NL032BT23 THRU NL362BT23

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NL032BT23 THRU NL362BT23

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

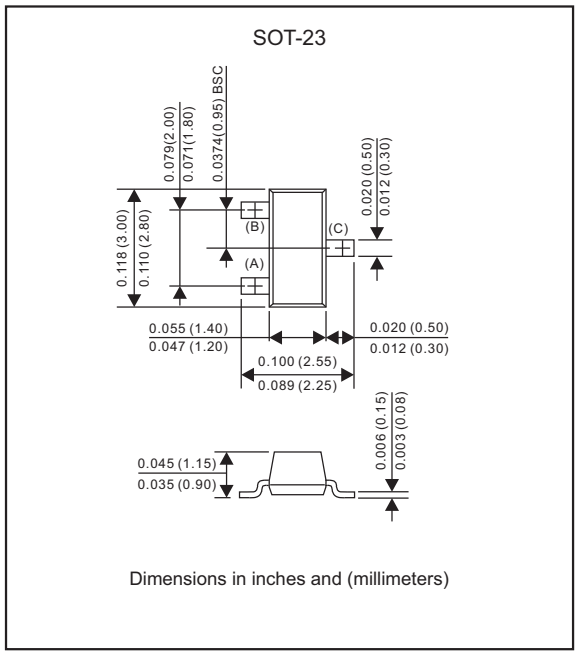
Features

- 330 - 570 Watts peak pulse power (tp=8/20us).
- Working voltages : 3.3V,5V,12V,15V,24V,36V.
- Protects two bidirectional I/O lines.
- Low clamping voltage.
- Low leakage current.
- IEC61000-4-2 (ESD) ±15kV (air), ±8kV (contact)
- IEC61000-4-4 (EFT) 40A (5/50ns)
- Suffix "-H" indicates Halogen-free part, ex.NL032BT23-H.

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	Condition	Symbol	Value	Unit
Peak pulse power	tp = 8/20 us waveform(Note 1'2)	P_{PP}	330 - 570	W
ESD Voltage	Per IEC61000-4-2 NL032BT23 Thru NL242BT23 Contact Air NL362BT23 Contact Air	V_{ESD}	 ±30 ±30 ±8 ±15	kV
Operating junction temperature range		T_J	-55~+125	°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_{PP}(A) Max. (Note 1'2)	V_C(V)@ I_{PP} Max. (Note 1'2)	P_{PK}(W) Max. (Note 1'2)	C_J(pF) Typ. (Note 3)	C_J(pF) Max. (Note 3)
NL032BT23	3.3	1.0	4.0	30.0	12.0	360	62	80
NL052BT23	5.0	1.0	6.0	20.0	25.0	500	75	90
NL122BT23	12.0	1.0	13.3	12.0	30.0	360	40	45
NL152BT23	15.0	1.0	16.7	10.0	35.0	350	25	30
NL242BT23	24.0	1.0	26.7	6.0	55.0	330	15	20
NL362BT23	36.0	1.0	40.0	6.0	95.0	570	15	18

Note:
1. Non-repetitive current pulse 8/20 us exponential decay waveform according to IEC 61000-4-5.
2. Measured form pin A to pin C or pin B to pin C.
3. MeasureD at V_R= 0Vdc,f=1MHZ.

Rating and characteristic curves (NL032BT23 THRU NL362BT23)

FIG.1 Pulse Waveform

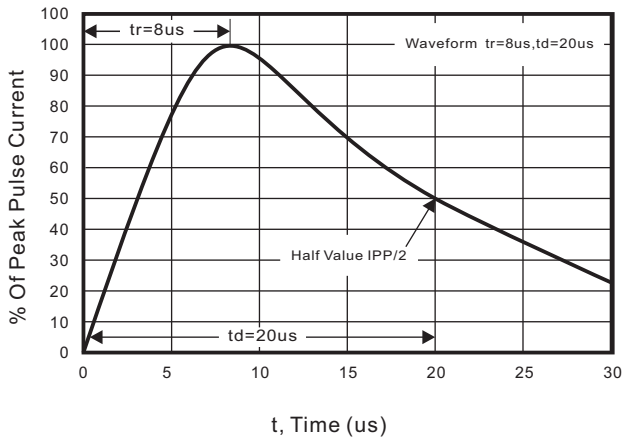


FIG.2 Power Derating Curve

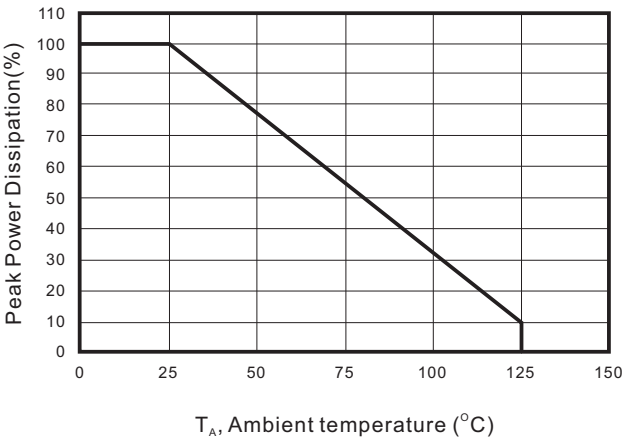
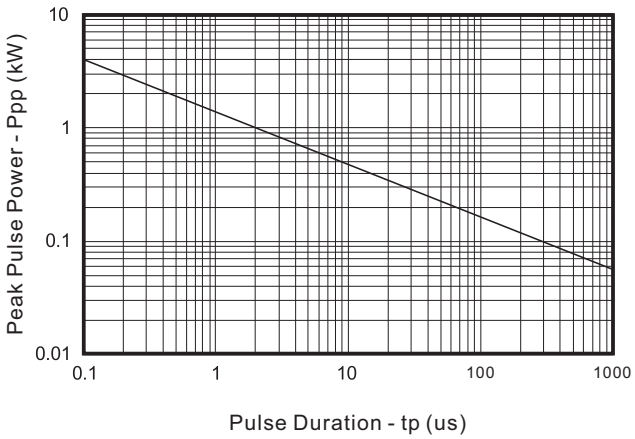


FIG.3 Non-Repetitive Peak Pulse Power vs. Pulse Time



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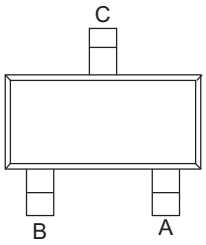
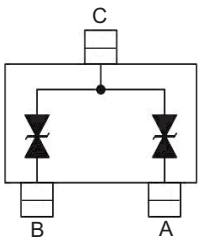
Pinning information

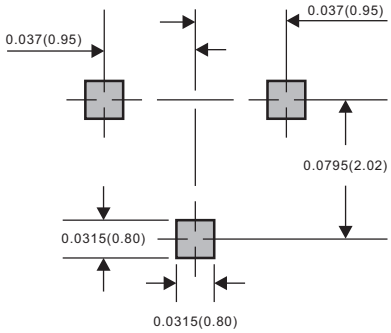
Pin Configuration	Circuit Diagram
	

Marking

Type number	Marking code
NL032BT23	3B2
NL052BT23	5B2
NL122BT23	AB2
NL152BT23	BB2
NL242BT23	CB2
NL362BT23	DB2

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)

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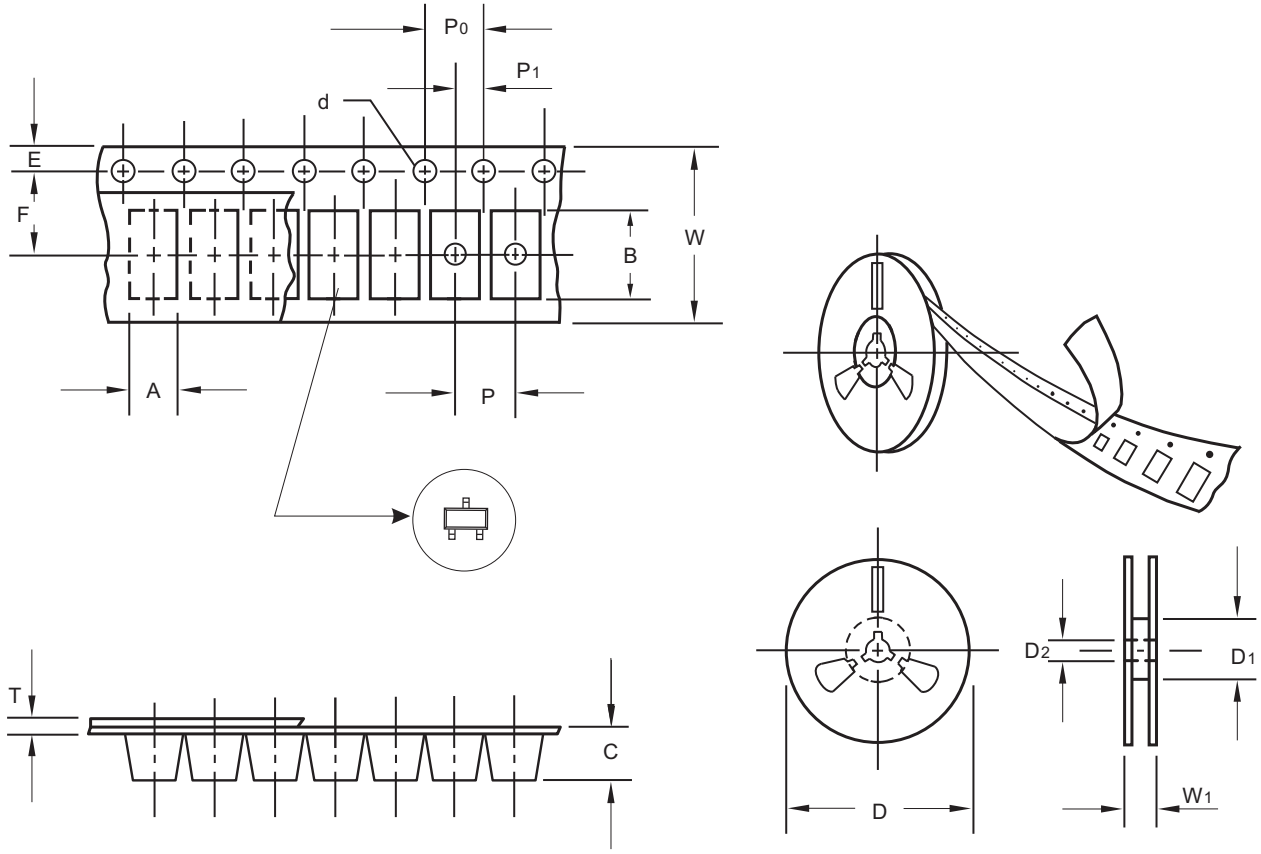
Packing information



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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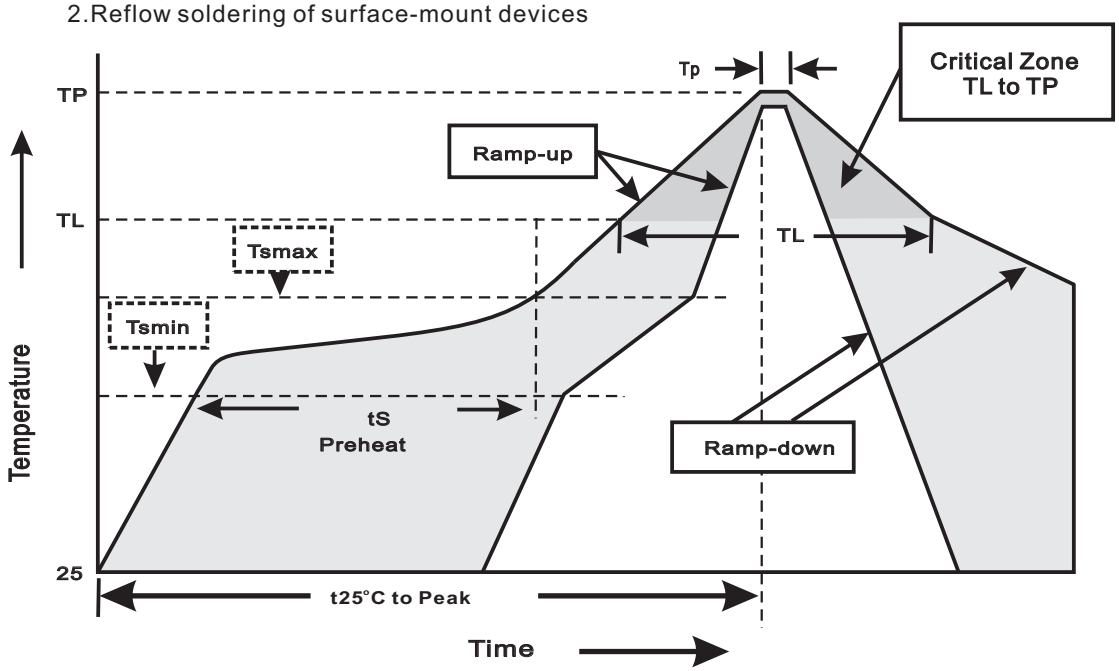
Reel packing

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 150°C for 1000 hrs.	MIL-STD-750D METHOD-1031