N07122BT23

List

N07122BT23

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

Features

- IEC61000-4-2 (ESD) ±15kV (air), ±8kV (contact)
- IEC61000-4-4 (EFT) 40A (5/50ηs)
- IEC61000-4-5 (Lighting) 12A (8/20μs)
- 400Watts peak pulse power per (tp=8/20μs)
- Protects two +12V to-7V lines
- Low capacitance
- Low clamping voltage
- Low leakage current
- Lead-free parts meet RoHS requirments
- Suffix "-H" indicates Halogen-free part, ex.N07122BT23-H.

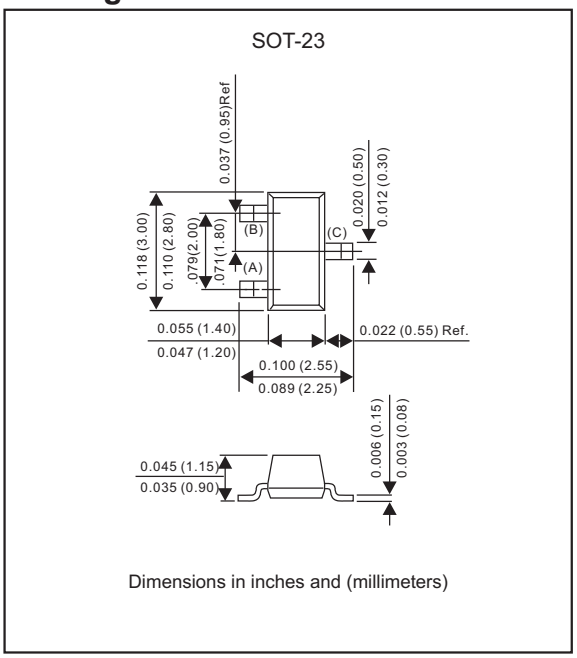
Applications

- Protection of RS-485 transceivers with extended common-mode range
- Security systems
- Automatic Teller Machines
- HFC systems
- Networks

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

Package outline



Dimensions in inches and (millimeters)

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

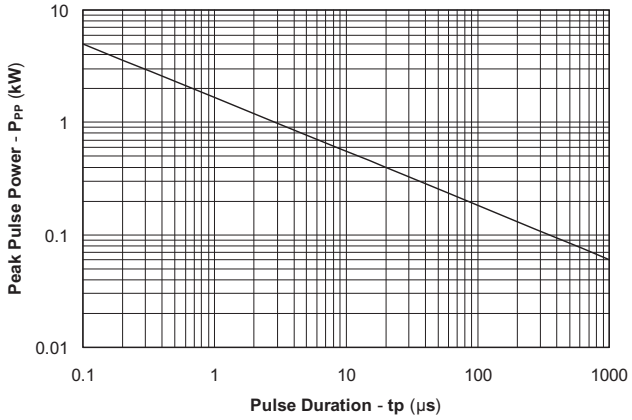
Parameter	Symbol	Value	Units
Peak pulse power(tp=8/20μs waveform)	P_{PP}	400	Watts
ESD per IEC 61000-4-2 (air) ESD per IEC 61000-4-2 (contact)	V_{ESD}	±15 ±8	kV
Peak pulse current(tp=8/20μs waveform)	I_{PP}	17	A
Operating junction temperature range	T_J	-55 to +150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

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

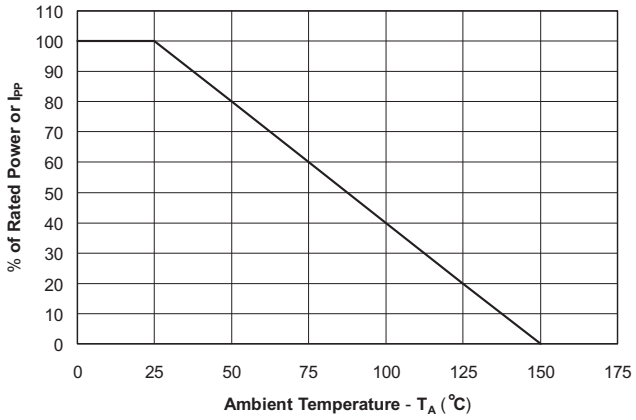
Parameter	Test condition	Symbol	Pin 1 to 3 and Pin 2 to 3 (12V) TVS			Pin 3 to 1 and Pin 3 to 2 (7V TVS)			Units
			Min	Typ	Max	Min	Typ	Max	
Reverse working voltage	Pin 3 to 1 or Pin 2 to 1	V_{RWM}			12			7	V
Reverse breakdown voltage	I_T = 1mA	V_{BR}	13.3			7.5			V
Reverse leakage current	$V_R = V_{RWM}$	I_R			1.0			20	μA
Clamping voltage 1	I_{PP} = 5A, tp = 8/20μs	V_{C1}			20			10	V
Clamping voltage 2	I_{PP} = 17A, tp = 8/20μs	V_{C2}			26			12	V
Junction capacitance 1	V_R = 0V, f = 1MHz	C_{J1}			75			75	pF
Junction capacitance 2	$V_R = V_{RWM}$, f = 1MHz	C_{J2}		45			45		pF

Rating and characteristic curves

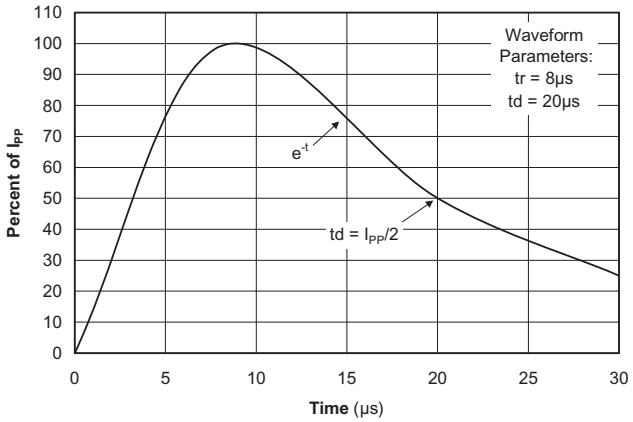
Peak Pulse Power vs. Pulse Time



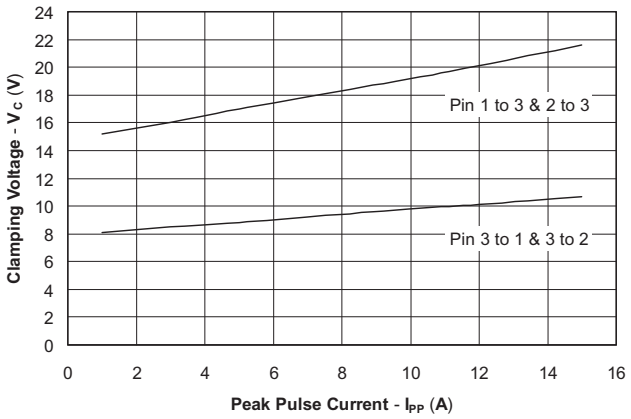
Power Derating Curve



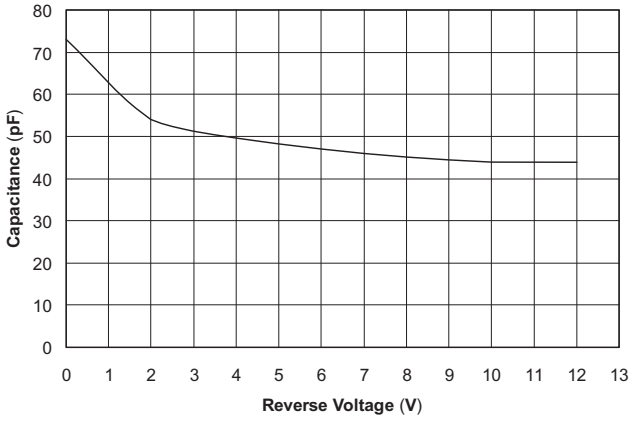
Pulse Waveform



Clamping Voltage vs. Peak Pulse Current



Capacitance vs. Reverse Voltage



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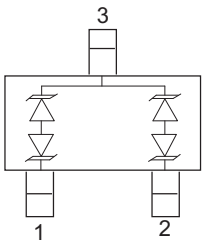
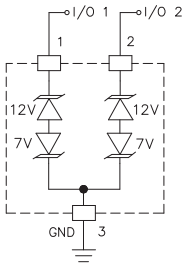
Pinning information

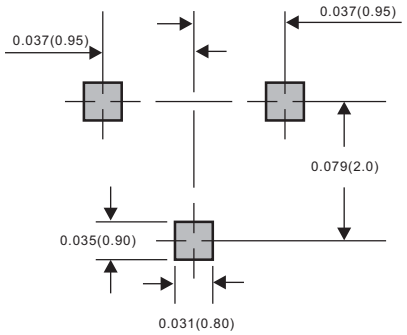
Pin Configuration	Circuit Diagram
	

Marking

Type number	Marking code
N07122BT23	712 or C72

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)

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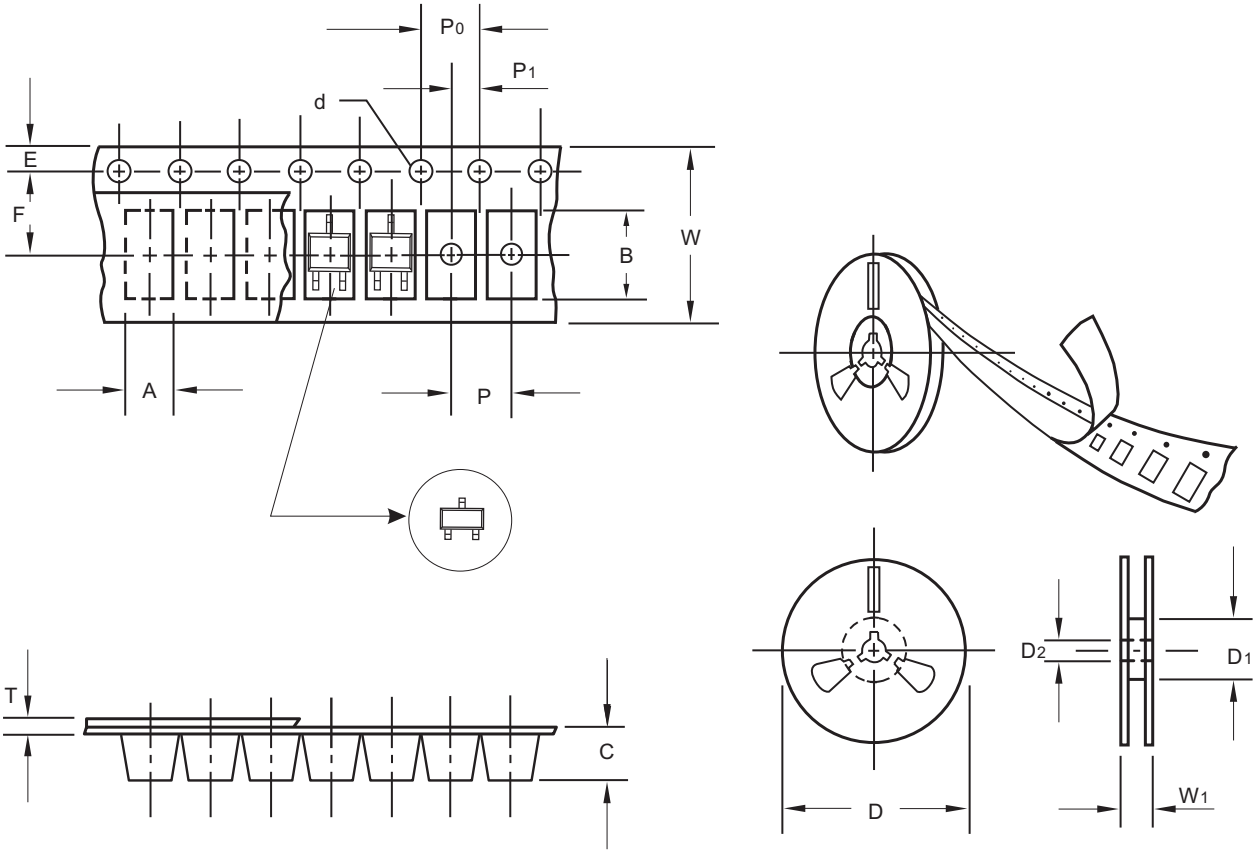
Packing information



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	0.1	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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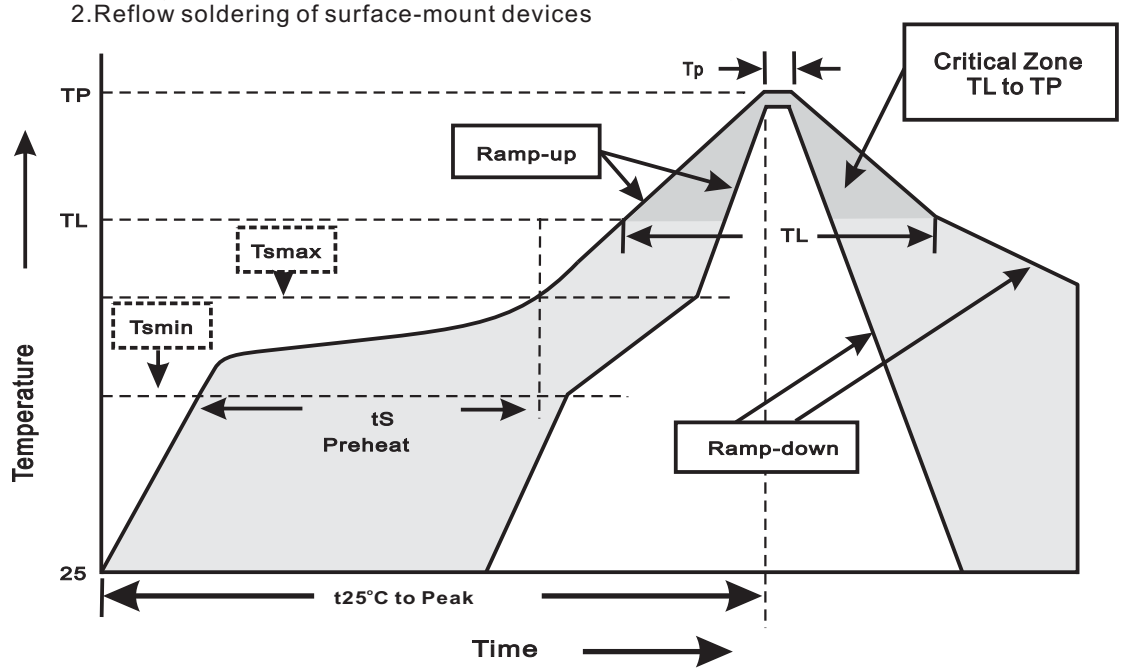
Reel packing

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"	3,000	4.0	30,000	183*123*183	178	383*257*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.	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_{BR}= V_{BR} Min * 80% 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