

LL052AT23A

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LL052AT23A

40W Ultra Low Capacitance TVS For ESD Array Protection : 5.0V

Features

- 40Watts peak pulse power ($t_p=8/20\mu s$).
- Protect I/O ports.
- Protects one data or power line to:
 - IEC 61000-4-2 $\pm 15kV$ (Contact), $\pm 20kV$ (Air).
 - IEC 61000-4-4 (EFT) 40A (5/50ns).
 - IEC 61000-4-5 (Lightning) 3.5A (8/20us).
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.LL052AT23A-H.

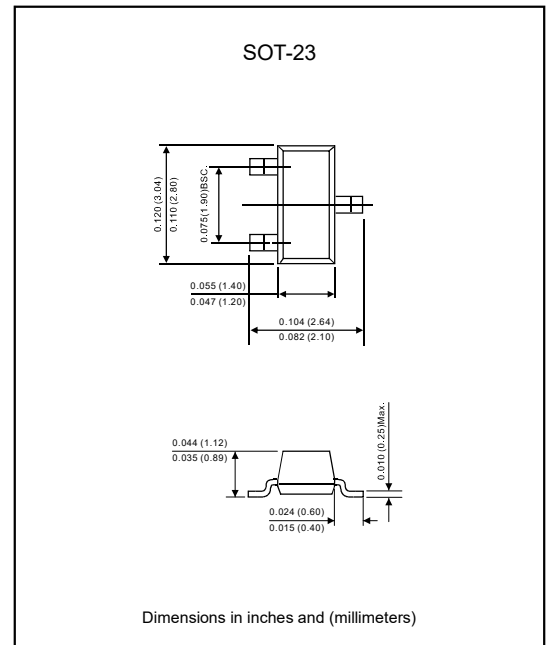
Applications

- Dataline.
- Automatic teller machines.
- Net works.
- High definition multi-media interface (HDMI).
- Digital visual interface (DVI).
- Other electronics equipments communication systems.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-23.
- Terminals : High temperature soldering guaranteed, 260°C/10 seconds at terminals.
- Mounting Position : Any.

Package outline



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

Parameter	Symbol	Ratings	Units
Peak pulse power ($t_p=8/20\mu s$)	P_{PP}	40	W
Peak pulse current ($t_p=8/20\mu s$)	I_{PP}	3.5	A
ESD per IEC 61000-4-2 (Air)	V_{ESD}	± 20	KV
ESD per IEC 61000-4-2 (Contact)		± 15	KV
Operating temperature	T_J	+125	$^\circ C$
Storage temperature range	T_{STG}	-55 to +150	$^\circ C$

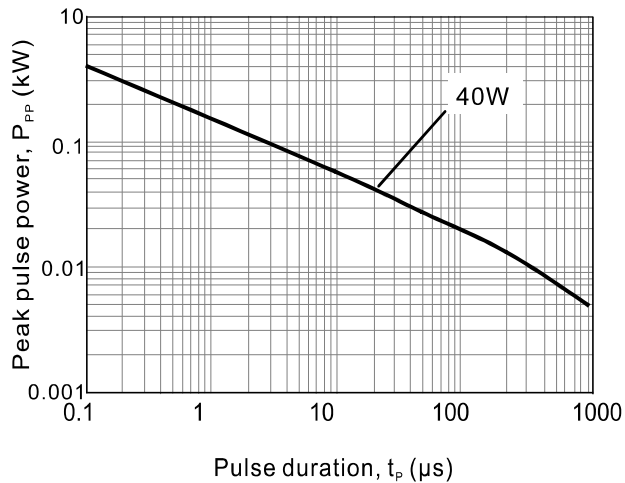
Electrical characteristics (at $T_A=25^\circ C$ unless otherwise noted)

Parameter	Test condition	Symbol	Min.	Typ.	Max.	Units
Reverse stand-off voltage		V_{RWM}			5	V
Minimum Reverse breakdown voltage	$I_T=1mA$, Pin 1/2 to Pin 3	V_{BR}	6.5			V
Reverse leakage current	$V_R=5V$	I_R		0.5	1	μA
Clamping voltage (surge)	$I_{PP}=3.5A$, $T_p=8/20\mu s$	V_C		11		V
Clamping voltage (ESD)	$V_{ESD}=+6kV$			10.5		
Clamping voltage (TLP)	$I_{PP}=16A$, $T_p=100ns$			11		
Junction capacitance	$V_R=0V$, $f=1.0MHz$, pin1,2 to 3	C_J		0.25		pF

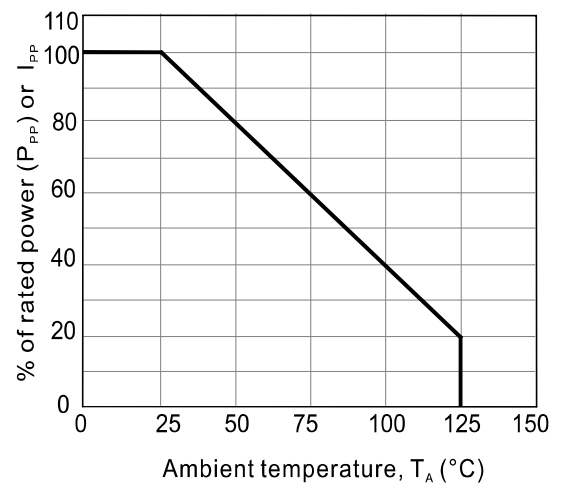
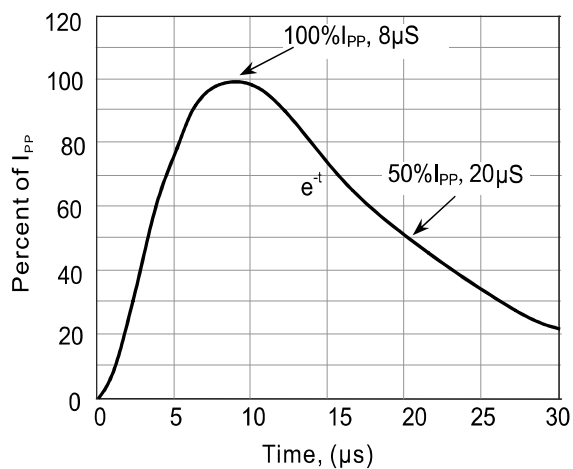
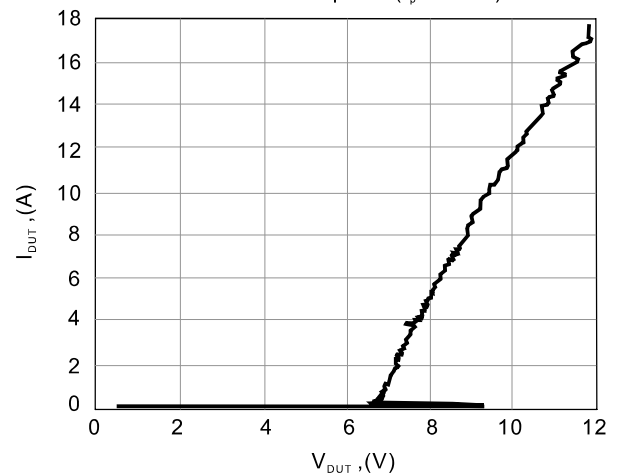
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Rating and characteristic curves

Peak pulse power rating curve

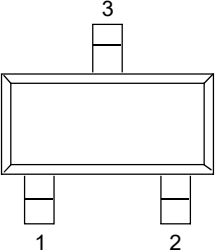
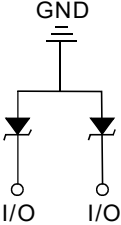


Pulse derating curve

Pulse waveform, 8/20 μs Transmission line pulse ($t_p=100ns$)

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Pinning information

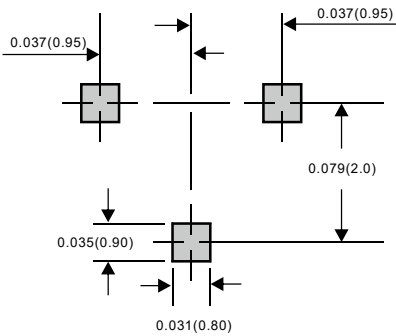
Pin	Simplified outline	Symbol
Pin1 I/O Pin2 I/O Pin3 GND		

Marking

Type number	Marking code
LL052AT23A	5ML

Suggested solder pad layout

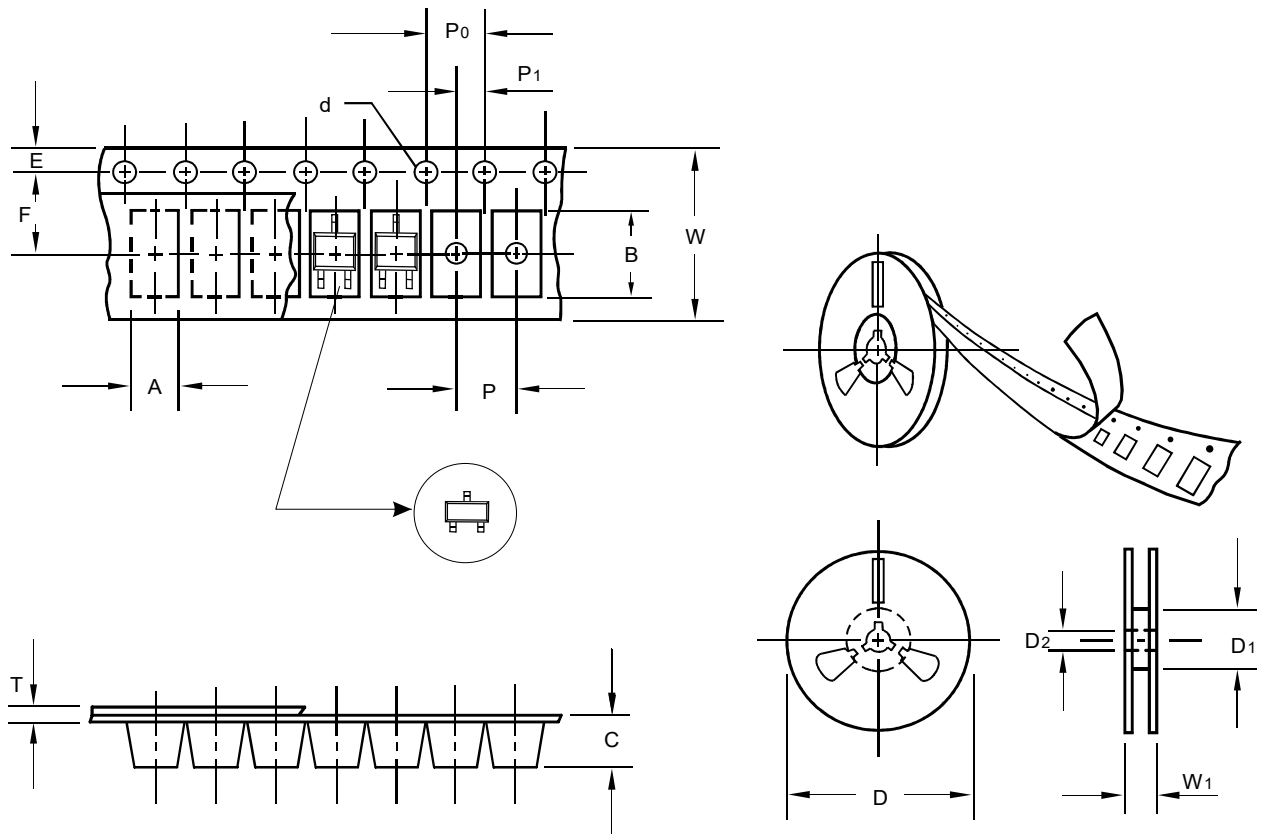
SOT-23



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	D ₁	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D ₁	min	54.40
Feed hole diameter	D ₂	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	P ₀	0.1	4.00
Embossment center	P ₁	0.1	2.00
Overall tape thickness	T	0.4	0.22
Tape width	W	0.3	8.00
Reel width	W ₁	1.0	11.40

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

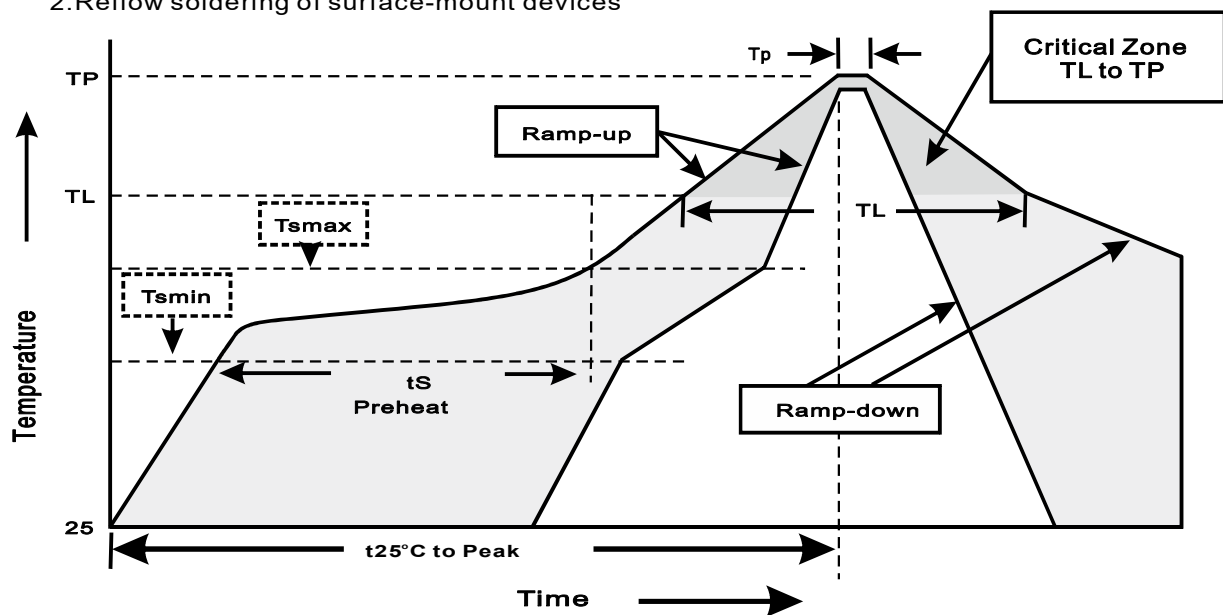
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Reel packing

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)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	383*257*387	240,000

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 _{sm}) -Temperature Max(T _{sm}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{sm} 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

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High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at $260 \pm 5^{\circ}\text{C}$ for $10 \pm 2\text{sec.}$	MIL-STD-750D METHOD-2031
2. Solderability	at $245 \pm 5^{\circ}\text{C}$ for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_{\text{BR}} = V_{\text{BR Min}} * 80\%$ at $T_{\text{J}} = 150^{\circ}\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	$15P_{\text{SIG}}$ at $T_{\text{A}} = 121^{\circ}\text{C}$ for 4 hrs.	JESD22-A102
5. Temperature Cycling	-55°C to $+125^{\circ}\text{C}$ dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
6. Humidity	at $T_{\text{A}} = 85^{\circ}\text{C}$, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
7. High Temperature Storage Life	at 150°C for 1000 hrs.	MIL-STD-750D METHOD-1031