

$V_{RSM} = 2800 \text{ V}$
 $I_{FAVM} = 7385 \text{ A}$
 $I_{FRMS} = 11600 \text{ A}$
 $I_{FSM} = 87000 \text{ A}$
 $V_{F0} = 0.80 \text{ V}$
 $r_F = 0.050 \text{ m}\Omega$

Rectifier Diode

5SDD 60Q2800

Doc. No. 5SYA1161-01 Nov.00

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

Blocking

Part Number	5SDD 60Q2800	5SDD 60Q2600	5SDD 60Q2200	Conditions
V_{RRM}	2000 V	1850 V	1600 V	$f = 50 \text{ Hz}$, $t_p = 10\text{ms}$
V_{RSM}	2800 V	2600 V	2200 V	$f = 5 \text{ Hz}$, $t_p = 10\text{ms}$
I_{RRM}	$\leq 400 \text{ mA}$			V_{RRM} $T_j = 160^\circ\text{C}$

Mechanical data

F_M	Mounting force	nom.	90 kN
		min.	81 kN
		max.	108 kN
a	Acceleration		
	Device unclamped		50 m/s^2
	Device clamped		100 m/s^2
m	Weight		2.9 kg
D_S	Surface creepage distance		56 mm
D_a	Air strike distance		22 mm

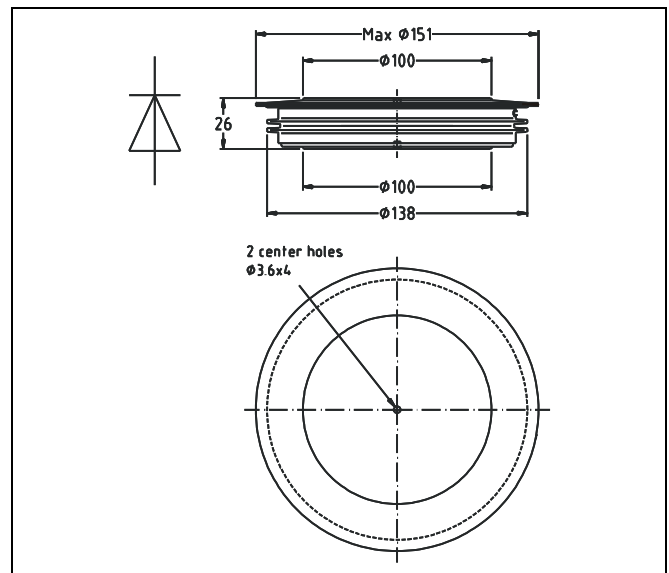


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On-state

I _{FAVM}	Max. average on-state current	7385 A	Half sine wave, T _C = 90°C		
I _{FRMS}	Max. RMS on-state current	11600 A			
I _{FSM}	Max. peak non-repetitive surge current	87000 A	tp =	10 ms	T _j = 160°C After surge:
		95000 A	tp =	8.3 ms	
I ² t	Limiting load integral	38500 kA ² s	tp =	10 ms	V _D = V _R = 0V
		38000 kA ² s	tp =	8.3 ms	
V _F	On-state voltage	1.05 V	I _F =	5000 A	T _j = 160°C
V _{F0}	Threshold voltage	0.80 V	I _F =	2500 - 7500 A	
r _F	Slope resistance	0.050 mΩ			

Switching

Q_{rr}	Recovery charge	min	4400 μAs	$di_F/dt = -10\text{A}/\mu\text{s}$	$V_R = 200\text{ V}$
		max	6300 μAs	$I_{FRM} = 4000\text{A}$	$T_j = 160^\circ\text{C}$

Thermal

$T_{j\text{ max}}$	Max. junction temperature	160 $^\circ\text{C}$	
$T_{j\text{ stg}}$	Storage temperature range	-40...175 $^\circ\text{C}$	
R_{thJC}	Thermal resistance junction to case	10 K/kW	Anode side cooled
		10 K/kW	Cathode side cooled
		5 K/kW	Double side cooled
R_{thCH}	Thermal resistance case to heat sink	2 K/kW	Single side cooled
		1 K/kW	Double side cooled

Analytical function for transient thermal impedance:

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

i	1	2	3	4
$R_i(\text{K/kW})$	3.27	0.74	0.66	0.31
$\tau_i(\text{s})$	0.5237	0.1082	0.02	0.0075

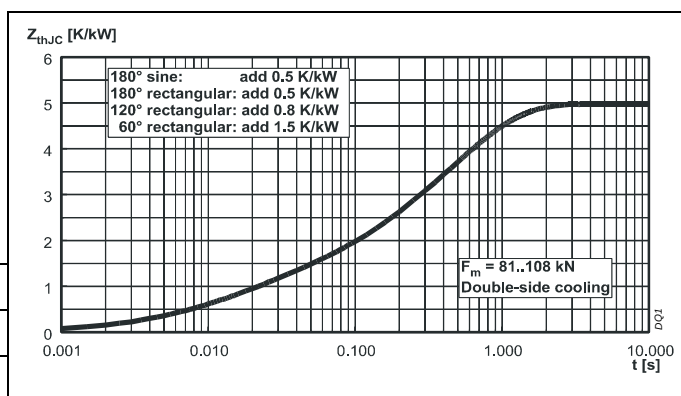
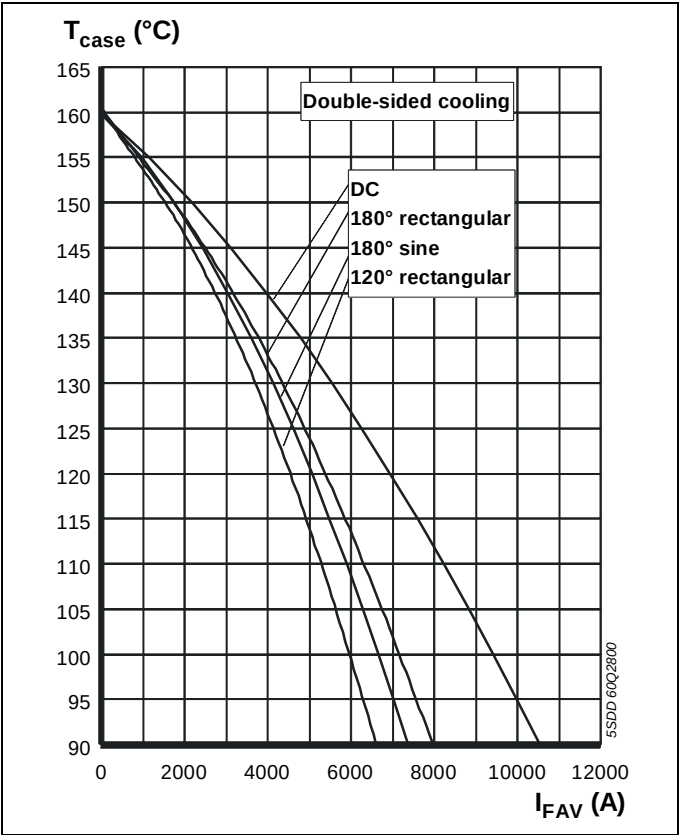
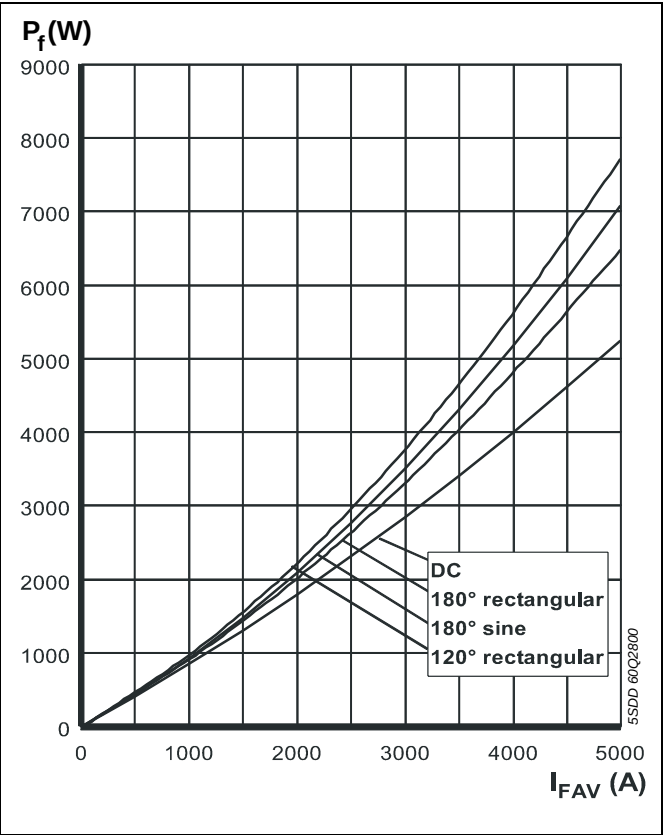
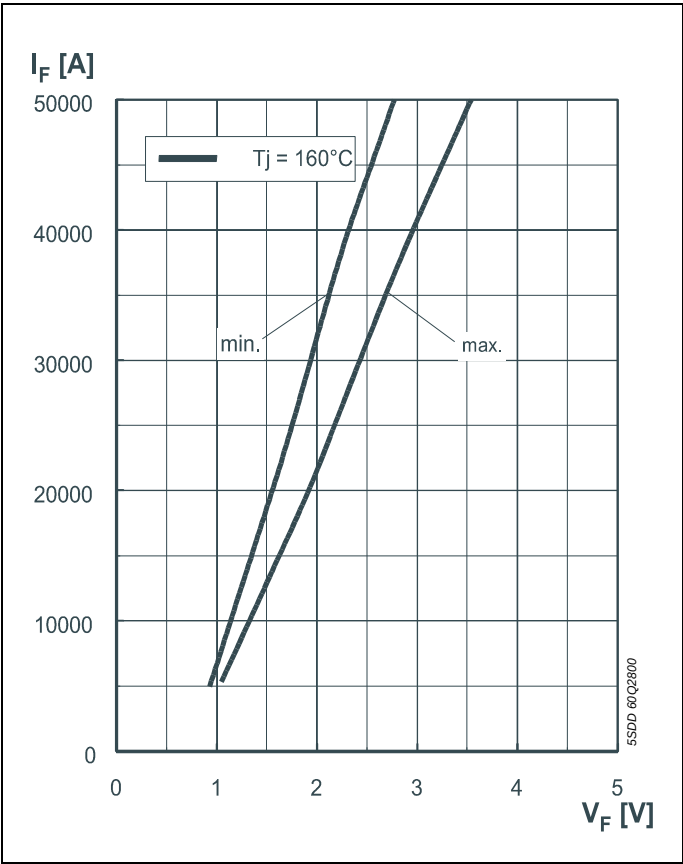
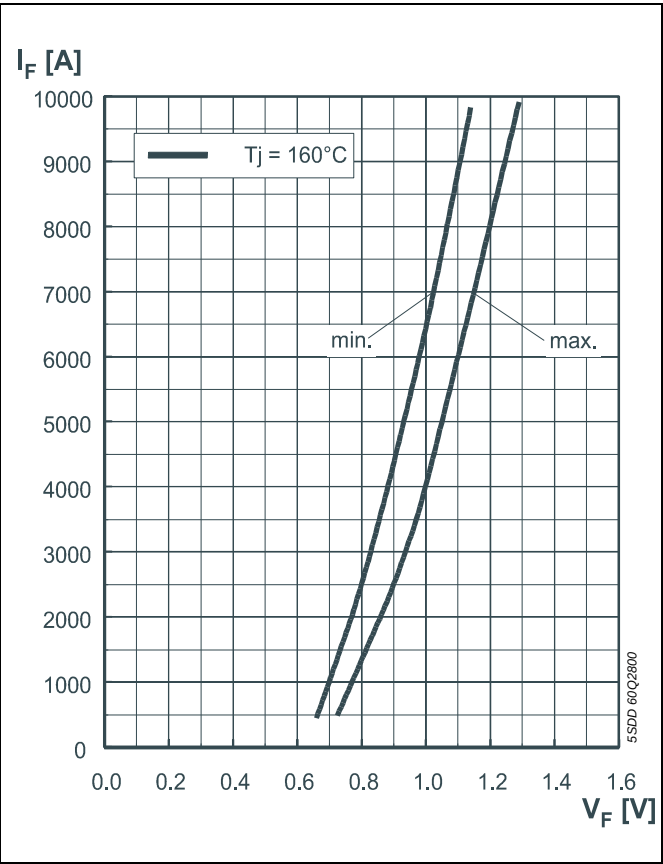


Fig. 1 Transient thermal impedance junction to case



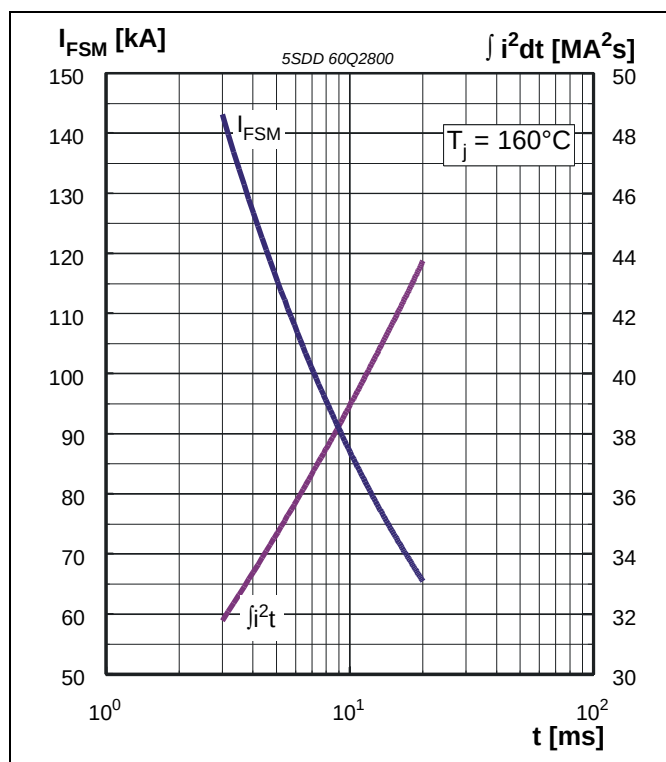


Fig. 6 Surge on-state current vs. pulse length. Half-sine wave.

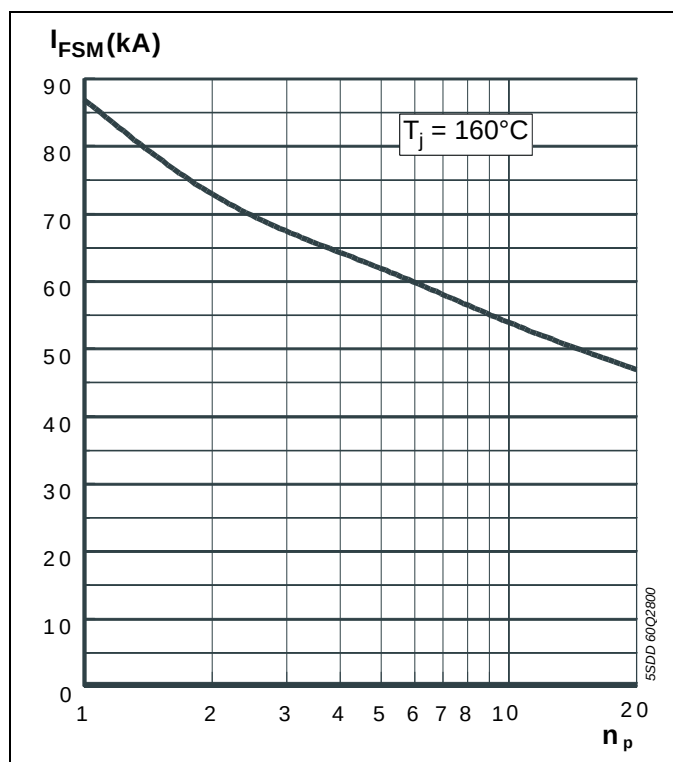


Fig. 7 Surge on-state current vs. number of pulses. Half-sine wave, 10 ms, 50Hz.

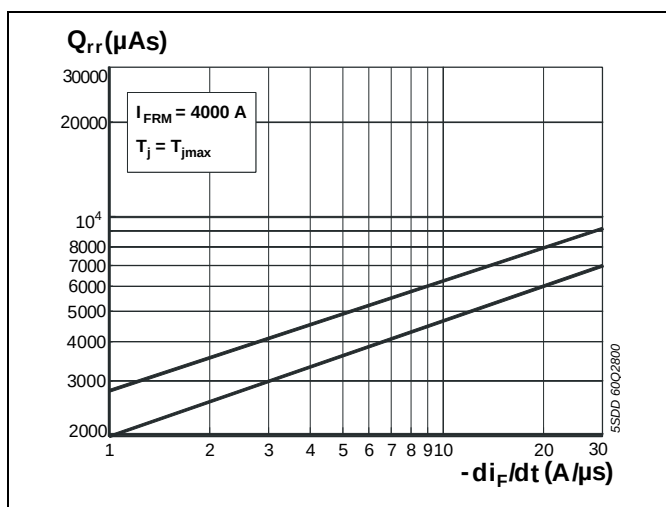


Fig. 8 Recovery charge vs. decay rate of on-state current.

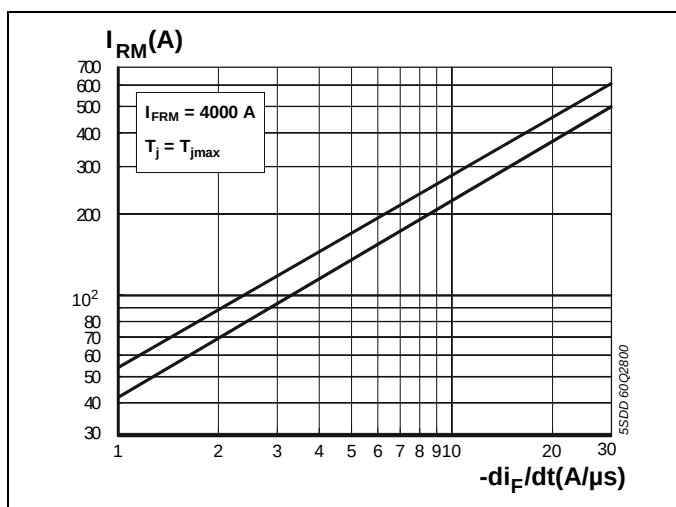


Fig. 9 Peak reverse recovery current vs. decay rate of on-state current.

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