SOLID STATE INC.
46 FARRAND STREET
BLOOMFIELD, NEW JERSEY 07003 www.solidstateinc.com

Silicon Controlled Rectifiers

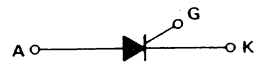
Reverse Blocking Triode Thyristor

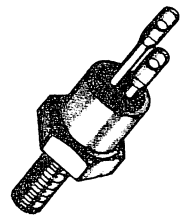
2N4168 thru 2N4174

. . . multi-purpose PNPN silicon controlled rectifiers suited for industrial, consumer, and military applications. Offered in a choice of space-saving, economical packages for mounting versatility.

- Uniform Low-Level Noise-Immune Gate Triggering — I_{GT} = 10 mA (Typ) @ T_C = 25°C
- Low Forward "On" Voltage — v_T = 1 V (Typ) @ 5 Amp @ 25°C
- High Surge-Current Capability — I_{TSM} = 100 Amp Peak
- Shorted Emitter Construction

SCRs
8 AMPERES RMS
50 thru 600 VOLTS





TO-64

MAXIMUM RATINGS (Apply over operating temperature range and for all case types unless otherwise noted.)

Rating	Symbol	Value	Unit
*Peak Repetitive Forward and Reverse Blocking Voltage, Note 1 2N4168	V_{DRM} or V_{RRM}	50	Volts
2N4169		100	
2N4170		200	
2N4172		400	
2N4174		600	
Forward Current RMS	$I_{T(RMS)}$	8	Amps
*Peak Forward Surge Current (One cycle, 60 Hz, T_J = −40 to +100°C)	I_{TSM}	100	Amps
Circuit Fusing (T_J = −40 to +100°C; t ≤ 8.3 ms)	I^2t	40	A^2s
*Peak Gate Power	P_{GM}	5	Watts
*Average Gate Power	$P_{G(AV)}$	0.5	Watt
*Peak Gate Current	I_{GM}	2	Amps
Peak Gate Voltage, Note 2	V_{GM}	10	Volts
*Operating Temperature Range	T_J	−40 to +100	°C
*Storage Temperature Range	T_{stg}	−40 to +150	°C
Stud Torque		15	in. lb.

*Indicates JEDEC Registered Data.

Notes: 1. Ratings apply for zero or negative gate voltage. Devices should not be tested for blocking capability in a manner such that the voltage applied exceeds the rated blocking voltage.

2. Devices should not be operated with a positive bias applied to the gate concurrently with a negative potential applied to the anode.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.5	2.5*	°C/W
Thermal Resistance, Case to Ambient (See Figure 11) 2N4183–98	$R_{\theta CA}$	50	—	°C/W

*Indicates JEDEC Registered Data.

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
*Peak Forward or Reverse Blocking Current (Rated V_{DRM} or V_{RRM}, gate open) T_J = 25°C	I_{DRM}, I_{RRM}	—	—	10	μA
T_J = 100°C		—	—	2	mA
Gate Trigger Current (Continuous dc), Note 1	I_{GT}				mA
(V_D = 7 Vdc, R_L = 100 Ω)		—	10	30	
*(V_D = 7 Vdc, R_L = 100 Ω, T_C = −40°C)		—	—	60	
Gate Trigger Voltage (Continuous dc)	V_{GT}				Volts
(V_D = 7 Vdc, R_L = 100 Ω)		—	0.75	1.5	
*(V_D = 7 Vdc, R_L = 100 Ω, T_C = −40°C)		—	—	2.5	
*(V_D = 7 Vdc, R_L = 100 Ω, T_J = 100°C)		0.2	—	—	
*Forward "On" Voltage (pulsed, 1 ms max, duty cycle ≤ 1%) (I_{TM} = 15.7 A)	v_{TM}	—	1.4	2	Volts
Holding Current	I_H				mA
(V_D = 7 Vdc, gate open)		—	10	30	
*(V_D = 7 Vdc, gate open, T_C = −40°C)		—	—	60	
Turn-On Time (t_d + t_r) (I_G = 20 mAdc, I_F = 5 Adc, V_D = Rated V_{DRM})	t_{on}	—	1	—	μs
Turn-Off Time	t_{off}				μs
(I_F = 5 Adc, I_R = 5 Adc)		—	15	—	
(I_F = 5 Adc, I_R = 5 Adc, T_J = 100°C, V_D = Rated V_{DRM}) (dv/dt = 30 V/μs)		—	25	—	
Forward Voltage Application Rate (Exponential) (Gate open, T_J = 100°C, V_D = Rated V_{DRM})	dv/dt	—	50	—	V/μs

*Indicates JEDEC Registered Data

Note 1. For optimum operation, i.e. faster turn-on, lower switching losses, best di/dt capability, recommended I_{GT} = 200 mA minimum.

TYPICAL TRIGGER CHARACTERISTICS

FIGURE 1 – PULSE CURRENT TRIGGERING

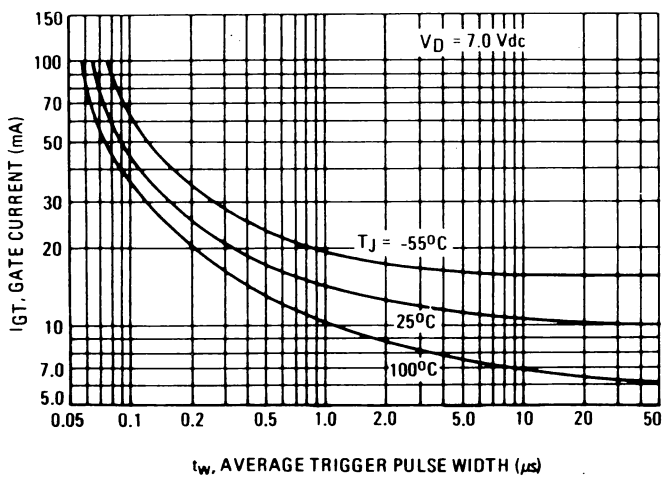
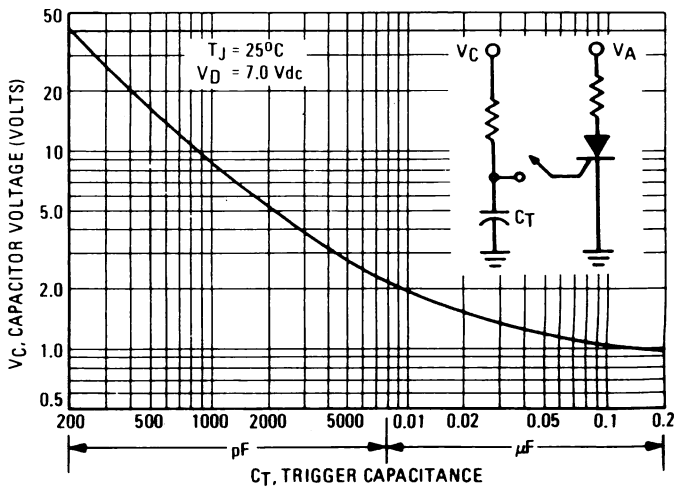


FIGURE 2 – CAPACITIVE DISCHARGE TRIGGERING



CURRENT DERATING

FIGURE 3 – MAXIMUM CASE TEMPERATURE

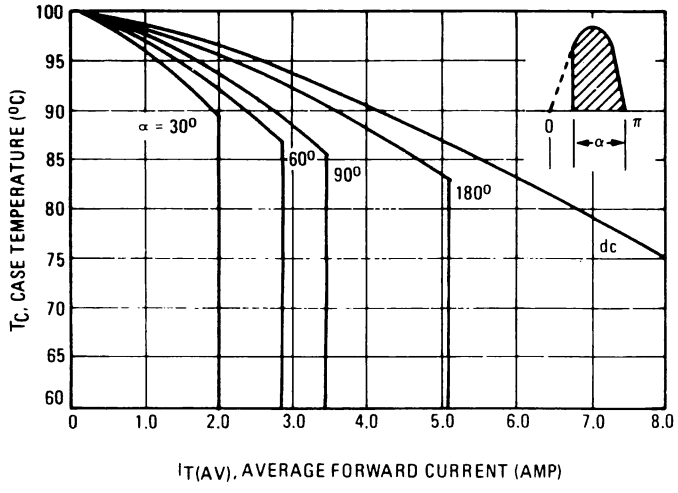


FIGURE 4 – MAXIMUM AMBIENT TEMPERATURE

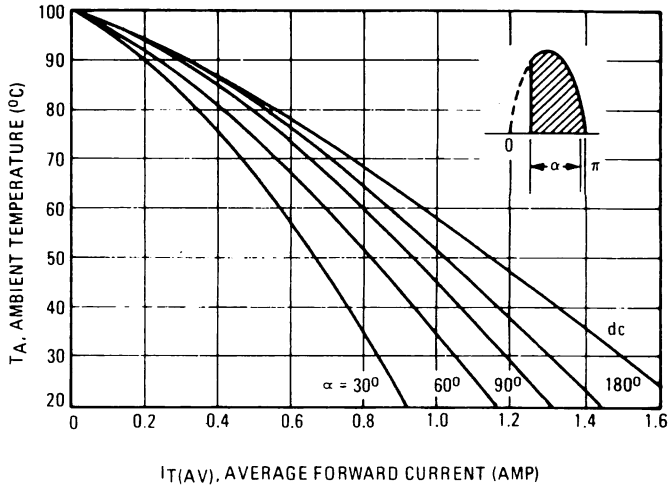


FIGURE 5 – POWER DISSIPATION

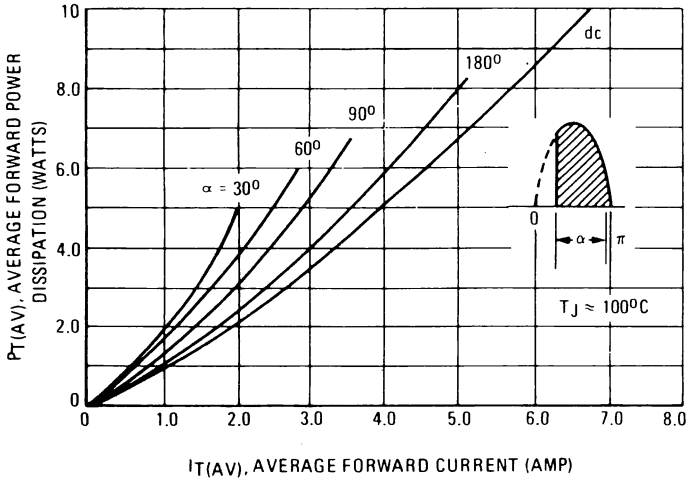


FIGURE 6 – MAXIMUM SURGE CAPABILITY

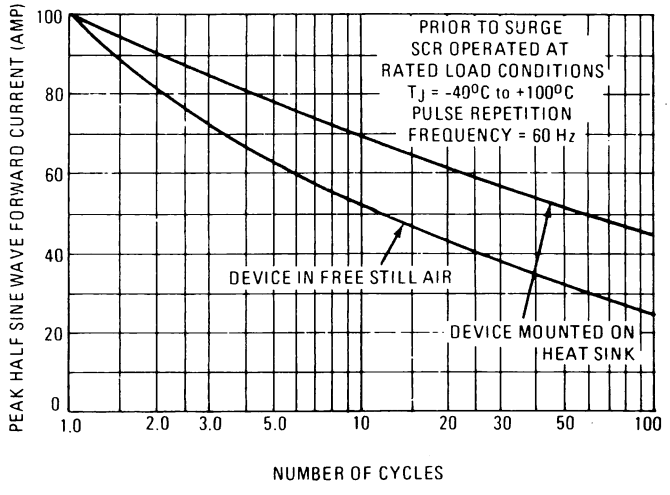


FIGURE 7 – THERMAL RESPONSE

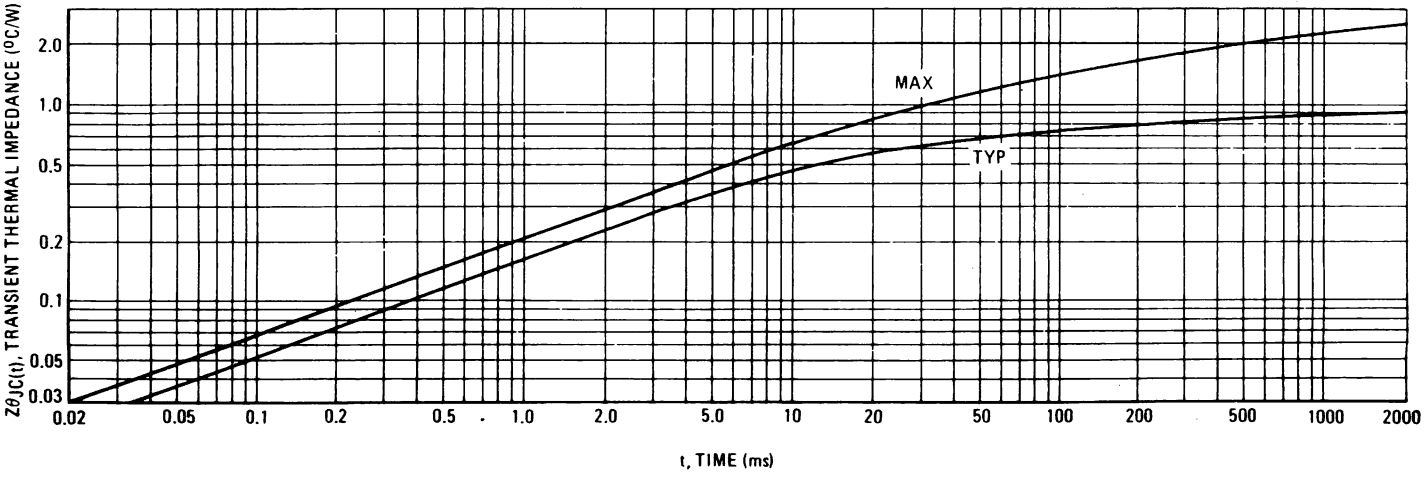


FIGURE 8 – FORWARD VOLTAGE

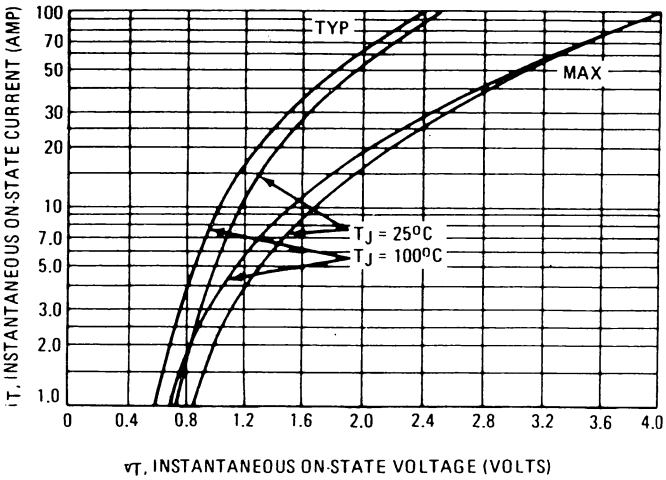


FIGURE 9 – HOLDING CURRENT

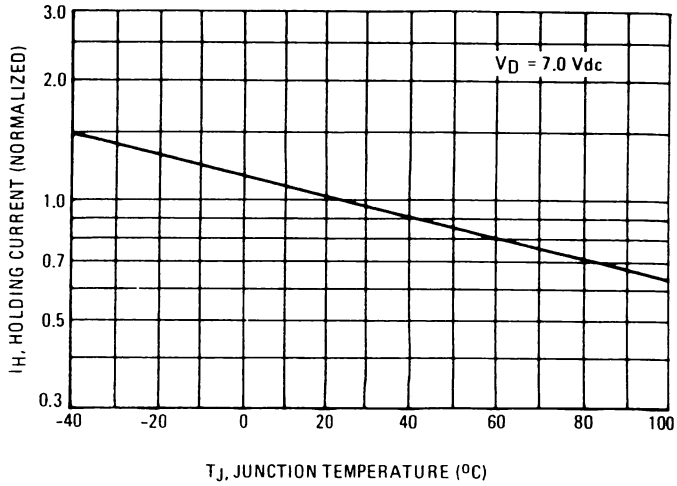


FIGURE 10 – TYPICAL THERMAL RESISTANCE OF PLATES

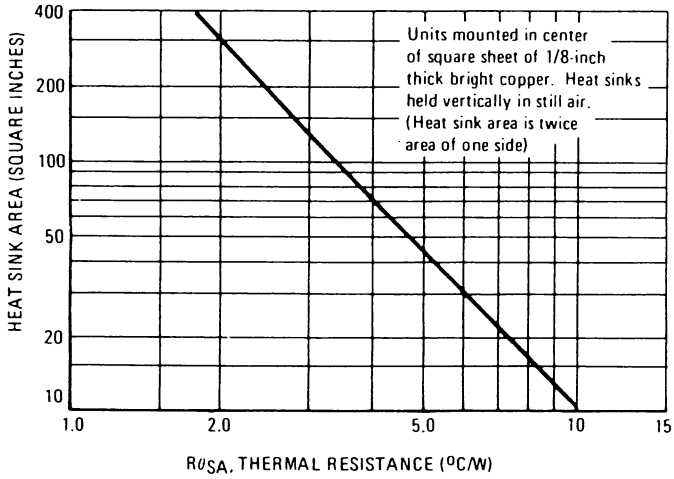
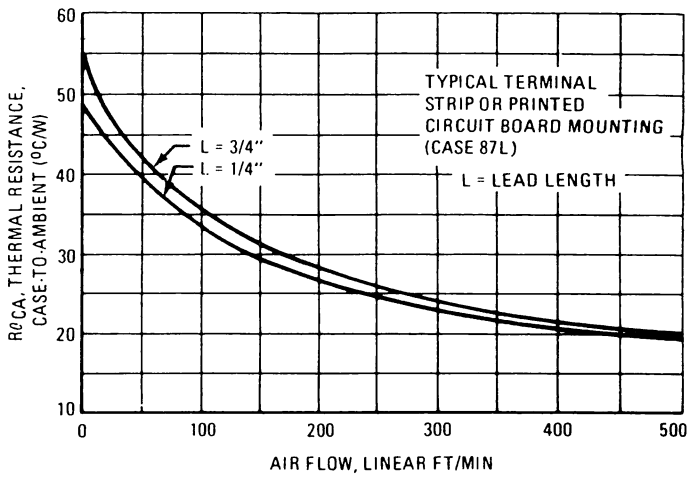
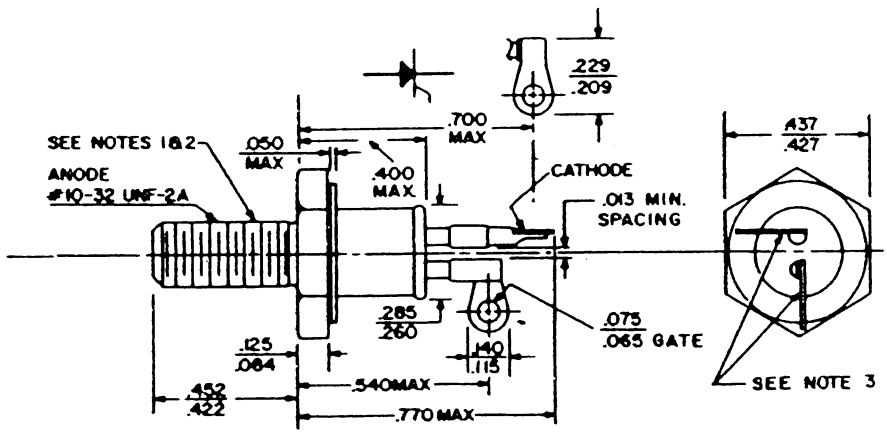


FIGURE 11 – CASE-TO-AMBIENT THERMAL RESISTANCE





NOTES: 1. COMPLETE THREADS EXTEND TO WITHIN 2-1/2 THREADS OF HEAD.

2. DIAMETER OF UNTHREADED PORTION .190 MAX.
3. ANGULAR ORIENTATION OF THESE TERMINALS IS UNDEFINED.
4. CASE IS ANODE CONNECTION.
5. ALL DIMENSIONS IN INCHES.