



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:	$T_j = -40 \div 160\text{ }^{\circ}\text{C}$, half sine waveform, $f = 50\text{ Hz}$

Mechanical Data

F_m	Mounting force	$22 \pm 2\text{ kN}$
m	Weight	0.46 kg
D_s	Surface creepage distance	30 mm
D_a	Air strike distance	20.5 mm

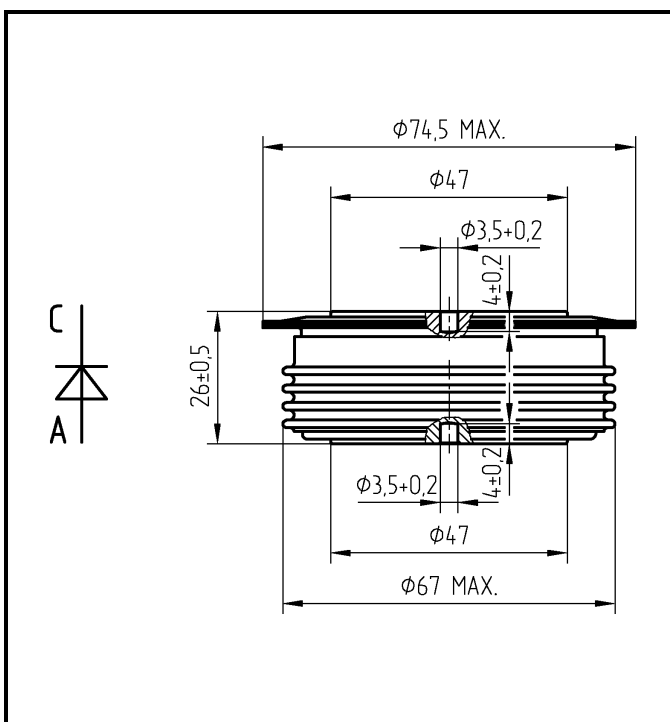


Fig. 1 Case



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Maximum Ratings			Maximum Limits	Unit
V_{RRM}	Repetitive peak reverse voltage $T_j = -40 \div 160\text{ }^{\circ}\text{C}$		2 300	V
I_{FAVm}	Average forward current $T_c = 85\text{ }^{\circ}\text{C}$		2 350	A
I_{FRMS}	RMS forward current $T_c = 85\text{ }^{\circ}\text{C}$		3 690	A
I_{RRM}	Repetitive reverse current $V_R = V_{RRM}$		50	mA
I_{FSM}	Non repetitive peak surge current $V_R = 0\text{ V}$, half sine pulse	$t_p = 8.3\text{ ms}$	31 000	A
		$t_p = 10\text{ ms}$	29 000	A
I^2t	Limiting load integral $V_R = 0\text{ V}$, half sine pulse	$t_p = 8.3\text{ ms}$	3 990 000	A ² s
		$t_p = 10\text{ ms}$	4 205 000	A ² s
P_{RSM}	Maximum avalanche power dissipation rectangular pulse 20 μ s		75	kW
$T_{jmin} - T_{jmax}$	Operating temperature range		-40 $\div$ 160	$^{\circ}\text{C}$
T_{STG}	Storage temperature range		-40 $\div$ 160	$^{\circ}\text{C}$

Unless otherwise specified $T_j = 160\text{ }^{\circ}\text{C}$

Characteristics		Value			Unit
		min	typ	max	
V_{T0}	Threshold voltage			0.840	V
r_T	Forward slope resistance $I_F = 2000 \div 6000\text{ A}$			0.130	m Ω
V_{FM}	Maximum forward voltage $I_{FM} = 4\text{ }000\text{ A}$			1.410	V
Q_{rr}	Recovered charge $V_R = 100\text{ V}$, $I_{FM} = 2\text{ }000\text{ A}$, $di_F/dt = -5\text{ A}/\mu\text{s}$		2 250		μC

Unless otherwise specified $T_j = 160\text{ }^{\circ}\text{C}$

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:

$F_m = 22 \pm 2$ 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

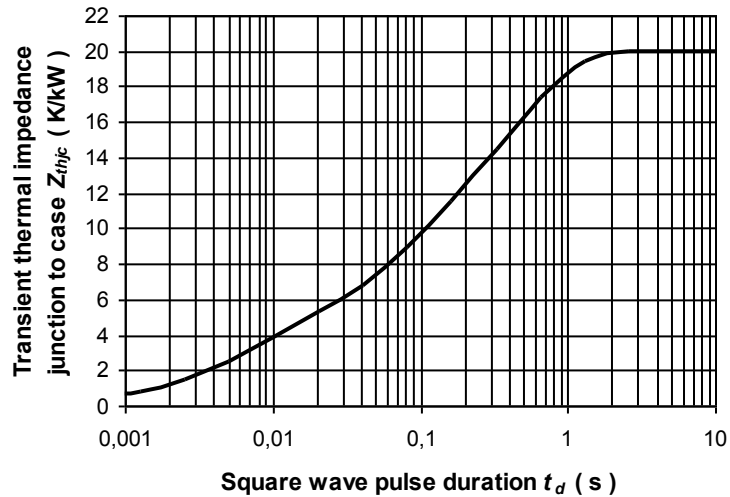


Fig. 2 Transient thermal impedance junction to case

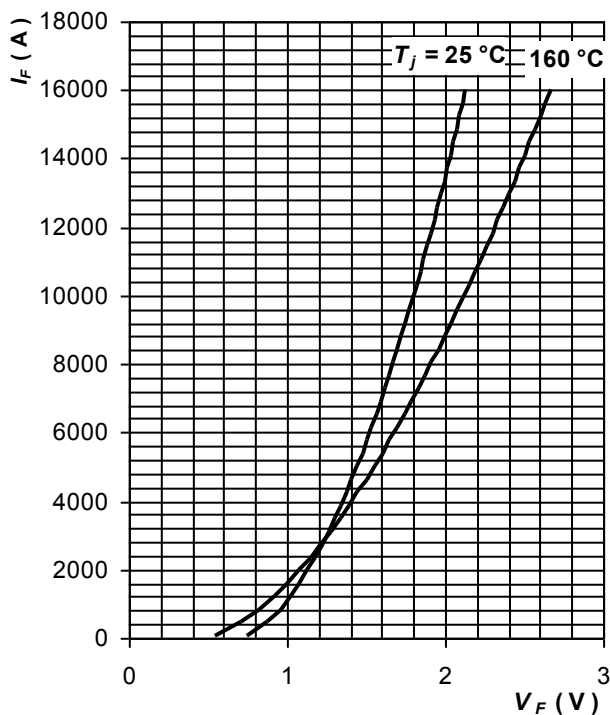


Fig. 3 Maximum forward voltage drop characteristics

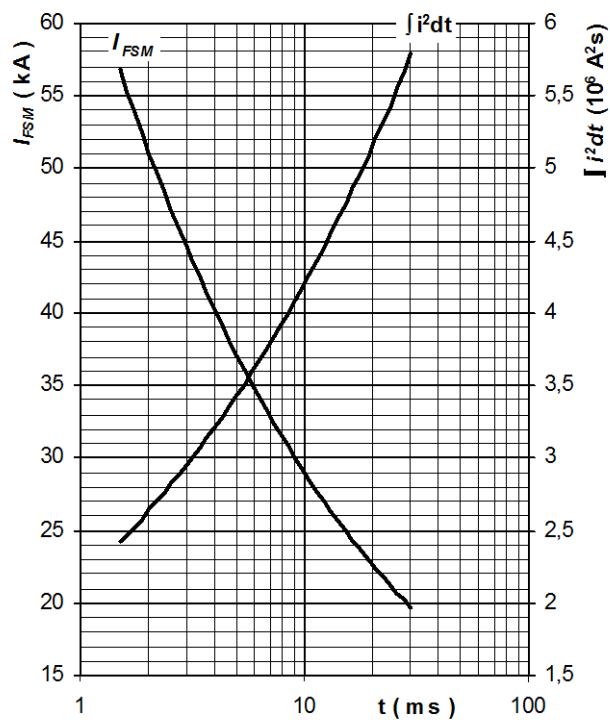


Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse, $V_R = 0$ V, $T_j = T_{jmax}$

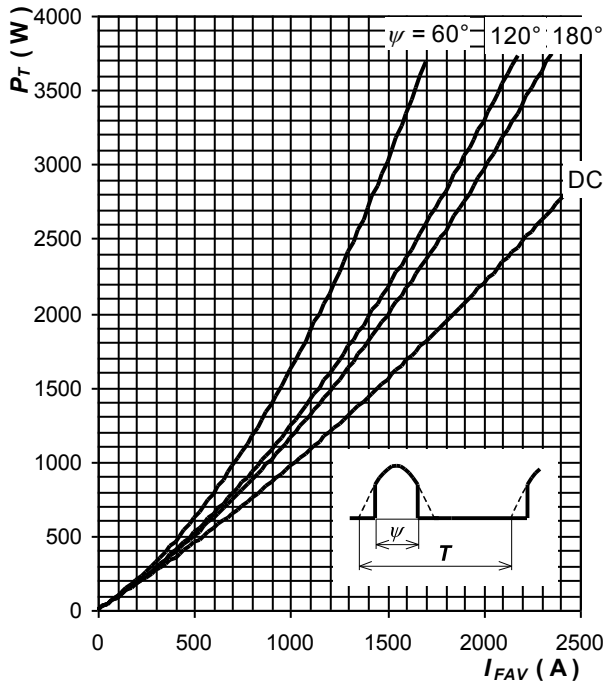


Fig. 5 Forward power loss vs. average forward current, sine waveform, $f = 50$ Hz, $T = 1/f$

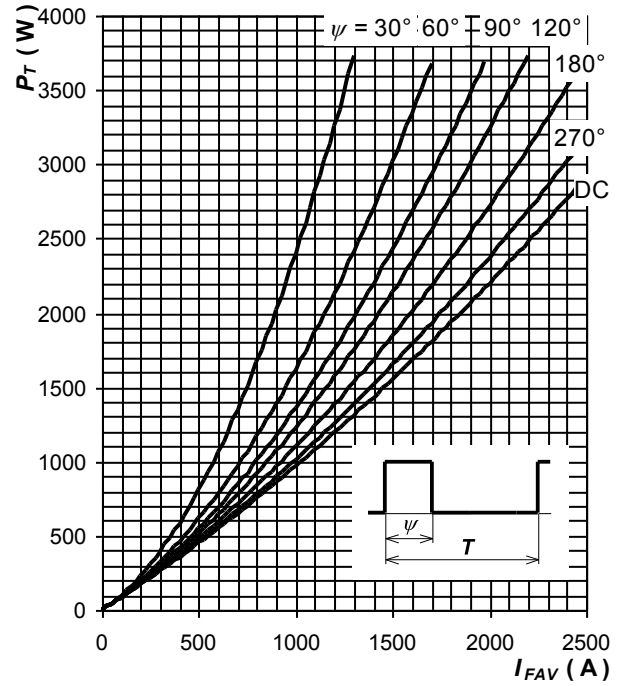


Fig. 6 Forward power loss vs. average forward current, square waveform, $f = 50$ Hz, $T = 1/f$

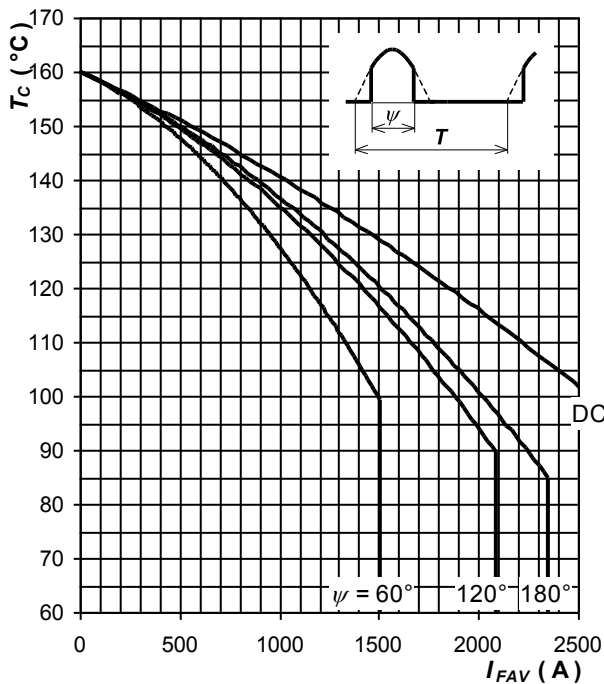


Fig. 7 Max. case temperature vs. aver. forward current, sine waveform, $f = 50$ Hz, $T = 1/f$

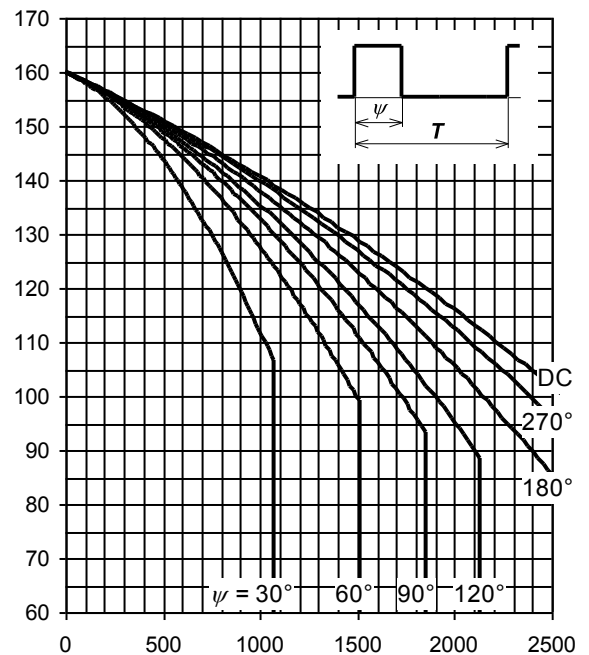


Fig. 8 Max. case temperature vs. aver. forward current, square waveform, $f = 50$ Hz, $T = 1/f$

Notes: