

N04V5UT1610

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N04V5UT1610

Surface Mount Uni-directional TVS For ESD Protection : 4.5V

Features

- Peak pulse current : 135A ($t_p=8/20\mu s$).
- Protects one I/O line.
- Provide transient protection:
IEC 61000-4-2 (ESD) Contact $\pm 30KV$ /Air $\pm 30KV$
IEC 61000-4-4 (EFT) 40A (5/50ns)
- We declare that the material of product compliance with RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex.N04V5UT1610-H

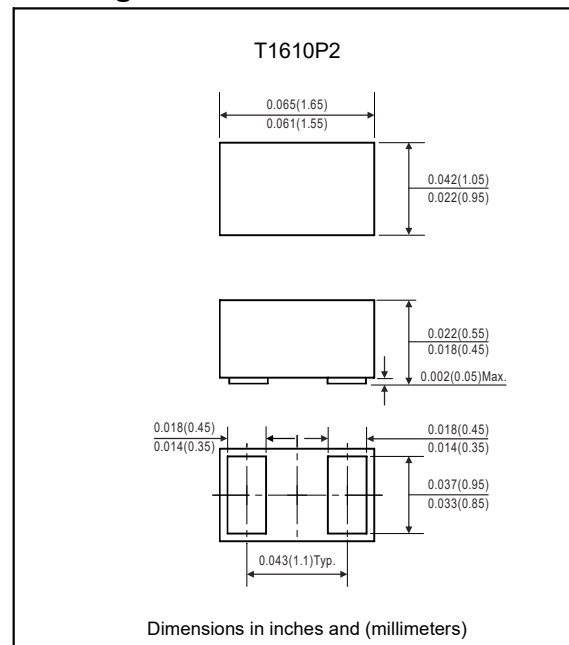
Applications

- Mobile phones and accessories.
- Battery protection.
- USB V_{BUS} .
- Power lin protection.

Mechanical data

- Case : Molded plastic, T1610P2.
- Flammability rating : UL94V-0.
- Weight : Approximated 2.5 mg

Package outline



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

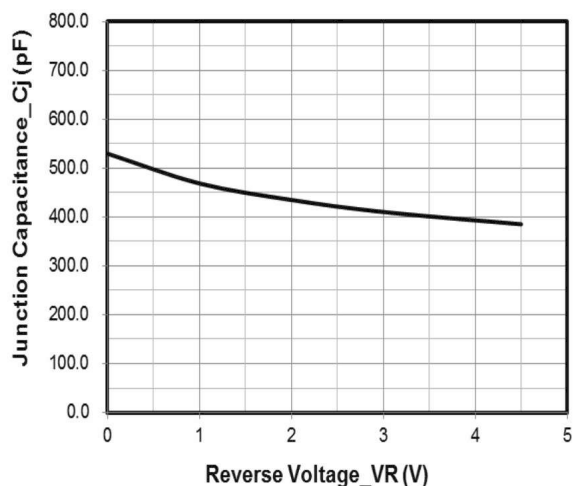
Parameter	Symbol	Value	Unit
Peak pulse current (8/20 μs)	I_{PP}	135	A
Electrostatic discharge voltage (IEC61000-4-2 Contact & Air)	V_{ESD}	± 30	KV
Operating temperature range	T_J	-55 ~ +125	$^\circ C$
Storage temperature	T_{STG}	-55 to +150	$^\circ C$
Lead soldering temperature (10 sec.)	T_L	260	$^\circ C$

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

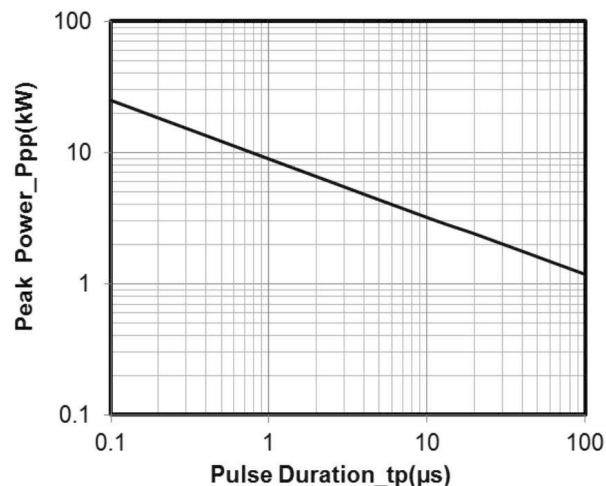
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				4.5	V
Reverse leakage current	I_R	$V_{RWM} = 4.5V$			0.2	μA
Breakdown voltage	V_{RWM}	$I_T = 1mA$	4.8			V
Forward voltage	V_F	$I_F = 10mA$		0.75		V
Clamping voltage ($t_p = 8/20\mu s$)	V_C	$I_{PP} = 10A$			7.0	V
		$I_{PP} = 135A$			18	
Junction capacitance	C_{ESD}	$V_R = 0V, f=1MHz$			600	pF

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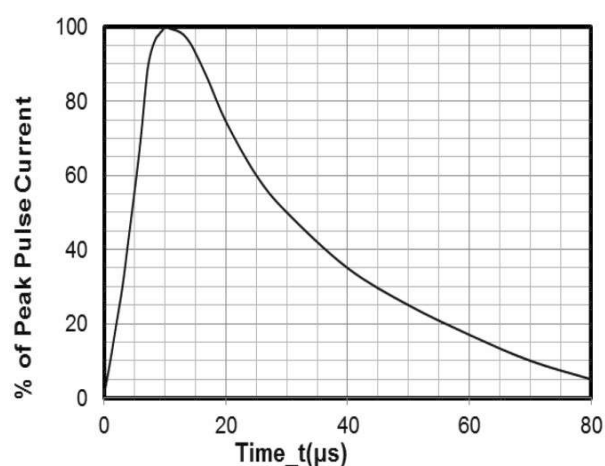
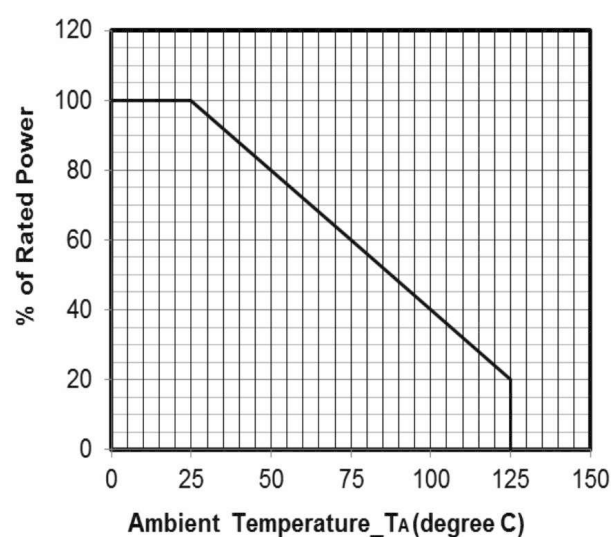
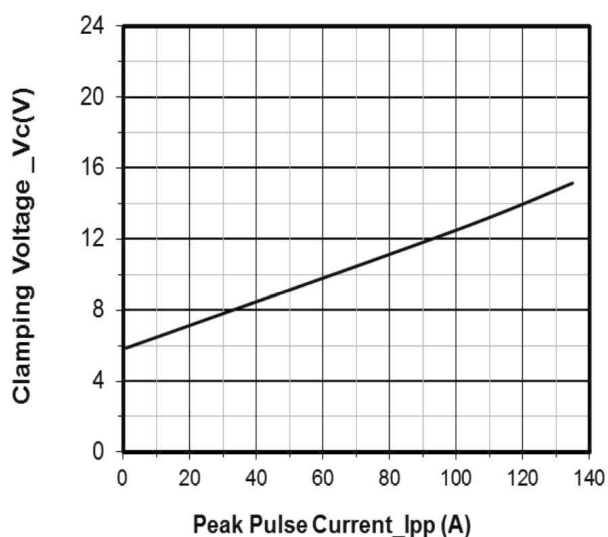
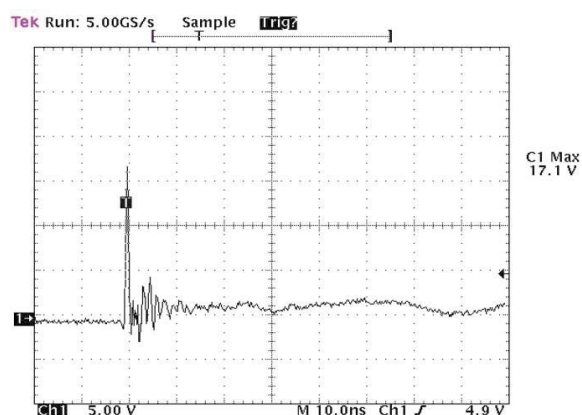
Typical performance characteristics



Junction Capacitance vs. Reverse Voltage



Peak Pulse Power vs. Pulse Time

8 X 20 μ s Pulse Waveform

Note: Data is taken with a 10x attenuator

ESD Clamping Voltage

+8 kV Contact per IEC61000-4-2

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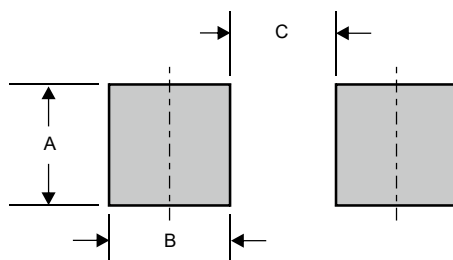
Pinning information

Pin	Simplified outline	Symbol
Pin1 Cathode Pin2 Anode		

Marking

Type number	Marking code
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Suggested solder pad layout

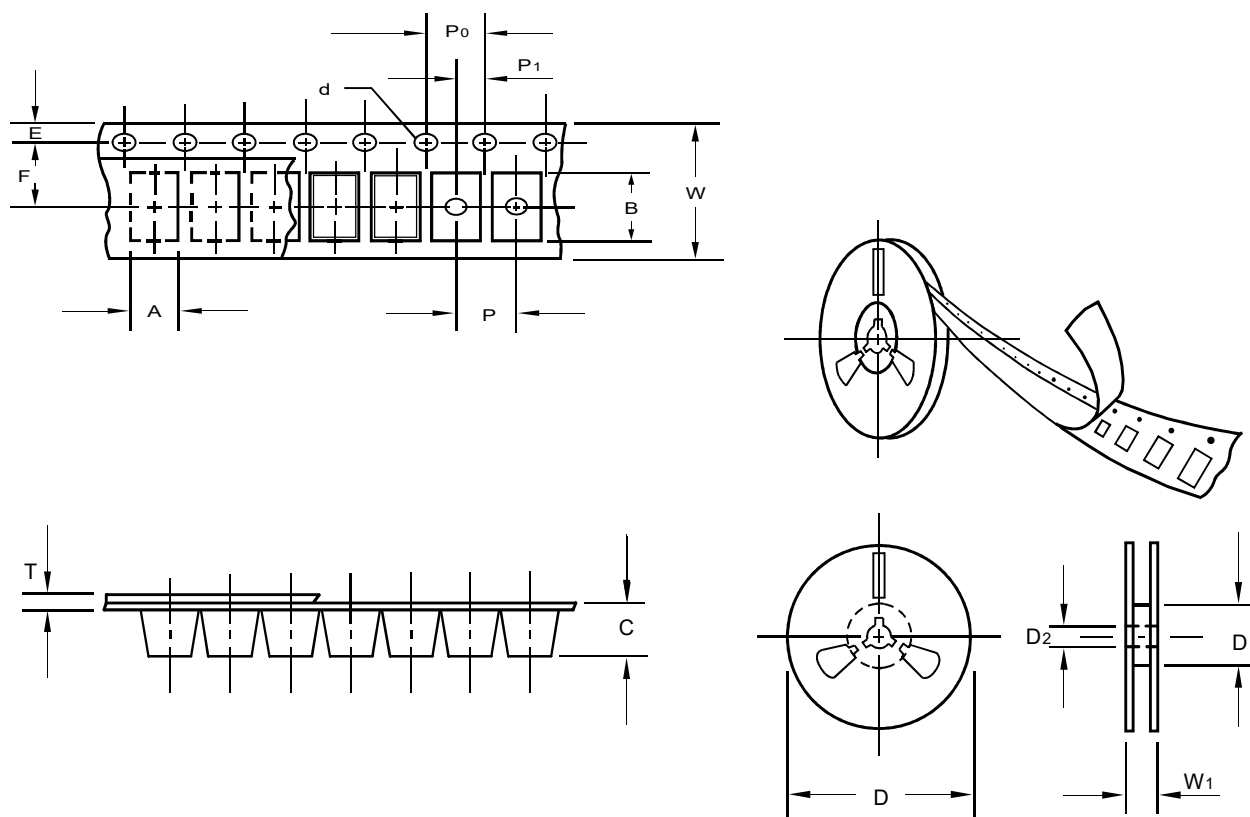


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
T1610P2	0.039 (1.00)	0.025 (0.625)	0.024 (0.60)

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Packing information



unit:mm

Item	Symbol	Tolerance	T1610P2
Carrier width	A	0.1	1.15
Carrier length	B	0.1	1.80
Carrier depth	C	0.1	0.63
Sprocket hole	d	0.1	1.55
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D ₁	min	50.00
Feed hole diameter	D ₂	0.2	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	2.00
Sprocket hole pitch	P ₀	0.1	4.00
Embossment center	P ₁	0.1	2.00
Overall tape thickness	T	0.1	0.20
Tape width	W	0.3	8.00
Reel width	W ₁	1.0	9.50

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

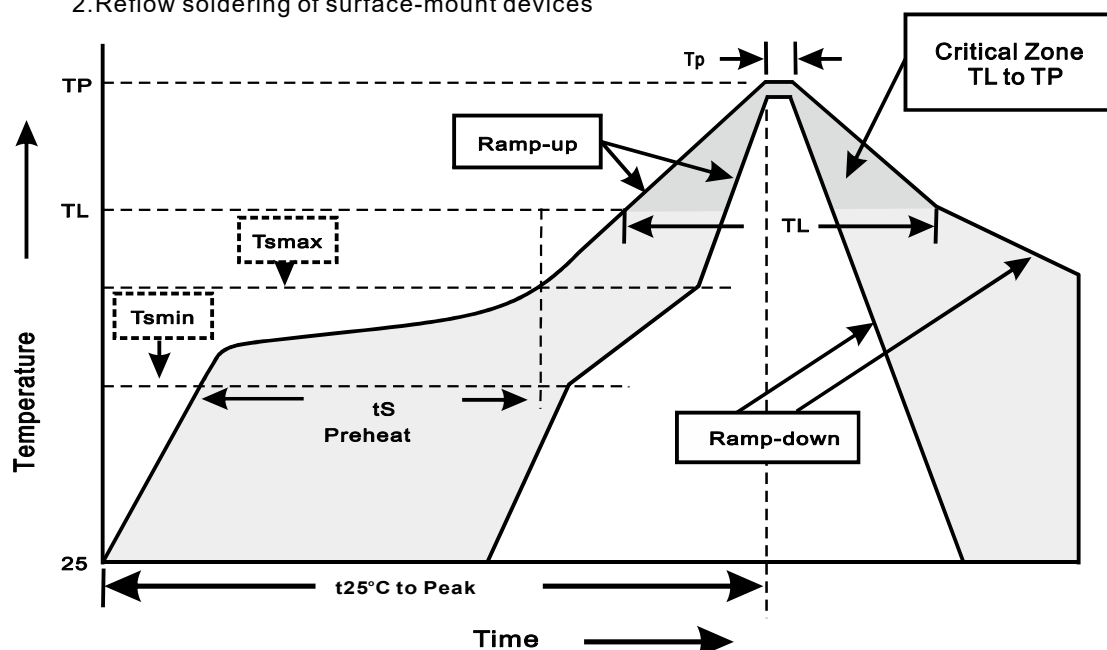
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Reel packing

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)
T1610P2	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	9.6

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. 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 $T_J = 150^\circ\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	$15P_{\text{SIG}}$ at $T_A = 121^\circ\text{C}$ 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 $T_A = 85^\circ\text{C}$, 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