

LL052AT23

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LL052AT23

Surface Mount TVS For Ultra Low Capacitance ESD Protection Diode - 5.0V

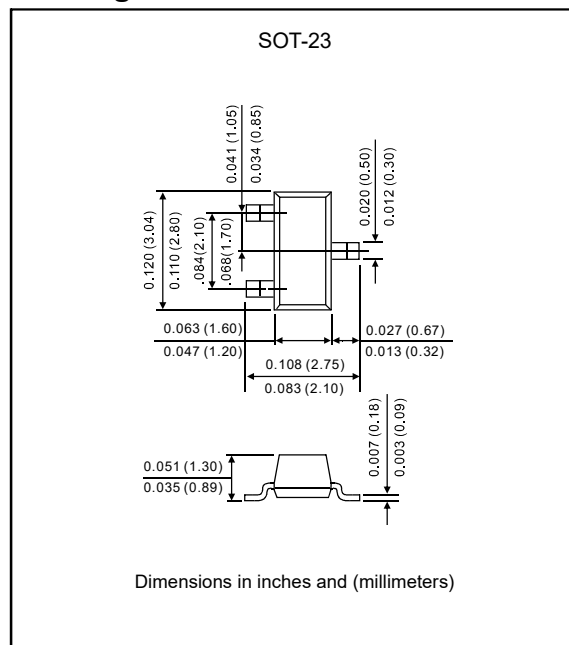
Features

- Ultra low capacitance: 0.3pF typical.
- Operating voltage: 5V.
- Low clamping voltage.
- Up to 2-line protects.
- Complies with following standards :
 - IEC 61000-4-2 (ESD) immunity test - Air discharge: $\pm 25\text{kV}$.
 - Contact discharge: $\pm 20\text{kV}$.
 - IEC61000-4-5 (Lightning) 5A (8/20 μs).
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.LL052AT23-H.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per
MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.008 gram

Package outline



Maximum ratings (at $T_A=25^\circ\text{C}$ unless otherwise noted)

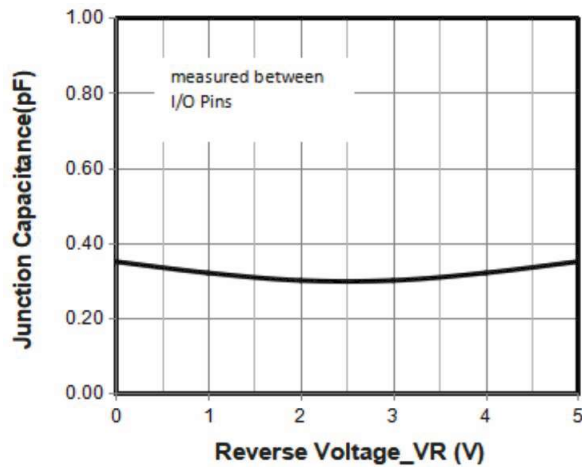
Parameter	Symbol	Value	Unit
Peak pulse power (8/20 μs)	P_{PK}	80	W
Peak pulse current (8/20 μs)	I_{PP}	5	A
ESD Per IEC 61000-4-2 (Air)	V_{ESD}	± 25	KV
ESD Per IEC 61000-4-2 (Contact)		± 20	
Operating temperature	T_J	-55 ~ +125	$^\circ\text{C}$
Storage temperature	T_{STG}	-55 to +150	$^\circ\text{C}$

Electrical characteristics (at $T_A=25^\circ\text{C}$ unless otherwise noted)

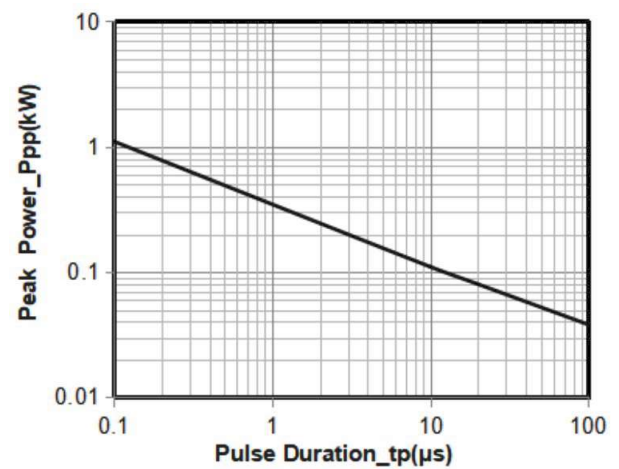
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Reverse working voltage	V_{RWM}				5	V
Breakdown voltage	V_{BR}	$I_T = 1\text{mA}$	6		8.5	V
Reverse leakage current	I_R	$V_{RWM} = 5\text{V}$		0.01	0.5	μA
	V_C	$I_{PP} = 1\text{A}$ (8 / 20 μs Pulse)			9	V
Clamping voltage	V_C	$I_{PP} = 5\text{A}$ (8 / 20 μs Pulse)			16	V
Junction capacitance	C_J	$V_R = 0\text{V}$, $f = 1\text{MHz}$, Between Pin1 and Pin2		0.3	0.4	pF
		$V_R = 0\text{V}$, $f = 1\text{MHz}$, Between Pin1 and Pin2 to Pin3			0.8	

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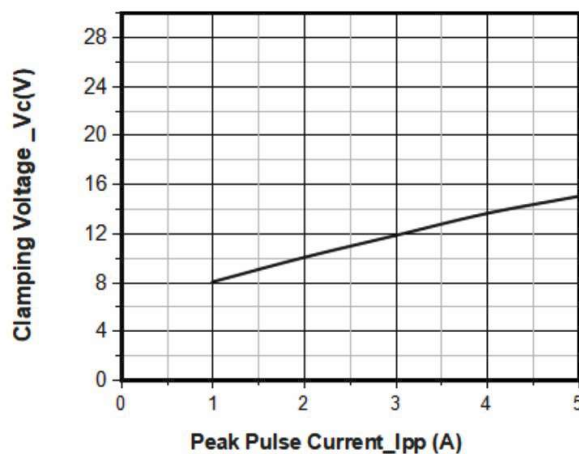
Rating and characteristic curves



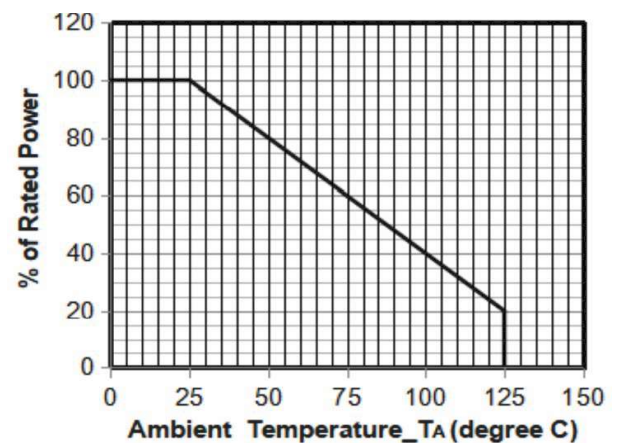
Junction Capacitance vs. Reverse Voltage



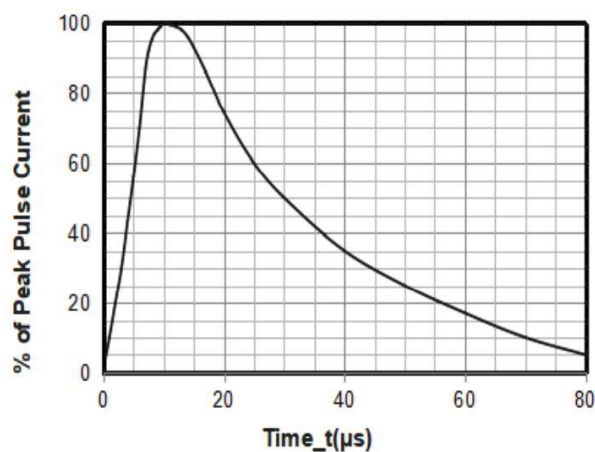
Peak Pulse Power vs. Pulse Time



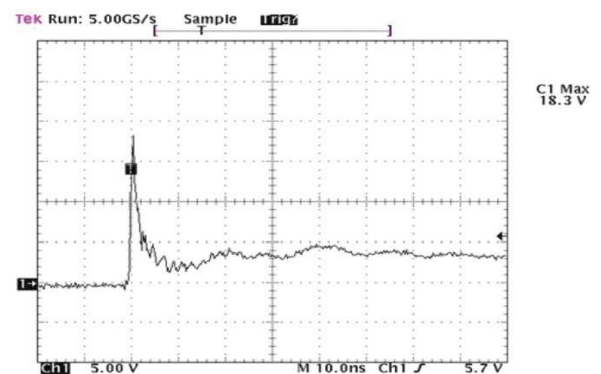
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



8 X 20μs Pulse Waveform



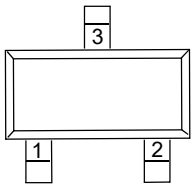
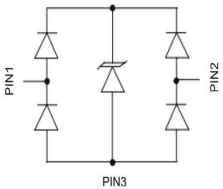
Note: Data is taken with a 10x attenuator

ESD Clamping Voltage

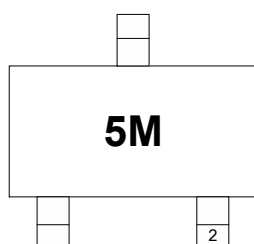
8 kV Contact per IEC61000-4-2

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Pinning information

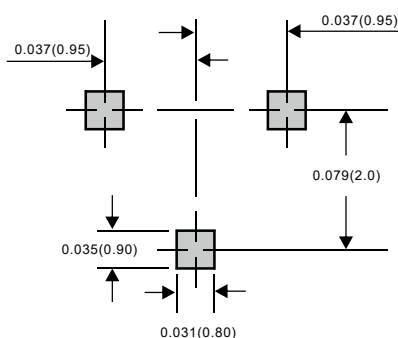
Pin Configuration	Simplified outline	Symbol
Pin 1, 2 Cathode Pin 3 Anode		

Marking



Suggested solder pad layout

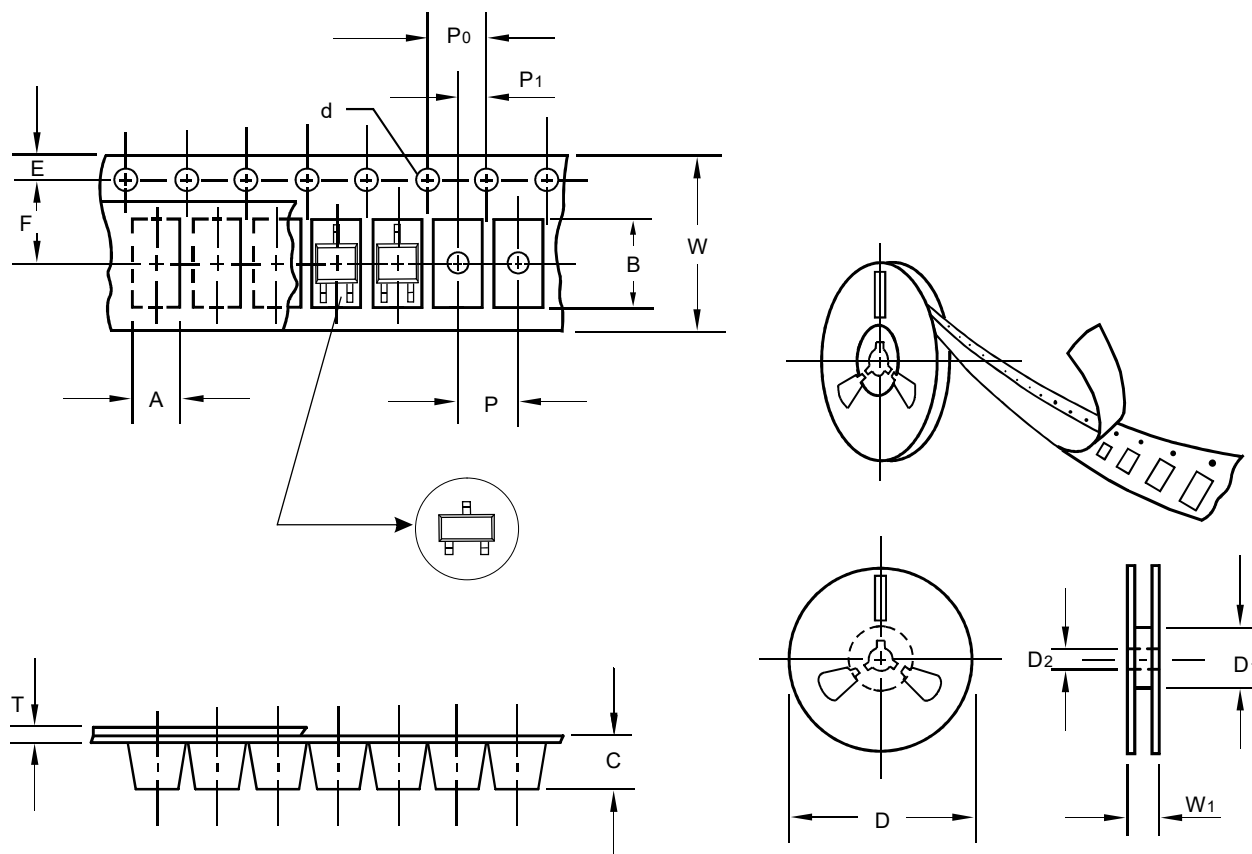
SOT-23



Dimensions in inches and (millimeters)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	3.15
Carrier length	B	0.1	2.77
Carrier depth	C	0.1	1.22
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	55.00
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W1	1.0	12.0

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

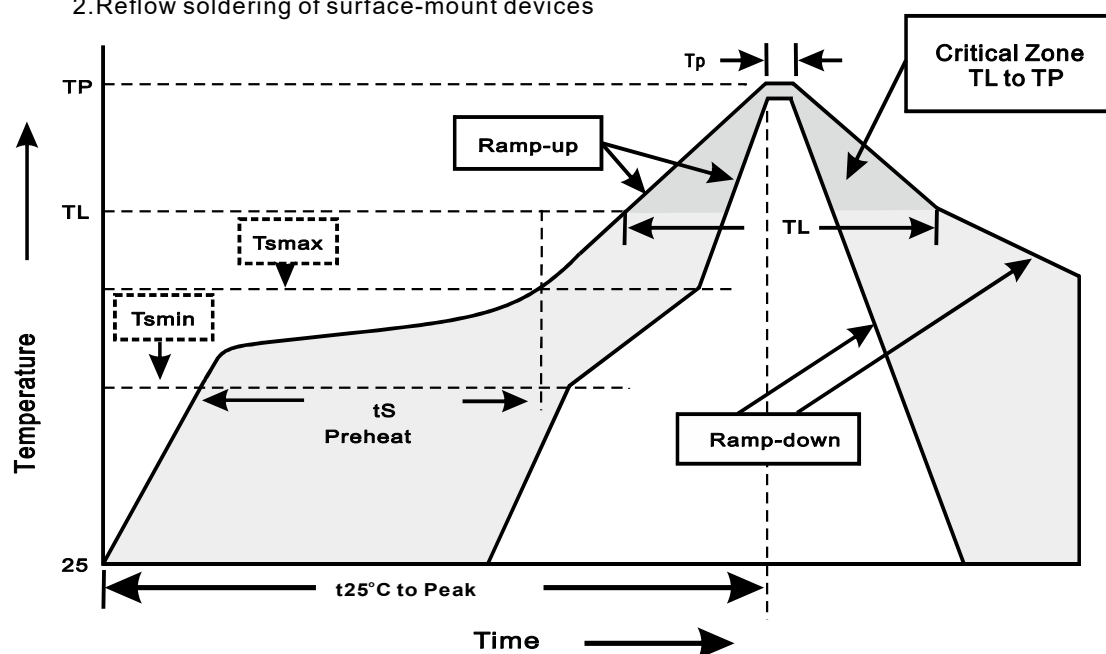
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	11.6

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T _L to T _P)	<3°C/sec
Preheat -Temperature Min(T _{smín}) -Temperature Max(T _{smáx}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smáx} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t _P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes