5SDD 19T3000

Old part no. DV 808C-1890-30

Rectifier Diode

Properties

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

Key Parameters

V_{RRM}	=	3 000	V
I_{FAVm}	=	1 926	A
I_{FSM}	=	26 000	A
V_{TO}	=	0.972	V
r_T	=	0.149	mΩ

Types

	V_{RRM}
5SDD 19T3000 **5SDD 19T2800**	**3 000 V** **2 800 V**
Conditions:	T_j = -40 ÷ 150 °C, *half sine waveform,* *f = 50 Hz*

Mechanical Data

F_m	**Mounting force**	**25 ± 5 kN**
m	**Weight**	**0.44 kg**
D_S	**Surface creepage distance**	**22 mm**
D_a	**Air strike distance**	**13.9 mm**

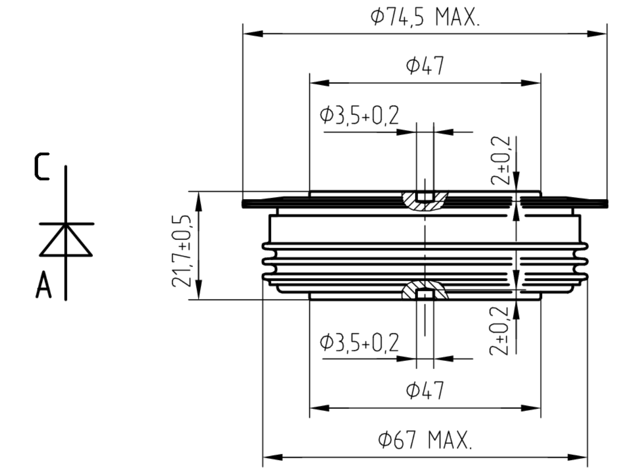

Fig. 1 Case

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Maximum Ratings				***Maximum Limits***	***Unit***
V_{RRM}	**Repetitive peak reverse voltage** T_j = -40 ÷ 150 °C		**5SDD 19T3000** **5SDD 19T2800**	**3 000** **2 800**	**V**
I_{FAVm}	**Average forward current** T_c = 85 °C			**1 926**	**A**
I_{FRMS}	**RMS forward current** T_c = 85 °C			**3 025**	**A**
I_{RRM}	**Repetitive reverse current** $V_R = V_{RRM}$			**40**	**mA**
I_{FSM}	**Peak non-repetitive surge** *half sine pulse,* V_R = 0 V		t_p = 10 ms	**26 000**	**A**
			t_p = 8.3 ms	**27 800**	
I_{FSM}	**Peak non-repetitive surge** *half sine pulse,* V_R = 0.7 V_{RRM}		t_p = 10 ms	**20 800**	**A**
			t_p = 8.3 ms	**22 200**	
I^2t	**Limiting load integral** *half sine pulse,* V_R = 0 V		t_p = 10 ms	**3 338 000**	**A^2s**
			t_p = 8.3 ms	**3 210 000**	
I^2t	**Limiting load integral** *half sine pulse,* V_R = 0.7 V_{RRM}		t_p = 10 ms	**2 163 000**	**A^2s**
			t_p = 8.3 ms	**2 045 000**	
T_{jmin} - T_{jmax}	**Operating temperature range**			**-40 ÷ 150**	**°C**
T_{STG}	**Storage temperature range**			**-40 ÷ 175**	**°C**

Unless otherwise specified T_j *= 150 °C*

Characteristics		***Value***			***Unit***
		min	***typ***	***max***	
V_{T0}	**Threshold voltage**			**0.972**	**V**
r_T	***Forward slope resistance*** I_{F1} = 2 969 A, I_{F2} = 8 906 A			**0.149**	**mW**
V_{FM}	**Maximum forward voltage** I_{FM} = 5 000 A, T_j = 25 °C			**1.575**	**V**
Q_{rr}	**Recovered charge** V_R = 100 V, I_{FM} = 1 000 A, di/dt = -30 A/µs		**3 800**		**µC**

Unless otherwise specified T_j *= 150 °C*

Thermal Parameters			**Value**	**Unit**
R_{thjc}	**Thermal resistance junction to case**	*double side cooling*	**18.5**	**K/kW**
		anode side cooling	**33**	
		cathode side cooling	**42**	
R_{thch}	**Thermal resistance case to heatsink**	*double side cooling*	**4**	**K/kW**
		single side cooling	**8**	

Transient Thermal Impedance

Analytical function for transient thermal impedance

$$Z_{thjc} = \sum_{i=1}^{5} R_i (1 - \exp(-t / \tau_i))$$

Conditions:

F_m = 25 ± 5 kN, Double side cooled

Correction for periodic waveforms

180°	**sine:**	**1.6**	**K/kW**
180°	**rectangular:**	**2.2**	**K/kW**
120°	**rectangular:**	**3.6**	**K/kW**
60°	**rectangular:**	**5.9**	**K/kW**

i	1	2	3	4	5
τ_i (s)	**0.4293**	**0.0940**	**0.0413**	**0.0042**	**0.0005**
R_i(K/kW)	**9.22**	**5.65**	**1.79**	**1.76**	**0.06**

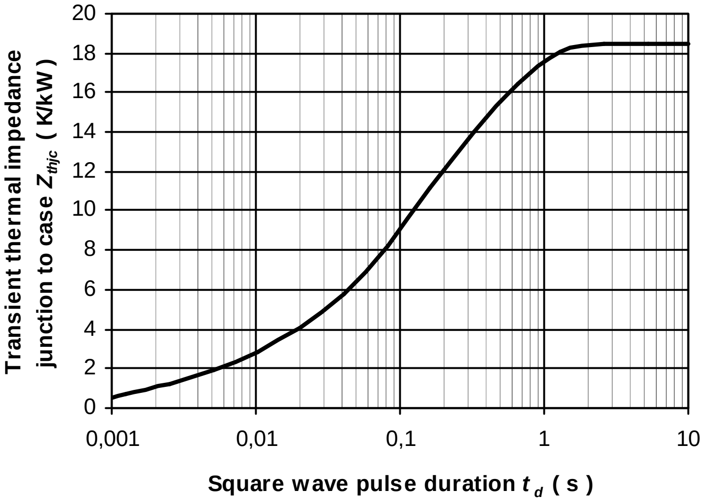

Fig. 2 Dependence transient thermal impedance junction to case on square pulse

Maximum forward voltage drop characteristics

Analytical function for maximum forward drop characteristics

$$\boxed{V_F = A + B \cdot I_F + C \cdot \sqrt{I_F} + D \cdot \ln(I_F + 1)}$$

Conditions:
F_m = 25 ± 5 kN, halfsine pulse 8.3 ÷ 10 ms

T_j (°C)	*A*	*B*
25	**5.0351 E-1**	**1.1473 E-4**
150	**7.5931 E-2**	**1.6382 E-4**

T_j (°C)	*C*	*D*
25	**-4.1929 E-3**	**9.3316 E-2**
150	**-6.3547 E-3**	**1.4976 E-1**

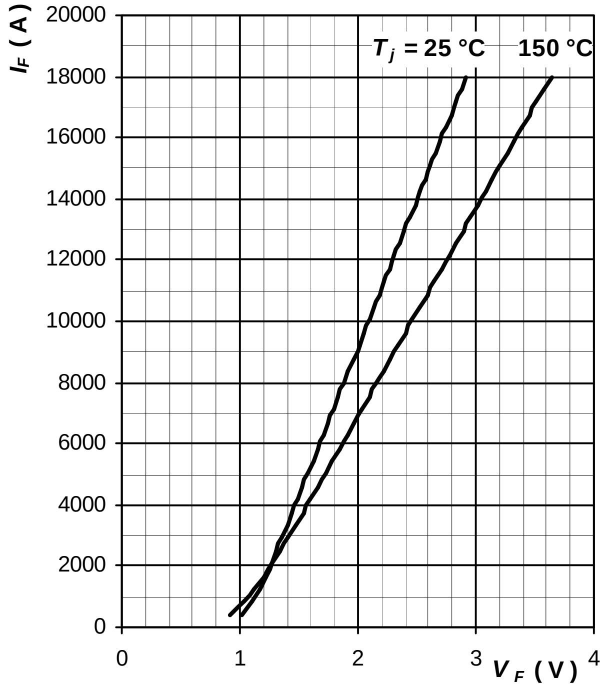

Fig. 3 Maximum forward voltage drop characteristics

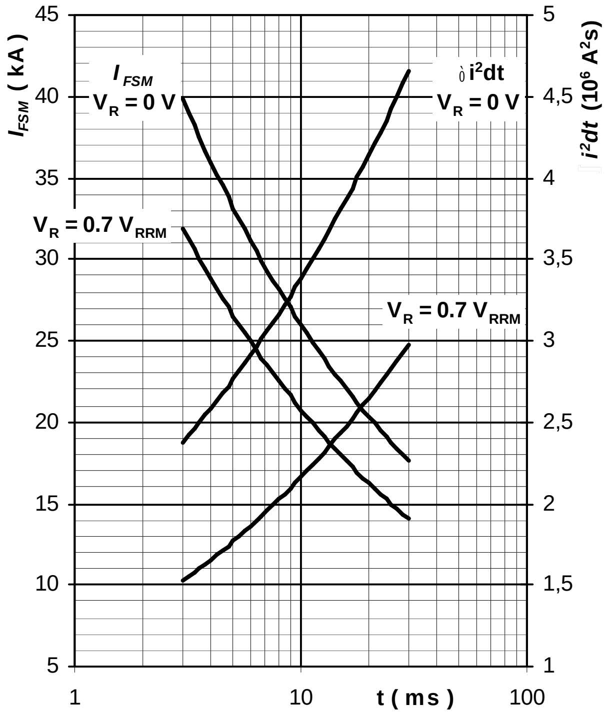

Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse, $T_j = T_{jmax}$

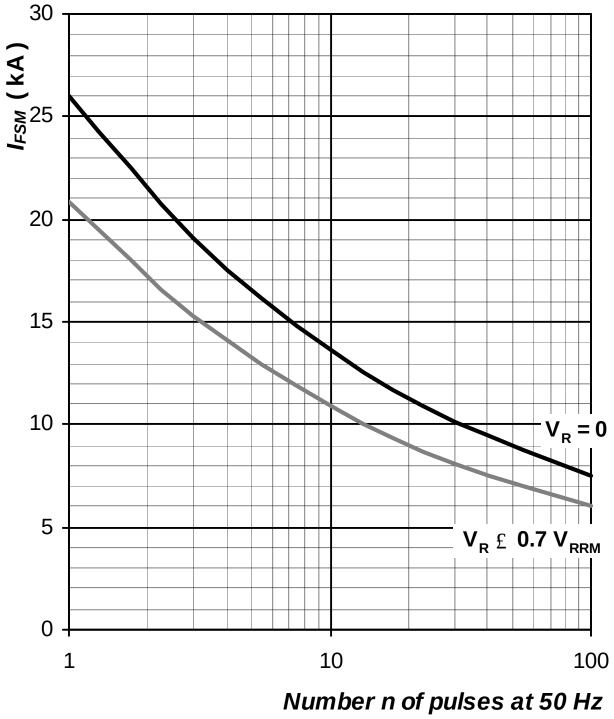

Fig. 5 Surge forward current vs. number of pulses, half sine wave, $T_j = T_{jmax}$

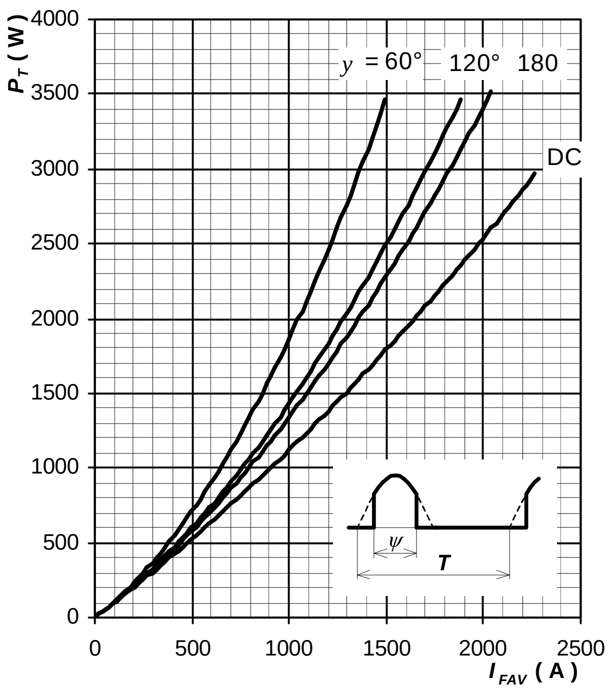

Fig. 6 Forward power loss vs. average forward current, sine waveform, f = 50 Hz, T = 1/f

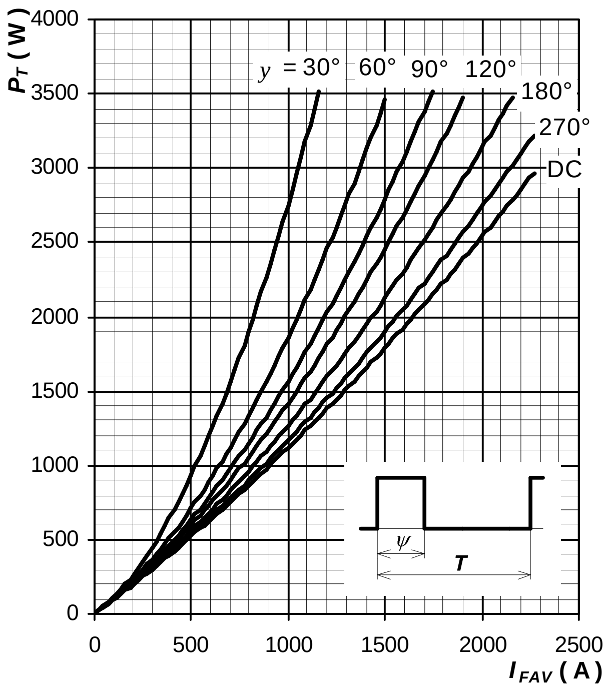

Fig. 7 Forward power loss vs. average forward current, square waveform, f = 50 Hz, T = 1/f

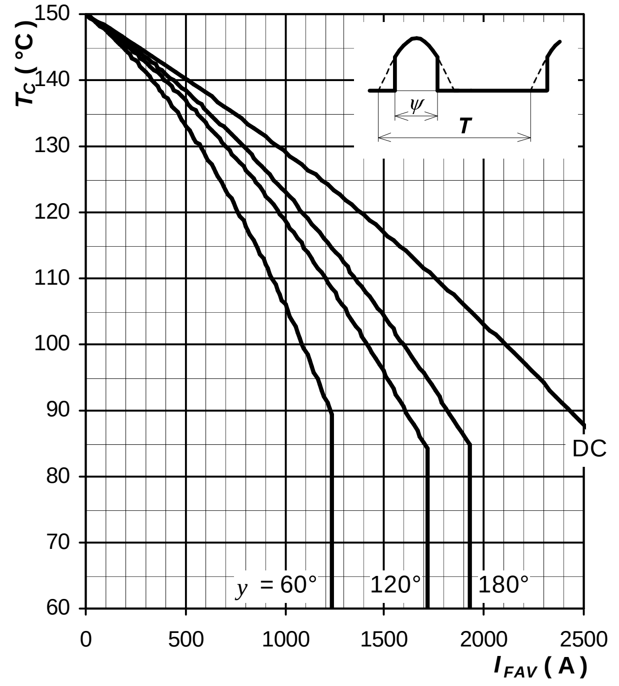

Fig. 8 Max. case temperature vs. aver. forward current, sine waveform, f = 50 Hz, T = 1/f

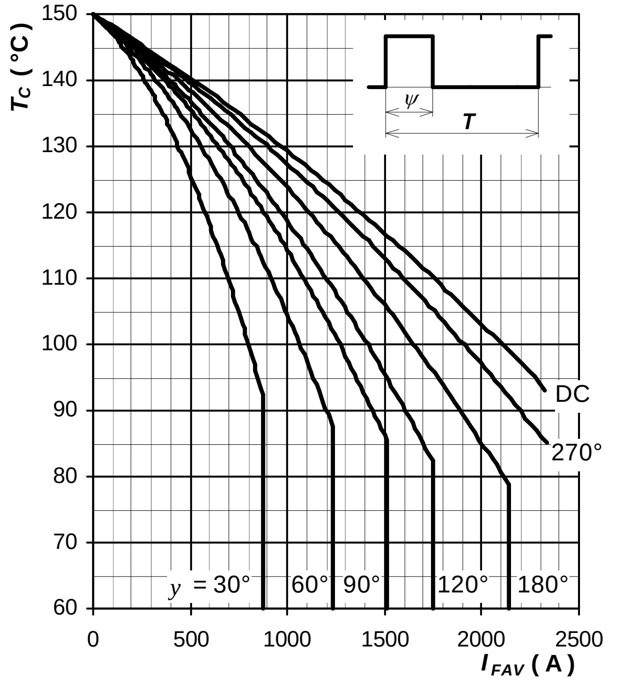

Fig. 9 Max.case temperature vs. aver. forward current, square waveform, f = 50 Hz, T = 1/f

Notes: