DV 827C-800-50

Rectifier Diode

Properties

- low forward voltage drop
- low recovery charge
- high operating temperature
- low leakage current

Applications

- Rectifier bridges

Key Parameters

V_{RRM}	=	5 000	V
I_{FAVm}	=	1 028	A
I_{FSM}	=	12 000	A
V_{TO}	=	0.894	V
r_T	=	0.487	mΩ

Types

	V_{RRM}
DV 827C-800-50	**5 000 V**
DV 827C-800-48	**4 800 V**
DV 827C-800-46	**4 600 V**
DV 827C-800-42	**4 200 V**
Conditions:	*T_j = -40 ÷ 160 °C, half sine waveform, f = 50 Hz*

Mechanical Data

F_m	**Mounting force**	**10 ± 2**	**kN**
m	**Weight**	**0.20**	**kg**
D_S	**Surface creepage distance**	**20**	**mm**
D_a	**Air strike distance**	**14**	**mm**

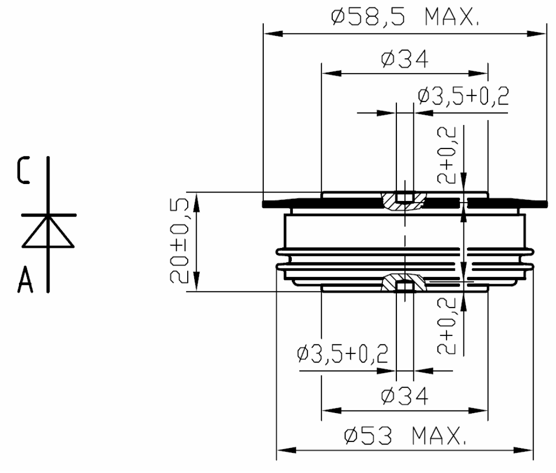

Fig. 1 Case

Maximum Ratings				***Maximum Limits***	***Unit***
V_{RRM}	**Repetitive peak reverse voltage** *T_j = -40 ÷ 160 °C*	**DV 827C-800-50** **DV 827C-800-48** **DV 827C-800-46** **DV 827C-800-42**		**5 000** **4 800** **4 600** **4 200**	**V**
I_{FAVm}	**Average forward current** *T_c = 85 °C*			**1 028**	**A**
I_{FRMS}	**RMS forward current** *T_c = 85°C*			**1 614**	**A**
I_{RRM}	**Repetitive reverse current** *$V_R = V_{RRM}$*			**30**	**mA**
I_{FSM}	**Non repetitive peak surge current** *V_R = 0 V, half sine pulse, T_j = 25 °C*		*t_p = 8.3 ms*	**16 000**	**A**
			t_p = 10 ms	**15 000**	**A**
	Non repetitive peak surge current *V_R = 0 V, half sine pulse*		*t_p = 8.3 ms*	**12 800**	**A**
			t_p = 10 ms	**12 000**	**A**
I^2t	**Limiting load integral** *V_R = 0 V, half sine pulse, T_j = 25 °C*		*t_p = 8.3 ms*	**1 066 000**	**A^2s**
			t_p = 10 ms	**1 125 000**	**A^2s**
	Limiting load integral *V_R = 0 V, half sine pulse*		*t_p = 8.3 ms*	**682 000**	**A^2s**
			t_p = 10 ms	**720 000**	**A^2s**
T_{jmin} - T_{jmax}	**Operating temperature range**			**-40 ÷ 160**	**°C**
T_{STG}	**Storage temperature range**			**-40 ÷ 160**	**°C**

Unless otherwise specified T_j = 160 °C

Characteristics		***Value***			***Unit***
		min	***typ***	***max***	
V_{T0}	**Threshold voltage**			**0.894**	**V**
r_T	**Forward slope resistance** *I_{F1} = 1 500 A, I_{F2} = 4 500 A*			**0.487**	**mΩ**
V_{FM}	**Maximum forward voltage** *I_{FM} = 1 500 A*			**1.65**	**V**
Q_{rr}	**Recovered charge** *V_R = 100 V, I_{FM} = 1 000 A, di/dt = -30 A/µs*		**2 400**	**3 500**	**µC**

Unless otherwise specified T_j = 160 °C

Thermal Parameters			**Value**	**Unit**
R_{thjc}	**Thermal resistance junction to case**	*double side cooling*	**32**	**K/kW**
		anode side cooling	**50**	
		cathode side cooling	**88**	
R_{thch}	**Thermal resistance case to heatsink**	*double side cooling*	**8**	**K/kW**
		single side cooling	**16**	

Transient Thermal Impedance

Analytical function for transient thermal impedance

$$Z_{thjc} = \sum_{i=1}^{5} R_i (1 - \exp(-t / \tau_i))$$

Conditions:

F_m = 10 ± 2 kN, Double side cooled

Correction for periodic waveforms

180°	**sine:**	**2.3**	**K/kW**
180°	**rectangular:**	**3.1**	**K/kW**
120°	**rectangular:**	**5.1**	**K/kW**
60°	**rectangular:**	**8.7**	**K/kW**

i	1	2	3	4	5
τ_i (s)	0.7033	0.2185	0.0588	0.0042	0.0006
R_i(K/kW)	11.56	10.08	7.84	2.38	0.13

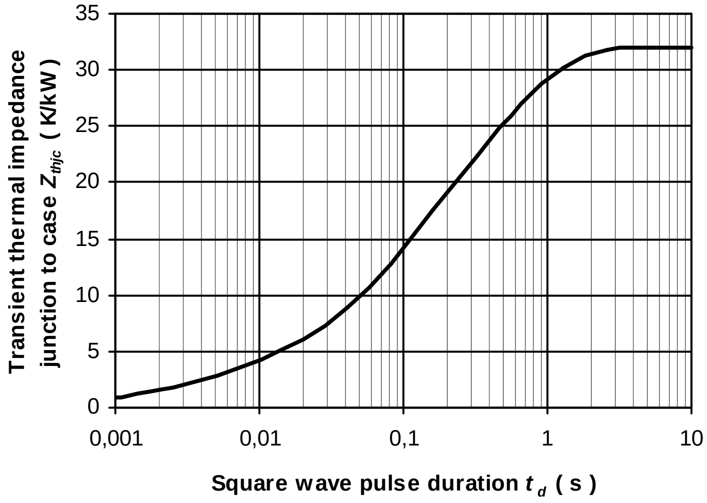

Fig. 2 Dependence transient thermal impedance junction to case on square pulse

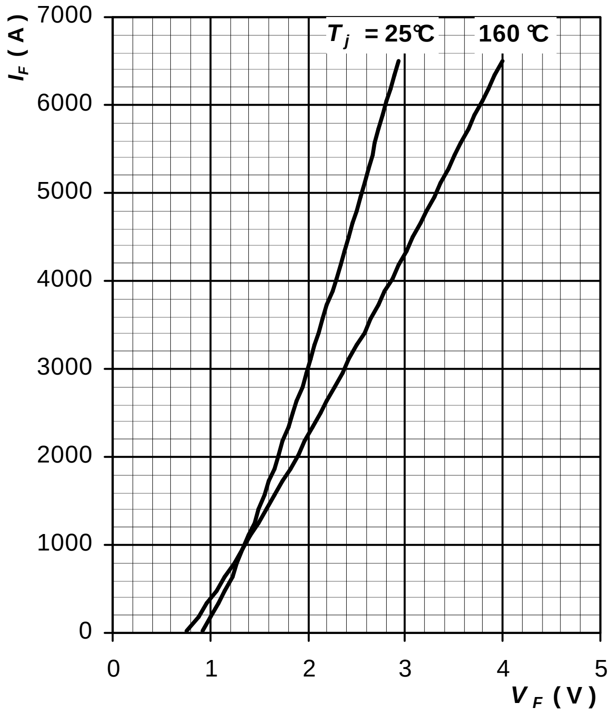

Fig. 3 Maximum forward voltage drop characteristics

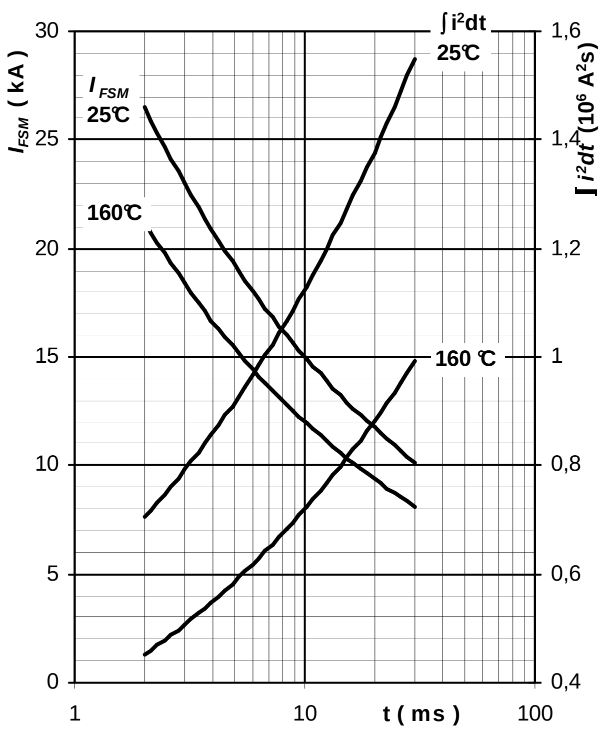

Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse, $V_R = 0$ V

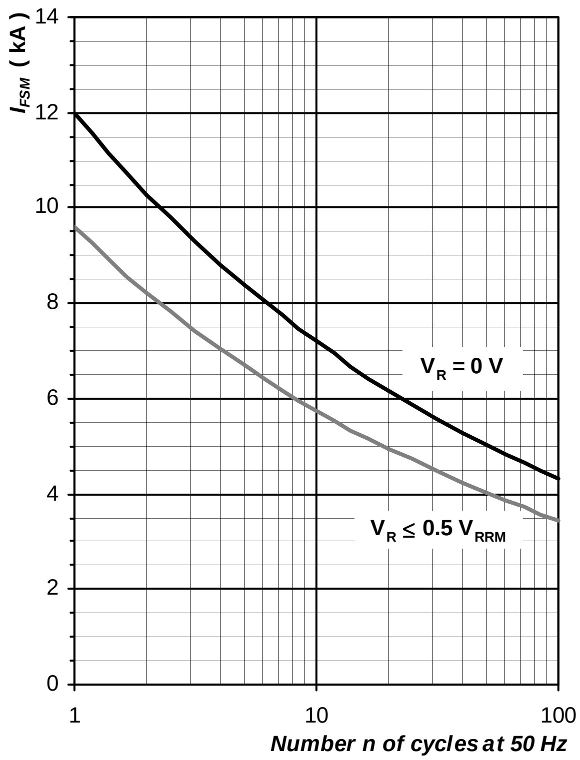

Fig. 5 Surge forward current vs. number of pulses, half sine wave, $T_j = T_{jmax}$

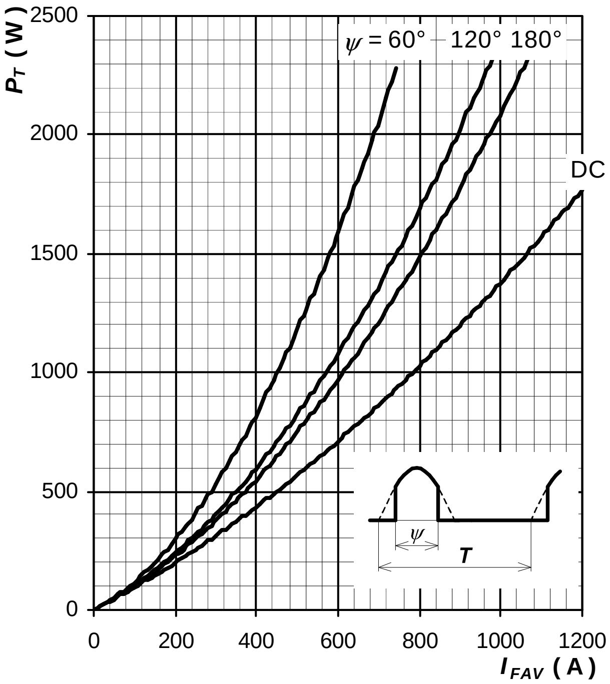

Fig. 6 *Forward power loss vs. average forward current, sine waveform, f = 50 Hz, T = 1/f*

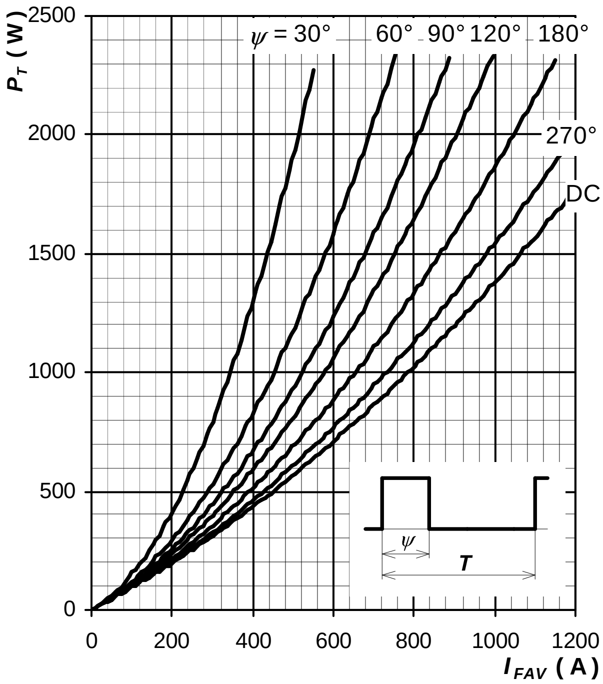

Fig. 7 *Forward power loss vs. average forward current, square waveform,f = 50 Hz, T = 1/f*

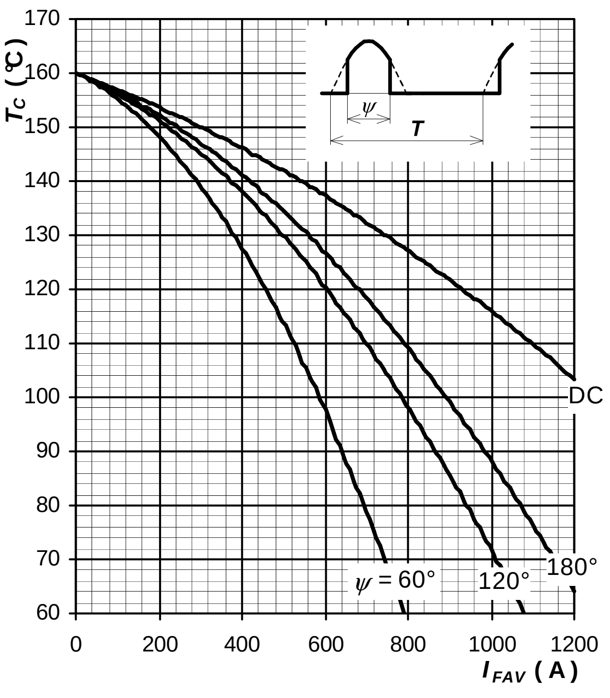

Fig. 8 *Max. case temperature vs. aver. forward current, sine waveform, f = 50 Hz, T = 1/f*

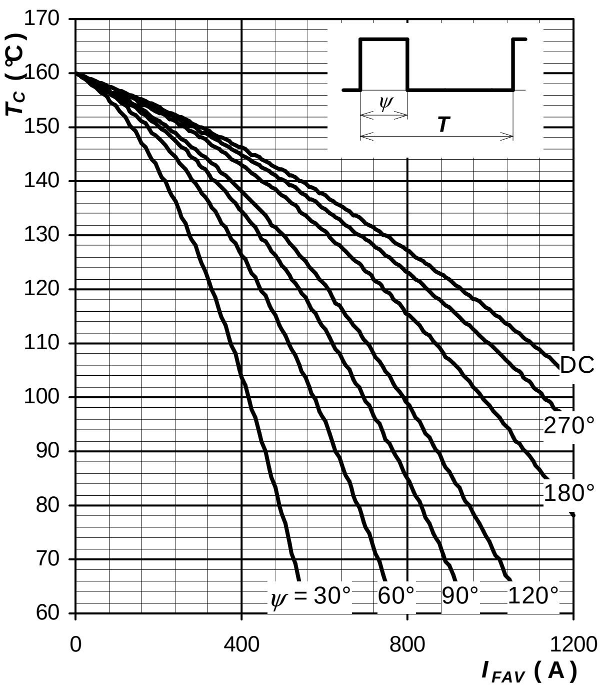

Fig. 9 *Max.case temperature vs. aver. forward current, square waveform,f = 50 Hz, T = 1/f*

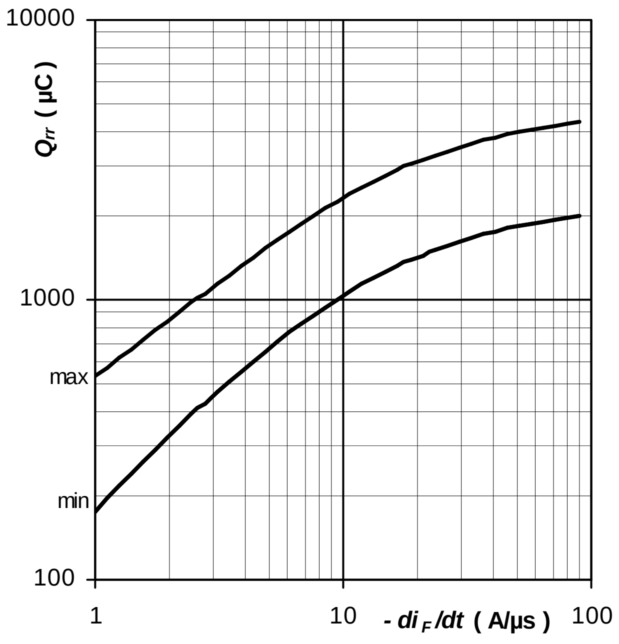

Fig. 10 *Recovered charge* $\boldsymbol{Q_{rr}}$
vs. rate of fall forward current $\boldsymbol{di_F/dt}$,
trapezoid pulse, I_{FM} *= 1 000 A,*
V_R *= 100 V,* $T_j = T_{jmax}$

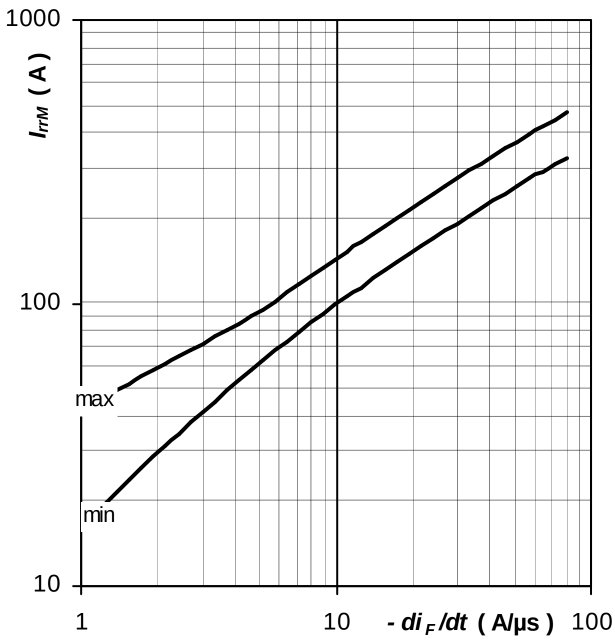

Fig. 11 *Reverse recovery maximum current* $\boldsymbol{I_{rrM}}$
vs. rate of fall forward current $\boldsymbol{di_F/dt}$,
trapezoid pulse, I_{FM} *= 1 000 A,*
V_R *= 100 V,* $T_j = T_{jmax}$

Notes