

N		Datenblatt / Data sheet	power electronics in motion eupec
Netz-Dioden-Modul Rectifier Diode Module		DD350N	

DD350N

DD350N..K..-K

Elektrische Eigenschaften / Electrical properties

Höchstzulässige Werte / Maximum rated values

Periodische Spitzensperrspannung repetitive peak reverse voltages	$T_{vj} = -40^{\circ}\text{C} \dots T_{vj\text{max}}$	V_{RRM}	1200 1600	1400 1800	V V
Stoßspitzensperrspannung non-repetitive peak reverse voltage	$T_{vj} = +25^{\circ}\text{C} \dots T_{vj\text{max}}$	V_{RSM}	1300 1700	1500 1900	V V
Durchlaßstrom-Grenzeffektivwert maximum RMS on-state current		I_{FRMSM}		550	A
Dauergrenzstrom average on-state current	$T_C = 100^{\circ}\text{C}$	I_{FAVM}		350	A
Stoßstrom-Grenzwert surge current	$T_{vj} = 25^{\circ}\text{C}, t_p = 10\text{ms}$ $T_{vj} = T_{vj\text{max}}, t_p = 10\text{ms}$	I_{FSM}		13.000 11.000	A A
Grenzlastintegral I^2t -value	$T_{vj} = 25^{\circ}\text{C}, t_p = 10\text{ms}$ $T_{vj} = T_{vj\text{max}}, t_p = 10\text{ms}$	I^2t		845.000 605.000	A ² s A ² s

Charakteristische Werte / Characteristic values

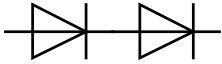
Durchlaßspannung on-state voltage	$T_{vj} = T_{vj\text{max}}, I_F = 1000\text{A}$	V_F	max.	1,28	V
Schleusenspannung threshold voltage	$T_{vj} = T_{vj\text{max}}$	$V_{(TO)}$		0,75	V
Ersatzwiderstand slope resistance	$T_{vj} = T_{vj\text{max}}$	Γ_T		0,4	mΩ
Sperrstrom reverse current	$T_{vj} = T_{vj\text{max}}, V_R = V_{RRM}$	i_R	max.	30	mA
Isolations-Prüfspannung insulation test voltage	RMS, $f = 50\text{Hz}, t = 1\text{sec}$ RMS, $f = 50\text{Hz}, t = 1\text{min}$	V_{ISOL}		3,6 3,0	kV kV


Thermische Eigenschaften / Thermal properties

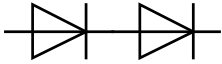
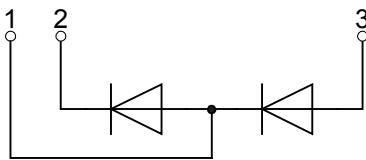
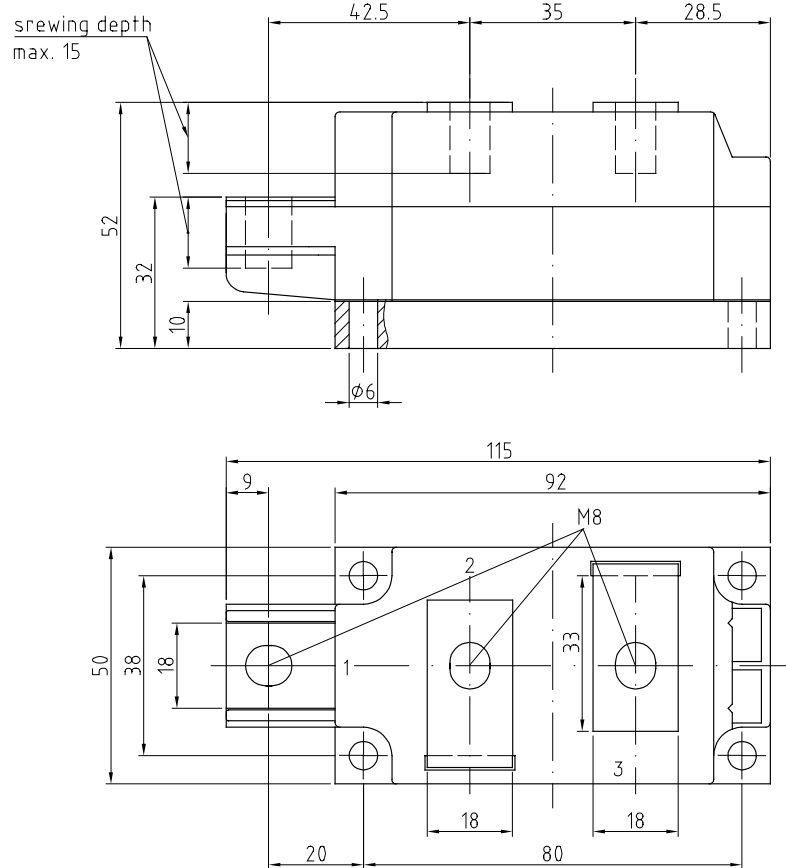
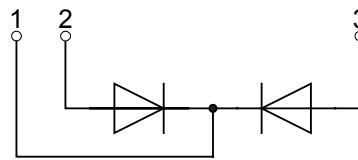
Innerer Wärmewiderstand thermal resistance, junction to case	pro Modul / per Module, $\Theta = 180^{\circ}\text{sin}$ pro Zweig / per arm, $\Theta = 180^{\circ}\text{sin}$ pro Modul / per Module, DC pro Zweig / per arm, DC	R_{thJC}	max.	0,065 0,130 0,062 0,124	°C/W °C/W °C/W °C/W
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	pro Modul / per Module pro Zweig / per arm	R_{thCH}	max.	0,02 0,04	°C/W °C/W
Höchstzulässige Sperrschichttemperatur maximum junction temperature		$T_{vj\text{max}}$		150	°C
Betriebstemperatur operating temperature		$T_{c\text{op}}$		- 40...+150	°C
Lagertemperatur storage temperature		T_{stg}		- 40...+150	°C

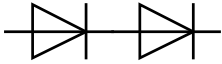
prepared by:	C. Drilling	date of publication:	06.05.03
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N**Datenblatt / Data sheet**power electronics in motion
eupec**Netz-Dioden-Modul**
Rectifier Diode Module**DD350N****Mechanische Eigenschaften / Mechanical properties**

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 ²
	file-No.		E 83336	

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Rectifier Diode Module****DD350N****DD****DD-K**



Netz-Dioden-Modul
Rectifier Diode Module

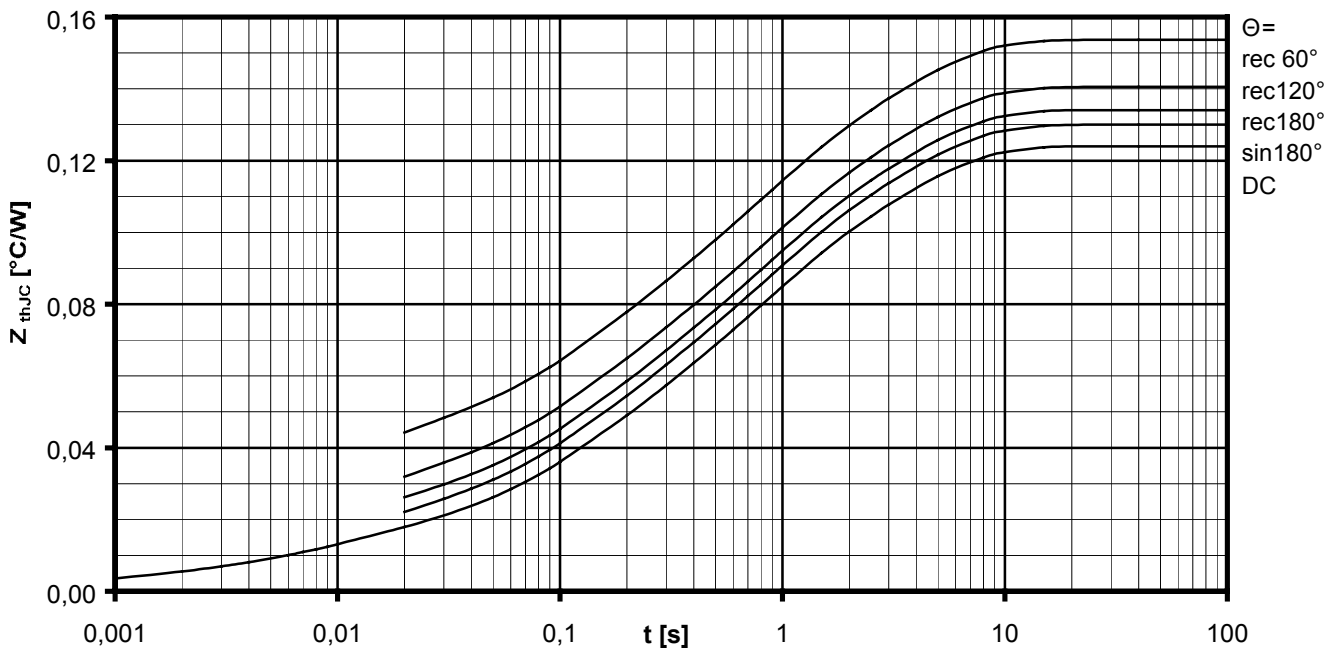
DD350N

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]	0,0031	0,0097	0,0257	0,0429	0,0426		
T_n [s]	0,0009	0,008	0,11	0,61	3,06		

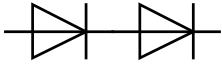
Analytische Funktion / Analytical function:

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



Transienter innerer Wärmewiderstand je Zweig / Transient thermal impedance per arm $Z_{thJC} = f(t)$

Parameter: Stromflußwinkel Θ / Current conduction angle Θ

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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				

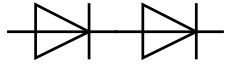
Verstärkte Kühlung / Forced cooling
3 Module pro Kühler / 3 modules per heatsink
Kühler / Heatsink type: KM17 (Papst 4650)

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				

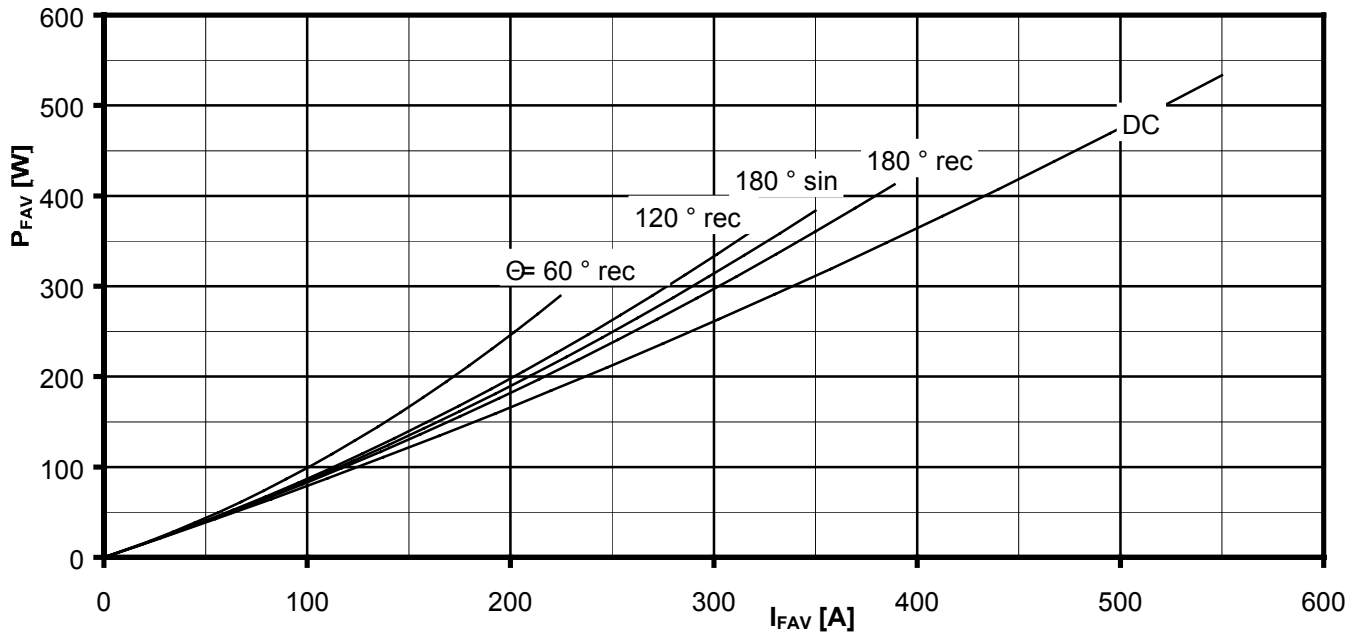
Analytische Funktion / Analytical function:

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



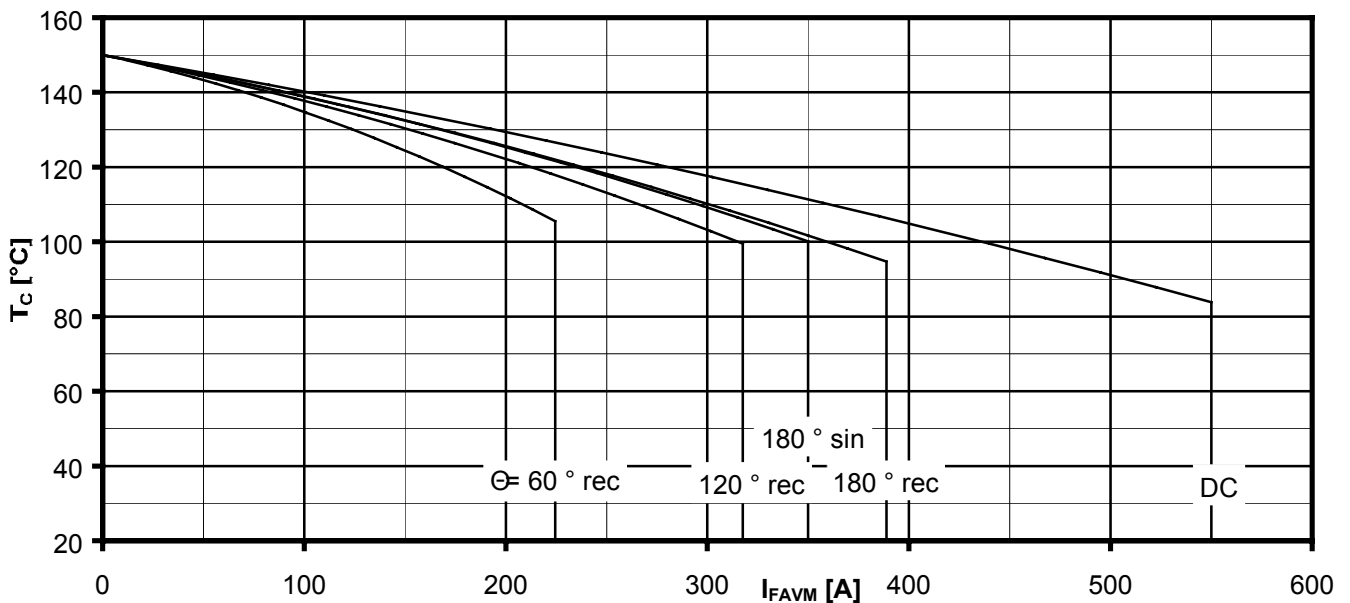
Netz-Dioden-Modul
Rectifier Diode Module

DD350N



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

Parameter: Stromflußwinkel / Current conduction angle Θ

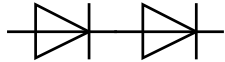


Höchstzulässige Gehäusetemperatur / Maximum allowable case temperature $T_C = f(I_{FAVM})$

Strombelastung je Zweig / Current load per arm

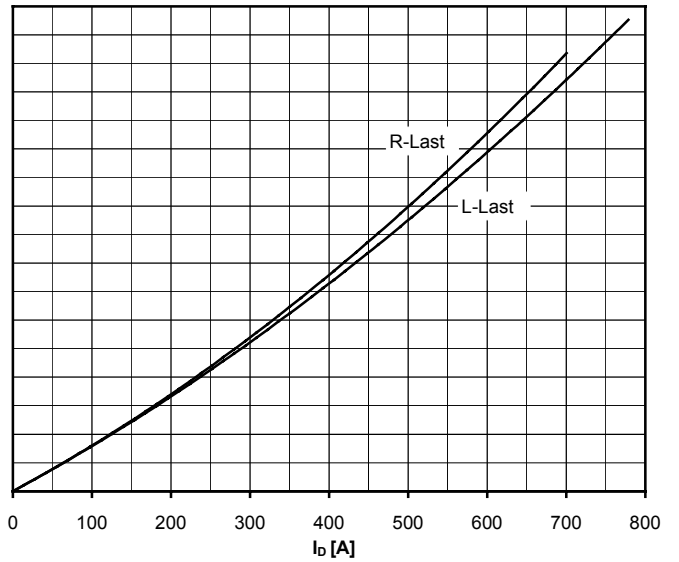
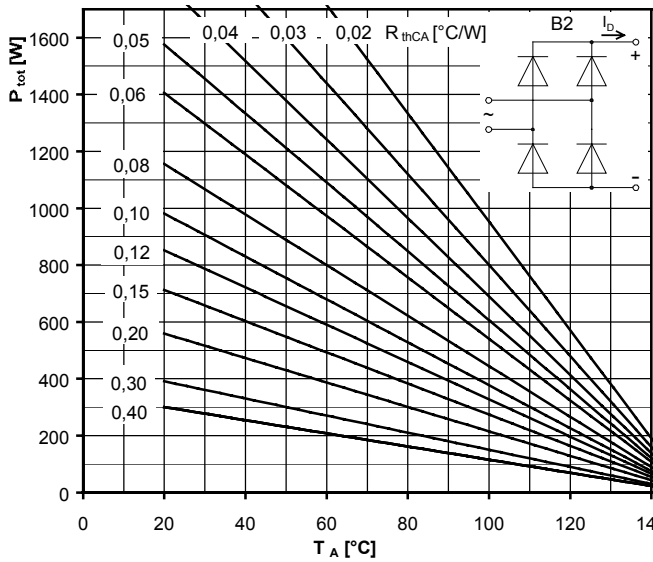
Berechnungsgrundlage P_{TAV}
Calculation base P_{TAV}

Parameter: Stromflußwinkel Θ / Current conduction angle Θ



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

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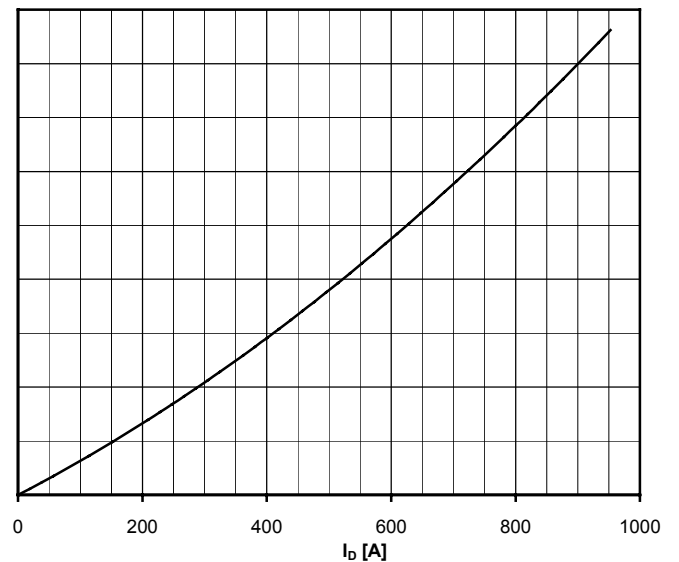
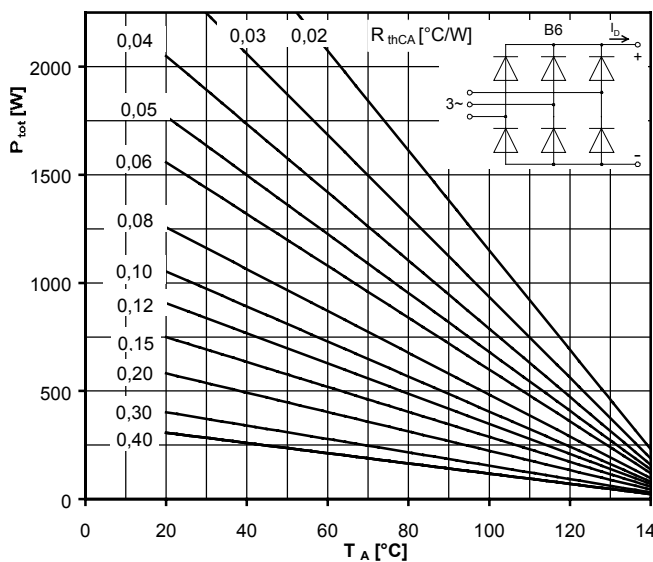
Höchstzulässiger Ausgangsstrom / Maximum rated output current I_b

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}

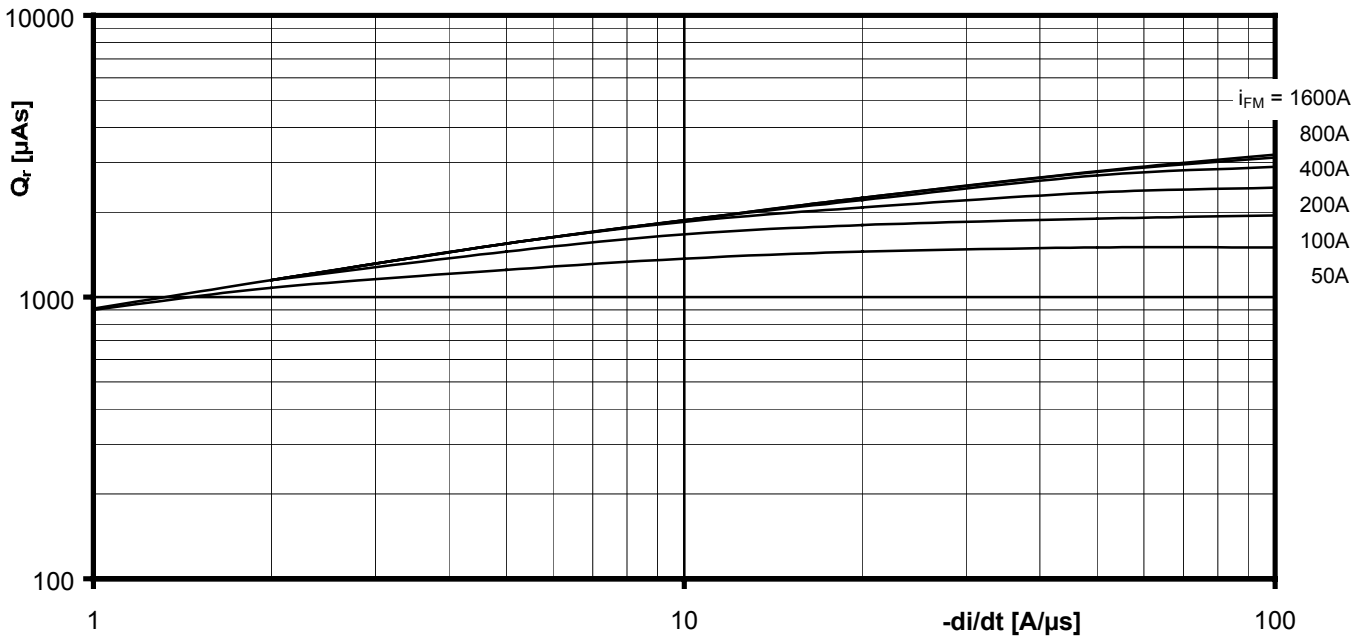
Parameter:

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



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Rectifier Diode Module

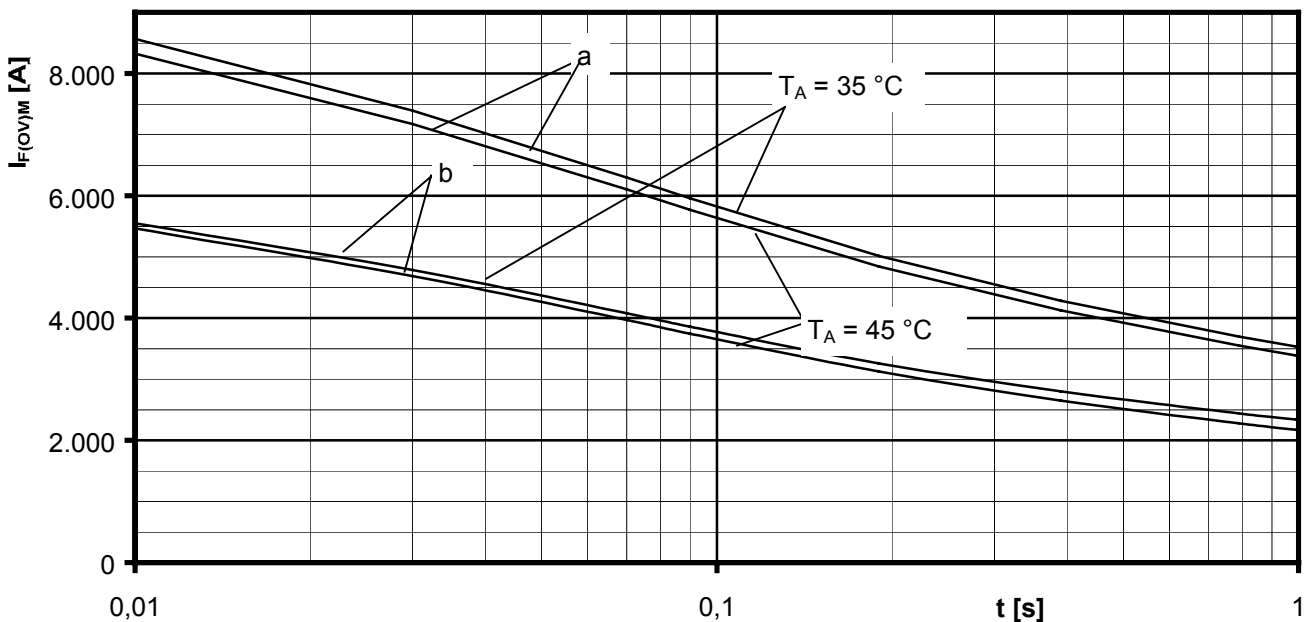
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Sperrverzögerungsladung / Recovered charge $Q_r = f(-di/dt)$

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

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 $I_{FAV(vor)} = I_{FAVM}$

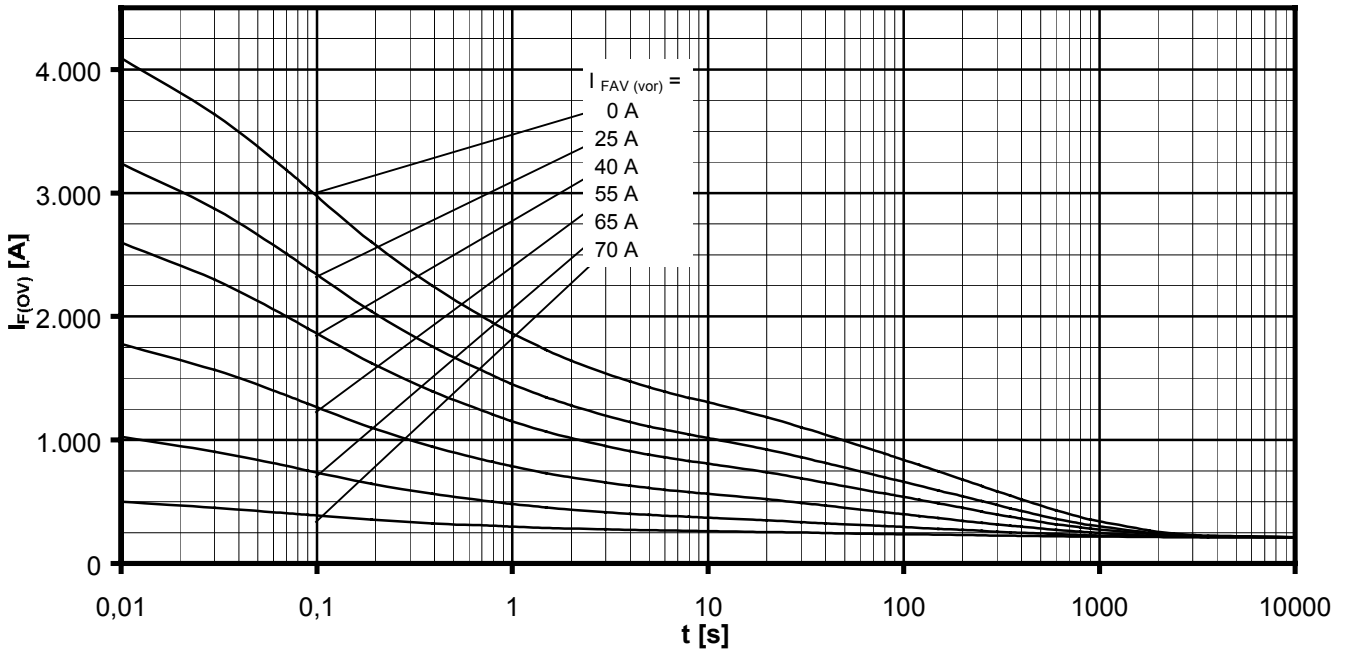
$T_a = 35^\circ C$, verstärkte Luftkühlung / Forced air cooling Kühlkörper / Heatsink type: KM17 (Papst 4650)

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



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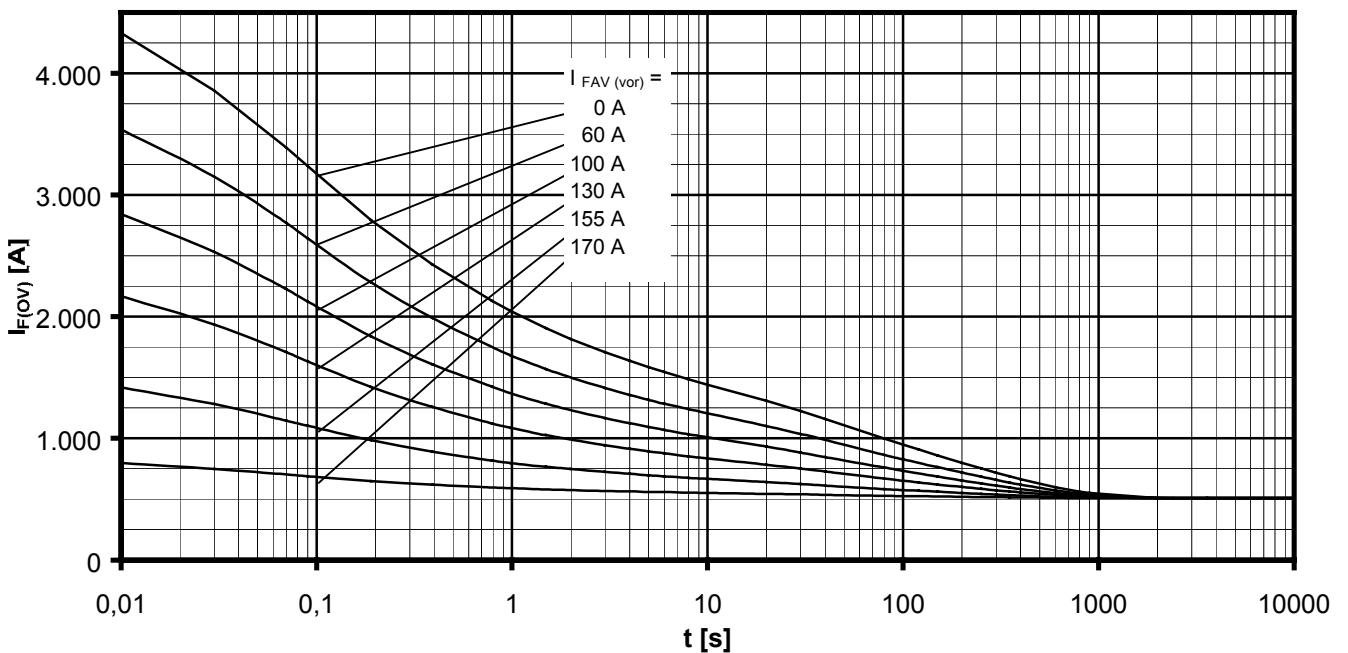


Überstrom je Zweig / Overload on-state current $I_{F(OV)}$

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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