

WESTCODE



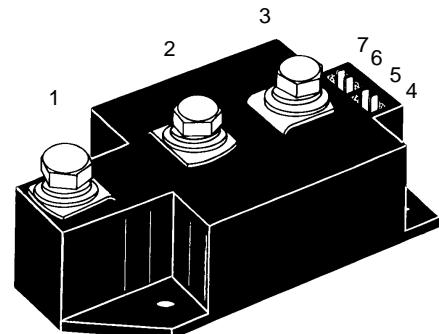
SEMICONDUCTORS

Thyristor Modules Thyristor/Diode Modules

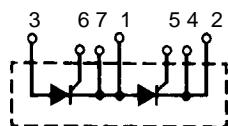
I_{TRMS} = 2 x 450 A
I_{TAVM} = 2 x 287 A
V_{RRM} = 800 - 1800 V

V _{RSM}	V _{RRM}	Type
V _{DSM}	V _{DRM}	
V	V	
900	800	WPT 250-08 WPH 250-08
1300	1200	WPT 250-12 WPH 250-12
1500	1400	WPT 250-14 WPH 250-14
1700	1600	WPT 250-16 WPH 250-16
1900	1800	WPT 250-18

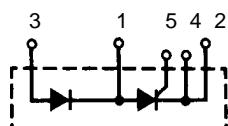
Symbol	Test Conditions	Maximum Ratings		
I _{TRMS} , I _{FRMS}	T _{VJ} = T _{VJM}	450	A	
I _{TAVM} , I _{FAVM}	T _C = 85°C; 180° sine	287	A	
I _{TSM} , I _{FSM}	T _{VJ} = 45°C; V _R = 0	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	9000 9600	A A
	T _{VJ} = T _{VJM} V _R = 0	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	7800 8500	A A
Ji ² dt	T _{VJ} = 45°C V _R = 0	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	405 000 380 000	A ² s A ² s
	T _{VJ} = T _{VJM} V _R = 0	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	304 000 300 000	A ² s 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 = 860 A non repetitive, I _T = 290 A	100 800	A/µs 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 = 500 µs	120 60 20	W W W
P _{GAV}				
V _{RGM}			10	V
T _{VJ}			-40...+140	°C
T _{VJM}			140	°C
T _{stg}			-40...+125	°C
V _{ISOL}	50/60 Hz, RMS I _{ISOL} ≤ 1 mA	t = 1 min t = 1 s	3000 3600	V~ V~
M _d	Mounting torque (M5) Terminal connection torque (M8)		2.5-5/22-44 12-15/106-132	Nm/lb.in. Nm/lb.in.
Weight	Typical including screws		320	g



WPT 250



WPH 250



Features

- International standard package
- Direct copper bonded Al₂O₃-ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- 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

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	$I_T, I_F = 600 \text{ A}$; $T_{VJ} = 25^\circ\text{C}$	1.36	V
V_{TO}	For power-loss calculations only ($T_{VJ} = 140^\circ\text{C}$)	0.85	V
r_T		0.82	$\text{m}\Omega$
V_{GT}	$V_D = 6 \text{ V}$; $T_{VJ} = 25^\circ\text{C}$	2	V
	$T_{VJ} = -40^\circ\text{C}$	3	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}	$T_{VJ} = T_{VJM}$; $V_D = 2/3 V_{DRM}$	0.25	V
I_{GD}		10	mA
I_L	$T_{VJ} = 25^\circ\text{C}$; $t_p = 30 \mu\text{s}$; $V_D = 6 \text{ V}$	200	mA
	$I_G = 0.45 \text{ A}$; $di_G/dt = 0.45 \text{ A}/\mu\text{s}$		
I_H	$T_{VJ} = 25^\circ\text{C}$; $V_D = 6 \text{ V}$; $R_{GK} = \infty$	150	mA
t_{gd}	$T_{VJ} = 25^\circ\text{C}$; $V_D = 1/2 V_{DRM}$	2	μs
	$I_G = 1 \text{ A}$; $di_G/dt = 1 \text{ A}/\mu\text{s}$		
t_q	$T_{VJ} = T_{VJM}$; $I_T = 300 \text{ A}$, $t_p = 200 \mu\text{s}$; $-di/dt = 10 \text{ A}/\mu\text{s}$	typ.	μs
	$V_R = 100 \text{ V}$; $dv/dt = 50 \text{ V}/\mu\text{s}$; $V_D = 2/3 V_{DRM}$		
Q_s	$T_{VJ} = 125^\circ\text{C}$; $I_T, I_F = 400 \text{ A}$, $-di/dt = 50 \text{ A}/\mu\text{s}$	760	μC
I_{RM}		275	A
R_{thJC}	per thyristor/diode; DC current	0.129	K/W
	per module	0.0645	K/W
R_{thJK}	per thyristor/diode; DC current	0.169	K/W
	per module	0.0845	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/s^2

Optional accessories for modules

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

Type **U9911** UL 758, style 1385,
CSA class 5851, guide 460-1-1

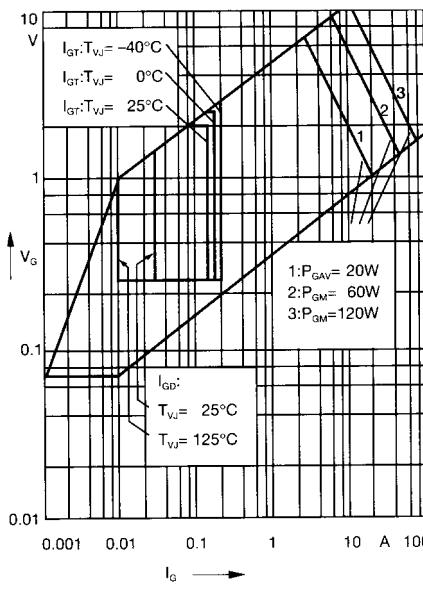


Fig. 1 Gate trigger characteristics

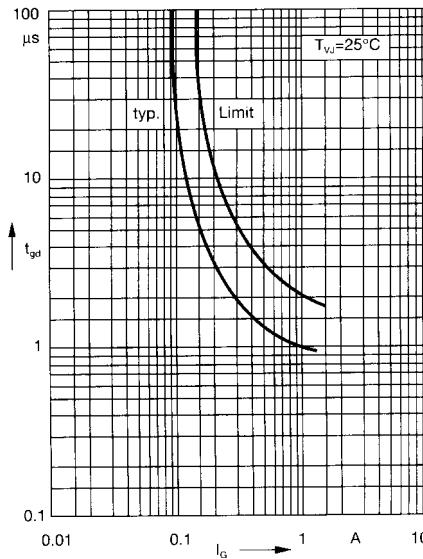
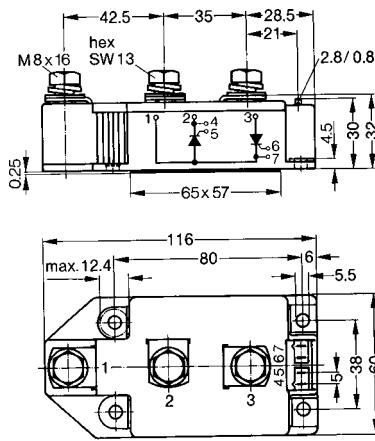


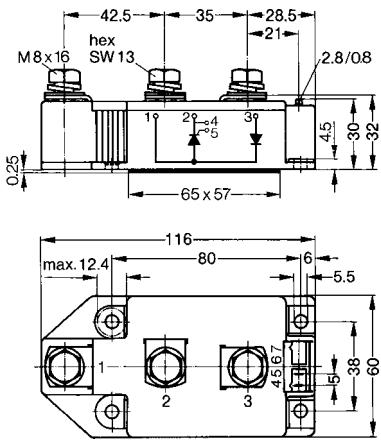
Fig. 2 Gate trigger delay time

Dimensions in mm (1 mm = 0.0394")

WPT 250

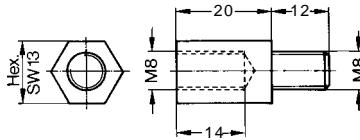


WPH 250



Threaded spacer for higher Anode/Cathode construction:

Type **9912**, material brass



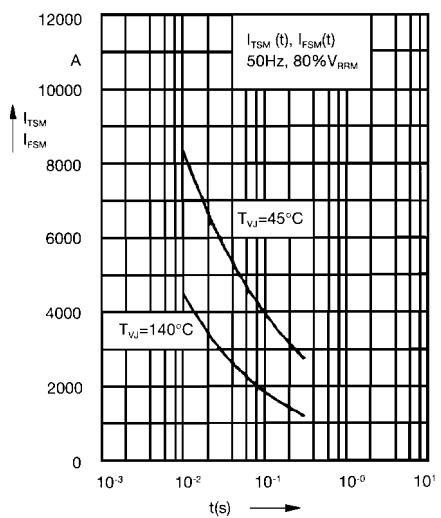


Fig. 3 Surge overload current
 I_{TSM}, I_{FSM} : Crest value, t : duration

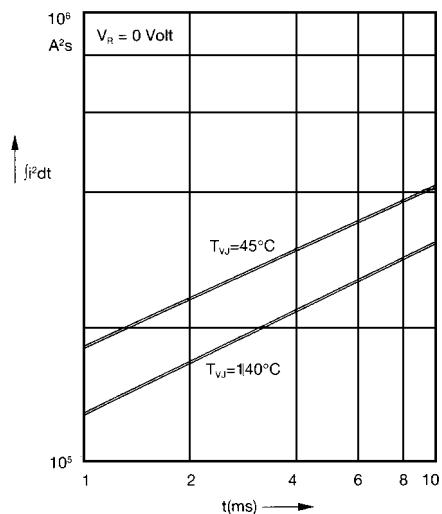


Fig. 4 $\int j^2 dt$ versus time (1-10 ms)

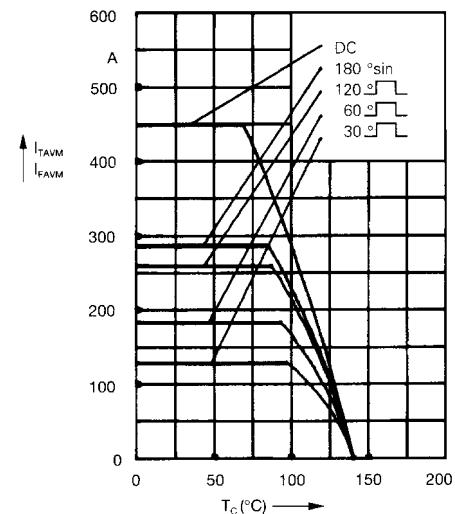


Fig. 4a Maximum forward current
at case temperature

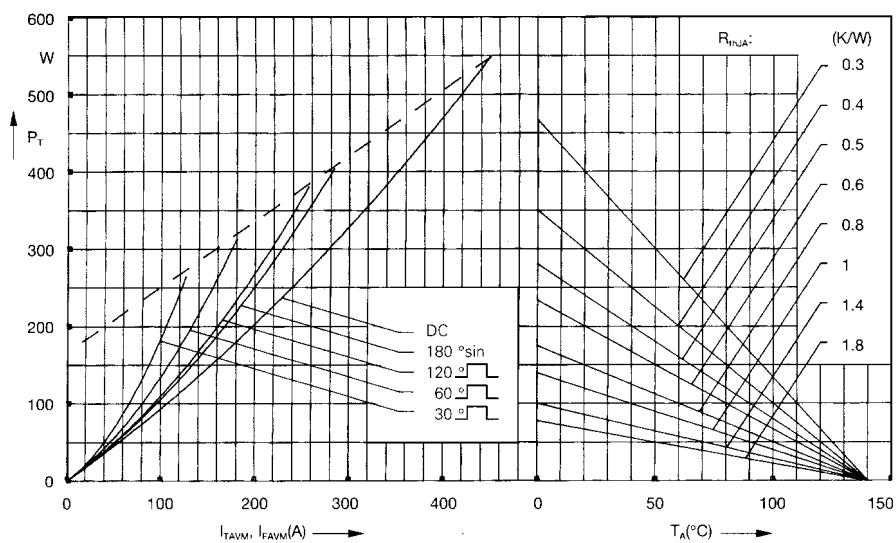


Fig. 5 Power dissipation versus on-state current and ambient temperature (per thyristor or diode)

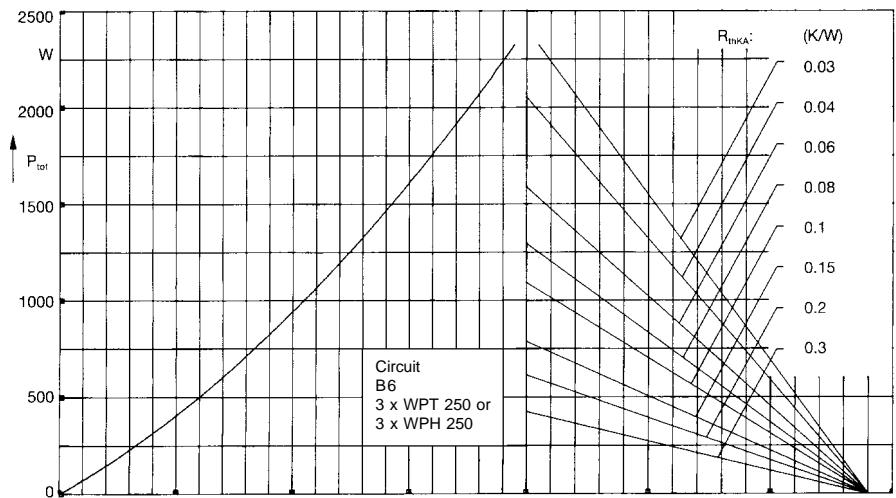


Fig. 6 Three phase rectifier bridge:
Power dissipation versus direct output current and ambient temperature

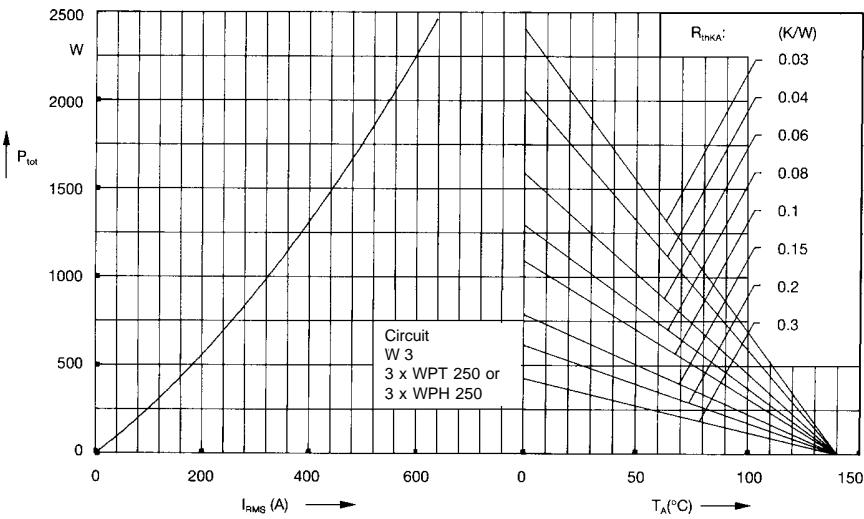


Fig. 7 Three phase AC-controller:
Power dissipation versus RMS output
current and ambient temperature

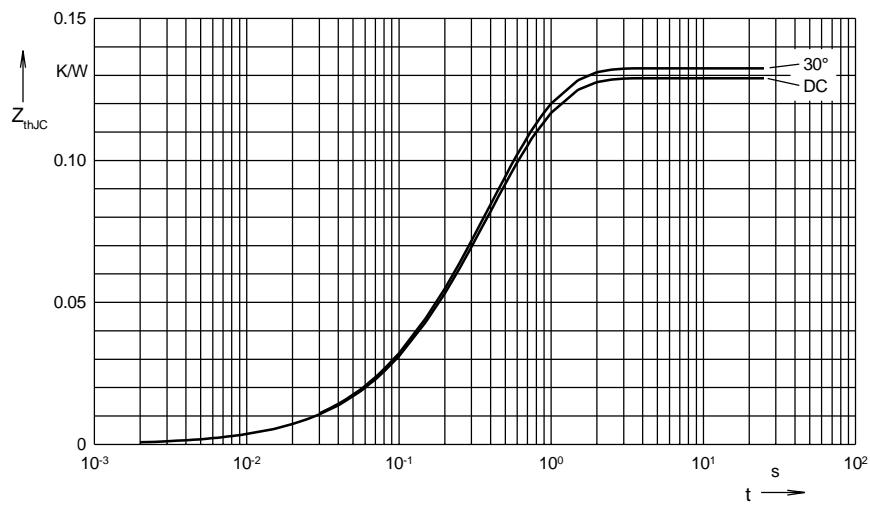


Fig. 8 Transient thermal impedance junction
to case (per thyristor or diode)
 R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	0.129
180°C	0.131
120°C	0.131
60°C	0.132
30°C	0.132

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0035	0.099
2	0.0165	0.168
3	0.1091	0.456

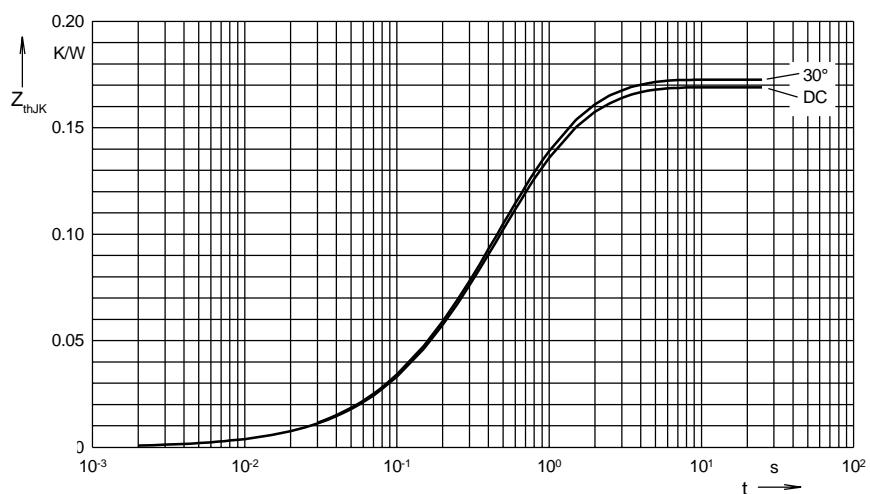


Fig. 9 Transient thermal impedance junction
to heatsink (per thyristor or diode)

R_{thJK} for various conduction angles d:

d	R_{thJK} (K/W)
DC	0.169
180°C	0.171
120°C	0.172
60°C	0.172
30°C	0.173

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0033	0.099
2	0.0159	0.168
3	0.1053	0.456
4	0.04	1.36

WESTCODE 
SEMICONDUCTORS

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