

**RoHS T10B Series - DO-201**



**Agency Approvals**

| Agency | Agency File Number |
|--------|--------------------|
|        | E128662            |

**Pinout Designation**

Not Applicable

**Schematic Symbol**



**Description**

T10B Series are SIDACtor® devices designed protect baseband equipment such as modems, line cards, CPE and DSL from damaging overvoltage transients.

The series provides a robust and 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
- High Surge Current Rating

**Applicable Global Standards**

- TIA-968-A
- 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

**Electrical Characteristics**

| Part Number | Marking  | $V_{DRM}$<br>@ $I_{DRM}=5\mu A$ | $V_S$<br>@ 100V/ $\mu s$ | $I_H$  | $I_S$  | $I_T$ | $V_T$<br>@ $I_T=2.2$ Amp | Capacitance<br>@ 1MHz, 2V Bias |
|-------------|----------|---------------------------------|--------------------------|--------|--------|-------|--------------------------|--------------------------------|
|             |          | V Min                           | V Max                    | mA Min | mA Max | A Max | V Max                    | pF                             |
| T10B080Bxx  | T10B080B | 70                              | 125                      | 120    | 800    | 2.2   | 4                        | 60                             |
| T10B110Bxx  | T10B110B | 100                             | 142                      | 120    | 800    | 2.2   | 4                        | 55                             |
| T10B140Bxx  | T10B140B | 120                             | 178                      | 120    | 800    | 2.2   | 4                        | 48                             |
| T10B180Bxx  | T10B180B | 170                             | 220                      | 120    | 800    | 2.2   | 4                        | 44                             |
| T10B220Bxx  | T10B220B | 200                             | 275                      | 120    | 800    | 2.2   | 4                        | 41                             |
| T10B270Bxx  | T10B270B | 240                             | 370                      | 120    | 800    | 2.2   | 4                        | 36                             |
| T10B080Exx  | T10B080E | 70                              | 125                      | 180    | 800    | 2.2   | 4                        | 60                             |
| T10B110Exx  | T10B110E | 100                             | 142                      | 180    | 800    | 2.2   | 4                        | 55                             |
| T10B140Exx  | T10B140E | 120                             | 178                      | 180    | 800    | 2.2   | 4                        | 48                             |
| T10B180Exx  | T10B180E | 170                             | 220                      | 180    | 800    | 2.2   | 4                        | 44                             |
| T10B220Exx  | T10B220E | 200                             | 275                      | 180    | 800    | 2.2   | 4                        | 41                             |
| T10B270Exx  | T10B270E | 240                             | 370                      | 180    | 800    | 2.2   | 4                        | 36                             |

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), **Blank** (Bulk Pack), or **'60'** (Type 60 lead form, Bulk Pack)

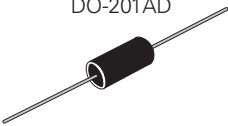
## Surge Ratings

| Series | $I_{PP}$                                 |                                           |                                              | $I_{TSM}$<br>50/60 Hz | di/dt    |
|--------|------------------------------------------|-------------------------------------------|----------------------------------------------|-----------------------|----------|
|        | 8x20 <sup>1</sup><br>1.2x50 <sup>2</sup> | 5x310 <sup>1</sup><br>10x700 <sup>2</sup> | 10x1000 <sup>1</sup><br>10x1000 <sup>2</sup> |                       |          |
|        | A min                                    | A min                                     | A min                                        | A min                 | A/μs max |
| B      | 250                                      | 125                                       | 100                                          | 30                    | 500      |

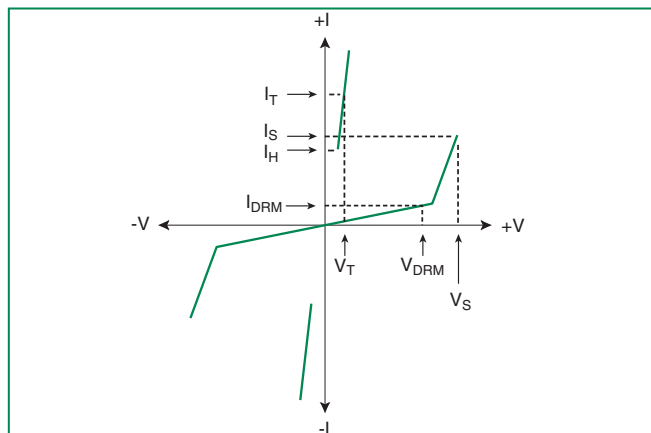
Notes:

- 1 Current waveform in μs
  - 2 Voltage waveform in μs
- 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°C to +85°C
  - The device must initially be in thermal equilibrium with -40°C ≤  $T_J$  ≤ +150°C

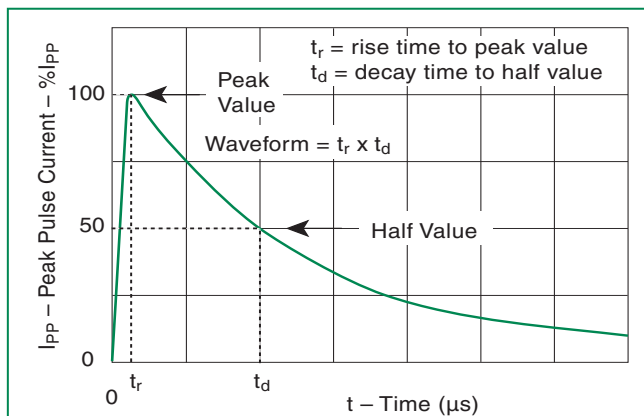
## Thermal Considerations

| Package                                                                                      | Symbol          | Parameter                               | Value       | Unit |
|----------------------------------------------------------------------------------------------|-----------------|-----------------------------------------|-------------|------|
| DO-201AD<br> | $T_J$           | Operating Junction Temperature Range    | -40 to +150 | °C   |
|                                                                                              | $T_S$           | Storage Temperature Range               | -65 to +150 | °C   |
|                                                                                              | $R_{\theta JA}$ | Thermal Resistance: Junction to Ambient | 120         | °C/W |

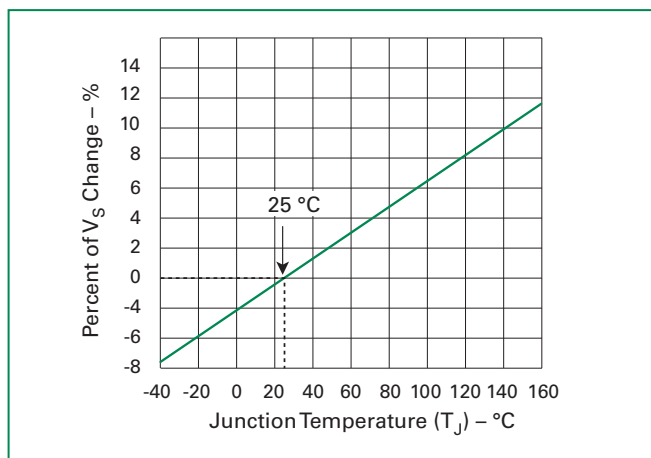
## V-I Characteristics



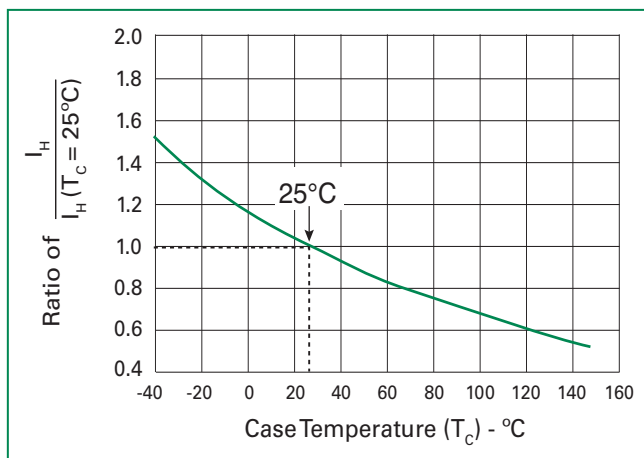
## $t_r \times t_d$ Pulse Waveform



## Normalized $V_S$ Change vs. Junction Temperature

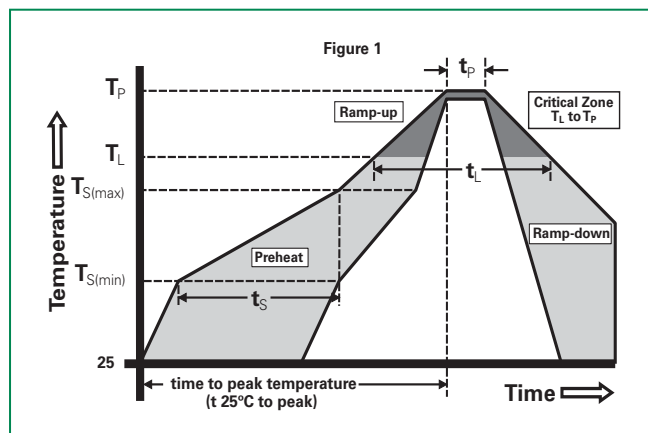


## Normalized DC Holding Current vs. Case Temperature



## 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                        |



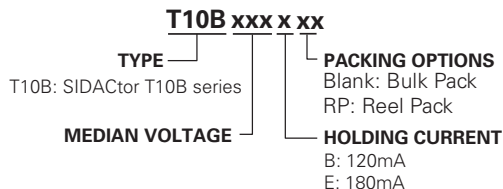
## Physical Specifications

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

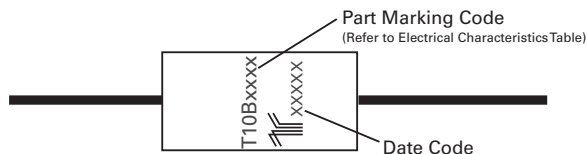
## Environmental Specifications

|                                  |                                                                                                                       |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| 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                                       |

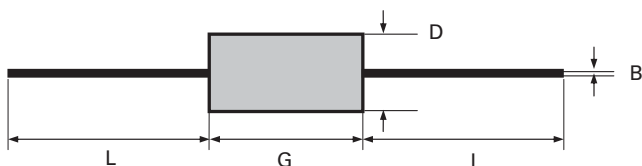
## Part Numbering



## Part Marking



## Dimensions — DO-201AD

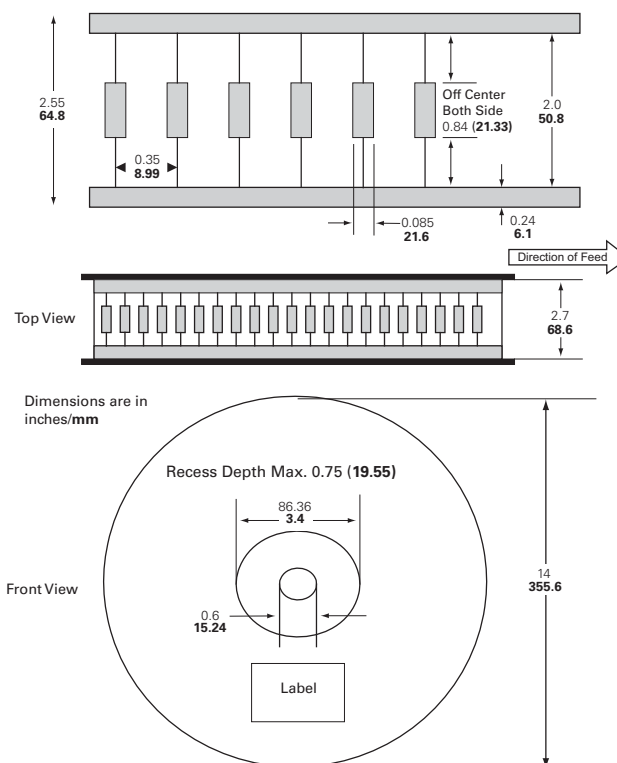


| Dimension | Inches |       | Millimeters |       |
|-----------|--------|-------|-------------|-------|
|           | MIN    | MAX   | MIN         | MAX   |
| <b>B</b>  | 0.028  | 0.042 | 0.711       | 1.067 |
| <b>D</b>  | 0.190  | 0.205 | 4.826       | 5.207 |
| <b>G</b>  | 0.360  | 0.375 | 9.146       | 9.527 |
| <b>L</b>  | 1      |       | 25.4        |       |

## Packing Options

| Package Type | Description                 | Quantity | Added Suffix | Industry Standard |
|--------------|-----------------------------|----------|--------------|-------------------|
| T10B         | DO-201AD Tape and Reel Pack | 1000     | RP           | EIA-RS-296-D      |
|              | DO-201AD Bulk Pack          | 500      | N/A          | N/A               |

## Tape and Reel Specification — DO-201AD



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