

V_{RRM}	=	400 V
I_{FAVM}	=	11350 A
I_{FRMS}	=	17800 A
I_{FSM}	=	85000 A
V_{F0}	=	0.74 V
r_F	=	0.018 mW

Rectifier Diode

5SDD 0120C0400

Doc. No. 5SYA1159-01 July 06

- Optimized for high current rectifiers
- Very low on-state voltage
- Very low thermal resistance

Blocking

V_{RRM}	Repetitive peak reverse voltage	400 V	Half sine wave, $t_P = 10$ ms, $f = 50$ Hz
V_{RSM}	Maximum peak reverse voltage	450 V	Half sine wave, $t_P = 10$ ms
I_{RRM}	Repetitive peak reverse current	≤ 50 mA	$T_j = 170$ °C $V_R = V_{RRM}$

Mechanical

F_M	Mounting force	min.	35 kN
		max.	40 kN
a	Acceleration:	Device unclamped	50 m/s ²
		Device clamped	200 m/s ²
m	Weight		0.22 kg
D_S	Surface creepage distance		4 mm
D_a	Air strike distance		4 mm

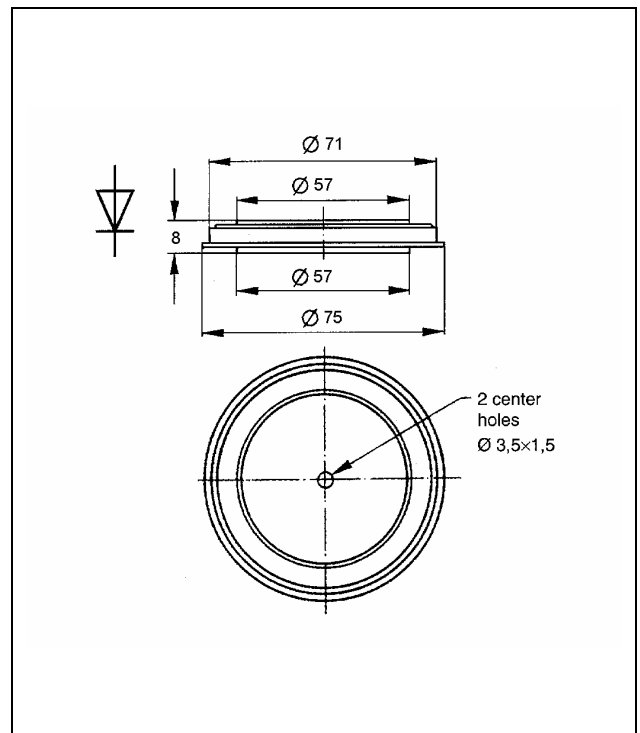


Fig. 1

Outline drawing.

All dimensions are in millimeters and represent nominal values unless stated otherwise.

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On-state

I_{FAVM}	Max. average on-state current	11350 A	Half sine wave, $T_c = 85\text{ °C}$	
I_{FRMS}	Max. RMS on-state current	17800 A		
I_{FSM}	Max. peak non-repetitive surge current	85000 A	$t_p = 10\text{ ms}$	Before surge
		92500 A	$t_p = 8.3\text{ ms}$	$T_j = 170\text{ °C}$
$\int i^2 dt$	Max. surge current integral	36100 kA^2s	$t_p = 10\text{ ms}$	After surge: $V_R \approx 0\text{V}$
		35700 kA^2s	$t_p = 8.3\text{ ms}$	
$V_{F\text{ min}}$	Minimum on-state voltage	$\geq 0.83\text{ V}$	$I_F = 8000\text{ A}$	$T_j = 170\text{ °C}$
$V_{F\text{ max}}$	Maximum on-state voltage	$\leq 0.88\text{ V}$		
V_{F0}	Threshold voltage	0.74 V	Approximation for $I_F = 8 - 18\text{ kA}$	$T_j = 170\text{ °C}$
r_F	Slope resistance	0.018 $\text{m}\Omega$		

Thermal characteristics

T_j	Operating junction temperature range	-40...170 °C		
T_{stg}	Storage temperature range	-40...170 °C		
$R_{\text{th}(j-c)}$	Thermal resistance junction to case	$\leq 12\text{ K/kW}$	Anode side cooled	$F_M = 35...40\text{ kN}$
		$\leq 12\text{ K/kW}$	Cathode side cooled	
		$\leq 6\text{ K/kW}$	Double side cooled	
$R_{\text{th}(c-h)}$	Thermal resistance case to heatsink	$\leq 6\text{ K/kW}$	Single side cooled	
		$\leq 3\text{ K/kW}$	Double side cooled	

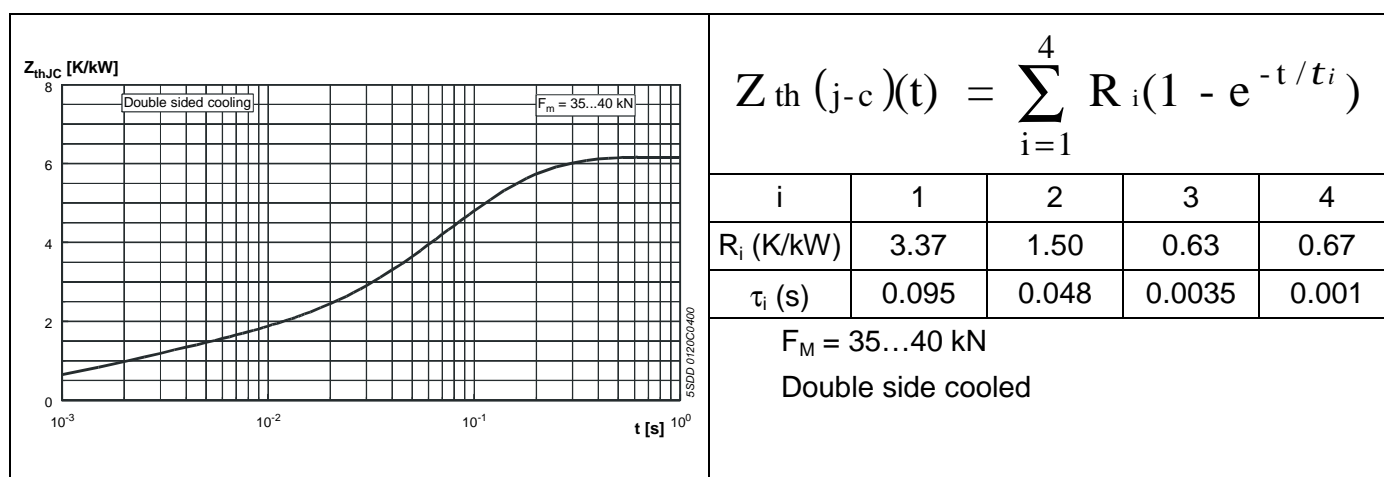


Fig. 2 Transient thermal impedance (junction-to-case) vs. time in analytical and graphical forms.

On-state characteristics

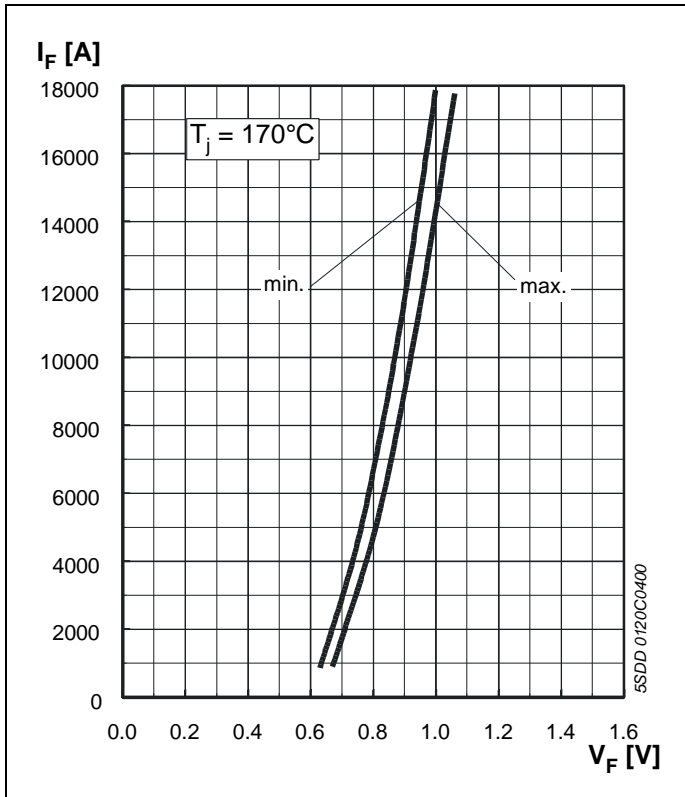


Fig. 3 Forward current vs. forward voltage (min. and max. values).

Surge current characteristics

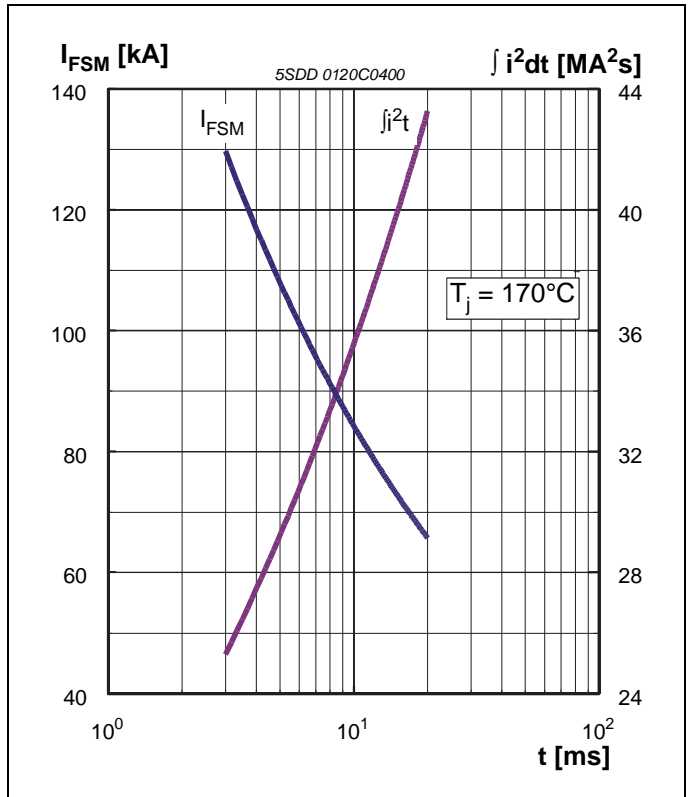


Fig. 4 Surge current and fusing integral vs. pulse width (max. values) for non-repetitive, half-sinusoidal surge current pulses.

Current load capability

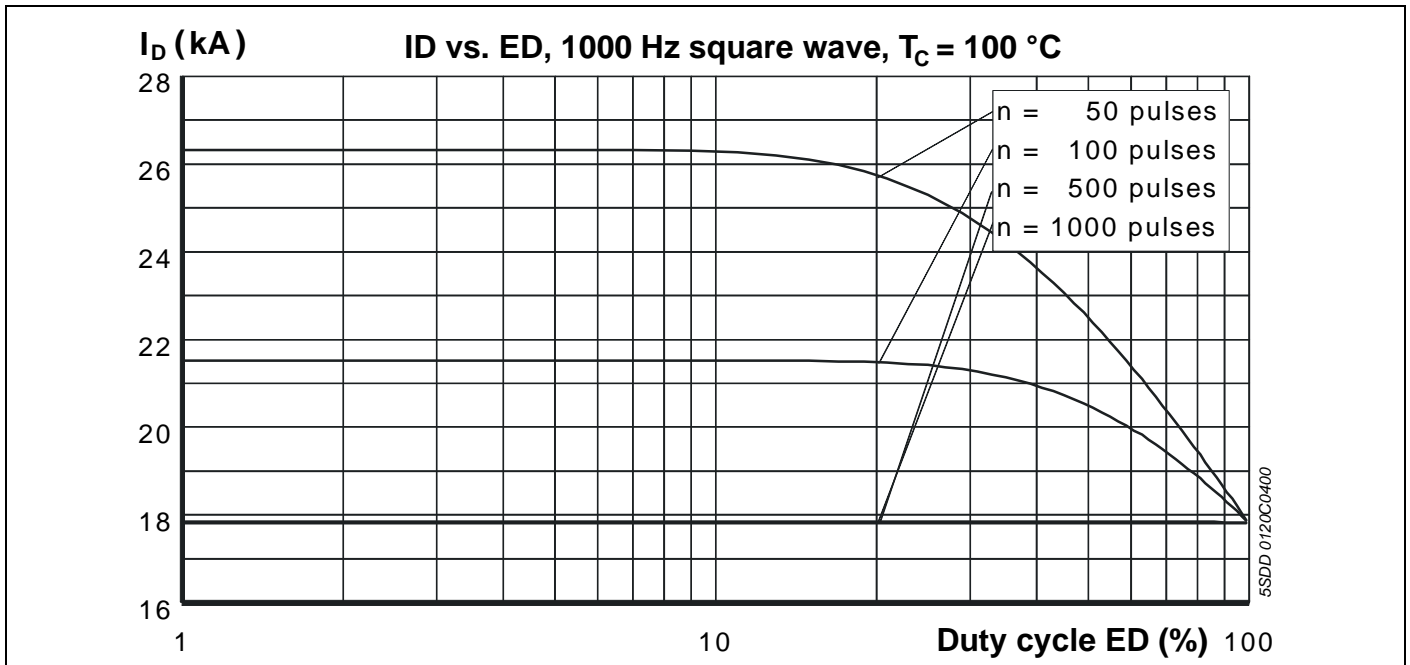


Fig. 5 DC-output current with single-phase centre tap

Current load capacity, cont.

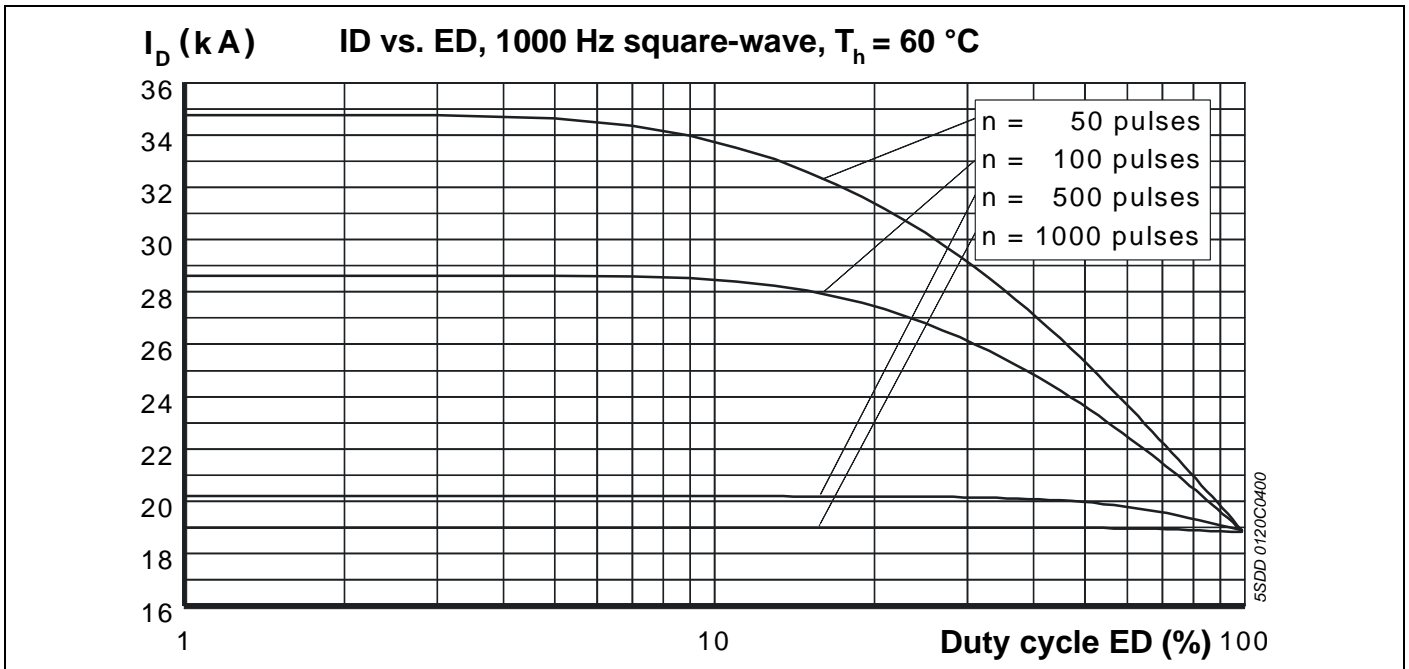


Fig. 6 DC-output current with single-phase centre tap

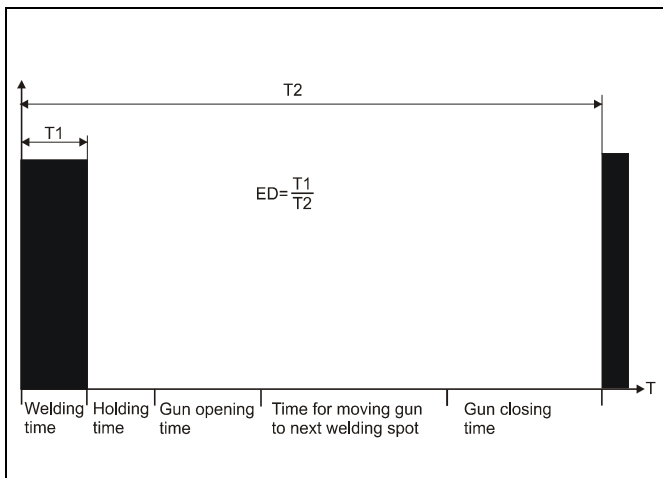


Fig. 7 Definition of ED for typical welding sequence

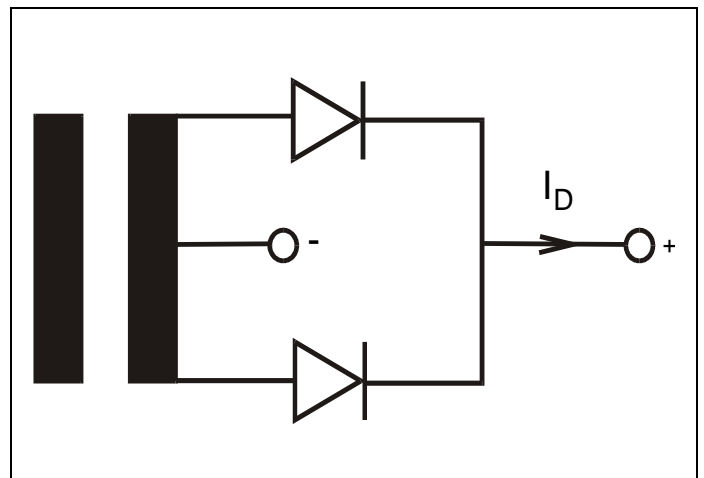


Fig. 8 Definition of I_D for single-phase centre tap

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