

< HIGH VOLTAGE DIODE MODULES >

RM1800HE-34X

HIGH POWER SWITCHING USE
INSULATED TYPE

High Voltage Diode Modules

RM1800HE-34X



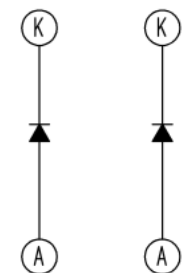
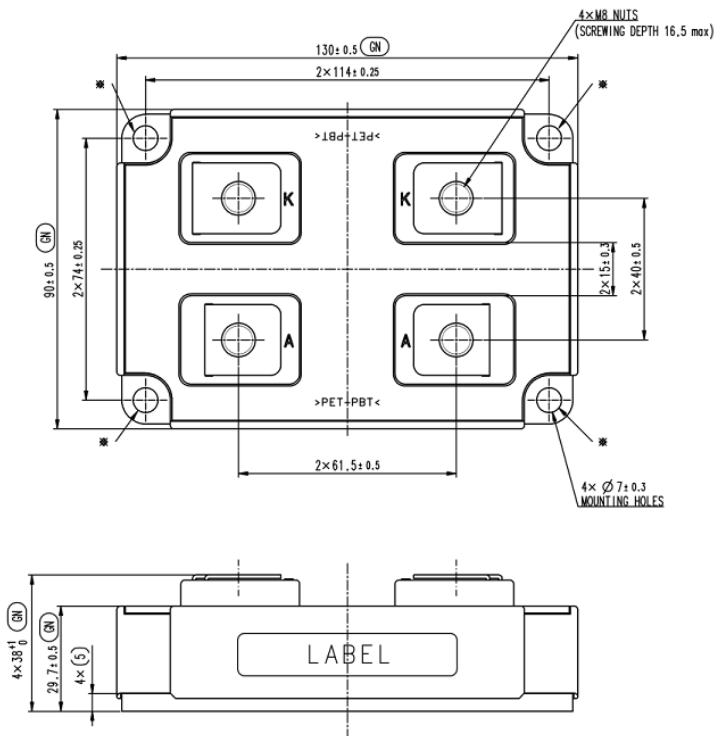
- I_F 1800A
- V_{RRM} 1700V
- 1-element in a Pack
- Insulated Type
- RFC Diode
- AISiC Baseplate

APPLICATION

Traction drives, High Reliability Converters / Inverters, DC choppers

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



接続図
CIRCUIT DIAGRAM

(GN) indicates minimum circumscribed size (ISO 14405-1:2016).

Centerlines are defined by ※ mounting holes centers.

RM1800HE-34X**HIGH POWER SWITCHING USE
INSULATED TYPE****MAXIMUM RATINGS (Tj=25 °C, unless otherwise specified)**

Item	Symbol	Condition	Ratings	Unit
Repetitive peak reverse voltage	V_{RRM}	$T_j = -40 \dots +150 \text{ }^{\circ}\text{C}$	1700	V
		$T_j = -50 \text{ }^{\circ}\text{C}$	1650	V
Non-repetitive peak reverse voltage	V_{RSM}	$T_j = -40 \dots +150 \text{ }^{\circ}\text{C}$	1700	V
		$T_j = -50 \text{ }^{\circ}\text{C}$	1650	V
Forward current	I_F	$T_c = 80 \text{ }^{\circ}\text{C}$, DC The maximum effective current should be 1200Arms. Junction temperature (Tj) should not exceed Tjmax rating (150°C).	1800	A
Repetitive peak forward current	I_{FRM}	Pulse $T_j = 150 \text{ }^{\circ}\text{C}$	3600	A
Isolation voltage	V_{isol}	Charged part to the baseplate RMS sinusoidal, 60Hz 1min. $T_c = 25 \text{ }^{\circ}\text{C}$	6000	V_{rms}
Partial discharge charge	Q_{pd}	Charged part to the baseplate RMS sinusoidal, 60 Hz 1min $V_1 = 3500 \text{ V}$, $V_2 = 2600 \text{ V}$ (acc. to IEC 61287-1)	10	pC
Junction temperature	T_j	Maximum temperature range in off-state or on-state(non-switching)	-50~+150	$^{\circ}\text{C}$
Storage temperature	T_{stg}	Maximum case temperature range in off-state	-55~+150	$^{\circ}\text{C}$
Operating junction temperature	T_{jop}	Maximum junction temperature range for switching operation	-50~+150	$^{\circ}\text{C}$
Reverse recovery power dissipation	P_{rr}	$V_{CC} \leq 1200\text{V}$, $L_s \leq 100\text{nH}$, $I_F \leq 3600\text{A}$, $d_{ion}/d_t \leq 10000\text{A/us}$ $T_j = 150 \text{ }^{\circ}\text{C}$	2.6	MW
Non-repetitive surge forward current	I_{FSM}	$t_b = 10\text{ms}$, $F(t)_{weibull} = 1\%$, Half sine wave $T_j = 150 \text{ }^{\circ}\text{C}$	12900	A
I2t value	I^2t	$t_b = 10\text{ms}$, $F(t)_{weibull} = 1\%$, Half sine wave $T_j = 150 \text{ }^{\circ}\text{C}$	830	kA^2s

ELECTRICAL CHARACTERISTICS (Tj=25 °C, unless otherwise specified)

Item	Symbol	Condiiton	Limits			Unit
			Min.	Typ.	Max.	
Peak reverse recovery current	I_{RRM}	$V_{RM} = 1700 \text{ V}$	$T_j = 25 \text{ }^{\circ}\text{C}$	-	2.00	mA
			$T_j = 125 \text{ }^{\circ}\text{C}$	-	1.00	mA
			$T_j = 150 \text{ }^{\circ}\text{C}$	-	60.00	mA
Forward voltage	V_F (Terminal)	$I_F = 1800 \text{ A}$	$T_j = 25 \text{ }^{\circ}\text{C}$	-	1.95	V
			$T_j = 125 \text{ }^{\circ}\text{C}$	-	2.10	V
			$T_j = 150 \text{ }^{\circ}\text{C}$	-	2.10	V
Forward voltage	V_F (Chip)	$I_F = 1800 \text{ A}$	$T_j = 25 \text{ }^{\circ}\text{C}$	-	1.65	V
			$T_j = 125 \text{ }^{\circ}\text{C}$	-	1.70	V
			$T_j = 150 \text{ }^{\circ}\text{C}$	-	1.70	V
Reverse recovery time	t_{rr}	$V_{CC} = 900 \text{ V}$, $I_F = 1800 \text{ A}$, $L_s = 100 \text{ nH}$ $-diF/dt = 7600\text{A/us@ } T_j = 25 \text{ }^{\circ}\text{C}$ $6800 \text{ A/us@ } T_j = 125 \text{ }^{\circ}\text{C}$ $6800\text{A/us@ } T_j = 150 \text{ }^{\circ}\text{C}$	$T_j = 25 \text{ }^{\circ}\text{C}$	-	0.46	μs
			$T_j = 125 \text{ }^{\circ}\text{C}$	-	0.59	μs
			$T_j = 150 \text{ }^{\circ}\text{C}$	-	0.62	μs
Reverse recovery current	I_{rr}	$V_{CC} = 900 \text{ V}$, $I_F = 1800 \text{ A}$, $L_s = 100 \text{ nH}$ $-diF/dt = 7600\text{A/us@ } T_j = 25 \text{ }^{\circ}\text{C}$ $6800 \text{ A/us@ } T_j = 125 \text{ }^{\circ}\text{C}$ $6800\text{A/us@ } T_j = 150 \text{ }^{\circ}\text{C}$	$T_j = 25 \text{ }^{\circ}\text{C}$	-	1260	A
			$T_j = 125 \text{ }^{\circ}\text{C}$	-	1500	A
			$T_j = 150 \text{ }^{\circ}\text{C}$	-	1590	A
Reverse recovered charge	Q_{rr}	$V_{CC} = 900 \text{ V}$, $I_F = 1800 \text{ A}$, $L_s = 100 \text{ nH}$ $-diF/dt = 7600\text{A/us@ } T_j = 25 \text{ }^{\circ}\text{C}$ $6800 \text{ A/us@ } T_j = 125 \text{ }^{\circ}\text{C}$ $6800\text{A/us@ } T_j = 150 \text{ }^{\circ}\text{C}$	$T_j = 25 \text{ }^{\circ}\text{C}$	-	320	μC
			$T_j = 125 \text{ }^{\circ}\text{C}$	-	550	μC
			$T_j = 150 \text{ }^{\circ}\text{C}$	-	670	μC
Reverse recovery charge 10% integral	$Q_{rr(10\%)}$	$V_{CC} = 900 \text{ V}$, $I_F = 1800 \text{ A}$, $L_s = 100 \text{ nH}$ $-diF/dt = 7600\text{A/us@ } T_j = 25 \text{ }^{\circ}\text{C}$ $6800 \text{ A/us@ } T_j = 125 \text{ }^{\circ}\text{C}$ $6800\text{A/us@ } T_j = 150 \text{ }^{\circ}\text{C}$	$T_j = 25 \text{ }^{\circ}\text{C}$	-	310	μC
			$T_j = 125 \text{ }^{\circ}\text{C}$	-	530	μC
			$T_j = 150 \text{ }^{\circ}\text{C}$	-	610	μC

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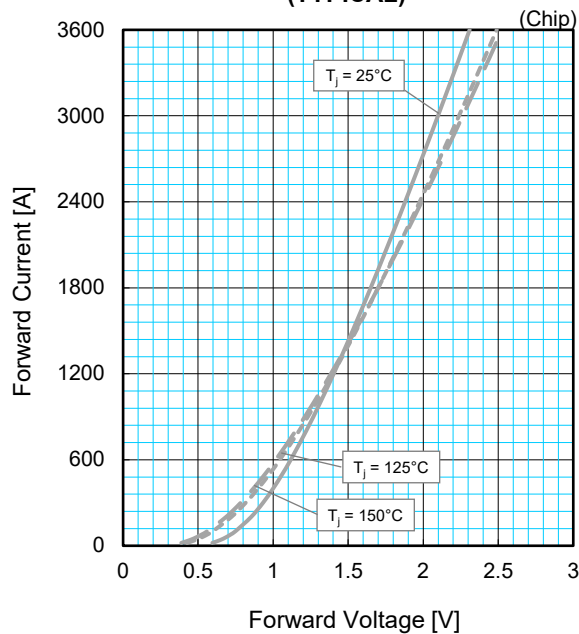
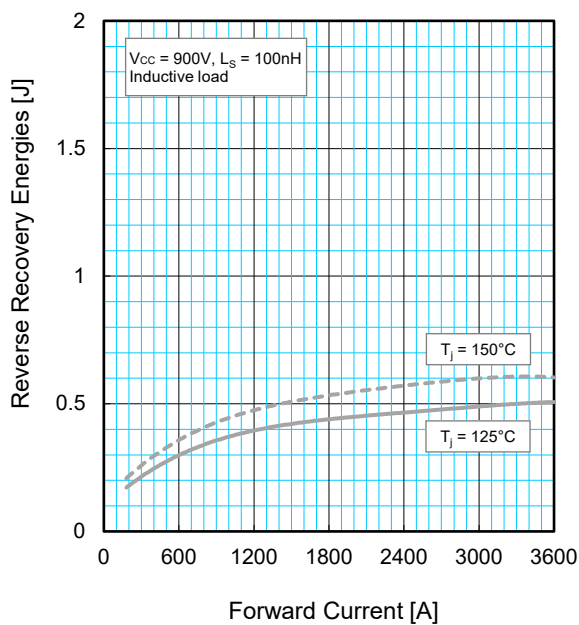
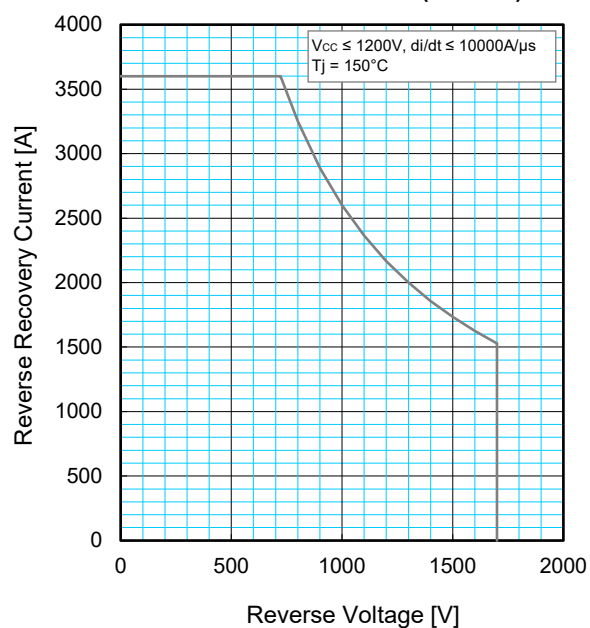
Item	Symbol	Condiiton		Limits			Unit
				Min.	Typ.	Max.	
Reverse recovery energy	E _{rec}	V _{CC} = 900 V , I _F = 1800 A , L _s = 100 nH —diF/dt = 7600A/μs@ T _J = 25 °C 6800 A/μs@ T _J = 125 °C 6800A/μs@ T _J = 150 °C	T _J = 25 °C	-	0.27	-	J
			T _J = 125 °C	-	0.44	-	J
			T _J = 150 °C	-	0.53	-	J
Reverse recovery energy per pulse 10% integral	E _{rec(10%)}	V _{CC} = 900 V , I _F = 1800 A , L _s = 100 nH —diF/dt = 7600A/μs@ T _J = 25 °C 6800 A/μs@ T _J = 125 °C 6800A/μs@ T _J = 150 °C	T _J = 25 °C	-	0.26	-	J
			T _J = 125 °C	-	0.42	-	J
			T _J = 150 °C	-	0.48	-	J

THERMAL CHARACTERISTICS

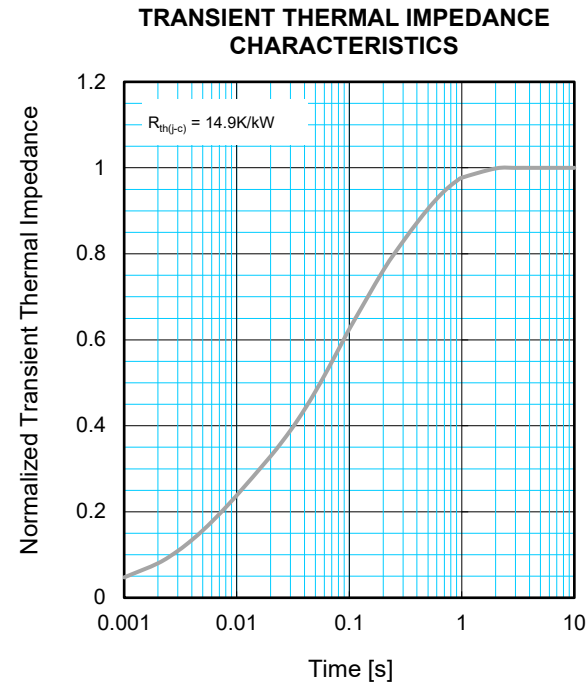
Item	Symbol	Condiiton	Limits			Unit
			Min.	Typ.	Max.	
Thermal resistanc Junction to case DIODE	R _{th(j-c)D}	Junction to Case	-	-	14.9	K/kW
Contact thermal resistance case to heatsink	R _{th(c-s)}	Case to heatsink λ _{grease} = 1W/m·K, D _(c-s) = 100 μm	-	14.0	-	K/kW

MECHANICAL CHARACTERISTICS

Item	Symbol	Condition	Limits			Unit
			Min.	Typ.	Max.	
Mounting torque	M _t	Main terminal screw : M8	6.7	-	10.8	N·m
Mounting torque	M _s	Mounting screw : M6	3.0	-	6.0	N·m
mass, Mass(IEC)	m	-	-	0.52	-	kg
Comparative tracking index	CTI	-	600	-	-	-
Clearance distance in air	d _a	Anode teminal -Cathode terminal	19.5	-	-	mm
Creepage distance along surface	d _s	Anode teminal -Cathode terminal	32.0	-	-	mm
Internal inductance (a-K)	L _{P(A-K)}	T _C =25°C	-	17.0	-	nH
Internal lead resistance	R _{AA'+KK'}	T _C =25°C	-	0.16	-	mΩ

RM1800HE-34XHIGH POWER SWITCHING USE
INSULATED TYPE**PERFORMANCE CURVES****FORWARD CHARACTERISTICS
(TYPICAL)****REVERSE RECOVERY ENERGY
CHARACTERISTICS (TYPICAL)****REVERSE RECOVERY
SAFE OPERATING AREA (RRSOA)**

PERFORMANCE CURVES



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

	1	2	3	4
R_i [K/kW]	0.0096	0.1893	0.4044	0.3967
τ_i [sec]	0.0001	0.0058	0.0602	0.3512

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