

N24BT1608-Q1

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N24BT1608-Q1

110W Surface Mount TVS Bi-Directional ESD Protection - 24V

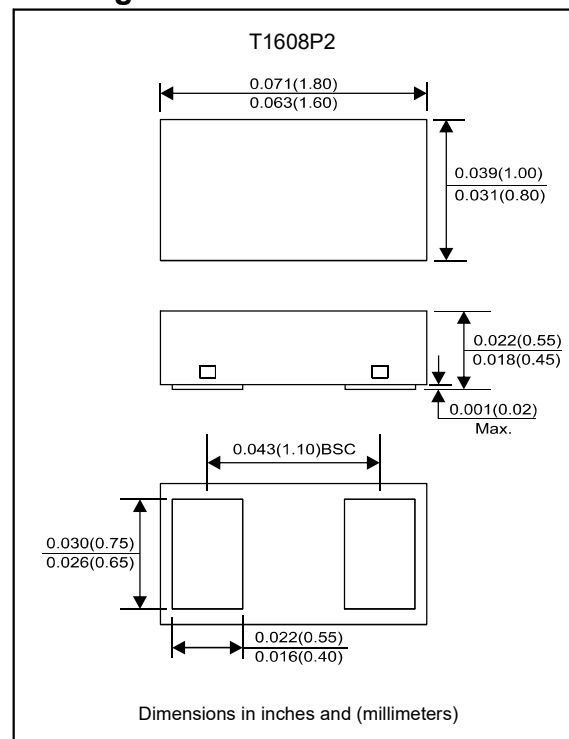
Features

- Bi-directional ESD protection.
- Surface mount package.
- Ultra small SMD package.
- High component density.
- AEC-Q101 Qualified.
- Response time is typically < 1ns.
- Suffix "-H" indicates Halogen-free parts, ex.N24BT1608-Q1-H

Mechanical data

- Case T1608P2 Standard package, molded plastic.
- Terminalis : Gold plated, solder able per MIL-STD-750, Method 2026.
- Mounting position : Any.
- Weight : 0.003 grams (Approx).

Package outline



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

Parameter	Symbol	Value	Unit
Peak pulse power ($t_p=8/20\mu\text{s}$)	P_{PP}	110	W
Electrostatic discharge voltage (IEC61000-4-2 Contact & Air)	V_{ESD}	± 25	KV
Peak pulse current ($t_p=8/20\mu\text{s}$, IEC61000-4-5)	I_{PP}	2.5	A
Operating temperature	T_J	+125	$^{\circ}\text{C}$
Storage temperature	T_{STG}	-55 to +150	$^{\circ}\text{C}$

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

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse stand-off voltage		V_{RWM}			24	V
Breakdown voltage	$I_T=1\text{mA}$	V_{BR}	26.5	28	32	V
Reverse leakage current	$V_{RWM}=24\text{V}$	I_R			100	nA
Clamping voltage	$I_{PP}=1\text{A}$, $t_p=8/20\mu\text{s}$	V_C			36	V
	$I_{PP}=2.5\text{A}$, $t_p=8/20\mu\text{s}$				44	
Junction capacitance	$V_R=0\text{V}$, $f=1\text{MHz}$	C_J		16	25	pF

Rating and characteristic curves(N24BT1609-Q1)

Fig.1 - 8/20 μ s Peak Pulse Current Waveform ACC. IEC 61000-4-5

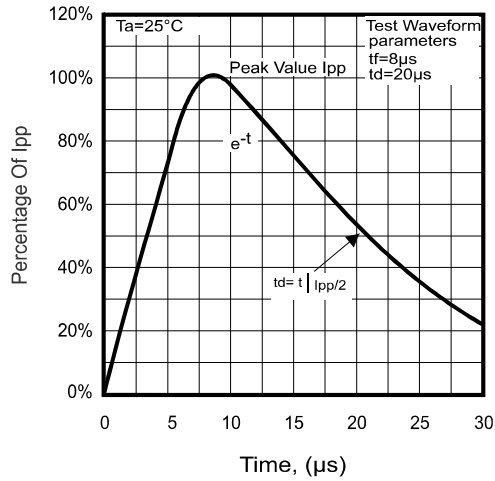


Fig.2 - Power Rating Derating Curve

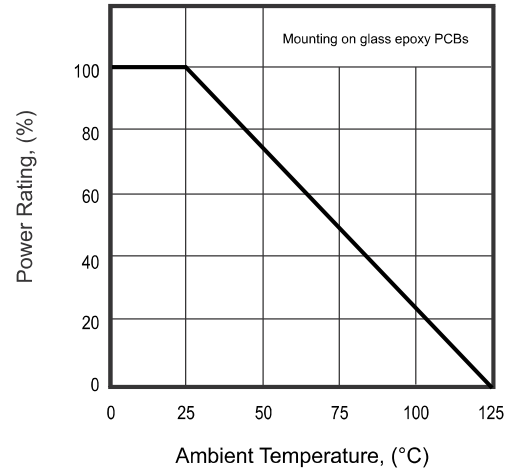


Fig.3 - Clamping Voltage Vs. Peak Pulse Current

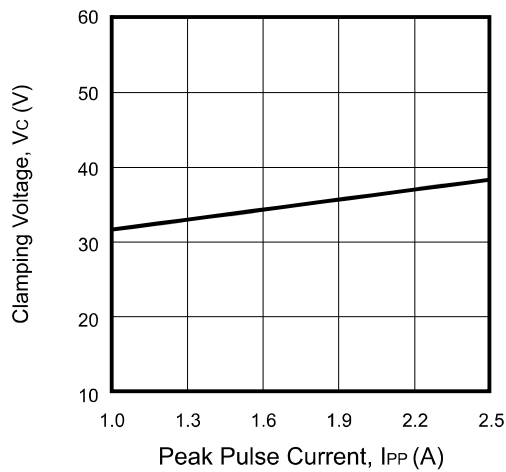
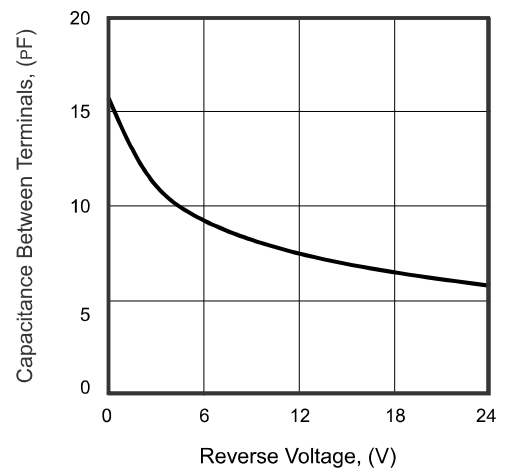


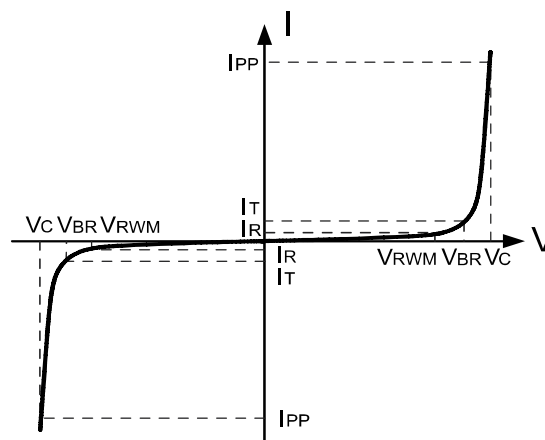
Fig.4 - Capacitance Between Terminals Characteristics



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Electrical Parameters ($T_A=25^{\circ}\text{C}$)

Symbol	Parameter
I_{PP}	Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Reverse Stand-Off Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_R
I_T	Test Current

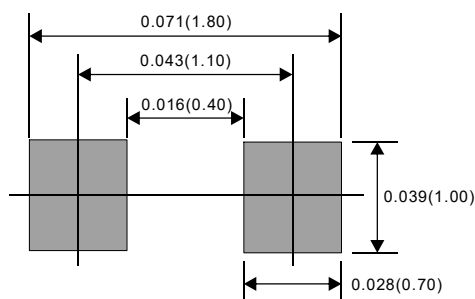


Pinning information

Marking Code	Symbol
E24	

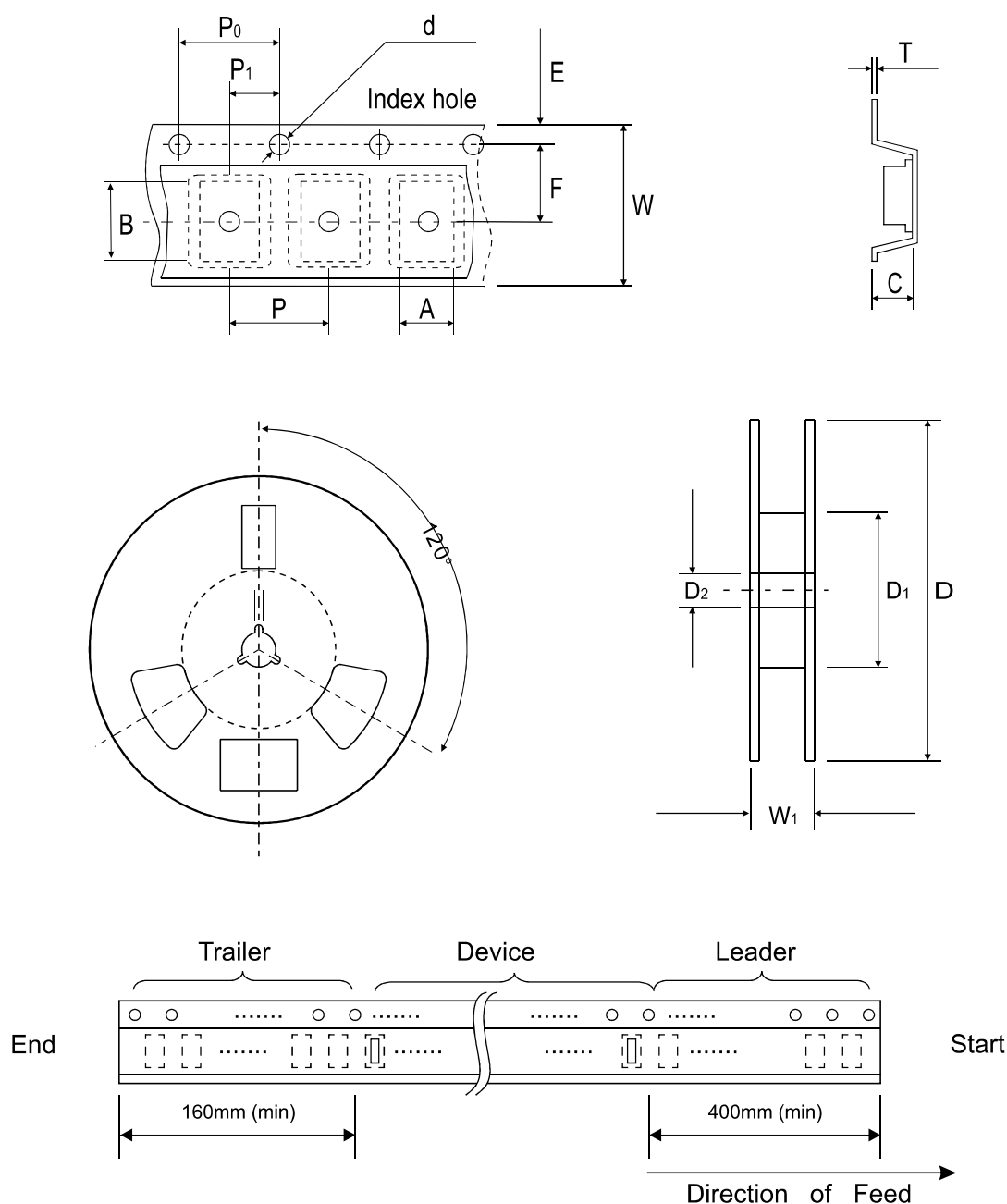
Suggested solder pad layout

T1608P2



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Packing information



T1608P2	SYMBOL	A	B	C	d	D	D ₁	D ₂
	(mm)	1.05 ± 0.05	1.96 ± 0.05	0.57 ± 0.05	1.50 ± 0.10	178 ± 1.00	60.0 ± 0.50	13.50 ± 0.20
	(inch)	0.041 ± 0.002	0.077 ± 0.002	0.022 ± 0.0042	0.059 ± 0.004	7.008 ± 0.04	2.362 ± 0.020	0.531 ± 0.008

T1608P2	SYMBOL	E	F	P	P ₀	P ₁	T	W	W ₁
	(mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.05	2.00 ± 0.05	0.20 ± 0.03	8.00 ± 0.20	12.00 + 0.50 - 0
	(inch)	0.069 ± 0.004	0.138 ± 0.002	0.157 ± 0.004	0.157 ± 0.002	0.079 ± 0.002	0.008 ± 0.001	0.315 ± 0.008	0.472 + 0.020 - 0

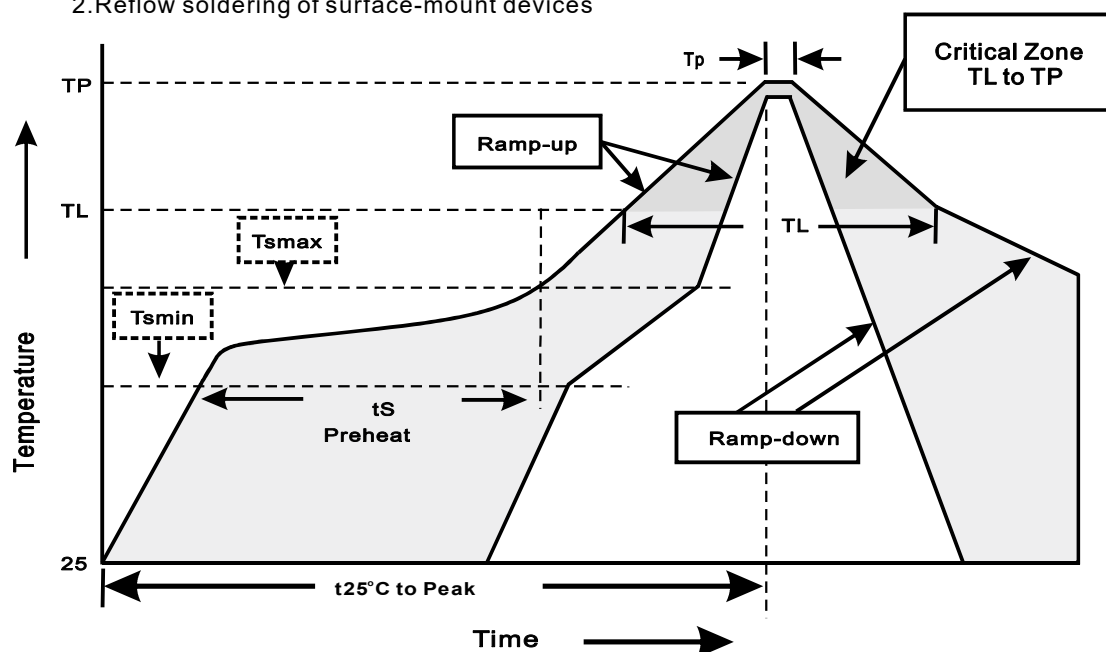
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Reel packing

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)
T1608P2	7"	4,000	2.0	40,000	183*123*183	178	382*257*387	320,000	9.5

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(TL to TP)	<3°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(ts)	150°C 200°C 60~120sec
Tsmax to TL -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(TL) -Time(tL)	217°C 60~260sec
Peak Temperature(TP)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(tp)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes