

# Triacs

## Bidirectional Triode Thyristors

... designed primarily for industrial and military applications for the fullwave control of ac loads in applications such as light dimmers, power supplies, heating controls, motor controls, welding equipment and power switching systems.

- All Diffused and Glass Passivated Junctions for Greater Stability
- Pressfit, Stud and Isolated Stud Packages
- Gate Triggering Guaranteed In All 4 Quadrants

**2N5567  
2N5568  
MAC5569  
MAC5570  
T4101M  
MAC4111M  
MAC4121  
Series**

**TRIACS  
10 AMPERES RMS  
200 thru 800 VOLTS**

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
*Peak Repetitive Off-State Voltage ( $T_J = -65$ to $+100^\circ\text{C}$ ) 1/2 Sine Wave 50 to 60 Hz, Gate Open 2N5567, MAC5569, MAC4121B 2N5568, MAC5570, MAC4121D T4101M, MAC4111M, MAC4121M MAC4121N	VDRM	200 400 600 800	Volts
*Peak Gate Voltage	VGM	20	Volts
*RMS On-State Current ( $T_C = -65$ to $+85^\circ\text{C}$ ) ( $T_C = +90^\circ\text{C}$ ) Full cycle, Sine Wave, 50 to 60 Hz	$I_T(\text{RMS})$	10 6.7	Amps
*Peak Non-Repetitive Surge Current (One Full cycle of surge current at 60 Hz, preceded and followed by rated current, $T_C = 85^\circ\text{C}$ )	$I_{\text{TSM}}$	100	Amps
Circuit Fusing Considerations ( $t = 8.3$ ms)	$I^2t$	40	$\text{A}^2\text{s}$
Peak Gate Power *( $T_C = 85^\circ\text{C}$ , Pulse Width = $1 \mu\text{s}$ )	PGM	16	Watts
*Average Gate Power ( $T_C = 85^\circ\text{C}$ , Pulse Width = $8.3$ ms)	$P_{G(\text{AV})}$	0.5	Watt
*Operating Junction Temperature Range	$T_J$	$-65$ to $+100$	$^\circ\text{C}$
*Storage Temperature Range	$T_{\text{stg}}$	$-65$ to $+150$	$^\circ\text{C}$
Stud Torque	—	30	in. lb.

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Thermal Resistance, Junction to Case Stud and Pressfit Isolated Stud	$R_{\theta\text{JC}}$	1 1.1	$^\circ\text{C/W}$

\*Indicates JEDEC Registered Data.



**CASE 174-04  
(TO-203AA)  
STYLE 3  
2N5567  
2N5568  
T4101M**



**CASE 263-04  
STYLE 2  
MAC5569  
MAC5570  
MAC4111M**



**CASE 311-02  
STYLE 2  
MAC4121 SERIES**

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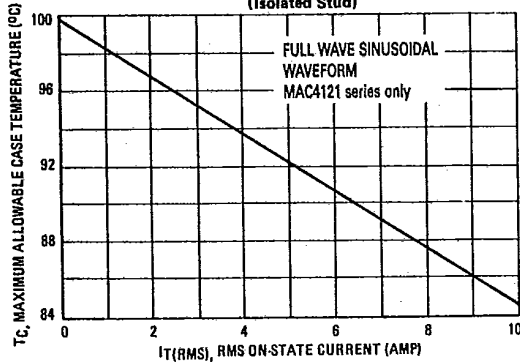
**ELECTRICAL CHARACTERISTICS** ( $T_C = 25^\circ\text{C}$ , and Either Polarity of MT2 to MT1 Voltage unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
*Peak Forward or Reverse Blocking Current (Rated $V_{DRM}$ or $V_{RRM}$ ) $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$	$I_{DRM}$ , $I_{RRM}$	—	—	10 2	$\mu\text{A}$ mA
*Peak On-State Voltage ( $I_{TM} = 14.2$ A Peak, Pulse Width = 1 to 2 ms, Duty Cycle $\leq 2\%$ )	$V_{TM}$	—	1.3	1.65	Volts
Gate Trigger Current (Continuous dc), Note 1 ( $V_D = 12$ Vdc, $R_L = 12$ Ohms) MT2(+), G(+); MT2(-), G(-) MT2(+), G(-); MT2(-), G(+) *MT2(+), G(+); MT2(-), G(-), $T_C = -65^\circ\text{C}$ *MT2(+), G(-); MT2(-), G(+), $T_C = -65^\circ\text{C}$	$I_{GT}$	—	—	25 40 100 150	mA
Gate Trigger Voltage (Continuous dc) (All Quadrants) ( $V_D = 12$ Vdc, $R_L = 12$ Ohms) $T_C = 25^\circ\text{C}$ * $T_C = -65^\circ\text{C}$ ( $V_D = \text{Rated } V_{DRM}$ , $R_L = 125 \Omega$ ) $T_C = 100^\circ\text{C}$	$V_{GT}$	—	—	2.5 4 —	Volts
Holding Current ( $V_D = 12$ Vdc, Gate Open) $T_C = 25^\circ\text{C}$ * $T_C = -65^\circ\text{C}$	$I_H$	—	—	30 200	mA
Gate Controlled Turn-On Time ( $V_D = \text{Rated } V_{DRM}$ , $I_{TM} = 15$ A Peak, $I_{GT} = 160$ mA, Rise Time = $0.1 \mu\text{s}$ , Pulse Width = $2 \mu\text{s}$ ) MT2(+), G(+); MT2(-), G(-)	$t_{gt}$	—	1	2.5	$\mu\text{s}$
*Critical Rate-of-Rise of Commutation Voltage ( $V_D = \text{Rated } V_{DRM}$ , $I_{TM} = 14.2$ A Peak, Commutating $di/dt = 5.4$ A/ms, gate unenergized) $T_C = 85^\circ\text{C}$	$dv/dt(c)$	2	10	—	V/ $\mu\text{s}$
Critical Rate-of-Rise of Off-State Voltage ( $V_D = \text{Rated } V_{DRM}$ , Exponential Voltage Rise, Gate Open, $T_C = 100^\circ\text{C}$ ) *2N5567, *MAC5569, MAC4121B *2N5568, *MAC5570, MAC4121D T4101M, MAC4111M, MAC4121M MAC4121N	$dv/dt$	30 20 10 10	150 100 75 75	— — — —	V/ $\mu\text{s}$

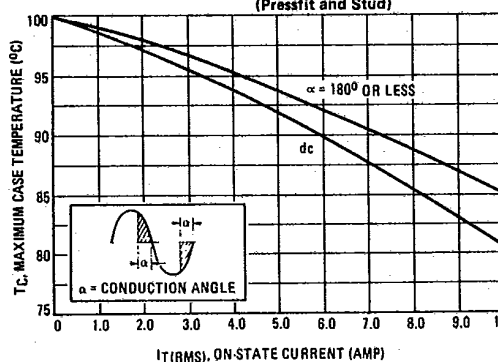
\*Indicates JEDEC Registered Data.  
 Note 1. All Voltage polarities referenced to main terminal 1.

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**FIGURE 1 - RMS CURRENT DERATING**  
(Isolated Stud)



**FIGURE 2 - RMS CURRENT DERATING**  
(Pressfit and Stud)



T-25-15

FIGURE 3 - POWER DISSIPATION  
 (Isolated Stud)

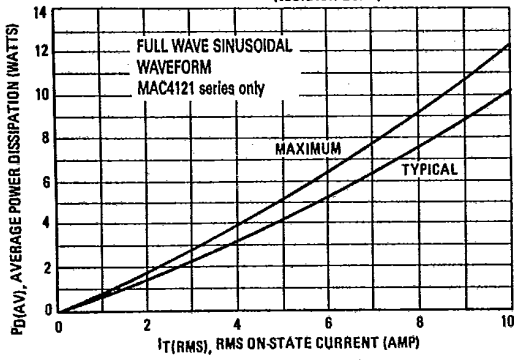


FIGURE 4 - POWER DISSIPATION  
 (Pressfit and Stud)

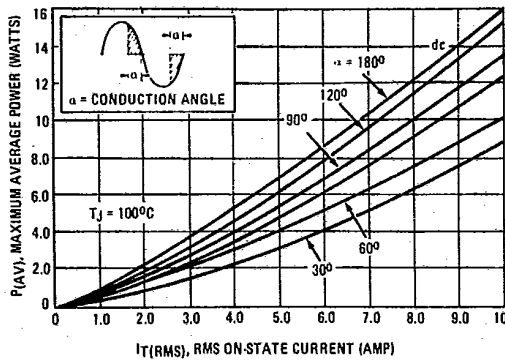


FIGURE 5 - TYPICAL GATE TRIGGER VOLTAGE

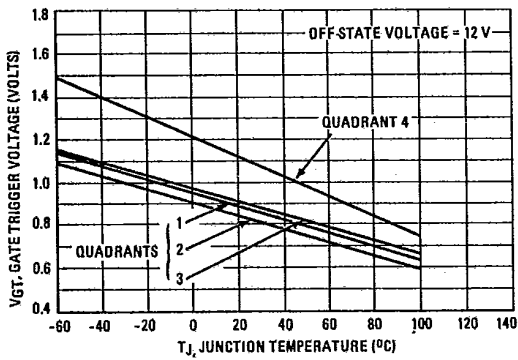
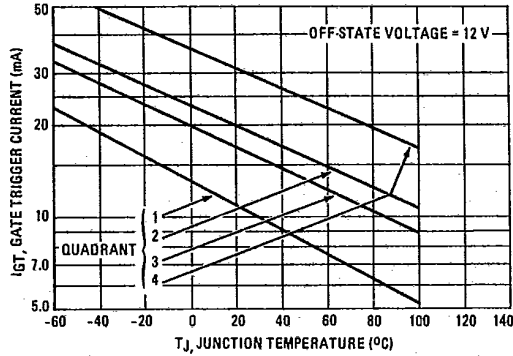


FIGURE 6 - TYPICAL GATE TRIGGER CURRENT



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FIGURE 7 - ON-STATE CHARACTERISTICS

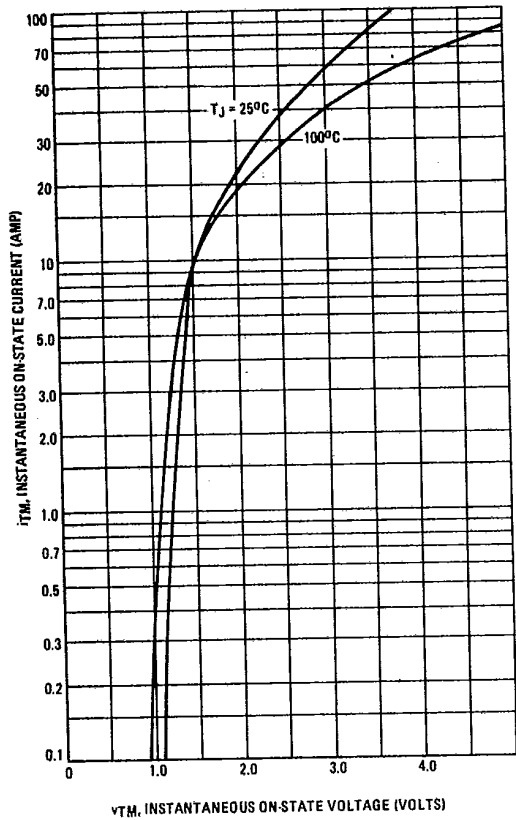


FIGURE 8 - TYPICAL HOLDING CURRENT

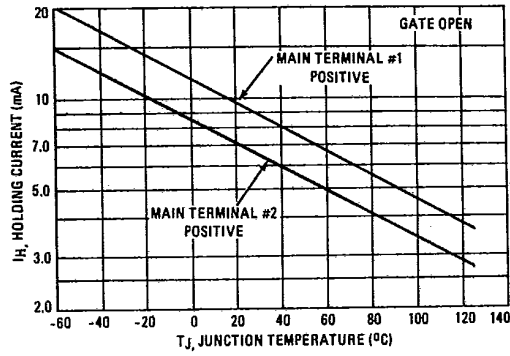


FIGURE 9 - MAXIMUM NON-REPETITIVE SURGE CURRENT

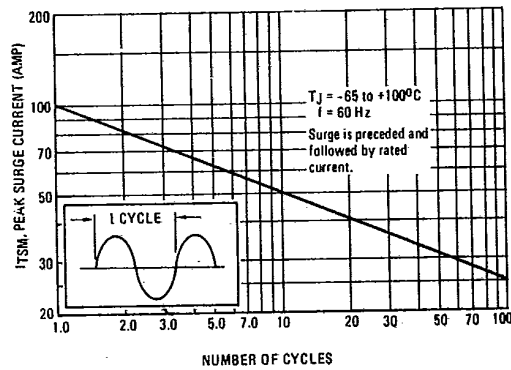


FIGURE 10 - TYPICAL THERMAL RESPONSE

