

5SDA 14F5007

Old part no. DA 808-1410-50

V_{RRM}	=	5 000 V
I_{FAVm}	=	1 410 A
I_{FSM}	=	17 500 A
V_{TO}	=	1.130 V
r_T	=	0.440 mΩ

Avalanche Diode

Properties

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

Key Parameters

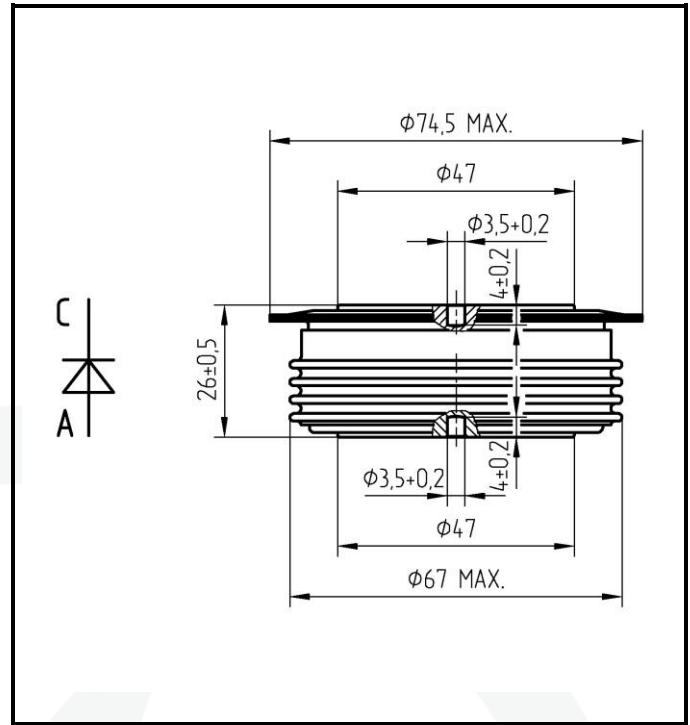
	V_{RRM}
5SDA 14F5007	5 000 V
5SDA 14F4407	4 400 V
Conditions:	$T_j = -40 \div 160 \text{ }^\circ\text{C}$, half sine waveform, $f = 50 \text{ Hz}$

F_m	Mounting force	22 ± 2 kN
m	Weight	0.46 kg
D_s	Surface creepage distance	30 mm

D_a	Air strike distance	20.5 mm
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Types

Mechanical Data



Maximum Ratings		Maximum Limits	Unit	
V_{RRM}	Repetitive peak reverse voltage $T_j = -40 \div 160 \text{ } ^\circ\text{C}$	5SDA 14F5007 5SDA 14F4407	5 000 4 400	V
I_{FAVm}	Average forward current $T_c = 85 \text{ } ^\circ\text{C}$		1 410	A
I_{FRMS}	RMS forward current $T_c = 85 \text{ } ^\circ\text{C}$		2 210	A
I_{RRM}	Repetitive reverse current $V_R = V_{RRM}$		50	mA
I_{FSM}	Non repetitive peak surge current $V_R = 0 \text{ V, half sine pulse}$	$t_p = 8.3 \text{ ms}$	18 700	A
		$t_p = 10 \text{ ms}$	17 500	A
βt	Limiting load integral $V_R = 0 \text{ V, half sine pulse}$	$t_p = 8.3 \text{ ms}$	1 450 000	A ² s
		$t_p = 10 \text{ ms}$	1 531 000	A ² s
P_{RSM}	Maximum avalanche power dissipation <i>rectangular pulse 20 μs</i>		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_{TO} r_T	Threshold voltage			1.130	V
	Forward slope resistance $I_F = 1000 \div 3000$ A			0.440	m Ω
V_{FM}	Maximum forward voltage $I_{FM} = 4000$ A			2.880	V
Q_{rr}	Recovered charge $V_R = 100$ V, $I_{FM} = 2000$ A, $di_F/dt = -5$ A/ μ s		4 250		μ C μ s

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	i	1	2	3	4	
	R_t (K/kW)	11.83	4.26	1.63	2.28	

$$Z_{thjc} = R_j (1 - \exp(-t/\tau))$$

Conditions:
 $F_m = 22 \pm 2$ kN, Double side cooled

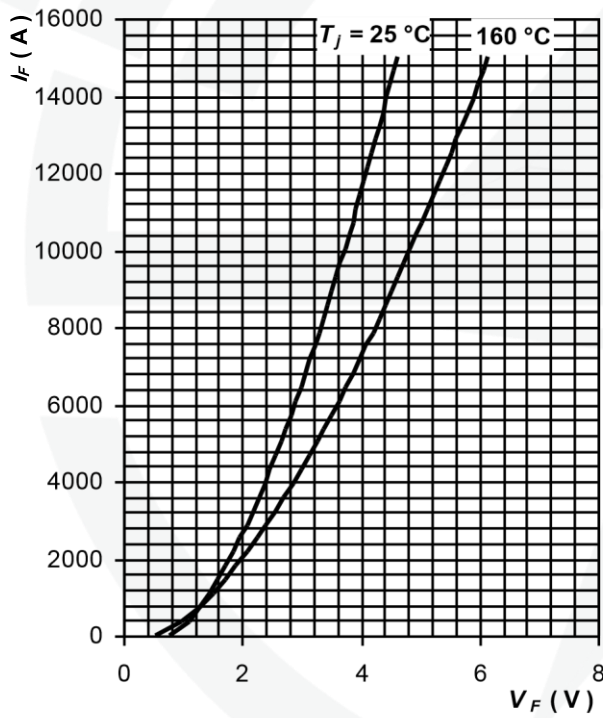
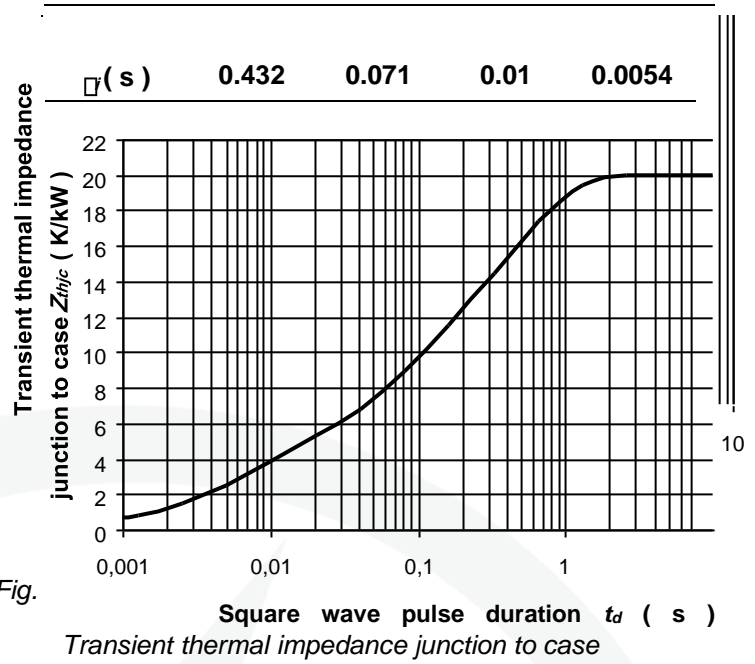


Fig. 3 Maximum forward voltage drop characteristics

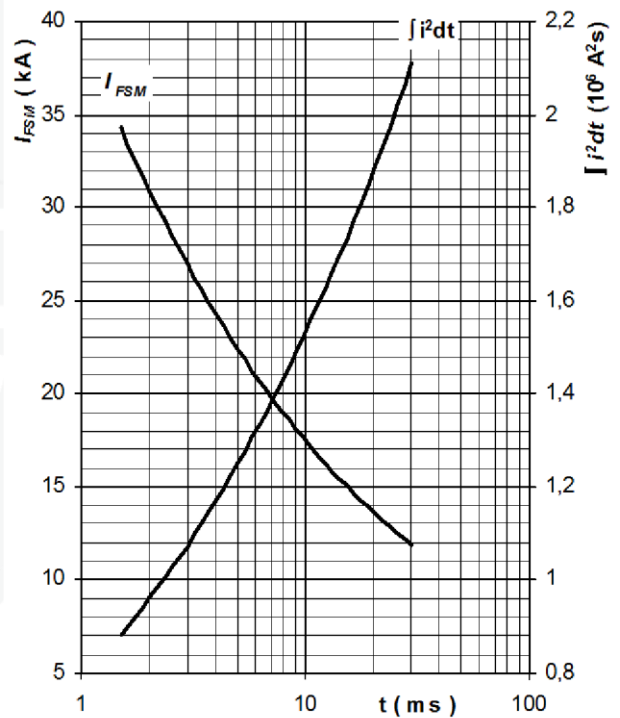


Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse, $V_R = 0$ V, $T_j = T_{jmax}$

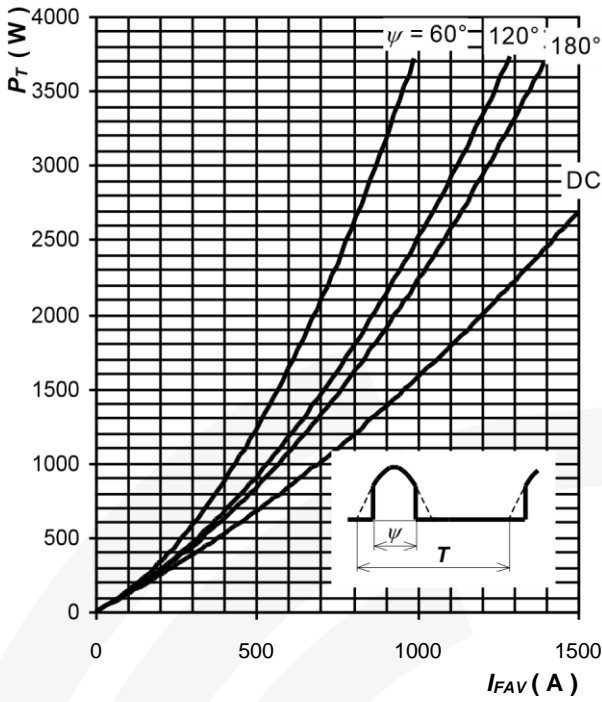


Fig. 5 Forward power loss vs. average forward current, sine waveform, $f = 50 \text{ Hz}$, $T = 1/f$

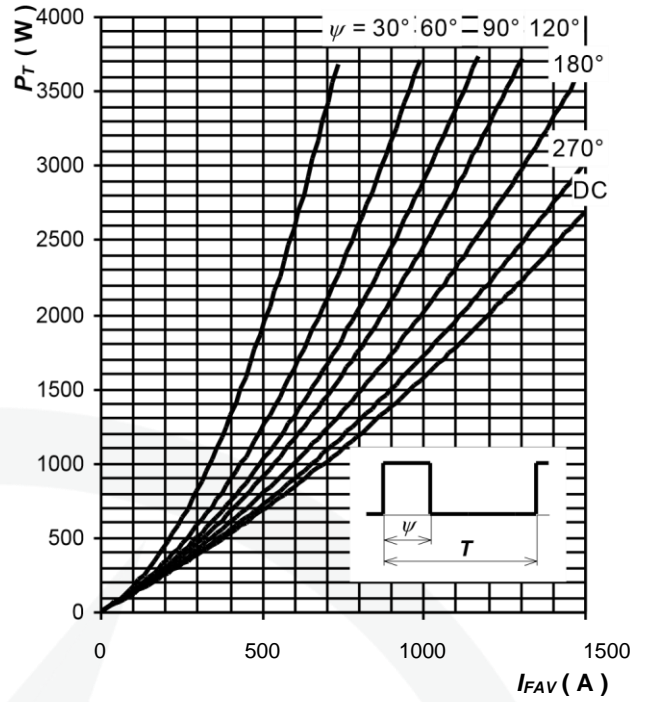


Fig. 6 Forward power loss vs. average forward current, square waveform, $f = 50 \text{ Hz}$, $T = 1/f$

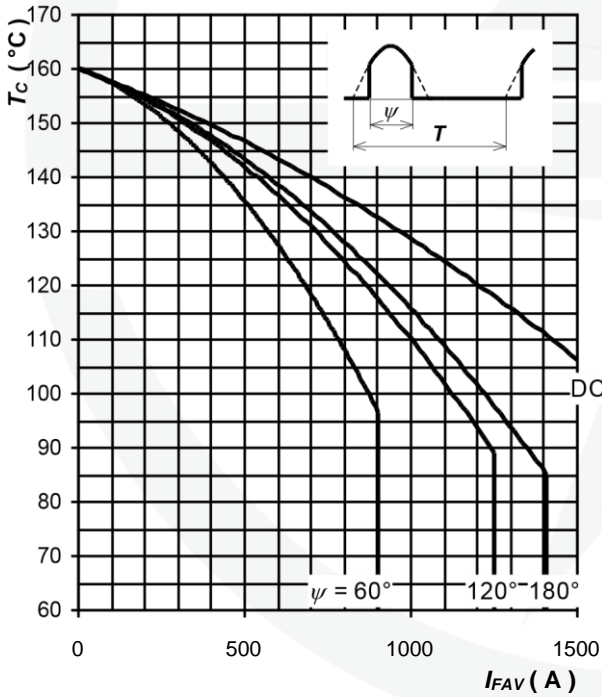


Fig. 7 Max. case temperature vs. aver. forward current, sine waveform, $f = 50 \text{ Hz}$, $T = 1/f$

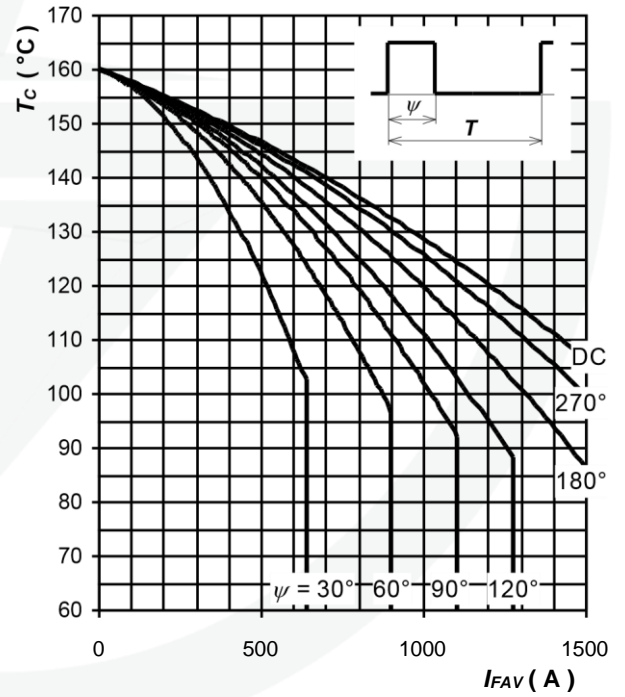


Fig. 8 Max. case temperature vs. aver. forward current, square waveform, $f = 50 \text{ Hz}$, $T = 1/f$

Notes: