V_{RSM}	=	3000 V
I_{FAVM}	=	2596 A
I_{FRMS}	=	4078 A
I_{FSM}	=	30×10^3 A
V_{F0}	=	0.906 V
r_F	=	0.135 mΩ

Rectifier Diode
5SDD 24F2800

Doc. No. 5SYA1167-00 Jan. 03

- **Very low on-state losses**
- **Optimum power handling capability**

Blocking

Maximum rated values [1)]

Parameter	Symbol	Conditions	Value	Unit
Repetetive peak reverse voltage	V_{RRM}	f = 50 Hz, t_p = 10ms, T_j = -40...160°C	2800	V
Non - repetetive peak reverse voltage	V_{RSM}	f = 5 Hz, t_p = 10ms, T_j = -40...160°C	3000	V

Characteristic values

Parameter	Symbol	Conditions	min	typ	max	Unit
Max. (reverse) leakage current	I_{RRM}	V_{RRM}, Tj = 160°C			50	mA

Mechanical data

Maximum rated values [1)]

Parameter	Symbol	Conditions	min	typ	max	Unit
Mounting force	F_M		20	22	24	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			0.5		kg
Housing thickness	H			26		mm
Pole-piece diameter	D_P			47		mm
Surface creepage distance	D_S		33			mm
Air strike distance	D_a		18			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
Max. average on-state current	I_{FAVM}	50 Hz, Half sine wave, T_C = 85 °C			2596	A
Max. RMS on-state current	I_{FRMS}				4078	A
Max. peak non-repetitive surge current	I_{FSM}	t_p = 10 ms, T_j = 160°C, V_R = 0 V			30×10^3	A
Limiting load integral	I^2t				4.5×10^6	A^2s
Max. peak non-repetitive surge current	I_{FSM}	t_p = 8.3 ms, T_j = 160°C, V_R = 0 V			32×10^3	A
Limiting load integral	I^2t				4.262×10^6	A^2s

Characteristic values

Parameter	Symbol	Conditions	min	typ	max	Unit
On-state voltage	V_F	I_F = 3000 A, T_j = 160°C			1.3	V
Threshold voltage	$V_{(T0)}$	T_j = 160°C I_T = 3140...9420 A			0.906	V
Slope resistance	r_T				0.135	mΩ

Switching

Characteristic values

Parameter	Symbol	Conditions	min	typ	max	Unit
Recovery charge	Q_{rr}	di_F/dt = -30 A/µs, V_R = 100 V I_{FRM} = 1000 A, T_j = 160°C		3000	3500	µAs

Thermal

Maximum rated values [1)]

Parameter	Symbol	Conditions	min	typ	max	Unit
Operating junction temperature range	T_{vj}		-40		160	°C
Storage temperature range	T_{stg}		-40		160	°C

Characteristic values

Parameter	Symbol	Conditions	min	typ	max	Unit
Thermal resistance junction to case	$R_{th(j-c)}$	Double-side cooled			15	K/kW
	$R_{th(j-c)A}$	Anode-side cooled			24	K/kW
	$R_{th(j-c)C}$	Cathode-side cooled			40	K/kW
Thermal resistance case to heatsink	$R_{th(c-h)}$	Double-side cooled			4	K/kW
	$R_{th(c-h)}$	Single-side cooled			8	K/kW

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(K/kW)	6.060	3.850	3.780	1.320
τ_i(s)	0.6937	0.2040	0.0452	0.0040

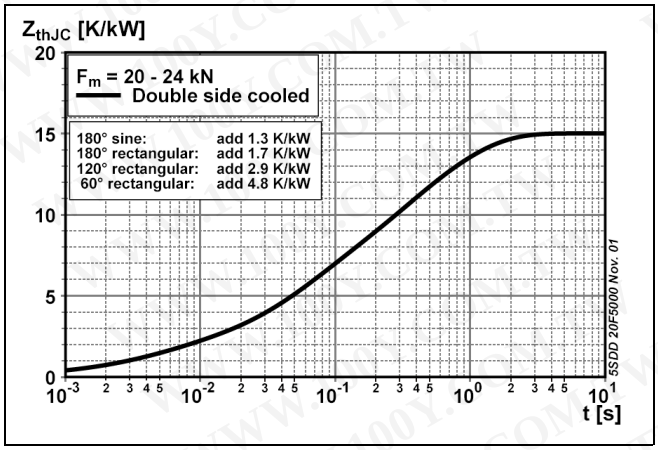

Fig. 1 Transient thermal impedance junction-to-case.

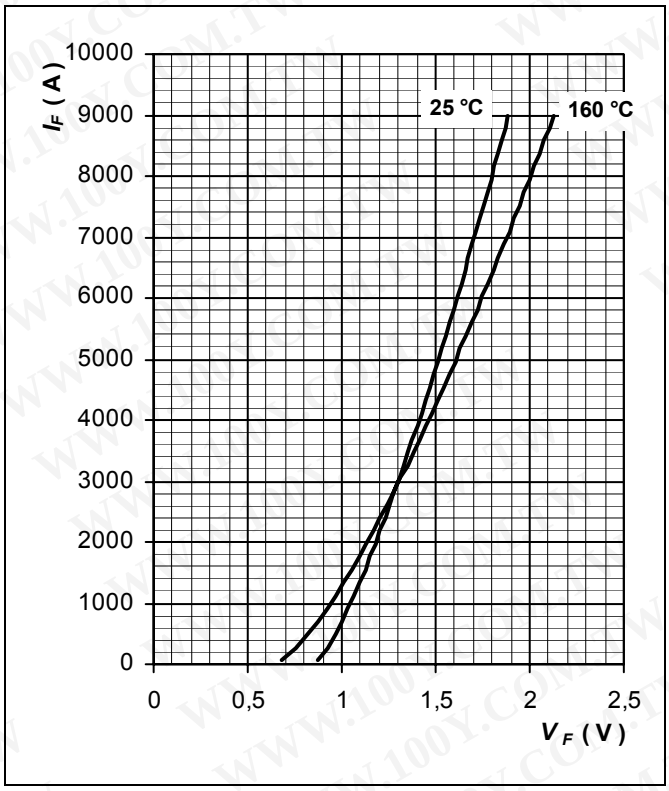

Fig. 2 Max. on-state characteristics.

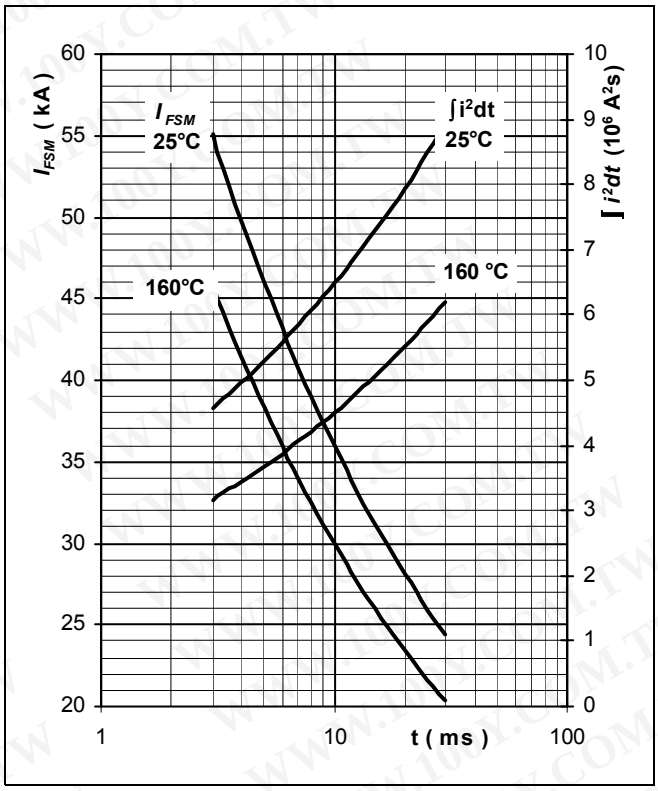

Fig. 3 Surge forward current vs. pulse length. Half sine wave, single pulse, V_R = 0 V

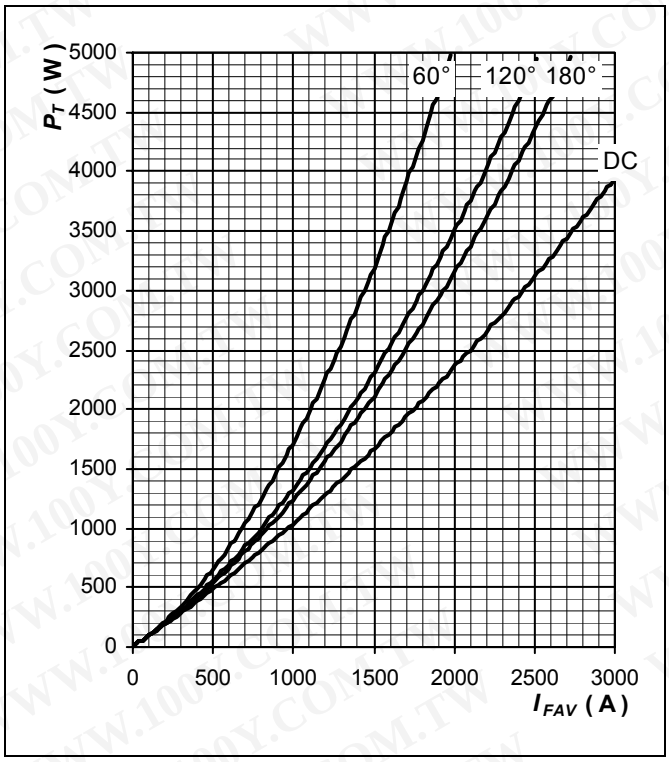

Fig. 4 Forward power loss vs. average forward current, sine waveform, f = 50 Hz

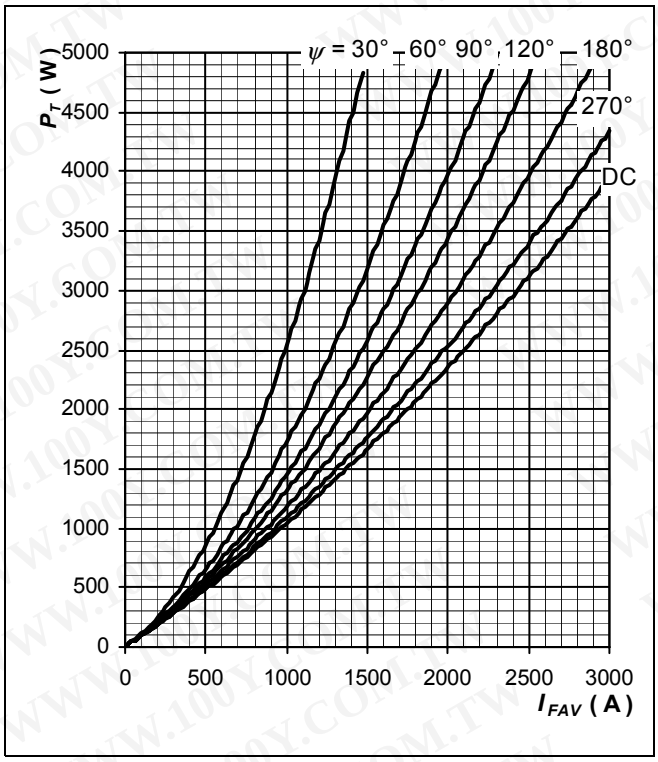

Fig. 5 Forward power loss vs. average forward current, square waveform, f = 50 Hz

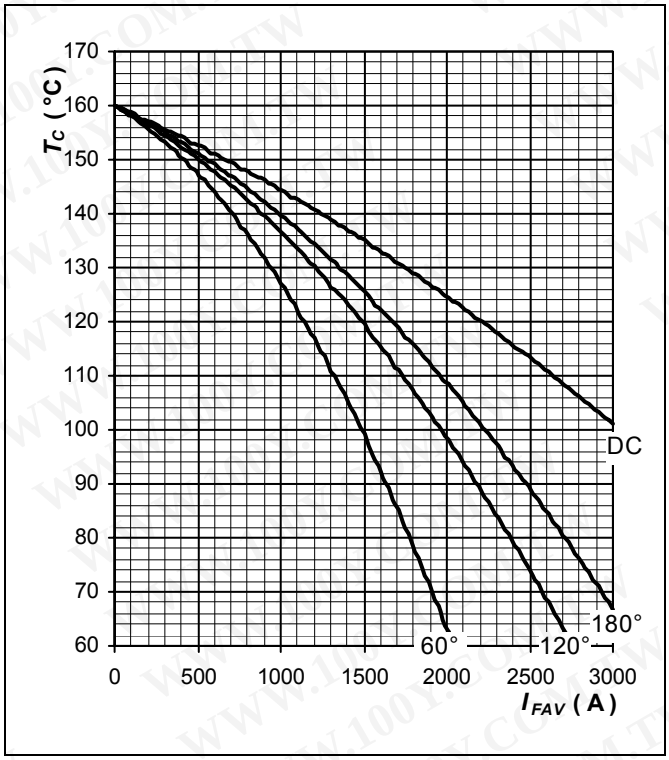

Fig. 6 Max. case temperature vs aver. forward current, sine waveform, f = 50 Hz

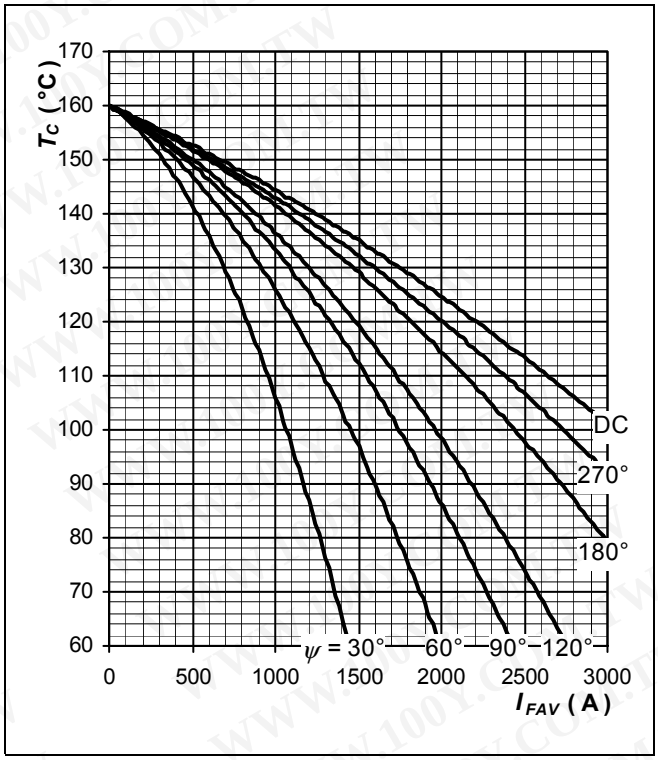

Fig. 7 Max. case temperature vs aver. forward current, square waveform, f = 50 Hz

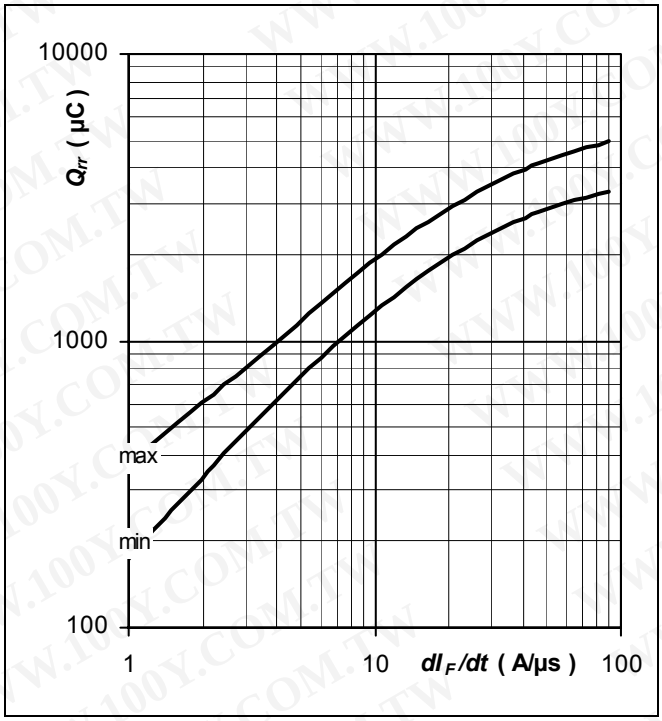

Fig. 8 Reverse recovery charge vs. dI_F/dt, I_F= 1000 A; $T_j = T_{jmax}$, limit values

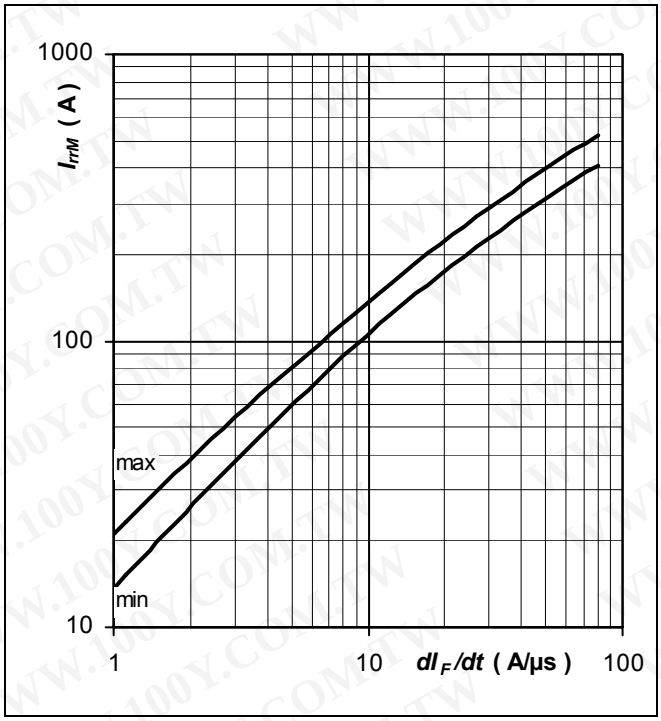

Fig. 9 Peak reverse recovery current vs. di_F/dt, I_F = 1000 A; $T_j = T_{jmax}$, limit values

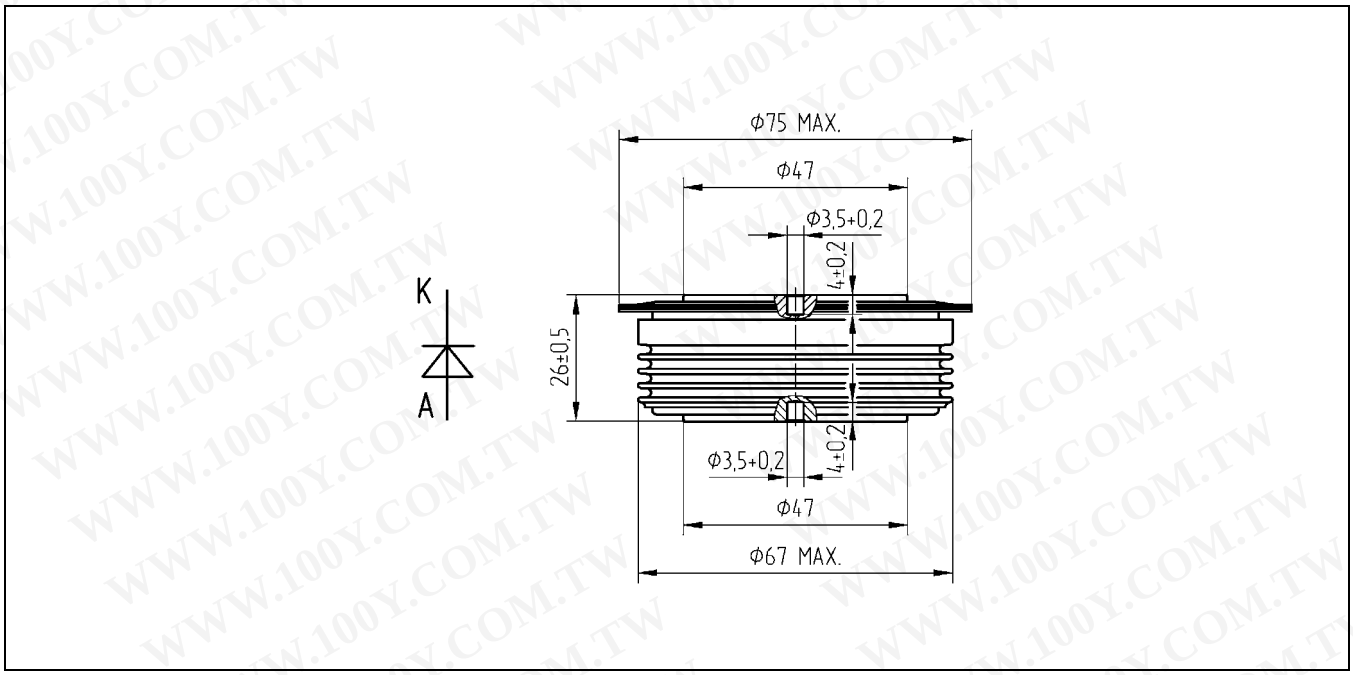

Fig. 10 Outline drawing. All dimensions are in millimeters and represent nominal values unless stated otherwise.