DF685

FAST RECOVERY DIODE

APPLICATIONS

- Snubber Diode For GTO Applications.

KEY PARAMETERS

V_{RRM}	4500V
$I_{F(AV)}$	445A
I_{FSM}	4500A
Q_r	650μC
t_{rr}	5μs

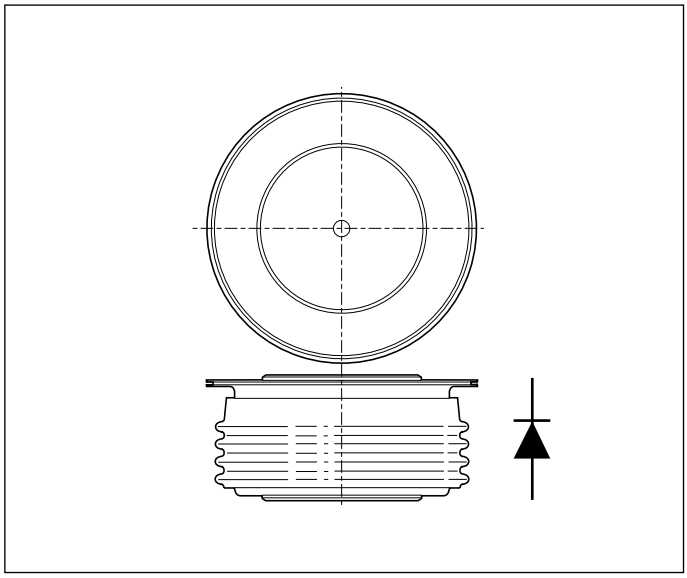
FEATURES

- Double Side Cooling.
- High Surge Capability.
- Low Recovery Charge.

VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage V_{RRM} V	Conditions
DF685 45	4500	$V_{RSM} = V_{RRM} + 100V$
DF685 44	4400	
DF685 43	4300	
DF685 42	4200	
DF685 41	4100	
DF685 40	4000	

Lower voltage grades available.



Outline type code: M779b. Turn to page 8 for further information.

CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, T_{case} = 65°C	445	A
$I_{F(RMS)}$	RMS value	T_{case} = 65°C	700	A
I_F	Continuous (direct) forward current	T_{case} = 65°C	610	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, T_{case} = 65°C	280	A
$I_{F(RMS)}$	RMS value	T_{case} = 65°C	440	A
I_F	Continuous (direct) forward current	T_{case} = 65°C	365	A

SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; with 0% $V_{RRM,}$ T_j = 150°C	4.5	kA
I^2t	I^2t for fusing		$101.25x10^3$	A^2s
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; with 50% $V_{RRM,}$ T_j = 150°C	3.6	kA
I^2t	I^2t for fusing		$64.8x10^3$	A^2s
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; with 100% $V_{RRM,}$ T_j = 150°C	-	kA
I^2t	I^2t for fusing		-	A^2s

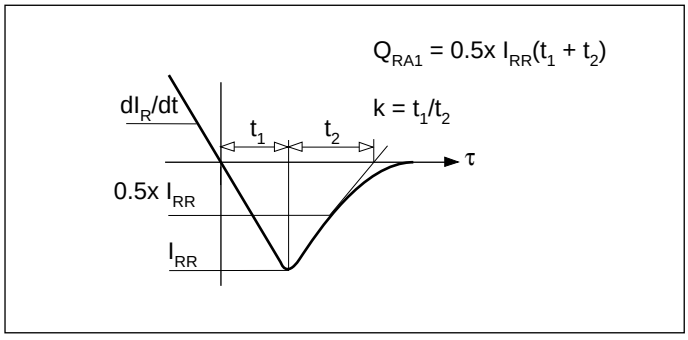
THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.045	°C/W
		Single side cooled	Anode dc	-	0.086	°C/W
			Cathode dc	-	0.095	°C/W
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 10kN with mounting compound	Double side	-	0.01	°C/W
			Single side	-	0.02	°C/W
T_{vj}	Virtual junction temperature	On-state (conducting)		-	150	°C
T_{stg}	Storage temperature range			-55	150	°C
-	Clamping force			9.0	11.0	kN

CHARACTERISTICS

Symbol	Parameter	Conditions	Typ.	Max.	Units
V_{FM}	Forward voltage	At 1500A peak, T_{case} = 25°C	-	4.8	V
I_{RRM}	Peak reverse current	At V_{RRM}, T_{case} = 150°C	-	80	mA
t_{rr}	Reverse recovery time	I_F = 1000A, di_{RR}/dt = 100A/µs T_{case} = 150°C, V_R = 100V	5	-	µs
Q_{RA1}	Recovered charge (50% chord)		-	650	µC
I_{RM}	Reverse recovery current		270	-	A
K	Soft factor		1.8	-	-
V_{TO}	Threshold voltage	At T_{vj} = 150°C	-	2.0	V
r_T	Slope resistance	At T_{vj} = 150°C	-	1.76	mΩ
V_{FRM}	Forward recovery voltage	di/dt = 1000A/µs, T_j = 125°C	-	220	V

DEFINITION OF K FACTOR AND Q_{RA1}



CURVES

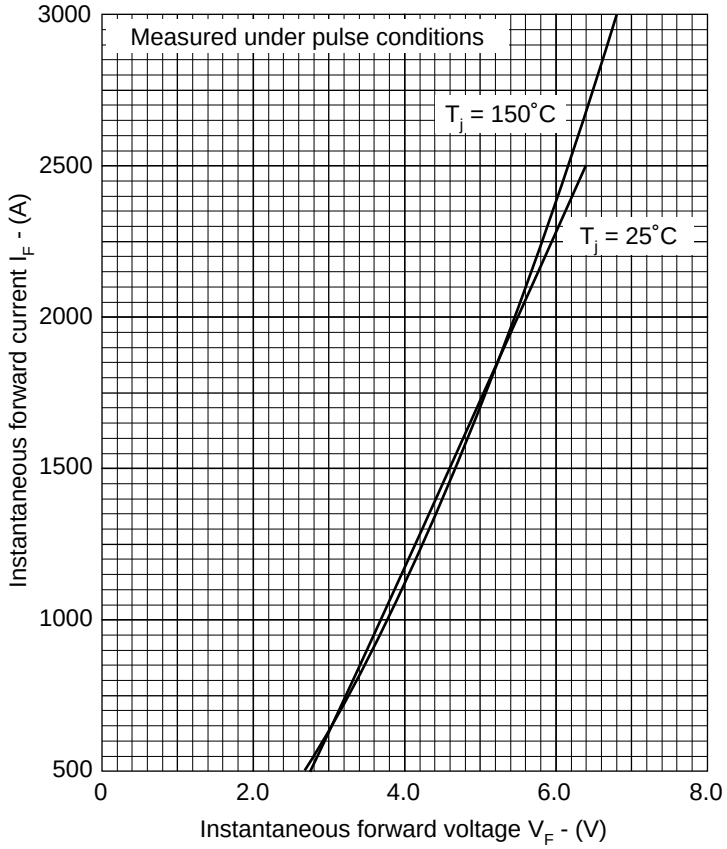


FIG. 1 MAXIMUM (LIMIT) FORWARD CHARACTERISTICS

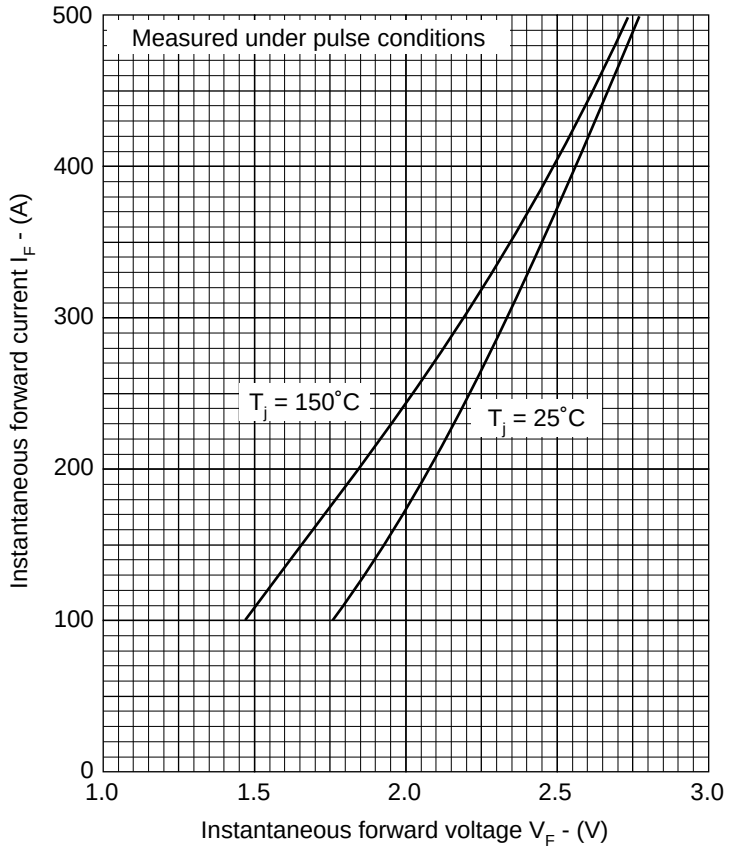


FIG. 2 MAXIMUM (LIMIT) FORWARD CHARACTERISTICS

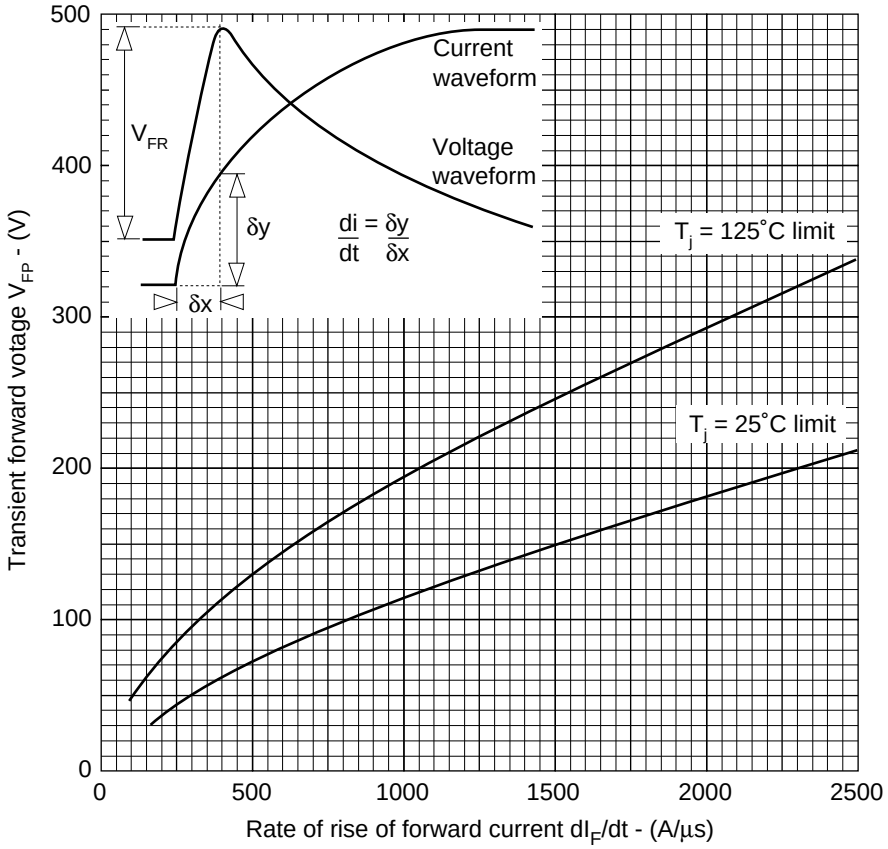


FIG. 3 TRANSIENT FORWARD VOLTAGE vs RATE OF RISE OF FORWARD CURRENT

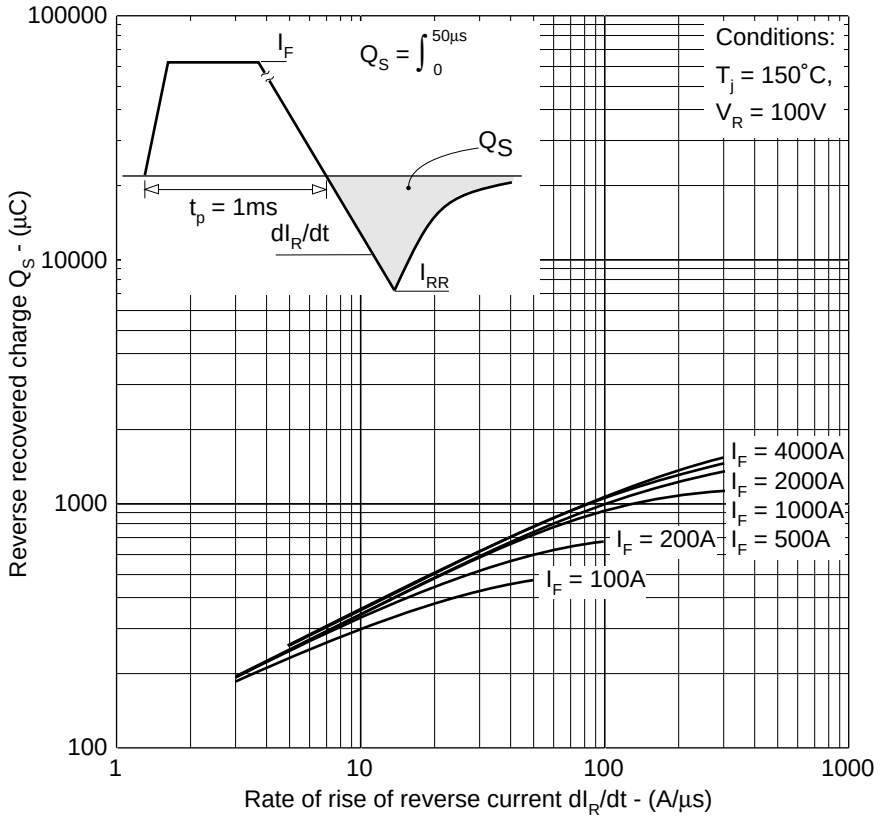


FIG. 4 RECOVERED CHARGE

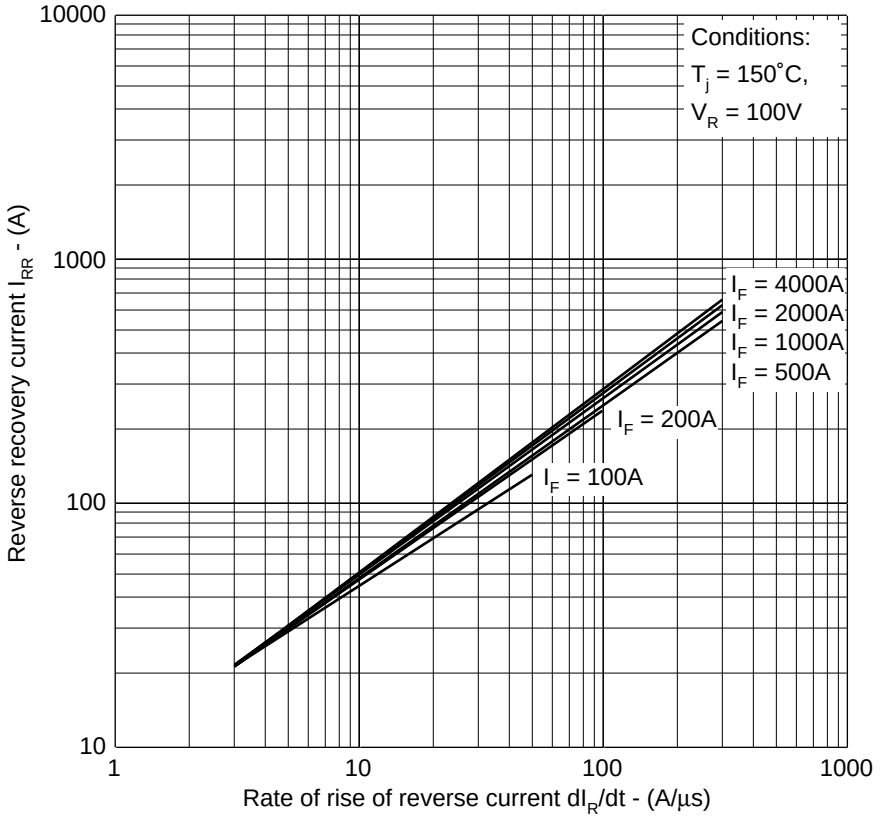


FIG. 5 TYPICAL REVERSE RECOVERY CURRENT vs RATE OF RISE OF REVERSE CURRENT

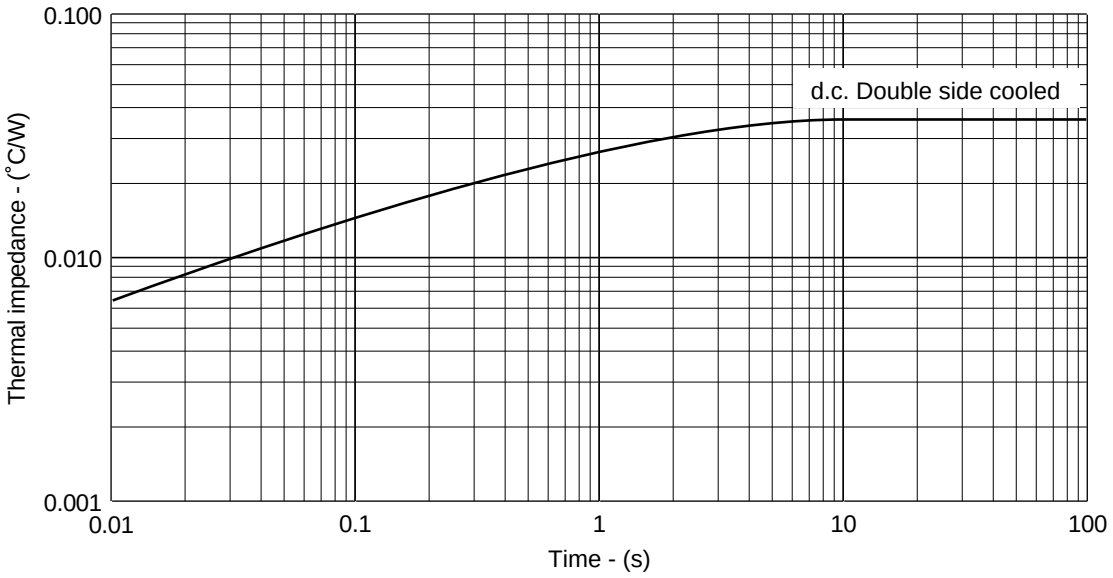
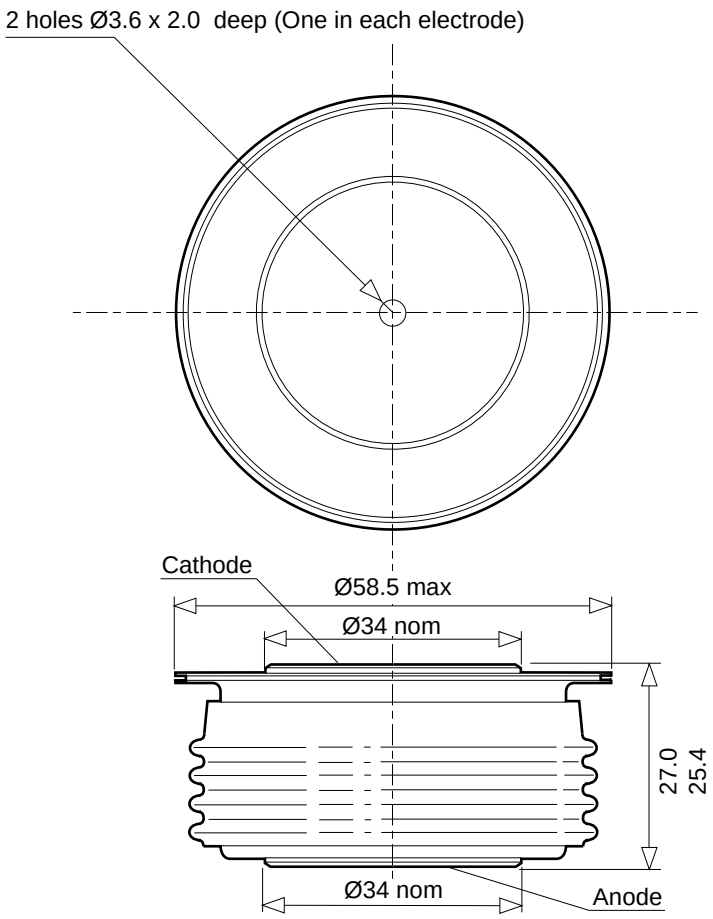


FIG. 6 MAXIMUM (LIMIT) TRANSIENT THERMAL IMPEDANCE - JUNCTION TO CASE - (˚C/W)

PACKAGE DETAILS - M779b

For further package information, please contact your local Customer Service Centre. All dimensions in mm, unless stated otherwise. DO NOT SCALE.



Weight: 270g

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 Publication No. DS4303-1 Issue No. 1.2 September 1995