

T10A Series - DO-15



OBSOLETE DATE: 04/01st/2021 PCN/ECN#_LFPCN41374
REPLACED BY: _____



Agency Approvals

Agency	Agency File Number
	E128662*

Note: *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 Intra-building
- IEC 61000-4-5 2nd edition
- YD/T 1082
- YD/T 993
- YD/T 950
- GR 1089 Inter-building*

*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/ 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
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 $T_J = 25^\circ C$.
- Components are bi-directional (unless otherwise noted).
- **XX** Part Number Suffix: **"RP"** (Reel Pack) or **Blank** (Bulk Pack)

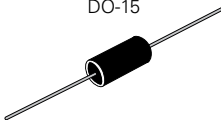
Surge Ratings

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	100	37.5	50	20	100

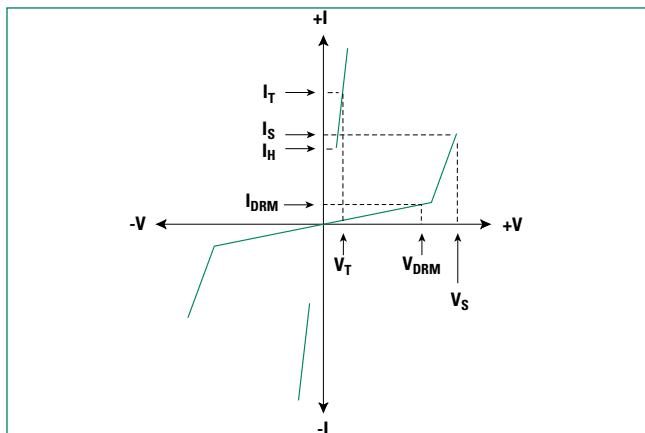
Notes:

- 1 Current waveform in μs
 - 2 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 $-40^\circ C \leq T_J \leq +150^\circ C$

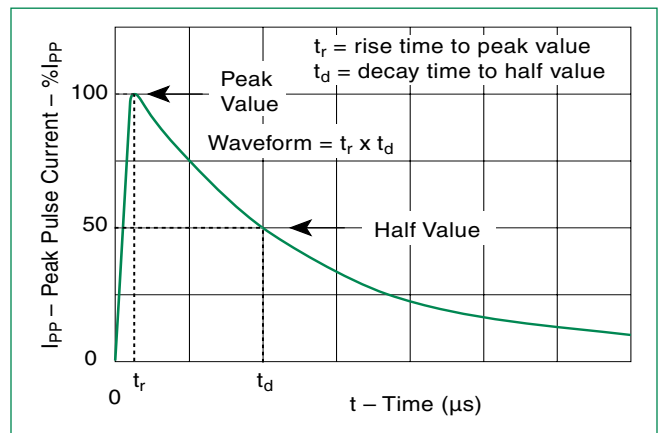
Thermal Considerations

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	$^\circ C/W$

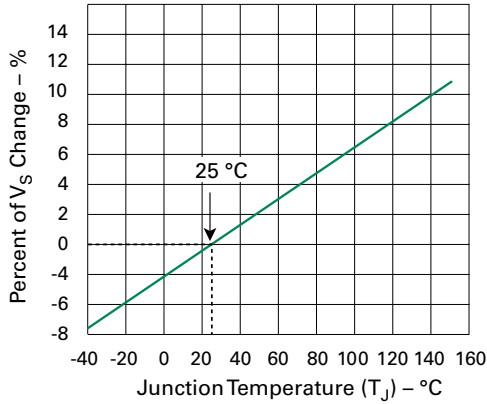
V-I Characteristics



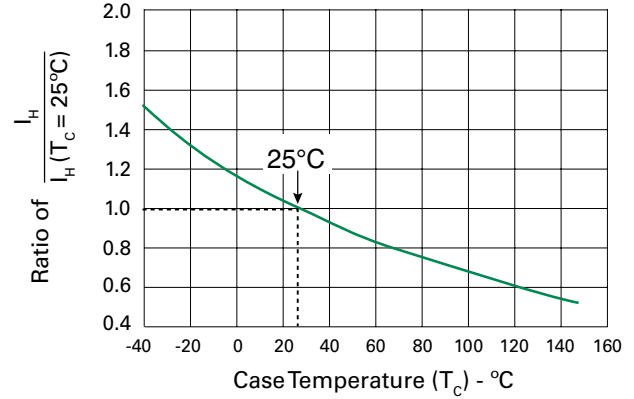
$t_r \times t_d$ Pulse Waveform



Normalized V_s Change vs. Junction Temperature

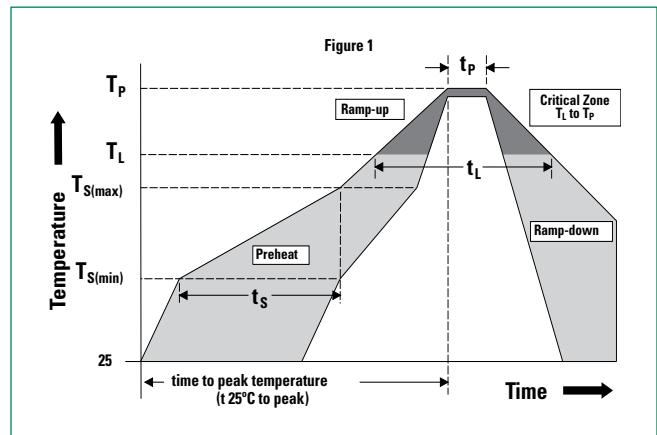


Normalized DC Holding Current vs. Case Temperature



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	



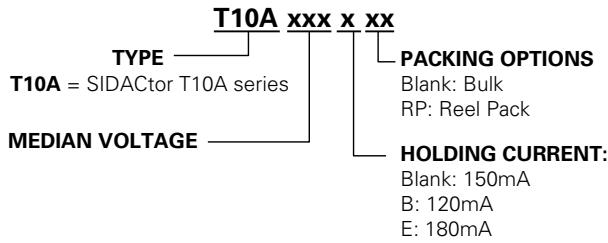
Physical Specifications

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

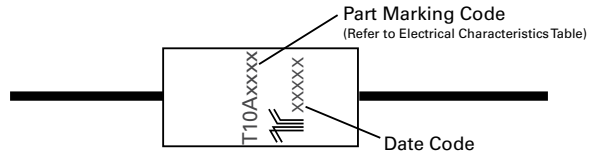
Environmental Specifications

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

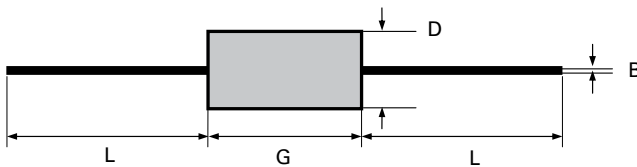
Part Numbering



Part Marking



Dimensions – DO-15

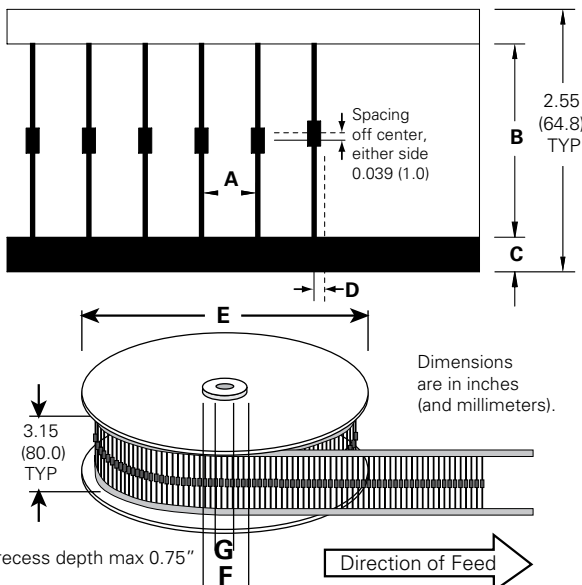


Dimension	Inches		Millimeters	
	MIN	MAX	MIN	MAX
B	0.028	0.034	0.711	0.864
D	0.12	0.14	3.048	3.556
G	0.235	0.27	5.969	6.858
L	1		25.4	

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. Abor Hole	0.68"	17.27

Additional Information



Datasheet



Resources



Samples

Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.