POLOVODIČE
akciová společnost

DV 818-3800-20

Rectifier Diode

Properties

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

Key Parameters

V_{RRM}	=	2 000	V
I_{FAVm}	=	3 730	A
I_{FSM}	=	34 000	A
V_{TO}	=	0.915	V
r_T	=	0.088	mΩ

Types

	V_{RRM}
DV 818-3800-20	**2 000 V**
DV 818-3800-18	**1 800 V**
DV 818-3800-16	**1 600 V**
Conditions:	*T_j = 0 ÷ 190 °C, half sine waveform, f = 50 Hz*

Mechanical Data

F_m	**Mounting force**	**22 ± 2**	**kN**
m	**Weight**	**0.49**	**kg**
D_S	**Surface creepage distance**	**33**	**mm**
D_a	**Air strike distance**	**20**	**mm**

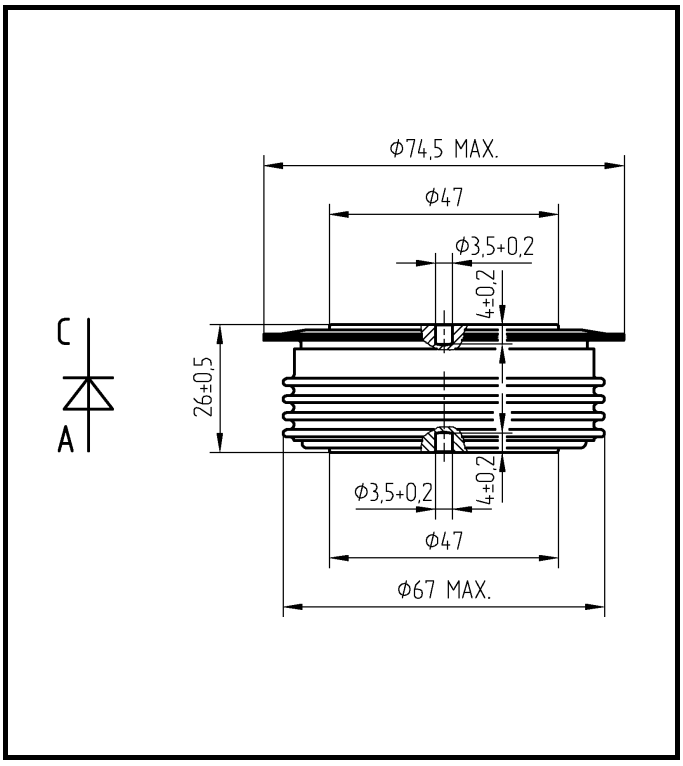

Fig. 1 Case

Polovodice, a.s.
Novodvorska 1768/138a, 142 21 Praha 4, Czech Republic
tel.: +420 261 306 265, fax: +420 261 306 307, http://www.polovodice.cz/

Maximum Ratings				*Maximum Limits*	*Unit*
V_{RRM}	**Repetitive peak reverse voltage** $T_j = 0 \div 190$ ℃	**DV 818-3800-20** **DV 818-3800-18** **DV 818-3800-16**		**2 000** **1 800** **1 600**	**V**
I_{FAVm}	**Average forward current** $T_c = 85$ ℃			**3 730**	**A**
I_{FRMS}	**RMS forward current** $T_c = 85$ ℃			**5 859**	**A**
I_{RRM}	**Repetitive reverse current** $V_R = V_{RRM}$			**60**	**mA**
I_{FSM}	**Non repetitive peak surge current** $V_R = 0$ V, half sine pulse, $T_j = 25$ ℃		t_p = 8.3 ms	**42 700**	**A**
			t_p = 10 ms	**40 000**	**A**
	Non repetitive peak surge current $V_R = 0$ V, half sine pulse		t_p = 8.3 ms	**36 000**	**A**
			t_p = 10 ms	**34 000**	**A**
I^2t	**Limiting load integral** $V_R = 0$ V, half sine pulse, $T_j = 25$ ℃		t_p = 8.3 ms	**7 577 000**	**A^2s**
			t_p = 10 ms	**8 000 000**	**A^2s**
	Limiting load integral $V_R = 0$ V, half sine pulse		t_p = 8.3 ms	**5 474 000**	**A^2s**
			t_p = 10 ms	**5 780 000**	**A^2s**
T_{jmin} **-** T_{jmax}	**Operating temperature range**			**0 ÷ 190**	**℃**
T_{STG}	**Storage temperature range**			**-40 ÷ 190**	**℃**

Unless otherwise specified T_j = 190 ℃

Characteristics		*Value*			*Unit*
		min	*typ*	*max*	
V_{T0}	**Threshold voltage**			**0.915**	**V**
r_T	**Forward slope resistance** $I_{F1} = 5\,969$ A, $I_{F2} = 17\,907$ A			**0.088**	**mΩ**
V_{FM}	**Maximum forward voltage** $I_{FM} = 4\,000$ A			**1.225**	**V**
Q_{rr}	**Recovered charge** $V_R = 100$ V, $I_{FM} = 2000$ A, di/dt = -30 A/µs		**2 900**		**µC**

Unless otherwise specified T_j = 190 ℃

Thermal Parameters			*Value*	*Unit*
R_{thjc}	**Thermal resistance junction to case**	*double side cooling*	**15**	**K/kW**
		anode side cooling	**24**	
		cathode side cooling	**40**	
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 = 22 ± 2 kN, Double side cooled

Correction for periodic waveforms

180°	**sine:**	**1.3 K/kW**
180°	**rectangular:**	**1.7 K/kW**
120°	**rectangular:**	**2.9 K/kW**
60°	**rectangular:**	**4.8 K/kW**

i	1	2	3	4	5
τ_i (s)	0.6937	0.2040	0.0452	0.0040	0.0005
R_i(K/kW)	6.04	3.83	3.76	1.31	0.07

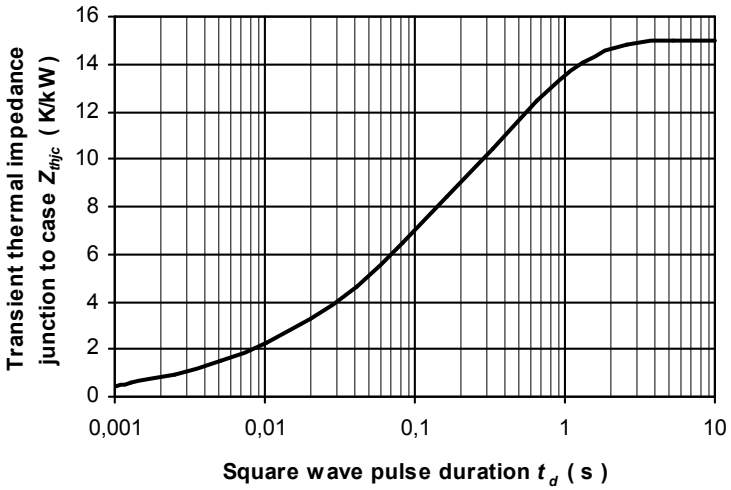

Fig. 2 Dependence transient thermal impedance junction to case on square pulse

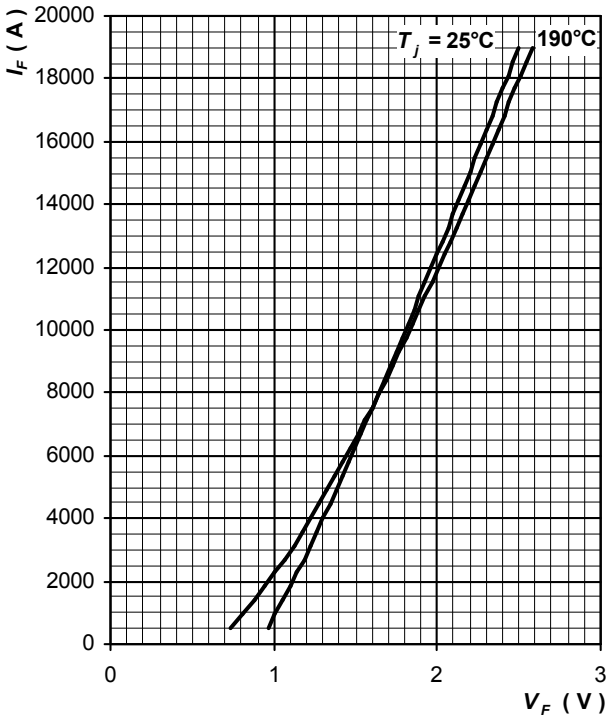

Fig. 3 Maximum forward voltage drop characteristics

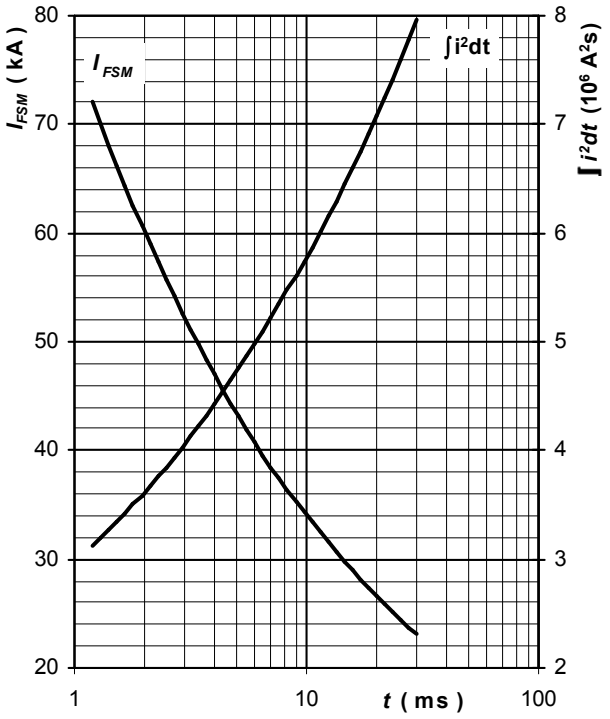

Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse, V_R = 0 V, $T_j = T_{jmax}$

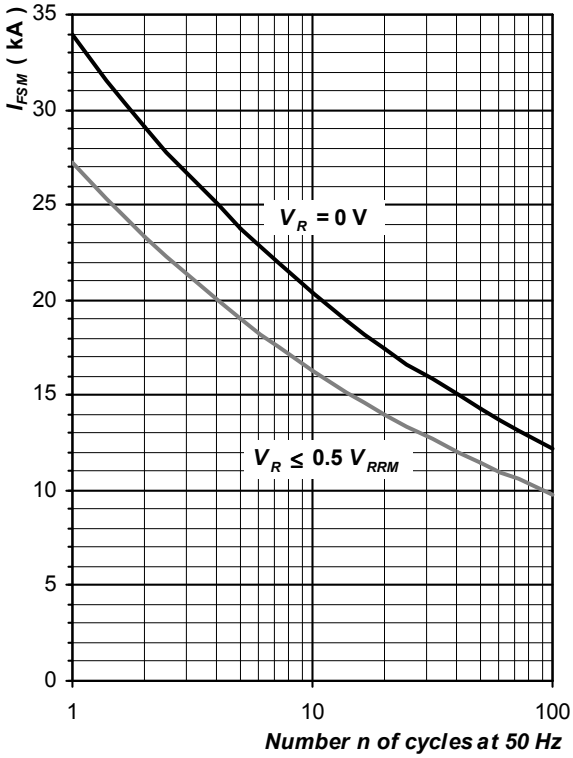

Fig. 5 Surge forward current vs. number of pulses, half sine wave, $T_j = T_{jmax}$

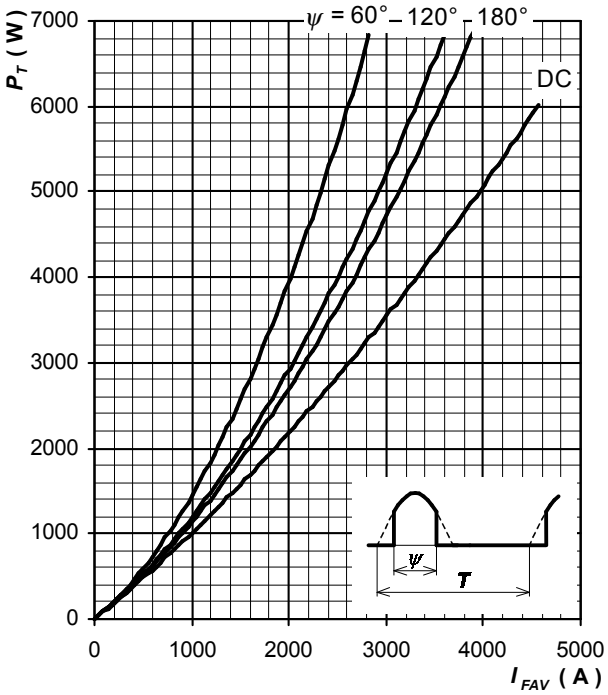

Fig. 6 Forward power loss vs. average forward current, sine waveform, f = 50 Hz, T = 1/f

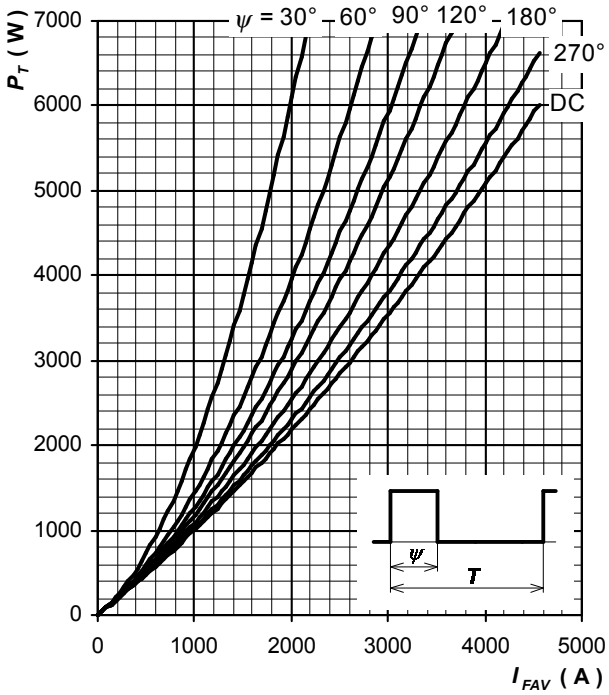

Fig. 7 Forward power loss vs. average forward current, square waveform, f = 50 Hz, T = 1/f

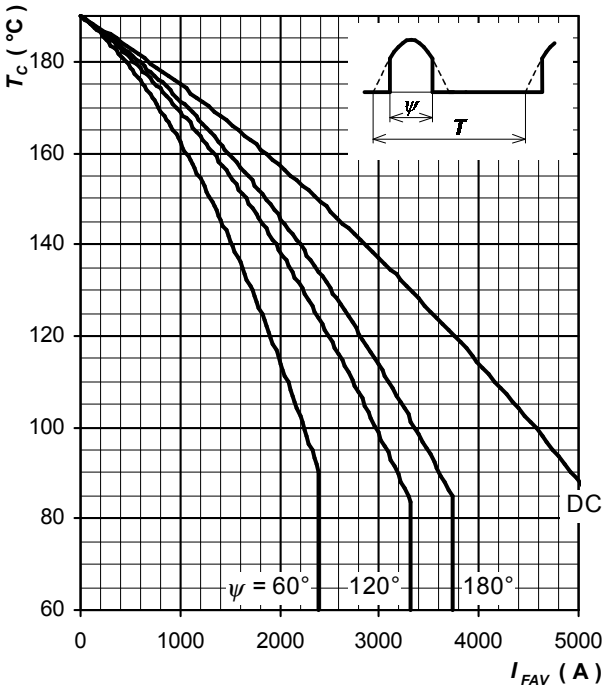

Fig. 8 Max. case temperature vs. aver. forward current, sine waveform, f = 50 Hz, T = 1/f

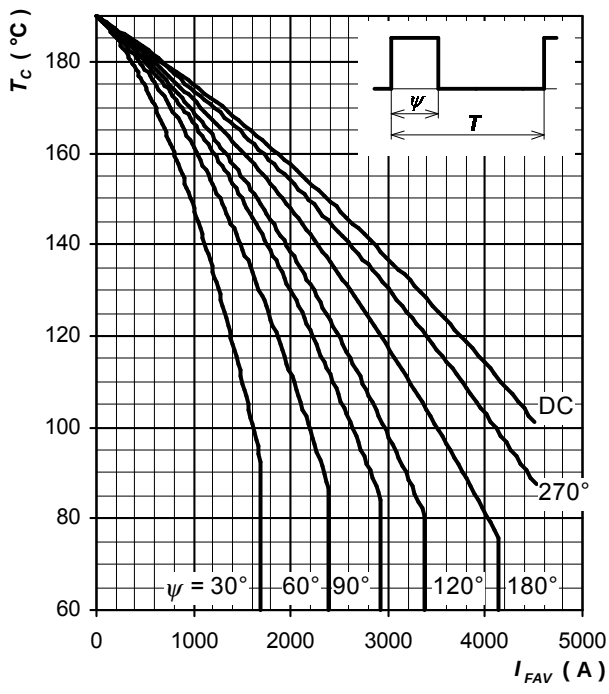

Fig. 9 Max.case temperature vs. aver. forward current, square waveform, f = 50 Hz, T = 1/f

Notes