

# 5SDA 06D5007

Old part no. DA 807-590-50

$V_{RRM}$	=	5 000	V
$I_{FAVm}$	=	690	A
$I_{FSM}$	=	7 000	A
$V_{TO}$	=	1.100	V
$r_T$	=	1.010	mΩ

## Avalanche Diode

### Properties

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

### Key Parameters

	$V_{RRM}$
<b>5SDA 06D5007</b>	<b>5 000 V</b>
Conditions:	$T_j = -40 \div 160 \text{ }^\circ\text{C}$ , half sine waveform, $f = 50 \text{ Hz}$

$F_m$	<b>Mounting force</b>	11 ± 1 kN
$m$	<b>Weight</b>	0.23 kg
$D_s$	<b>Surface creepage distance</b>	30 mm
$D_a$	<b>Air strike distance</b>	20.5 mm

## Types

## Mechanical Data

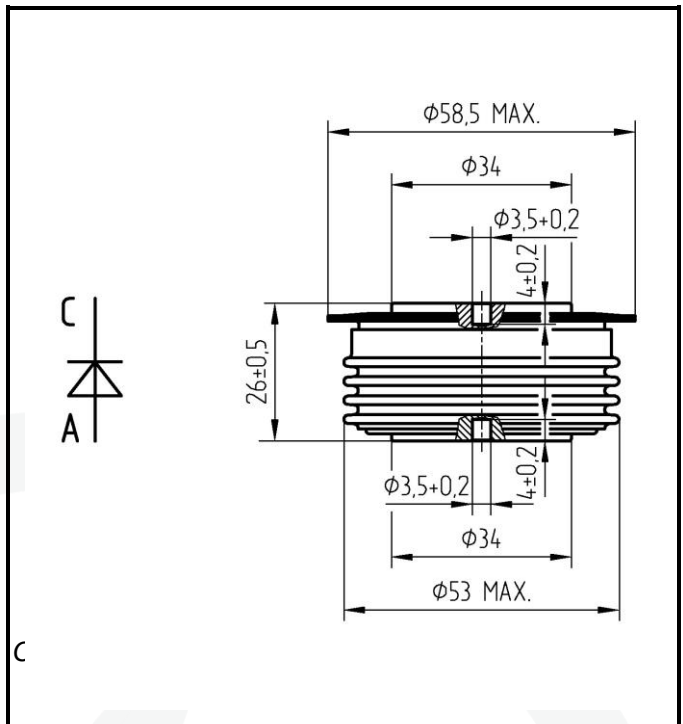


Fig. 1 C

Maximum Ratings		Maximum Limits	Unit	
$V_{RRM}$	Repetitive peak reverse voltage $T_j = -40 \div 160 \text{ }^\circ\text{C}$	5 000	V	
$I_{FAVm}$	Average forward current $T_c = 85 \text{ }^\circ\text{C}$	690	A	
$I_{FRMS}$	RMS forward current $T_c = 85 \text{ }^\circ\text{C}$	1 080	A	
$I_{RRM}$	Repetitive reverse current $V_R = V_{RRM}, T_j = 160 \text{ }^\circ\text{C},$	50	mA	
$I_{FSM}$	Non repetitive peak surge current $V_R = 0 \text{ V}, \text{ half sine pulse}$	$t_p = 8.3 \text{ ms}$	7 500	A
		$t_p = 10 \text{ ms}$	7 000	A
$I^2t$	Limiting load integral $V_R = 0 \text{ V}, \text{ half sine pulse}$	$t_p = 8.3 \text{ ms}$	230 000	A <sup>2</sup> s
		$t_p = 10 \text{ ms}$	245 000	A <sup>2</sup> s
$P_{RSM}$	Maximum avalanche power dissipation <i>rectangular pulse 20 μs</i>	50	kW	
$T_{jmin} - T_{jmax}$	Operating temperature range	-40 ÷ 160	°C	
$T_{STG}$	Storage temperature range	-40 ÷ 160	°C	

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

Characteristics		Value			Unit
		min	typ	max	
$V_{TO rT}$	Threshold voltage			1.100	V
	Forward slope resistance $I_F = 700 \div 2000 A$			1.010	m $\Omega$
$V_{FM}$	Maximum forward voltage $I_{FM} = 1\ 800 A$			2.860	V
$Q_{rr}$	Recovered charge $V_R = 100 V, I_{FM} = 1\ 000 A, di_F/dt = -5 A/\mu s$		1 620		$\mu C\mu$

Unless otherwise specified  $T_j = 160\ ^\circ C$

Thermal Parameters			Value	Unit
$R_{thjc}$	Thermal resistance junction to case	double side cooling	40	K/kW
		anode side cooling	65	
		cathode side cooling	104	
$R_{thch}$	Thermal resistance case to heatsink	double side cooling	10	K/kW
		single side cooling	20	

### Transient Thermal Impedance

Analytical function for transient thermal impedance	$i$	1	2	3	4
	$R_i$ ( K/kW )		20.95	10.57	7.15

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

Conditions:  
 $F_m = 11 \pm 1$  kN, Double side cooled

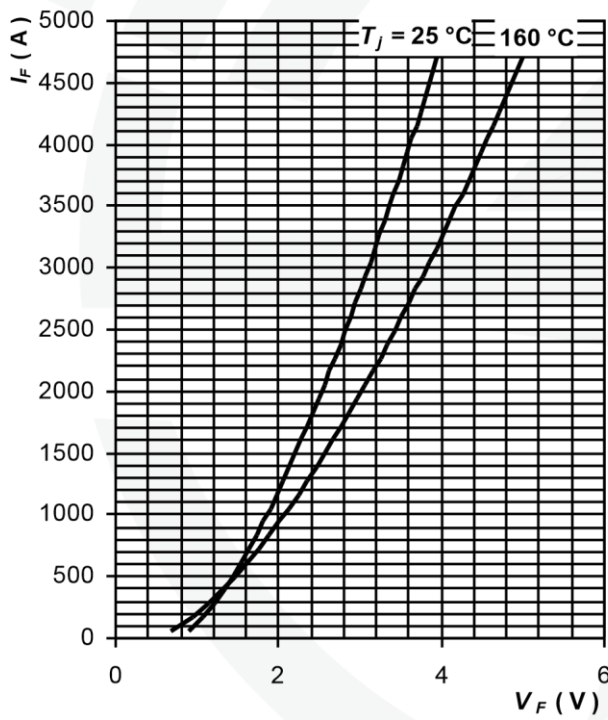
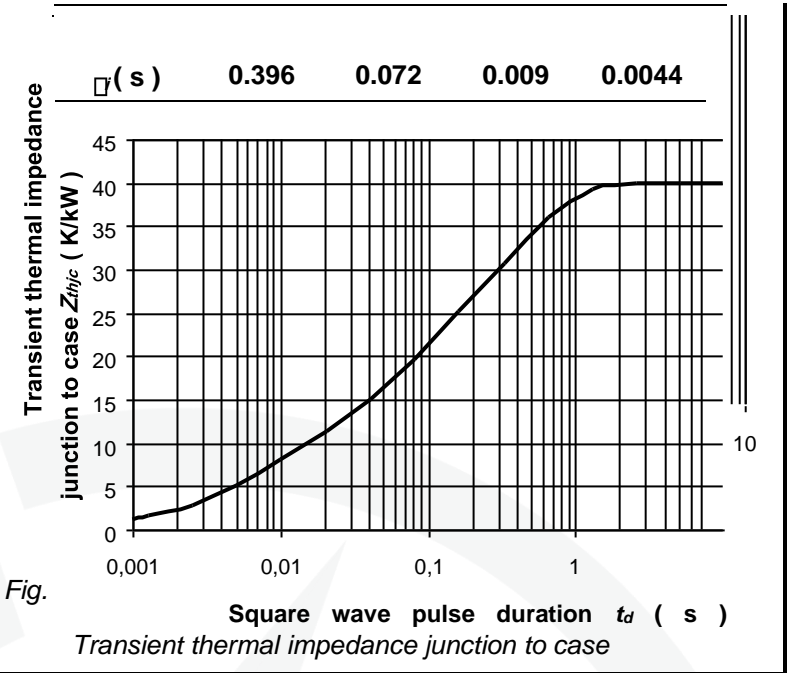


Fig. 3 Maximum forward voltage drop characteristics

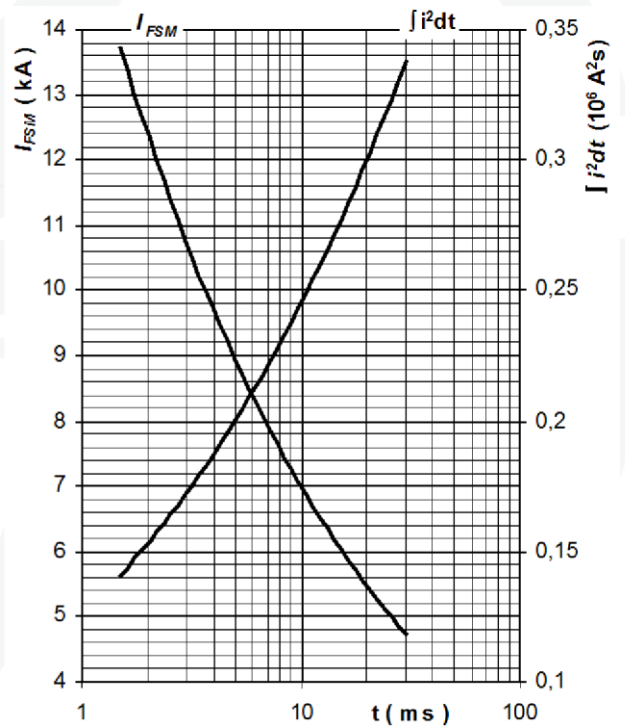


Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse,  $V_R = 0$  V,  $T_j = T_{jmax}$

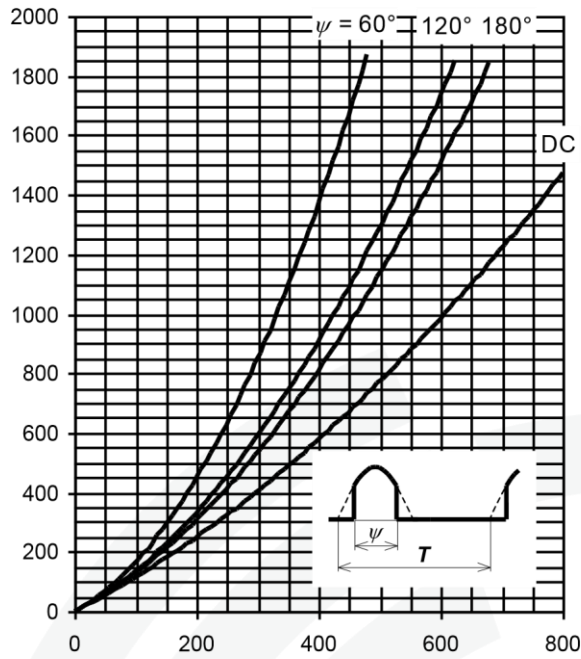


Fig. 5 Forward power loss vs. average forward current, sine waveform,  $f = 50 \text{ Hz}$ ,  $T = 1/f$

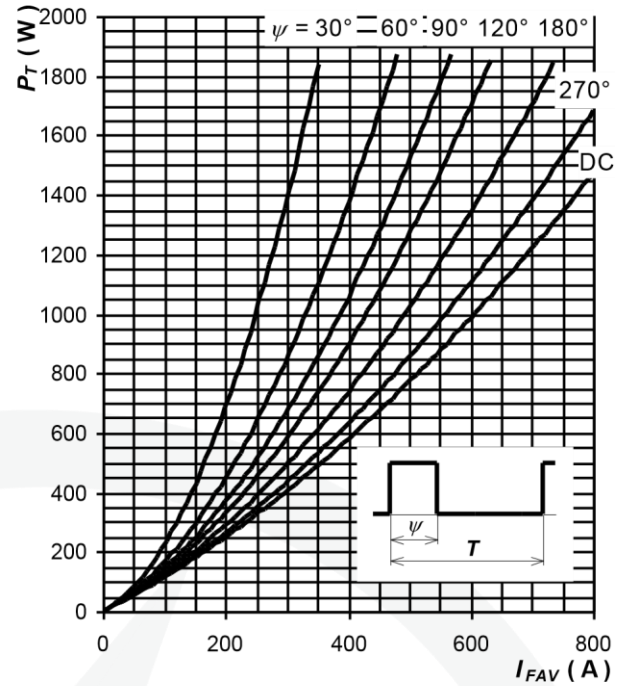


Fig. 6 Forward power loss vs. average forward current, square waveform,  $f = 50 \text{ Hz}$ ,  $T = 1/f$

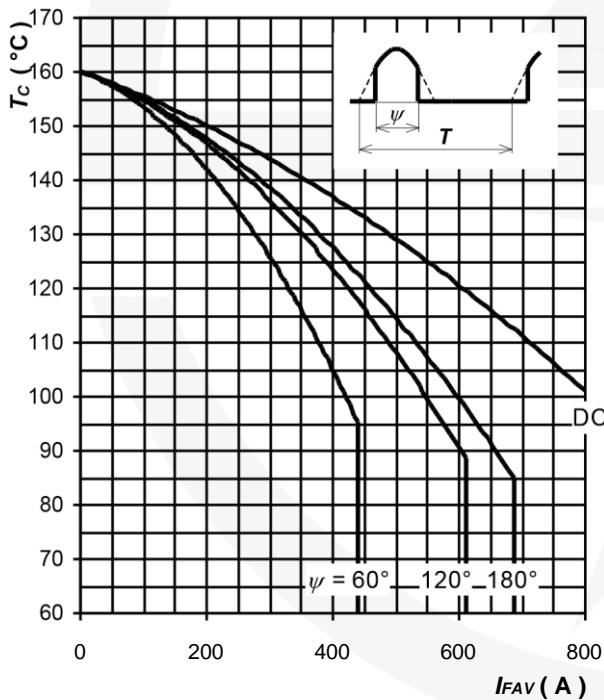


Fig. 7 Max. case temperature vs. aver. forward current, sine waveform,  $f = 50 \text{ Hz}$ ,  $T = 1/f$

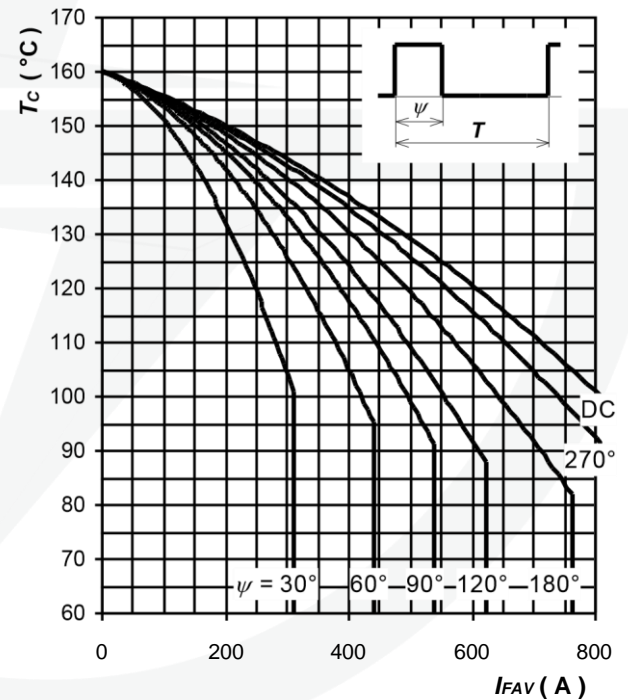


Fig. 8 Max. case temperature vs. aver. forward current, square waveform,  $f = 50 \text{ Hz}$ ,  $T = 1/f$

Notes: