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## Product Qualification Plan

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To: Those who may concern

From: Haipeng Xu, Senior Product Engineer, Littelfuse, Wuxi

Date: Apr 6<sup>th</sup>, 2020 – Rev.A

Subject: **Qualification plan of High Voltage TPSMBxx and TPSMCxx BCP and capacity extension**

### **Purpose:**

This report is to inform the qualification plan for high voltage TPSMBxx and TPSMCxx BCP (Business Continuous Plan) and capacity extension.

Best Regards,

Haipeng Xu

Senior Product Engineer  
Littelfuse Semiconductor

## 1. Change Description

### TPSMB <sup>1</sup>

Change Description		Before	After	Benefits
<b>Fab</b>	Wafer	Raw wafer Vendor: Siltronic	1.Raw wafer Vendor: Siltronic 2. Raw wafer Vendor: Huan Ou	BCP
<b>BE</b>	Manufacturing Line	Existing line	Existing line & New lines	Capacity extension
	Lead Frame & Clip Vendor	L/F Vendor: JIH Long Clip vendor: G-Shank	L/F & Clip vendor: 1.JIH Long 2. G-Shank	BCP
	Solder Paste	Heraeus F367SN10-90P4	1. Heraeus FS5116 2.Indium 9.32	BCP
	EMC	EME-G630AY Vendor: Sumitomo	1.EME-G630AYD Vendor: Sumitomo 2.EME-E500HME Vendor: Sumikon	BCP
	Plating Source	1.Bandl (Suzhou) 2. Suyang (Wuxi)	1.Bandl (Suzhou) 2. Suyang (Wuxi) 3. Littelfuse inhouse (Wuxi)	BCP

Note 1: PNs with VBR≥600V are released in new lines and only affected by wafer, solder paste and plating source change.

### TPSMC

Change Description		Before	After	Benefits
<b>Fab</b>	Wafer	Raw wafer Vendor: Siltronic	1.Raw wafer Vendor: Siltronic 2.Raw wafer Vendor: Huan Ou	BCP
<b>BE</b>	Manufacturing Line	Existing line	Existing line & New lines	Capacity extension
	Lead Frame & Clip Vendor	L/F Vendor: Kenly Clip vendor: G-Shank	L/F & Clip vendor: 1.SDI 2.G-Shank	BCP
	Solder Paste	Heraeus F367SN10-90P4	1. Heraeus FS5116 2.Indium 9.32	BCP
	EMC	EME-G720C Vendor: Sumitomo	1.EME-G720C Vendor: Sumitomo 2.EME-E500HME Vendor: Sumikon	BCP
	Plating Source	1.Bandl (Suzhou) 2. Suyang (Wuxi)	1.Bandl (Suzhou) 2. Suyang (Wuxi) 3. Littelfuse inhouse (Wuxi)	BCP

## 2. Qualification Test Vehicle

Part Number	Package Type	Lot Size
TPSMB200CA	DO214AA(SMB)	2
TPSMB440A-A	DO214AA(SMB)	2
TPSMB550CA-A	DO214AA(SMB)	2
TPSMB600CA-A	DO214AA(SMB)	2
SMCJ200A-JD <sup>2</sup>	DO214AB(SMC)	9

Note 2: SMCJ200A-JD should come from three wafer lots.

## 3. Qualification Test Plan

Reliability Test	Part Number	S.S	Test Condition	Ref. Spec
Pre-conditioning	TPSMB200CA	462	24hr 125°C bake, 168hrs 85°C/85% humidity storage, 3 times reflow	JESD22A-113
	TPSMB440A-A	462		
	TPSMB550CA-A	462		
	TPSMB600CA-A	462		
	SMCJ200A-JD	2079		
High temperature Reverse Bias (HTRB)	TPSMB200CA	154	Tj specified in datasheet, 1008hrs, biased at VR	MIL-STD-750- 1 M1038 Method A
	TPSMB440A-A	154		
	TPSMB550CA-A	154		
	TPSMB600CA-A	154		
	SMCJ200A-JD	693		
High Humidity High Temp. Reverse Bias (H3TRB)	TPSMB200CA	154	TA: 85°C, RH: 85%, 1000hrs, Reverse biased at V <sub>R</sub> or max 100V	JESD22-A101
	TPSMB440A-A	154		
	TPSMB550CA-A	154		
	TPSMB600CA-A	154		
	SMCJ200A-JD	693		
Unbiased Highly Accelerated Stress Test(UHAST)	TPSMB200CA	154	96 hours at TA=130°C/85%RH.	JESD22-A118
	TPSMB440A-A	154		
	TPSMB550CA-A	154		
	TPSMB600CA-A	154		
	SMCJ200A-JD	693		
Temperature Cycling(TC)	TPSMB200CA	154	TA: -55°C to +150°C , dwell time >15mins, 1000 cycle)	JESD22-A104
	TPSMB440A-A	154		
	TPSMB550CA-A	154		
	TPSMB600CA-A	154		
	SMCJ200A-JD	693		
High temperature Storage Life (HTSL)	TPSMB200CA	154	TA: 150°C, 1008hours	JESD22-A103
	TPSMB440A-A	154		
	TPSMB550CA-A	154		

	TPSMB600CA-A	154		
	SMCJ200A-JD	693		
Resistance to Solder Heat (RSH)	TPSMB200CA	40	260°C, 10secs	JESD22-A111
	TPSMB440A-A	40		
	TPSMB550CA-A	40		
	TPSMB600CA-A	40		
	SMCJ200A-JD	180		
Solderability	TPSMB200CA	20	245°C ± 5°C, 5 ± 0.5s	J-STD002
	TPSMB440A-A	20		
	TPSMB550CA-A	20		
	TPSMB600CA-A	20		
	SMCJ200A-JD	90		



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## Appendix 1: Affected PN list

TPSMB	TPSMB-VR	TPSMC
TPSMB100A	TPSMB90A-VR	TPSMC100A
TPSMB100CA	TPSMB90CA-VR	SMCJ180A-JD
TPSMB110A	TPSMB100A-VR	SMCJ193A-JD
TPSMB110CA	TPSMB100CA-VR	SMCJ200A-JD
TPSMB120A	TPSMB110A-VR	
TPSMB120CA	TPSMB110CA-VR	
TPSMB130A	TPSMB120A-VR	
TPSMB130CA	TPSMB120CA-VR	
TPSMB150A	TPSMB130A-VR	
TPSMB150CA	TPSMB130CA-VR	
TPSMB160A	TPSMB150A-VR	
TPSMB160CA	TPSMB150CA-VR	
TPSMB170A	TPSMB160A-VR	
TPSMB170CA	TPSMB160CA-VR	
TPSMB180A	TPSMB170A-VR	
TPSMB180CA	TPSMB170CA-VR	
TPSMB200A	TPSMB180A-VR	
TPSMB200CA	TPSMB180CA-VR	
TPSMB210A	TPSMB188A-VR	
TPSMB210CA	TPSMB188CA-VR	
TPSMB220A	TPSMB200A-VR	
TPSMB220CA	TPSMB200CA-VR	
TPSMB250A	TPSMB220A-VR	
TPSMB250CA	TPSMB220CA-VR	
TPSMB300A-A	TPSMB250A-VR	
TPSMB300CA-A	TPSMB250CA-VR	
TPSMB350A-A	TPSMB300A-VR	
TPSMB350CA-A	TPSMB300CA-VR	
TPSMB400CA-A	TPSMB350A-VR	
TPSMB440CA-A	TPSMB350CA-VR	
TPSMB400A-A	TPSMB400A-VR	
TPSMB440A-A	TPSMB400CA-VR	
TPSMB480A-A	TPSMB440A-VR	
TPSMB480CA-A	TPSMB440CA-VR	
TPSMB510A-A		
TPSMB510CA-A		
TPSMB520A-A		
TPSMB520CA-A		
TPSMB530A-A		
TPSMB530CA-A		
TPSMB540A-A		
TPSMB540CA-A		
TPSMB550A-A		
TPSMB550CA-A		
TPSMB600CA-A <sup>3</sup>		
TPSMB650CA-A <sup>3</sup>		

Note 3: PNs are released in new lines and only affected by wafer, solder paste and plating source change.

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TPSMB	TPSMB-VR	TPSMC
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TPSMB100CA	TPSMB90CA-VR	SMCJ180A-JD
TPSMB110A	TPSMB100A-VR	SMCJ193A-JD
TPSMB110CA	TPSMB100CA-VR	SMCJ200A-JD
TPSMB120A	TPSMB110A-VR	
TPSMB120CA	TPSMB110CA-VR	
TPSMB130A	TPSMB120A-VR	
TPSMB130CA	TPSMB120CA-VR	
TPSMB150A	TPSMB130A-VR	
TPSMB150CA	TPSMB130CA-VR	
TPSMB160A	TPSMB150A-VR	
TPSMB160CA	TPSMB150CA-VR	
TPSMB170A	TPSMB160A-VR	
TPSMB170CA	TPSMB160CA-VR	
TPSMB180A	TPSMB170A-VR	
TPSMB180CA	TPSMB170CA-VR	
TPSMB200A	TPSMB180A-VR	
TPSMB200CA	TPSMB180CA-VR	
TPSMB210A	TPSMB188A-VR	
TPSMB210CA	TPSMB188CA-VR	
TPSMB220A	TPSMB200A-VR	
TPSMB220CA	TPSMB200CA-VR	
TPSMB250A	TPSMB220A-VR	
TPSMB250CA	TPSMB220CA-VR	
TPSMB300A-A	TPSMB250A-VR	
TPSMB300CA-A	TPSMB250CA-VR	
TPSMB350A-A	TPSMB300A-VR	
TPSMB350CA-A	TPSMB300CA-VR	
TPSMB400CA-A	TPSMB350A-VR	
TPSMB440CA-A	TPSMB350CA-VR	
TPSMB400A-A	TPSMB400A-VR	
TPSMB440A-A	TPSMB400CA-VR	
TPSMB480A-A	TPSMB440A-VR	
TPSMB480CA-A	TPSMB440CA-VR	
TPSMB510A-A	P6SMB510CA-HE	
TPSMB510CA-A	P6SMB510CA-JK	
TPSMB520A-A	P6SMB510CA-SU	
TPSMB520CA-A	P6SMB510A-LG	
TPSMB530A-A		
TPSMB530CA-A		
TPSMB540A-A		
TPSMB540CA-A		
TPSMB550A-A		
TPSMB550CA-A		
TPSMB600CA-A <sup>3</sup>		
TPSMB650CA-A <sup>3</sup>		

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