



Key Parameters

| | | | |
|--------------|---|------|----|
| $I_{F(AV)M}$ | = | 89 | A |
| V_{RRM} | = | 1200 | V |
| I_{FSM} | = | 2800 | A |
| V_{T0} | = | 0.75 | V |
| r_T | = | 2.3 | mΩ |

Properties

- International standard package
- High operation reliability
- Electrically insulated base plate

MAXIMUM ALLOWABLE RATINGS

| Symbols and parameters | | | Maximum Limits | Unit |
|------------------------|-------------------------------------|---|----------------|------------------|
| V_{RRM} | Repetitive peak reverse voltage | $T_{vj} = -40^{\circ}\text{C} \dots T_{vj \text{ max}}$ | 1200 | V |
| V_{RSM} | Non-repetitive peak reverse voltage | $T_{vj} = +25^{\circ}\text{C} \dots T_{vj \text{ max}}$ | 1300 | V |
| I_{FAVM} | Average on-state current | $T_C = 100^{\circ}\text{C}$ | 89 | A |
| I_{FRMSM} | Maximum RMS on-state current | | 140 | A |
| I_{FSM} | Surge current | $T_{vj} = 25^{\circ}\text{C}, t_p = 10 \text{ ms}$ | 2800 | A |
| | | $T_{vj} = T_{vj \text{ max}}, t_p = 10 \text{ ms}$ | 2400 | A |
| I^2t | Safety factor | $T_{vj} = 25^{\circ}\text{C}, t_p = 10 \text{ ms}$ | 39200 | A ² s |
| | | $T_{vj} = T_{vj \text{ max}}, t_p = 10 \text{ ms}$ | 28800 | A ² s |

CHARACTERISTICS

| Symbols and parameters | | | Value | | | Unit |
|------------------------|-------------------|--|-------|-----|------|------|
| | | | min | typ | max | |
| V_F | On-state voltage | $T_{vj} = T_{vj \text{ max}}, I_F = 300 \text{ A}$ | | | 1.5 | V |
| $V_{(T0)}$ | Threshold voltage | $T_{vj} = T_{vj \text{ max}}$ | | | 0.75 | V |
| r_T | Slope resistance | $T_{vj} = T_{vj \text{ max}}$ | | | 2.3 | mΩ |

| | | | | | | |
|-------------------------|-------------------------|--|--|--|------------|----|
| I_R | Reverse current | $T_{vj} = T_{vj\ max}, V_R = V_{RRM}$ | | | 20 | mA |
| V_{ISOL} | Insulation test voltage | RMS, f = 50Hz, t = 1 sec RMS, f = 50Hz, t = 1 min | | | 3.0 2.5 | kV |

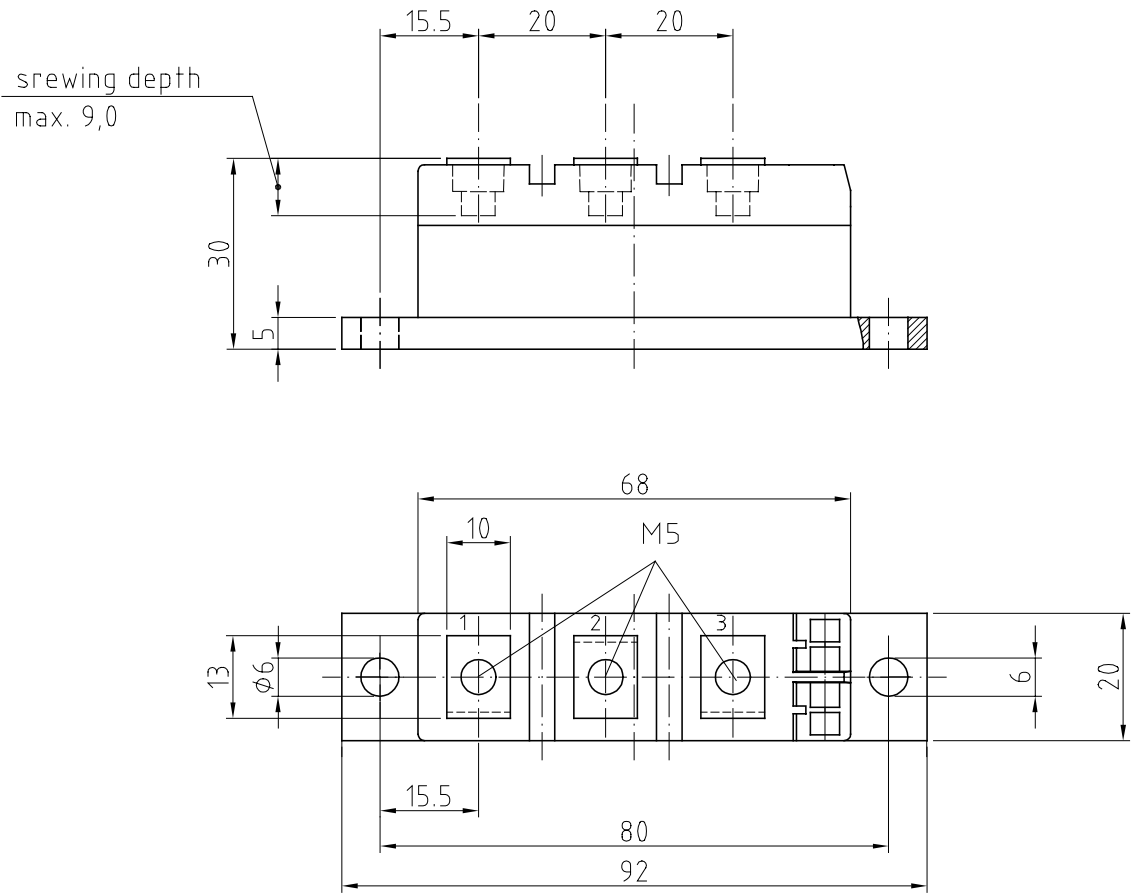
THERMAL PARAMETERS

| Symbols and parameters | | | Value | Unit |
|----------------------------|---|--------------------------------------|------------|------|
| R_{th(j-c)} | Thermal resistance, junction to case | per Module, $\theta = 180^\circ$ sin | 0.225 | °C/W |
| | | per arm, $\theta = 180^\circ$ sin | 0.450 | |
| | | per Module, DC | 0.215 | |
| | | per arm, DC | 0.430 | |
| R_{th(c-h)} | Thermal resistance, case to heatsink | per Module | 0.05 | °C/W |
| | | per arm | 0.10 | |
| T_{vj max} | Maximum junction temperature | | +150 | °C |
| T_{C op} | Operating temperature range | | -40...+150 | °C |
| T_{stg} | Storage temperature range | | -40...+150 | °C |

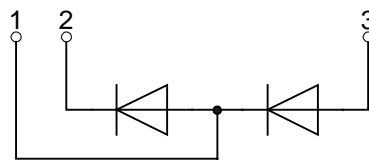
MECHANICAL PARAMETERS

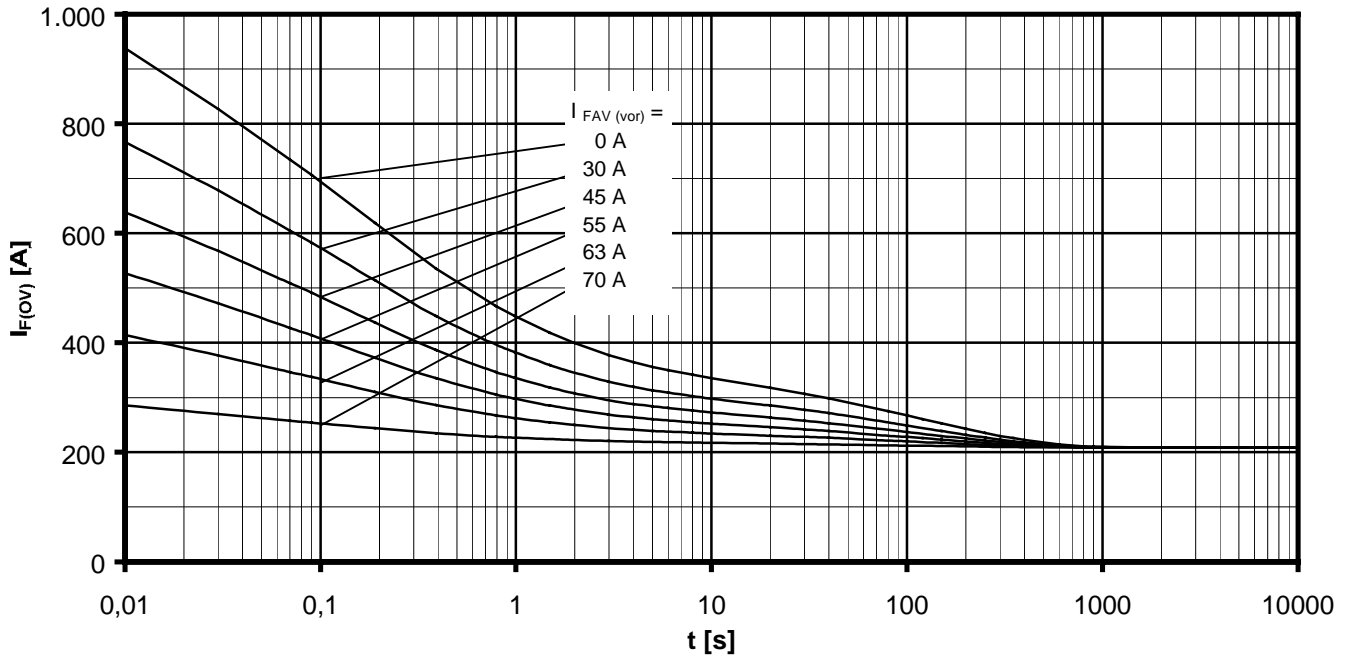
| Symbols and parameters | | | Value | Unit |
|------------------------|----------------------------|----------------------|-------|------------------|
| M1 | Mounting torque | Tolerance $\pm 15\%$ | 4 | Nm |
| M2 | Terminal connection torque | Tolerance $\pm 10\%$ | 4 | Nm |
| W | Weight | | 160 | g |
| a | Vibration resistance | f = 50 Hz | 50 | m/s ² |

DIMENSIONS



TOPOLOGY OF INTERNAL CONNECTION



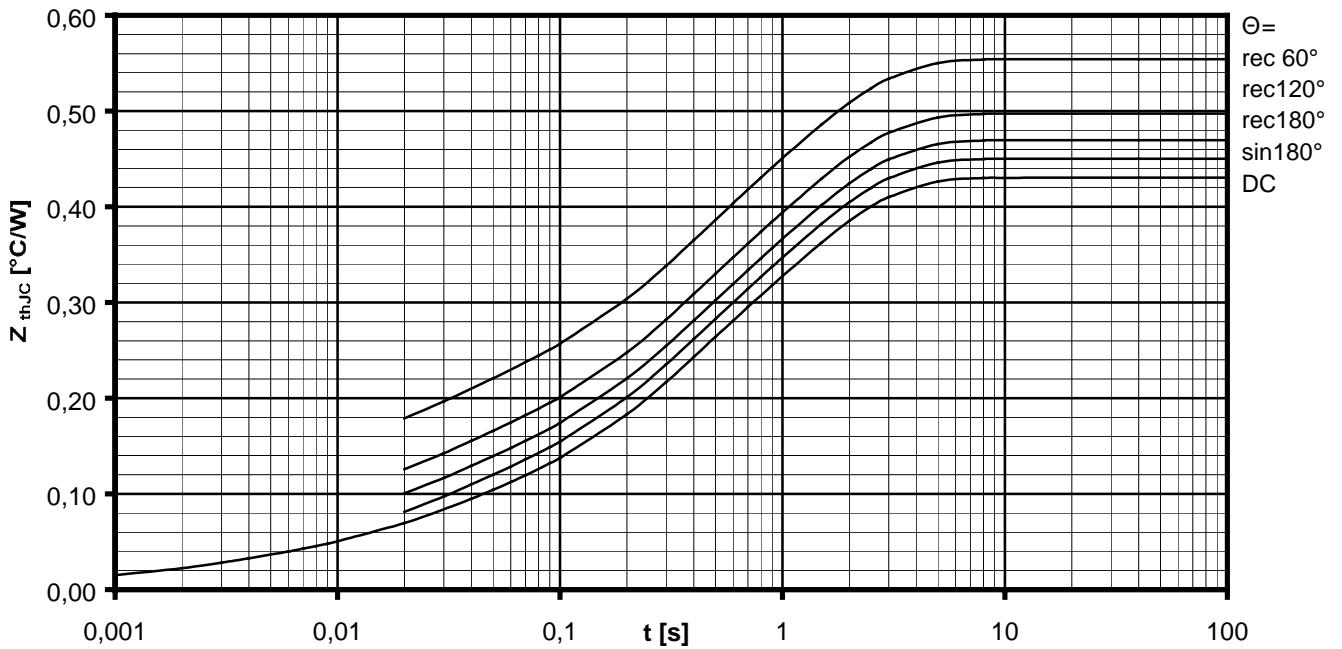


Overload on-state current $I_{F(ov)}$

B6- Six-pulse bridge circuit 120° rectangular Heatsink type KM14 (Papst 4650)

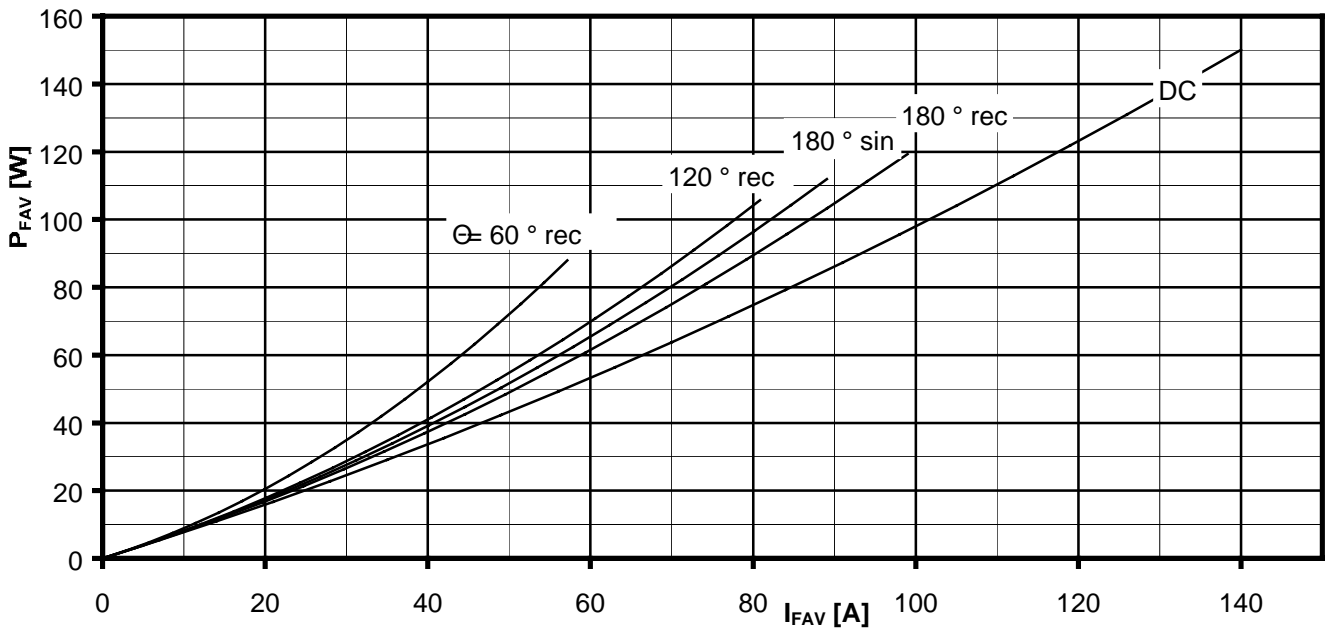
Forced cooling at $T_A = 35^\circ\text{C}$

Parameter: Pre-load current per arm $I_{FAV(vor)}$



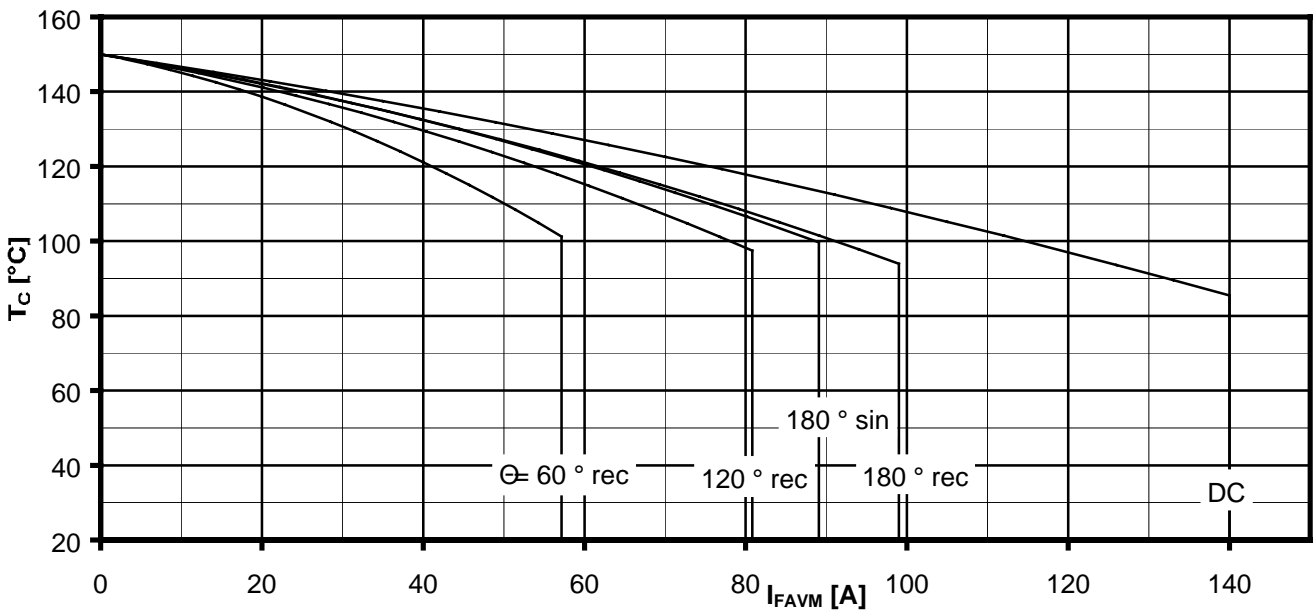
Transient thermal impedance per arm $Z_{thJC} = f(t)$

Parameter: Current conduction angle Θ



On-state power loss per arm $P_{FAV} = f(I_{FAV})$

Parameter: Current conduction angle Θ

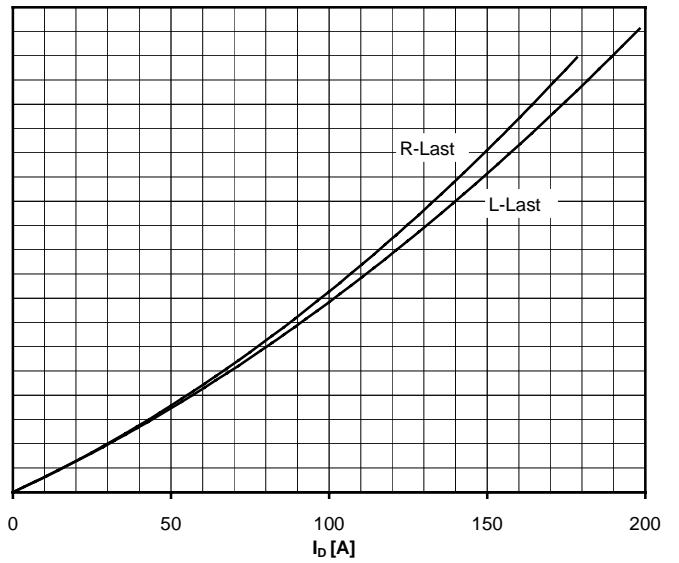
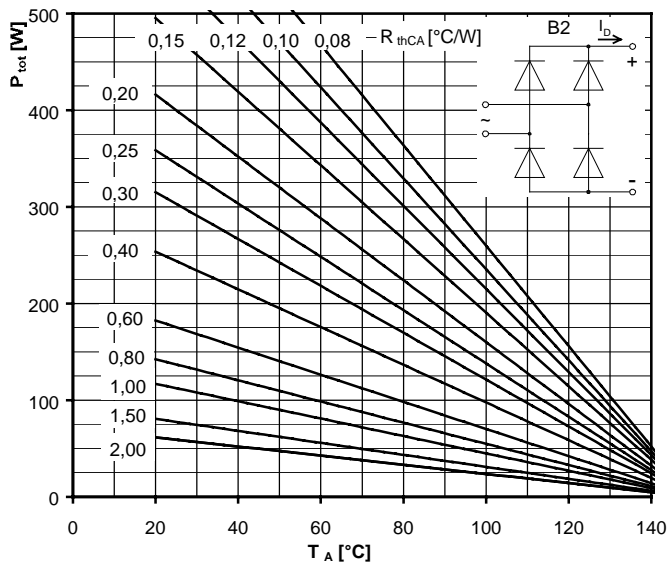


Maximum allowable case temperature $T_C = f(I_{FAVM})$

Current load per arm

Calculation base P_{TAV}

Parameter: Current conduction angle Θ



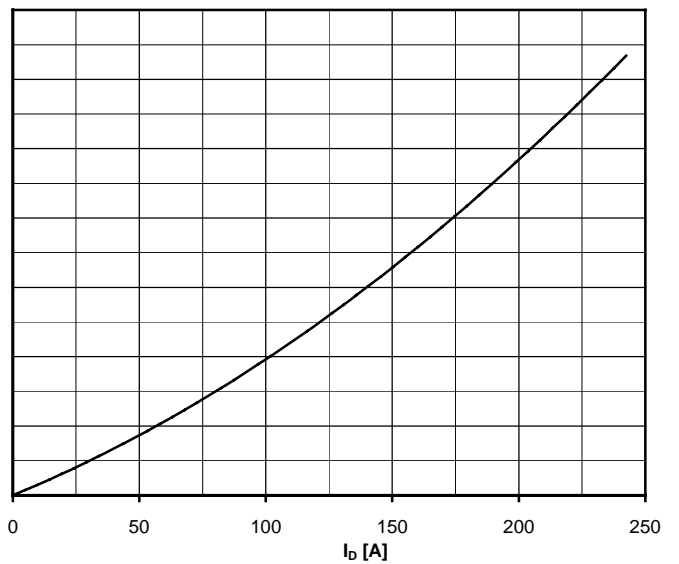
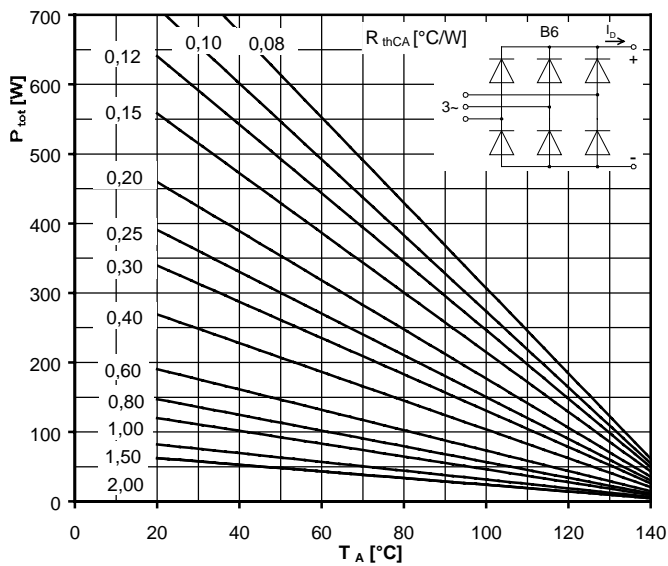
Maximum rated output current I_b

B2- Two-pulse bridge circuit

Total power dissipation at circuit P_{tot}

Parameter:

Thermal resistance cases to ambient R_{thCA}



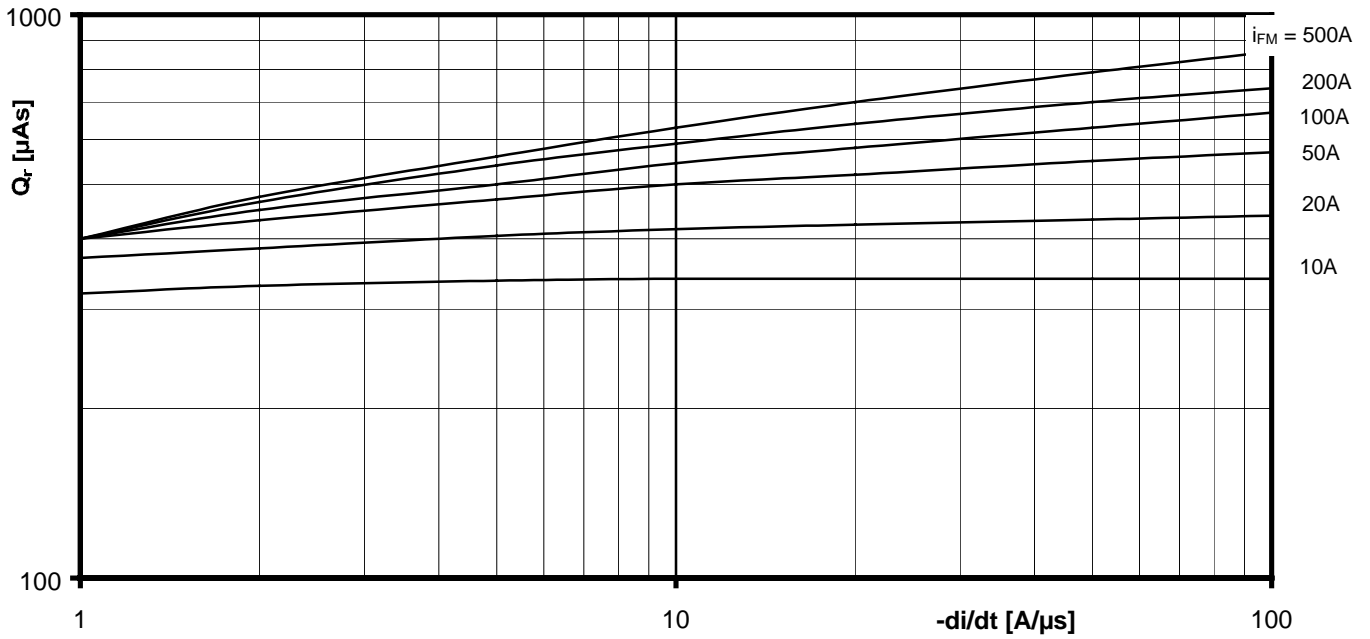
Maximum rated output current I_b

B6- Six-pulse bridge circuit

Total power dissipation at circuit P_{tot}

Parameter:

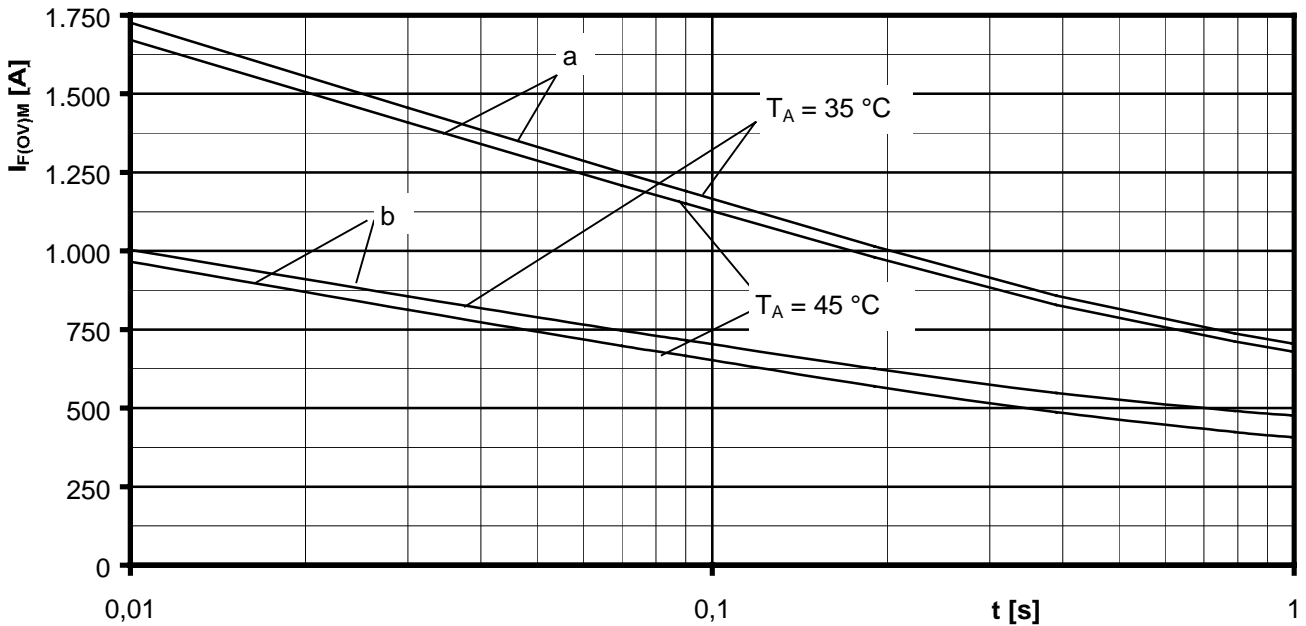
Thermal resistance cases to ambient R_{thCA}



Recovered charge $Q_r = f(-di/dt)$

$T_{vj} = T_{vjmax}$, $V_R \leq 0,5 V_{RRM}$, $V_{RM} = 0,8 V_{RRM}$

Parameter: On-state current i_{FM}



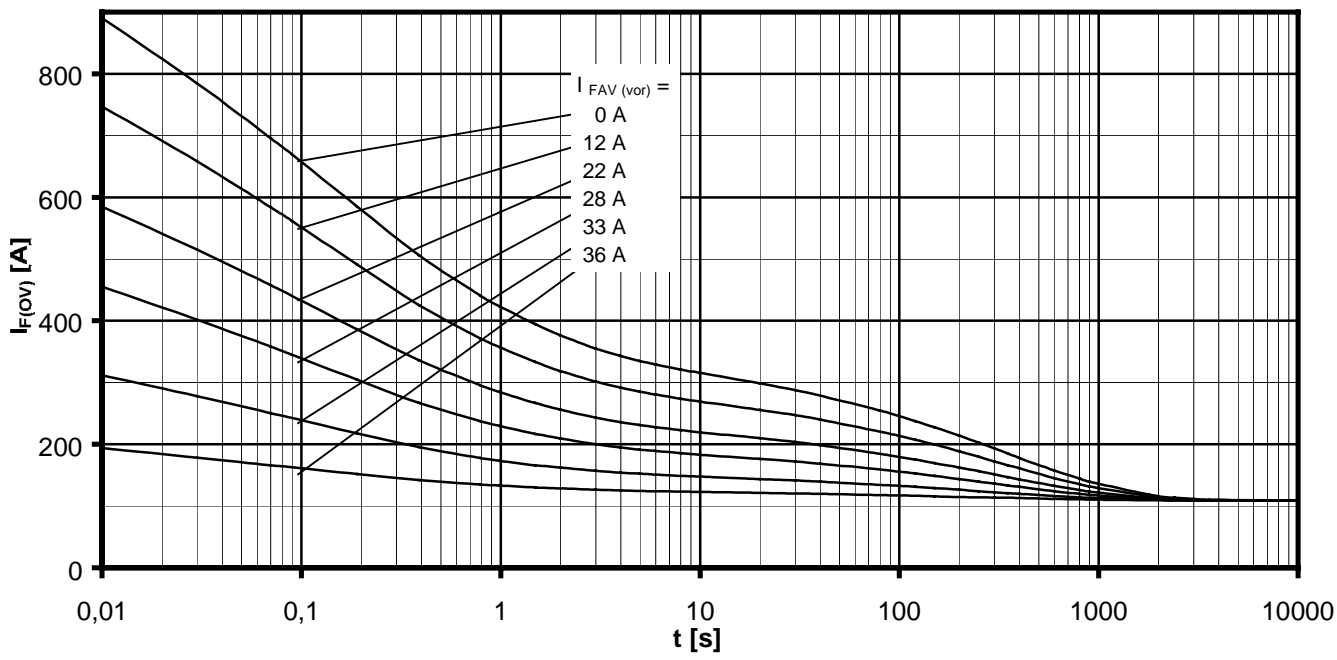
Maximum overload on-state current per arm $I_{F(OV)M} = f(t)$, $V_{RM} = 0,8 V_{RRM}$

a: No-load conditions

b: Pre-load current per arm $I_{FAV(vor)} = I_{FAVM}$

$T_a = 35^\circ\text{C}$, Forced air cooling Heatsink type: KM14 (Papst 4650)

$T_a = 45^\circ\text{C}$, Natural air cooling Heatsink type: KM14 (50W)



Overload on-state current $I_{F(ov)}$

B6- Six-pulse bridge circuit, 120° rectangular Heatsink type KM14 (50W)

Natural cooling at $T_A = 45^\circ\text{C}$

Parameter: Pre-load current per arm $I_{FAV(vor)}$