

C106 Series

Preferred Device

Sensitive Gate Silicon Controlled Rectifiers

Reverse Blocking Thyristors

Glassivated PNP devices designed for high volume consumer applications such as temperature, light, and speed control; process and remote control, and warning systems where reliability of operation is important.

- Glassivated Surface for Reliability and Uniformity
- Power Rated at Economical Prices
- Practical Level Triggering and Holding Characteristics
- Flat, Rugged, Thermopad Construction for Low Thermal Resistance, High Heat Dissipation and Durability
- Sensitive Gate Triggering
- Device Marking: Device Type, e.g., C106B, Date Code

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

| Rating | Symbol | Value | Unit |
|---|--------------------------|----------------|----------------------|
| Peak Repetitive Off-State Voltage ⁽¹⁾ (Sine Wave, 50–60 Hz, $R_{GK} = 1\text{ k}\Omega$, $T_C = -40^\circ$ to 110°C) | V_{DRM} , V_{RRM} | | Volts |
| C106B | | 200 | |
| C106D, C106D1 | | 400 | |
| C106M, C106M1 | | 600 | |
| On-State RMS Current (180° Conduction Angles, $T_C = 80^\circ\text{C}$) | $I_{T(RMS)}$ | 4.0 | Amps |
| Average On-State Current (180° Conduction Angles, $T_C = 80^\circ\text{C}$) | $I_{T(AV)}$ | 2.55 | Amps |
| Peak Non-Repetitive Surge Current (1/2 Cycle, Sine Wave, 60 Hz, $T_J = +110^\circ\text{C}$) | I_{TSM} | 20 | Amps |
| Circuit Fusing Considerations ($t = 8.3\text{ ms}$) | I^2t | 1.65 | A^2s |
| Forward Peak Gate Power (Pulse Width $\leq 1.0\text{ }\mu\text{sec}$, $T_C = 80^\circ\text{C}$) | P_{GM} | 0.5 | Watt |
| Forward Average Gate Power (Pulse Width $\leq 1.0\text{ }\mu\text{sec}$, $T_C = 80^\circ\text{C}$) | $P_{G(AV)}$ | 0.1 | Watt |
| Forward Peak Gate Current (Pulse Width $\leq 1.0\text{ }\mu\text{sec}$, $T_C = 80^\circ\text{C}$) | I_{GM} | 0.2 | Amp |
| Operating Junction Temperature Range | T_J | -40 to +110 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | -40 to +150 | $^\circ\text{C}$ |
| Mounting Torque ⁽²⁾ | — | 6.0 | in. lb. |

(1) V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

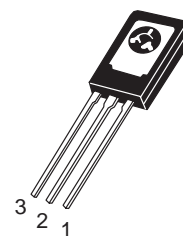
(2) Torque rating applies with use of compression washer (B52200F006). Mounting torque in excess of 6 in. lb. does not appreciably lower case-to-sink thermal resistance. Anode lead and heatsink contact pad are common.



ON Semiconductor

<http://onsemi.com>

SCRs
4 AMPERES RMS
200 thru 600 VOLTS



TO-225AA
(formerly TO-126)
CASE 077
STYLE 2

| PIN ASSIGNMENT | |
|----------------|---------|
| 1 | Cathode |
| 2 | Anode |
| 3 | Gate |

ORDERING INFORMATION

| Device | Package | Shipping |
|--------|---------|----------|
| C106B | TO225AA | 500/Box |
| C106D | TO225AA | 500/Box |
| C106D1 | TO225AA | 500/Box |
| C106M | TO225AA | 500/Box |
| C106M1 | TO225AA | 500/Box |

Preferred devices are recommended choices for future use and best overall value.

C106 Series

Thermal Characteristics (T_C = 25°C unless otherwise noted.)

| Characteristic | Symbol | Max | Unit |
|---|------------------|-----|------|
| Thermal Resistance, Junction to Case | R _{θJC} | 3.0 | °C/W |
| Thermal Resistance, Junction to Ambient | R _{θJA} | 75 | °C/W |
| Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds | T _L | 260 | °C |

Electrical Characteristics (T_C = 25°C unless otherwise noted.)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

OFF CHARACTERISTICS

| | | | | | |
|---|-------------------------------------|---|---|-----|----|
| Peak Repetitive Forward or Reverse Blocking Current (V _{AK} = Rated V _{DRM} or V _{RRM} , R _{GK} = 1000 Ohms) | I _{DRM} , I _{RRM} | — | — | 10 | μA |
| T _J = 25°C | | — | — | | |
| T _J = 110°C | | — | — | 100 | μA |

ON CHARACTERISTICS

| | | | | | |
|---|------------------|-----|-----|-----|-------|
| Peak Forward On-State Voltage ⁽¹⁾ (I _{FM} = 1 A Peak for C106B, D, & M) (I _{FM} = 4 A Peak for C106D1, & M1) | V _{TM} | — | — | 2.2 | Volts |
| Gate Trigger Current (Continuous dc) ⁽²⁾ (V _{AK} = 6 Vdc, R _L = 100 Ohms) | I _{GT} | — | 15 | 200 | μA |
| T _J = 25°C | | — | 35 | 500 | |
| T _J = -40°C | | — | | | |
| Peak Reverse Gate Voltage (I _{GR} = 10 μA) | V _{GRM} | — | — | 6.0 | Volts |
| Gate Trigger Voltage (Continuous dc) ⁽²⁾ (V _{AK} = 6 Vdc, R _L = 100 Ohms) | V _{GT} | 0.4 | .60 | 0.8 | Volts |
| T _J = 25°C | | 0.5 | .75 | 1.0 | |
| T _J = -40°C | | | | | |
| Gate Non-Trigger Voltage (Continuous dc) ⁽²⁾ (V _{AK} = 12 V, R _L = 100 Ohms, T _J = 110°C) | V _{GD} | 0.2 | — | — | Volts |
| Latching Current (V _{AK} = 12 V, I _G = 20 mA) | I _L | — | .20 | 5.0 | mA |
| T _J = 25°C | | — | .35 | 7.0 | |
| T _J = -40°C | | — | | | |
| Holding Current (V _D = 12 Vdc) (Initiating Current = 20 mA, Gate Open) | I _H | — | .19 | 3.0 | mA |
| T _J = 25°C | | — | .33 | 6.0 | |
| T _J = -40°C | | — | .07 | 2.0 | |
| T _J = +110°C | | — | | | |

DYNAMIC CHARACTERISTICS

| | | | | | |
|---|-------|---|-----|---|------|
| Critical Rate-of-Rise of Off-State Voltage (V _{AK} = Rated V _{DRM} , Exponential Waveform, R _{GK} = 1000 Ohms, T _J = 110°C) | dv/dt | — | 8.0 | — | V/μs |
|---|-------|---|-----|---|------|

(1) Pulse Test: Pulse Width ≤ 2.0 ms, Duty Cycle ≤ 2%.

(2) R_{GK} is not included in measurement.

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Voltage Current Characteristic of SCR

| Symbol | Parameter |
|-----------|---|
| V_{DRM} | Peak Repetitive Off State Forward Voltage |
| I_{DRM} | Peak Forward Blocking Current |
| V_{RRM} | Peak Repetitive Off State Reverse Voltage |
| I_{RRM} | Peak Reverse Blocking Current |
| V_{TM} | Peak On State Voltage |
| I_H | Holding Current |

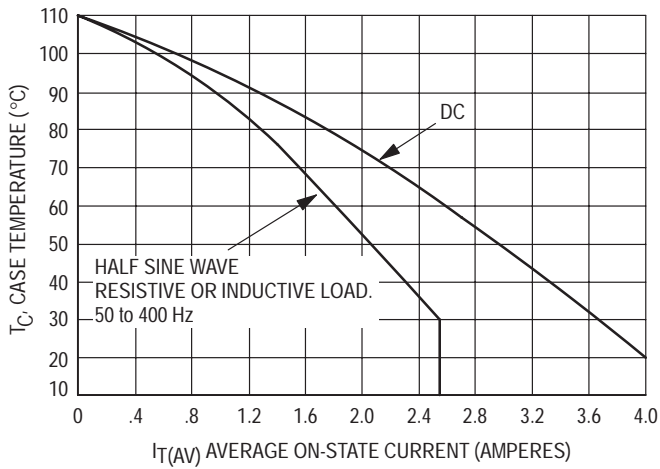
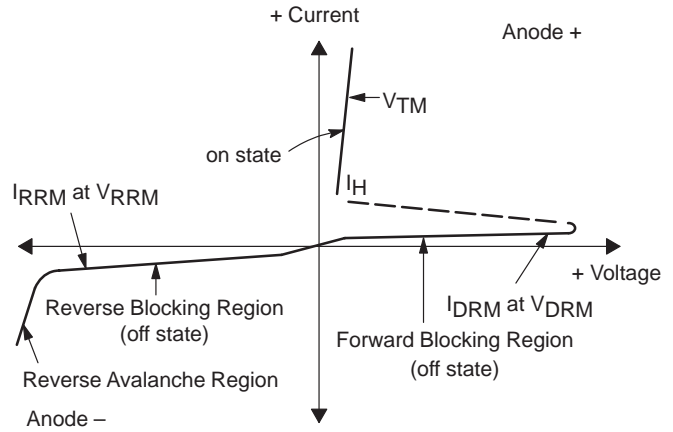


Figure 1. Average Current Derating

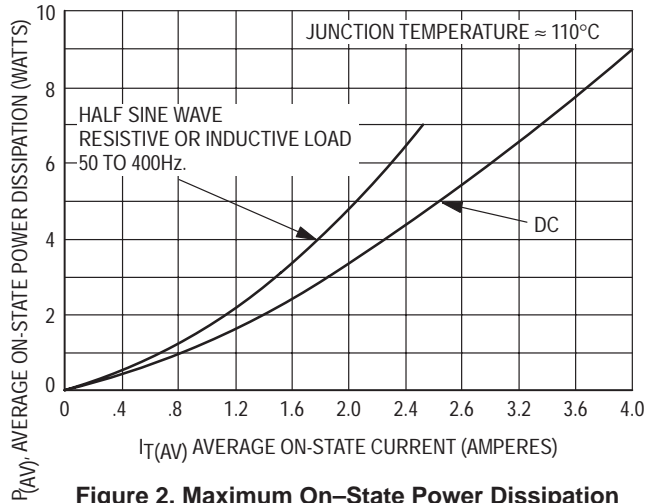


Figure 2. Maximum On-State Power Dissipation

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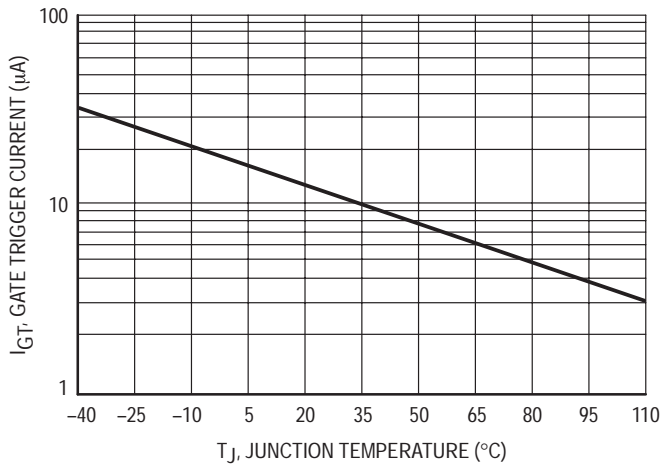


Figure 3. Typical Gate Trigger Current versus Junction Temperature

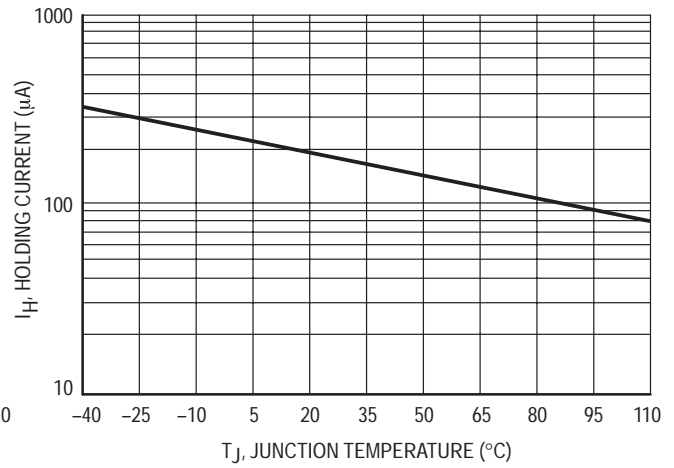


Figure 4. Typical Holding Current versus Junction Temperature

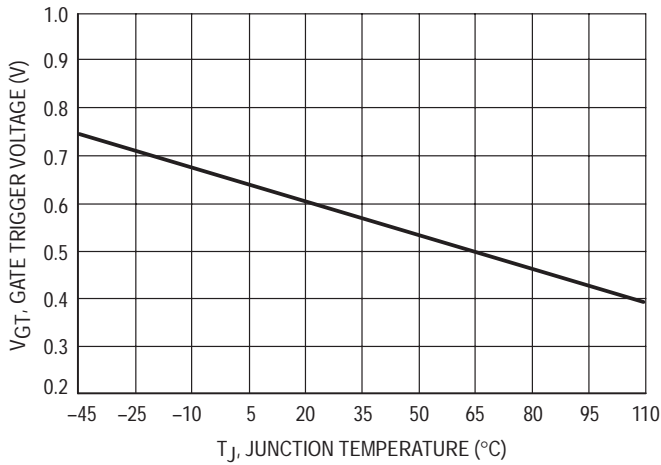


Figure 5. Typical Gate Trigger Voltage versus Junction Temperature

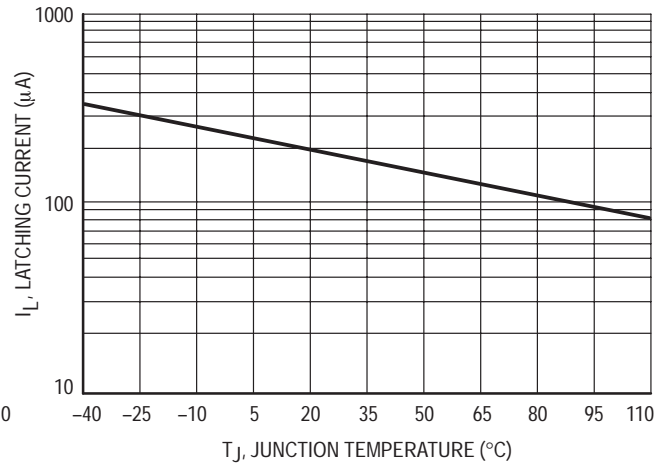
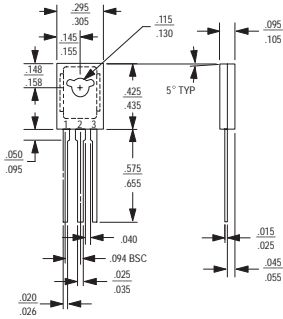


Figure 6. Typical Latching Current versus Junction Temperature

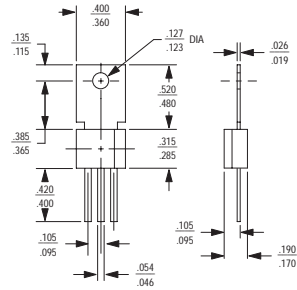
C106 Series

Package Interchangeability

The dimensional diagrams below compare the critical dimensions of the ON Semiconductor C-106 package with competitive devices. It has been demonstrated that the smaller dimensions of the ON Semiconductor package make it compatible in most lead-mount and chassis-mount applications. The user is advised to compare all critical dimensions for mounting compatibility.



ON Semiconductor C-106 Package

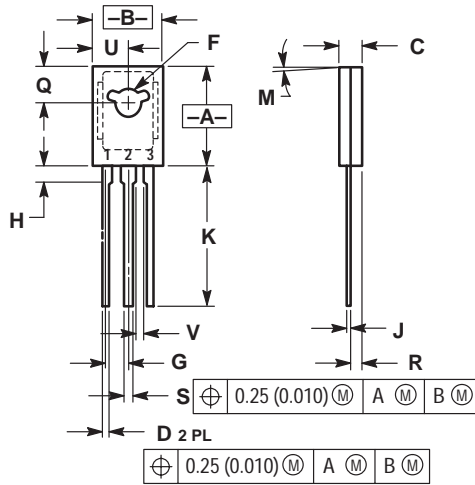


Competitive C-106 Package

C106 Series

PACKAGE DIMENSIONS

TO-225AA
(formerly TO-126)
CASE 077-09
ISSUE W



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.425 | 0.435 | 10.80 | 11.04 |
| B | 0.295 | 0.305 | 7.50 | 7.74 |
| C | 0.095 | 0.105 | 2.42 | 2.66 |
| D | 0.020 | 0.026 | 0.51 | 0.66 |
| F | 0.115 | 0.130 | 2.93 | 3.30 |
| G | 0.094 BSC | | 2.39 BSC | |
| H | 0.050 | 0.095 | 1.27 | 2.41 |
| J | 0.015 | 0.025 | 0.39 | 0.63 |
| K | 0.575 | 0.655 | 14.61 | 16.63 |
| M | 5° TYP | | 5° TYP | |
| Q | 0.148 | 0.158 | 3.76 | 4.01 |
| R | 0.045 | 0.065 | 1.15 | 1.65 |
| S | 0.025 | 0.035 | 0.64 | 0.88 |
| U | 0.145 | 0.155 | 3.69 | 3.93 |
| V | 0.040 | — | 1.02 | — |

- STYLE 2:
PIN 1. CATHODE
2. ANODE
3. GATE

Notes

C106 Series

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