STT500

Thyristor-Thyristor Modules

Type	V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V
STT500GK08	900	800
STT500GK12	1300	1200
STT500GK14	1500	1400
STT500GK16	1700	1600
STT500GK18	1900	1800

Dimensions in mm (1mm=0.0394")
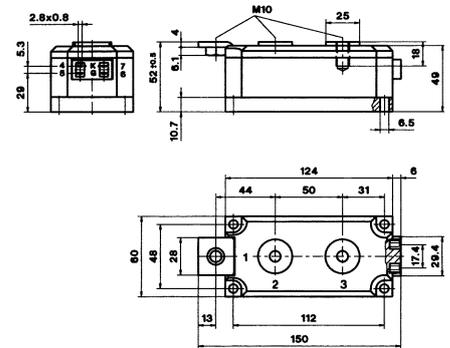
Symbol	Test Conditions		Maximum Ratings	Unit
I_{TRMS}, I_{FRMS} I_{TAVM}, I_{FAVM}	$T_{VJ}=T_{VJM}$ $T_C=85^oC$; 180° sine		785 500	A
I_{TSM}, I_{FSM}	$T_{VJ}=45^oC$ $V_R=0$	t=10ms (50Hz), sine t=8.3ms (60Hz), sine	15000 16000	A
	$T_{VJ}=T_{VJM}$ $V_R=0$	t=10ms(50Hz), sine t=8.3ms(60Hz), sine	13000 14400	
$\int i^2 dt$	$T_{VJ}=45^oC$ $V_R=0$	t=10ms (50Hz), sine t=8.3ms (60Hz), sine	1125000 1062000	A^2s
	$T_{VJ}=T_{VJM}$ $V_R=0$	t=10ms(50Hz), sine t=8.3ms(60Hz), sine	845000 813000	
$(di/dt)_{cr}$	$T_{VJ}=T_{VJM}$ f=50Hz, t_p=200us $V_D=2/3V_{DRM}$ I_G=1A di_G/dt=1A/us	repetitive, I_T=960A non repetitive, I_T=I_{TAVM}	100 500	A/us
$(dv/dt)_{cr}$	$T_{VJ}=T_{VJM}$; $R_{GK}=\infty$; method 1 (linear voltage rise)	$V_{DR}=2/3V_{DRM}$	1000	V/us
P_{GM}	$T_{VJ}=T_{VJM}$ I_T=I_{TAVM}	t_p=30us t_p=500us	120 60	W
P_{GAV}			20	W
V_{RGM}			10	V
T_{VJ} T_{VJM} T_{stg}			-40...+140 140 -40...+125	^oC
V_{ISOL}	50/60Hz, RMS $I_{ISOL}\leq1mA$	t=1min t=1s	3000 3600	V~
M_d	Mounting torque (M6) Terminal connection torque (M8)		4.5-7/40-60 11-13/97-115	Nm/lb.in.
Weight	Typical including screws		940	g

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Symbol	Test Conditions	Characteristic Values	Unit
I_{RRM}	$T_{VJ}=T_{VJM}$; $V_R=V_{RRM}$	40	mA
V_T	$I_T=1200A$; $T_{VJ}=25^oC$	1.3	V
V_{TO}	For power-loss calculations only ($T_{VJ}=T_{VJM}$)	0.8	V
r_T		0.38	$m\Omega$
V_{GT}	$V_D=6V$; $\qquad\qquad T_{VJ}=25^oC$ $T_{VJ}=-40^oC$	2 3	V
I_{GT}	$V_D=6V$; $\qquad\qquad T_{VJ}=25^oC$ $T_{VJ}=-40^oC$	300 400	mA
V_{GD}	$T_{VJ}=T_{VJM}$; $\qquad V_D=2/3V_{DRM}$	0.25	V
I_{GD}	$T_{VJ}=T_{VJM}$; $\qquad V_D=2/3V_{DRM}$	10	mA
I_L	$T_{VJ}=25^oC$; $t_P=30us$; $V_D=6V$ $I_G=1A$; $di_G/dt=1A/us$	400	mA
I_H	$T_{VJ}=25^oC$; $V_D=6V$; $R_{GK}=\infty$	300	mA
t_{gd}	$T_{VJ}=25^oC$; $V_D=1/2V_{DRM}$ $I_G=1A$; $di_G/dt=1A/us$	2	us
t_q	$T_{VJ}=T_{VJM}$; $I_T=500A$; $t_P=200us$; $-di/dt=10A/us$ typ. $V_R=100V$; $dv/dt=50V/us$; $V_D=2/3V_{DRM}$	350	us
R_{thJC}	DC current	0.072	K/W
R_{thJK}	DC current	0.096	K/W
ds	Creeping distance on surface	12.7	mm
d_A	Creepage distance in air	9.6	mm
a	Maximum allowable acceleration	50	m/s^2

FEATURES
* International standard package
* Direct copper bonded Al_2O_3-ceramic with copper base plate
* Planar passivated chips
* Isolation voltage 3600 V~

APPLICATIONS
* Motor control, softstarter
* Power converter
* Heat and temperature control for industrial furnaces and chemical processes
* Lighting control
* Solid state switches

ADVANTAGES
* Simple mounting
* Improved temperature and power cycling
* Reduced protection circuits

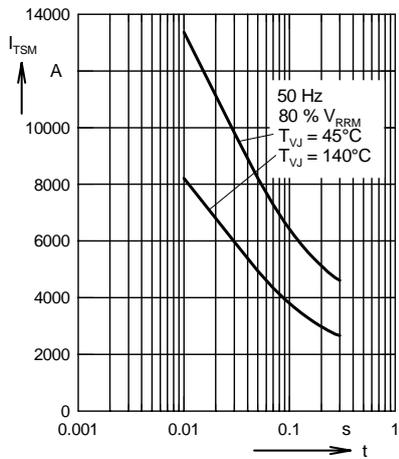Sirectifier®

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Fig. 1 Surge overload current
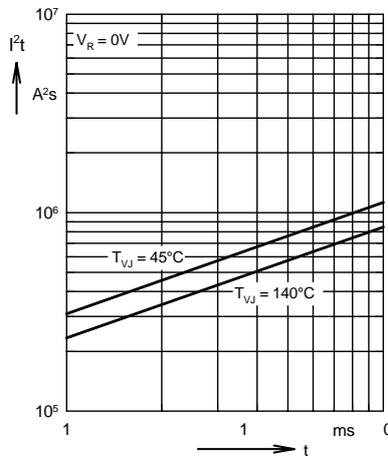I_{TSM}, I_{FSM}: Crest value, t: duration
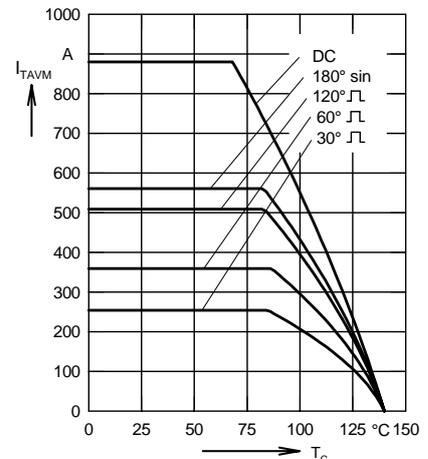
Fig. 2 $\int i^2 dt$ versus time (1-10 ms)

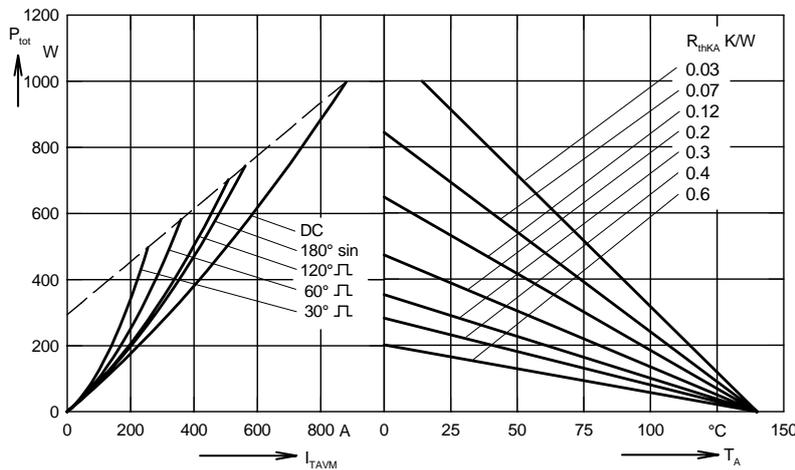Fig. 3 Maximum forward current
at case temperature

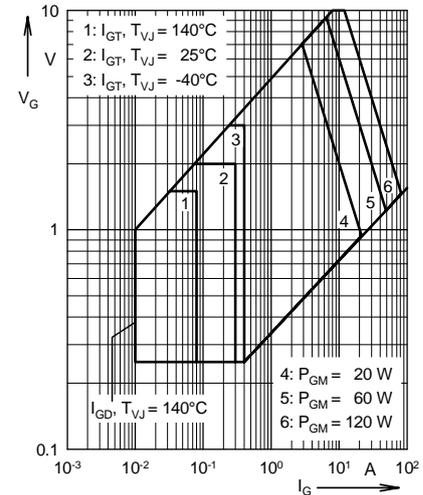Fig. 4 Power dissipation versus on-state current and ambient temperature

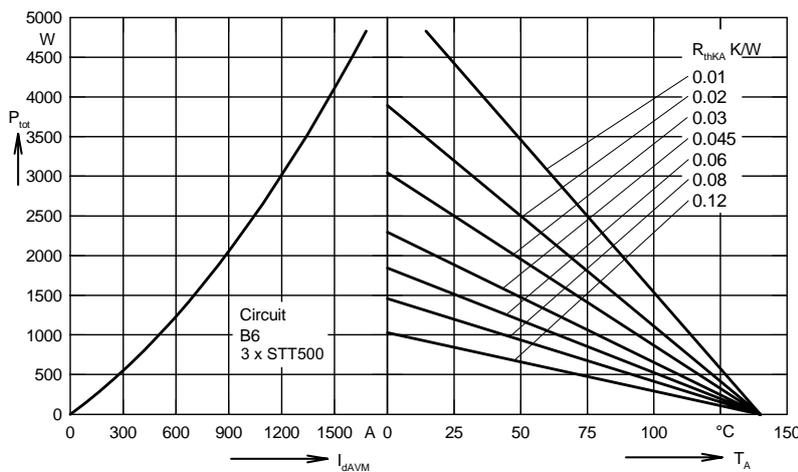Fig. 5 Gate trigger characteristics

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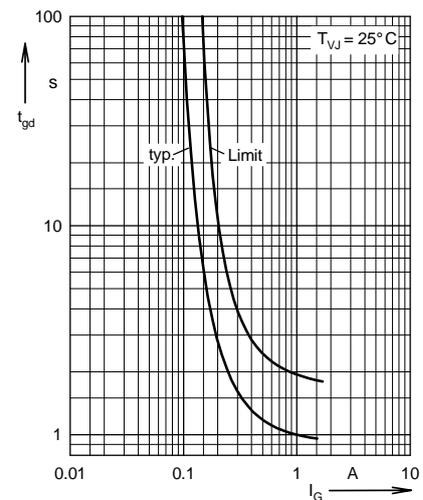and ambient temperature

Fig. 7 Gate trigger delay time
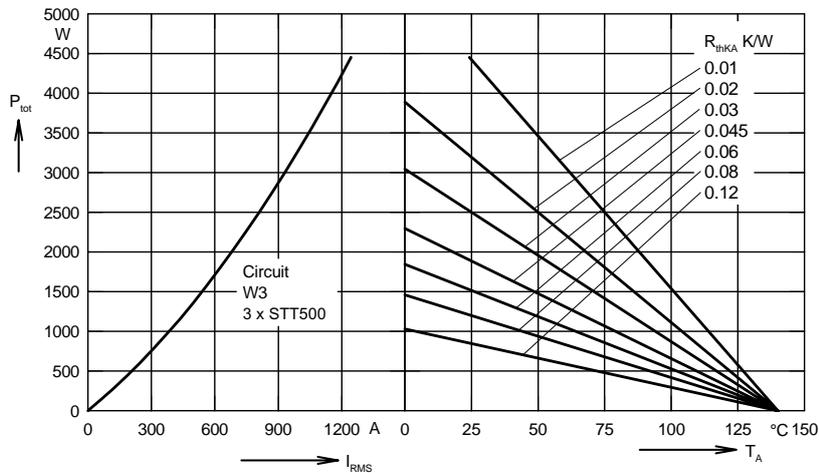
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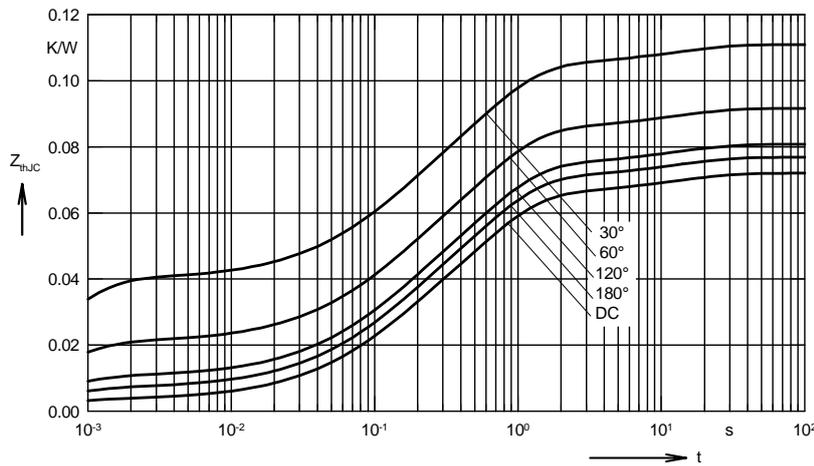Fig. 8 Three phase AC-controller: Power dissipation versus RMS output current and ambient temperature

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

R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	0.072
180°C	0.0768
120°C	0.081
60°C	0.092
30°C	0.111

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0035	0.0054
2	0.0186	0.098
3	0.0432	0.54
4	0.0067	12

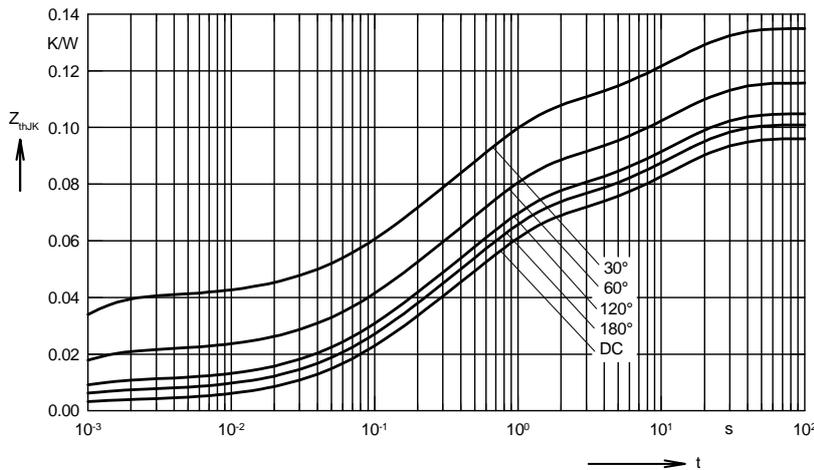Fig.10 Transient thermal impedance junction to heatsink (per thyristor)

R_{thJK} for various conduction angles d:

d	R_{thJK} (K/W)
DC	0.096
180°C	0.1
120°C	0.105
60°C	0.116
30°C	0.135

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0035	0.0054
2	0.0186	0.098
3	0.0432	0.54
4	0.0067	12
5	0.024	12

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