勝 特 力 材 料 886-3-5753170
胜特力电子(上海) 86-21-54151736
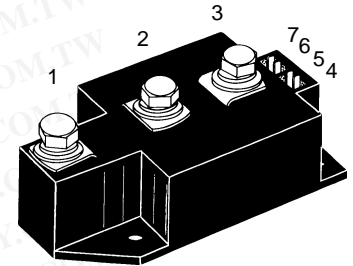胜特力电子(深圳) 86-755-83298787
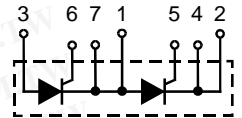Http://www.100y.com.tw

Thyristor Modules
Thyristor/Diode Modules

I_{TRMS} = 2x 500 A
I_{TAVM} = 2x 320 A
V_{RRM} = 800-2200 V

V_{RSM} V_{DSM}	V_{RRM} V_{DRM}	Type	
V	**V**	**Version 1**	**Version 1**
900	800	MCC 310-08io1	MCD 310-08io1
1300	1200	MCC 310-12io1	MCD 310-12io1
1500	1400	MCC 310-14io1	MCD 310-14io1
1700	1600	MCC 310-16io1	MCD 310-16io1
1900	1800	MCC 310-18io1	MCD 310-18io1

MCC

MCD

Symbol	Test Conditions		Maximum Ratings	
I_{TRMS}, I_{FRMS}	$T_{VJ} = T_{VJM}$		500	A
I_{TAVM}, I_{FAVM}	T_C = 85°C; 180° sine		320	A
I_{TSM}, I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	9200	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	9800	A
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	8000	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	8600	A
$\int i^2 dt$	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	420 000	A²s
	V_R = 0	t = 8.3 ms (60 Hz), sine	400 000	A²s
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	320 000	A²s
	V_R = 0	t = 8.3 ms (60 Hz), sine	306 000	A²s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$ f =50 Hz, t_P =200 µs V_D = 2/3 V_{DRM}	repetitive, I_T = 960 A	100	A/µs
	I_G = 1 A di_G/dt = 1 A/µs	non repetitive, I_T = 320 A	500	A/µs
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$; $R_{GK} = \infty$; method 1 (linear voltage rise)	V_{DR} = 2/3 V_{DRM}	1000	V/µs
P_{GM}	$T_{VJ} = T_{VJM}$	t_P = 30 µs	120	W
	$I_T = I_{TAVM}$	t_P = 500 µs	60	W
P_{GAV}			20	W
V_{RGM}			10	V
T_{VJ}			-40...+140	°C
T_{VJM}			140	°C
T_{stg}			-40...+125	°C
V_{ISOL}	50/60 Hz, RMS	t = 1 min	3000	V~
	$I_{ISOL} \le 1$ mA	t = 1 s	3600	V~
M_d	Mounting torque (M5)		2.5-5/22-44	Nm/lb.in.
	Terminal connection torque (M8)		12-15/106-132	Nm/lb.in.
Weight	Typical including screws		320	g

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

Applications
- Motor control
- Power converter
- Heat and temperature control for industrial furnaces and chemical processes
- Lighting control
- Contactless switches

Advantages
- Space and weight savings
- Simple mounting
- Improved temperature and power cycling
- Reduced protection circuits

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

030

Symbol	Test Conditions		Characteristic Values	
I_{RRM}	$T_{VJ} = T_{VJM}$; $V_R = V_{RRM}$; $V_D = V_{DRM}$		70	mA
I_{DRM}			40	mA
V_T, V_F	I_T, $I_F = 600$ A; $T_{VJ} = 25°C$		1.32	V
V_{T0}	For power-loss calculations only ($T_{VJ} = 140°C$)		0.8	V
r_T			0.82	mΩ
V_{GT}	$V_D = 6$ V;	$T_{VJ} = 25°C$	2	V
		$T_{VJ} = -40°C$	3	V
I_{GT}	$V_D = 6$ V;	$T_{VJ} = 25°C$	150	mA
		$T_{VJ} = -40°C$	200	mA
V_{GD}	$T_{VJ} = T_{VJM}$;	$V_D = 2/3\ V_{DRM}$	0.25	V
I_{GD}			10	mA
I_L	$T_{VJ} = 25°C$; $t_P = 30$ μs; $V_D = 6$ V $I_G = 0.45$ A; $di_G/dt = 0.45$ A/μs		200	mA
I_H	$T_{VJ} = 25°C$; $V_D = 6$ V; $R_{GK} = \infty$		150	mA
t_{gd}	$T_{VJ} = 25°C$; $V_D = 1/2\ V_{DRM}$ $I_G = 1$ A; $di_G/dt = 1$ A/μs		2	μs
t_q	$T_{VJ} = T_{VJM}$; $I_T = 300$ A, $t_P = 200$ μs; $-di/dt = 10$ A/μs typ. $V_R = 100$ V; $dv/dt = 50$ V/μs; $V_D = 2/3\ V_{DRM}$		200	μs
Q_S	$T_{VJ} = 125°C$; I_T, $I_F = 400$ A, $-di/dt = 50$ A/μs		760	μC
I_{RM}			275	A
R_{thJC}	per thyristor/diode; DC current		0.112	K/W
	per module	other values	0.056	K/W
R_{thJK}	per thyristor/diode; DC current	see Fig. 8/9	0.152	K/W
	per module		0.076	K/W
d_S	Creepage distance on surface		12.7	mm
d_A	Strike distance through air		9.6	mm
a	Maximum allowable acceleration		50	m/s²

Optional accessories for modules
Keyed gate/cathode twin plugs with wire length = 350 mm, gate = yellow, cathode = red
Type **ZY 180L** (L = Left for pin pair 4/5)   } UL 758, style 1385,
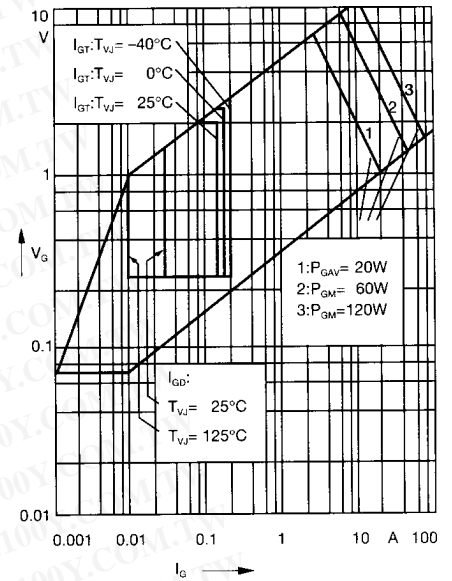Type **ZY 180R** (R = right for pin pair 6/7) } CSA class 5851, guide 460-1-1

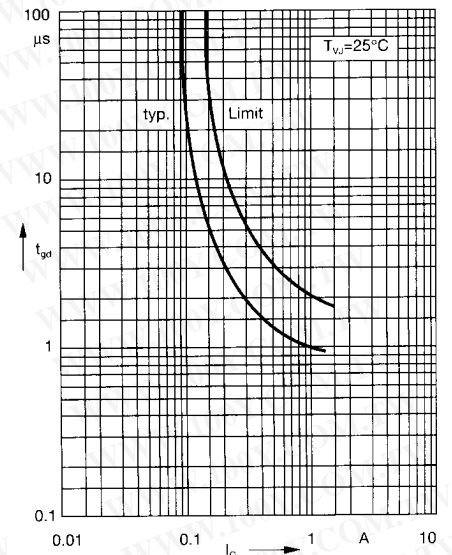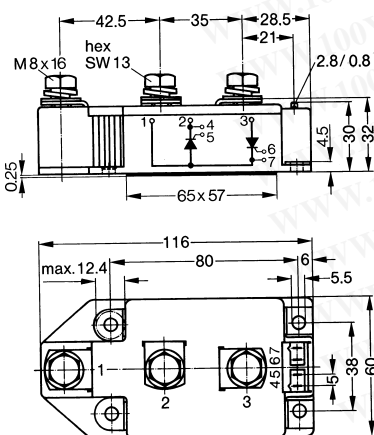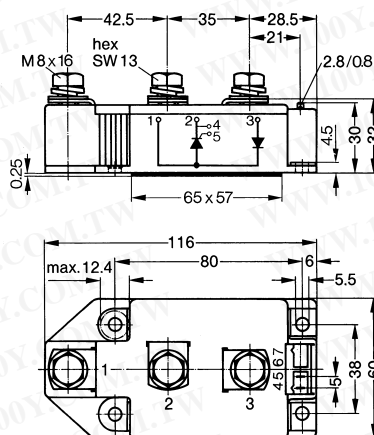Fig. 1 Gate trigger characteristics
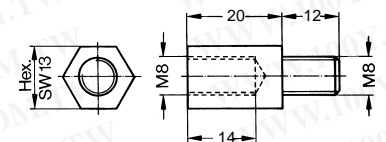

Fig. 2 Gate trigger delay time

Dimensions in mm (1 mm = 0.0394")

MCC

MCD

Threaded spacer for higher Anode/
Cathode construction:
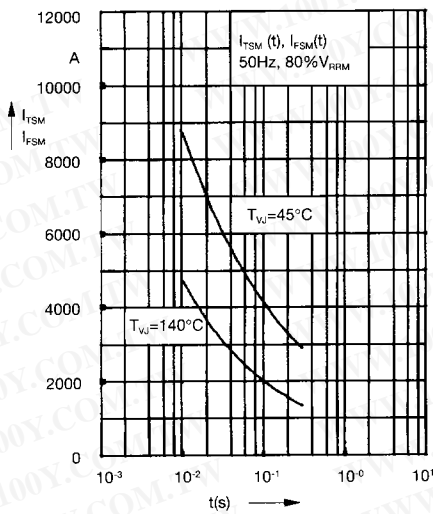Type **ZY 250**, material brass

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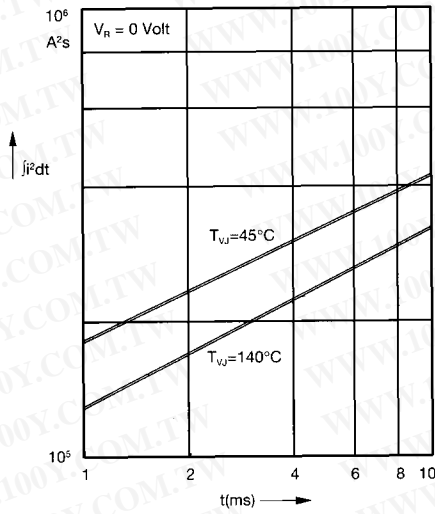I_{TSM}, I_{FSM}: Crest value, t: duration

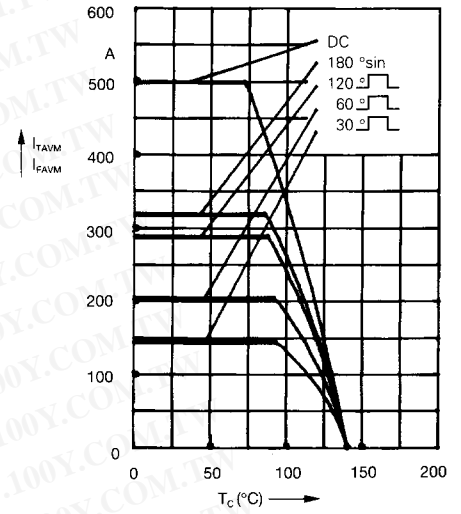Fig. 4 $\int i^2 dt$ versus time (1-10 ms)

Fig. 4a Maximum forward current
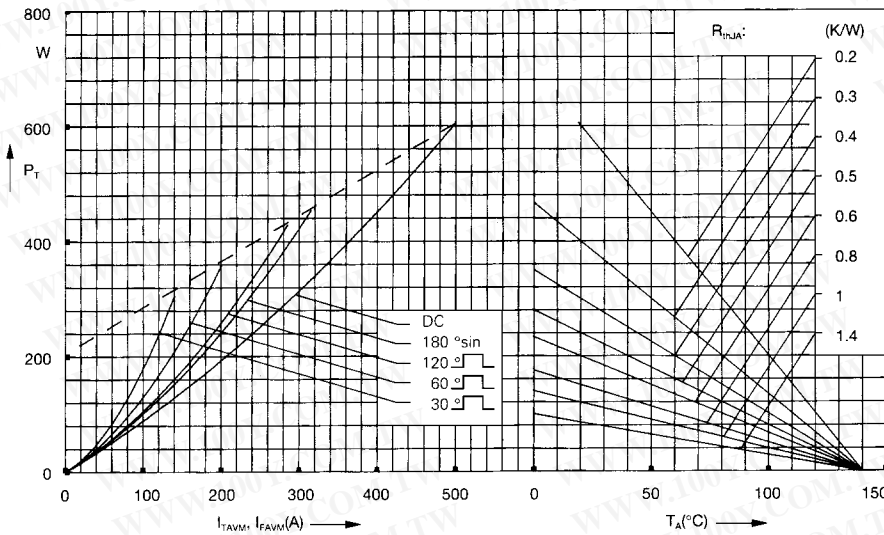at case temperature

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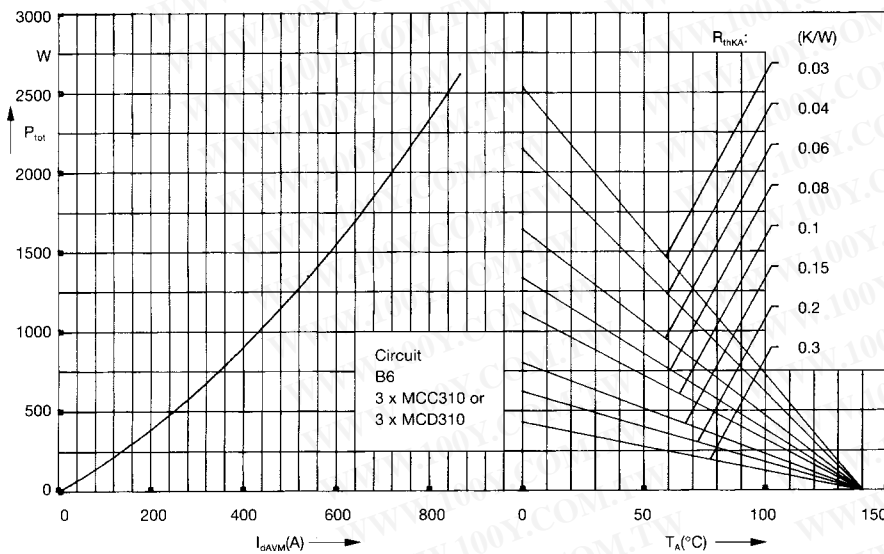

Fig. 6 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature
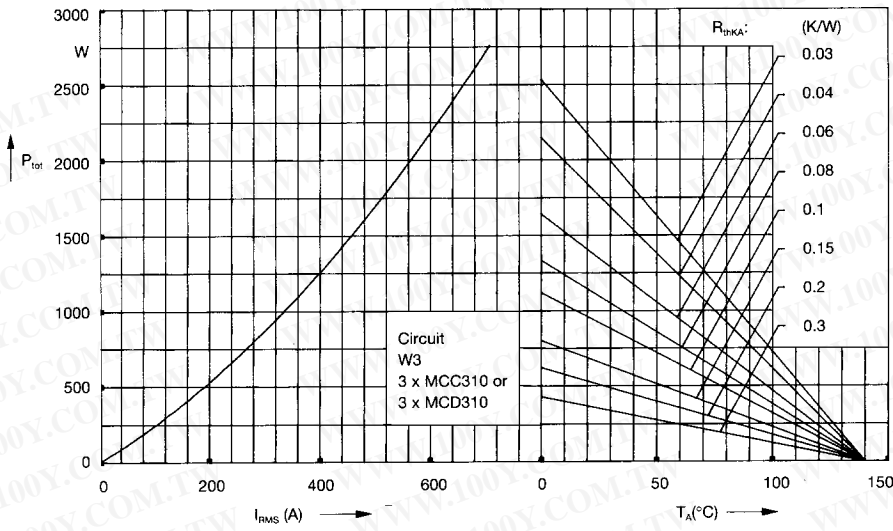
Fig. 7 Three phase AC-controller: Power dissipation versus RMS output current and ambient temperature
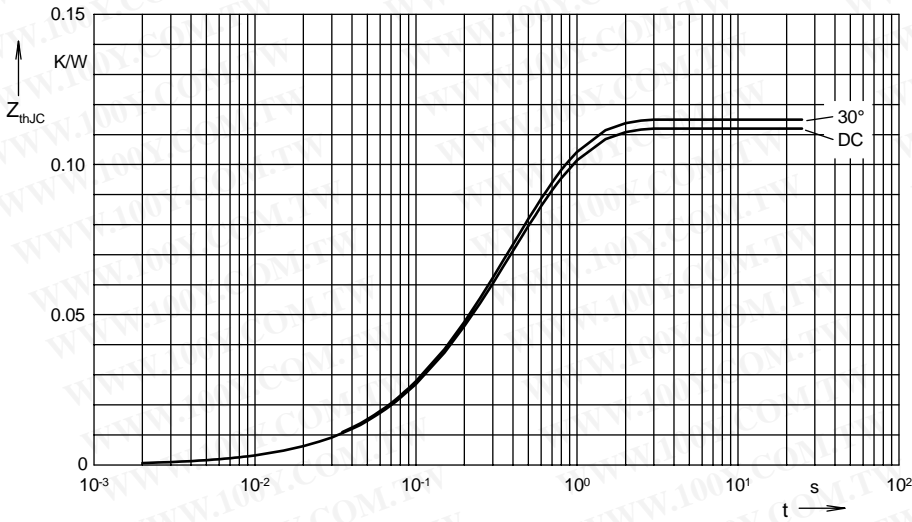

Fig. 8 Transient thermal impedance junction to case (per thyristor or diode)

R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	0.112
180°C	0.113
120°C	0.114
60°C	0.115
30°C	0.115

Constants for Z_{thJC} calculation:

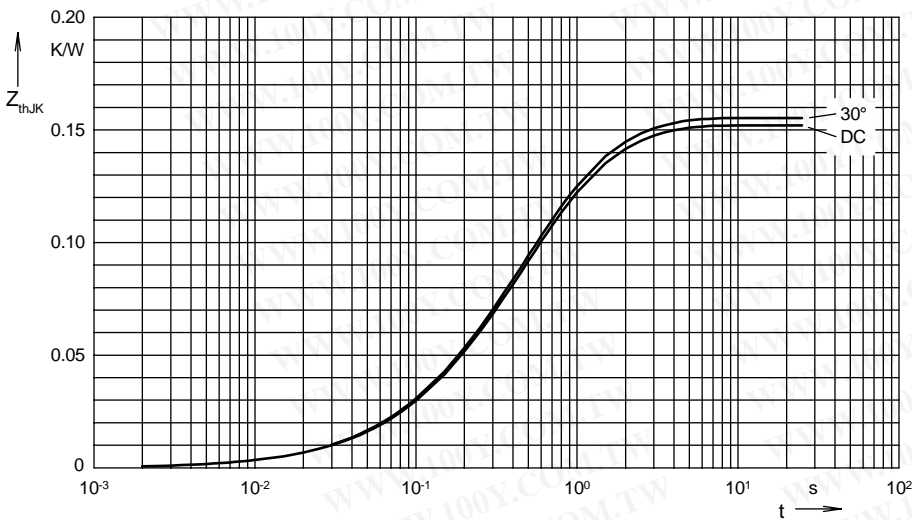| i	R_{thi} (K/W)	t_i (s)
1	0.003	0.099
2	0.0143	0.168
3	0.0947	0.456

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	0.152
180°C	0.154
120°C	0.154
60°C	0.155
30°C	0.155

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.003	0.099
2	0.0143	0.168
3	0.0947	0.456
4	0.04	1.36

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