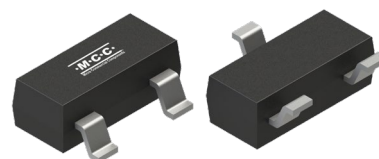


2-Line Bi-directional Standard Capacitance ESD

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														
3 XXX. 1 2 <table><thead><tr><th>MCC Part No.</th><th>Device Marking</th></tr></thead><tbody><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></tbody></table> XXX: Device Marking Code Dot(optional): Manufacturing Site Marking 3 1 2 Transparent top view 3 1 2	MCC Part No.	Device Marking	ESD3V3T2B	3B	ESD7V0T2B	7B	ESD12VT2B	12B	ESD15VT2B	15B	ESD24VT2B	6RS	ESD27VT2B	27B	ESD36VT2B	36B
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)

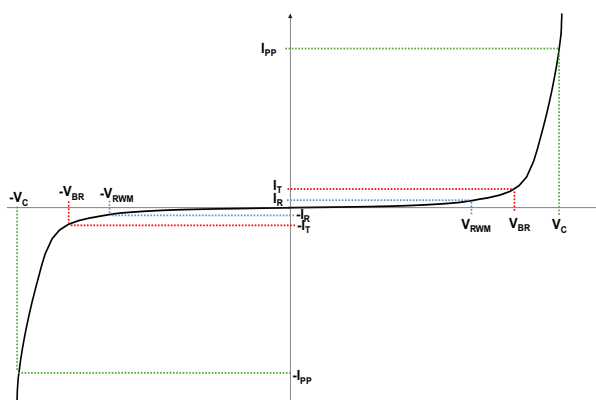
Parameter		Symbol	Rating	Unit
IEC61000-4-2(ESD)	Air	V _{ESD}	±30	kV
	Contact	V _{ESD}	±30	kV
Peak Pulse Power (8/20μs) (Note2)		P _{PK}	250	W
Operating Temperature Range		T _J	-55 to +150	°C
Storage Temperature Range		T _{STG}	-55 to +150	°C

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

ESD12VT2B

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

ESD15VT2B

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

ESD24VT2B

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

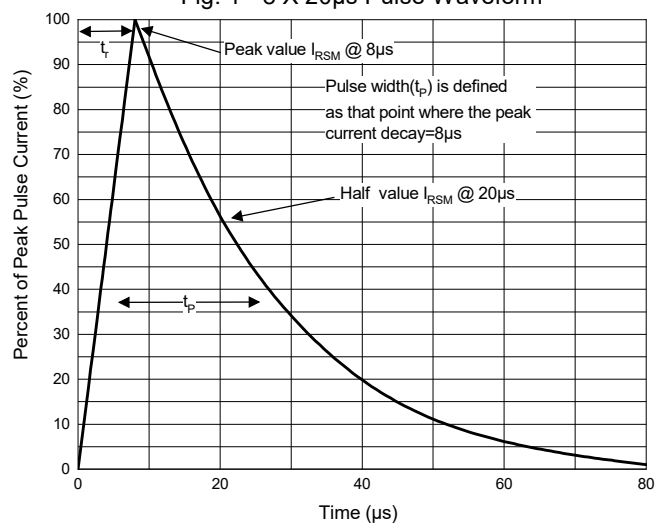


Fig. 2 - Non-Repetitive Peak Pulse Power

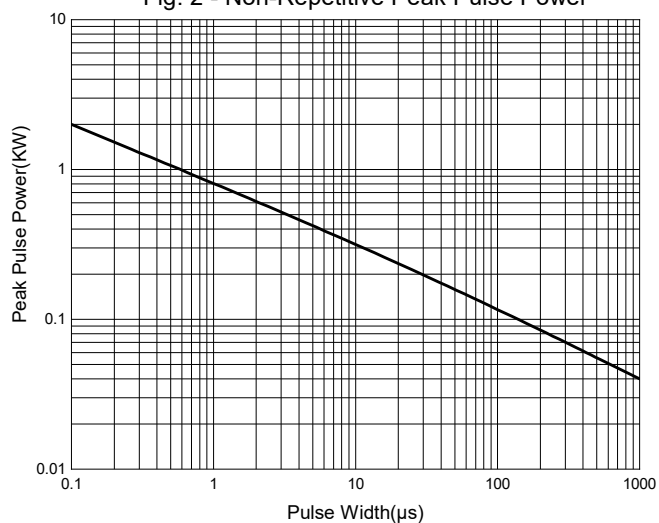


Fig. 3 - Capacitance Characteristics

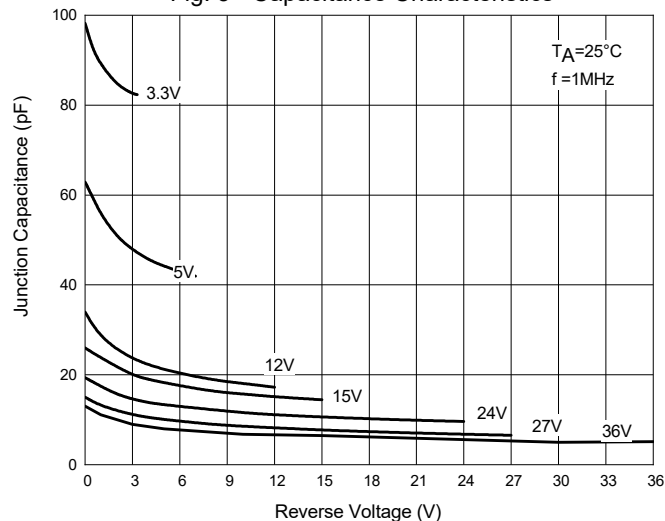


Fig. 4 - Clamping Voltage Characteristics

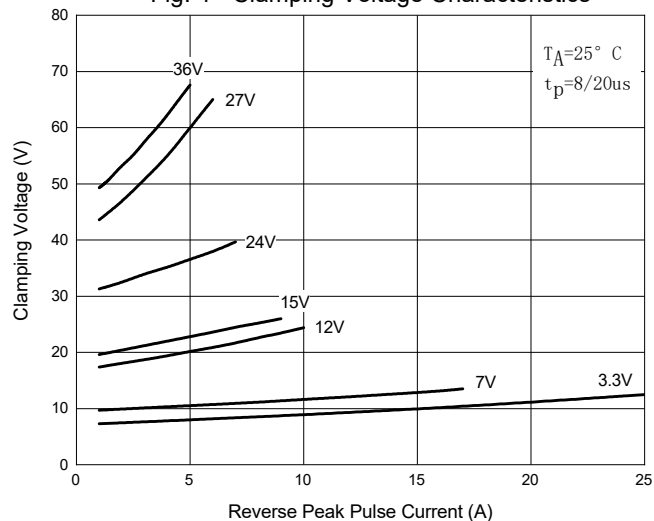


Fig. 5 - TLP Curve

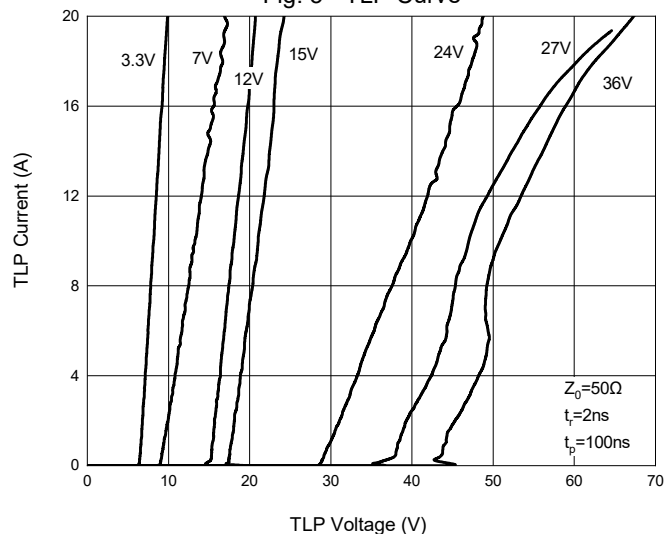
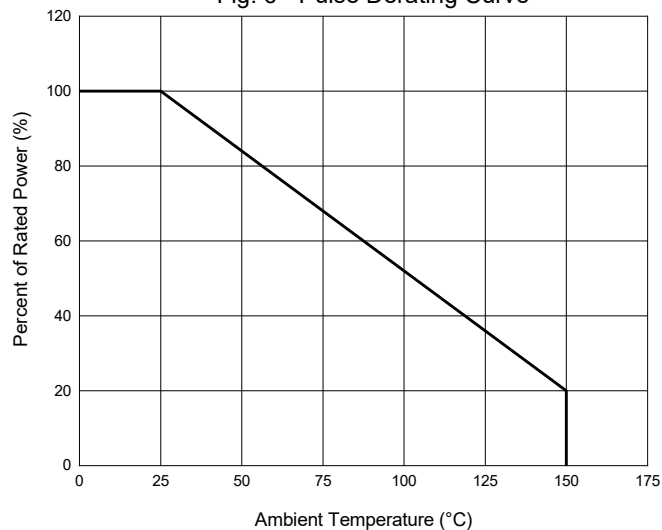
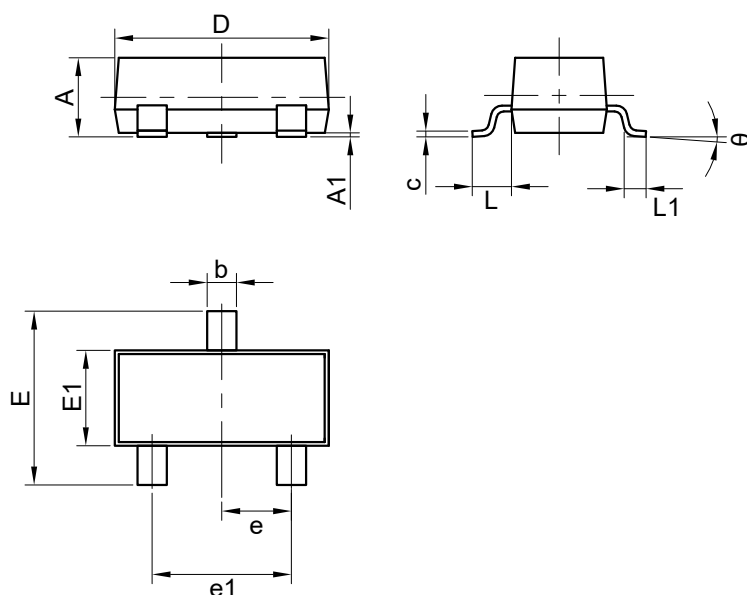


Fig. 6 - Pulse Derating Curve



Package Outline

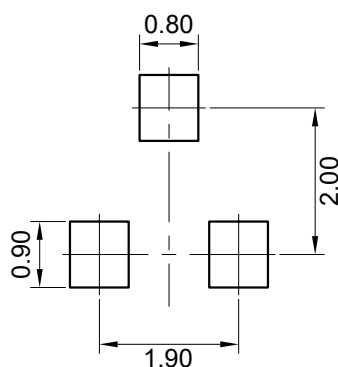


DIM	INCH		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.035	0.045*	0.90	1.15*	Note 1
A1	0.000	0.004	0.01	0.10	
b	0.012	0.020	0.30	0.50	
c	0.003	0.007	0.08	0.18	
D	0.110	0.120	2.80	3.04	
E	0.047	0.055	2.10	2.64	
E1	0.083	0.104	1.20	1.40	
e	0.037		0.95		TYP
e1	0.075		1.90		TYP
L	0.017	0.026	0.45	0.65	
L1	0.011	0.020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

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