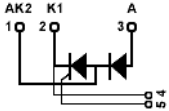
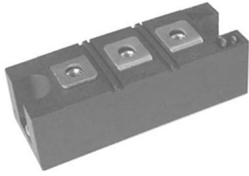


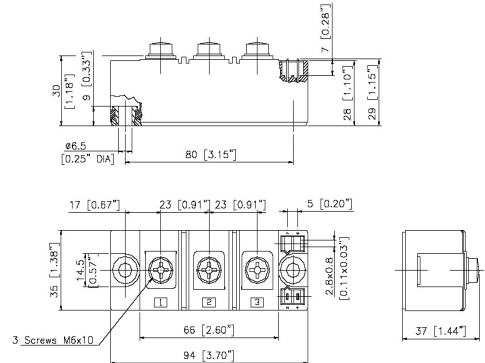
STD/SDT181

Thyristor-Diode Modules, Diode-Thyristor Modules



| Type | V_{RSM} | V_{RRM} |
|----------------|-----------|-----------|
| | V_{DSM} | V_{DRM} |
| | V | V |
| STD/SDT181GK08 | 900 | 800 |
| STD/SDT181GK12 | 1300 | 1200 |
| STD/SDT181GK14 | 1500 | 1400 |
| STD/SDT181GK16 | 1700 | 1600 |
| STD/SDT181GK18 | 1900 | 1800 |

Dimensions in mm (1mm=0.0394")



| Symbol | Test Conditions | Maximum Ratings | Unit |
|--|--|-----------------------------------|--|
| I_{TRMS}, I_{FRMS} I_{TAVM}, I_{FAVM} | $T_{VJ}=T_{VJM}$ $T_C=85^{\circ}C; 180^{\circ}$ sine | 300 181 | A |
| I_{TSM}, I_{FSM} | $T_{VJ}=45^{\circ}C$ $V_R=0$ $t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine | 6000 6400 | A |
| | $T_{VJ}=T_{VJM}$ $V_R=0$ $t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine | 5250 5600 | |
| $\int i^2 dt$ | $T_{VJ}=45^{\circ}C$ $V_R=0$ $t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine | 180000 170000 | A ² s |
| | $T_{VJ}=T_{VJM}$ $V_R=0$ $t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine | 137000 128000 | |
| $(di/dt)_{cr}$ | $T_{VJ}=T_{VJM}$ $f=50Hz, t_p=200\mu s$ $V_D=2/3V_{DRM}$ $I_G=0.5A$ $di_G/dt=0.5A/\mu s$ | repetitive, $I_T=500A$ 150 | A/ μs |
| | | non repetitive, $I_T=500A$ 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 60 W |
| P_{GAV} | | | 8 W |
| V_{RGM} | | | 10 V |
| T_{VJ} T_{VJM} T_{stg} | | | -40...+125 125 -40...+125 $^{\circ}C$ |
| V_{ISOL} | 50/60Hz, RMS $I_{ISOL} \leq 1mA$ | $t=1min$ $t=1s$ | 3000 3600 V~ |
| M_d | Mounting torque (M6) Terminal connection torque (M6) | | 2.25-2.75/20-25 4.5-5.5/40-48 Nm/lb.in. |
| Weight | Typical including screws | | 125 g |

STD/SDT181

Thyristor-Diode Modules, Diode-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_T, V_F | $I_T, I_F=300A; T_{VJ}=25^{\circ}C$ | 1.25 | 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 2.6 | 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 | μs |
| t_q | $T_{VJ}=T_{VJM}; I_T=300A; t_p=200\mu s; -di/dt=10A/\mu s$ $V_R=100V; dv/dt=20V/\mu s; V_D=2/3V_{DRM}$ | 150 | μs |
| Q_S | $T_{VJ}=T_{VJM}; I_T, I_F=300A; -di/dt=50A/\mu s$ | 550 | μC |
| 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^2 |

FEATURES

- * International standard package
- * Copper 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

STD/SDT181

Thyristor-Diode Modules, Diode-Thyristor Modules

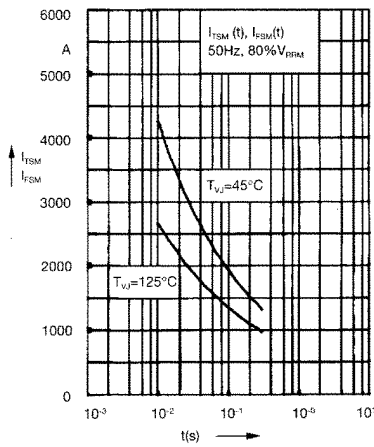


Fig. 1 Surge overload current
 I_{TSM} , I_{FSM} : Crest value, t: duration

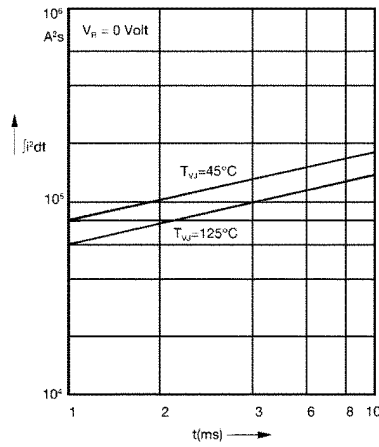


Fig. 2 I^2t versus time (1-10 ms)

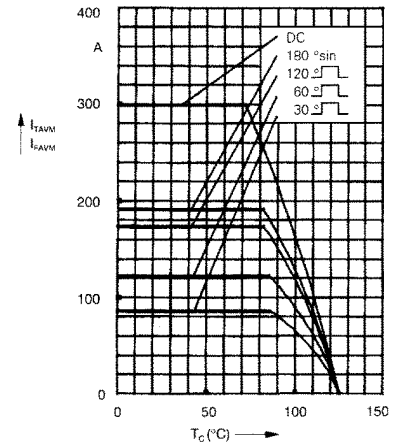


Fig. 2a Maximum forward current at case temperature

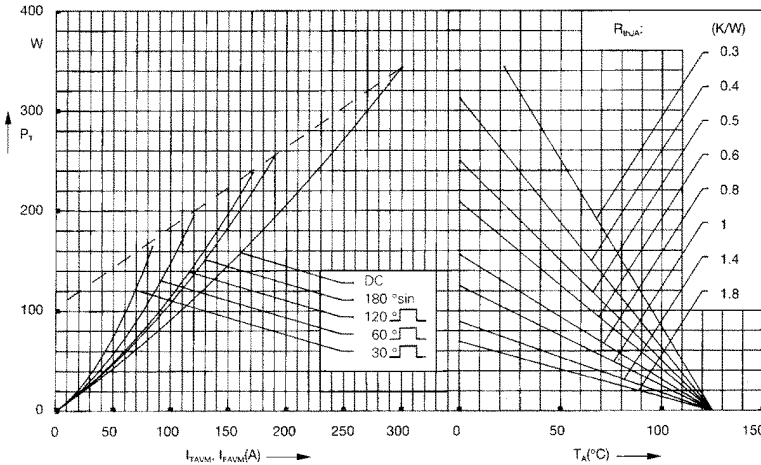


Fig. 3 Power dissipation versus on-state current and ambient temperature (per thyristor or diode)

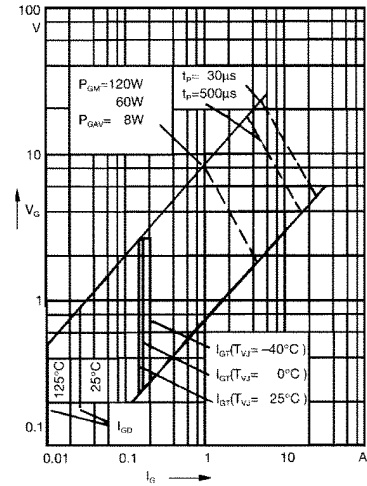


Fig. 4 Gate trigger characteristics

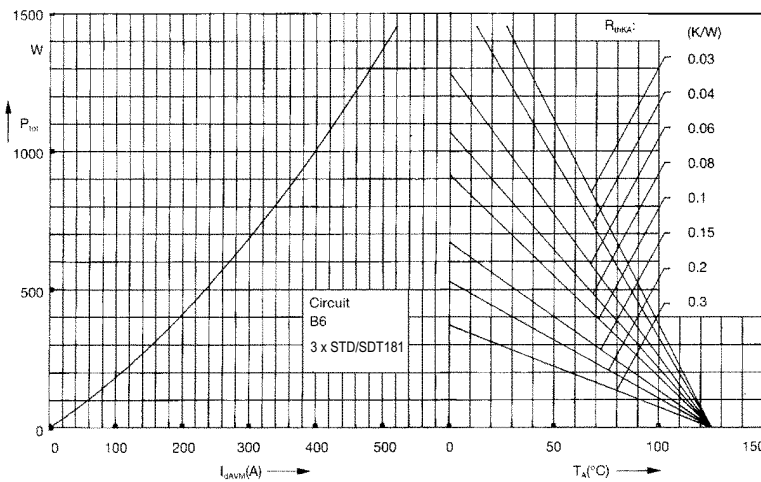


Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

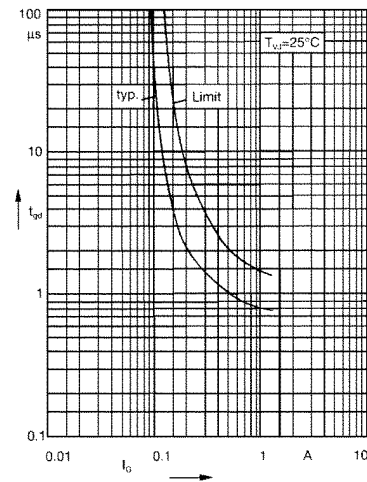


Fig. 6 Gate trigger delay time

STD/SDT181

Thyristor-Diode Modules, Diode-Thyristor Modules

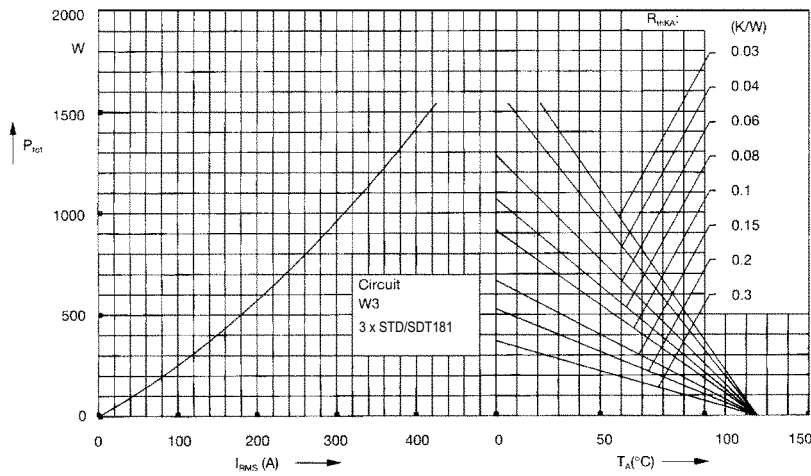


Fig. 7 Three phase AC-controller: Power dissipation versus ambient output current and ambient temperature

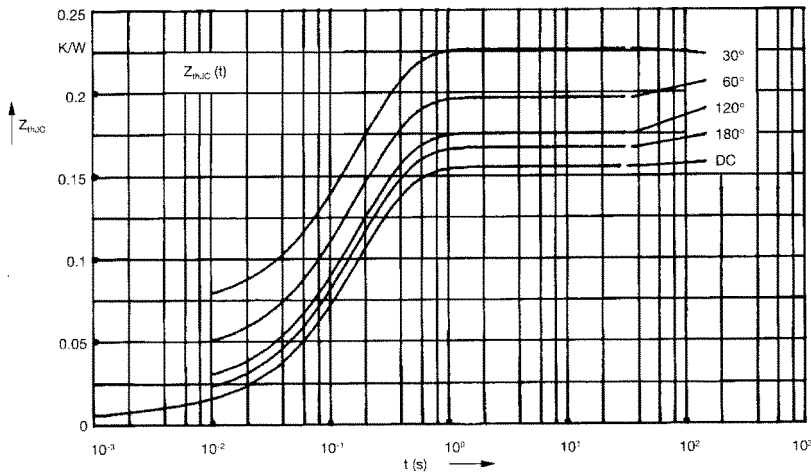


Fig. 8 Transient thermal impedance junction to case (per thyristor or diode)

R_{thJC} for various conduction angles d :

| d | R_{thJC} (K/W) |
|-------|------------------|
| DC | 0.155 |
| 180°C | 0.167 |
| 120°C | 0.176 |
| 60°C | 0.197 |
| 30°C | 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 |

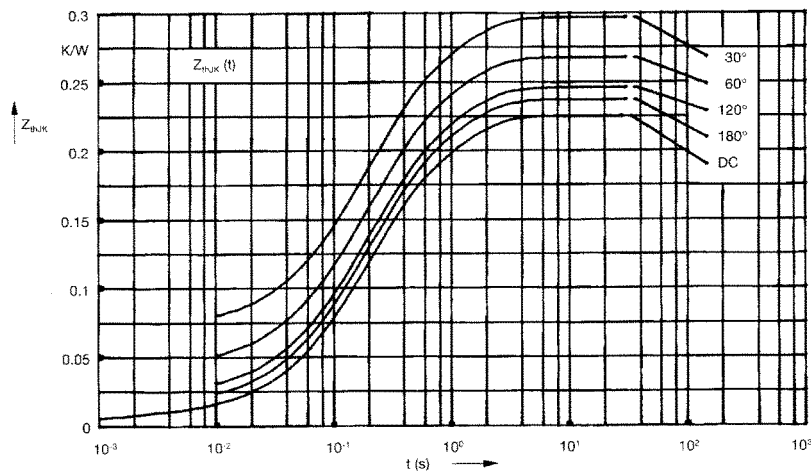


Fig. 9 Transient thermal impedance junction to heatsink (per thyristor or diode)

R_{thJK} for various conduction angles d :

| d | R_{thJK} (K/W) |
|-------|------------------|
| DC | 0.225 |
| 180°C | 0.237 |
| 120°C | 0.246 |
| 60°C | 0.267 |
| 30°C | 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 |