ABB 5SDD50M5500 Rectifier Diode datasheet

http://www.manuallib.com/abb/5sdd50m5500-rectifier-diode-datasheet.html

Properties

Key Parameters

- Industry standard housing
- Suitable for parallel operation
- High operating temperature
- Low forward voltage drop

5SDD 50M5500

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Key Parameters

V_{RSM}	=	5 500	V
I_{FAVm}	=	4 850	A
I_{FSM}	=	67 500	A
V_{TO}	=	0.912	V
r_T	=	0.089	mΩ

Types

	V_{RSM}
5SDD 50M5500	**5 500 V**
Conditions:	*T_j = -40 ÷ 150 °C, half sine waveform, f = 5 Hz, note 1*

Mechanical Data

F_m	**Mounting force**	**70 ± 7**	**kN**
m	**Weight**	**2.0**	**kg**
D_S	**Surface creepage distance**	**56**	**mm**
D_a	**Air strike distance**	**28**	**mm**

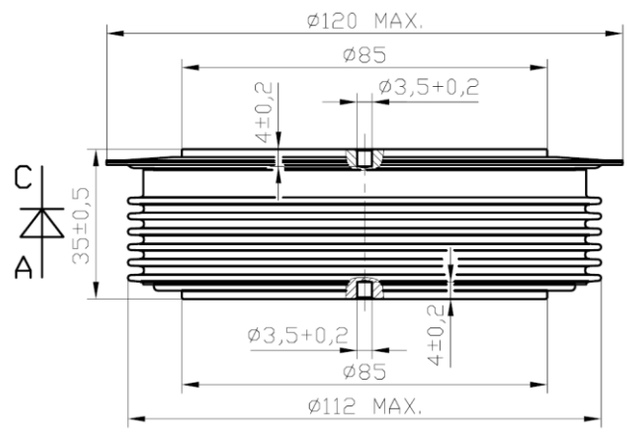

Fig. 1 Case

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Maximum Ratings			*Maximum Limits*	*Unit*
V_{RSM}	**Non-repetitive peak reverse voltage** *half sine waveform, f = 5 Hz, t_p = 10ms, note 1*		**5 500**	**V**
V_{RRM}	**Repetitive peak reverse voltage** *half sine waveform, f = 50 Hz, t_p = 10ms, note 1*		**5 000**	**V**
I_{FAVm}	**Average forward current** *T_c = 85 °C*		**4 850**	**A**
I_{FRMS}	**RMS forward current** *T_c = 85 °C*		**7 619**	**A**
I_{RRM}	**Repetitive reverse current** *$V_R = V_{RRM}$*		**200**	**mA**
I_{FSM}	**Non repetitive peak surge current** *V_R = 0 V, half sine pulse*	*t_p = 8.3 ms*	**72 100**	**A**
		t_p = 10 ms	**67 500**	**A**
I^2t	**Limiting load integral** *V_R = 0 V, half sine pulse*	*t_p = 8.3 ms*	**21 577 000**	**A^2s**
		t_p = 10 ms	**22 781 000**	**A^2s**
T_{jmin} **-** T_{jmax}	**Operating temperature range**		**-40 ÷ 150**	**°C**
T_{STG}	**Storage temperature range**		**-40 ÷ 150**	**°C**

Unless otherwise specified T_j = 150 °C
Note 1: De-rating factor of 0.13% V_{RRM} or V_{RSM} per °C is applicable for T_j below 25 °C

Characteristics		*Value*			*Unit*
		min	*typ*	*max*	
V_{T0}	**Threshold voltage**			**0.912**	**V**
r_T	**Forward slope resistance** *I_{F1} = 8 600 A, I_{F2} = 25 900 A*			**0.089**	**mΩ**
V_{FM}	**Maximum forward voltage** *I_{FM} = 5 000 A*			**1.330**	**V**
Q_{rr}	**Recovered charge** *V_R = 100 V, I_{FM} = 2000 A, di_F/dt = -30 A/µs*		**5 500**		**µC**

Unless otherwise specified T_j = 150 °C

Thermal Parameters			*Value*	*Unit*
R_{thjc}	**Thermal resistance junction to case**	*double side cooling*	**6.5**	**K/kW**
		anode side cooling	**12.2**	
		cathode side cooling	**14.1**	
R_{thch}	**Thermal resistance case to heatsink**	*double side cooling*	**1.5**	**K/kW**
		single side cooling	**3.0**	

Transient Thermal Impedance

Analytical function for transient thermal impedance

$$Z_{thjc} = \sum_{i=1}^{4} R_i (1 - \exp(-t / \tau_i))$$

Conditions:
F_m = 70 ± 7 kN, Double side cooled

Correction for periodic waveforms

180°	**sine:**	**0.3 K/kW**
120°	**sine:**	**0.4 K/kW**
60°	**sine:**	**0.6 K/kW**
180°	**rectangular:**	**0.3 K/kW**
120°	**rectangular:**	**0.4 K/kW**
60°	**rectangular:**	**0.8 K/kW**

i	1	2	3	4
τ_i (s)	1.1580	0.1268	0.0181	0.0014
R_i(K/kW)	4.3574	1.8085	0.2460	0.0902

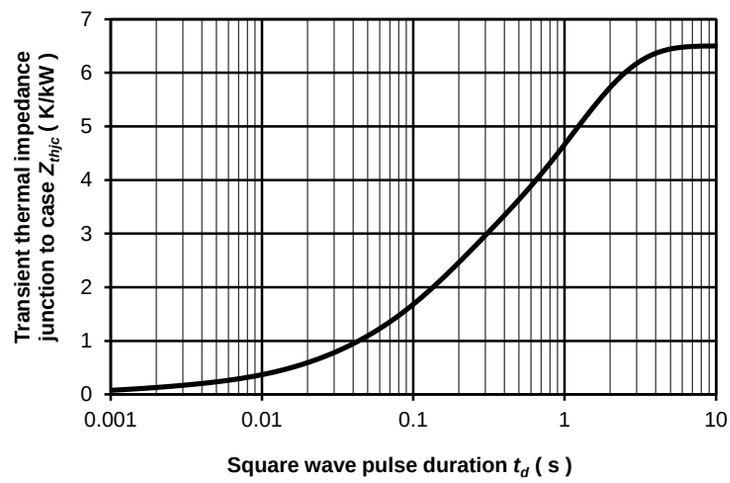

Fig. 2 Dependence transient thermal impedance junction to case on square pulse

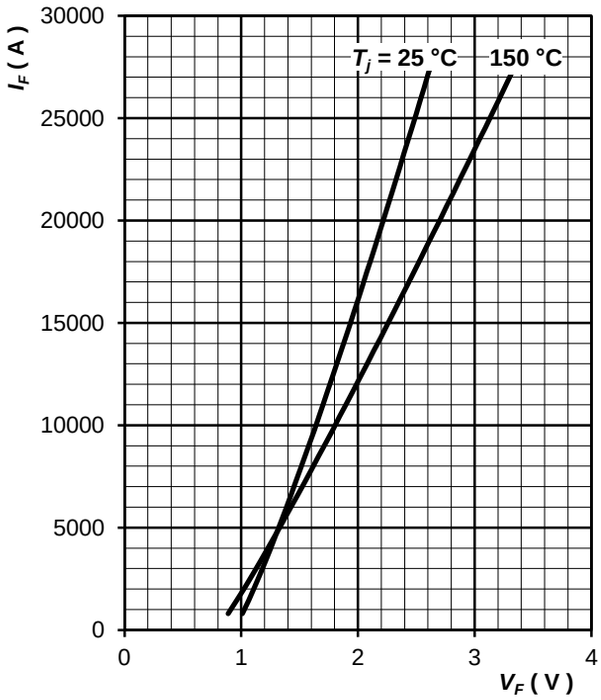

Fig. 3 Maximum forward voltage drop characteristics

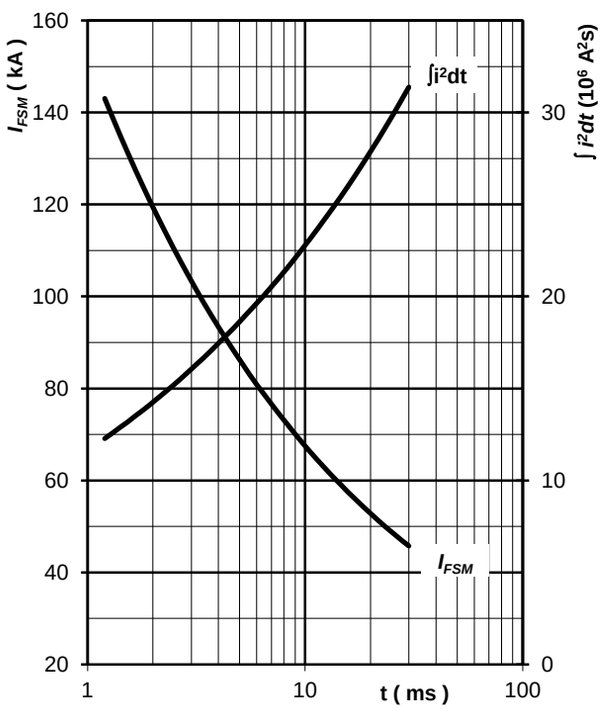

Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse, V_R = 0 V, $T_j = T_{jmax}$

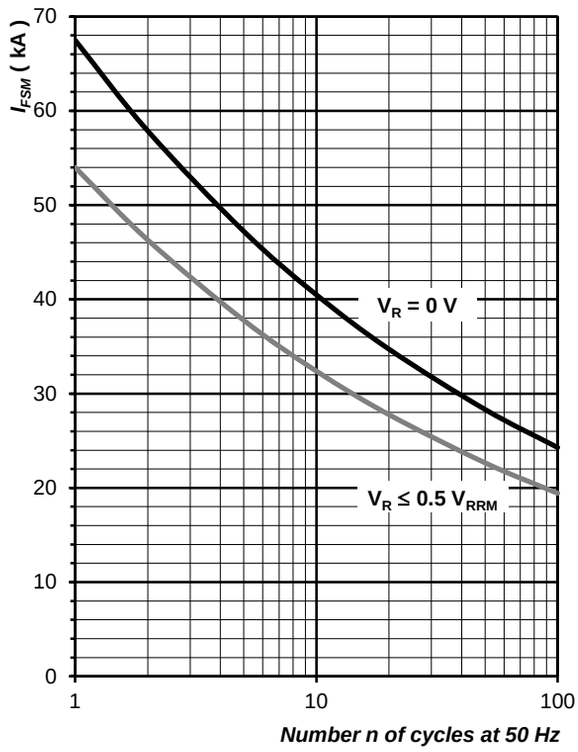

Fig. 5 Surge forward current vs. number of pulses, half sine wave, $T_j = T_{jmax}$

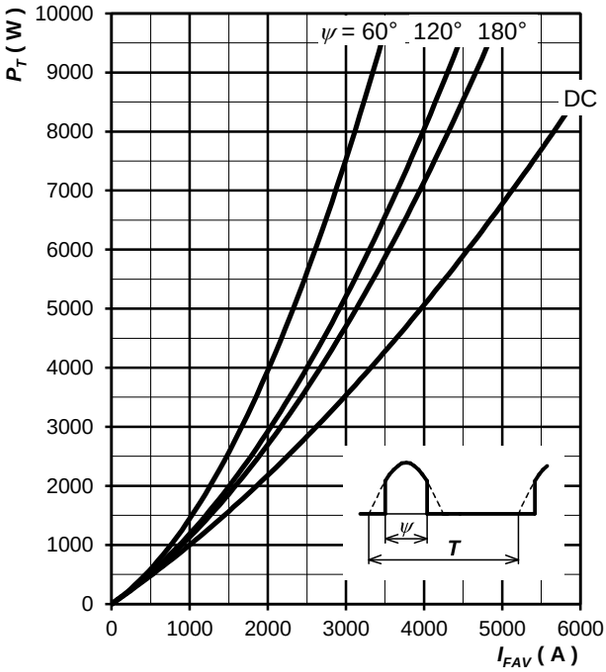

Fig. 6 Forward power loss vs. average forward current, sine waveform, f = 50 Hz, T = 1/f

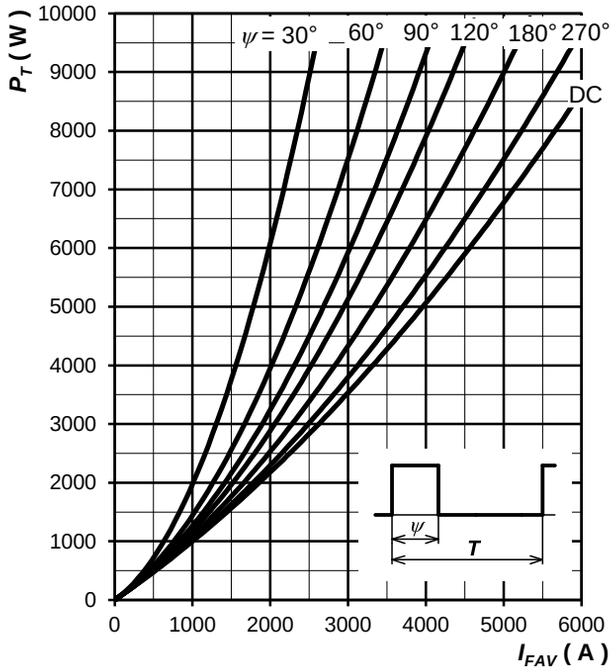

Fig. 7 Forward power loss vs. average forward current, square waveform, f = 50 Hz, T = 1/f

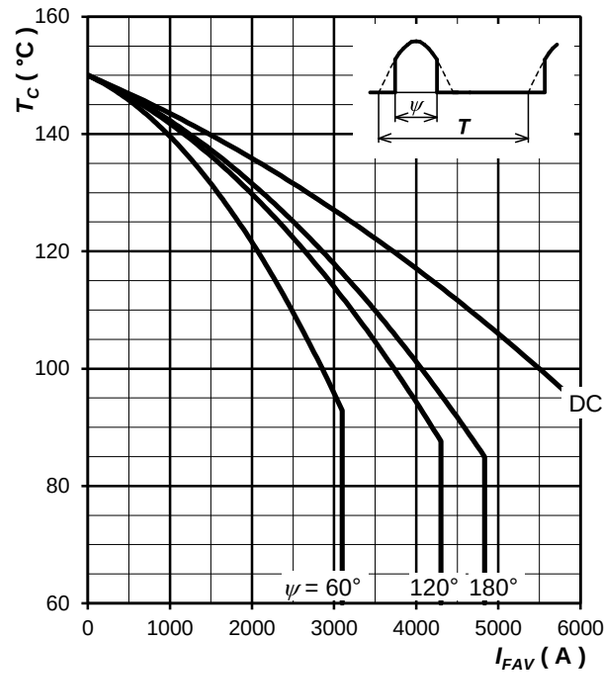

Fig. 8 Max. case temperature vs. aver. forward current, sine waveform, f = 50 Hz, T = 1/f

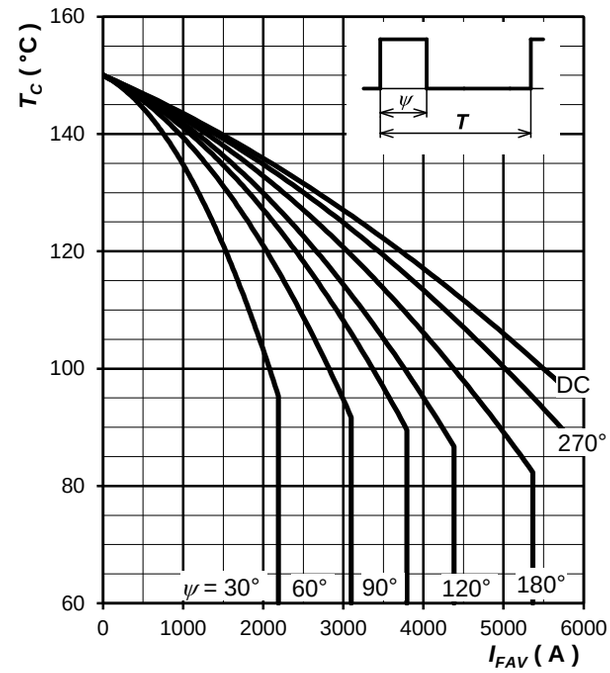

Fig. 9 Max.case temperature vs. aver. forward current, square waveform, f = 50 Hz, T = 1/f

Notes: