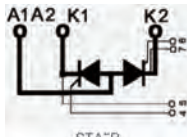
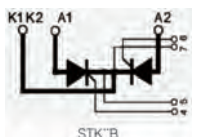
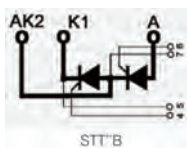


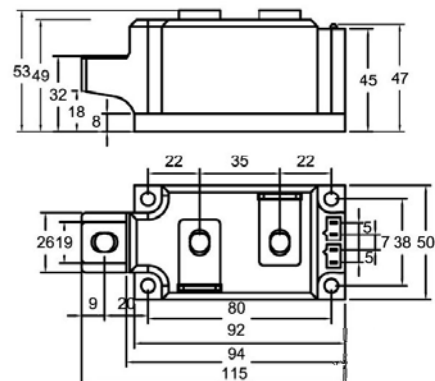
STT320GKXXBT

Thyristor-Thyristor Modules

Dimensions in mm (1mm=0.0394")



| Type | V_{RSM} V_{DSM} V | V_{RRM} V_{DRM} V |
|--------------|-----------------------------|-----------------------------|
| STT320GK08BT | 900 | 800 |
| STT320GK12BT | 1300 | 1200 |
| STT320GK14BT | 1500 | 1400 |
| STT320GK16BT | 1700 | 1600 |
| STT320GK18BT | 1900 | 1800 |
| STT320GK20BT | 2100 | 2000 |
| STT320GK22BT | 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 | 520 320 | A |
| I_{TSM} , I_{FSM} | $T_{VJ}=45^{\circ}C$ $V_R=0$ t=10ms (50Hz), sine t=8.3ms (60Hz), sine | 9200 10100 | A |
| | $T_{VJ}=T_{VJM}$ $V_R=0$ t=10ms(50Hz), sine t=8.3ms(60Hz), sine | 8000 8800 | |
| $\int i^2 dt$ | $T_{VJ}=45^{\circ}C$ $V_R=0$ t=10ms (50Hz), sine t=8.3ms (60Hz), sine | 423000 423000 | A ² s |
| | $T_{VJ}=T_{VJM}$ $V_R=0$ t=10ms(50Hz), sine t=8.3ms(60Hz), sine | 320000 321000 | |
| $(di/dt)_{cr}$ | $T_{VJ}=T_{VJM}$ f=50Hz, $t_p=200\mu s$ $V_D=2/3V_{DRM}$ $I_G=1A$ $di_G/dt=1A/\mu s$ repetitive, $I_T=750A$ | 100 | A/ μs |
| | non repetitive, $I_T=250A$ | 500 | |
| $(dv/dt)_{cr}$ | $T_{VJ}=T_{VJM}$; $R_{GK}=\infty$; method 1 (linear voltage rise) $V_{DR}=2/3V_{DRM}$ | 1000 | V/ μs |
| P_{GM} | $T_{VJ}=T_{VJM}$ $I_T=I_{TAVM}$ $t_p=30\mu s$ $t_p=500\mu s$ | 120 | W |
| | | 60 | |
| P_{GAV} | | 20 | W |
| V_{RGM} | | 10 | V |
| T_{VJ} T_{VJM} T_{stg} | | -40...+140 | °C |
| | | 140 | |
| | | -40...+125 | |
| V_{ISOL} | 50/60Hz, RMS $I_{ISOL} \leq 1mA$ t=1min t=1s | 3000 | V~ |
| | | 3600 | |
| M_d | Mounting torque (M5) Terminal connection torque (M8) | 2.5-5/22-44 | Nm/lb.in. |
| | | 12-15/106-132 | |
| Weight | Typical including screws | 600 | g |



STT320GKXXBT

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 | $I_T, I_F=960A; T_{VJ}=25^{\circ}C$ | 1.6 | V |
| V_{TO} | For power-loss calculations only ($T_{VJ}=140^{\circ}C$) | 0.8 | V |
| r_T | $T_{VJ}=130^{\circ}C$ | 0.82 | m Ω |
| V_{GT} | $V_D=6V;$ $T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$ | 3 4 | V |
| I_{GT} | $V_D=6V;$ $T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$ | 150 200 | 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 | $T_{VJ}=25^{\circ}C; t_p=30\mu s; V_D=6V$ $I_G=0.45A; di_G/dt=0.45A/\mu s$ | 200 | mA |
| I_H | $T_{VJ}=25^{\circ}C; V_D=6V; R_{GK}=\infty$ | 150 | mA |
| t_{gd} | $T_{VJ}=25^{\circ}C; V_D=1/2V_{DRM}$ $I_G=1A; di_G/dt=1A/\mu s$ | 2 | us |
| t_q | $T_{VJ}=T_{VJM}; I_T=300A; t_p=200\mu s; -di/dt=10A/\mu s$ $V_R=100V; dv/dt=50V/\mu s; V_D=2/3V_{DRM}$ | 200 | us |
| Q_s | $T_{VJ}=125^{\circ}C; I_T, I_F=400A; -di/dt=50A/\mu s$ | 760 | uC |
| I_{RM} | | 275 | A |
| R_{thJC} | per thyristor/thyristor; DC current per module | 0.112 0.056 | K/W |
| R_{thJK} | per thyristor/thyristor; 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
- * 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



STT320GKXXBT

Thyristor-Thyristor Modules

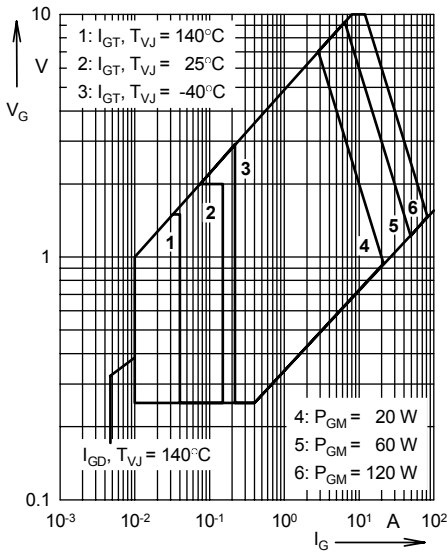


Fig. 1 Gate trigger characteristics

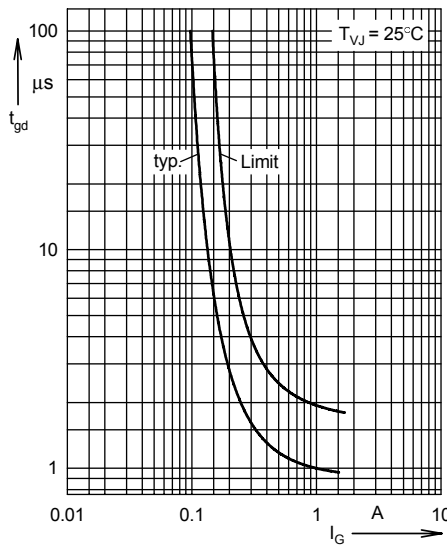


Fig. 2 Gate trigger delay time

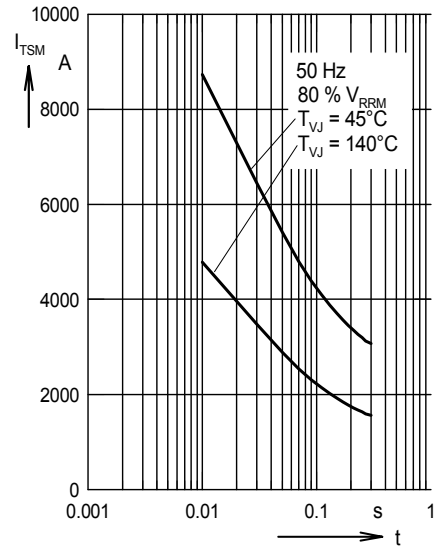


Fig. 3 Surge overload current
 I_{TSM}, I_{FSM} : Crest value, t: duration

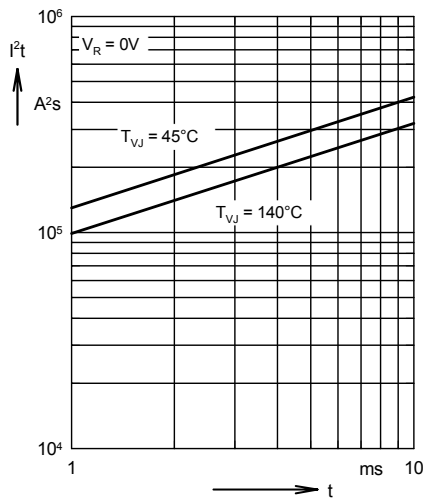


Fig. 4 I^2t versus time (1-10 ms)

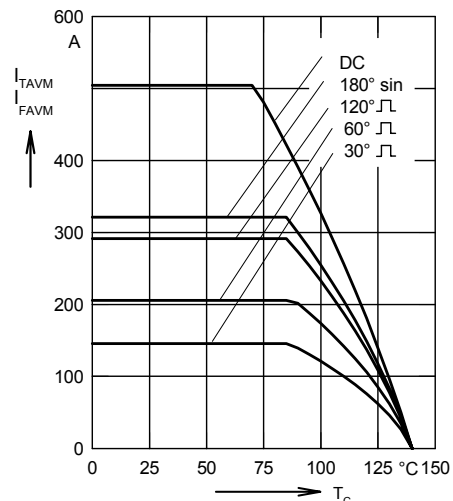


Fig. 4a Maximum forward current at case temperature

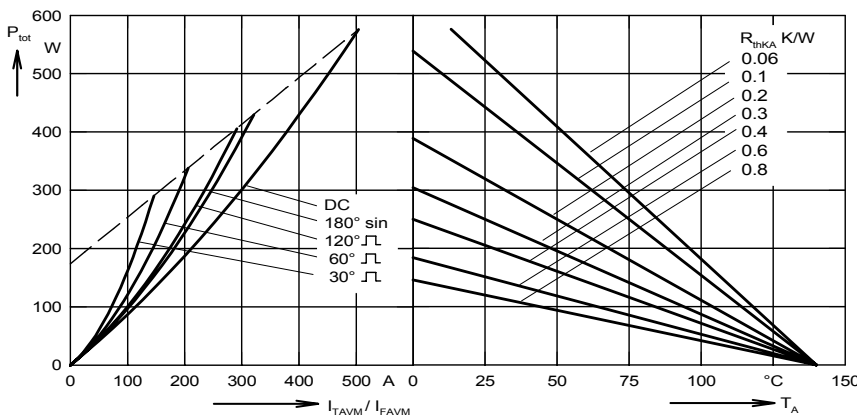


Fig. 5 Power dissipation versus on-state current and ambient temperature (per thyristor or diode)



STT320GKXXBT

Thyristor-Thyristor Modules

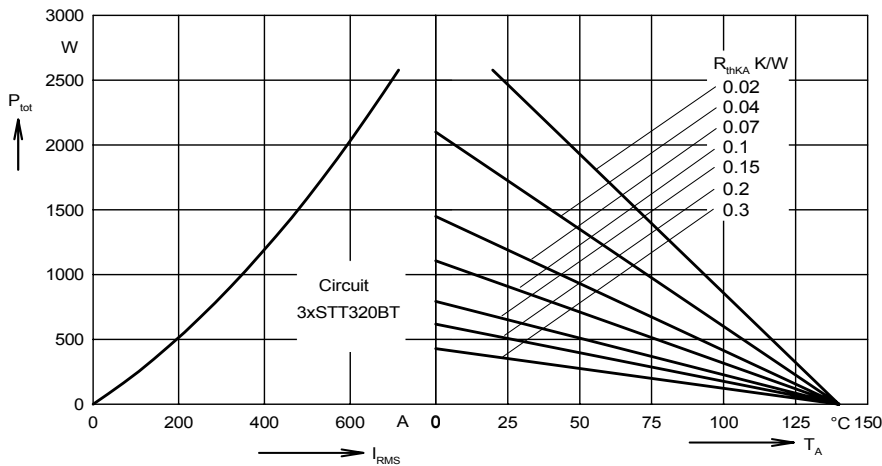


Fig. 6 Three phase AC-controller: Power dissipation versus RMS output current and ambient temperature

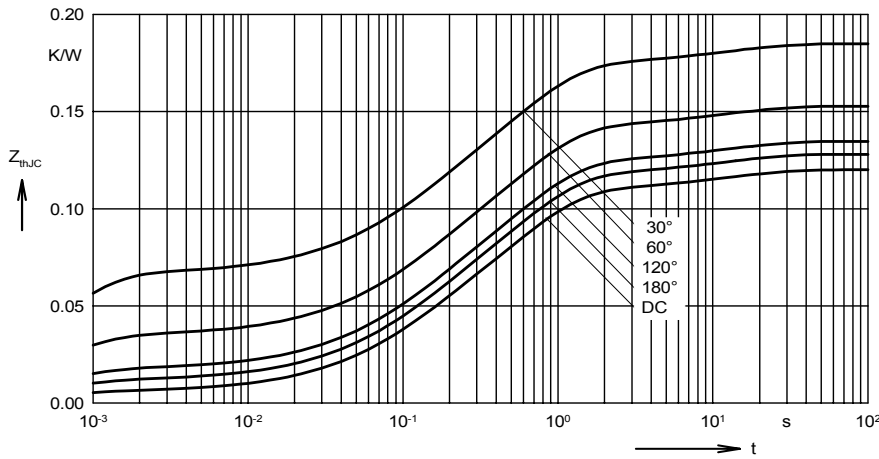


Fig. 7 Transient thermal impedance junction to case (per thyristor or diode)

R_{thJC} for various conduction angles d :

| d | R_{thJC} (K/W) |
|------|------------------|
| DC | 0.120 |
| 180° | 0.128 |
| 120° | 0.135 |
| 60° | 0.153 |
| 30° | 0.185 |

Constants for Z_{thJC} calculation:

| i | R_{thi} (K/W) | t_i (s) |
|-----|-----------------|-----------|
| 1 | 0.0058 | 0.00054 |
| 2 | 0.031 | 0.098 |
| 3 | 0.072 | 0.54 |
| 4 | 0.0112 | 12 |

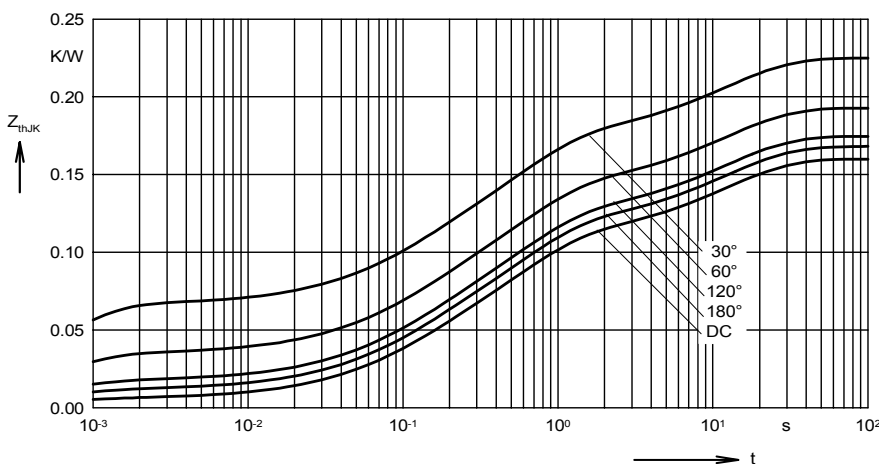


Fig. 8 Transient thermal impedance junction to heatsink (per thyristor or diode)

R_{thJK} for various conduction angles d :

| d | R_{thJK} (K/W) |
|------|------------------|
| DC | 0.160 |
| 180° | 0.168 |
| 120° | 0.175 |
| 60° | 0.193 |
| 30° | 0.225 |

Constants for Z_{thJK} calculation:

| i | R_{thi} (K/W) | t_i (s) |
|-----|-----------------|-----------|
| 1 | 0.0058 | 0.00054 |
| 2 | 0.031 | 0.098 |
| 3 | 0.072 | 0.54 |
| 4 | 0.0112 | 12 |
| 5 | 0.04 | 12 |

