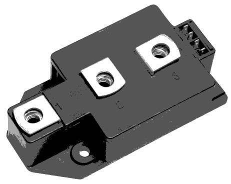
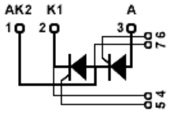
STT320

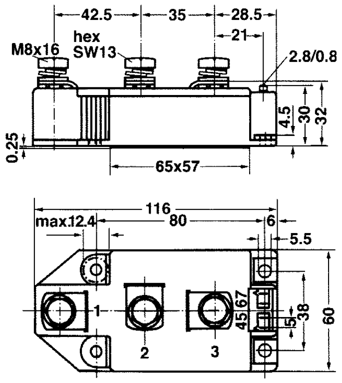
Thyristor-Thyristor Modules





Type	V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V
STT320GK08	900	800
STT320GK12	1300	1200
STT320GK14	1500	1400
STT320GK16	1700	1600
STT320GK18	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^o sine		500 320	A
I_{TSM}, I_{FSM}	$T_{VJ}=45^oC$ $V_R=0$	t=10ms (50Hz), sine t=8.3ms (60Hz), sine	9200 9800	A
	$T_{VJ}=T_{VJM}$ $V_R=0$	t=10ms(50Hz), sine t=8.3ms(60Hz), sine	8000 8600	
$\int i^2dt$	$T_{VJ}=45^oC$ $V_R=0$	t=10ms (50Hz), sine t=8.3ms (60Hz), sine	420000 400000	A^2s
	$T_{VJ}=T_{VJM}$ $V_R=0$	t=10ms(50Hz), sine t=8.3ms(60Hz), sine	320000 306000	
$(di/dt)_{cr}$	$T_{VJ}=T_{VJM}$ 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=320A	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}\leq$1mA	t=1min t=1s	3000 3600	V~
M_d	Mounting torque (M5) Terminal connection torque (M8)		2.5-5/22-44 12-15/106-132	Nm/lb.in.
Weight	Typical including screws		320	g

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Symbol	Test Conditions	Characteristic Values	Unit
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=600A; $T_{VJ}=25^oC$	1.32	V
V_{TO}	For power-loss calculations only ($T_{VJ}=140^oC$)	0.8	V
r_T		0.82	mΩ
V_{GT}	V_D=6V; $T_{VJ}=25^oC$ $T_{VJ}=-40^oC$	2 3	V
I_{GT}	V_D=6V; $T_{VJ}=25^oC$ $T_{VJ}=-40^oC$	150 200	mA
V_{GD}	$T_{VJ}=T_{VJM}$; $V_D=2/3V_{DRM}$	0.25	V
I_{GD}		10	mA
I_L	$T_{VJ}=25^oC$; t_p=30us; V_D=6V I_G=0.45A; di_G/dt=0.45A/us	200	mA
I_H	$T_{VJ}=25^oC$; V_D=6V; $R_{GK}=\infty$	150	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=300A; t_p=200us; -di/dt=10A/us typ. V_R=100V; dv/dt=50V/us; $V_D=2/3V_{DRM}$	200	us
Q_S	$T_{VJ}=125^oC$; I_T, I_F=400A; -di/dt=50A/us	760	uC
I_{RM}		275	A
R_{thJC}	per thyristor/diode; DC current per module	0.112 0.056	K/W
R_{thJK}	per thyristor/diode; DC current per module	0.152 0.076	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
- Direct copper bonded Al_2O_3-ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~

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

Sirectifier®

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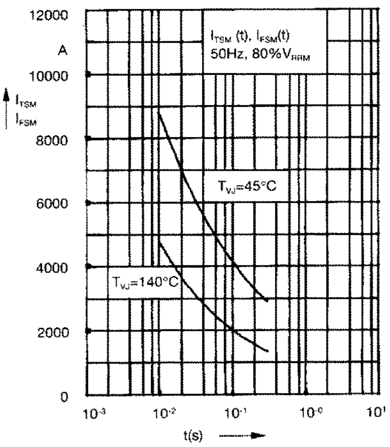

Fig. 1 Surge overload current
I_{TSM}, I_{FSM}: Crest value, t: duration

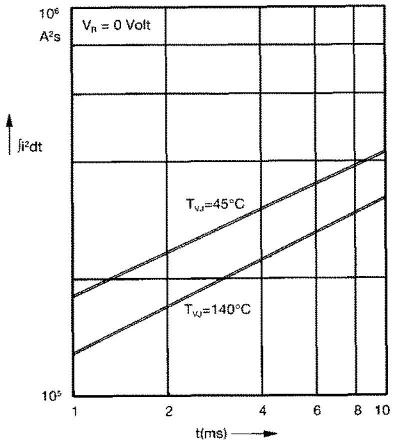

Fig. 2 ∫i²t versus time (1-10 ms)

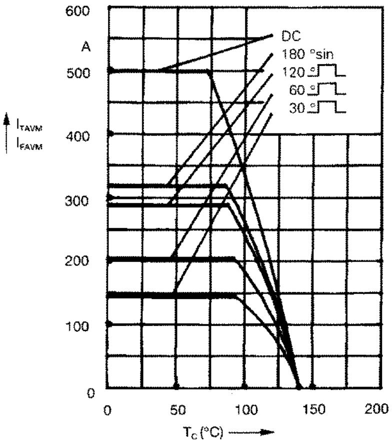

Fig. 2a Maximum forward current
at case temperature

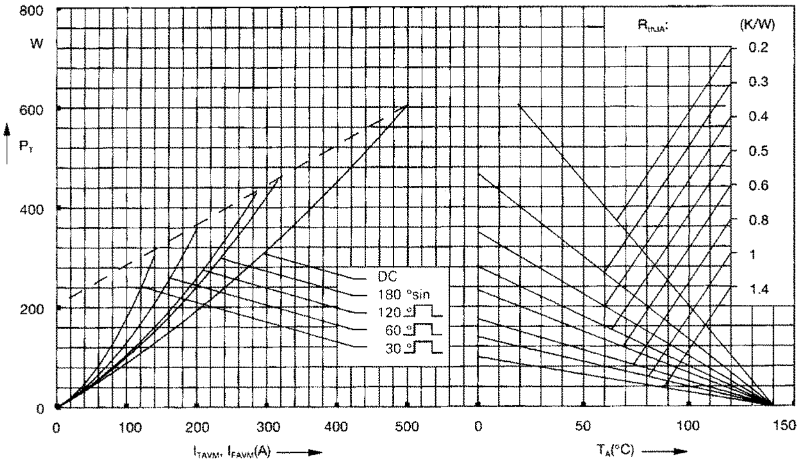

Fig. 3 Power dissipation versus on-state current and ambient temperature
(per thyristor or diode)

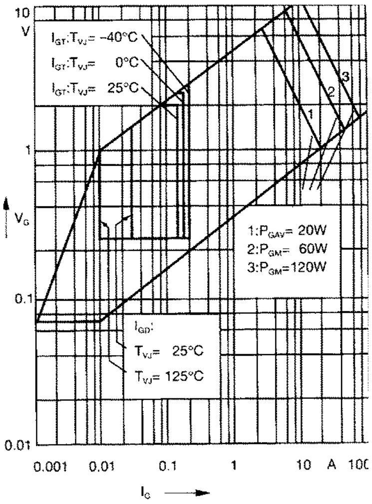

Fig. 4 Gate trigger characteristics

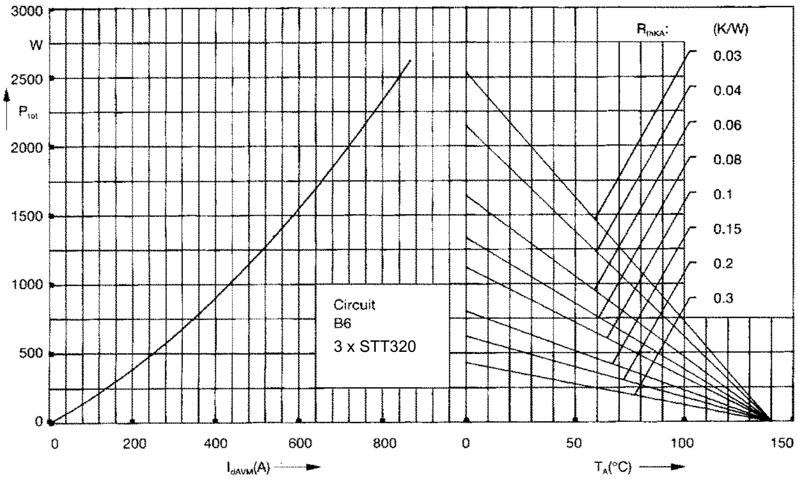

Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current
and ambient temperature

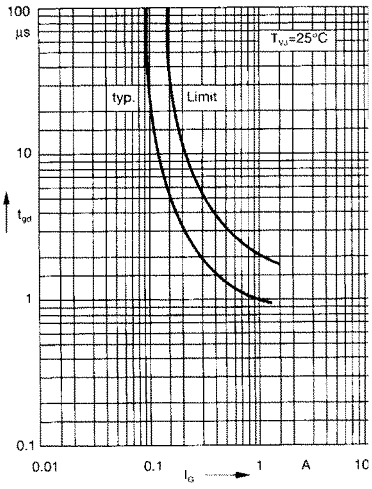

Fig. 6 Gate trigger delay time

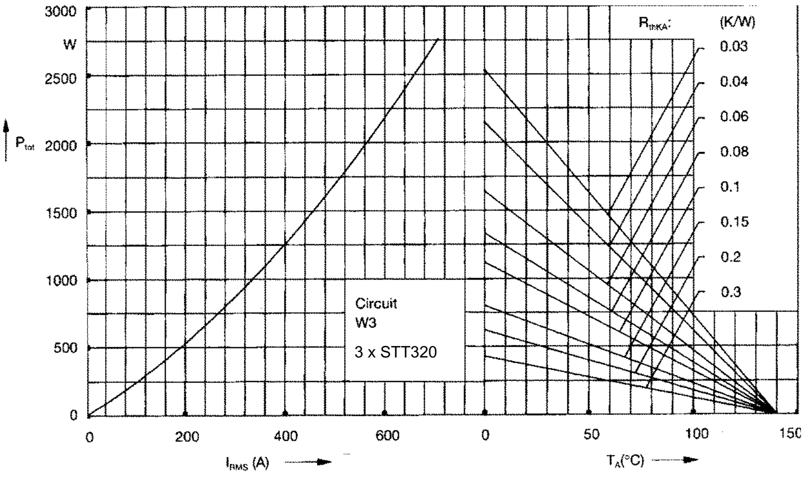

Fig. 7 Three phase AC-controller: Power dissipation versus RMS output current and ambient temperature

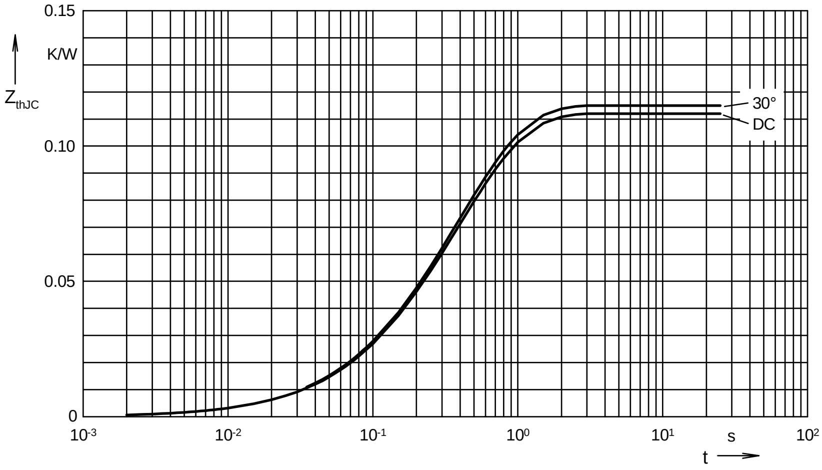

Fig. 8 Transient thermal impedance junction to case (per thyristor or diode)

R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	0.112
180°C	0.113
120°C	0.114
60°C	0.115
30°C	0.115

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.003	0.099
2	0.0143	0.168
3	0.0947	0.456

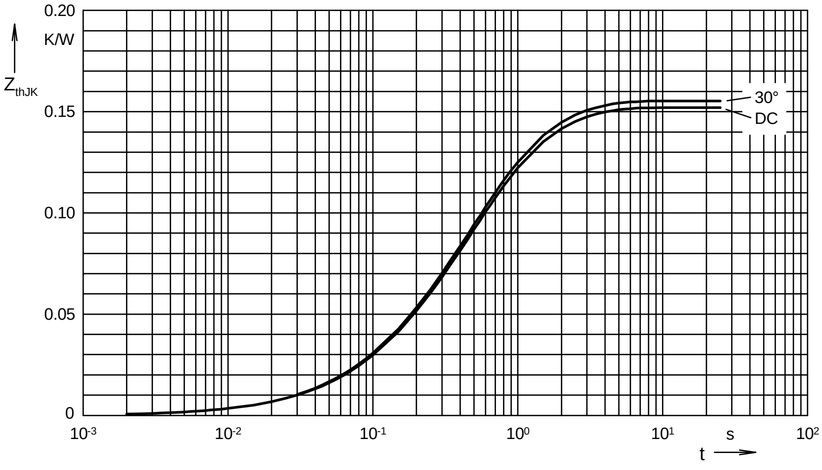

Fig. 9 Transient thermal impedance junction to heatsink (per thyristor or diode)

R_{thJK} for various conduction angles d:

d	R_{thJK} (K/W)
DC	0.152
180°C	0.154
120°C	0.154
60°C	0.155
30°C	0.155

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.003	0.099
2	0.0143	0.168
3	0.0947	0.456
4	0.04	1.36