



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

Nov 1st, 2022

PCN # ESW490-46 – Alternate Assembly Location for IXYS Power Thyristor & Diode TO-220AB_AC Package

To our valued customers,

Littelfuse would like to notify you that we qualified alternate assembly location for IXYS Power Thyristor & Diode TO-220AB_AC 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: Feb 1st, 2023
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#: ESW490-46 **Date:** Nov 1st, 2022

Product Identification:

Alternate Assembly Location for IXYS Power Thyristor & Diode TO-220AB_AC Package

Implementation Date for Change:

Feb 1st, 2023

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:

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Part number changes: None

Effective date: Feb 1st, 2023

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, Different Site Code
- Other,

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

Slight dimension difference but all in JEDEC spec

LF Qualification Plan/Results:

All affected products have been fully qualified in accordance with established performance and reliability criteria.

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 : Zhiwei Wang, Product Marketing Manager
Date : Nov 1st, 2022
Products : IXYS Power Thyristor/Diode TO-220AB_AC Package Products
Revision : A

1.0 Objective:

This qual report covers IXYS Power Thyristor/Diode TO-220AB_AC Package Products Alternative Assembly location qualification.

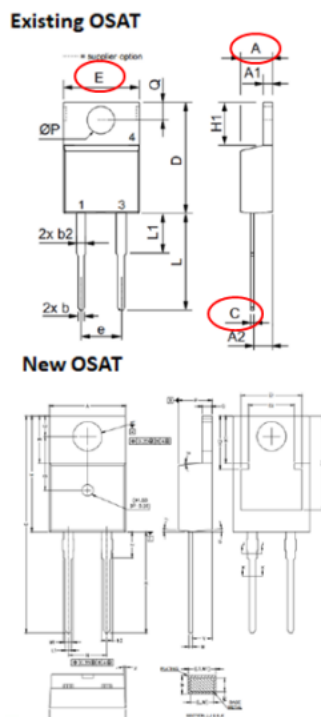
2.0 Applicable Products:

IXYS Power Thyristor/Diode TO-220AB_AC Package Products.
Refer to Appendix A for detail part number list.

3.0 Physical Differences/Changes:

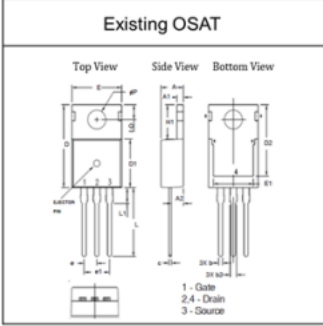
- Comparison of Package Detail Dimension between Existing Assy Site and Alternative Assy Site.

TO-220AC POD SPEC gap in A, C&E. But the actual measurement data all within Littelfuse SPEC.



Items	Existing OSAT		Items	New OSAT		New OSAT Actual Data		
	Min	Max		Min	Max	Min	Ave.	Max
A	4.32	4.82	P	4.19 _±	4.70 _±	4.40	4.46	4.51
A1	1.14	1.39	Q	1.22	1.37	1.26	1.28	1.30
A2	2.29	2.79	V	2.38	2.80	2.56	2.58	2.61
b	0.64	1.01	L1	0.63	0.92	0.83	0.84	0.85
b2	1.15	1.65	M1	1.14	1.40	1.28	1.30	1.31
C	0.35	0.56	W	0.35	0.64 _±	0.46	0.48	0.50
D	14.73	16.00	E	14.98	15.62	15.25	15.30	15.36
E	9.91	10.66	A	9.67 _±	10.42 _±	10.17	10.21	10.26
e	5.08BSC		N	4.95	5.21	5.06	5.08	5.11
H1	5.85	6.85	B	5.96	6.48	6.21	6.23	6.25
L	12.70	13.97	H	12.71	13.97	13.30	13.37	13.42
L1	2.79	5.84	Z	3.30	3.81	3.39	3.48	3.70
ΦP	3.54	4.08	ΦF	3.63	3.89	3.78	3.83	3.87
Q	2.54	3.18	C	2.54	3.05	2.68	2.73	2.77

TO-220AB POD SPEC gap in A, b1, D, D1, D2, E1, L, P, Q, D-Q, D+L1-Q.

Existing OSAT 	Existing OSAT		New OSAT		New OSAT measurement data			
	Sym	Min	Max	Min	Max	Min	AVG	Max
	A	4.3	4.7	4.2	4.6	4.36	4.42	4.46
	A1	1.2	1.4	1.2	1.4	1.30	1.31	1.32
	A2	2	2.7	2.2	2.6	2.36	2.39	2.46
	b	0.6	1	0.65	0.85	0.70	0.71	0.73
	b1	1.15	1.45	0.95	1.15	1.05	1.06	1.07
	c	0.35	0.65	0.4	0.6	0.49	0.50	0.51
	D	14.9	15.9	15.35	15.95	15.71	15.74	15.79
	D1	8.5	9.4	9.05	9.45	9.25	9.28	9.31
	D2	12.7	13.5	12.25	13.65	12.9	12.95	13.03
	E	9.7	10.3	9.8	10.2	9.90	9.97	10.07
	E1	7.2	8.2	8	9	8.46	8.50	8.60
	e	2.54		2.54		2.52	2.55	2.57
	e1	5.08		5.08		5.04	5.09	5.14
	H1	6.2	6.8	6.2	6.6	6.46	6.47	6.48
	L	12.5	13.9	13	14	13.43	13.48	13.55
	P	3.4	3.8	3.55	3.85	3.66	3.70	3.77
	Q	2.7	3.2	2.6	3	2.72	2.81	2.87
	D-Q	11.7	13.2	12.35	13.35	12.99	12.93	12.92
	L1(Modified)	2.8	3.9	2.8	3.9	2.92	2.99	3.05
	D+L1-Q(Modified)	14.5	17.1	15.15	17.25	15.91	15.92	15.97

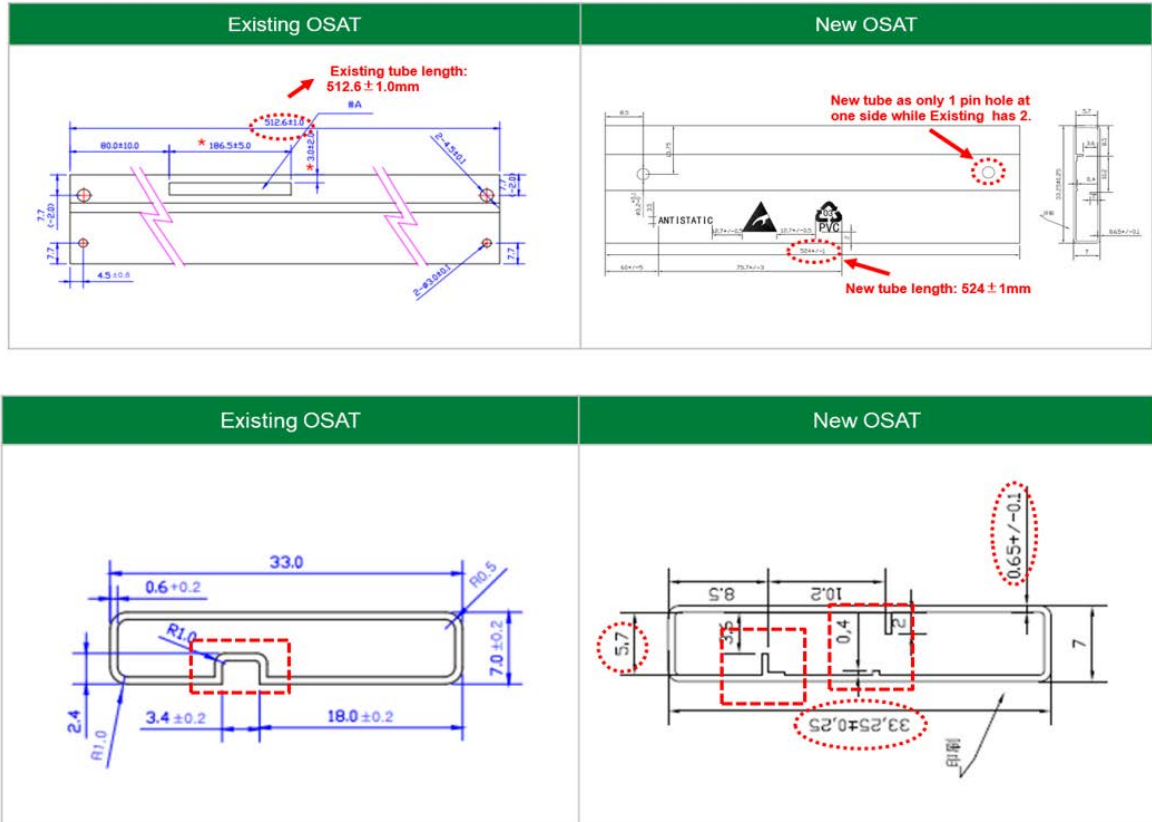
Conclusion: The variance is not critical which has no significant impact on customer application.

- Comparison in detail Packing Spec between Existing Assy Site and Alternative Assy Site

Inner/Outer Box dimension & packing qty:

Item	Description	Existing OSAT	New OSAT
1	Size of Inner Box	568*155*55mm	565*105*43mm
2	Size of Outer box	586*230*167mm	585*235*119mm
3	Size of Tube	512.6*33mm	534.5*33mm
4	Packing Qty per Tube	50 pcs	50 pcs
5	Packing Qty per Inner Box	1000 pcs	500 pcs
6	Packing Qty per Outer Box	8000 pcs	2500 pcs

Tube dimension:



Conclusion:

- Inner/Outer Box dimension & packing qty: Alternative Assy site's packing box is smaller than existing Assy site which lead to less packing qty. But it does not affect the MOQ.
- Tube dimension: Alternative Assy site's packing tube for TO-220 is different from existing Assy site. The difference may or may not impact the device unloading at customer side.

4.0 Qualification Test Result

All samples passed parametric and reliability test standard by Littelfuse.

TO-220 Thyristor & Diode Qualification Summary							
Package Type: TO-220						Supplier: Littelfuse, Inc	
						Family Type: Power Thyristor & Diode	
#	Abv	Sample P/N	Condition	Littelfuse Test Ref#	# of lot	Sample Qty	Results
1	TC	DSP8-08&12A	100 cycles, -55°C/150°C	Q11-8128	2	20	0 Failure
2	UHAST	DSP8-08&12A	96 h, 130°C, 85%RH	ETR168707	2	20	0 Failure
3	PC	DSP8-08&12A	4000 cycles, I_TAV=8A, I_TRMS=16A, P~14.8W, T_J=145°C, dT=100K, T_H=45-115.5°C, t_on=83s, t_off=64s	Q11-8128	2	20	0 Failure
4	HTRB	DSP8-08&12A	1000hrs, 150°C, 840 V AC	Q11-8128	2	20	0 Failure
5	Surge Current	DSP8-08&12A	120A, 10ms	Q11-8128	2	3	0 Failure
6	RSH	DSP8-08&12A	Tdwell=10 sec @ 260°C	Q11-8128	2	10	0 Failure
7	Solderability	DSP8-08&12A	5ea for method B(standard process, low temp) & method D	Q11-8128	2	5	0 Failure



1	TC	DSI30-8/16A	100 cycles, -40°C/150°C	Q11-8129	2	20	0 Failure
2	UHASt	DSI30-8/16A	96 h, 130°C, 85%RH	ETR175375	2	20	0 Failure
3	PC	DSI30-8/16A	4000 cycles, I_TAV=21A, I_TRMS=39A, P~38.7W, T_J=145°C, dT=100K, T_H=45-75.4, 1°C, t_on=55s, t_off=55s	Q11-8129	2	20	0 Failure
4	HTRB	DSI30-8/16A	1000h, 150°C, 1120 VAC	Q11-8129	2	20	0 Failure
5	Surge Current	DSI30-8/16A	300A, 10ms	Q11-8129	2	3	0 Failure
6	RSH	DSI30-8/16A	Tdwell=10 sec @ 260°C	Q11-8129	2	10	0 Failure
7	Solderability	DSI30-8/16A	5ea for method B(standard process, low temp) & method D	Q11-8129	2	5	0 Failure
1	TC	DSEP 12-12A	100 cycles, -55°C/150°C; EOL	Q11-8130	2	20	0 Failure
2	UHASt	DSEP 12-12A	96 h, 130°C, 85%RH	ETR175377	2	20	0 Failure
3	PC	DSEP 12-12A	4000 cycles, I=6A DC, P~7.5W/Chip, T_J=145°C, dT=100K, T_H=45-129°C, t_on=55s, t_off=40s	Q11-8130	2	20	0 Failure
4	HTRB	DSEP 12-12A	1000 hrs, 150°C, 960V DC	Q11-8130	2	20	0 Failure
5	Surge Current	DSEP 12-12A	90A, 10ms	Q11-8130	2	3	0 Failure
6	RSH	DSEP 12-12A	Tdwell=10 sec @ 260°C	Q11-8130	2	10	0 Failure
7	Solderability	DSEP 12-12A	5ea for method B(standard process, low temp) & method D	Q11-8130	2	5	0 Failure
1	TC	CS19-12HO1	200 cycles, -40°C/150°C; EOL	Q11-8132	2	20	0 Failure
2	UHASt	CS19-12HO1	96 h, 130°C, 85%RH	ETR168708	2	20	0 Failure
3	PC	CS19-12HO1	4000 cycles, I_L= 18A, P~38W, T_J= 125°C, dT = 80°C t_on = 62sec, t_off = 67sec	Q11-8132	2	20	0 Failure
4	HTRB	CS19-12HO1	1000hrs, 125°C, 840VAC mounted on heatsink	Q11-8132	2	20	0 Failure
5	Surge Current	CS19-12HO1	180A, t = 10ms, 50Hz	Q11-8132	2	3	0 Failure
6	RSH	CS19-12HO1	Tdwell=10 sec @ 260°C	Q11-8132	2	10	0 Failure
7	Solderability	CS19-12HO1	5ea for method B(standard process, low temp) & method D	Q11-8132	2	5	0 Failure
1	TC	DHG10I1800PA	100 cycles, -55/150 °C, EOL	Q11-8201	2	20	0 Failure
2	UHASt	DHG10I1800PA	96 h, 130°C, 85%RH	ETR175378	2	20	0 Failure
3	PC	DHG10I1800PA	4000 cycles, I=5A DC, P~8.4W/Chip, T_J=145°C, dT=100K, T_H=45-128°C, t_on=55s, t_off=50s	Q11-8201	2	20	0 Failure
4	HTRB	DHG10I1800PA	1000hrs, 150°C, 1440V DC	Q11-8201	2	20	0 Failure
5	Surge Current	DHG10I1800PA	60A, 10ms	Q11-8201	2	3	0 Failure
6	RSH	DHG10I1800PA	Tdwell=10 sec @ 260°C	Q11-8201	2	10	0 Failure
7	Solderability	DHG10I1800PA	5ea for method B(standard process, low temp) & method D	Q11-8201	2	5	0 Failure

5.0 Recommendations & Conclusions:

Based on the above qualification test results, Littelfuse concluded new Alternative Assembly Location can pass the release criterion and ready to start mass production for affected products.



Appendix A: Detail Part Number list affected

Material	Package
CS19-12HO1	TO-220AB
DHG10I1800PA	TO-220AB
DSEP12-12A	TO-220AC
CS19-12HO1	TO-220AB
CLA15E1200NPB	TO-220AB
CLA20EF1200PB	TO-220AB
CLA30E1200PB	TO-220AB
CLA30MT1200NPB	TO-220AB
CLA40MT1200NPB	TO-220AB
CLE30E1200PB	TO-220AB
CMA20E1600PB	TO-220AB
CMA30E1600PB	TO-220AB
CS19-08HO1	TO-220AB
DHG10C600PB	TO-220AB
DHG10I1200PA	TO-220AC
DHG10I600PA	TO-220AC
DHG20C1200PB	TO-220AB
DHG20C600PB	TO-220AB
DHG20I1200PA	TO-220AC
DHG20I600PA	TO-220AC
DHG30I600PA	TO-220AC
DHG40C600PB	TO-220AB
DHG5I600PA	TO-220AC
DMA10I1600PA	TO-220AC
DNA30E2200PA	TO-220AC
DPF30I300PA	TO-220AC
DPG10I200PA	TO-220AC
DPG10I300PA	TO-220AC
DPG10I400PA	TO-220AC
DPG15I200PA	TO-220AC
DPG15I300PA	TO-220AC
DPG20C200PB	TO-220AB

DPG20C300PB	TO-220AB
DPG20C400PB	TO-220AB
DPG30C200PB	TO-220AB
DPG30C300PB	TO-220AB
DPG30C400PB	TO-220AB
DPG30I300PA	TO-220AC
DSEC16-06A	TO-220AB
DSEC16-12A	TO-220AB
DSEI12-06A	TO-220AC
DSEI12-10A	TO-220AC
DSEI12-12A	TO-220AC
DSEI20-12A	TO-220AC
DSEI25-06A	TO-220AC
DSEI8-06A	TO-220AC
DSEP12-12B	TO-220AC
DSEP15-06A	TO-220AC
DSEP15-06B	TO-220AC
DSEP29-06A	TO-220AC
DSEP29-06B	TO-220AC
DSEP29-12A	TO-220AC
DSEP29-12B	TO-220AC
DSEP8-06A	TO-220AC
DSEP8-06B	TO-220AC
DSEP8-12A	TO-220AC
DSI30-08A	TO-220AC
DSI30-12A	TO-220AC
DSI30-16A	TO-220AC
DSP8-08A	TO-220AB
DSP8-12A	TO-220AB
DSEP15-03A	TO-220AB
DSEP29-03A	TO-220AB
DSI30-16A	TO-220AC
DSP8-12A	TO-220AB