

N07122BT23A-Q1

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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.
- Qualified to AEC-Q101 standards for high reliability.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex. N07122BT23A-Q1-H.

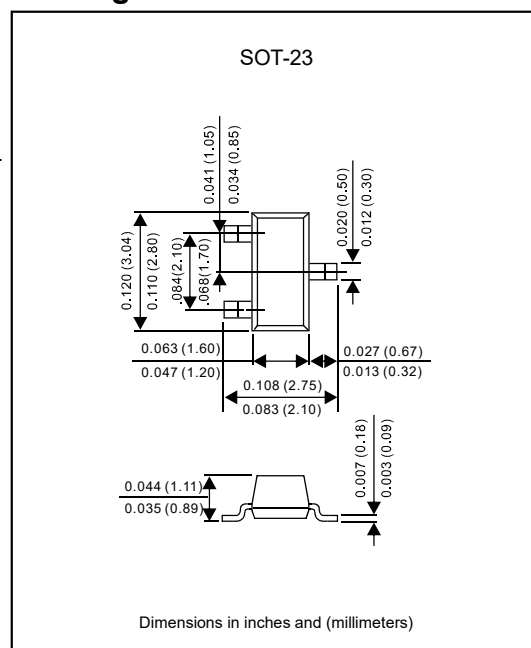
Applications

- 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)

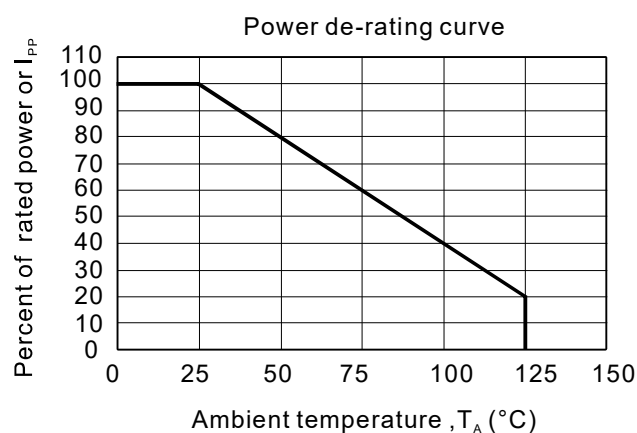
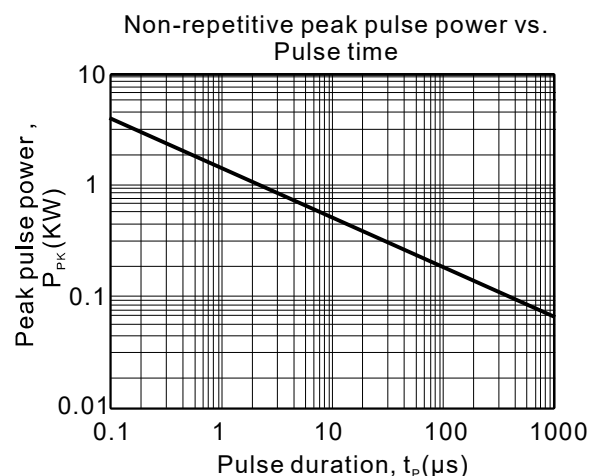
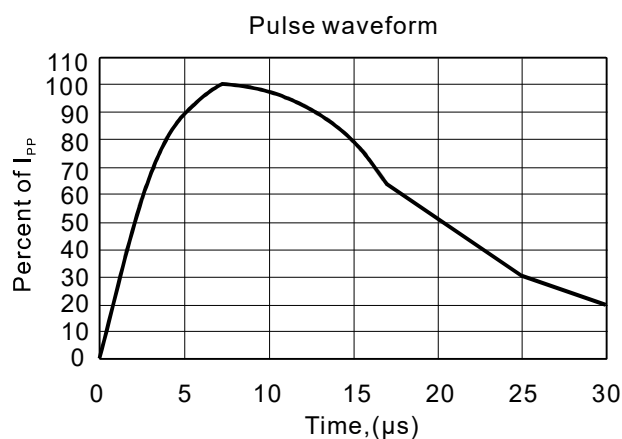
Parameter	Symbol	Ratings	Units
Peak pulse power (8/20 μs)	P_{PK}	350	W
ESD per IEC 61000-4-2 (Air)	V_{ESD}	± 30	kV
ESD per IEC 61000-4-2 (Contact)			
Operating temperature	T_J	-55 to +150	$^\circ\text{C}$
Storage temperature	T_{STG}	-55 to +150	$^\circ\text{C}$
Lead soldering temperature	T_{LST}	260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

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

Parameter	Conditions	Symbol	Pins1 to 3 and 2 to 3 (12V)			Pins3 to 1 and 3 to 2 (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	μA
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

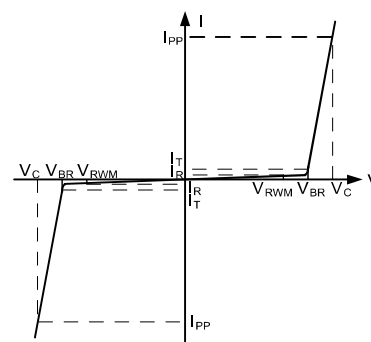
Rating and characteristic curves



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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



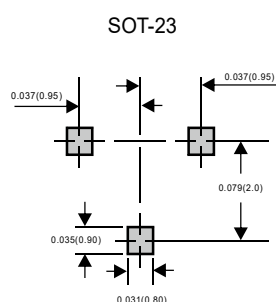
Pinning information

Pin Configuration	Circuit Diagram

Marking

Type number	Marking code
N07122BT23A-Q1	712A

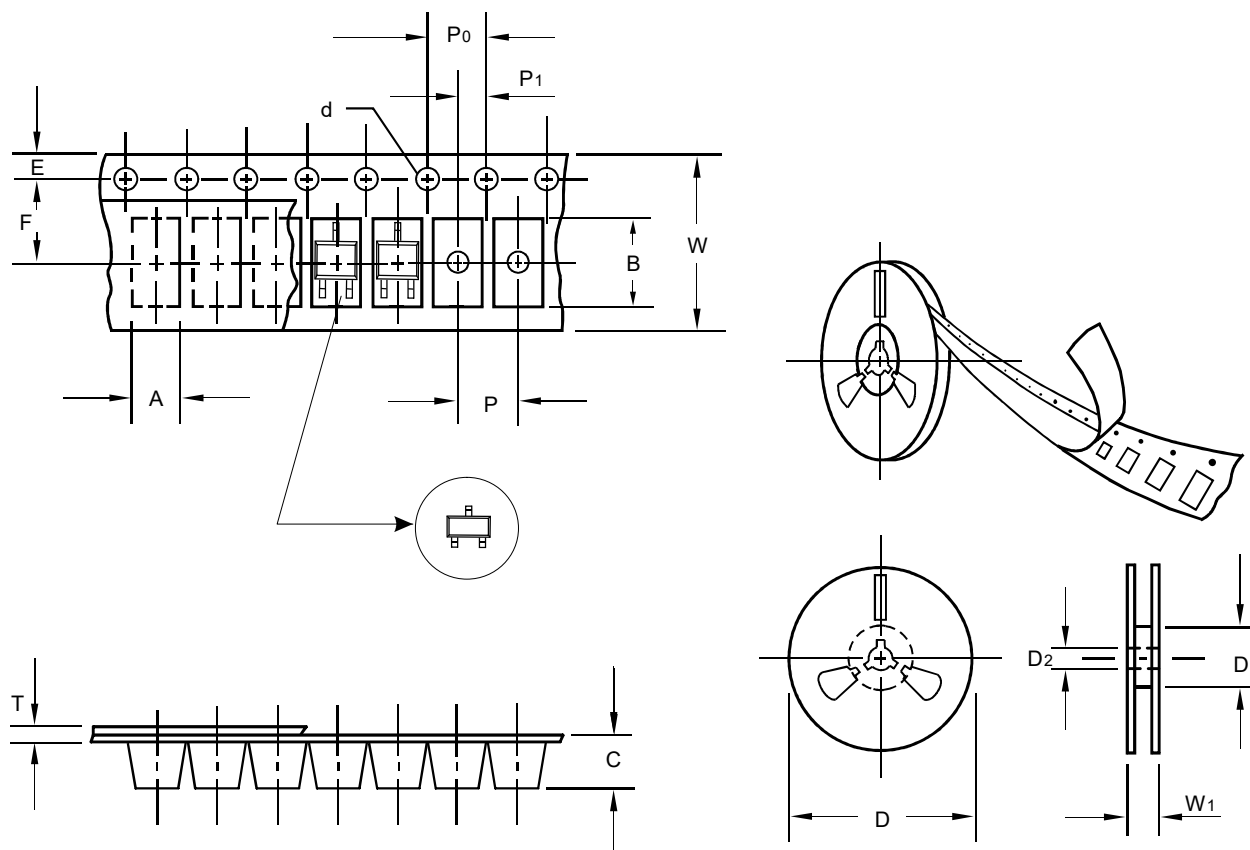
Suggested solder pad layout



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	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.

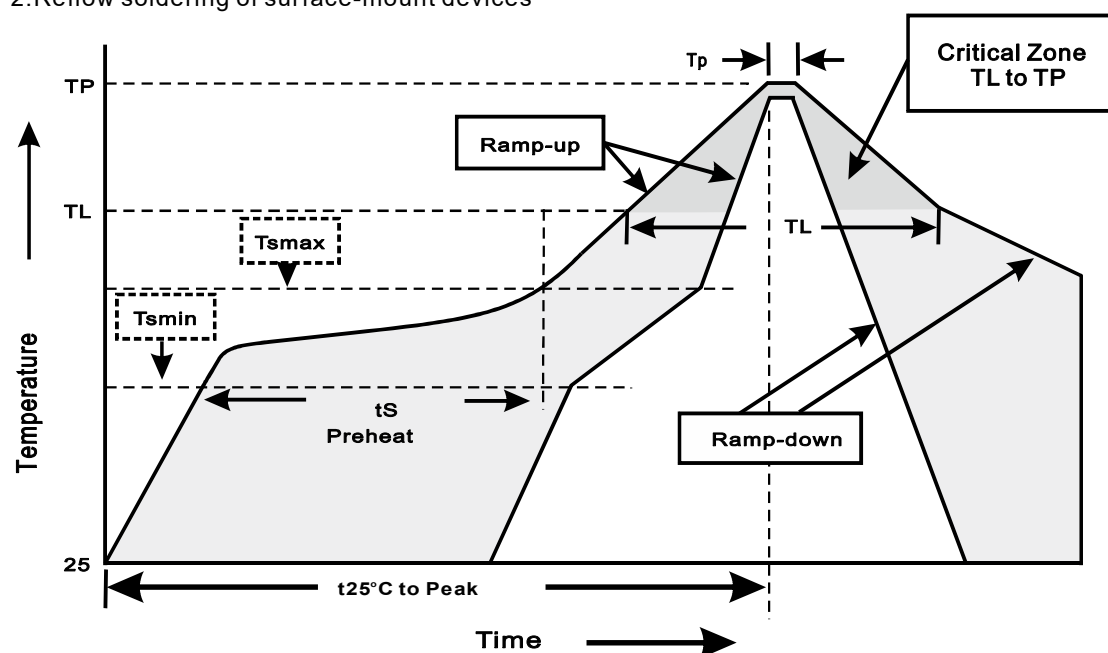
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Reel packing

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	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 _L to T _P)	<3°C/sec
Preheat -Temperature Min(T _{min}) -Temperature Max(T _{max}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{max} 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