

Features

- Uni-Directional ESD Protection of One Line
- Low Leakage
- Low Clamping Voltage
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

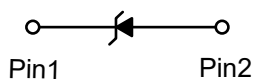
IEC61000-4-2 (ESD)	Air	±30KV
	Contact	±30KV
Peak Pulse Power (8/20μs) ^(Note2)	P _{PK}	200W
Operating Junction Temperature Range	T _J	-45°C to +125°C
Storage Temperature Range	T _{STG}	-55°C to +150°C

Note :

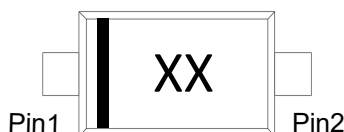
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

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

Internal Structure



Marking Code

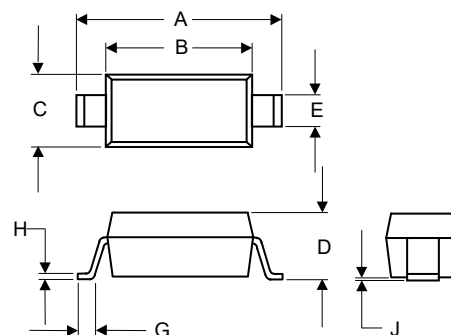


XX:Device code

MCC Part No.	Device Code
ESD3V3D3A	3A.
ESD5V0D3A	05U.
ESD12VD3A	12U.
ESD15VD3A	15U.
ESD18VD3A	18U.
ESD24VD3A	ZS.
ESD36VD3A	36U.

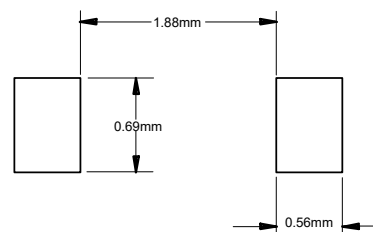
ESD Protection Device

SOD-323

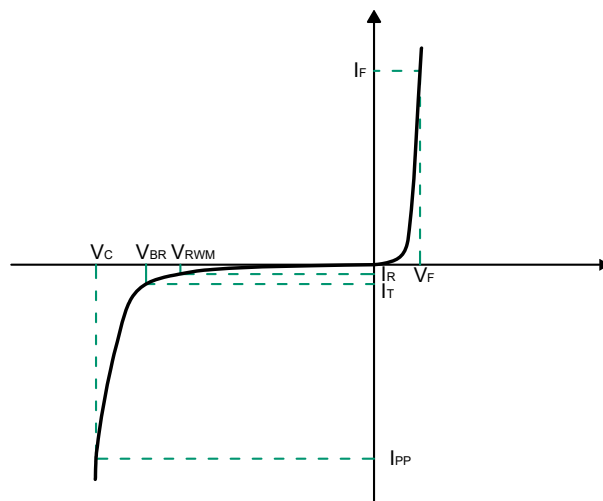


DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.090	0.107	2.30	2.70	
B	0.063	0.071	1.60	1.80	
C	0.045	0.053	1.15	1.35	
D	0.031	0.045	0.80	1.15	
E	0.010	0.016	0.25	0.40	
G	0.004	0.018	0.10	0.45	
H	0.004	0.010	0.10	0.25	
J	----	0.006	----	0.15	

Suggested Solder Pad Layout



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 @ 25°C (Unless Otherwise Specified)

ESD3V3D3A

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	V_{RWM}				3.3	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	4.5			V
Reverse Leakage Current	I_R	$V_{RWM}=3.3V$			0.5	μA
Forward Voltage	V_F	$I_F=10mA$			1.2	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=1A, t_p=8/20\mu s$			7	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=18A, t_p=8/20\mu s$			12	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		185		pF
Dynamic Resistance ^{Note2}	R_{DYN}	TLP, $t_p=100ns$		0.4		Ω

ESD5V0D3A

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	V_{RWM}				5	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	6.2			V
Reverse Leakage Current	I_R	$V_{RWM}=5V$			0.5	μA
Forward Voltage	V_F	$I_F=10mA$			1.2	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=1A, t_p=8/20\mu s$			8	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=15A, t_p=8/20\mu s$			14	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		140		pF
Dynamic Resistance ^{Note2}	R_{DYN}	TLP, $t_p=100ns$		0.1		Ω

ESD12VD3A

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	V_{RWM}				12	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	13.3			V
Reverse Leakage Current	I_R	$V_{RWM}=12V$			0.5	μA
Forward Voltage	V_F	$I_F=10mA$			1.2	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=1A, t_P=8/20\mu s$			19	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=10A, t_P=8/20\mu s$			28	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		55		pF
Dynamic Resistance ^{Note2}	R_{DYN}	TLP, $t_P=100ns$		0.18		Ω

ESD15VD3A

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	V_{RWM}				15	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	16.5			V
Reverse Leakage Current	I_R	$V_{RWM}=15V$			0.5	μA
Forward Voltage	V_F	$I_F=10mA$			1.2	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=1A, t_P=8/20\mu s$			24	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=8A, t_P=8/20\mu s$			35	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		45		pF
Dynamic Resistance ^{Note2}	R_{DYN}	TLP, $t_P=100ns$		0.19		Ω

ESD18VD3A

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	V_{RWM}				18	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	19			V
Reverse Leakage Current	I_R	$V_{RWM}=18V$			0.5	μA
Forward Voltage	V_F	$I_F=10mA$			1.2	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=1A, t_P=8/20\mu s$			27	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=8A, t_P=8/20\mu s$			38	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		39		pF
Dynamic Resistance ^{Note2}	R_{DYN}	TLP, $t_P=100ns$		0.35		Ω

ESD24VD3A

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	V_{RWM}				24	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	25			V
Reverse Leakage Current	I_R	$V_{RWM}=24V$			0.5	μA
Forward Voltage	V_F	$I_F=10mA$			1.2	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=1A, t_p=8/20\mu s$			32	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=7A, t_p=8/20\mu s$			50	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		36		pF
Dynamic Resistance ^{Note2}	R_{DYN}	TLP, $t_p=100ns$		0.36		Ω

ESD36VD3A

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	V_{RWM}				36	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	40			V
Reverse Leakage Current	I_R	$V_{RWM}=36V$			0.5	μA
Forward Voltage	V_F	$I_F=10mA$			1.2	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=1A, t_p=8/20\mu s$			55	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=5A, t_p=8/20\mu s$			75	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		24		pF
Dynamic Resistance ^{Note2}	R_{DYN}	TLP, $t_p=100ns$		0.8		Ω

Note :

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

2. 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.

Curve Characteristics

Fig. 1 - 8 X 20 μ s Pulse Waveform

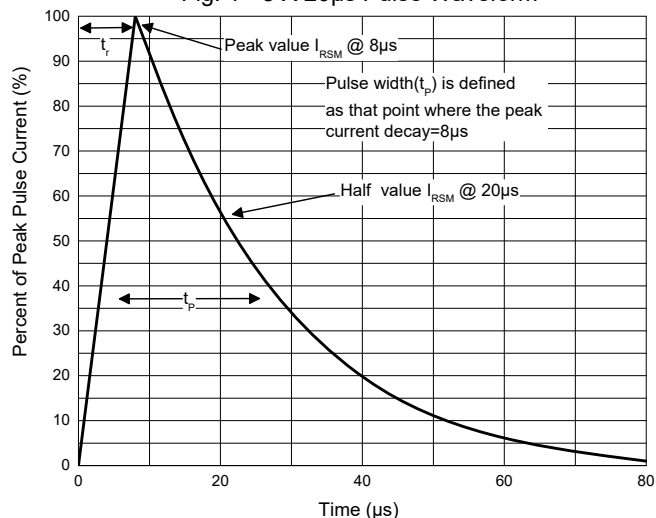


Fig. 2 - Non-Repetitive Peak Pulse Power

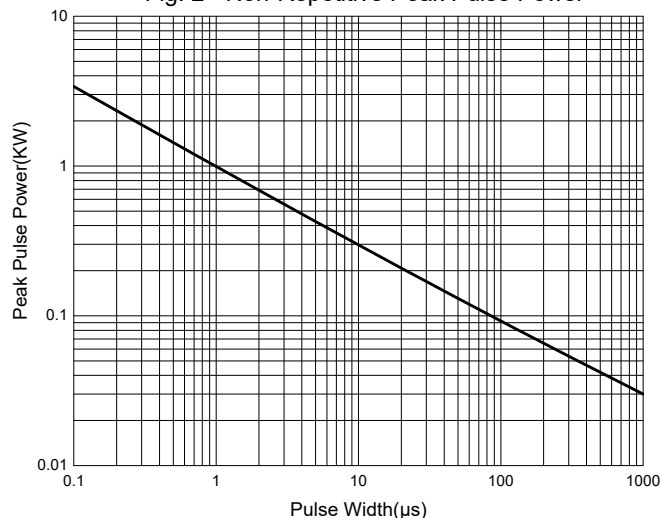


Fig. 3 - Capacitance Characteristics

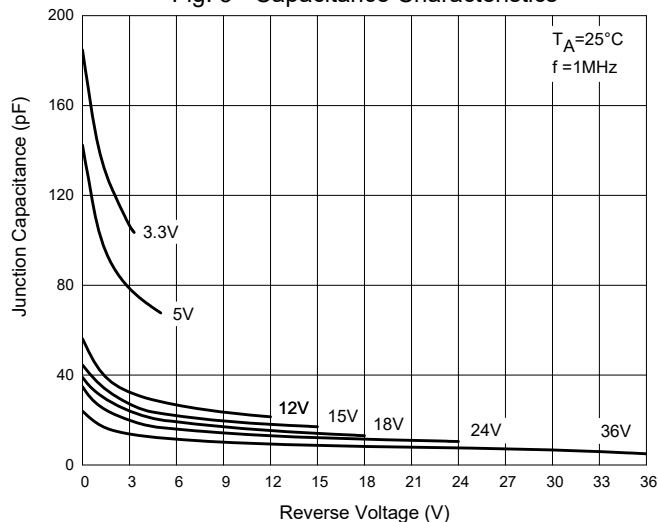


Fig. 4 - Clamping Voltage Characteristics

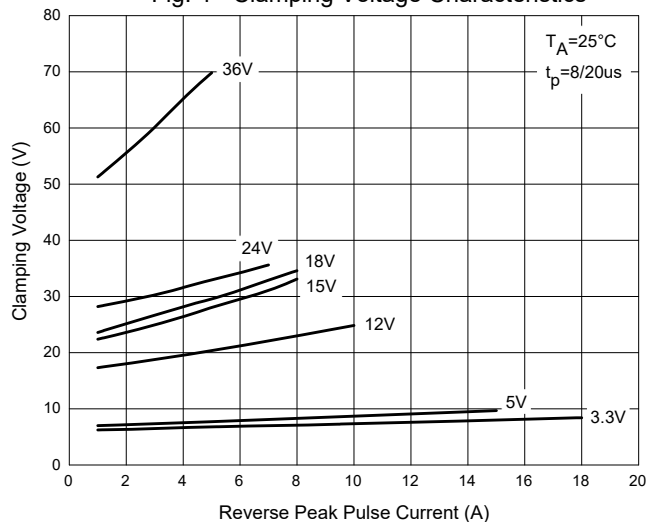


Fig. 5 - TLP Curve

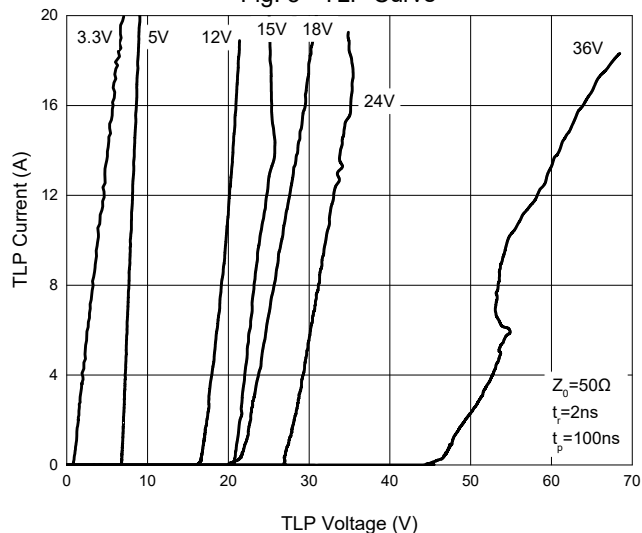
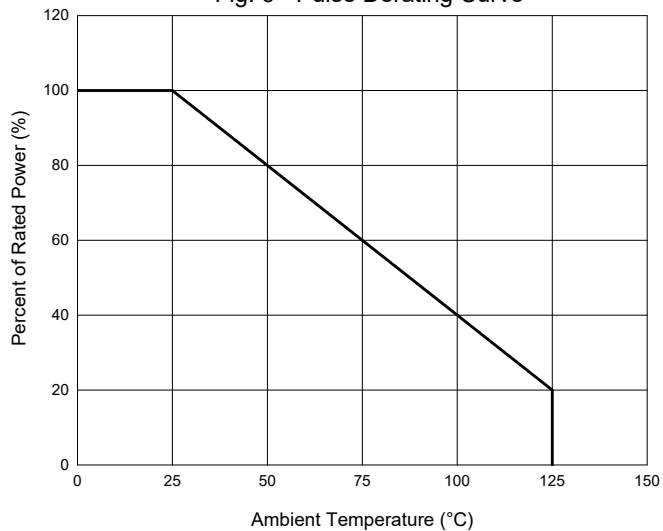


Fig. 6 - Pulse Derating Curve



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 3Kpcs/Reel

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