5SDA 16F3806

Old part no. DA 808-1620-38

Avalanche Diode

Properties

- low on-state voltage
- avalanche reverse characteristics
- high operational reliability
- suitable for parallel operation

Key Parameters

V_{RRM}	=	3 800	V
I_{FAVm}	=	1 620	A
I_{FSM}	=	20 500	A
V_{TO}	=	1.030	V
r_T	=	0.320	mΩ

Types

	V_{RRM}
5SDA 16F3806	**3 800 V**
Conditions:	*T_j = -40 ÷ 160 °C, half sine waveform, f = 50 Hz*

Mechanical Data

F_m	**Mounting force**	22 ± 2 kN
m	**Weight**	0.46 kg
D_S	**Surface creepage d stance**	30 mm
D_a	**Air strike distance**	20.5 mm

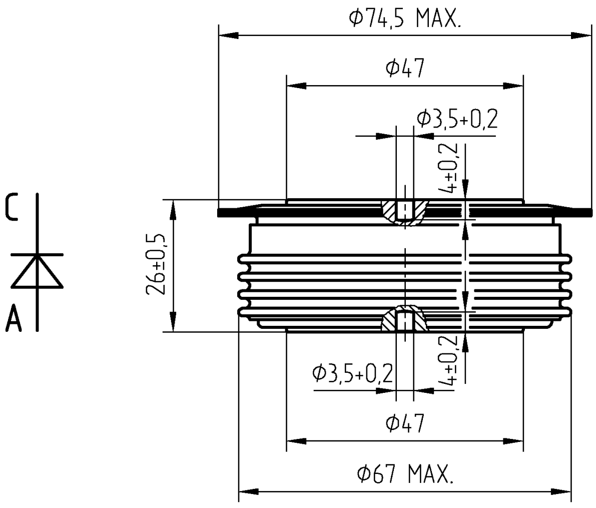

Fig. 1 Case

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Maximum Ratings			*Maximum Limits*	*Unit*
V_{RRM}	**Repetitive peak reverse voltage** *T_j = -40 ÷ 160 °C*		**3 800**	**V**
I_{FAVm}	**Average forward current** *T_c = 85 °C*		**1 620**	**A**
I_{FRMS}	**RMS forward current** *T_c = 85 °C*		**2 540**	**A**
I_{RRM}	**Repetitive reverse current** *$V_R = V_{RRM}$*		**50**	**mA**
I_{FSM}	**Non repetitive peak surge current** *V_R = 0 V, half sine pulse*	*t_p = 8.3 ms*	**21 900**	**A**
		t_p = 10 ms	**20 500**	**A**
I^2t	**Limiting load integral** *V_R = 0 V, half sine pulse*	*t_p = 8.3 ms*	**1 990 000**	**A^2s**
		t_p = 10 ms	**2 101 000**	**A^2s**
P_{RSM}	**Maximum avalanche power dissipation** *rectangular pulse 20 µs*		**50**	**kW**
T_{jmin} - T_{jmax}	**Operating temperature range**		**-40 ÷ 160**	**°C**
T_{STG}	**Storage temperature range**		**-40 ÷ 160**	**°C**

Unless otherwise specified T_j = 160 °C

Characteristics		*Value*			*Unit*
		min	*typ*	*max*	
V_{T0}	**Threshold voltage**			**1.030**	**V**
r_T	**Forward slope resistance** *I_F = 1000 ÷ 3000 A*			**0.320**	**mΩ**
V_{FM}	**Maximum forward voltage** *I_{FM} = 4 000 A*			**2.320**	**V**
Q_{rr}	**Recovered charge** *V_R = 100 V, I_{FM} = 2 000 A, di_F/dt = -5 A/µs*		**3 700**		**µC**

Unless otherwise specified T_j = 160 °C

Thermal Parameters			*Value*	*Unit*
R_{thjc}	**Thermal resistance junction to case**	*double side cooling*	**20**	**K/kW**
		anode side cooling	**34**	
		cathode side cooling	**48**	
R_{thch}	**Thermal resistance case to heatsink**	*double side cooling*	**5**	**K/kW**
		single side cooling	**10**	

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 = 22 ± 2 kN, Double side cooled

i	1	2	3	4
R_i (K/kW)	11.83	4.26	1.63	2.28
τ_i (s)	0.432	0.071	0.01	0.0054

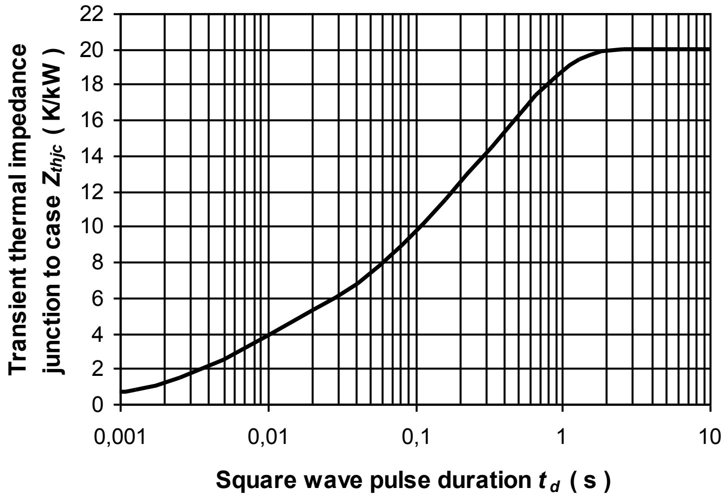

Fig. 2 Transient thermal impedance junction to case

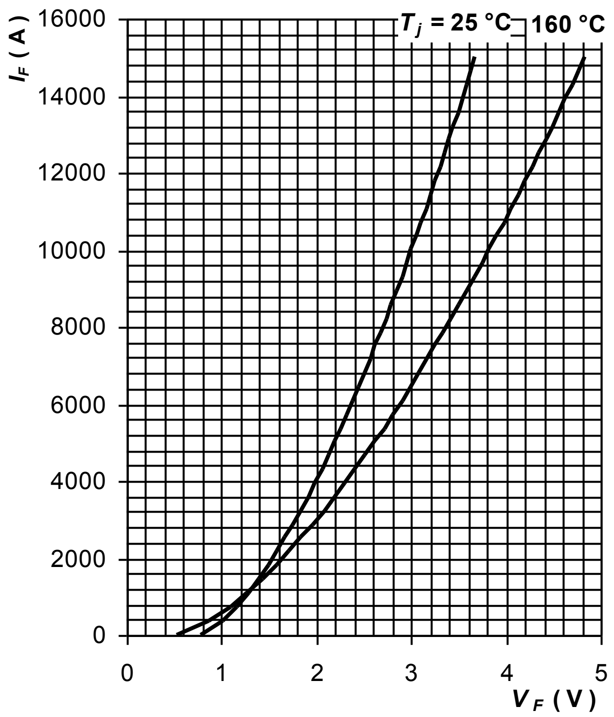

Fig. 3 Maximum forward voltage drop characteristics

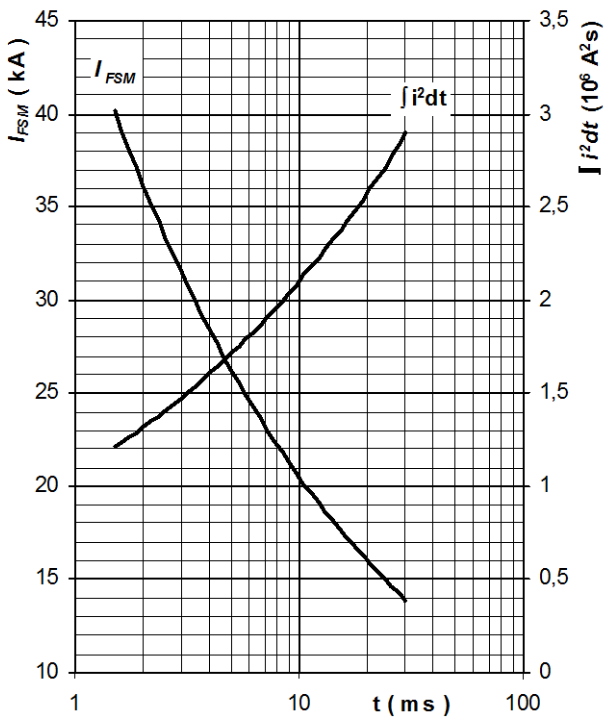

Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse, $V_R = 0\ V$, $T_j = T_{jmax}$

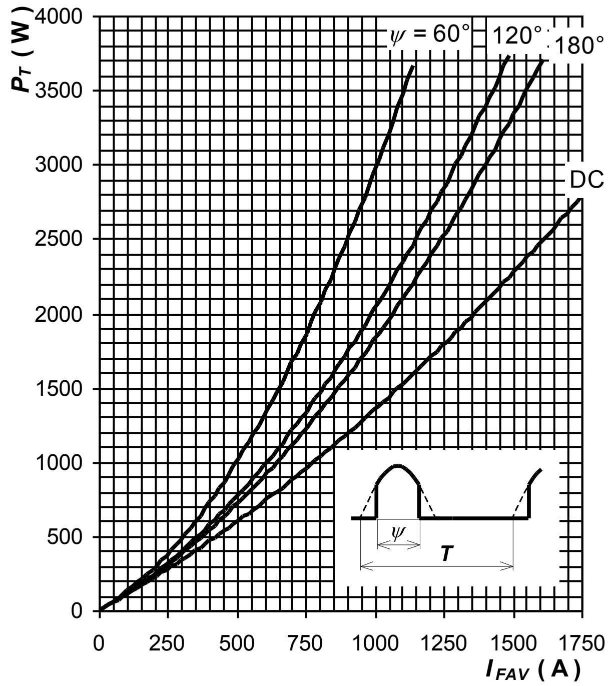

Fig. 5 Forward power loss vs. average forward current, sine waveform, f = 50 Hz, T = 1/f

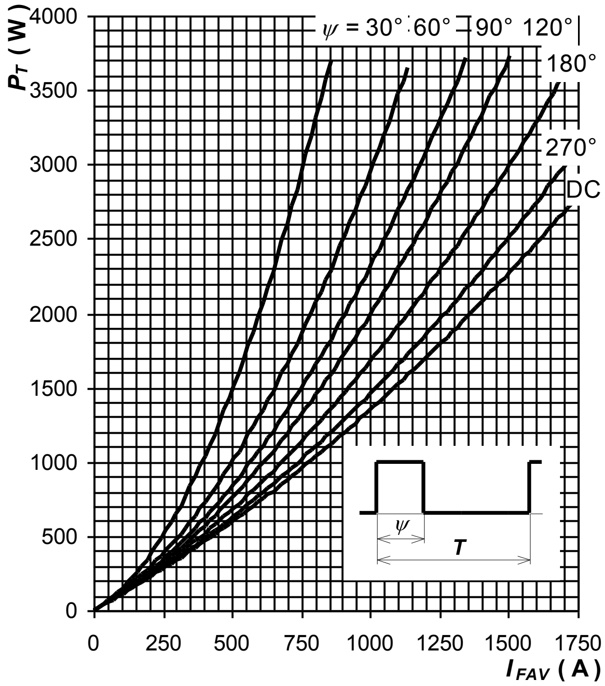

Fig. 6 Forward power loss vs. average forward current, square waveform, f = 50 Hz, T = 1/f

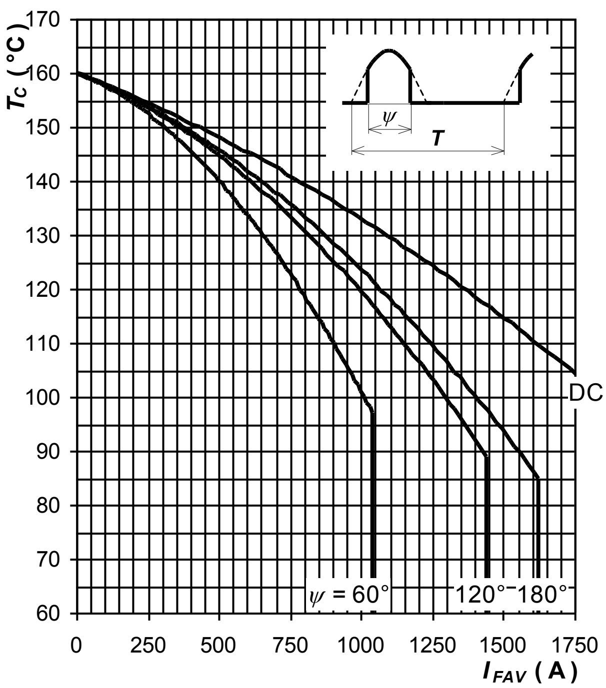

Fig. 7 Max. case temperature vs. aver. forward current, sine waveform, f = 50 Hz, T = 1/f

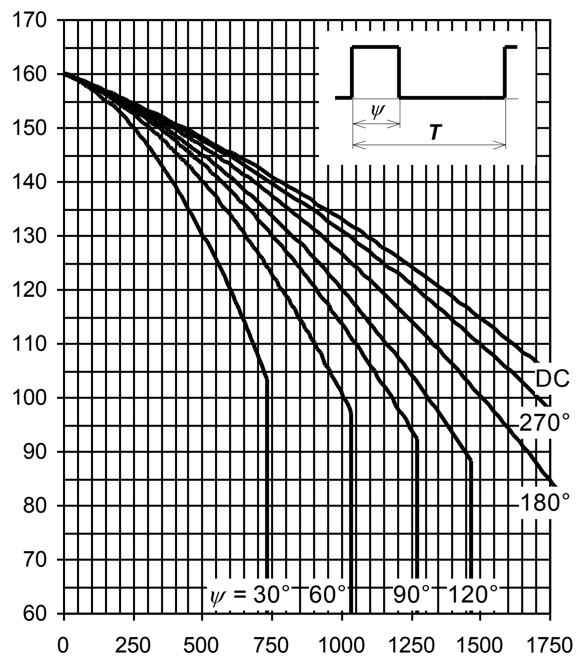

Fig. 8 Max.case temperature vs. aver. forward current, square waveform, f = 50 Hz, T = 1/f

Notes: