



### 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	$V_{RRM}$	$T_{vj} = -40^{\circ}\text{C}$ to $T_{vj} \text{ max}$	3600	4000	V
Non-repetitive peak reverse voltage	$V_{RSM}$	$T_{vj} = +25^{\circ}\text{C}$ to $T_{vj} \text{ max}$	3700	4100	V
Maximum RMS on-state current	$I_{FRMSM}$		1100		A
Average on-state current	$I_{FAVM}$	$T_C = 100^{\circ}\text{C}$	435		A
		$T_C = 47^{\circ}\text{C}$	700		
Surge current	$I_{FSM}$	$T_{vj} = 25^{\circ}\text{C}$ , $t_p = 10 \text{ ms}$	14.500		A
		$T_{vj} = T_{vj} \text{ max}$ , $t_p = 10 \text{ ms}$	12.000		
I <sup>2</sup> t-value	I <sup>2</sup> t	$T_{vj} = 25^{\circ}\text{C}$ , $t_p = 10 \text{ ms}$	1.050.000		A <sup>2</sup> s
		$T_{vj} = T_{vj} \text{ max}$ , $t_p = 10 \text{ ms}$	720.000		

### ELECTRICAL CHARACTERISTICS

DESCRIPTION	SYMBOL	Test Conditions	VALUE	UNIT
On-state voltage	$V_F$	$T_{vj} = T_{vj} \text{ max}$ , $i_F = 1200 \text{ A}$	1,71 Max	V
Threshold voltage	$V_{(TO)}$	$T_{vj} = T_{vj} \text{ max}$	0,84	V
Slope resistance	$r_T$	$T_{vj} = T_{vj} \text{ max}$	0,6	mΩ
Reverse current	$I_R$	$T_{vj} = T_{vj} \text{ max}$ , $V_R = V_{RRM}$	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

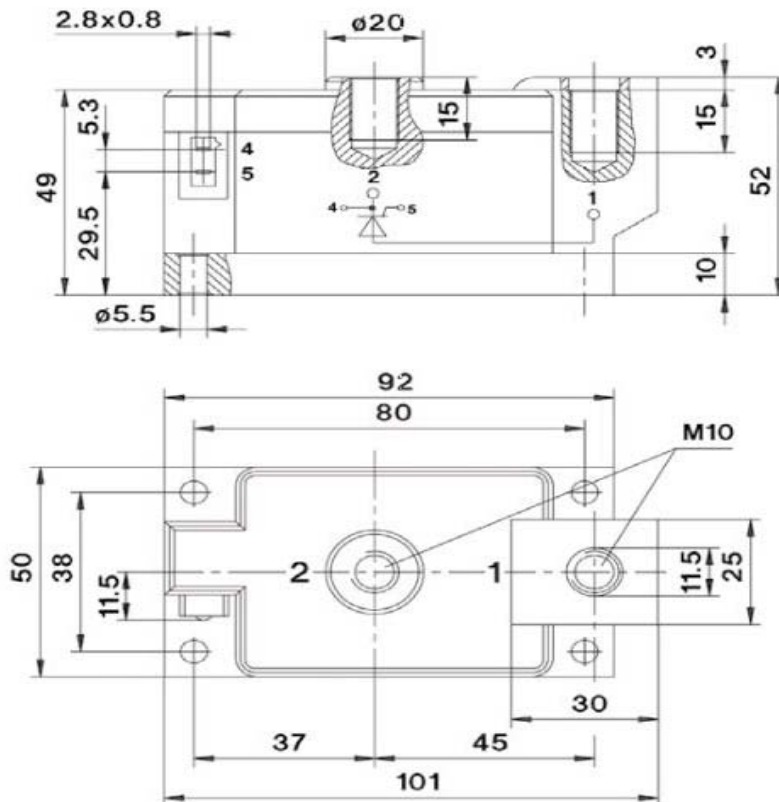
DESCRIPTION	SYMBOL	Test Conditions	VALUE	UNIT
Thermal resistance, junction to case	$R_{thJC}$	per Module, $\theta = 180^\circ$ sin	0,0780 max	°C/W
		per Module, DC	0,0745 max	
Thermal resistance, case to heatsink	$R_{thCH}$	pro Module / per Module	0,02 max	
Maximum junction temperature	$T_{vj,max}$		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 $\pm 15\%$	5	Nm
Terminal connection torque	M2	Tolerance $\pm 10\%$	12	Nm
Weight	G		900 (Typ.)	gm
Creepage distance			15	mm
Vibration resistance		f = 50 Hz	50	m/s <sup>2</sup>
		file-No.	E 83335	

### PACKAGE DETAILS

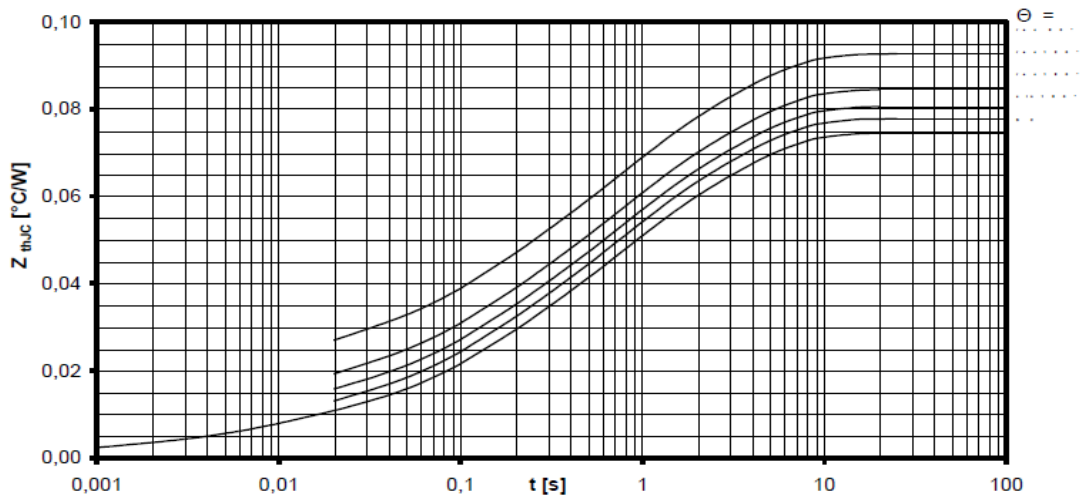
#### SEMIPACK 4



**Analytical elements of transient thermal impedance Z thJC for DC**

Pos. n	1	2	3	4	5	6	7
R <sub>thn</sub> [°C/W]	0,00194	0,00584	0,01465	0,0254	0,0267		
T <sub>n</sub> [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  $\theta$

**Analytical elements of transient thermal impedance Z<sub>thCA</sub>**

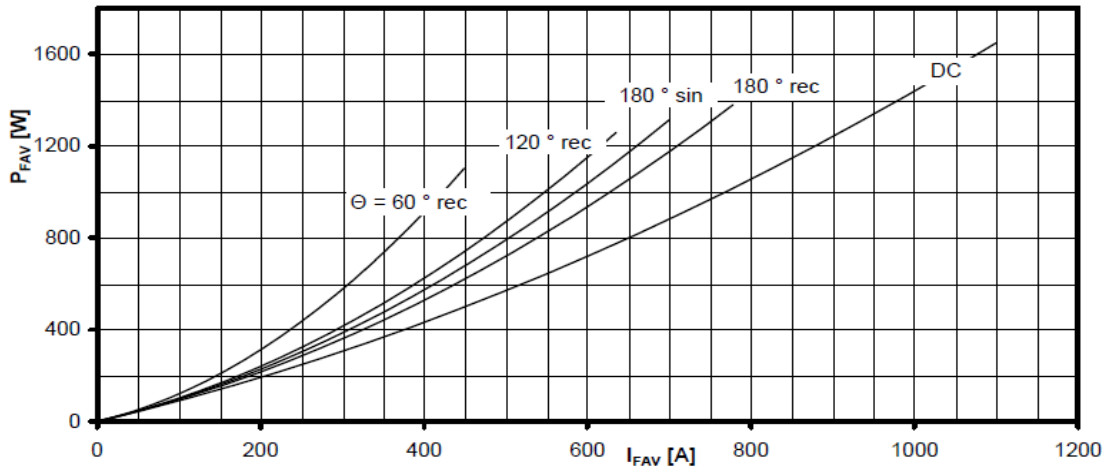
Pos. n	1	2	3	4	5	6	7
R <sub>thn</sub> [°C/W]	0,01176	0,0412	0,717				
T <sub>n</sub> [s]	3,19	28,3	1370				

<b>Forced cooling                  3 modules per heatsink                  Heatsink type: KM17 (Papst 4650)</b>							
Pos. n	1	2	3	4	5	6	7
R <sub>thn</sub> [°C/W]	0,0075	0,0435	0,239				
T <sub>n</sub> [s]	6,4	31,8	497				

Analytical function:

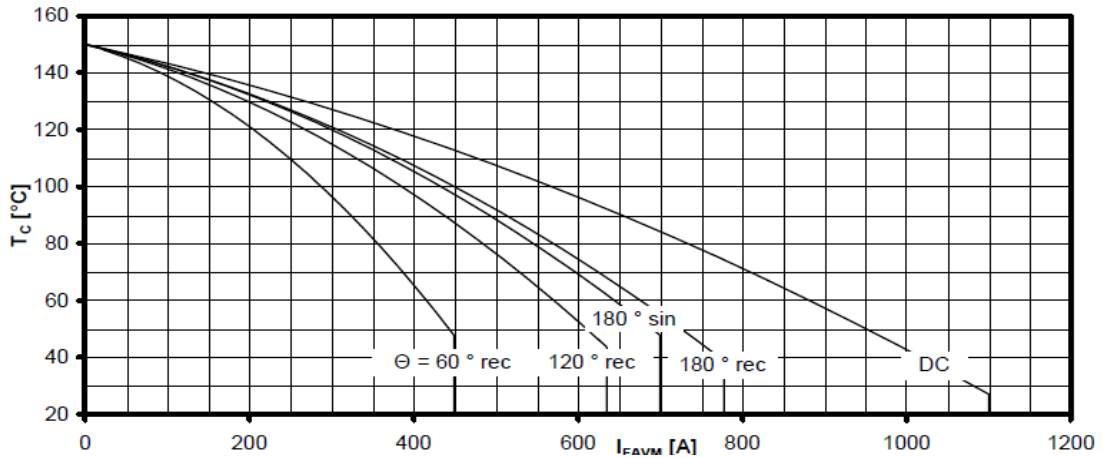
$$Z_{thCA} = \sum_{n=1}^{n_{max}} R_{thn} \left( 1 - e^{-\frac{t}{\tau}} \right)$$

**CHARACTERISTICS CURVES**

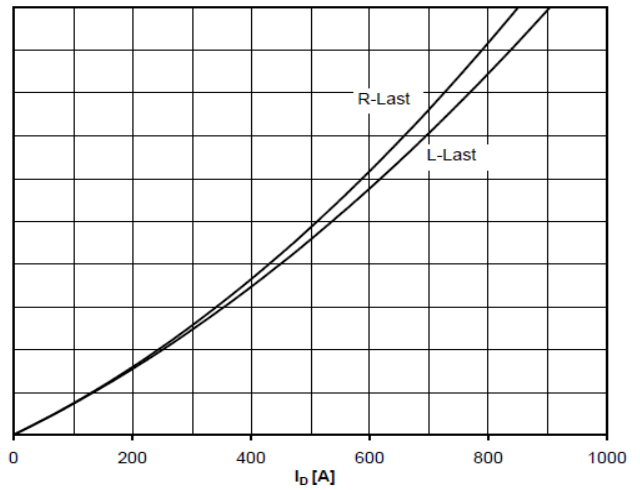
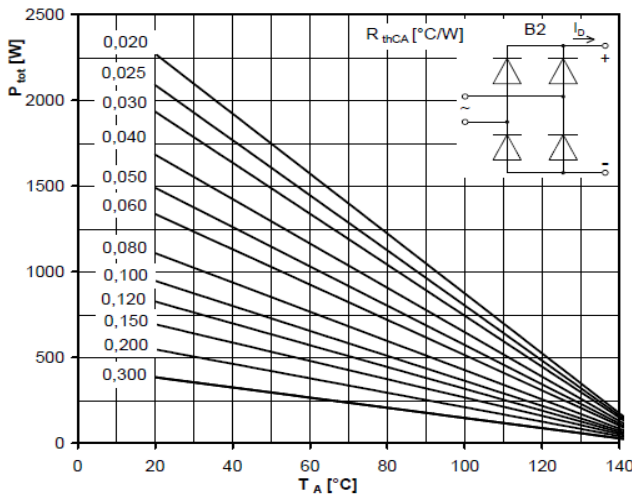


**CHARACTERISTICS CURVES (Cont.....)**

**On-state power loss per arm PFAV = f(IFAV)**  
**Current conduction angle  $\theta$**

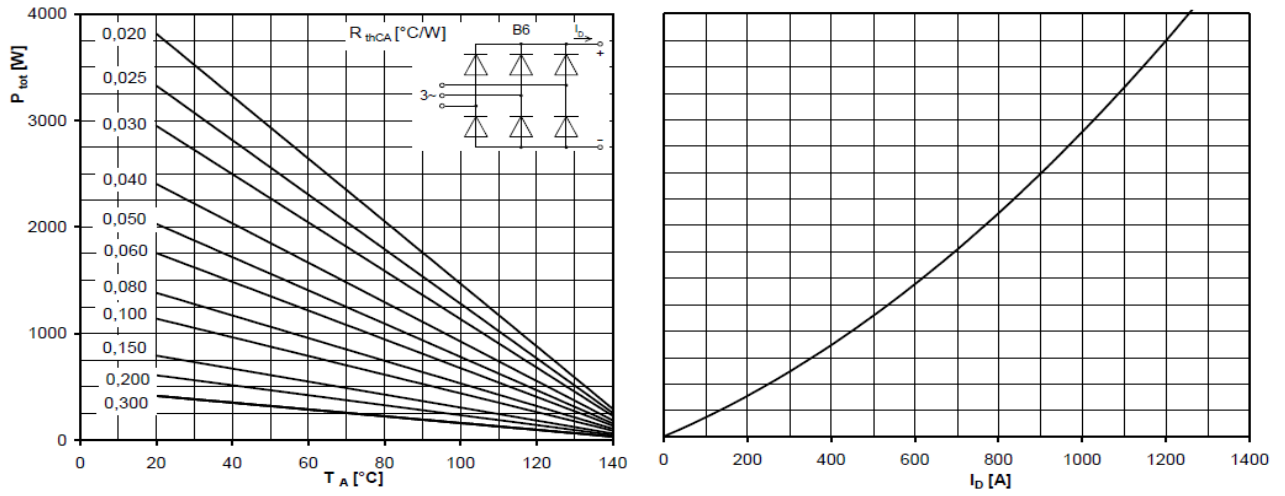


**Maximum allowable case temperature  $T_C = f(I_{FAVM})$**   
**Current load per arm**  
**Calculation base PTA<sub>V</sub> (switching losses should be considered separately)**  
**Parameter: Current conduction angle  $\theta$**

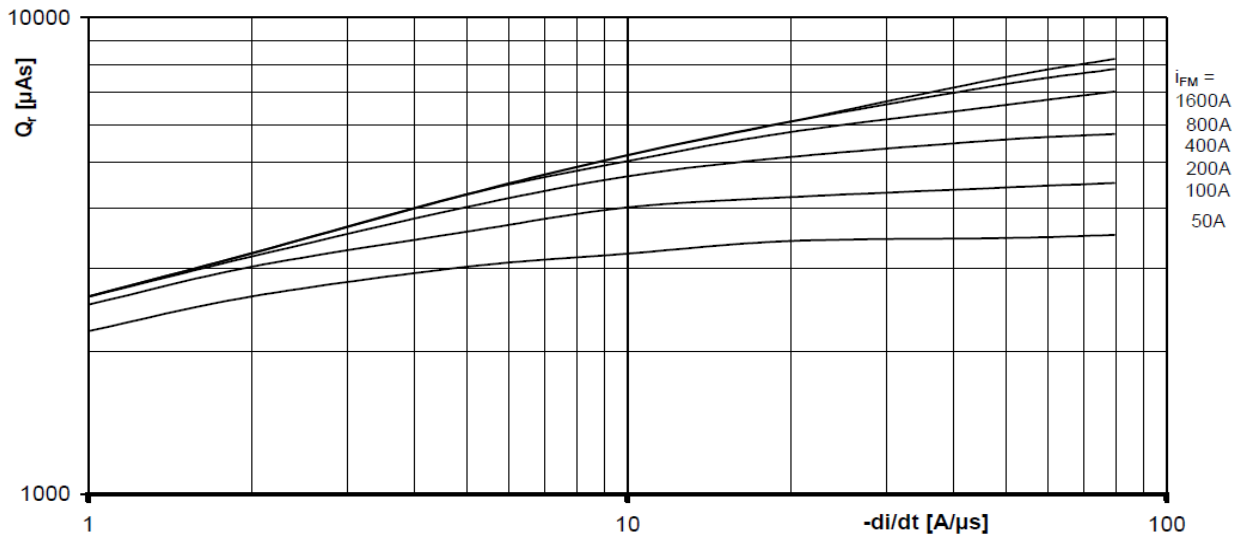


**Maximum rated output current  $I_D$**   
**B2 :Two-pulse bridge circuit**  
**Total power dissipation at circuit  $P_{tot}$**   
**Parameter:**  
**Thermal resistance cases to ambient  $R_{thCA}$**

**CHARACTERISTICS CURVES (Cont.....)**

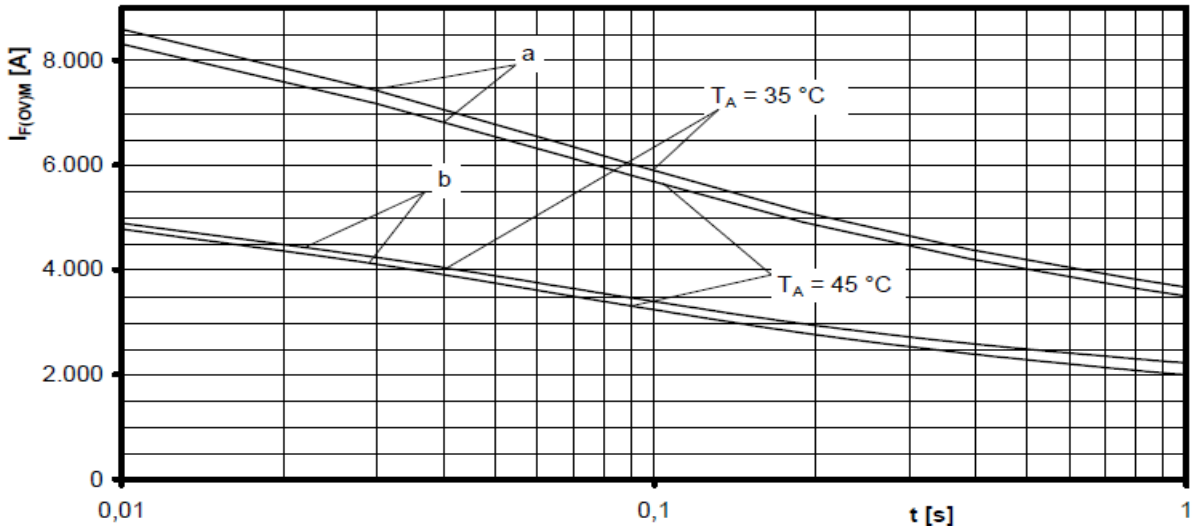


**Maximum rated output current  $I_D$**   
**B6: Six-pulse bridge circuit**  
**Total power dissipation at circuit  $P_{tot}$**   
**Parameter:**  
**Thermal resistance cases to ambient  $R_{thCA}$**

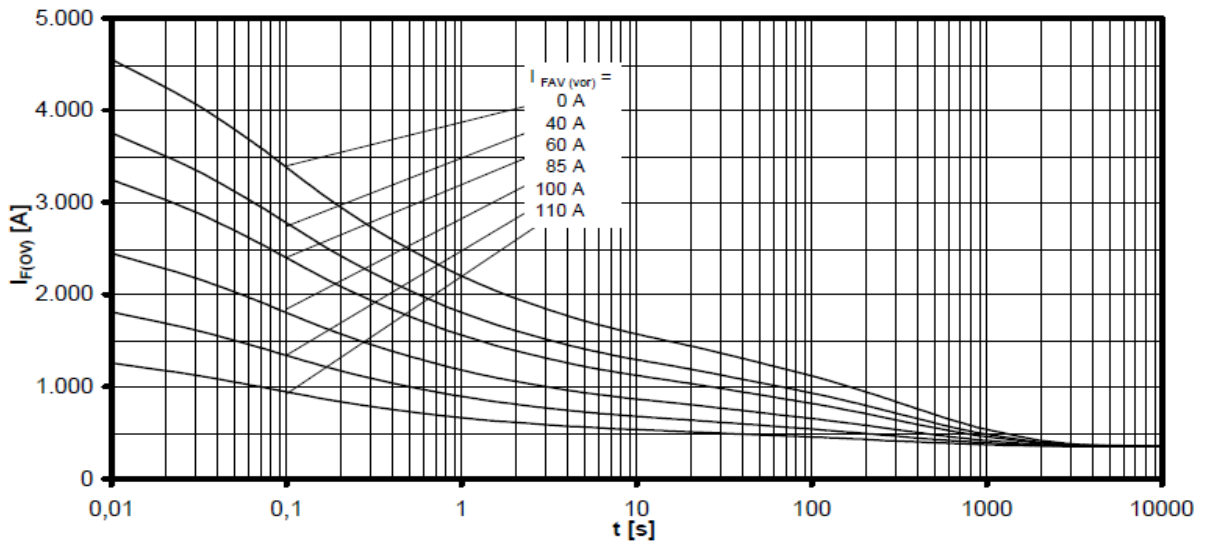


**Recovered charge  $Q_r = f(-di/dt)$**   
 $T_{vj} = T_{vjmax}, v_R \leq 0,5 V_{RRM}, v_{RM} = 0,8 V_{RRM}$   
**Parameter:**  
**On-state current  $i_{FM}$**

**CHARACTERISTICS CURVES (Cont.....)**

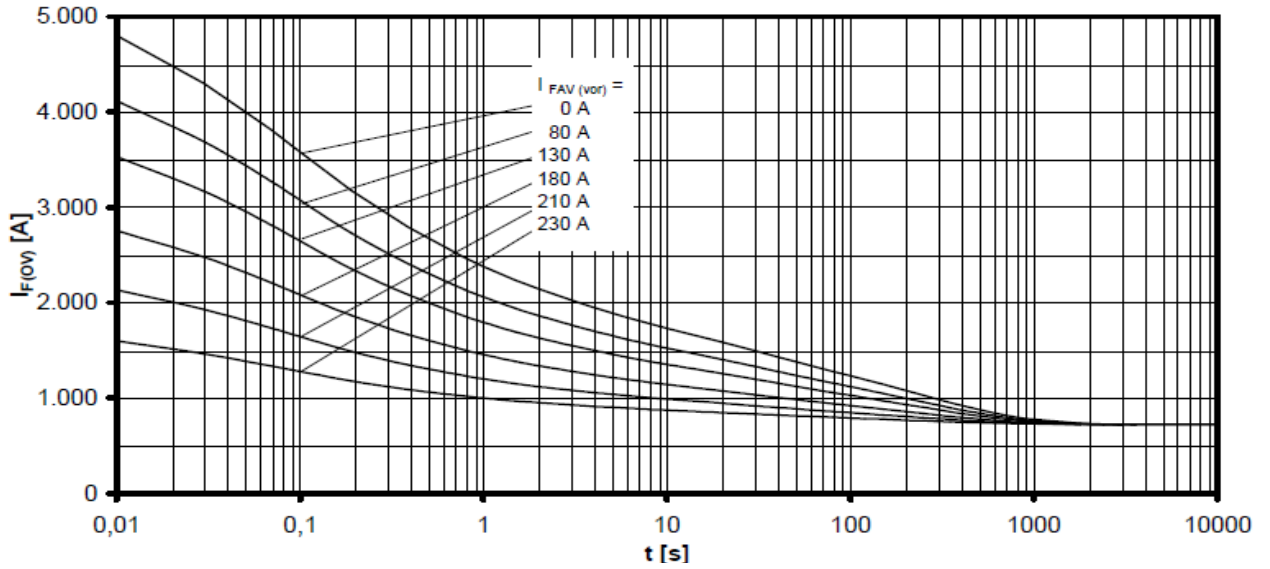


Maximum overload on-state current per arm  $I_{F(OV)M} = f(t)$ ,  $v_{RM} = 0,8$  VRRM  
No-load conditions  
Pre-load current per arm  $I_{FAV(vor)} = I_{FAVM}$   
 $T_A = 35^\circ\text{C}$ , Forced air cooling Heatsink type: KM17 (Papst 4650)  
 $T_A = 45^\circ\text{C}$ , Natural air cooling Heatsink type: KM17 (120W)



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

**CHARACTERISTICS CURVES (Cont.....)**



**Overload on-state current  $I_{F(OV)}$**   
**B6-Six-pulse bridge circuit 120° rectangular**  
**Heatsink type KM17 (Papst 4650) Forced cooling at  $T_A = 35^\circ\text{C}$**   
**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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