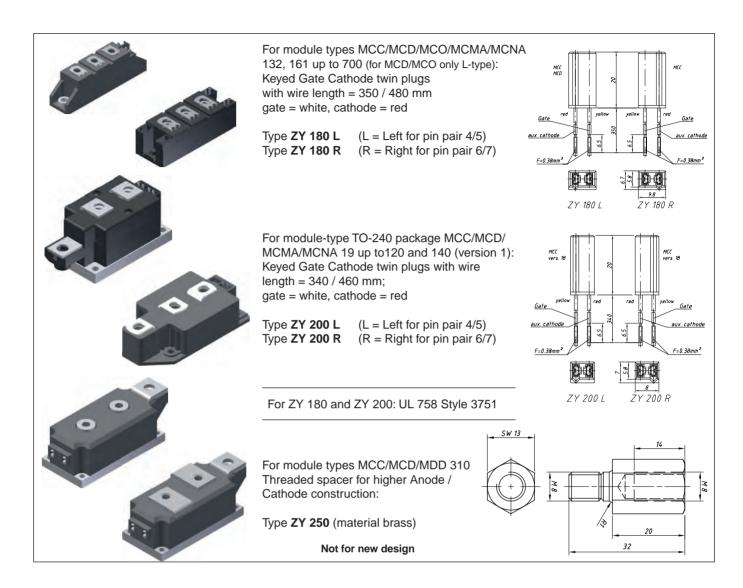
## Optional Accessories for Thyristor / Diode Modules



## **Design Information**

## For Thyristors, Diodes, Thyristor / Diode Modules and Rectifier Bridges

Surge current

Limiting Pt

Forward current

The 60 Hz value of  $I_{\text{TSM}}$  is 10% higher than the 50 Hz value The I<sub>TSM</sub> value at T<sub>VJM</sub> is 10% to 15% lower than the 45°C value

50 Hz:  $I^2t$  [A<sup>2</sup>s] =  $I_{TSM}$  [A] •  $I_{TSM}$  [A] • 0.005 [s]; use rated  $I_{TSM}$  value (10 ms) 60 Hz:  $I^2t[A^2s] = I_{TSM}[A] \cdot I_{TSM}[A] \cdot 0.0042[s]$ ; use 60-Hz-value of  $I_{TSM}$ 

The average current ratings in tables are mostly specified for temperature

conditions of:  $T_A = 45$ °C,  $T_C = 85$ °C or  $T_C = 100$ °C. For other temperature conditions the current ratings can be calculated using the

following formulas applicable up to 400 Hz.

$$I_{TAV} = \frac{-V_{T0} + \sqrt{V_{T0}^2 + 4 \cdot k^2 \cdot r_T \cdot P}}{2 \cdot k^2 \cdot r_T} \quad \text{where} \quad P = \frac{T_{VJM} - T_C}{R_{thJC}}$$

 $I_{TAV}\left[A\right],P\left[W\right];V_{T0}\left[V\right];r_{T}\left[\Omega\right],T_{VJM}\left[^{\circ}C\right],T_{C}\left[^{\circ}C\right],T_{A}\left[^{\circ}C\right],R_{thJC}\left[K/W\right],R_{thJA}\left[K/W\right]$ 

 $k^2 = 1$  for DC current

 $k^2 = 2.5$  for sinusoidal half wave current

k<sup>2</sup> = 3 for 120° rectangular current

k<sup>2</sup> = 6 for 60° rectangular current

The average forward current is limited by the RMS current value I<sub>T(RMS)</sub>. When the **calculated** value  $I_{TAV}$  is higher than  $I_{T(RMS)}/k$ , replace it by  $I_{TAV} = I_{T(RMS)}/k$ .

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