

< HIGH VOLTAGE DIODE MODULES >

RM1200DG-90F

HIGH POWER SWITCHING USE
INSULATED TYPE

High Voltage Diode Modules

RM1200DG-90F



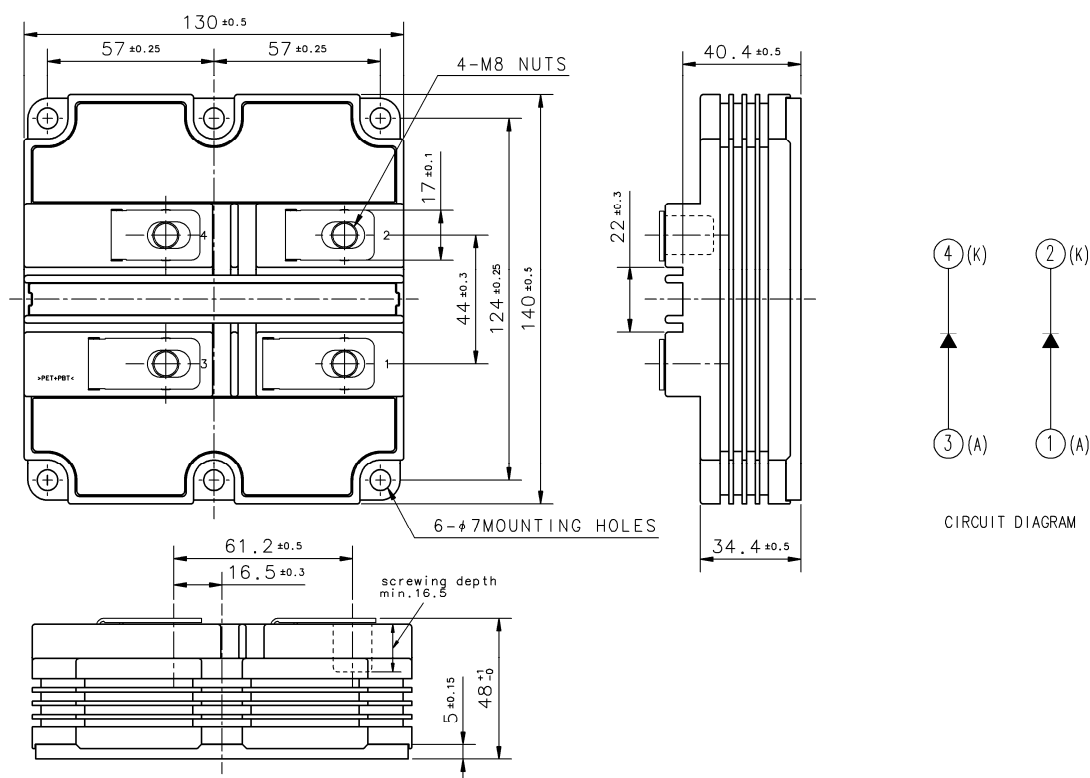
- I_F 1200A
- V_{RRM} 4500V
- 2-element in a Pack
- High insulated Type
- Soft Recovery Diode
- AISiC Baseplate

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	$T_j = -40 \dots +125^\circ\text{C}$	4500	V
		$T_j = -50^\circ\text{C}$	4400	
I_F	Forward current	DC, $T_c = 65^\circ\text{C}$	1200	A
I_{FSM}	Surge forward current	$T_{j_start} = 125^\circ\text{C}$, $t_p = 10$ ms, Half-sine wave, $V_R = 0$ V	9.8	kA
I_t^2	Surge current load integral		480	kA^2s
P_{tot}	Maximum power dissipation	$T_c = 25^\circ\text{C}$	6250	W
V_{iso}	Isolation voltage	RMS, sinusoidal, $f = 60$ Hz, $t = 1$ min.	10200	V
V_e	Partial discharge extinction voltage	RMS, sinusoidal, $f = 60$ Hz, $Q_{PD} \leq 10$ pC	3500	V
T_j	Junction temperature		$-50 \sim +150$	$^\circ\text{C}$
T_{jop}	Operating junction temperature		$-50 \sim +125$	$^\circ\text{C}$
T_{stg}	Storage temperature		$-55 \sim +125$	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS

Symbol	Item	Conditions		Limits			Unit
				Min	Typ	Max	
I _{RRM}	Repetitive reverse current	V _{RM} = V _{RRM}	T _J = 25°C	—	—	3.0	mA
			T _J = 125°C	—	9.0	—	
V _{FM}	Forward voltage	I _F = 1200 A	T _J = 25°C	—	2.55	—	V
			T _J = 125°C	—	2.85	3.45	
t _{rr}	Reverse recovery time	V _{CC} = 2800 V I _F = 1200 A	T _J = 25°C	—	0.70	—	μs
			T _J = 125°C	—	0.90	—	
I _{rr}	Reverse recovery current	-d _i /d _t = 3900 A/μs @ T _J = 25°C -d _i /d _t = 3600 A/μs @ T _J = 125°C L _s = 150 nH	T _J = 25°C	—	1050	—	A
			T _J = 125°C	—	1140	—	
Q _{r0Hr}	Reverse recovery charge	Inductive load	T _J = 25°C	—	990	—	μC
			T _J = 125°C	—	1560	—	
E _{rec(10%)}	Reverse recovery energy ^(Note 1)		T _J = 25°C	—	1.44	—	J
			T _J = 125°C	—	2.25	—	
E _{rec}	Reverse recovery energy		T _J = 25°C	—	1.65	—	J
			T _J = 125°C	—	2.55	—	

THERMAL CHARACTERISTICS

Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
$R_{th(j-c)}$	Thermal resistance	Junction to Case (per 1/2 module)	—	—	20.0	K/kW
$R_{th(c-s)}$	Contact thermal resistance	Case to heat sink, $\lambda_{grease} = 1$ W/ m^2K $D_{(c-s)} = 100$ μm (per 1/2 module)	—	16.0	—	K/kW

MECHANICAL CHARACTERISTICS

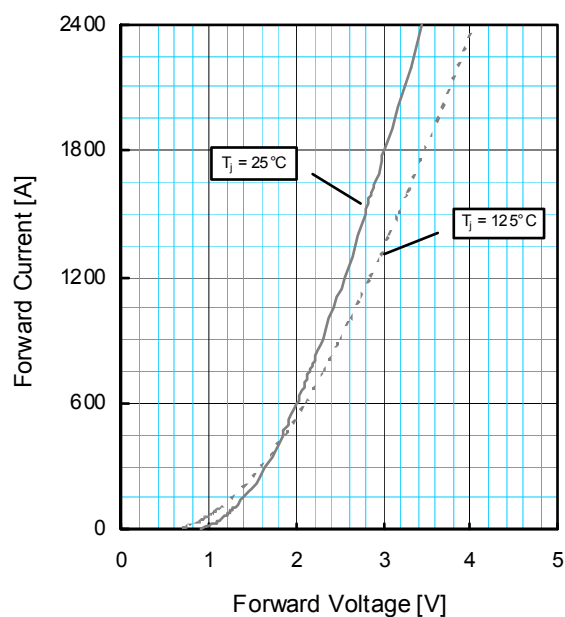
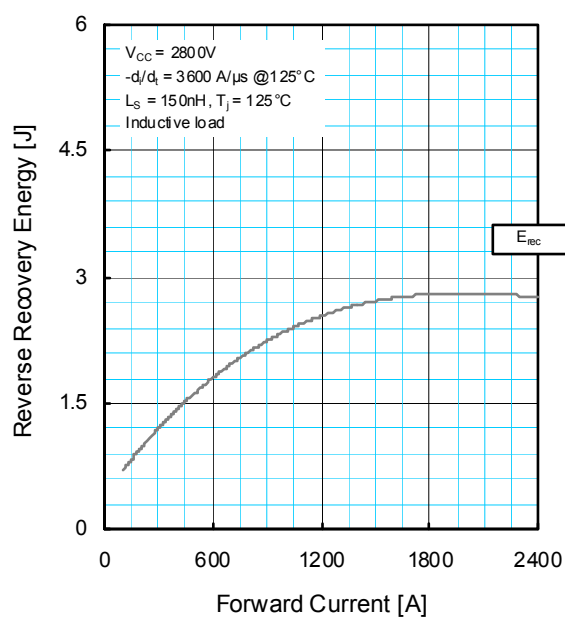
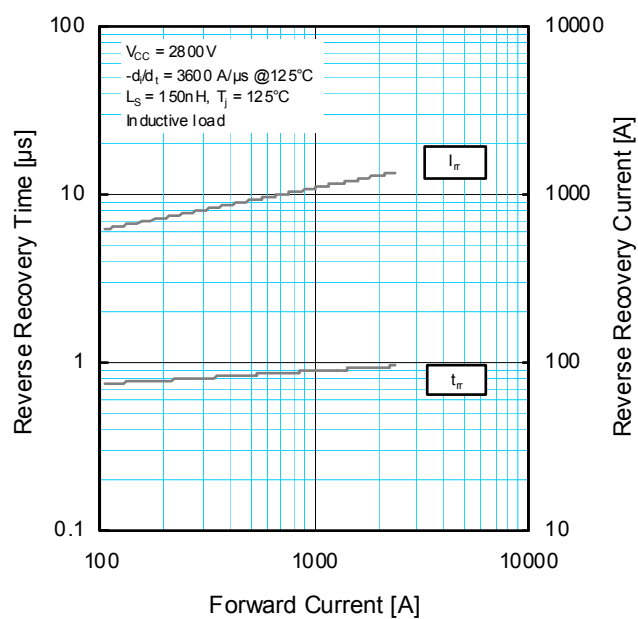
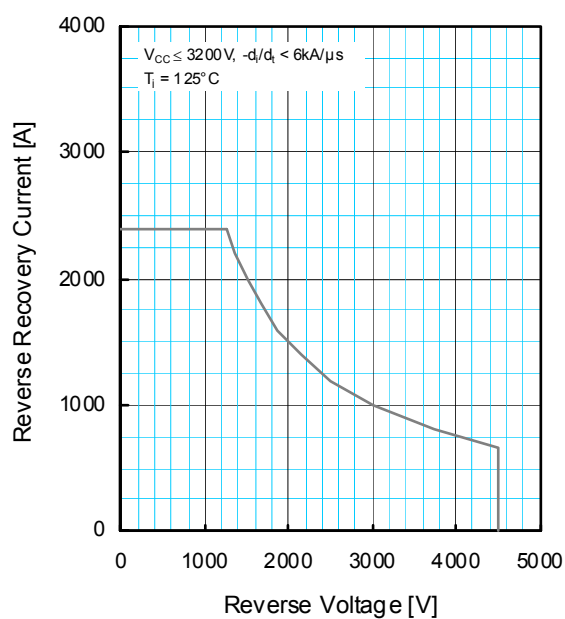
Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
M_t	Mounting torque	M8 : Main terminals screw	7.0	—	22.0	N·m
M_s		M6 : Mounting screw	3.0	—	6.0	N·m
m	Mass		—	1.0	—	kg
CTI	Comparative tracking index		600	—	—	—
d_a	Clearance		26.0	—	—	mm
d_s	Creepage distance		56.0	—	—	mm
L_{PAK}	Parasitic stray inductance		—	15.0	—	nH
$R_{AA+KK'}$	Internal lead resistance	$T_c = 25^\circ\text{C}$	—	0.09	—	m Ω

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

Note 2. Definition of all items is according to IEC 60747, unless otherwise specified.

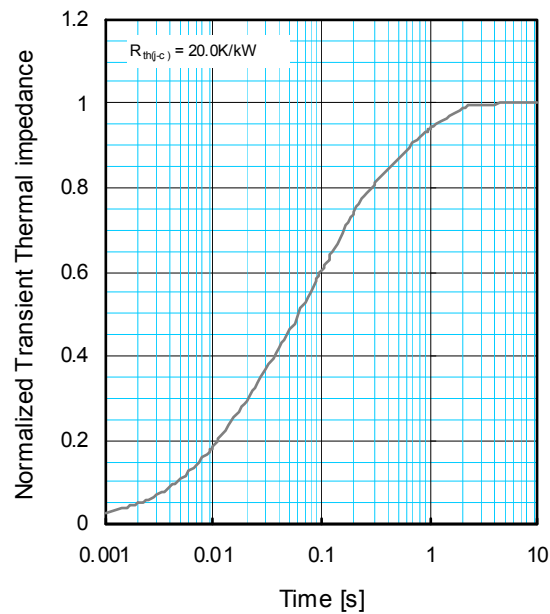
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PERFORMANCE CURVES

**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]	0.0055	0.2360	0.4680	0.2905
τ_i [sec]	0.0001	0.0131	0.0878	0.6247

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