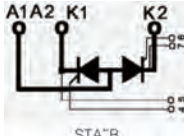
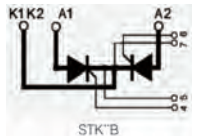
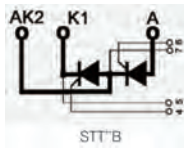


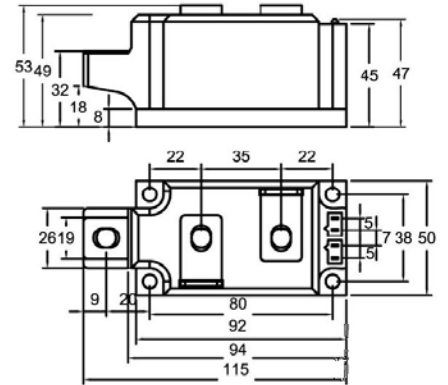
# STT253GKXXBT

## Thyristor-Thyristor Modules



Type	V <sub>RSM</sub> V <sub>DSM</sub> V	V <sub>RRM</sub> V <sub>DRM</sub> V
STT253GK08BT	900	800
STT253GK12BT	1300	1200
STT253GK14BT	1500	1400
STT253GK16BT	1700	1600
STT253GK18BT	1900	1800
STT253GK20BT	2100	2000
STT253GK22BT	2300	2200

Dimensions in mm (1mm=0.0394")



Symbol	Test Conditions	Maximum Ratings	Unit
I <sub>TRMS</sub> , I <sub>FRMS</sub> I <sub>TAVM</sub> , I <sub>FAVM</sub>	T <sub>VJ</sub> =T <sub>VJM</sub> T <sub>C</sub> =85°C; 180° sine	400 253	A
I <sub>TSM</sub> , I <sub>FSM</sub>	T <sub>VJ</sub> =45°C V <sub>R</sub> =0 t=10ms (50Hz), sine t=8.3ms (60Hz), sine	9000 9500	A
	T <sub>VJ</sub> =T <sub>VJM</sub> V <sub>R</sub> =0 t=10ms(50Hz), sine t=8.3ms(60Hz), sine	8000 8500	
∫i <sup>2</sup> dt	T <sub>VJ</sub> =45°C V <sub>R</sub> =0 t=10ms (50Hz), sine t=8.3ms (60Hz), sine	405000 336000	A <sup>2</sup> s
	T <sub>VJ</sub> =T <sub>VJM</sub> V <sub>R</sub> =0 t=10ms(50Hz), sine t=8.3ms(60Hz), sine	320000 240000	
(di/dt) <sub>cr</sub>	T <sub>VJ</sub> =T <sub>VJM</sub> f=50Hz, t <sub>p</sub> =200us V <sub>D</sub> =2/3V <sub>DRM</sub> I <sub>G</sub> =1A di <sub>G</sub> /dt=1A/us	repetitive, I <sub>T</sub> =750A 250 non repetitive, I <sub>T</sub> =250A 800	A/us
	T <sub>VJ</sub> =T <sub>VJM</sub> ; R <sub>GK</sub> =∞; method 1 (linear voltage rise)	V <sub>DR</sub> =2/3V <sub>DRM</sub> 1000	V/us
P <sub>GM</sub>	T <sub>VJ</sub> =T <sub>VJM</sub> I <sub>T</sub> =I <sub>TAVM</sub> t <sub>p</sub> =30us t <sub>p</sub> =500us	120 60	W
P <sub>GAV</sub>		20	W
V <sub>RGM</sub>		10	V
T <sub>VJ</sub> T <sub>VJM</sub> T <sub>stg</sub>		-40...+130 130 -40...+130	°C
V <sub>ISOL</sub>	50/60Hz, RMS I <sub>ISOL</sub> ≤1mA t=1min t=1s	3000 3600	V~
M <sub>d</sub>	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



# STT253GKXXBT

## Thyristor-Thyristor Modules

Symbol	Test Conditions	Characteristic Values	Unit
<b>I<sub>RRM</sub></b>	$T_{VJ}=T_{VJM}; V_R=V_{RRM}$	50	mA
<b>I<sub>DRM</sub></b>	$T_{VJ}=T_{VJM}; V_D=V_{DRM}$	50	mA
<b>V<sub>T</sub>, V<sub>F</sub></b>	$I_T, I_F=750A; T_{VJ}=25^{\circ}C$	1.6	V
<b>V<sub>TO</sub></b>	For power-loss calculations only ( $T_{VJ}=130^{\circ}C$ )	0.925	V
<b>r<sub>T</sub></b>	$T_{VJ}=130^{\circ}C$	0.45	m $\Omega$
<b>V<sub>GT</sub></b>	$V_D=6V; T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$	3 4	V
<b>I<sub>GT</sub></b>	$V_D=6V; T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$	200 250	mA
<b>V<sub>GD</sub></b>	$T_{VJ}=T_{VJM}; V_D=2/3V_{DRM}$	0.25	V
<b>I<sub>GD</sub></b>	$T_{VJ}=T_{VJM}$	10	mA
<b>I<sub>L</sub></b>	$T_{VJ}=25^{\circ}C; t_p=30\mu s; V_D=6V$ $I_G=0.45A; di_G/dt=0.45A/\mu s$	300	mA
<b>I<sub>H</sub></b>	$T_{VJ}=25^{\circ}C; V_D=6V; R_{GK}=\infty$	200	mA
<b>t<sub>gd</sub></b>	$T_{VJ}=25^{\circ}C; V_D=1/2V_{DRM}$ $I_G=1A; di_G/dt=1A/\mu s$	1	us
<b>t<sub>q</sub></b>	$T_{VJ}=T_{VJM}; I_T=300A; t_p=200\mu s; -di/dt=10A/\mu s$ $V_R=100V; dv/dt=50V/\mu s; V_D=2/3V_{DRM}$	150	us
<b>Q<sub>s</sub></b>	$T_{VJ}=125^{\circ}C; I_T, I_F=400A; -di/dt=50A/\mu s$	760	uC
<b>I<sub>RM</sub></b>		275	A
<b>R<sub>thJC</sub></b>	per thyristor/thyristor; DC current per module	0.14 0.07	K/W
<b>R<sub>thJK</sub></b>	per thyristor/thyristor; DC current per module	0.17 0.085	K/W
<b>d<sub>s</sub></b>	Creeping distance on surface	12.7	mm
<b>d<sub>A</sub></b>	Strike distance through air	9.6	mm
<b>a</b>	Maximum allowable acceleration	50	m/s <sup>2</sup>

### 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



# STT253GKXXBT

## Thyristor-Thyristor Modules

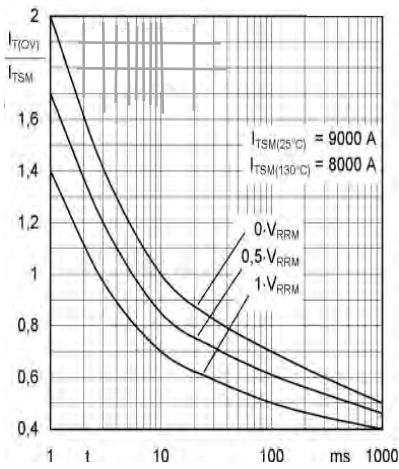


Fig. 1 Surge overload current  
 $I_{TSM}$ ,  $I_{FSM}$ : Crest value,  $t$ : duration

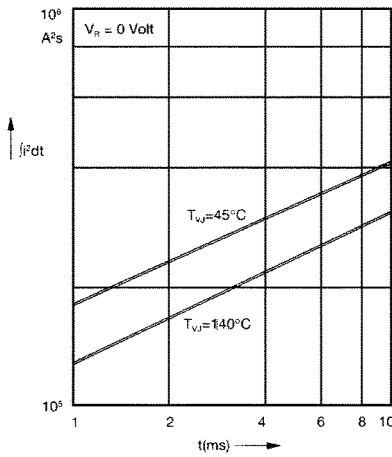


Fig. 2  $j^2t$  versus time (1-10 ms)

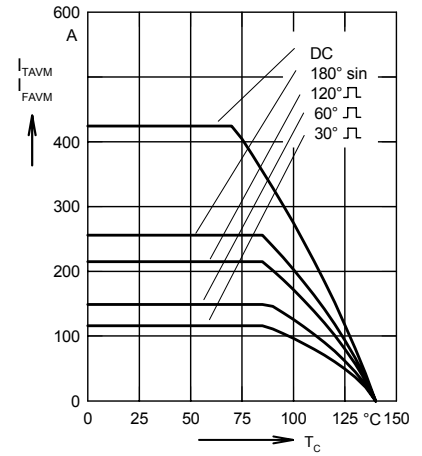


Fig. 2a Maximum forward current at case temperature

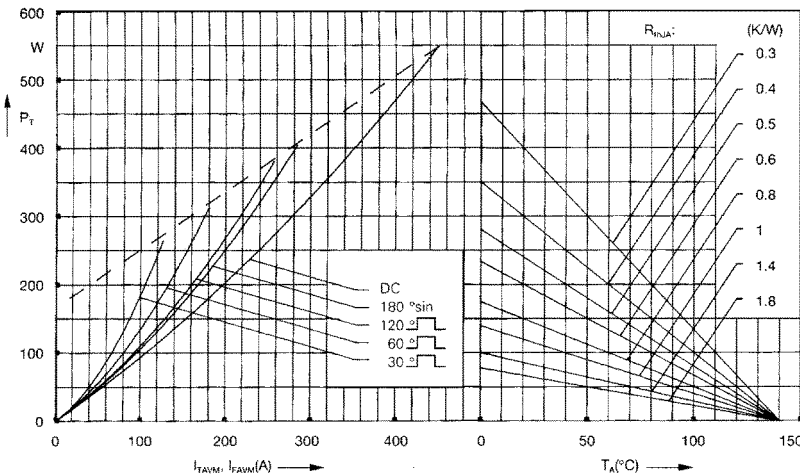


Fig. 3 Power dissipation versus on-state current and ambient temperature (per thyristor or diode)

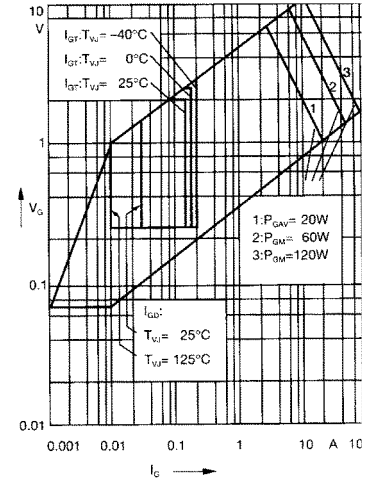


Fig. 4 Gate trigger characteristics

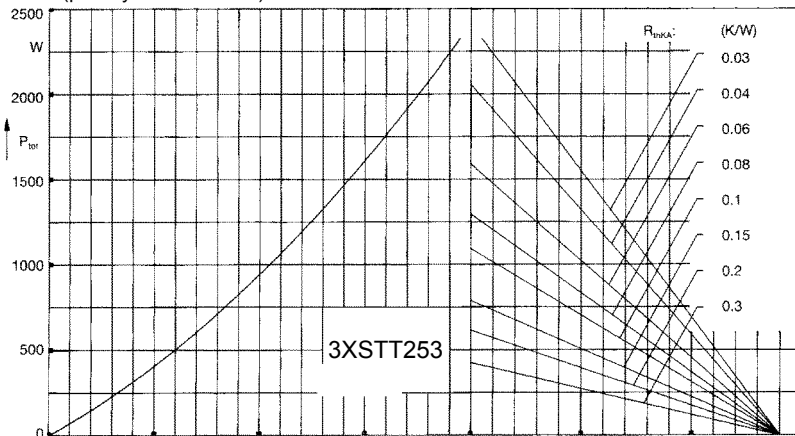


Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

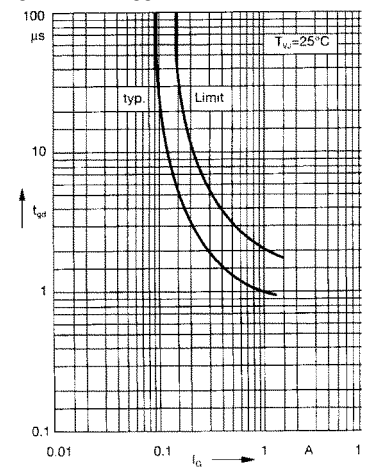


Fig. 6 Gate trigger delay time



# STT253BT

## Thyristor-Thyristor Modules

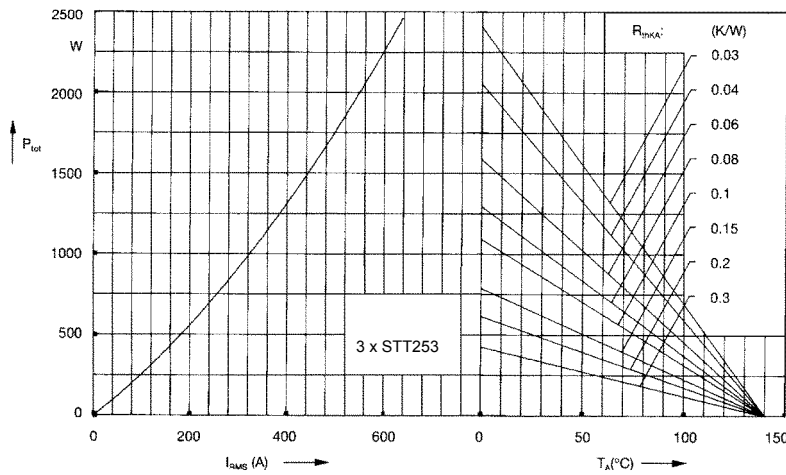


Fig. 7 Three phase AC-controller: Power dissipation versus RMS output current and ambient temperature

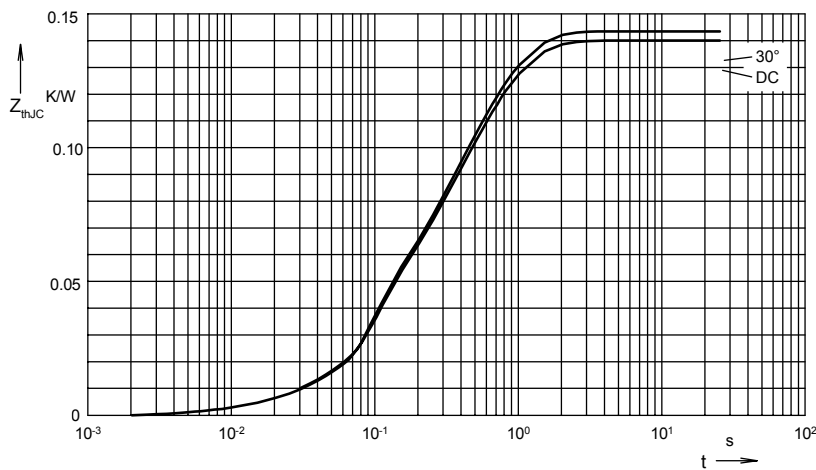


Fig. 8 Transient thermal impedance junction to case (per thyristor or diode)

$R_{thJC}$  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

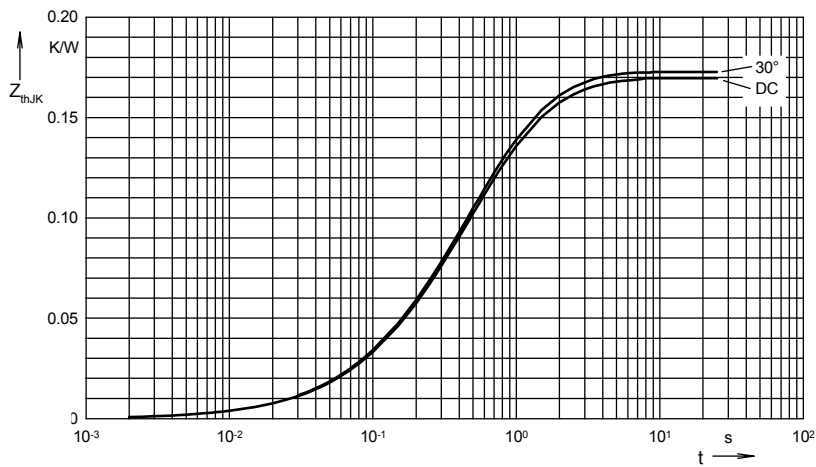


Fig. 9 Transient thermal impedance junction to heatsink (per thyristor or diode)

$R_{thJK}$  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

