MAC218A6FP, MAC218A8FP
MAC218A10FP

Preferred Devices

Triacs

Silicon Bidirectional Thyristors

Designed primarily for full-wave ac control applications, such as light dimmers, motor controls, heating controls and power supplies.

- Blocking Voltage to 800 Volts
- Glass Passivated Junctions for Greater Parameter Uniformity and Stability
- Isolated TO−220 Type Package for Ease of Mounting
- Gate Triggering Guaranteed in Four Modes
- Ⓤ Indicates UL Registered − File #E69369
- Device Marking: Logo, Device Type, e.g., MAC218A6FP, Date Code

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Peak Repetitive Off−State Voltage (Note 1.) (T_J = −40 to +125°C, Sine Wave 50 to 60 Hz, Gate Open) MAC218A6FP MAC218A8FP MAC218A10FP	V_{DRM}, V_{RRM}	400 600 800	Volts
On-State RMS Current (T_C = +80°C) (Note 2.) Full Cycle Sine Wave 50 to 60 Hz	$I_{T(RMS)}$	8.0	Amps
Peak Non−Repetitive Surge Current (One Full Cycle, 60 Hz, T_C = +80°C) Preceded and followed by rated current	I_{TSM}	100	Amps
Circuit Fusing Considerations (t = 8.3 ms)	I^2t	40	A^2s
Peak Gate Power (T_C = +80°C, Pulse Width = 10 μs)	P_{GM}	16	Watts
Average Gate Power (T_C = +80°C, t = 8.3 ms)	$P_{G(AV)}$	0.35	Watt
Peak Gate Current (T_C = +80°C, Pulse Width = 10 μs)	I_{GM}	4.0	Amps
RMS Isolation Voltage (T_A = 25°C, Relative Humidity ≤ 20%) Ⓤ	$V_{(ISO)}$	1500	Volts
Operating Junction Temperature	T_J	−40 to +125	°C
Storage Temperature Range	T_{stg}	−40 to +150	°C

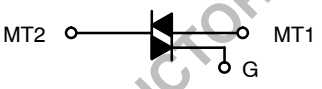
1. V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.
2. The case temperature reference point for all T_C measurements is a point on the center lead of the package as close as possible to the plastic body.

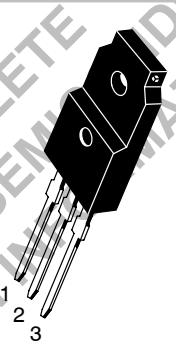
OBSOLETE
THIS DEVICE IS OBSOLETE
PLEASE CONTACT YOUR ON SEMICONDUCTOR
REPRESENTATIVE FOR INFORMATION

ON Semiconductor™

http://onsemi.com

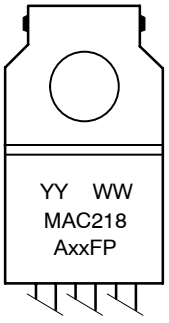
ISOLATED TRIAC Ⓤ
8 AMPERES RMS
400 thru 800 VOLTS





ISOLATED
TO−220 Full Pack
CASE 221C
STYLE 3

MARKING DIAGRAM



MAC218AxxFP = Specific Device Code
xx = 6, 8 or 10
YY = Year
WW = Work Week

PIN ASSIGNMENT	
1	Main Terminal 1
2	Main Terminal 2
3	Gate

ORDERING INFORMATION

Device	Package	Shipping
MAC218A6FP	ISOLATED TO220FP	500/Box
MAC218A8FP	ISOLATED TO220FP	500/Box
MAC218A10FP	ISOLATED TO220FP	500/Box

Preferred devices are recommended choices for future use and best overall value.

© Semiconductor Components Industries, LLC, 2006

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.2	°C/W
Thermal Resistance, Case to Sink	$R_{\theta CS}$	2.2 (typ)	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	60	°C/W
Maximum Lead Temperature for Soldering Purposes 1/8″ from Case for 10 Seconds	T_L	260	°C

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted; Electricals apply in both directions)

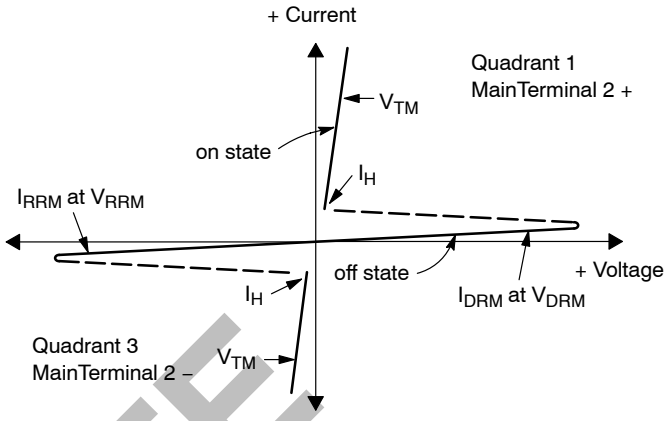
Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Peak Repetitive Blocking Current (V_D = Rated V_{DRM}, V_{RRM}; Gate Open)	T_J = 25° T_J = 125°C	I_{DRM}, I_{RRM}	– –	– –	10 2.0	μA mA
ON CHARACTERISTICS						
Peak On-State Voltage (Note 1) (I_{TM} = ±11.3 A Peak)		V_{TM}	–	1.7	2.0	Volts
Gate Trigger Current (Continuous dc) (V_D = 12 Vdc, R_L = 100 Ω)		I_{GT}				mA
MT2(+), G(+)			–	–	50	
MT2(+), G(–)			–	–	50	
MT2(–), G(–)			–	–	50	
MT2(–), G(+)			–	–	75	
Gate Trigger Voltage (Continuous dc) (Main Terminal Voltage = 12 Vdc, R_L = 100 Ohms)		V_{GT}				Volts
MT2(+), G(+)			–	0.9	2.0	
MT2(+), G(–)			–	0.9	2.0	
MT2(–), G(–)			–	1.1	2.0	
MT2(–), G(+)			–	1.4	2.5	
Gate Non−Trigger Voltage (Continuous dc) (Main Terminal Voltage = 12 V, R_L = 100 Ω, T_J = +125°C) All Four Quadrants		V_{GD}	0.2	–	–	Volts
Holding Current (V_D = 12 Vdc, Gate Open, Initiating Current = ±200 mA)		I_H	–	–	50	mA
DYNAMIC CHARACTERISTICS						
Critical Rate of Rise of Commutating Off−State Voltage (V_D = Rated V_{DRM}, I_{TM} = 11.3 A, Commutating di/dt = 4.1 A/ms, Gate Unenergized, T_C = 80°C)		$dv/dt_{(c)}$	–	5.0	–	V/μs
Critical Rate of Rise of Off−State Voltage (V_D = Rated V_{DRM}, Exponential Voltage Rise, Gate Open, T_J = 125°C)		dv/dt	–	100	–	V/μs

1. Pulse Test: Pulse Width ≤ 2.0 ms, Duty Cycle ≤ 2%.

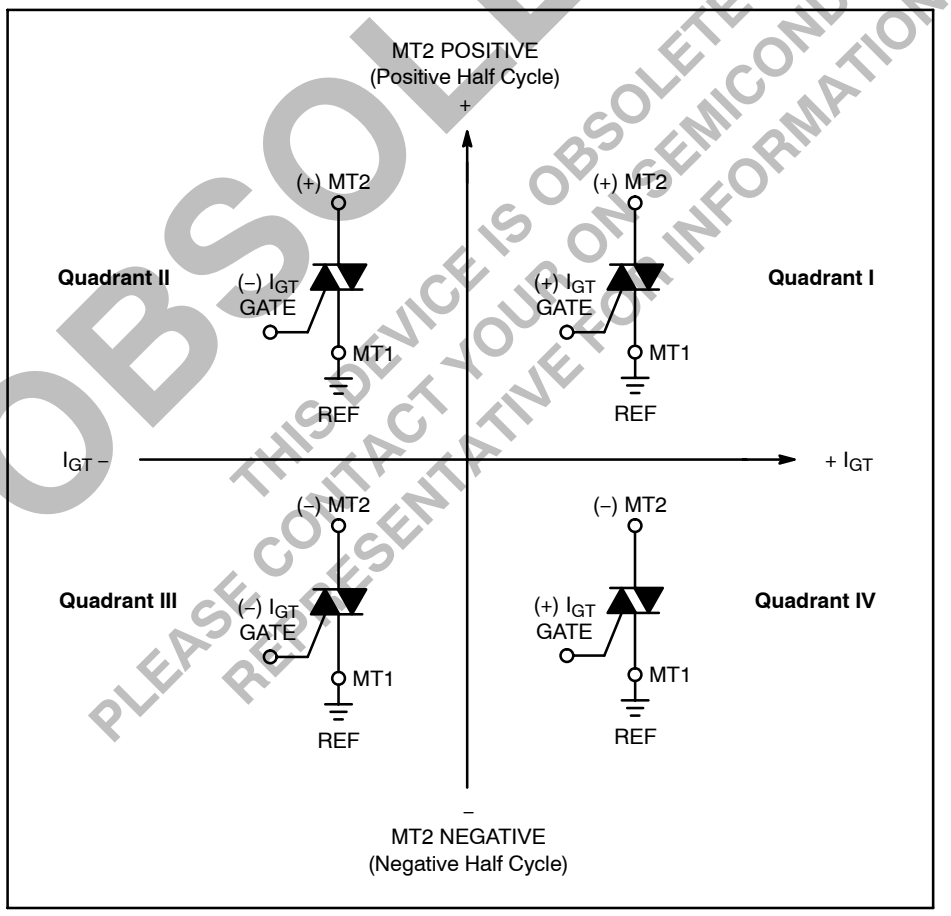
OBSOLETE
THIS DEVICE IS OBSOLETE
PLEASE CONTACT YOUR ON SEMICONDUCTOR
REPRESENTATIVE FOR INFORMATION

Voltage Current Characteristic of Triacs (Bidirectional Device)

Symbol	Parameter
V_{DRM}	Peak Repetitive Forward Off State Voltage
I_{DRM}	Peak Forward Blocking Current
V_{RRM}	Peak Repetitive Reverse Off State Voltage
I_{RRM}	Peak Reverse Blocking Current
V_{TM}	Maximum On State Voltage
I_H	Holding Current



Quadrant Definitions for a Triac



All polarities are referenced to MT1.
With in−phase signals (using standard AC lines) quadrants I and III are used.

OBSOLETE
THIS DEVICE IS OBSOLETE
PLEASE CONTACT YOUR ONSEMICONDUCTOR
REPRESENTATIVE FOR INFORMATION

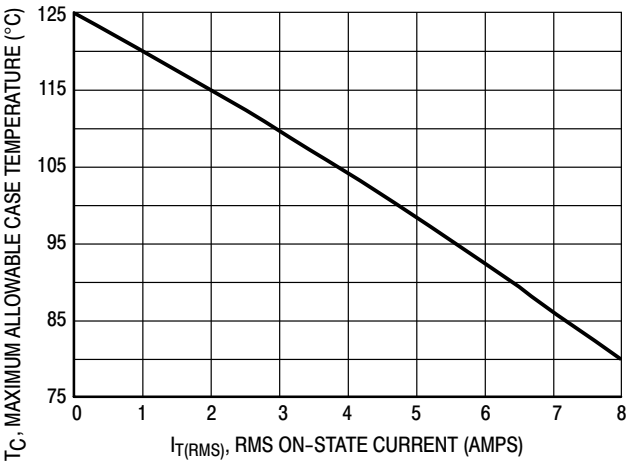


Figure 1. Current Derating

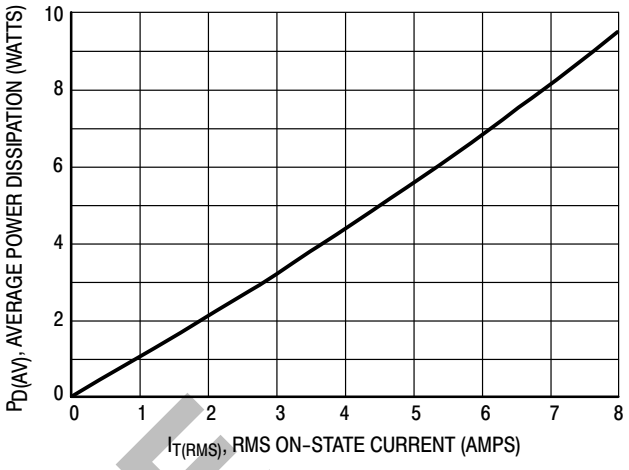


Figure 2. Power Dissipation

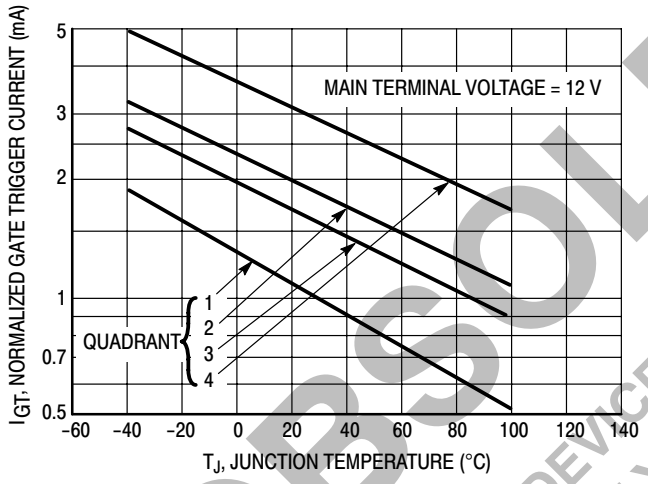


Figure 3. Normalized Gate Trigger Current

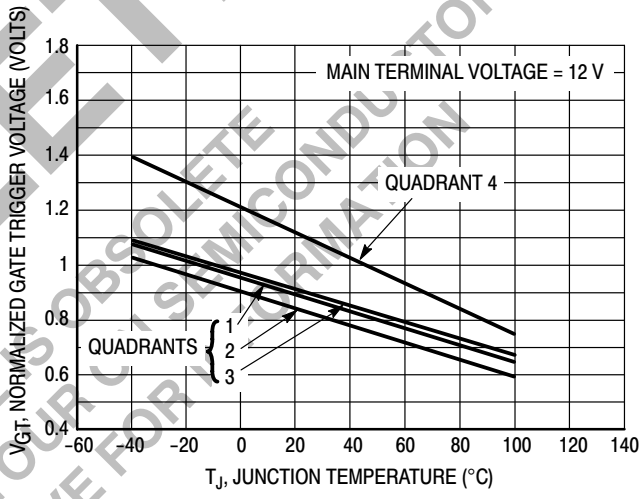


Figure 4. Normalized Gate Trigger Voltage

OBSOLETE
THIS DEVICE IS OBSOLETE
PLEASE CONTACT YOUR ON SEMICONDUCTOR
REPRESENTATIVE FOR INFORMATION

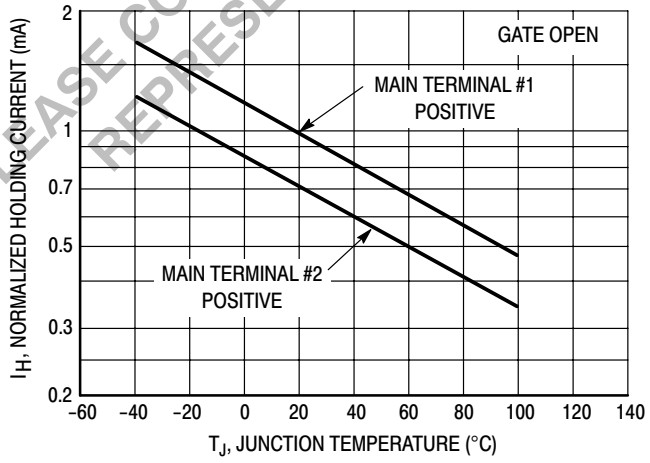
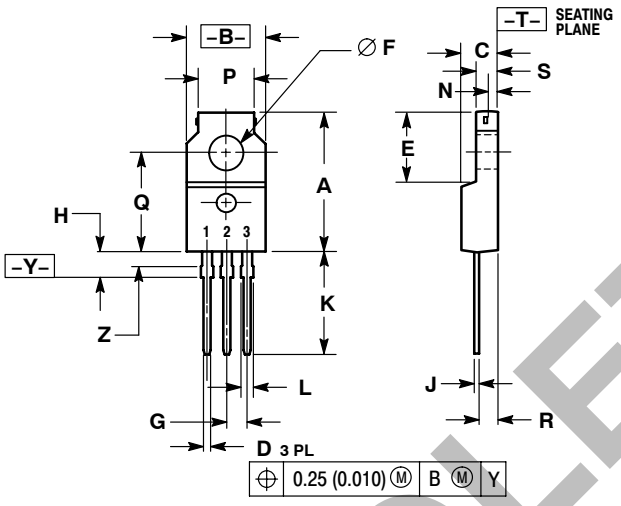


Figure 5. Normalized Holding Current

PACKAGE DIMENSIONS

TO−220 FULLPACK THYRISTOR
CASE 221C−02
ISSUE D



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. LEAD DIMENSIONS UNCONTROLLED WITHIN DIMENSION Z.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.680	0.700	17.28	17.78
B	0.388	0.408	9.86	10.36
C	0.175	0.195	4.45	4.95
D	0.025	0.040	0.64	1.01
E	0.340	0.355	8.64	9.01
F	0.140	0.150	3.56	3.81
G	0.100 BSC		2.54 BSC	
H	0.110	0.155	2.80	3.93
J	0.018	0.028	0.46	0.71
K	0.500	0.550	12.70	13.97
L	0.045	0.070	1.15	1.77
N	0.049	---	1.25	---
P	0.270	0.290	6.86	7.36
Q	0.480	0.500	12.20	12.70
R	0.090	0.120	2.29	3.04
S	0.105	0.115	2.67	2.92
Z	0.070	0.090	1.78	2.28

STYLE 3:
PIN 1. MT 1
2. MT 2
3. GATE

OBSOLETE
THIS DEVICE IS OBSOLETE
PLEASE CONTACT YOUR ON SEMICONDUCTOR
REPRESENTATIVE FOR INFORMATION

ON Semiconductor and ON are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC 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 special, consequential or incidental damages. “Typical” parameters which may be provided in SCILLC 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. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC 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 SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC 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 SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5773−3850

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative

MAC218A6FP/D