

V_{RRM}	=	5500 V
I_{FAVM}	=	360 A
I_{FRMS}	=	570 A
I_{FSM}	=	10 kA
V_{F0}	=	2.70 V
r_F	=	4.0 mΩ
V_{DClink}	=	3300 V

Fast Recovery Diode for IGCT applications

5SDF 04F6004

PRELIMINARY

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- Patented free-floating technology
- Industry standard housing
- Cosmic radiation withstand rating
- Low on-state and switching losses
- Optimized to use in snubberless operation

Blocking

V_{RRM}	Repetitive peak reverse voltage	5500 V	Half sine wave, $t_P = 10$ ms, $f = 50$ Hz
I_{RRM}	Repetitive peak reverse current	≤ 50 mA	$T_j = 115$ °C, $V_R = V_{RRM}$
V_{DClink}	Permanent DC voltage for 100 FIT failure rate	3300 V 3900 V	100% Duty 5% Duty Ambient cosmic radiation at sea level in open air.

Mechanical

F_M	Mounting force	min.	20 kN
		max.	24 kN
a	Acceleration:		
	Device unclamped		50 m/s ²
	Device clamped		200 m/s ²
m	Weight		0.46 kg
D_S	Surface creepage distance		33 mm
D_a	Air strike distance		20 mm

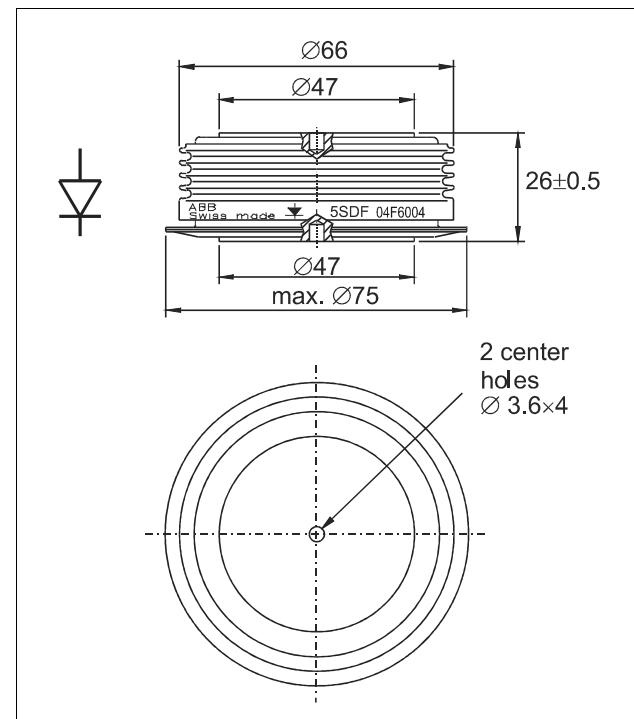


Fig. 1
Outline drawing.
All dimensions are in millimeters and represent nominal values unless stated otherwise.

On-state

I_{FAVM}	Max. average on-state current	360 A	Half sine wave, $T_c = 70^\circ\text{C}$		
I_{FRMS}	Max. RMS on-state current	570 A			
I_{FSM}	Max. peak non-repetitive surge current	10 kA	$t_p = 10 \text{ ms}$	Before surge $T_j = 115^\circ\text{C}$	
		22 kA	$t_p = 1 \text{ ms}$		
$\int I^2 dt$	Max. surge current integral	$0.50 \cdot 10^6 \text{ A}^2\text{s}$	$t_p = 10 \text{ ms}$	After surge: $V_R \approx 0\text{V}$	
		$0.24 \cdot 10^6 \text{ A}^2\text{s}$	$t_p = 1 \text{ ms}$		
V_F	Forward voltage drop	$\leq 6.30 \text{ V}$	$I_F = 900 \text{ A}$	$T_j = 115^\circ\text{C}$	
V_{FO}	Threshold voltage	2.70 V	Approximation for $I_F = 200 \dots 2000 \text{ A}$		
r_F	Slope resistance	4.0 m Ω			

Turn-on

V_{fr}	Peak forward recovery voltage	$\leq 80 \text{ V}$	$di/dt = 500 \text{ A}/\mu\text{s}, T_j = 115^\circ\text{C}$
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Turn-off

di/dt_{crit}	Max. decay rate of on-state current	$\leq 400 \text{ A}/\mu\text{s}$	$I_F = 900 \text{ A}, T_j = 115^\circ\text{C}$ $V_{DClink} = 3300 \text{ V}$
I_{rr}	Reverse recovery current	$\leq 470 \text{ A}$	$I_F = 900 \text{ A}, V_{DClink} = 3300 \text{ V}$
E_{rr}	Reverse recovery energy	$\leq 2.90 \text{ J}$	$di/dt = 350 \text{ A}/\mu\text{s}, T_j = 115^\circ\text{C}$

Thermal

T_j	Operating junction temperature range	$-40 \dots 115^\circ\text{C}$		
T_{stg}	Storage temperature range	$-40 \dots 125^\circ\text{C}$		
R_{thJC}	Thermal resistance junction to case	$\leq 40 \text{ K/kW}$	Anode side cooled	$F_M = 20 \dots 24 \text{ kN}$
		$\leq 40 \text{ K/kW}$	Cathode side cooled	
		$\leq 20 \text{ K/kW}$	Double side cooled	
R_{thCH}	Thermal resistance case to heatsink	$\leq 10 \text{ K/kW}$	Single side cooled	
		$\leq 5 \text{ K/kW}$	Double side cooled	

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ABB Semiconductors AG
Fabrikstrasse 2
CH-5600 Lenzburg, Switzerland

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Tel: +41 (0)62 888 6419
Fax: +41 (0)62 888 6306
E-mail: info@ch.abb.com
Internet: www.abbsem.com