MDM1200FH33F

FEATURES

* Low Reverse Recovery Loss diode module.
* Low noise recovery: Ultra soft fast recovery diode.
* High reverse recovery capability:
  Super HiRC Structure.
* High reliability, high durability diodes.
* Isolated heat sink (terminal to base).
* RoHS

ABSOLUTE MAXIMUM RATINGS (T_C=25°C)

Item		Symbol	Unit	MDM1200FH33F
Repetitive Peak Reverse Voltage		V_{RRM}	V	3,300
Forward Current	AC peak	I_{MFpeak}	A	1,200
	1ms	I_{Fpulse}		2,400
Operating Junction Temperature		$T_{vj\ op}$	°C	-50 ~ +150
Maximum Junction Temperature		$T_{vj\ max}$	°C	150 (1)
Storage Temperature		T_{stg}	°C	-50 ~ +150 (2)
Isolation Test Voltage	Terminals-base	V_{ISO}	V_{RMS}	10,200(AC 1 minute)
	Terminal 1-Terminal 2	$V_{ISO\ T\text{-}T}$		10,200(AC 1 minute)
Screw Torque	Terminals (M8)	-	N·m	10 (3)
	Mounting (M6)	-		6 (4)

Notes: (1) Regarding the definition of $T_{vj\ max}$ for each operation mode, please refer to LD-ES-130737.
(2) Terminal temperature shall not exceed the specified temperature in any operation.
(3) Recommended Value 9±1N·m (4) Recommended Value 5.5±0.5N·m

ELECTRICAL CHARACTERISTICS

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Repetitive Reverse Current	I_{RRM}	mA	-	12	20	V_R=3,300V, T_{vj}=150°C
Forward Voltage Drop	V_F	V	2.9	3.3	3.6	I_F=1,200A, T_{vj}=150°C
Reverse Recovery Time	t_{rr}	μs	-	0.9	-	V_R=1,800V, I_F=1,200A, di/dt=-6,000A/us, L_S=135nH T_{vj}=150°C, R_G=4.7Ω (5)
Reverse Recovery Current	I_{rr}	A	-	1,600	-	
Reverse Recovery Charge	Q_{rr}	μC	-	1,700	-	
Reverse Recovery Loss	E_{rr}	J/P	-	2.3	-	
I^2t value	I^2t	kA^2s	400	-	-	$T_{vj,start}$=150°C, 10ms, V_R=0V, half-sinewave
Partial discharge extinction voltage	V_e	V_{RMS}	5,000	-	-	f=50Hz, Q_{PD}≤10pC(acc. to IEC 61287)

Notes: (5) Counter arm; MBN1800FH33F V_{GE}=+/-15V
R_G value is the test condition's value for evaluation of the switching times, not recommended value.
Please, determine the suitable R_G value after the measurement of switching waveforms
(overshoot voltage, etc.) with appliance mounted

PACKAGE CHARACTERISTICS

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Terminal Resistance	R_{CE}	mΩ	-	0.38	-	par arm, T_{vj}=25°C
Stray inductance module	L_{SCE}	nH	-	36	-	par arm
Thermal Impedance	$R_{th(j\text{-}c)}$	K/W	-	-	0.020	Junction to case (par arm)
Comparative tracking index	CTI		-	600	-	
Contact Thermal Impedance	$R_{th(c\text{-}f)}$	K/W	-	0.020	-	Case to fin

* Please contact our representatives at order.
* For improvement, specifications are subject to change without notice.
* For actual application, please confirm this spec sheet is the newest revision.
* ELECTRICAL CHARACTERISTIC items shown in above table are according to IEC 60747–2.

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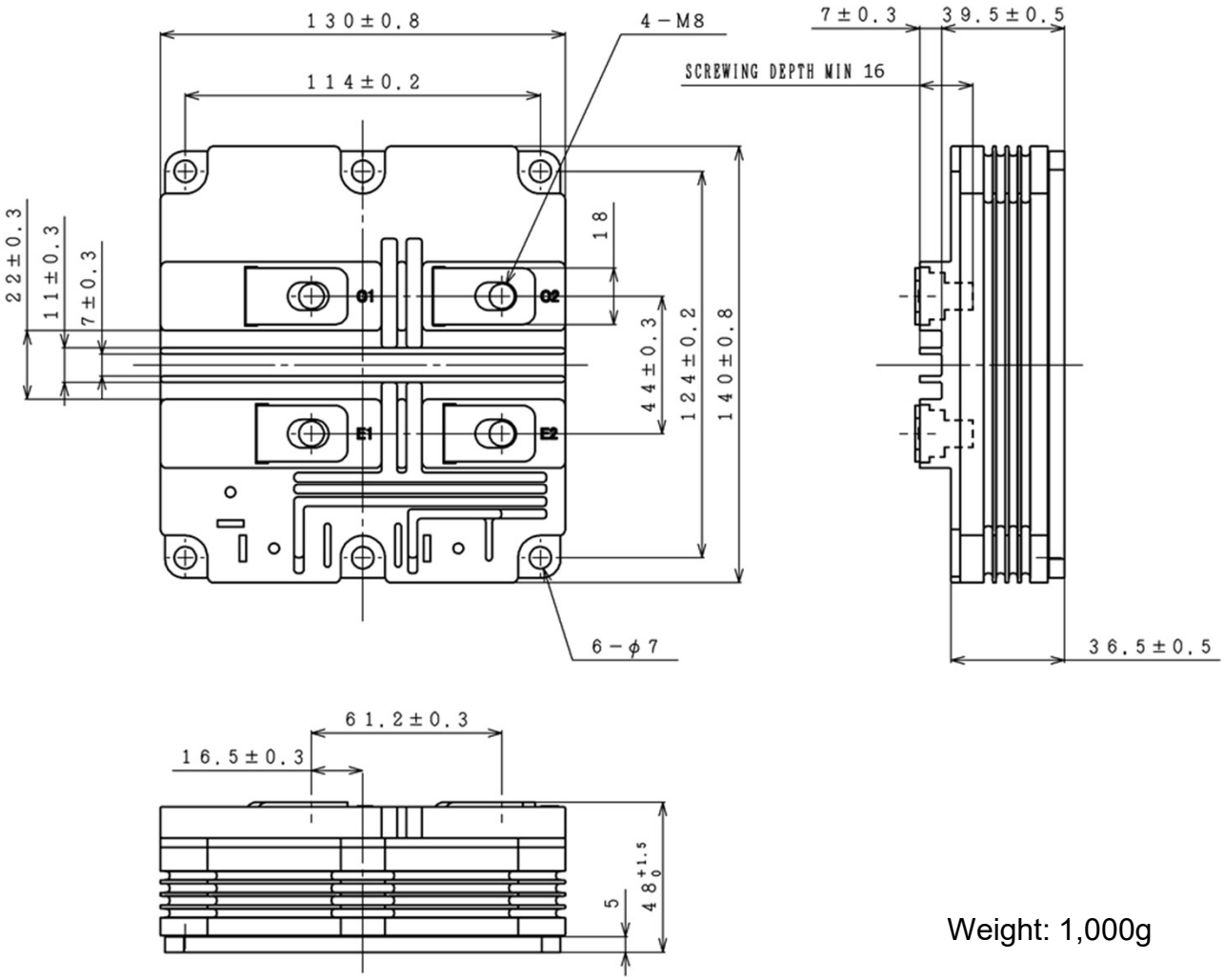
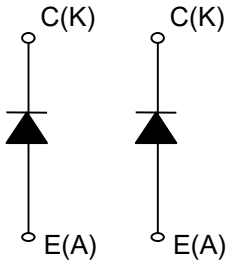
OUTLINE DRAWING

Unit in mm



Weight: 1,000g

CIRCUIT DIAGRAM



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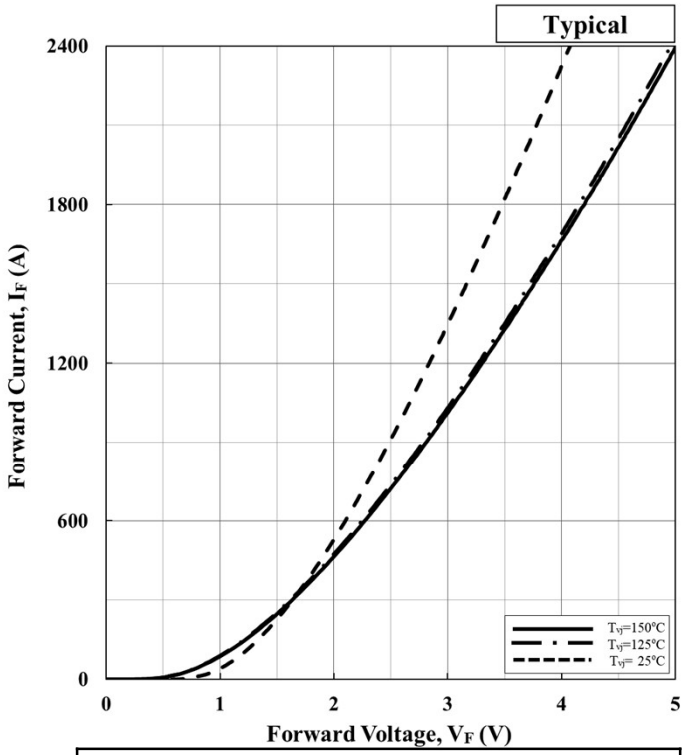
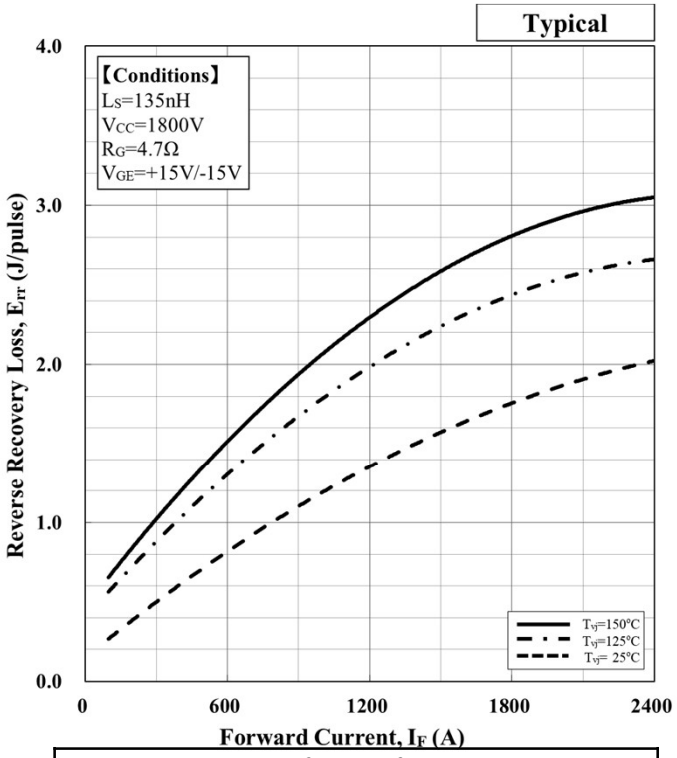


$V_F[V] = a_3 \cdot |I_F|^3 + a_2 \cdot |I_F|^2 + a_1 \cdot |I_F| + a_0$

Temp.[°C]	a_3	a_2	a_1	a_0
25	1.06E-10	-5.68E-07	2.02E-03	1.06E+00
125	1.29E-10	-7.18E-07	2.71E-03	8.41E-01
150	1.30E-10	-7.25E-07	2.74E-03	8.49E-01

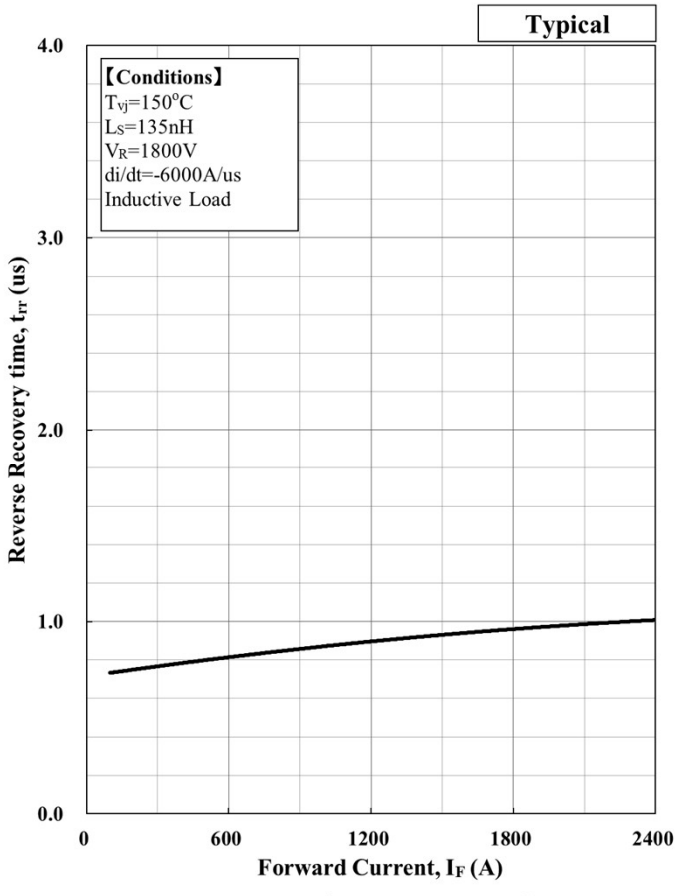
Forward Current vs. Forward Voltage



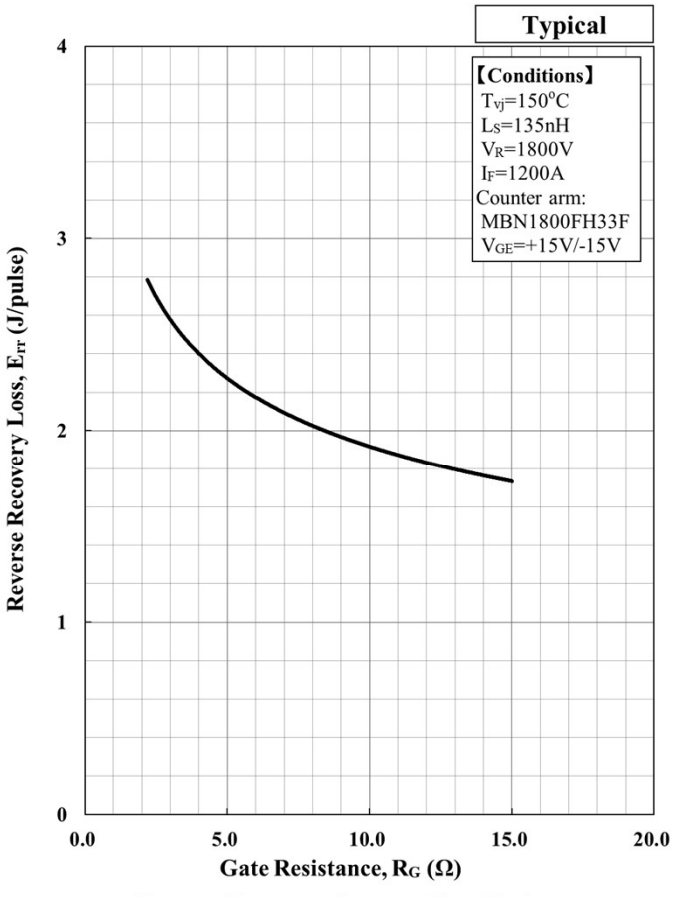
$E\ [J] = a_3 \cdot |I_F|^3 + a_2 \cdot |I_F|^2 + a_1 \cdot |I_F| + a_0$

Temp.[°C]	a_3	a_2	a_1	a_0
25	-	-1.88E-07	1.23E-03	1.46E-01
125	-	-3.17E-07	1.71E-03	3.97E-01
150	-	-3.75E-07	1.98E-03	4.61E-01

Recovery loss vs. Forward current



Reverse Recovery time vs. Forward Current



Reverse Recovery loss vs. Gate Resistance

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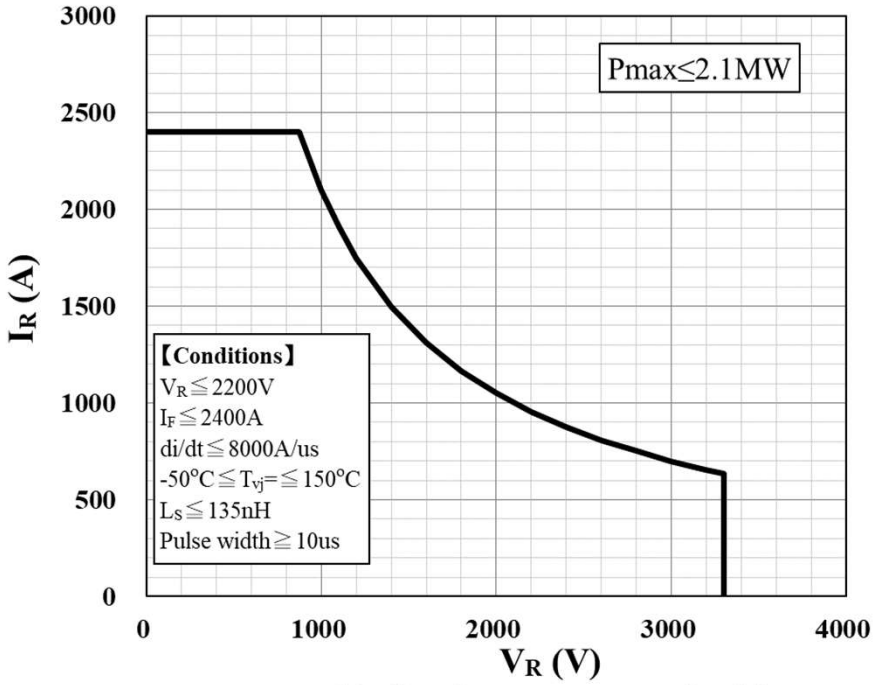
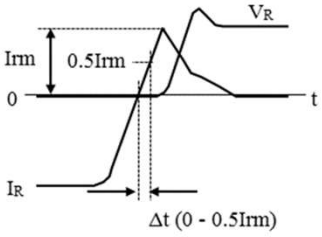


(Defined at power terminals)

Reverse Recovery Safe Operation Area (RRSOA)



$$di/dt = \frac{0.5Irm}{\Delta t}$$

Definition of Recovery di/dt

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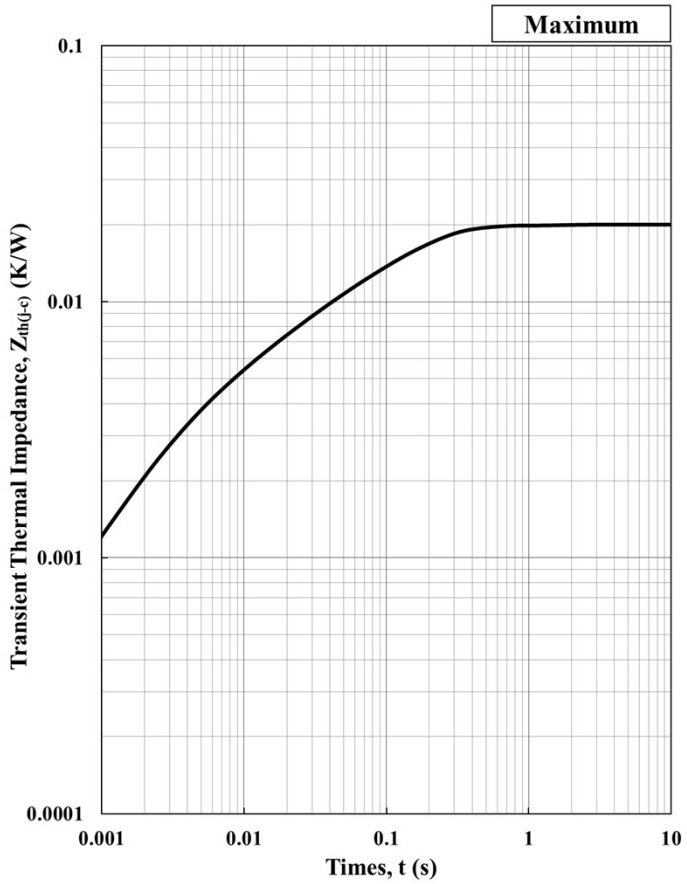

Transient Thermal Ipedance Curve

Foster model lumped circuit constant

n	1	2	3	4	Unit
R th, Diode [n]	3.77E-03	2.70E-03	1.12E-02	2.35E-03	[K/W]
C th, Diode [n]	7.96E-01	1.11E+01	8.94E+00	1.28E+02	[J/K]

Cauer model lumped circuit constant

n	1	2	3	4	Unit
R th, Diode [n]	5.08E-03	9.75E-03	4.38E-03	7.97E-04	[K/W]
C th, Diode [n]	6.82E-01	4.70E+00	1.40E+01	3.47E+02	[J/K]

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Minebea POWER SEMICONDUCTORS

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8. For handling other than described in this manual, follow the handling instructions (IGBT-HI-00002).

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Minebea POWER SEMICONDUCTORS

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