

### Features

- Protects One Data or Power 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) <sup>(Note2)</sup>	P <sub>PK</sub>	250W
Operating Junction Temperature Range	T <sub>J</sub>	-55°C to +150°C
Storage Temperature Range	T <sub>STG</sub>	-55°C to +150°C

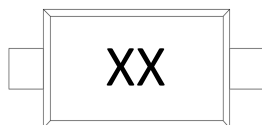
Note :

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

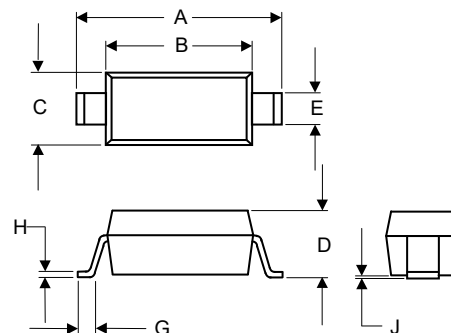


XX:Device code

MCC Part No.	Device Code
ESD12VD3BA	12B.
ESD15VD3BA	15B.
ESD18VD3BA	18B.
ESD24VD3BA	24B.
ESD36VD3BA	36B.

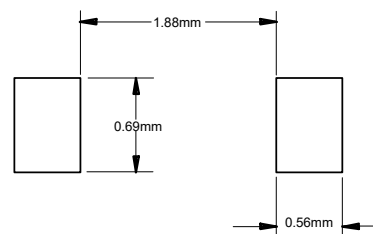
# ESD Protection Device

## SOD-323

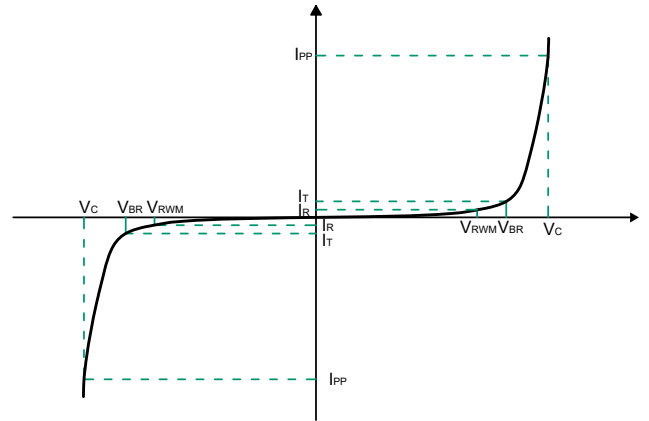


DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.090	0.107	2.30	2.70	
B	0.063	0.071	1.60	1.80	
C	0.045	0.053	1.15	1.35	
D	0.031	0.045	0.80	1.15	
E	0.010	0.016	0.25	0.40	
G	0.004	0.018	0.10	0.45	
H	0.004	0.010	0.10	0.25	
J	----	0.006	----	0.15	

### 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



**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

**ESD12VD3BA**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	$V_{RWM}$				12	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T=1mA$	13			V
Reverse Leakage Current	$I_R$	$V_{RWM}=12V$			1	$\mu A$
Clamping Voltage <sup>Note1</sup>	$V_C$	$I_{PP}=1A, t_p=8/20\mu s$			18.5	V
Clamping Voltage <sup>Note1</sup>	$V_C$	$I_{PP}=10A, t_p=8/20\mu s$			28	V
Junction Capacitance	$C_J$	$V_R=0V, f=1MHz$		30		pF
Dynamic Resistance <sup>Note2</sup>	$R_{DYN}$	TLP, $t_p=100ns$		0.3		$\Omega$

**ESD15VD3BA**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	$V_{RWM}$				15	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T=1mA$	15.5			V
Reverse Leakage Current	$I_R$	$V_{RWM}=15V$			1	$\mu A$
Clamping Voltage <sup>Note1</sup>	$V_C$	$I_{PP}=1A, t_p=8/20\mu s$			24	V
Clamping Voltage <sup>Note1</sup>	$V_C$	$I_{PP}=9A, t_p=8/20\mu s$			38	V
Junction Capacitance	$C_J$	$V_R=0V, f=1MHz$		22		pF
Dynamic Resistance <sup>Note2</sup>	$R_{DYN}$	TLP, $t_p=100ns$		0.48		$\Omega$

**ESD18VD3BA**

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	$I_R$	$V_{RWM}=18V$			1	$\mu A$
Clamping Voltage <sup>Note1</sup>	$V_C$	$I_{PP}=1A, t_p=8/20\mu s$			28	V
Clamping Voltage <sup>Note1</sup>	$V_C$	$I_{PP}=8A, t_p=8/20\mu s$			40	V
Junction Capacitance	$C_J$	$V_R=0V, f=1MHz$		20		pF
Dynamic Resistance <sup>Note2</sup>	$R_{DYN}$	TLP, $t_p=100ns$		0.35		$\Omega$

**ESD24VD3BA**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	$V_{RWM}$				24	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T=1mA$	26			V
Reverse Leakage Current	$I_R$	$V_{RWM}=24V$			1	$\mu A$
Clamping Voltage <sup>Note1</sup>	$V_C$	$I_{PP}=1A, t_p=8/20\mu s$			32	V
Clamping Voltage <sup>Note1</sup>	$V_C$	$I_{PP}=7A, t_p=8/20\mu s$			44	V
Junction Capacitance	$C_J$	$V_R=0V, f=1MHz$		20		pF
Dynamic Resistance <sup>Note2</sup>	$R_{DYN}$	TLP, $t_p=100ns$		0.44		$\Omega$

**ESD36VD3BA**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	$V_{RWM}$				36	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T=1mA$	39			V
Reverse Leakage Current	$I_R$	$V_{RWM}=24V$			1	$\mu A$
Clamping Voltage <sup>Note1</sup>	$V_C$	$I_{PP}=1A, t_p=8/20\mu s$			55	V
Clamping Voltage <sup>Note1</sup>	$V_C$	$I_{PP}=5A, t_p=8/20\mu s$			75	V
Junction Capacitance	$C_J$	$V_R=0V, f=1MHz$		13		pF
Dynamic Resistance <sup>Note2</sup>	$R_{DYN}$	TLP, $t_p=100ns$		0.9		$\Omega$

Note :

- 1.Non-repetitive current pulse 8/20 $\mu s$  exponential decay waveform according to IEC61000-4-5.
- 2.TLP parameter: Z0=50 $\Omega$ , tp=100ns, tr=2ns, averaging window from 60ns to 80ns. RDYN is calculated from 4A to 16A.

### Curve Characteristics

Fig. 1 - 8 X 20µs Pulse Waveform

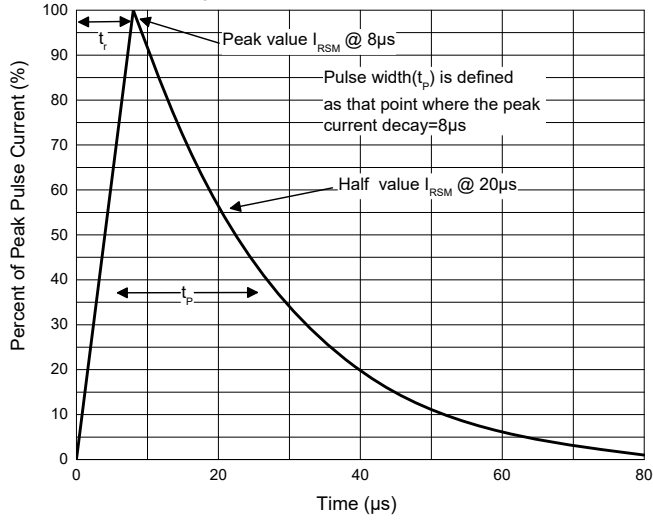


Fig. 2 - Non-Repetitive Peak Pulse Power

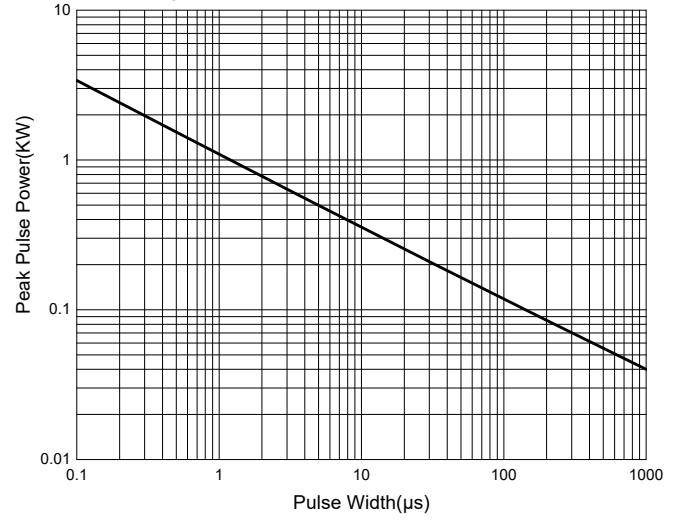


Fig. 3 - Capacitance Characteristics

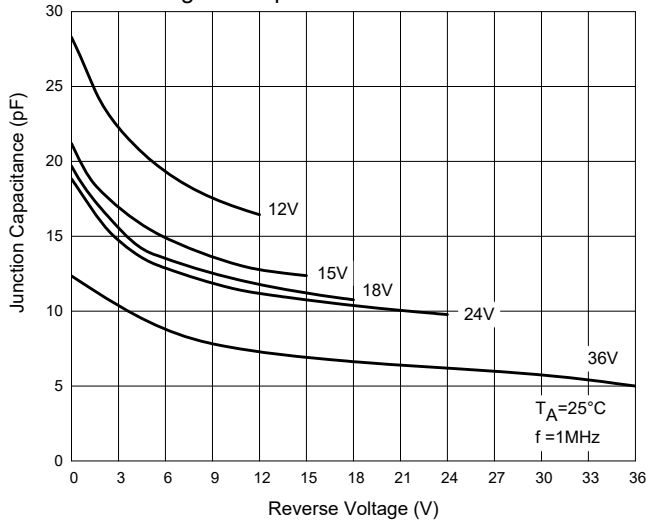


Fig. 4 - Clamping Voltage Characteristics

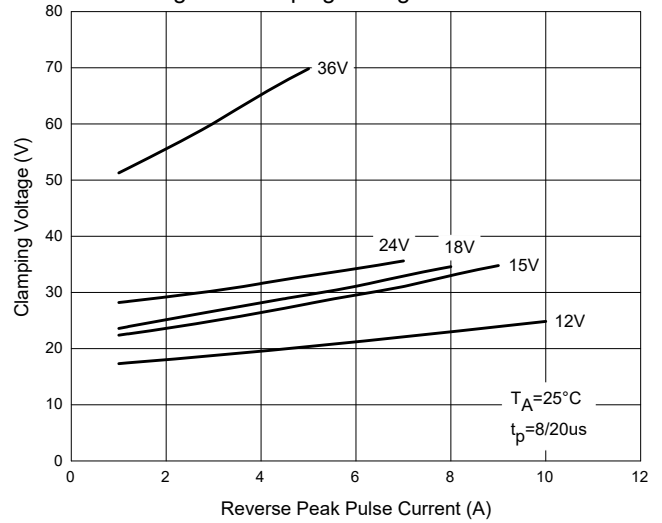


Fig. 5 - TLP Curve

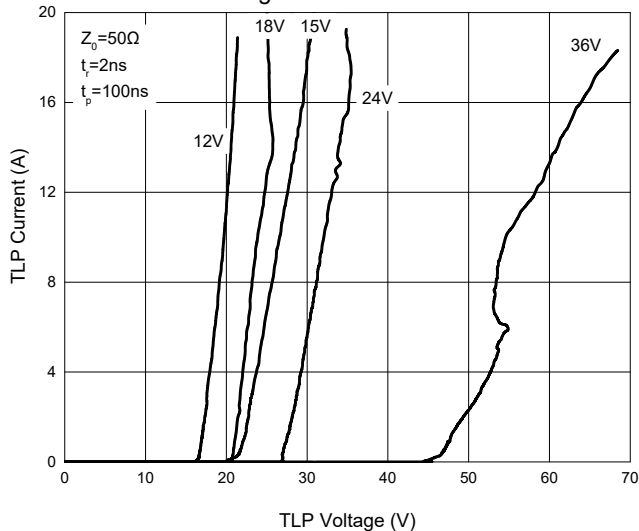
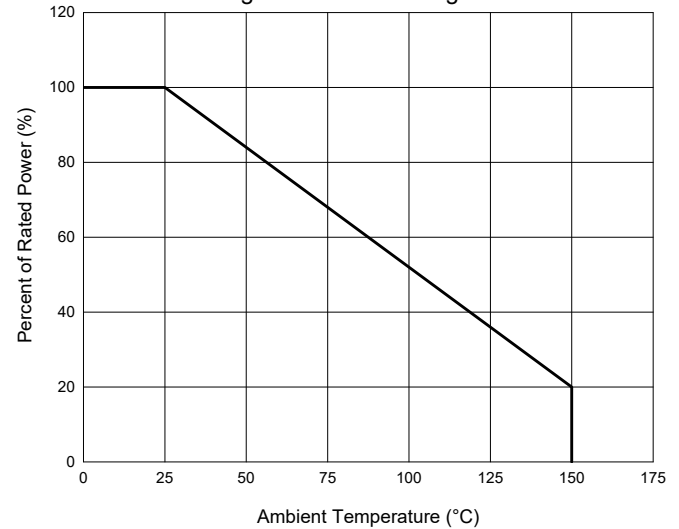


Fig. 6 - Pulse Derating Curve



## Ordering Information

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

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