

# DA 808-2350-23

## Avalanche Diode

### Properties

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

### Key Parameters

$V_{RRM}$	=	2 300 V
$I_{FAVm}$	=	2 350 A
$I_{FSM}$	=	29 000 A
$V_{TO}$	=	0.840 V
$r_T$	=	0.130 mΩ

### Types

	$V_{RRM}$
DA 808-2350-23	2 300 V
DA 808-2350-20	2 000 V
DA 808-2350-17	1 700 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

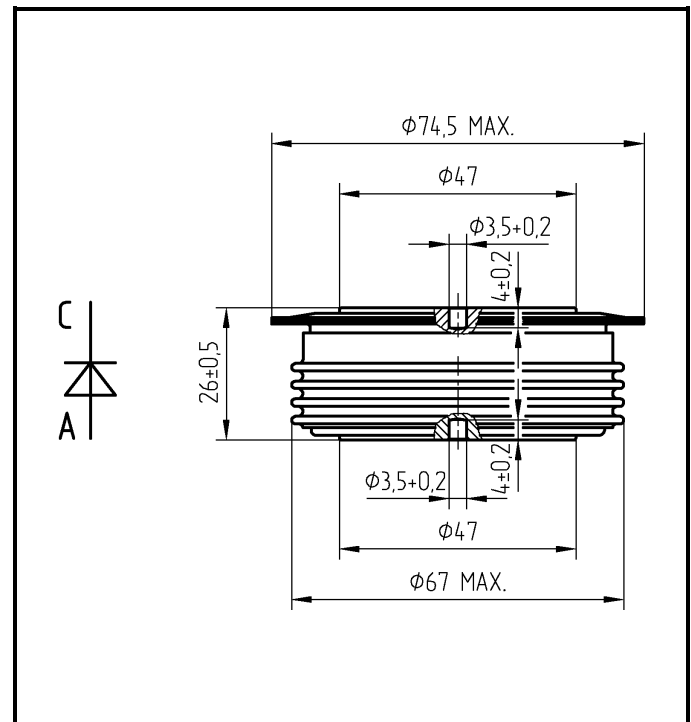


Fig. 1 Case

## Polovodice, a.s.

Novodvorska 1768/138a, 142 21 Praha 4, Czech Republic

tel.: +420 261 306 357, fax: +420 261 306 307, <http://www.polovodice.cz/>

<b>Maximum Ratings</b>			<b>Maximum Limits</b>	<b>Unit</b>
$V_{RRM}$	<b>Repetitive peak reverse voltage</b> $T_j = -40 \div 160 \text{ }^\circ\text{C}$	DA 808-2350-23 DA 808-2350-20 DA 808-2350-17	2 300 2 000 1 700	V
$I_{FAVm}$	<b>Average forward current</b> $T_c = 85 \text{ }^\circ\text{C}$		2 350	A
$I_{FRMS}$	<b>RMS forward current</b> $T_c = 85 \text{ }^\circ\text{C}$		3 690	A
$I_{RRM}$	<b>Repetitive reverse current</b> $V_R = V_{RRM}$		50	mA
$I_{FSM}$	<b>Non repetitive peak surge current</b> $V_R = 0 \text{ V}$ , half sine pulse	$t_p = 8.3 \text{ ms}$	31 000	A
		$t_p = 10 \text{ ms}$	29 000	A
$I^2t$	<b>Limiting load integral</b> $V_R = 0 \text{ V}$ , half sine pulse	$t_p = 8.3 \text{ ms}$	3 990 000	A <sup>2</sup> s
		$t_p = 10 \text{ ms}$	4 205 000	A <sup>2</sup> s
$P_{RSM}$	<b>Maximum avalanche power dissipation</b> rectangular pulse 20 $\mu\text{s}$		75	kW
$T_{jmin} - T_{jmax}$	<b>Operating temperature range</b>		-40 $\div$ 160	$^\circ\text{C}$
$T_{STG}$	<b>Storage temperature range</b>		-40 $\div$ 160	$^\circ\text{C}$

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

<b>Characteristics</b>		<b>Value</b>			<b>Unit</b>
		<i>min</i>	<i>typ</i>	<i>max</i>	
$V_{T0}$	<b>Threshold voltage</b>			0.840	V
$r_T$	<b>Forward slope resistance</b> $I_F = 2000 \div 6000 \text{ A}$			0.130	m $\Omega$
$V_{FM}$	<b>Maximum forward voltage</b> $I_{FM} = 4\,000 \text{ A}$ , $T_j = 25 \text{ }^\circ\text{C}$			1.350	V
$Q_{rr}$	<b>Recovered charge</b> $V_R = 100 \text{ V}$ , $I_{FM} = 2\,000 \text{ A}$ , $di_F/dt = -5 \text{ A}/\mu\text{s}$			2 250	$\mu\text{C}$

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

<b>Thermal Parameters</b>			<b>Value</b>	<b>Unit</b>
$R_{thjc}$	<b>Thermal resistance junction to case</b>	double side cooling	20	K/kW
		anode side cooling	34	
		cathode side cooling	48	
$R_{thch}$	<b>Thermal resistance case to heatsink</b>	double side cooling	5	K/kW
		single side cooling	10	

Polovodice, a.s., Novodvorska 1768/138a, 142 21 Praha 4, Czech Republic

Polovodice, a.s. reserves the right to change the data contained herein at any time without notice

**Transient Thermal Impedance**

Analytical function for transient thermal impedance

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

Conditions:

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

<i>i</i>	1	2	3	4
$R_i$ (K/kW)	11.83	4.26	1.63	2.28
$\tau_i$ (s)	0.432	0.071	0.01	0.0054

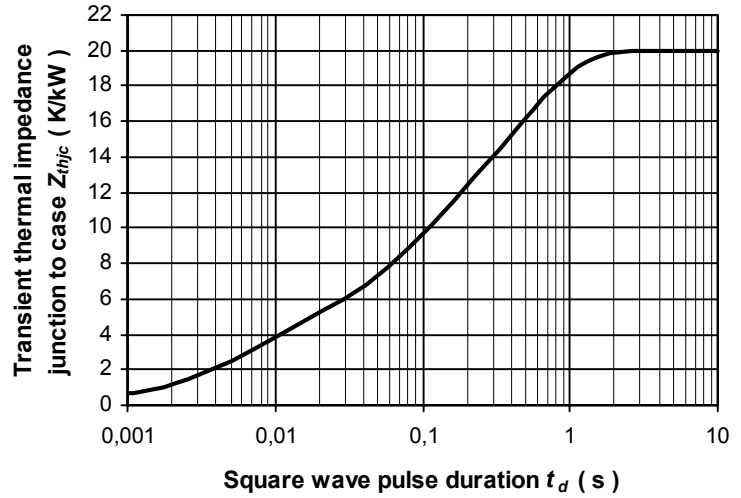


Fig. 2 Transient thermal impedance junction to case

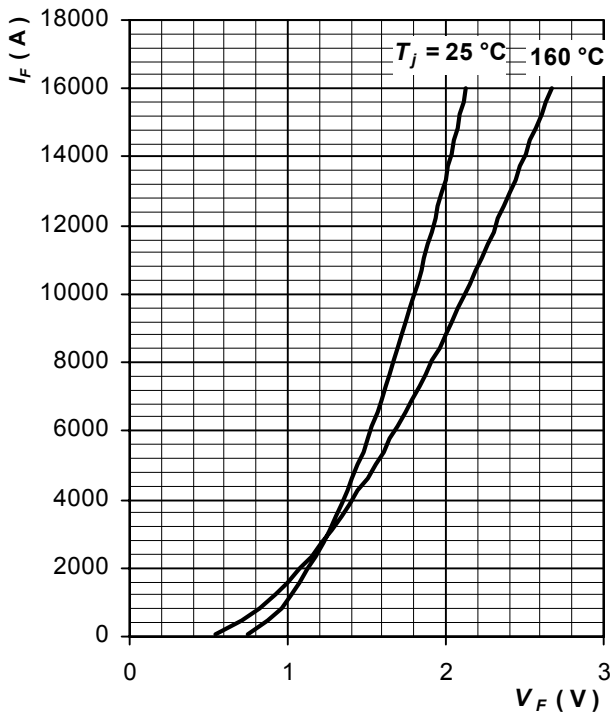


Fig. 3 Maximum forward voltage drop characteristics

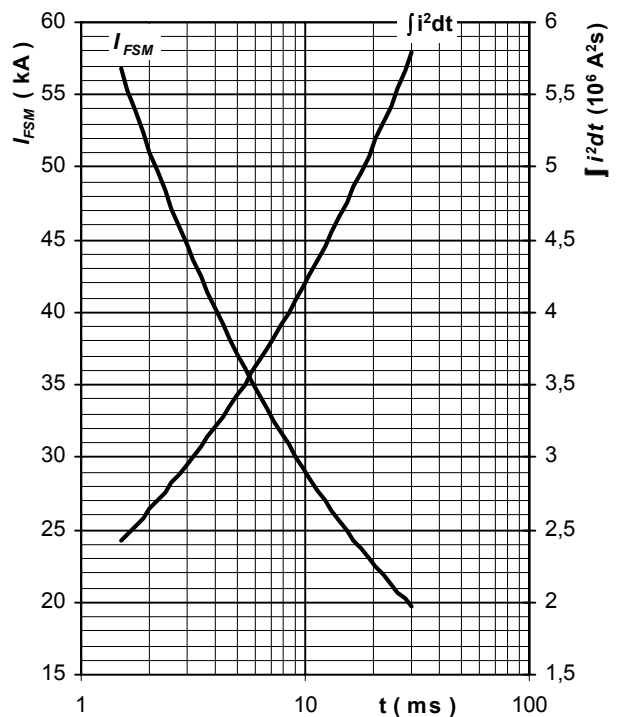


Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse,  $V_R = 0$  V,  $T_j = T_{jmax}$

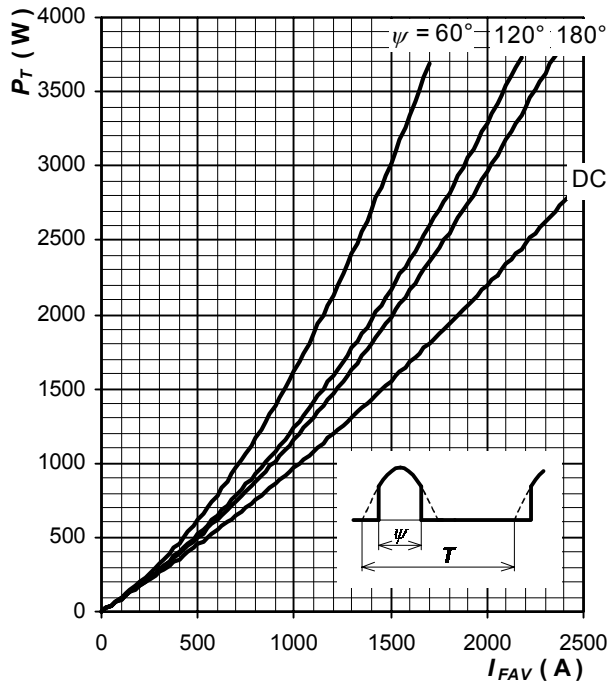


Fig. 5 Forward power loss vs. average forward current, sine waveform,  $f = 50 \text{ Hz}$ ,  $T = 1/f$

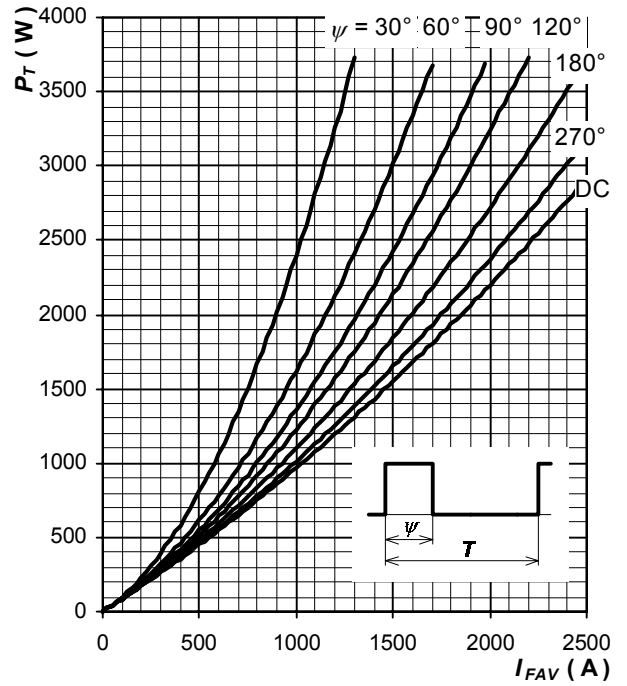


Fig. 6 Forward power loss vs. average forward current, square waveform,  $f = 50 \text{ Hz}$ ,  $T = 1/f$

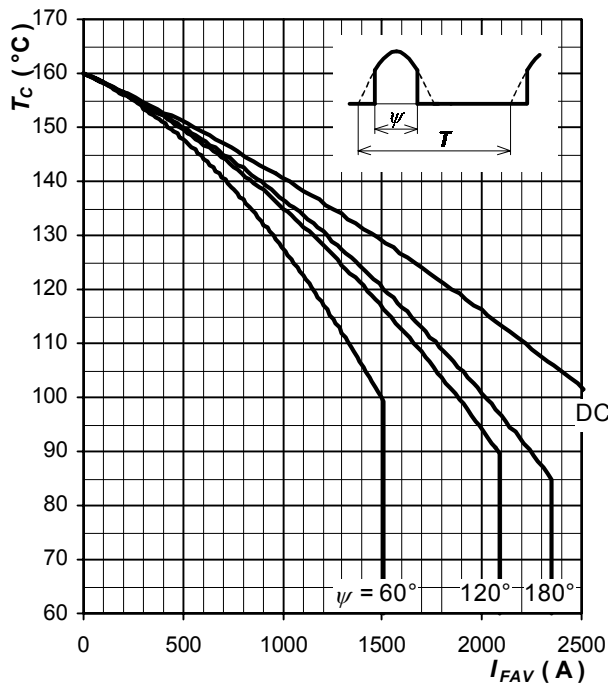


Fig. 7 Max. case temperature vs. aver. forward current, sine waveform,  $f = 50 \text{ Hz}$ ,  $T = 1/f$

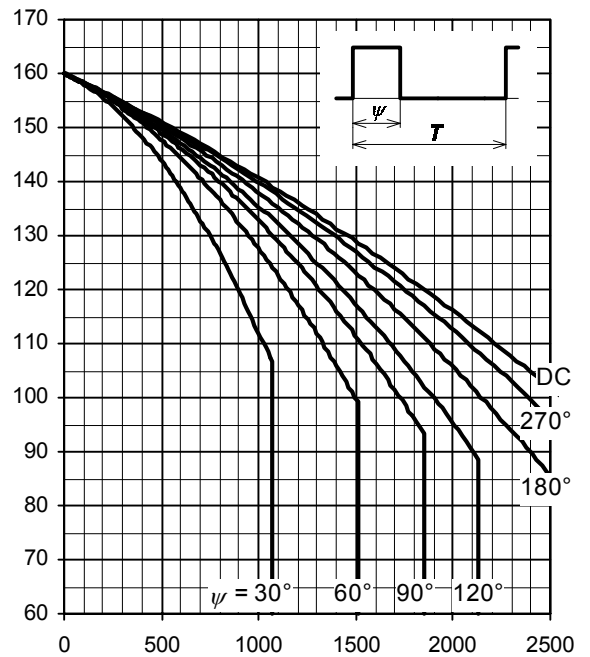


Fig. 8 Max. case temperature vs. aver. forward current, square waveform,  $f = 50 \text{ Hz}$ ,  $T = 1/f$

Notes