OCTOBER 1995

DS4231-2.2

DSF21060SV

FAST RECOVERY DIODE

APPLICATIONS

- Freewheel Diode.
- Antiparallel Diode.
- Inverters.
- Choppers.

KEY PARAMETERS

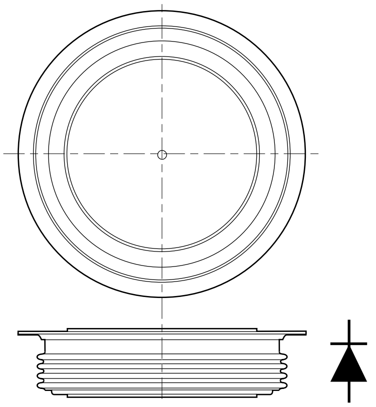
V_{RRM}	6000V
$I_{F(AV)}$	1690A
I_{FSM}	16000A
Q_r	1200μC
t_{rr}	6.5μs

FEATURES

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

VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage V_{RRM} V	Conditions
DSF21060SV60	6000	$V_{RSM} = V_{RRM}$ + 100V
DSF21060SV59	5900	
DSF21060SV58	5800	
DSF21060SV57	5700	
DSF21060SV56	5600	
DSF21060SV55	5500	



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CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 65^oC$	1690	A
$I_{F(RMS)}$	RMS value	$T_{case} = 65^oC$	2655	A
I_F	Continuous (direct) forward current	$T_{case} = 65^oC$	2460	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 65^oC$	1090	A
$I_{F(RMS)}$	RMS value	$T_{case} = 65^oC$	1710	A
I_F	Continuous (direct) forward current	$T_{case} = 65^oC$	1520	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	12.8	kA
I^2t	I^2t for fusing		819.2 x 10^3	A^2s
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; with 50% $V_{RRM,}$ T_j = 125°C	16.0	kA
I^2t	I^2t for fusing		1280 x 10^3	A^2s
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; with 100% $V_{RRM,}$ T_j = 125°C	-	kA
I^2t	I^2t for fusing		-	A^2s

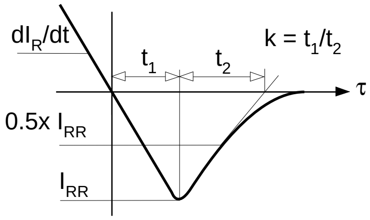
THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.0075	°C/W
		Single side cooled	Anode dc	-	0.015	°C/W
			Cathode dc	-	0.015	°C/W
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 40.0kN with mounting compound	Double side	-	0.002	°C/W
			Single side	-	0.004	°C/W
T_{vj}	Virtual junction temperature	Forwartd (conducting)		-	130	°C
T_{stg}	Storage temperature range			-55	150	°C
-	Clamping force			36.0	44.0	kN

CHARACTERISTICS

Symbol	Parameter	Conditions	Typ.	Max.	Units
V_{FM}	Forward voltage	At 600A peak, T_{case} = 25°C	-	3.0	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)		-	1500	µC
I_{RM}	Reverse recovery current		-	460	A
K	Soft factor		1.8	-	-
V_{TO}	Threshold voltage	At T_{vj} = 125°C	-	1.625	V
r_T	Slope resistance	At T_{vj} = 125°C	-	0.66	mΩ
V_{FRM}	Forward recovery voltage	di/dt = 1000A/µs, T_j = 100°C	140	-	V

DEFINITION OF K FACTOR AND Q_{RA1}



$Q_{RA1} = 0.5x\ I_{RR}(t_1 + t_2)$

$k = t_1/t_2$

CURVES

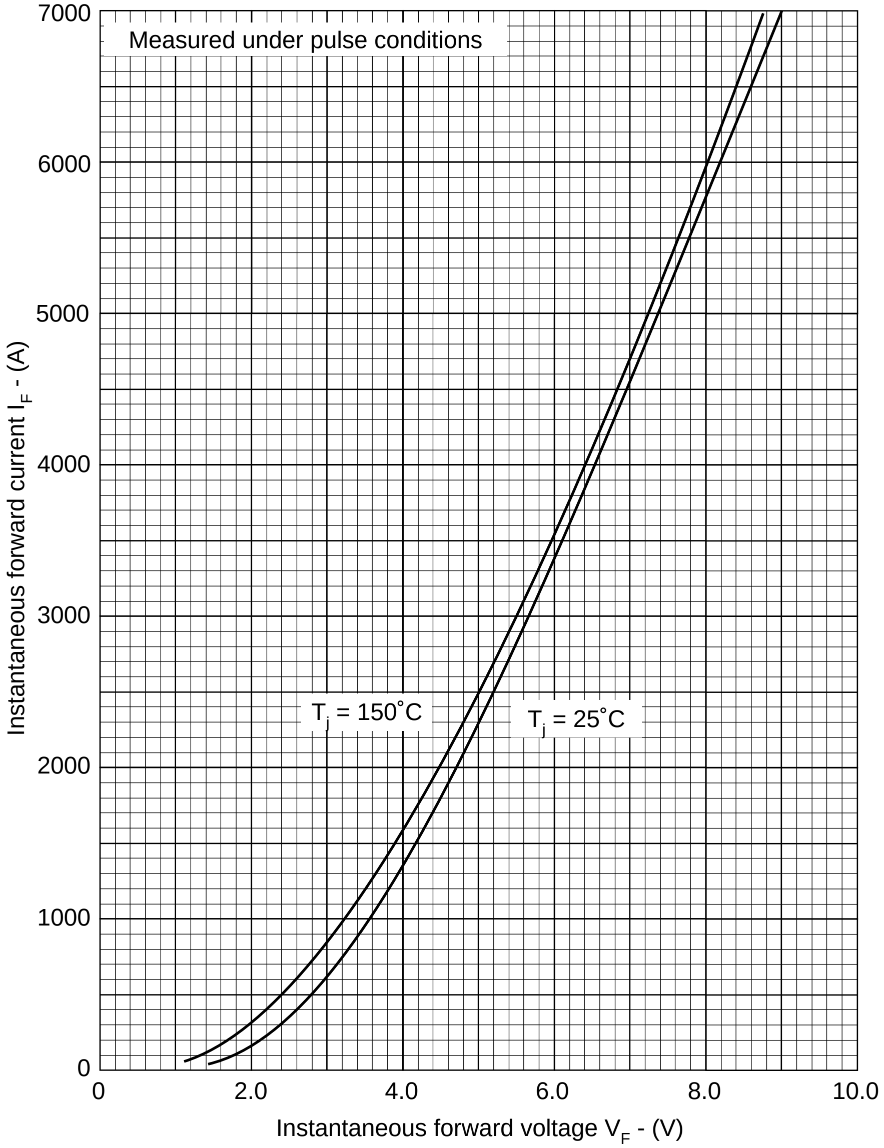


FIG. 1 MAXIMUM (LIMIT) FORWARD CHARACTERISTICS

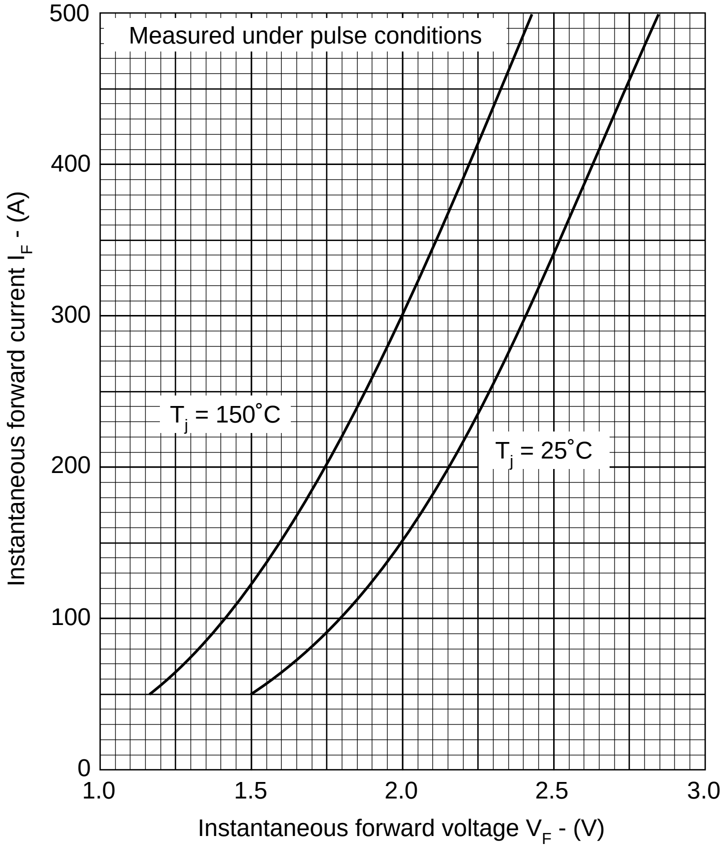


FIG. 2 MAXIMUM (LIMIT) FORWARD CHARACTERISTICS

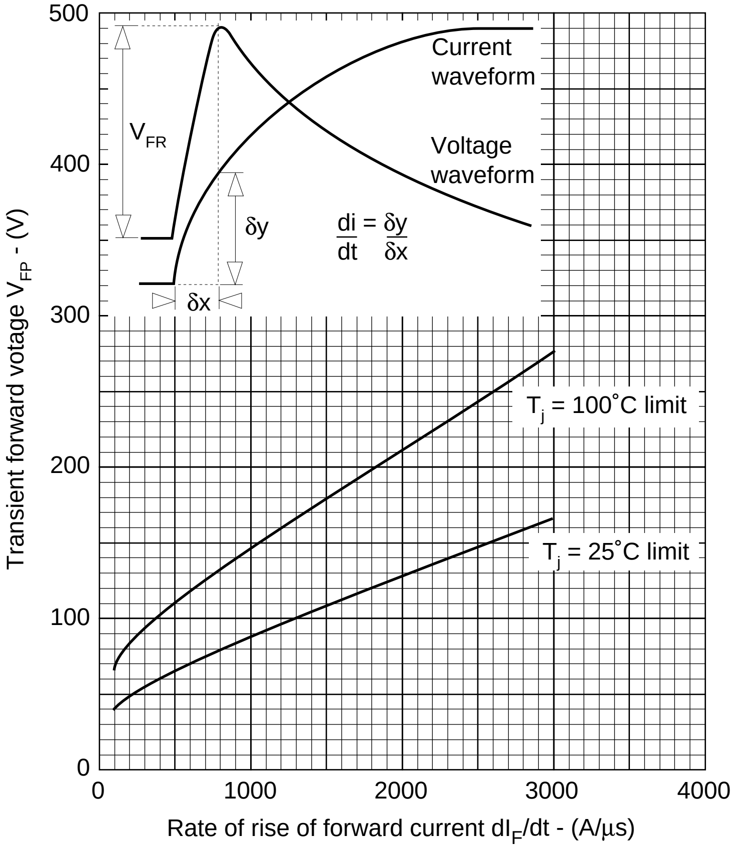


FIG. 3 TRANSIENT FORWARD VOLTAGE vs RATE OF RISE OF FORWARD CURRENT

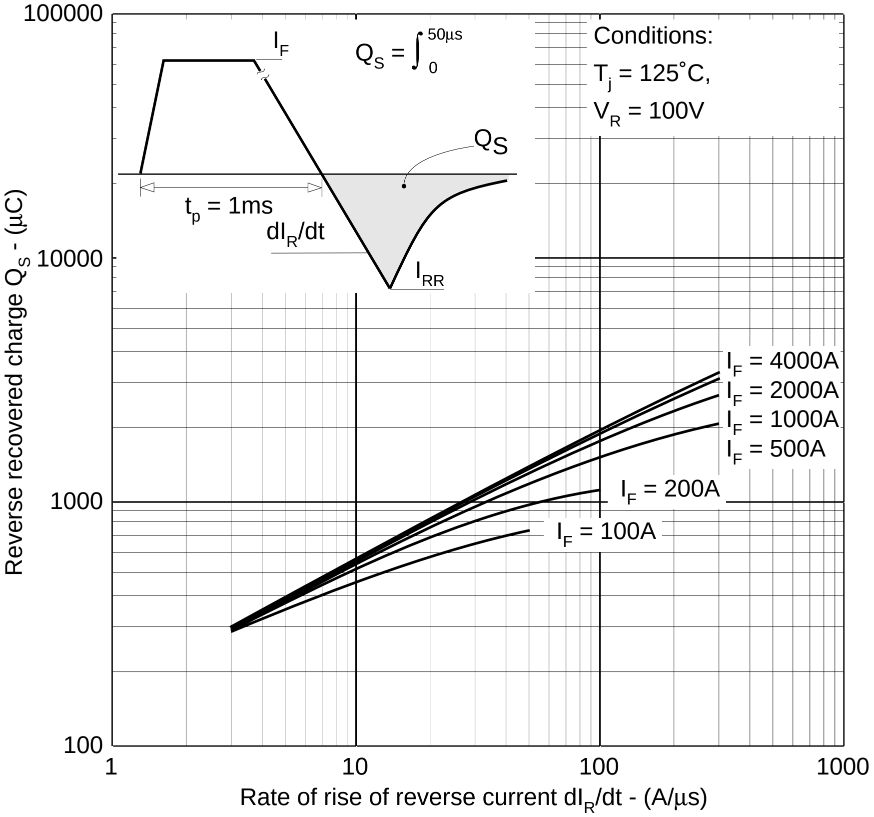


FIG. 4 RECOVERED CHARGE

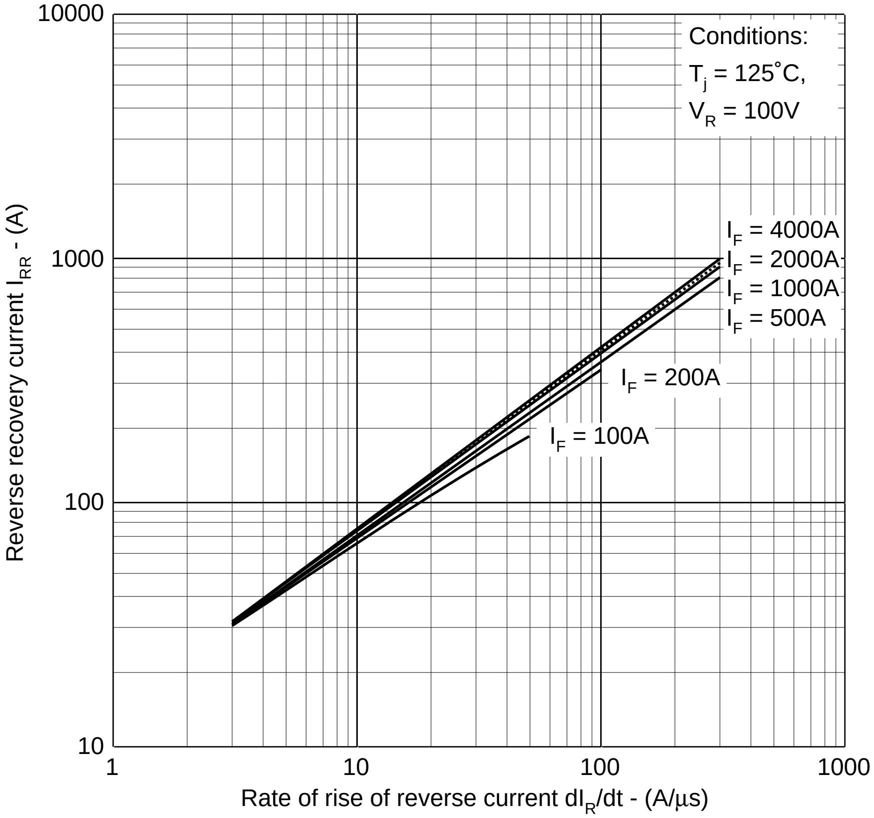


FIG. 5 TYPICAL REVERSE RECOVERY CURRENT vs RATE OF RISE OF REVERSE CURRENT

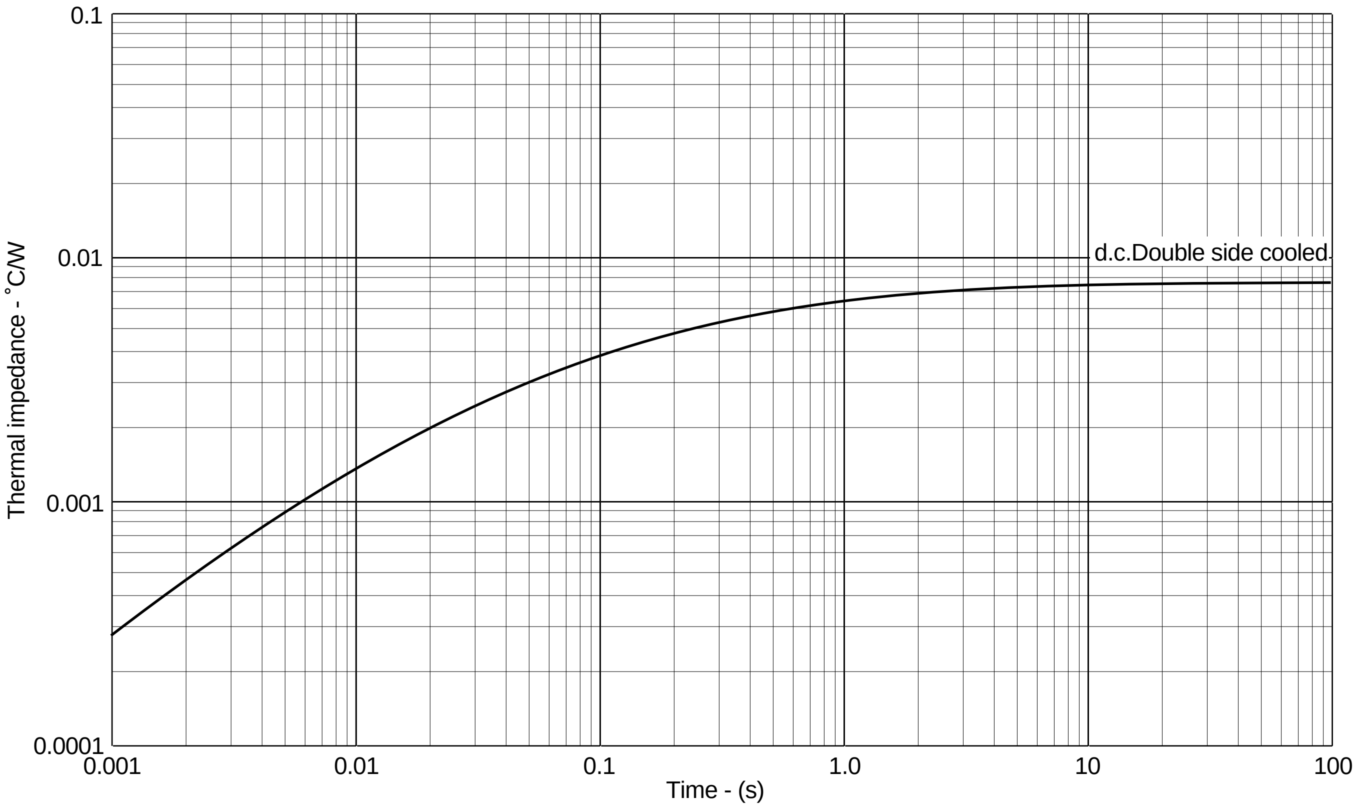
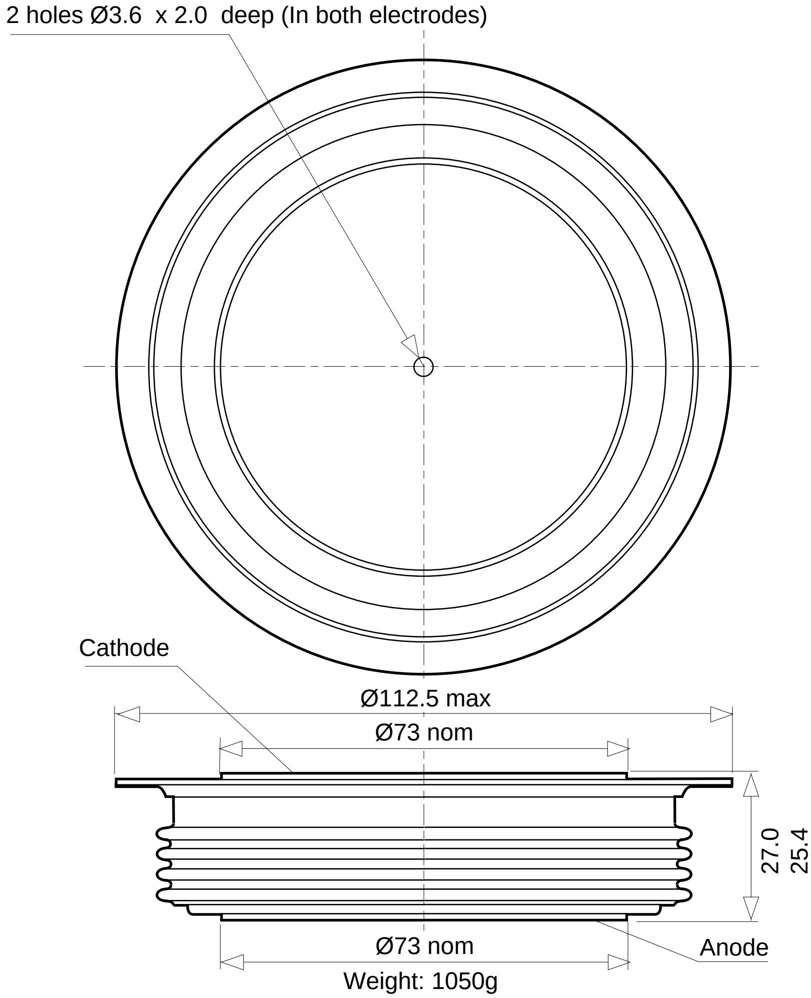


FIG. 5 MAXIMUM (LIMIT) TRANSIENT THERMAL IMPEDANCE - JUNCTION TO CASE

PACKAGE DETAILS - V

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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