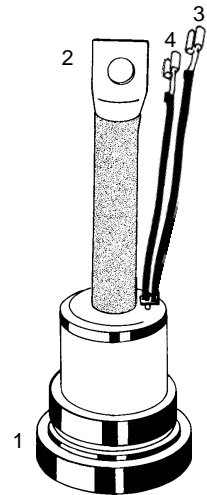
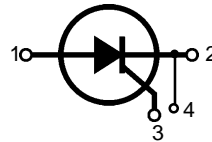


Phase Control Thyristors

$V_{RRM} = 1200-1800 \text{ V}$
 $I_{T(RMS)} = 600 \text{ A}$
 $I_{T(AV)M} = 380 \text{ A}$

| V_{RSM} V_{DSM} V | V_{RRM} V_{DRM} V | Type |
|-----------------------------|-----------------------------|--------------|
| 1300 | 1200 | CS 300-12io3 |
| 1700 | 1600 | CS 300-16io3 |
| 1900 | 1800 | CS 300-18io3 |

Not for new application



1 = Anode, 2 = Cathode, 3 = Gate, 4 = Auxiliary Cathode

| Symbol | Test Conditions | Maximum Ratings | |
|----------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------------------|
| $I_{T(RMS)}$ | $T_{VJ} = T_{VJM}$ | 600 | A |
| | $T_{case} = 85^{\circ}\text{C}; 180^{\circ}$ sine | 330 | A |
| $I_{T(AV)M}$ | $T_{case} = 75^{\circ}\text{C}; 180^{\circ}$ sine | 380 | A |
| I_{TSM} | $T_{VJ} = 45^{\circ}\text{C}; V_R = 0$ | t = 10 ms (50 Hz), sine | 8500 A |
| | | t = 8.3 ms (60 Hz), sine | 9000 A |
| | $T_{VJ} = T_{VJM}; V_R = 0$ | t = 10 ms (50 Hz), sine | 8000 A |
| | | t = 8.3 ms (60 Hz), sine | 8500 A |
| I^2t | $T_{VJ} = 45^{\circ}\text{C}; V_R = 0$ | t = 10 ms (50 Hz), sine | 360 000 A ² s |
| | | t = 8.3 ms (60 Hz), sine | 340 000 A ² s |
| | $T_{VJ} = T_{VJM}; V_R = 0$ | t = 10 ms (50 Hz), sine | 320 000 A ² s |
| | | t = 8.3 ms (60 Hz), sine | 303 500 A ² s |
| $(di/dt)_{cr}$ | $T_{VJ} = T_{VJM}; f = 50\text{Hz}; t_p = 200\mu\text{s}; V_D = 2/3 V_{DRM}; I_G = 1 \text{ A}; di_G/dt = 1 \text{ A}/\mu\text{s}$ | repetitive, $I_T = 1000 \text{ A}$ | 100 A/ μs |
| | | non repetitive, $I_T = I_{T(AV)M}$ | 500 A/ μs |
| $(dv/dt)_{cr}$ | $T_{VJ} = T_{VJM}; R_{GK} = \infty; \text{method 1 (linear voltage rise)}$ | $V_{DR} = 2/3 V_{DRM}$ | 1000 V/ μs |
| P_{GM} | $T_{VJ} = T_{VJM}; I_T = I_{T(AV)M}$ | $t_p = 30 \mu\text{s}$ | 120 W |
| | | $t_p = 10 \text{ ms}$ | 10 W |
| V_{RGM} | | 10 | V |
| T_{VJ} | | -40...+125 | $^{\circ}\text{C}$ |
| T_{VJM} | | 125 | $^{\circ}\text{C}$ |
| T_{stg} | | -40...+125 | $^{\circ}\text{C}$ |
| M_d | Mounting torque | 3.5 | Nm |
| | | 31 | lb.in. |
| Weight | | 500 | g |

Features

- Thyristor for line frequencies
- International flat base package
- Planar glassivated chip
- Long-term stability of blocking currents and voltages

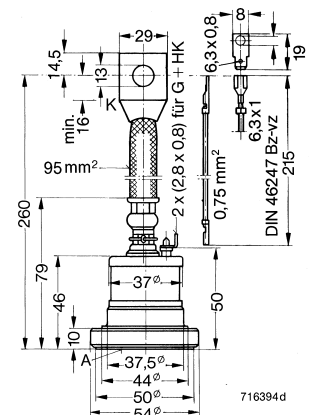
Applications

- Motor control
- Power converter
- AC power controller

Advantages

- Space and weight savings
- Simple mounting
- Improved temperature and power cycling

Dimensions in mm (1 mm = 0.0394")



Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

| Symbol | Test Conditions | Characteristic Values | |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------|
| I_R, I_D | $T_{VJ} = T_{VJM}; V_R = V_{RRM}; V_D = V_{DRM}$ | \leq | 40 mA |
| V_T | $I_T = 1000 \text{ A}; T_{VJ} = 25^\circ\text{C}$ | \leq | 1.43 V |
| V_{T0} | For power-loss calculations only ($T_{VJ} = 125^\circ\text{C}$) | | 1.0 V |
| r_T | | | 0.43 m Ω |
| V_{GT} | $V_D = 6 \text{ V}; T_{VJ} = 25^\circ\text{C}$ | \leq | 2.0 V |
| | $T_{VJ} = -40^\circ\text{C}$ | \leq | 2.8 V |
| I_{GT} | $V_D = 6 \text{ V}; T_{VJ} = 25^\circ\text{C}$ | \leq | 150 mA |
| | $T_{VJ} = -40^\circ\text{C}$ | \leq | 250 mA |
| V_{GD} | $T_{VJ} = T_{VJM}; V_D = 2/3 V_{DRM}$ | \leq | 0.2 V |
| I_{GD} | | \leq | 1 mA |
| I_L | $T_{VJ} = 25^\circ\text{C}; t_p = 10 \mu\text{s}$ $I_G = 0.7 \text{ A}; di_G/dt = 0.7 \text{ A}/\mu\text{s}$ | \leq | 100 mA |
| I_H | $T_{VJ} = 25^\circ\text{C}; V_D = 6 \text{ V}; R_{GK} = \infty$ | \leq | 100 mA |
| t_{gd} | $T_{VJ} = 25^\circ\text{C}; V_D = 1/2 V_{DRM}$ $I_G = 0.7 \text{ A}; di_G/dt = 0.7 \text{ A}/\mu\text{s}$ | \leq | 2 μs |
| t_q | $T_{VJ} = T_{VJM}; I_T = 330 \text{ A}, t_p = 300 \mu\text{s}; di/dt = -20 \text{ A}/\mu\text{s}$ $V_R = 100 \text{ V}; dv/dt = 20 \text{ V}/\mu\text{s}; V_D = 2/3 V_{DRM}$ | typ. | 150 μs |
| R_{thJC} | DC current | | 0.09 K/W |
| R_{thJH} | DC current | | 0.12 K/W |
| d_s | Creepage distance on surface | | 1.55 mm |
| d_A | Strike distance through air | | 1.55 mm |
| a | Max. acceleration, 50 Hz | | 50 m/s ² |

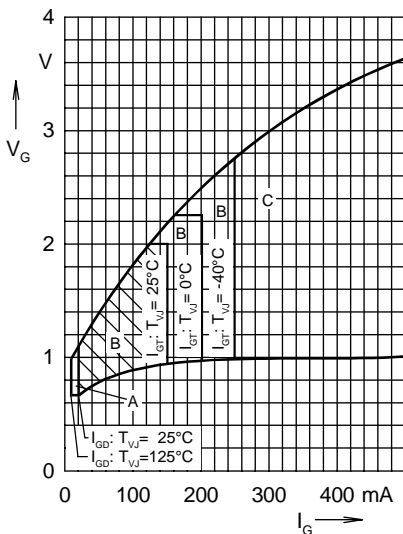


Fig. 1 Gate voltage and gate current
Triggering:
A = no; B = possible; C = safe

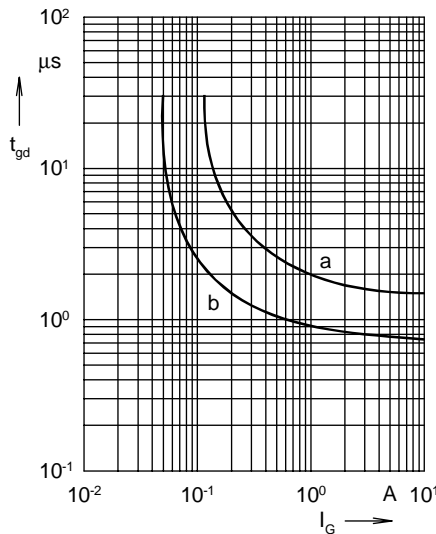


Fig. 2 Gate controlled delay time t_{gd}
a = limit; b = typical

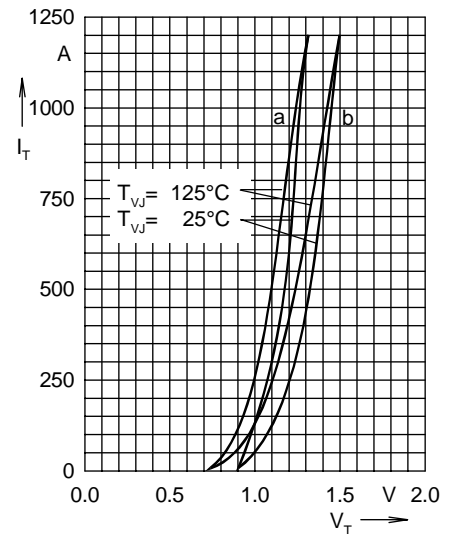


Fig. 3 On-state characteristics
a = typical; b = limit

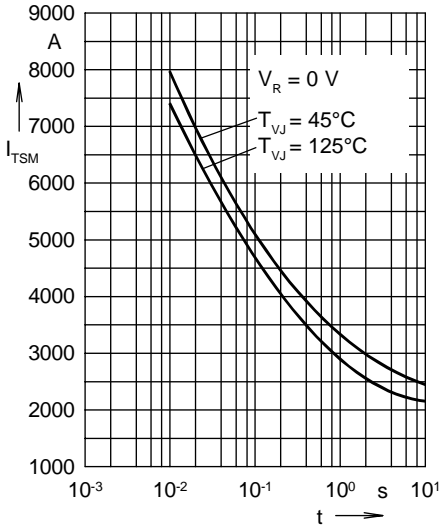


Fig. 4 Surge overload current
 I_{TSM} : crest value, t: duration

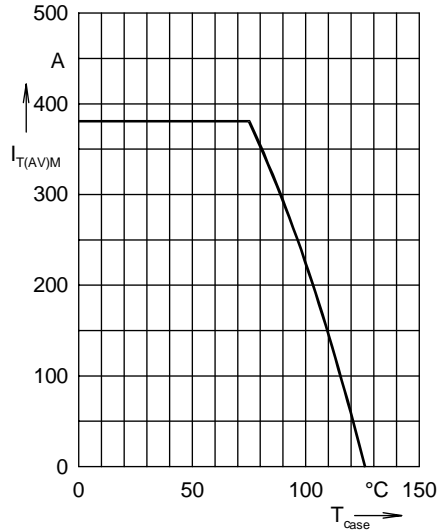


Fig. 5 Maximum forward current at case temperature 180° sine

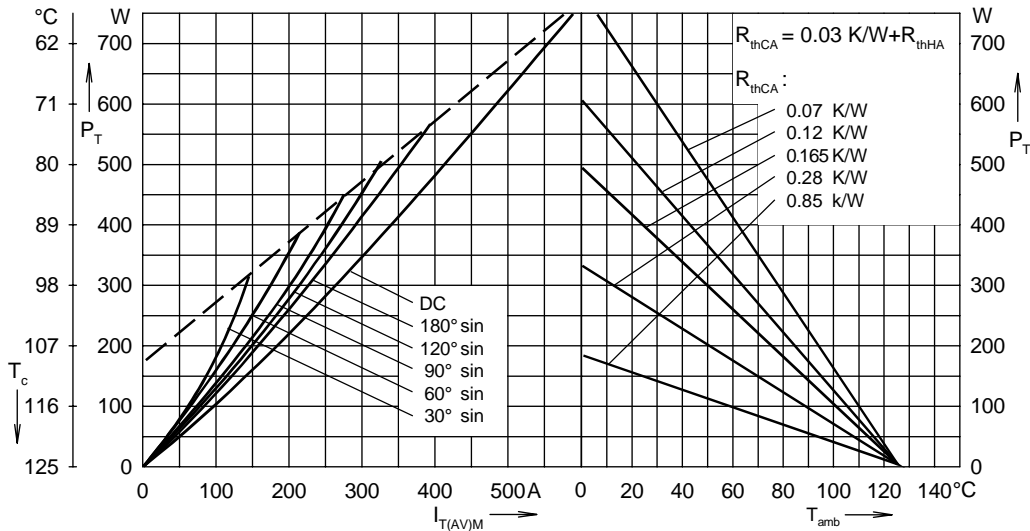


Fig. 6 Power dissipation versus on-state current and ambient temperature (sinusoidal current)

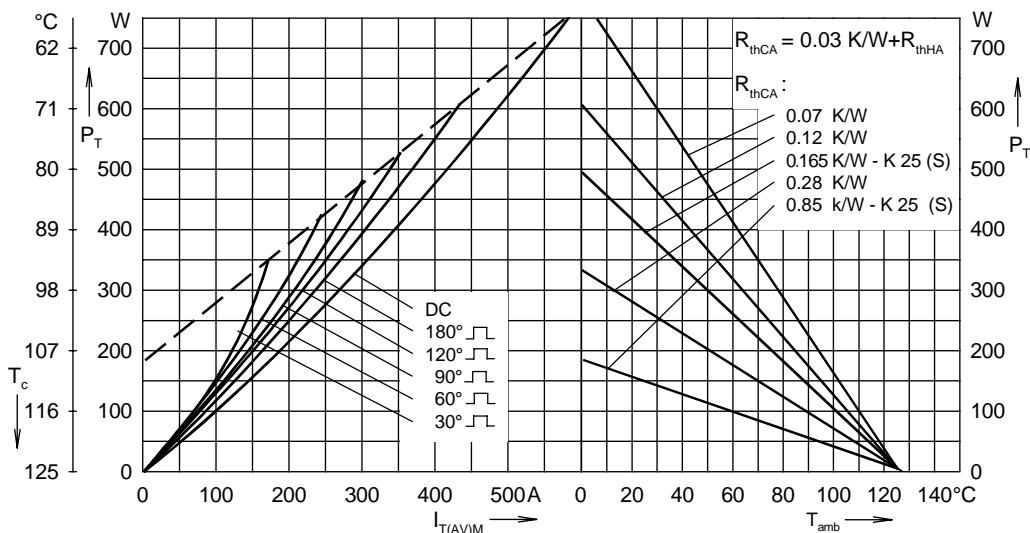


Fig. 7 Power dissipation versus on-state current and ambient temperature (rectangular current)