

<b>N</b>		<b>Datenblatt / Data sheet</b>	power electronics in motion <b>eupec</b>
<b>Netz-Dioden-Modul Rectifier Diode Module</b>		<b>DD285N</b>	

**DD285N**

**Elektrische Eigenschaften / Electrical properties**

Höchstzulässige Werte / Maximum rated values

Periodische Spitzensperrspannung repetitive peak reverse voltages	T <sub>vj</sub> = -40°C... T <sub>vj max</sub>	V <sub>RRM</sub>	400	600	V
				800	V
Stoßspitzensperrspannung non-repetitive peak reverse voltage	T <sub>vj</sub> = +25°C... T <sub>vj max</sub>	V <sub>RSM</sub>	500	700	V
				900	V
Durchlaßstrom-Grenzeffektivwert maximum RMS on-state current		I <sub>FRMSM</sub>		450	A
Dauergrenzstrom average on-state current	T <sub>C</sub> = 100°C	I <sub>FAVM</sub>		285	A
Stoßstrom-Grenzwert surge current	T <sub>vj</sub> = 25 °C, t <sub>p</sub> = 10 ms T <sub>vj</sub> = T <sub>vj max</sub> , t <sub>p</sub> = 10 ms	I <sub>FSM</sub>		9.500	A
				8.300	A
Grenzlastintegral I <sup>2</sup> t-value	T <sub>vj</sub> = 25 °C, t <sub>p</sub> = 10 ms T <sub>vj</sub> = T <sub>vj max</sub> , t <sub>p</sub> = 10 ms	I <sup>2</sup> t		451.000	A <sup>2</sup> s
				344.000	A <sup>2</sup> s

Charakteristische Werte / Characteristic values

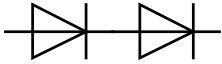
Durchlaßspannung on-state voltage	T <sub>vj</sub> = T <sub>vj max</sub> , I <sub>F</sub> = 800 A	V <sub>F</sub>	max.	1,15	V
Schleusenspannung threshold voltage	T <sub>vj</sub> = T <sub>vj max</sub>	V <sub>(TO)</sub>		0,75	V
Ersatzwiderstand slope resistance	T <sub>vj</sub> = T <sub>vj max</sub>	Γ <sub>T</sub>		0,4	mΩ
Sperrstrom reverse current	T <sub>vj</sub> = T <sub>vj max</sub> , V <sub>R</sub> = V <sub>RRM</sub>	I <sub>R</sub>	max.	20	mA
Isolations-Prüfspannung insulation test voltage	RMS, f = 50 Hz, t = 1 sec RMS, f = 50 Hz, t = 1 min	V <sub>ISOL</sub>		3,6	kV
				3,0	kV


**Thermische Eigenschaften / Thermal properties**

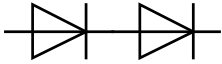
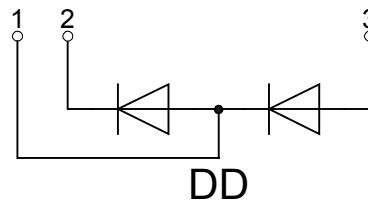
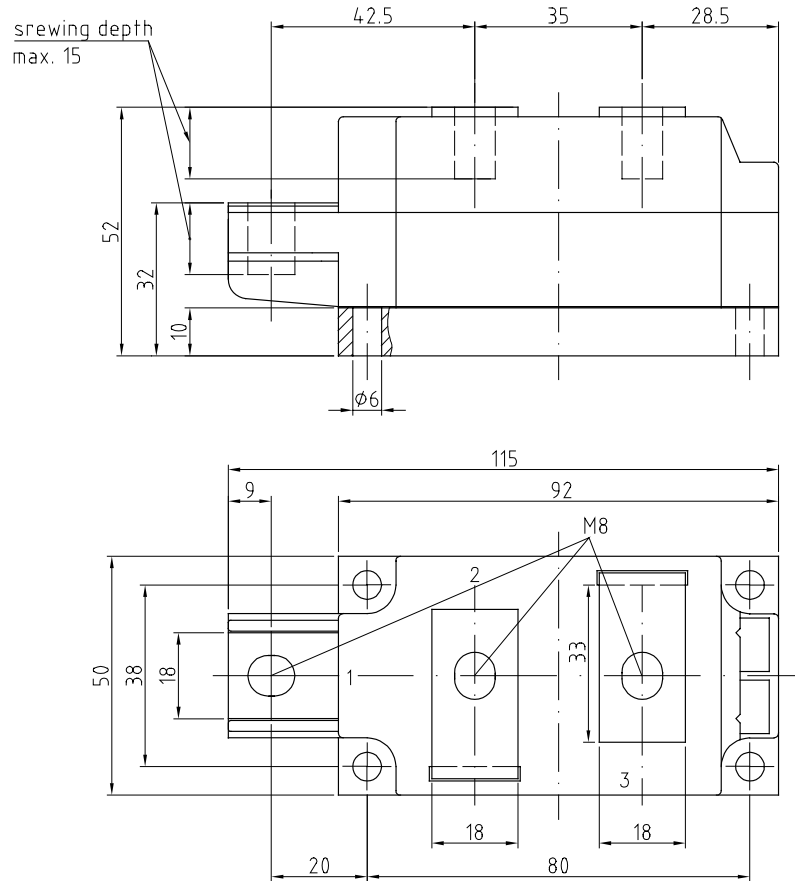
Innerer Wärmewiderstand thermal resistance, junction to case	pro Modul / per Module, Θ = 180° sin pro Zweig / per arm, Θ = 180° sin pro Modul / per Module, DC pro Zweig / per arm, DC	R <sub>thJC</sub>	max.	0,085	°C/W
			max.	0,170	°C/W
			max.	0,082	°C/W
			max.	0,164	°C/W
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	pro Modul / per Module pro Zweig / per arm	R <sub>thCH</sub>	max.	0,02	°C/W
			max.	0,04	°C/W
Höchstzulässige Sperrschichttemperatur maximum junction temperature		T <sub>vj max</sub>		150	°C
Betriebstemperatur operating temperature		T <sub>c op</sub>		- 40...+150	°C
Lagertemperatur storage temperature		T <sub>stg</sub>		- 40...+150	°C

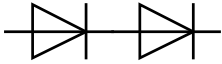
prepared by:	C. Drilling	date of publication:	30.04.03
approved by:	M. Leifeld	revision:	1



**N****Datenblatt / Data sheet**power electronics in motion  
**eupec****Netz-Dioden-Modul  
Rectifier Diode Module****DD285N****Mechanische Eigenschaften / Mechanical properties**

Gehäuse, siehe Anlage case, see annex			Seite 3 page 3	
Si-Element mit Druckkontakt Si-pellet with pressure contact				
Innere Isolation internal insulation			AIN	
Anzugsdrehmoment für mechanische Anschlüsse mounting torque	Toleranz ±15%	M1	5	Nm
Anzugsdrehmoment für elektrische Anschlüsse terminal connection torque	Toleranz ±10%	M2	12	Nm
Gewicht weight		G	typ. 800	g
Kriechstrecke creepage distance			17	mm
Schwingfestigkeit vibration resistance	f = 50 Hz		50	m/s <sup>2</sup>
	file-No.		E 83336	

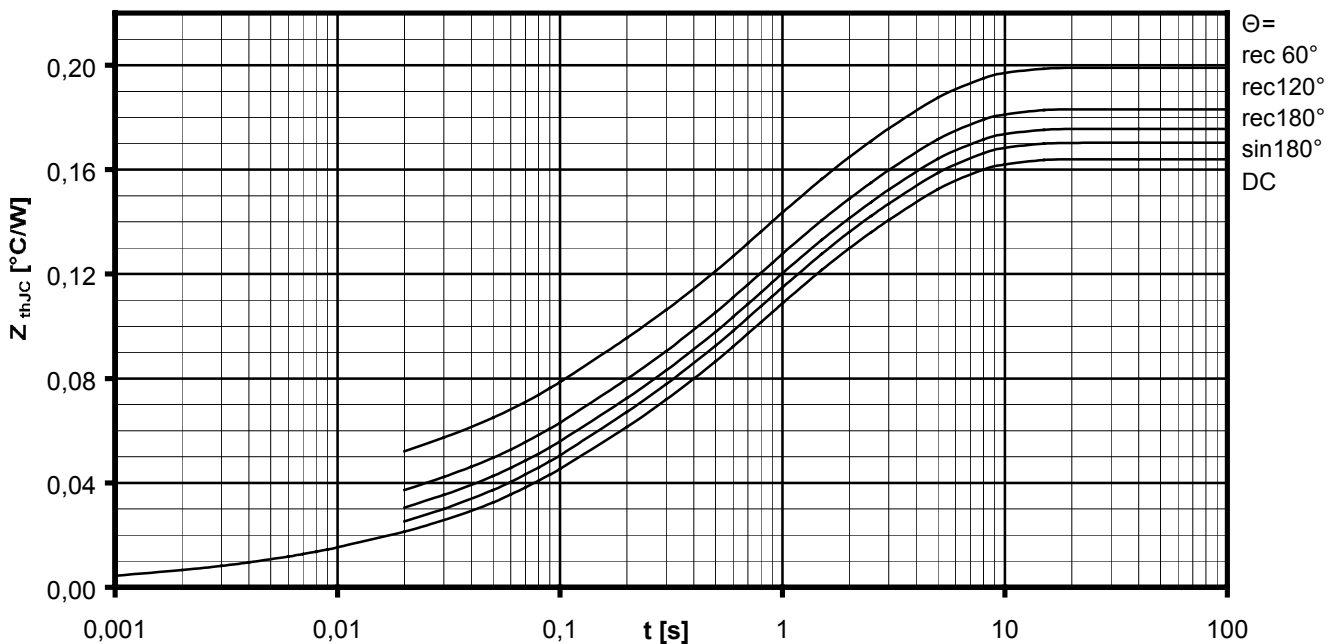
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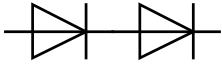
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Rectifier Diode Module**DD285N**
**Analytische Elemente des transienten Wärmewiderstandes  $Z_{thJC}$  für DC**  
**Analytical elements of transient thermal impedance  $Z_{thJC}$  for DC**

Pos. n	1	2	3	4	5	6	7
$R_{thn}$ [°C/W]	0,0039	0,0097	0,0291	0,0552	0,0661		
$T_n$ [s]	0,0008	0,008	0,085	0,54	2,85		

Analytische Funktion / Analytical function:

$$Z_{thJC} = \sum_{n=1}^{n_{max}} R_{thn} \left( 1 - e^{-\frac{t}{\tau_n}} \right)$$


**Transienter innerer Wärmewiderstand je Zweig / Transient thermal impedance per arm  $Z_{thJC} = f(t)$** 
Parameter: Stromflußwinkel  $\Theta$  / Current conduction angle  $\Theta$

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Natürliche Kühlung / Natural cooling  
3 Module pro Kühler / 3 modules per heatsink  
Kühler / Heatsink type: KM17 (60W)

**Analytische Elemente des transienten Wärmewiderstandes  $Z_{thCA}$**   
**Analytical elements of transient thermal impedance  $Z_{thCA}$**

Pos. n	1	2	3	4	5	6	7
$R_{thn}$ [°C/W]	0,0205	0,07905	1,535				
$T_n$ [s]	2,04	36,4	1340				

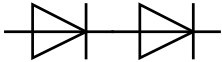
Verstärkte Kühlung / Forced cooling  
3 Module pro Kühler / 3 modules per heatsink  
Kühler / Heatsink type: KM17 (Papst 4650)

**Analytische Elemente des transienten Wärmewiderstandes  $Z_{thCA}$**   
**Analytical elements of transient thermal impedance  $Z_{thCA}$**

Pos. n	1	2	3	4	5	6	7
$R_{thn}$ [°C/W]	0,015	0,08	0,475				
$T_n$ [s]	4,11	40,4	458				

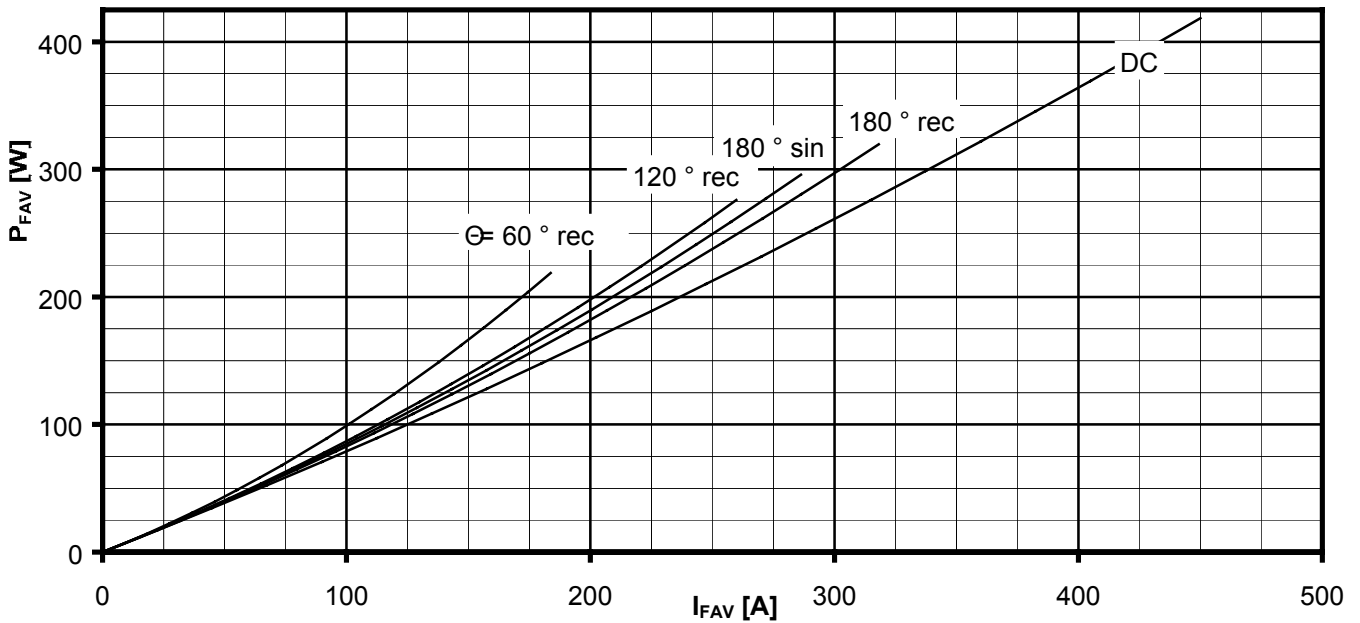
Analytische Funktion / Analytical function:

$$Z_{thCA} = \sum_{n=1}^{n_{max}} R_{thn} \left( 1 - e^{-\frac{t}{\tau_n}} \right)$$



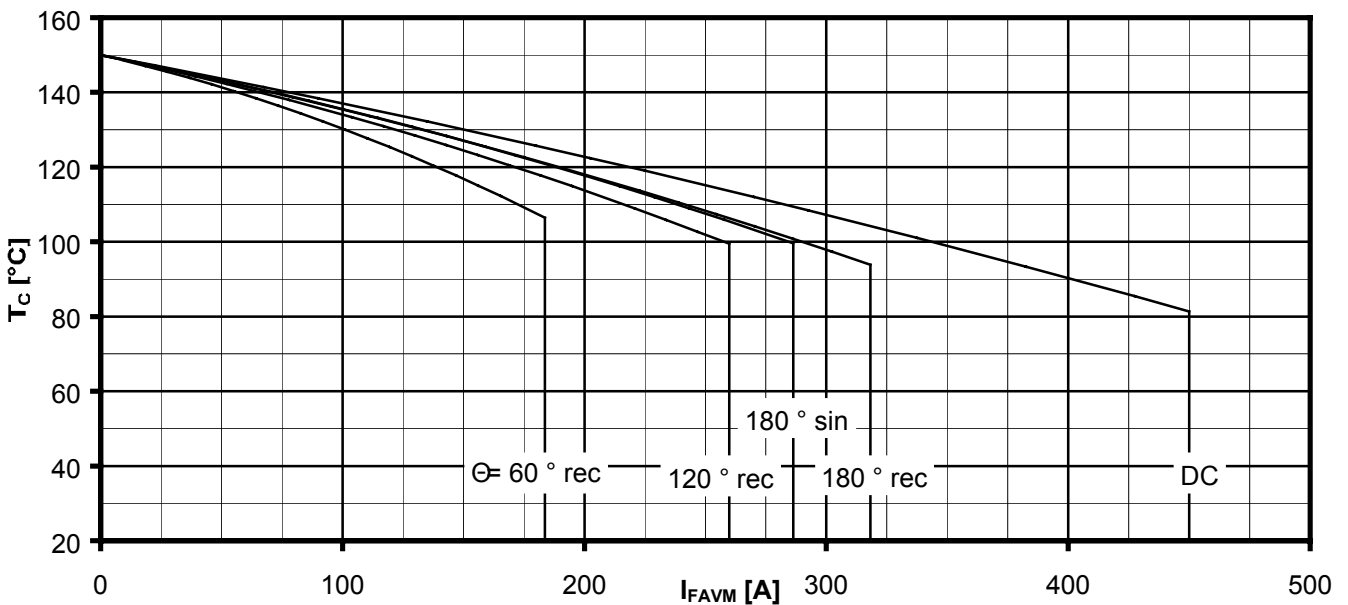
Netz-Dioden-Modul  
Rectifier Diode Module

**DD285N**



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

Parameter: Stromflußwinkel / Current conduction angle  $\Theta$

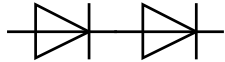


Höchstzulässige Gehäusetemperatur / Maximum allowable case temperature  $T_c = f(I_{FAVM})$

Strombelastung je Zweig / Current load per arm

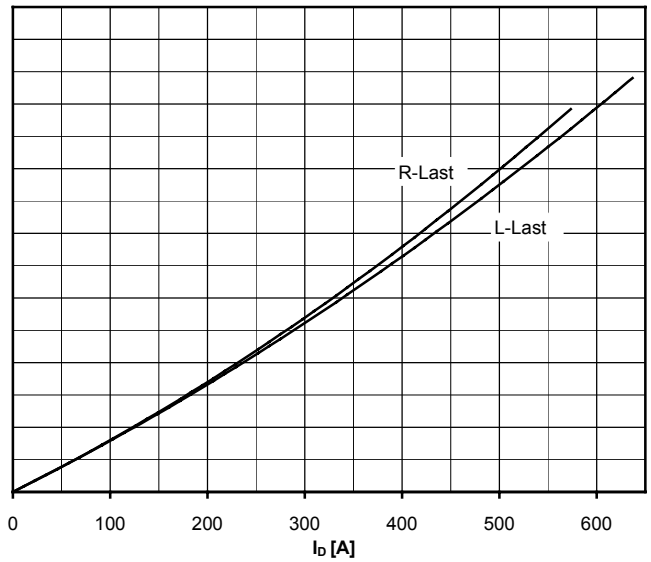
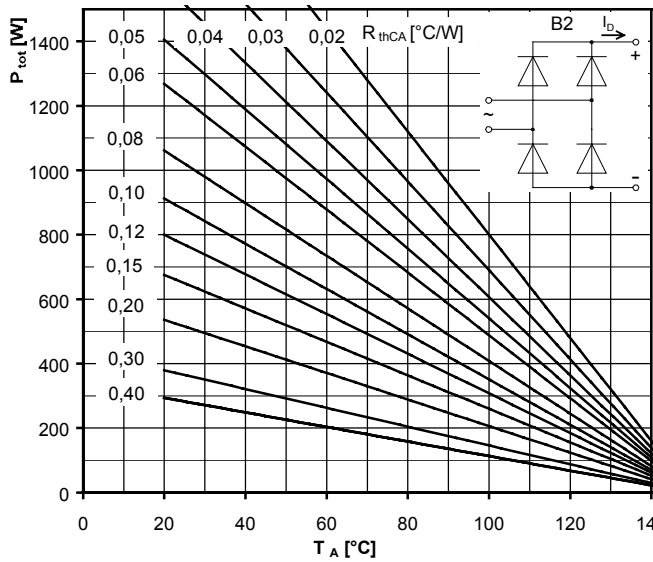
Berechnungsgrundlage  $P_{TAV}$   
Calculation base  $P_{TAV}$

Parameter: Stromflußwinkel  $\Theta$  / Current conduction angle  $\Theta$



**Netz-Dioden-Modul  
Rectifier Diode Module**

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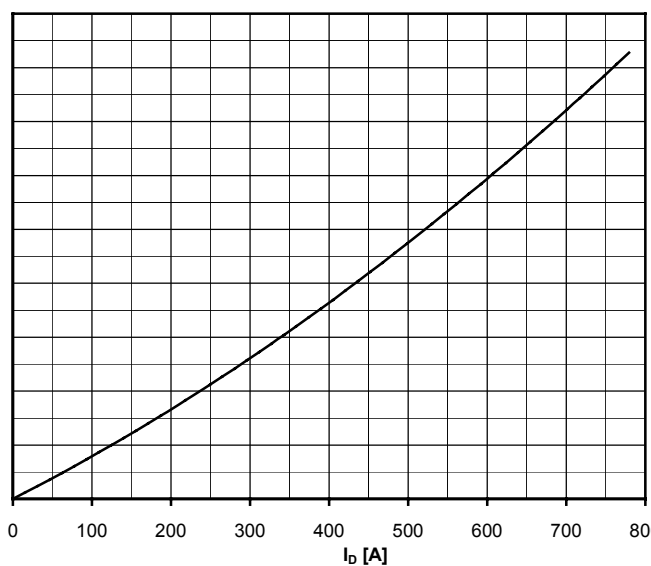
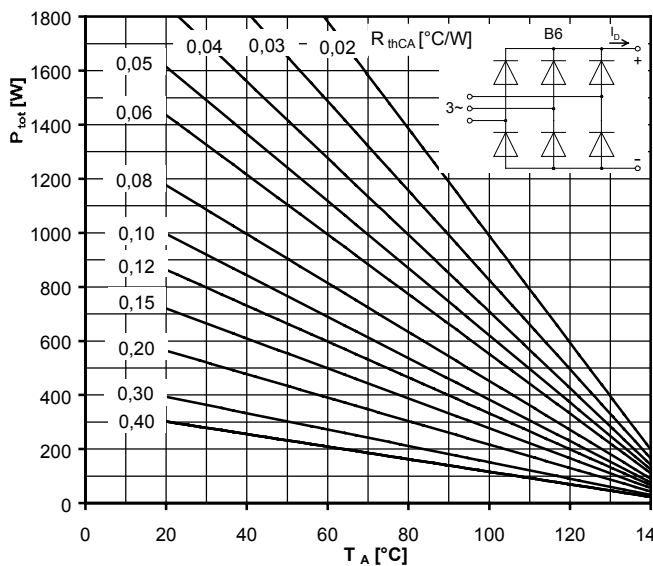
**Höchstzulässiger Ausgangsstrom / Maximum rated output current  $I_b$**

B2- Zweipuls-Brückenschaltung / Two-pulse bridge circuit

Gesamtverlustleistung der Schaltung / Total power dissipation at circuit  $P_{tot}$

Parameter:

Wärmewiderstand zwischen den Gehäusen und Umgebung / Thermal resistance cases to ambient  $R_{thCA}$



**Höchstzulässiger Ausgangsstrom / Maximum rated output current  $I_b$**

B6- Sechspuls-Brückenschaltung / Six-pulse bridge circuit

Gesamtverlustleistung der Schaltung / Total power dissipation at circuit  $P_{tot}$

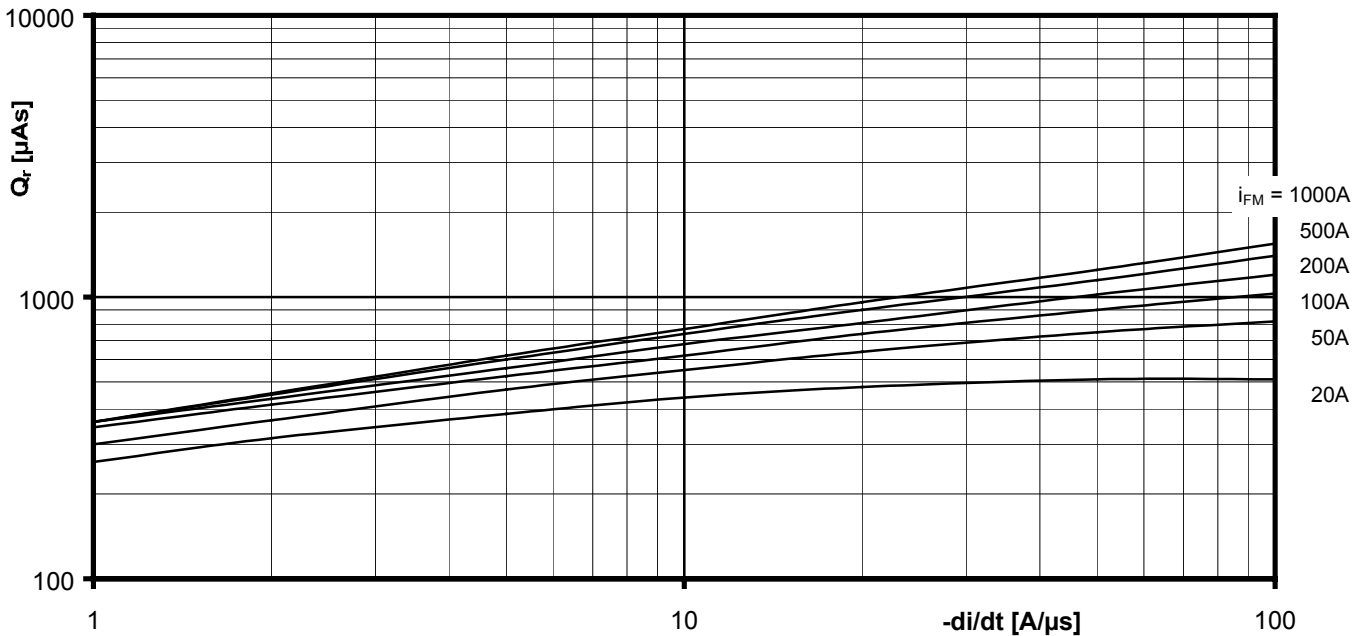
Parameter:

Wärmewiderstand zwischen den Gehäusen und Umgebung / Thermal resistance cases to ambient  $R_{thCA}$



Netz-Dioden-Modul  
Rectifier Diode Module

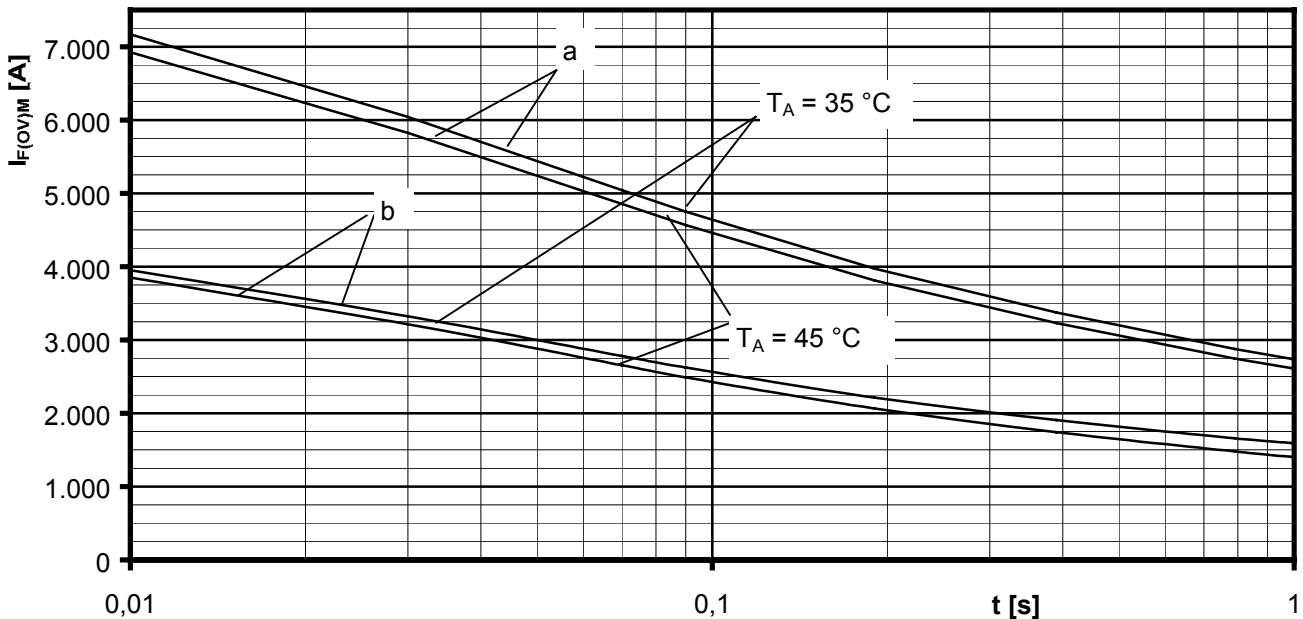
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Sperrverzögerungsladung / Recovered charge  $Q_r = f(-di/dt)$

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

Parameter: Durchlaßstrom / On-state current  $i_{FM}$



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

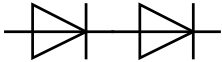
a: Leerlauf / No-load conditions

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

$T_a = 35^\circ\text{C}$ , verstärkte Luftkühlung / Forced air cooling    Kühlkörper / Heatsink type: KM17 (Papst 4650)

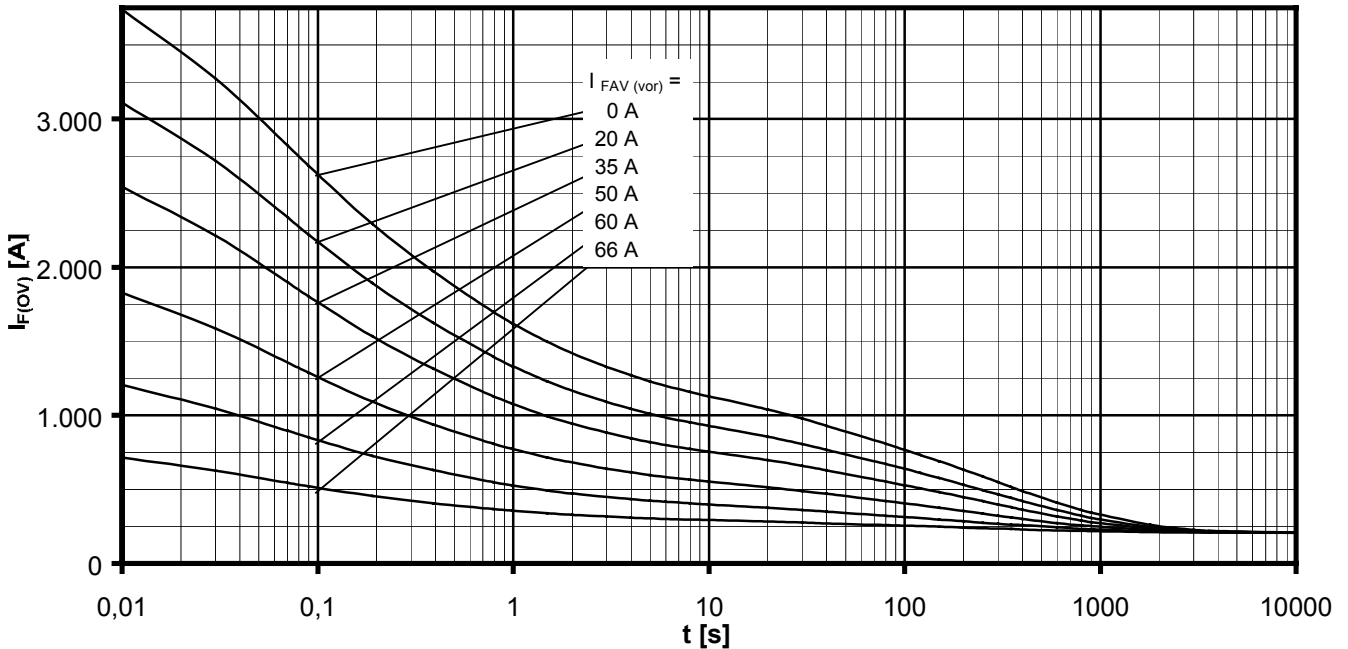
$T_a = 45^\circ\text{C}$ , natürliche Luftkühlung / Natural air cooling    Kühlkörper / Heatsink type: KM17 (60W)





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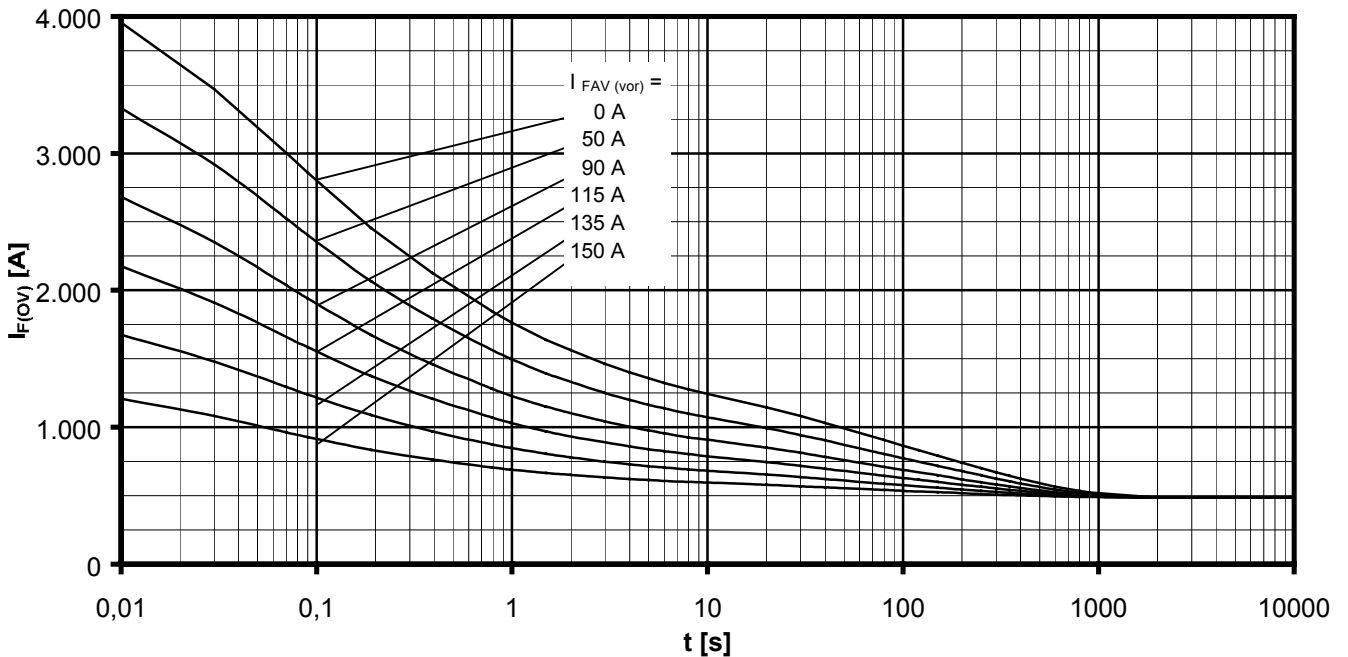


Überstrom je Zweig / Overload on-state current  $I_{F(ov)}$

B6- Sechspuls-Brückenschaltung, 120° Rechteck / Six-pulse bridge circuit, 120° rectangular

Kühlkörper / Heatsink type KM17 (60W) Natürliche Kühlung bei / Natural cooling at  $T_A = 45^\circ\text{C}$

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



Überstrom je Zweig / Overload on-state current  $I_{F(ov)}$

B6- Sechspuls-Brückenschaltung, 120° Rechteck / Six-pulse bridge circuit 120° rectangular

Kühlkörper / Heatsink type KM17 (Papst 4650) Verstärkte Kühlung bei / Forced cooling at  $T_A = 35^\circ\text{C}$

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

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