

N20UT2020P3

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**Surface Mount Uni-Directional TVS
For ESD Protection Diode : 20V**

Features

- 6500W peak pulse power ($t_p=8/20\mu s$).
- Ultra low clamping voltage.
- One power line protects.
- Provide transient protection:
IEC 61000-4-2 (ESD) $\pm 30KV$ (Air), $\pm 30KV$ (Contact).
IEC 61000-4-5 (Lightning) 140A (8/20us).
- Suffix "-H" indicates Halogen-free part, ex.N20UT2020P3-H.

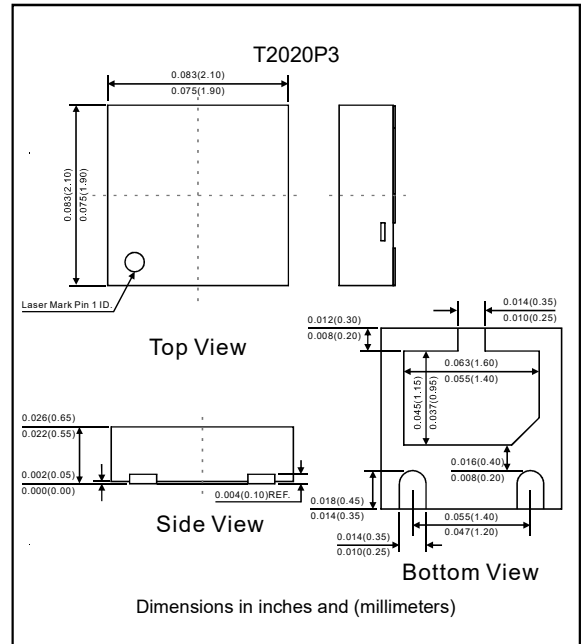
Applications

- Power Management.
- Industrial application.
- Power supply protection.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, T2020P3
- Terminals : Solder plated, solder able per MIL-STD-750, Method 2026.
- Mounting Position : Any
- Weight : Approximated 0.005 gram

Package outline



Absolute maximum ratings (At $T_A=25^\circ C$ unless otherwise specified)

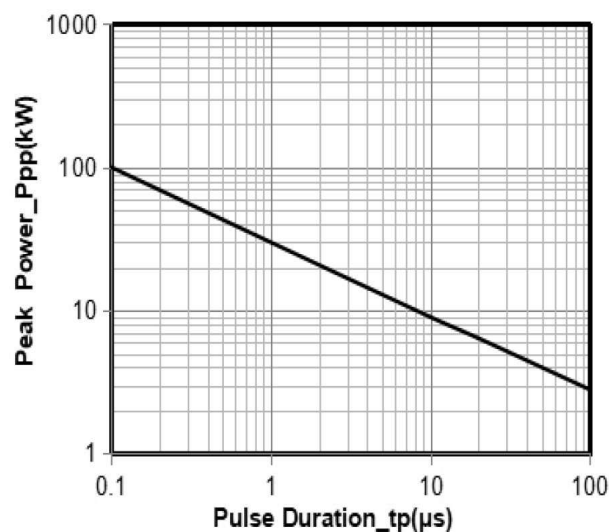
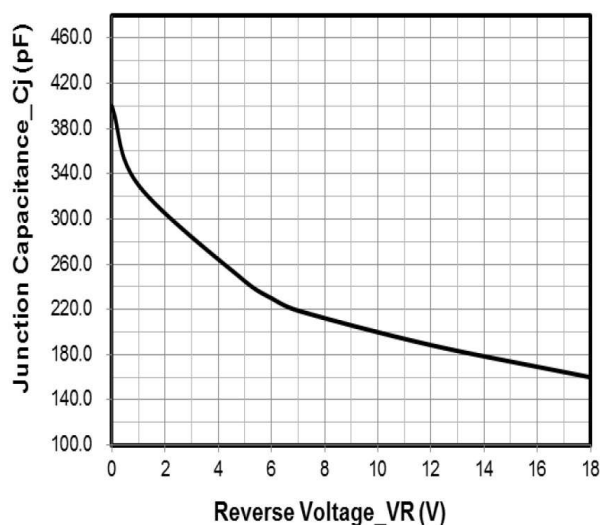
Parameter	Symbol	Value	Unit
Peak pulse power ($t_p=8/20\mu s$)	P_{PP}	6500	W
Electrostatic discharge voltage (IEC61000-4-2 Contact & Air)	V_{ESD}	± 30	KV
Peak pulse current ($t_p=8/20\mu s$, IEC61000-4-5)	I_{PP}	145	A
Operating temperature	T_J	+125	$^\circ C$
Storage temperature	T_{STG}	-55 to +150	$^\circ C$

Electrical characteristics (At $T_A=25^\circ C$ unless otherwise specified)

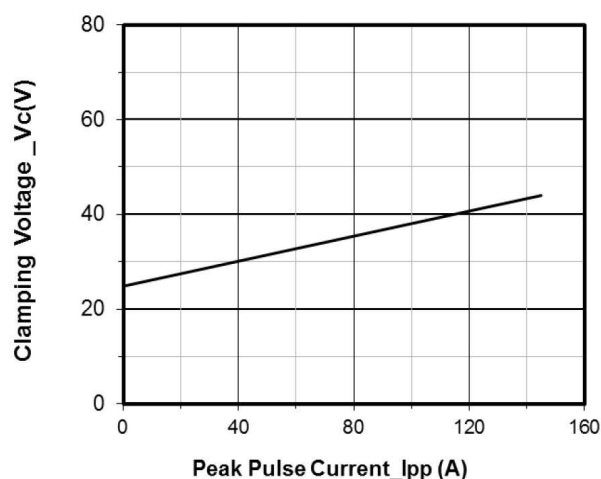
Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse stand-off voltage		V_{RWM}			20	V
Breakdown voltage	$I_T=1mA$	V_{BR}	22			V
Reverse leakage current	$V_{RWM}=18V$	I_R			0.5	μA
Clamping voltage	$I_{PP}=20A$, $t_p=8/20\mu s$	V_C			28	V
	$I_{PP}=145A$, $t_p=8/20\mu s$				45	
Junction capacitance	$V_R=0V$, $f=1MHz$	C_J			440	pF

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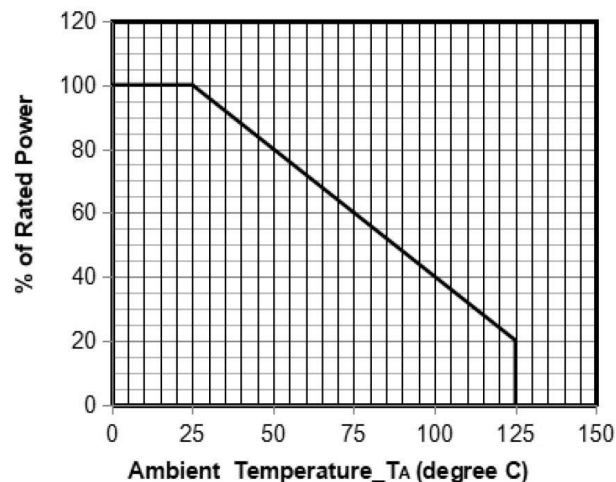
Rating and characteristic curves



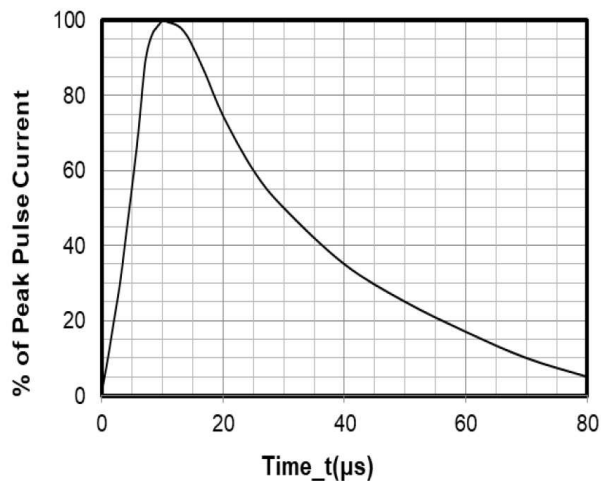
Novction Capacitance vs. Reverse Voltage



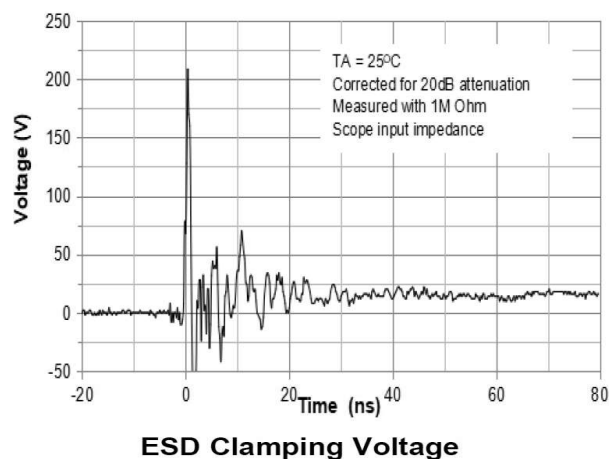
Peak Pulse Power vs. Pulse Time



Clamping Voltage vs. Peak Pulse Current

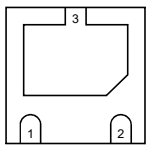


Power Derating Curve

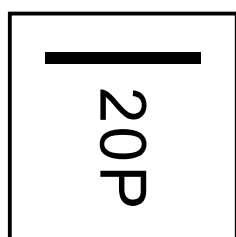


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Pinning information

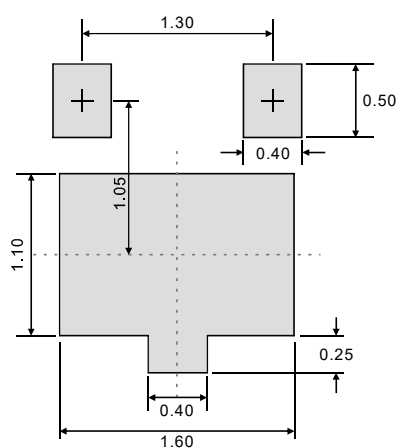
Pin	Pin Schematic	Circuit Daiagram
Pin 1, 2 : Anode Pin 3 : Cathode	 Transparent Top View	

Marking



20P = Device Marking Code
Bar denotes cathode

Suggested solder pad layout



Dimensions in millimeters

Suggested thermal profiles for soldering processes

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Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	$<3^{\circ}\text{C}/\text{sec}$
Preheat -Temperature Min(T_{min}) -Temperature Max(T_{max}) -Time(min to max)(t_s)	150°C 200°C $60\sim 120\text{sec}$
T_{max} to T_L -Ramp-upRate	$<3^{\circ}\text{C}/\text{sec}$
Time maintained above: -Temperature(T_L) -Time(t_L)	217°C $60\sim 260\text{sec}$
Peak Temperature(T_P)	$255^{\circ}\text{C}-0/+5^{\circ}\text{C}$
Time within 5°C of actual Peak Temperature(t_P)	$10\sim 30\text{sec}$
Ramp-down Rate	$<6^{\circ}\text{C}/\text{sec}$
Time 25°C to Peak Temperature	$<6\text{minutes}$

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High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at $260 \pm 5^{\circ}\text{C}$ for $10 \pm 2\text{sec.}$	MIL-STD-750D METHOD-2031
2. Solderability	at $245 \pm 5^{\circ}\text{C}$ for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_{\text{BR}} = V_{\text{BR Min}} * 80\%$ at $T_{\text{J}} = 150^{\circ}\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	$15P_{\text{SIG}}$ at $T_{\text{A}} = 121^{\circ}\text{C}$ for 4 hrs.	JESD22-A102
5. Temperature Cycling	-55°C to $+125^{\circ}\text{C}$ dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
6. Humidity	at $T_{\text{A}} = 85^{\circ}\text{C}$, 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