

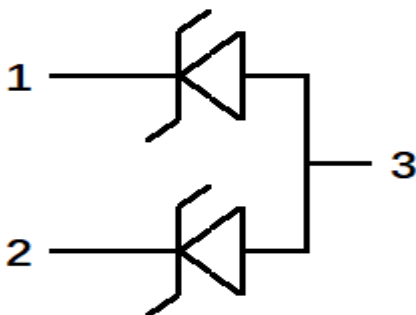
Features

- ◆ Ultra low capacitance: 0.6pF typical
- ◆ Ultra low leakage: nA level
- ◆ Operating voltage: 5.0V
- ◆ Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 20\text{kV}$
 - Contact discharge: $\pm 15\text{kV}$
 - IEC 61000-4-4 (EFT) 40A (5/50ns)
 - IEC 61000-4-5 (Lightning) 4A (8/20 μs)
- ◆ RoHS Compliant
- ◆ Package: SOT-23

Description

The ESDA5U0R0T1 is a Uni-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive data and power line. The ESDA5U0R0T1 complies with the IEC 61000-4-2 (ESD) standard with $\pm 20\text{ kV}$ air and $\pm 15\text{ kV}$ contact discharge. It is assembled into an ultra-small SOT-23 package. The small size and low capacitance protection make ESDA5U0R0T1 an ideal choice to protect Power and many other portable applications.

Circuit Diagram



Applications

- ◆ Wireless System
- ◆ Networks
- ◆ Portable Instrumentation
- ◆ RS485 Ports

Absolute Maximum Ratings : ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

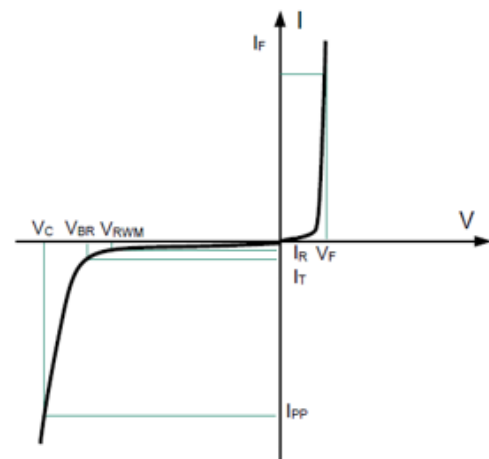
Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 μs)	Ppk	80	W
Peak Pulse Current (8/20 μs)	IPP	4	A
ESD per IEC 61000-4-2 (Air)	VESD	± 20	kV
ESD per IEC 61000-4-2 (Contact)		± 15	
Operating Temperature Range	TJ	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	Tstg	-55 to +150	$^{\circ}\text{C}$

Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

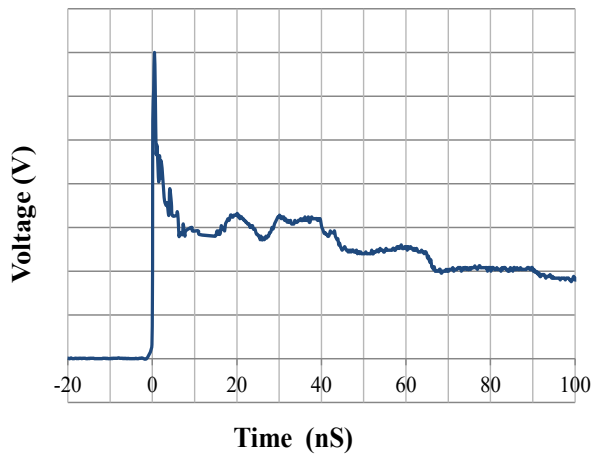
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				5	V
Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$, Pin1/Pin2-Pin3	6.5		9	V
Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$, Pin1-Pin2	6.5		9.5	V
Reverse Leakage Current	I_R	$V_{RWM} = 5\text{V}$			0.1	μA
Clamping Voltage	V_C	$I_{PP} = 1\text{A}$ (8 / 20 μs pulse), Pin1/Pin2-Pin3			9	V
Clamping Voltage	V_C	$I_{PP} = 4\text{A}$ (8 / 20 μs pulse), Pin1/Pin2-Pin3			15	V
Clamping Voltage	V_C	$I_{PP} = 1\text{A}$ (8 / 20 μs pulse), Pin1-Pin2			12	V
Clamping Voltage	V_C	$I_{PP} = 4\text{A}$ (8 / 20 μs pulse), Pin1-Pin2			20	V
Junction Capacitance	C_J	$V_R = 0\text{V}$, $f = 1\text{MHz}$, Pin1/Pin2-Pin3		0.6	0.8	pF
Junction Capacitance	C_J	$V_R = 0\text{V}$, $f = 1\text{MHz}$, Pin1-Pin2		0.3	0.5	pF

Portion Electronics Parameter

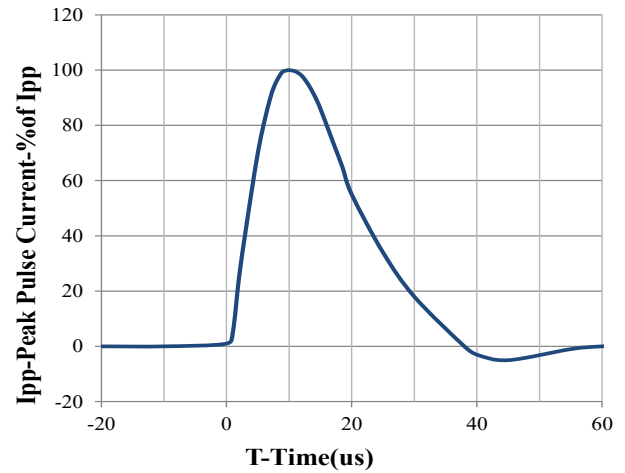
Symbol	Parameter
V_{RWM}	Peak Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_{PP}	Maximum Reverse Peak Pulse Cur-
V_C	Clamping Voltage @ I_{PP}



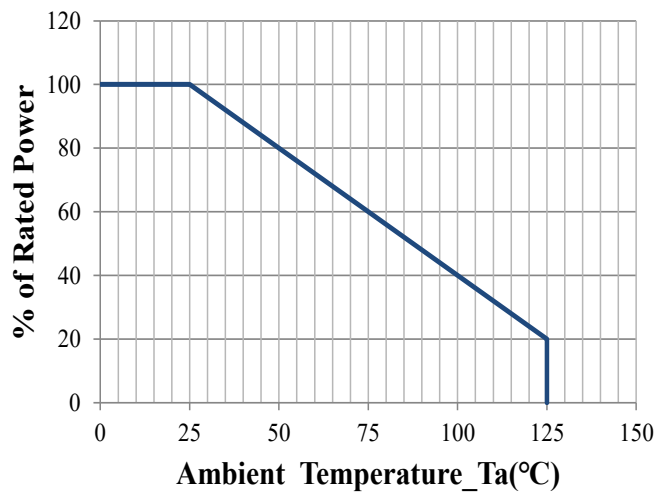
Typical Characteristics : ($T_c=25^{\circ}\text{C}$ unless otherwise noted)



IEC61000-4-2 Pulse Waveform

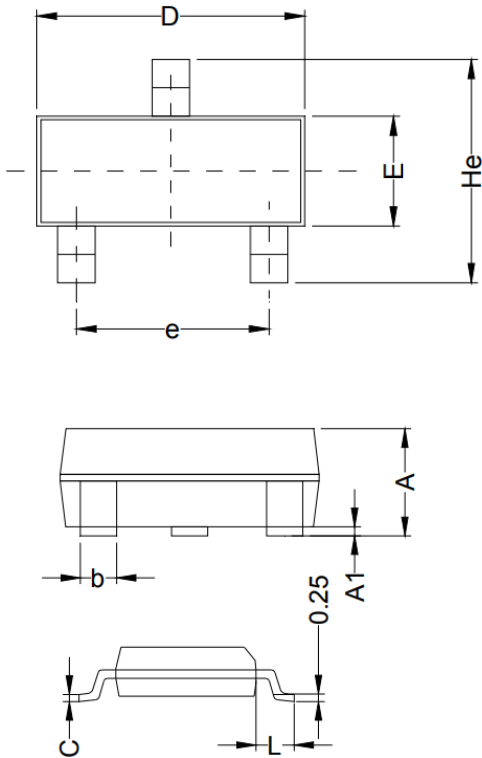


8 / 20us Pulse Waveform



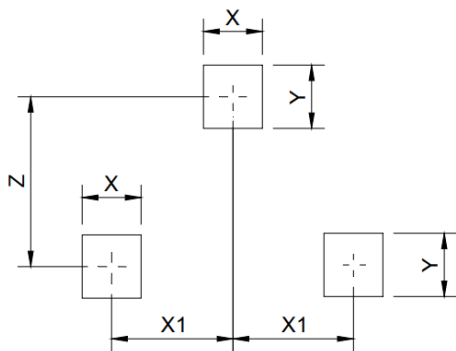
Power Derating Curve

SOT-23 Package Outline Drawing

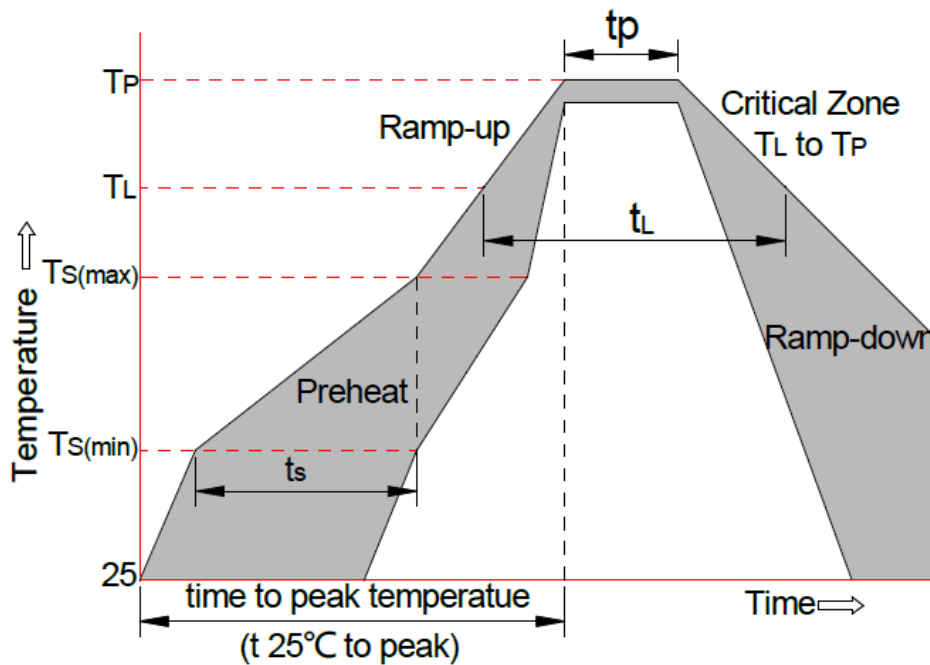


Symbol	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90	1.063	1.15	0.035	0.042	0.045
A1	0.00	0.075	0.14	0.000	0.003	0.006
b	0.30	0.40	0.50	0.012	0.016	0.020
C	0.07	0.10	0.15	0.003	0.004	0.006
D	2.80	2.90	3.00	0.110	0.114	0.118
e	1.80	1.90	2.00	0.071	0.075	0.079
E	1.20	1.30	1.40	0.047	0.051	0.055
L	0.55REF			0.022REF		
He	2.25	2.40	2.55	0.089	0.094	0.100
X	0.80			0.031		
X1	0.95			0.037		
Y	0.80			0.031		
Z	2.02			0.080		

Suggested Land Pattern



Soldering Parameters



Reflow Condition		Pb-Free Assembly
Pre-heat	-Temperature Min ($T_{S (min)}$)	+150°C
	-Temperature Max ($T_{S (max)}$)	+200°C
	-Time (Min to Max) (t_s)	60-180 secs
Average ramp up rate(Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{S (max)}$ to T_L -Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature (T_L) (Liquid us)	+217°C
	-Temperature (t_L)	60-150 secs
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6 °C/secs. Max
xTime 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C