



# STT181GKxxB

## Thyristor-Thyristor Modules

Symbol	Test Conditions	Characteristic Values	Unit
$I_{RRM}, I_{DRM}$	$T_{VJ}=T_{VJM}; V_R=V_{RRM}; V_D=V_{DRM}$	10	mA
$V_{TM}$	$I_{TM}=543A; T_{VJ}=25^{\circ}C$	1.65	V
$V_{TO}$	For power-loss calculations only ( $T_{VJ}=125^{\circ}C$ )	0.88	V
$r_T$		1.15	m $\Omega$
$V_{GT}$	$V_D=6V;$ $T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$	2.5 max 2.6 max	V
$I_{GT}$	$V_D=6V;$ $T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$	150 200	mA
$V_{GD}$	$T_{VJ}=T_{VJM}; V_D=2/3V_{DRM}$	0.2	V
$I_{GD}$		10	mA
$I_L$	$T_{VJ}=25^{\circ}C; t_p=30\mu s; V_D=6V$ $I_G=0.5A; di_G/dt=0.5A/\mu s$	300	mA
$I_H$	$T_{VJ}=25^{\circ}C; V_D=6V; R_{GK}=\infty$	200	mA
$t_{gd}$	$T_{VJ}=25^{\circ}C; V_D=1/2V_{DRM}$ $I_G=0.5A; di_G/dt=0.5A/\mu s$	2	$\mu s$
$t_q$	$T_{VJ}=T_{VJM}; I_T=300A; t_p=200\mu s; -di/dt=10A/\mu s$ $V_R=100V; dv/dt=20V/\mu s; V_D=2/3V_{DRM}$	150	$\mu s$
$Q_s$	$T_{VJ}=T_{VJM}; I_T, I_F=300A; -di/dt=50A/\mu s$	550	$\mu C$
$I_{RM}$		235	A
$R_{thJC}$	per thyristor/diode; DC current per module	0.155 0.0775	K/W
$R_{thJK}$	per thyristor/diode; DC current per module	0.225 0.1125	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 <sup>2</sup>

### FEATURES

- \* International standard package
- \* Copper base plate
- \* Glass passivated chips
- \* Isolation voltage 3600 V~
- \* UL file NO.310749
- \* RoHs compliant

### 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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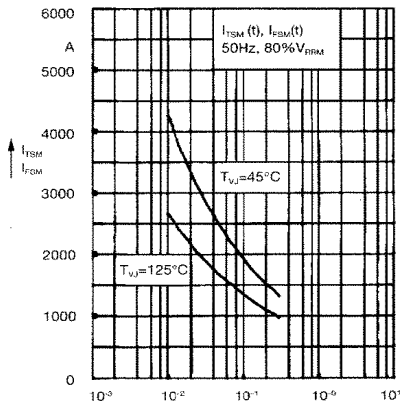


Fig. 1 Surge overload current  
 $I_{TSM}, I_{FSM}$ : Crest value,  $t$ : duration

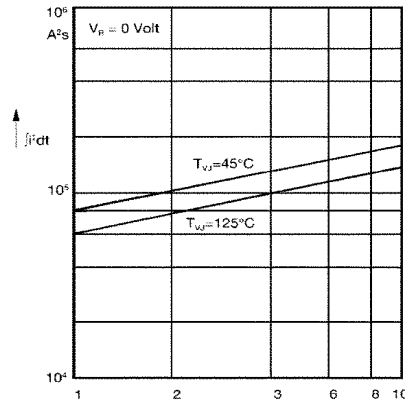


Fig. 2  $I^2t$  versus time ( $t=1-10$  ms)

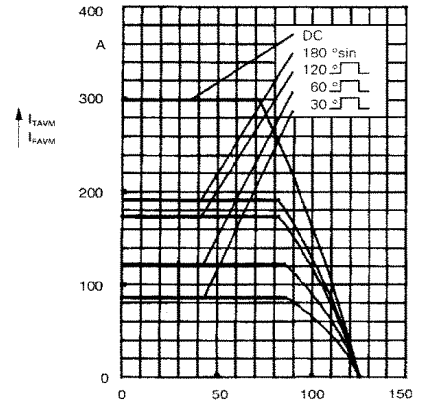


Fig. 2a Maximum forward current at case temperature

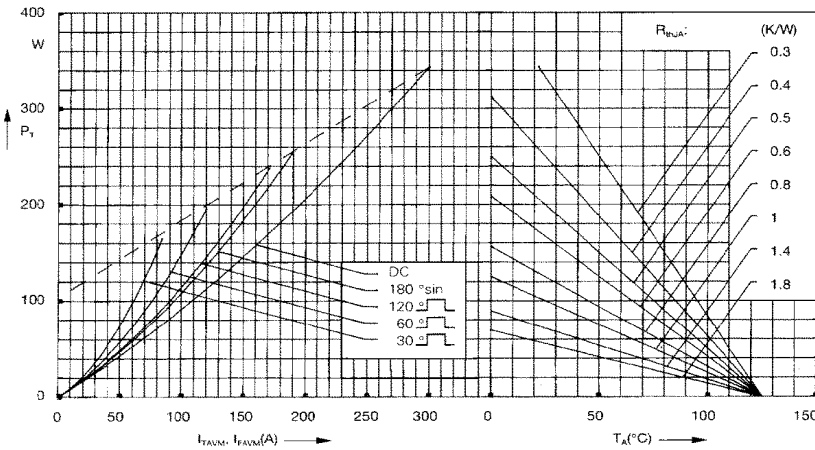


Fig. 3 Power dissipation versus on-state current and ambient temperature (per thyristor or diode)

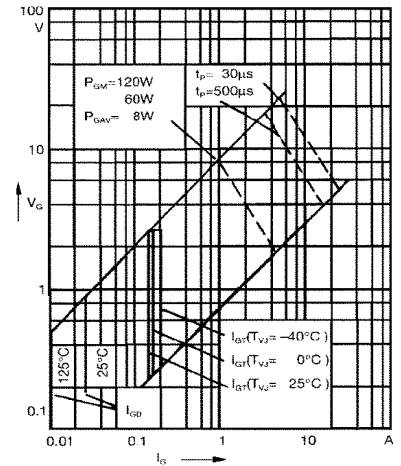


Fig. 4 Gate trigger characteristics

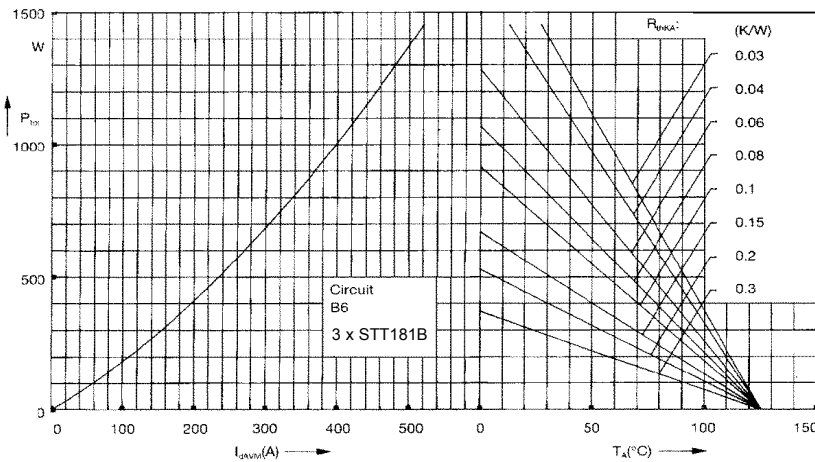


Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

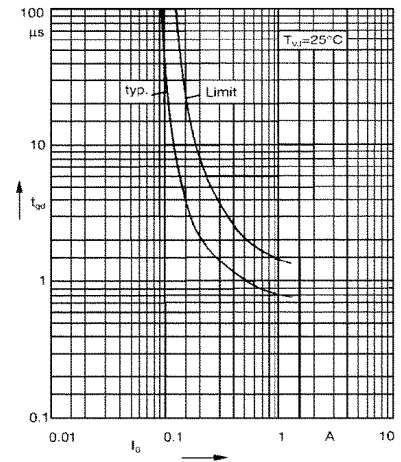


Fig. 6 Gate trigger delay time

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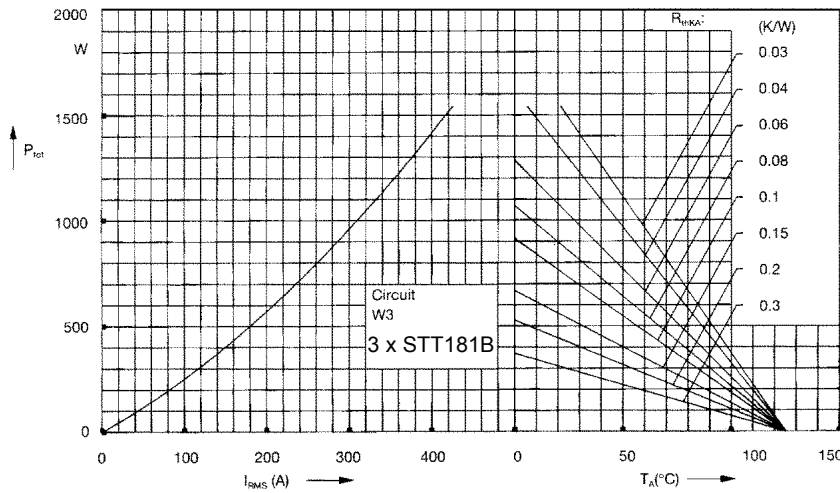


Fig. 7 Three phase AC-controller: Power dissipation versus RMS output current and ambient temperature

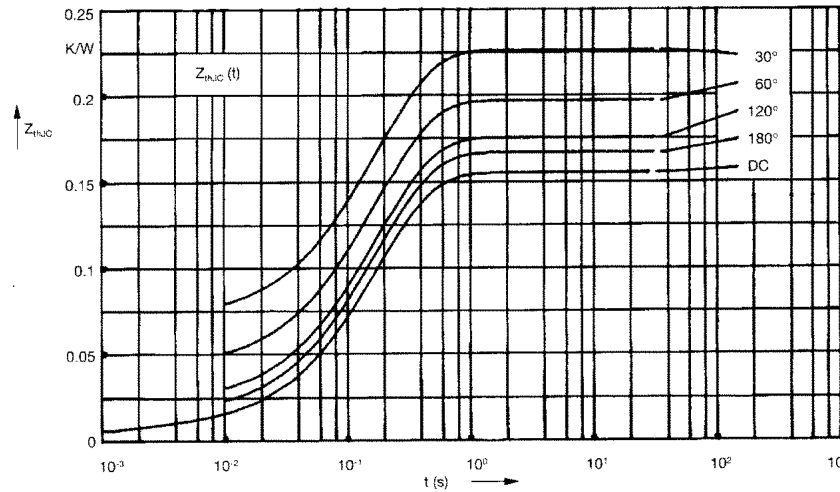


Fig. 8 Transient thermal impedance junction to case (per thyristor or diode)

$R_{thjC}$  for various conduction angles  $d$ :

$d$	$R_{thjC}$ (K/W)
DC	0.155
180°	0.167
120°	0.176
60°	0.197
30°	0.227

Constants for  $Z_{thjC}$  calculation:

$i$	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.0072	0.001
2	0.0188	0.08
3	0.129	0.2

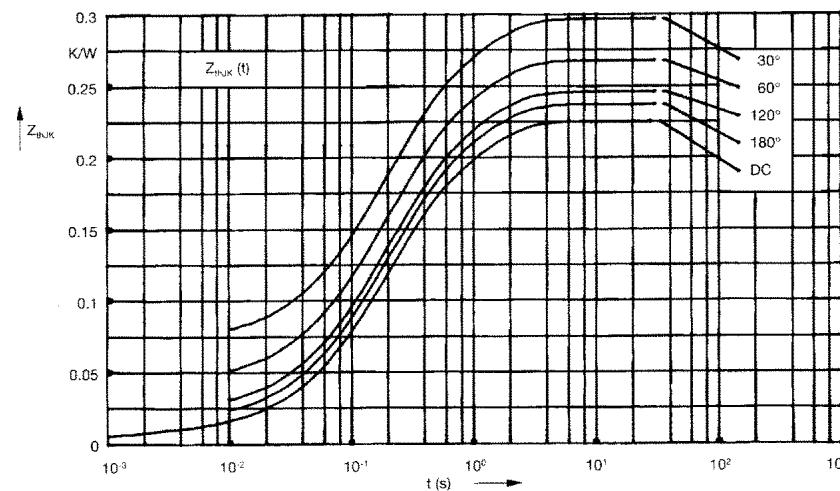


Fig. 9 Transient thermal impedance junction to heatsink (per thyristor or diode)

$R_{thjK}$  for various conduction angles  $d$ :

$d$	$R_{thjK}$ (K/W)
DC	0.225
180°	0.237
120°	0.246
60°	0.267
30°	0.297

Constants for  $Z_{thjK}$  calculation:

$i$	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.0072	0.001
2	0.0188	0.08
3	0.129	0.2
4	0.07	1.0