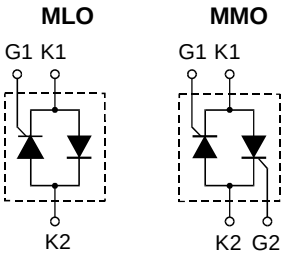
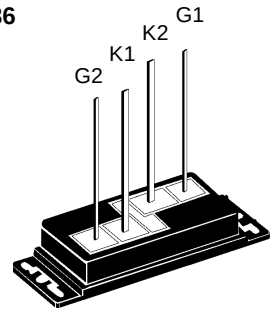
AC Controller Modules

I_{RMS} = 39 A
V_{RRM} = 1200-1600 V

V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V	Type	
1200	1200	MLO 36-12io1	MMO 36-12io1
1600	1600	MLO 36-16io1	MMO 36-16io1



MMO 36



K1 = Cathode 1, G1 = Gate 1
K2 = Cathode 2, G2 = Gate 2
(MLO 36 has no G2 lead)

Symbol	Test Conditions		Maximum Ratings	
I_{RMS}	T_K = 85°C, 50 - 400 Hz (for single controller)		39	A
I_{TRMS}	$T_{VJ} = T_{VJM}$		28	A
I_{TAVM}	T_K = 85°C; (180° sine)		18	A
I_{TSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	360	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	390	A
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	320	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	350	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	645	A^2s
	V_R = 0	t = 8.3 ms (60 Hz), sine	630	A^2s
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	510	A^2s
	V_R = 0	t = 8.3 ms (60 Hz), sine	510	A^2s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$ f =50 Hz, t_P =200 µs V_D = 2/3 V_{DRM} I_G = 0.3 A di_G/dt = 0.3 A/µs	repetitive, I_T = 150 A	100	A/µs
		non repetitive, $I_T = I_{TAVM}$	500	A/µs
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$; V_{DR} = 2/3 V_{DRM} R_{GK} = ∞; method 1 (linear voltage rise)		1000	V/µs
P_{GM}	$T_{VJ} = T_{VJM}$	t_p = 30 µs	10	W
	$I_T = I_{TAVM}$	t_p = 300 µs	5	W
P_{GAVM}			0.5	W
V_{RGM}			10	V
T_{VJ}			-40...+125	°C
T_{VJM}			125	°C
T_{stg}			-40...+125	°C
V_{ISOL}	50/60 Hz, RMS	t = 1 min	3000	V~
	$I_{ISOL} \leq$ 1 mA	t = 1 s	3600	V~
M_d	Mounting torque	(M3)	0.7 ± 0.1	Nm
		(UNF 4-32)	6 ± 0.9	lb.in.
Weight	typ.		15	g

Features
- Thyristor controller for AC (circuit W1C acc. to IEC) for mains frequency
- Direct copper bonded Al_2O_3 -ceramic base plate
- Isolation voltage 3600 V~
- Planar passivated chips
- UL registered, E 72873
- Long wire leads suitable for PC board soldering

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.

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Symbol	Test Conditions		Characteristic Values		
I_R, I_D	$T_{VJ} = T_{VJM}$; $V_R = V_{RRM}$; $V_D = V_{DRM}$		≤	5	mA
V_T	I_T = 45 A; T_{VJ} = 25°C		≤	1.49	V
V_{T0}	For power-loss calculations only			0.85	V
r_T				15	mΩ
V_{GT}	V_D = 6 V;	T_{VJ} = 25°C	≤	1.0	V
		T_{VJ} = -40°C	≤	1.15	V
I_{GT}	V_D = 6 V;	T_{VJ} = 25°C	≤	65	mA
		T_{VJ} = -40°C	≤	120	mA
I_{GM}	t_p = 50 µs, f = 60 Hz, $I_T = I_{TAVM}$			6	A
V_{GD}	$T_{VJ} = T_{VJM}$;	V_D = 2/3 V_{DRM}	≤	0.2	V
I_{GD}			≤	1	mA
I_L	T_{VJ} = 25°C; t_P = 10 µs, V_D = 6 V I_G = 0.3 A; di_G/dt = 0.3 A/µs		≤	150	mA
I_H	T_{VJ} = 25°C; V_D = 6 V; R_{GK} = ∞		≤	100	mA
t_{gd}	T_{VJ} = 25°C; V_D = 1/2 V_{DRM} I_G = 0.3 A; di_G/dt = 0.3 A/µs		≤	2	µs
t_q	$T_{VJ} = T_{VJM}$; I_T = 11 A, t_P = 200 µs; -di/dt = 10 A/µs V_R = 100 V; dv/dt = 10 V/µs; V_D = 2/3 V_{DRM}		typ.	150	µs
R_{thJC}	per thyristor/diode; DC current			1.3	K/W
	per module			0.65	K/W
R_{thJK}	per thyristor/diode; DC current			1.5	K/W
	per module			0.75	K/W
d_S	Creeping distance on surface			6	mm
d_A	Creepage distance in air			6	mm
a	Max. allowable acceleration			50	m/s^2

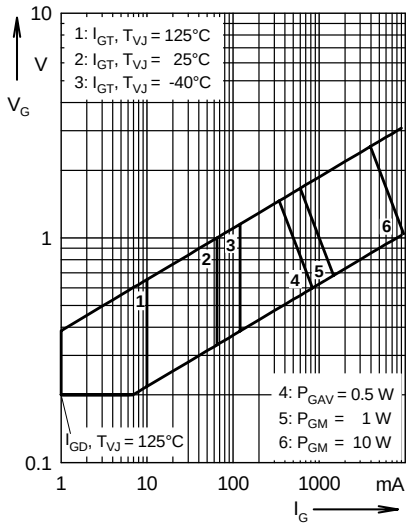


Fig. 1 Gate trigger characteristics

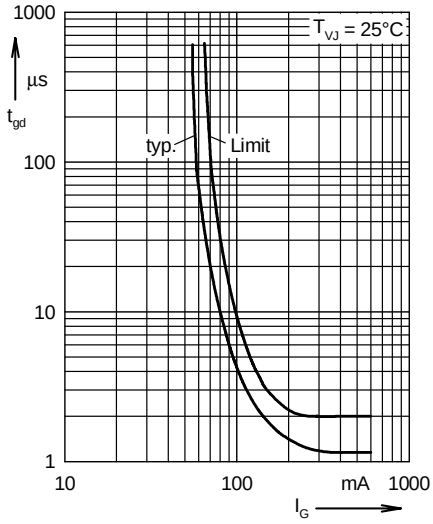


Fig. 2 Gate trigger delay time

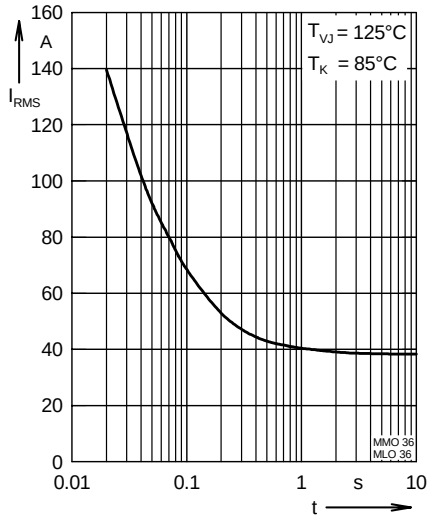
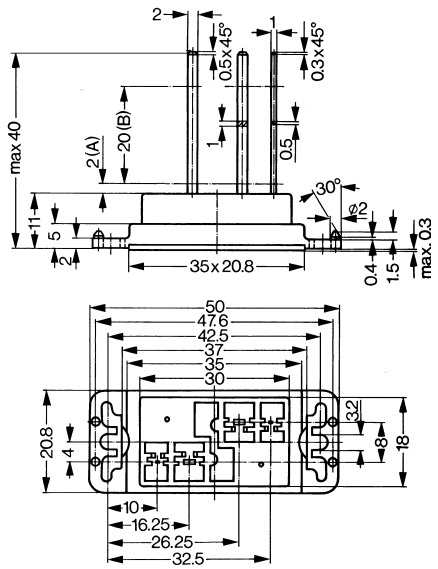


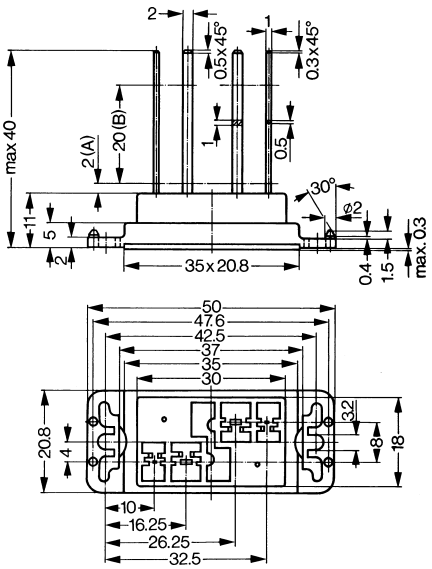
Fig. 3 Rated RMS current versus time (360° conduction)

Dimensions in mm (1 mm = 0.0394")

MLO 36



MMO 36



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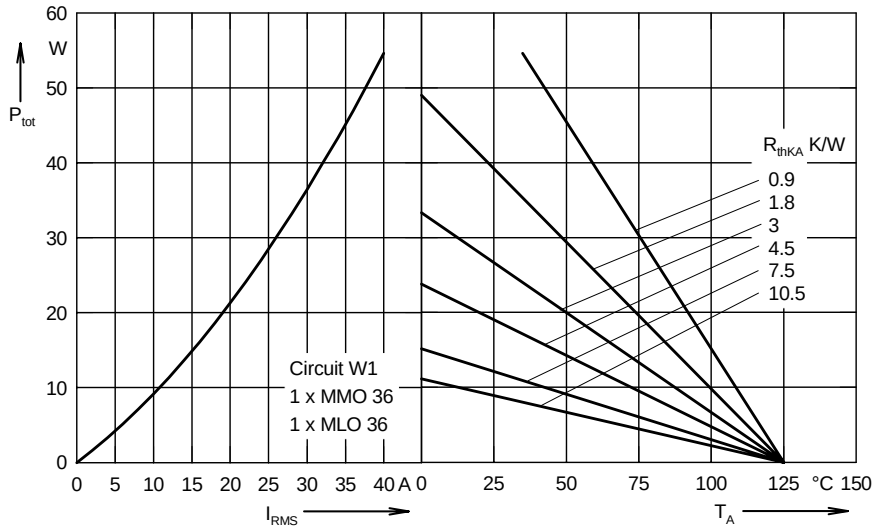

Fig. 4 Load current capability for single phase AC controller

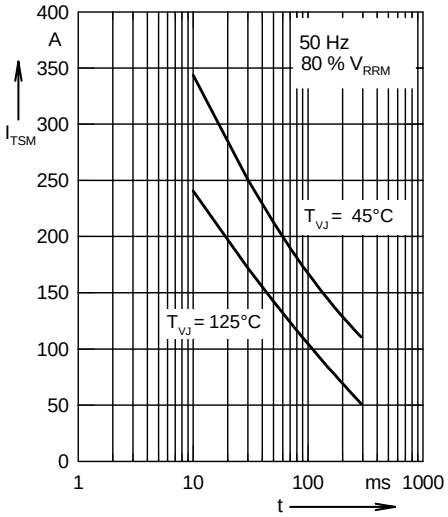

Fig. 5 Surge overload current
I_{TSM}, I_{FSM}: Crest value, t: duration

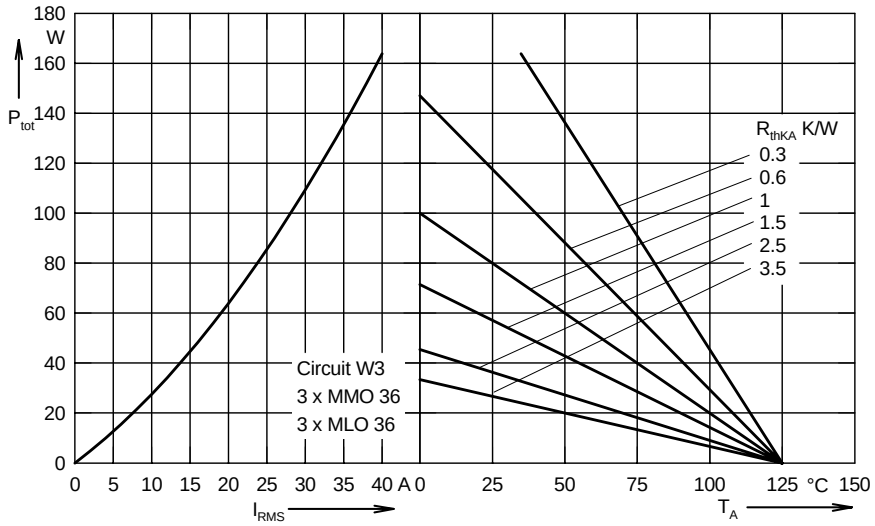

Fig. 6 Load current capability for three phase AC controller: 3xMMO 36/MLO 36

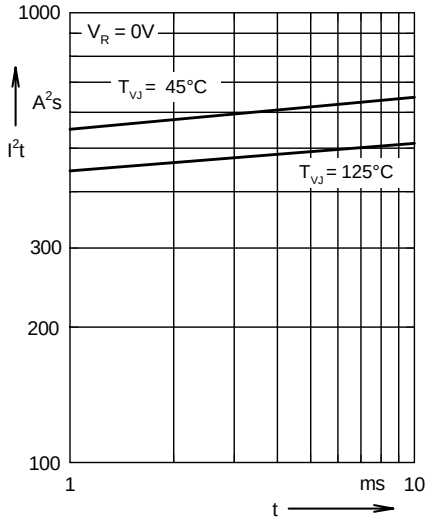

Fig. 7 I^2t versus time (1-10 ms)

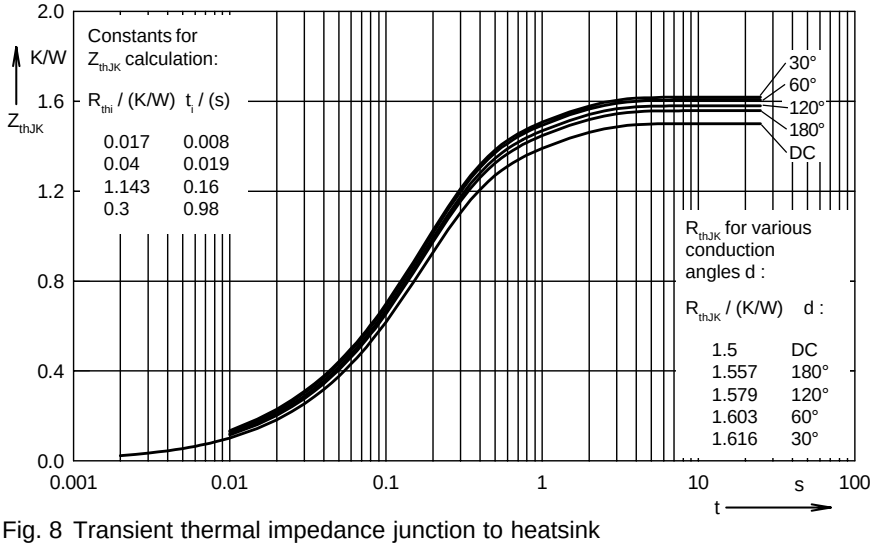

Fig. 8 Transient thermal impedance junction to heatsink (per thyristor or diode)

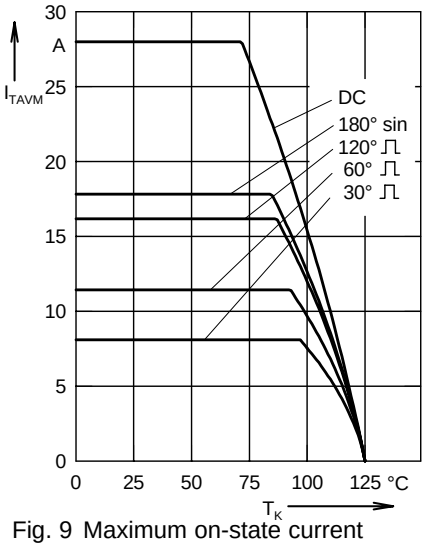

Fig. 9 Maximum on-state current versus heatsink temperature

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