Littelfuse
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May 17th, 2018

Littelfuse TVS STD DO-214AB Package Capacity Expansion Notification Letter

To: Our Valued Customers

In order to support growing demand, Littelfuse SBU (Semiconductor Business Unit) completed TVS STD DO-214AB package capacity expansion qualification. With this new capacity expansion line released, there will have more capacity to support growing demand of TVS STD DO-214AB package.

This DO-214AB package backend new line for capacity expansion is installed in Littelfuse Semiconductor Wuxi China, and is planned to have production since June 2018. As rolling change, please expect to receive products manufactured by either current line or new capacity expansion automation line.

The affected part numbers as attached excel file, have been fully qualified in accordance with established performance and reliability criteria. The next few pages summarize the qualification results for your reference please.

There are no changes on FIT, form, function and reliability of the finished product.

Form, fit, function, reliability changes: None
Part number changes: None
Effective date: June 2018 or sooner
Replacement products: N/A
Last time buy: N/A

This communication letter is for your information and acknowledgement. If you have any other questions or concerns, please contact your local sales team or product team below for further assistance.

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

Sincerely,

Jenny Chen
Assistant Product Manager
Commercial TVS Products
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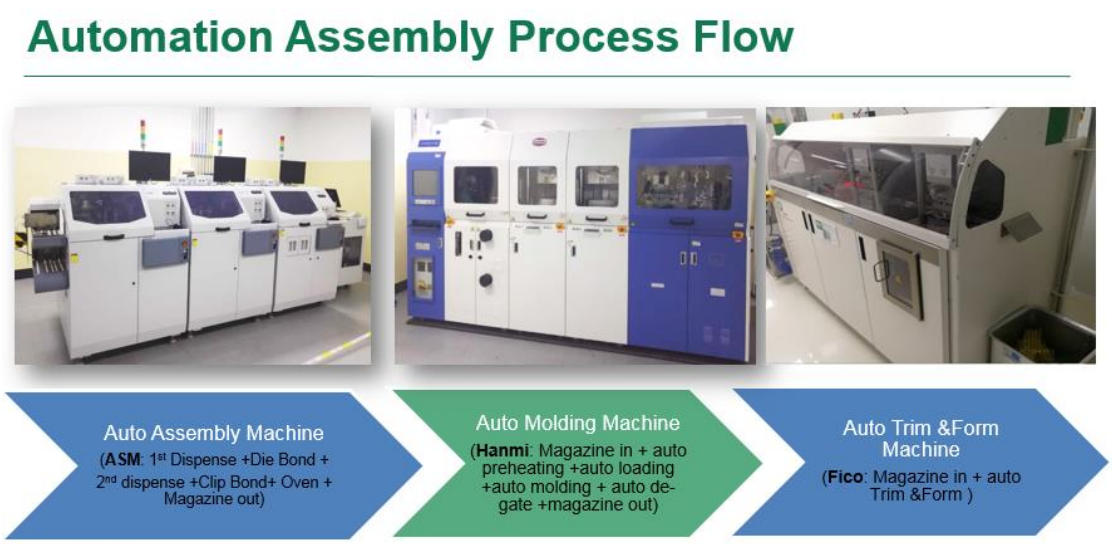
Product Qualification Report

From: Zhihui Chen, Product Engineering, Littelfuse
Date: Apr 27th, 2018
Subject: **Qualification report for Littelfuse TVS STD DO-214AB capacity expansion project**

Backend capacity expansion Line Picture



Purpose:

This report is to inform the successful TVS STD DO-214AB capacity expansion qualification test results.

1. Qualification Types (Test Vehicle)

Product Package	Product Series	Representative Test Sample Part Numbers	Assembly Location
DO-214AB	TVS	1.5SMC6.8A	Wuxi
		1.5SMC300CA	
		SMDJ6.0CA	
		1.5SMC170A	

2. Qualification Test Items and Result Summary

Test Category	Description	Sample P/N	Sample Qty	Littelfuse test Ref#	Contents/Conditions	Result Summary
Parametric	Electrical Parameters	1.5SMC6.8A	207	106592	VBR, IR	100% meet published spec.
		1.5SMC300CA	207	106592		
		1.5SMC170A	207	106592		
		SMDJ6.0CA	207	106592		
Surge out test	10*1000us Surge out Test	1.5SMC6.8A	10	106592	+/- 1 hit, at rated IPP	100% passing at Rated IPP
		1.5SMC300CA	10	106592		
		1.5SMC170A	10	106592		
		SMDJ6.0CA	10	106592		
Reliability Test	Pre-condition (PC)	1.5SMC6.8A	80	106590	SMD qualification parts for TC,H3TRB	0 failure
		1.5SMC300CA	80	106593		
		1.5SMC170A	80	106595		
		SMDJ6.0CA	80	106601		
	DC Blocking (HTRB)	1.5SMC6.8A	77	106590	150℃, DC bias=100% of VR spec	0 failure at 1008hrs
		1.5SMC300CA	77	106593		
		1.5SMC170A	77	106595		
		SMDJ6.0CA	77	106601		
	RSH	1.5SMC6.8A	30	106590	260℃,10second	0 failure after RSH
		1.5SMC300CA	30	106593		
		1.5SMC170A	30	106595		
		SMDJ6.0CA	30	106601		
	Biased Temp & Humidity (H3TRB)	1.5SMC6.8A	40	106590	85℃, 85%RH DC bias=100% of VR spec	0 failure at 1008hrs
		1.5SMC300CA	40	106593		
		1.5SMC170A	40	106595		
		SMDJ6.0CA	40	106601		
	Autoclave	1.5SMC6.8A	40	106590	TA=121℃ , RH=100%,2atm	0 failure at 96hrs
		1.5SMC300CA	40	106593		
		1.5SMC170A	40	106595		
		SMDJ6.0CA	40	106601		
	Temp Cycle	1.5SMC6.8A	40	106590	-55℃&150℃ (air to air)	0 failure at 1008hrs
		1.5SMC300CA	40	106593		
		1.5SMC170A	40	106595		
		SMDJ6.0CA	40	106601		

3. MTBF Calculation

Estimate of Failure Rate, MTBF, FITS for a Given Operation Temperature **(See note)**

Temp ℃	% FR/khrs	MTBF (K)	FITS
30	0.00001	17490735	0.06
55	0.00011	947835	1.1
85	0.00204	49062	20.4
100	0.00749	13344	74.9
125	0.05278	1895	527.8
150	0.29514	339	2951.4

Note: The **M**ean-**T**ime-**B**etween-**F**ailure (MTBF) in hours and the percent failure rate per 1000 hours (%FR/khr) are computed at a 60% confidence level using the chi square method and the Arrhenius derating model for various junction operating temperatures. For the calculations, a value of 1 eV was used for the activation energy.

4. Conclusion

According to the above qualification test results, Littelfuse concluded that TVS STD DO-214AB package capacity expansion project has been fully qualified and released to production.