DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

# SC136 SERIES

## BIDIRECTIONAL TRIODE THYRISTORS

### FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

### MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| **Repetitive peak off-stage voltage**<br>($T_C$ = 110°C)<br>SC136B<br>SC136C<br>SC136D<br>SC136E<br>SC136M | $V_{DRM}$ | <br><br>200<br>300<br>400<br>500<br>600 | Volts |
| **RMS on-state current** ($T_C$ = 65°C) | $I_{T(RMS)}$ | 3.0 | Amps |
| **Peak non-repetitive surge current** (One Cycle, 60Hz) | $I_{TSM}$ | 30 | Amps |
| **Circuit fusing considerations**<br>(t = 1ms to 8.3ms) | $I^2t$ | <br>3.6 | $A^2s$ |
| **Circuit rate of rise of on-state current** | di/dt | 5.0 | A/µs |
| **Peak gate power** | $P_{GM}$ | 5.0 | Watts |
| **Average gate power** | $P_{G(AV)}$ | 0.1 | Watts |
| **Peak gate voltage** | $V_{GM}$ | 5.0 | Volts |
| **Operating junction temperature range** | $T_J$ | -40 to +110 | °C |
| **Storage temperature range** | $T_{stg}$ | -40 to +150 | °C |

### THERMAL CHARACTERISTICS

| Characteristics | Symbol | Max | Unit |
|---|---|---|---|
| **Thermal resistance, junction to case** | $R_{\Theta JC}$ | 10 | °C/W |
| **Thermal resistance, junction to ambient** | $R_{\Theta JA}$ | 75 | °C/W |

### ELECTRICAL CHARACTERISTICS ($T_C$ = 25°C and either polarity of MT2 to MT1 voltage, unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| **Peak off state current** (Rated $V_{DRM}$ or $V_{RRM}$, gate open)<br>$T_C$ = 25°C<br>$T_C$ = 110°C | $I_{DRM}$,<br>$I_{RRM}$ | <br>-<br>- | <br>-<br>- | <br>10<br>500 | µA |
| **Peak on-state voltage**<br>($I_{TM}$ = 5A peak, pulse width = 1 ms, duty cycle ≤ 2%) | $V_{TM}$ | - | - | 1.8 | Volts |
| **DC gate trigger current** (continuous dc)<br>($V_D$ = 6V, $R_L$ = 50Ω)<br>MT2(+), G(+); MT2(-), G(-); MT2(+), G(-), $T_C$ = 25°C<br>($V_D$ = 12V, $R_L$ = 50Ω)<br>MT2(+), G(+); MT2(-), G(-); MT2(+), G(-),$T_C$ = -40°C | $I_{GT}$ | <br><br>-<br><br>- | <br><br>-<br><br>- | <br><br>25<br><br>50 | mA |
| **DC gate trigger voltage** (continuous dc)<br>($V_D$ = 12V, $R_L$ = 50Ω)<br>MT2(+), G(+); MT2(-), G(-); MT2(+), G(-), $T_C$ = 25°C<br>MT2(+), G(+); MT2(-), G(-); MT2(+), G(-), $T_C$ = -40°C<br>($V_D$ = rated $V_{DRM}$, all mode, $T_C$ = 110°C) | $V_{GT}$ | <br><br>-<br>-<br>0.2 | <br><br>-<br>-<br>- | <br><br>2.0<br>3.0<br>- | Volts |

DIGITRON™ Semiconductors

**High-reliability discrete products and engineering services since 1977**

# SC136 SERIES

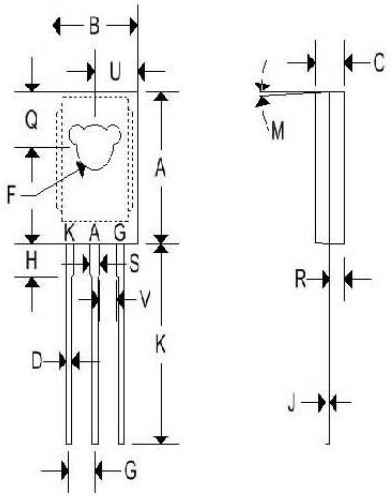
## BIDIRECTIONAL TRIODE THYRISTORS

| | | | | | |
|---|---|---|---|---|---|
| **Holding current**<br>($V_D$ = 24V, $R_L$ = 200Ω, gate open)<br>$T_C$ = 25°C<br>$T_C$ = -40°C | $I_H$ | <br><br>-<br>- | <br><br>-<br>- | <br><br>50<br>100 | mA |
| **Latching current**<br>($V_D$ = 24V)<br>Trigger source: 5V, 50Ω)<br>MT2(+), G(+); MT2(-), G(-), $T_C$ = 25°C<br>MT2(+), G(-), $T_C$ = 25°C<br>Trigger source: 10V, 50Ω)<br>MT2(+), G(+); MT2(-), G(-), $T_C$ = -40°C<br>MT2(+), G(-), $T_C$ = -40°C | $I_L$ | <br><br><br><br>-<br>-<br><br>-<br>- | <br><br><br><br>-<br>-<br><br>-<br>- | <br><br><br><br>50<br>100<br><br>100<br>200 | mA |
| **Critical rate of rise of off-state voltage**<br>($V_D$ = Rated $V_{DRM}$, gate open, $T_C$ = 110°C) | dv/dt | <br>- | <br>15 | <br>- | V/µs |
| **Critical rate of rise of commutating voltage**<br>($V_D$ = Rated $V_{DRM}$, $I_{T(RMS)}$ = 3A, di/dt = 1.6A/ms,gate open, $T_C$ = 65°C) | dv/dt | <br>- | <br>5 | <br>- | V/µs |

Note 1: Torque rating applies with use of compression washer. Mounting torque in excess of 6 in. lb. does not appreciably lower case-to-sink thermal resistance. Node lead and heatsink contact pad are common. Soldering temperatures shall not exceed +200°C.

### MECHANICAL CHARACTERISTICS

| | |
|---|---|
| **Case** | TO-126 |
| **Marking** | Alpha-numeric |
| **Polarity** | Cathode is stud |




| | TO-126 | | | |
|---|---|---|---|---|
| | Inches | | Millimeters | |
| | Min | Max | Min | Max |
| A | 0.425 | 0.435 | 10.80 | 11.050 |
| B | 0.295 | 0.305 | 7.490 | 7.750 |
| C | 0.095 | 0.105 | 2.410 | 2.670 |
| D | 0.020 | 0.026 | 0.510 | 0.660 |
| F | 0.115 | 0.125 | 2.920 | 3.180 |
| G | 0.091 | 0.097 | 2.310 | 2.460 |
| H | 0.050 | 0.095 | 1.270 | 2.410 |
| J | 0.015 | 0.025 | 0.380 | 0.640 |
| K | 0.595 | 0.655 | 15.110 | 16.640 |
| M | 3° TYP | | 3° TYP | |
| Q | 0.148 | 0.158 | 3.760 | 4.010 |
| R | 0.045 | 0.055 | 1.140 | 1.400 |
| S | 0.025 | 0.035 | 0.640 | 0.890 |
| U | 0.145 | 0.155 | 3.680 | 3.940 |
| V | 0.040 | - | 1.020 | - |

DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

# SC136 SERIES

## BIDIRECTIONAL TRIODE THYRISTORS

**FIGURE 1 – RMS CURRENT DERATING**

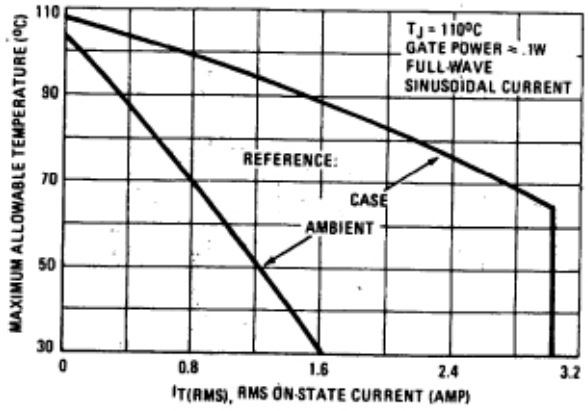



**FIGURE 2 – MAXIMUM POWER DISSIPATION**