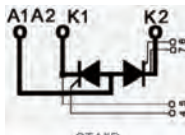
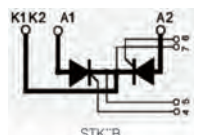
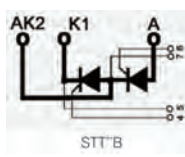


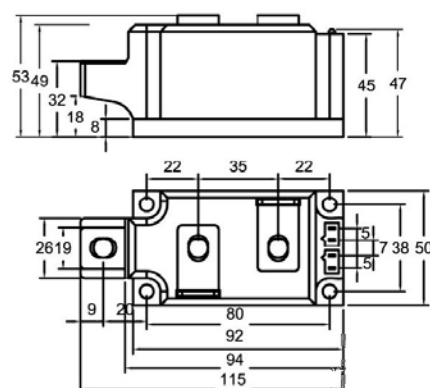
STT253GKXXBT

Thyristor-Thyristor Modules

Dimensions in mm (1mm=0.0394")



Type	V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V
STT253GK08BT	900	800
STT253GK12BT	1300	1200
STT253GK14BT	1500	1400
STT253GK16BT	1700	1600
STT253GK18BT	1900	1800
STT253GK20BT	2100	2000
STT253GK22BT	2300	2200



Symbol	Test Conditions	Maximum Ratings	Unit
I_{TRMS} , I_{FRMS} I_{TAVM} , I_{FAVM}	$T_{VJ}=T_{VJM}$ $T_C=85^{\circ}C$; 180° sine	400 253	A
I_{TSM} , I_{FSM}	$T_{VJ}=45^{\circ}C$ $V_R=0$ $t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine	9000 9500	A
	$T_{VJ}=T_{VJM}$ $V_R=0$ $t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine	8000 8500	
$\int i^2 dt$	$T_{VJ}=45^{\circ}C$ $V_R=0$ $t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine	405000 336000	A ² s
	$T_{VJ}=T_{VJM}$ $V_R=0$ $t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine	320000 240000	
$(di/dt)_{cr}$	$T_{VJ}=T_{VJM}$ $f=50Hz$, $t_p=200\mu s$ $V_D=2/3V_{DRM}$ $I_G=1A$ $di/dt=1A/\mu s$ repetitive, $I_T=750A$	250	A/ μs
	non repetitive, $I_T=250A$	800	
$(dv/dt)_{cr}$	$T_{VJ}=T_{VJM}$; $V_{DR}=2/3V_{DRM}$ $R_{GK}=\infty$; method 1 (linear voltage rise)	1000	V/ μs
P_{GM}	$T_{VJ}=T_{VJM}$ $I_T=I_{TAVM}$ $t_p=30\mu s$ $t_p=500\mu s$	120 60	W
P_{GAV}		20	W
V_{RGM}		10	V
T_{VJ} T_{VJM} T_{stg}		-40...+130 130 -40...+130	°C
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	600	g

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Thyristor-Thyristor Modules

Symbol	Test Conditions	Characteristic Values	Unit
I_{RRM}	$T_{VJ}=T_{VJM}; V_R=V_{RRM}$	50	mA
I_{DRM}	$T_{VJ}=T_{VJM}; V_D=V_{DRM}$	50	mA
V_T, V_F	$I_T, I_F=750A; T_{VJ}=25^{\circ}C$	1.6	V
V_{TO}	For power-loss calculations only ($T_{VJ}=130^{\circ}C$)	0.925	V
r_T	$T_{VJ}=130^{\circ}C$	0.45	m Ω
V_{GT}	$V_D=6V;$ $T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$	3 4	V
I_{GT}	$V_D=6V;$ $T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$	200 250	mA
V_{GD}	$T_{VJ}=T_{VJM}; V_D=2/3V_{DRM}$	0.25	V
I_{GD}	$T_{VJ}=T_{VJM}$	10	mA
I_L	$T_{VJ}=25^{\circ}C; t_p=30\mu s; V_D=6V$ $I_G=0.45A; di_G/dt=0.45A/\mu s$	300	mA
I_H	$T_{VJ}=25^{\circ}C; V_D=6V; R_{GK}=\infty$	200	mA
t_{gd}	$T_{VJ}=25^{\circ}C; V_D=1/2V_{DRM}$ $I_G=1A; di_G/dt=1A/\mu s$	1	μs
t_q	$T_{VJ}=T_{VJM}; I_T=300A; t_p=200\mu s; -di/dt=10A/\mu s$ $V_R=100V; dv/dt=50V/\mu s; V_D=2/3V_{DRM}$	150	μs
Q_s	$T_{VJ}=125^{\circ}C; I_T, I_F=400A; -di/dt=50A/\mu s$	760	μC
I_{RM}		275	A
R_{thJC}	per thyristor/thyristor; DC current per module	0.14 0.07	K/W
R_{thJK}	per thyristor/thyristor; DC current per module	0.17 0.085	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
- * Heat transfer through aluminium nitride ceramic isolated metal baseplate
- * 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

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Thyristor-Thyristor Modules

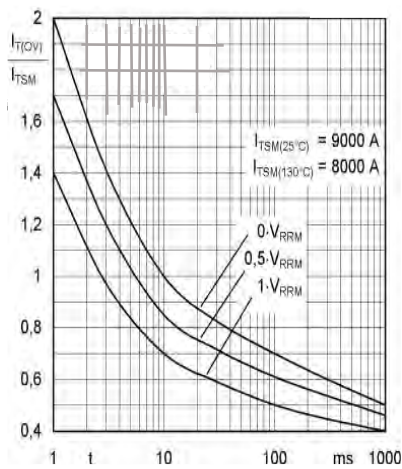


Fig. 1 Surge overload current
 I_{TSM} , I_{FSM} : Crest value, t : duration

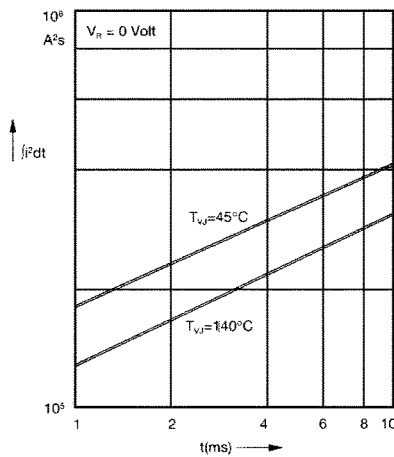


Fig. 2 j^2t versus time (1-10 ms)

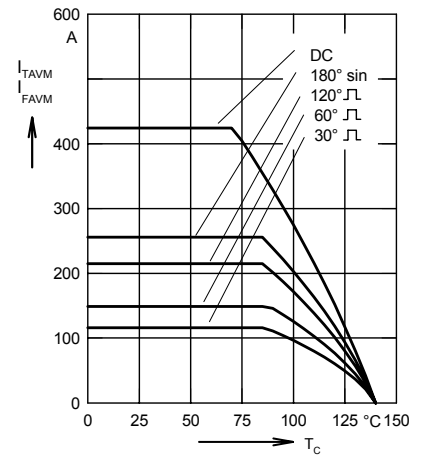


Fig. 2a Maximum forward current
at case temperature

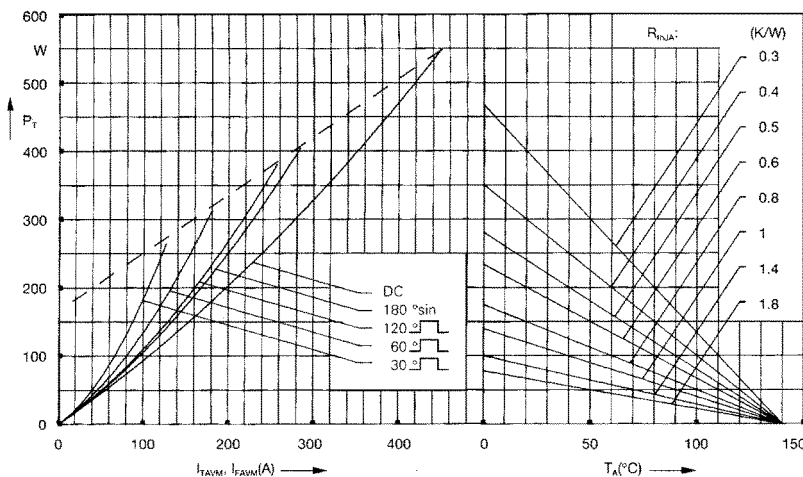


Fig. 3 Power dissipation versus on-state current and ambient temperature
(per thyristor or diode)

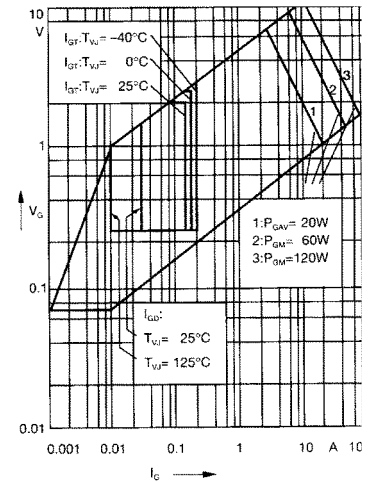


Fig. 4 Gate trigger characteristics



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

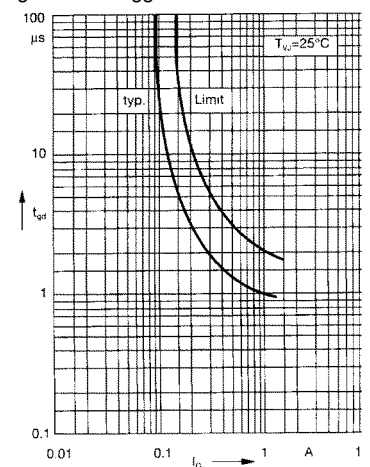


Fig. 6 Gate trigger delay time



STT253BT

Thyristor-Thyristor Modules

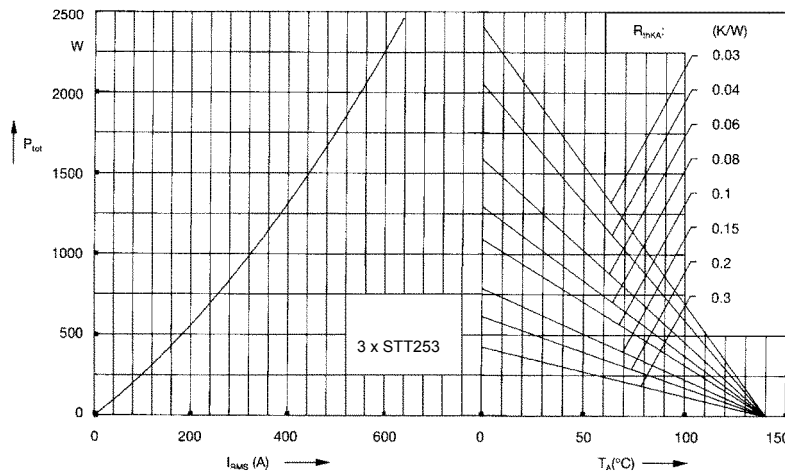


Fig. 7 Three phase AC-controller:
Power dissipation versus RMS
output current and ambient
temperature

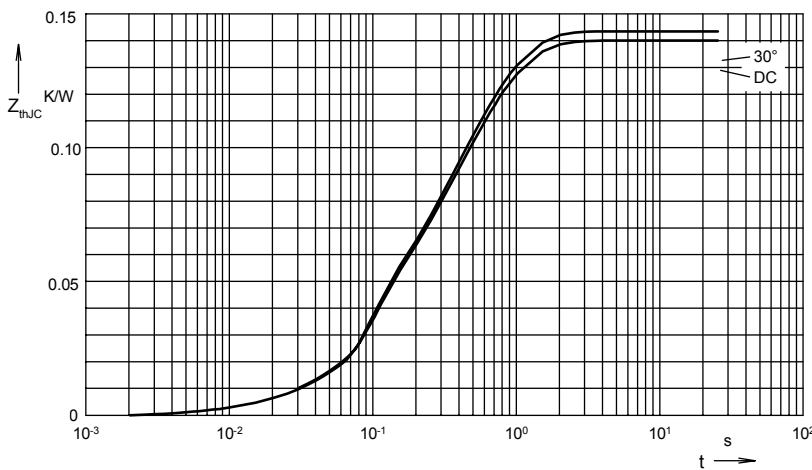


Fig. 8 Transient thermal impedance
junction to case (per thyristor or
diode)

R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	0.14
180°	0.141
120°	0.142
60°	0.143
30°	0.145

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

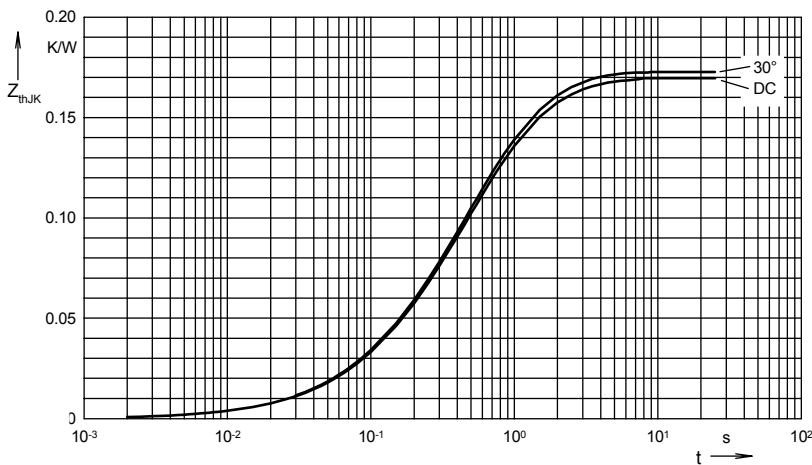


Fig. 9 Transient thermal impedance
junction to heatsink (per thyristor
or diode)

R_{thJK} for various conduction angles d:

d	R_{thJK} (K/W)
DC	0.17
180°	0.171
120°	0.172
60°	0.172
30°	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	0.14	1.36

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