

< HIGH VOLTAGE DIODE MODULES >

RM600DC-66X

HIGH POWER SWITCHING USE
INSULATED TYPE

High Voltage Diode Modules

RM600DC-66X



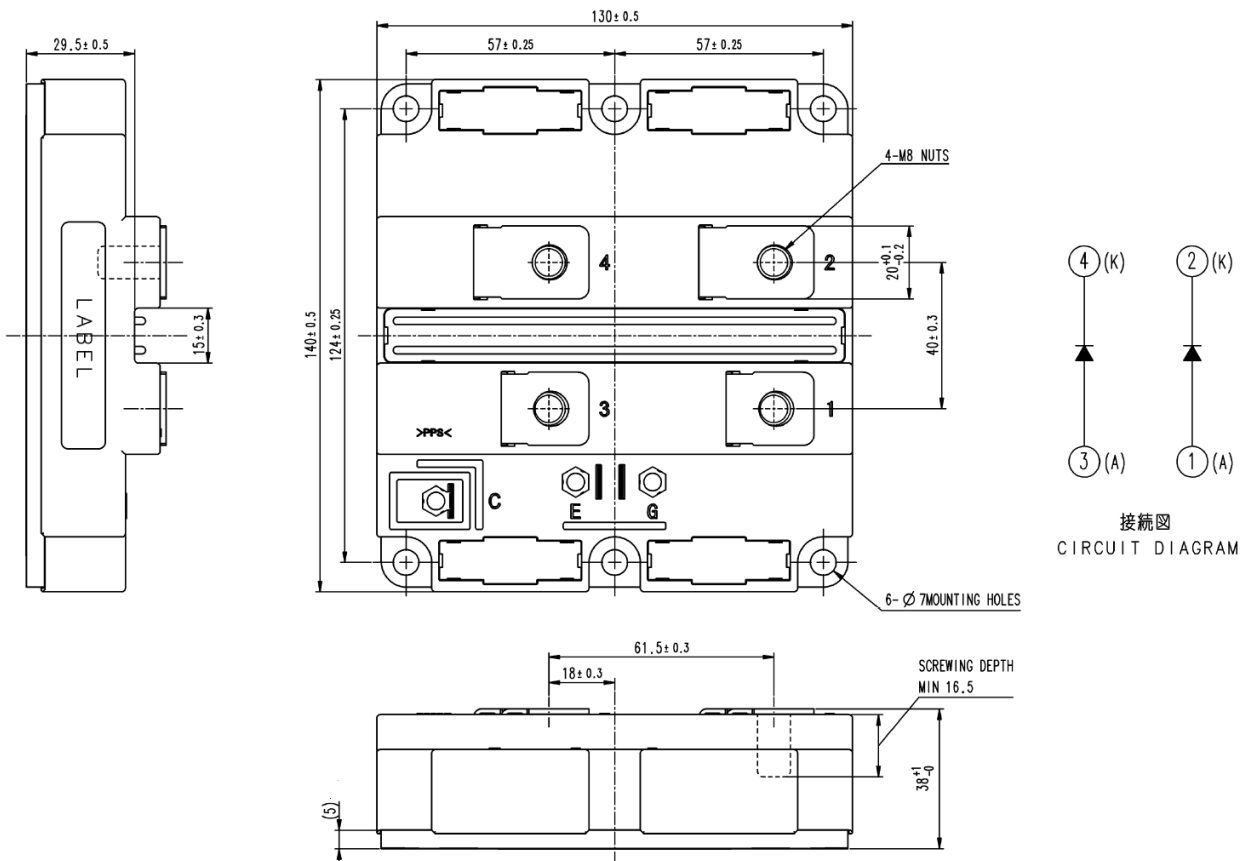
- I_F2 x 600A
- V_{RRM}3300V
- 2-element in a Pack
- Insulated Type
- RFC Diode
- AISiC Baseplate

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	Rated	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	600	A
I _{FSM}	Surge (non-repetitive) forward current	T _{j_start} = 150°C, t _p = 10 ms, Half-sine wave, V _R = 0 V	5.8	kA
I _t ²	Surge current load integral		168	kA ² s
P _{tot}	Maximum power dissipation	T _c = 25°C	3750	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 _{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	—	—	1.0	mA
			T _j = 125°C	—	1.0	—	
			T _j = 150°C	—	6.0	—	
V _{FM}	Forward voltage (Note 1)	I _F = 600 A	T _j = 25°C	—	2.20	—	V
			T _j = 125°C	—	2.40	—	
			T _j = 150°C	—	2.50	3.00	
t _{rr}	Reverse recovery time		T _j = 25°C	—	0.95	—	μs
			T _j = 125°C	—	1.10	—	
			T _j = 150°C	—	1.15	—	
I _{rr}	Reverse recovery current	V _{CC} = 1800V I _F = 600 A	T _j = 25°C	—	900	—	A
			T _j = 125°C	—	780	—	
			T _j = 150°C	—	830	—	
Q _{rr(10%)}	Reverse recovery charge	-d _F /d _t = 2200 A/μs @ T _j = 25°C 1950 A/μs @ T _j = 125°C 1950 A/μs @ T _j = 150°C	T _j = 25°C	—	530	—	μC
			T _j = 125°C	—	800	—	
			T _j = 150°C	—	830	—	
Q _{rr}	Reverse recovery charge	L _s = 300 nH Inductive load	T _j = 25°C	—	600	—	μC
			T _j = 125°C	—	870	—	
			T _j = 150°C	—	900	—	
E _{rec(10%)}	Reverse recovery energy per pulse (Note 2)		T _j = 25°C	—	0.55	—	J
			T _j = 125°C	—	0.80	—	
			T _j = 150°C	—	0.90	—	
E _{rec}	Reverse recovery energy per pulse		T _j = 25°C	—	0.60	—	J
			T _j = 125°C	—	0.90	—	
			T _j = 150°C	—	1.00	—	

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THERMAL CHARACTERISTICS

Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
$R_{th(f-c)}$	Thermal resistance	Junction to Case (per 1/2 module)	—	—	33.0	K/kW
$R_{th(c-s)}$	Contact thermal resistance	Case to heat sink, $\lambda_{grease} = 1 \text{ W/m}\cdot\text{k}$ $D_{(c-s)} = 80 \mu\text{m}$ (per 1/2 module)	—	25.6	—	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		—	0.9	—	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	—	24.0	—	nH
$R_{AA+KK'}$	Internal lead resistance	$T_c = 25^\circ\text{C}$, 1/2 module	—	0.27	—	mΩ

Note 1. Pulse width and repetition rate should be such as to cause negligible temperature rise.

Note 2. The integration range of switching energies is from $E_{rec(10\%)}$ is from $10\%V_R$ to $10\%I_F$.

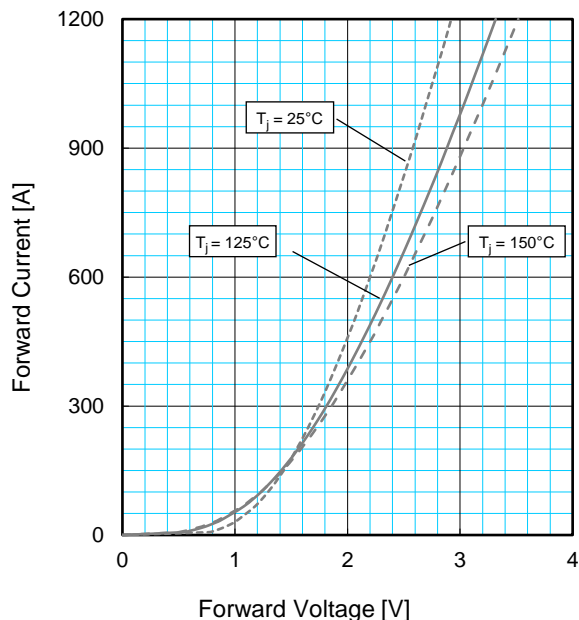
Note 3. Definition of all items is according to IEC 60747, unless otherwise specified.

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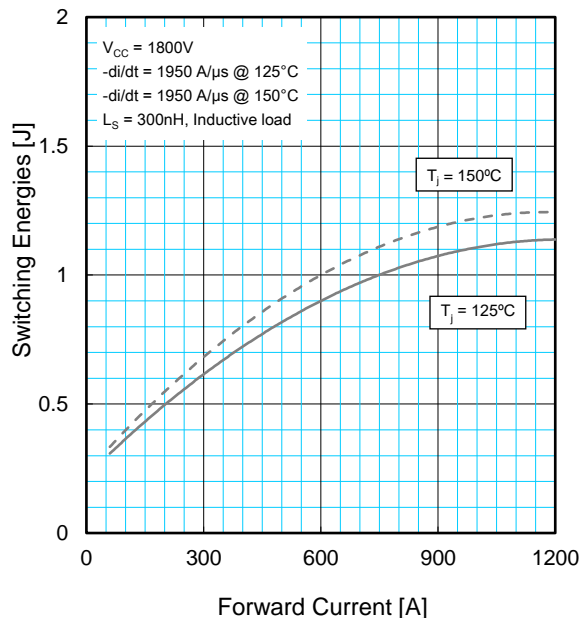
HIGH POWER SWITCHING USE
INSULATED TYPE

PERFORMANCE CURVES

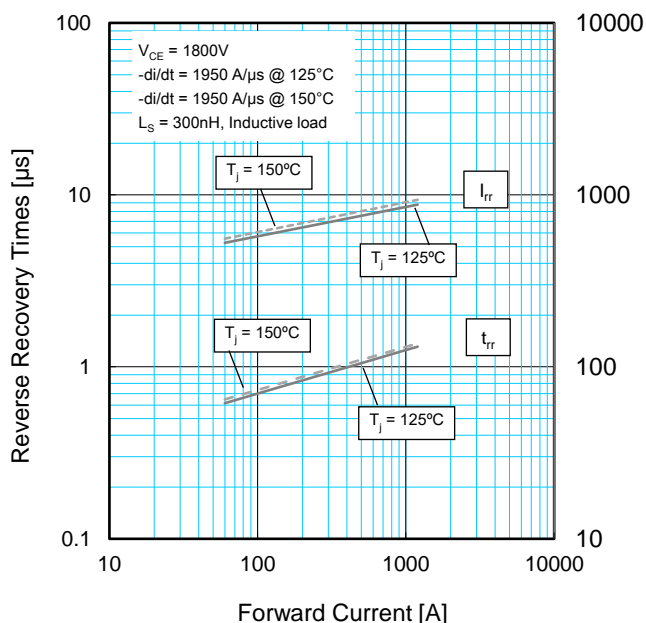
FREE-WHEEL DIODE FORWARD CHARACTERISTICS (TYPICAL)



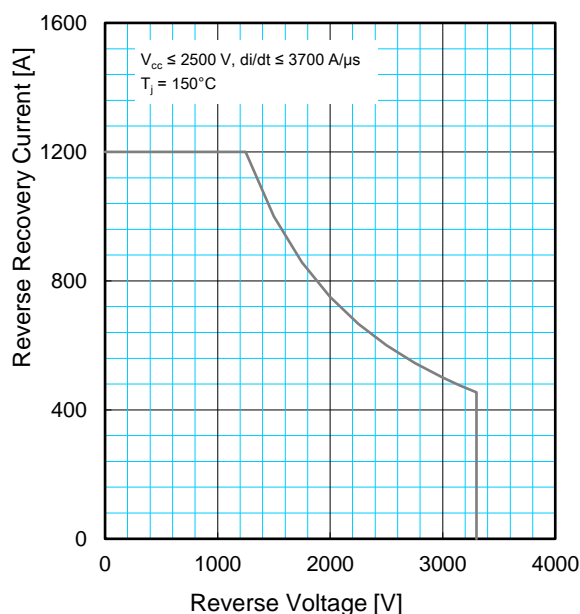
HALF-BRIDGE SWITCHING ENERGY CHARACTERISTICS (TYPICAL)



FREE-WHEEL DIODE REVERSE RECOVERY CHARACTERISTICS (TYPICAL)

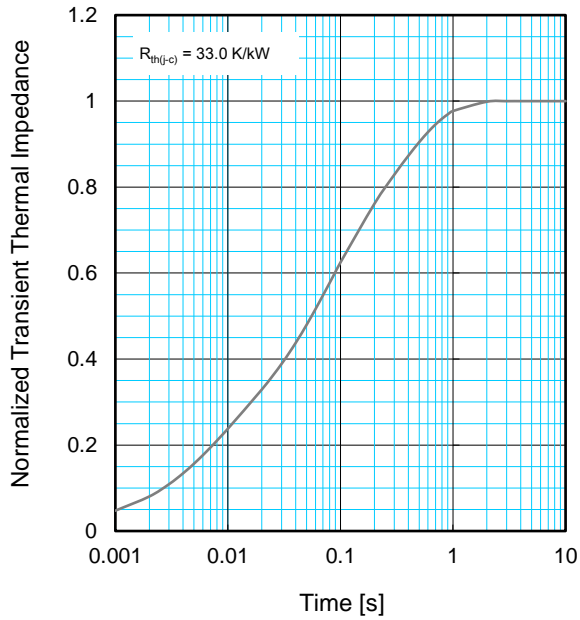


FREE-WHEEL DIODE REVERSE RECOVERY SAFE OPERATING AREA (RRSOA)



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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