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

Sep 17th, 2014

RE: PCN # ESU270-27 -- SP3021-01ETG Alternate Manufacturing Location Approval for Wafer Foundry & Backend Assembly, Test and Packing

To our valued customers,

Littelfuse would like to notify you of a newly approved wafer foundry location and two backend locations for the SP3021-01ETG TVS Diode Array (SPA® Diodes) products. The new wafer foundry in Taiwan and the two backend factories in Thailand and China are all fully approved. There are no changes to fit, form, and function of the finished product.

Qualification efforts are complete and the new factories are online for immediate shipments. Please see the attached documentation for change detail and affected part numbers.

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: None
Part number changes: None
Effective date: Sep 17th, 2014
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 Chad Marak, Product Manager.

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

Best Regards,

Chad Marak
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cmarak@littelfuse.com

800 E. Northwest Highway Des Plaines, IL 60016

Product/Process Change Notice (PCN)

PCN#: ESU270-27 Date: 09/17/2014

Product Identification:

SP3021-01ETG of TVS

Diode Array Products

Implementation Date for Change:

09/17/2014

Contact Information

Name: Chad Marak

Title: Product Marketing Manager

Phone #: +1 408 886 1600

Fax#: N/A

E-mail: cmarak@littelfuse.com

Category of Change:

- ☐ Assembly Process
- ☐ Data Sheet
- ☐ Technology
- ☐ Discontinuance/Obsolescence
- ☐ Equipment
- ☒ Manufacturing Site
- ☐ Raw Material
- ☐ Testing
- ☐ Fabrication Process
- ☐ Other: _____

Description of Change:

Approve an alternate wafer foundry location and two alternate backend assembly, test, and packing locations for SP3021-01ETG product.

There are no changes to fit, form & function of the finished product. The affected products have been fully qualified in accordance with all established criteria for performance and reliability

All relevant detail is included in the supplemental pages..

Important Dates:

- ☒ Qualification Samples Available: 09/17/2014
- ☐ Last Time Buy:
- ☒ Final Qualification Data Available: 09/17/2014
- ☐ Date of Final Product Shipment:

Method of Distinguishing Changed Product

- ☐ Product Mark,
- ☐ Date Code,
- ☒ Other, See (4.0) in the succeeding PCN report for details

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

N/A

LF Qualification Plan/Results:

N/A

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
ETR # Various

Prepared By : Jordan Hsieh-SPA Product Engineering Manager,

Date : 09/12/2014
Device : SP3021-01ETG Product
Revision : A

1.0 Objective:

The purpose of this project is to qualify one alternate wafer foundry location & two alternate assembly locations for SP3021-01ETG product. Succeeding pages summarize the physical, electrical and reliability test performed in qualification lots.

2.0 Applicable Devices:

Standard Part Numbers	Special Part Numbers
SP3021-01ETG	

3.0 Assembly, Process & Material Differences/Changes:

3.1 Assembly and Process Changes

There are no changes in the assembly and process method.

3.2 Material Changes
New Backend Location A:

Material	SOD882				
	Original		New		Changed?
	Material Name	Supplier	Material Name	Supplier	
Wafer	AX10xx	CSWC	IMP0xx	IP	Yes
Lead frame	C7025	DCI	EFTECT64T	DCI	Yes
Die Attach Material	8006NS	HENKEL	8006NS	HENKEL	NO
Au Wire	Au 0.8 mils, 99.99%	TANAKA	Au 0.8 mils, 99.99%	Heraeus	Yes
Molding Compound	G770	Sumitomo	G770	Sumitomo	NO
Lead Finish	NiPdAu	DCI	NiPdAu	DCI	NO

New Backend Location B:

Material	SOD882				
	Original		New		Changed?
	Material Name	Supplier	Material Name	Supplier	
Wafer	AX10xx	CSWC	IMP0xx	IP	Yes
Lead frame	C7025	DCI	F2L UTDFN	ASM	Yes
Die Attach Material	8006NS	HENKEL	8006NS	HENKEL	NO
Au Wire	Au 0.8 mils, 99.99%	TANAKA	Au 0.8 mils, 99.99%	TANAKA	NO
Molding Compound	G770	Sumitomo	CEL9220HF	HITACHI	Yes
Lead Finish	NiPdAu	DCI	NiPdAu	ASM	Yes

4.0 Packing Method

There will be no changes in the packing method.
To distinguish different manufacturing locations please refer to label information as CAT NO below,

Original	New Backend Location A	New Backend Location B
CAT NO : Z	CAT NO : G	CAT NO : H

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	S/S	Results	ETR #
DC Blocking	Bias = Rated Voltage Ta = 150°C Duration = 1008 Hours	77	0/77	ETR 60077 60078
Temperature Cycle	Ta = -55°C to +150°C Duration = 1000 Cycles	77	0/77	
Temperature/Humidity	Ta = 85°C, 85% RH Duration = 168 Hours	77	0/77	
Autoclave	Ta = 121°C, 100%RH, 2ATM Duration = 96 Hours	77	0/77	
Moisture Sensitivity Level(MSL)	Per Jedec J-STD-020D Level 1	11	0/11	

7.0 Electrical Characteristic Summary:

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

8.0 Changed Part Identification:

There is no change in the SP3021-01ETG product manufactured by currently location.

9.0 Recommendations & Conclusions:

Based on the test results, it is determined that the one alternate wafer foundry location and two alternate assembly locations are qualified and certified for production of Littelfuse SP3021-01ETG product.

10.0 Approvals:

Jordan Hsieh
SPA Product Engineering Manager
Littelfuse, Hsinchu