



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:	$T_j = -40 \div 160\text{ }^{\circ}\text{C}$, 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

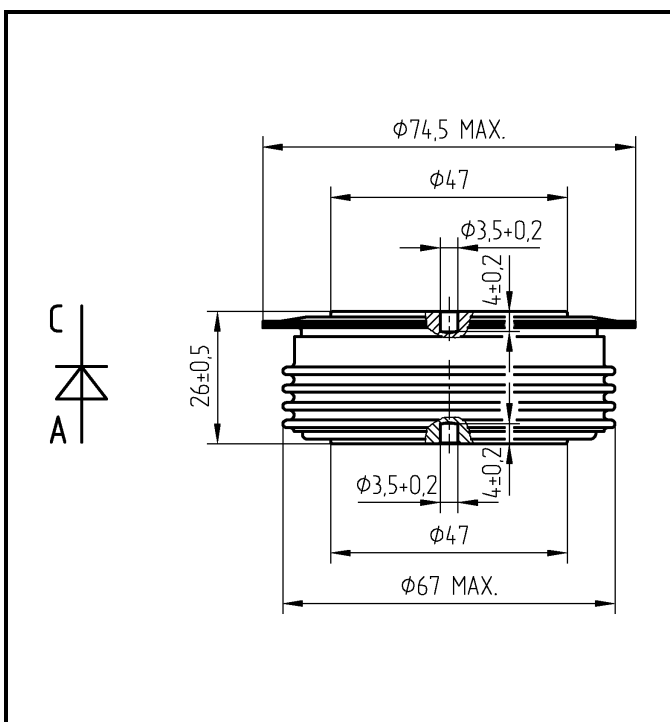


Fig. 1 Case



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Maximum Ratings			Maximum Limits	Unit
V_{RRM}	Repetitive peak reverse voltage $T_j = -40 \div 160\text{ }^{\circ}\text{C}$		3 800	V
I_{FAVm}	Average forward current $T_c = 85\text{ }^{\circ}\text{C}$		1 620	A
I_{FRMS}	RMS forward current $T_c = 85\text{ }^{\circ}\text{C}$		2 540	A
I_{RRM}	Repetitive reverse current $V_R = V_{RRM}$		50	mA
I_{FSM}	Non repetitive peak surge current $V_R = 0\text{ V}$, half sine pulse	$t_p = 8.3\text{ ms}$	21 900	A
		$t_p = 10\text{ ms}$	20 500	A
I^2t	Limiting load integral $V_R = 0\text{ V}$, half sine pulse	$t_p = 8.3\text{ ms}$	1 990 000	A ² s
		$t_p = 10\text{ ms}$	2 101 000	A ² s
P_{RSM}	Maximum avalanche power dissipation rectangular pulse 20 μ s		50	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			1.030	V
r_T	Forward slope resistance $I_F = 1000 \div 3000\text{ A}$			0.320	m Ω
V_{FM}	Maximum forward voltage $I_{FM} = 4\,000\text{ A}$			2.320	V
Q_{rr}	Recovered charge $V_R = 100\text{ V}$, $I_{FM} = 2\,000\text{ A}$, $di_F/dt = -5\text{ A}/\mu\text{s}$		3 700		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	

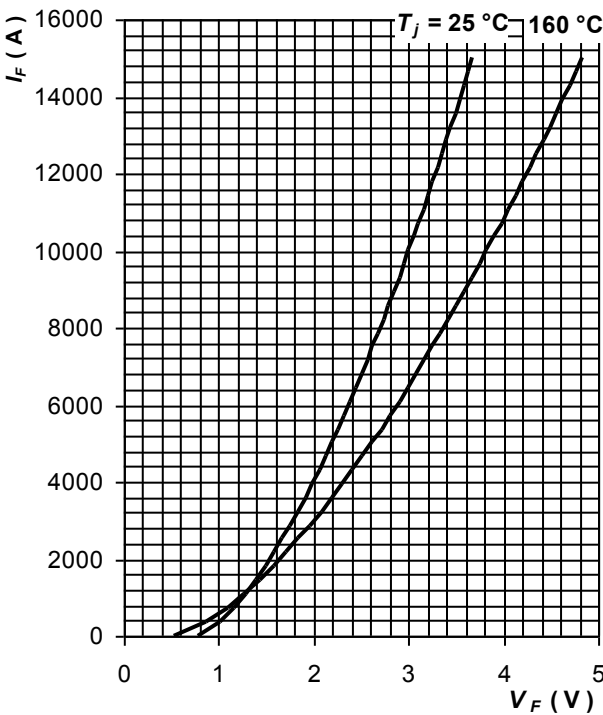
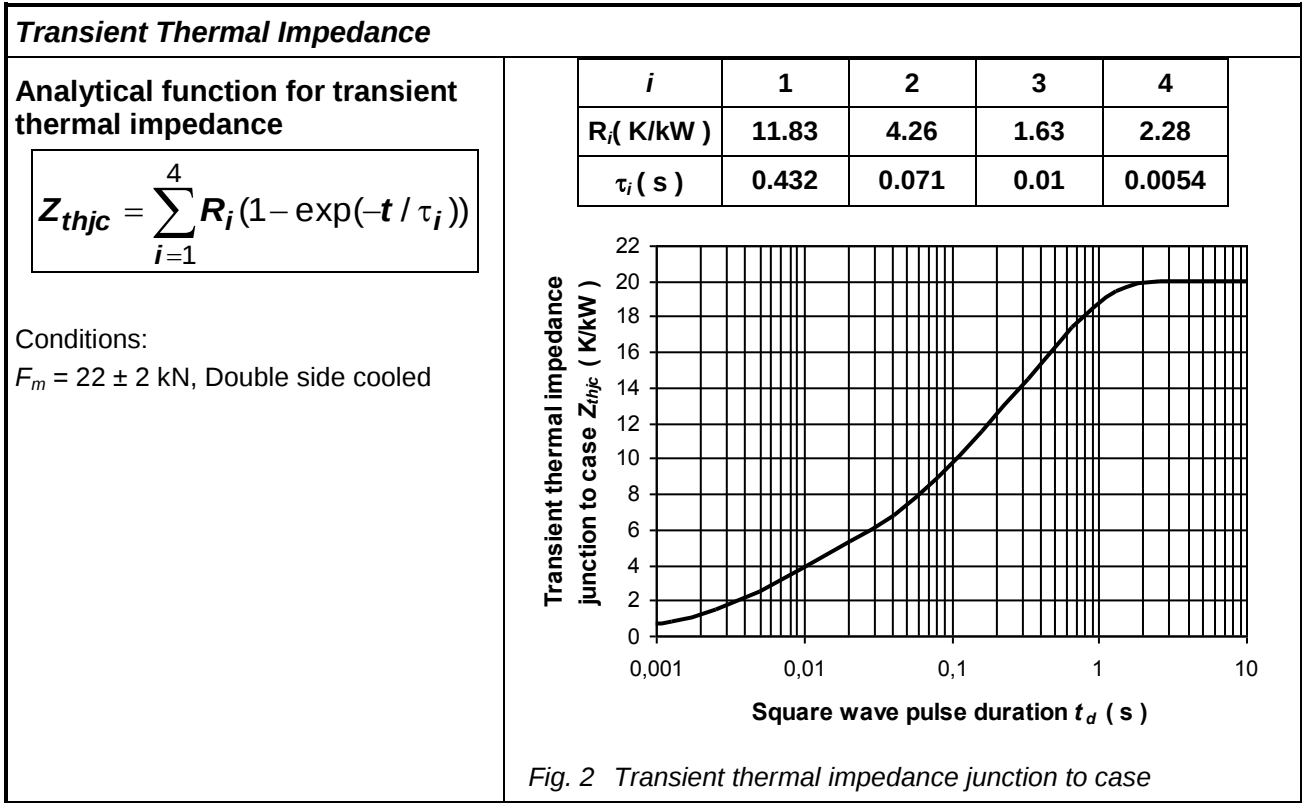


Fig. 3 Maximum forward voltage drop characteristics

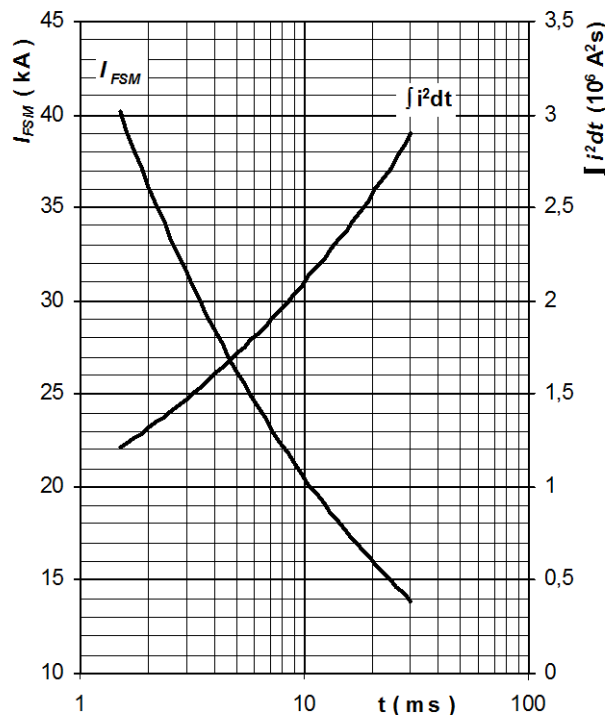


Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse, $V_R = 0$ V, $T_j = T_{jmax}$

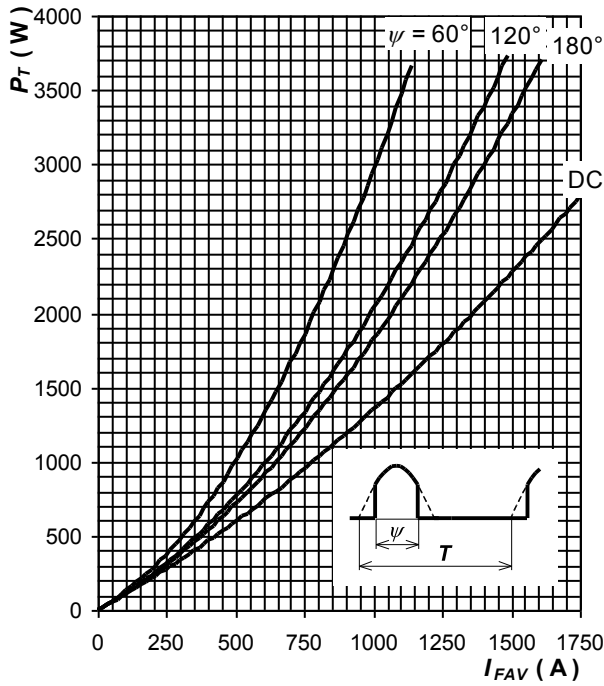


Fig. 5 Forward power loss vs. average forward current, sine waveform, $f = 50 \text{ Hz}$, $T = 1/f$

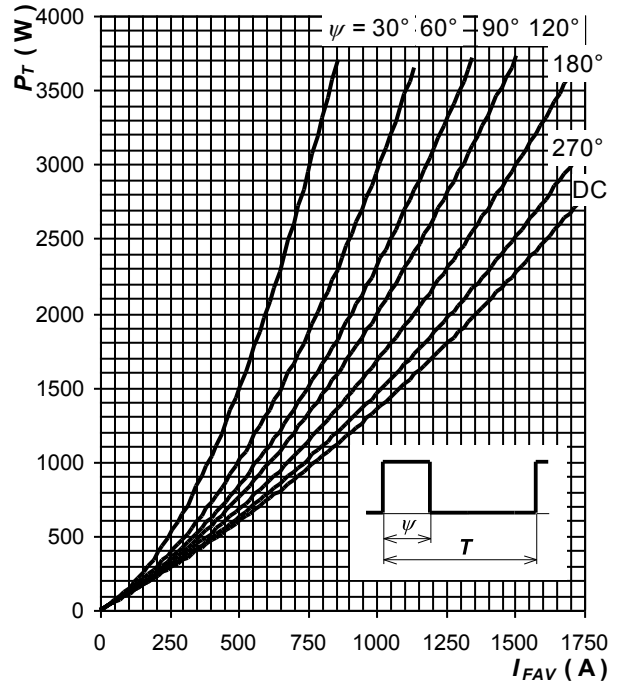


Fig. 6 Forward power loss vs. average forward current, square waveform, $f = 50 \text{ Hz}$, $T = 1/f$

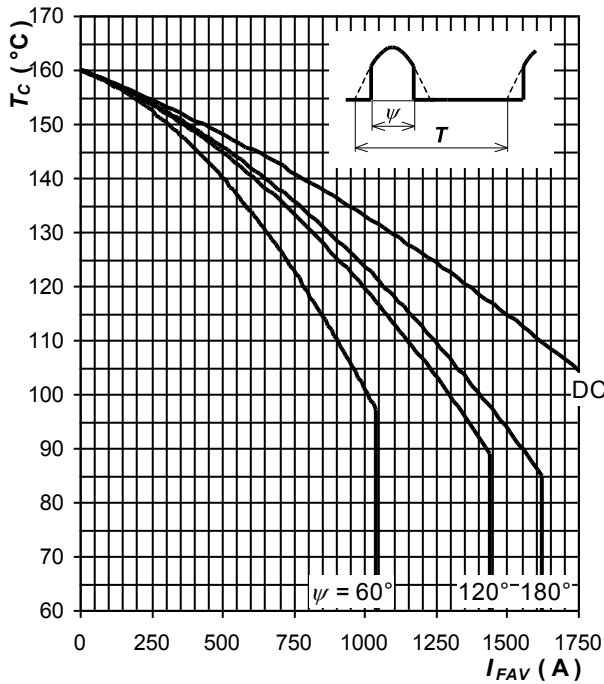


Fig. 7 Max. case temperature vs. aver. forward current, sine waveform, $f = 50 \text{ Hz}$, $T = 1/f$

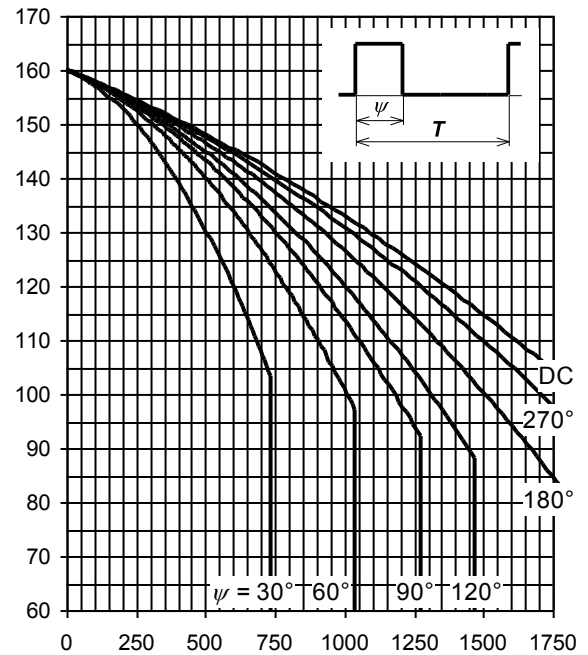


Fig. 8 Max. case temperature vs. aver. forward current, square waveform, $f = 50 \text{ Hz}$, $T = 1/f$

Notes: