RM300DG-90S

HIGH POWER SWITCHING USE
INSULATED TYPE

High Voltage Diode Module

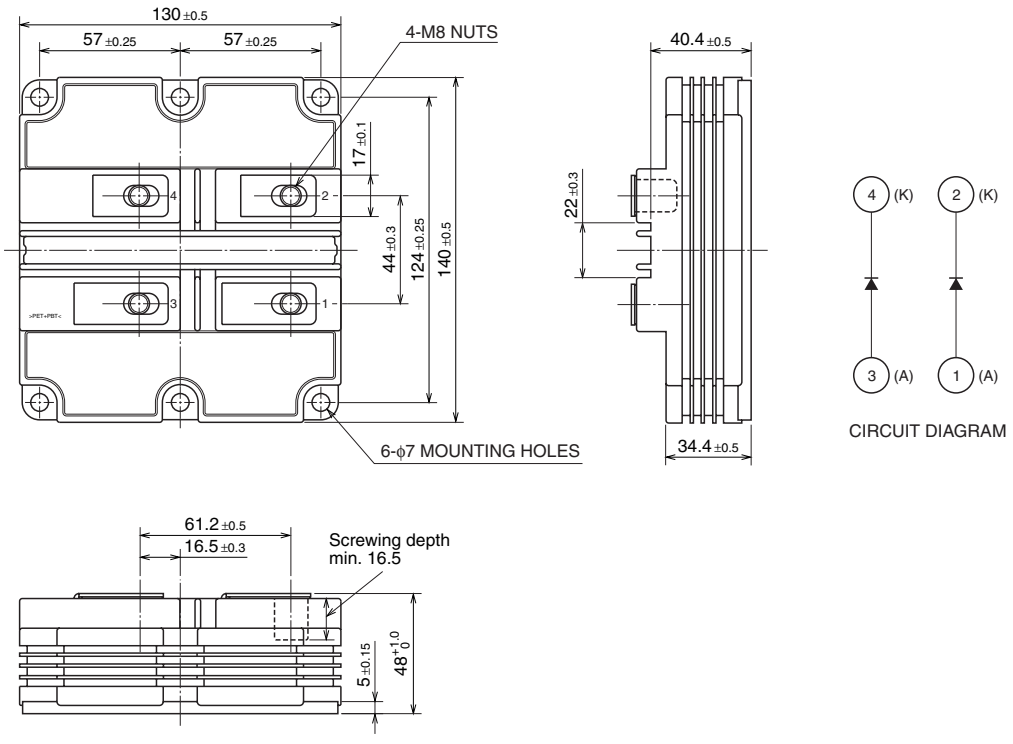
RM300DG-90S

- I_F 300A
- V_{RRM} 4500V
- High Insulated Type
- 2-element in a Pack
- AlSiC Baseplate

APPLICATION

Traction drives, High Reliability Converters / Inverters, DC choppers

OUTLINE DRAWING & CIRCUIT DIAGRAM **Dimensions in mm**



MITSUBISHI ELECTRIC

MAXIMUM RATINGS

Symbol	Item	Conditions	Ratings	Unit
V_{RRM}	Repetitive peak reverse voltage	T_j = 25 °C	4500	V
V_{RSM}	Non-repetitive peak reverse voltage	T_j = 25 °C	4500	V
$V_{R(DC)}$	Reverse DC voltage	T_j = 25 °C	3000	V
I_F	DC forward current	T_C = 25 °C	300	A
I_{FSM}	Surge forward current	T_j = 25 °C start, t_w = 8.3 ms Half sign wave	2400	A
I^2t	Current-squared, time integration	T_j = 25 °C start, t_w = 8.3 ms Half sign wave	24	kA^2s
V_{iso}	Isolation voltage	Charged part to the baseplate RMS sinusoidal, 60Hz 1min.	10200	V
V_e	Partial discharge extinction voltage	RMS sinusoidal, 60Hz, $Q_{PD} \leq 10pC$	5100	V
T_j	Junction temperature	—	–40 ~ +150	°C
T_{op}	Operating temperature	—	–40 ~ +125	°C
T_{stg}	Storage temperature	—	–40 ~ +125	°C

ELECTRICAL CHARACTERISTICS

Symbol	Item	Conditions		Limits			Unit
				Min	Typ	Max	
I_{RRM}	Repetitive reverse current	$V_{RM} = V_{RRM}$	T_j = 25 °C	—	—	1	mA
			T_j = 125 °C	—	0.5	10	
V_{FM}	Forward voltage (Note 1)	I_F = 300 A	T_j = 25 °C	—	4.80	—	V
			T_j = 125 °C	—	4.15	—	
t_{rr}	Reverse recovery time	V_R = 2250 V, I_F = 300 A di/dt = –800 A/µs L_S=100nH, T_j = 125 °C		—	1.0	—	µs
I_{rr}	Reverse recovery current			—	280	—	A
Q_{rr}	Reverse recovery charge			—	250	—	µC
E_{rec}	Reverse recovery energy (Note 2)			—	0.33	—	J/P

Note 1. It doesn't include the voltage drop by internal lead resistance.
2. E_{rec} is the integral of $0.1V_R \times 0.1I_{rr} \times dt$.

THERMAL CHARACTERISTICS

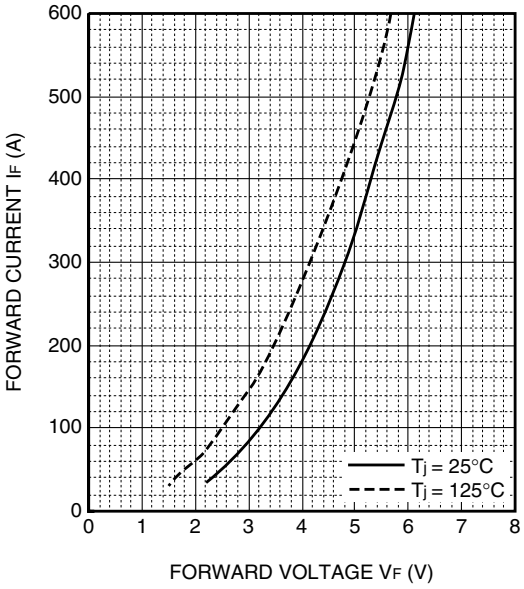
Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
$R_{th(j-c)}$	Thermal resistance	Junction to case (per 1/2 module)	—	—	66.0	K/kW
$R_{th(c-f)}$	Contact thermal resistance	Case to Fin, λ_{grease} = 1W/m·K $D_{(c-f)}$=100μm, (per 1/2 module)	—	48.0	—	K/kW

MECHANICAL CHARACTERISTICS

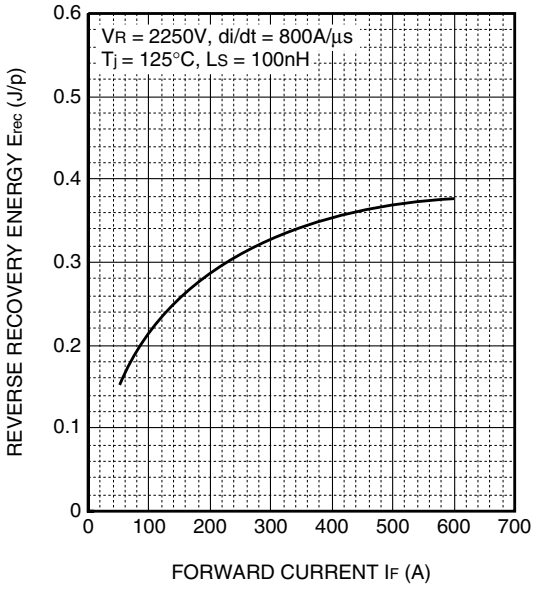
Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
M_t	Mounting torque	M8: Main terminals screw	7.0	—	15.0	N·m
M_s		M6: Mounting screw	3.0	—	6.0	N·m
m	Mass	—	—	1.0	—	kg
CTI	Comparative tracking index	—	600	—	—	—
D_a	Clearance	—	26	—	—	mm
D_s	Creepage distance	—	56	—	—	mm
$L_{P\ CE}$	Internal inductance	—	—	44	—	nH
$R_{CC'+EE'}$	Internal lead resistance	T_c = 25 °C	—	0.27	—	mΩ

PERFORMANCE CURVES

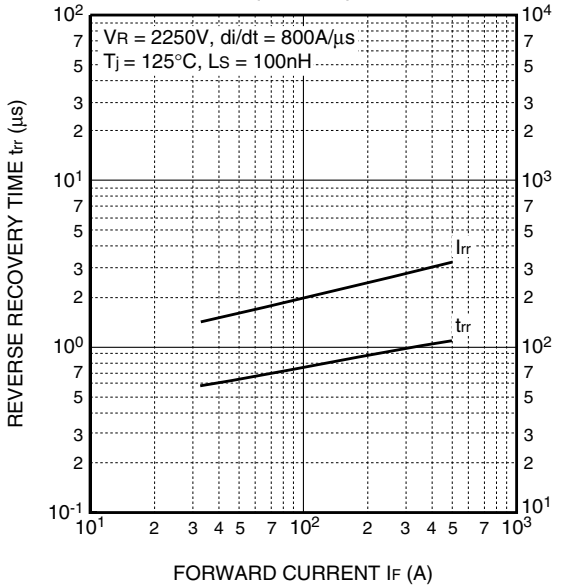
FORWARD CHARACTERISTICS (TYPICAL)



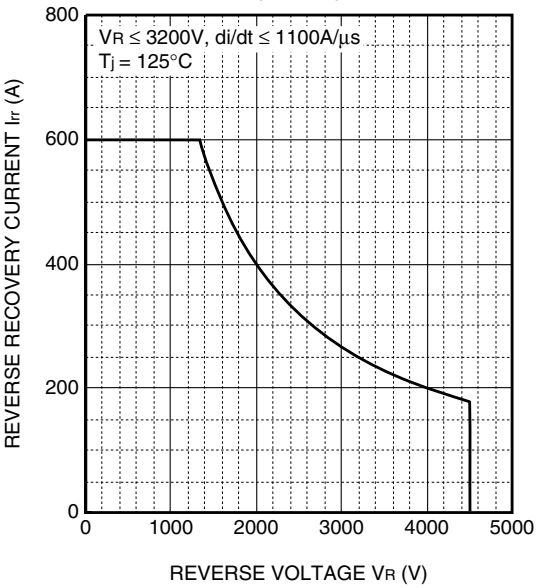
REVERSE RECOVERY ENERGY CHARACTERISTICS (TYPICAL)



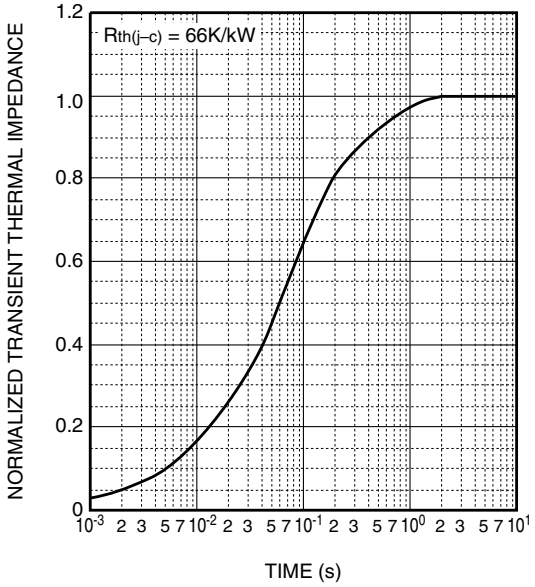
REVERSE RECOVERY CHARACTERISTICS (TYPICAL)



REVERSE RECOVERY SAFE OPERATING AREA (RRSOA)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS



$$Z_{th(j-c)}(t) = \sum_{i=1}^{n} R_i \left\{ 1 - exp\left(-\frac{t}{\tau_i}\right) \right\}$$

	1	2	3	4
R_i [K/kW]	0.0059	0.0978	0.6571	0.2392
τ_i [sec]	0.0002	0.0074	0.0732	0.4488