

## Silicon Controlled Rectifiers

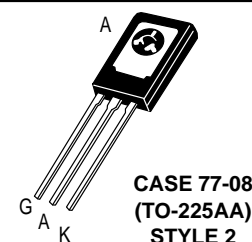
### Reverse Blocking Triode Thyristors

. . . 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.

- Passivated 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
- Recommended Electrical Replacement for C106

**2N6240**

**SCRs**  
**4 AMPERES RMS**  
**400 VOLTS**



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

Rating	Symbol	Value	Unit
*Repetitive Peak Forward and Reverse Blocking Voltage <sup>(1)</sup> (1/2 Sine Wave) (R <sub>GK</sub> = 1000 ohms, T <sub>C</sub> = -40 to +110°C)	V <sub>DRM</sub> or V <sub>RRM</sub>	400	Volts
*Non-repetitive Peak Reverse Blocking Voltage (1/2 Sine Wave, R <sub>GK</sub> = 1000 ohms, T <sub>C</sub> = -40° to +110°C)	V <sub>RSM</sub>	450	Volts
*Average On-State Current (T <sub>C</sub> = -40 to +90°C) (T <sub>C</sub> = +100°C)	I <sub>T(AV)</sub>	2.6 1.6	Amps
*Surge On-State Current (1/2 Sine Wave, 60 Hz, T <sub>C</sub> = +90°C) (1/2 Sine Wave, 1.5 ms, T <sub>C</sub> = +90°C)	I <sub>TSM</sub>	25 35	Amps
Circuit Fusing (t = 8.3 ms)	I <sup>2</sup> t	2.6	A <sup>2</sup> s
*Peak Gate Power (Pulse Width = 10 μs, T <sub>C</sub> = 90°C)	P <sub>GM</sub>	0.5	Watts

\*Indicates JEDEC Registered Data.

(continued)

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, 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.

## 2N6240

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

Rating	Symbol	Value	Unit
*Average Gate Power ( $t = 8.3 \text{ ms}$ , $T_C = 90^\circ\text{C}$ )	$P_{G(AV)}$	0.1	Watt
Peak Forward Gate Current	$I_{GM}$	0.2	Amp
Peak Reverse Gate Voltage	$V_{RGM}$	6	Volts
*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 <sup>(1)</sup>	—	6	in. lb.

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Min	Max	Unit
*Thermal Resistance, Junction to Case	$R_{\theta JC}$	—	3	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	—	75	$^\circ\text{C/W}$

\*Indicates JEDEC Registered Data.

### ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ and $R_{GK} = 1000 \text{ ohms}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
*Peak Forward or Reverse Blocking Current ( $V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}$ ) $T_C = 25^\circ\text{C}$ $T_C = 110^\circ\text{C}$	$I_{DRM}$ , $I_{RRM}$	— —	— —	10 200	$\mu\text{A}$ $\mu\text{A}$
*Peak Forward "On" Voltage ( $I_{TM} = 8.2 \text{ A Peak}$ , Pulse Width = 1 to 2 ms, 2% Duty Cycle)	$V_{TM}$	—	—	2.2	Volts
Gate Trigger Current (Continuous dc) <sup>(2)</sup> ( $V_{AK} = 12 \text{ Vdc}$ , $R_L = 24 \text{ Ohms}$ ) *( $V_{AK} = 12 \text{ Vdc}$ , $R_L = 24 \text{ Ohms}$ , $T_C = -40^\circ\text{C}$ )	$I_{GT}$	— —	— —	200 500	$\mu\text{A}$
Gate Trigger Voltage (Continuous dc) (Source Voltage = 12 V, $R_S = 50 \text{ Ohms}$ ) *( $V_{AK} = 12 \text{ Vdc}$ , $R_L = 24 \text{ Ohms}$ , $T_C = -40^\circ\text{C}$ )	$V_{GT}$	—	—	1	Volts
Gate Non-Trigger Voltage ( $V_{AK} = \text{Rated } V_{DRM}$ , $R_L = 100 \text{ Ohms}$ , $T_C = 110^\circ\text{C}$ )	$V_{GD}$	0.2	—	—	Volts
Holding Current ( $V_{AK} = 12 \text{ Vdc}$ , $I_{GT} = 2 \text{ mA}$ ) $T_C = 25^\circ\text{C}$ *(Initiating On-State Current = 200 mA) $T_C = -40^\circ\text{C}$	$I_H$	— —	— —	5 10	mA
*Total Turn-On Time (Source Voltage = 12 V, $R_S = 6 \text{ k Ohms}$ ) ( $I_{TM} = 8.2 \text{ A}$ , $I_{GT} = 2 \text{ mA}$ , Rated $V_{DRM}$ ) (Rise Time = 20 ns, Pulse Width = 10 $\mu\text{s}$ )	$t_{gt}$	—	2	—	$\mu\text{s}$
Forward Voltage Application Rate ( $V_D = \text{Rated } V_{DRM}$ , $T_C = 110^\circ\text{C}$ )	$dv/dt$	—	10	—	$\text{V}/\mu\text{s}$

\*Indicates JEDEC Registered Data.

- Torque rating applies with use of compression washer (B52200F006 or equivalent). 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. (See AN-209 B)  
For soldering purposes (either terminal connection or device mounting), soldering temperatures shall not exceed  $+200^\circ\text{C}$ . For optimum results an activated flux (oxide removing) is recommended.
- Measurement does not include  $R_{GK}$  current.

FIGURE 1 – MAXIMUM CASE TEMPERATURE

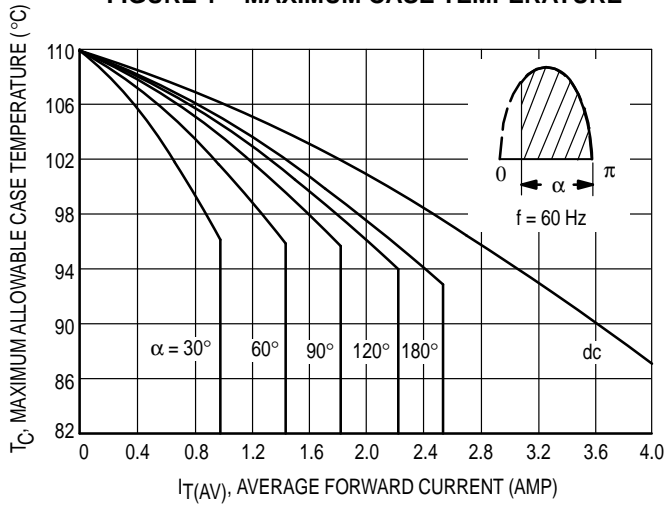
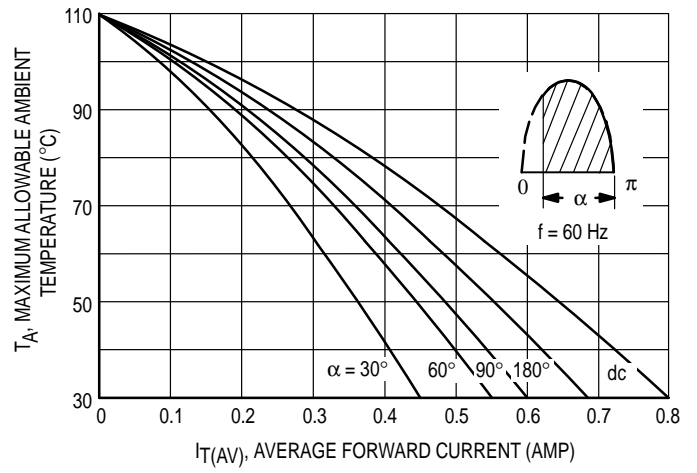
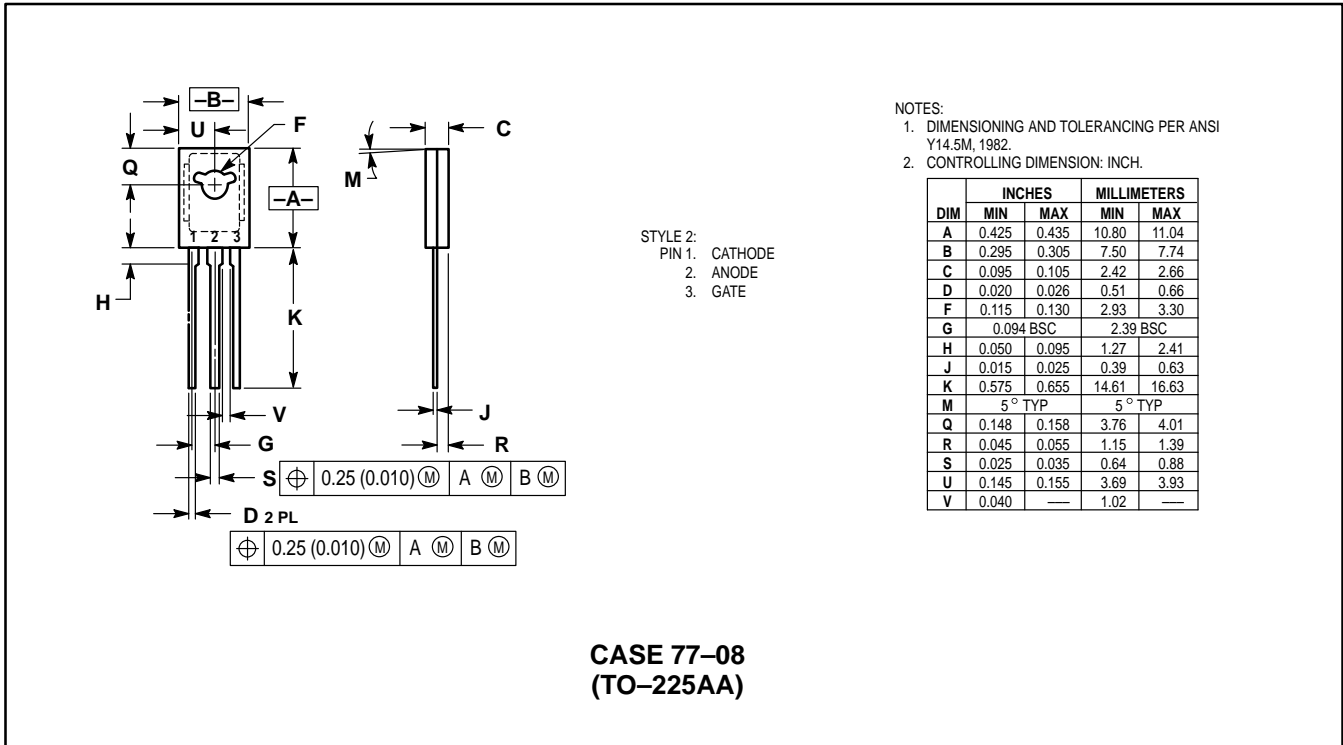


FIGURE 2 – MAXIMUM AMBIENT TEMPERATURE



PACKAGE DIMENSIONS



Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

Mfax is a trademark of Motorola, Inc.

**How to reach us:**

**USA/EUROPE/Locations Not Listed:** Motorola Literature Distribution;  
P.O. Box 5405, Denver, Colorado 80217. 1-303-675-2140 or 1-800-441-2447

**JAPAN:** Motorola Japan Ltd.; SPD, Strategic Planning Office, 141,  
4-32-1 Nishi-Gotanda, Shinagawa-ku, Tokyo, Japan. 81-3-5487-8488

**Customer Focus Center: 1-800-521-6274**

**Mfax™:** RMFAX0@email.sps.mot.com – TOUCHTONE 1-602-244-6609  
Motorola Fax Back System – US & Canada ONLY 1-800-774-1848  
– http://sps.motorola.com/mfax/

**ASIA/PACIFIC:** Motorola Semiconductors H.K. Ltd.; Silicon Harbour Centre,  
2, Dai King Street, Tai Po Industrial Estate, Tai Po, N.T., Hong Kong.  
852-26629298

**HOME PAGE:** <http://motorola.com/sps/>

