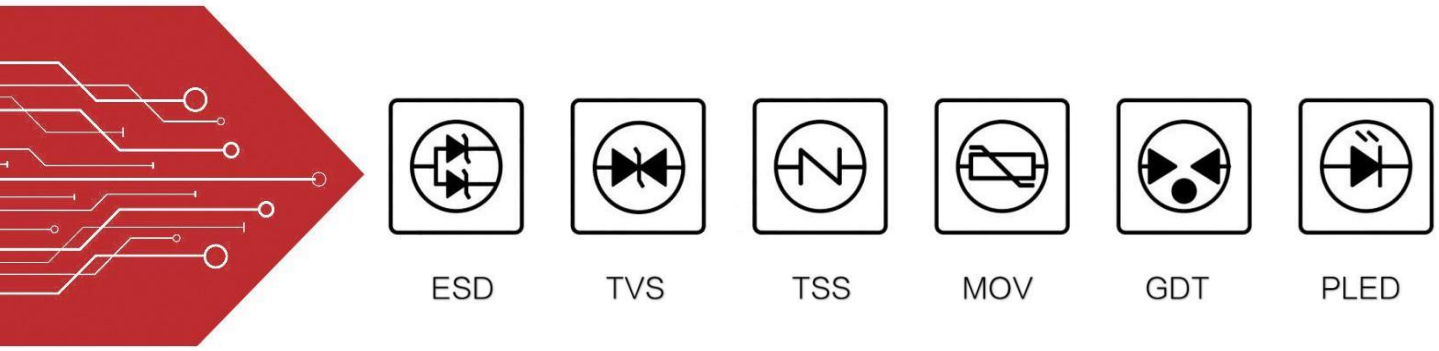
MSKSEMI
SEMICONDUCTOR



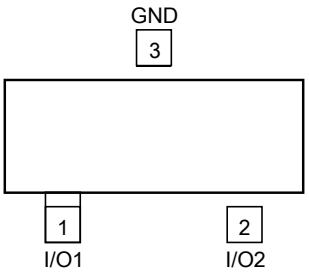
Product data sheet

SOT-23

Features

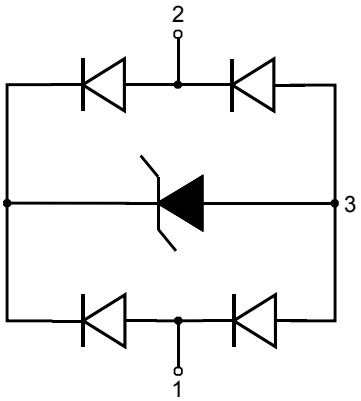
- Stand-off voltage: 5V Max
- Transient protection for each line according to
  IEC61000-4-2 (ESD): ±20kV (contact and air discharge)
  IEC61000-4-4 (EFT): 40A (5/50ns)
  IEC61000-4-5 (surge): 4A (8/20μs)
- Ultra-low capacitance: C_J = 0.4pF typ.
- Ultra-low leakage current: I_R <1nA typ.
- Low clamping voltage: V_{CL} = 20V @ I_{PP} = 16A(TLP)
- Solid-state silicon technology

Circuit diagram



Applications

- USB 2.0 and USB 3.0
- HDMI 1.3 and HDMI 1.4
- SATA and eSATA
- DVI
- IEEE 1394
- PCI Express
- Portable Electronics
- Notebooks



Parameter	Symbol	Rating	Unit
Peak pulse power (t_p = 8/20μs)	P_{pk}	60	W
Peak pulse current (t_p = 8/20μs)	I_{PP}	4	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	±20	kV
ESD according to IEC61000-4-2 contact discharge		±20	
Junction temperature	T_J	125	°C
Operating temperature	T_{OP}	-40~85	°C
Lead temperature	T_L	260	°C
Storage temperature	T_{STG}	-55~150	°C

Electrical characteristics (T_A=25 °C, unless otherwise noted)

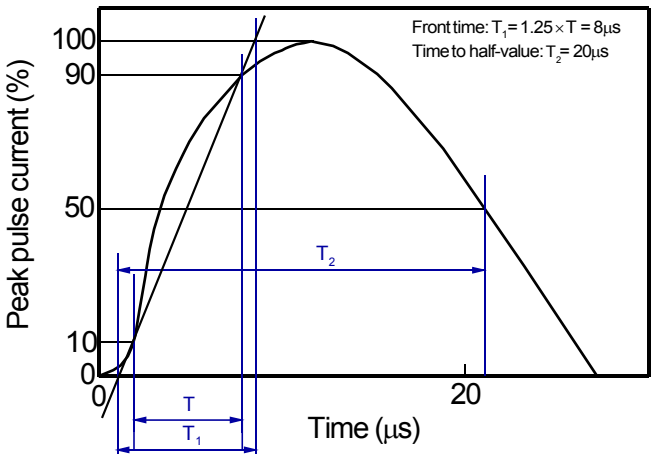
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse maximum working voltage	V_{RWM}				5.0	V
Reverse leakage current	I_R	V_{RWM} = 5V		<1	100	nA
Reverse breakdown voltage	V_{BR}	I_T = 1mA	7.0	8.0	9.0	V
Forward voltage	V_F	I_T = 10mA	0.6	0.9	1.2	V
Clamping voltage 1)	V_{CL}	I_{PP} = 16A, t_p = 100ns		20		V
Dynamic resistance 1)	R_{DYN}			0.65		Ω
Clamping voltage 2)	V_{CL}	I_{PP} = 1A, t_p = 8/20μs			11	V
		I_{PP} = 4A, t_p = 8/20μs			15	V
Junction capacitance	C_J	V_R = 0V, f = 1MHz Any I/O pin to GND		0.40	0.65	pF
		V_R = 0V, f = 1MHz Between any I/O pin		0.25	0.40	pF

Notes:

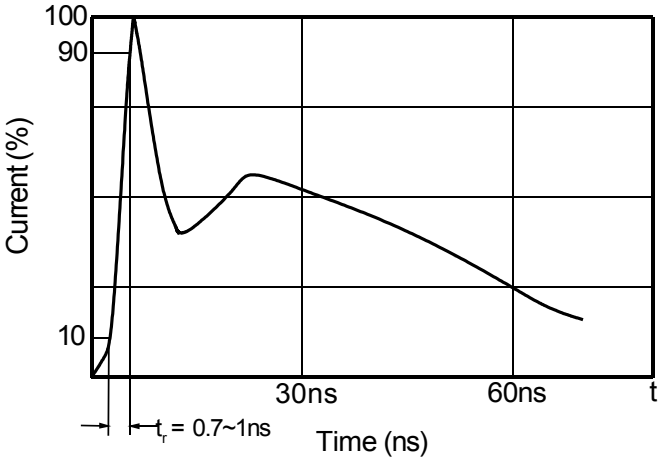
1) TLP parameter: Z_0 = 50 Ω , t_p = 100ns, t_r = 2ns, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.

2) According to IEC61000-4-5.

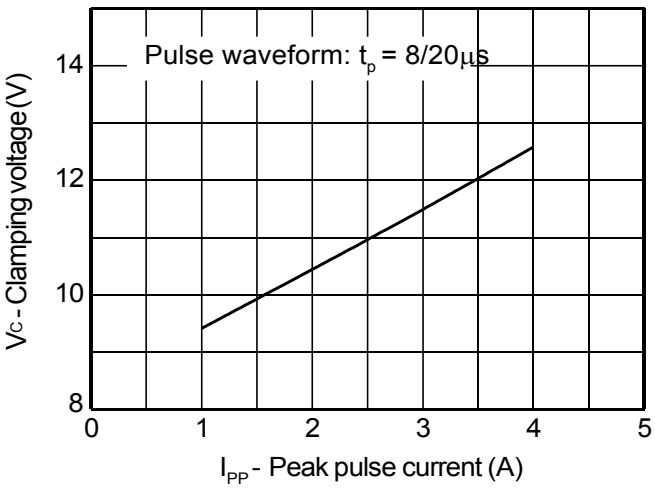
Typical characteristics (T_A=25°C, unless otherwise noted)



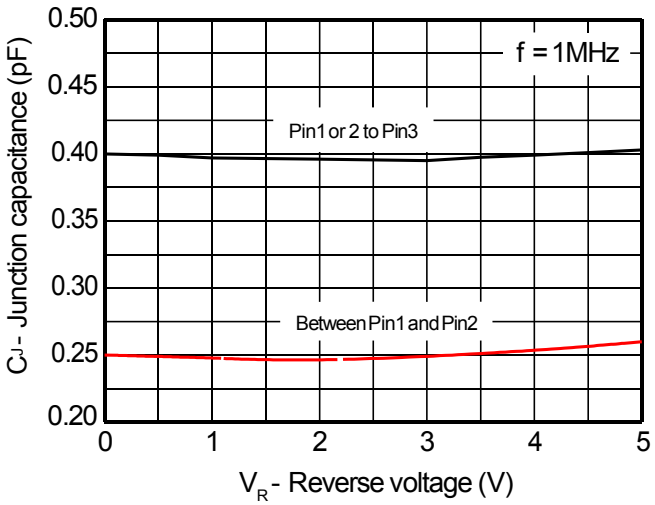
8/20μs waveform per IEC61000-4-5



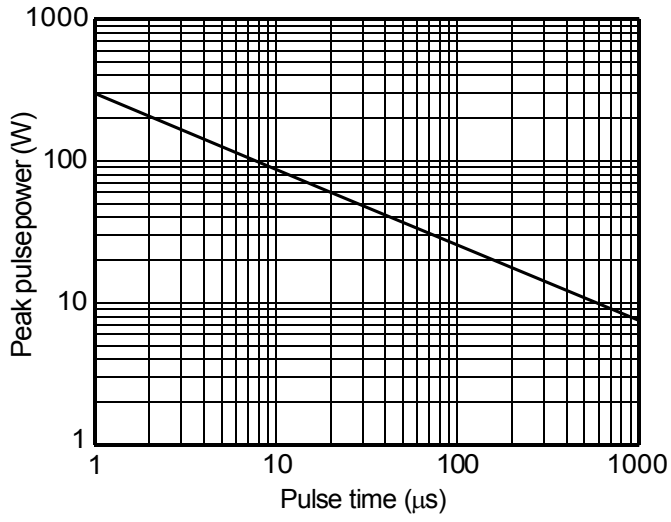
Contact discharge current waveform per IEC61000-4-2



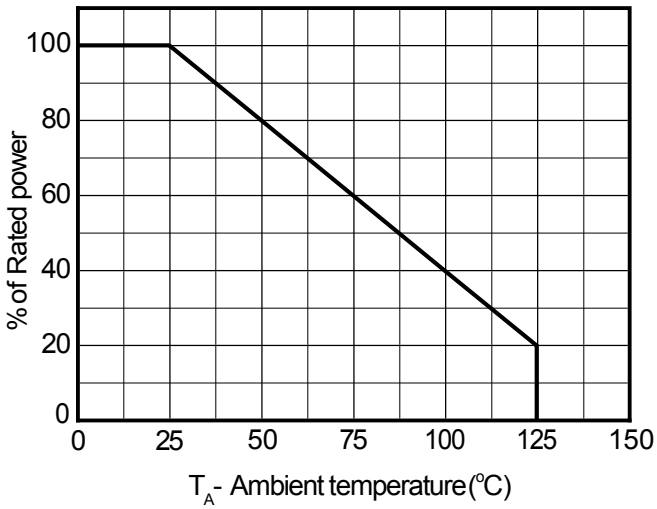
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage

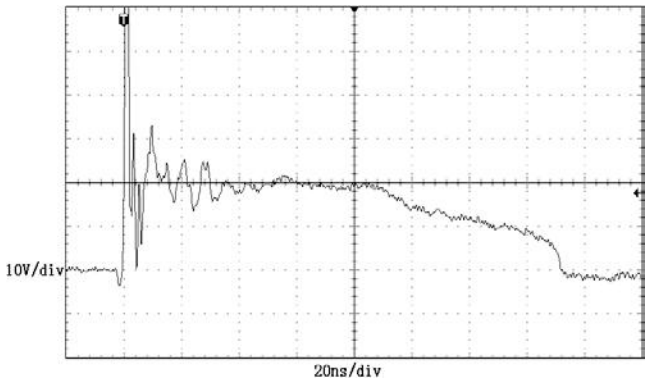


Non-repetitive peak pulse power vs. Pulse time

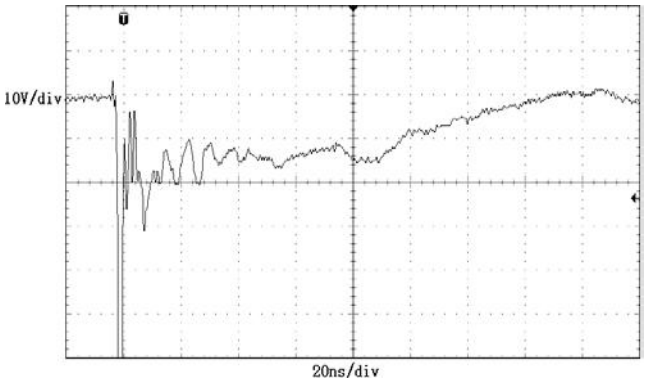


Power derating vs. Ambient temperature

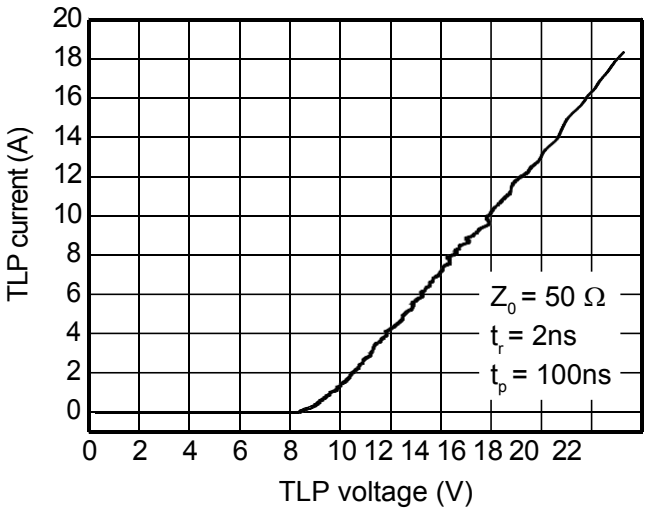
Typical characteristics (T_A=25°C, unless otherwise noted)



ESD clamping
(+8kV contact discharge per IEC61000-4-2)

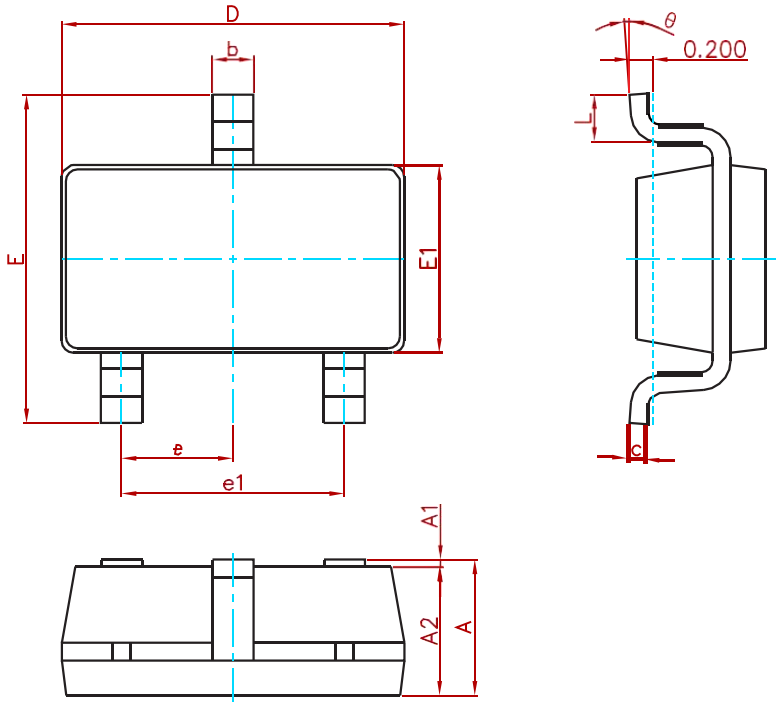


ESD clamping
(-8kV contact discharge per IEC61000-4-2)



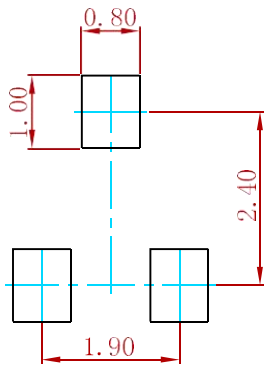
TLP Measurement

PACKAGE MECHANICAL DATA



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
0	0°	8°	0°	8°

Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

REEL SPECIFICATION

P/N	PKG	QTY
AZC199-02S-MS	SOT-23	3000

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