MITSUBISHI SOFT RECOVERY DIODES

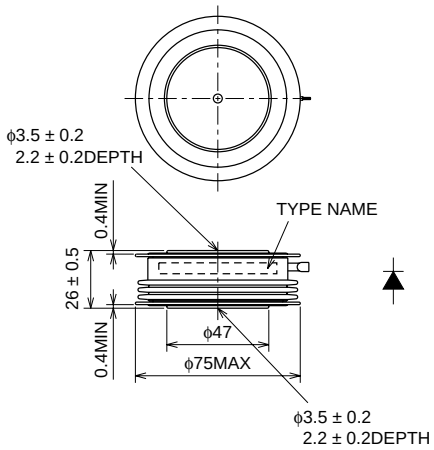
FD500JV-90DA

HIGH POWER, HIGH FREQUENCY, PRESS PACK TYPE

FD500JV-90DA

- $I_{F(AV)}$ Average forward current 500A
- V_{RRM} Repetitive peak reverse voltage 4500V
- Q_{RR} Reverse recovery charge 1500μC
- Press pack type

OUTLINE DRAWING Dimensions in mm



APPLICATION

Clamp diode for GCT Thyristor

High-power inverters

Power supplies as high frequency rectifiers

MAXIMUM RATINGS

Symbol	Parameter	Voltage class	Unit
V_{RRM}	Repetitive peak reverse voltage	4500	V
V_{RSM}	Non-repetitive peak reverse voltage	4500	V
$V_{R(DC)}$	DC reverse voltage	3600	V

Symbol	Parameter	Conditions	Ratings	Unit
$I_{F(RMS)}$	RMS forward current	Applied for all conduction angles	785	A
$I_{F(AV)}$	Average forward current	f = 60Hz, sine wave θ = 180°, T_f =76°C	500	A
I_{FSM}	Surge forward current	One half cycle at 60Hz, T_j =125°C	10	kA
I^2t	Current-squared, time integration		4.2×10^5	A^2s
di/dt	Critical rate of rise of reverse recovery current	I_{FM} =500A, $V_R \leq$ 2250V, T_j = 125°C (Fig. 1 and Fig. 2)	2000	A/μs
T_j	Junction temperature		–20 ~ 125	°C
T_{stg}	Storage temperature		–40 ~ 150	°C
—	Mounting force required	(Recommended value 23.5kN)	22 ~ 28	kN
—	Weight	Typical 530g	—	g

MITSUBISHI ELECTRIC

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ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I_{RRM}	Repetitive peak reverse current	V_{RM} = 4500V, T_j = 125°C	—	—	80	mA
V_{FM}	Forward voltage	I_{FM} = 1570A, T_j = 125°C	—	—	3.5	V
Q_{RR}	Reverse recovery charge	I_{FM} = 500A, di/dt = 1000A/µs, V_R = 2250V, T_j = 125°C (Refer to Fig. 1 and Fig. 2)	—	—	1500	µC
Erec	Reverse recovery loss		—	4.0	—	J/P
tb/ta	Soft recovery rate		—	2	—	—
V_{FP}	Forward recovery voltage	di/dt = 1000A/µs, T_j = 25°C	—	100	—	V
$R_{th(j-f)}$	Thermal resistance	Junction to fin	—	—	.027	°C/W

Fig. 1 (Definition of reverse recovery waveform)

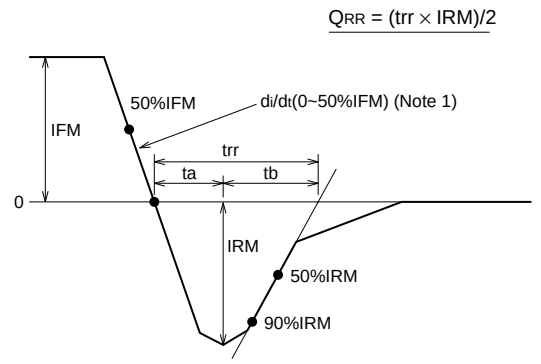
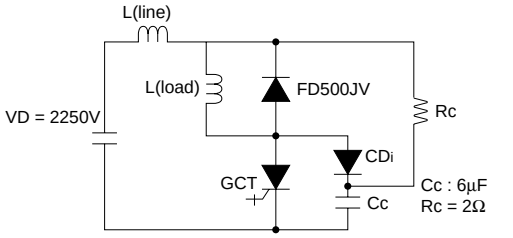


Fig. 2 (Reverse recovery test circuit)



di/dt = VD/L(line) = 2250V/1.125µH = 2000A (Note 1)

Note 1

In case of 2000A/µs, definition of di/dt is by VD and inductance value of L (line) as follows.

di/dt = VD/L (line) = 2250V/1.125µH = 2000A/µs

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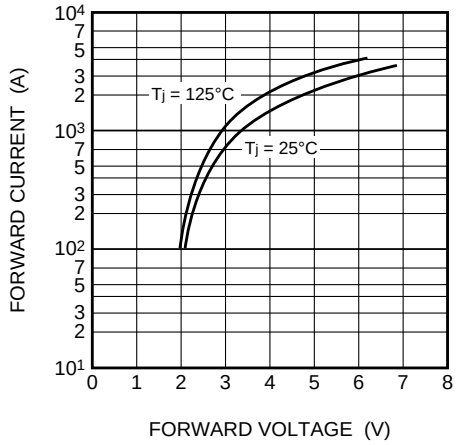
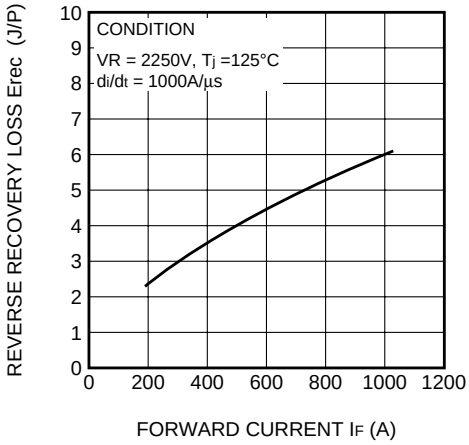
PERFORMANCE CURVES

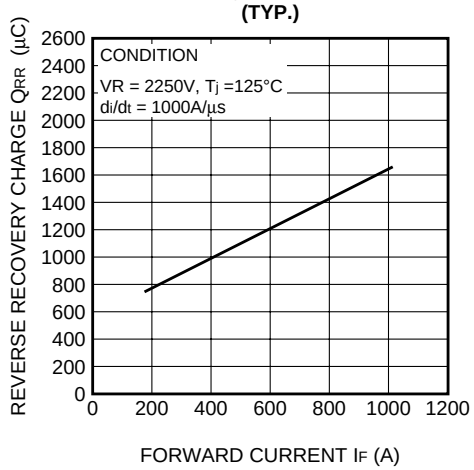
MAXIMUM FORWARD CHARACTERISTICS



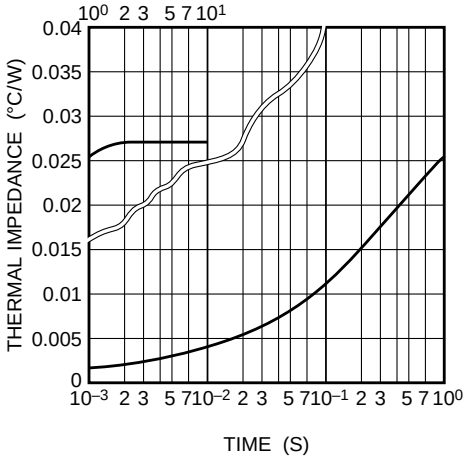
Erec VS IF (TYP.)



QRR VS IF (TYP.)



MAXIMUM THERMAL IMPEDANCE CHARACTERISTIC (JUNCTION TO FIN)



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