



Technische Information / technical information



Netz-Dioden-Modul
Rectifier Diode Module

DD540N

Infineon Technologies Bipolar
GmbH & Co. KG

Key Parameters

V_{DRM} / V_{RRM}	2000 V - 2600 V
I_{FAVM}	540 A ($T_C=100\text{ }^\circ\text{C}$)
I_{FSM}	16500 A
V_{T0}	0,78 V
r_T	0,31 m Ω
R_{thJC}	0,078 K/W
Base plate	60 mm
Weight	1500 g



For type designation please refer to actual short form catalog

<http://www.ifbip.com/catalog>

Merkmale

- Druckkontakt-Technologie für hohe Zuverlässigkeit
- Advanced Medium Power Technology (AMPT)
- Industrie-Standard-Gehäuse
- Elektrisch isolierte Bodenplatte

Features

- Pressure contact technology for high reliability
- Advanced Medium Power Technology (AMPT)
- Industrial standard package
- Electrically insulated base plate

Typische Anwendungen

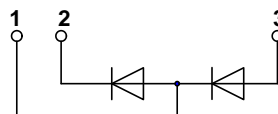
- Gleichrichter für Antriebsapplikationen
- Gleichrichter für UPS
- Batterieladegleichrichter

Typical Applications

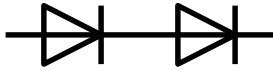
- Rectifier for drives applications
- Rectifiers for UBS
- Battery chargers



content of customer DMX code	DMX code digit	DMX code digit quantity
serial number	1..5	5
SAP material number	6..12	7
Internal production order number	13..20	8
datecode (production year)	21..22	2
datecode (production week)	23..24	2



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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}	2000 2400	2200 2600	V V
Stoßspitzensperrspannung non-repetitive peak reverse voltage	$T_{vj} = +25^{\circ}\text{C} \dots T_{vj\text{max}}$	V_{RSM}	2100 2500	2300 2700	V V
Durchlaßstrom-Grenzeffektivwert maximum RMS on-state current		I_{FRMSM}		900	A
Dauergrenzstrom average on-state current	$T_C = 100^{\circ}\text{C}$	I_{FAVM}		540	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}		16500 14000	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		1360000 980000	A ² s A ² s

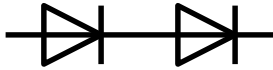
Charakteristische Werte / Characteristic values

Durchlaßspannung on-state voltage	$T_{vj} = T_{vj\text{max}}, I_F = 1700\text{A}$	V_F	max.	1,48	V
Schleusenspannung threshold voltage	$T_{vj} = T_{vj\text{max}}$	$V_{(TO)}$	max.	0,78	V
Ersatzwiderstand slope resistance	$T_{vj} = T_{vj\text{max}}$	r_T	max.	0,31	m Ω
Sperrstrom reverse current	$T_{vj} = T_{vj\text{max}}, V_R = V_{RRM}$	i_R	max.	40	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, $\Theta = 180^{\circ}\text{ sin}$	R_{thJC}	max.	0,039	K/W
	pro Zweig / per arm, $\Theta = 180^{\circ}\text{ sin}$		max.	0,078	K/W
	pro Modul / per Module, DC		max.	0,0373	K/W
	pro Zweig / per arm, DC		max.	0,0745	K/W
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	pro Modul / per Module	R_{thCH}	max.	0,01	K/W
	pro Zweig / per arm		max.	0,02	K/W
Höchstzulässige Sperrschichttemperatur maximum junction temperature		$T_{vj\text{max}}$		150	$^{\circ}\text{C}$
Betriebstemperatur operating temperature		$T_{c\text{op}}$		- 40...+150	$^{\circ}\text{C}$
Lagertemperatur storage temperature		T_{stg}		- 40...+150	$^{\circ}\text{C}$

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Mechanische Eigenschaften / Mechanical properties

Gehäuse, siehe Anlage case, see annex			Seite 4 page 4	
Si-Element mit Druckkontakt Si-pellet with pressure contact				
Innere Isolation internal insulation	Basisisolation (Schutzklasse 1, EN 61140) Basic insulation (class 1, IEC 61140)		AIN	
Anzugsdrehmoment für mechanische Anschlüsse mounting torque	Toleranz ±15%	M1	6	Nm
Anzugsdrehmoment für elektrische Anschlüsse terminal connection torque	Toleranz ±10%	M2	12	Nm
Gewicht weight		G	typ. 1500	g
Kriechstrecke creepage distance			19	mm
Schwingfestigkeit vibration resistance	f = 50Hz		50	m/s ²
	file-No.		E 83335	



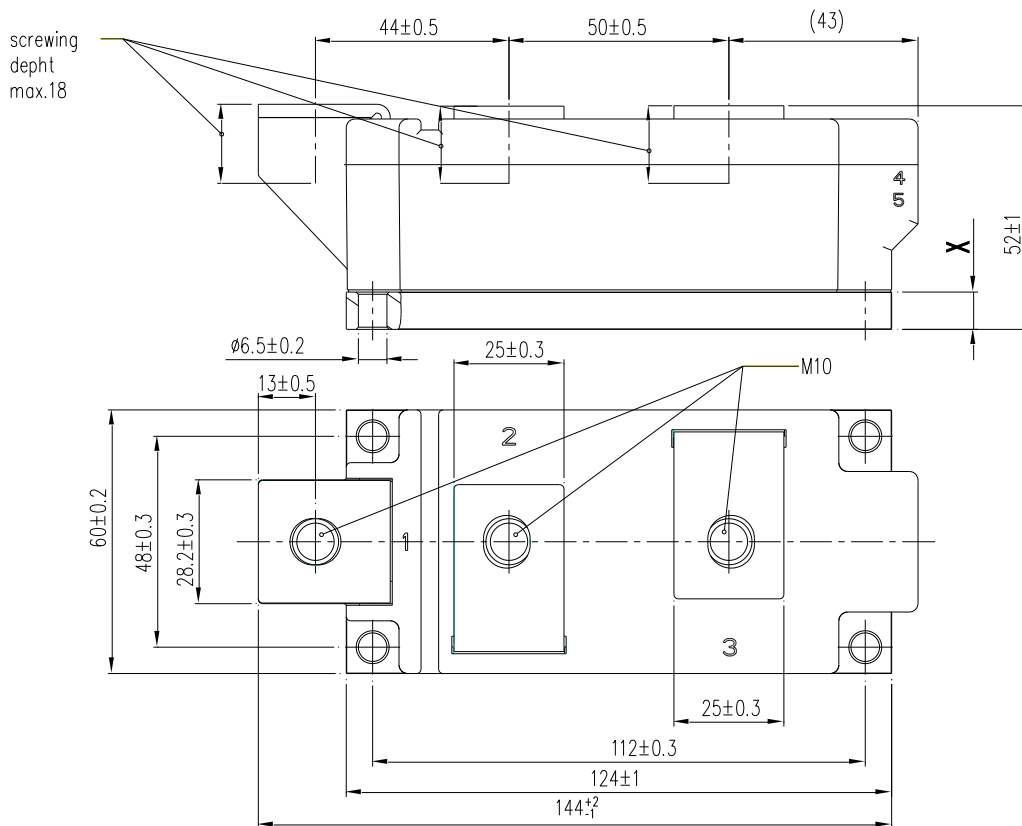
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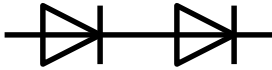
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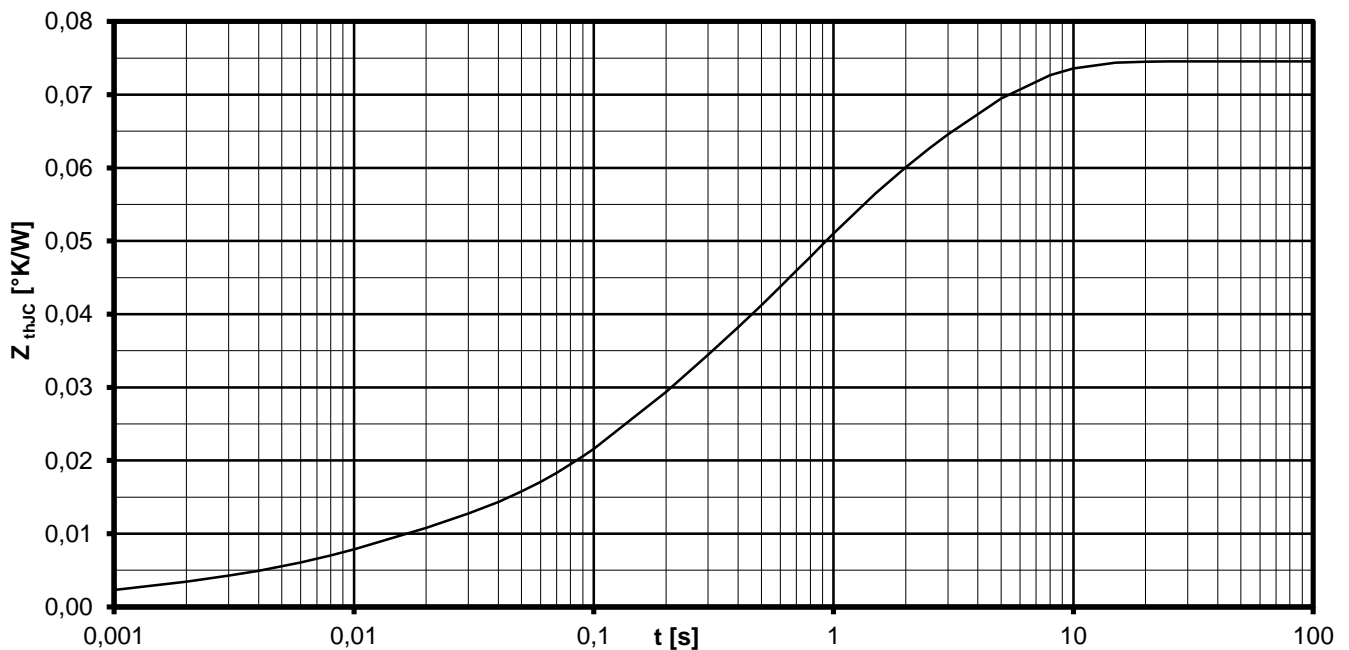
Höhe der Bodenplatte / Height of Baseplate	X	8,5mm	8,5mm	10mm	10mm
Periodische Spitzensperrspannung / repetitive peak reverse voltages	V _{RRM}	2000V	2200V	2400V	2600V



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

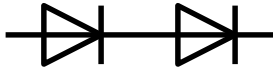
Pos. n	1	2	3	4	5	6	7
R_{thn} [K/W]	0,0267	0,0254	0,01465	0,00584	0,00194		
τ_n [s]	3	0,57	0,108	0,00824	0,000732		

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 $Z_{thJC} = f(t)$

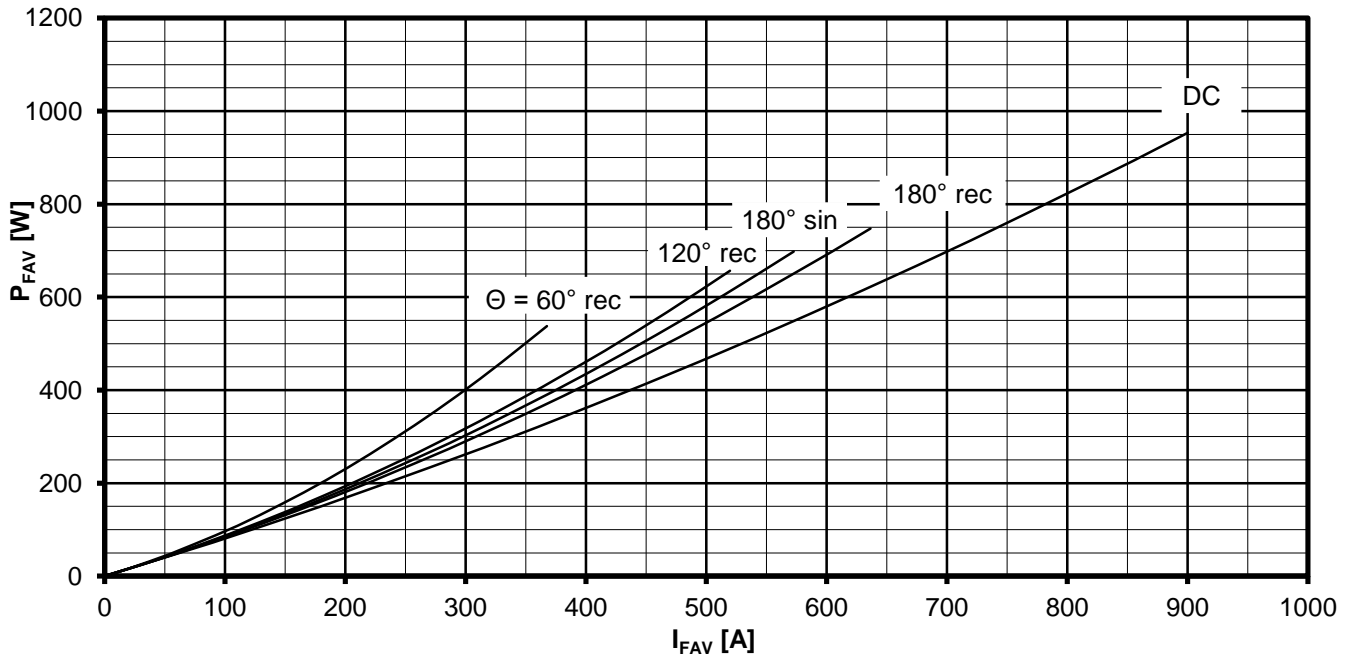
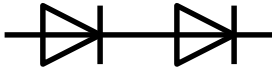
Parameter: Stromflußwinkel Θ / Current conduction angle Θ



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
 $\Delta Z_{th \Theta rec} / \Delta Z_{th \Theta sin}$

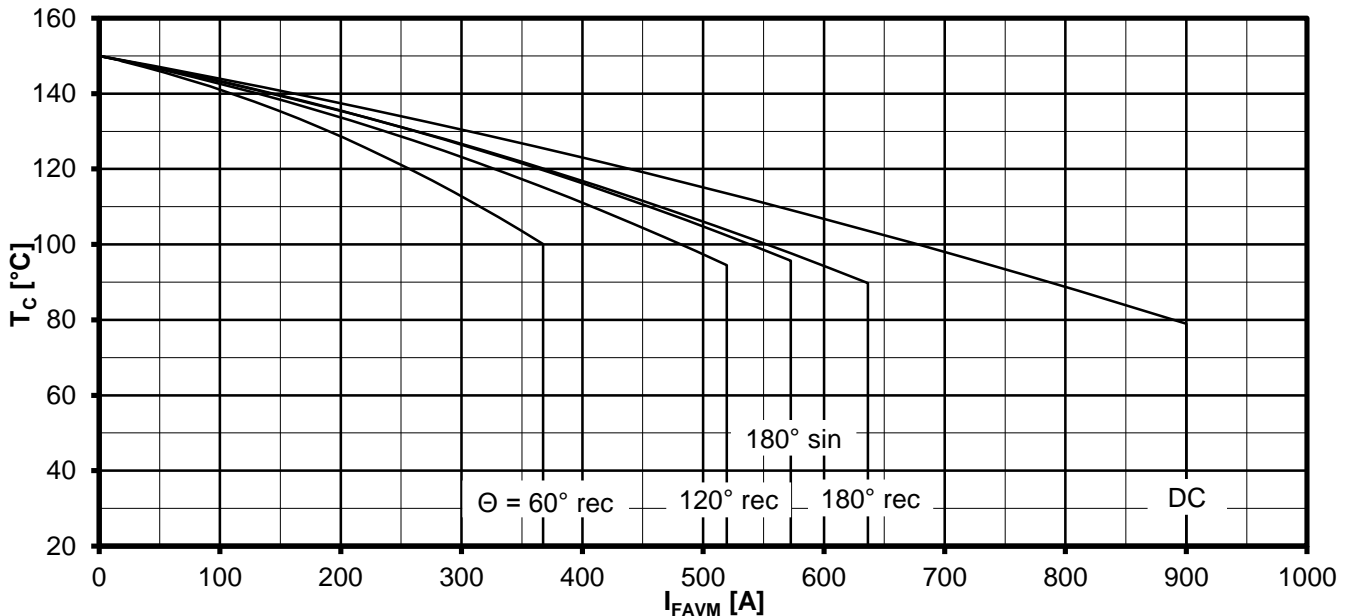
	$\Theta = 180^\circ$	$\Theta = 120^\circ$	$\Theta = 90^\circ$	$\Theta = 60^\circ$	$\Theta = 30^\circ$
$\Delta Z_{th \Theta rec}$ [K/W]	0,00605	0,00996	0,01306	0,01824	0,02897
$\Delta Z_{th \Theta sin}$ [K/W]	0,00327	0,00555	0,00986	0,01529	0,02699

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



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

Parameter: Stromflußwinkel / Current conduction angle Θ

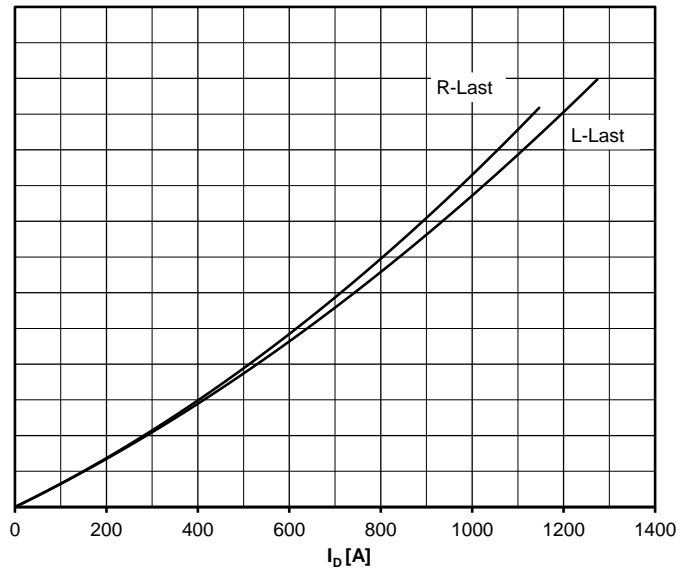
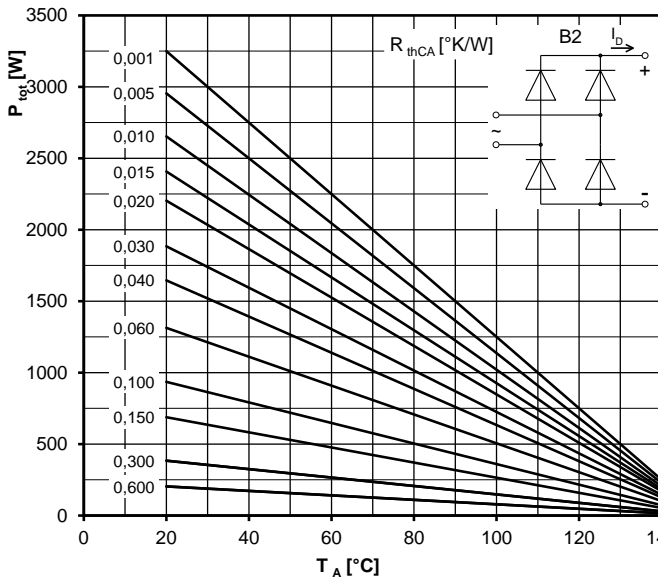
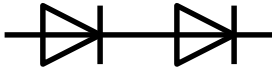


Höchstzulässige Gehäusetemperatur / Maximum allowable case temperature $T_c = f(I_{FAVM})$

Strombelastung je Zweig / Current load per arm

Berechnungsgrundlage P_{TAV}
Calculation base P_{TAV}

Parameter: Stromflußwinkel Θ / Current conduction angle Θ



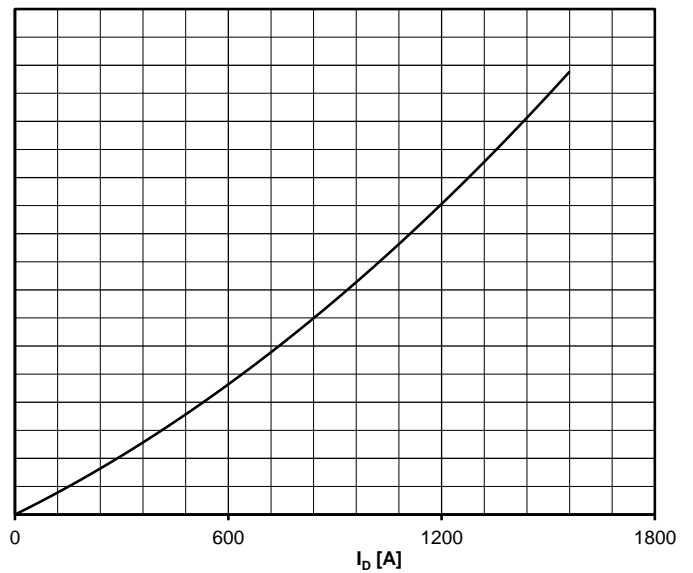
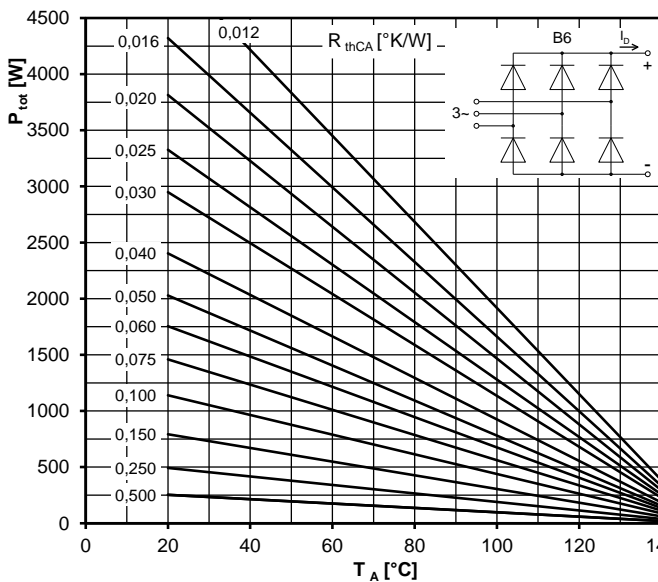
Höchstzulässiger Ausgangsstrom / Maximum rated output current I_D

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}



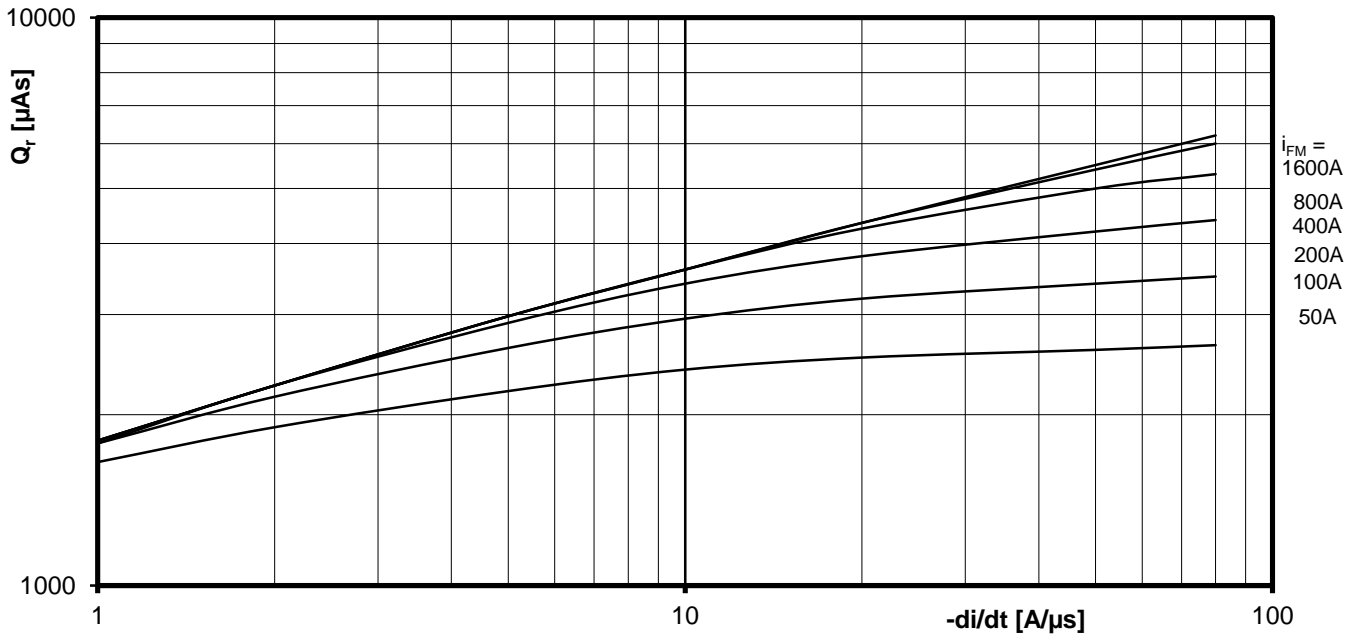
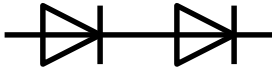
Höchstzulässiger Ausgangsstrom / Maximum rated output current I_D

B6- Sechspuls-Brückenschaltung / Six-pulse bridge circuit

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

Parameter:

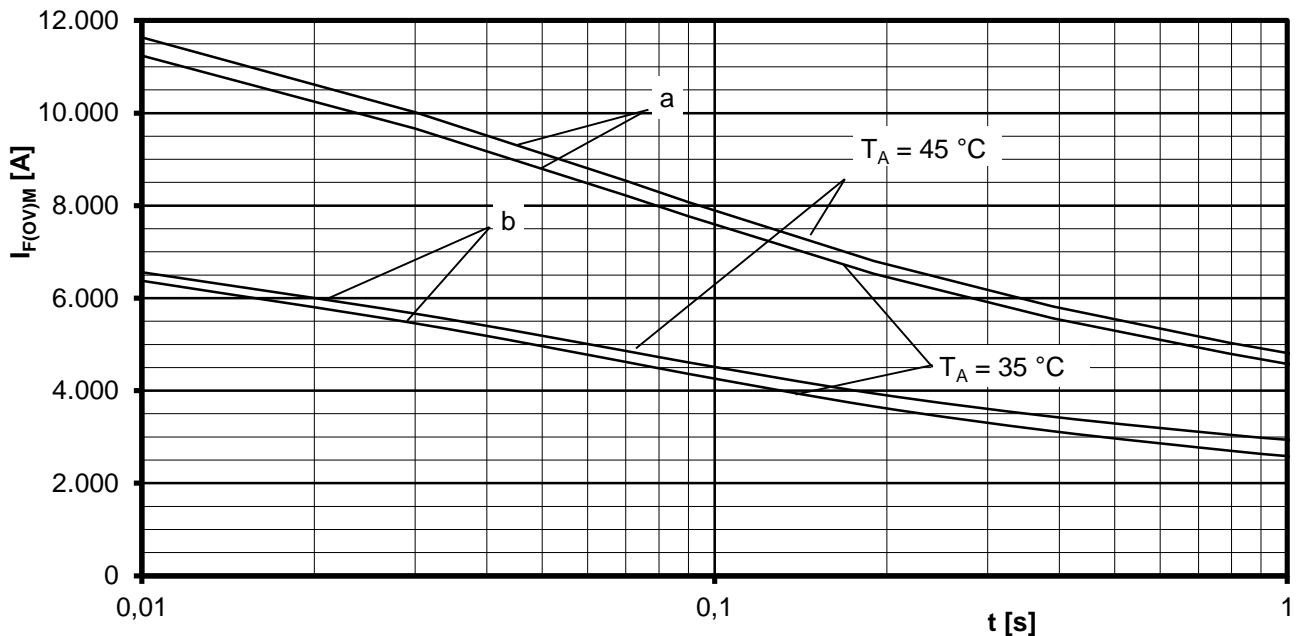
Wärmewiderstand zwischen den Gehäusen und Umgebung / Thermal resistance cases to ambient R_{thCA}



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 (160W)