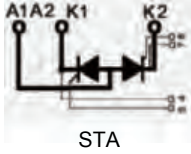# STT18GKXX

Thyristor-Thyristor Modules

Type	V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V
STT18GK08	900	800
STT18GK12	1300	1200
STT18GK14	1500	1400
STT18GK16	1700	1600
STT18GK18	1900	1800
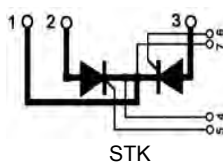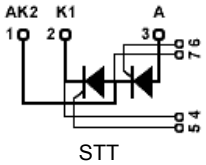
Dimensions in mm (1mm=0.0394")
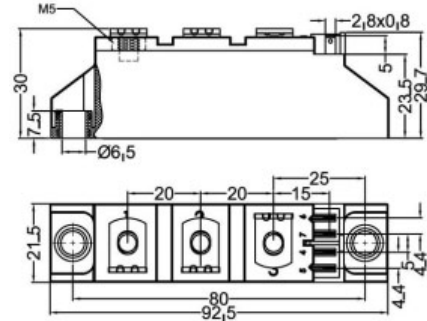
Symbol	Test Conditions		Maximum Ratings	Unit
I_{TRMS}, I_{FRMS} I_{TAVM}, I_{FAVM}	$T_{VJ}=T_{VJM}$ $T_C=85^oC$; 180° sine		40 18	A
I_{TSM}, I_{FSM}	$T_{VJ}=45^oC$ $V_R=0$	t=10ms (50Hz), sine t=8.3ms (60Hz), sine	400 420	A
	$T_{VJ}=T_{VJM}$ $V_R=0$	t=10ms(50Hz), sine t=8.3ms(60Hz), sine	350 370	
$\int i^2 dt$	$T_{VJ}=45^oC$ $V_R=0$	t=10ms (50Hz), sine t=8.3ms (60Hz), sine	800 730	A^2s
	$T_{VJ}=T_{VJM}$ $V_R=0$	t=10ms(50Hz), sine t=8.3ms(60Hz), sine	600 570	
$(di/dt)_{cr}$	$T_{VJ}=T_{VJM}$ 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
$(dv/dt)_{cr}$	$T_{VJ}=T_{VJM}$; $R_{GK}=\infty$; 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=300us	10 5	W
P_{GAV}			0.5	W
V_{RGM}			10	V
T_{VJ} T_{VJM} T_{stg}			-40...+125 125 -40...+125	^oC
V_{ISOL}	50/60Hz, RMS $I_{ISOL} \leq 1mA$	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		77	g

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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	$I_T, I_F=80A$; $T_{VJ}=25^oC$	2.05	V
V_{TO}	For power-loss calculations only ($T_{VJ}=125^oC$)	0.85	V
r_T		18	$m\Omega$
V_{GT}	$V_D=6V$; $T_{VJ}=25^oC$ $T_{VJ}=-40^oC$	1.5 1.6	V
I_{GT}	$V_D=6V$; $T_{VJ}=25^oC$ $T_{VJ}=-40^oC$	100 200	mA
V_{GD}	$T_{VJ}=T_{VJM}$; $V_D=2/3V_{DRM}$	0.2	V
I_{GD}		10	mA
I_L	$T_{VJ}=25^oC$; $t_p=10us$; $V_D=6V$ $I_G=0.45A$; $di_G/dt=0.45A/us$	450	mA
I_H	$T_{VJ}=25^oC$; $V_D=6V$; $R_{GK}=\infty$	200	mA
t_{gd}	$T_{VJ}=25^oC$; $V_D=1/2V_{DRM}$ $I_G=0.45A$; $di_G/dt=0.45A/us$	2	us
t_q	$T_{VJ}=T_{VJM}$; $I_T=20A$; $t_p=200us$; $-di/dt=10A/us$ typ. $V_R=100V$; $dv/dt=20V/us$; $V_D=2/3V_{DRM}$	150	us
Q_s	$T_{VJ}=T_{VJM}$; $I_T, I_F=25A$; $-di/dt=0.64A/us$	50	uC
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
* DCB base plate
* Glass passivated chips
* Isolation voltage 3600 V~
* UL File NO.E310749
* RoHS compliant

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

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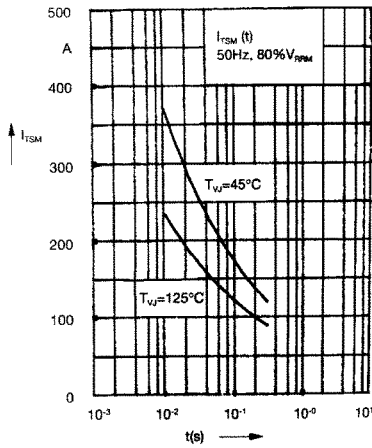www.sirectifier.com

STT18GKXX

Thyristor-Thyristor Modules

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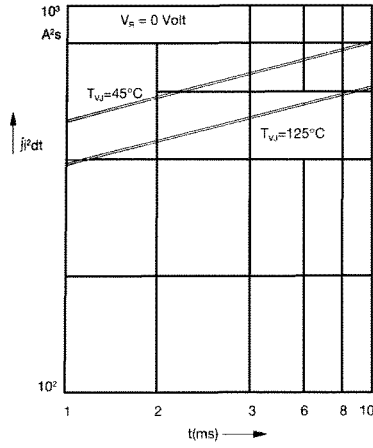I_{TSM}: Crest value, t: duration
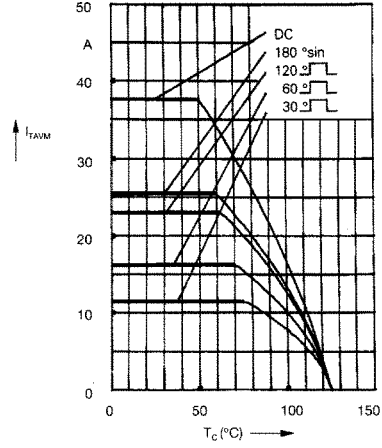
Fig. 2 $\int i^2 dt$ versus time (1-10 ms)

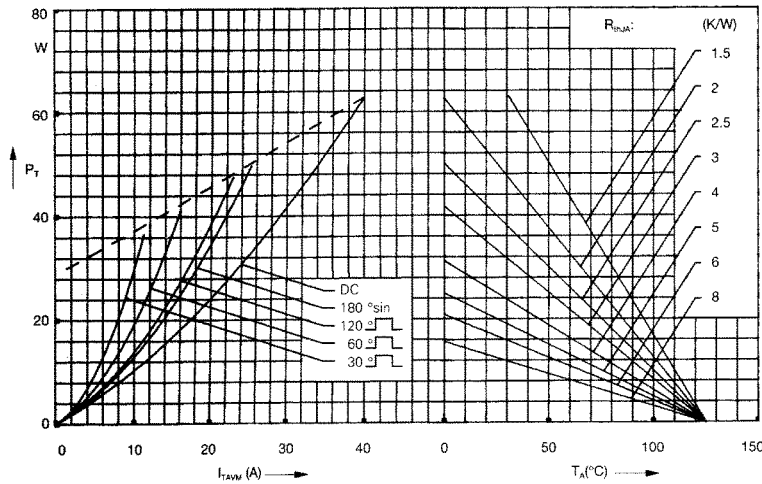Fig. 2a Maximum forward current
at case temperature

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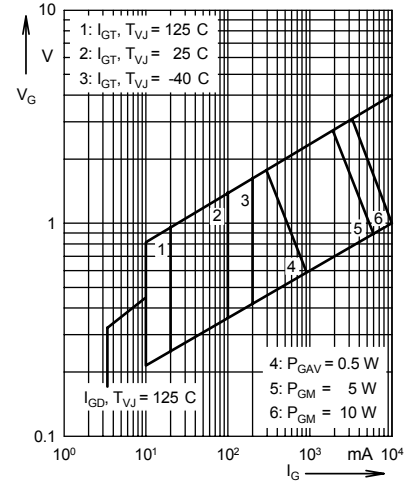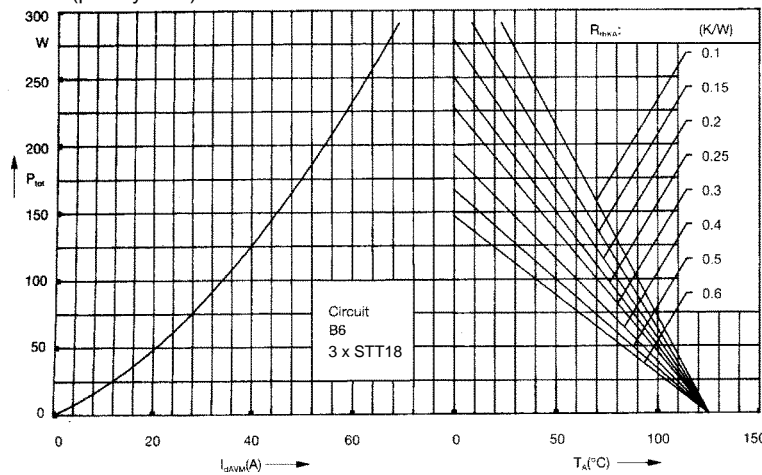(per thyristor)

Fig. 4 Gate trigger characteristics

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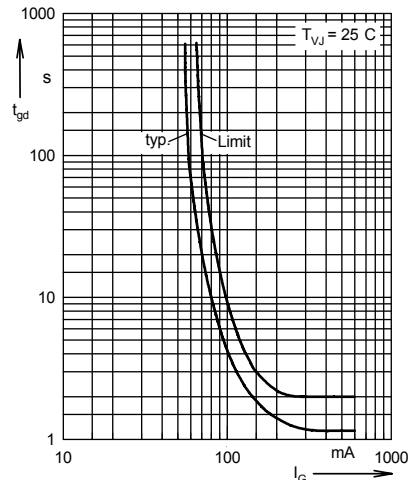and ambient temperature

Fig. 6 Gate trigger delay time

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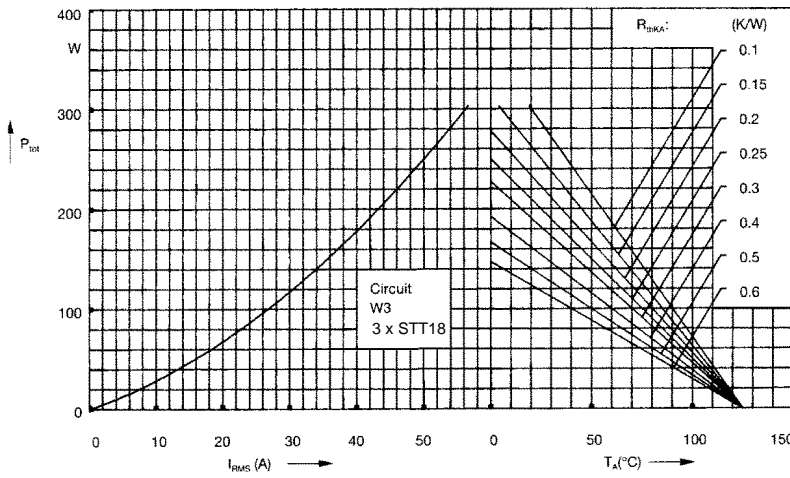Sirectifier®

Thyristor-Thyristor Modules

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

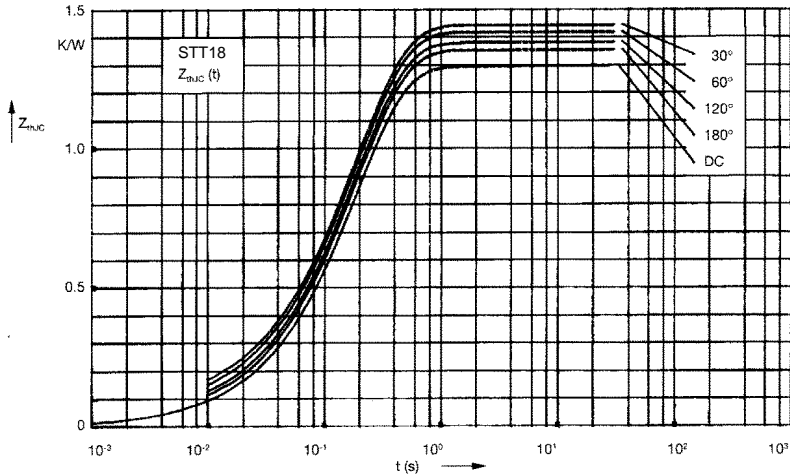Fig. 8 Transient thermal impedance
junction to case (per thyristor)

R_{thJC} for various conduction angles d:

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

Constants for Z_{thJC} calculation:

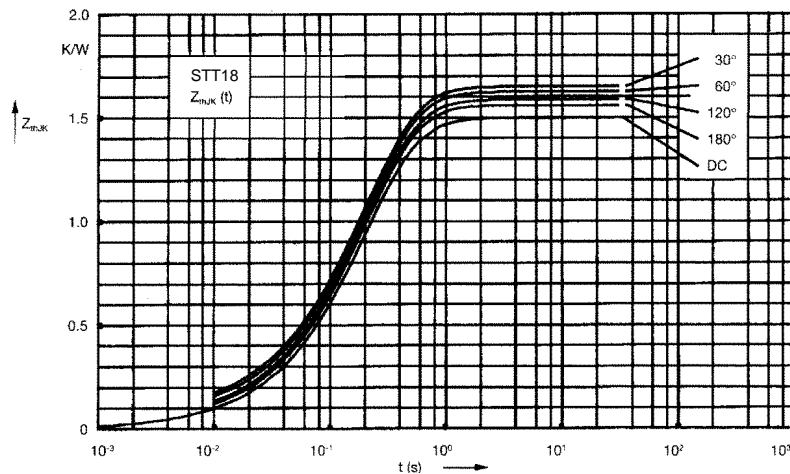| i	R_{thi} (K/W)	t_i (s)
1	0.018	0.0033
2	0.041	0.0216
3	1.241	0.191

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

R_{thJK} for various conduction angles d:

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

Constants for Z_{thJK} calculation:

i	R_{thi} (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

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