec
Clamping Pressure	100 ± 20kg/cm ²	101kg/cm ²	140 ± 20kg/cm ²	142kg/cm ²

2. Qualification Test Vehicle

Part Number	Package Type	Lot Size	Internal Reference #
DST560S	TO-277	1	168115
DST2080S	TO-277	1	168116
DST12100S	TO-277	1	168117

3. Qualification Test Items and Result Summary

Item #	Test	Abrv	Test Conditions	# Lot	# Tested per lot	# Failed
1	Pre-conditioning	PC	Bake: 125°C/24H	3	120	0
			THT: 85°C/85%RH, 168H			
			Reflow: 260°C, 3 times			
2	Pressure Cooker Test	PCT	TA=121°C Pressure: 0.215MPa Test duration: 96H.	3	40	0
3	Temperature Cycling	TC	High temp. side: 150 °C	3	40	0
			Low temp. side: -55 °C			
			Duration time: HT 15min, LT 15 min			
			Number of cycles: 1000cycles			
4	High Temp. Storage	HTS	Temperature: 150 °C Test duration: 1000h	3	40	0
5	High Temperature Reverse Bias	HTRB	TA=85 °C Bias Voltage: VR=80% Rated VR Test duration: 1000H	3	40	0
6	High Humidity High Temp. Reverse Bias	H3TRB	Temperature: 85 °C Relative humidity: 85% Bias Voltage: VR=80% Rated VR Test duration: 1000 h	3	40	0
7	Resistance to Solder Heat	RSH	260°C±5 °C Reflow Soldering	3	40	0

Conclusion: All qual vehicles pass reliability test.



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Appendix: Affected PN list

DST10100S
DST10100S-A
DST1040S
DST1040S-A
DST1045S
DST1045S-A
DST1050S
DST1050S-A
DST12100S
DST1545S
DST1550S
DST2050S
DST2080S
DST5100S
DST5100S-A
DST560S
DST560S-A
DST580S
DST580S-A
DST8100S
DST8100S-A
DST860S
DST860S-A