

T10A Series - DO-15



Agency Approvals

Agency	Agency File Number
	E128662 (68V-270V)

Pinout Designation

Not Applicable

Schematic Symbol



Description

T10A Series are SIDACTor® thyristors designed to protect baseband equipment such as modems, line cards, CPE and DSL from damaging overvoltage transients.

The series provides a cost effective through-hole solution that enables equipment to comply with global regulatory standards.

Features and Benefits

- Low voltage overshoot
- Low on-state voltage
- Does not degrade surge capability after multiple surge events within limit.
- RoHS Compliant
- Fails short circuit when surged in excess of ratings
- Low capacitance
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin(Sn) (IPC/JEDEC J-STD-609A.01)

Applicable Global Standards

- TIA-968-A
- TIA-968-B
- ITU K.20/21/45 Enhanced Level*
- ITU K.20/21/45 Basic Level
- GR 1089 Inter-building*
- GR 1089 Intra-building
- IEC 61000-4-5 2nd edition
- YD/T 1082
- YD/T 993
- YD/T 950

*A-rated parts require series resistance

Electrical Characteristics

Part Number	Marking	V_{DRM} @ $I_{DRM}=5\mu A$	V_S @ 100V/ μs	I_H	I_S	I_T	V_T @ $I_T=2.2$ Amp	Capacitance @ 1MHz, 2V Bias
		V Min	V Max	mA Min	mA Max	A Max	V Max	pF Typ
T10A060Bxx	T10A060B	50	84	120	800	2.2	4	50
T10A060Exx	T10A060E	50	84	180	800	2.2	4	50
T10A062xx	T10A062	56	86	150	800	2.2	4	50
T10A068xx	T10A068	61	94	150	800	2.2	4	50
T10A080Bxx	T10A080B	70	125	120	800	2.2	4	43
T10A080Exx	T10A080E	70	125	180	800	2.2	4	43
T10A100xx	T10A100	90	140	150	800	2.2	4	43
T10A110Bxx	T10A110B	100	142	120	800	2.2	4	38
T10A110Exx	T10A110E	100	142	180	800	2.2	4	38
T10A120xx	T10A120	108	168	150	800	2.2	4	38
T10A130xx	T10A130	117	178	150	800	2.2	4	38
T10A140Bxx	T10A140B	120	178	120	800	2.2	4	34
T10A140Exx	T10A140E	120	178	180	800	2.2	4	34
T10A180xx	T10A180	170	220	150	800	2.2	4	34
T10A180Bxx	T10A180B	170	220	120	800	2.2	4	32
T10A180Exx	T10A180E	170	220	180	800	2.2	4	32
T10A200xx	T10A200	180	275	150	800	2.2	4	30
T10A220xx	T10A220	200	275	150	800	2.2	4	30

Table continues on next page.

Electrical Characteristics (continued)

Part Number	Marking	V_{DRM} @ $I_{DRM}=5\mu A$	V_S @ $100V/\mu s$	I_H	I_S	I_T	V_T @ $I_T=2.2$ Amp	Capacitance @ 1MHz, 2V Bias
		V Min	V Max	mA Min	mA Max	A Max	V Max	pF Typ
T10A220Bxx	T10A220B	200	275	120	800	2.2	4	30
T10A220Exx	T10A220E	200	275	180	800	2.2	4	30
T10A240xx	T10A240	216	330	150	800	2.2	4	30
T10A270xx	T10A270	245	370	150	800	2.2	4	30
T10A270Bxx	T10A270B	245	370	120	800	2.2	4	30
T10A270Exx	T10A270E	245	370	180	800	2.2	4	30

Notes:

- Absolute maximum ratings measured at $T_A = 25^\circ C$.
- Components are bi-directional (unless otherwise noted).
- **XX** Part Number Suffix: "**RP**" (Reel Pack) or **Blank** (Bulk Pack)

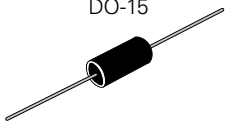
Surge Ratings

Series	I_{PP}			I_{TSM} 50/60 Hz	di/dt
	8/20 ¹ 1.2/50 ²	5/310 ¹ 10/700 ²	10/1000 ¹ 10/1000 ²		
	A min	A min	A min	A min	A/ μs max
A	100	37.5	50	20	100

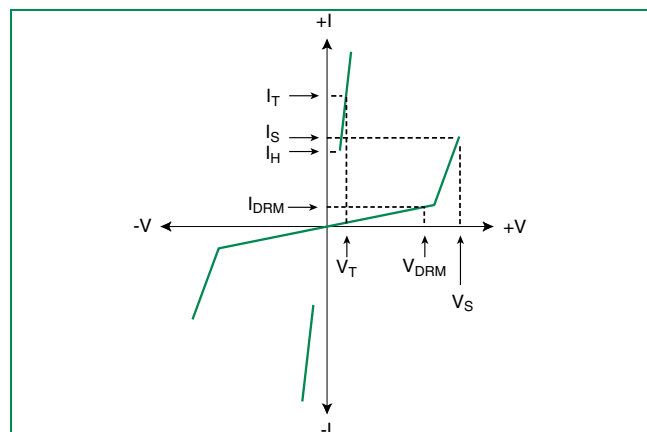
Notes:

- Current waveform in μs
 - Voltage waveform in μs
- Peak pulse current rating (I_{PP}) is repetitive and guaranteed of the product in thermal equilibrium.
 - I_{PP} ratings applicable over temperature range of $-40^\circ C$ to $+85^\circ C$.
 - The component must initially be in thermal equilibrium with $-40^\circ C \leq T_J \leq +150^\circ C$

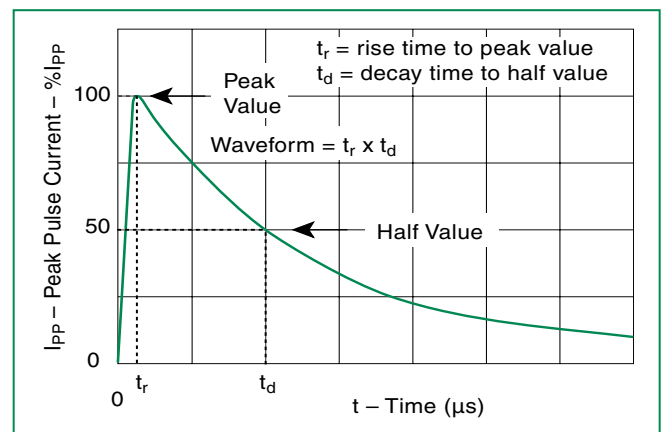
Thermal Considerations

Package	Symbol	Parameter	Value	Unit
 DO-15	T_J	Operating Junction Temperature Range	-40 to +150	$^\circ C$
	T_S	Storage Temperature Range	-65 to +150	$^\circ C$
	$R_{\theta JA}$	Thermal Resistance: Junction to Ambient	120	$^\circ C/W$

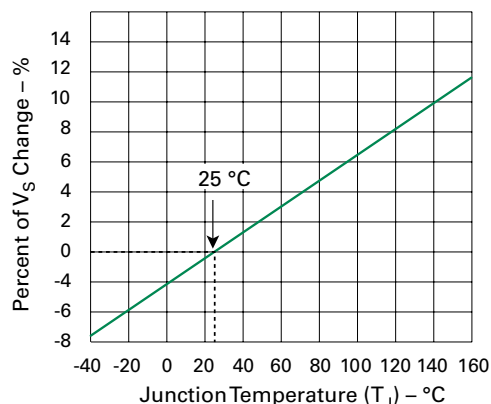
V-I Characteristics



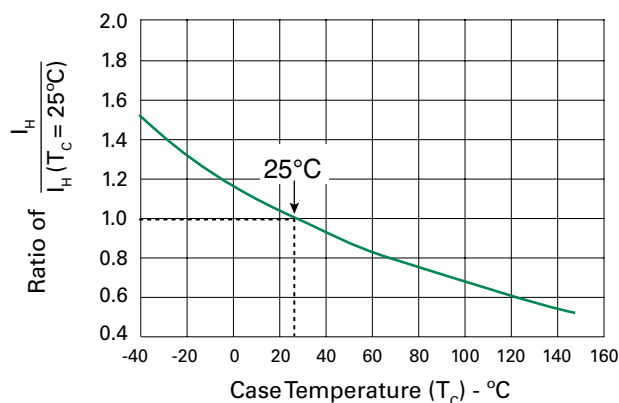
$t_r \times t_d$ Pulse Waveform



Normalized V_S Change vs. Junction Temperature

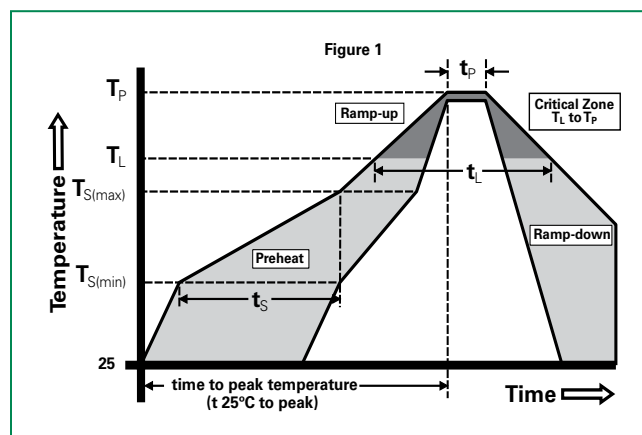


Normalized DC Holding Current vs. Case Temperature



Soldering Parameters

Reflow Condition		Pb-Free assembly (see Fig. 1)
Pre Heat	-Temperature Min ($T_{s(\min)}$)	+150°C
	-Temperature Max ($T_{s(\max)}$)	+200°C
	-Time (Min to Max) (t_s)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/sec. Max.
$T_{s(\max)}$ to T_L - Ramp-up Rate		3°C/sec. Max.
Reflow	-Temperature (T_L) (Liquidus)	+217°C
	-Temperature (t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_P)		30 secs. Max.
Ramp-down Rate		6°C/sec. Max.
Time 25°C to Peak Temp (T_P)		8 min. Max.
Do not exceed		+260°C



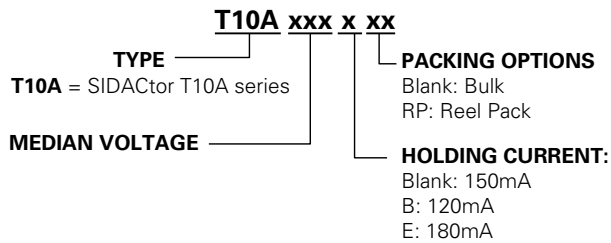
Physical Specifications

Lead Material	Copper Alloy
Terminal Finish	100% Matte-Tin Plated
Body Material	UL Recognized epoxy meeting flammability classification V-0

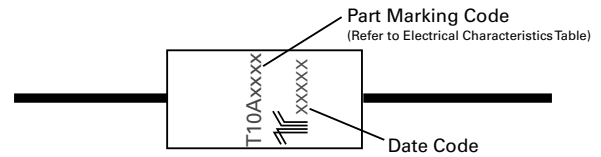
Environmental Specifications

High Temp Voltage Blocking	80% Rated V_{DRM} (V_{AC} Peak) +125°C or +150°C, 504 or 1008 hrs. MIL-STD-750 (Method 1040) JEDEC, JESD22-A-101
Temp Cycling	-65°C to +150°C, 15 min. dwell, 10 up to 100 cycles. MIL-STD-750 (Method 1051) EIA/JEDEC, JESD22-A-104
Biased Temp & Humidity	52 V_{DC} (+85°C) 85% RH, 504 up to 1008 hrs. EIA/JEDEC, JESD22-A-101
High Temp Storage	+150°C 1008 hrs. MIL-STD-750 (Method 1031) JEDEC, JESD22-A-101
Low Temp Storage	-65°C, 1008 hrs.
Thermal Shock	0°C to +100°C, 5 min. dwell, 10 sec. transfer, 10 cycles. MIL-STD-750 (Method 1056) JEDEC, JESD22-A-106
Autoclave (Pressure Cooker Test)	+121°C, 100%RH, 2atm, 24 up to 168 hrs. EIA/JEDEC, JESD22-A-102
Resistance to Solder Heat	+260°C, 30 secs. MIL-STD-750 (Method 2031)
Moisture Sensitivity Level	85%RH, +85°C, 168 hrs., 3 reflow cycles (+260°C Peak). JEDEC-J-STD-020, Level 1

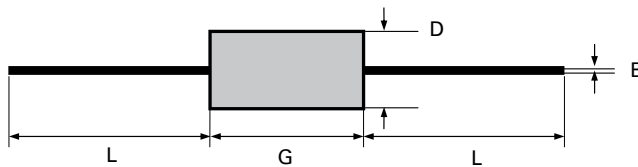
Part Numbering



Part Marking



Dimensions — DO-15

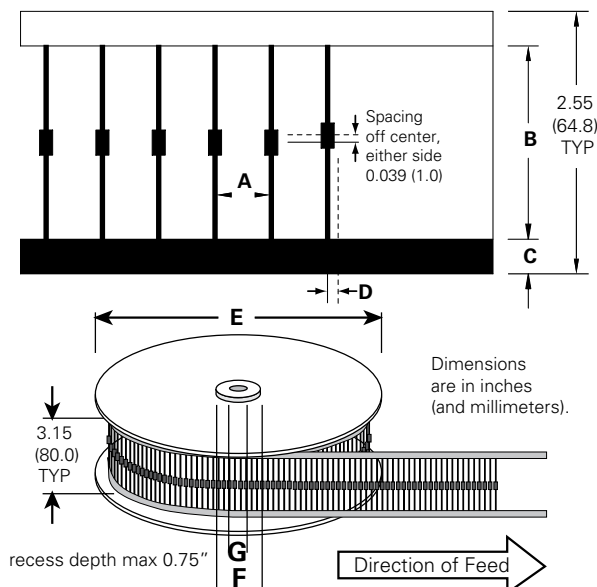


Dimension	Inches		Millimeters	
	MIN	MAX	MIN	MAX
B	0.028	0.034	0.711	0.864
D	0.12	0.14	3.048	3.556
G	0.235	0.27	5.969	6.858
L	1		25.4	

Packing Options

Package Type	Description	Packaging Quantity	Added Suffix	Industry Standard
T10A	DO-15 Tape and Reel Pack	1000	RP	EIA-RS-296-D
	DO-15 Bulk Pack	500	N/A	N/A

Tape and Reel Specification — DO-15



Symbols	Description	Inches	MM
A	Component Spacing (lead to lead)	0.200 ± 0.020"	5.08 ± 0.508
B	Inner Tape Pitch	2.062 ± 0.059"	52.37 ± 1.498
C	Tape Width	0.250"	6.35
D	Max. Off Alignment	0.048"	1.219
E	Reel Dimension	13"	330.2
F	Max. Hub Recess	3"	76.19
G	Max. Arbor Hole	0.68"	17.27

Additional Information



Datasheet



Resources



Samples

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Littelfuse:

[T10A110B](#) [T10A110E](#) [T10A270B](#) [T10A270E](#) [T10A080E](#) [T10A080B](#) [T10A220E](#) [T10A220B](#) [T10A140B](#) [T10A140E](#)
[T10A270](#) [T10A240](#) [T10A062](#) [T10A180B](#) [T10A180E](#) [T10A120](#) [T10A060B](#) [T10A060E](#) [T10A068](#) [T10A100](#)
[T10A130](#) [T10A200](#) [T10A220](#) [T10A180](#)