

## Silicon Controlled Rectifier Reverse Blocking Triode Thyristors

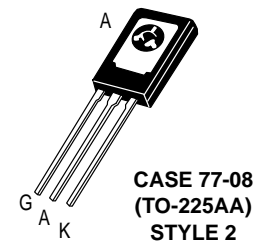
... Glassivated PNP devices designed for high volume consumer applications such as temperature, light, and speed control; process and remote control, and warning systems where reliability of operation is important.

- 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

### C106 Series \*

\*Motorola preferred devices

SCRs  
4 AMPERES RMS  
50 thru 600 VOLTS



#### MAXIMUM RATINGS (T<sub>J</sub> = 25°C unless otherwise noted.)

Rating	Symbol	Value	Unit
Peak Repetitive Forward and Reverse Blocking Voltage <sup>(1)</sup> (R <sub>GK</sub> = 1 kΩ) (T <sub>C</sub> = -40° to 110°C)	V <sub>DRM</sub> or V <sub>RRM</sub>	50 100 200 400 600	Volts
RMS Forward Current (All Conduction Angles)	I <sub>T(RMS)</sub>	4	Amps
Average Forward Current (T <sub>A</sub> = 30°C)	I <sub>T(AV)</sub>	2.55	Amps
Peak Non-repetitive Surge Current (1/2 Cycle, 60 Hz, T <sub>J</sub> = -40 to +110°C)	I <sub>TSM</sub>	20	Amps
Circuit Fusing (t = 8.3 ms)	I <sup>2</sup> t	1.65	A <sup>2</sup> s
Peak Gate Power	P <sub>GM</sub>	0.5	Watt
Average Gate Power	P <sub>G(AV)</sub>	0.1	Watt
Peak Forward Gate Current	I <sub>GFM</sub>	0.2	Amp

1. V<sub>DRM</sub> and V<sub>RRM</sub> for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, (cont.) 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.

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

**C106 Series**

**MAXIMUM RATINGS — continued**

Rating	Symbol	Value	Unit
Peak Reverse Gate Voltage	$V_{GRM}$	6	Volts
Operating Junction Temperature Range	$T_J$	-40 to +110	°C
Storage Temperature Range	$T_{stg}$	-40 to +150	°C
Mounting Torque <sup>(1)</sup>	—	6	in. lb.

1. 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.

For soldering purposes (either terminal connection or device mounting), soldering temperatures shall not exceed +200°C. For optimum results, an activated flux (oxide removing) is recommended.

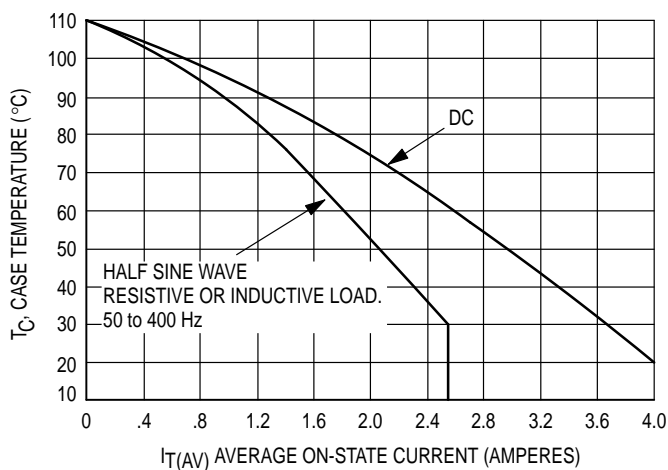
**THERMAL CHARACTERISTICS** ( $T_C = 25^\circ\text{C}$ ,  $R_{GK} = 1\text{ k}\Omega$  unless otherwise noted.)

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	3	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	75	°C/W

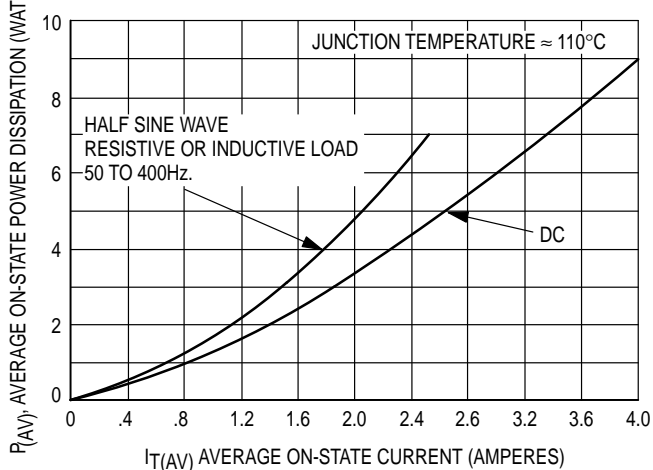
**ELECTRICAL CHARACTERISTICS** ( $T_C = 25^\circ\text{C}$  unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Forward or Reverse Blocking Current ( $V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}$ , $R_{GK} = 1000\text{ Ohms}$ ) $T_J = 25^\circ\text{C}$ $T_J = 110^\circ\text{C}$	$I_{DRM}$ , $I_{RRM}$	— —	— —	10 100	$\mu\text{A}$ $\mu\text{A}$
Forward "On" Voltage ( $I_{FM} = 1\text{ A Peak}$ )	$V_{TM}$	—	—	2.2	Volts
Gate Trigger Current (Continuous dc) ( $V_{AK} = 6\text{ Vdc}$ , $R_L = 100\text{ Ohms}$ ) ( $V_{AK} = 6\text{ Vdc}$ , $R_L = 100\text{ Ohms}$ , $T_C = -40^\circ\text{C}$ )	$I_{GT}$	— —	30 75	200 500	$\mu\text{A}$
Gate Trigger Voltage (Continuous dc) ( $V_{AK} = 6\text{ Vdc}$ , $R_L = 100\text{ Ohms}$ , $R_{GK} = 1000\text{ Ohms}$ ) ( $V_{AK} = \text{Rated } V_{DRM}$ , $R_L = 3000\text{ Ohms}$ , $R_{GK} = 1000\text{ Ohms}$ , $T_J = 110^\circ\text{C}$ ) $T_J = 25^\circ\text{C}$ $T_J = -40^\circ\text{C}$	$V_{GT}$	0.4 0.5 0.2	— — —	0.8 1 —	Volts
Holding Current ( $V_D = 12\text{ Vdc}$ , $R_{GK} = 1000\text{ Ohms}$ ) $T_J = 25^\circ\text{C}$ $T_J = -40^\circ\text{C}$ $T_J = +110^\circ\text{C}$	$I_{HX}$	0.3 0.4 0.14	— — —	3 6 2	mA
Forward Voltage Application Rate ( $T_J = 110^\circ\text{C}$ , $R_{GK} = 1000\text{ Ohms}$ , $V_D = \text{Rated } V_{DRM}$ )	dv/dt	—	8	—	V/ $\mu\text{s}$
Turn-On Time	$t_{gt}$	—	1.2	—	$\mu\text{s}$
Turn-Off Time	$t_q$	—	40	—	$\mu\text{s}$

**FIGURE 1 – AVERAGE CURRENT DERATING**

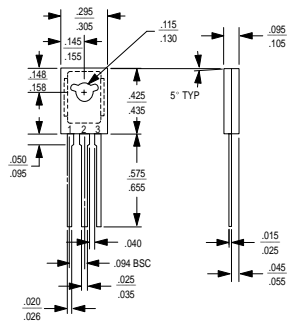


**FIGURE 2 – MAXIMUM ON-STATE POWER DISSIPATION**

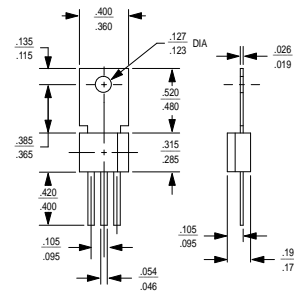


### Package Interchangeability

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

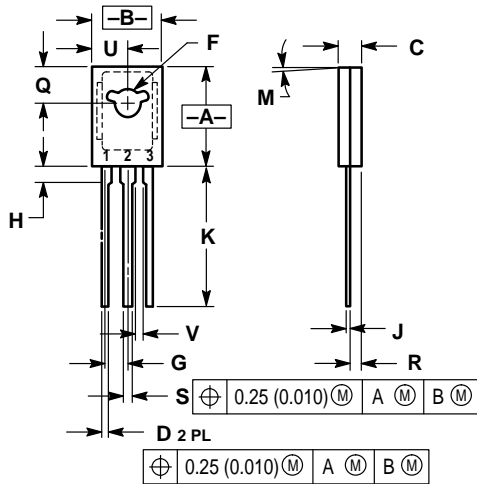


Motorola C-106 Package



Competitive C-106 Package

PACKAGE DIMENSIONS



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

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	0.055	1.15	1.39
S	0.025	0.035	0.64	0.88
U	0.145	0.155	3.69	3.93
V	0.040	—	1.02	—

CASE 77-08  
 (TO-225AA)