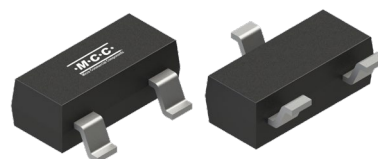


2-Line Uni-directional Standard Capacitance ESD

Features

- Transient protection:
 - IEC 61000-4-2 (ESD) $\pm 30\text{kV}$ (Air), $\pm 30\text{kV}$ (Contact)
 - IEC 61000-4-5 (Lightning) 5~20A (8/20 μs)
- Uni-directional ESD protection of two lines
- Reverse working voltage, V_{RWM} : 5.0V~36V
- Standard capacitance: 24~140pF
- Low clamping voltage: 15~75V max
- Low reverse leakage current: 1uA max



SOT-23



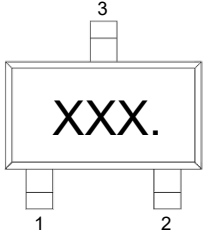
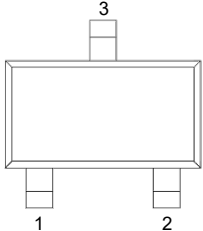
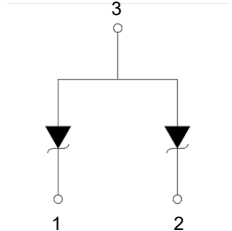
Applications

- CAN Bus Protection
- 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 border="1" data-bbox="456 1377 759 1541"><thead><tr><th>MCC Part No.</th><th>Device Marking</th></tr></thead><tbody><tr><td>ESD5V0T2</td><td>05A</td></tr><tr><td>ESD12VT2</td><td>12A</td></tr><tr><td>ESD15VT2</td><td>15A</td></tr><tr><td>ESD24VT2</td><td>24A</td></tr><tr><td>ESD36VT2</td><td>36A</td></tr></tbody></table> XXX: Device Marking Code Dot(optional): Manufacturing Site Marking	MCC Part No.	Device Marking	ESD5V0T2	05A	ESD12VT2	12A	ESD15VT2	15A	ESD24VT2	24A	ESD36VT2	36A	 Transparent top view	
MCC Part No.	Device Marking													
ESD5V0T2	05A													
ESD12VT2	12A													
ESD15VT2	15A													
ESD24VT2	24A													
ESD36VT2	36A													

Ordering Information

Product Name	Reel Size	Packing Type	Qty/Reel
ESD5V0T2-TP THRU ESD36VT2-TP	7"	Tape & Reel	3,000

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

2-Line Uni-directional Standard Capacitance ESD

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

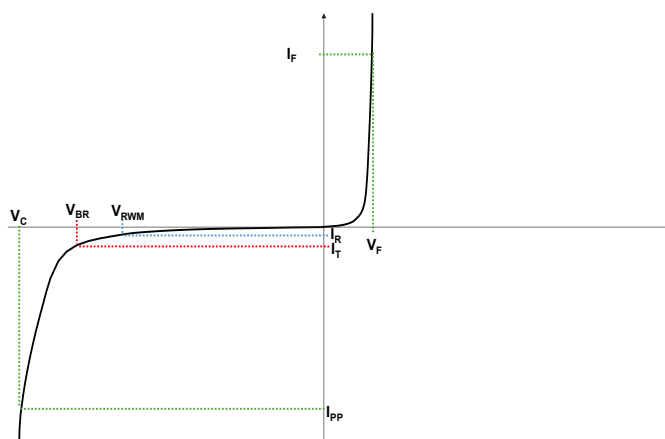
Parameter		Symbol	Rating	Unit
IEC61000-4-2(ESD)	Air	V _{ESD}	±30	kV
	Contact	V _{ESD}	±30	kV
Operating Temperature Range		T _J	-55 to +150	°C
Storage Temperature Range		T _{STG}	-55 to +150	°C

Note:

1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and 1000ppm antimony compounds.

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
I _F	Forward Current
V _F	Forward Voltage @ I _F



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

ESD5V0T2

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V _{RWM}				5	V
Reverse Breakdown Voltage	V _{BR}	I _T = 1mA	6		7.5	V
Reverse Leakage Current	I _R	V _{RWM} = 5V			1	μA
Forward Voltage	V _F	I _F = 10mA			1.1	V
Peak Pulse Power (8/20μs) (Note2)	P _{PK}				300	W
Clamping Voltage (Note2)	V _C	I _{PP} = 1A, t _p = 8/20μs			9	V
	V _C	I _{PP} = 20A, t _p = 8/20μs			15	V
Junction Capacitance	C _J	V _R = 0V, f = 1MHz		140	160	pF
Dynamic Resistance (Note3)	R _{DYN}	TLP, t _p = 100ns		0.1		Ω

2-Line Uni-directional Standard Capacitance ESD

ESD12VT2

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	$V_{RWM}=12\text{V}$			1	μA
Forward Voltage	V_F	$I_F=10\text{mA}$			1.1	V
Peak Pulse Power (8/20 μs) (Note2)	P_{PK}				280	W
Clamping Voltage (Note2)	V_C	$I_{PP}=1\text{A}$, $t_P=8/20\mu\text{s}$			18.5	V
	V_C	$I_{PP}=10\text{A}$, $t_P=8/20\mu\text{s}$			28	V
Junction Capacitance	C_J	$V_R=0\text{V}$, $f=1\text{MHz}$		55	70	pF
Dynamic Resistance (Note3)	R_{DYN}	TLP, $t_P = 100\text{ns}$		0.18		Ω

ESD15VT2

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				15	V
Reverse Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$	15.5		19	V
Reverse Leakage Current	I_R	$V_{RWM}=15\text{V}$			1	μA
Forward Voltage	V_F	$I_F=10\text{mA}$			1.1	V
Peak Pulse Power (8/20 μs) (Note2)	P_{PK}				342	W
Clamping Voltage (Note2)	V_C	$I_{PP}=1\text{A}$, $t_P=8/20\mu\text{s}$			24	V
	V_C	$I_{PP}=9\text{A}$, $t_P=8/20\mu\text{s}$			38	V
Junction Capacitance	C_J	$V_R=0\text{V}$, $f=1\text{MHz}$		45	55	pF
Dynamic Resistance (Note3)	R_{DYN}	TLP, $t_P = 100\text{ns}$		0.19		Ω

ESD24VT2

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		30	V
Reverse Leakage Current	I_R	$V_{RWM}=24\text{V}$			1	μA
Forward Voltage	V_F	$I_F=10\text{mA}$			1.1	V
Peak Pulse Power (8/20 μs) (Note2)	P_{PK}				308	W
Clamping Voltage (Note2)	V_C	$I_{PP}=1\text{A}$, $t_P=8/20\mu\text{s}$			32	V
	V_C	$I_{PP}=7\text{A}$, $t_P=8/20\mu\text{s}$			44	V
Junction Capacitance	C_J	$V_R=0\text{V}$, $f=1\text{MHz}$		36	50	pF
Dynamic Resistance (Note3)	R_{DYN}	TLP, $t_P = 100\text{ns}$		0.36		Ω

2-Line Uni-directional Standard Capacitance ESD

ESD36VT2

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				36	V
Reverse Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$	39		45	V
Reverse Leakage Current	I_R	$V_{RWM} = 36\text{V}$			1	μA
Forward Voltage	V_F	$I_F = 10\text{mA}$			1.1	V
Peak Pulse Power (8/20 μs) (Note2)	P_{PK}				375	W
Clamping Voltage (Note2)	V_C	$I_{PP} = 1\text{A}$, $t_P = 8/20\mu\text{s}$			55	V
	V_C	$I_{PP} = 5\text{A}$, $t_P = 8/20\mu\text{s}$			75	V
Junction Capacitance	C_J	$V_R = 0\text{V}$, $f = 1\text{MHz}$		24	35	pF
Dynamic Resistance (Note3)	R_{DYN}	TLP, $t_P = 100\text{ns}$		0.8		Ω

Note:

2. Non-repetitive current pulse 8/20 μs exponential decay waveform according to IEC61000-4-5..

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

2-Line Uni-directional Standard Capacitance ESD

Curve Characteristics

Fig. 1 - 8 X 20 μ s Pulse Waveform

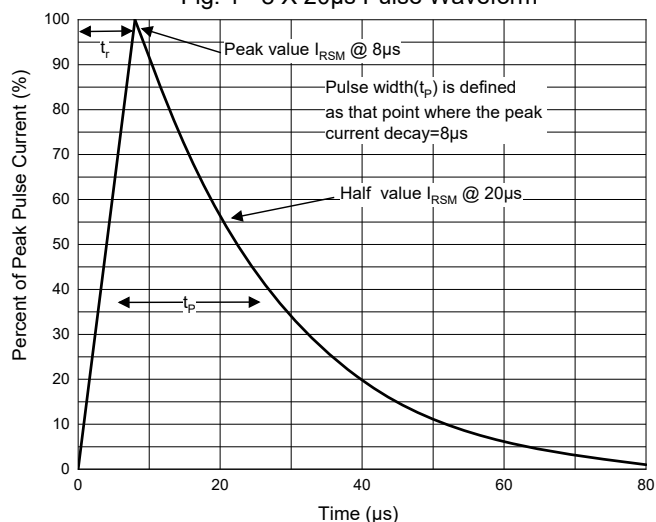


Fig. 2 - Non-Repetitive Peak Pulse Power

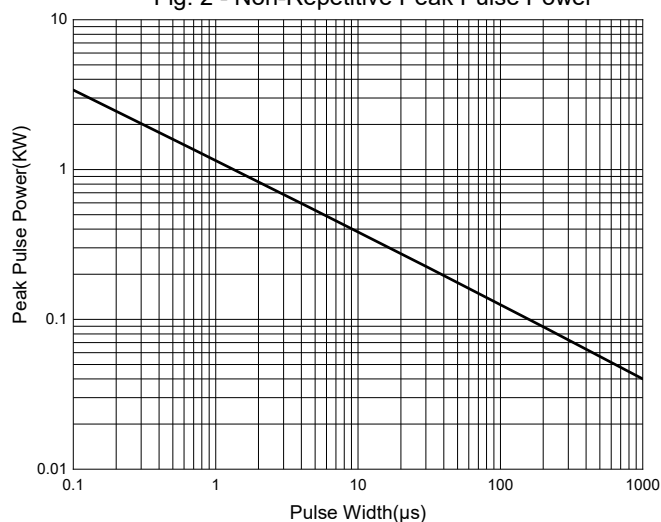


Fig. 3 - Capacitance Characteristics

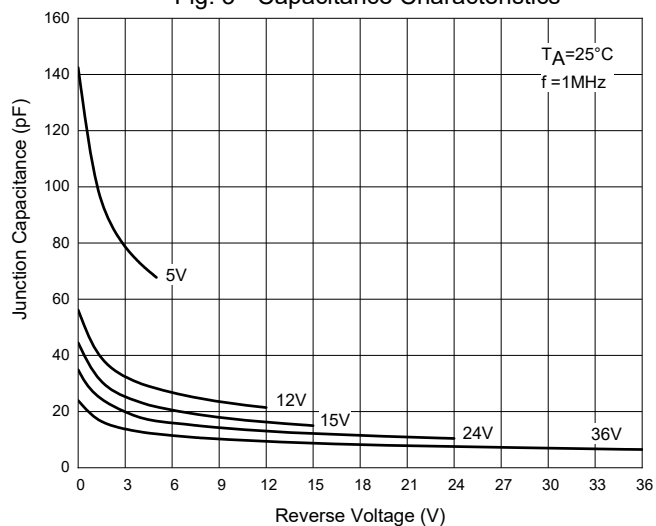


Fig. 4 - Clamping Voltage Characteristics

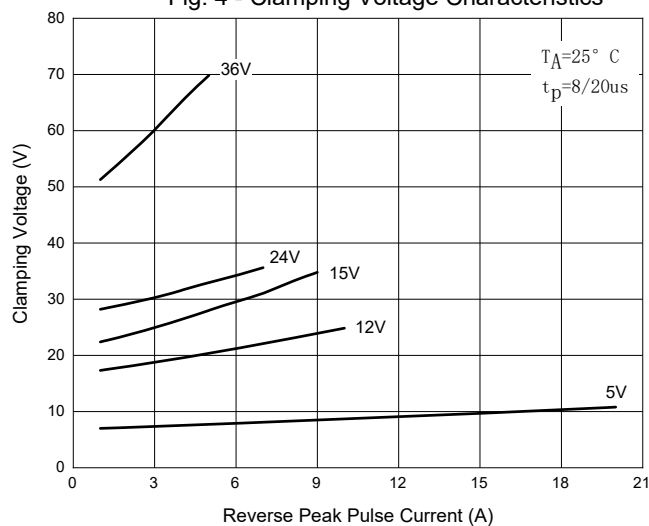


Fig. 5 - TLP Curve

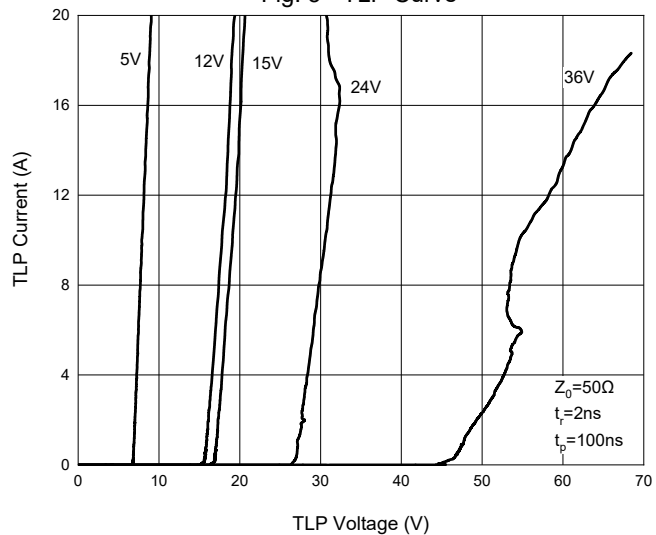
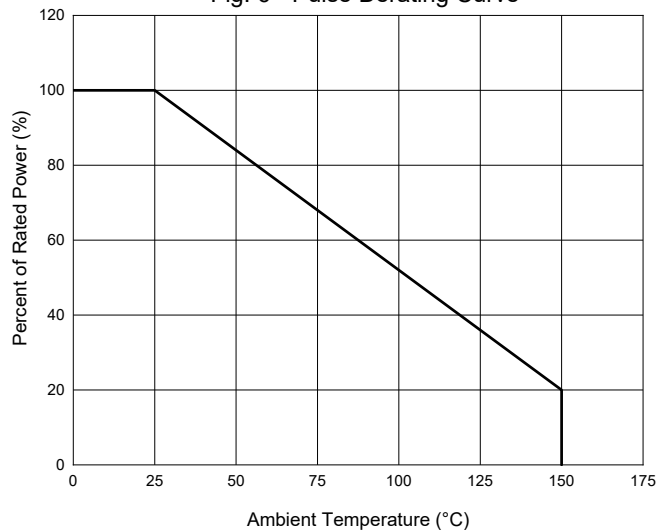
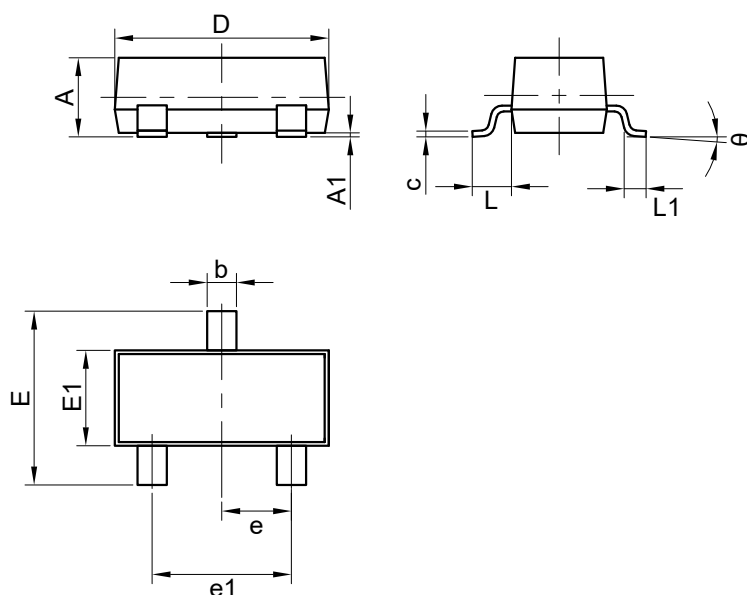


Fig. 6 - Pulse Derating Curve



Package Outline

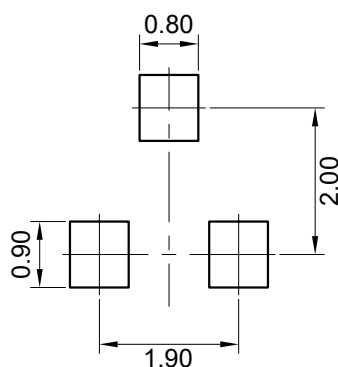


DIM	INCH		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.035	0.045*	0.90	1.15*	Note 1
A1	0.000	0.004	0.01	0.10	
b	0.012	0.020	0.30	0.50	
c	0.003	0.007	0.08	0.18	
D	0.110	0.120	2.80	3.04	
E	0.083	0.104	2.10	2.64	
E1	0.047	0.055	1.20	1.40	
e	0.037		0.95		TYP
e1	0.075		1.90		TYP
L	0.017	0.026	0.45	0.65	
L1	0.011	0.020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

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