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# TSMBJ0506C THRU TSMBJ0524C

## Transient Voltage Protection Device 75 to 320 Volts

## Features

- Oxide-Glass passivated Junction
- Bi-Directional protection in a single device
- Surge capabilities up to 80A@10/1000us or 250A@8/20us
- High Off-State impedance and Low On-State voltage
- Plastic material has UL flammability classification 94V-0

## Mechanical Data

- Case : Molded plastic
- Polarity : None cathode band denotes
- Approx Weight : 0.093grams

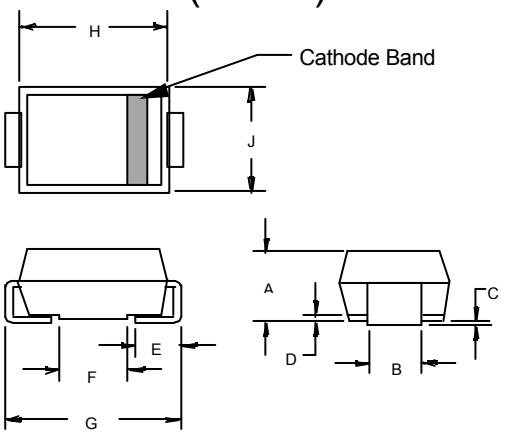
## Maximum Rating

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Non-repetitive peak impulse current | $I_{PP}$ | 80A | 10/1000us |
| Non-repetitive peak On-state current | $I_{TSM}$ | 30A | 8.3ms, one-half cycle |
| Operating temperature range | $T_{OP}$ | -40~150°C | |
| Junction and storage temperature range | $T_J$, $T_{STG}$ | -55~150°C | |

## Thermal Resistance

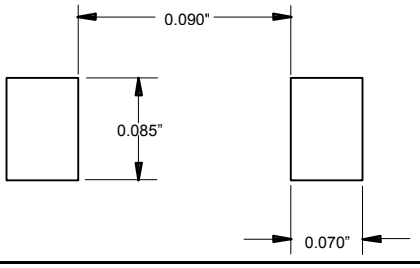
| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance junction to lead | $R_{\theta JL}$ | 20°C/W | |
| Thermal Resistance junction to ambient | $R_{\theta JA}$ | 100°C/W | On recommended pad layout |
| Typical positive temperature coefficient for breakdown voltage | $\triangle V_{BR}/\triangle T_J$ | 0.1%/°C | |

## DO-214AA (SMBJ)




| DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| | INCHES | | MM | | |
| DIM | MIN | MAX | MIN | MAX | NOTE |
| A | .078 | .096 | 2.00 | 2.44 | |
| B | .077 | .083 | 1.96 | 2.10 | |
| C | .002 | .008 | .05 | .20 | |
| D | --- | .02 | --- | .51 | |
| E | .030 | .060 | .76 | 1.52 | |
| F | .065 | .091 | 1.65 | 2.32 | |
| G | .205 | .220 | 5.21 | 5.59 | |
| H | .160 | .180 | 4.06 | 4.57 | |
| J | .130 | .155 | 3.30 | 3.94 | |

SUGGESTED SOLDER PAD LAYOUT



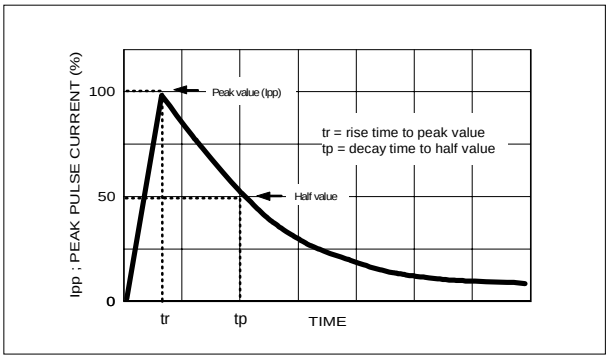
# TSMBJ0506C thru TSMBJ0524C

## ELECTRICAL CHARACTERISTIC @25℃ Unless otherwise specified

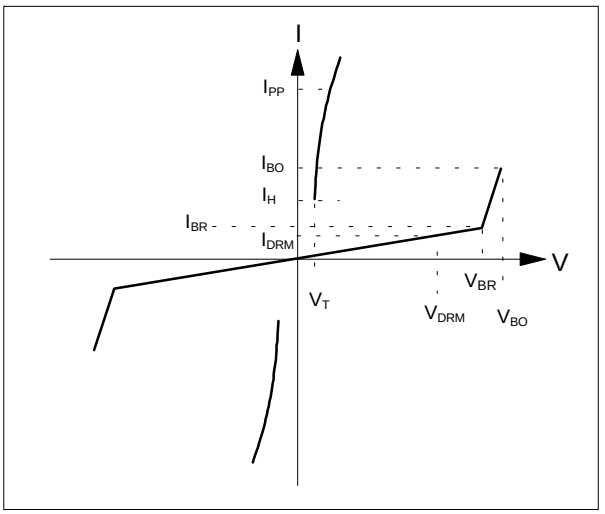
| Parameter | Rated Repetitive Off-state Voltage | Off-state Leakage Current@$V_{DRM}$ | Breakover Voltage | On-State Voltage @$I_T$=1.0A | Breakover Current | | Holding Current | | Off-State Capacitance |
|---|---|---|---|---|---|---|---|---|---|
| Symbol | $V_{DRM}$ | $I_{DRM}$ | $V_{BO}$ | $V_T$ | $I_{BO-}$ | $I_{BO+}$ | $I_{H-}$ | $I_{H+}$ | $C_J$ |
| Units | Volts | uA | Volts | Volts | mA | mA | mA | mA | pF |
| Limit | Max | Max | Max | Max | Min | Max | Min | Max | Typ. |
| TSMBJ0506C | 75 | 5 | 98 | 5 | 50 | 800 | 150 | 800 | 140 |
| TSMBJ0507C | 90 | 5 | 130 | 5 | 50 | 800 | 150 | 800 | 90 |
| TSMBJ0510C | 140 | 5 | 180 | 5 | 50 | 800 | 150 | 800 | 90 |
| TSMBJ0512C | 160 | 5 | 220 | 5 | 50 | 800 | 150 | 800 | 90 |
| TSMBJ0516C | 190 | 5 | 265 | 5 | 50 | 800 | 150 | 800 | 60 |
| TSMBJ0518C | 220 | 5 | 300 | 5 | 50 | 800 | 150 | 800 | 60 |
| TSMBJ0522C | 275 | 5 | 350 | 5 | 50 | 800 | 150 | 800 | 60 |
| TSMBJ0524C | 320 | 5 | 400 | 5 | 50 | 800 | 150 | 800 | 60 |

## MAXIMUM RATED SURGE WAVEFORM

| Waveform | Standard | Ipp (A) |
|---|---|---|
| 2/10 us | GR-1089-CORE | 250 |
| 8/20 us | IEC 61000-4-5 | 250 |
| 10/160 us | FCC Part 68 | 150 |
| 10/700 us | ITU-T K20/21 | 100 |
| 10/560 us | FCC Part 68 | 100 |
| 10/1000 us | GR-1089-CORE | 80 |




| Symbol | Parameter | |
|---|---|---|
| $V_{DRM}$ | Stand-off voltage | |
| $I_{DRM}$ | Leakage current at stand-off voltage | |
| $V_{BR}$ | Breakdown voltage | |
| $I_{BR}$ | Breakdown current | |
| $V_{BO}$ | Breakover voltage | |
| $I_{BO}$ | Breakover current | |
| $I_H$ | Holding current | NOTE: 1 |
| $V_T$ | On state voltage | |
| $I_{PP}$ | Peak pulse current | |
| $C_O$ | Off-state capacitance | NOTE: 2 |




NOTE：

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. It does not exceed 30ms.
2. Off-state capacitance measured at f=1.0MHz , 1.0Vrms signal , VR=2Vdc bias.

Fig.1 - Off-State Current v.s Junction Temperature

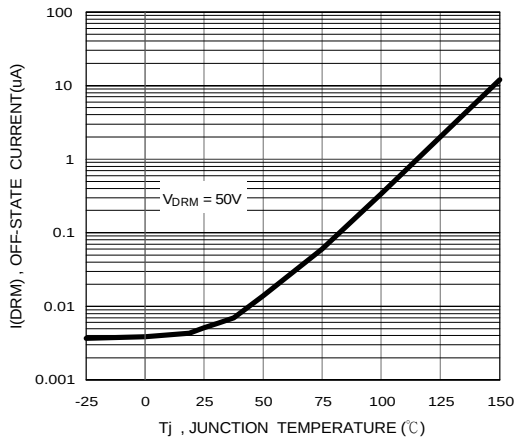



Fig.2 - Relative Variation of
Breakdown Voltage v.s Junction Temperature

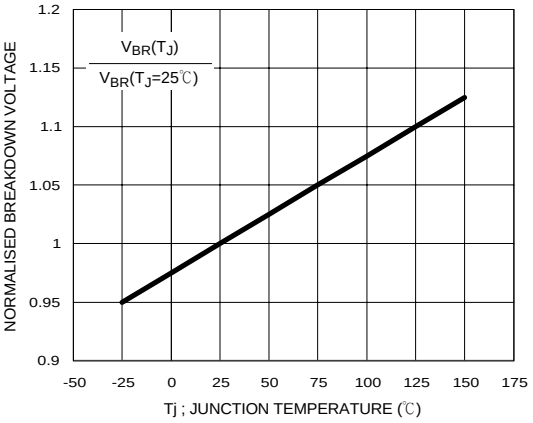



Fig.3 - Relative Variation of
Breakover Voltage v.s Junction Temperature

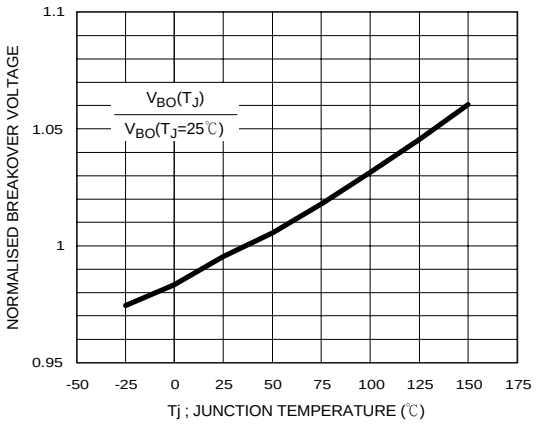



Fig.4 - On-State Current v.s On-State Voltage

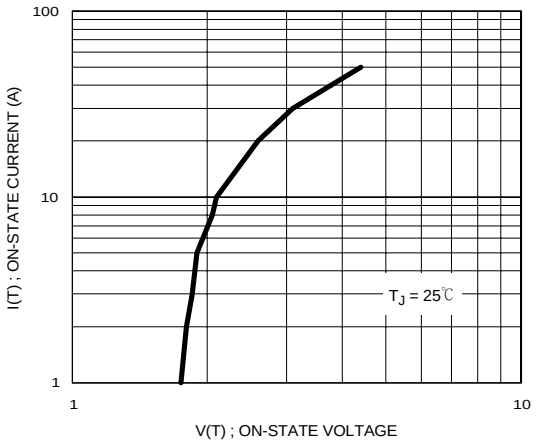



Fig.5 - Relative Variation of
Holding Current v.s Junction Temperature

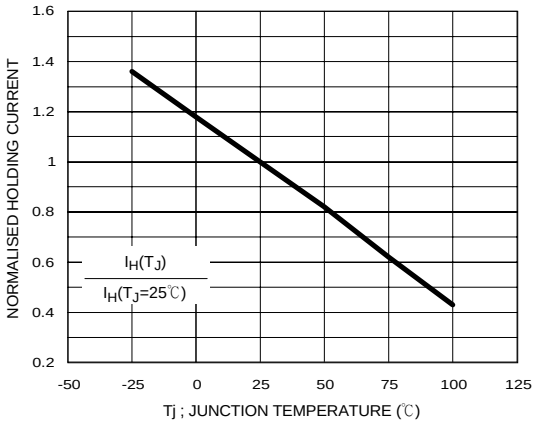
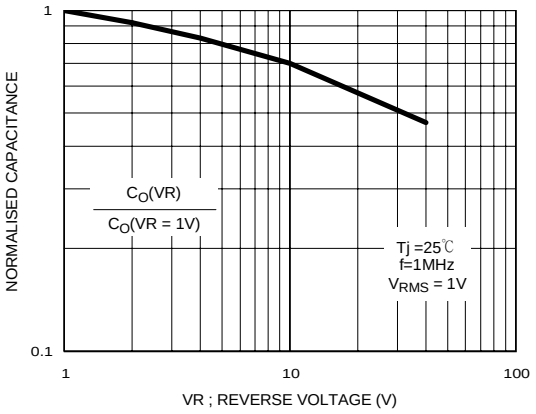
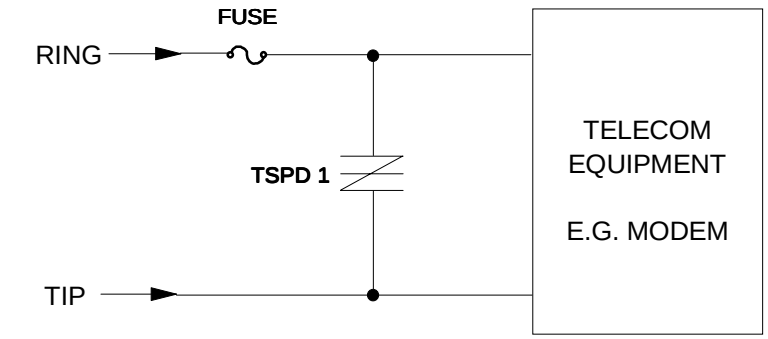
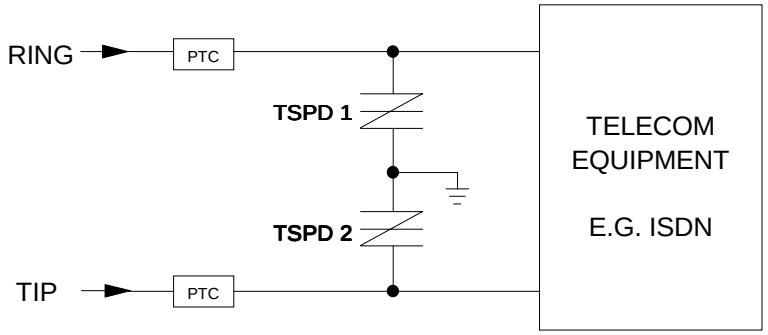


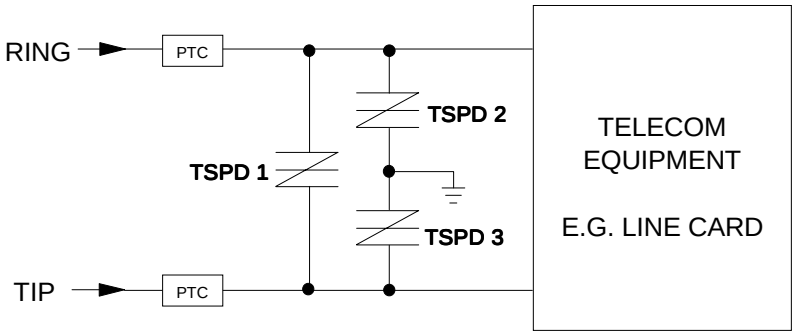

Fig.6 - Relative Variation of
Junction Capacitance v.s Reverse Voltage Bias



## TYPICAL APPLICATION CIRCUITS




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