

$V_{RSM} =$	2800 V	<b>Rectifier Diode</b>
$I_{F(AV)M} =$	5380 A	<b>5SDD 51L2800</b>
$I_{F(RMS)} =$	8450 A	
$I_{FSM} =$	$65 \times 10^3$ A	
$V_{F0} =$	0.77 V	
$r_F =$	0.082 mW	

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- Patented free-floating silicon technology
- Very low on-state losses
- High average and surge current.

## Blocking

Maximum rated values <sup>1)</sup>

Parameter	Symbol	Conditions	Value	Unit	
Max repetitive peak reverse voltage	$V_{RRM}$	$f = 50$ Hz, $t_p = 10$ ms, $T_{vj} = 0 \dots 175$ °C		2000	V
Max non-repetitive peak reverse voltage	$V_{RSM}$	$f = 5$ Hz, $t_p = 10$ ms, $T_{vj} = 0 \dots 175$ °C		2800	V

Characteristic values

Parameter	Symbol	Conditions	min	typ	max	Unit
Reverse leakage current	$I_{RRM}$	$V_{RRM}$ , $T_{vj} = 175$ °C			400	mA

## Mechanical data

Maximum rated values <sup>1)</sup>

Parameter	Symbol	Conditions	min	typ	max	Unit
Mounting force	$F_M$		63	70	77	kN
Acceleration	a	Device unclamped			50	m/s <sup>2</sup>
Acceleration	a	Device clamped			100	m/s <sup>2</sup>

Characteristic values

Parameter	Symbol	Conditions	min	typ	max	Unit
Weight	m				1.45	kg
Housing thickness	H	$F_M = 70$ kN, $T_a = 25$ °C	25.7		26.3	mm
Surface creepage distance	$D_s$		35			mm
Air strike distance	$D_a$		14			mm

1) Maximum rated values indicate limits beyond which damage to the device may occur

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## On-state

*Maximum rated values* <sup>1)</sup>

Parameter	Symbol	Conditions	min	typ	max	Unit
Average on-state current	$I_{F(AV)M}$	50 Hz, Half sine wave, $T_c = 85\text{ }^\circ\text{C}$			5380	A
RMS on-state current	$I_{F(RMS)}$				8450	A
Peak non-repetitive surge current	$I_{FSM}$	$t_p = 10\text{ ms}$ , $T_{vj} = 175\text{ }^\circ\text{C}$ , sine half wave, $V_R = 0\text{ V}$ , after surge			$65 \times 10^3$	A
Limiting load integral	$I^2t$		$21.13 \times 10^6$	$\text{A}^2\text{s}$		
Peak non-repetitive surge current	$I_{FSM}$	$t_p = 10\text{ ms}$ , $T_{vj} = 175\text{ }^\circ\text{C}$ , sine half wave, $V_R = 0.6 \times V_{RRM}$ , after surge				A
Limiting load integral	$I^2t$			$\text{A}^2\text{s}$		

*Characteristic values*

Parameter	Symbol	Conditions	min	typ	max	Unit
On-state voltage	$V_F$	$I_F = 5000\text{ A}$ , $T_{vj} = 175\text{ }^\circ\text{C}$		1.18		V
Threshold voltage	$V_{F0}$	$T_{vj} = 175\text{ }^\circ\text{C}$ $I_T = 2500 \dots 7500\text{ A}$			0.77	V
Slope resistance	$r_F$		0.082	mW		

## Switching

*Characteristic values*

Parameter	Symbol	Conditions	min	typ	max	Unit
Reverse recovery charge	$Q_{rr}$	$di_F/dt = -10\text{ A}/\mu\text{s}$ , $V_R = 200\text{ V}$ $I_F = 4000\text{ A}$ , $T_{vj} = 175\text{ }^\circ\text{C}$	5000		7000	$\mu\text{As}$
Reverse recovery current	$I_{RM}$					A

## Thermal

### Maximum rated values <sup>1)</sup>

Parameter	Symbol	Conditions	min	typ	max	Unit
Operating junction temperature range	$T_{vj}$		0		175	°C
Storage temperature range	$T_{stg}$		-40		150	°C

### Characteristic values

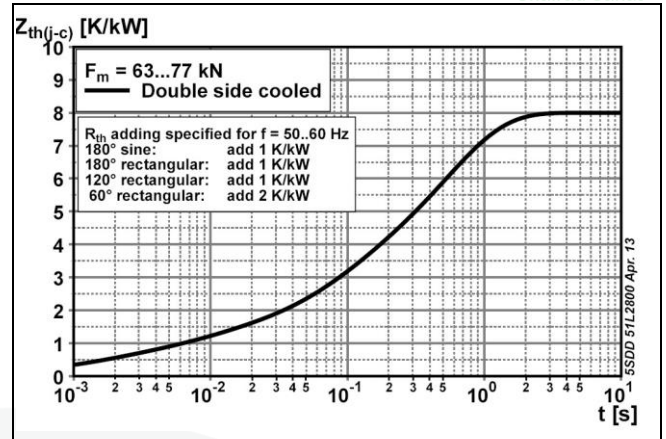
Parameter	Symbol	Conditions	min	typ	max	Unit
Thermal resistance junction to case	$R_{th(j-c)}$	Double-side cooled $F_m = 63...77$ kN			8	K/kW
	$R_{th(j-c)A}$	Anode-side cooled $F_m = 63...77$ kN			16	K/kW
	$R_{th(j-c)C}$	Cathode-side cooled $F_m = 63...77$ kN			16	K/kW
Thermal resistance case to heatsink	$R_{th(c-h)}$	Double-side cooled $F_m = 63...77$ kN			3	K/kW
	$R_{th(c-h)}$	Single-side cooled $F_m = 63...77$ kN			6	K/kW

i	1	2	3	4
$R_{th,i}(K/kW)$	5.364	1.586	0.638	0.412
$t_i(s)$	0.5339	0.0684	0.0067	0.0013

Analytical function for transient thermal

impedance:  $\Omega$

$$Z_{th(j-c)}(t) = \sum_{i=1}^n \dot{a}_i R_{thi} (1 - e^{-t/t_i})$$



case) vs. time

Fig. 1 Transient thermal impedance (junction-to-

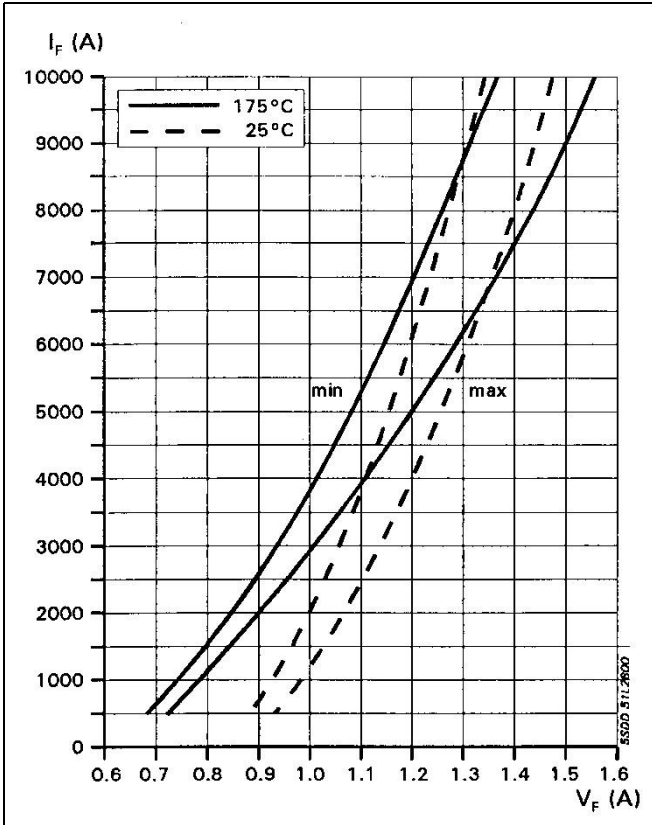


Fig. 2 On-state voltage characteristics

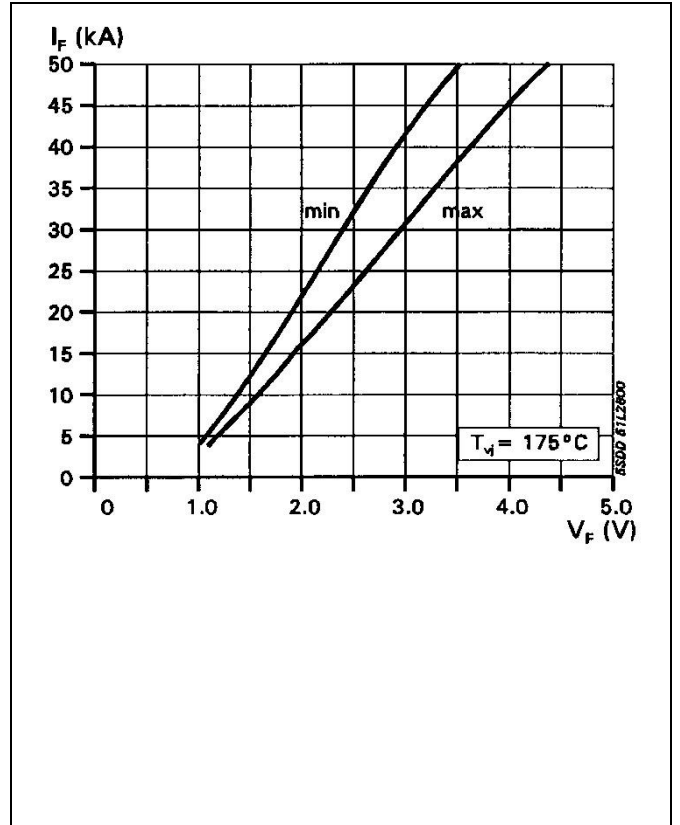


Fig. 3 On-state voltage characteristics

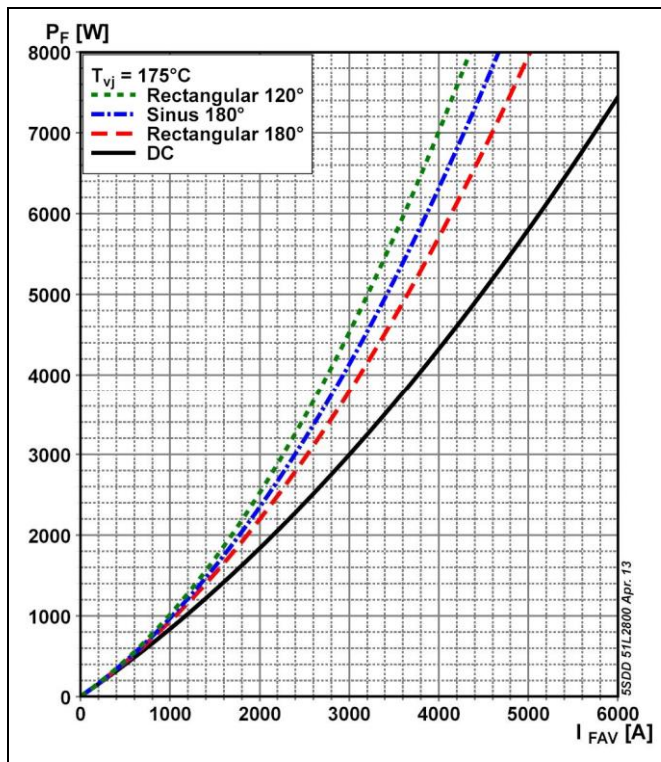


Fig. 4 On-state power dissipation vs. mean on-state current

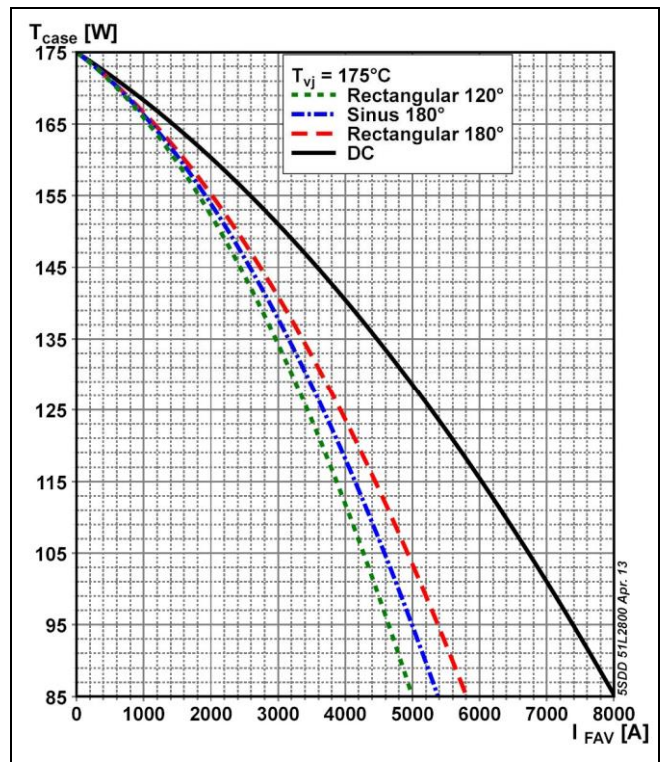
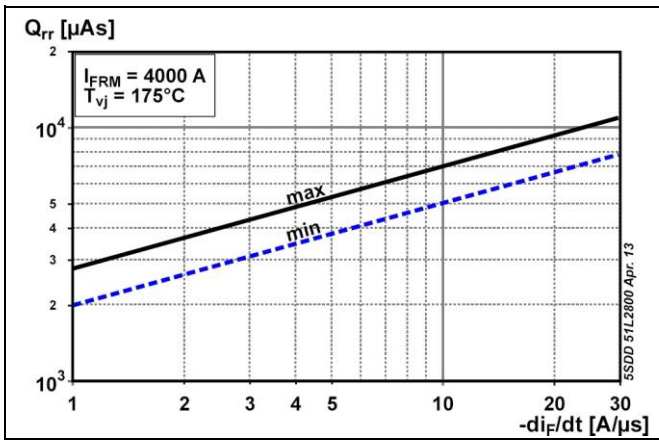
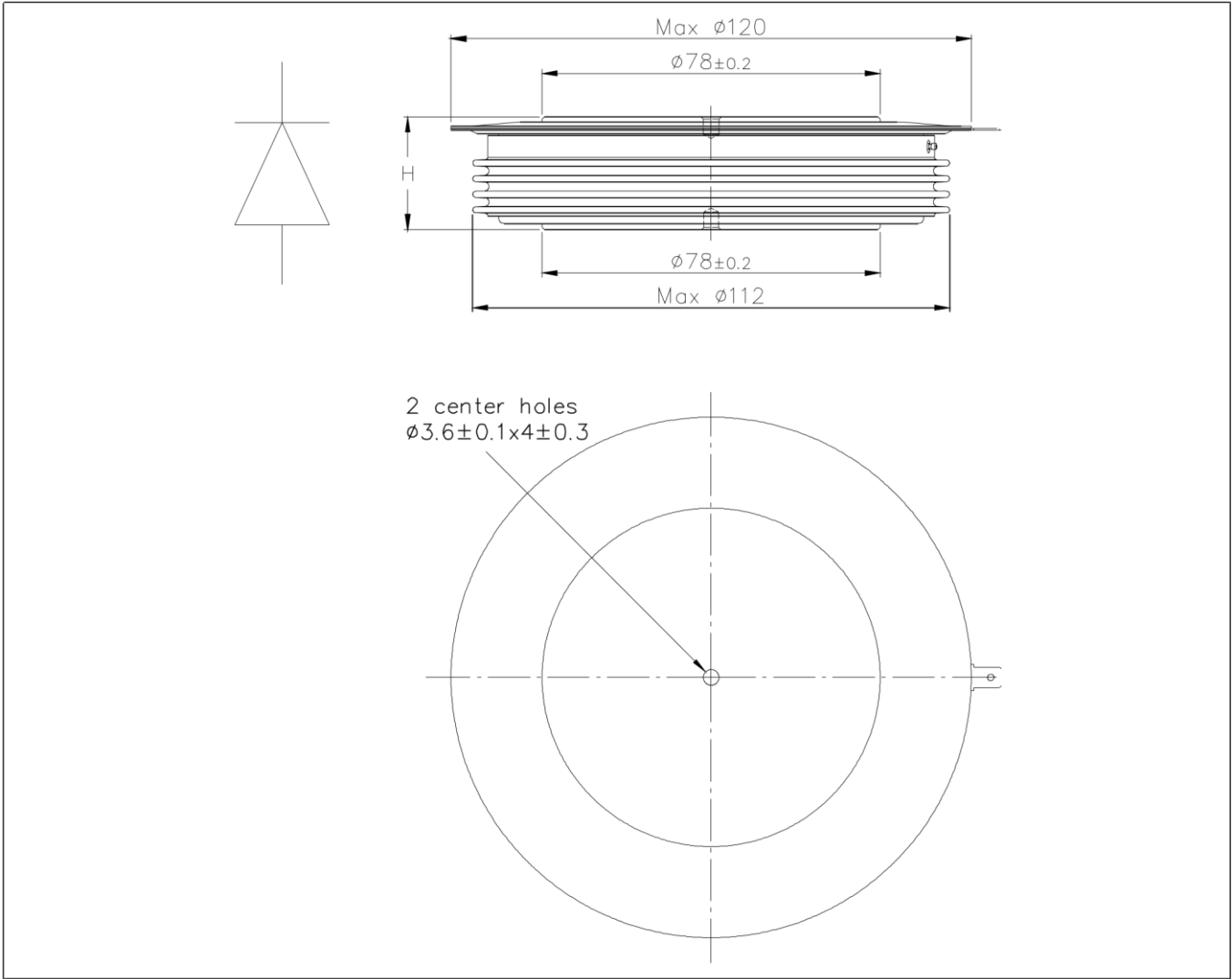


Fig. 5 Max. permissible case temperature vs. mean current



**Fig. 6** Reverse recovery charge vs. decay rate of onstate current



**Fig. 7** Device Outline Drawing