V_{RRM}	=	400 V
I_{FAVM}	=	9244 A
I_{FRMS}	=	14520 A
I_{FSM}	=	60000 A
V_{F0}	=	0.780 V
r_F	=	0.031 mW

Housingless Welding Diode

5SDD 92Z0400

PRELIMINARY

Doc. No. 5SYA1178-00 March 07

- **High forward current capability**
- **Low forward and reverse recovery losses**
- **High current application up to 2000 Hz**
- **For parallel connection, please contact factory**

Blocking

V_{RRM}	Repetitive peak reverse voltage	400 V	Half sine waveform, f = 50 Hz T_j = -40...180 °C
I_{RRM}	Repetitive peak reverse current	50 mA	$V_R = V_{RRM}$

Mechanical

F_M	Mounting force	22 ..50 kN
m	Weight	0.10 kg
D_S	Surface creepage distance	2 mm
D_a	Air strike distance	2 mm

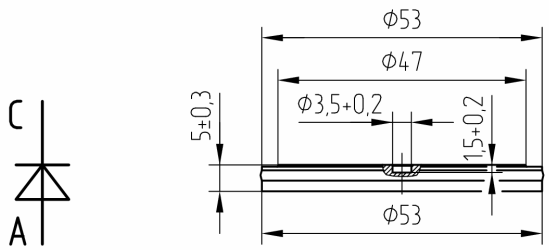


Fig. 1
Outline drawing.
All dimensions are in millimeters and represent nominal values unless stated otherwise.

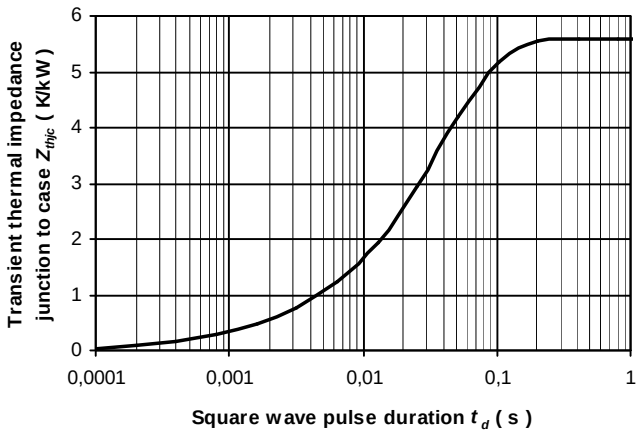
On-state

I_{FAVM}	Max. average on-state current	9244 A	T_c = 85 °C	Half sine pulse
I_{FRMS}	Max. RMS on-state current	14520 A	T_c = 85 °C	Half sine pulse
I_{FSM}	Max. peak non-repetitive surge current	64000 A	t_p = 8.3 ms	V_R = 0 V Half sine pulse
		60000 A	t_p = 10 ms	
$\int I^2dt$	Max. surge current integral	17049 kA^2s	t_p = 8.3 ms	V_R = 0 V Half sine pulse
		18000 kA^2s	t_p = 10 ms	
$V_{F\,max}$	Max. on-state voltage	0.920 V	I_F = 5000 A	
		1.030 V	I_F = 8000 A	
V_{F0}	Max. Threshold voltage	0.780 V		
r_F	Max. Slope resistance	0.031 mΩ	I_F = 7 000…21 000 A	
Q_{rr}	Typ. Recovered charge	400 µC	I_F = 1 000 A, di/dt = -30 A/µs, V_R = 100 V	

Unless otherwise specified T_j = 180 °C

Thermal characteristics

T_j	Operating junction temperature range	-40...180 °C	
T_{stg}	Storage temperature range	-40...180 °C	
$R_{th(j-c)}$	Thermal resistance junction to case	7.4 K/kW	Anode side cooled
		23.5 K/kW	Cathode side cooled
		5.6 K/kW	Double side cooled
$R_{th(c-h)}$	Thermal resistance case to heatsink	6.7 K/kW	Anode side cooled
		8.0 K/kW	Cathode side cooled
		3.6 K/kW	Double side cooled



$$Z_{th(j-c)}(t) = \sum_{i=1}^{4} R_i(1 - e^{-t/t_i})$$

i	1	2	3	4
R_i (K/kW)	3.8860	1.1830	0.3610	0.1700
τ_i (s)	0.0461	0.0241	0.0045	0.0006

Conditions:
F_m = 22 ± 2 kN, Double side cooled

Correction for periodic waveforms

180°	**sine:**	**1.3 K/kW**
120°	**sine:**	**1.6 K/kW**
60°	**sine:**	**2.7 K/kW**
180°	**rectangular:**	**1.1 K/kW**
120°	**rectangular:**	**1.8 K/kW**
60°	**rectangular:**	**3.0 K/kW**

Fig. 2 Transient thermal impedance (junction-to-case) vs. time in analytical and graphical forms.

On-state characteristics

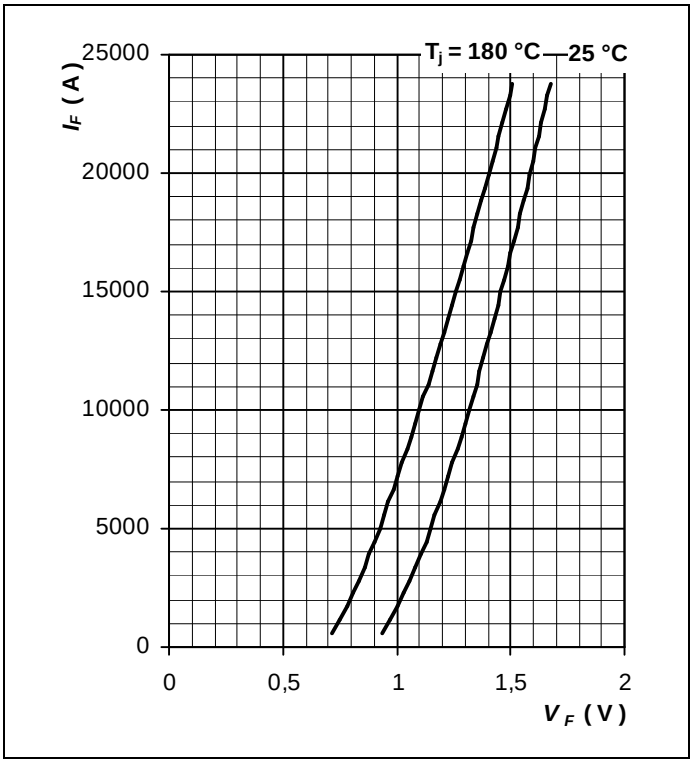


Fig. 3 Forward current vs. forward voltage (max. values).

Surge current characteristics

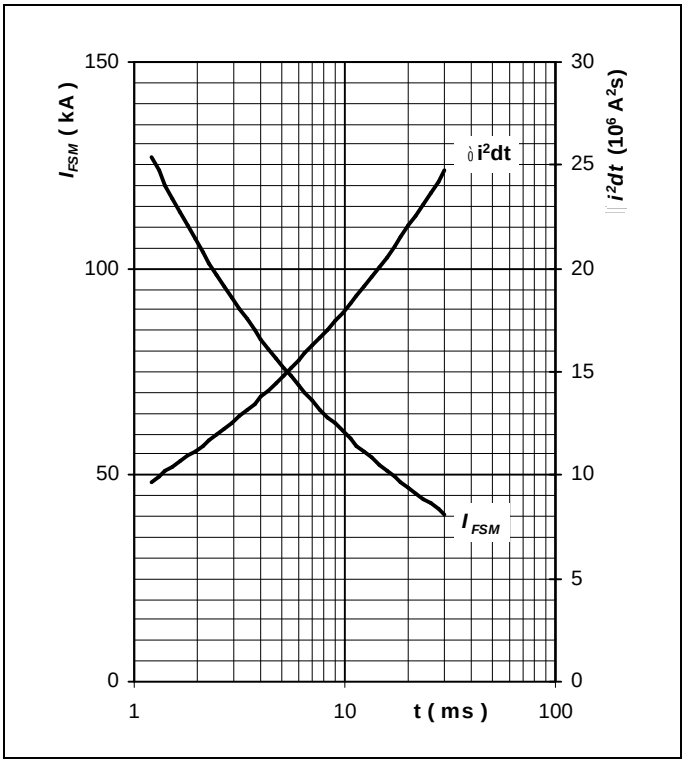


Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse, V_R = 0 V, $T_j = T_{jmax}$

Surge current characteristics

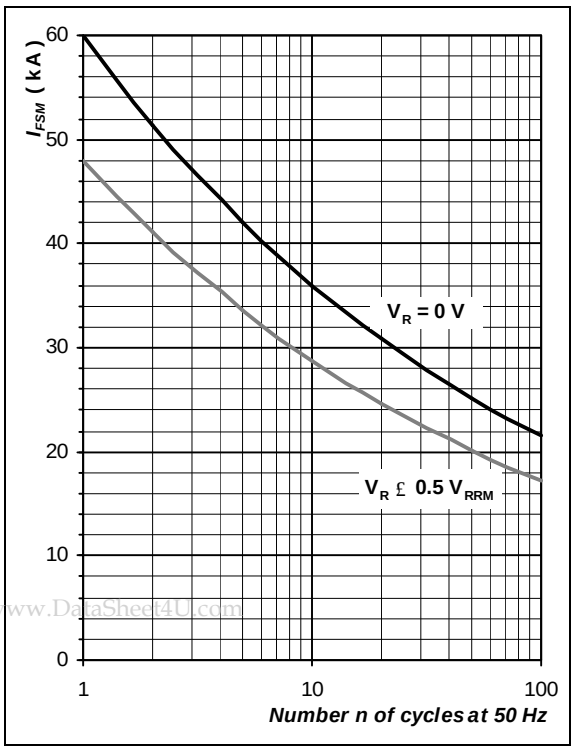


Fig. 5 Surge forward current vs. number *of pulses, half sine wave, $T_j = T_{jmax}$*

Forward power loss

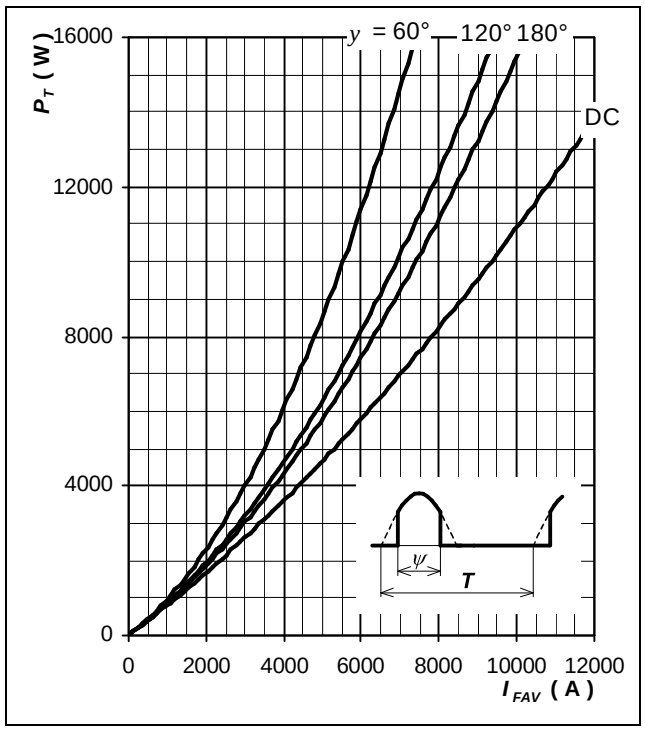


Fig. 6 Forward power loss vs. average forward current, sine waveform, f = 50 Hz, T = 1/f

Forward power loss

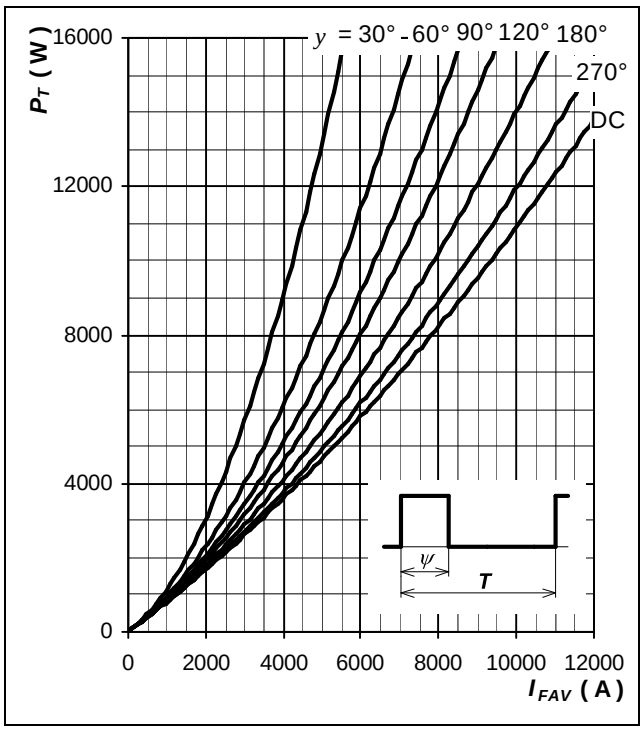


Fig. 7 Forward power loss vs. average forward current, square waveform, f = 50 Hz, T = 1/f

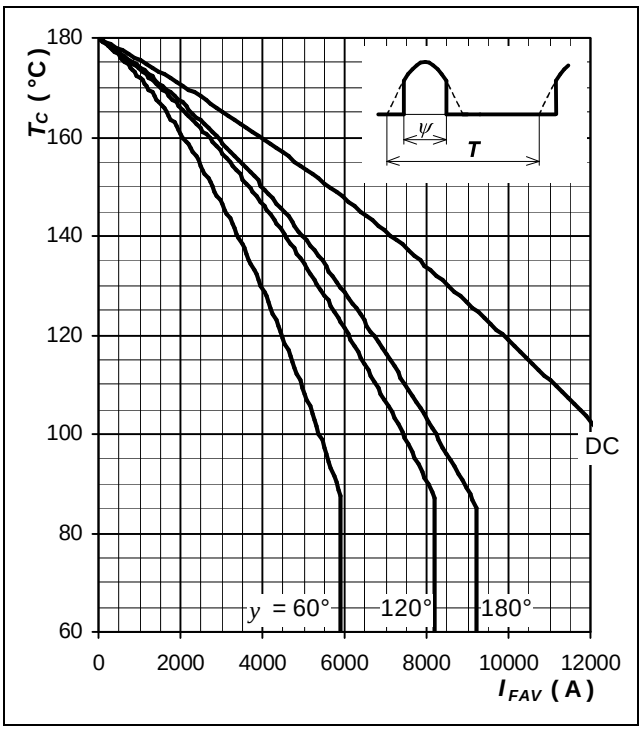


Fig. 8 Forward power loss vs. average forward current, sine waveform, f = 50 Hz, T = 1/f

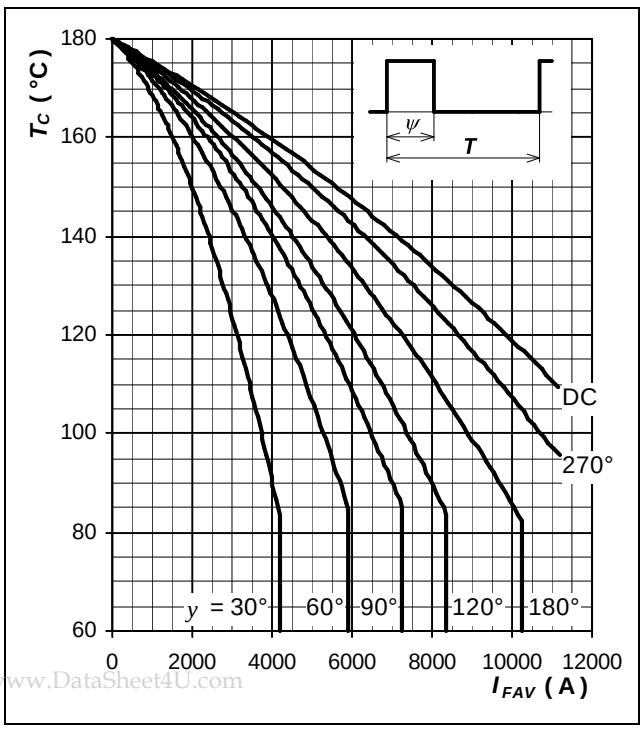


Fig. 9 Max. case temperature vs. aver. forward current, square waveform, f = 50 Hz, T = 1/f

ABB Switzerland Ltd, Semiconductors reserves the right to change specifications without notice.

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