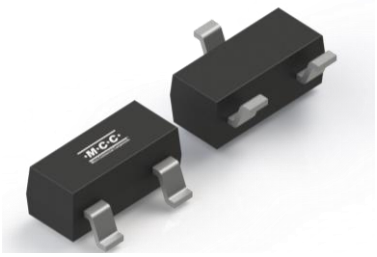
Micro Commercial Components

2-Line Bi-directional Ultra Low Capacitance ESD

Features

- Transient protection:
  - IEC 61000-4-2 (ESD) ±16kV (Air), ±16kV (Contact)
  - IEC 61000-4-5 (Lightning) 4A (8/20μs)
- AEC-Q101 Qualified
- Bi-directional ESD protection of two lines
- Reverse working voltage, V_{RWM}: 5V
- Low capacitance: 0.4pF (typical)
- Low clamping voltage: 25V (max)
- Low reverse leakage current: 100nA max at V_R = 5V
- Solid-state silicon-avalanche



SOT-23

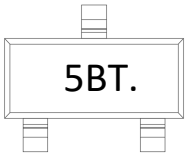
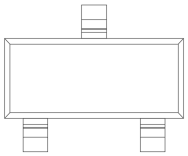
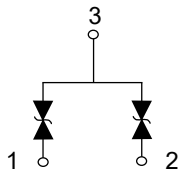
Applications

- Automotive Application
- High-speed data lines
- 10/100/1000 Ethernet

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
	 Transparent top view	

Ordering Information

Product Name	Packing info
ESDULC5V0T2BHE3-TP	3K pcs/reel

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

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

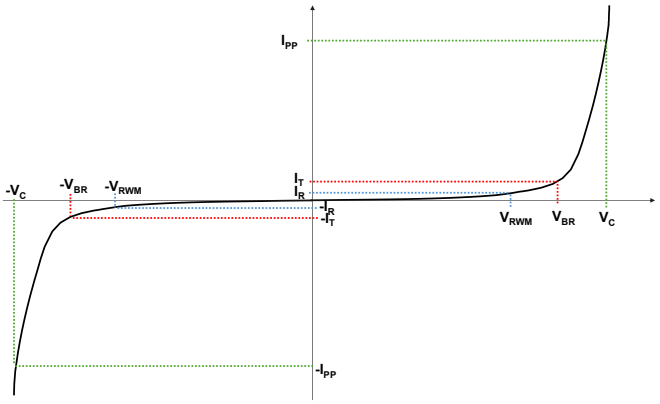
Parameter		Symbol	Rating	Unit
IEC61000-4-2(ESD)	Air	V_{ESD}	±16	kV
	Contact	V_{ESD}	±16	kV
Peak Pulse Current (8/20μs) (Note 2)		I_{PP}	4	A
Peak Pulse Power (8/20μs) (Note 2)		P_{PK}	100	W
Operating Temperature Range		T_J	-55 to +150	°C
Storage Temperature Range		T_{STG}	-55 to +150	°C

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)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				5	V
Reverse Breakdown Voltage	V_{BR}	I_T =1mA	5.8		9.5	V
Reverse Leakage Current	I_R	V_{RWM}=5V			0.1	μA
Clamping Voltage (Note3)	V_C	I_{PP}=1A, t_P=8/20μs			15	V
		I_{PP}=4A, t_P=8/20μs			25	
Junction Capacitance	C_J	V_R=0V, f=1MHz		0.4	0.6	pF
Dynamic Resistance (Note4)	R_{DYN}	TLP, t_p=100ns		1.4		Ω

Note:

3. Non-repetitive current pulse 8/20μs exponential decay waveform according to IEC61000-4-5..
4. TLP parameter: Z0=50Ω, tp=100ns, tr=2ns, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.

Curve Characteristics

Fig. 1 - 8 X 20μs Pulse Waveform

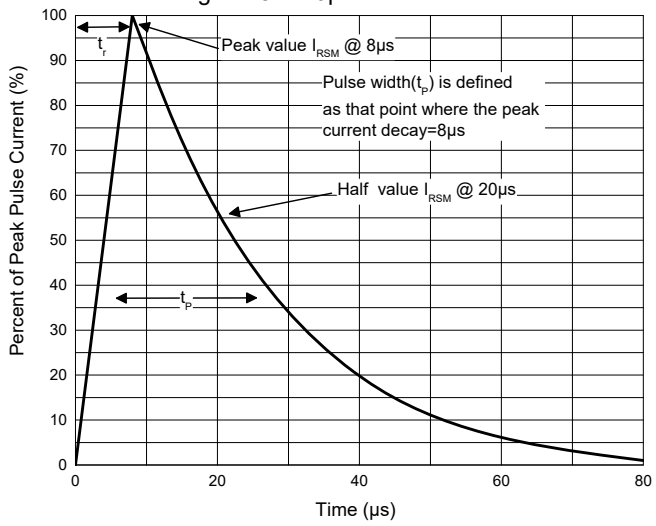


Fig. 2 - Pulse Derating Curve

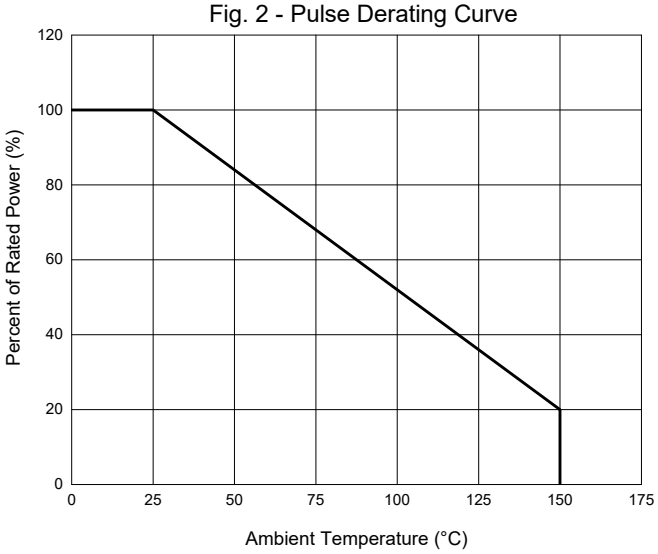


Fig. 3 - Capacitance Characteristics

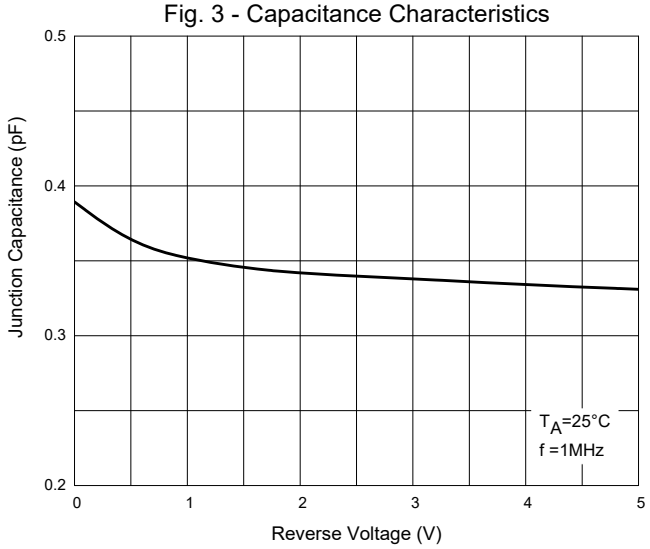


Fig. 4 - Clamping Voltage Characteristics

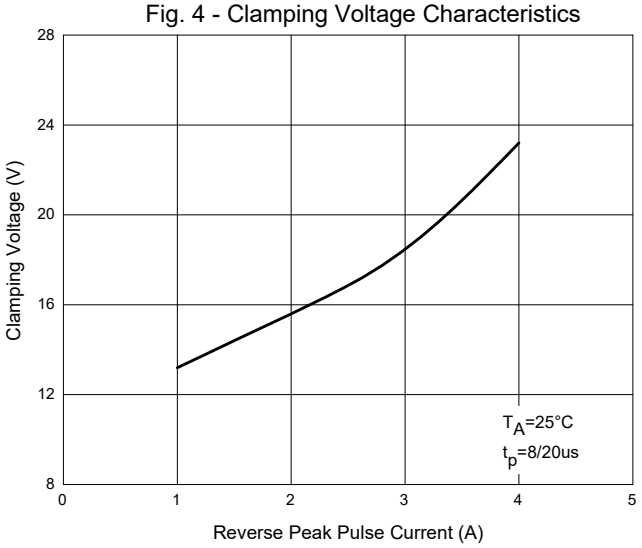
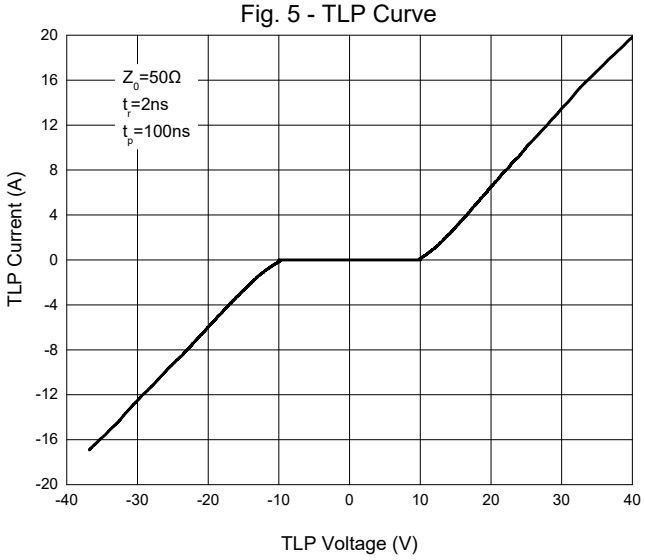
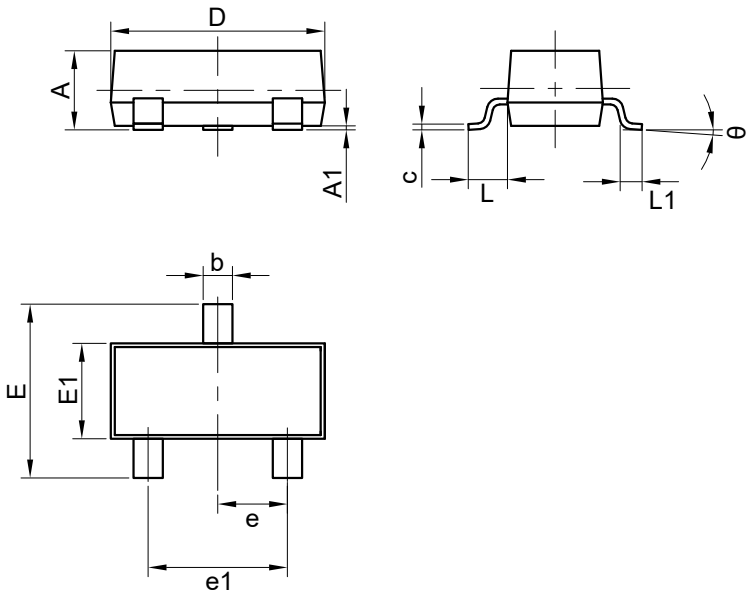


Fig. 5 - TLP Curve



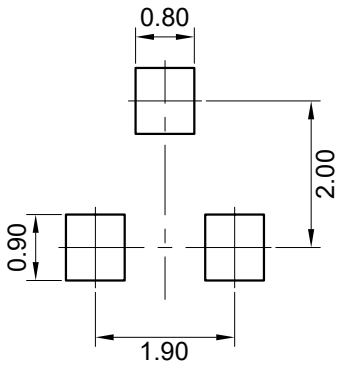
Package Outline



DIM	INCH		MM		
	MIN	MAX	MIN	MAX	NOTE
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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