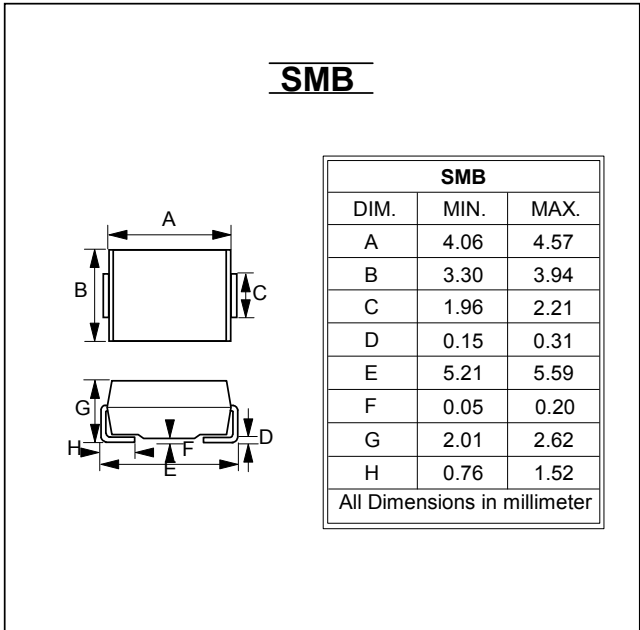


**SURFACE MOUNT  
THYRISTOR SURGE PROTECTIVE DEVICE**

**Bi-Directional**  
VDRM - **58 to 400** Volts  
IPP - **100** Amperes

- FEATURES**
- Oxide Glass Passivated Junction
  - Bidirectional protection in a single device
  - Surge capabilities up to 100A @ 10/1000us or 400 @ 8/20us
  - High off state Impedance and low on state voltage
  - Low Capacitance
  - Plastic material has UL flammability classification 94V-0
- MECHANICAL DATA**
- Case : Molded plastic
  - Polarity : Denotes none cathode band
  - Weight : 0.003 ounces, 0.093 grams



**MAXIMUM RATINGS**

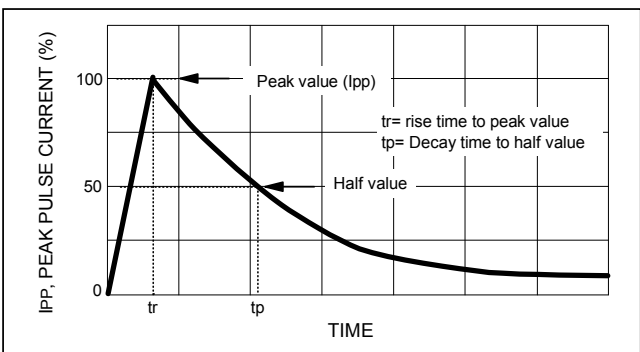
| CHARACTERISTICS                                               | SYMBOL | VALUE       | UNIT |
|---------------------------------------------------------------|--------|-------------|------|
| Non-repetitive peak impulse current @ 10/1000us               | IPP    | 100         | A    |
| Non-repetitive peak On-state current @ 8.3ms (one half cycle) | ITSM   | 50          | A    |
| Junction temperature range                                    | TJ     | -40 to +150 | °C   |
| storage temperature range                                     | TSTG   | -55 to +150 | °C   |

**THERMAL RESISTANCE**

| CHARACTERISTICS                                                  | SYMBOL                     | VALUE | UNIT |
|------------------------------------------------------------------|----------------------------|-------|------|
| Junction to leads                                                | Rth(J-L)                   | 20    | °C/W |
| Junction to ambient on print circuit (on recommended pad layout) | Rth(J-A)                   | 100   | °C/W |
| Typical positive temperature coefficient for brekdown voltage    | $\Delta V_{BR}/\Delta T_J$ | 0.1   | %/°C |

**MAXIMUM RATED SURGE WAVEFORM**

| WAVEFORM   | STANDARD      | IPP (A) |
|------------|---------------|---------|
| 2/10 us    | GR-1089-CORE  | 500     |
| 8/20 us    | IEC 61000-4-5 | 400     |
| 10/160 us  | FCC Part 68   | 250     |
| 10/560 us  | FCC Part 68   | 200     |
| 10/700 us  | ITU-T K20/K21 | 160     |
| 10/1000 us | GR-1089-CORE  | 100     |



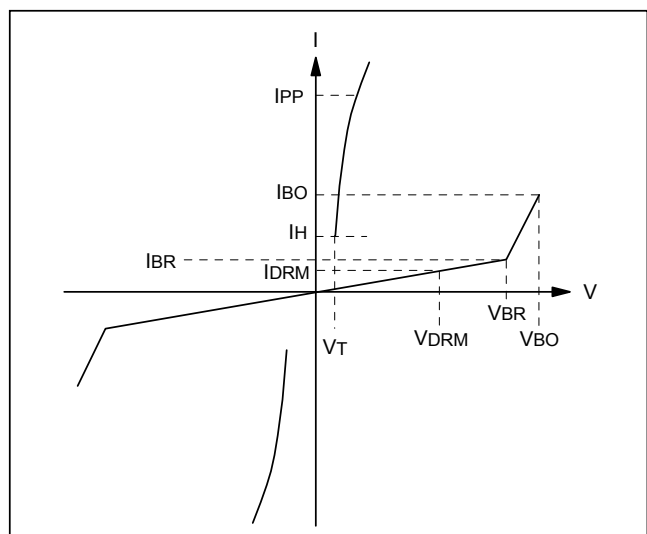
**ELECTRICAL CHARACTERISTICS**  
**TB0640HL thru TB4600HL**



@ TA= 25°C unless otherwise specified

| PARAMETER | MARKING CODE | RATED REPETITIVE OFF-STATE VOLTAGE | OFF-STATE LEAKAGE CURRENT @ VDRM | BREAKOVER VOLTAGE | ON-STATE VOLTAGE @ IT=1.0A | BREAKOVER CURRENT |           | HOLDING CURRENT |  | OFF-STATE CAPACITANCE |
|-----------|--------------|------------------------------------|----------------------------------|-------------------|----------------------------|-------------------|-----------|-----------------|--|-----------------------|
| SYMBOL    |              | VDRM                               | IDRM                             | VBO               | VT                         | IBO               | IH        | Co              |  |                       |
| UNITS     |              | V                                  | uA                               | V                 | V                          | mA                | mA        | pF              |  |                       |
| LIMIT     |              | Max                                | Max                              | Max               | Max                        | Min   Max         | Min   Max | Typ             |  |                       |
| TB0640HL  | T064HL       | 58                                 | 5                                | 77                | 3.5                        | 50   800          | 150   800 | 40              |  |                       |
| TB0720HL  | T072HL       | 65                                 | 5                                | 88                | 3.5                        | 50   800          | 150   800 | 40              |  |                       |
| TB0900HL  | T090HL       | 75                                 | 5                                | 98                | 3.5                        | 50   800          | 150   800 | 40              |  |                       |
| TB1100HL  | T110HL       | 90                                 | 5                                | 130               | 3.5                        | 50   800          | 150   800 | 40              |  |                       |
| TB1300HL  | T130HL       | 120                                | 5                                | 160               | 3.5                        | 50   800          | 150   800 | 40              |  |                       |
| TB1500HL  | T150HL       | 140                                | 5                                | 180               | 3.5                        | 50   800          | 150   800 | 40              |  |                       |
| TB1800HL  | T180HL       | 170                                | 5                                | 220               | 3.5                        | 50   800          | 150   800 | 40              |  |                       |
| TB2300HL  | T230HL       | 190                                | 5                                | 265               | 3.5                        | 50   800          | 150   800 | 40              |  |                       |
| TB2600HL  | T260HL       | 220                                | 5                                | 300               | 3.5                        | 50   800          | 150   800 | 40              |  |                       |
| TB3100HL  | T310HL       | 275                                | 5                                | 350               | 3.5                        | 50   800          | 150   800 | 40              |  |                       |
| TB3500HL  | T350HL       | 320                                | 5                                | 400               | 3.5                        | 50   800          | 150   800 | 40              |  |                       |
| TB4000HL  | T400HL       | 360                                | 5                                | 450               | 3.5                        | 50   800          | 150   800 | 40              |  |                       |
| TB4600HL  | T460HL       | 400                                | 5                                | 520               | 3.5                        | 50   800          | 150   800 | 40              |  |                       |

| SYMBOL | PARAMETER                                                      |
|--------|----------------------------------------------------------------|
| VDRM   | Stand-off Voltage                                              |
| IDRM   | Leakage current at stand-off voltage                           |
| VBR    | Breakdown voltage                                              |
| IBR    | Breakdown current                                              |
| VBO    | Breakover voltage                                              |
| IBO    | Breakover current                                              |
| IH     | Holding current <span style="float:right">Note: 1</span>       |
| VT     | On state voltage                                               |
| IPP    | Peak pulse current                                             |
| CO     | Off state capacitance <span style="float:right">Note: 2</span> |



NOTES: 1.  $I_H > (V_L/R_L)$  If this criterion is not obeyed, the TSPD Triggers but does not return correctly to high-resistance state.

The Surge recovery time does not exceed 30ms.

2. Off-state capacitance measured at  $f=1.0\text{MHz}$ ;  $1.0\text{VRMS}$  signal;  $V_R=2\text{VDC}$  bias.

FIG. 1 - OFF STATE CURRENT vs JUNCTION TEMPERATURE

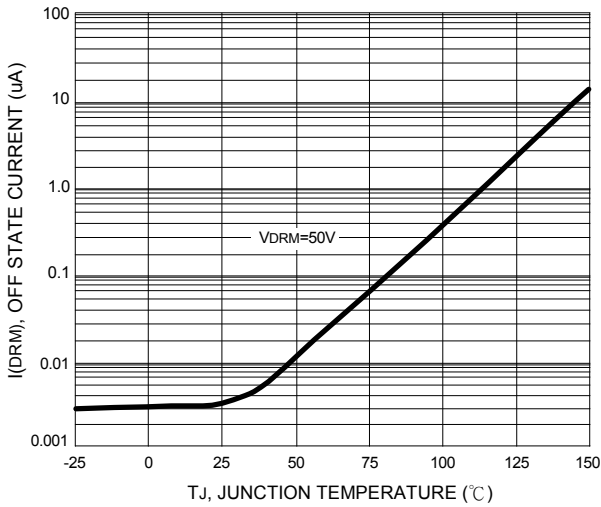


FIG. 2 - RELATIVE VARIATION OF BREAKDOWN VOLTAGE vs JUNCTION TEMPERATURE

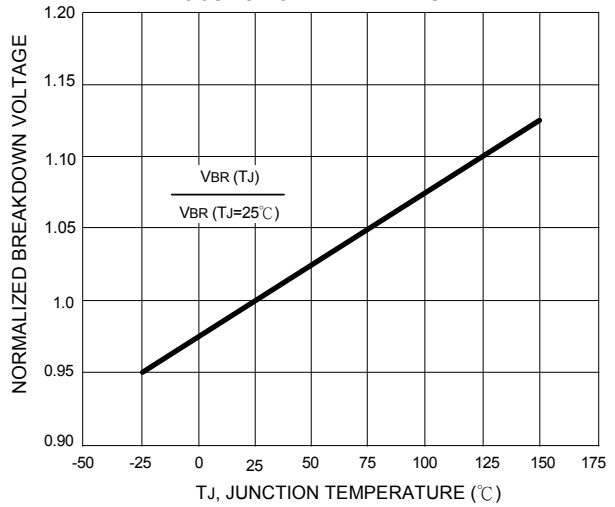


FIG. 3 - RELATIVE VARIATION OF BREAKOVER VOLTAGE vs JUNCTION TEMPERATURE

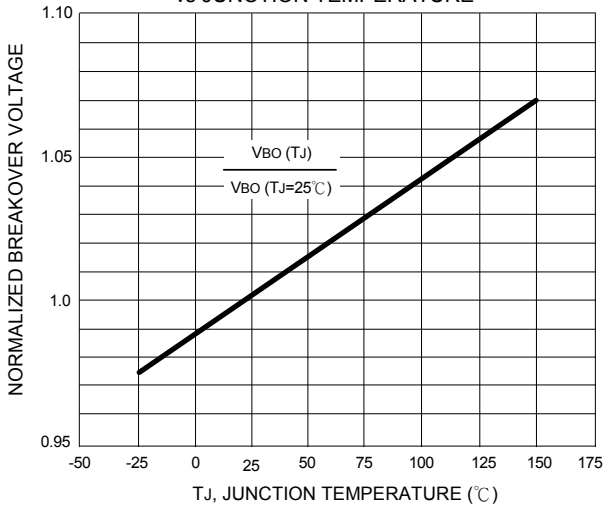


FIG. 4 - ON STATE CURRENT vs ON STATE VOLTAGE

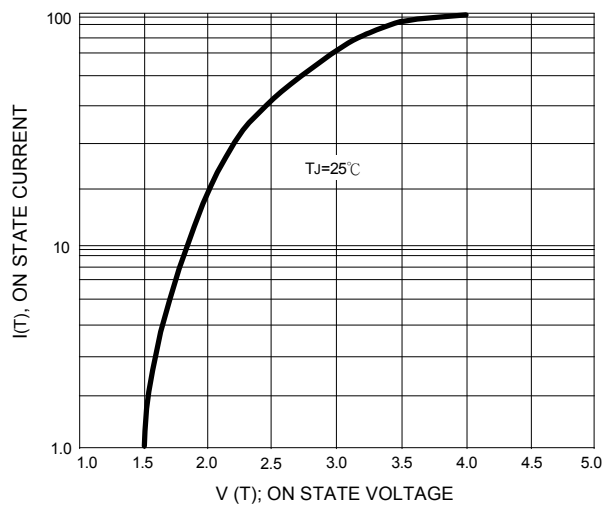


FIG. 5 - RELATIVE VARIATION OF HOLDING CURRENT vs JUNCTION TEMPERATURE

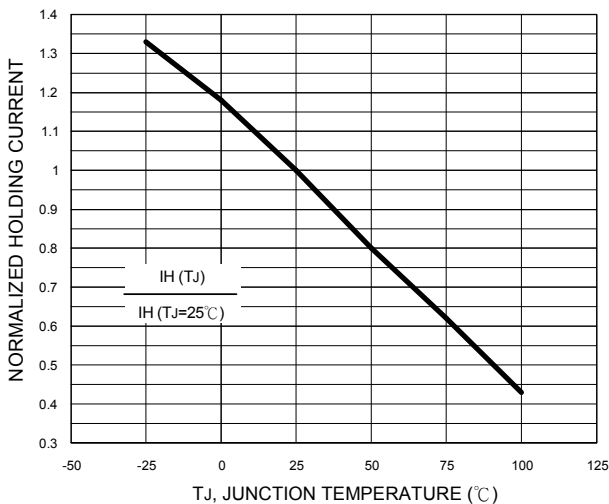
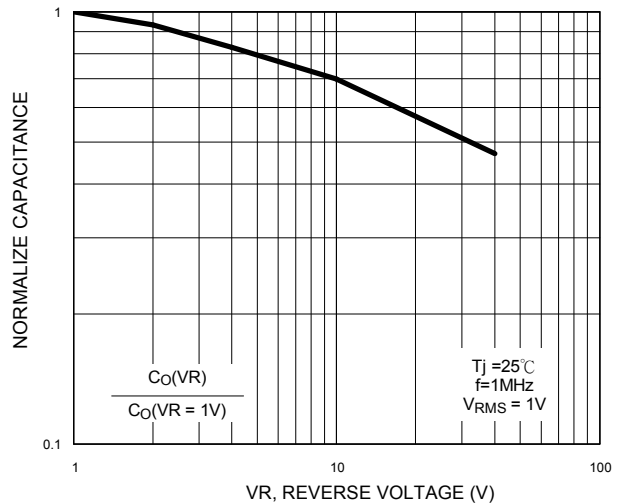
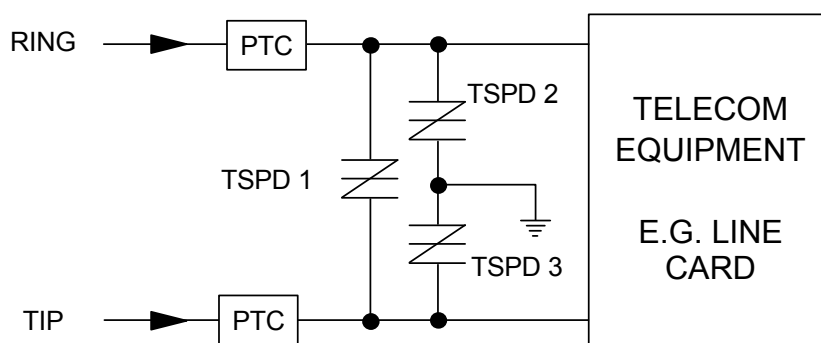
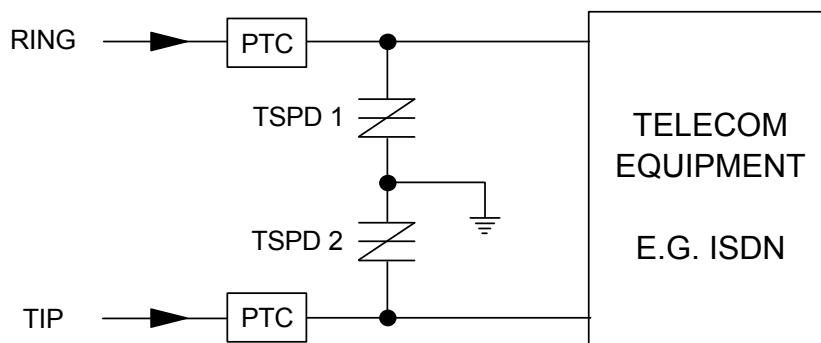
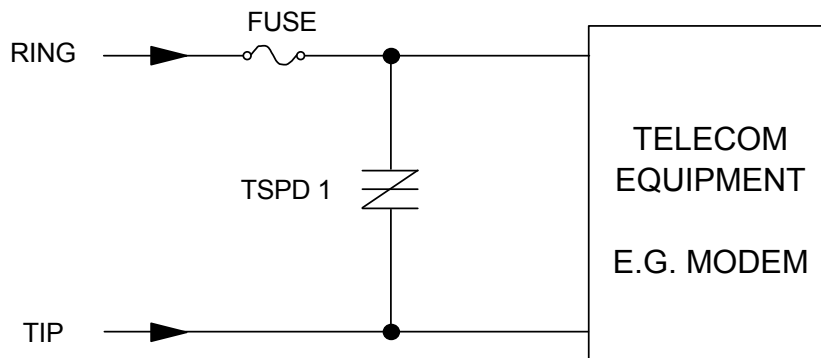


FIG. 6 - RELATIVE VARIATION OF JUNCTION CAPACITANCE vs REVERSE VOLTAGE BIAS





The PTC (Positive Temperature Coefficient) is an overcurrent protection device

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