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Approved by	H. Yamaguchi	: Apr. 2009

MITSUBISHI HVDi MODULES
RM1500DC-66F
HIGH POWER SWITCHING USE
INSULATED TYPE

HVDi (High Voltage Diode) Modules

RM1500DC-66F

N/A

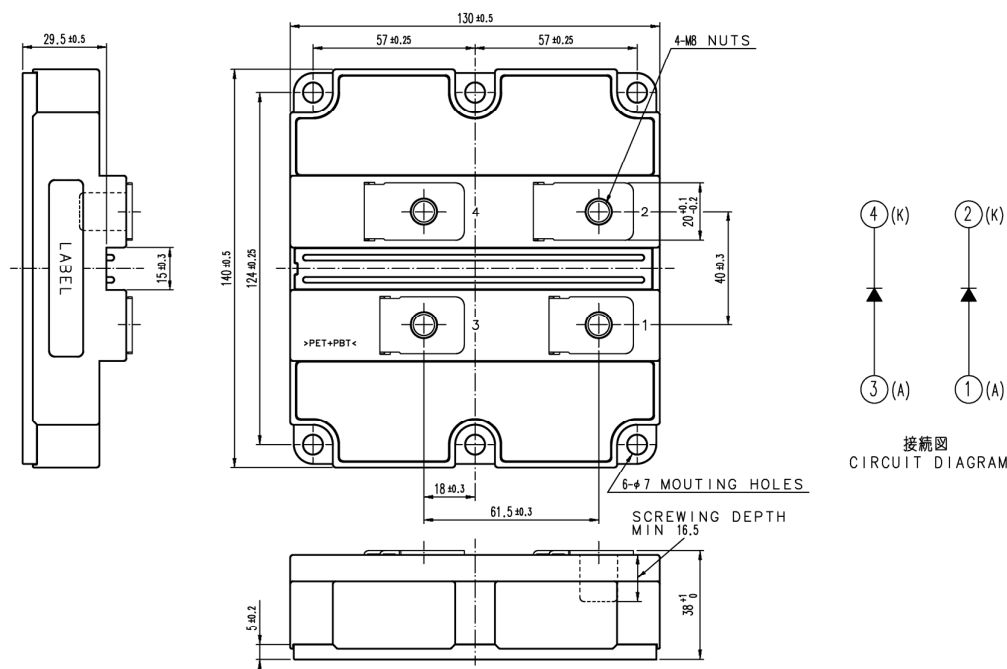
- I_F 2 x 1500 A
- V_{rm} 3300 V
- 2-element in a Pack
- Insulated Type
- Soft Recovery Diode
- AISiC Baseplate

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...+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	Collector current	DC, T _c = 25°C	1500	A
I _{FM}		Pulse ^(Note 1)	3000	A
I _{FSM}	Surge (non-repetitive) forward current	T _J = 125°C, V _R = 0 V, t = 10 ms	14.0	kA
I ² t	Surge forward current integral	T _J = 125°C, V _R = 0 V, t = 10 ms	980	kA ² s
V _{iso}	Isolation voltage	RMS, sinusoidal, f = 60Hz, t = 1 min.	6000	V
V _e	Partial discharge extinction voltage	RMS, sinusoidal, f = 60Hz, Q _{PD} ≤ 10 pC	2600	V
T _J	Junction temperature		-50 ~ +150	°C
T _{op}	Operating 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 ^(Note 2)	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		T _J = 25°C	—	0.55	—	μs
			T _J = 125°C	—	0.75	—	
			T _J = 150°C	—	0.85	—	
I _{rr}	Reverse recovery current	V _{CC} = 1800 V I _C = 1500 A V _{GE} = ±15 V L _s = 100 nH	T _J = 25°C	—	1200	—	A
			T _J = 125°C	—	1450	—	
			T _J = 150°C	—	1500	—	
Q _{rr}	Reverse recovery charge	-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	—	1050	—	μC
			T _J = 125°C	—	1700	—	
			T _J = 150°C	—	2000	—	
E _{rec(10%)}	Reverse recovery energy ^(Note 3)	Inductive load	T _J = 25°C	—	1.15	—	J/P
			T _J = 125°C	—	1.85	—	
			T _J = 150°C	—	2.10	—	
E _{rec}	Reverse recovery energy ^(Note 4)		T _J = 25°C	—	1.30	—	J/P
			T _J = 125°C	—	2.10	—	
			T _J = 150°C	—	2.40	—	

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THERMAL CHARACTERISTICS

Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
$R_{th(j-c)}$	Thermal resistance	Junction to Case, 1/2 module	—	—	16.0	K/kW
$R_{th(c-f)}$	Contact thermal resistance	Case to Fin, $\lambda_{grease} = 1W/m \cdot K$ $D_{(c-f)} = 100 \mu m$, 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	—	nH
R_{AA+KK}	Internal lead resistance	$T_c = 25^\circ C$, 1/2 module	—	0.24	—	m Ω

- 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. $E_{rec(10\%)}$ is the integral of $0.1V_R \times 0.1I_F \times dt$.
 Note 4. The integration range of E_{rec} according to IEC 60747.

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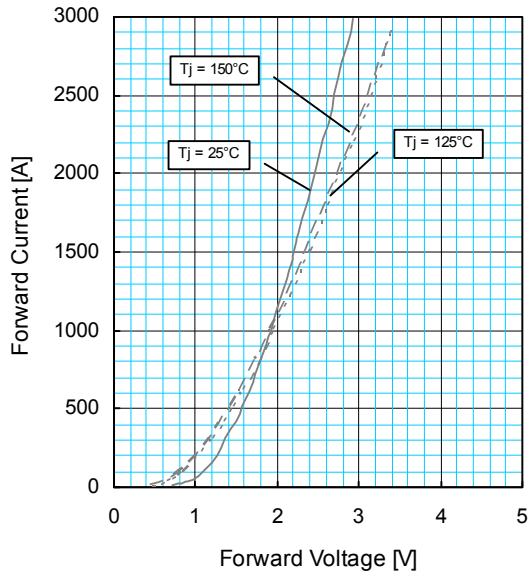
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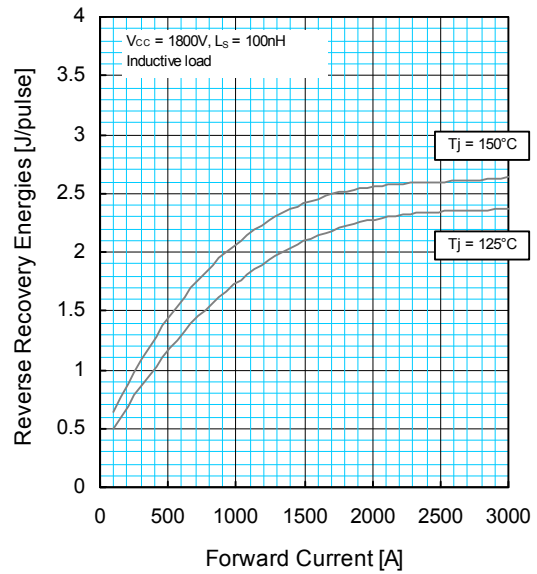
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PERFORMANCE CURVES

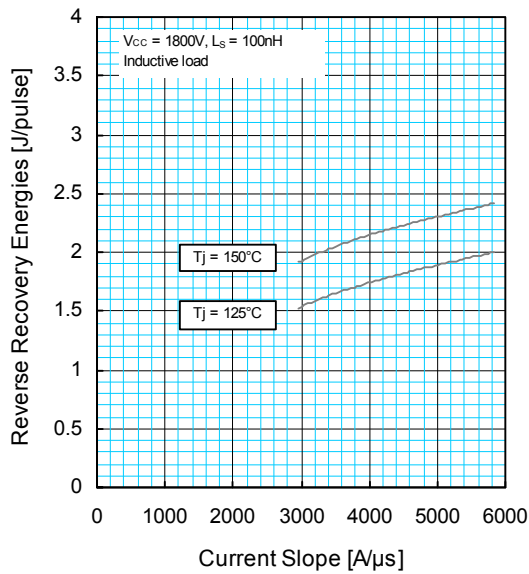
**FORWARD CHARACTERISTICS
(TYPICAL)**



**REVERSE RECOVERY CHARACTERISTICS
(TYPICAL)**



**REVERSE RECOVERY CHARACTERISTICS
(TYPICAL)**



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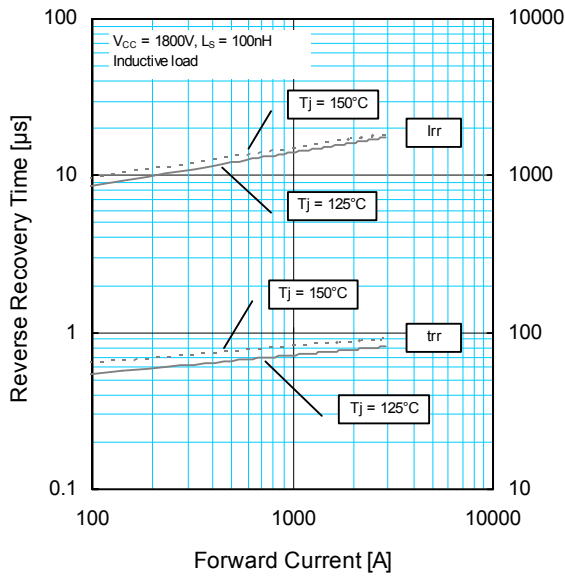
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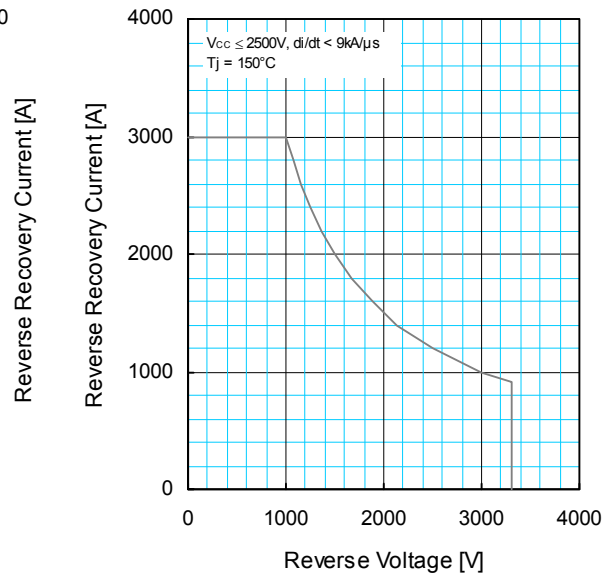
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PERFORMANCE CURVES

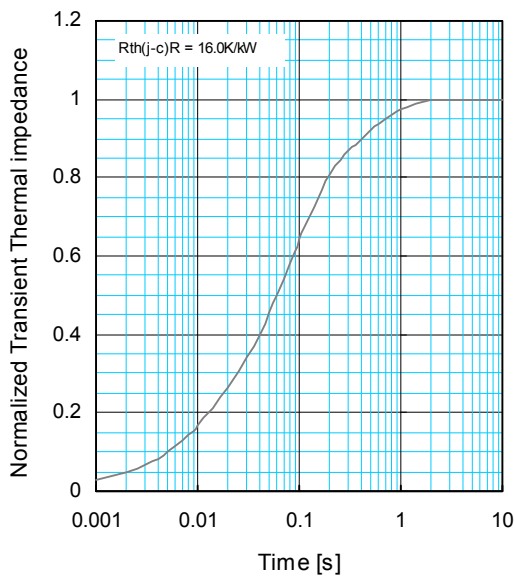
REVERSE RECOVERY CHARACTERISTICS (TYPICAL)



REVERSE RECOVERY SAFE OPERATING AREA (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS



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

R_i [K/KW] :	0.0059	0.0978	0.6571	0.2392
τ_i [sec] :	0.0002	0.0074	0.0732	0.4488

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