

< HIGH VOLTAGE DIODE MODULES >

RM250DG-130F

HIGH POWER SWITCHING USE
INSULATED TYPE

High Voltage Diode Modules

RM250DG-130F



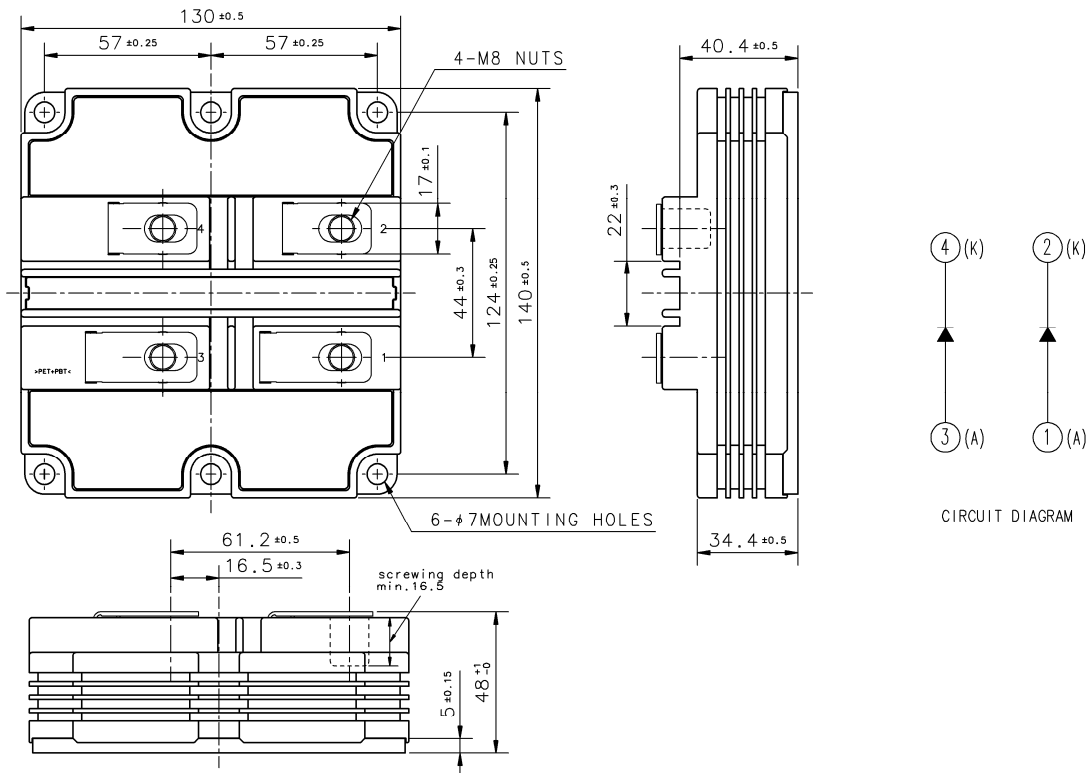
- I_F250A
- V_{RRM}6500V
- 2-element in a Pack
- High insulated Type
- Soft Recovery Diode
- AISiC Baseplate

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 = +125°C	6500	V
		T _j = +25°C	6300	
		T _j = -50°C	5700	
V _{RSM}	Non-repetitive peak reverse voltage	T _j = +125°C	6500	V
		T _j = +25°C	6300	
		T _j = -50°C	5700	
I _F	Collector current	DC, T _c = 65°C	250	A
I _{FRM}		Pulse ^(Note 1)	500	A
I _{FSM}	Surge (non-repetitive) forward current	T _{L,start} = 125°C, t _p = 10 ms, Half-sine wave, V _R = 0 V	2350	A
I _t ²	Surge current load integral		28	kA ² s
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} ≤ 10 pC	5100	V
T _j	Junction temperature		-50 ~ +150	°C
T _{jop}	Operating junction temperature		-50 ~ +125	°C
T _{stg}	Storage temperature		-55 ~ +125	°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	10.0	
V _{FM}	Forward voltage	I _F = 250 A ^(Note 2)	T _j = 25°C	—	3.30	—	V
			T _j = 125°C	—	3.40	4.30	
t _{rr}	Reverse recovery time	V _{CC} = 3600 V I _F = 250 A L _s = 150 nH	T _j = 25°C	—	0.50	—	μs
			T _j = 125°C	—	0.60	—	
I _{rr}	Reverse recovery current		T _j = 25°C	—	260	—	A
			T _j = 125°C	—	290	—	
Q _{rr}	Reverse recovery charge	-d _i /d _t = 1250 A/μs @ T _j = 25°C 1100 A/μs @ T _j = 125°C	T _j = 25°C	—	240	—	μC
			T _j = 125°C	—	340	—	
E _{rec(10%)}	Reverse recovery energy ^(Note 3)		T _j = 25°C	—	0.30	—	J
			T _j = 125°C	—	0.60	—	
E _{rec}	Reverse recovery energy ^(Note 4)	Inductive load	T _j = 25°C	—	0.40	—	J
			T _j = 125°C	—	0.80	—	

RM250DG-130FHIGH POWER SWITCHING USE
INSULATED TYPE**THERMAL CHARACTERISTICS**

Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
$R_{th(j-c)}$	Thermal resistance	Junction to Case (per 1/2 module)	—	—	75.0	K/kW
$R_{th(c-s)}$	Contact thermal resistance	Case to heat sink, $\lambda_{grease} = 1 \text{ W/m}^2\text{K}$ $D_{(c-s)} = 100 \mu\text{m}$ (per 1/2 module)	—	48.0	—	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
$L_{P AK}$	Parasitic stray inductance	1/2 module	—	44.0	—	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 that junction temperature (T_j) does not exceed T_{opmax} rating (125°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 $0.1V_R \times 0.1I_F \times dt$.

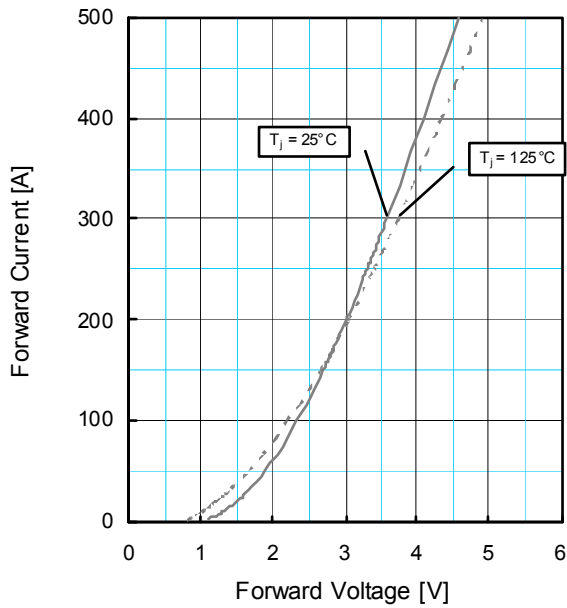
Note 4. The integration range of E_{rec} according to IEC 60747.

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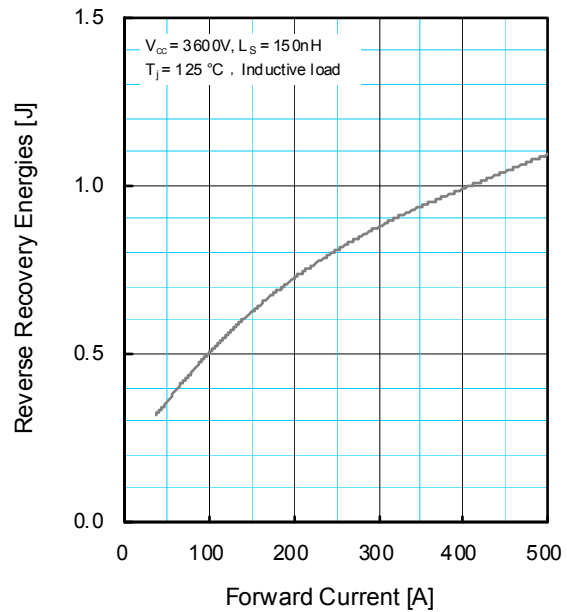
HIGH POWER SWITCHING USE
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PERFORMANCE CURVES

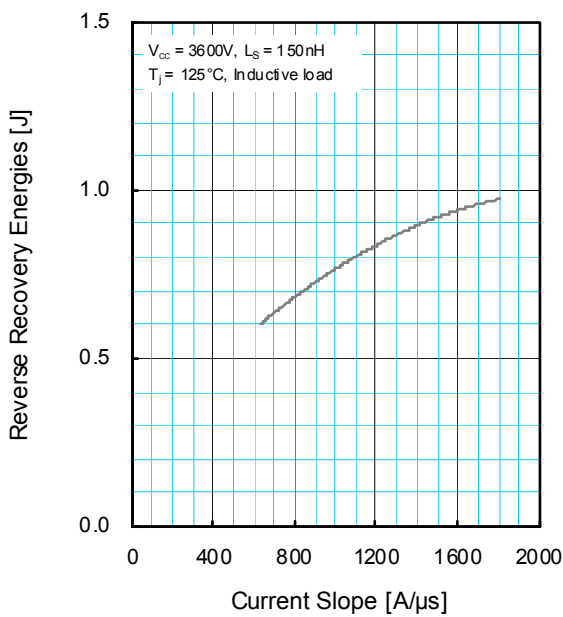
FORWARD CHARACTERISTICS (TYPICAL)



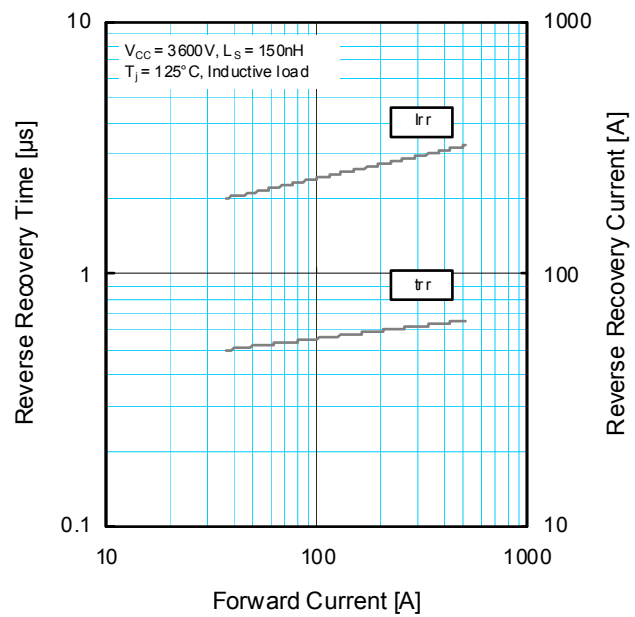
REVERSE RECOVERY ENERGY CHARACTERISTICS (TYPICAL)



REVERSE RECOVERY CHARACTERISTICS (TYPICAL)



REVERSE RECOVERY CHARACTERISTICS (TYPICAL)

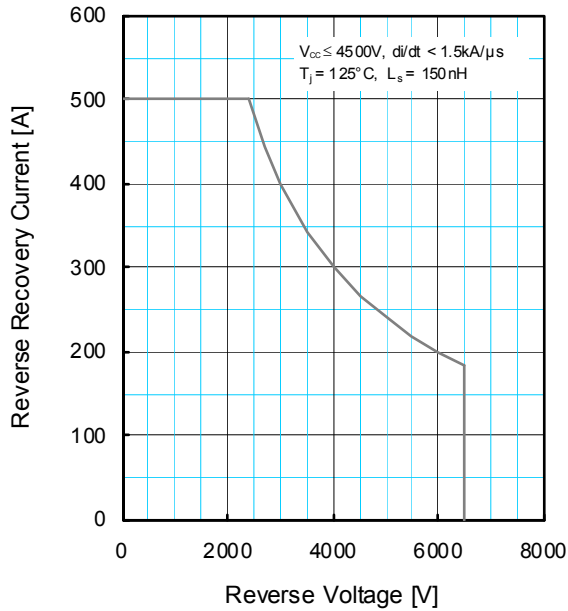


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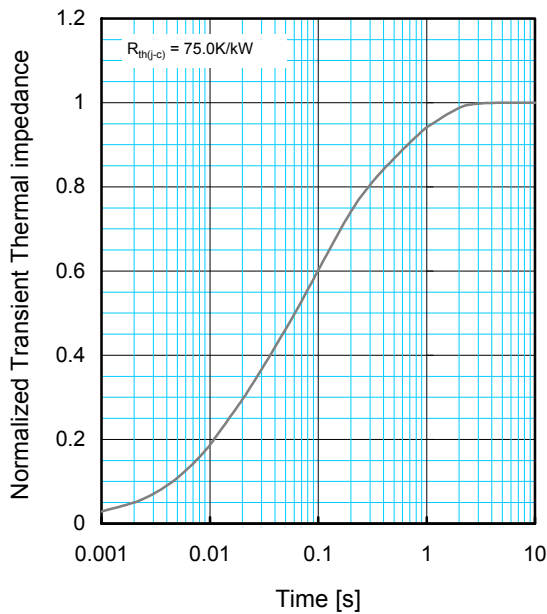
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PERFORMANCE CURVES

REVERSE RECOVERY SAFE OPERATING AREA (RRSOA)



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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