	Technische Information / technical information	
Netz-Dioden-Modul Rectifier Diode Module	**DD170N16S**	Infineon Technologies Bipolar GmbH & Co. KG

Key Parameters

V_{DRM} / V_{RRM}	1600 V
I_{FAVM}	170 A (T_C=100 °C)
I_{FSM}	6600 A
V_{T0}	0,75 V
r_T	1,05 mΩ
R_{thJC}	0,18 K/W
Base plate	34 mm
Weight	165 g

For type designation please refer to actual short form catalog

http://www.ifbip.com/catalog

Merkmale

- Löt-Bond Technologie
- Industrie-Standard-Gehäuse
- Elektrisch isolierte Bodenplatte

Features

- Solder-Bond Technology
- Industrial standard package
- Electrically insulated base plate

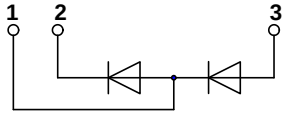
Typische Anwendungen

- Gleichrichter für Antriebsapplikationen
- Gleichrichter für UPS
- Batterieladegleichrichter

Typical Applications

- Rectifier for drives applications
- Rectifiers for UPS
- Battery chargers

content of customer DMX code	DMX code digit	DMX code digit quantity
type designation	1..18	18
serial number	19..23	5
internal production order number	24..31	8
material number	32..41	10
date code (YY/WW)	42..45	4
add on for date code	46	1



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Elektrische Eigenschaften / Electrical properties

Höchstzulässige Werte / Maximum rated values

Periodische Spitzensperrspannung repetitive peak reverse voltages	T_{vj} = -40°C... $T_{vj\,max}$	V_{RRM}	1600	V
Stoßspitzensperrspannung non-repetitive peak reverse voltage	T_{vj} = +25°C... $T_{vj\,max}$	V_{RSM}	1700	V
Durchlaßstrom-Grenzeffektivwert maximum RMS on-state current		I_{FRMSM}	260	A
Dauergrenzstrom average on-state current	T_C = 100°C	I_{FAVM}	165	A
Stoßstrom-Grenzwert surge current	T_{vj} = 25°C, t_P = 10ms T_{vj} = $T_{vj\,max}$, t_P = 10ms	I_{FSM}	6600 5500	A A
Grenzlastintegral I²t-value	T_{vj} = 25°C, t_P = 10ms T_{vj} = $T_{vj\,max}$, t_P = 10ms	I²t	217800 151250	A²s A²s

Charakteristische Werte / Characteristic values

Durchlaßspannung on-state voltage	T_{vj} = 25°C i_F = 500A	v_F	max.	1,4	V
Schleusenspannung threshold voltage	T_{vj} = $T_{vj\,max}$	$V_{(TO)}$	max.	0,75	V
Ersatzwiderstand slope resistance	T_{vj} = $T_{vj\,max}$	r_T	max.	1,05	mΩ
Sperrstrom reverse current	T_{vj} = $T_{vj\,max}$, v_R = V_{RRM}	i_R	max.	9	mA
Isolations-Prüfspannung insulation test voltage	RMS, f = 50Hz, t = 1 sec RMS, f = 50Hz, t = 1 min	V_{ISOL}		3,6 3	kV 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_{thJC}	max. max. max. max.	0,09 0,18 0,09 0,18	K/W K/W K/W K/W
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	pro Modul / per Module pro Zweig / per arm	R_{thCH}	max. max.	0,05 0,10	K/W K/W
Höchstzulässige Sperrschichttemperatur maximum junction temperature		$T_{vj\,max}$		135	°C
Betriebstemperatur operating temperature		$T_{c\,op}$		- 40...+125	°C
Lagertemperatur storage temperature		T_{stg}		- 40...+125	°C

prepared by:	AG		date of publication:	2021-10-29
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Mechanische Eigenschaften / Mechanical properties

Gehäuse, siehe Anlage case, see annex			Seite 4 page 4	
Innere Isolation internal insulation	Basisisolierung (Schutzklasse 1, EN 61140) Basic insulation (class 1, IEC 61140)		Al_2O_3	
Anzugsdrehmoment für mechanische Anschlüsse mounting torque	Toleranz ±15%	M1	5	Nm
Anzugsdrehmoment für elektrische Anschlüsse terminal connection torque	Toleranz ±15%	M2	5	Nm
Gewicht weight		G	typ. 165	g
Kriechstrecke creepage distance				mm
Schwingfestigkeit vibration resistance	f = 50Hz		50	m/s^2
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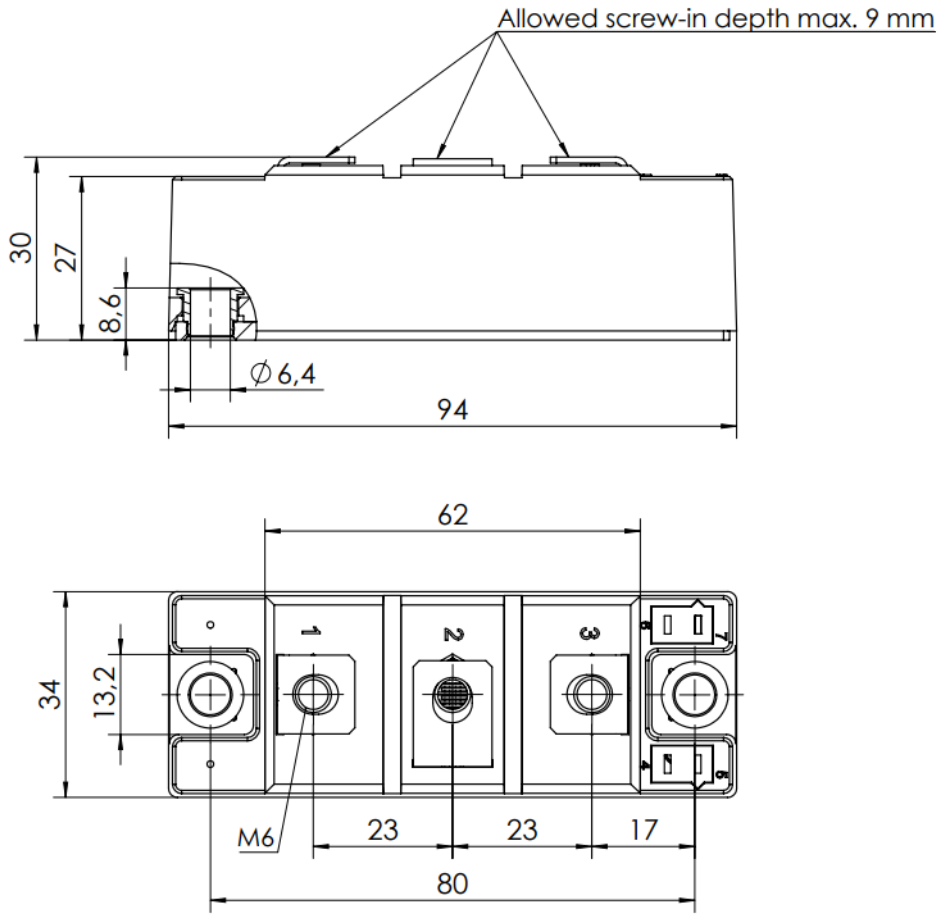
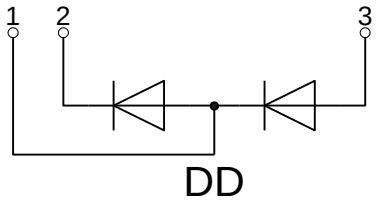


General tolerance ± 0,5 mm

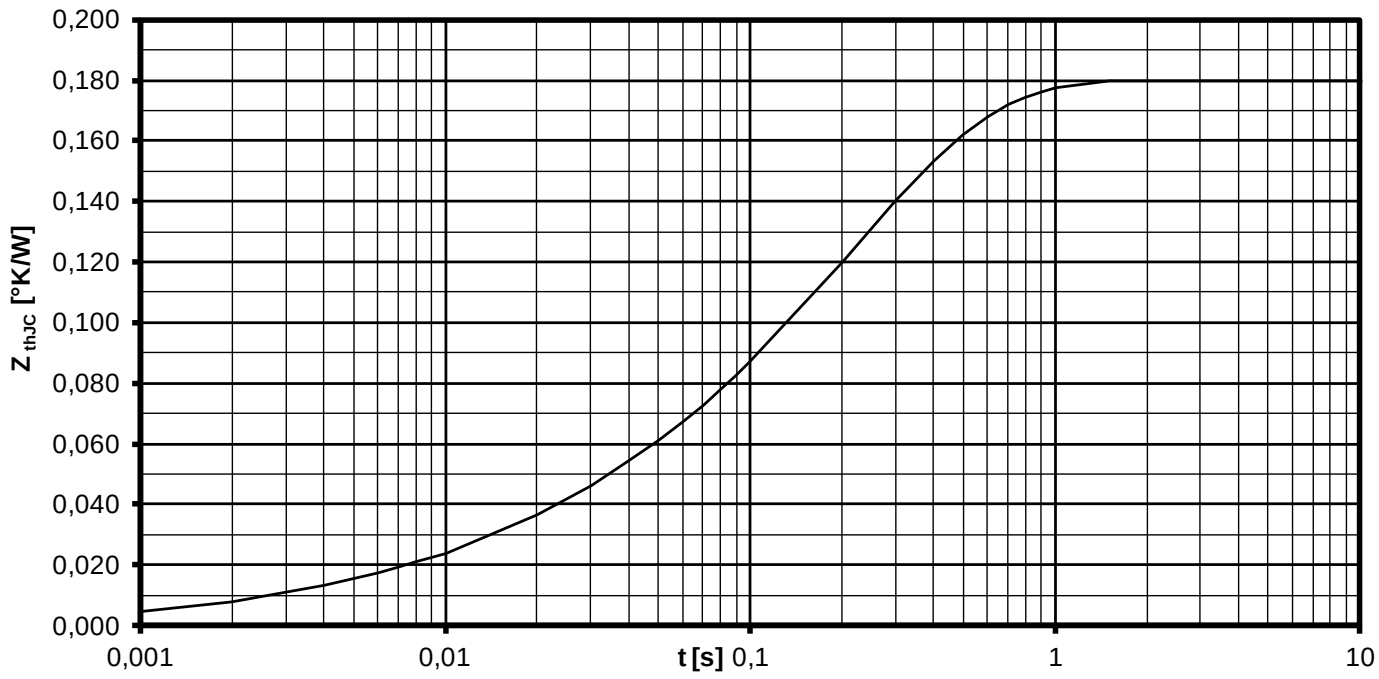


Analytische Elemente des transienten Wärmewiderstandes Z_{thJC} für DC
Analytical elements of transient thermal impedance Z_{thJC} for DC

Pos. n	1	2	3	4	5	6	7
R_{thn} [K/W]	0,1281	0,0253	0,0201	0,0065	0	0	0
τ_n [s]	0,2536	0,07357	0,01602	0,0022	1	1	1

Analytische Funktion / Analytical function:

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



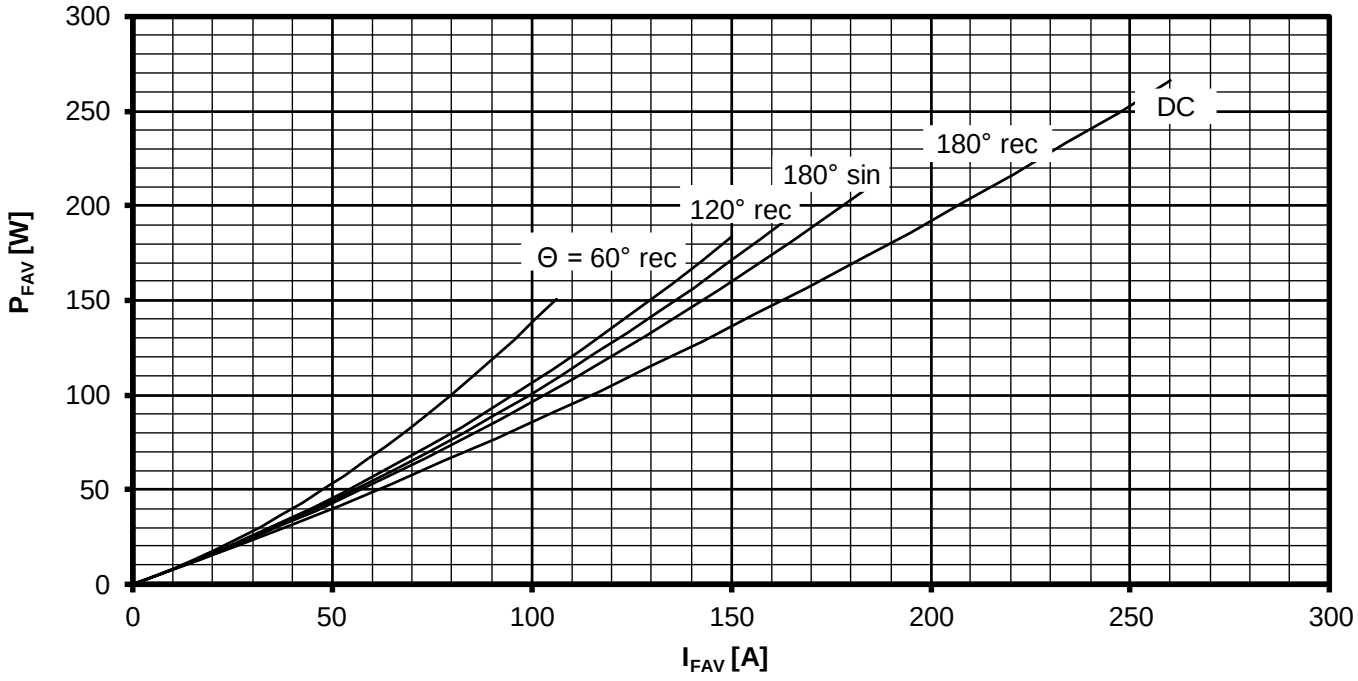
Transienter innerer Wärmewiderstand je Zweig / Transient thermal impedance per arm Z_{thJC} = f(t)

Parameter: Stromflußwinkel Θ / Current conduction angle Θ

Erhöhung des $Z_{th\ DC}$ bei Sinus und Rechteckströmen mit unterschiedlichen Stromflusswinkeln Θ
Rise of $Z_{th\ DC}$ for sinewave and rectangular current with different current conduction angles Θ
$\Delta Z_{th\ \Theta\ rec}$ / $\Delta Z_{th\ \Theta\ sin}$

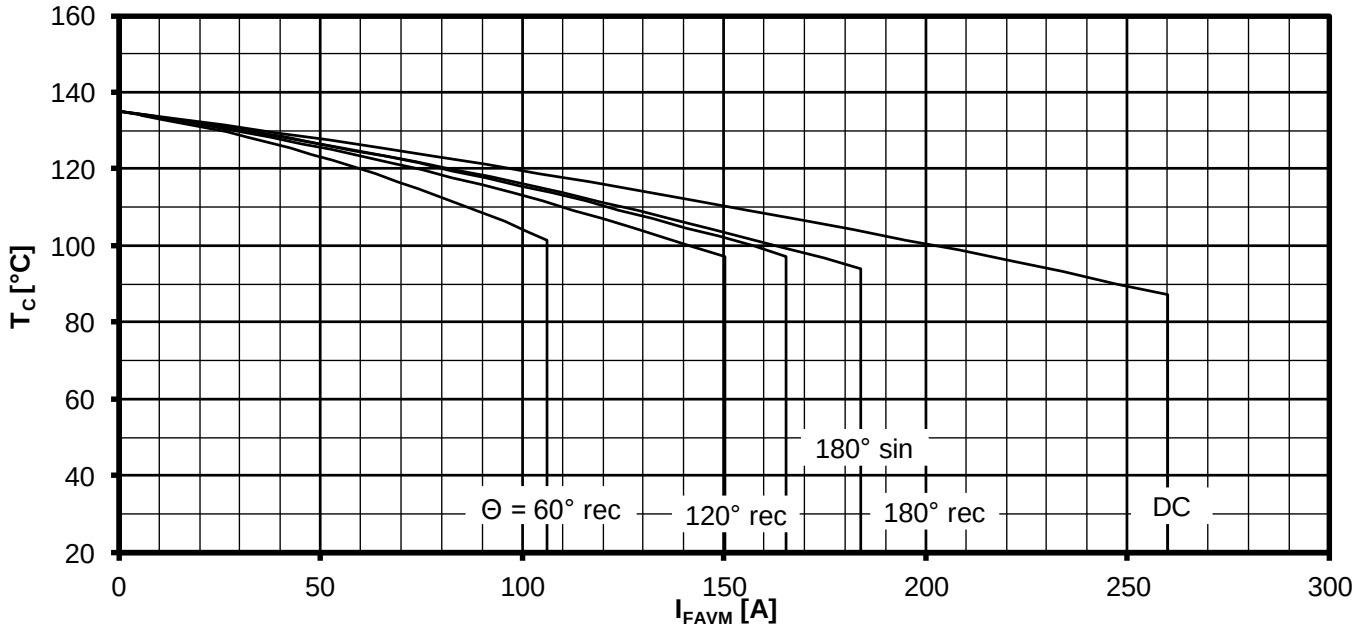
	Θ = 180°	Θ = 120°	Θ = 90°	Θ = 60°	Θ = 30°
$\Delta Z_{th\ \Theta\ rec}$ [K/W]	0,01668	0,00766	0,03340	0,04282	0,05625
$\Delta Z_{th\ \Theta\ sin}$ [K/W]					

$$Z_{th\ \Theta\ rec} = Z_{th\ DC} + \Delta Z_{th\ \Theta\ rec}$$
$$Z_{th\ \Theta\ sin} = Z_{th\ DC} + \Delta Z_{th\ \Theta\ sin}$$



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

Parameter: Stromflußwinkel / Current conduction angle Θ

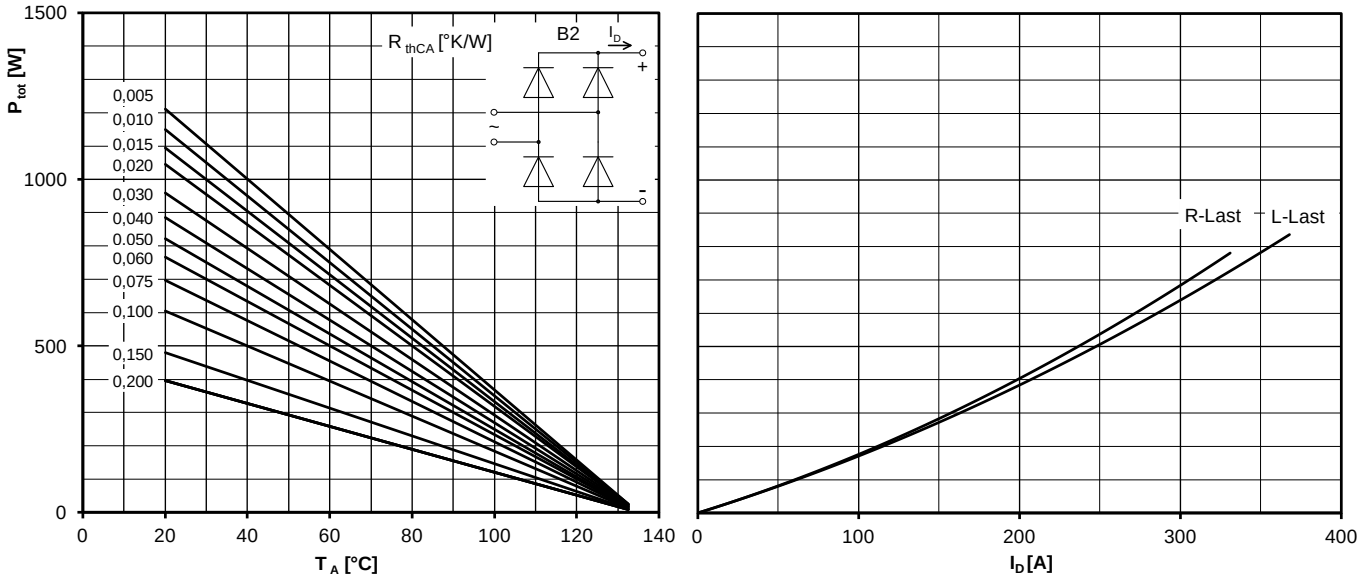


Höchstzulässige Gehäusetemperatur / Maximum allowable case temperature $T_C = f(I_{FAVM})$

Strombelastung je Zweig / Current load per arm

Berechungsgrundlage P_{TAV}
Calculation base P_{TAV}

Parameter: Stromflußwinkel Θ / Current conduction angle Θ

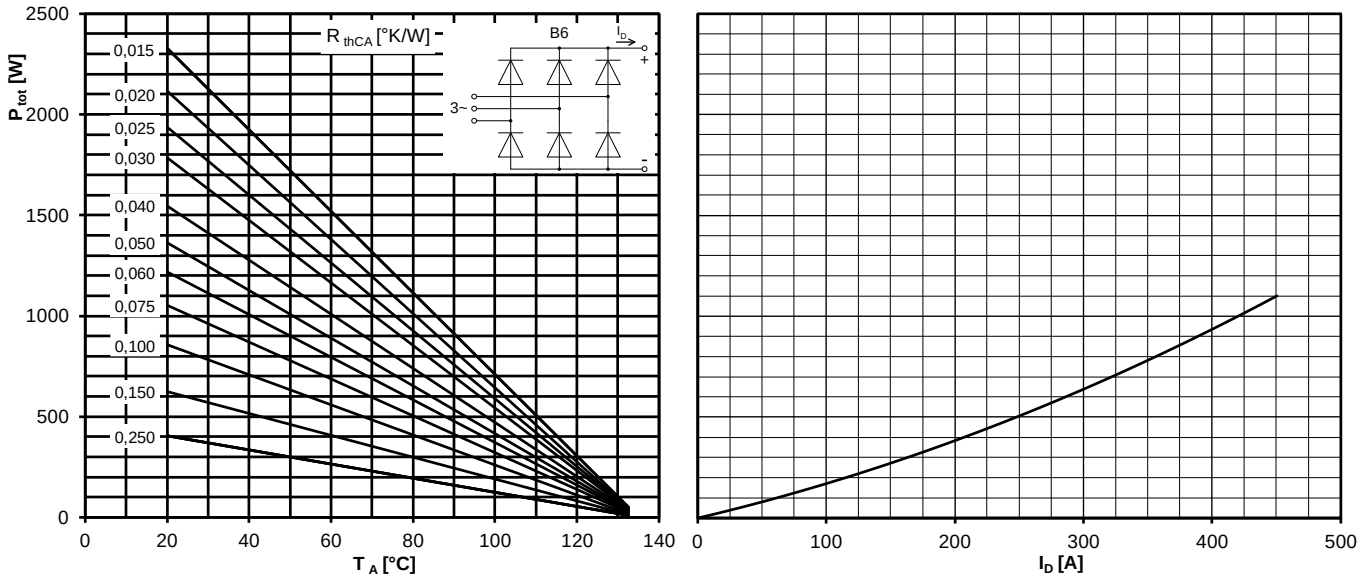


Höchstzulässiger Ausgangsstrom / Maximum rated output current I_D

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}

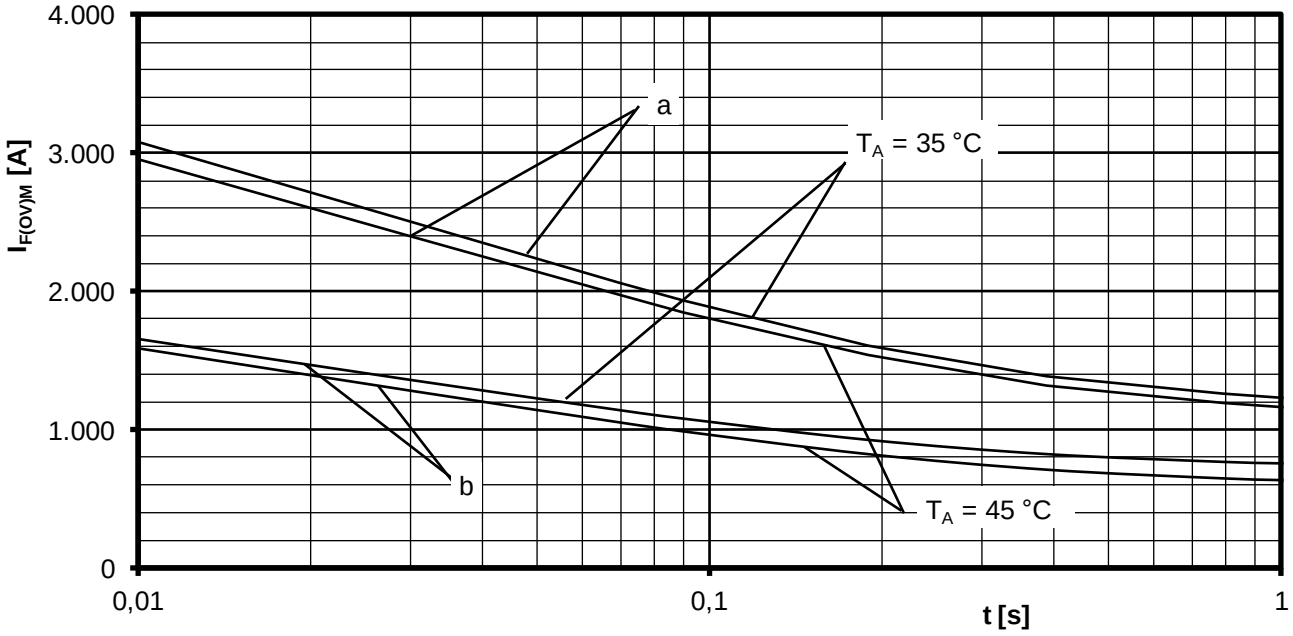


Höchstzulässiger Ausgangsstrom / Maximum rated output current I_D

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}



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°C, verstärkte Luftkühlung / Forced air cooling Kühlkörper / Heatsink type: KM17 (Papst 4650)

T_a = 45°C, natürliche Luftkühlung / Natural air cooling Kühlkörper / Heatsink type: KM17 (160W)