MITSUBISHI ELECTRIC

< HIGH VOLTAGE DIODE MODULES >

RM1500DC-66F

HIGH POWER SWITCHING USE
INSULATED TYPE

High Voltage Diode Modules

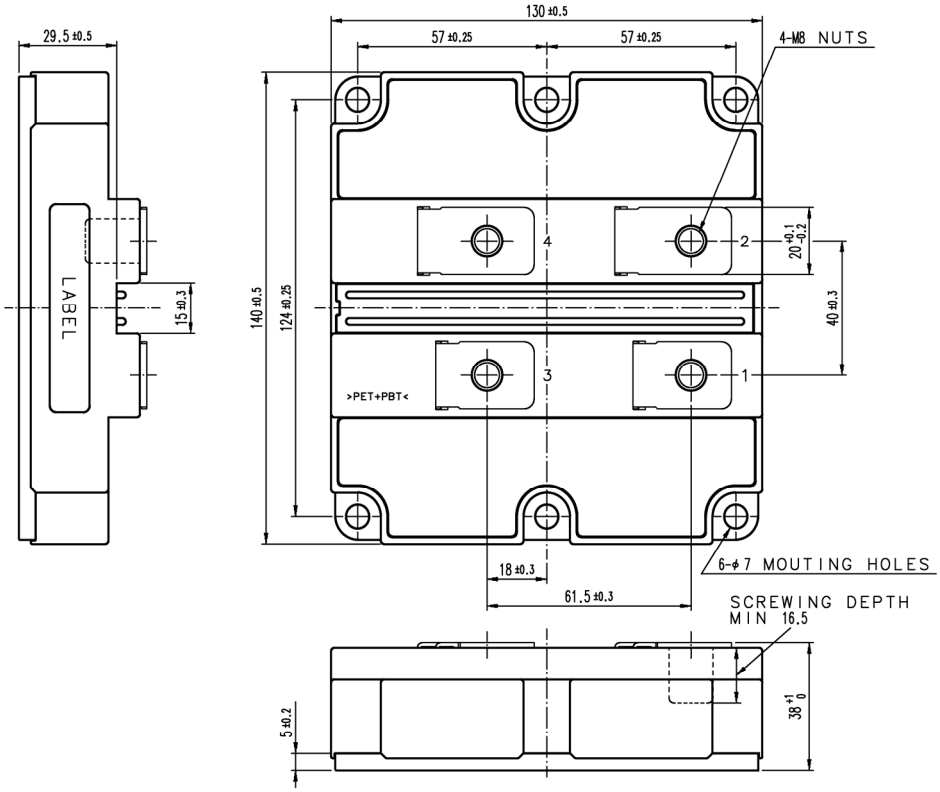
RM1500DC-66F

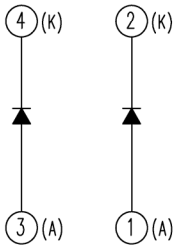
- I_F ..... 2 x 1500A
- V_{RRM} 3300V
- 2-element in a Pack
- Insulated Type
- Soft Recovery Diode
- AlSiC Baseplate

APPLICATION

Traction drives, High Reliability Converters / Inverters, DC choppers

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





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CIRCUIT DIAGRAM

MAXIMUM RATINGS

Symbol	Item	Conditions	Ratings	Unit
V_{RRM}	Repetitive peak reverse voltage	T_j = −40…+125°C	3300	V
		T_j = −50°C	3200	
I_F	Forward current	DC, T_c = 80°C	1500	A
I_{FSM}	Surge (non-repetitive) forward current	T_{j_start} = 125°C, t_p = 10 ms, Half-sine wave, V_R = 0 V	14.0	kA
I^2t	Surge current load integral		980	kA^2s
P_{tot}	Maximum power dissipation	T_c = 25°C	7800	W
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	2600	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	—	—	2.0	mA
			T_j = 125°C	—	2.0	—	
			T_j = 150°C	—	12.0	—	
V_{FM}	Forward voltage	I_F = 1500 A	T_j = 25°C	—	2.20	—	V
			T_j = 125°C	—	2.40	2.90	
			T_j = 150°C	—	2.35	—	
t_{rr}	Reverse recovery time	V_{CC} = 1800 V I_F = 1500 A $-d_{iF}/d_t$ = 5500 A/µs @ T_j = 25°C 5200 A/µs @ T_j = 125°C 5100 A/µs @ T_j = 150°C L_s = 100 nH Inductive load	T_j = 25°C	—	0.65	—	µs
			T_j = 125°C	—	0.85	—	
			T_j = 150°C	—	0.95	—	
I_{rr}	Reverse recovery current		T_j = 25°C	—	1200	—	A
			T_j = 125°C	—	1450	—	
			T_j = 150°C	—	1500	—	
Q_{rr}	Reverse recovery charge		T_j = 25°C	—	1000	—	µC
			T_j = 125°C	—	1650	—	
			T_j = 150°C	—	1950	—	
$E_{rec(10\%)}$	Reverse recovery energy (Note 1)		T_j = 25°C	—	1.05	—	J
			T_j = 125°C	—	1.75	—	
			T_j = 150°C	—	2.00	—	
E_{rec}	Reverse recovery energy		T_j = 25°C	—	1.20	—	J
			T_j = 125°C	—	2.00	—	
			T_j = 150°C	—	2.30	—	

THERMAL CHARACTERISTICS

Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
$R_{th(j-c)}$	Thermal resistance	Junction to Case (per 1/2 module)	—	—	16.0	K/kW
$R_{th(c-s)}$	Contact thermal resistance	Case to heat sink, λ_{grease} = 1 W/m·k $D_{(c-s)}$ = 100 µm (per 1/2 module)	—	17.5	—	K/kW

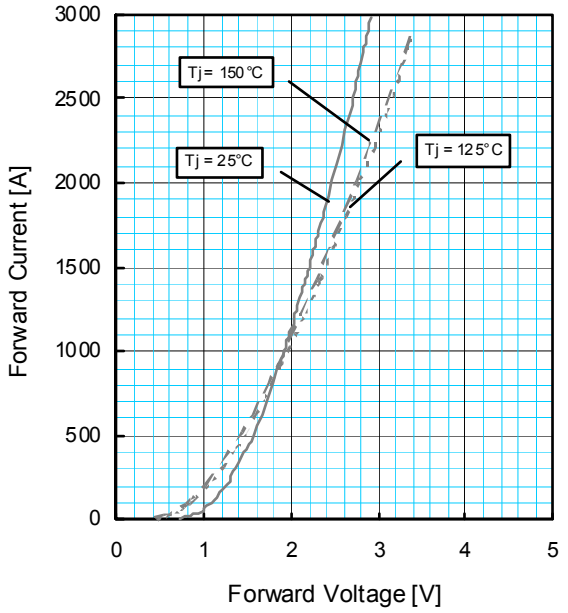
MECHANICAL CHARACTERISTICS

Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
M_t	Mounting torque	M8 : Main terminals screw	7.0	—	22.0	N·m
M_s		M6 : Mounting screw	3.0	—	6.0	N·m
m	Mass		—	0.8	—	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	1/2 module	—	33.0	—	nH
$R_{AA'+KK'}$	Internal lead resistance	T_c = 25°C, 1/2 module	—	0.14	—	mΩ

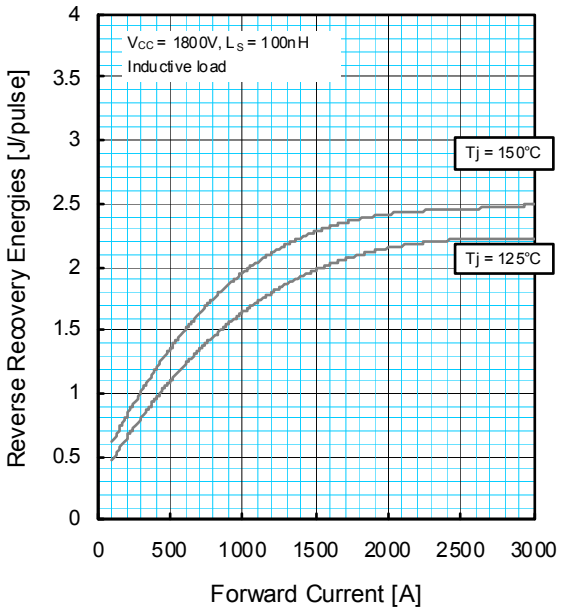
Note 1. $E_{rec(10\%)}$ is the integral of $0.1V_R \times 0.1I_F \times dt$.

PERFORMANCE CURVES

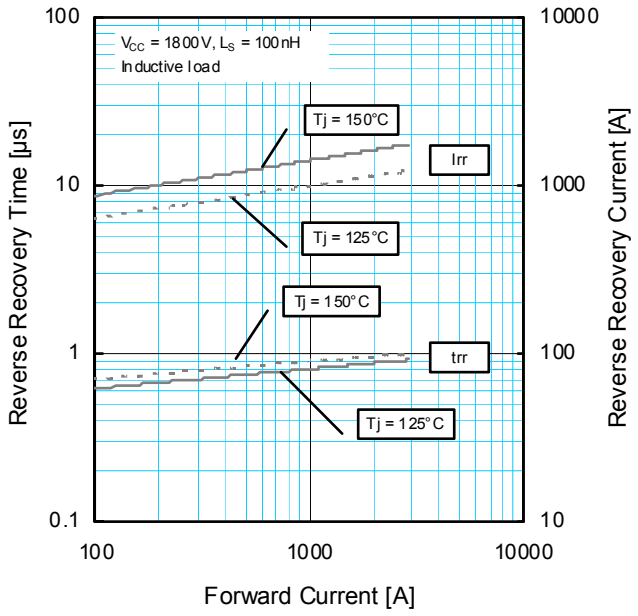
FORWARD CHARACTERISTICS (TYPICAL)



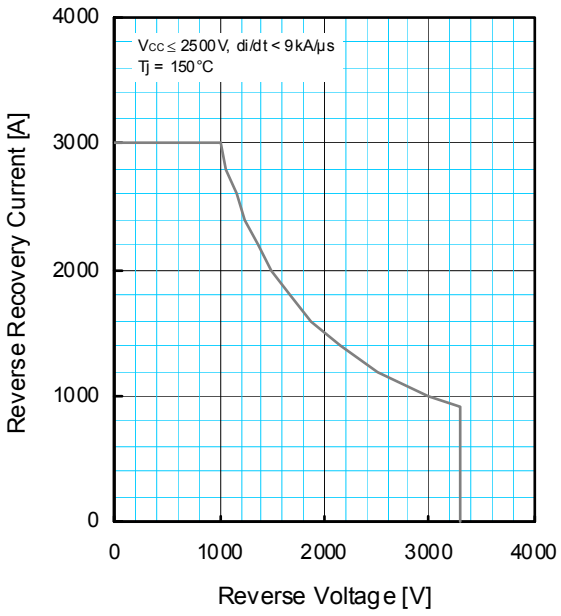
REVERSE RECOVERY ENERGY CHARACTERISTICS (TYPICAL)



REVERSE RECOVERY CHARACTERISTICS (TYPICAL)

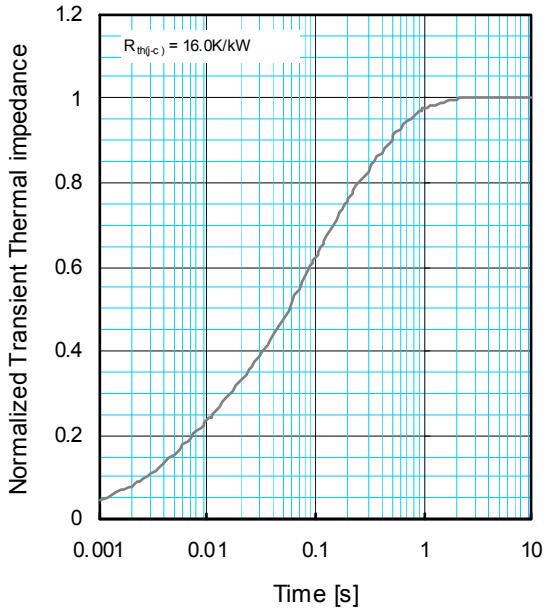


REVERSE RECOVERY SAFE OPERATING AREA (RRSOA)



PERFORMANCE CURVES

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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