5SDD 0120C0200

Old part no. DS 879D-12000-02

Welding diode

Properties

- High forward current capability
- Low forward and reverse recovery losses
- High operational reliability

Key parameters

V_{RRM}	=	200	V
I_{FAVm}	=	11 000	A
I_{FSM}	=	85 000	A
V_{TO}	=	0.75	V
r_T	=	0.020	mΩ

Applications

- Welding equipment
- High current application up to 2000 Hz

Types

type	V_{RRM}
5SDD 0120C0200	**200 V**
Conditions:	*T_j = -40 ÷ 170 °C, half sine waveform, f = 50 Hz*

Mechanical data

F_m	**Mounting force**	35 ÷ 40 kN
m	**Weight**	0.22 kg
D_S	**Surface creepage distance**	4 mm
D_a	**Air strike distance**	4 mm

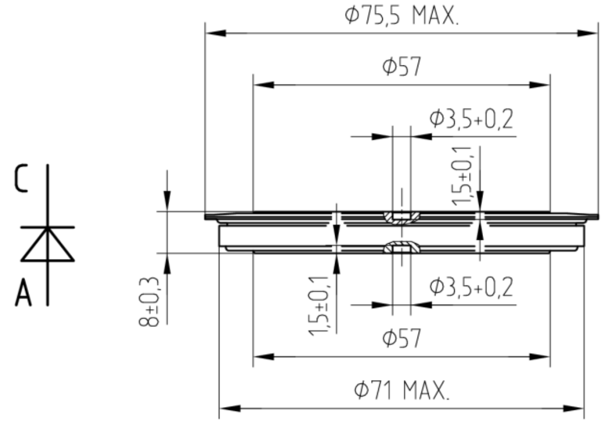

Fig. 1 Case

ABB s.r.o.
Novodvorska 1768/138a, 142 21 Praha 4, Czech Republic
tel.: +420 261 306 250, http://www.abb.com/semiconductors

Maximum Ratings		***Maximum Limits***	***Unit***
V_{RRM}	**Repetitive peak reverse voltage** T_j = -40 ÷ 170 °C	**200**	**V**
I_{FAVm}	***Average forward current*** T_c = 85 °C	**11 000**	**A**
I_{FRMS}	***RMS forward current*** T_c = 85 °C	**17 300**	**A**
I_R	***Repetitive reverse current*** $V_R = V_{RRM}$	**50**	**mA**
I_{FSM}	***Nonrepetitive peak surge current*** t_p = 10 ms, V_R = 0 V, half sine pulse	**85 000**	**A**
I^2t	***Limiting load integral*** t_p = 10 ms, V_R = 0 V, half sine pulse	**36 000 000**	**A^2s**
T_{jmin} –T_{jmax}	***Operating temperature range***	**- 40 ÷ 170**	**°C**
T_{stgmin} - T_{stgmax}	***Storage temperature range***	**- 40 ÷ 170**	**°C**

Unless otherwise specified T_j = 170 °C

Characteristics		***Value***			***Unit***
		min	***typ***	***max***	
V_{T0}	**Threshold voltage**			**0.750**	**V**
r_T	**Forward slope resistance** I_{F1} = 8 000 A, I_{F2} = 18 000 A			**0.020**	**mΩ**
V_{FM}	**Maximum forward voltage** I_{FM} = 8000 A			**0.92**	**V**
Q_{rr}	**Recovered charge** I_{FM} = 1000 A, di/dt = -30 A/µs, V_R = 50 V		**350**		**µC**

Unless otherwise specified T_j = 170 °C

Thermal Specifications			***Value***	***Unit***
R_{thjc}	**Thermal resistance junction to case**	*double side cooling*	**6**	**K/kW**
		single side cooling	**12**	
R_{thch}	**Thermal resistance case to heatsink**	*double side cooling*	**3**	**K/kW**
		single side cooling	**6**	

Analytical function for transient thermal impedance

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

Conditions:

F_m = 35 ÷ 40 kN, Double side cooled

i	1	2	3	4
R_i(K/kW)	4.6507	0.8219	0.4408	0.0870
τ_i (s)	0.0830	0.0172	0.0040	0.0002

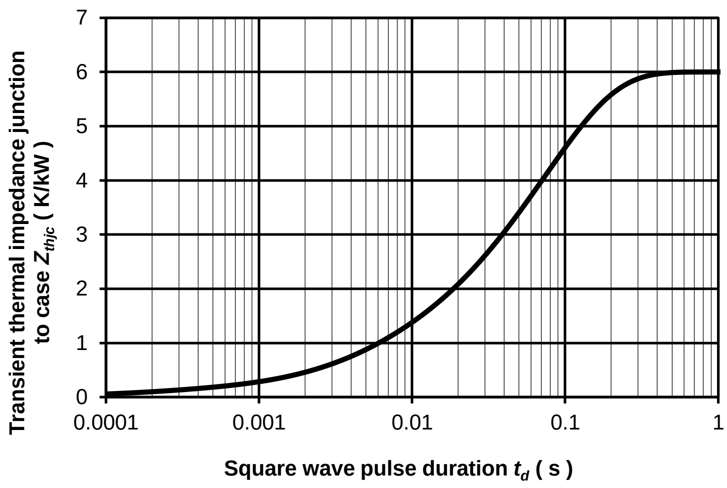

Fig. 2 Dependence transient thermal impedance junction to case on square pulse

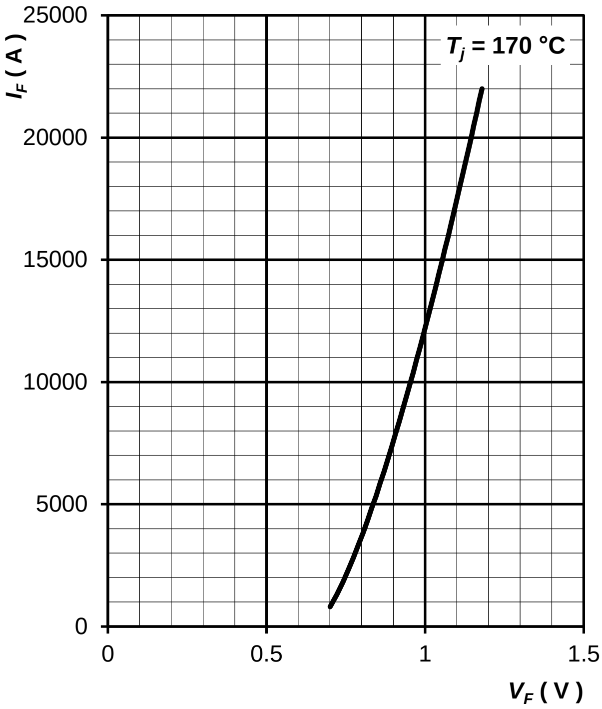

Fig. 3 Maximum forward voltage drop characteristics

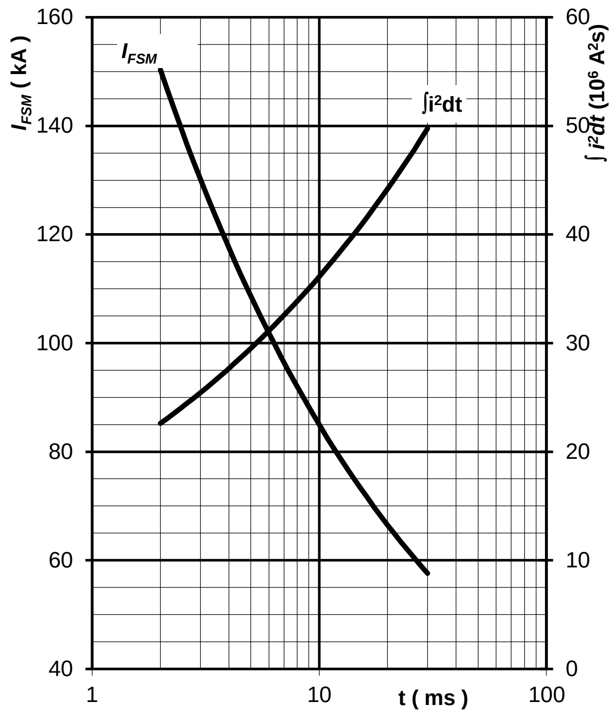

Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse, V_R = 0 V, $T_j = T_{jmax}$

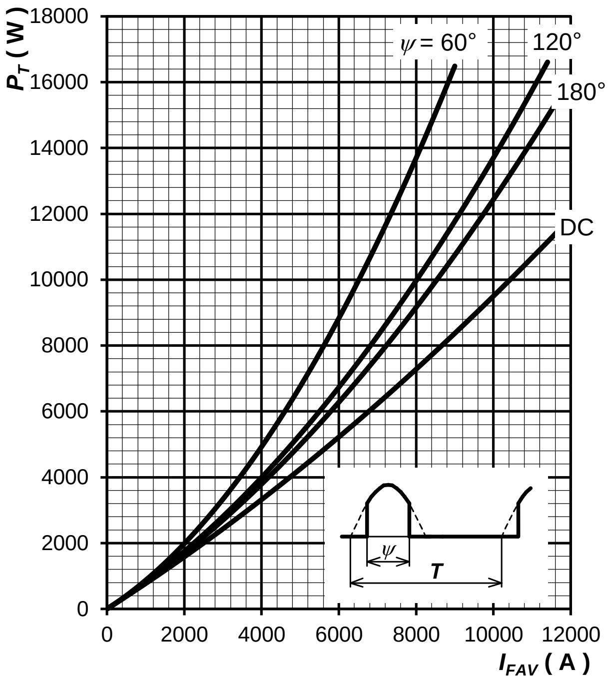

Fig. 5 Forward power loss vs. average forward current, sine waveform, f = 50 Hz

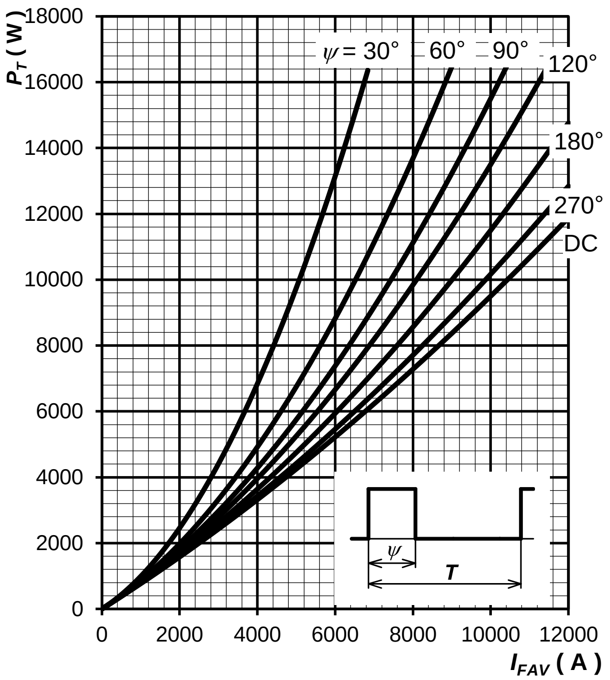

Fig. 6 Forward power loss vs. average forward current, square waveform, f = 50 Hz

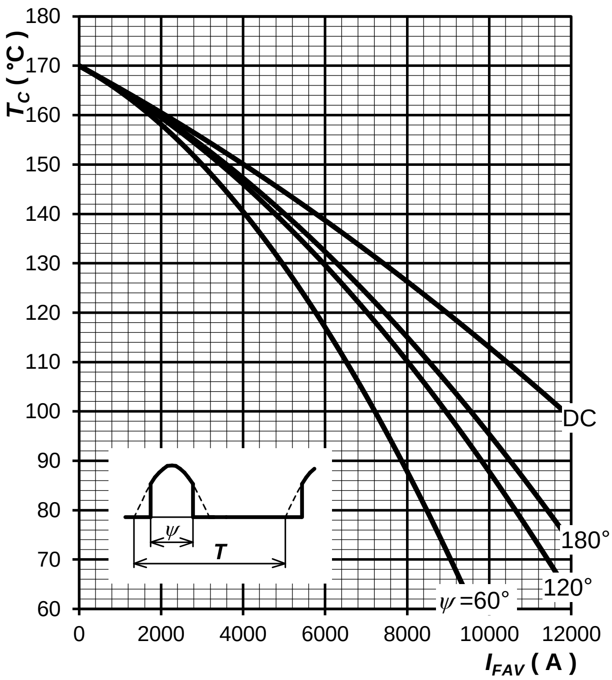

Fig. 7 Max. case temperature vs. aver. forward current, sine waveform, f = 50 Hz

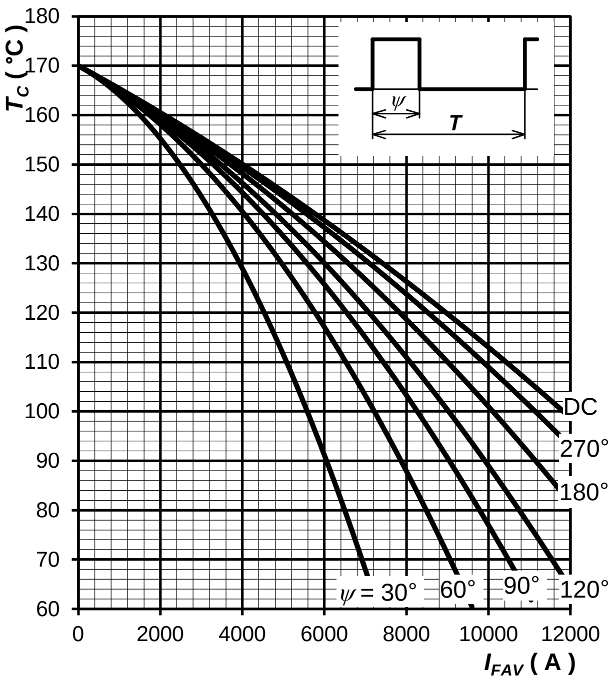

Fig. 8 Max.case temperature vs. aver. forward current, square waveform, f = 50 Hz

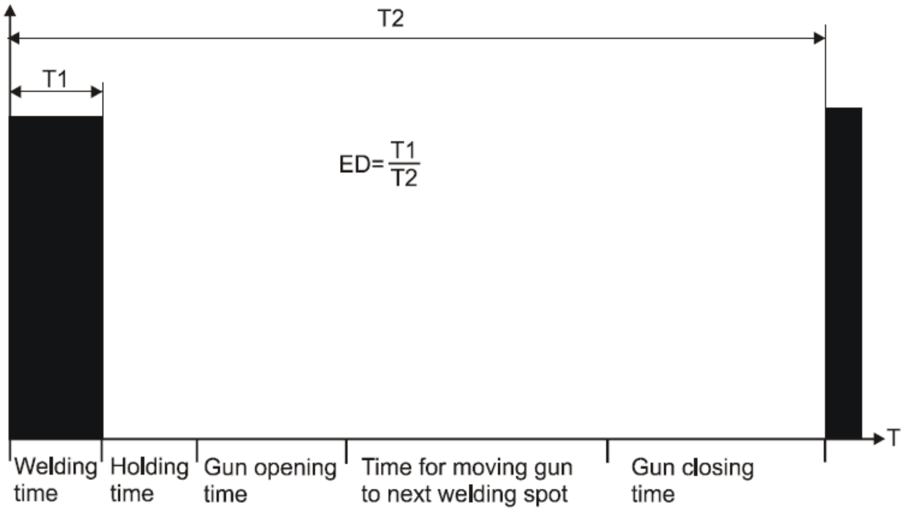

Fig. 9 Definition of ED for typical welding sequence

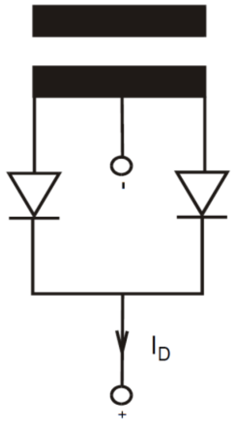

Fig. 10 Definition of I_D for single-phase centre tap

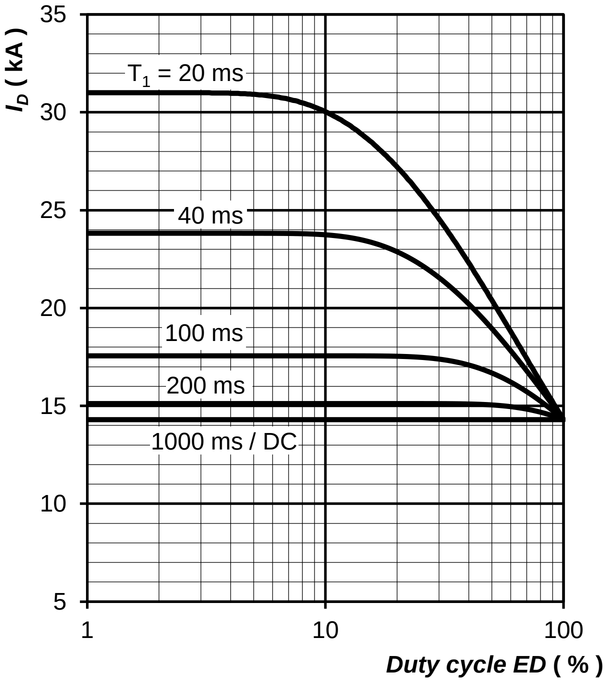

Fig. 11 Current load capacity, cont., DC output welding current with single-phase centre tap vs. duty cycle f = 1000 Hz, square wave, ΔT_j = 80 °C

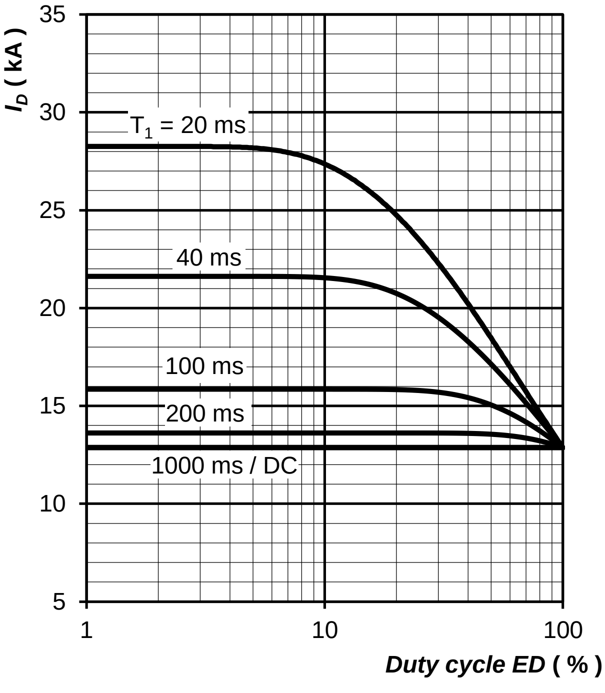

Fig. 12 Current load capacity, cont., DC output welding current with single-phase centre tap vs. duty cycle f = 1000 Hz, square wave, ΔT_j = 70 °C

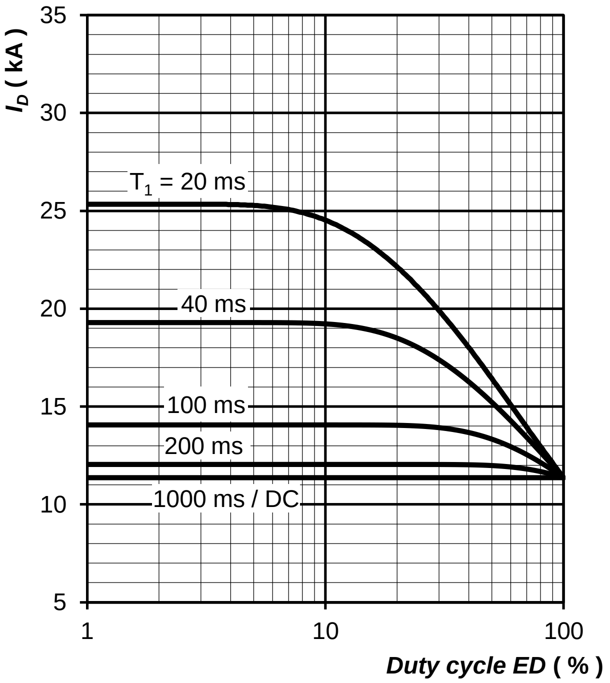

Fig. 13 Current load capacity, cont., DC output welding current with single-phase centre tap vs. duty cycle f = 1000 Hz, square wave, ΔT_j = 60 °C

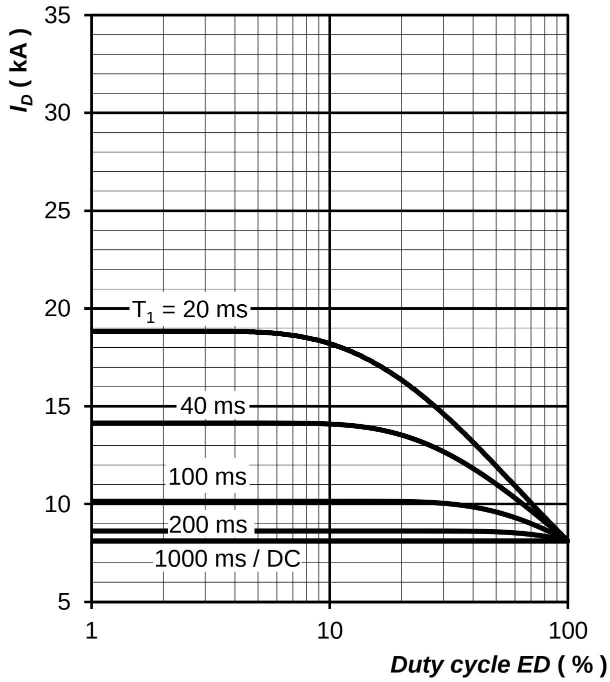

Fig. 14 Current load capacity, cont., DC output welding current with single-phase centre tap vs. duty cycle f = 1000 Hz, square wave, ΔT_j = 40 °C

Notes: