

# N07122BT23A

## List

|                                                         |   |
|---------------------------------------------------------|---|
| List.....                                               | 1 |
| Package outline.....                                    | 2 |
| Features.....                                           | 2 |
| Applications.....                                       | 2 |
| Mechanical data.....                                    | 2 |
| Maximum ratings .....                                   | 2 |
| Electrical characteristics.....                         | 2 |
| Rating and characteristic curves.....                   | 3 |
| Pinning information.....                                | 4 |
| Marking.....                                            | 4 |
| Suggested solder pad layout.....                        | 4 |
| Packing information.....                                | 5 |
| Reel packing.....                                       | 6 |
| Suggested thermal profiles for soldering processes..... | 6 |

# N07122BT23A

## Surface Mount TVS Diode For Extended Common-Mode RS-485

### Features

- Transient protection for high-speed data lines.
- ESD protects two +12V to -7V lines.
- Low clamping voltage.
- Each I/O pin can withstand over 1K ESD strikes for  $\pm 8\text{kV}$  contact discharge.
- Complies with following standards:
  - IEC61000-4-2 (ESD)  $\pm 30\text{kV}$  (Air),  $\pm 30\text{kV}$  (Contact).
  - IEC61000-4-4 (EFT) 40A (5/50ns).
- Cable discharge event (CDE).
- Lead-free parts meet RoHS requirements.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.N07122BT23A-H.

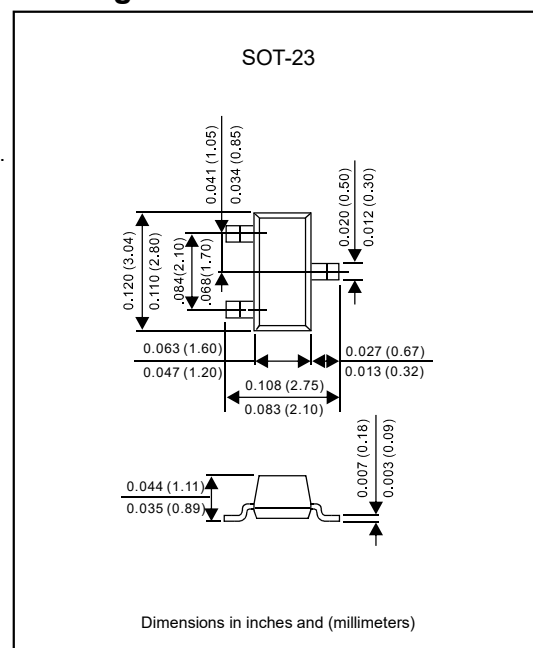
### Applications

- Data line, industrial controls, computers and peripherals.
- Portable instrumentation.
- Security systems, automatic teller machines, networks.
- HFC systems.
- Protection of RS-485 transceivers with extended common-mode range.

### 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.

### Package outline



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

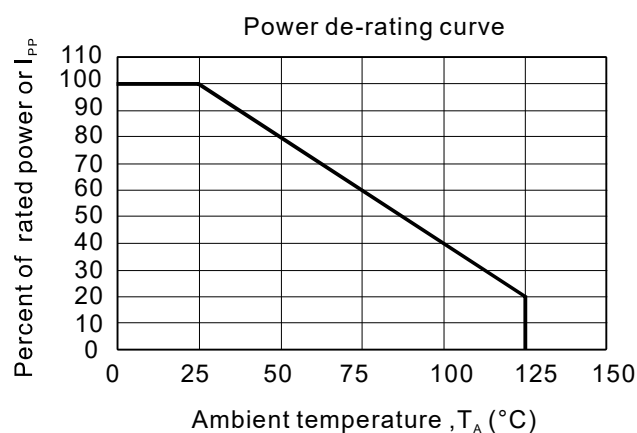
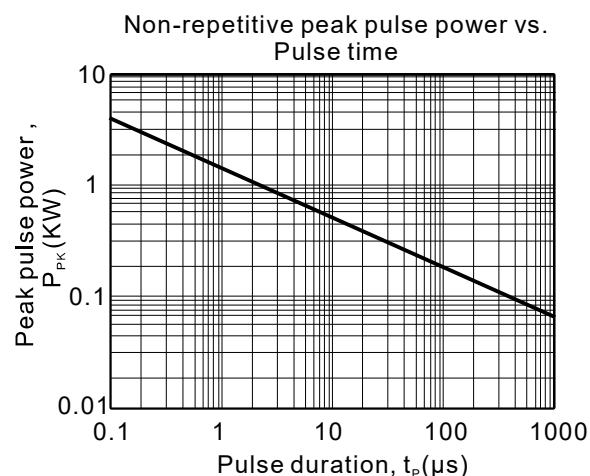
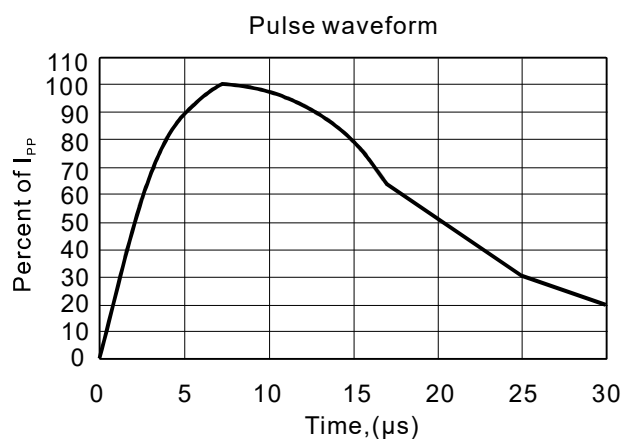
| Parameter                              | Symbol    | Ratings     | Units            |
|----------------------------------------|-----------|-------------|------------------|
| Peak pulse power (8/20 $\mu\text{s}$ ) | $P_{PK}$  | 350         | W                |
| ESD per IEC 61000-4-2 (Air)            | $V_{ESD}$ | $\pm 30$    | kV               |
| ESD per IEC 61000-4-2 (Contact)        |           |             |                  |
| Operating temperature                  | $T_J$     | -55 to +150 | $^\circ\text{C}$ |
| Storage temperature                    | $T_{STG}$ | -55 to +150 | $^\circ\text{C}$ |
| Lead soldering temperature             | $T_{LST}$ | 260         | $^\circ\text{C}$ |

# N07122BT23A

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

| Parameter                 | Conditions                                  | Symbol    | Pins1 to 3 and 2 to 3<br>(12V) |      |      | Pins3 to 1 and 3 to 2<br>(7V) |      |      | Units         |
|---------------------------|---------------------------------------------|-----------|--------------------------------|------|------|-------------------------------|------|------|---------------|
|                           |                                             |           | Min.                           | Typ. | Max. | Min.                          | Typ. | Max. |               |
| Reverse working voltage   | Pins3 to 1 or Pins2 to 1                    | $V_{RWM}$ |                                |      | 12   |                               |      | 7    | V             |
| Reverse leakage current   | $V_R = V_{RWM}$                             | $I_R$     |                                |      | 1    |                               |      | 20   | $\mu\text{A}$ |
| Reverse breakdown voltage | $I_T=1\text{mA}$                            | $V_{BR}$  | 13.3                           |      |      | 7.5                           |      |      | V             |
| Clamping voltage          | $I_{PP}=1\text{A}$ , $t_p=8/20\mu\text{s}$  | $V_C$     |                                |      | 20   |                               |      | 12   | V             |
|                           | $I_{PP}=12\text{A}$ , $t_p=8/20\mu\text{s}$ |           |                                |      | 30   |                               |      | 16   |               |
| Parasitic capacitance     | $V_R=0\text{V}$ , $f=1.0\text{MHz}$         | $C_{ESD}$ |                                | 50   | 60   |                               | 50   | 60   | pF            |

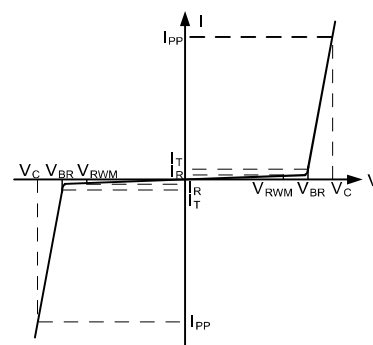
## Rating and characteristic curves



# N07122BT23A

## Rating and characteristic curves

| Symbol    | Parameter                           |
|-----------|-------------------------------------|
| $V_{RWM}$ | Nominal reverse working voltage     |
| $I_R$     | Reverse leakage current @ $V_{RWM}$ |
| $V_{BR}$  | Reverse breakdown voltage @ $I_T$   |
| $I_T$     | Test current for reverse breakdown  |
| $V_C$     | Clamping voltage @ $I_{PP}$         |
| $I_{PP}$  | Maximum peak pulse current          |
| $C_{ESD}$ | Parasitic capacitance               |
| $V_R$     | Reverse voltage                     |
| f         | Small signal frequency              |



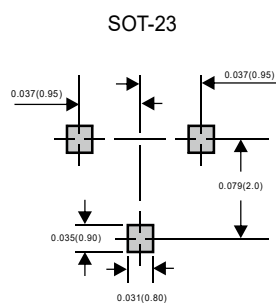
## Pinning information

| Pin Configuration | Circuit Diagram |
|-------------------|-----------------|
|                   |                 |

## Marking

| Type number | Marking code |
|-------------|--------------|
| N07122BT23A | 712          |

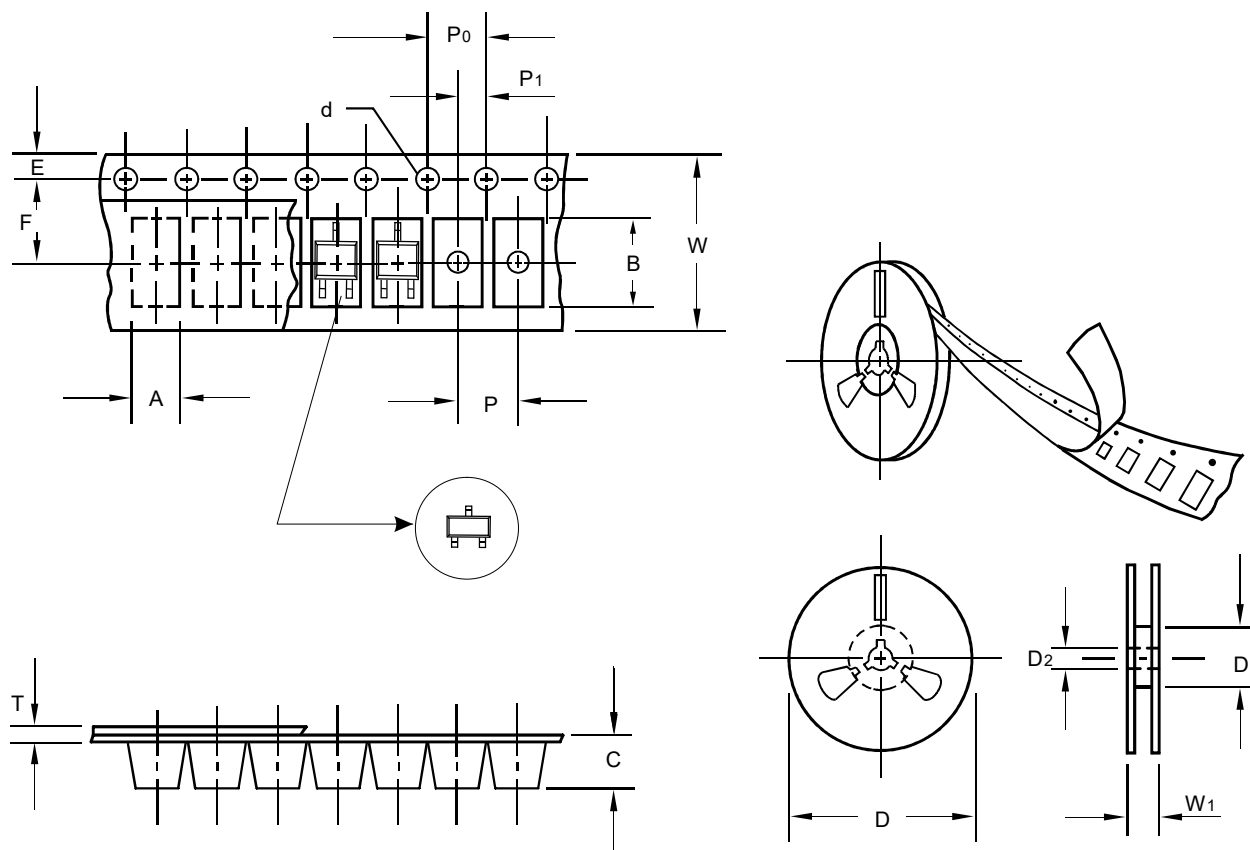
## Suggested solder pad layout



Dimensions in inches and (millimeters)

## N07122BT23A

## 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       | 62.00  |
| 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       | 11.40  |

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

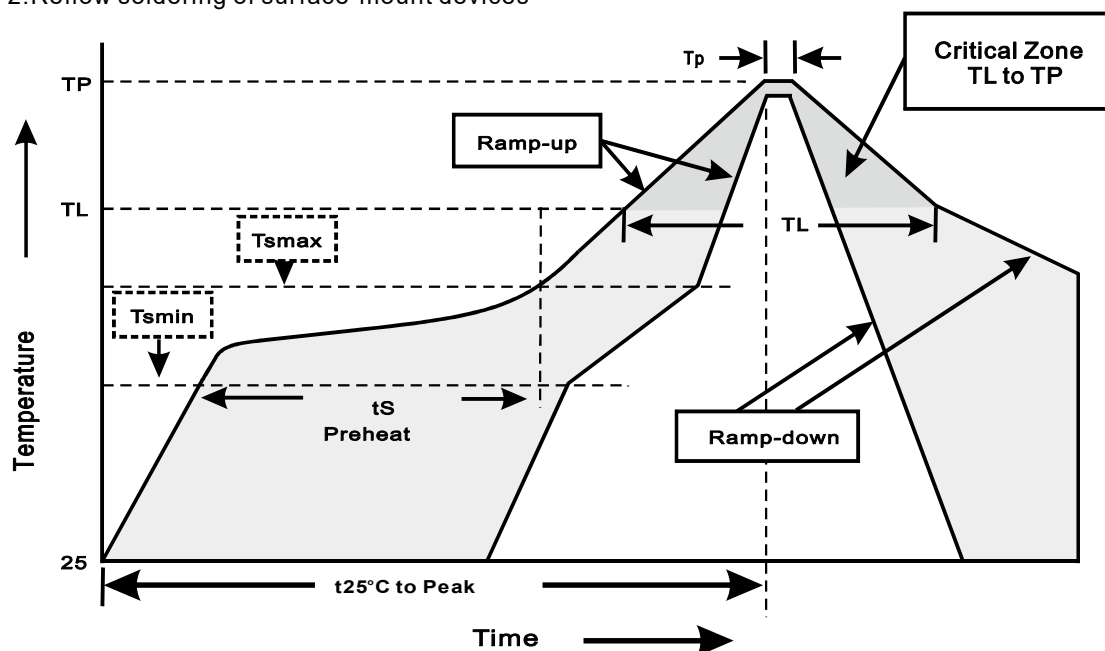
## N07122BT23A

## 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             | 382*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 <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                   |