

**RoHS T10A Series - DO-15**



**Agency Approvals**

Agency	Agency File Number
	E128662

**Pinout Designation**

Not Applicable

**Schematic Symbol**



**Description**

T10A Series are SIDACTor® devices designed 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 with use
- Fails short circuit when surged in excess of ratings
- Low Capacitance

**Applicable Global Standards**

- TIA-968-A
- TIA-968-B
- ITU K.20/21 Enhanced Level\*
- ITU K.20/21 Basic Level
- GR 1089 Inter-building\*
- GR 1089 Intra-building
- IEC 61000-4-5
- 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/ $\mu s$	$I_H$	$I_S$	$I_T$	$V_T$ @ $I_T=2.2$ Amp	Capacitance @ 1MHz, 2V Bias
		V Min	V Max	mA Min	mA Max	A Max	V Max	pF Typ
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  $T_A = 25^\circ C$  (unless otherwise noted).
- Devices are bi-directional (unless otherwise noted).
- **XX** Part Number Suffix: "**RP**" (Reel Pack) or **Blank** (Bulk Pack)

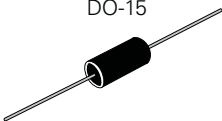
**Surge Ratings**

Series	$I_{PP}$			$I_{TSM}$ 50/60 Hz	di/dt
	8x20 <sup>1</sup> 1.2x50 <sup>2</sup>	5x310 <sup>1</sup> 10x700 <sup>2</sup>	10x1000 <sup>1</sup> 10x1000 <sup>2</sup>		
	A min	A min	A min		
A	100	37.5	50	20	100

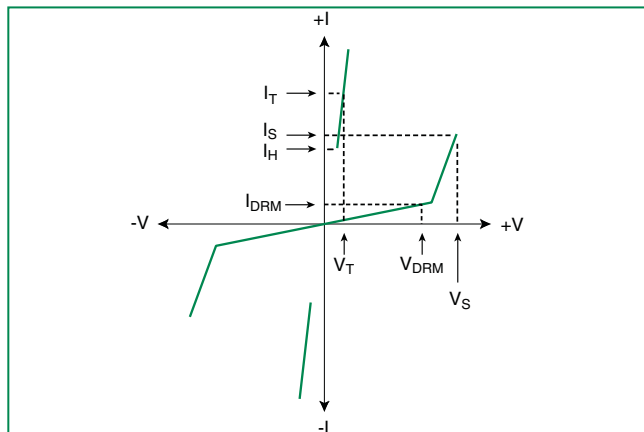
Notes:

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

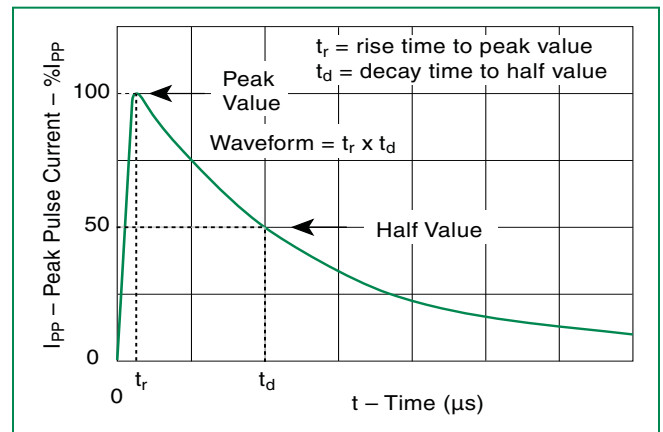
**Thermal Considerations**

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	$^\circ C/W$

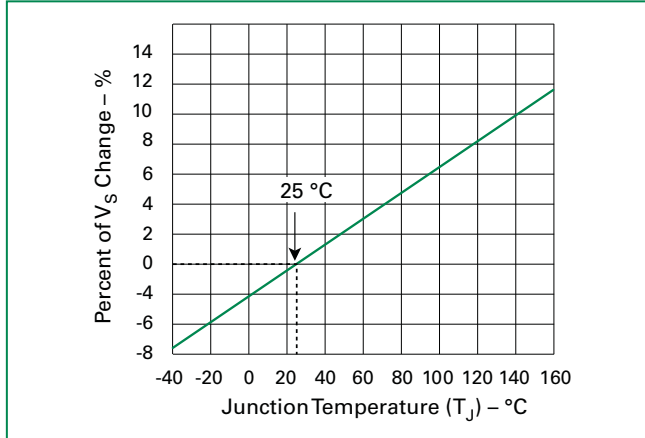
**V-I Characteristics**



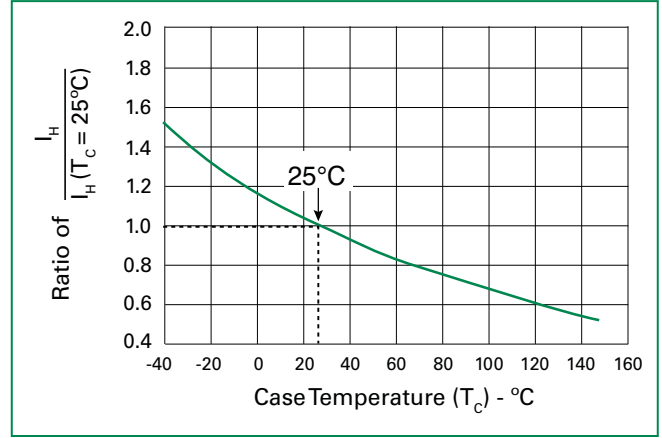
**$t_r \times t_d$  Pulse Waveform**



**Normalized  $V_s$  Change vs. Junction Temperature**

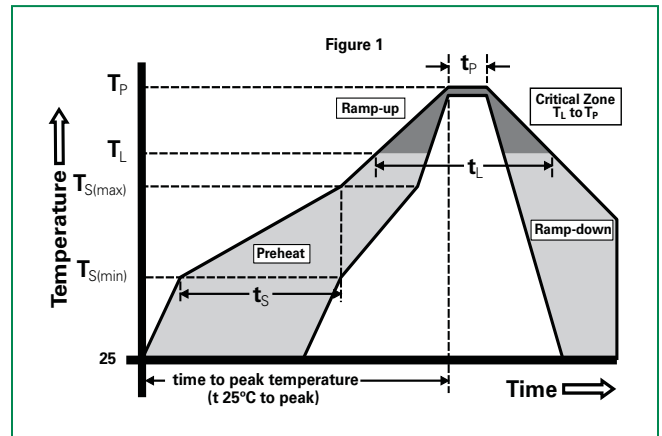


**Normalized DC Holding Current vs. Case Temperature**



**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	



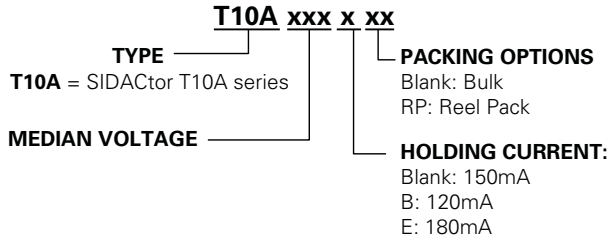
**Physical Specifications**

<b>Lead Material</b>	Copper Alloy
<b>Terminal Finish</b>	100% Matte-Tin Plated
<b>Body Material</b>	UL recognized epoxy meeting flammability classification 94V-0

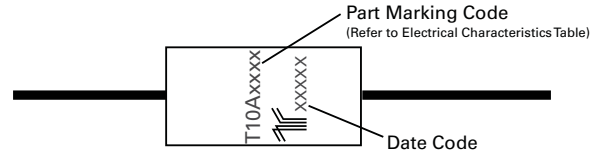
**Environmental Specifications**

<b>High Temp Voltage Blocking</b>	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
<b>Temp Cycling</b>	-65°C to +150°C, 15 min. dwell, 10 up to 100 cycles. MIL-STD-750 (Method 1051) EIA/JEDEC, JESD22-A104
<b>Biased Temp &amp; Humidity</b>	52 $V_{DC}$ (+85°C) 85%RH, 504 up to 1008 hrs. EIA/JEDEC, JESD22-A-101
<b>High Temp Storage</b>	+150°C 1008 hrs. MIL-STD-750 (Method 1031) JEDEC, JESD22-A-101
<b>Low Temp Storage</b>	-65°C, 1008 hrs.
<b>Thermal Shock</b>	0°C to +100°C, 5 min. dwell, 10 sec. transfer, 10 cycles. MIL-STD-750 (Method 1056) JEDEC, JESD22-A-106
<b>Autoclave (Pressure Cooker Test)</b>	+121°C, 100%RH, 2atm, 24 up to 168 hrs. EIA/JEDEC, JESD22-A-102
<b>Resistance to Solder Heat</b>	+260°C, 30 secs. MIL-STD-750 (Method 2031)
<b>Moisture Sensitivity Level</b>	85%RH, +85°C, 168 hrs., 3 reflow cycles (+260°C Peak). JEDEC-J-STD-020, Level 1

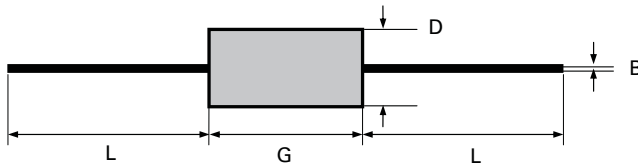
**Part Numbering**



**Part Marking**



**Dimensions – DO-15**

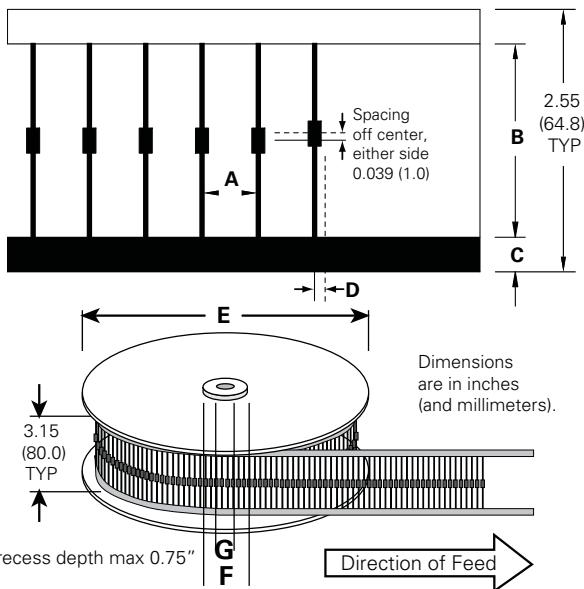


Dimension	Inches		Millimeters	
	MIN	MAX	MIN	MAX
<b>B</b>	0.028	0.034	0.711	0.864
<b>D</b>	0.12	0.14	3.048	3.556
<b>G</b>	0.235	0.27	5.969	6.858
<b>L</b>	1		25.4	

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