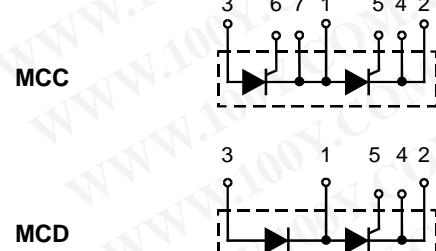
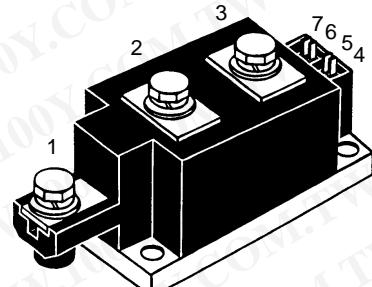


Thyristor Modules

Thyristor/Diode Modules

$I_{TRMS} = 2 \times 450 \text{ A}$
 $I_{TAVM} = 2 \times 250 \text{ A}$
 $V_{RRM} = 1200-1800 \text{ V}$

V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V	Type
1300	1200	MCC 255-12io1
1500	1400	MCC 255-14io1
1700	1600	MCC 255-16io1
1900	1800	MCC 255-18io1
		MCD 255-12io1
		MCD 255-14io1
		MCD 255-16io1
		MCD 255-18io1



Symbol	Test Conditions	Maximum Ratings		
I_{TRMS}, I_{FRMS}	$T_{VJ} = T_{VJM}$	450	A	
I_{TAVM}, I_{FAVM}	$T_c = 85^\circ\text{C}$; 180° sine	250	A	
I_{TSM}, I_{FSM}	$T_{VJ} = 45^\circ\text{C}$; $V_R = 0$	9000	A	
	$t = 10 \text{ ms (50 Hz)}$ $t = 8.3 \text{ ms (60 Hz)}$	9600	A	
	$T_{VJ} = T_{VJM}$ $V_R = 0$	7800	A	
	$t = 10 \text{ ms (50 Hz)}$ $t = 8.3 \text{ ms (60 Hz)}$	8600	A	
$\int i^2 dt$	$T_{VJ} = 45^\circ\text{C}$ $V_R = 0$	405 000	A^2s	
	$t = 10 \text{ ms (50 Hz)}$ $t = 8.3 \text{ ms (60 Hz)}$	382 000	A^2s	
	$T_{VJ} = T_{VJM}$ $V_R = 0$	304 000	A^2s	
	$t = 10 \text{ ms (50 Hz)}$ $t = 8.3 \text{ ms (60 Hz)}$	307 000	A^2s	
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$ $f = 50 \text{ Hz}, t_p = 200 \mu\text{s}$ $V_D = 2/3 V_{DRM}$ $I_G = 1 \text{ A},$ $di_G/dt = 1 \text{ A}/\mu\text{s}$	repetitive, $I_T = 860 \text{ A}$	100	$\text{A}/\mu\text{s}$
		non repetitive, $I_T = I_{TAVM}$	500	$\text{A}/\mu\text{s}$
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}; V_{DR} = 2/3 V_{DRM}$ $R_{GK} = \infty$; method 1 (linear voltage rise)	1000	$\text{V}/\mu\text{s}$	
P_{GM}	$T_{VJ} = T_{VJM}$ $I_T = I_{TAVM}$	$t_p = 30 \mu\text{s}$ $t_p = 500 \mu\text{s}$	120 60 20 10	W W W V
P_{GAV}				
V_{RGM}				
T_{VJ}			-40...+130	$^\circ\text{C}$
T_{VJM}			130	$^\circ\text{C}$
T_{stg}			-40...+125	$^\circ\text{C}$
V_{ISOL}	50/60 Hz, RMS	$t = 1 \text{ min}$	3000	$\text{V}_\text{~}$
	$I_{ISOL} \leq 1 \text{ mA}$	$t = 1 \text{ s}$	3600	$\text{V}_\text{~}$
M_d	Mounting torque (M6) Terminal connection torque (M8)		4.5-7/40-62 Nm/lb.in. 11-13/97-115 Nm/lb.in.	
Weight	Typical including screws		750	g

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

Features

- International standard package
- Direct copper bonded Al_2O_3 -ceramic with copper base plate
- Planar passivated chips
- Isolation voltage 3600 V ~
- UL registered E 72873
- Keyed gate/cathode twin pins

Applications

- Motor control, softstarter
- Power converter
- Heat and temperature control for industrial furnaces and chemical processes
- Lighting control
- Solid state switches

Advantages

- Simple mounting
- Improved temperature and power cycling
- Reduced protection circuits

Symbol	Test Conditions	Characteristic Values		
I_{RRM}, I_{DRM}	$T_{VJ} = T_{VJM}; V_R = V_{RRM}; V_D = V_{DRM}$	40	mA	
V_T, V_F	$I_T, I_F = 600 \text{ A}; T_{VJ} = 25^\circ\text{C}$	1.36	V	
V_{TO} r_T	For power-loss calculations only ($T_{VJ} = 130^\circ\text{C}$)	0.8 0.68	V $\text{m}\Omega$	
V_{GT}	$V_D = 6 \text{ V}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = -40^\circ\text{C}$	2 3	V V	
I_{GT}	$V_D = 6 \text{ V}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = -40^\circ\text{C}$	150 220	mA mA	
V_{GD} I_{GD}	$T_{VJ} = T_{VJM}; V_D = 2/3 V_{DRM}$ $T_{VJ} = T_{VJM}; V_D = 2/3 V_{DRM}$	0.25 10	V mA	
I_L	$T_{VJ} = 25^\circ\text{C}; t_p = 30 \mu\text{s}; V_D = 6 \text{ V}$ $I_G = 0.45 \text{ A}; di_G/dt = 0.45 \text{ A}/\mu\text{s}$	200	mA	
I_H	$T_{VJ} = 25^\circ\text{C}; V_D = 6 \text{ V}; R_{GK} = \infty$	150	mA	
t_{gd}	$T_{VJ} = 25^\circ\text{C}; V_D = 1/2 V_{DRM}$ $I_G = 1 \text{ A}; di_G/dt = 1 \text{ A}/\mu\text{s}$	2	μs	
t_q	$T_{VJ} = T_{VJM}; I_T = 300 \text{ A}, t_p = 200 \mu\text{s}; -di/dt = 10 \text{ A}/\mu\text{s}$ $V_R = 100 \text{ V}; dv/dt = 50 \text{ V}/\mu\text{s}; V_D = 2/3 V_{DRM}$	typ.	200	μs
Q_s I_{RM}	$T_{VJ} = 125^\circ\text{C}; I_T, I_F = 300 \text{ A}; -di/dt = 50 \text{ A}/\mu\text{s}$	760 275	μC A	
R_{thJC} R_{thJK}	per thyristor (diode); DC current per module per thyristor (diode); DC current per module	other values see Fig. 8/9	0.140 0.07	K/W
d_s d_A a	Creeping distance on surface Creepage distance in air Maximum allowable acceleration		0.18 0.09	K/W
d_s d_A a	Creeping distance on surface Creepage distance in air Maximum allowable acceleration	12.7 9.6 50	mm mm m/s^2	

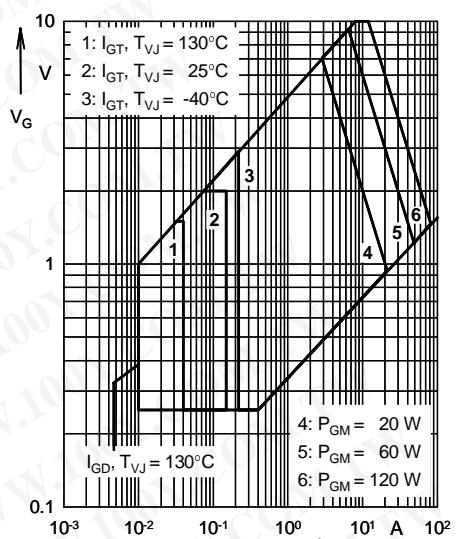


Fig. 1 Gate trigger characteristics

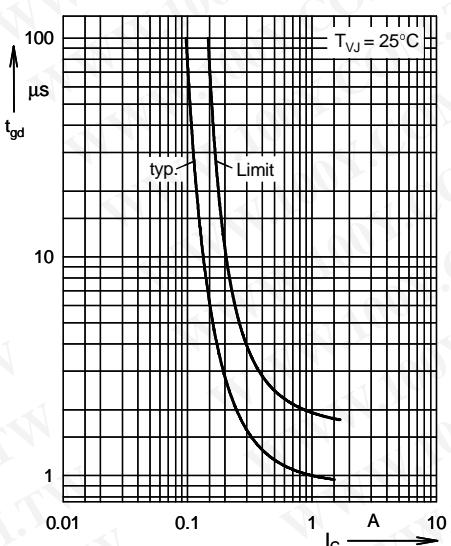
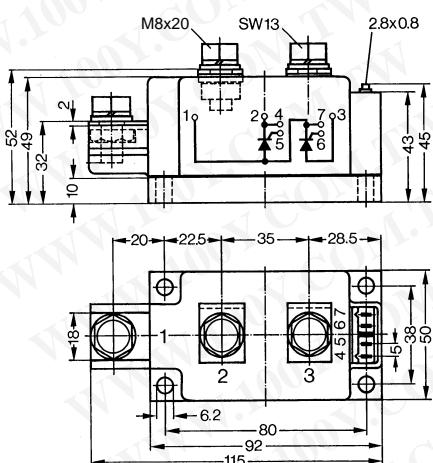


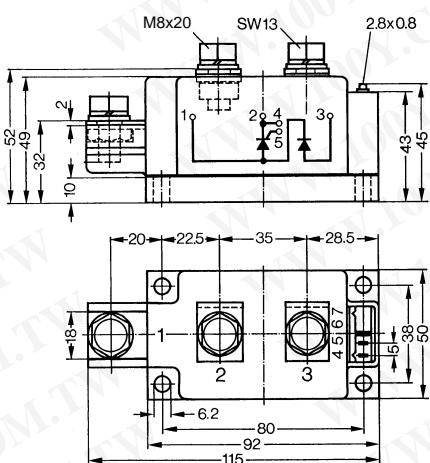
Fig. 2 Gate trigger delay time

Dimensions in mm (1 mm ≈ 0.0394")

MCC 255



MCD 255



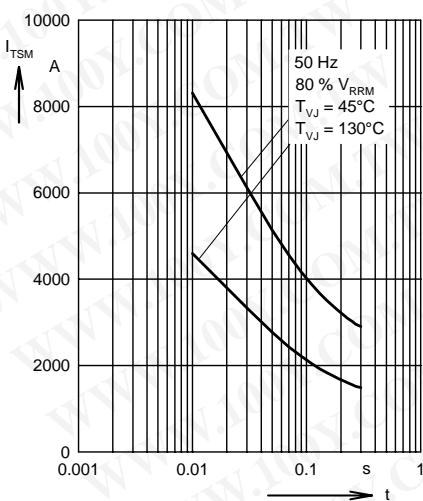


Fig. 3 Surge overload current
 I_{TSM}, I_{FSM} : Crest value, t : duration

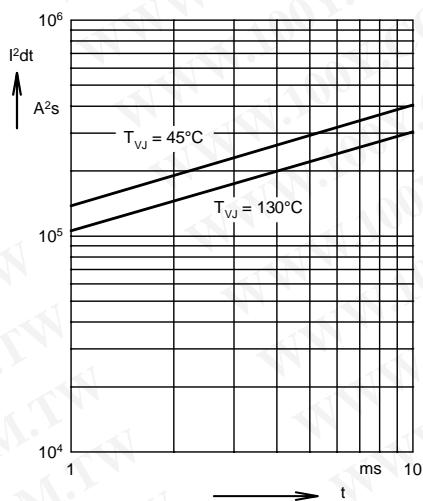


Fig. 4 $\int I^2 dt$ versus time (1-10 ms)

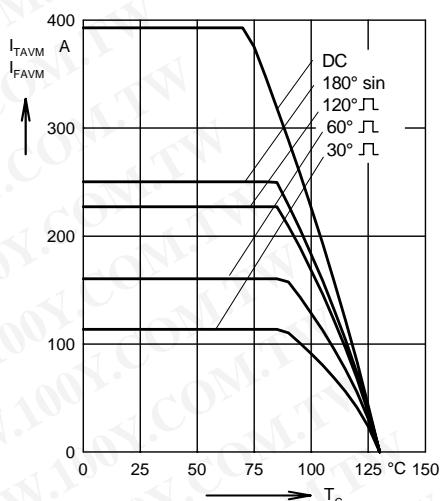


Fig. 4a Maximum forward current at case temperature

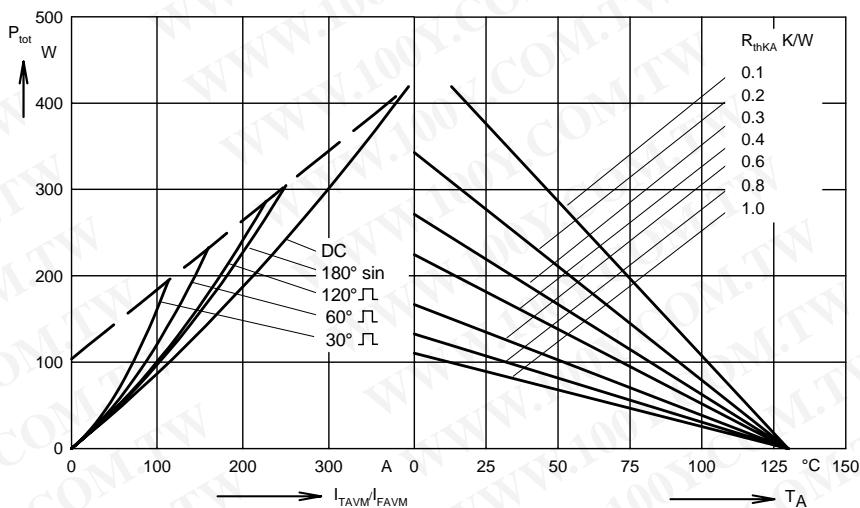


Fig. 5 Power dissipation versus on-state current and ambient temperature (per thyristor or diode)

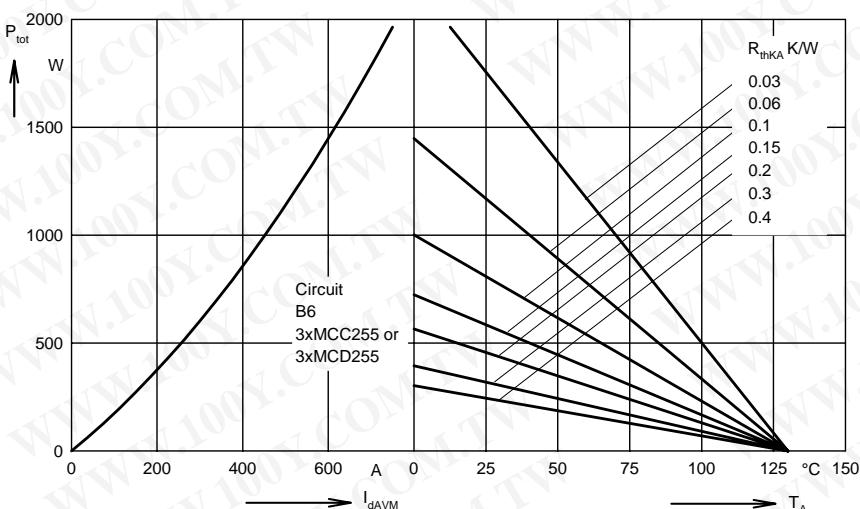


Fig. 6 Three phase rectifier bridge:
Power dissipation versus direct output current and ambient temperature

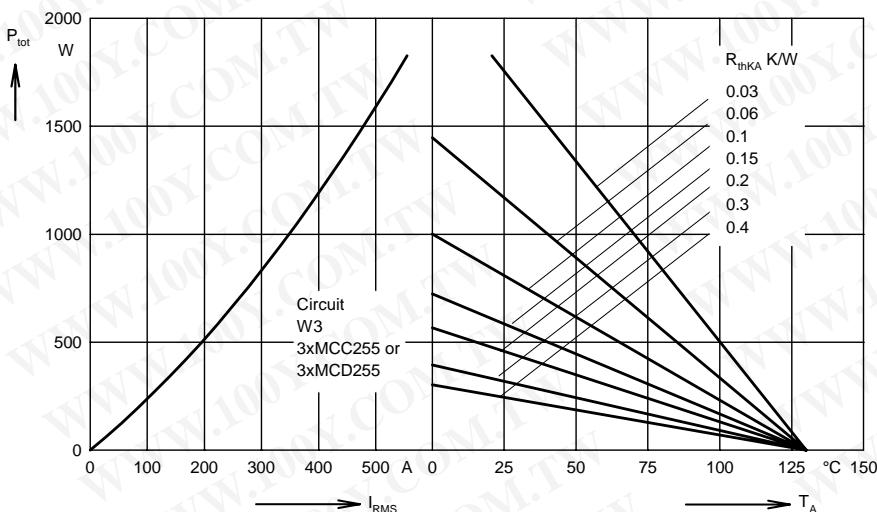


Fig. 7 Three phase AC-controller:
Power dissipation versus RMS
output current and ambient
temperature

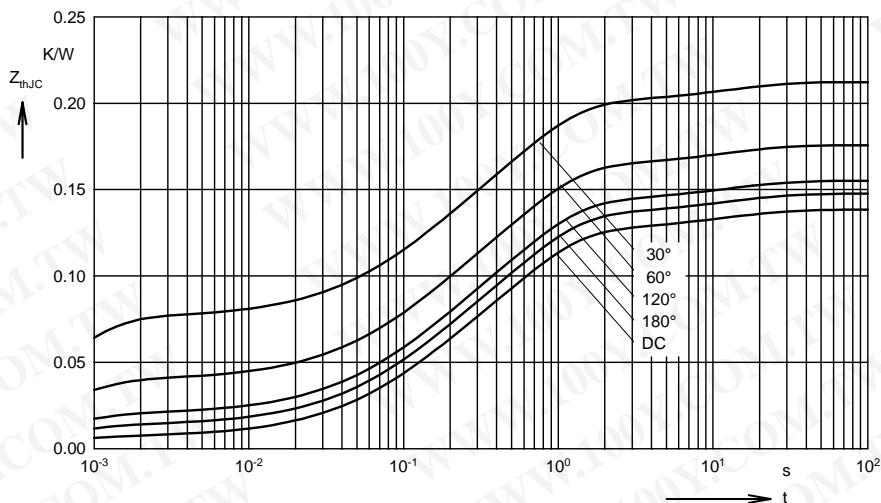


Fig. 8 Transient thermal impedance
junction to case (per thyristor or
diode)

R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	0.139
180°	0.148
120°	0.156
60°	0.176
30°	0.214

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0066	0.00054
2	0.0358	0.098
3	0.0831	0.54
4	0.0129	12

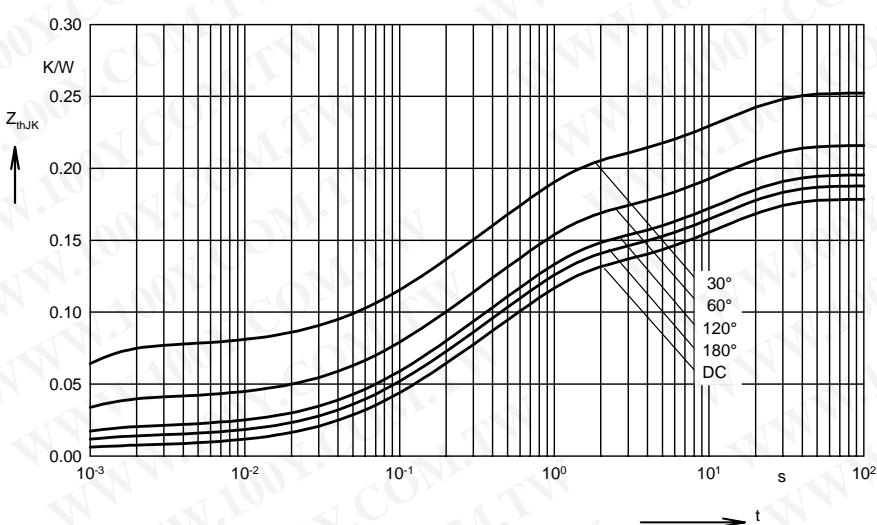


Fig. 9 Transient thermal impedance
junction to heatsink (per thyristor or
diode)

R_{thJK} for various conduction angles d:

d	R_{thJK} (K/W)
DC	0.179
180°	0.188
120°	0.196
60°	0.216
30°	0.254

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0066	0.00054
2	0.0358	0.098
3	0.0831	0.54
4	0.0129	12
5	0.04	12