Silicon Controlled Rectifier
Reverse Blocking Triode Thyristors

C106 Series*

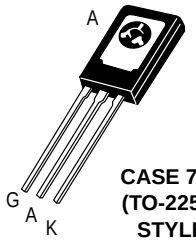
***Motorola preferred devices**

. . . Glassivated PNPN 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

SCRs
4 AMPERES RMS
50 thru 600 VOLTS





CASE 77-08
(TO-225AA)
STYLE 2

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted.)

Rating		Symbol	Value	Unit
Peak Repetitive Forward and Reverse Blocking Voltage(1) (R_{GK} = 1 kΩ) (T_C = –40° to 110°C)	C106F C106A C106B C106D C106M	V_{DRM} or V_{RRM}	 50 100 200 400 600	Volts
RMS Forward Current (All Conduction Angles)		$I_{T(RMS)}$	4	Amps
Average Forward Current (T_A = 30°C)		$I_{T(AV)}$	2.55	Amps
Peak Non-repetitive Surge Current (1/2 Cycle, 60 Hz, T_J = –40 to +110°C)		I_{TSM}	20	Amps
Circuit Fusing (t = 8.3 ms)		I^2t	1.65	A^2s
Peak Gate Power		P_{GM}	0.5	Watt
Average Gate Power		$P_{G(AV)}$	0.1	Watt
Peak Forward Gate Current		I_{GFM}	0.2	Amp

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, (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.

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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(1)	—	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°C, R_{GK} = 1 kΩ 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°C unless otherwise noted.)

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

FIGURE 1 – AVERAGE CURRENT DERATING

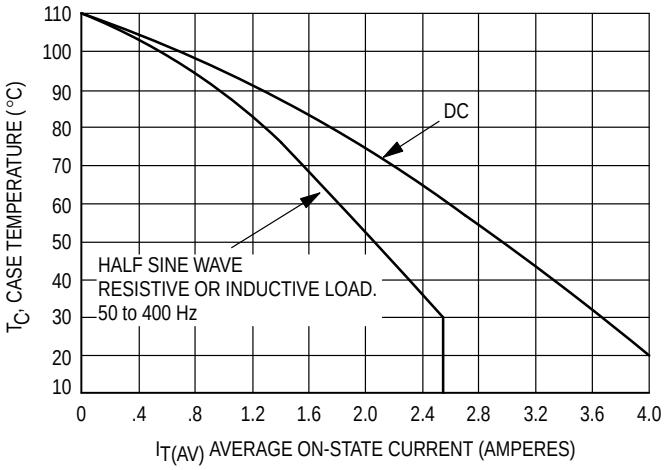
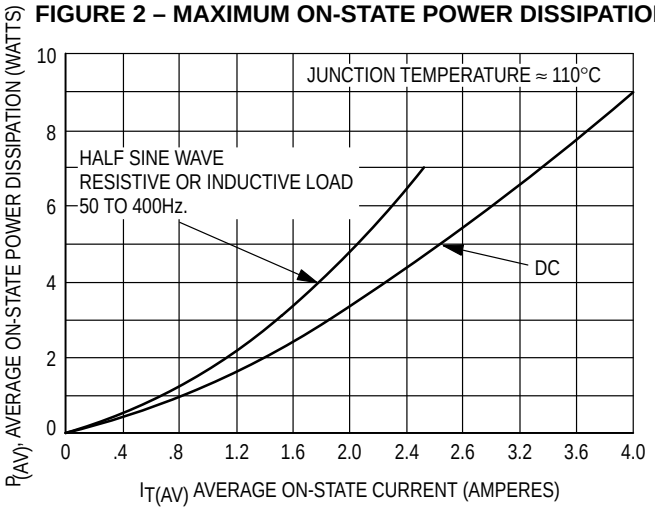
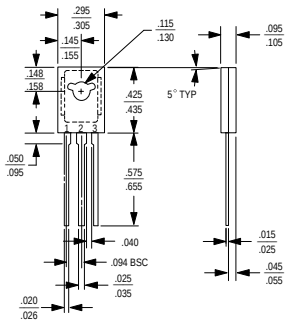


FIGURE 2 – MAXIMUM ON-STATE POWER DISSIPATION

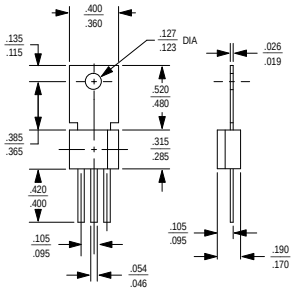


Package Interchangeability

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.

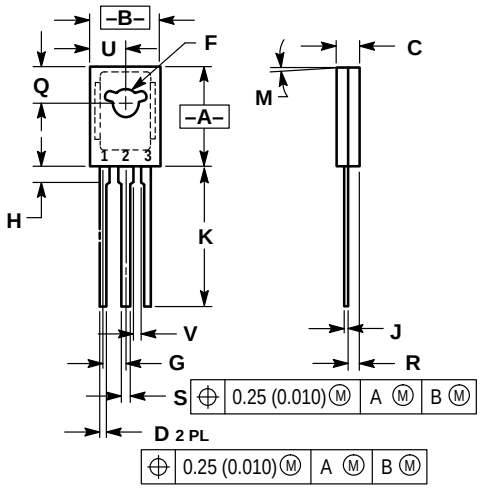


Motorola C-106 Package



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.

	INCHES		MILLIMETERS	
DIM	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)

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