

# 5SDA 11D1702

Old part no. DA 807-1110-17

$V_{RRM}$	=	1 700 V
$I_{FAVm}$	=	1 310 A
$I_{FSM}$	=	15 000 A
$V_{TO}$	=	0.740 V
$r_T$	=	0.210 mΩ

## Avalanche Diode

### Properties

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

### Key Parameters

	$V_{RRM}$
<b>5SDA 11D1702</b>	<b>1 700 V</b>
Conditions:	$T_j = -40 \div 160 \text{ }^\circ\text{C}$ , half sine waveform, $f = 50 \text{ Hz}$

$F_m$	Mounting force	11 ± 1 kN
$m$	Weight	0.23 kg
$D_s$	Surface creepage distance	30 mm

$D_a$	Air strike distance	20.5 mm
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## Types

## Mechanical Data

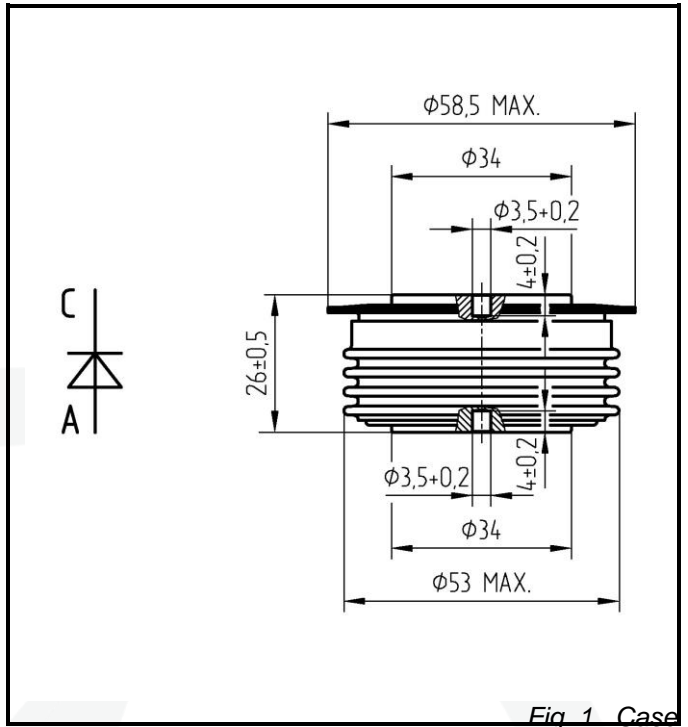


Fig. 1 Case

Maximum Ratings		Maximum Limits	Unit	
$V_{RRM}$	Repetitive peak reverse voltage $T_j = -40 \div 160 \text{ }^\circ\text{C}$	1 700	V	
$I_{FAVm}$	Average forward current $T_c = 85 \text{ }^\circ\text{C}$	1 310	A	
$I_{FRMS}$	RMS forward current $T_c = 85 \text{ }^\circ\text{C}$	2 060	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	$t_p = 8.3 \text{ ms}$	16 000	A
		$t_p = 10 \text{ ms}$	15 000	A
$\beta t$	Limiting load integral $V_R = 0 \text{ V}$ , half sine pulse	$t_p = 8.3 \text{ ms}$	1 060 000	A <sup>2</sup> s
		$t_p = 10 \text{ ms}$	1 125 000	A <sup>2</sup> s
$P_{RSM}$	Maximum avalanche power dissipation rectangular pulse 20 $\mu\text{s}$	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	
$V_{TO}$ $r_T$	Threshold voltage			0.740	V
	Forward slope resistance $I_F = 1000 \div 3000$ A			0.210	m $\Omega$
$V_{FM}$	Maximum forward voltage $I_{FM} = 1800$ A			1.170	V
$Q_{rr}$	Recovered charge $V_R = 100$ V, $I_{FM} = 1000$ A, $di_F/dt = -5$ A/ $\mu$ s		530		$\mu$ C

Unless otherwise specified  $T_j = 160$  °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

$$Z_{thjc} = \sum_{i=1}^4 R_i (1 - \exp(-t/\tau_i))$$

Conditions:

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

$i$	1	2	3	4
$R_i$ (K/kW)	20.95	10.57	7.15	1.33

$\tau_i$ (s)	0.396	0.072	0.009	0.0044
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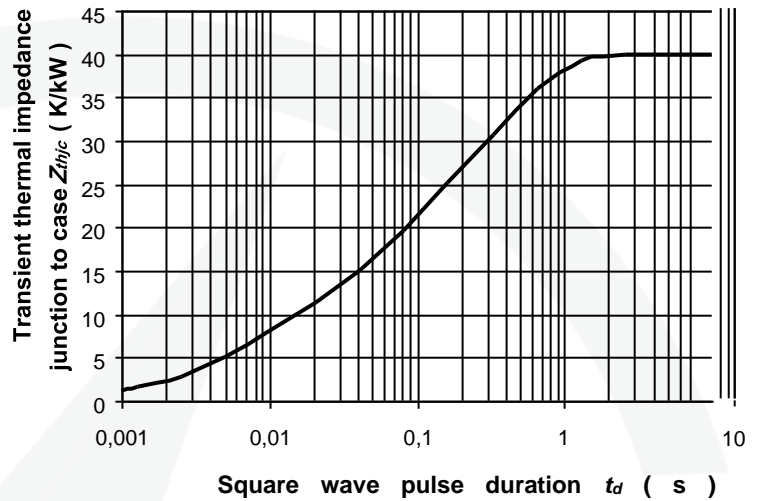


Fig. Transient thermal impedance junction to case

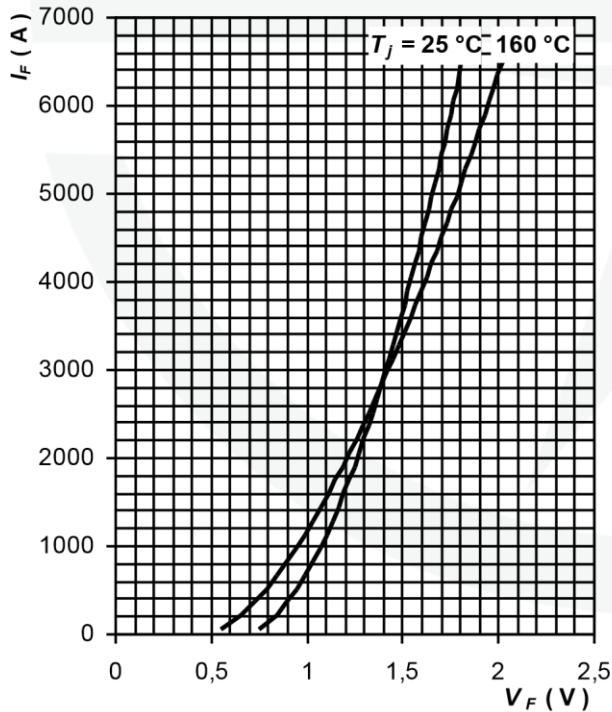


Fig. 3 Maximum forward voltage drop characteristics

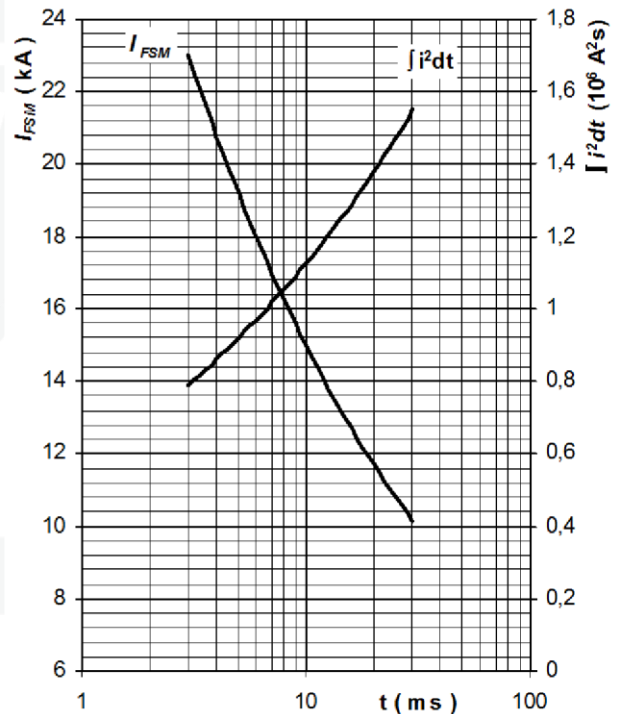


Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse,

$V_R = 0$  V,  $T_j = T_{jmax}$

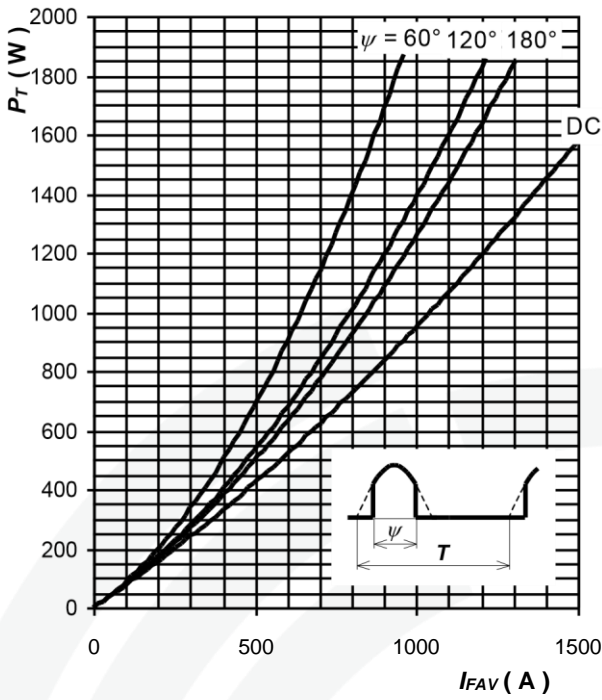


Fig. 5 Forward power loss vs. average forward current, sine waveform,  $f = 50 \text{ Hz}$ ,  $T = 1/f$

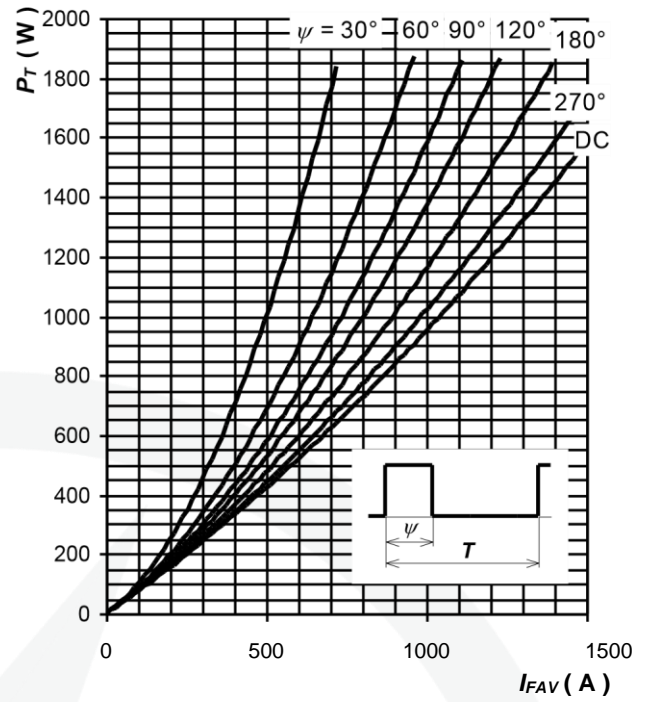


Fig. 6 Forward power loss vs. average forward current, square waveform,  $f = 50 \text{ Hz}$ ,  $T = 1/f$

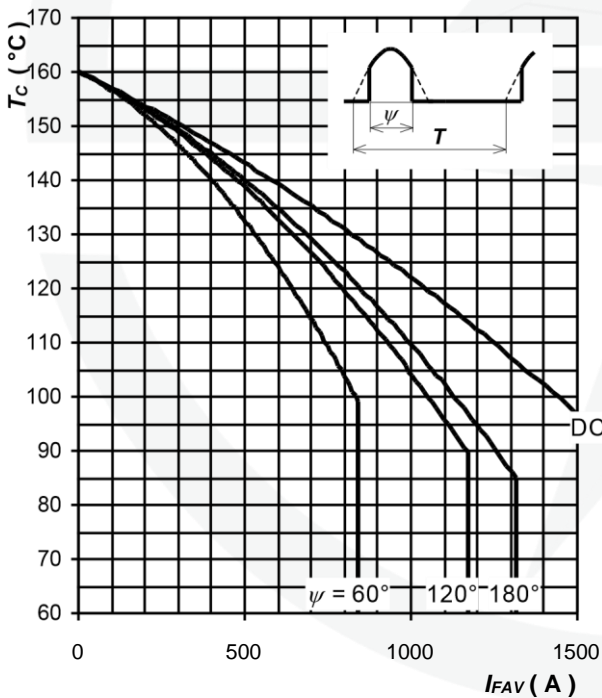


Fig. 7 Max. case temperature vs. aver. forward current, sine waveform,  $f = 50 \text{ Hz}$ ,  $T = 1/f$

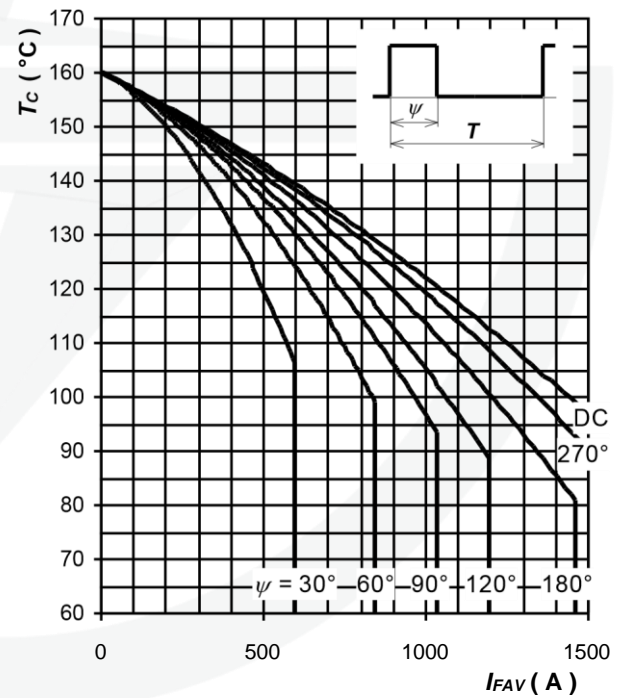


Fig. 8 Max. case temperature vs. aver. forward current, square waveform,  $f = 50 \text{ Hz}$ ,  $T = 1/f$

Notes: