

DA 807-780-32

Avalanche Diode

Properties

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

Key Parameters

V_{RRM}	=	3 200	V
I_{FAVm}	=	910	A
I_{FSM}	=	9 200	A
V_{TO}	=	0.930	V
r_T	=	0.520	mΩ

Types

	V_{RRM}
DA 807-780-32	3 200 V
DA 807-780-29	2 900 V
Conditions: $T_j = -40 \div 160 \text{ }^\circ\text{C}$, half sine waveform, $f = 50 \text{ Hz}$	

Mechanical Data

F_m	Mounting force	$11 \pm 1 \text{ kN}$
m	Weight	0.23 kg
D_s	Surface creepage distance	30 mm
D_a	Air strike distance	20.5 mm

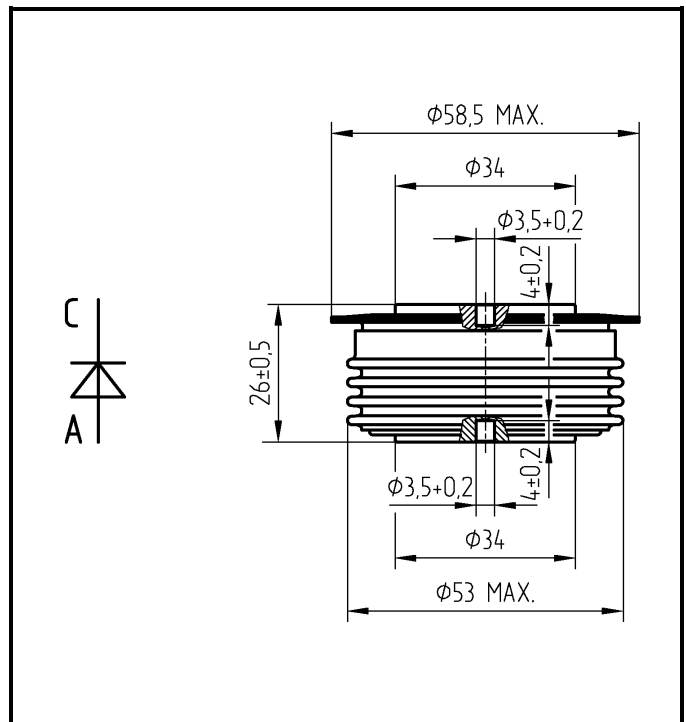


Fig. 1 Case

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Maximum Ratings			Maximum Limits	Unit
V_{RRM}	Repetitive peak reverse voltage $T_j = -40 \div 160 \text{ }^\circ\text{C}$	DA 807-780-32 DA 807-780-29	3 200 2 900	V
I_{FAVm}	Average forward current $T_c = 85 \text{ }^\circ\text{C}$		910	A
I_{FRMS}	RMS forward current $T_c = 85 \text{ }^\circ\text{C}$		1 430	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	$t_p = 8.3 \text{ ms}$	9 800	A
		$t_p = 10 \text{ ms}$	9 200	A
I^2t	Limiting load integral $V_R = 0 \text{ V}$, half sine pulse	$t_p = 8.3 \text{ ms}$	400 000	A ² s
		$t_p = 10 \text{ ms}$	423 000	A ² s
P_{RSM}	Maximum avalanche power dissipation rectangular pulse 20 μs		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			0.930	V
r_T	Forward slope resistance $I_F = 800 \div 2400 \text{ A}$			0.520	m Ω
V_{FM}	Maximum forward voltage $I_{FM} = 1\,800 \text{ A}$, $T_j = 25 \text{ }^\circ\text{C}$			1.700	V
Q_{rr}	Recovered charge $V_R = 100 \text{ V}$, $I_{FM} = 1\,000 \text{ A}$, $di_F/dt = -5 \text{ A}/\mu\text{s}$		1 050		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	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	

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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>i</i>	1	2	3	4
R_i (K/kW)	20.95	10.57	7.15	1.33
τ_i (s)	0.396	0.072	0.009	0.0044

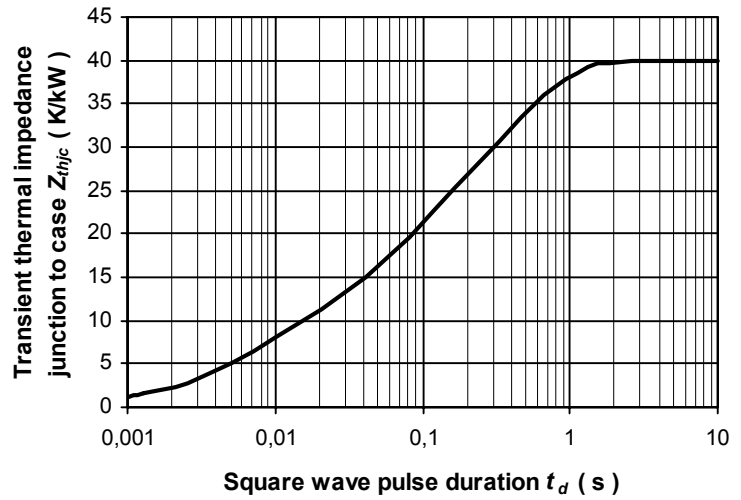


Fig. 2 Transient thermal impedance junction to case

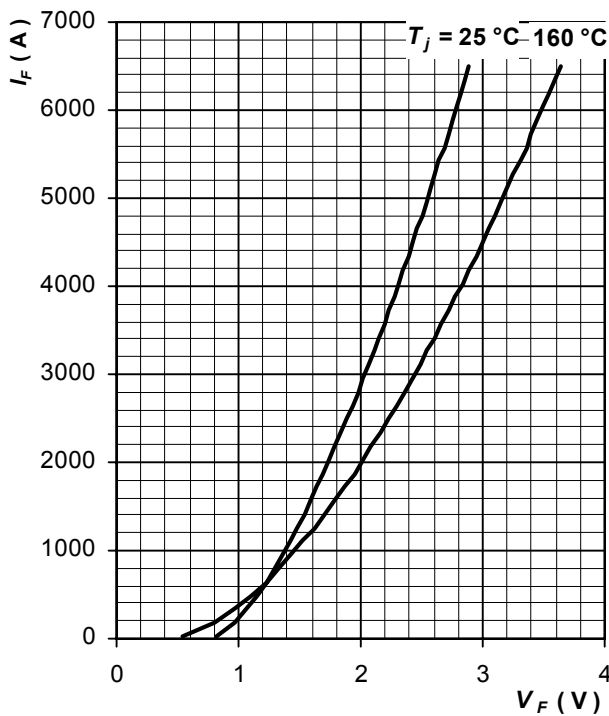


Fig. 3 Maximum forward voltage drop characteristics

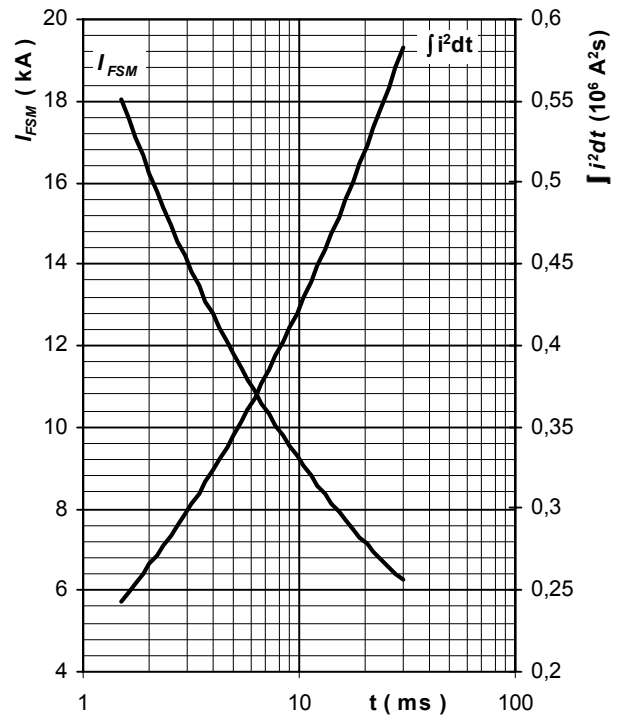


Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse, $V_R = 0$ V, $T_j = T_{jmax}$

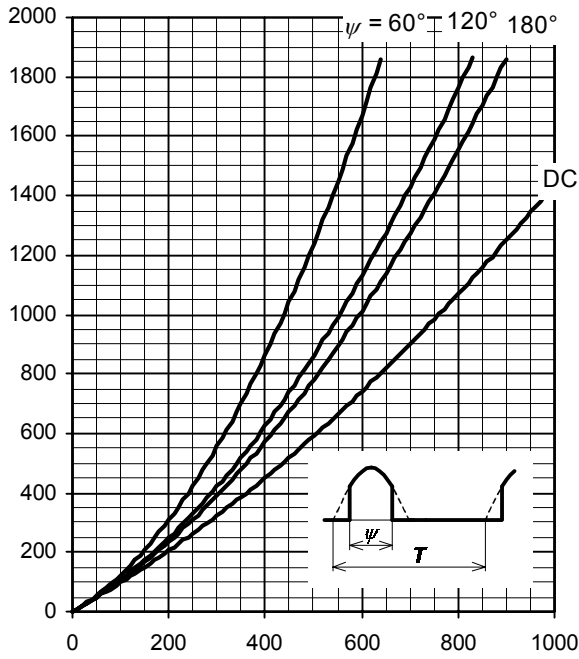


Fig. 5 Forward power loss vs. average forward current, sine waveform, $f = 50 \text{ Hz}$, $T = 1/f$

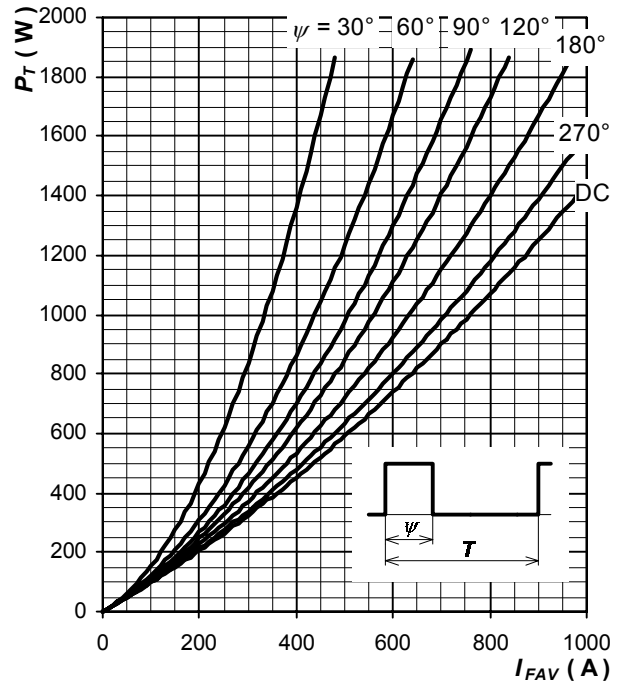


Fig. 6 Forward power loss vs. average forward current, square waveform, $f = 50 \text{ Hz}$, $T = 1/f$

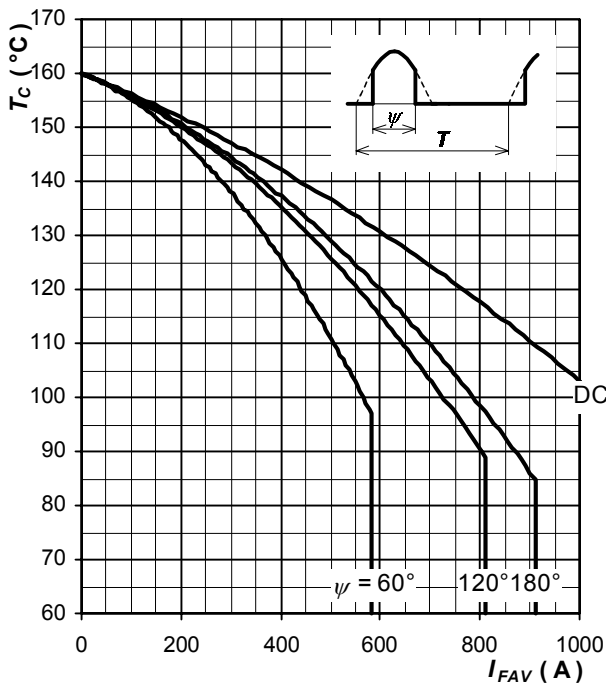


Fig. 7 Max. case temperature vs. aver. forward current, sine waveform, $f = 50 \text{ Hz}$, $T = 1/f$

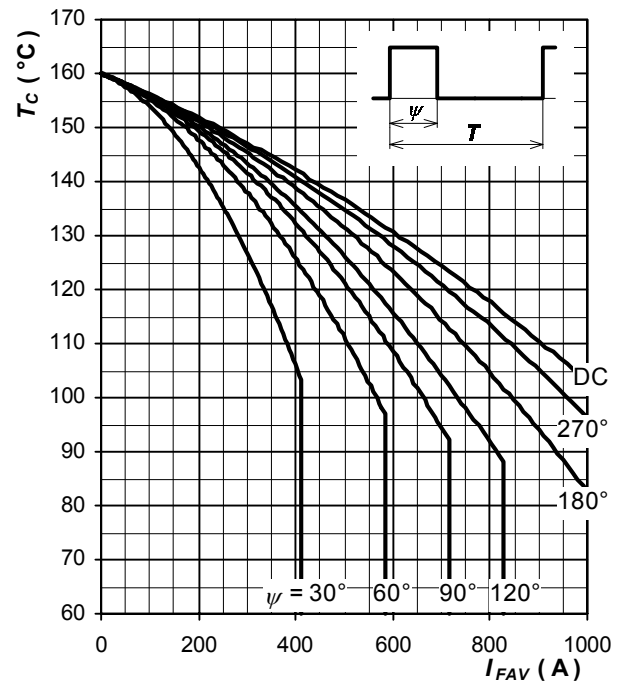


Fig. 8 Max. case temperature vs. aver. forward current, square waveform, $f = 50 \text{ Hz}$, $T = 1/f$

Notes