

NL242BT23-Q1

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NL242BT23-Q1

Surface Mount TVS For ESD Protection Diode 24V

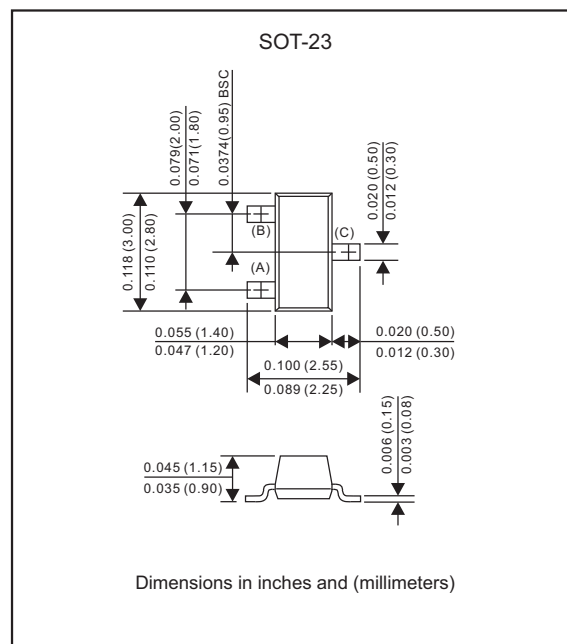
Features

- 330 Watts peak pulse power ($t_p=8/20\mu s$).
- Working voltages : 24V.
- Protects two bidirectional I/O lines.
- Low clamping voltage.
- Low leakage current.
- IEC61000-4-2 (ESD) $\pm 30\text{KV}$ (air), $\pm 30\text{KV}$ (contact)
- IEC61000-4-4 (EFT) 40A (5/50ns)
- Qualified to AEC-Q101 standards for high reliability.
- Suffix "-H" indicates Halogen-free part, ex. NL242BT23-Q1-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



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

Parameter	Condition	Symbol	Value	Unit
Peak pulse power	$t_p = 8/20 \mu s$ waveform (Note 1'2)	PPp	330	W
ESD Voltage	Per IEC61000-4-2 Contact Air	V_{ESD}	± 30 ± 30	kV
Operating junction temperature range		T_J	$-55 \sim +125$	$^\circ\text{C}$
Storage temperature range		T_{STG}	$-55 \sim +150$	$^\circ\text{C}$

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

Part No.	V_{RWM} (V) Max.	$I_R(\mu A)$ @ 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)
NL242BT23-Q1	24.0	1.0	26.7	6.0	55.0	330	15	20

Note:

1. Non-repetitive current pulse 8/20 μs exponential decay waveform according to IEC 61000-4-5.
2. Measured from pin A to pin C or pin B to pin C.
3. Measured at $V_R = 0V_{dc}$, $f = 1\text{MHz}$.

Rating and characteristic curves (NL242BT23-Q1)

FIG.1 Pulse Waveform

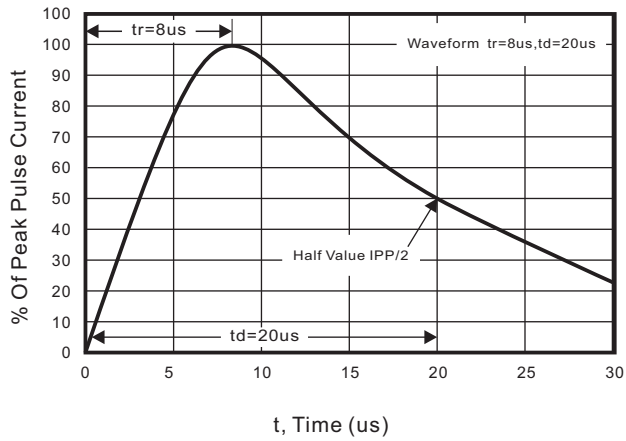


FIG.2 Power Derating Curve

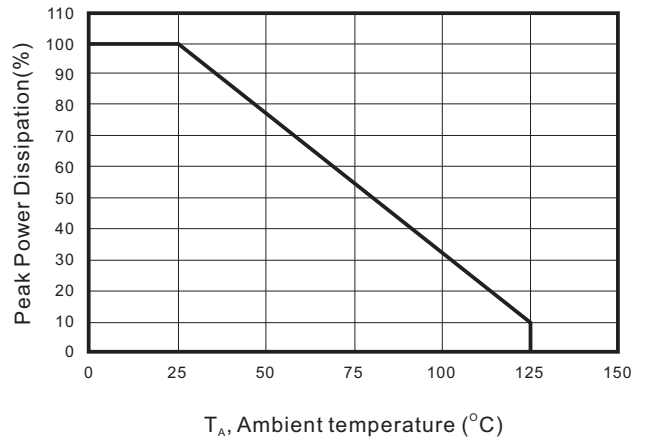
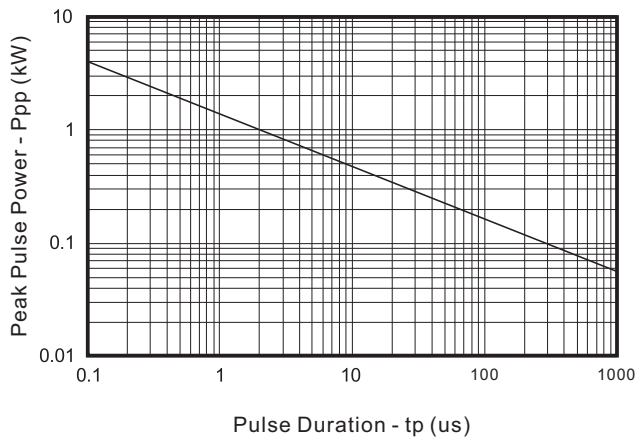
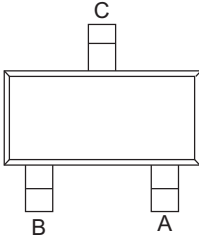
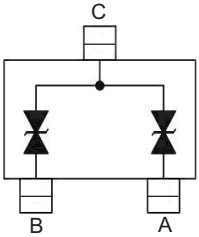


FIG.3 Non-Repetitive Peak Pulse Power vs. Pulse Time



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Pinning information

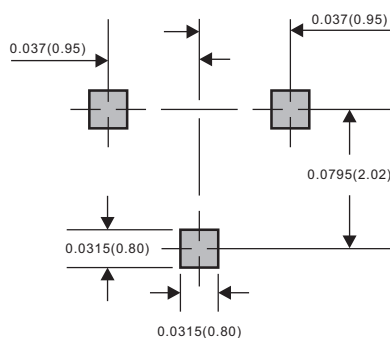
Pin Configuration	Circuit Diagram
	

Marking

Type number	Marking code
NL242BT23-Q1	CB2

Suggested solder pad layout

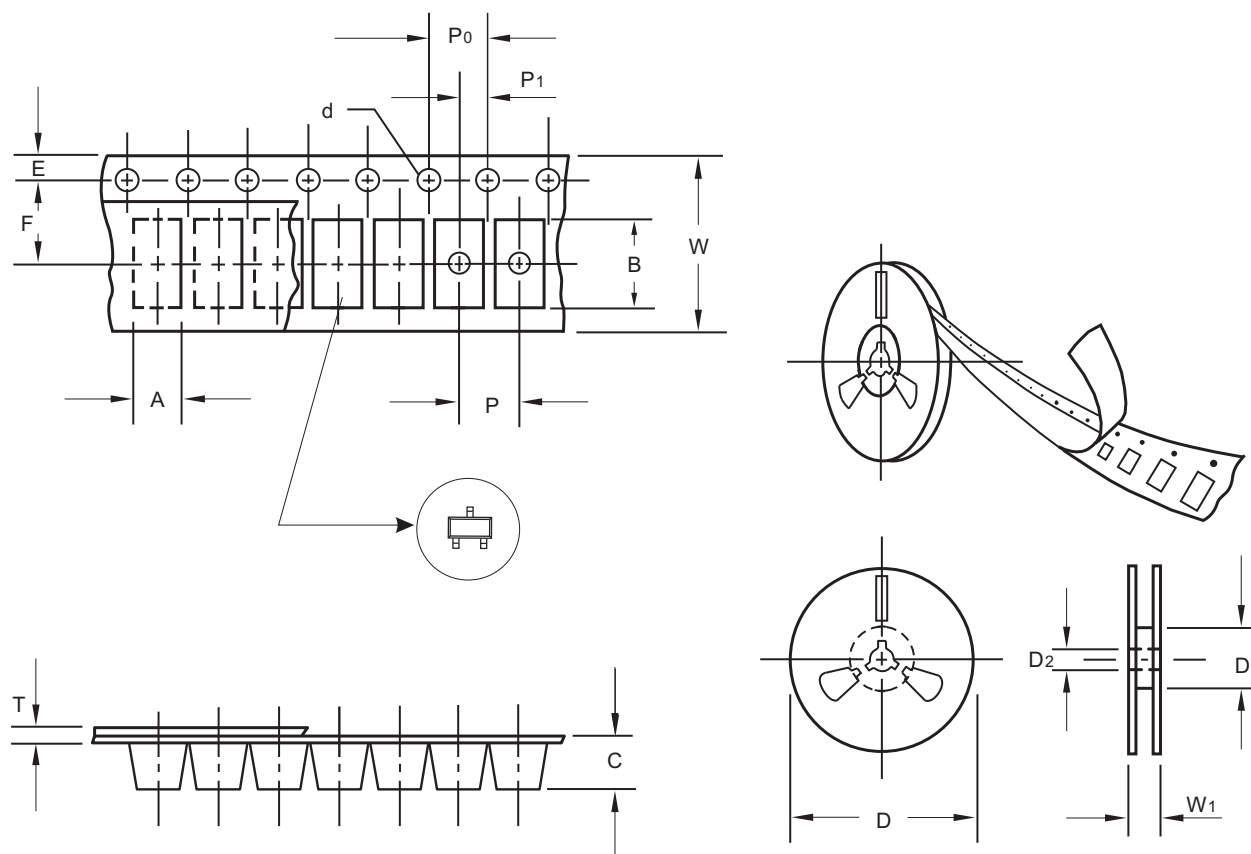
SOT-23



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 accordance with EIA standard RS-481-A and specifications listed above.

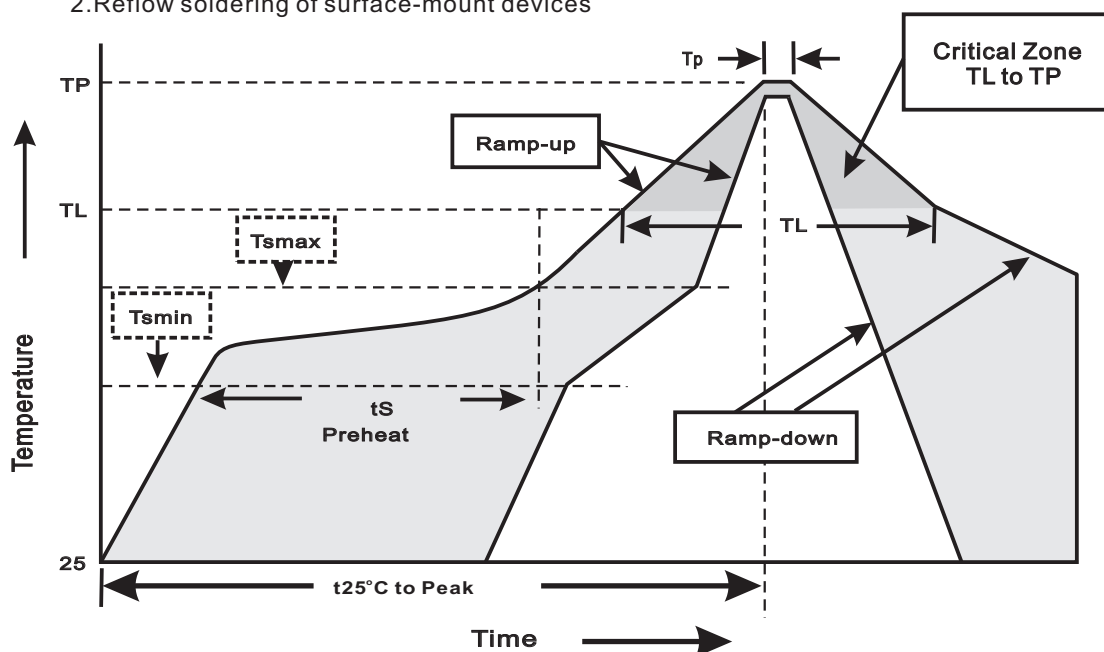
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Reel packing

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)	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(T _{smin}) -Temperature Max(T _{smax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smax} 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. MSL Preconditioning	24hr bake@125°C+168hrs@85°C /85%RH+3xIR@260°C+1flux immersion+alcohol+DI H2O rinse	JESD22-A113
2. High Temperature Reverse Bias	$V_{BR}=V_{BR\ Nom}*80\%$ ($T_j=150^{\circ}C$) Test Duration:1000hrs	JESD22-A108
3. High Temperature Storage Life	$T_a=125^{\circ}C$ Test Duration: 1000hrs	JESD22 A-103
4. Temperature Cycle	$-55^{\circ}C$ (15min) to $150^{\circ}C$ (15min) Test Cycles: 1000cycles	JESD22 A-104
5. Autoclave	$P=2atm$ $T_a=121^{\circ}C$ $RH=100\%$ Test Duration:96hrs	JESD22 A-102
6. Solderability	$245\pm5^{\circ}C$ for 5sec	J-STD-002
7. Moisture Resistance	$T_a=85^{\circ}C/85\%$ Relative humidity Test Duration:1000hrs	MIL-STD-750E METHOD 1021.2
8. Resistance To Solder Heat	$260\pm5^{\circ}C$ for 10sec	JESD22 B-106
9. High Temperature High Humidity Reverse Bias	$T_a=85^{\circ}C$, 85%RH, with device reverse biased at 80% of rated breakdown voltage up to a maximum of 100V or limit of chamber Test Duration:1000hrs	JESD22-A101