MITEL
SEMICONDUCTOR

DSF20060SF

Fast Recovery Diode

Advance Information

Supersedes September 1996 version, DS4218 - 3.3

DS4218 - 3.4 March 1998

APPLICATIONS

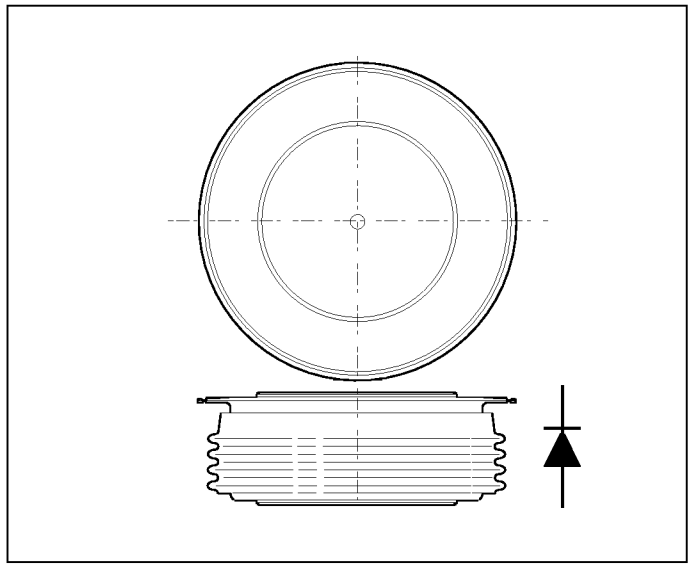
- Inverters.
- Choppers.
- Inverse Parallel Diode.
- Freewheel Diode.

KEY PARAMETERS

V_{RRM}	6000V
$I_{F(AV)}$	780A
I_{FSM}	7800A
Q_r	1400μC
t_{rr}	6.5μs

FEATURES

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



Outline type code: CB450.
See package outlines for further information.

VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage V_{RRM} V	Conditions
DSF20060SF60	6000	$V_{RSM} = V_{RRM} + 100V$
DSF20060SF58	5800	
DSF20060SF56	5600	
DSF20060SF55	5500	

Lower voltage grades available.

CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, T_{case} = 65°C	620	A
$I_{F(RMS)}$	RMS value	T_{case} = 65°C	960	A
I_F	Continuous (direct) forward current	T_{case} = 65°C	840	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, T_{case} = 65°C	412	A
$I_{F(RMS)}$	RMS value	T_{case} = 65°C	645	A
I_F	Continuous (direct) forward current	T_{case} = 65°C	535	A

SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; with 0% $V_{RRM,}$ T_j = 125°C	7.8	kA
I^2t	I^2t for fusing		300 x 10^3	A^2s
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; with 50% $V_{RRM,}$ T_j = 125°C	6.4	kA
I^2t	I^2t for fusing		205 x 10^3	A^2s

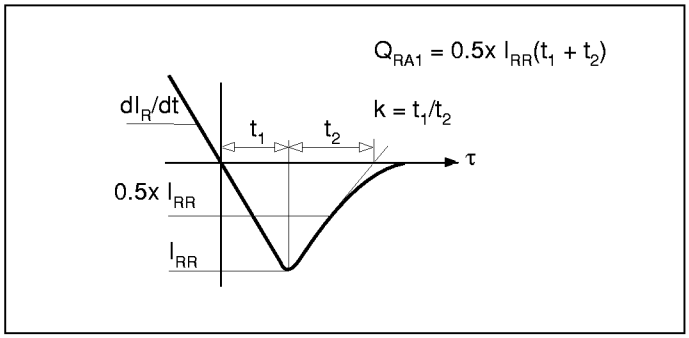
THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.022	°C/W
		Single side cooled	Anode dc	-	0.039	°C/W
			Cathode dc	-	0.050	°C/W
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 19.5kN with mounting compound	Double side	-	0.004	°C/W
			Single side	-	0.008	°C/W
T_{vj}	Virtual junction temperature	On-state (conducting)		-	125	°C
T_{stg}	Storage temperature range			-55	150	°C
-	Clamping force			18.0	22.0	kN

CHARACTERISTICS

Symbol	Parameter	Conditions	Typ.	Max.	Units
V_{FM}	Forward voltage	At 1500A peak, T_{case} = 25°C	-	3.9	V
I_{RRM}	Peak reverse current	At V_{RRM}, T_{case} = 125°C	-	75	mA
t_{rr}	Reverse recovery time	I_F = 1000A, di_{RR}/dt = 100A/µs T_{case} = 125°C, V_R = 100V	-	6.5	µs
Q_{RA1}	Recovered charge (50% chord)		-	1400	µC
I_{RM}	Reverse recovery current		-	450	A
K	Soft factor		1.8	-	-
V_{TO}	Threshold voltage	At T_{vj} = 125°C	-	2.2	V
r_T	Slope resistance	At T_{vj} = 125°C	-	1.24	mΩ
V_{FRM}	Forward recovery voltage	di/dt = 1000A/µs, T_j = 100°C	-	260	V

DEFINITION OF K FACTOR AND Q_{RA1}



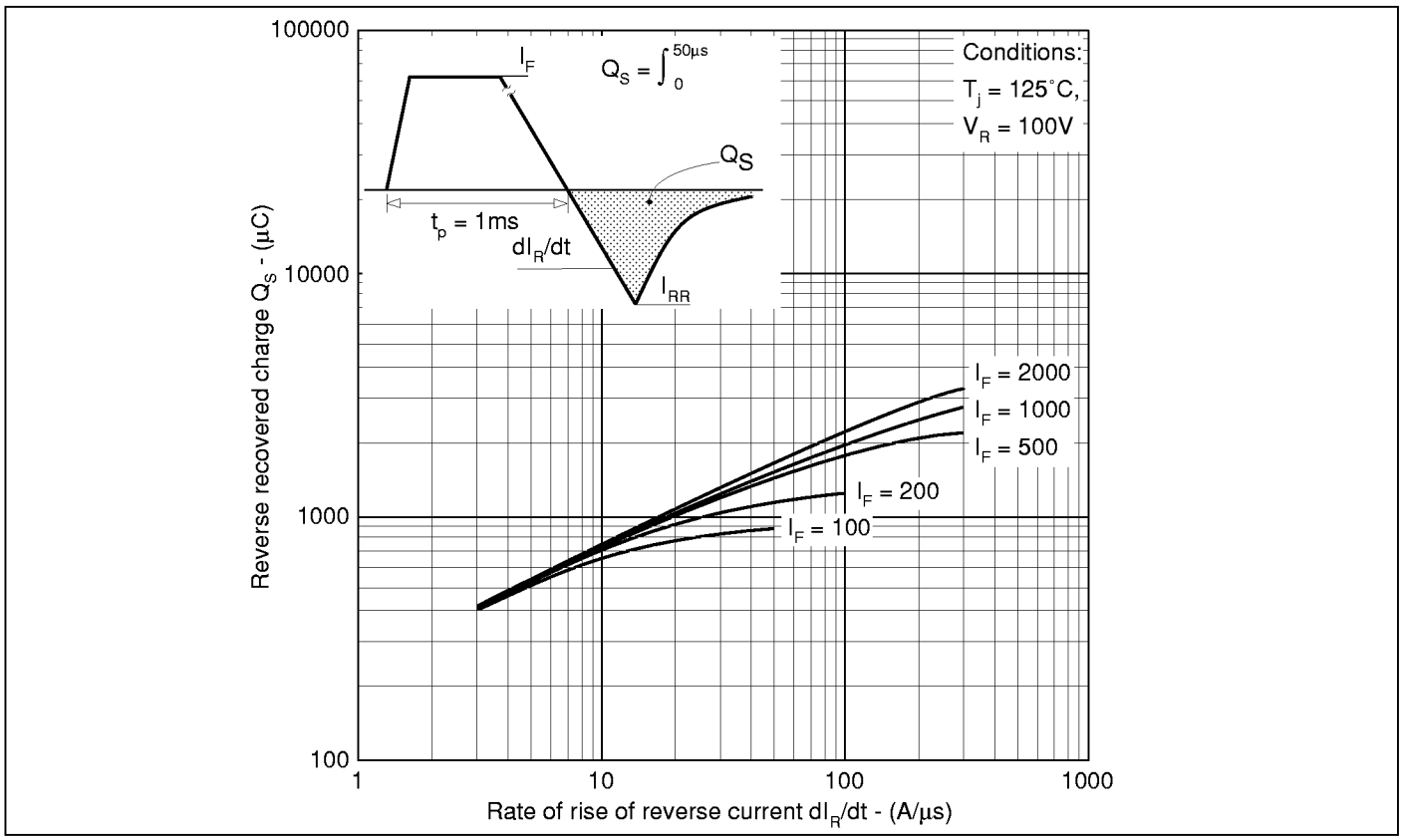


Fig.1 Recovered charge

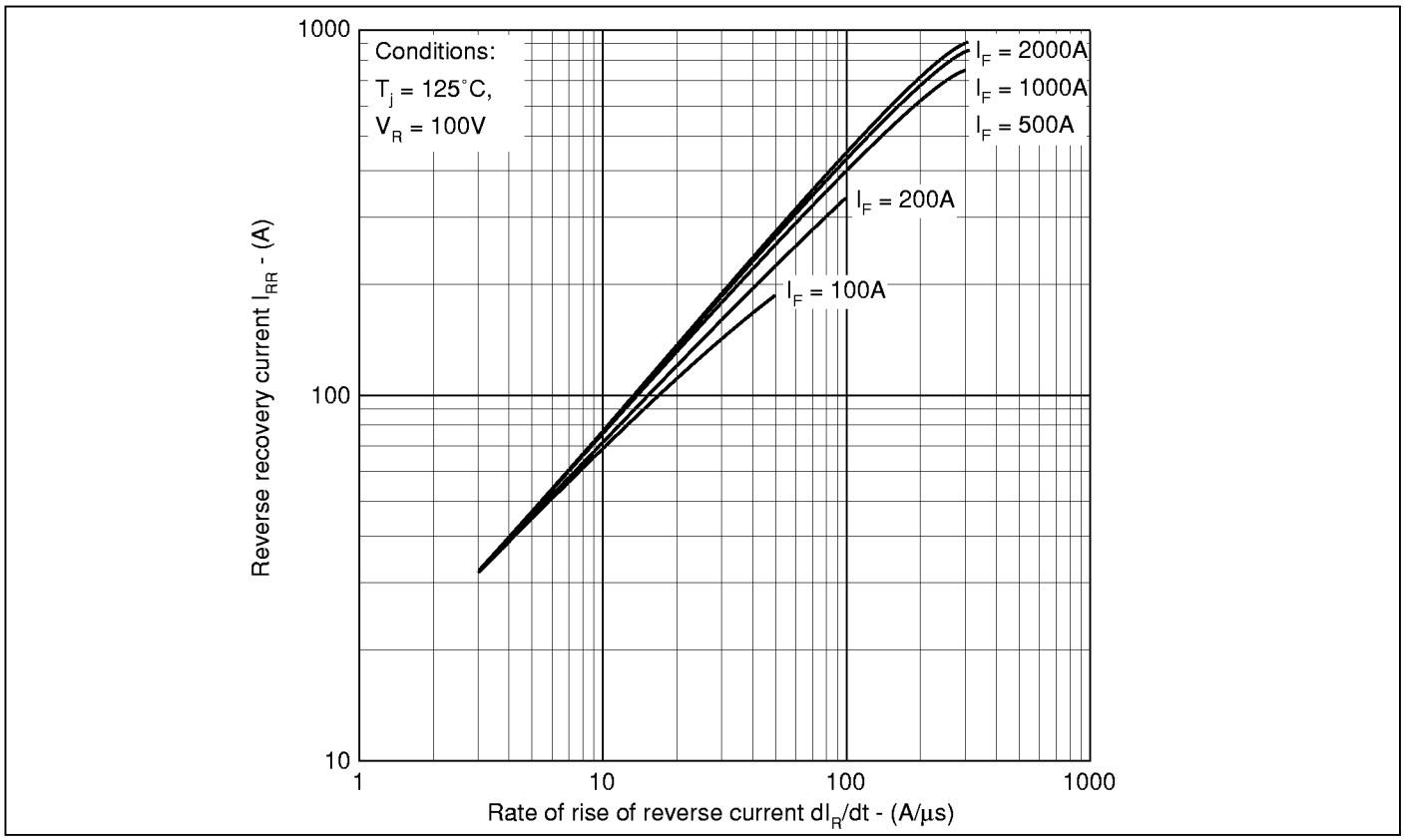


Fig.2 Typical reverse recovery current vs rate of rise of reverse current

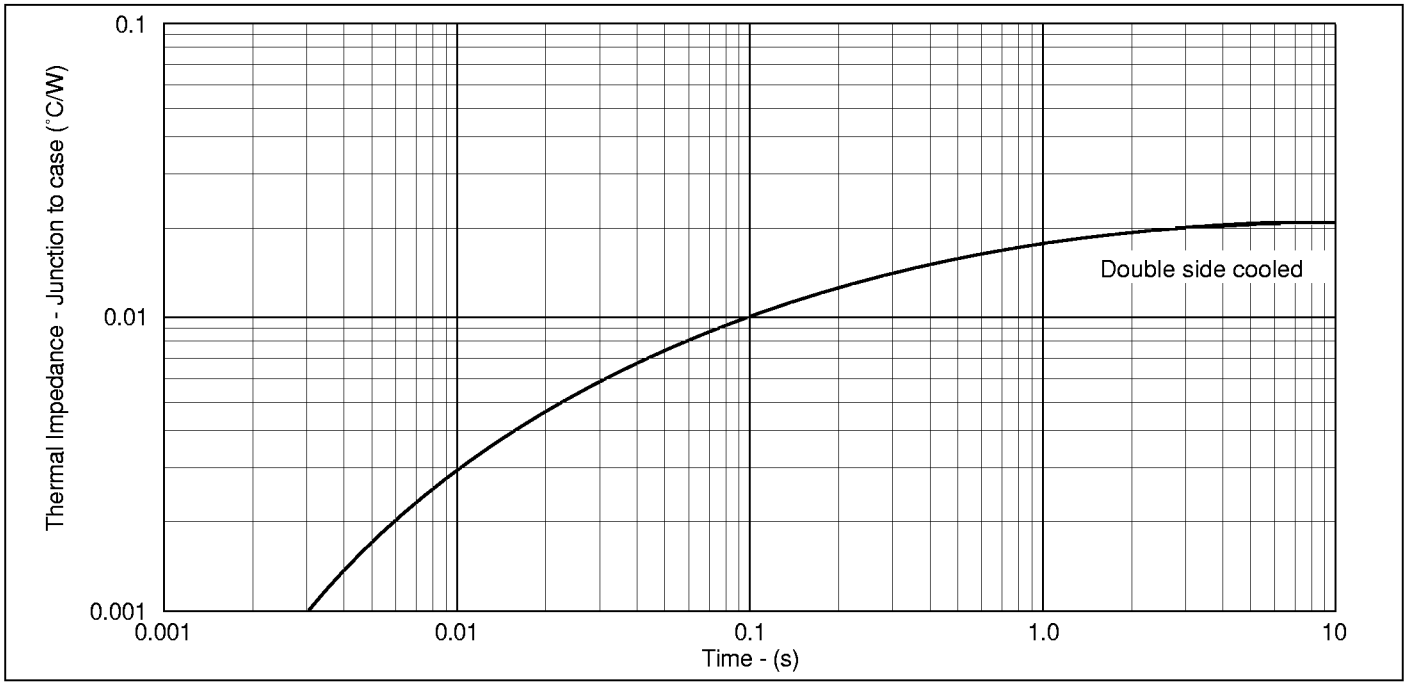
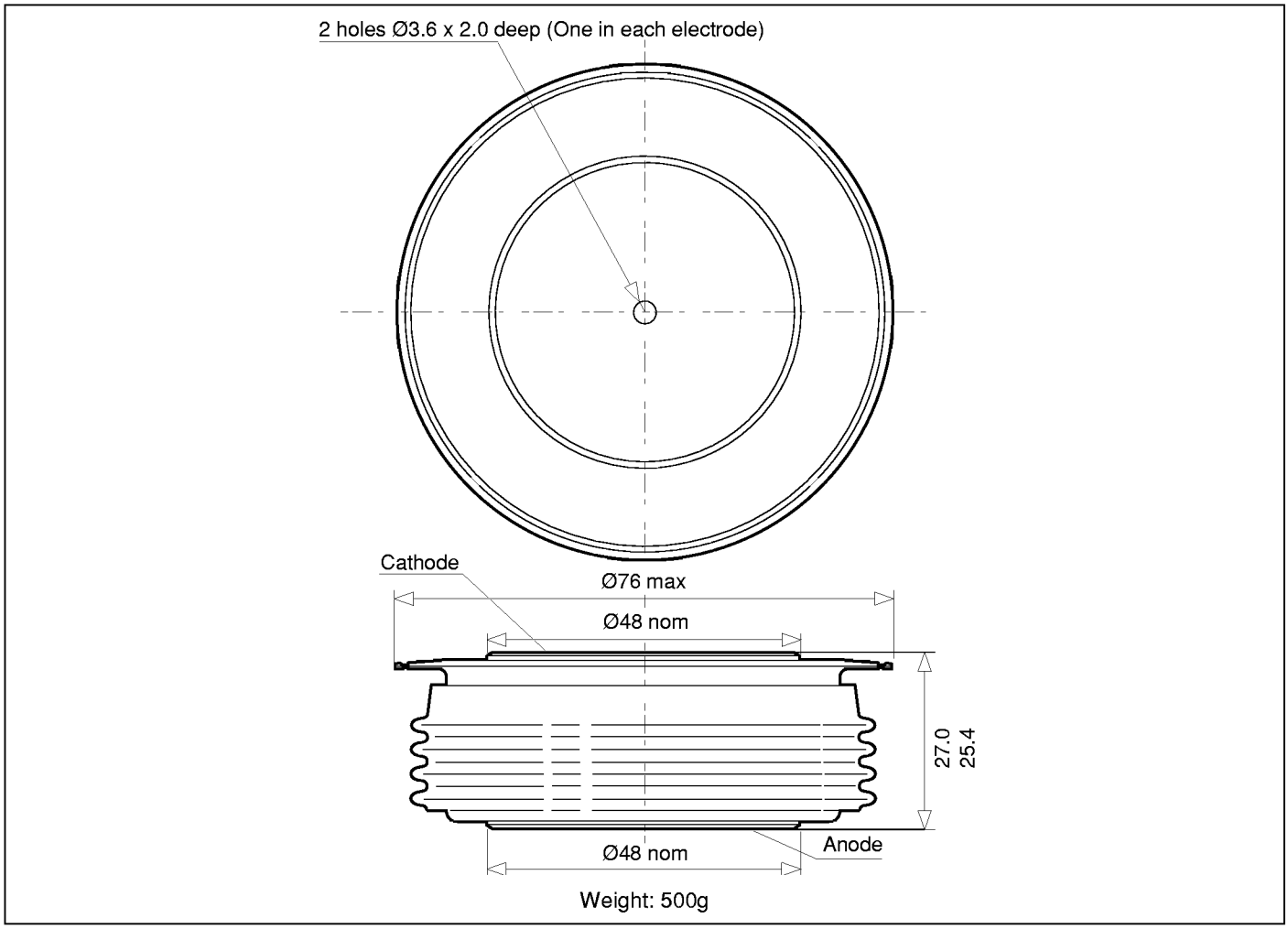


Fig.3 Maximum (limit) transient thermal impedance - junction to case - (°C/W)

PACKAGE DETAILS - CB450 (alternative outline F includes gate connection, all other details are the same as CB450).

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



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