

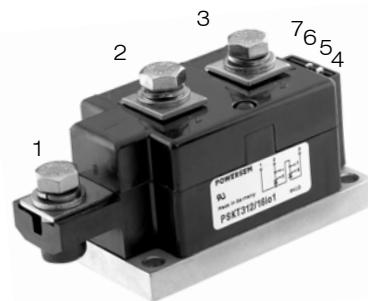
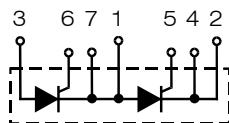
Thyristor Modules Thyristor/Diode Modules

PSKT 170

I_{TRMS} = 2x 350 A
I_{TAVM} = 2x 203 A
V_{RRM} = 1200-1800 V

Preliminary Data Sheet

V _{RSM}	V _{RRM}	Type
V _{DSM}	V _{DRM}	
V	V	Version 1
1300	1200	PSKT 170/12io1
1500	1400	PSKT 170/14io1
1700	1600	PSKT 170/16io1
1900	1800	PSKT 170/18io1



Symbol	Test Conditions	Maximum Ratings		
I _{TRMS}	T _{VJ} = T _{VJM}	350	A	
I _{TAVM}	T _C = 85°C; 180° sine	203	A	
I _{TSM} , I _{FSM}	T _{VJ} = 45°C; V _R = 0	t = 10 ms (50 Hz) t = 8.3 ms (60 Hz)	5400 5800	A
	T _{VJ} = T _{VJM} V _R = 0	t = 10 ms (50 Hz) t = 8.3 ms (60 Hz)	5000 5500	A
∫i ² dt	T _{VJ} = 45°C V _R = 0	t = 10 ms (50 Hz) t = 8.3 ms (60 Hz)	146 000 140 000	A ² s
	T _{VJ} = T _{VJM} V _R = 0	t = 10 ms (50 Hz) t = 8.3 ms (60 Hz)	125 000 126 000	A ² s
(di/dt) _{cr}	T _{VJ} = T _{VJM} f=50 Hz, t _p = 200 µs V _D = 2/3 V _{DRM} I _G = 1 A, di _G /dt = 1 A/µs	repetitive, I _T = 660 A non repetitive, I _T = I _{TAVM}	100 500	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	120	W
	I _T = I _{TAVM}	t _p = 500 µs	60 20 10	W W V
P _{GAV}			-40...+130	°C
V _{RGM}			130	°C
T _{VJ}			-40...+125	°C
T _{VJM}				
T _{stg}				
V _{ISOL}	50/60 Hz, RMS	t = 1 min	3000	V~
	I _{ISOL} ≤ 1 mA	t = 1 s	3600	V~
M _d	Mounting torque (M6)		4.5-7/40-62	Nm/lb.in.
	Terminal connection torque (M8)		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.

Features

- International standard package
- Direct copper bonded Al₂O₃-ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E 148688
- 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 capability
- 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	$I_T, I_F = 600 \text{ A}; T_{VJ} = 25^\circ\text{C}$	1.65	V	
V_{T0}	For power-loss calculations only ($T_{VJ} = 130^\circ\text{C}$)	0.8	V	
r_T		1	$\text{m}\Omega$	
V_{GT}	$V_D = 6 \text{ V}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = -40^\circ\text{C}$	2	V	
I_{GT}	$V_D = 6 \text{ V}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = -40^\circ\text{C}$	150	mA	
		220	mA	
V_{GD}	$T_{VJ} = T_{VJM}; V_D = 2/3 V_{DRM}$	0.25	V	
I_{GD}	$T_{VJ} = T_{VJM}; V_D = 2/3 V_{DRM}$	10	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	$T_{VJ} = 125^\circ\text{C}; I_T, I_F = 300 \text{ A}; -di/dt = 50 \text{ A}/\mu\text{s}$	550	μC	
I_{RM}		235	A	
R_{thJC}	per thyristor (diode); DC current	other values see Fig. 8/9	0.164	K/W
	per module		0.082	K/W
R_{thJK}	per thyristor (diode); DC current		0.204	K/W
	per module		0.102	K/W
d_s	Creeping distance on surface	12.7	mm	
d_A	Creepage distance in air	9.6	mm	
a	Maximum allowable acceleration	50	m/s^2	

Optional accessories for modules

Keyed Gate/Cathode twin plugs with wire length = 350 mm, gate = yellow, cathode = red

Dimensions in mm (1 mm = 0.0394")

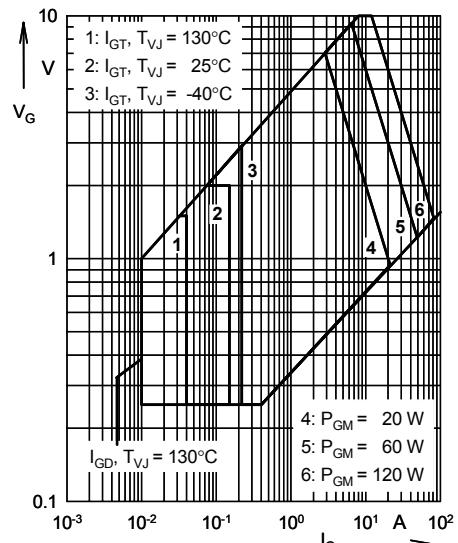
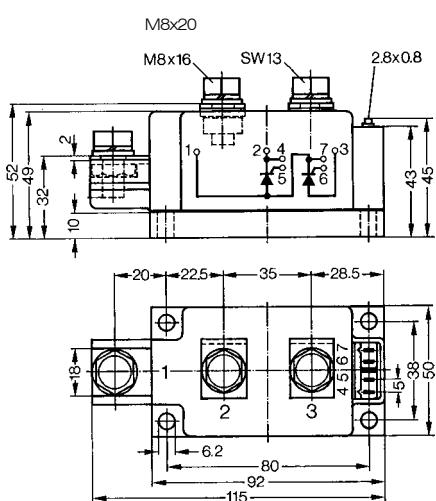


Fig. 1 Gate trigger characteristics

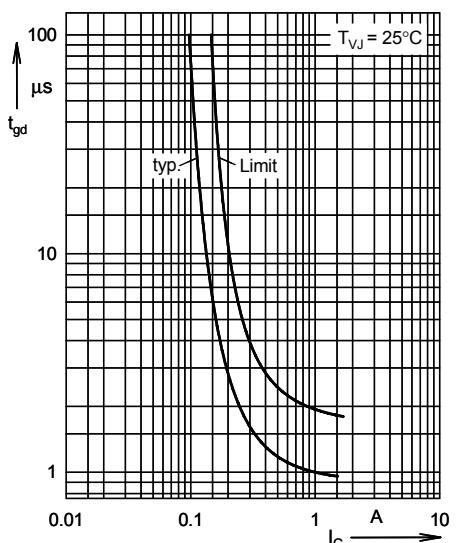


Fig. 2 Gate trigger delay time

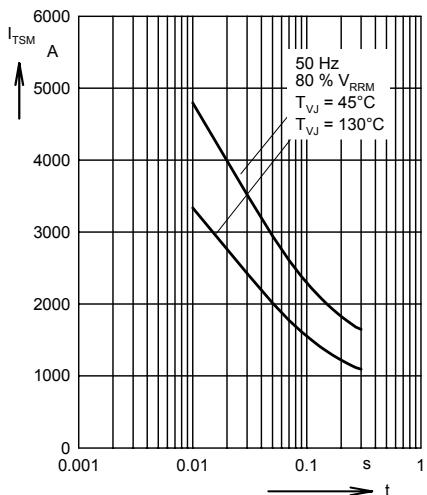


Fig. 3 Surge overload current
 I_{TSM}, I_{FSM} : Crest value, t: duration

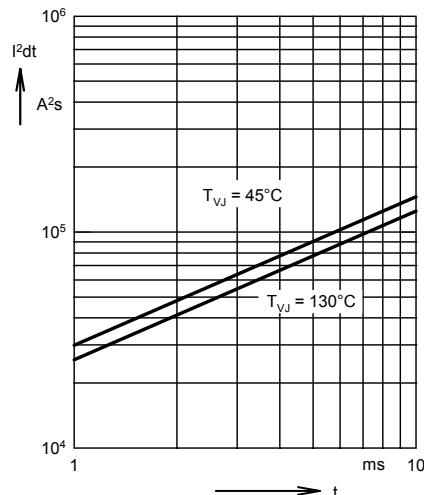


Fig. 4 $\int i^2 dt$ versus time (1-10 ms)

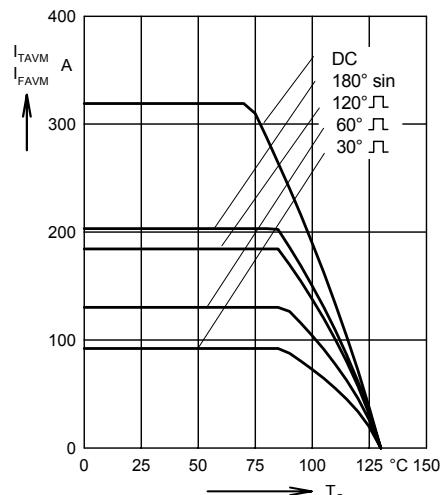


Fig. 4a Maximum forward current at case temperature

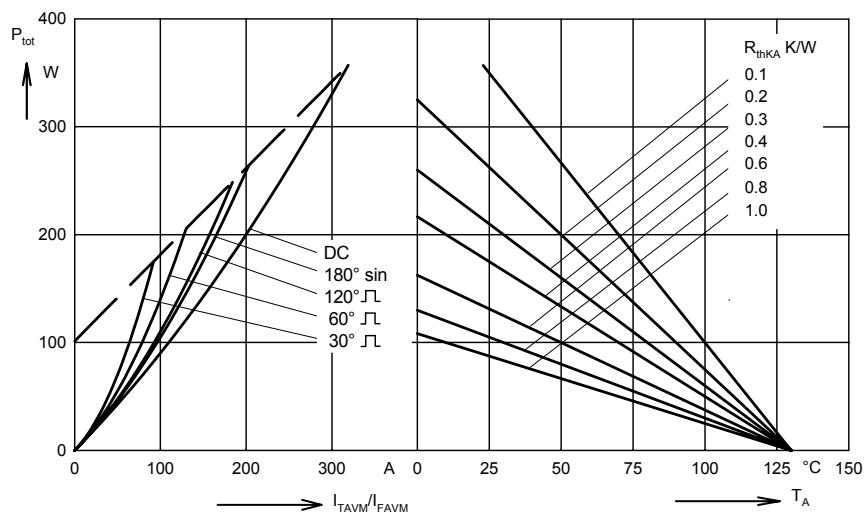


Fig. 5 Power dissipation versus on-state current and ambient temperature (per thyristor or diode)

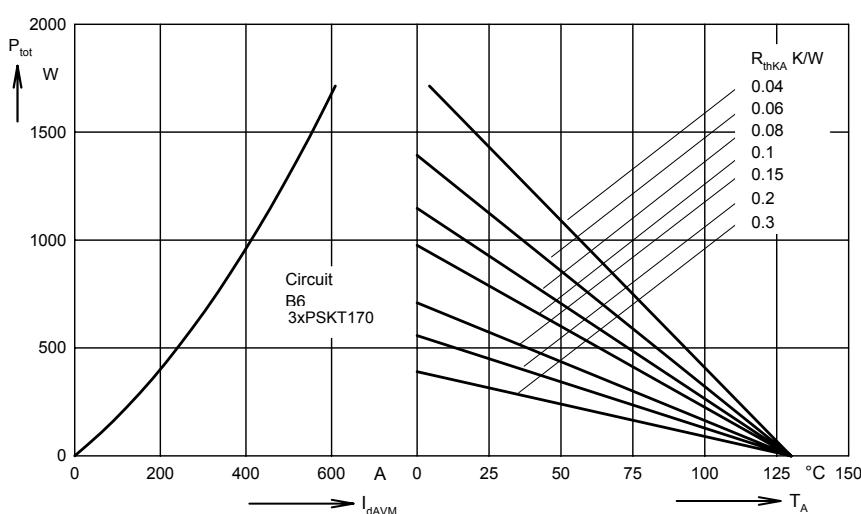


Fig. 6 Three phase rectifier bridge:
Power dissipation versus direct output current and ambient temperature

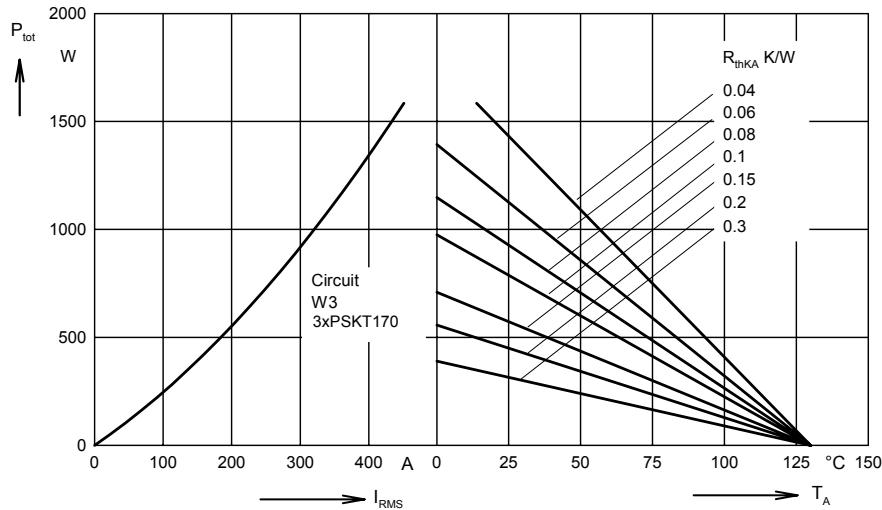


Fig. 7 Three phase AC-controller:
Power dissipation versus RMS
output current and ambient
temperature

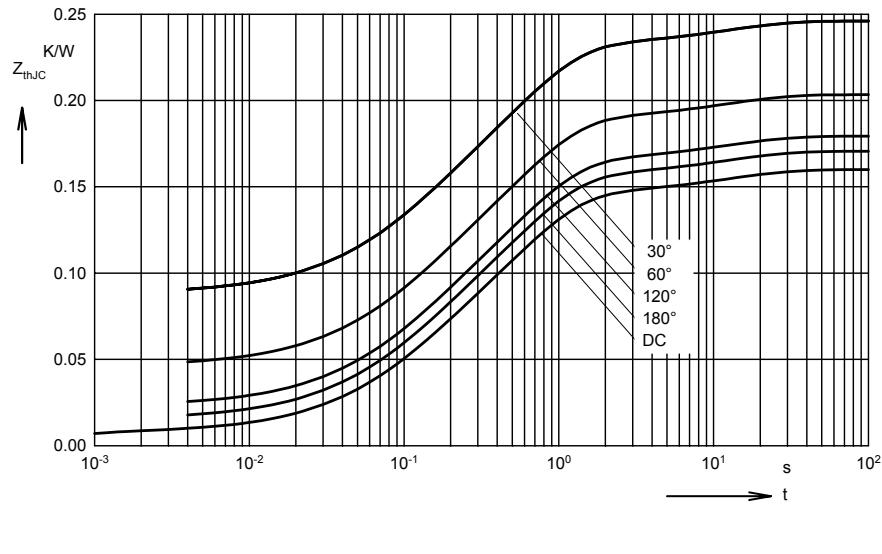


Fig. 8 Transient thermal impedance
junction to case (per thyristor or
diode)

R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	0.160
180°	0.171
120°	0.180
60°	0.203
30°	0.247

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0077	0.00054
2	0.0413	0.098
3	0.096	0.54
4	0.0149	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	0.200
180°	0.211
120°	0.220
60°	0.243
30°	0.287

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0077	0.00054
2	0.0413	0.098
3	0.096	0.54
4	0.0149	12
5	0.04	12