

Thyristor Modules Thyristor/Diode Modules

PSKT 95
PSKH 95

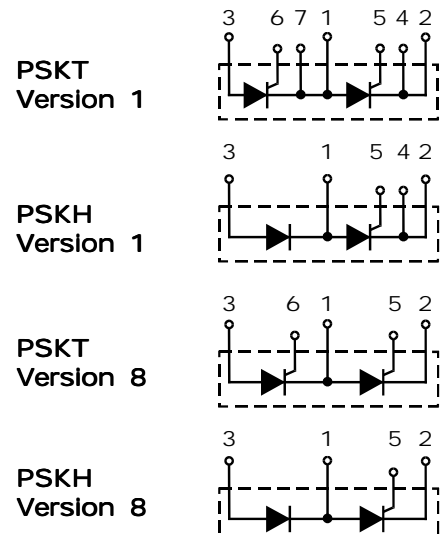
$I_{TRMS} = 2x 180 A$
 $I_{TAVM} = 2x 116 A$
 $V_{RRM} = 800-1800 V$

Preliminary Data Sheet

V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V	Type			
		Version 1		Version 8	
900	800	PSKT 95/08io1	--	PSKT 95/08io8	PSKH 95/08io8
1300	1200	PSKT 95/12io1	PSKH 95-12io1	PSKT 95/12io8	PSKH 95/12io8
1500	1400	PSKT 95/14io1	--	PSKT 95/14io8	PSKH 95/14io8
1700	1600	PSKT 95/16io1	PSKH 95-16io1	PSKT 95/16io8	PSKH 95/16io8
1900	1800	PSKT 95/18io1	--	PSKT 95/18io8	PSKH 95/18io8



Symbol	Test Conditions	Maximum Ratings	
I_{TRMS}^1 , I_{FRMS} I_{TAVM}^2 , I_{FAVM}	$T_{VJ} = T_{VJM}$ $T_C = 85^\circ C$; 180° sine	180	A
I_{TSM}^3 , I_{FSM}	$T_{VJ} = 45^\circ C$; $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	2250 A 2400 A
	$T_{VJ} = T_{VJM}$ $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	2000 A 2150 A
$\int i^2 dt$	$T_{VJ} = 45^\circ C$ $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	25 300 A ² s 23 900 A ² s
	$T_{VJ} = T_{VJM}$ $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	20 000 A ² s 19 100 A ² s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$ f = 50 Hz, t _p = 200 μs $V_D = 2/3 V_{DRM}$ $I_G = 0.45 A$ di _G /dt = 0.45 A/μs	repetitive, I _T = 250 A non repetitive, I _T = I _{TAVM}	150 A/μs 500 A/μs
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$; R _{GK} = ∞; method 1 (linear voltage rise)	$V_{DR} = 2/3 V_{DRM}$	1000 V/μs
P_{GM}	$T_{VJ} = T_{VJM}$ I _T = I _{TAVM}	t _p = 30 μs t _p = 300 μs	10 W 5 W
P_{GAV}			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 I _{ISOL} ≤ 1 mA	t = 1 min t = 1 s	3000 V~ 3600 V~
M_d	Mounting torque (M5) Terminal connection torque (M5)		2.5-4.0/22-35 Nm/lb.in. 2.5-4.0/22-35 Nm/lb.in.
Weight	Typical including screws		90 g



Features

- International standard package, JEDEC TO-240 AA
- Direct copper bonded Al₂O₃ -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E 148688
- Gate-cathode twin pins for version 1

Applications

- DC motor control
- Softstart AC motor controller
- Light, heat and temperature control

Advantages

- Space and weight savings
- Simple mounting with two screws
- Improved temperature and power cycling
- Reduced protection circuits

Data according to IEC 60747 and refer to a single thyristor/diode unless otherwise stated.

Symbol	Test Conditions	Characteristic Values
I_{RRM}, I_{DRM}	$T_{VJ} = T_{VJM}; V_R = V_{RRM}; V_D = V_{DRM}$	5 mA
V_T, V_F	$I_T, I_F = 300 \text{ A}; T_{VJ} = 25^\circ\text{C}$	1.5 V
V_{T0}	For power-loss calculations only ($T_{VJ} = 125^\circ\text{C}$)	0.8 V
r_T		2.4 mΩ
V_{GT}	$V_D = 6 \text{ V}; T_{VJ} = 25^\circ\text{C}$	2.5 V
	$T_{VJ} = -40^\circ\text{C}$	2.6 V
I_{GT}	$V_D = 6 \text{ V}; T_{VJ} = 25^\circ\text{C}$	150 mA
	$T_{VJ} = -40^\circ\text{C}$	200 mA
V_{GD}, I_{GD}	$T_{VJ} = T_{VJM}; V_D = 2/3 V_{DRM}$	0.2 V 10 mA
I_L	$T_{VJ} = 25^\circ\text{C}; t_p = 10 \mu\text{s}; V_D = 6 \text{ V}$ $I_G = 0.45 \text{ A}; di_G/dt = 0.45 \text{ A}/\mu\text{s}$	450 mA
I_H	$T_{VJ} = 25^\circ\text{C}; V_D = 6 \text{ V}; R_{CK} = \infty$	200 mA
t_{gd}	$T_{VJ} = 25^\circ\text{C}; V_D = 1/2 V_{DRM}$ $I_G = 0.45 \text{ A}; di_G/dt = 0.45 \text{ A}/\mu\text{s}$	2 μs
t_q	$T_{VJ} = T_{VJM}; I_T = 150 \text{ A}, t_p = 200 \mu\text{s}; -di/dt = 10 \text{ A}/\mu\text{s}$ typ. $V_R = 100 \text{ V}; dv/dt = 20 \text{ V}/\mu\text{s}; V_D = 2/3 V_{DRM}$	185 μs
Q_S, I_{RM}	$T_{VJ} = T_{VJM}; I_T, I_F = 50 \text{ A}, -di/dt = 6 \text{ A}/\mu\text{s}$	170 μC 45 A
R_{thJC}, R_{thJK}	per thyristor/diode; DC current per module per thyristor/diode; DC current per module	0.22 K/W 0.11 K/W 0.42 K/W 0.21 K/W
d_s, d_A, a	Creepage distance on surface Strike distance through air Maximum allowable acceleration	12.7 mm 9.6 mm 50 m/s ²

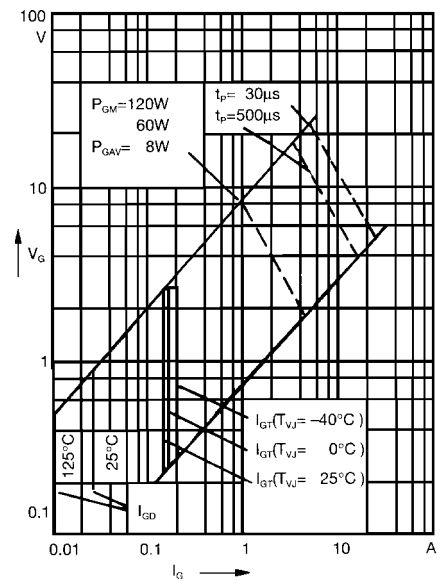


Fig. 1 Gate trigger characteristics

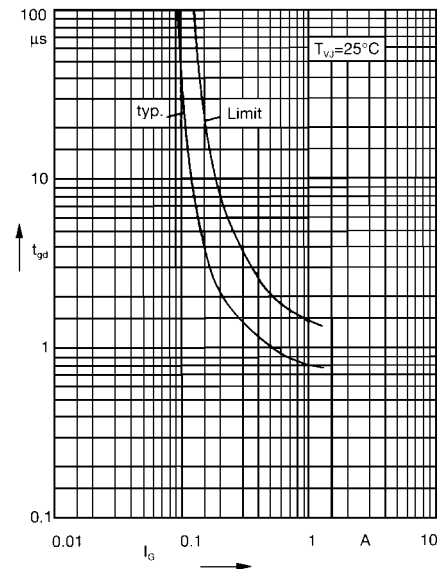
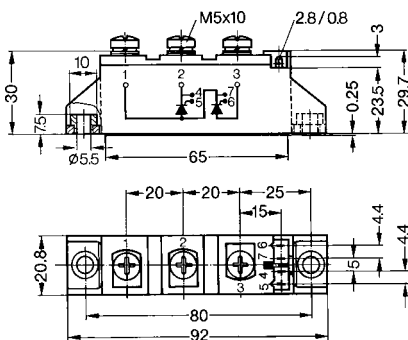


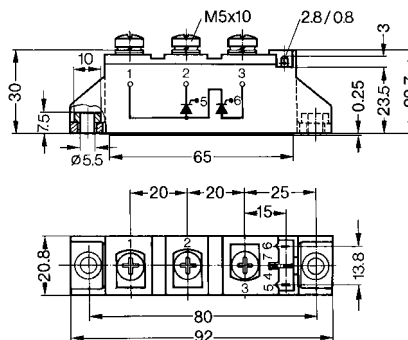
Fig. 2 Gate trigger delay time

Dimensions in mm (1 mm = 0.0394")

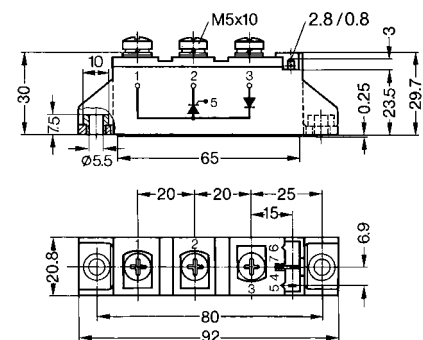
PSKT/ PSKH Version 1



PSKT Version 8



PSKH Version 8



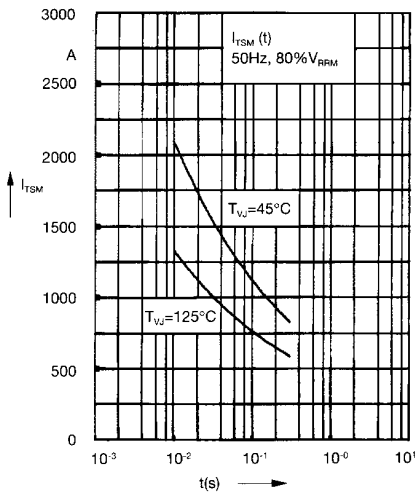


Fig. 3 Surge overload current
 I_{TSM} , I_{FSM} : Crest value, t: duration

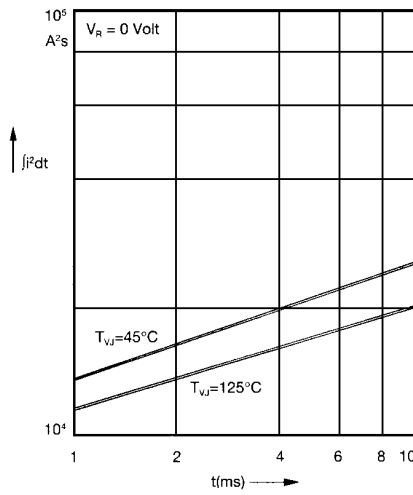


Fig. 4 $\int i^2 dt$ versus time (1-10 ms)

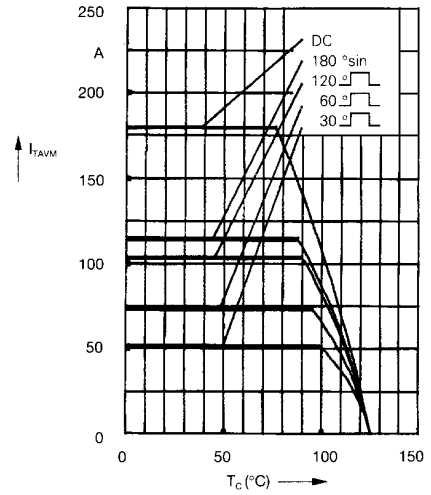


Fig. 4a Maximum forward current at case temperature

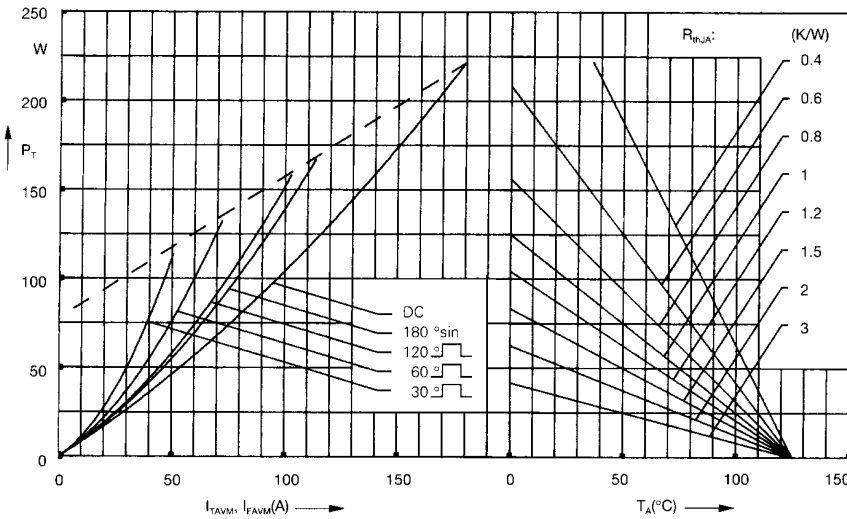


Fig. 5 Power dissipation versus on-state current and ambient temperature (per thyristor or diode)

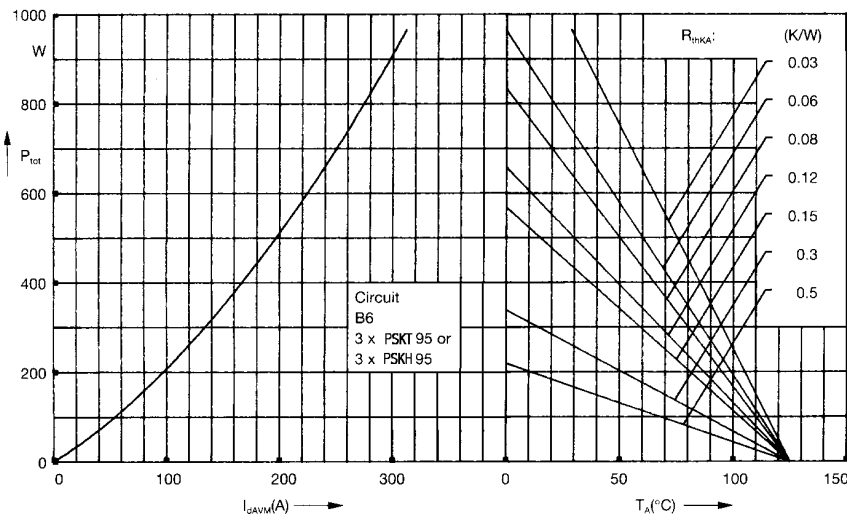


Fig. 6 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

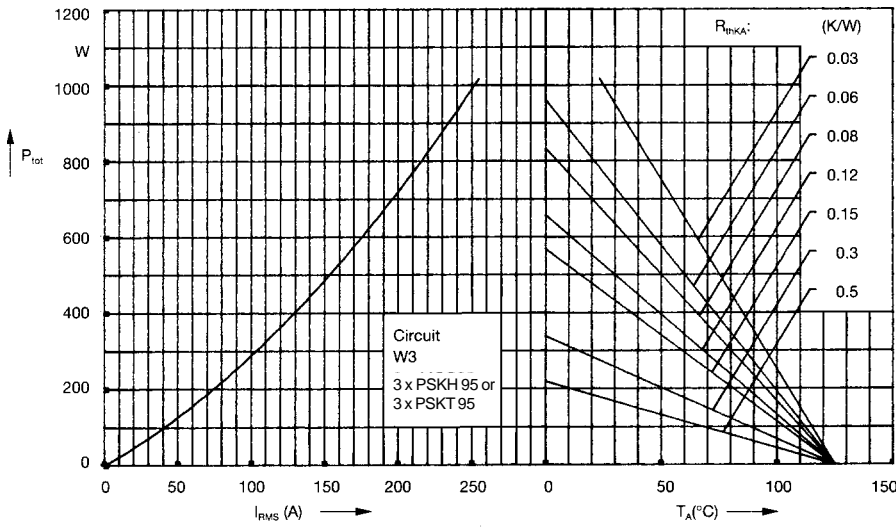


Fig. 7 Three phase AC-controller: Power dissipation versus RMS output current and ambient temperature

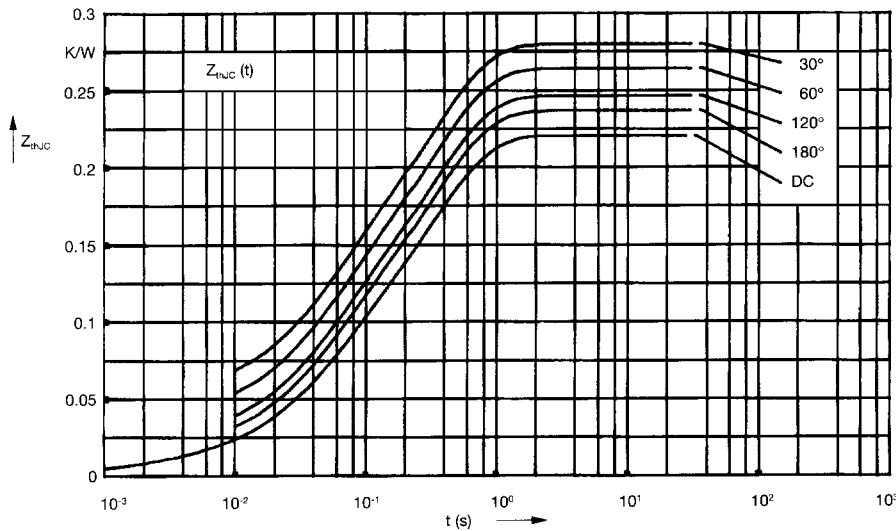


Fig. 8 Transient thermal impedance junction to case (per thyristor or diode)

R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	0.22
180°	0.23
120°	0.25
60°	0.27
30°	0.28

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0066	0.0019
2	0.0678	0.0477
3	0.1456	0.344

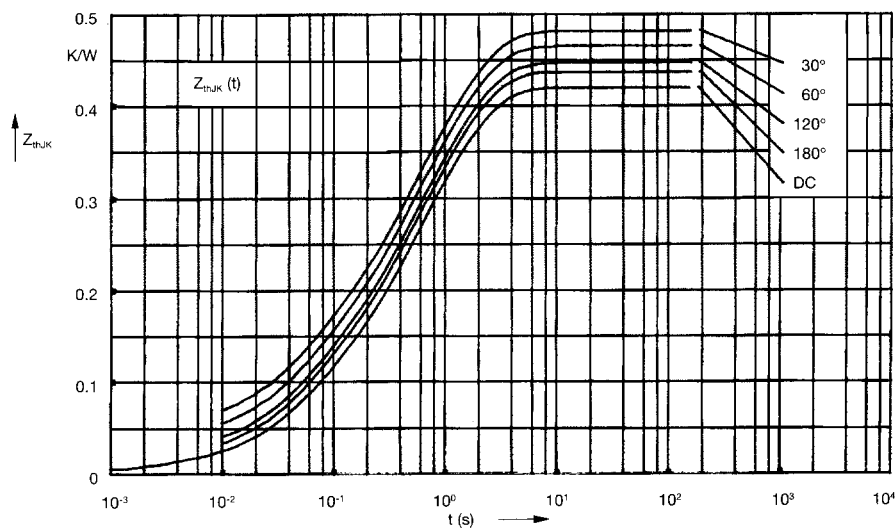


Fig. 9 Transient thermal impedance junction to heatsink (per thyristor or diode)

R_{thJK} for various conduction angles d:

d	R_{thJK} (K/W)
DC	0.42
180°	0.43
120°	0.45
60°	0.47
30°	0.48

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0066	0.0019
2	0.0678	0.0477
3	0.1456	0.344
4	0.2	1.32