

< HIGH VOLTAGE DIODE MODULES >

RM1500DC-66F

HIGH POWER SWITCHING USE
INSULATED TYPE

High Voltage Diode Modules

RM1500DC-66F



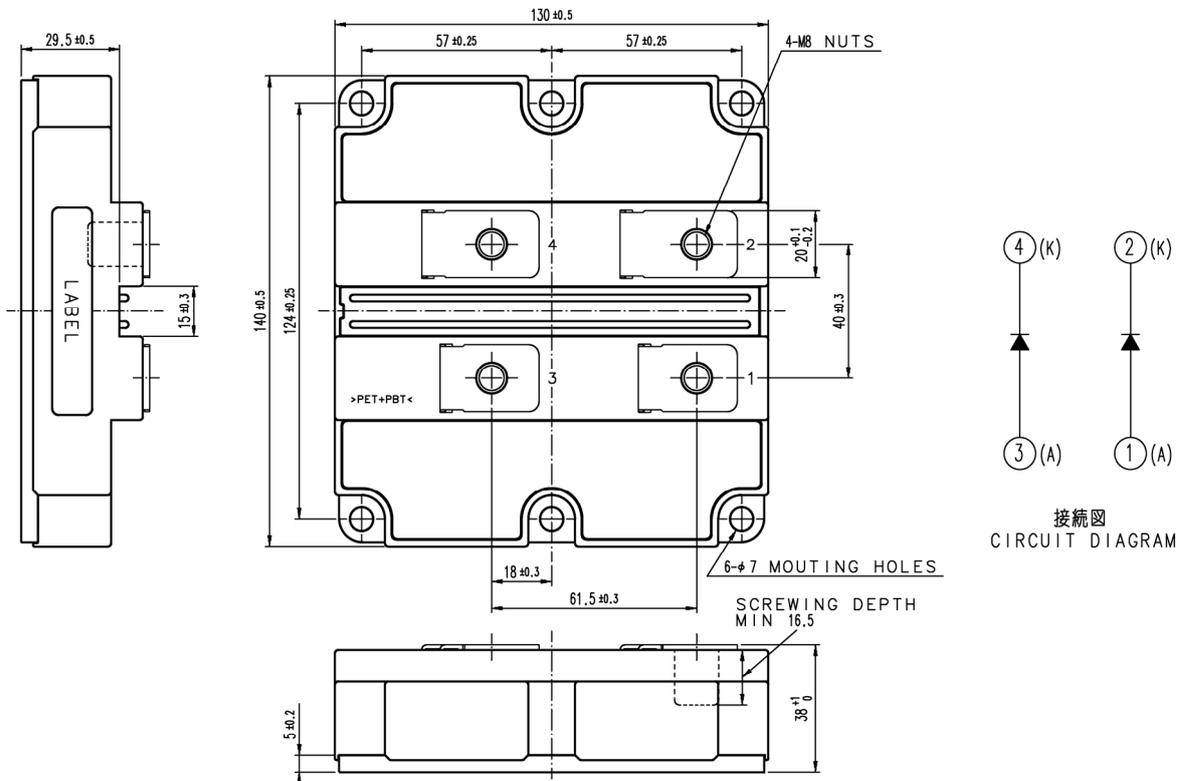
- I_F2 x 1500A
- V_{RRM}3300V
- 2-element in a Pack
- Insulated Type
- Soft Recovery Diode
- AISiC Baseplate

APPLICATION

Traction drives, High Reliability Converters / Inverters, DC choppers

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



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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 _t ²	Surge current load integral		980	kA ² s
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	T _j = 25°C	—	0.65	—	μs
			T _j = 125°C	—	0.85	—	
			T _j = 150°C	—	0.95	—	
I _{rr}	Reverse recovery current	-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	T _j = 25°C	—	1200	—	A
			T _j = 125°C	—	1450	—	
			T _j = 150°C	—	1500	—	
Q _{rr}	Reverse recovery charge	L _s = 100 nH Inductive load	T _j = 25°C	—	1000	—	μC
			T _j = 125°C	—	1650	—	
			T _j = 150°C	—	1950	—	
E _{rec(10%)}	Reverse recovery energy ^(Note 1)	L _s = 100 nH Inductive load	T _j = 25°C	—	1.05	—	J
			T _j = 125°C	—	1.75	—	
			T _j = 150°C	—	2.00	—	
E _{rec}	Reverse recovery energy	L _s = 100 nH Inductive load	T _j = 25°C	—	1.20	—	J
			T _j = 125°C	—	2.00	—	
			T _j = 150°C	—	2.30	—	

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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, $\lambda_{grease} = 1 \text{ W/m}\cdot\text{k}$ $D_{(c-s)} = 100 \mu\text{m}$ (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	$T_c = 25^\circ\text{C}$, 1/2 module	—	0.14	—	mΩ

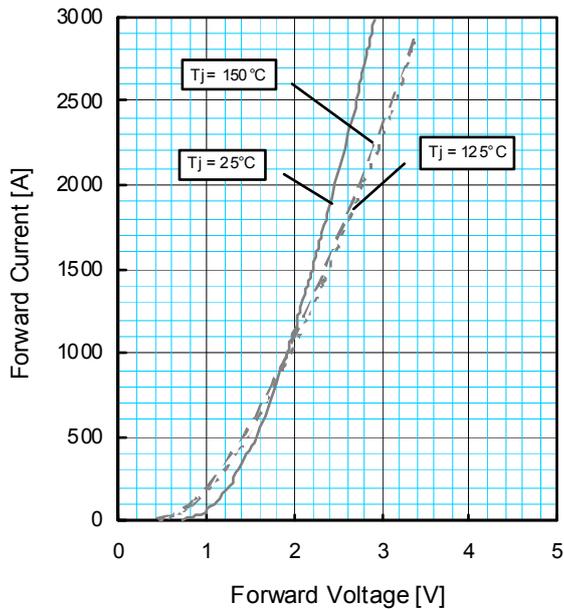
Note 1. $E_{rec(10\%)}$ is the integral of $0.1V_R \times 0.1I_F \times dt$.

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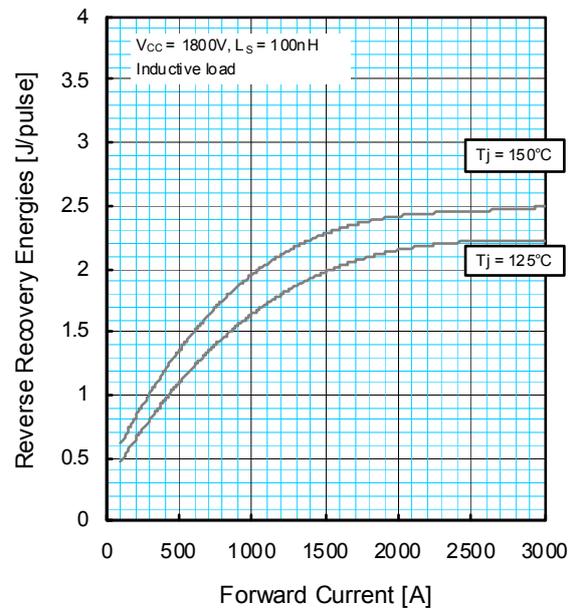
HIGH POWER SWITCHING USE
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PERFORMANCE CURVES

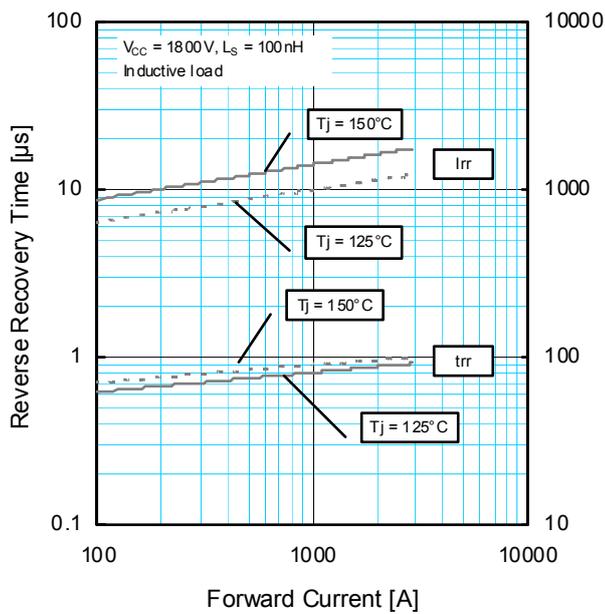
FORWARD CHARACTERISTICS (TYPICAL)



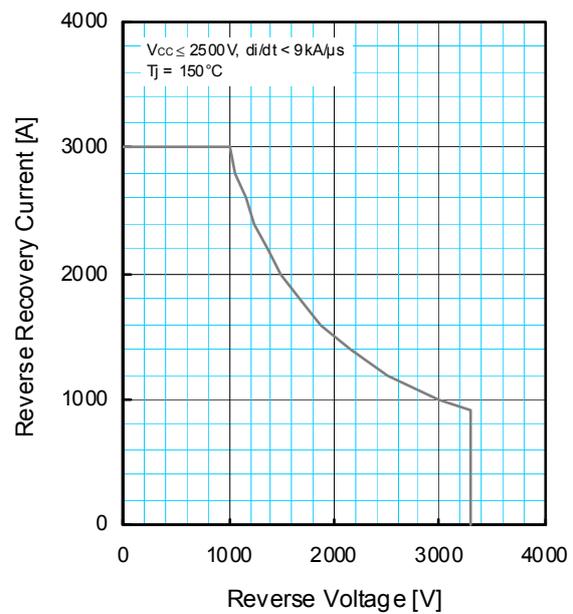
REVERSE RECOVERY ENERGY CHARACTERISTICS (TYPICAL)



REVERSE RECOVERY CHARACTERISTICS (TYPICAL)

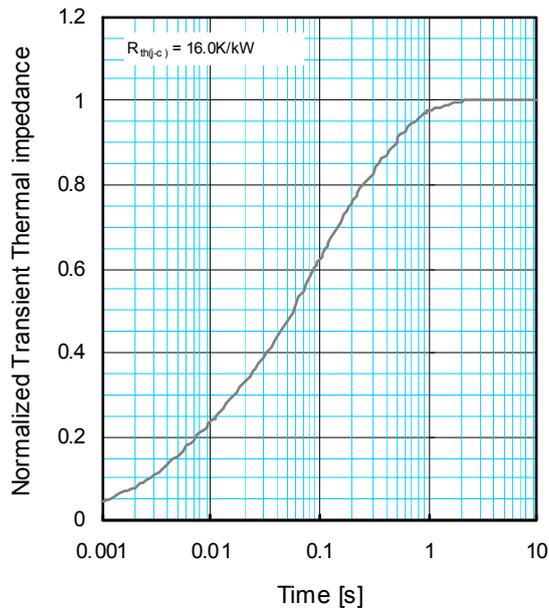


REVERSE RECOVERY SAFE OPERATING AREA (RRSOA)



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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