MITSUBISHI ELECTRIC

< HIGH VOLTAGE DIODE MODULES >

RM1500HE-66F

HIGH POWER SWITCHING USE
INSULATED TYPE

High Voltage Diode Modules

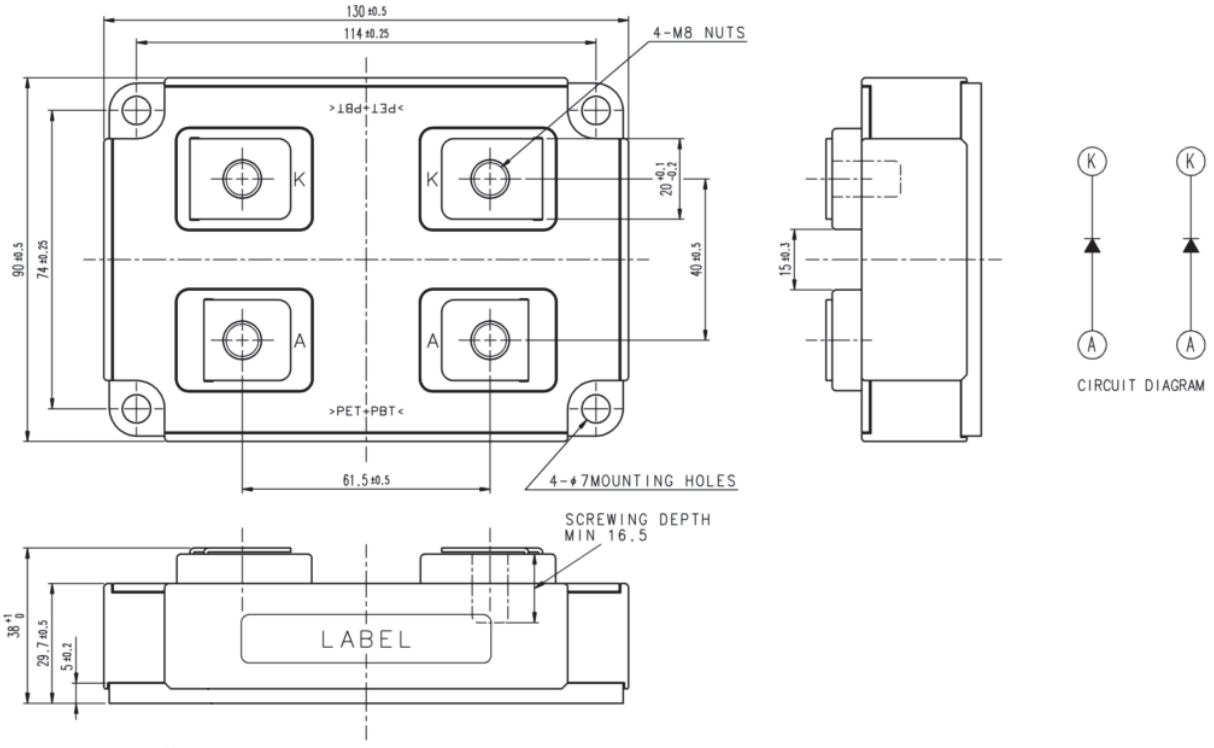
RM1500HE-66F

- I_F 1500A
- V_{RRM} 3300V
- 1-element in a Pack
- Insulated Type
- Soft Recovery Diode
- AlSiC Baseplate

APPLICATION

Traction drives, High Reliability Converters / Inverters, DC choppers

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



MAXIMUM RATINGS

Symbol	Item	Conditions	Ratings	Unit
V_{RRM}	Repetitive peak reverse voltage	T_j = −40 … +150°C	3300	V
		T_j = −50°C	3200	
V_{RSM}	Non-repetitive peak reverse voltage	T_j = −40 … +150°C	3300	V
		T_j = −50°C	3200	
I_F	Forward current	DC, T_c = 75°C	1500	A
I_{FRM}		Pulse (Note 1)	3000	A
I_{FSM}	Surge (non-repetitive) forward current	T_{j_start} = 25°C, t_p = 8.3 ms, Half-sine wave, V_R = 0 V	12000	A
I^2t	Surge current load integral		598	kA^2s
V_{iso}	Isolation voltage	RMS, sinusoidal, f = 60 Hz, t = 1 min.	6000	V
V_e	Partial discharge extinction voltage	RMS, sinusoidal, f = 60 Hz, Q_{PD} ≤ 10 pC	2400	V
T_j	Junction temperature		−50 ~ +150	°C
T_{jop}	Operating junction temperature		−50 ~ +150	°C
T_{stg}	Storage temperature		−55 ~ +150	°C

ELECTRICAL CHARACTERISTICS

Symbol	Item	Conditions		Limits			Unit
				Min	Typ	Max	
I_{RRM}	Repetitive reverse current	V_{RM} = V_{RRM}	T_j = 25°C	—	—	5.0	mA
			T_j = 150°C	—	12.0	—	
V_{FM}	Forward voltage	I_F = 1500 A (Note 2)	T_j = 25°C	—	2.60	3.20	V
			T_j = 150°C	—	2.70	—	
t_{rr}	Reverse recovery time	V_{CC} = 1500 V I_F = 1500 A L_s = 100 nH $-di_F/dt$ = 4400 A/µs @ T_j = 150°C Inductive load	T_j = 25°C	—	—	—	µs
			T_j = 150°C	—	0.9	—	
Q_{rr}	Reverse recovery charge		T_j = 25°C	—	—	—	µC
			T_j = 150°C	—	1300	—	
E_{rec}	Reverse recovery energy (Note 3)		T_j = 25°C	—	—	—	J
			T_j = 150°C	—	1.35	—	

THERMAL CHARACTERISTICS

Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
$R_{th(j-c)}$	Thermal resistance	Junction to Case	—	—	14.5	K/kW
$R_{th(c-s)}$	Contact thermal resistance	Case to heat sink, λ_{grease} = 1 W/m·k $D_{(c-s)}$ = 100 µm	—	15.0	—	K/kW

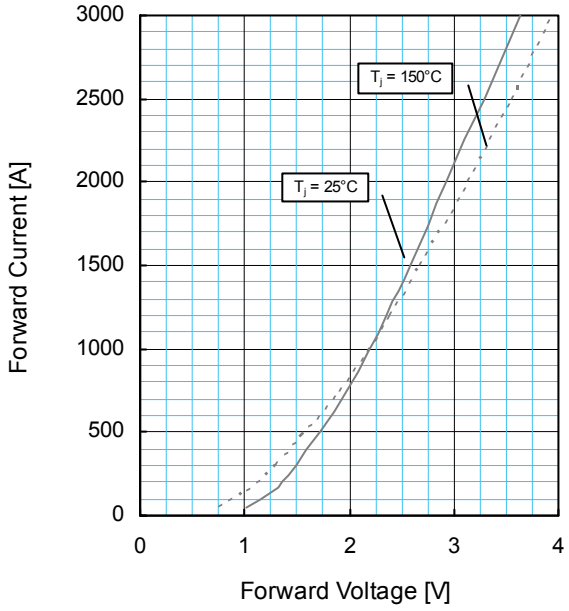
MECHANICAL CHARACTERISTICS

Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
M_t	Mounting torque	M8 : Main terminals screw	6.7	—	10.8	N·m
M_s		M6 : Mounting screw	2.9	—	3.4	N·m
m	Mass		—	0.66	—	kg
CTI	Comparative tracking index		600	—	—	—
d_a	Clearance		19.5	—	—	mm
d_s	Creepage distance		32.0	—	—	mm
$L_{P\,AK}$	Parasitic stray inductance		—	17.0	—	nH
$R_{AA'+KK'}$	Internal lead resistance	T_c = 25°C	—	0.16	—	mΩ

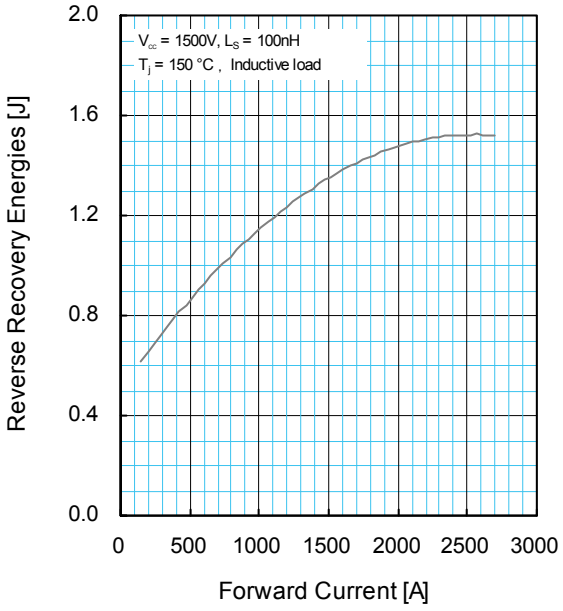
Note 1. Pulse width and repetition rate should be such that junction temperature (T_j) does not exceed T_{opmax} rating (150°C).
Note 2. Pulse width and repetition rate should be such as to cause negligible temperature rise.
Note 3. E_{rec} is the integral of $0.1V_R \times 0.1I_F \times dt$.

PERFORMANCE CURVES

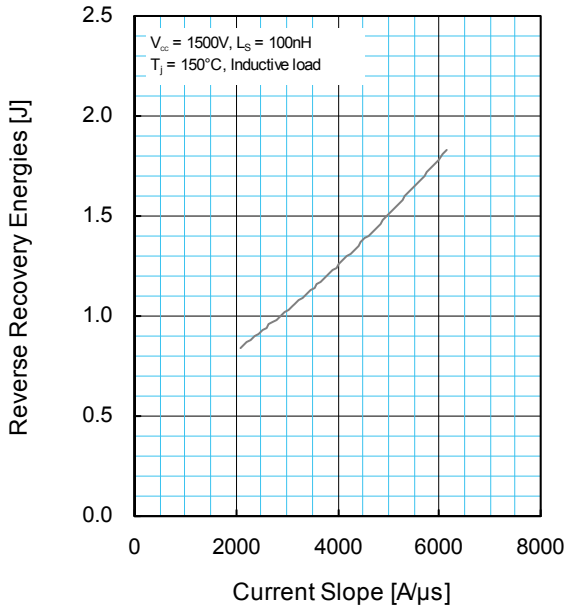
FORWARD CHARACTERISTICS (TYPICAL)



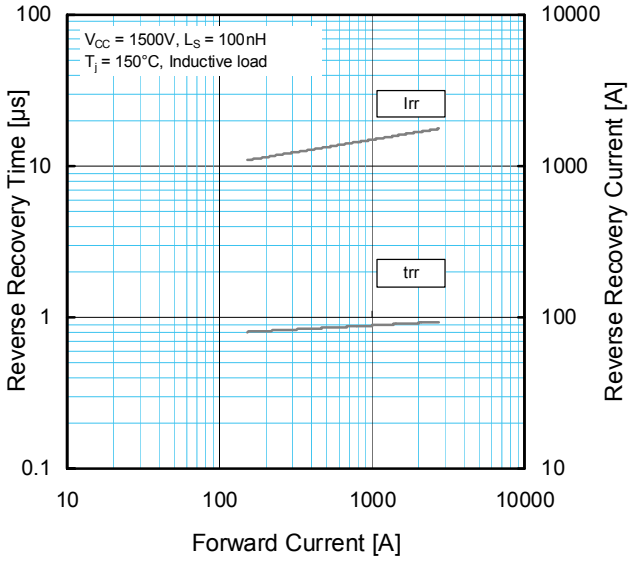
REVERSE RECOVERY ENERGY CHARACTERISTICS (TYPICAL)



REVERSE RECOVERY CHARACTERISTICS (TYPICAL)

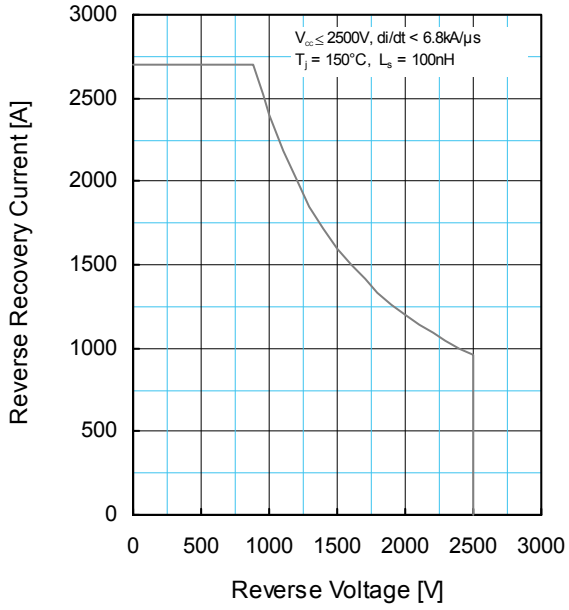


REVERSE RECOVERY CHARACTERISTICS (TYPICAL)

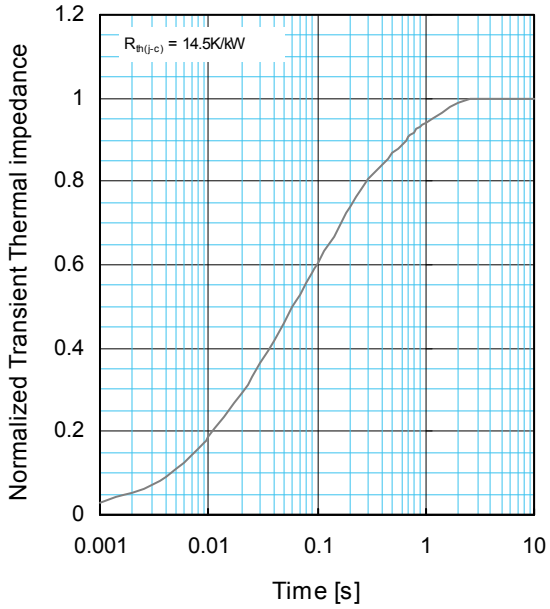


PERFORMANCE CURVES

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]	0.0096	0.1893	0.4044	0.3967
τ_i [sec]	0.0001	0.0058	0.0602	0.3512

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