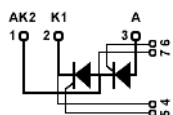


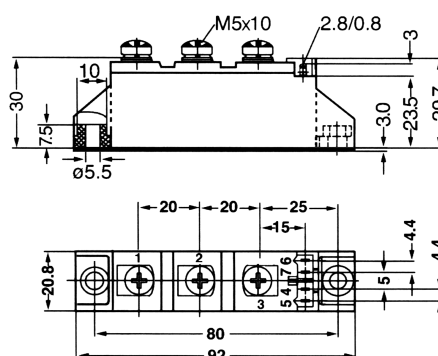
STT18

Thyristor-Thyristor Modules



Type	V_{RSM}	V_{RRM}
	V_{DSM}	V_{DRM}
	V	V
STT18GK08	900	800
STT18GK12	1300	1200
STT18GK14	1500	1400
STT18GK16	1700	1600
STT18GK18	1900	1800

Dimensions in mm (1mm=0.0394")



Symbol	Test Conditions		Maximum Ratings	Unit
I_{TRMS}, I_{FRMS} I_{TAVM}, I_{FAVM}	$T_V = T_{VJM}$ $T_C = 85^{\circ}C$; 180° sine		40 18	A
I_{TSM}, I_{FSM}	$T_V = 45^{\circ}C$ $V_R = 0$	t=10ms (50Hz), sine t=8.3ms (60Hz), sine	400 420	A
	$T_V = T_{VJM}$ $V_R = 0$	t=10ms(50Hz), sine t=8.3ms(60Hz), sine	350 370	
$\int i^2 dt$	$T_V = 45^{\circ}C$ $V_R = 0$	t=10ms (50Hz), sine t=8.3ms (60Hz), sine	800 730	A ² s
	$T_V = T_{VJM}$ $V_R = 0$	t=10ms(50Hz), sine t=8.3ms(60Hz), sine	600 570	
$(di/dt)_{cr}$	$T_V = T_{VJM}$ f=50Hz, t _p =200us $V_D = 2/3V_{DRM}$ I _G =0.45A di _G /dt=0.45A/us	repetitive, I _T =45A non repetitive, I _T =I _{TAVM}	150 500	A/us
	$(dv/dt)_{cr}$	$T_V = T_{VJM}$; $V_{DR} = 2/3V_{DRM}$ R _{GK} =∞; method 1 (linear voltage rise)	1000	
P_{GM}	$T_V = T_{VJM}$ I _T =I _{TAVM}	t _p =30us t _p =300us	10 5	W
P_{GAV}			0.5	W
V_{RGM}			10	V
T_V T_{VJM} T_{stg}			-40...+125 125 -40...+125	°C
V_{ISOL}	50/60Hz, RMS I _{ISOL} ≤1mA	t=1min t=1s	3000 3600	V~
M_d	Mounting torque (M5) Terminal connection torque (M5)		2.5-4.0/22-35 2.5-4.0/22-35	Nm/lb.in.
Weight	Typical including screws		90	g

STT18

Thyristor-Thyristor Modules

Symbol	Test Conditions	Characteristic Values	Unit
I_{RRM}, I_{DRM}	$T_{VJ}=T_{VJM}; V_R=V_{RRM}; V_D=V_{DRM}$	3	mA
V_T, V_F	$I_T, I_F=80A; T_{VJ}=25^{\circ}C$	2.05	V
V_{TO}	For power-loss calculations only ($T_{VJ}=125^{\circ}C$)	0.85	V
r_T		18	$m\Omega$
V_{GT}	$V_D=6V; T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$	1.5 1.6	V
I_{GT}	$V_D=6V; T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$	100 200	mA
V_{GD}	$T_{VJ}=T_{VJM}; V_D=2/3V_{DRM}$	0.2	V
I_{GD}		10	mA
I_L	$T_{VJ}=25^{\circ}C; t_p=10\mu s; V_D=6V$ $I_G=0.45A; di_G/dt=0.45A/\mu s$	450	mA
I_H	$T_{VJ}=25^{\circ}C; V_D=6V; R_{GK}=\infty$	200	mA
t_{gd}	$T_{VJ}=25^{\circ}C; V_D=1/2V_{DRM}$ $I_G=0.45A; di_G/dt=0.45A/\mu s$	2	μs
t_q	$T_{VJ}=T_{VJM}; I_T=20A; t_p=200\mu s; -di/dt=10A/\mu s$ $V_R=100V; dv/dt=20V/\mu s; V_D=2/3V_{DRM}$ typ.	150	μs
Q_s	$T_{VJ}=T_{VJM}; I_T, I_F=25A; -di/dt=0.64A/\mu s$	50	μC
I_{RM}		6	A
R_{thJC}	per thyristor/diode; DC current per module	1.3 0.65	K/W
R_{thJK}	per thyristor/diode; DC current per module	1.5 0.75	K/W
d_s	Creeping distance on surface	12.7	mm
d_A	Strike distance through air	9.6	mm
a	Maximum allowable acceleration	50	m/s^2

FEATURES

- * International standard package
- * Copper base plate
- * Planar passivated chips
- * Isolation voltage 3600 V~

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



STT18

Thyristor-Thyristor Modules

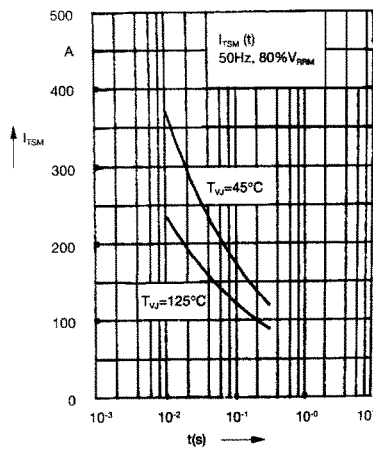


Fig. 1 Surge overload current
 I_{TSM} : Crest value, t : duration

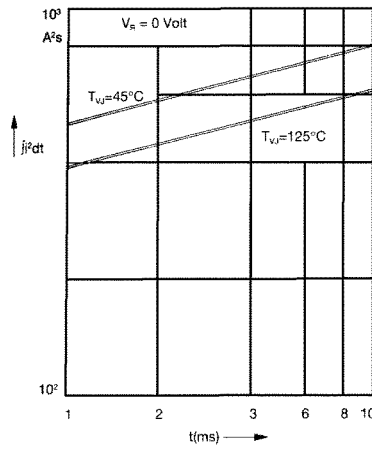


Fig. 2 $\int i^2 dt$ versus time (1-10 ms)

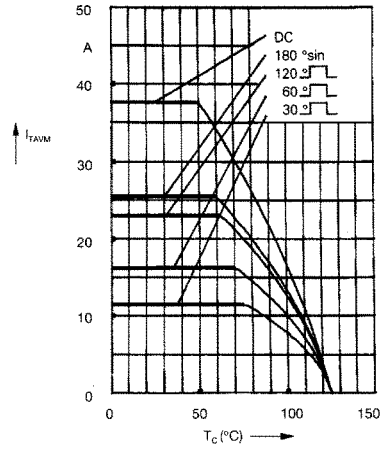


Fig. 2a Maximum forward current
 at case temperature

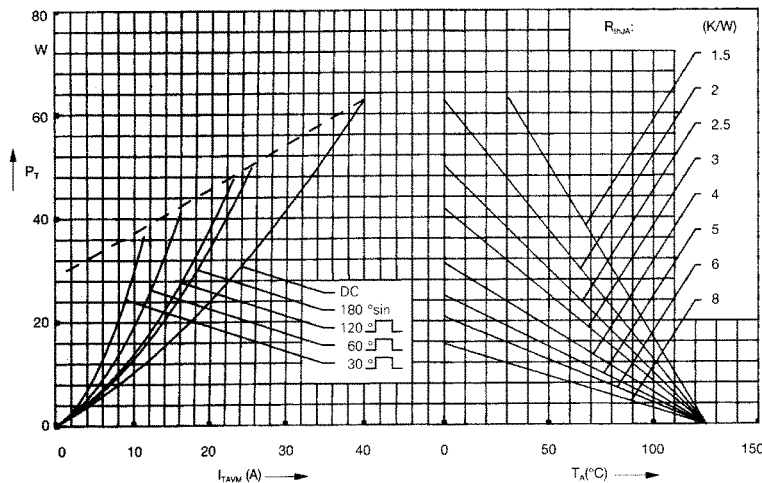


Fig. 3 Power dissipation versus on-state current and ambient temperature
 (per thyristor)

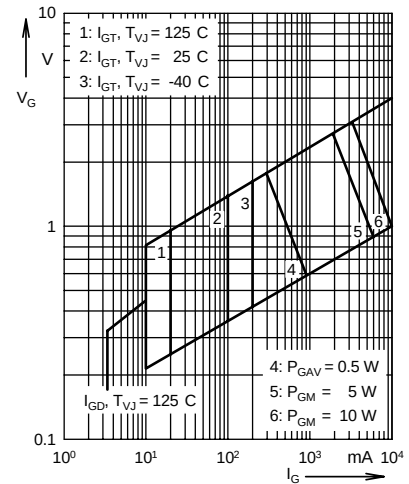


Fig. 4 Gate trigger characteristics

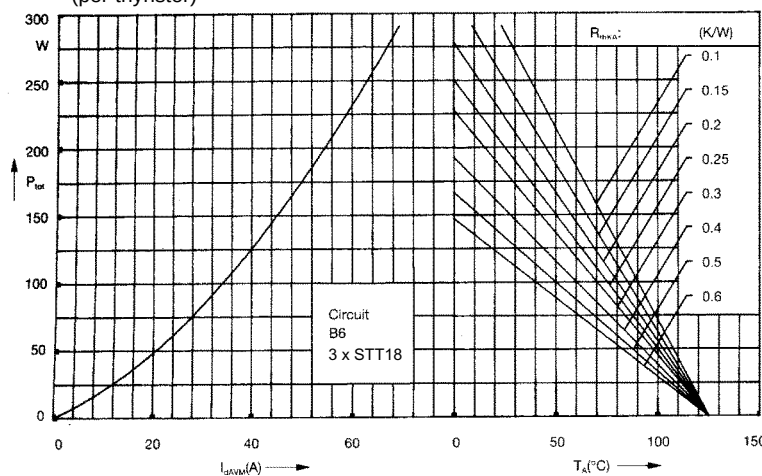


Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current
 and ambient temperature

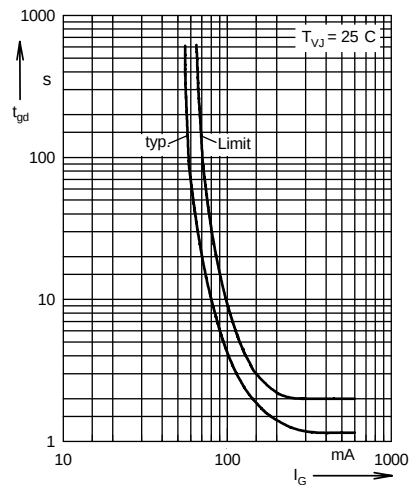


Fig. 6 Gate trigger delay time

STT18

Thyristor-Thyristor Modules

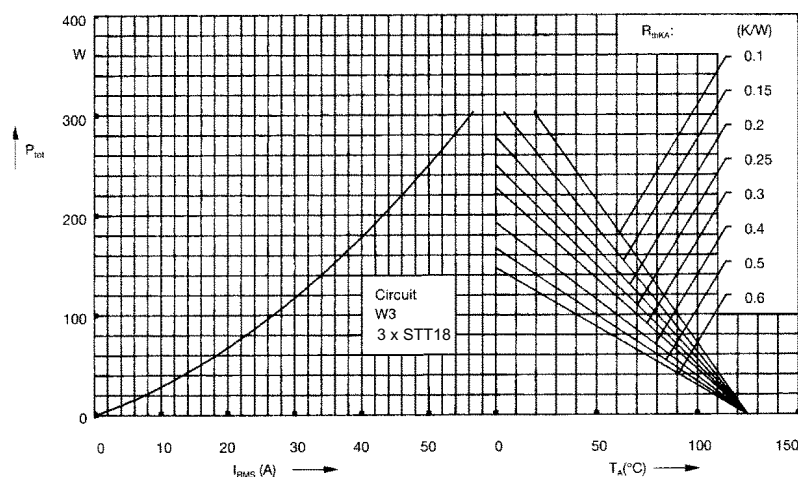


Fig. 7 Three phase AC-controller: Power dissipation versus RMS output current and ambient temperature

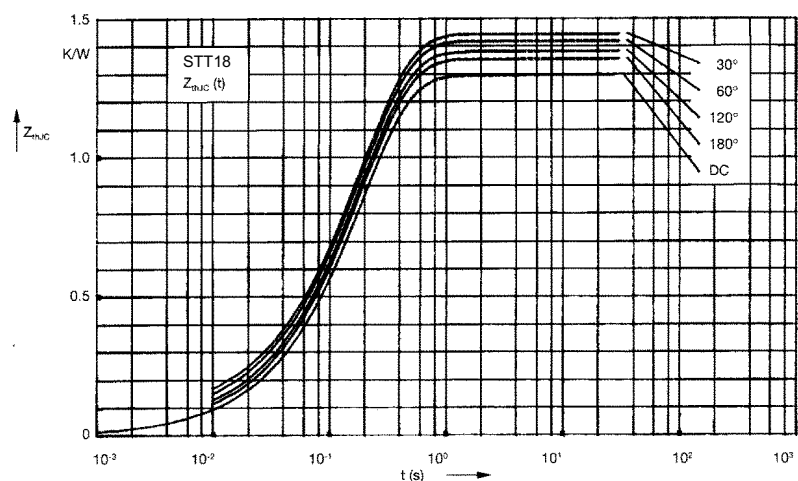


Fig. 8 Transient thermal impedance junction to case (per thyristor)

$R_{\theta JC}$ for various conduction angles d:

d	$R_{\theta JC}$ (K/W)
DC	1.3
180°C	1.35
120°C	1.39
60°C	1.42
30°C	1.45

Constants for $Z_{\theta JC}$ calculation:

i	$R_{\theta i}$ (K/W)	t_i (s)
1	0.018	0.0033
2	0.041	0.0216
3	1.241	0.191

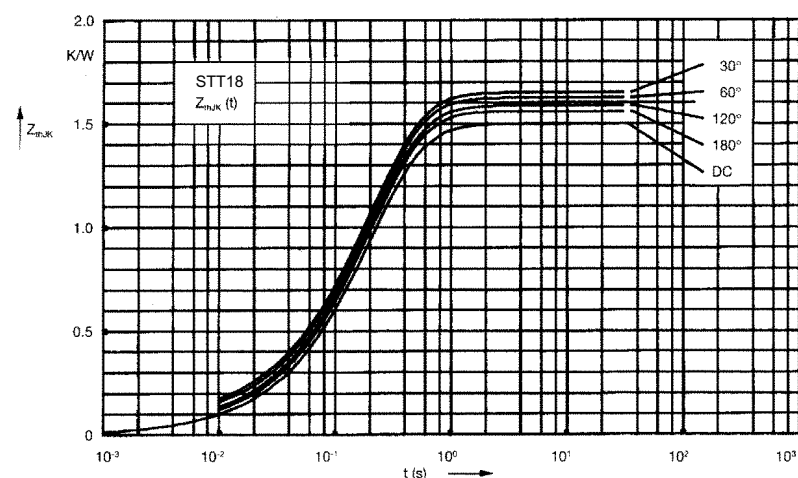


Fig. 9 Transient thermal impedance junction to heatsink (per thyristor)

$R_{\theta JK}$ for various conduction angles d:

d	$R_{\theta JK}$ (K/W)
DC	1.5
180°C	1.55
120°C	1.59
60°C	1.62
30°C	1.65

Constants for $Z_{\theta JK}$ calculation:

i	$R_{\theta i}$ (K/W)	t_i (s)
1	0.018	0.0033
2	0.041	0.0216
3	1.241	0.191
4	0.2	0.46