Process / Product Change Notification

PCN No: 2011-005
Date: 8th September 2011
Subject: Change of die source and device assembly of the M Series of SMB, SMC & SML part families and their derivatives.

Description of Change:
This correspondence is official notification of the change of die source and assembly process for the Microsemi manufactured parts listed below. This change was initially announced in IPCN No. 2011-001, dated 7th July 2011. The part specifications are available on the Microsemi website at www.microsemi.com.

Qualification and Reliability data is enclosed in the Appendix section below. Further technical information is available from your local Sales office or Felim Downey at (felim.downey@microsemi.com)

Open Orders:
All currently scheduled orders shall be delivered per the dates reflected in the Order Acknowledgement from Microsemi.

Part Numbers Affected:
All M/MA/MXL/MX level parts in the following Transient Voltage Suppressor series:
SMBJ5.0A to SMBJ170A
SMBJ5.0CA to SMBJ170CA
SMCJ5.0A to SMCJ170A
SMCJ5.0CA to SMCJ170CA
SMLJ5.0A to SMLJ170A
SMLJ5.0CA to SMLJ170CA

Date Code Implementation: 1134

Microsemi Contacts:
For further Sales information, please contact:

Americas
Microsemi Lawrence
6 Lake Street
Lawrence, MA 01841
USA
Tel: (978)620-2600
Email: sales.LAW@microsemi.com

International
Microsemi Ireland
Gort Road Business Park
Ennis, Co. Clare
Ireland
Tel: +353 65 68 40044
Email: sales.IRE@microsemi.com

For all other queries concerning this notification please contact

Technical
Felim Downey
Applications Support Engineer
Microsemi Ireland
Tel: +353 65 6840044 ext 2126
Email: felim.downey@microsemi.com

PCN Originator
Ciara O'Callaghan,
Plastic Line Business Manager,
Microsemi Ireland.
Tel: +353 65 6840044 ext 2140
Email: cocallaghan@microsemi.com

Please acknowledge or approve as applicable and return to:

Document Control
Microsemi Ireland
Gort Road Business Park
Ennis, Co. Clare
Ireland
TEL: +353 65 68 40044 FAX: +353 65 68 22298
EMAIL: mdaly@microsemi.com

To be completed by the customer:

Please indicate your
Approval □
Acknowledgement □

Remarks:

______________________	______________	______________
Name	Title	Date

Customers are requested within the following timeline to support implementation of the change

i) Approval – (within 30 calendar days)
ii) Acknowledgement – (within 7 calendar days)

Note: For Acknowledgement only, when no response is received the change will become effective on the proposed date.

Appendix I

Qualification Data Summary

Table 1 details the qualification tests performed on the devices.

Qualification Data Summary							
Screening Level	**Test Performed**	**Condition**	**Duration or Qty**	**Standard / Reference**	**Sample size per Lot**	**No. of Lots**	**Failures**
M	Temperature Cycle	-55 °C to +150 °C	1000 cycles	MIL-STD-750E Method 1051	77	3	0
M	HTRB	125 °C	1000 hours	MIL-STD-750E Method 1038	77	3	0
M	Autoclave	121 °C, 100 % RH, 15 psig	96 hours	JESD22-A102	77	3	0
MX	Visual and Mechanical Review			MIL-STD-750E Method 2071	45	2	0
MX	Solderability			MIL-STD-750E Method 2026	4	2	0
MX	Surge Tests	100 % I_{PP}	100 times	10/1000 µS waveform	22	2	0
MX	HTRB	125 °C	1000 hours	MIL-STD-750E Method 1038	22	2	0
MX	Physical Dimensions			MIL-STD-750E Method 2066	15	2	0
MX	Terminal Strength			MIL-STD-750E Method 2036	22	2	0
MX	Moisture Resistance			MIL-STD-750E Method 1021	22	2	0

Table 1: Qualification Data

Reliability Data

The results in Table 2 below have been accumulated from High Temperature Reverse Bias (HTRB) testing performed on the M and MX-level devices.

Reliability Data		
Term	**M Level**	**MX Level**
Cumulative Device Hours	>270,000	44,000
Equivalent Device Hours	>21 million	>3.4 million
# of Failures	0	0
Failure Rate	4.35E-08	2.67E-07
FIT (per billion hours)	44	267
MTTF (in years)	2,622	427

Table 2: Reliability Results

NOTE: There have been zero failures to date. The reliability data will be updated as more data is accumulated.

Definitions

Cumulative device hours: Number of devices tested (n) * test hours per device
Equivalent devices hours (EDH): Acceleration factor (A_F) * cumulative device hours

where the acceleration factor (A_F) using the Arrhenius model is expressed as:

$A_F = e^{-Ea/k(1/T_{TEST} - 1/T_{USE})}$ where:

Ea = thermal activation energy (eV) which, for semiconductors is typically 0.7 eV
k = Boltzmann's constant = 8.617 x10-5 eV/°K
T_{TEST} = Test junction temperature of 125 °C (398 °K)
T_{USE} = Typical usage junction temperature of 55 °C (328 °K)

Failure Rate: Number of failures / hour @ 60 % confidence level
FIT: Failure rate x 109 hours (Failures in time)
MTTF: 1 / failure rate (Mean time to failure)