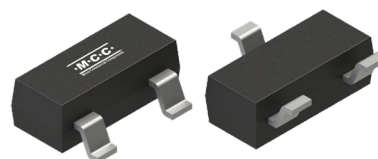


2-Line Bi-directional Standard Capacitance ESD

Features

- Transient protection:
 - IEC 61000-4-2 (ESD) $\pm 30\text{kV}$ (Air), $\pm 30\text{kV}$ (Contact)
 - IEC 61000-4-5 (Lightning) 5~25A (8/20 μs)
- Bi-directional ESD protection of two lines
- Reverse working voltage, V_{RWM} : 3.3V~36V
- Standard capacitance: 13~100pF
- Low clamping voltage: 16~90V
- Low reverse leakage current: 0.5uA



SOT-23



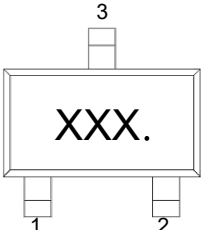
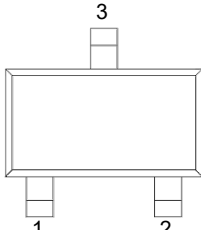
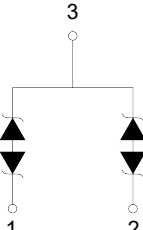
Applications

- Netbooks and Handhelds
- Portable Instrumentation

Mechanical Data

- Package: SOT-23
- Moisture Sensitivity Level 1, per J-STD-020
- Halogen Free. "Green" Device (Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Body Marking and Pin Layout

Marking Code	Simplified Outline	Internal Structure																
 <table><tr><th>MCC Part No.</th><th>Device Marking</th></tr><tr><td>ESD3V3T2B</td><td>3B</td></tr><tr><td>ESD7V0T2B</td><td>7B</td></tr><tr><td>ESD12VT2B</td><td>12B</td></tr><tr><td>ESD15VT2B</td><td>15B</td></tr><tr><td>ESD24VT2B</td><td>6RS</td></tr><tr><td>ESD27VT2B</td><td>27B</td></tr><tr><td>ESD36VT2B</td><td>36B</td></tr></table> XXX: Device Marking Code Dot(optional): Manufacturing Site Marking	MCC Part No.	Device Marking	ESD3V3T2B	3B	ESD7V0T2B	7B	ESD12VT2B	12B	ESD15VT2B	15B	ESD24VT2B	6RS	ESD27VT2B	27B	ESD36VT2B	36B	 Transparent top view	
MCC Part No.	Device Marking																	
ESD3V3T2B	3B																	
ESD7V0T2B	7B																	
ESD12VT2B	12B																	
ESD15VT2B	15B																	
ESD24VT2B	6RS																	
ESD27VT2B	27B																	
ESD36VT2B	36B																	

Ordering Information

Product Name	Reel Size	Packing Type	Qty/Reel
ESD3V3T2B-TP THRU ESD36VT2B-TP	7"	Tape & Reel	3,000

For packaging details, visit our website at <https://www.mccsemi.com/Package/List>

2-Line Bi-directional Standard Capacitance ESD

Maximum Ratings (T_A=25°C unless otherwise specified)

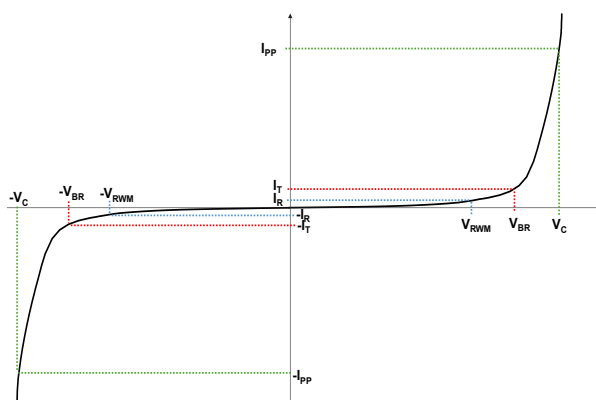
Parameter		Symbol	Rating	Unit
IEC61000-4-2(ESD)	Air	V _{ESD}	±30	kV
	Contact	V _{ESD}	±30	kV
Peak Pulse Power (8/20μs) (Note2)		P _{PK}	250	W
Operating Temperature Range		T _J	-55 to +150	°C
Storage Temperature Range		T _{STG}	-55 to +150	°C

Note:

1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and 1000ppm antimony compounds.
2. Non-repetitive current pulse 8/20μs exponential decay waveform according to IEC61000-4-5.

Parameter Definition

Symbol	Parameter
V _{RWM}	Peak Reverse Working Voltage
I _R	Reverse Leakage Current @ V _{RWM}
V _{BR}	Breakdown Voltage @ I _T
I _T	Test Current
I _{PP}	Maximum Reverse Peak Pulse Current
V _C	Clamping Voltage @ I _{PP}
P _{PK}	Peak Pulse Power
C _J	Junction Capacitance



Electrical Characteristics (T_A=25°C unless otherwise specified)

ESD3V3T2B

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V _{RWM}				3.3	V
Reverse Breakdown Voltage	V _{BR}	I _T = 1mA	5		6.9	V
Reverse Leakage Current	I _R	V _{RWM} = 3.3V			0.5	μA
Clamping Voltage (Note2)	V _C	I _{PP} = 1A, t _p = 8/20μs			9	V
	V _C	I _{PP} = 25A, t _p = 8/20μs			16	V
Junction Capacitance	C _J	V _R = 0V, f = 1MHz		100		pF
Dynamic Resistance (Note3)	R _{DYN}	TLP, t _p = 100ns		0.18		Ω

2-Line Bi-directional Standard Capacitance ESD

ESD7V0T2B

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				7	V
Reverse Breakdown Voltage	V_{BR}	$I_T = 1mA$	7.5		9.6	V
Reverse Leakage Current	I_R	$V_{RWM} = 7V$			0.5	μA
Clamping Voltage ^(Note2)	V_C	$I_{PP} = 1A, t_P = 8/20\mu s$			13	V
	V_C	$I_{PP} = 17A, t_P = 8/20\mu s$			15	V
Junction Capacitance	C_J	$V_R = 0V, f = 1MHz$		65		pF
Dynamic Resistance ^(Note3)	R_{DYN}	TLP, $t_P = 100ns$		0.37		Ω

ESD12VT2B

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				12	V
Reverse Breakdown Voltage	V_{BR}	$I_T = 1mA$	13		17	V
Reverse Leakage Current	I_R	$V_{RWM} = 12V$			0.5	μA
Clamping Voltage ^(Note2)	V_C	$I_{PP} = 1A, t_P = 8/20\mu s$			20	V
	V_C	$I_{PP} = 10A, t_P = 8/20\mu s$			30	V
Junction Capacitance	C_J	$V_R = 0V, f = 1MHz$		35		pF
Dynamic Resistance ^(Note3)	R_{DYN}	TLP, $t_P = 100ns$		0.28		Ω

ESD15VT2B

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				15	V
Reverse Breakdown Voltage	V_{BR}	$I_T = 1mA$	16		19	V
Reverse Leakage Current	I_R	$V_{RWM} = 15V$			0.5	μA
Clamping Voltage ^(Note2)	V_C	$I_{PP} = 1A, t_P = 8/20\mu s$			20	V
	V_C	$I_{PP} = 9A, t_P = 8/20\mu s$			30	V
Junction Capacitance	C_J	$V_R = 0V, f = 1MHz$		30		pF
Dynamic Resistance ^(Note3)	R_{DYN}	TLP, $t_P = 100ns$		0.4		Ω

ESD24VT2B

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				24	V
Reverse Breakdown Voltage	V_{BR}	$I_T = 1mA$	26		32.2	V
Reverse Leakage Current	I_R	$V_{RWM} = 24V$			0.5	μA
Clamping Voltage ^(Note2)	V_C	$I_{PP} = 1A, t_P = 8/20\mu s$			34	V
	V_C	$I_{PP} = 7A, t_P = 8/20\mu s$			44	V
Junction Capacitance	C_J	$V_R = 0V, f = 1MHz$		20		pF
Dynamic Resistance ^(Note3)	R_{DYN}	TLP, $t_P = 100ns$		0.83		Ω

2-Line Bi-directional Standard Capacitance ESD

ESD27VT2B

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				27	V
Reverse Breakdown Voltage	V_{BR}	$I_T = 1mA$	31		38	V
Reverse Leakage Current	I_R	$V_{RWM}=27V$			0.5	μA
Clamping Voltage ^(Note2)	V_C	$I_{PP}=1A, t_P=8/20\mu s$			50	V
	V_C	$I_{PP}=6A, t_P=8/20\mu s$			70	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		15		pF
Dynamic Resistance ^(Note3)	R_{DYN}	TLP, $t_P=100ns$		1.1		Ω

ESD36VT2B

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				36	V
Reverse Breakdown Voltage	V_{BR}	$I_T = 1mA$	38		48	V
Reverse Leakage Current	I_R	$V_{RWM}=36V$			0.5	μA
Clamping Voltage ^(Note2)	V_C	$I_{PP}=1A, t_P=8/20\mu s$			55	V
	V_C	$I_{PP}=5A, t_P=8/20\mu s$			90	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		13		pF
Dynamic Resistance ^(Note3)	R_{DYN}	TLP, $t_P=100ns$		0.9		Ω

Note:

3. TLP parameter: $Z_0=50\Omega$, $t_P=100ns$, $t_r=2ns$, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.

2-Line Bi-directional Standard Capacitance ESD

Curve Characteristics

Fig. 1 - 8 X 20 μ s Pulse Waveform

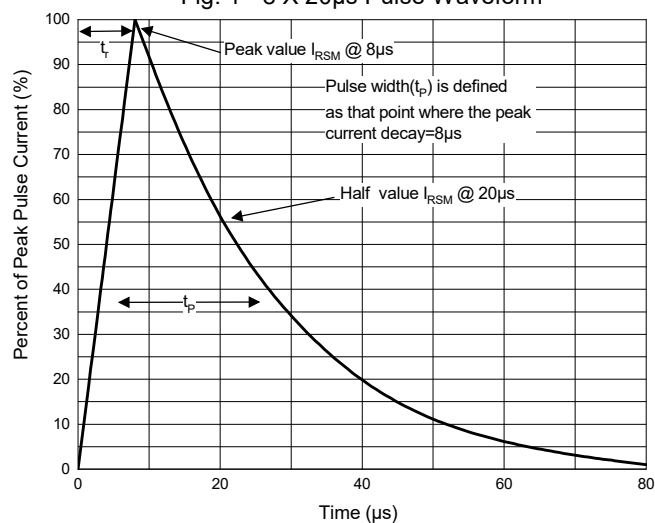


Fig. 2 - Non-Repetitive Peak Pulse Power

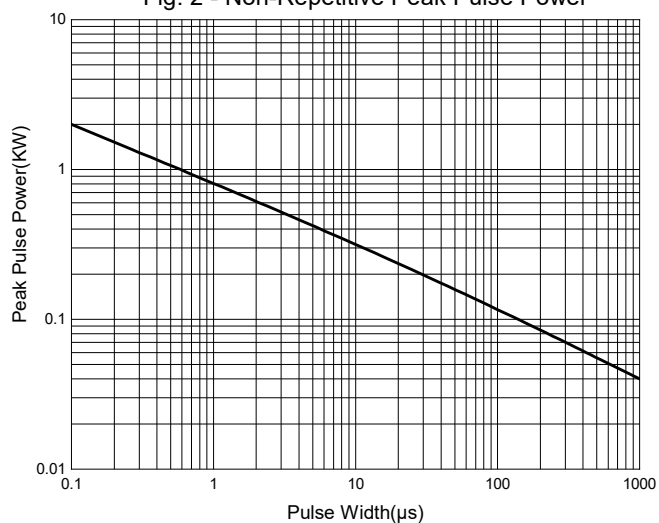


Fig. 3 - Capacitance Characteristics

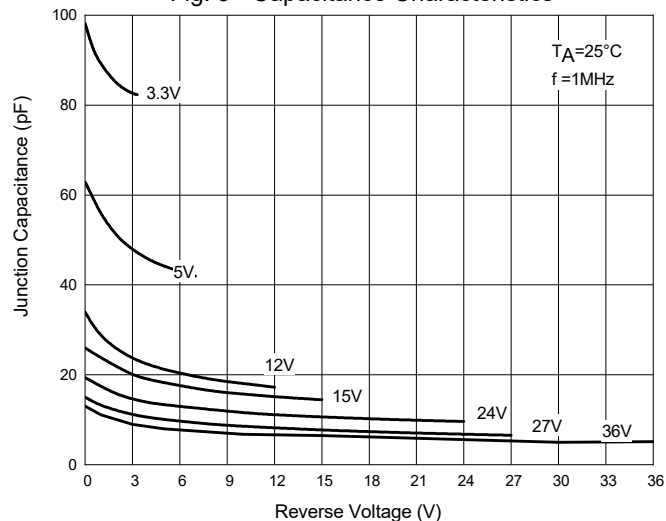


Fig. 4 - Clamping Voltage Characteristics

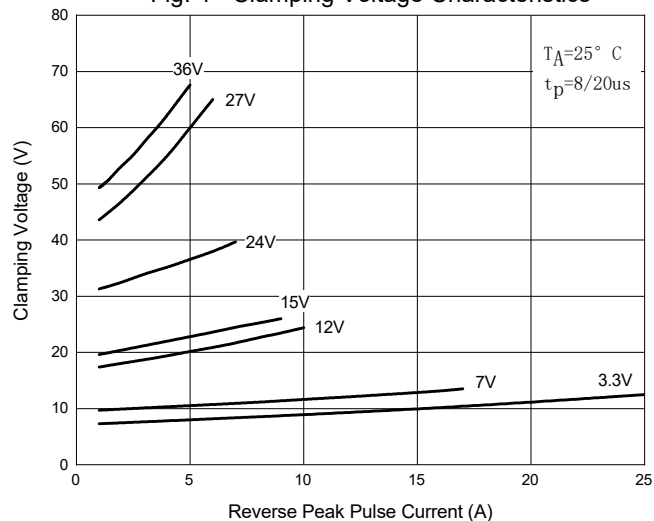


Fig. 5 - TLP Curve

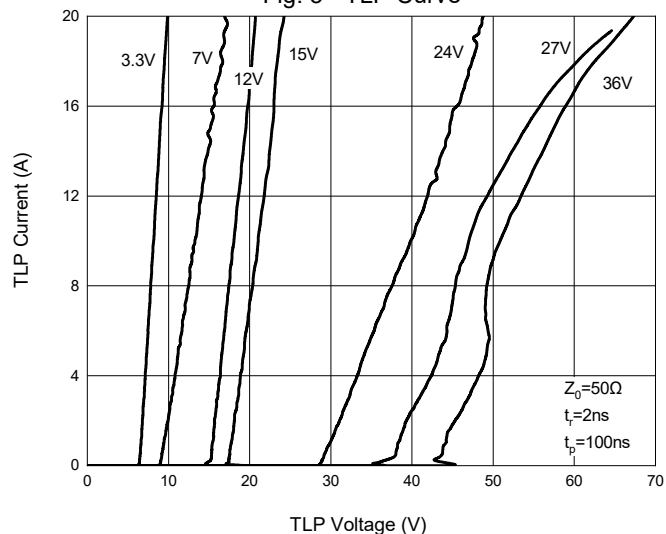
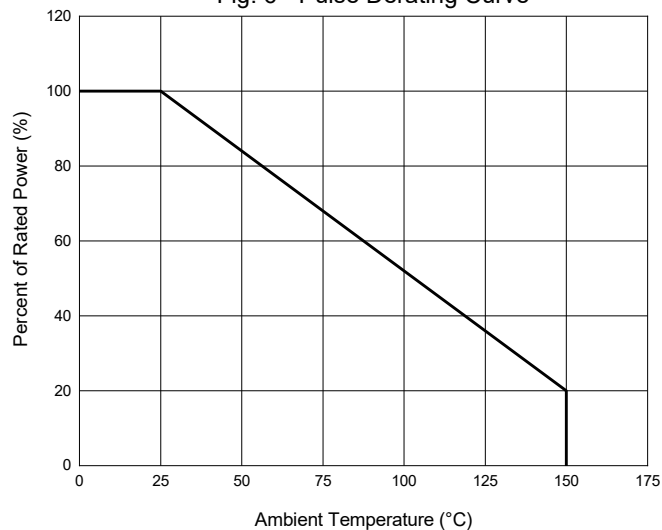
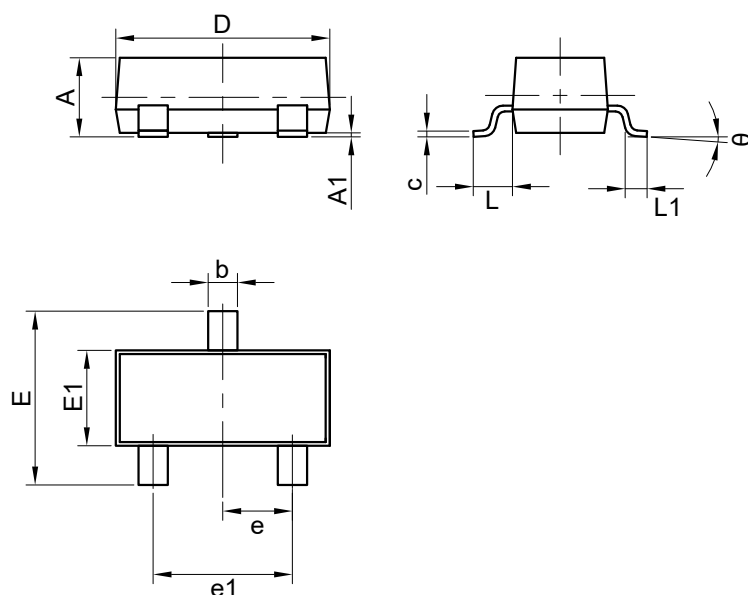


Fig. 6 - Pulse Derating Curve



Package Outline

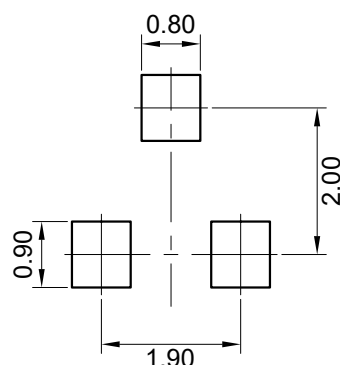


DIM	INCH		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.035	0.045*	0.90	1.15*	Note 1
A1	0.000	0.004	0.01	0.10	
b	0.012	0.020	0.30	0.50	
c	0.003	0.007	0.08	0.18	
D	0.110	0.120	2.80	3.04	
E	0.083	0.104	2.10	2.64	
E1	0.047	0.055	1.20	1.40	
e	0.037		0.95		TYP
e1	0.075		1.90		TYP
L	0.017	0.026	0.45	0.65	
L1	0.011	0.020	0.30	0.50	
θ	0°	8°	0°	8°	

Notes:

1. Dimension A for products from manufacturing site VN is controlled at maximum 1.10 mm.

Suggested Pad Layout (Unit:mm)



Notes:

1. The suggested land pattern dimensions have been provided for reference only.
2. For further information, please refer to document IPC-7351A.

DISCLAIMERS

Micro Commercial Components Corp. (MCC) reserves the right to make changes to any product without prior notice, including corrections, modifications, enhancements, improvements, or other changes. MCC's products are not designed, authorized, or warranted for use in medical, military, aircraft, space, or life support equipment, nor in applications where failure or malfunction of an MCC product can reasonably be expected to result in personal injury, death, or severe property or environmental damage. MCC does not assume liability for any application or use of the products described herein, nor does it convey any license under its patent rights or those of others. Users of MCC's products in any such application assume all risks associated with their use and agree to hold MCC and all companies whose products are represented on our website harmless against any damages. MCC's products are not authorized for use as critical components in life support devices or systems without the express written approval of MCC.

Counterfeiting of semiconductor parts is an increasing problem in the industry. MCC is taking strong measures to protect both ourselves and our customers from counterfeit products. We strongly encourage customers to purchase our parts either directly from MCC or through Authorized Distributors, who are listed by country on our website. Products purchased directly from MCC or from Authorized Distributors are genuine, have full traceability, and meet our quality standards for handling and storage. MCC will not provide warranty coverage or any other assistance for parts bought from Unauthorized Sources.

This document, along with the item(s) described within, may be subject to export control regulations. Exporting these items may require prior authorization from national authorities.

Terms and Conditions - MCC products are sold subject to the general terms and conditions of commercial sale, as published at <https://www.mccsemi.com/Home/TermsAndConditions>.