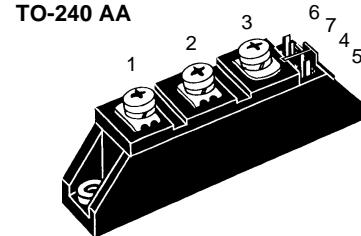


Thyristor Modules

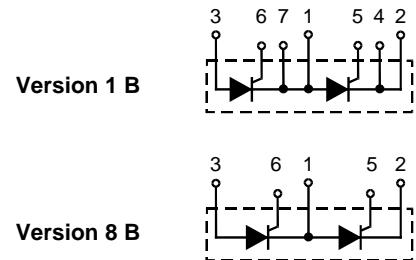
I_{TRMS} = 2x 40 A
I_{TAVM} = 2x 25 A
V_{RRM} = 800-1600 V

| V _{RSM} | V _{RRM} | Type | |
|------------------|------------------|----------------|----------------|
| V _{DSM} | V _{DRM} | | |
| V | V | Version 1 B | Version 8 B |
| 900 | 800 | MCC 19-08io1 B | MCC 19-08io8 B |
| 1300 | 1200 | MCC 19-12io1 B | MCC 19-12io8 B |
| 1500 | 1400 | MCC 19-14io1 B | MCC 19-14io8 B |
| 1700 | 1600 | MCC 19-16io1 B | MCC 19-16io8 B |



| Symbol | Test Conditions | Maximum Ratings | | |
|-----------------------|---|---|--|--------------------------------------|
| I _{TRMS} | T _{VJ} = T _{VJM} | 40 | A | |
| I _{TAVM} | T _C = 58°C; 180° sine | 25 | A | |
| | T _C = 85°C; 180° sine | 18 | A | |
| I _{TSM} | T _{VJ} = 45°C; V _R = 0 | t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine | 400 420 | A A |
| | T _{VJ} = T _{VJM} V _R = 0 | t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine | 350 370 | A A |
| ∫i ² dt | T _{VJ} = 45°C V _R = 0 | t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine | 800 730 | A ² s A ² s |
| | T _{VJ} = T _{VJM} V _R = 0 | t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine | 600 570 | A ² s A ² s |
| (di/dt) _{cr} | T _{VJ} = T _{VJM} f = 50 Hz, t _p = 200 μs V _D = 2/3 V _{DRM} I _G = 0.45 A di _G /dt = 0.45 A/μs | repetitive, I _T = 45 A non repetitive, I _T = I _{TAVM} | 150 500 | A/μs A/μs |
| (dv/dt) _{cr} | T _{VJ} = T _{VJM} ; R _{GK} = ∞; method 1 (linear voltage rise) | V _{DR} = 2/3 V _{DRM} | 1000 | V/μs |
| P _{GM} | T _{VJ} = T _{VJM} I _T = I _{TAVM} | t _p = 30 μs t _p = 300 μs | 10 5 0.5 | W W W |
| P _{GAV} | | | 10 | V |
| V _{RGM} | | | | |
| T _{VJ} | | | -40...+125 | °C |
| T _{VJM} | | | 125 | °C |
| T _{stg} | | | -40...+125 | °C |
| V _{ISOL} | 50/60 Hz, RMS I _{ISOL} ≤ 1 mA | t = 1 min t = 1 s | 3000 3600 | V~ V~ |
| M _d | Mounting torque (M5) Terminal connection torque (M5) | | 2.5-4.0/22-35 Nm/lb.in. 2.5-4.0/22-35 Nm/lb.in. | |
| Weight | Typical including screws | | 90 | g |

Data according to IEC 60747 and refer to a single thyristor unless otherwise stated.
 IXYS reserves the right to change limits, test conditions and dimensions



Features

- International standard package, JEDEC TO-240 AA
- Direct copper bonded Al₂O₃ -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E 72873
- Gate-cathode twin pins for version 1B

Applications

- DC motor control
- Softstart AC motor controller
- Light, heat and temperature control

Advantages

- Space and weight savings
- Simple mounting with two screws
- Improved temperature and power cycling
- Reduced protection circuits

| Symbol | Test Conditions | Characteristic Values | | |
|--------------------|--|-----------------------|------------------|---------|
| I_{RRM}, I_{DRM} | $T_{VJ} = T_{VJM}; V_R = V_{RRM}; V_D = V_{DRM}$ | 3 | mA | |
| V_T | $I_T = 80 A; T_{VJ} = 25^\circ C$ | 2.05 | V | |
| V_{TO} | For power-loss calculations only ($T_{VJ} = 125^\circ C$) | 0.85 | V | |
| r_T | | 18 | $\text{m}\Omega$ | |
| V_{GT} | $V_D = 6 V; T_{VJ} = 25^\circ C$ $T_{VJ} = -40^\circ C$ | 1.5 | V | |
| I_{GT} | $V_D = 6 V; T_{VJ} = 25^\circ C$ $T_{VJ} = -40^\circ C$ | 100 | mA | |
| V_{GD} | $T_{VJ} = T_{VJM}; V_D = 2/3 V_{DRM}$ | 0.2 | V | |
| I_{GD} | | 10 | mA | |
| I_L | $T_{VJ} = 25^\circ C; t_p = 10 \mu s; V_D = 6 V$ $I_G = 0.45 A; di_G/dt = 0.45 A/\mu s$ | 450 | mA | |
| I_H | $T_{VJ} = 25^\circ C; V_D = 6 V; R_{GK} = \infty$ | 200 | mA | |
| t_{gd} | $T_{VJ} = 25^\circ C; V_D = 1/2 V_{DRM}$ $I_G = 0.45 A; di_G/dt = 0.45 A/\mu s$ | 2 | μs | |
| t_q | $T_{VJ} = T_{VJM}; I_T = 20 A, t_p = 200 \mu s; -di/dt = 10 A/\mu s$ $V_R = 100 V; dv/dt = 20 V/\mu s; V_D = 2/3 V_{DRM}$ | typ. | 150 | μs |
| Q_s | $T_{VJ} = T_{VJM}; I_T = 25 A, -di/dt = 0.64 A/\mu s$ | 50 | μC | |
| I_{RM} | | 6 | A | |
| R_{thJC} | per thyristor; DC current | 1.3 | K/W | |
| | per module | 0.65 | K/W | |
| R_{thJK} | per thyristor; DC current | 1.5 | K/W | |
| | per module | 0.75 | K/W | |
| d_s | Creepage distance on surface | 12.7 | mm | |
| d_A | Strike distance through air | 9.6 | mm | |
| a | Maximum allowable acceleration | 50 | m/s^2 | |

Optional accessories for module-type MCC 19 version 1 B

Keyed gate/cathode twin plugs with wire length = 350 mm, gate = yellow, cathode = red
 Type ZY 200L (L = Left for pin pair 4/5) } UL 758, style 1385,
 Type ZY 200R (R = right for pin pair 6/7) } CSA class 5851, guide 460-1-1

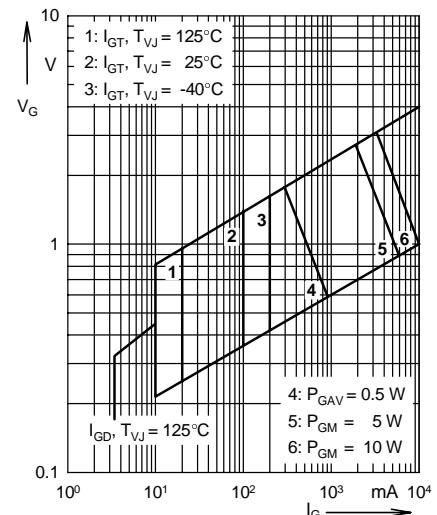


Fig. 1 Gate trigger characteristics

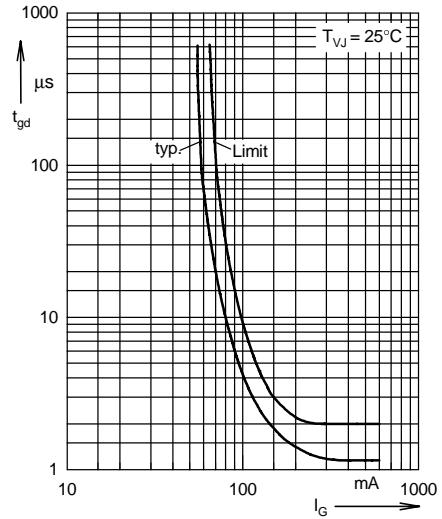
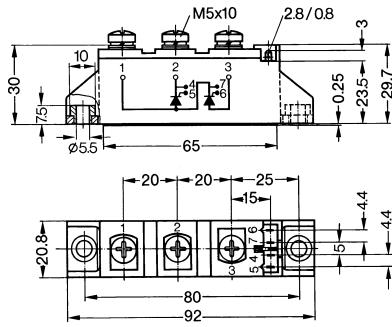


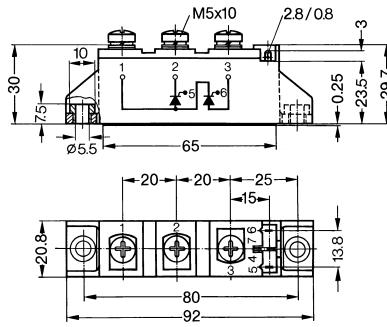
Fig. 2 Gate trigger delay time

Dimensions in mm (1 mm = 0.0394")

Version 1 B



Version 8 B



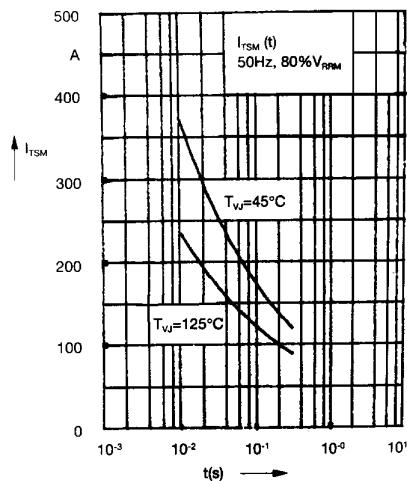


Fig. 3 Surge overload current
 I_{TSM} : Crest value, t : duration

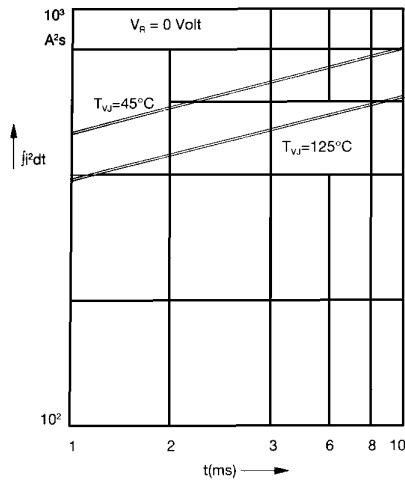


Fig. 4 $\int i^2 dt$ versus time (1-10 ms)

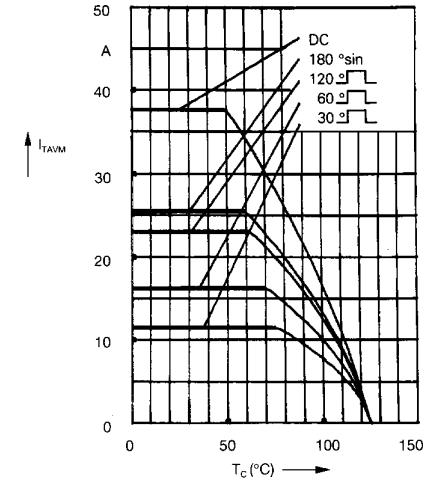


Fig. 4a Maximum forward current
at case temperature

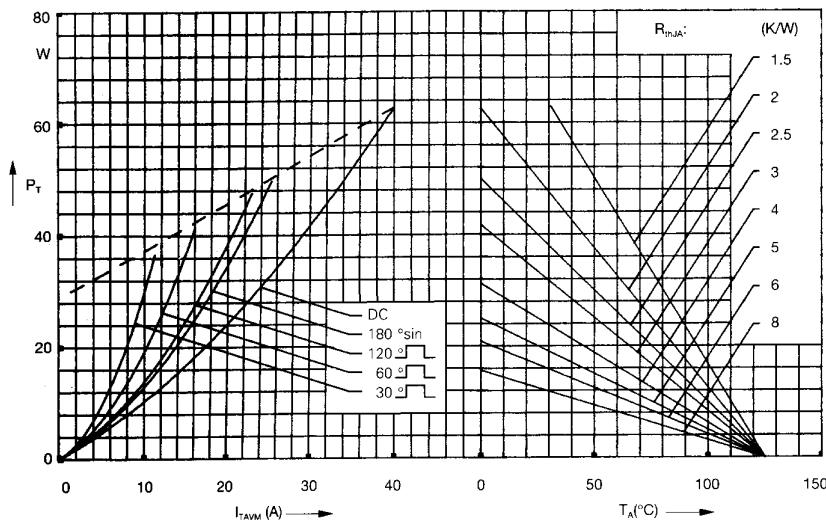


Fig. 5 Power dissipation versus on-state current and ambient temperature (per thyristor)

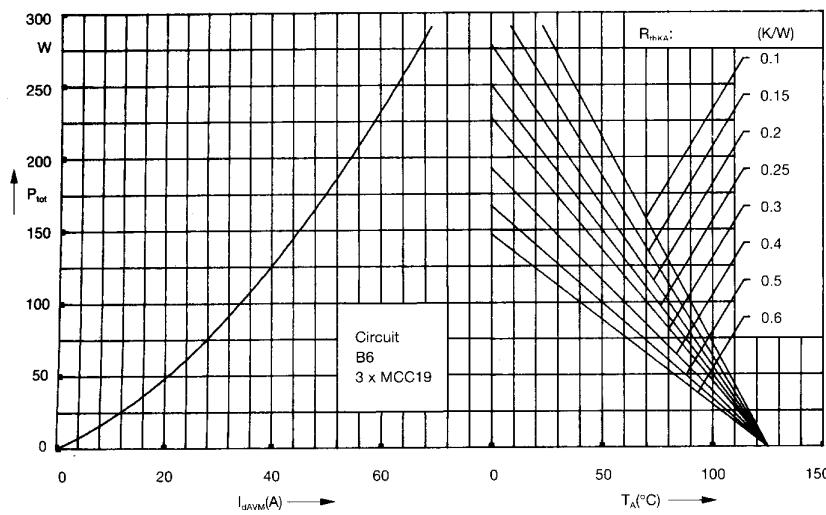


Fig. 6 Three phase rectifier bridge:
Power dissipation versus direct
output current and ambient
temperature

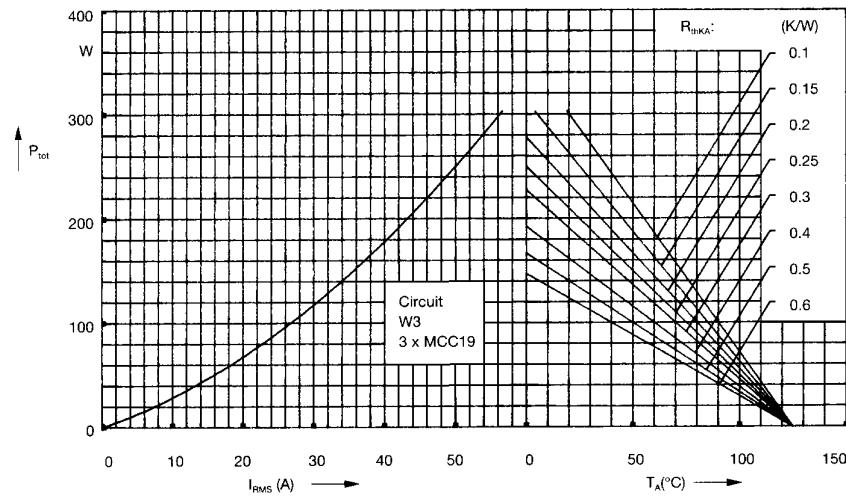


Fig. 7 Three phase AC-controller:
Power dissipation versus RMS
output current and ambient
temperature

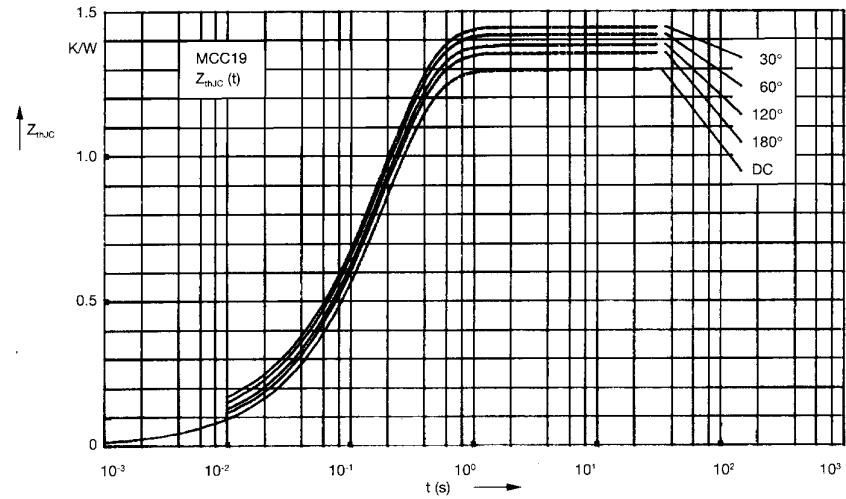


Fig. 8 Transient thermal impedance
junction to case (per thyristor)

R_{thJC} for various conduction angles d:

| d | R_{thJC} (K/W) |
|------|------------------|
| DC | 1.3 |
| 180° | 1.35 |
| 120° | 1.39 |
| 60° | 1.42 |
| 30° | 1.45 |

Constants for Z_{thJC} calculation:

| i | R_{thi} (K/W) | t_i (s) |
|---|-----------------|-----------|
| 1 | 0.018 | 0.0033 |
| 2 | 0.041 | 0.0216 |
| 3 | 1.241 | 0.191 |

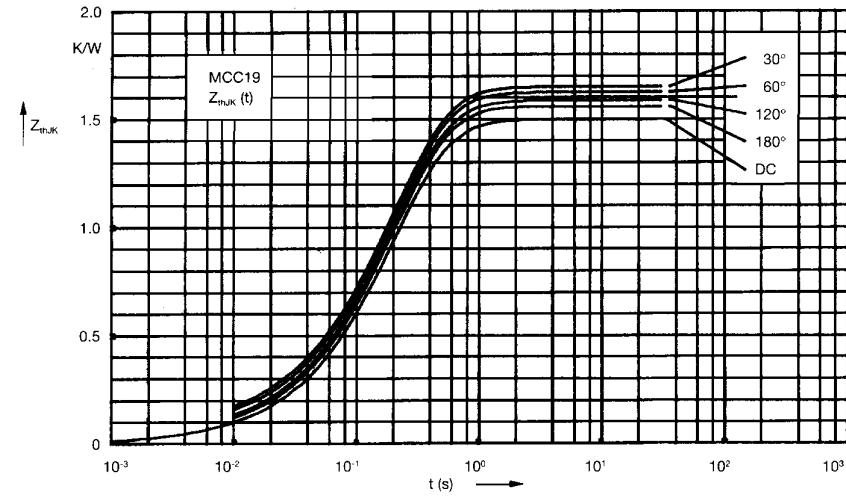


Fig. 9 Transient thermal impedance
junction to heatsink (per thyristor)

R_{thJK} for various conduction angles d:

| d | R_{thJK} (K/W) |
|------|------------------|
| DC | 1.5 |
| 180° | 1.55 |
| 120° | 1.59 |
| 60° | 1.62 |
| 30° | 1.65 |

Constants for Z_{thJK} calculation:

| i | R_{thi} (K/W) | t_i (s) |
|---|-----------------|-----------|
| 1 | 0.018 | 0.0033 |
| 2 | 0.041 | 0.0216 |
| 3 | 1.241 | 0.191 |
| 4 | 0.2 | 0.46 |