

< HIGH VOLTAGE DIODE MODULES >

RM1200DG-66X

HIGH POWER SWITCHING USE
INSULATED TYPE

High Voltage Diode Modules

RM1200DG-66X



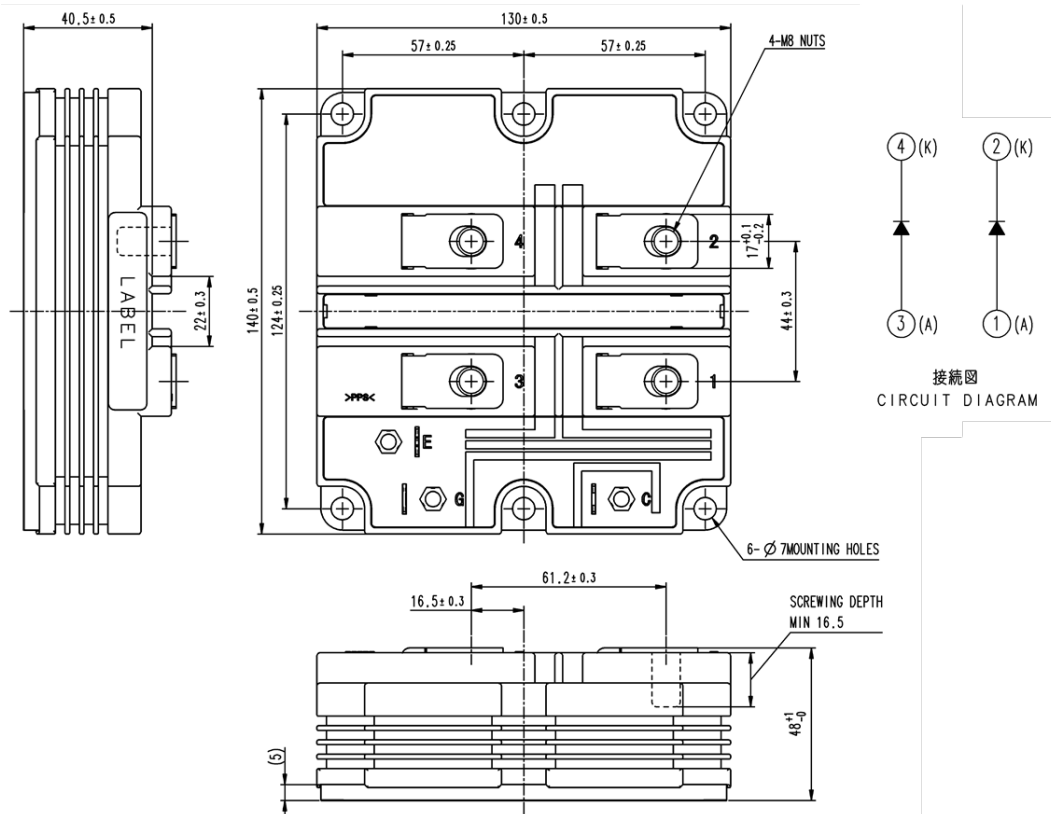
- I_F2 x 1200A
- V_{RRM}3300V
- 2-element in a Pack
- High Insulated Type
- RFC Diode
- AISiC Baseplate

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	
I _F	Forward current	DC, T _c = 90°C	1200	A
I _{FRM}		Pulse ^(Note1)	2400	A
I _{FSM}	Surge (non-repetitive) forward current	T _{j_start} = 125°C, t _p = 10 ms, Half-sine wave, V _R = 0 V	10.6	kA
I ₂	Surge current load integral		561	kA ² s
P _{tot}	Maximum power dissipation	T _c = 25°C	7500	W
V _{iso}	Isolation voltage	RMS, sinusoidal, f = 60 Hz, t = 1 min.	10200	V
Q _{pd}	Partial discharge	V ₁ = 6900 V _{rms} , V ₂ = 5100 V _{rms} , 60 Hz	10	pC
T _j	Junction temperature		-50 ~ +150	°C
T _{top}	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	—	33.0	
V _{FM} (Chip)	Forward voltage	I _F = 1200 A ^(Note 2)	T _j = 25°C	—	2.20	V
			T _j = 125°C	—	2.40	
			T _j = 150°C	—	2.50	
V _{FM} (Terminal)	Forward voltage	I _F = 1200 A ^(Note 2)	T _j = 25°C	—	2.65	V
			T _j = 125°C	—	2.90	
			T _j = 150°C	—	3.05	
t _{rr}	Reverse recovery time		T _j = 25°C	—	1.20	μs
			T _j = 125°C	—	1.35	
			T _j = 150°C	—	1.40	
I _{rr}	Reverse recovery current	V _{CC} = 1800 V I _F = 1200 A	T _j = 25°C	—	1700	A
			T _j = 125°C	—	1450	
			T _j = 150°C	—	1550	
Q _{rr(10%)}	Reverse recovery charge ^(Note 3)	-d _I /d _t = 3350 A/μs @ T _j = 25°C 3050 A/μs @ T _j = 125°C 3000 A/μs @ T _j = 150°C	T _j = 25°C	—	1050	μC
			T _j = 125°C	—	1600	
			T _j = 150°C	—	1650	
Q _{rr}	Reverse recovery charge		T _j = 25°C	—	1200	μC
			T _j = 125°C	—	1750	
			T _j = 150°C	—	1800	
E _{rec(10%)}	Reverse recovery energy ^(Note 4)	L _s = 225 nH Inductive load	T _j = 25°C	—	1.25	J
			T _j = 125°C	—	1.75	
			T _j = 150°C	—	2.00	
E _{rec}	Reverse recovery energy		T _j = 25°C	—	1.35	J
			T _j = 125°C	—	1.85	
			T _j = 150°C	—	2.10	

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THERMAL CHARACTERISTICS

Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
$R_{th(l-c)}$	Thermal resistance	Junction to Case (per 1/2 module)	—	—	16.5	K/kW
$R_{th(c-s)}$	Contact thermal resistance	Case to heat sink, $\lambda_{grease} = 1 \text{ W/m}^2\text{K}$ $D_{(c-s)} = 80 \mu\text{m}$ (per 1/2 module)	—	15.0	—	K/kW

MECHANICAL CHARACTERISTICS

Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
M_t	Mounting torque	M8 : Main terminals screw	7.0	—	19.0	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		26.0	—	—	mm
d_s	Creepage distance		56.0	—	—	mm
$L_{P_{AK}}$	Parasitic stray inductance		—	41	—	nH
R_{AA+KK}	Internal lead resistance	$T_c = 25^\circ\text{C}$, 1/2 module	—	0.36	—	mΩ

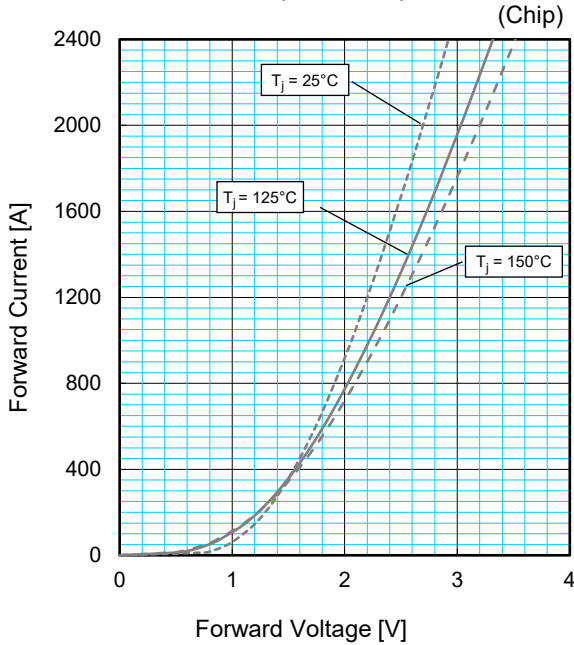
- Note 1. Pulse width and repetition rate should be such that junction temperature (T_j) does not exceed T_{opmax} rating (150°C).
Note 2. Pulse width and repetition rate should be such as to cause negligible temperature rise.
Note 3. The integration range of reverse recovery charge is from $I_F = 0\text{A}$ to $10\%I_F$.
Note 4. The integration range of switching energies is from $10\%V_R$ to $10\%I_F$.
Note 5. Definition of all item is according to IEC 60747, unless otherwise specified.

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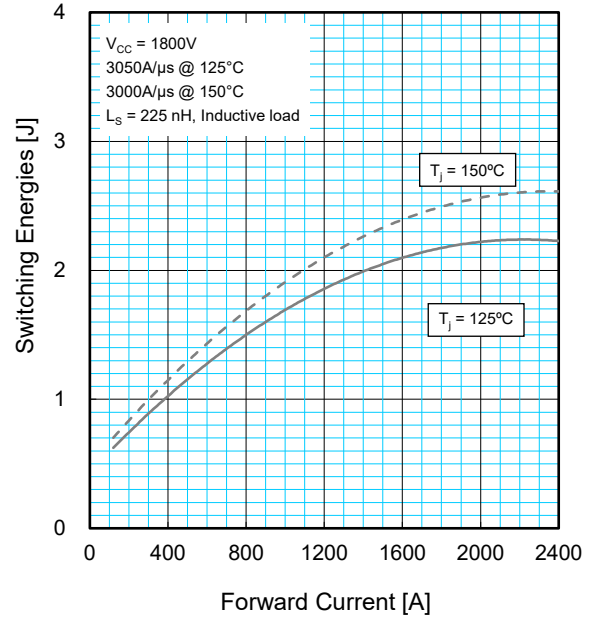
HIGH POWER SWITCHING USE
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PERFORMANCE CURVES

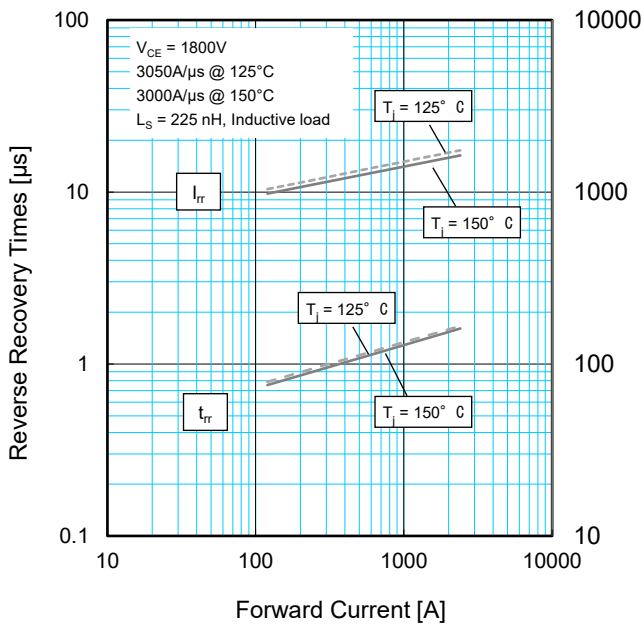
FORWARD CHARACTERISTICS (TYPICAL)



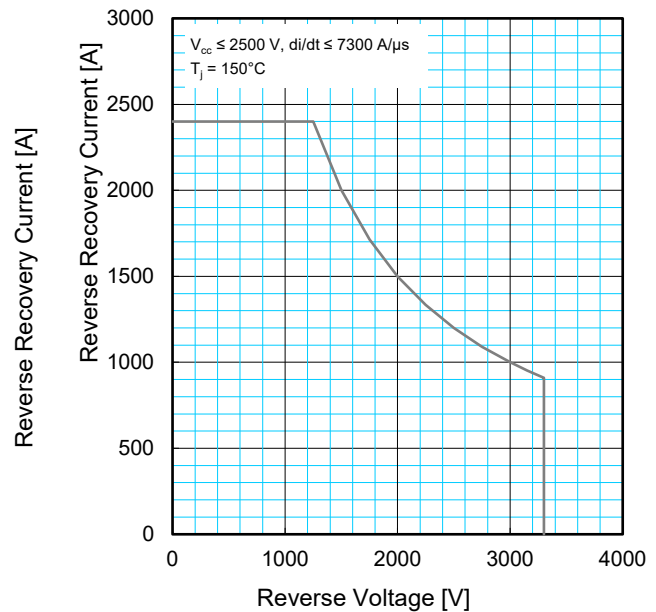
REVERSE RECOVERY ENERGY CHARACTERISTICS (TYPICAL)



REVERSE RECOVERY CHARACTERISTICS (TYPICAL)

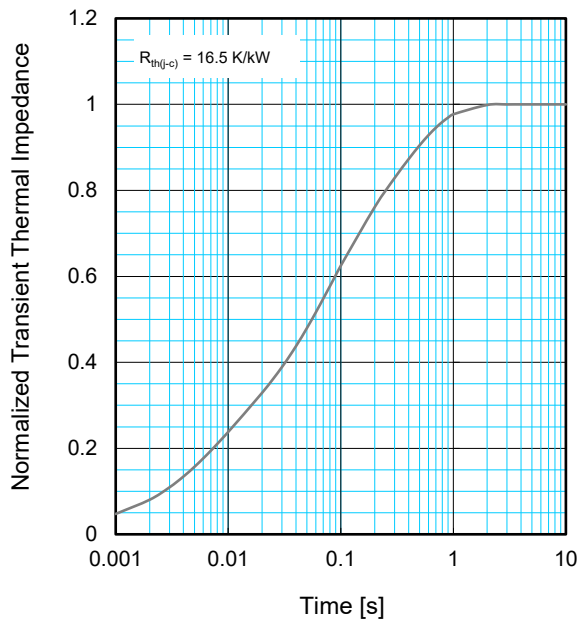


REVERSE RECOVERY SAFE OPERATING AREA (RRSOA)



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
$R_i / R_{th(j-c)}$:	0.0096	0.1893	0.4044	0.3967
τ_i [sec]:	0.0001	0.0058	0.0602	0.3512

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