5SDA 24F2303

Old part no. DA 808-2350-23

Avalanche Diode

Properties

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

Key Parameters

V_{RRM}	=	2 300	V
I_{FAVm}	=	2 350	A
I_{FSM}	=	29 000	A
V_{TO}	=	0.840	V
r_T	=	0.130	mΩ

Types

	V_{RRM}
5SDA 24F2303	**2 300 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

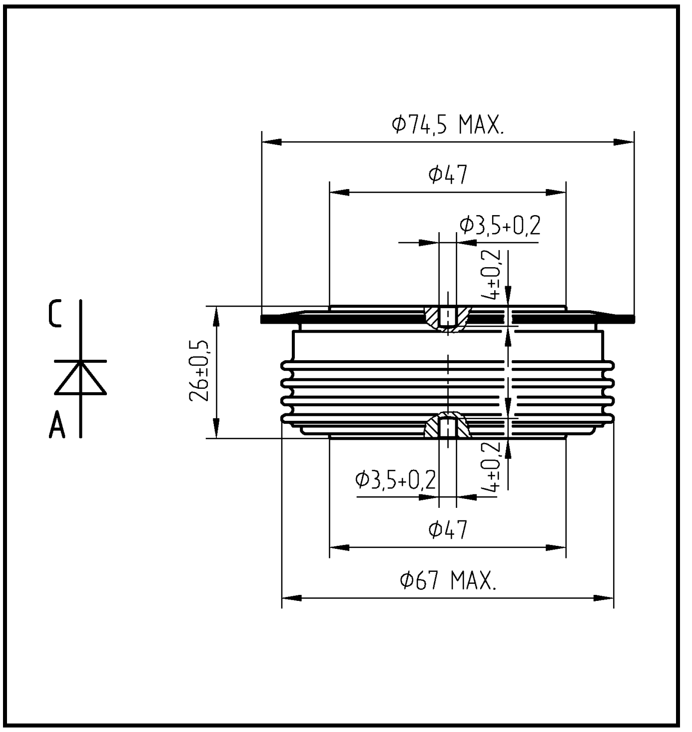

Fig. 1 Case

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Maximum Ratings			Maximum Limits	Unit
V_{RRM}	**Repetitive peak reverse voltage** *T_j = -40 ÷ 160 °C*		**2 300**	**V**
I_{FAVm}	**Average forward current** *T_c = 85 °C*		**2 350**	**A**
I_{FRMS}	**RMS forward current** *T_c = 85 °C*		**3 690**	**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*	**31 000**	**A**
		t_p = 10 ms	**29 000**	**A**
I^2t	**Limiting load integral** *V_R = 0 V, half sine pulse*	*t_p = 8.3 ms*	**3 990 000**	**A^2s**
		t_p = 10 ms	**4 205 000**	**A^2s**
P_{RSM}	**Maximum avalanche power dissipation** *rectangular pulse 20 µs*		**75**	**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**			**0.840**	**V**
r_T	**Forward slope resistance** *I_F = 2000 ÷ 6000 A*			**0.130**	**mΩ**
V_{FM}	**Maximum forward voltage** *I_{FM} = 4 000 A*			**1.410**	**V**
Q_{rr}	**Recovered charge** *V_R = 100 V, I_{FM} = 2 000 A, di_F/dt = -5 A/µs*		**2 250**		**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

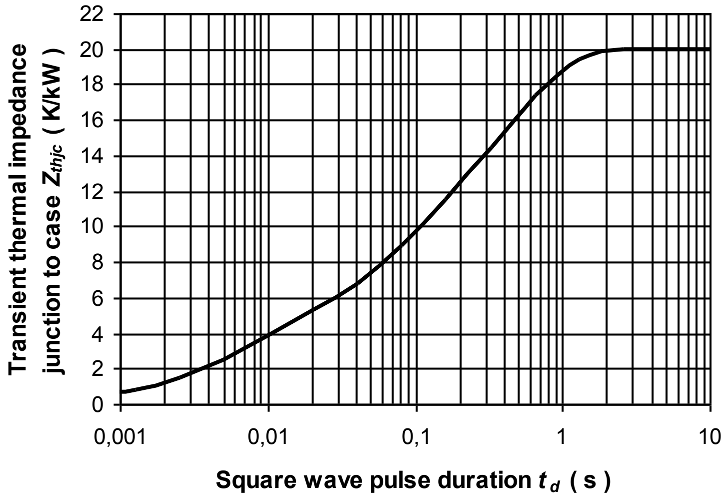

Fig. 2 Transient thermal impedance junction to case

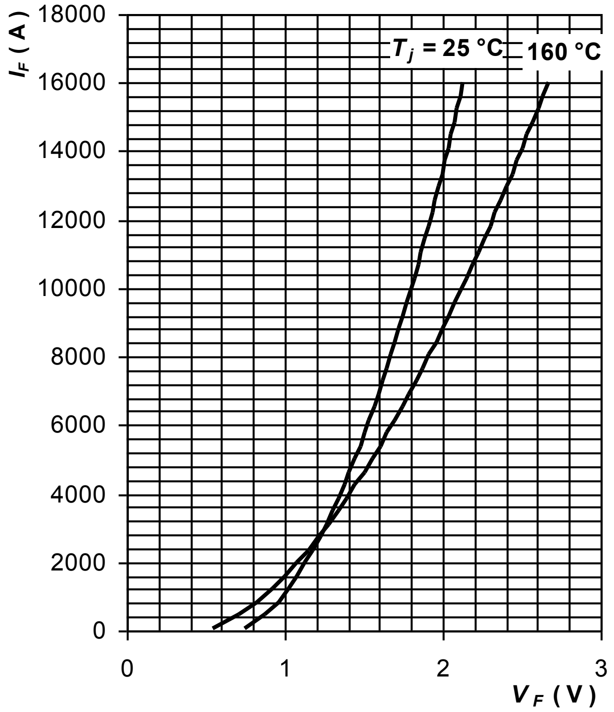

Fig. 3 Maximum forward voltage drop characteristics

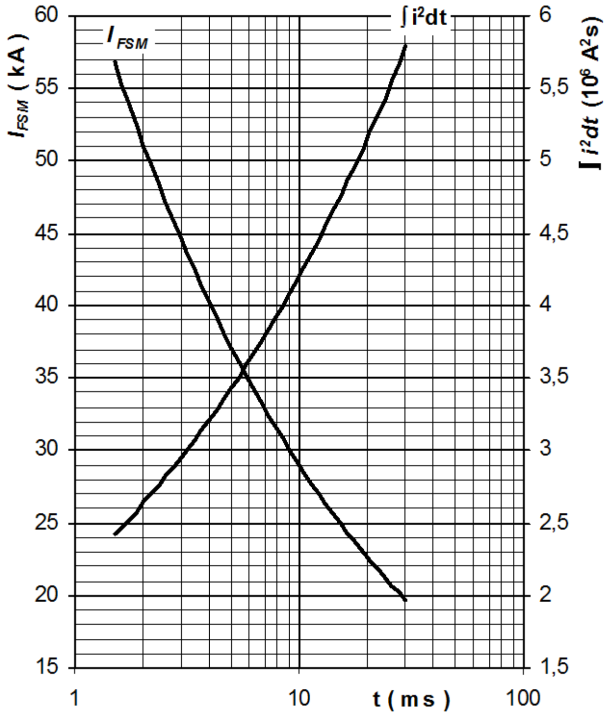

Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse, $V_R = 0\ V$, $T_j = T_{jmax}$

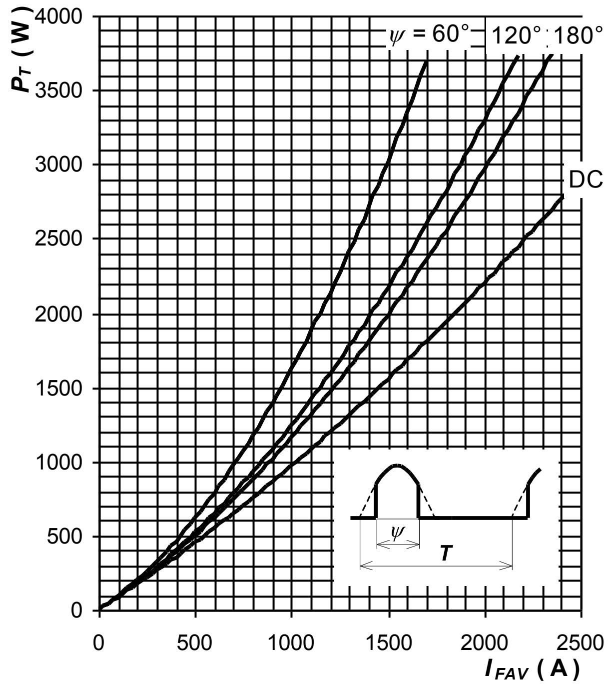

Fig. 5 Forward power loss vs. average forward current, sine waveform, f = 50 Hz, T = 1/f

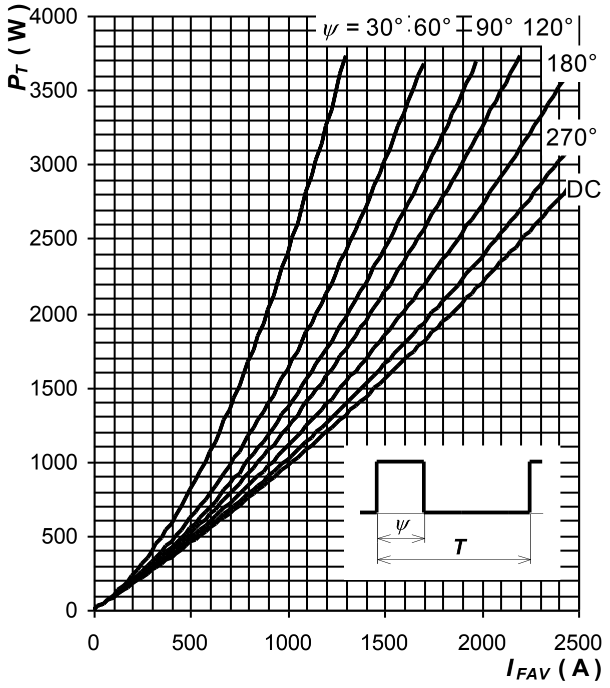

Fig. 6 Forward power loss vs. average forward current, square waveform, f = 50 Hz, T = 1/f

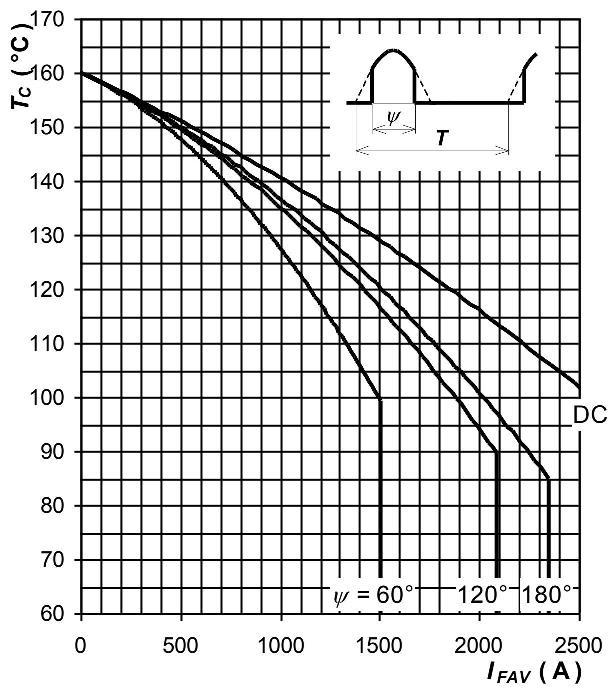

Fig. 7 Max. case temperature vs. aver. forward current, sine waveform, f = 50 Hz, T = 1/f

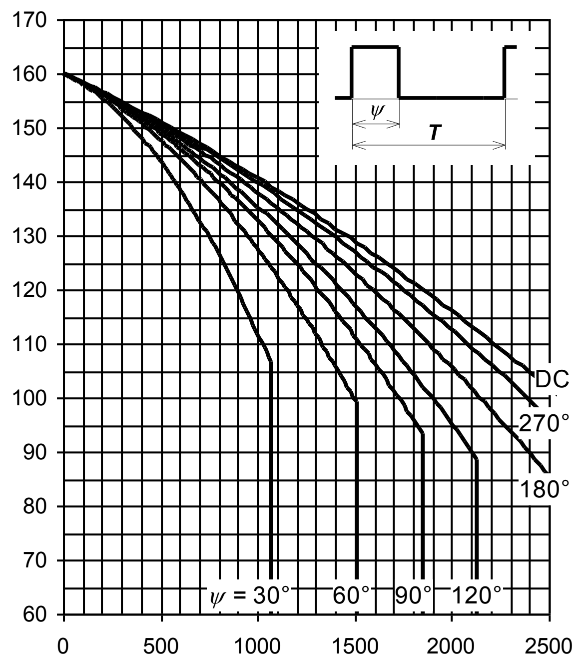

Fig. 8 Max.case temperature vs. aver. forward current, square waveform, f = 50 Hz, T = 1/f

Notes: