

New Jersey Semi-Conductor Products, Inc.

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Triacs Silicon Bidirectional Thyristors

... designed for full-wave ac power control applications, and specifically designed to be used in conjunction with MOC30XX opto couplers in circuits similar to that shown on page 3-189.

- Blocking Voltages to 400 Volts
- Load Current Controlled Up to 40 A
- Glass Passivated Junctions for Greater Parameter Uniformity and Stability
- Gate Triggering Guaranteed in Four Modes
- Designed for Use with MOC Series Optoisolators Having Triac Driver Outputs
- MAC3010/MAC3030 Are Recommended For Use With MOC3010/MOC3030 Optoisolators
- MAC3020/MAC3040 Are Recommended For Use With MOC3020/MOC3040 Optoisolators

**MAC3010
MAC3020
MAC3030
MAC3040
Series**

**TRIACs
4, 8, 15, 25 and 40
AMPERES RMS
250 thru 400 VOLTS**



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

Rating	Symbol	Current Ratings					Unit
		-4	-8	-15	-25	-40 -80	
On-State RMS Current (see Figure 1) (Full Cycle Sine Wave 50 to 60 Hz)	$I_T(\text{RMS})$	4	8	15	25	40	Amps
Peak Non-Repetitive Surge Current (One Full Cycle, 60 Hz, $T_J = 110^\circ\text{C}$)	I_{TSM}	30	60	150	250	300	Amps
Circuit Fusing Considerations ($T_J = -40$ to $+110^\circ\text{C}$, $t = 8.3$ ms)	I_{CT}	3.6	28	90	280	370	A^2s
Peak Gate Voltage ($t \leq 2 \mu\text{s}$)	V_{GM}	± 5	± 10	± 10	± 10	± 10	Volts
Peak Gate Power ($t \leq 2 \mu\text{s}$)	P_{GM}	10	20	20	20	20	Watts
Average Gate Power ($T_C = 80^\circ\text{C}$, $t \leq 8.3$ ms)	$P_{G(AV)}$	0.5	0.5	0.5	0.5	0.5	Watts
Peak Gate Current ($t \leq 2 \mu\text{s}$)	I_{GM}	11	12	12	12	12	Amps
Operating Junction Temperature Range	T_J	*		-40 to +125		*	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40 to +150					$^\circ\text{C}$
Mounting Torque	—	6	8	8	8	30	in. lb.
MAC3010/MAC3030, Note 1 ($T_J = 25$ to 125°C) MAC3020/MAC3040	V_{DRM}	250 400	250 400	250 400	250 400	250 400	Volts

Note 1. V_{DRM} for all types can be applied on a continuous basis. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.



CASE 77-87
(TO-225AA)
STYLE 3
4



CASE 221A-84
(TO-225AB)
STYLE 4
-8, -15, -25



CASE 283-84
STYLE 2
-40



CASE 311-82
STYLE 2
-400



Quality Semi-Conductors

MAC3010, MAC3020, MAC3030, MAC3040 Series

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 Blocking Current (Note 1) ($V_D = 250\text{ V}$, $T_J = 110^\circ\text{C}$)	I_{DRM}	—	—	2.0	mA
Peak On-State Voltage (Either Direction) ($I_{TM} = 5\text{ A}$ Peak, Pulse Width $\leq 2.0\text{ ms}$, Duty Cycle $\leq 2.0\%$)	V_{TM}	—	—	2.0	Volts
Gate Trigger Current, Continuous dc ($V_D = 12\text{ V}$, $R_L = 100\ \Omega$) MT2(+), G(+), MT2(-), G(-)	I_{GT}	—	—	3.0	mA
Gate Trigger Voltage, Continuous dc ($V_D = 12\text{ V}$, $R_L = 100\ \Omega$) MT2(+), G(+), MT2(-), G(-) ($V_D = 250\text{ V}$, $R_L = 10\text{ k}\ \Omega$, $T_J = 110^\circ\text{C}$) MT2(+), G(+), MT1(-), G(-)	V_{GT}	— 0.2	—	2.0	Volts
Holding Current ($V_D = 12\text{ V}$, $I_{TM} = 200\text{ mA}$, Gate Open)	I_H	—	—	40	mA
Gate Controlled Turn-On Time ($V_D = 250\text{ V}$, $I_{TM} = 5\text{ A}$ pk, $I_G = 100\text{ mA}$)	t_{gt}	—	1.5	—	μs
Critical Rate of Rise of Commutation Voltage ($V_D = 250\text{ V}$, $I_{TM} = 5.7\text{ A}$ pk, Commutating diode = 2.0 A/ms , Gate Unenergized, $T_C = 85^\circ\text{C}$)	dv/dt	—	5.0	—	$\text{V}/\mu\text{s}$
Critical Rate of Rise of Off-State Voltage ($V_D = 250\text{ V}$, Exponential Waveform, $T_C = 110^\circ\text{C}$)	dv/dt	—	20	—	$\text{V}/\mu\text{s}$

Note 1: Ratings apply for open gate conditions. Thyristor devices shall not be tested with a constant current source for blocking voltage such that the voltage applied exceeds the rated blocking voltage.

FIGURE 1 — CURRENT DERATING AND
POWER DISSIPATION
REFERENCE: CASE TEMPERATURE

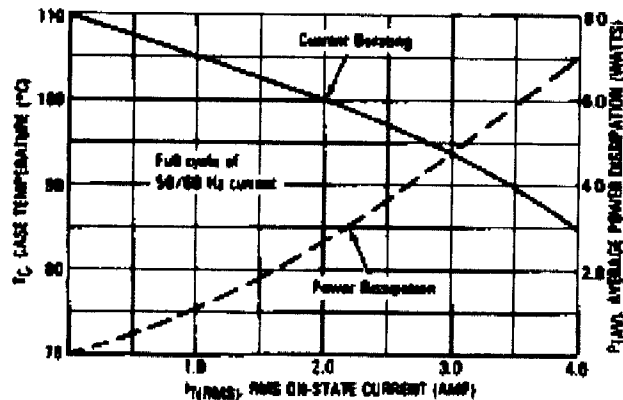


FIGURE 2 — CURRENT DERATING AND
POWER DISSIPATION
REFERENCE: AMBIENT TEMPERATURE

