

Features

- 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)

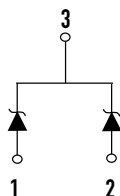
Maximum Ratings

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

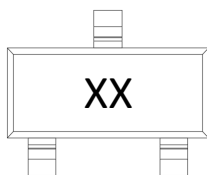
Note :

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

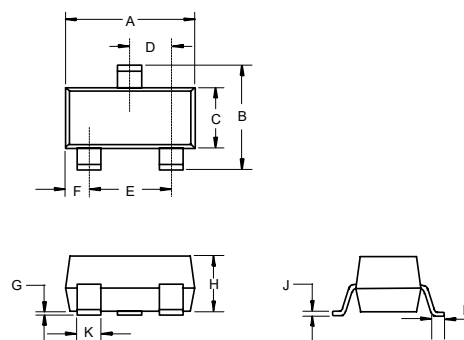


XX:Device code

MCC Part No.	Device Code
ESD5V0ET2	C05.
ESD12VET2	C12.
ESD15VET2	C15.
ESD24VET2	C24.
ESD36VET2	C36.

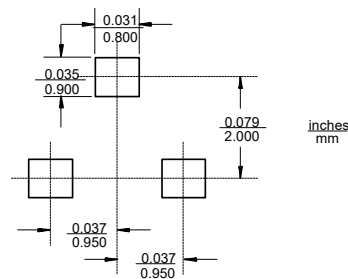
ESD Protection Device

SOT-23

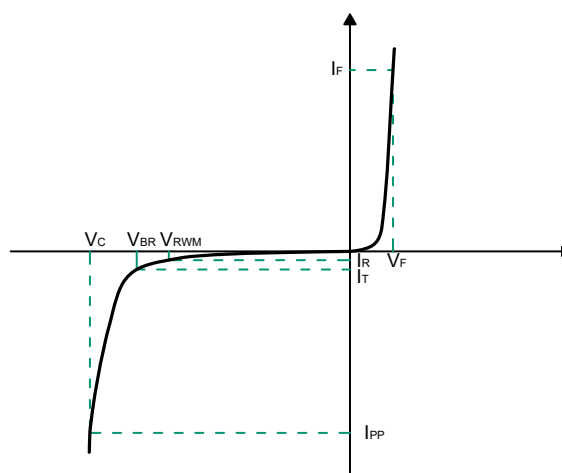


DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.110	0.120	2.80	3.04	
B	0.083	0.104	2.10	2.64	
C	0.047	0.055	1.20	1.40	
D	0.034	0.041	0.85	1.05	
E	0.067	0.083	1.70	2.10	
F	0.018	0.024	0.45	0.60	
G	0.0004	0.006	0.01	0.15	
H	0.035	0.043	0.90	1.10	
J	0.003	0.007	0.08	0.18	
K	0.012	0.020	0.30	0.51	
L	0.007	0.020	0.20	0.50	

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)

ESD5V0ET2

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	V_{RWM}				5	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	6			V
Reverse Leakage Current	I_R	$V_{RWM}=5V$			1	μA
Forward Voltage	V_F	$I_F=10mA$			1.1	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=1A, t_p=8/20\mu s$			9	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=20A, t_p=8/20\mu s$			15	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		140		pF
Dynamic Resistance ^{Note2}	R_{DYN}	TLP, $t_p=100ns$		0.1		Ω

ESD12VET2

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	μA
Forward Voltage	V_F	$I_F=10mA$			1.1	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=1A, t_p=8/20\mu s$			18.5	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

ESD15VET2

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	μA
Forward Voltage	V_F	$I_F=10mA$			1.1	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=1A, t_p=8/20\mu s$			24	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=9A, t_p=8/20\mu s$			38	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		45		pF
Dynamic Resistance ^{Note2}	R_{DYN}	TLP, $t_p=100ns$		0.19		Ω

ESD24VET2

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	μA
Forward Voltage	V_F	$I_F=10mA$			1.1	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=1A, t_p=8/20\mu s$			32	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=7A, t_p=8/20\mu s$			44	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		36		pF
Dynamic Resistance ^{Note2}	R_{DYN}	TLP, $t_p=100ns$		0.36		Ω

ESD36VET2

Parameter	Symbol	Conditions				Units
Reverse Working Voltage	V_{RWM}				36	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	39			V
Reverse Leakage Current	I_R	$V_{RWM}=36V$			1	μA
Forward Voltage	V_F	$I_F=10mA$			1.1	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

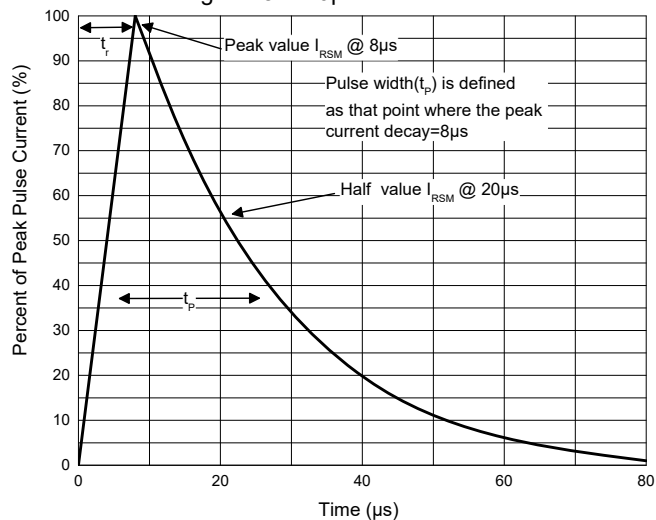


Fig. 2 - Non-Repetitive Peak Pulse Power

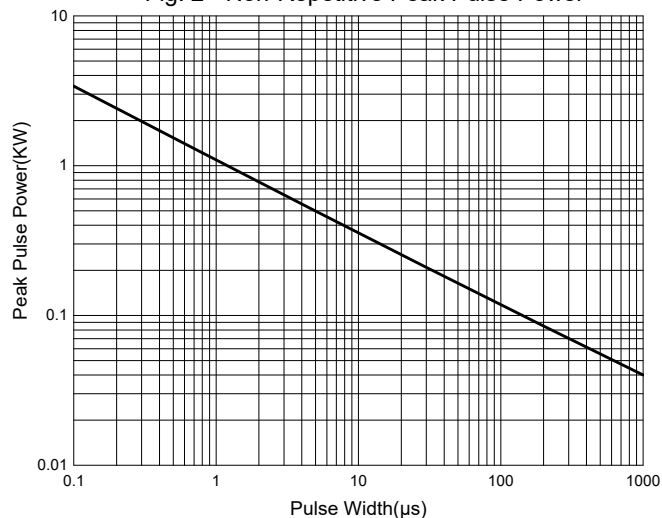


Fig. 3 - Capacitance Characteristics

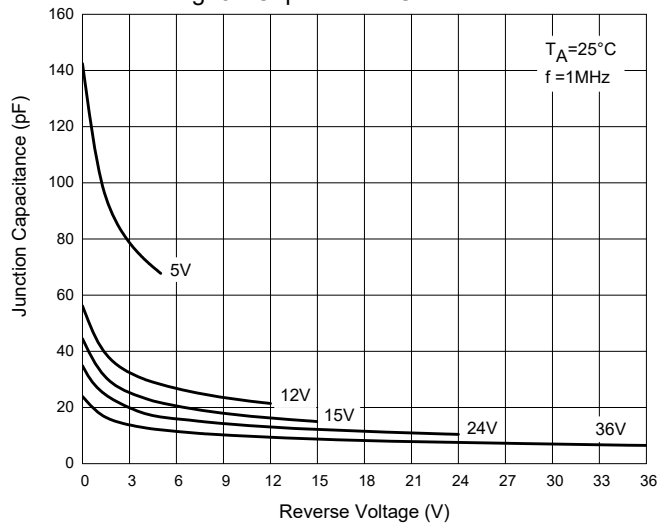


Fig. 4 - Clamping Voltage Characteristics

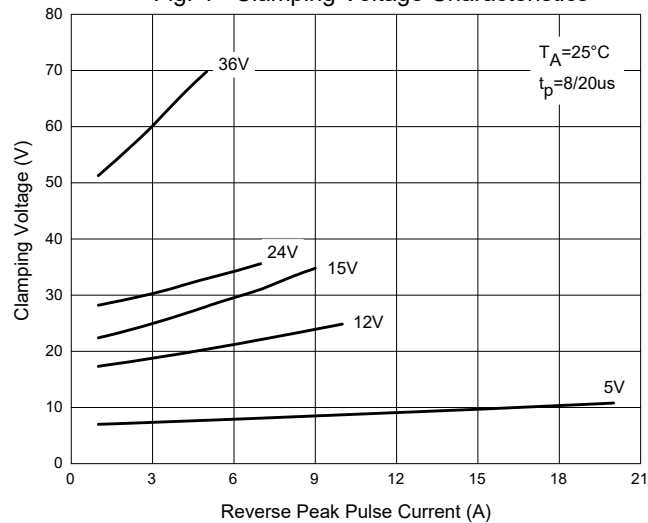


Fig. 5 - TLP Curve

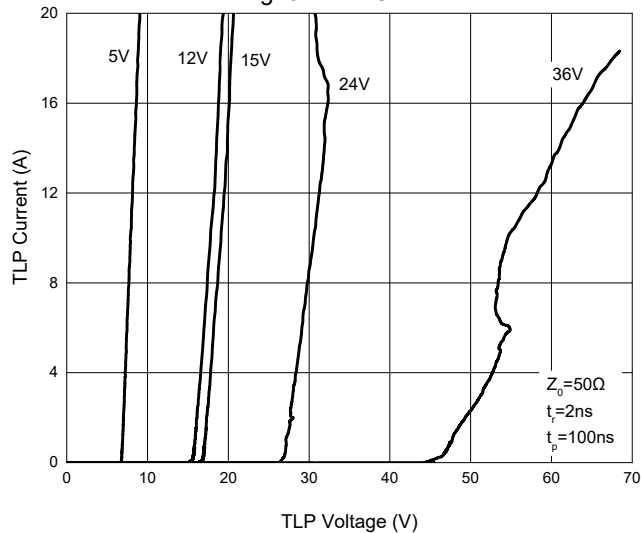
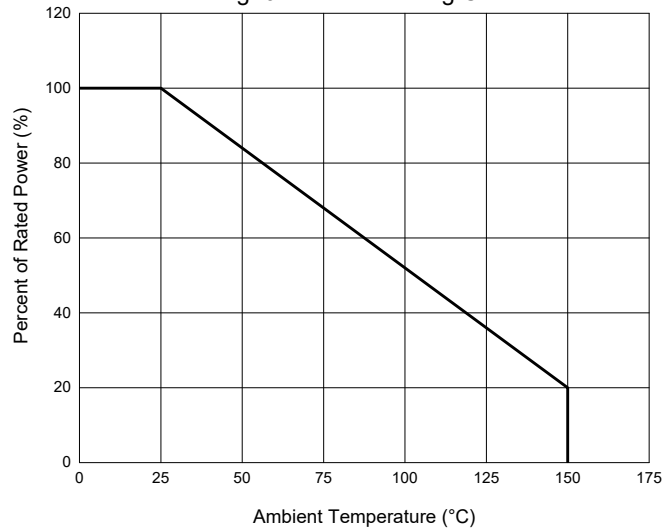


Fig. 6 - Pulse Derating Curve



Ordering Information

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

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