N032AT23 THRU N362AT23

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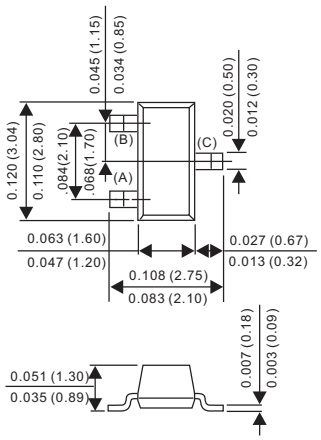
Surface Mount TVS
For ESD Protection Diode - 3.3V - 36V

Features

- IEC61000-4-2 ESD 15kV Air, 8kV contact compliance
- Protects one bidirectional line or two unidirectional lines
- Peak power dissipation of 400W under 8/20us waveform
- Working voltage : 3.0V, 5.0V, 12V, 24V and 36V
- Low leakage current
- Low operating and clamping voltages
- Sold-state silicon avalanche technology
- Lead-free parts meet environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen-free part, ex.N032AT23-H

Package outline

SOT-23



Dimensions in inches and (millimeters)

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

Maximum ratings (at T_A=25°C unless otherwise noted)

Parameter	Condition	Symbol	Value	Unit
Peak pulse power	tp = 8/20 us waveform	P_{PP}	400	W
ESD Voltage	HBM Contact AIR Contact	V_{ESD}	±8 ±15	kV
Operating junction temperature range		T_J	-55~+150	°C
Storage temperature range		T_{STG}	-55~+150	°C

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

Part No.	V_{RWM} (V) Max.	I_R(uA) @V_{RWM} Max.	V_{BR}(V)@I_T Min.	I_T (mA)	V_C(V) tp=8/20us @I_{PP}=1.0A Max.	I_{PP} (A)	V_C(V) tp=8/20us @ I_{PP} Max.	P_{PK} (W) tp=8/20 us Max.	C_J(pF) 0Vdc,f=1MHZ between I/O pins and GND Max.
N032AT23	3.3	20	4.0	1.0	7.5	25.0	10.0	250	450
N052AT23	5.0	5.0	6.0	1.0	9.8	20.0	12.0	240	350
N122AT23	12.0	1.0	13.3	1.0	19.0	15.0	24.0	360	150
N242AT23	24.0	1.0	26.7	1.0	43.0	10.0	47.0	470	88
N362AT23	36.0	1.0	40.0	1.0	50.0	5.0	75.0	375	80

Rating and characteristic curves (N032AT23 THRU N362AT23)

FIG.1 Pulse Waveform

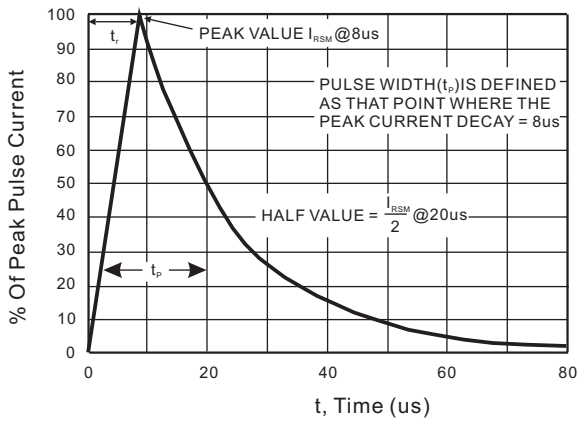


FIG.2 Power Derating Curve

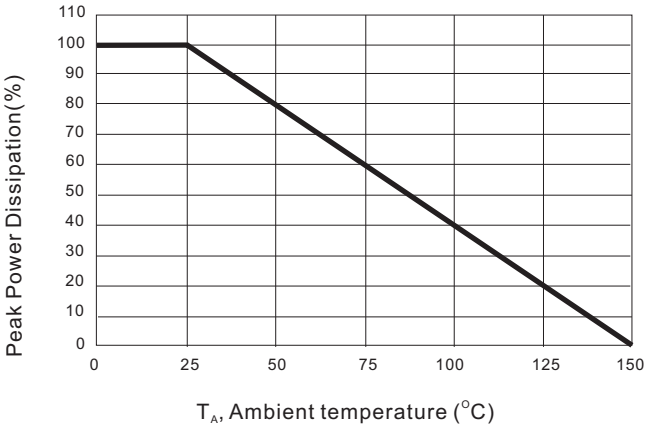


FIG.3 Non-Repetitive Peak Pulse Power vs. Pulse Time

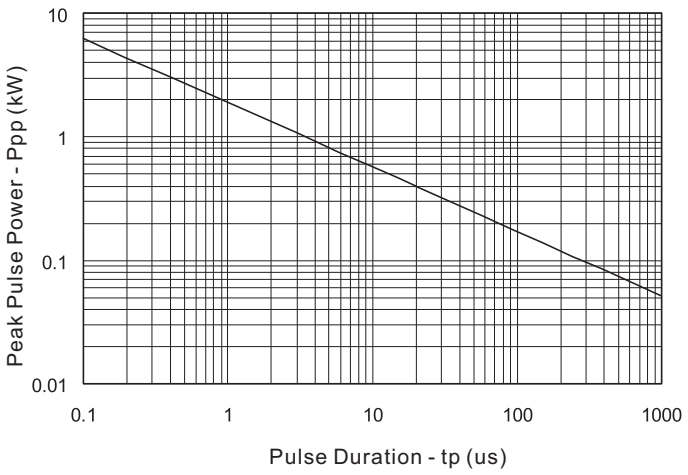
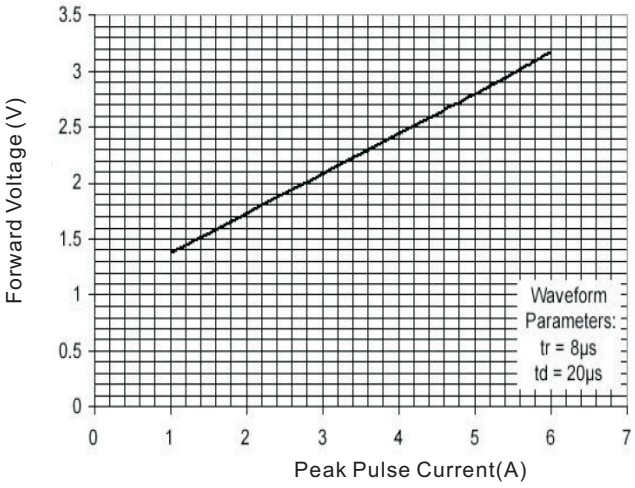


FIG.4 Forward Characteristics



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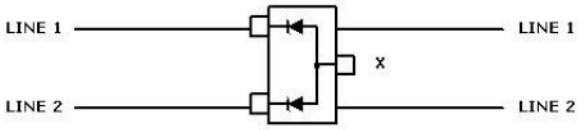
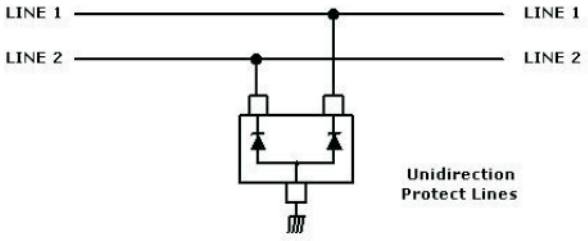
Applications

- Cell Phone Handsets and Accessories
- Personal Digital Assistants (PDA's)
- Notebooks, Desktops, and Servers
- Portable Instrumentation
- Set Top Box(STB)
- RS-232, RS-422,RS-423 Protection
- Wireless Bus Protection

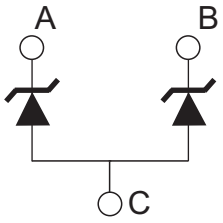


Bidirection
Protect Line



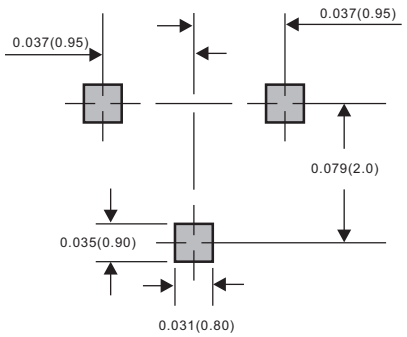
Unidirection
Protect Lines

Pinning information

Type number	Marking code	Symbol
N032AT23 N052AT23 N122AT23 N242AT23 N362AT23	B 03C B 05C B 12C B 24C B 36C	

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)

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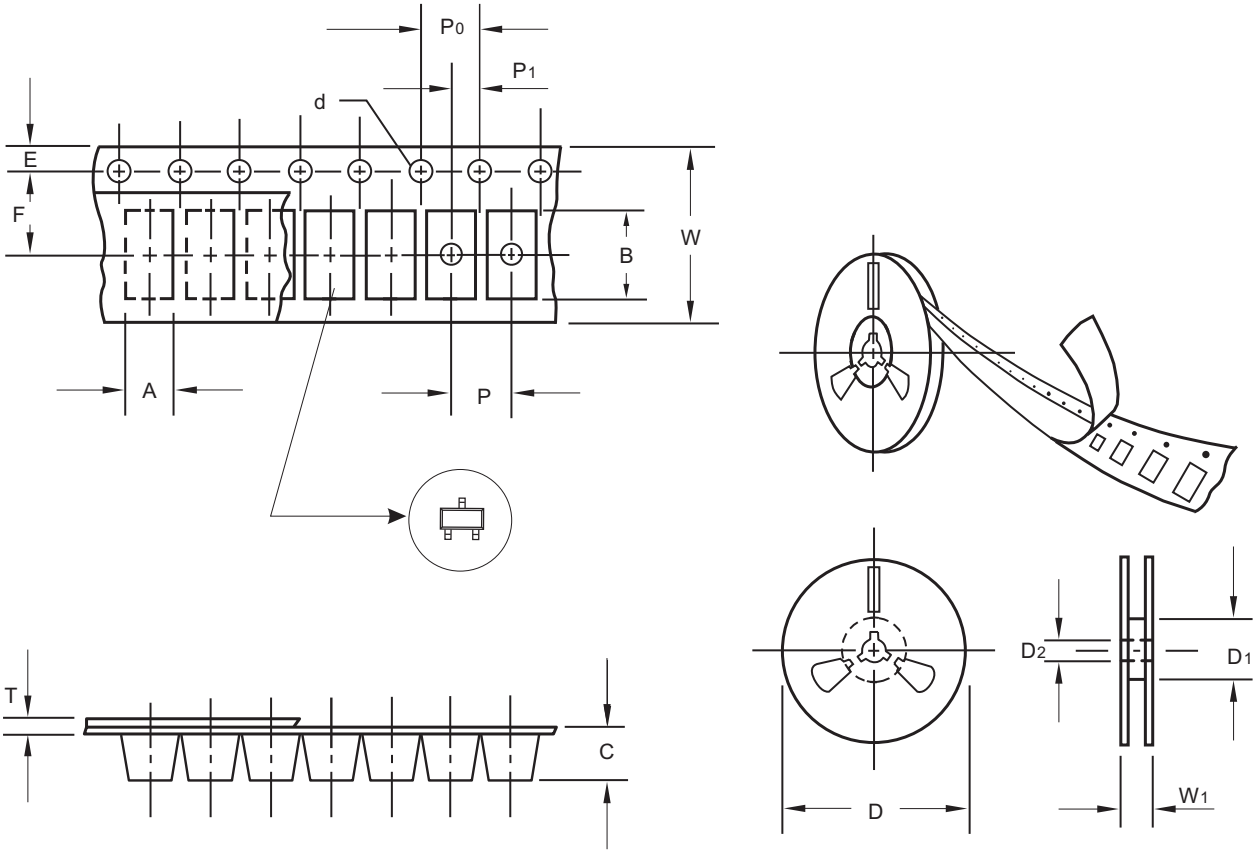
Packing information



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	62.00
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	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W_1	1.0	11.40

Note:Devices are packed in accor dance with EIA standar RS-481-A and specifications listed above.

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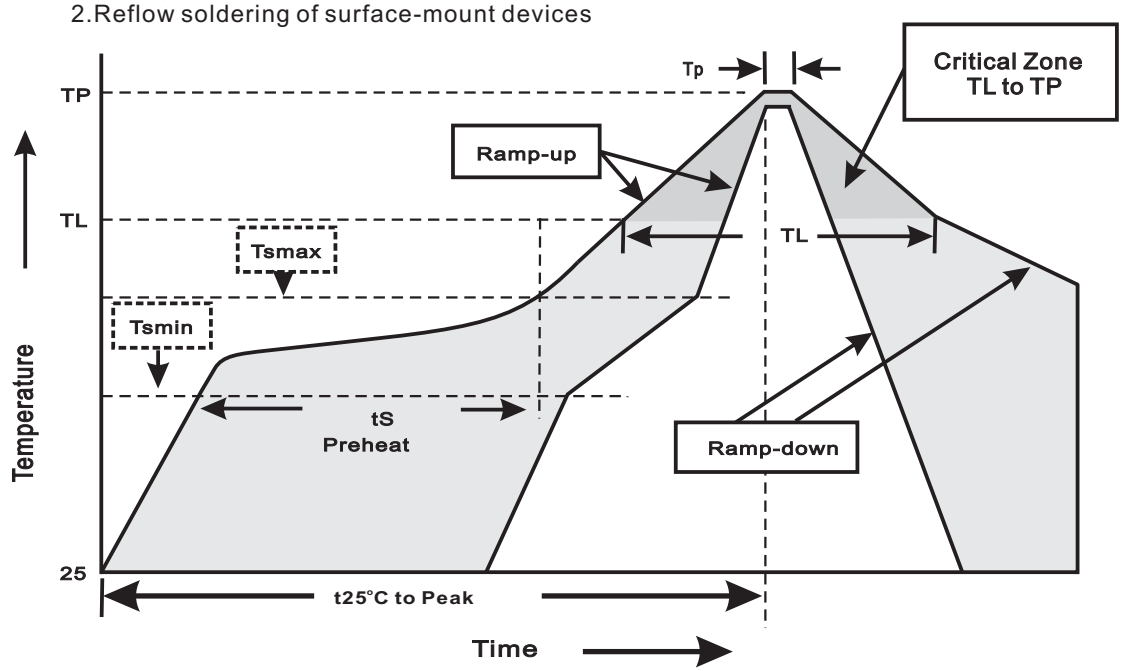
Reel packing

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"	3000	4.0	30,000	183*183*123	178	383*262*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(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(t_s)	 150°C 200°C 60~120sec
Tsmax 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±5°C for 10±2sec. immerse body into solder 1/16"±1/32"	MIL-STD-750D METHOD-2031
2. Solderability	at 245±5°C for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	V_{RWM}=80% rate at T_J=150°C for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	15P_{SIG} at T_A=121°C for 4 hrs.	JESD22-A102
5. Temperature Cycling	-55°C to +125°C dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
6. Humidity	at T_A=85°C, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
7. High Temperature Storage Life	at 175°C for 1000 hrs.	MIL-STD-750D METHOD-1031