

# N032AT23A

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# N032AT23A

## 300W 2-Channel Uni-direction TVS For ESD Protection : 3.3V

### Features

- 300Watts peak pulse power( $t_p=8/20\mu s$ ).
- Complies with following standards:  
IEC 61000-4-2 (ESD)  $\pm 30kV$  (Contact),  $\pm 30kV$  (Air).  
IEC 61000-4-5 (Lightning) 25A (8/20us).
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex. N032AT23A-H.

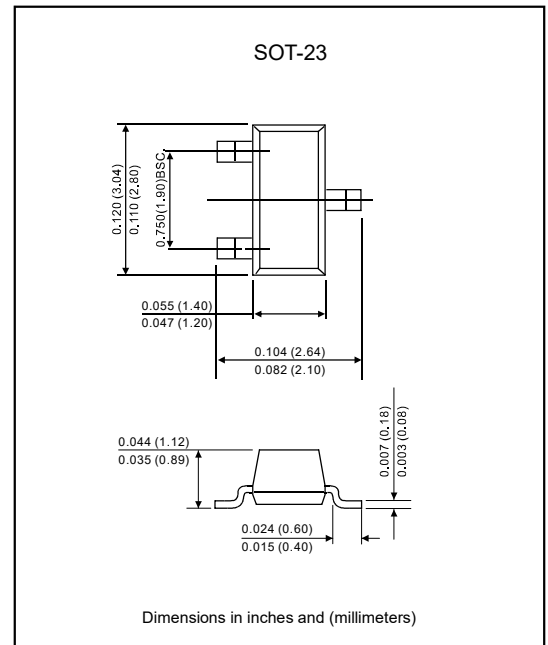
### Applications

- Peripherals.
- Industrial equipment.
- Notebook computers .
- Portable instrumentation and microprocessor based equipment.
- Cell phone handsets and accessories.
- Personal digital assistants(PDAs) and pagers.

### Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-23.
- Mounting Position : Any.

### Package outline



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

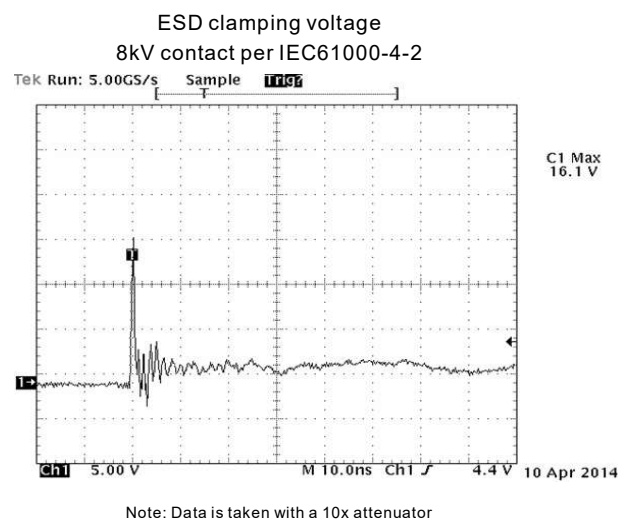
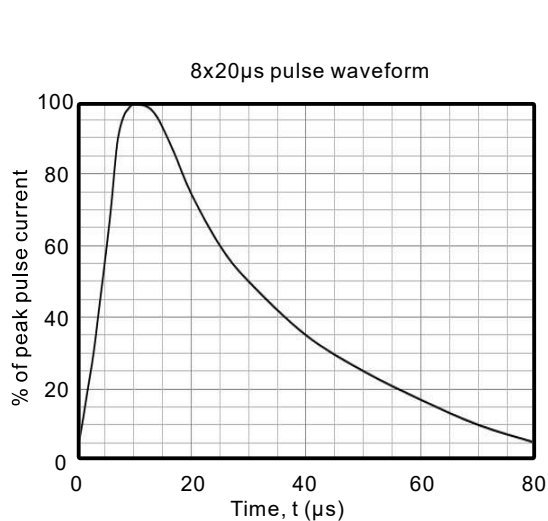
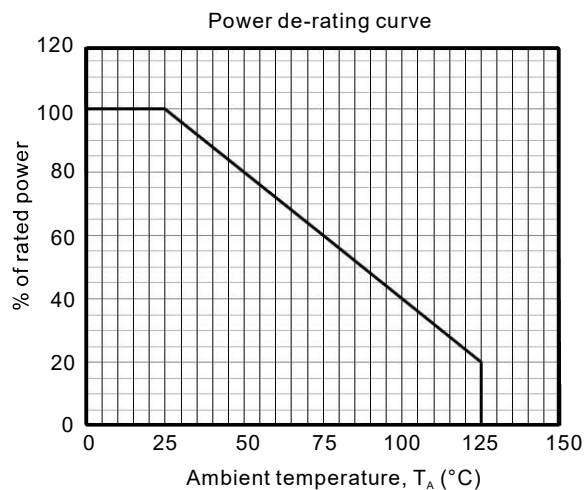
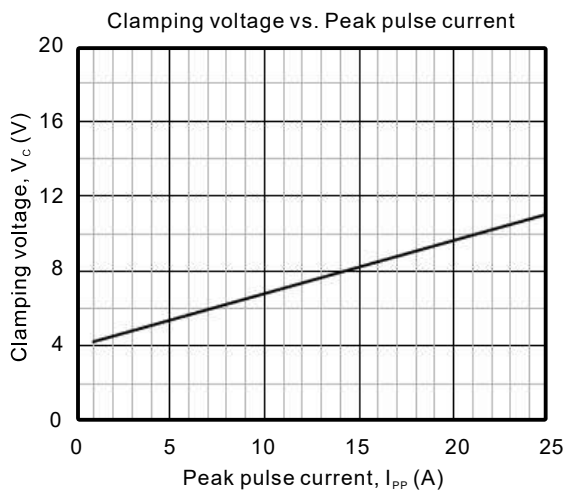
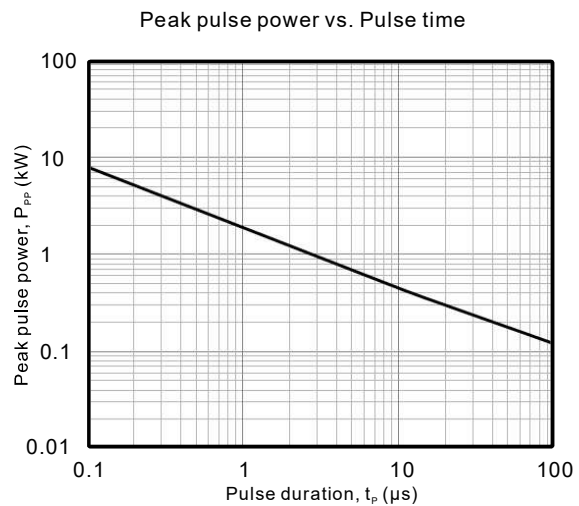
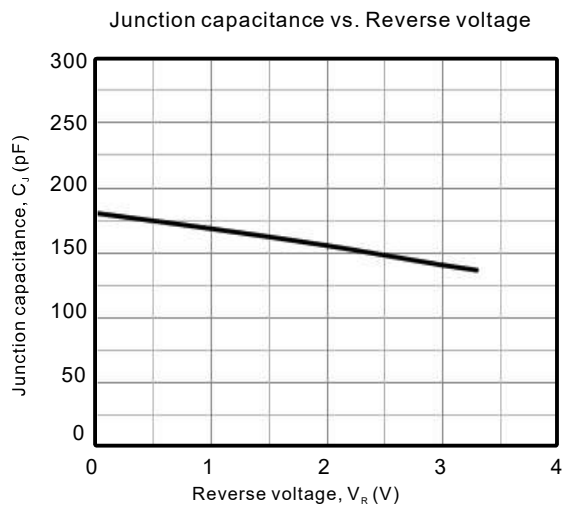
| Parameter                              | Symbol    | Ratings     | Unit       |
|----------------------------------------|-----------|-------------|------------|
| Peak pulse power ( $t_p=8/20\mu s$ )   | $P_{PP}$  | 350         | W          |
| Peak pulse current ( $t_p=8/20\mu s$ ) | $I_{PP}$  | 25          | A          |
| ESD per IEC 61000-4-2 (Air)            | $V_{ESD}$ | $\pm 30$    | KV         |
| ESD per IEC 61000-4-2 (Contact)        |           | $\pm 30$    | KV         |
| Operating temperature range            | $T_J$     | +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. | Unit    |
|---------------------------|----------------------------------------------------------|-----------|------|------|------|---------|
| Reverse stand-off voltage |                                                          | $V_{RWM}$ |      |      | 3.3  | V       |
| Reverse breakdown voltage | $I_T=1mA$                                                | $V_{BR}$  | 3.5  |      | 7    | V       |
| Reverse leakage current   | $V_{RWM}=3.3V$ , any I/O pin to ground                   | $I_R$     |      |      | 0.5  | $\mu A$ |
| Clamping voltage          | $I_{PP}=1A$ (8x20 $\mu s$ pulse), any I/O pin to ground  | $V_C$     |      |      | 8    | V       |
|                           | $I_{PP}=25A$ (8x20 $\mu s$ pulse), any I/O pin to ground |           |      |      | 14   |         |
| Junction capacitance      | $V_R=0V$ , $f=1.0MHz$ , any I/O pin to ground            | $C_J$     |      |      | 200  | pF      |

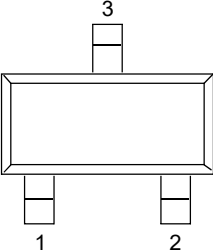
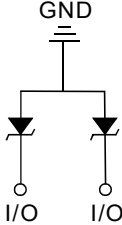
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## Rating and characteristic curves



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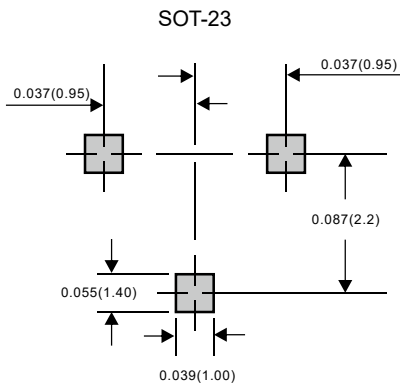
Pinning information

| Pin                                 | Simplified outline                                                                | Symbol                                                                              |
|-------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Pin 1 I/O<br>Pin 2 I/O<br>Pin 3 GND |  |  |

Marking

| Type number | Marking code |
|-------------|--------------|
| N032AT23A   | S33          |
|             | 3M2          |

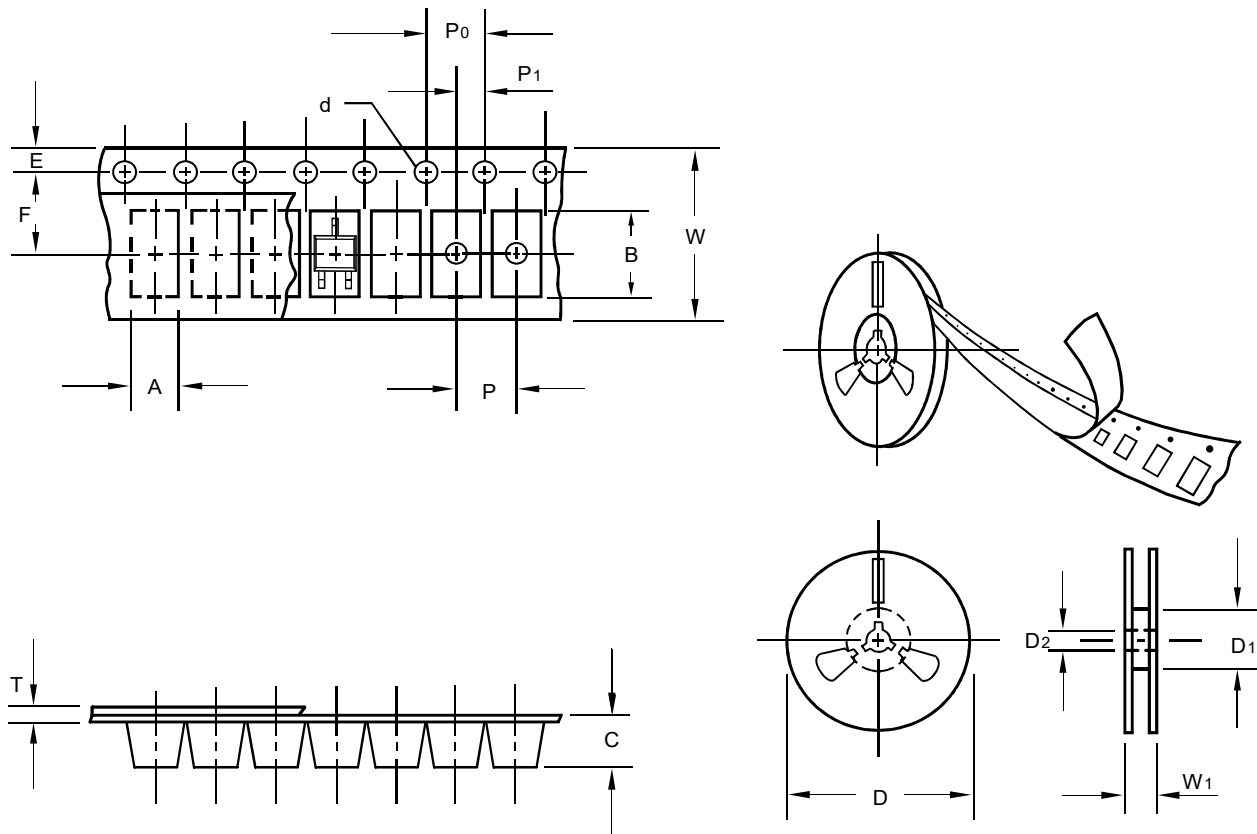
Suggested solder pad layout



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       | 54.40  |
| 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      | 0.4       | 0.22   |
| Tape width                | W      | 0.3       | 8.00   |
| Reel width                | W1     | 1.0       | 11.40  |

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

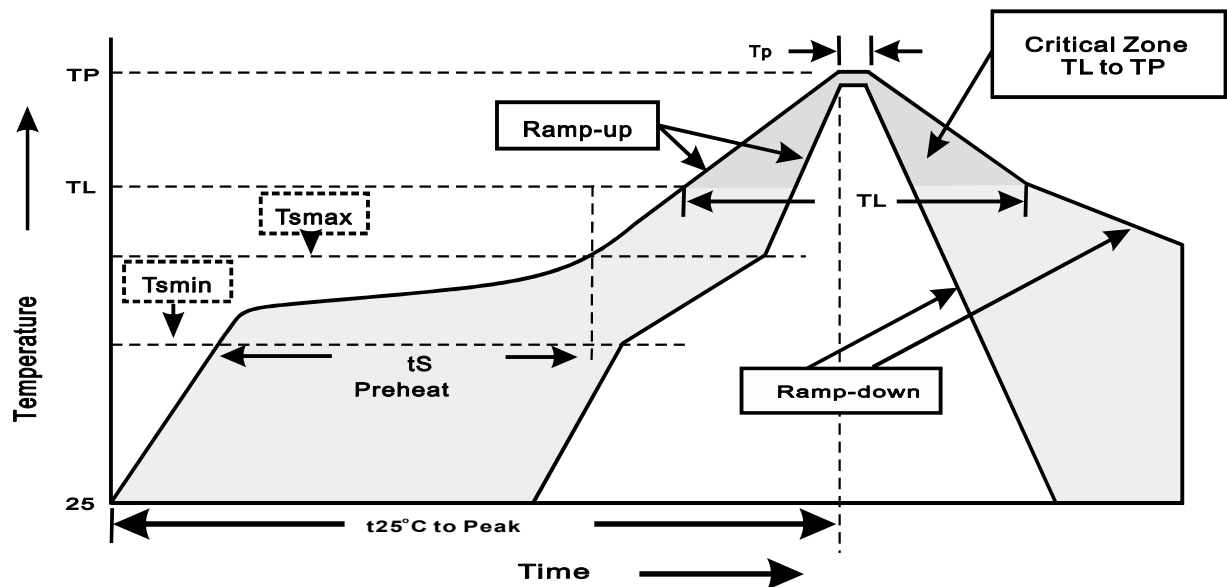
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## Reel packing

| PACKAGE | REEL SIZE | REEL (pcs) | COMPONENT SPACING (m/m) | BOX (pcs) | REEL DIA, (m/m) | CARTON (pcs) |
|---------|-----------|------------|-------------------------|-----------|-----------------|--------------|
| SOT-23  | 7"        | 3,000      | 4.0                     | 30,000    | 178             | 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 <sub>L</sub> to T <sub>P</sub> )                                                                     | <3°C/sec                    |
| Preheat<br>-Temperature Min(T <sub>min</sub> )<br>-Temperature Max(T <sub>max</sub> )<br>-Time(min to max)(t <sub>s</sub> ) | 150°C<br>200°C<br>60~120sec |
| T <sub>max</sub> to T <sub>L</sub><br>-Ramp-upRate                                                                          | <3°C/sec                    |
| Time maintained above:<br>-Temperature(T <sub>L</sub> )<br>-Time(t <sub>L</sub> )                                           | 217°C<br>60~260sec          |
| Peak Temperature(T <sub>P</sub> )                                                                                           | 255°C-0/+5°C                |
| Time within 5°C of actual Peak Temperature(t <sub>P</sub> )                                                                 | 10~30sec                    |
| Ramp-down Rate                                                                                                              | <6°C/sec                    |
| Time 25°C to Peak Temperature                                                                                               | <6minutes                   |