

SC146 SERIES

BIDIRECTIONAL TRIODE THYRISTORS

Available Non-RoHS (standard) or RoHS compliant (add PBF suffix).

Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|--------------|---------------------------------|----------------------|
| Repetitive peak off-stage voltage, gate open SC146B SC146D SC146E SC146M SC146N | V_{DRM} | 200 400 500 600 700 | Volts |
| RMS on-state current ($T_C = 80^\circ\text{C}$) | $I_{T(RMS)}$ | 10 | Amps |
| Peak non-repetitive surge current (One Cycle, 60Hz) | I_{TSM} | 120 | Amps |
| Circuit fusing considerations ($t = 8.3\text{ms}$) | I^2t | 60 | A^2s |
| Peak gate power (pulse width = $10\mu\text{s}$) | P_{GM} | 10 | Watts |
| Average gate power ($T_C = 80^\circ\text{C}$, $t = 8.3\text{ms}$) | $P_{G(AV)}$ | 0.5 | Watts |
| Peak gate current (pulse width = $10\mu\text{s}$) | I_{GM} | 3.5 | Amps |
| Peak gate voltage | V_{GM} | 10 | Volts |
| Operating junction temperature range | T_J | -40 to +100 | $^\circ\text{C}$ |
| Storage temperature range | T_{stg} | -40 to +125 | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

| Characteristics | Symbol | Max | Unit |
|---|-----------------|-----|---------------------------|
| Thermal resistance, junction to case | $R_{\theta JC}$ | 1.5 | $^\circ\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS

($T_C = 25^\circ\text{C}$ unless otherwise noted, either polarity of MT2 to MT1, unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|------------|-------------------------|-----------------------|-------------------------------|------------------------|
| Peak off state current ($V_D = V_{DRM}$, gate open) $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$ | I_{DRM} | - - | - - | 0.1 0.5 | mA |
| Peak on-state voltage ($I_{TM} = 14\text{A}$ peak, pulse width $\leq 1\text{ms}$, duty cycle $\leq 2\%$) | V_{TM} | - | - | 1.65 | Volts |
| Critical rate of rise of off-state voltage ($V_D = \text{Rated } V_{DRM}$, gate open, exponential waveform, $T_C = 100^\circ\text{C}$) | dv/dt | - | 50 | - | $\text{V}/\mu\text{s}$ |
| Critical rate of rise of commutating voltage ($I_{T(RMS)} = \text{Rated } I_{T(RMS)}$, $V_D = \text{Rated } V_{DRM}$, commutating $di/dt = 5.4\text{A}/\text{ms}$, gate open, $T_C = 80^\circ\text{C}$) | $dv/dt(c)$ | 4 | - | - | $\text{V}/\mu\text{s}$ |
| DC gate trigger current (continuous dc) ($V_D = 12\text{V}$, trigger mode) MT2(+), G(+); MT2(-), G(-); $R_L = 100\Omega$ MT2(+), G(-); $R_L = 50\Omega$ MT2(+), G(+); MT2(-), G(-); $R_L = 50\Omega$, $T_C = -40^\circ\text{C}$ MT2(+), G(-); $R_L = 25\Omega$, $T_C = -40^\circ\text{C}$ | I_{GT} | - - - - | - - - - | 50 50 80 80 | mA |
| DC gate trigger voltage (continuous dc) ($V_D = 12\text{V}$, trigger mode) MT2(+), G(+); MT2(-), G(-); $R_L = 100\Omega$ MT2(+), G(-); $R_L = 50\Omega$ MT2(+), G(+); MT2(-), G(-); $R_L = 50\Omega$, $T_C = -40^\circ\text{C}$ MT2(+), G(-); $R_L = 25\Omega$, $T_C = -40^\circ\text{C}$ ($V_D = \text{Rated } V_{DRM}$, $R_L = 1000\Omega$, $T_C = 100^\circ\text{C}$) all polarities | V_{GT} | - - - - 0.2 | - - - - - | 2.5 2.5 3.5 3.5 - | Volts |

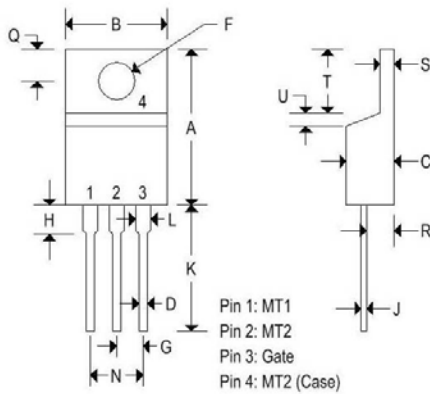
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BIDIRECTIONAL TRIODE THYRISTORS

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|--------|-----|-----|--------------------------|------|
| Holding current ($V_D = 24V$, $I_T = 0.5A$, pulse width = 1ms, duty cycle $\leq 2\%$, gate trigger source 7V, 20 Ω) $T_C = 25^\circ C$ $T_C = -40^\circ C$ | I_H | - | - | 50 100 | mA |
| Latching current ($V_D = 24V$) Trigger source: 15V, 100 Ω , trigger mode) MT2(+), G(+); MT2(-), G(-) MT2(+), G(-) MT2(+), G(+); MT2(-), G(-), $T_C = -40^\circ C$ MT2(+), G(-), $T_C = -40^\circ C$ | I_L | - | - | 100 200 200 400 | mA |

MECHANICAL CHARACTERISTICS

| | |
|----------|---------------|
| Case | TO-220AB |
| Marking | Alpha-numeric |
| Polarity | See below |



| | TO-220AB | | | |
|---|----------|-------|-------------|--------|
| | Inches | | Millimeters | |
| | Min | Max | Min | Max |
| A | 0.575 | 0.620 | 14.600 | 15.750 |
| B | 0.360 | 0.405 | 9.650 | 10.290 |
| C | 0.160 | 0.190 | 4.060 | 4.820 |
| D | 0.025 | 0.035 | 0.640 | 0.890 |
| F | 0.142 | 0.147 | 3.610 | 3.730 |
| G | 0.095 | 0.105 | 2.410 | 2.670 |
| H | 0.110 | 0.155 | 2.790 | 3.930 |
| J | 0.014 | 0.022 | 0.360 | 0.560 |
| K | 0.500 | 0.562 | 12.700 | 14.270 |
| L | 0.045 | 0.055 | 1.140 | 1.390 |
| N | 0.190 | 0.210 | 4.830 | 5.330 |
| Q | 0.100 | 0.120 | 2.540 | 3.040 |
| R | 0.080 | 0.110 | 2.040 | 2.790 |
| S | 0.045 | 0.055 | 1.140 | 1.390 |
| T | 0.235 | 0.255 | 5.970 | 6.480 |
| U | - | 0.050 | - | 1.270 |
| V | 0.045 | - | 1.140 | - |
| Z | - | 0.080 | - | 2.030 |

