New Jersey Semi-Conductor Products, Inc.

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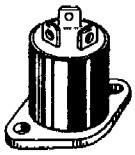
MAC20A
MAC25A
MAC50A

Triacs
Silicon Bidirectional Triode Thyristors

TRIACs
15, 25 and 40
AMPERES RMS
200 thru 800 VOLTS

. . . designed primarily for industrial and consumer applications for full-wave control of ac loads such as appliance controls, power supplies, solid-state relays, heating controls, motor controls, welding equipment, and power switching systems.

- Electrically Isolated From Mounting Base
- Isolation Voltage of 2500 Volts RMS
- Quick Connect/Disconnect Terminals
- Glass Passivated and Center Gate Geometry
- Gate Triggering Guaranteed in Four Modes



CASE 326-01

MAXIMUM RATINGS (T_J = −40 to +125°C unless otherwise noted.)

Rating	Symbol	MAC series			Unit
		20A	25A	50A	
Repetitive Peak Off-State Voltage 1/2 Sine Wave 50 to 60 Hz, Gate Open MAC20A/25A/50A4 MAC20A/25A/50A6 MAC20A/25A/50A8 MAC20A/25A/50A10	V_{DRM}		200 400 600 800		Volts
RMS On-State Current (T_C = 100°C for MAC20A) (T_C = 90°C for MAC25A) (T_C = 70°C for MAC50A)	$I_{T(RMS)}$	15 — —	— 25 —	— — 40	Amps
Peak Non-Repetitive Surge Current (One Full Cycle, 60 Hz)	I_{TSM}	150	250	300	Amps
Circuit Fusing (t = 1 to 8.3 ms)	I^2t	90	260	375	A^2s
Average Gate Power	$P_{G(AV)}$	0.5	0.5	0.75	Watt
Peak Gate Current (10 μs)	I_{GM}	2	2	4	Amps
Operating Junction Temperature Range	T_J	0 to +125			°C
Storage Temperature Range	T_{stg}	−40 to +125			°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum Value			Unit
Thermal Resistance, Junction to Case (DC)	$R_{\theta JC}$	1.6	1.5	1.4	°C/W
(Apparent) Note 1		1.3	1	0.95	

Note 1. Defined as: $\frac{(125°C - T_C)}{P_{AV}}$ for a 60 Hz full sine wave.

ELECTRICAL CHARACTERISTICS

(All voltage polarity reference to MT1; applies to either polarity of MT2 to MT1; T_C = 25°C unless otherwise noted.)

Characteristic		Symbol	MAC20A			MAC25A			MAC50A			Unit
			Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Peak Forward or Reverse Blocking Current		I_{DRM},										
(Rated V_{DRM} or V_{RRM}, gate open) T_C = 25°C		I_{RRM}	—	—	10	—	—	10	—	—	10	μA
T_C = 125°C			—	—	2	—	—	2	—	—	2	mA
Peak On-State Voltage		V_{TM}										Volts
(Pulse Width = 1 ms, Duty Cycle 2%)												
(I_{TM} = 21 A Peak)	MAC20A		—	1.3	1.6	—	—	—	—	—	—	
(I_{TM} = 35 A Peak)	MAC25A		—	—	—	—	1.4	1.7	—	—	—	
(I_{TM} = 56 A Peak)	MAC20A		—	—	—	—	—	—	—	1.65	1.75	
Gate Trigger Current (Continuous dc)		I_{GT}										mA
(V_D = 12 Vdc, R_L = 50 Ohms)												
MT2(+), G(+); MT2(−), G(−); MT2(+), G(−)			—	15	50	—	20	70	—	20	70	
MT2(−), G(+)			—	30	75	—	35	100	—	35	100	
Gate Trigger Voltage (Continuous dc)		V_{GT}										Volts
(V_D = 12 Vdc, R_L = 50 Ohms)												
MT2(+), G(+); MT2(−), G(−); MT2(+), G(−)			—	0.9	2	—	1.1	2	—	1.1	2	
MT2(−), G(+)			—	1.4	2.5	—	1.3	2.5	—	1.3	2.5	
(V_D = Rated V_{DRM}, R_L = 10 kΩ, T_C = 125°C)			0.2	—	—	0.2	—	—	0.2	—	—	
Holding Current		I_H	—	6	40	—	10	75	—	10	75	mA
(V_D = 12 Vdc, Gate Open, R_L = 40 Ohms)												
Turn-On Time		t_{gt}										μs
(V_D = Rated V_{DRM})												
(I_{TM} = 21 A, I_G = 120 mA)	MAC20A		—	1.5	—	—	—	—	—	—	—	
(I_{TM} = 35 A, I_G = 200 mA)	MAC25A		—	—	—	—	1.5	—	—	—	—	
(I_{TM} = 56 A, I_G = 200 mA)	MAC50A		—	—	—	—	—	—	—	1.5	—	
Critical Rate-of-Rise of Commutation Voltage		dv/dt(c)										V/μs
(V_D = Rated V_{DRM}, I_{TM} = 21 A,												
Commutating di/dt = 8 A/ms, T_C = 100°C)	MAC20A		5	30	—	—	—	—	—	—	—	
(V_D = Rated V_{DRM}, I_{TM} = 35 A,												
Commutating di/dt = 16 A/ms, T_C = 90°C)	MAC25A		—	—	—	5	30	—	—	—	—	
(V_D = Rated V_{DRM}, I_{TM} = 56 A,												
Commutating di/dt = 22 A/ms, T_C = 70°C)	MAC50A		—	—	—	—	—	—	5	30	—	
Critical Rate-of-Rise of Off-State Voltage (Exponential Rise)		dv/dt	—	100	—	—	100	—	—	75	—	V/μs
(V_D = Rated V_{DRM}, Gate Open, T_C = 125°C)												