V_{RSM}	=	2800 V
$I_{F(AV)M}$	=	7385 A
$I_{F(RMS)}$	=	11600 A
I_{FSM}	=	$87 \cdot 10^3$ A
V_{F0}	=	0.8 V
r_F	=	0.05 mΩ

Rectifier Diode
5SDD 60Q2800

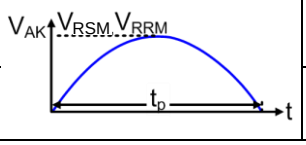
Doc. No. 5SYA1161-03 Oct. 17

- **Patented free-floating silicon technology**
- **Very low on-state losses**
- **Optimum power handling capability**

Blocking

Maximum rated values [1)]

Parameter	Symbol	Conditions	Value	Unit
Max repetitive peak reverse voltage	V_{RRM}	f = 50 Hz, t_p = 10 ms, T_{vj} = 0…160 °C	2000	V
Max non-repetitive peak reverse voltage	V_{RSM}	f = 5 Hz, t_p = 10 ms, T_{vj} = 0…160 °C	2800	V



Characteristic values

Parameter	Symbol	Conditions	min	typ	max	Unit
Reverse leakage current	I_{RRM}	V_{RRM}, T_{vj} = 0...160 °C			400	mA

Mechanical data

Maximum rated values [1)]

Parameter	Symbol	Conditions	min	typ	max	Unit
Mounting force	F_M		81	90	108	kN
Acceleration	a	Device unclamped			50	m/s^2
Acceleration	a	Device clamped			100	m/s^2

Characteristic values

Parameter	Symbol	Conditions	min	typ	max	Unit
Weight	m			2.1		kg
Housing thickness	H	F_M = 90 kN, T_a = 25 °C	25.8		26.2	mm
Surface creepage distance	D_S		36			mm
Air strike distance	D_a		15			mm

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

On-state

Maximum rated values [1)]

Parameter	Symbol	Conditions	min	typ	max	Unit
Average on-state current	$I_{F(AV)M}$	50 Hz, Half sine wave, Tc = 90°C			7385	A
RMS on-state current	$I_{F(RMS)}$				11600	A
Peak non-repetitive surge current	I_{FSM}	t_p = 10 ms, T_{vj} = 160 °C, sine half wave, V_R= 0 V, after surge			$87 \cdot 10^3$	A
Limiting load integral	I^2t				$38.5 \cdot 10^6$	A^2s

Characteristic values

Parameter	Symbol	Conditions	min	typ	max	Unit
On-state voltage	V_F	I_F = 5000 A, T_{vj} = 160 °C		1.02	1.05	V
Threshold voltage	V_{F0}	T_{vj} = 160 °C I_F = 2500...7500 A			0.8	V
Slope resistance	r_F				0.05	mΩ

Switching

Characteristic values

Parameter	Symbol	Conditions	min	typ	max	Unit
Reverse recovery charge	Q_{rr}	di_F/dt = -10 A/µs, V_R = 200 V I_F = 4000 A, T_{vj} = 160 °C	5400	6100	6700	µAs
Reverse recovery current	I_{RM}		220	270	300	A

Thermal

Maximum rated values [1)]

Parameter	Symbol	Conditions	min	typ	max	Unit
Operating junction temperature range	T_{vj}		0		160	°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 = 81... 108 kN			5	K/kW
	$R_{th(j-c)A}$	Anode-side cooled F_m = 81... 108 kN			10	K/kW
	$R_{th(j-c)C}$	Cathode-side cooled F_m = 81... 108 kN			10	K/kW
Thermal resistance case to heatsink	$R_{th(c-h)}$	Double-side cooled F_m = 81... 108 kN			1	K/kW
	$R_{th(c-h)}$	Single-side cooled F_m = 81... 108 kN			2	K/kW

Analytical function for transient thermal impedance:

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

i	1	2	3	4
R_i(K/kW)	3.560	0.680	0.460	0.280
τ_i(s)	0.4069	0.0559	0.0075	0.0018

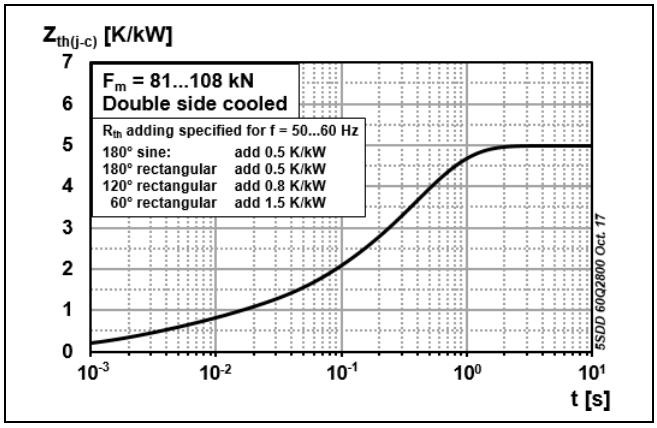


Fig. 1 Transient thermal impedance (junction-to-case) vs. time

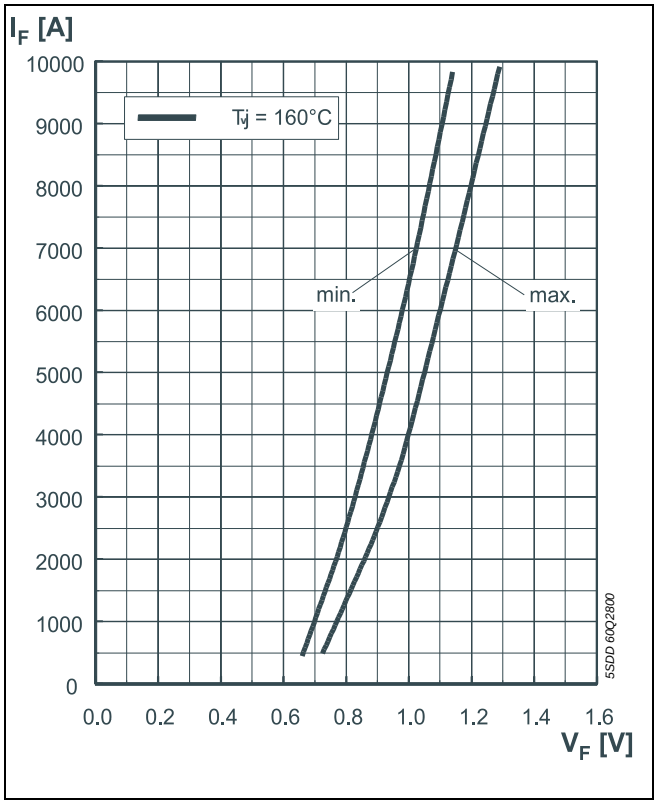


Fig. 2 On-state voltage characteristics

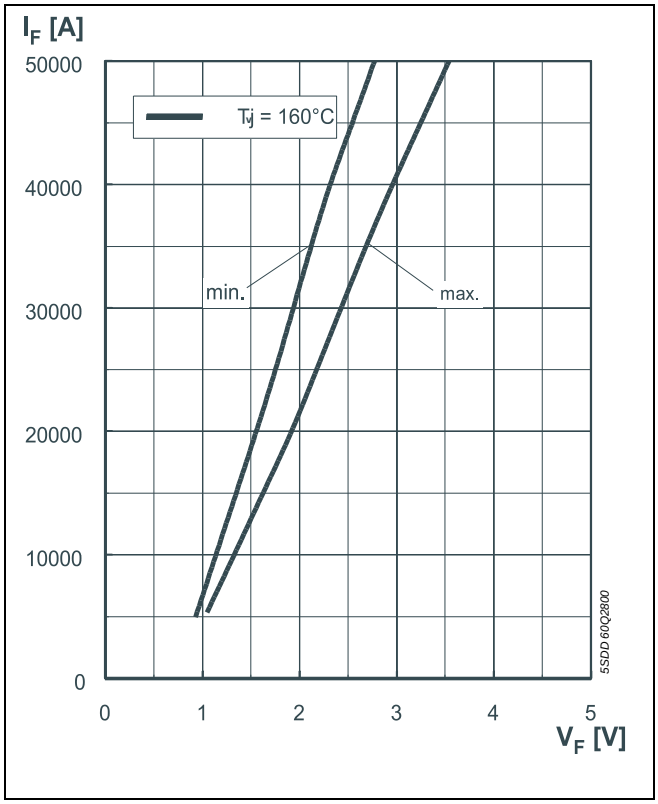


Fig. 3 On-state voltage characteristics

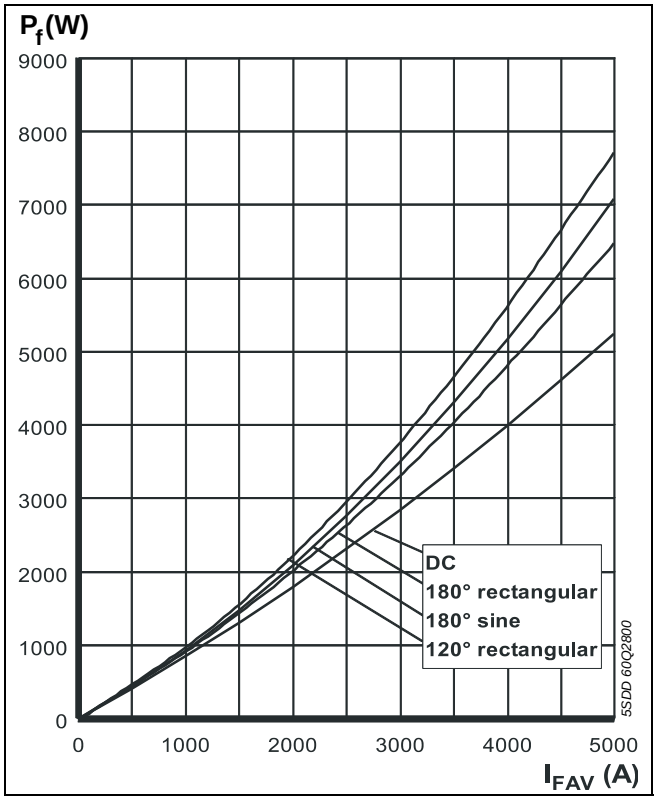


Fig. 4 On-state power dissipation vs. mean on-state current

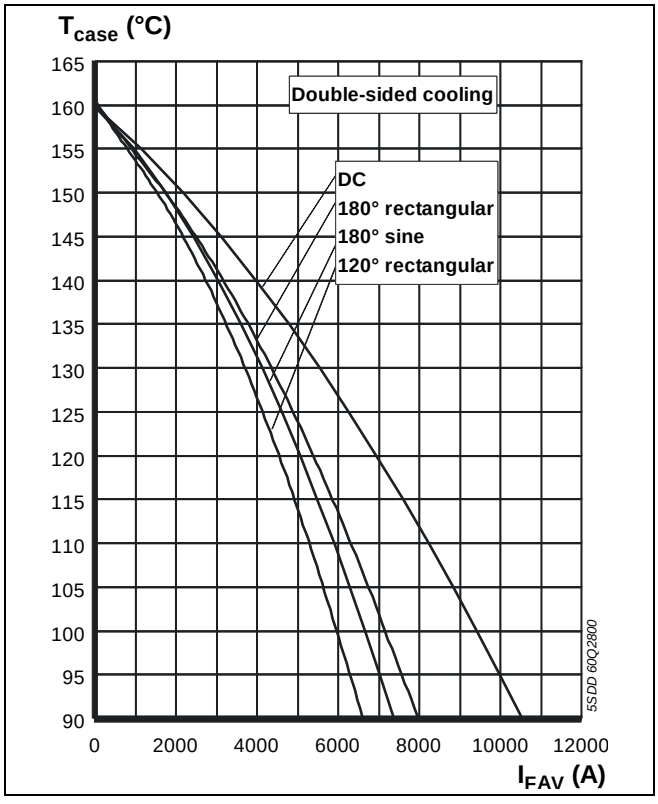


Fig. 5 Max. permissible case temperature vs. mean on-state current

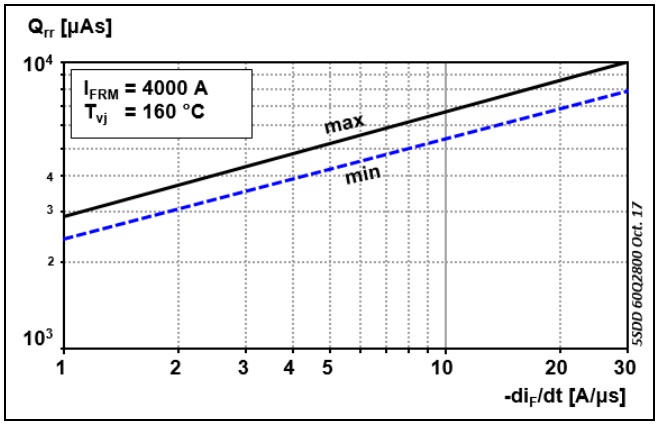


Fig. 6 Reverse recovery charge vs. decay rate of on-state current

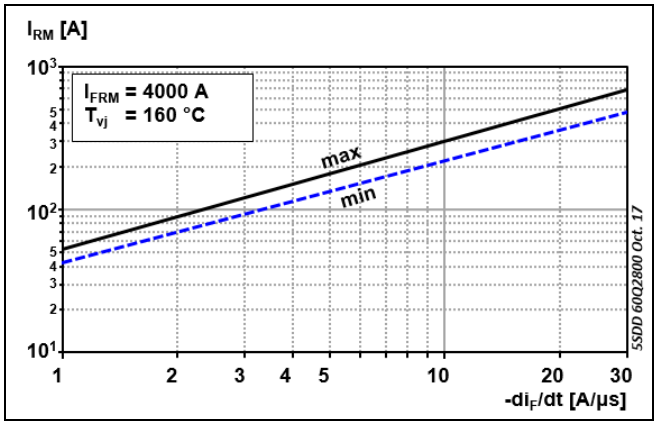


Fig. 7 Peak reverse recovery current vs. decay rate of on-state current

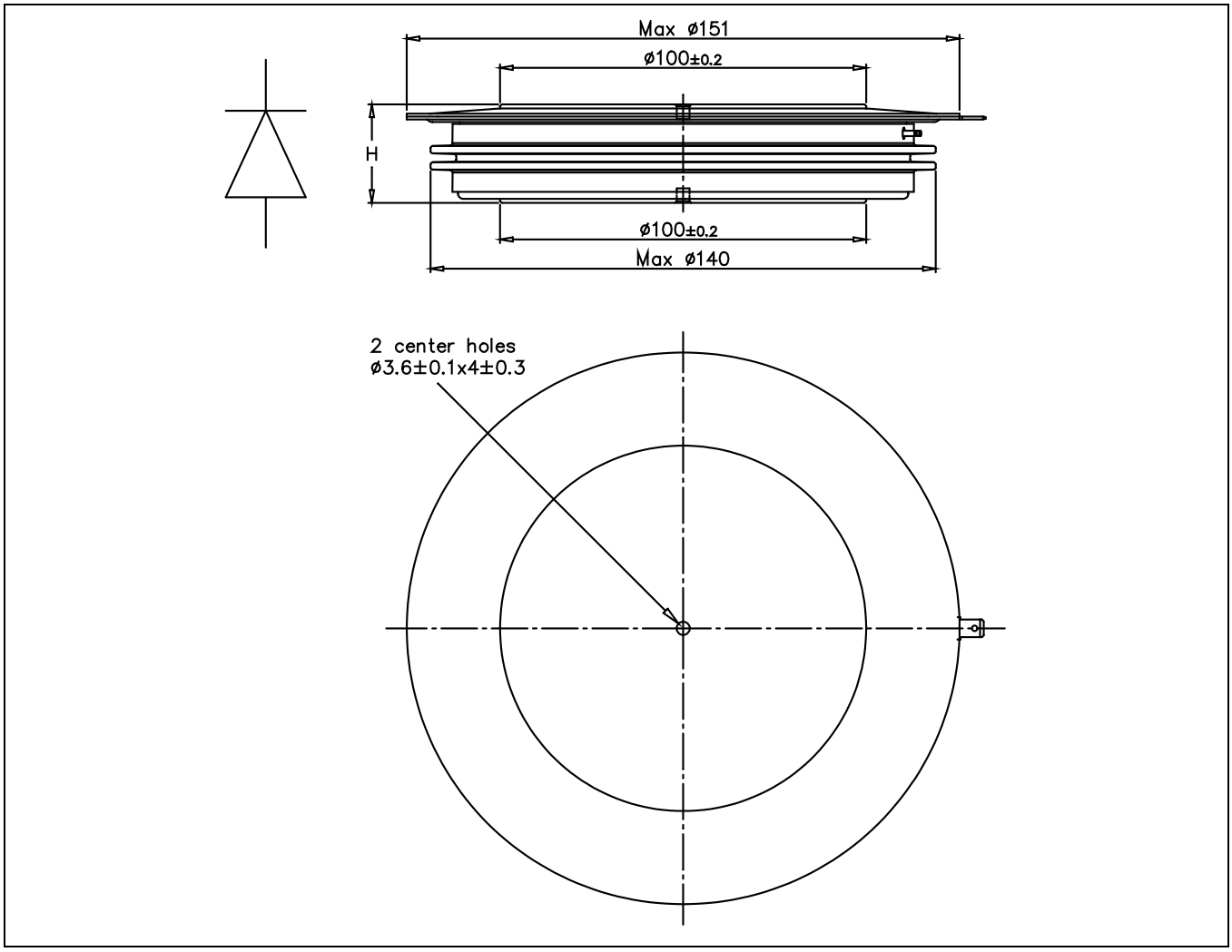


Fig. 8 Device Outline Drawing

Related documents:

5SYA 2020	Design of RC-Snubbers for Phase Control Applications
5SYA 2029	High Power Rectifier Diodes
5SYA 2036	Recommendations regarding mechanical clamping of Press Pack High Power Semiconductors
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5SZK 9115	Specification of environmental class for presspack Diodes, PCTs and GTOs, Operation (Industry)
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