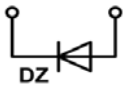
Rectifier Diode Module **CD435N36K**

SEMIPACK 4



Key Parameters

1) V_{DRM} / V_{RRM} : 3600-4000V
2) I_{FAVM} : 435 A (TC=100°C)
3) I_{FSM} :14500 A
4) V_{T0} :0,84 V
5) r_T:0,6 mΩ
6) R_{thJC}:0,078 K/W
7) Baseplate 70 mm
8) Weight : 900 g

Features

1) Pressure contact technology for high reliability
2) Industrial standard package
3) Electrically insulated baseplate
4) Advanced medium power technology

Typical Applications

1) Rectifier for Drives Applications
2) Rectifiers for UPS
3) Battery chargers

DMX code description	Position of DMX code	Number of digits of DMX code
serial number	1 to 7	7
SP material number	8 to 16	9
date code (production day)	17 to 18	2
date code (production year)	19 to 20	2
date code (production month)	21 to 22	2
vT class	23 to 26	4
QR class	27 to 30	4

ABSOLUTE MAXIMUM RATINGS

DESCRIPTION	SYMBOL	Test Conditions	VALUE		UNIT
			DZ435N36K	DZ435N40K	
Repetitive peak reverse voltages	V_{RRM}	T_{vj} = -40°C to T_{vj} max	3600	4000	V
Non-repetitive peak reverse voltage	V_{RSM}	T_{vj} = +25°C toT_{vj} max	3700	4100	V
Maximum RMS on-state current	I_{FRMSM}		1100		A
Average on-state current	I_{FAVM}	T_C = 100°C	435		A
		T_C = 47°C	700		
Surge current	I_{FSM}	T_{vj} = 25 °C, t_P = 10 ms	14.500		A
		T_{vj} = T_{vj} max, t_P = 10 ms	12.000		
I²t-value	I²t	T_{vj} = 25 °C, t_P = 10 ms	1.050.000		A²s
		T_{vj} = T_{vj} max, t_P = 10 ms	720.000		

ELECTRICAL CHARACTERISTICS

DESCRIPTION	SYMBOL	Test Conditions	VALUE	UNIT
On-state voltage	v_F	T_{vj} = T_{vj} max , i_F = 1200 A	1,71 Max	V
Threshold voltage	$V_{(TO)}$	T_{vj} = T_{vj} max	0,84	V
Slope resistance	r_T	Tvj = Tvj max	0,6	mΩ
Reverse current	i_R	T_{vj} = T_{vj} max , v_R = V_{RRM}	50 max.	mA
Insulation test voltage	V_{ISOL}	RMS, f = 50 Hz, t = 1 sec	3.6	KV
		RMS, f = 50 Hz, t = 1 min	3	

Thermal CHARACTERISTICS

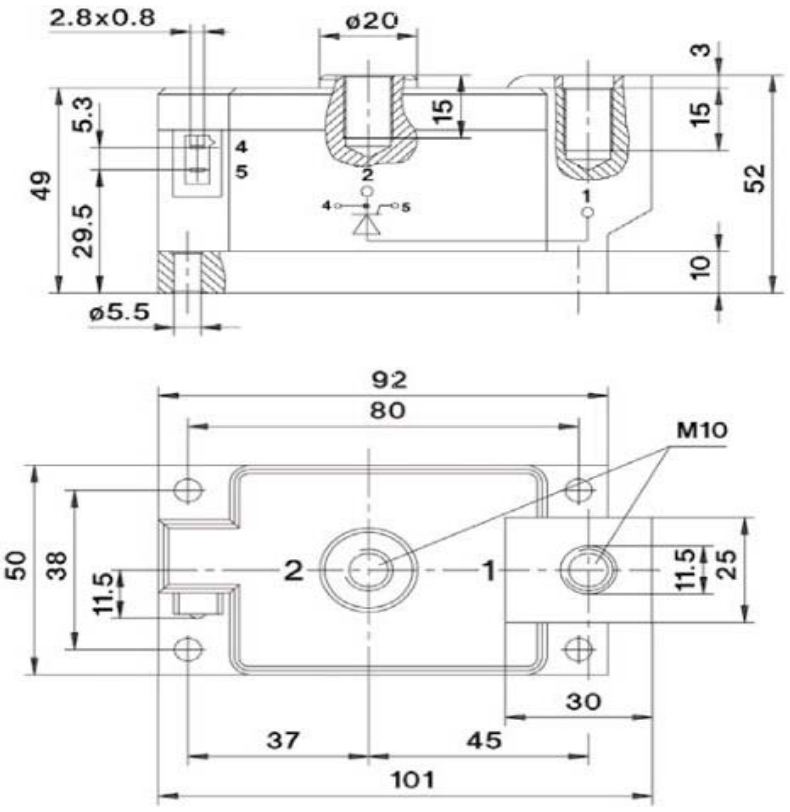
DESCRIPTION	SYMBOL	Test Conditions	VALUE	UNIT
Thermal resistance, junction to case	R_{thJC}	per Module, θ = 180° sin	0,0780 max	°C/W
		per Module, DC	0,0745 max	
Thermal resistance, case to heatsink	R_{thCH}	pro Module / per Module	0,02 max	
Maximum junction temperature	$T_{vj\ max}$		150	°C
Operating temperature	$T_{c\ op}$		- 40 to +150	°C
Storage temperature	T_{stg}		- 40 to +151	°C

Mechanical properties

DESCRIPTION	SYMBOL	Details	VALUE	UNIT
Case, see package drawing				SEMIPACK 4
Si-pellet with pressure contact				
Internal insulation				
Mounting torque	M1	Tolerance ±15%	5	Nm
Terminal connection torque	M2	Tolerance ±10%	12	Nm
Weight	G		900 (Typ.)	gm
Creepage distance			15	mm
Vibration resistance		f = 50 Hz	50	m/s²
		file-No.	E 83335	

PACKAGE DETAILS

SEMIPACK 4

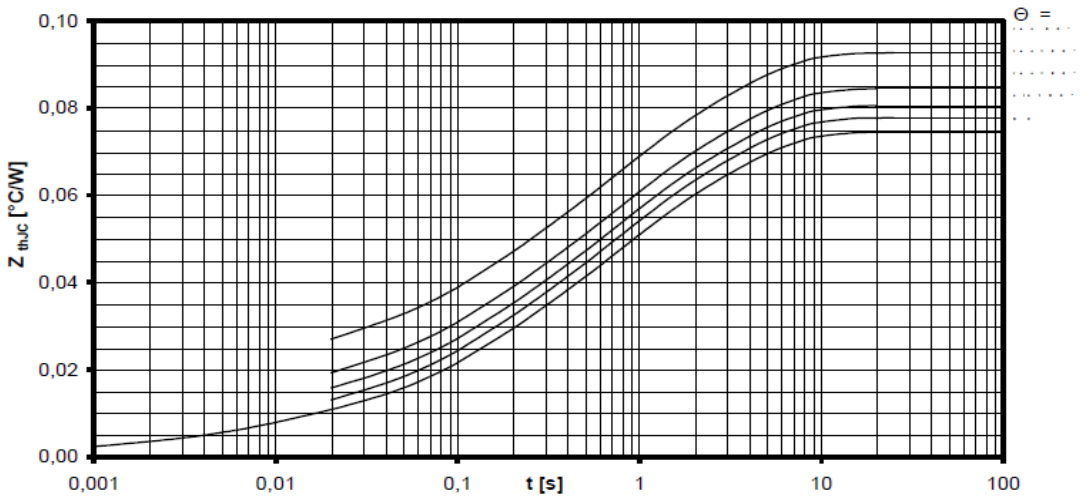


Analytical elements of transient thermal impedance Z thJC for DC

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

Analytical function:

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



Transient thermal impedance per arm ZthJC = f(t)
Parameter:Current conduction angle θ

Analytical elements of transient thermal impedance Z thCA

Pos. n	1	2	3	4	5	6	7
R_{thn} [°C/W]	0,01176	0,0412	0,717				
T_n [s]	3,19	28,3	1370				

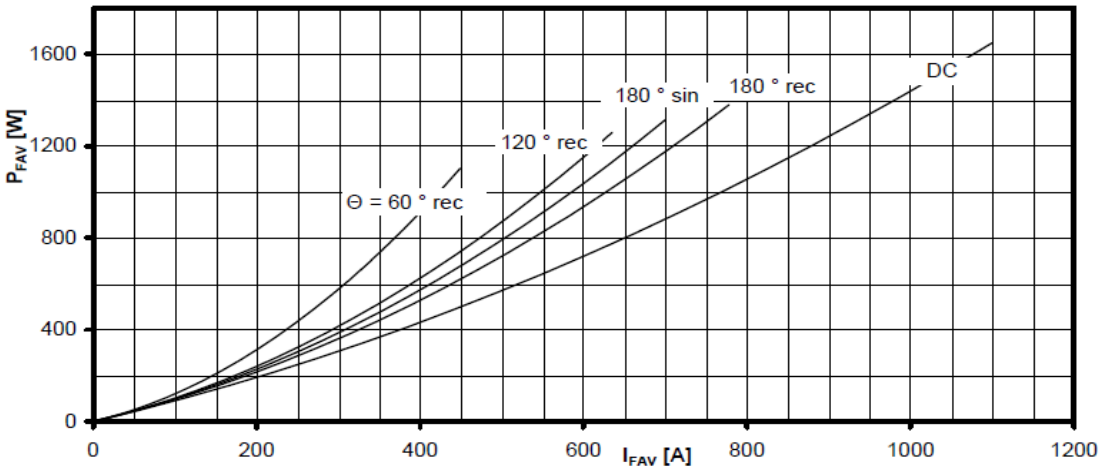
Forced cooling
3 modules per heatsink
Heatsink type: KM17 (Papst 4650)

Pos. n	1	2	3	4	5	6	7
R_{thn} [°C/W]	0,0075	0,0435	0,239				
T_n [s]	6,4	31,8	497				

Analytical function:

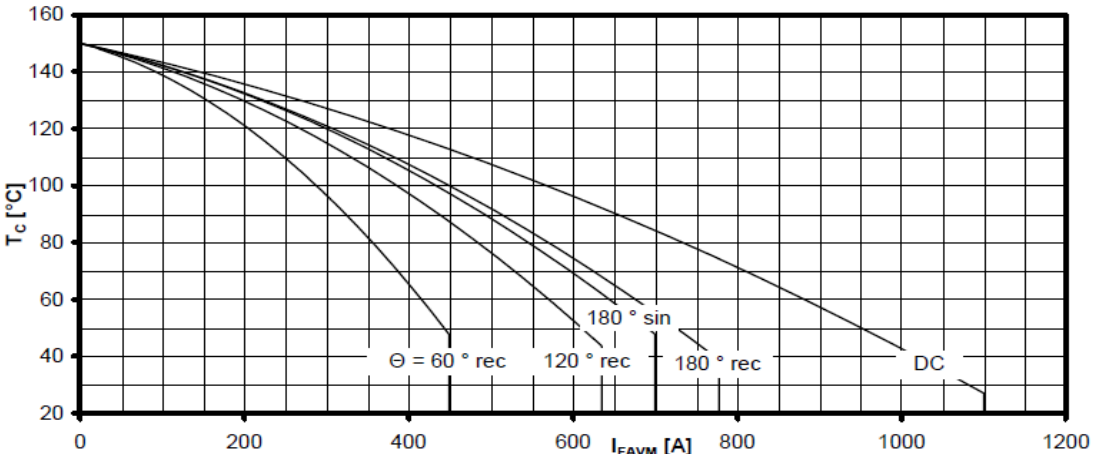
$$Z_{thCA} = \sum_{n=1}^{n_{max}} R_{thn} \left(1 - e^{-\frac{t}{\tau_n}}\right)$$

CHARACTERISTICS CURVES

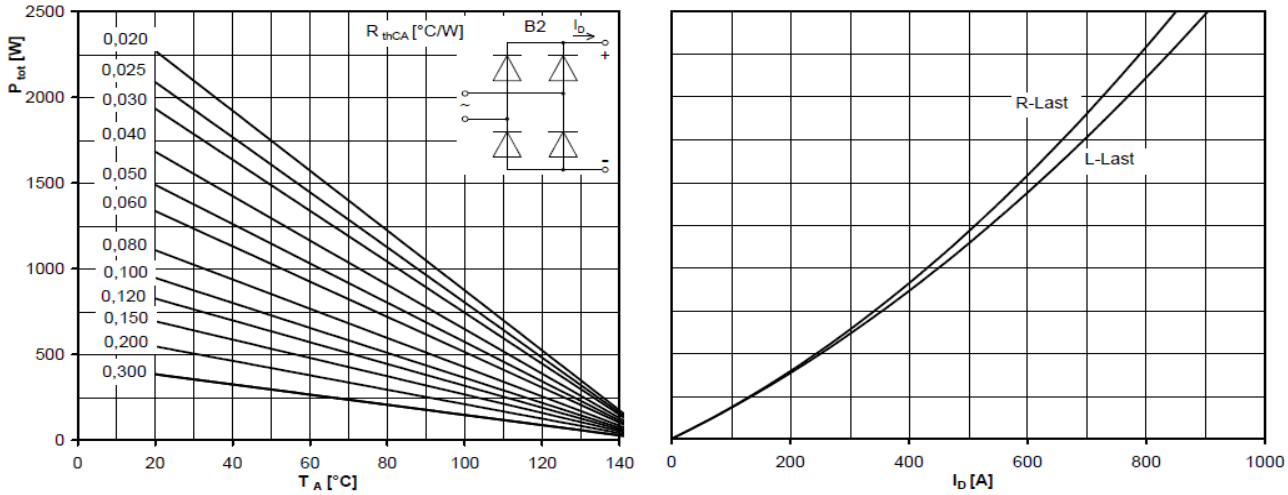


CHARACTERISTICS CURVES (Cont.....)

On-state power loss per arm PFAV = f(IFAV)
Current conduction angle θ

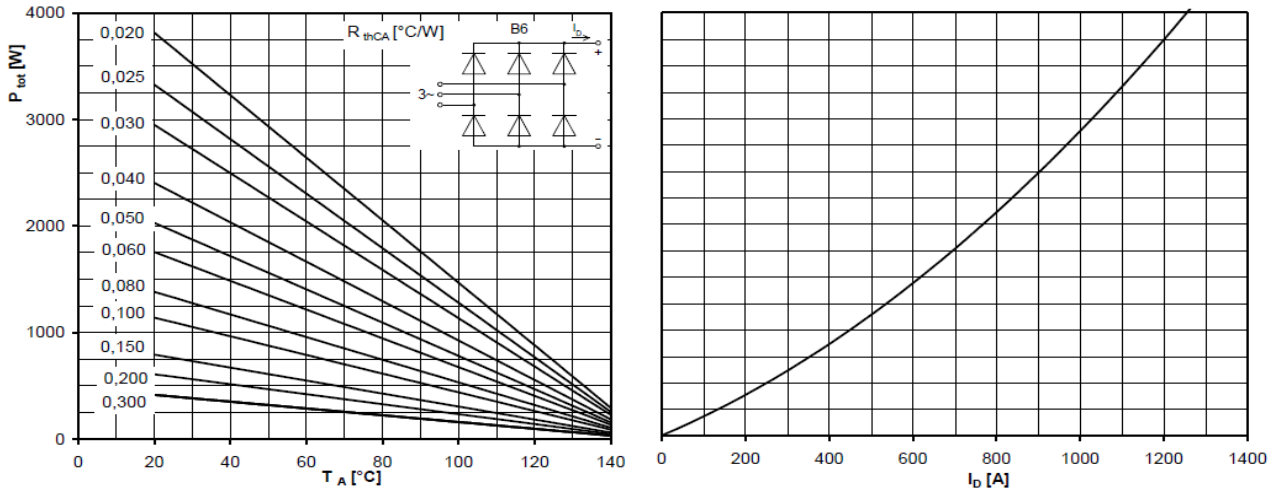


Maximum allowable case temperature TC = f(IFAVM)
Current load per arm
Calculation base PTAV (switching losses should be considered separately)
Parameter: Current conduction angle θ

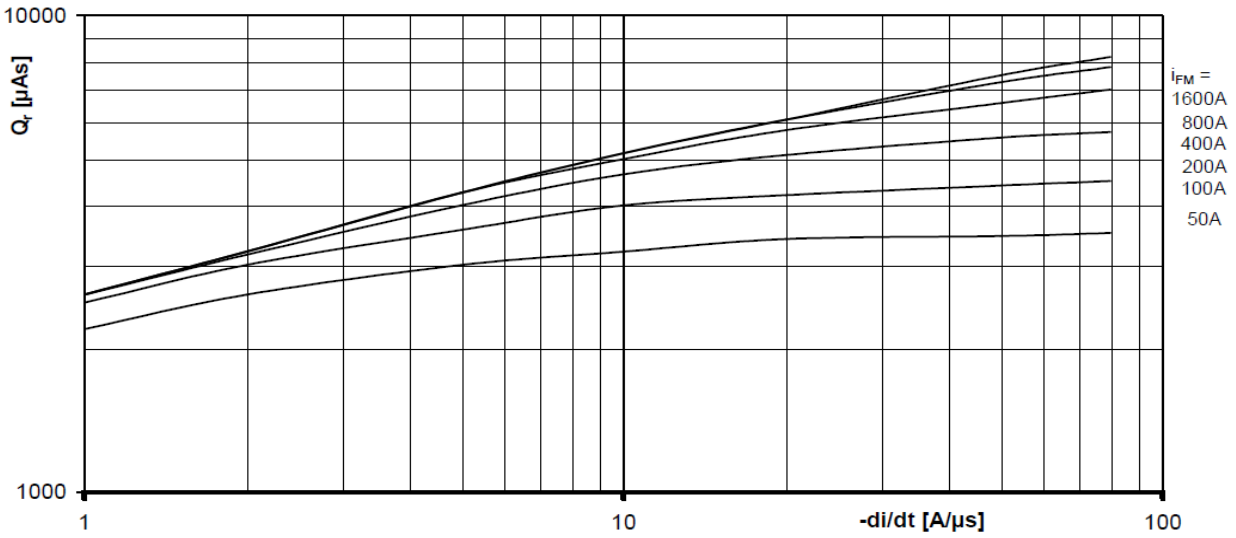


Maximum rated output current ID
B2 :Two-pulse bridge circuit
Total power dissipation at circuit Ptot
Parameter:
Thermal resistance cases to ambient R_{thCA}

CHARACTERISTICS CURVES (Cont.....)

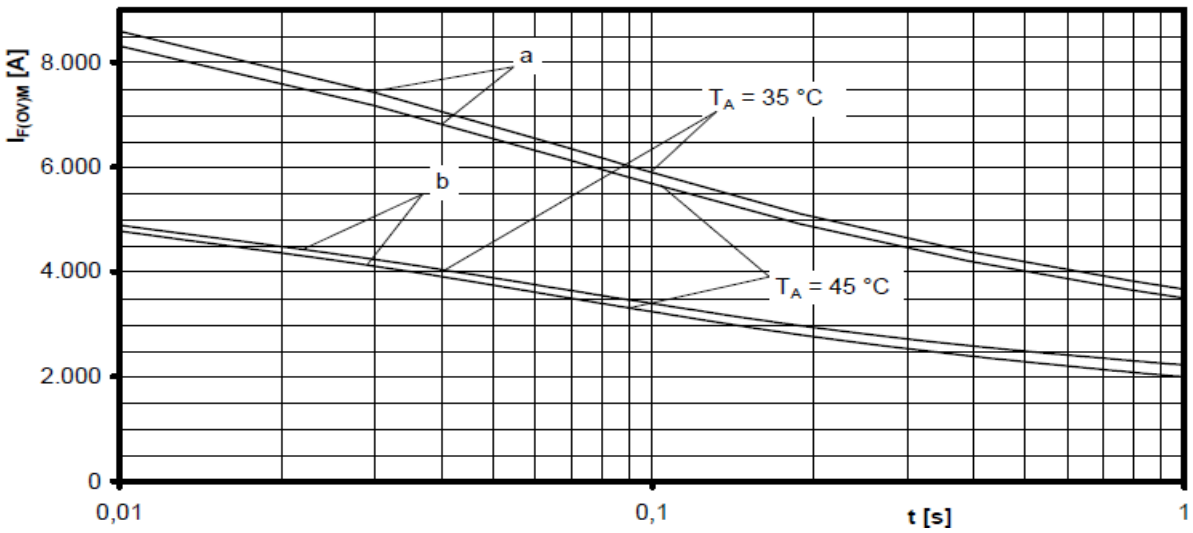


Maximum rated output current ID
B6:Six-pulse bridge circuit
Total power dissipation at circuit Ptot
Parameter:
Thermal resistance cases to ambient R_{thCA}

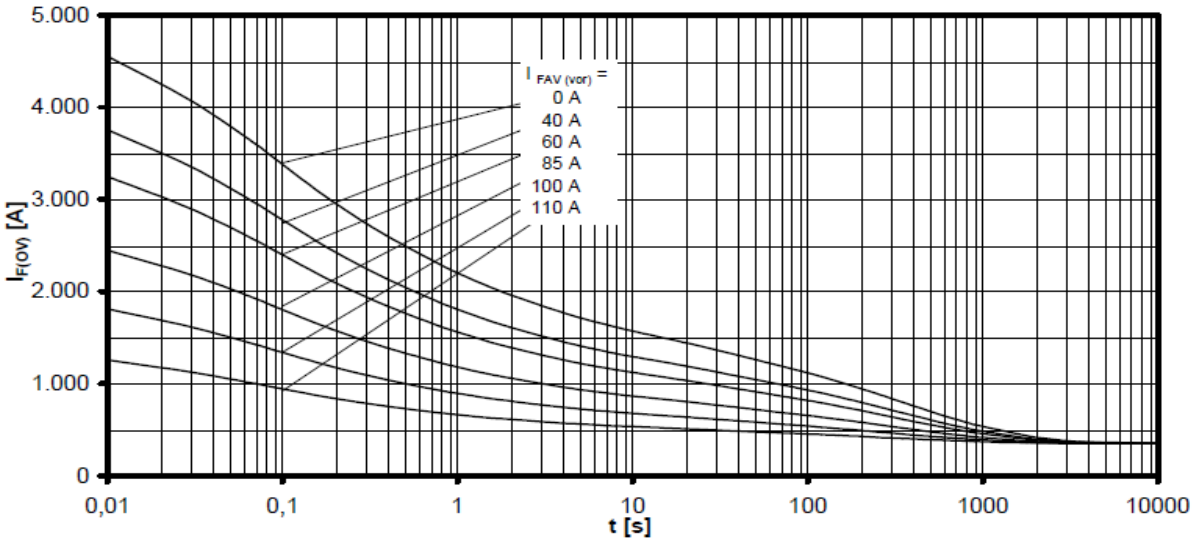


Recovered charge Qr = f(-di/dt)
$T_{vj} = T_{vjmax}$, $v_R \leq 0,5\ V_{RRM}$, $v_{RM} = 0,8\ V_{RRM}$
Parameter:
On-state current i_{FM}

CHARACTERISTICS CURVES (Cont.....)

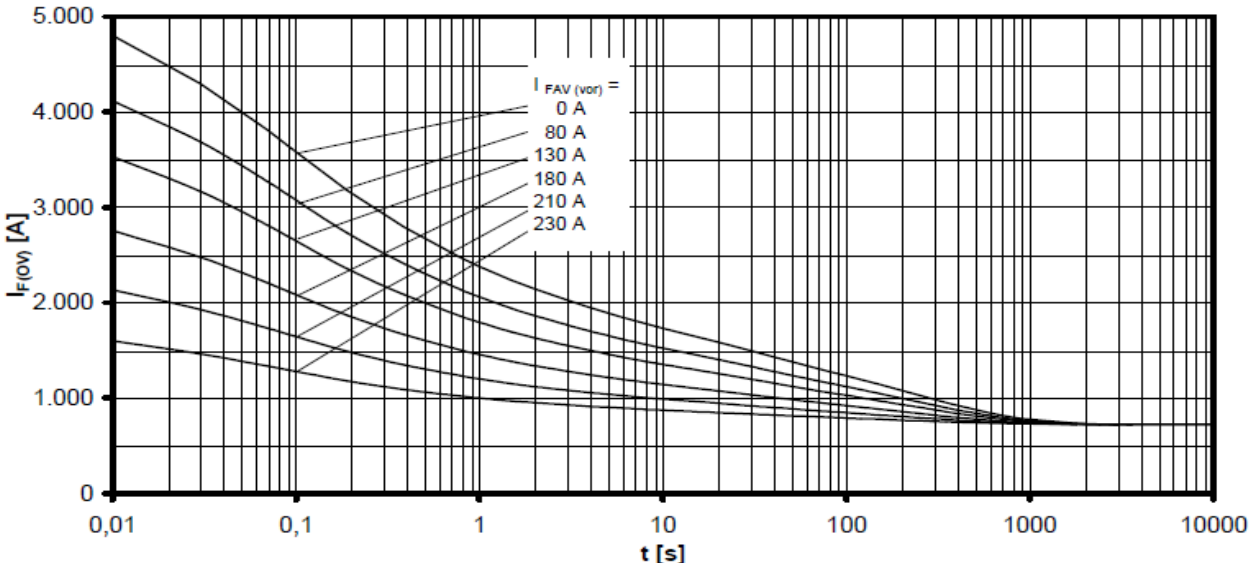


Maximum overload on-state current per arm IF(OV)M = f(t), vRM = 0,8 VRRM
No-load conditions
Pre-load current per arm IFAV(vor) = IFAVM
Ta = 35°C,Forced air cooling Heatsink type: KM17 (Papst 4650)
Ta = 45°C, Natural air cooling Heatsink type: KM17 (120W)



Overload on-state current IF(OV)
B6Six-pulse bridge circuit, 120° rectangular
Heatsink type KM17 (120W),Natural cooling at T_A = 45°C
Parameter:
Pre-load current per arm $I_{FAV(vor)}$

CHARACTERISTICS CURVES (Cont.....)



Overload on-state current IF(OV)
B6-Six-pulse bridge circuit 120° rectangular
Heatsink type KM17 (Papst 4650) Forced cooling at TA = 35°C
Parameter:
Pre-load current per arm $I_{FAV(vor)}$

Customer Notes

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.

2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

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