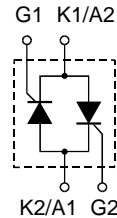


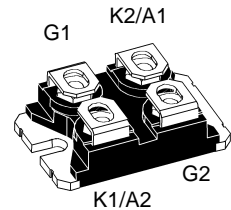
# AC Controller Modules

**$I_{RMS} = 90\text{ A}$**   
 **$V_{RRM} = 1200\text{-}1600\text{ V}$**

$V_{RSM}$ $V_{DSM}$ $V$	$V_{RRM}$ $V_{DRM}$ $V$	Type
<b>1200</b>	<b>1200</b>	<b>MMO 90-12io6</b>
<b>1600</b>	<b>1600</b>	<b>MMO 90-16io6</b>



**miniBLOC, SOT-227 B**



Symbol	Test Conditions	Maximum Ratings	Features
$I_{RMS}$	$T_C = 110^\circ\text{C}$ , 50 - 400 Hz, module	90 A	<ul style="list-style-type: none"> <li>• Thyristor controller for AC (circuit W1C acc. to IEC) for mains frequency</li> <li>• International standard package miniBLOC (ISOTOP compatible)</li> <li>• Isolation voltage 2500 V~</li> <li>• Planar passivated chips</li> <li>• UL registered, E 72873</li> </ul>
$I_{TRMS}$	$T_{VJ} = T_{VJM}$	65 A	
$I_{TAVM}$	$T_C = 110^\circ\text{C}$ ; (180° sine)	41 A	
$I_{TSM}$	$T_{VJ} = 45^\circ\text{C}$ ; $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	800 A 860 A
	$T_{VJ} = T_{VJM}$ $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	700 A 750 A
$I^2t$	$T_{VJ} = 45^\circ\text{C}$ $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	3200 A <sup>2</sup> s 3110 A <sup>2</sup> s
	$T_{VJ} = T_{VJM}$ $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	2450 A <sup>2</sup> s 2360 A <sup>2</sup> s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$ f = 50 Hz, $t_p = 200\ \mu\text{s}$	repetitive, $I_T = 150\text{ A}$	100 A/ $\mu\text{s}$
	$V_D = \frac{2}{3} V_{DRM}$ $I_G = 0.3\text{ A}$ $di_G/dt = 0.3\text{ A}/\mu\text{s}$	non repetitive, $I_T = I_{TAVM}$	500 A/ $\mu\text{s}$
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$ ; $R_{GK} = \infty$ ; method 1 (linear voltage rise)	$V_{DR} = \frac{2}{3} V_{DRM}$	1000 V/ $\mu\text{s}$
$P_{GM}$	$T_{VJ} = T_{VJM}$ $I_T = I_{TAVM}$	$t_p = 30\ \mu\text{s}$	10 W
		$t_p = 300\ \mu\text{s}$	5 W
$P_{GAVM}$			0.5 W
$V_{RGM}$			10 V
$T_{VJ}$			-40...+150 °C
$T_{VJM}$			150 °C
$T_{stg}$			-40...+150 °C
$V_{ISOL}$	50/60 Hz, RMS; $I_{ISOL} \leq 1\text{ mA}$		2500 V~
$M_d$	Mounting torque (M4)		1.1 - 1.5 / 9 - 13 Nm/lb.in.
	Terminal connection torque (M4)		1.1 - 1.5 / 9 - 13 Nm/lb.in.
<b>Weight</b>	typ.		30 g

## Features

- Thyristor controller for AC (circuit W1C acc. to IEC) for mains frequency
- International standard package miniBLOC (ISOTOP compatible)
- Isolation voltage 2500 V~
- Planar passivated chips
- UL registered, E 72873

## Applications

- Switching and control of single and three phase AC
- Softstart AC motor controller
- Solid state switches
- Light and temperature control

## Advantages

- Easy to mount with two screws
- Space and weight savings
- Improved temperature and power cycling
- High power density

Data according to IEC 60747 and to a single thyristor/diode unless otherwise stated. IXYS reserves the right to change limits, test conditions and dimensions.

Symbol	Test Conditions	Characteristic Values	
$I_D$	$T_{VJ} = T_{VJM}; V_R = V_{RRM}; V_D = V_{DRM}$	$\leq$	20 mA
$V_T$	$I_T = 80; T_{VJ} = 25^\circ\text{C}$	$\leq$	1.43 V
$V_{T0}$	For power-loss calculations only		0.9 V
$r_T$			5.8 m $\Omega$
$V_{GT}$	$V_D = 6\text{ V}; T_{VJ} = 25^\circ\text{C}$	$\leq$	1.5 V
	$T_{VJ} = -40^\circ\text{C}$	$\leq$	1.6 V
$I_{GT}$	$V_D = 6\text{ V}; T_{VJ} = 25^\circ\text{C}$	$\leq$	100 mA
	$T_{VJ} = -40^\circ\text{C}$	$\leq$	200 mA
$V_{GD}$	$T_{VJ} = T_{VJM}; V_D = \frac{2}{3} V_{DRM}$	$\leq$	0.2 V
$I_{GD}$		$\leq$	5 mA
$I_L$	$T_{VJ} = 25^\circ\text{C}; t_p = 10\ \mu\text{s}$ $I_G = 0.3\text{ A}; di_G/dt = 0.3\text{ A}/\mu\text{s}$	$\leq$	250 mA
$I_H$	$T_{VJ} = 25^\circ\text{C}; V_D = 6\text{ V}; R_{GK} = \infty$	$\leq$	100 mA
$t_{gd}$	$T_{VJ} = 25^\circ\text{C}; V_D = \frac{1}{2} V_{DRM}$ $I_G = 0.3\text{ A}; di_G/dt = 0.3\text{ A}/\mu\text{s}$	$\leq$	2 $\mu\text{s}$
$t_q$	$T_{VJ} = T_{VJM}; I_T = 20\text{ A}; t_p = 200\ \mu\text{s}; di/dt = -10\text{ A}/\mu\text{s}$ $V_R = 100\text{ V}; dv/dt = 15\text{ V}/\mu\text{s}; V_D = \frac{2}{3} V_{DRM}$	typ.	150 $\mu\text{s}$
$R_{thJC}$	per thyristor; DC current		0.6 K/W
	per module		0.3 K/W
$R_{thCH}$	per thyristor; DC current		0.1 K/W
	per module		0.05 K/W
$d_s$	Creeping distance on surface		8 mm
$d_A$	Creepage distance in air		4 mm
$a$	Max. allowable acceleration		50 m/s <sup>2</sup>

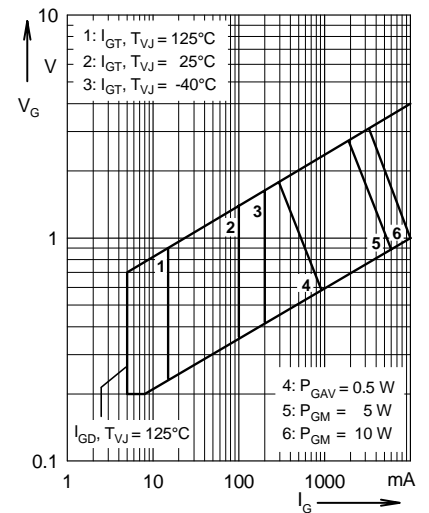


Fig. 1 Gate trigger characteristics

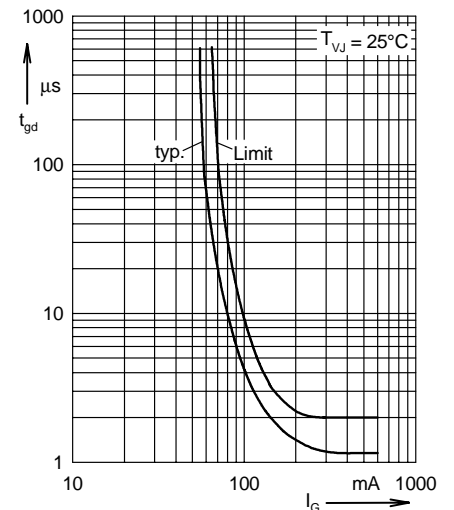


Fig. 2 Gate trigger delay time

**miniBLOC, SOT-227 B**

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.20	1.489	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.76	0.84	0.030	0.033
M	12.60	12.85	0.496	0.506
N	25.15	25.42	0.990	1.001
O	1.98	2.13	0.078	0.084
P	4.95	5.97	0.195	0.235
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.174
S	4.72	4.85	0.186	0.191
T	24.59	25.07	0.968	0.987
U	-0.05	0.1	-0.002	0.004
V	3.30	4.57	0.130	0.180
W	0.780	0.830	0.031	0.033

M4 screws (4x) supplied

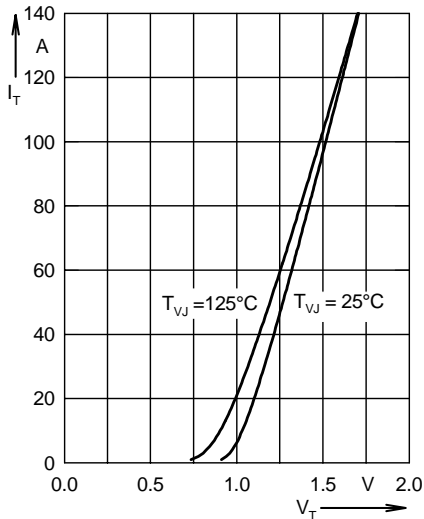


Fig. 3 Forward current versus voltage drop per leg

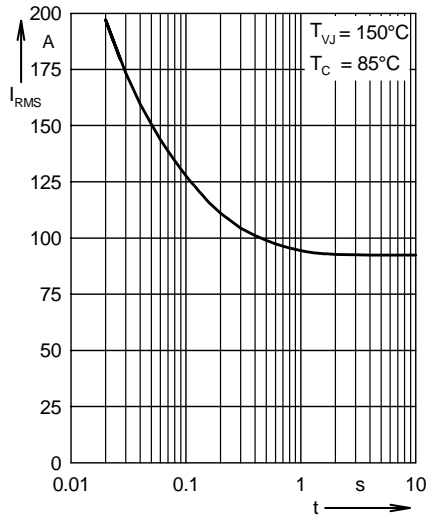


Fig. 4 Rated RMS current versus time (360° conduction)

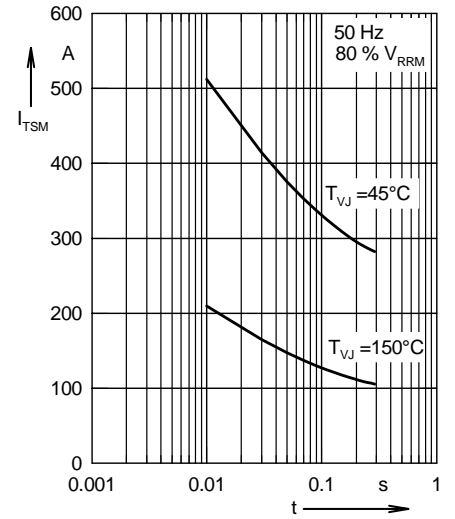


Fig. 5 Surge overload current

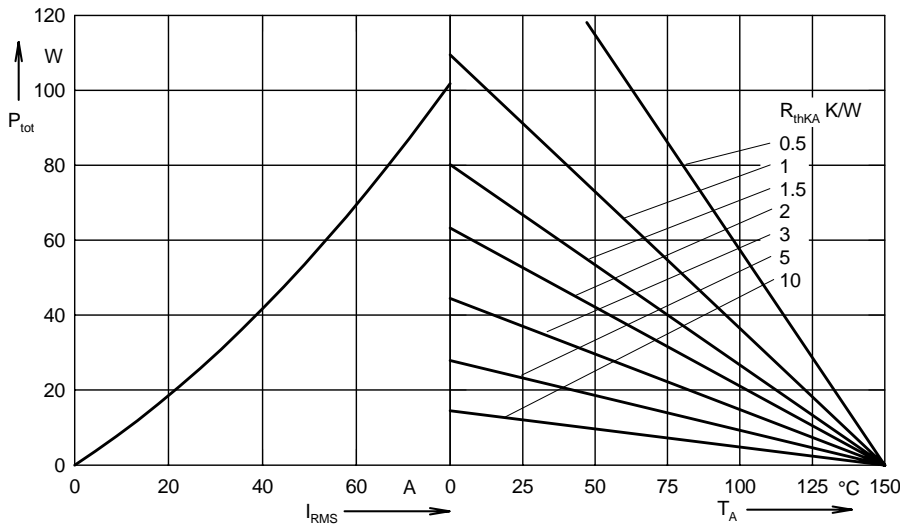


Fig. 6 Load current capability for single AC controller; 1 x MMO 90

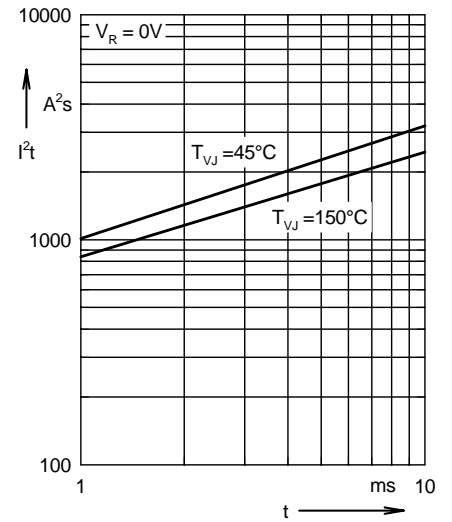


Fig. 7  $I^2t$  versus time (per thyristor)

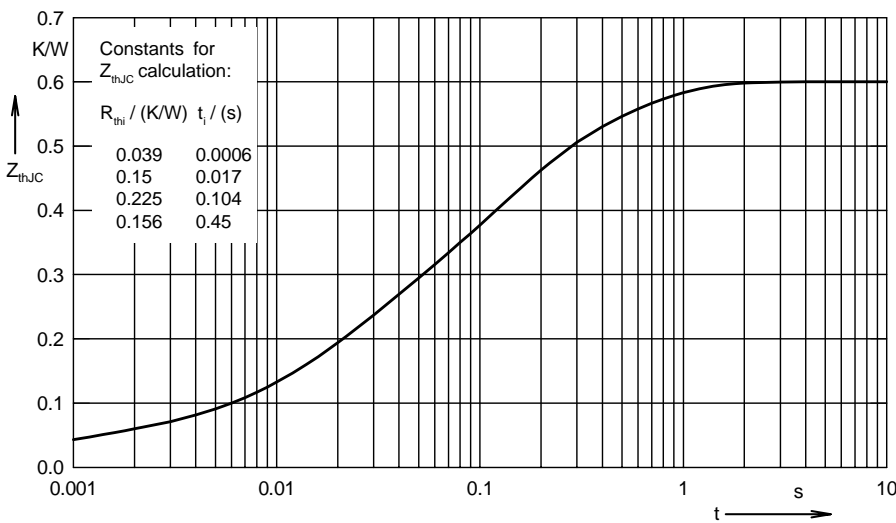


Fig. 8 Transient thermal impedance junction to case (per thyristor)

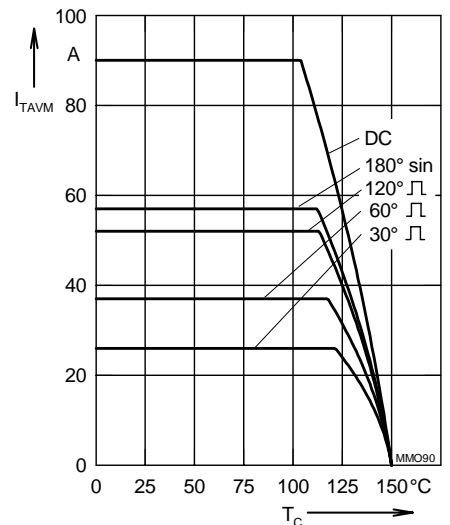


Fig. 9 Maximum forward current at case temperature