



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

Applications

- Welding equipment
- High current application up to 2000 Hz

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

Types

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

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

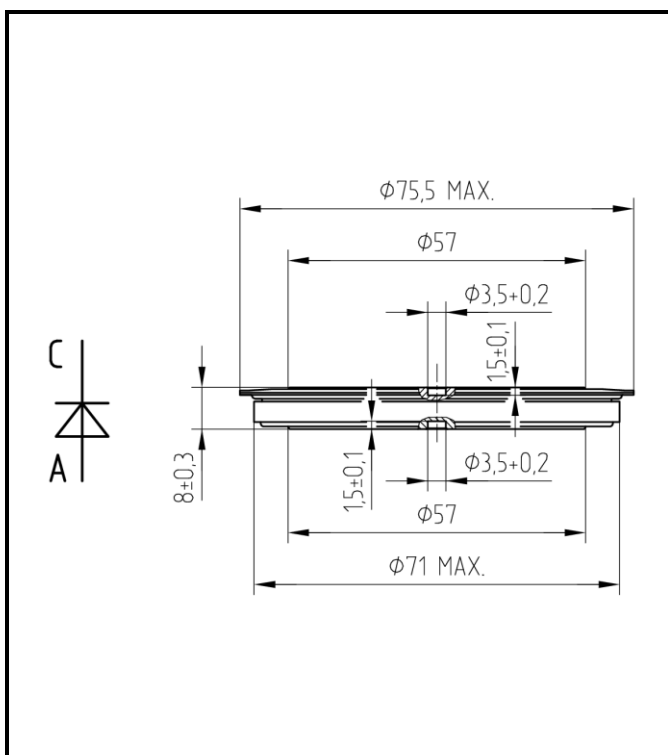


Fig. 1 Case



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Maximum Ratings		Maximum Limits	Unit
V_{RRM}	Repetitive peak reverse voltage $T_j = -40 \div 170\text{ }^{\circ}\text{C}$	200	V
I_{FAVm}	Average forward current $T_c = 85\text{ }^{\circ}\text{C}$	11 000	A
I_{FRMS}	RMS forward current $T_c = 85\text{ }^{\circ}\text{C}$	17 300	A
I_R	Repetitive reverse current $V_R = V_{RRM}$	50	mA
I_{FSM}	Nonrepetitive peak surge current $t_p = 10\text{ ms}$, $V_R = 0\text{ V}$, half sine pulse	85 000	A
I^2t	Limiting load integral $t_p = 10\text{ ms}$, $V_R = 0\text{ V}$, half sine pulse	36 000 000	A²s
$T_{jmin} - T_{jmax}$	Operating temperature range	- 40 ÷ 170	°C
$T_{stgmin} - T_{stgmax}$	Storage temperature range	- 40 ÷ 170	°C

Unless otherwise specified $T_j = 170\text{ }^{\circ}\text{C}$

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

Unless otherwise specified $T_j = 170\text{ }^{\circ}\text{C}$

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	

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Analytical function for transient thermal impedance

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

Conditions:

$F_m = 35 \div 40$ 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

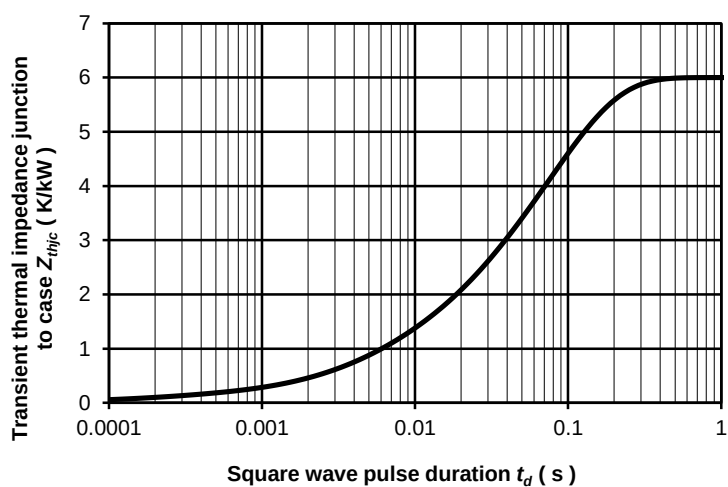


Fig. 2 Dependence transient thermal impedance junction to case on square pulse

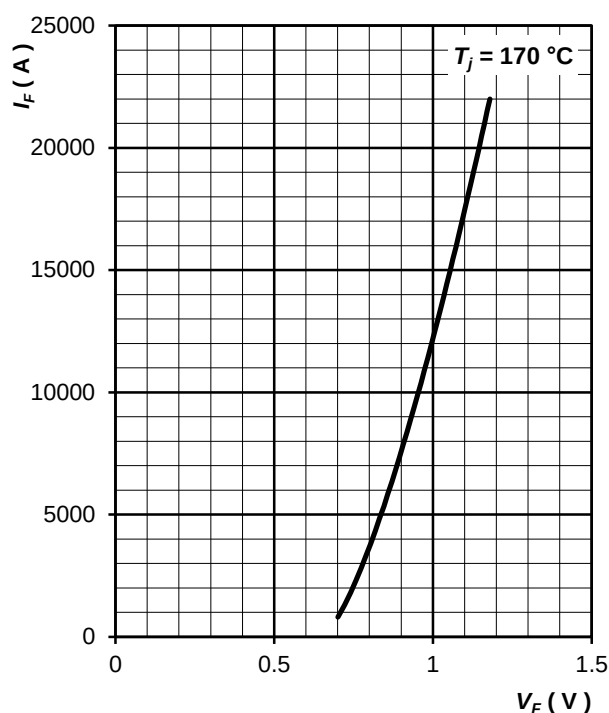


Fig. 3 Maximum forward voltage drop characteristics

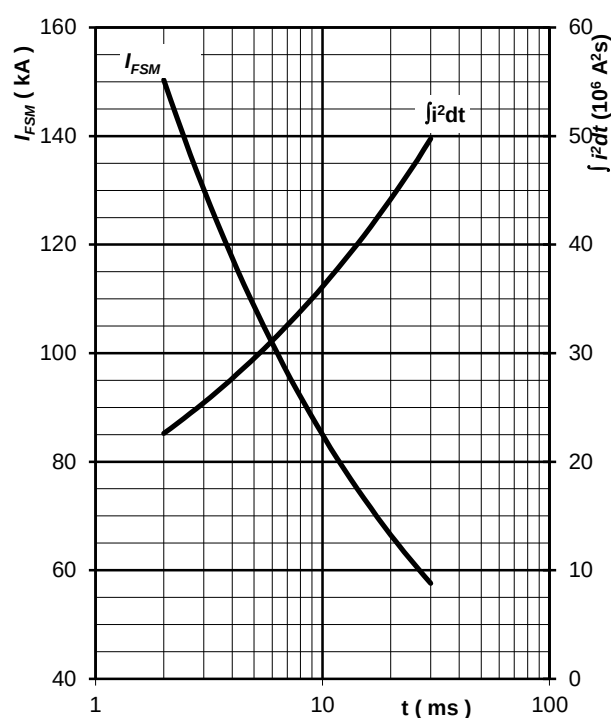


Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse, $V_R = 0$ V, $T_j = T_{jmax}$

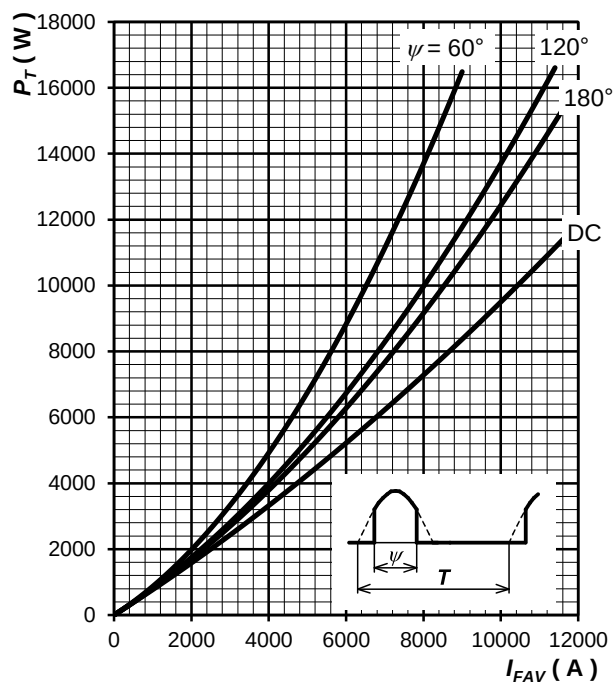


Fig. 5 Forward power loss vs. average forward current, sine waveform, $f = 50$ Hz

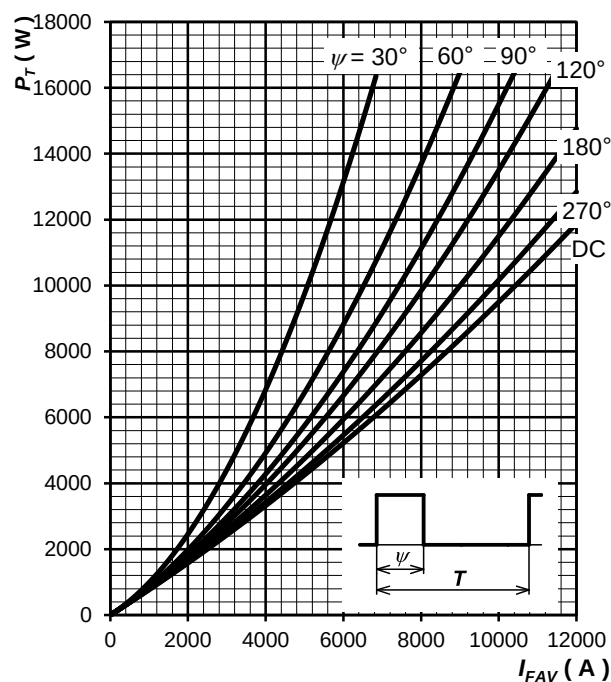


Fig. 6 Forward power loss vs. average forward current, square waveform, $f = 50$ Hz

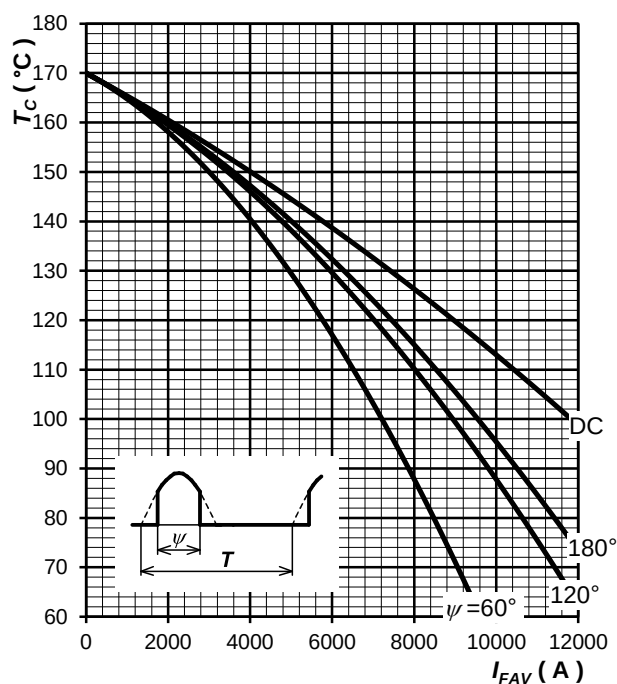


Fig. 7 Max. case temperature vs. aver. forward current, sine waveform, $f = 50$ Hz

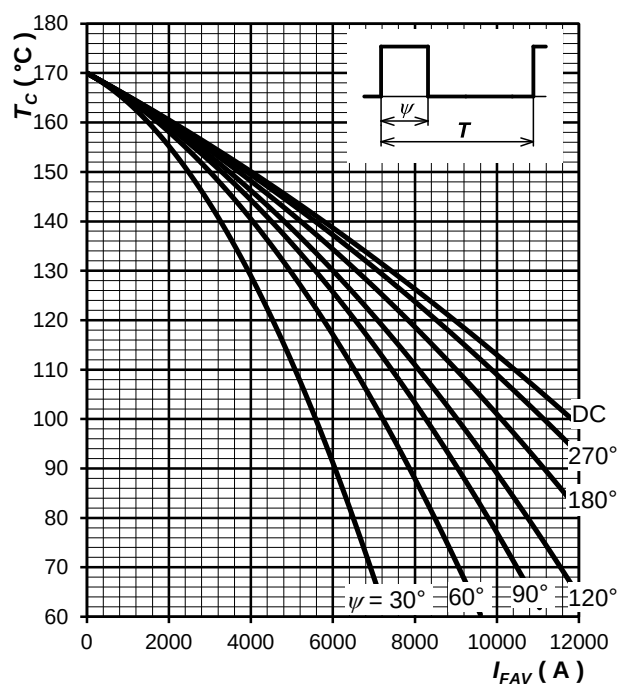
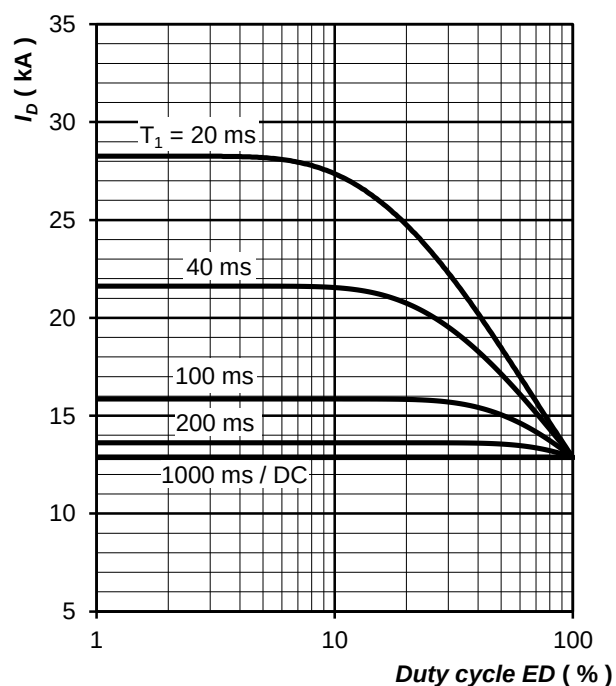
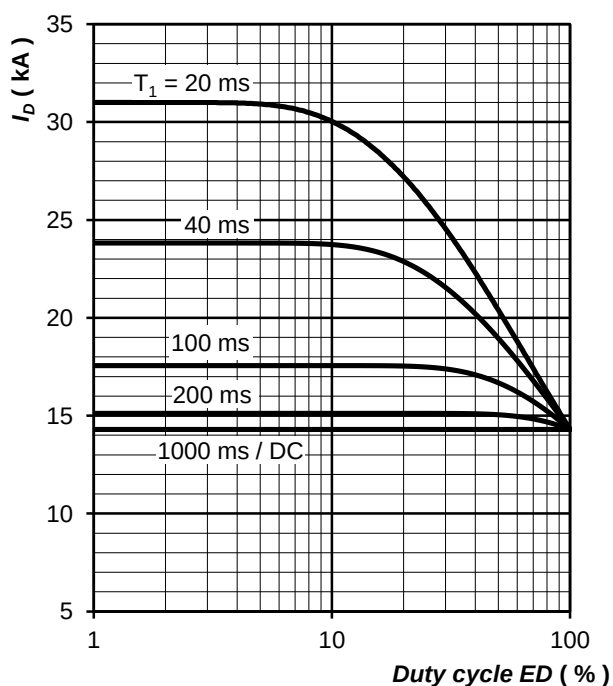
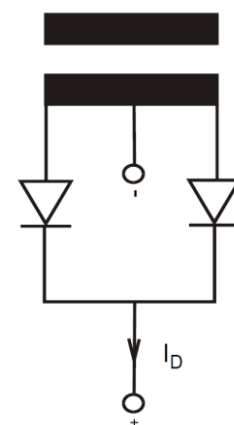
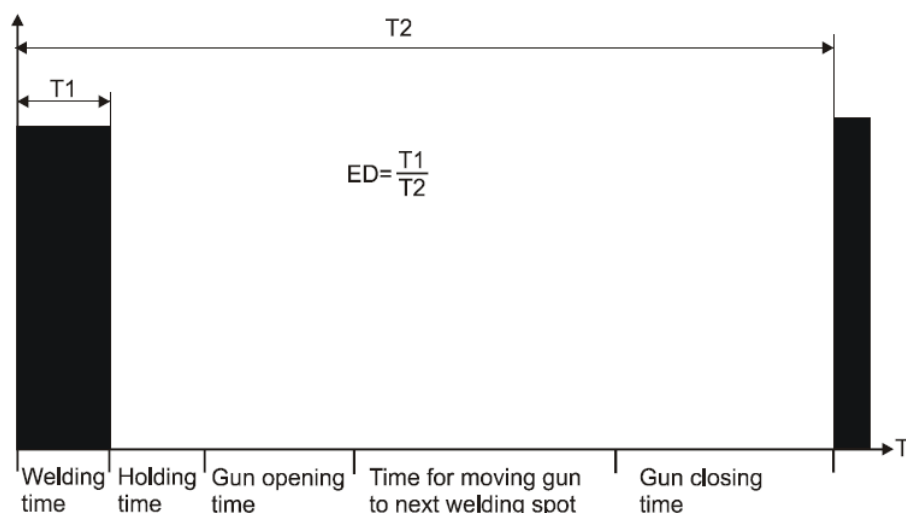


Fig. 8 Max. case temperature vs. aver. forward current, square waveform, $f = 50$ Hz



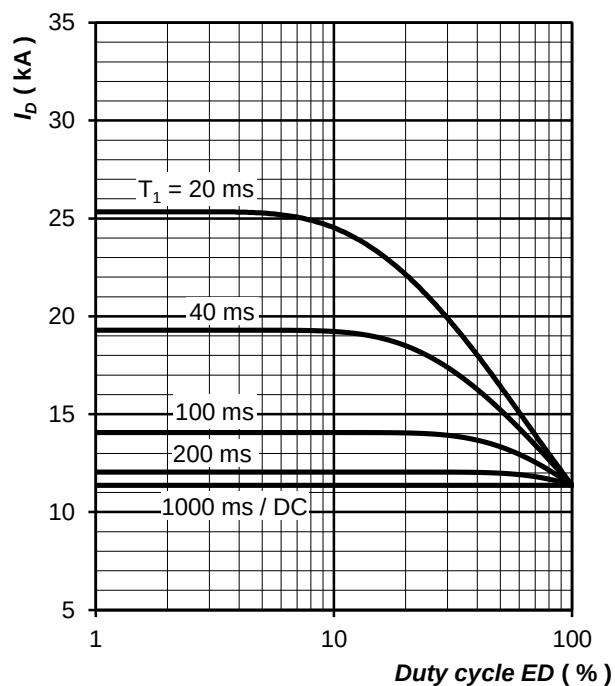


Fig. 13 Current load capacity, cont.,
DC output welding current with single-phase
centre tap vs. duty cycle
 $f = 1000 \text{ Hz}$, square wave, $\Delta T_j = 60 \text{ }^{\circ}\text{C}$

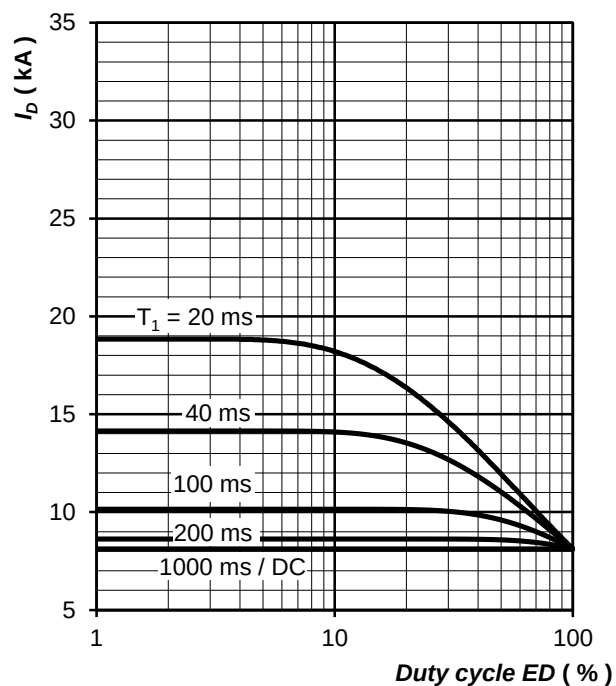


Fig. 14 Current load capacity, cont.,
DC output welding current with single-phase
centre tap vs. duty cycle
 $f = 1000 \text{ Hz}$, square wave, $\Delta T_j = 40 \text{ }^{\circ}\text{C}$

Notes: