

Formosa MS

N05UT1610A Thru N36UT1610A

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N05UT1610A Thru N36UT1610A

1600W Uni-directional TVS For ESD Protection : 5V ~ 36V

Features

- Protects one I/O line (Unidirectional).
- Provide transient protection:
IEC 61000-4-2 (ESD) Contact $\pm 30\text{KV}$ / Air $\pm 30\text{KV}$.
IEC 61000-4-4 (EFT) 80A (5/50ns).
- We declare that the material of product compliance with RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex. N05UT1610A-H.

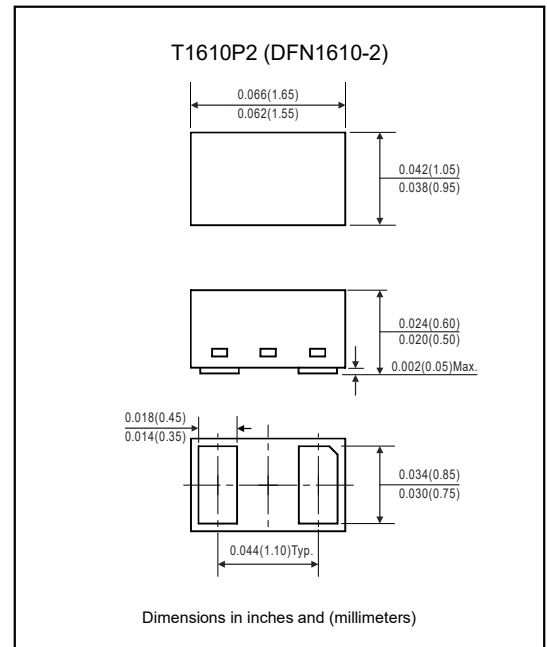
Applications

- USB voltage bus.
- Battery protection.
- Mobile devices.
- Screen panels.
- Other power rails.

Mechanical data

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

Package outline



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

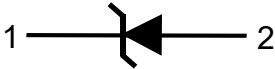
Parameter	Symbol	Value	Unit
Peak pulse power (8 / 20 μs)	I_{PP}	1600	W
Electrostatic discharge voltage (IEC61000-4-2 Contact & Air)	V_{ESD}	± 30	KV
Operating temperature range	T_{OPT}	-55 ~ +125	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^\circ\text{C}$

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

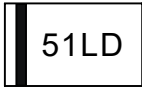
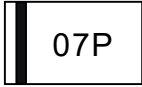
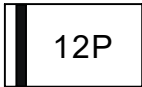
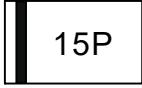
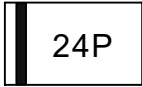
Parameter	Conditions	Symbol	N05UT 1610A	N07UT 1610A	N12UT 1610A	N15UT 1610A	N20UT 1610A	N24UT 1610A	N36UT 1610A	Unit
Reverse stand-off voltage		$V_{RWM (Max)}$	5	7	12	15	20	24	36	V
Reverse leakage current	@ $V_{RWM (Max)}$	$I_R (Max)$	0.1	0.1	0.1	0.1	0.1	0.1	0.1	μA
Breakdown voltage	$I_T = 1\text{mA}$	$V_{BR (Min)}$	6	7.5	13.3	16.5	22.0	26.0	37.0	V
		$V_{BR (Max)}$	8	10	16.0	20.0	26.0	31.5	44.0	
Peak pulse current	$t_p = 8/20\mu\text{s}$	I_{PP}	100	100	65	55	35	25	22	A
Clamping voltage	@ I_{PP}	$V_C (Max)$	20	25	40	40	45	50	75	V
Junction capacitance	$V_R=0\text{V}$, $f=1\text{MHz}$	$C_{ESD (Typ)}$	860	760	360	320	220	200	125	pF

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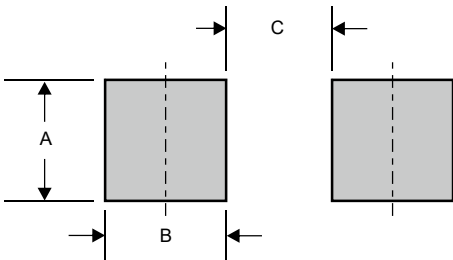
Pinning information

Pin	Simplified outline	Symbol
Pin1 Cathode Pin2 Anode		

Marking

Type number	Marking code
N05UT1610A	
N07UT1610A	
N012UT1610A	
N15UT1610A	
N20UT1610A	
N24UT1610A	
N36UT1610A	

Suggested solder pad layout

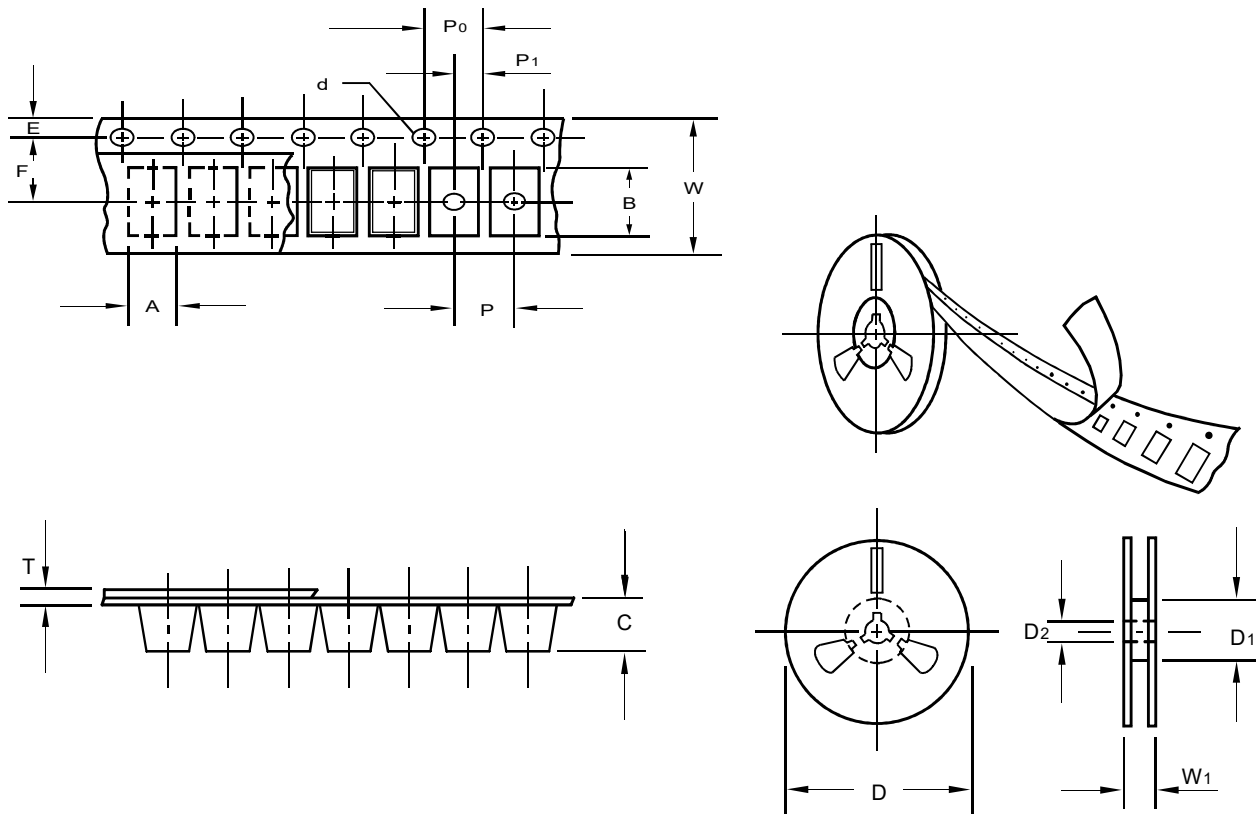


Dimensions in inches and (millimeters)

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.

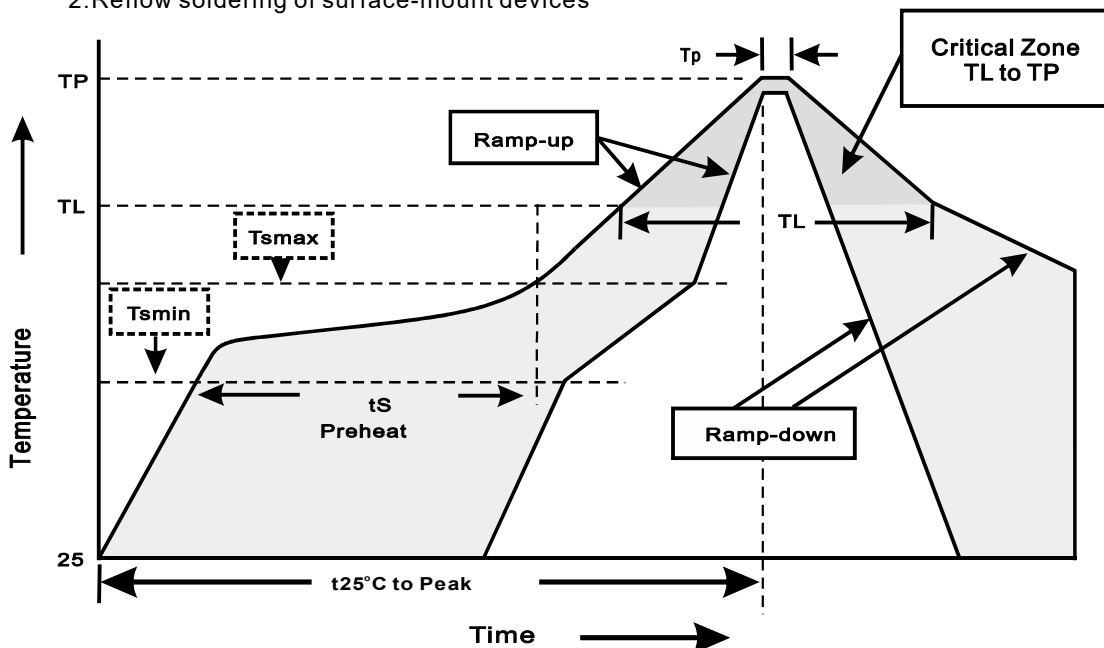
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Reel packing

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

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 _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} 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 $T_{\text{J}} = 150^{\circ}\text{C}$ 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