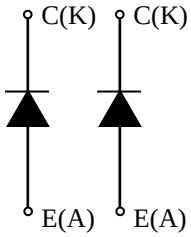
MDM1200H45E2

FEATURES

- Low VF 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).

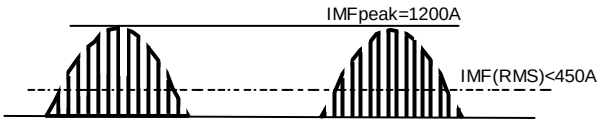
CIRCUIT DIAGRAM



ABSOLUTE MAXIMUM RATINGS (TC=25℃)

Item		Symbol	Unit	MDM1200H45E2
Repetitive Peak Reverse Voltage		V_{RRM}	V	4,500
Forward Current	AC peak	I_{MFpeak}	A	1,200
	1ms	I_{Fpulse}		2,400
Junction Temperature		Tj	℃	-40 ～ +125
Storage Temperature		Tstg	℃	-50 ～ +125 (1)
Isolation Test Voltage	Terminals-base	V_{ISO}	V_{RMS}	8,400 (AC 1 minute)
	Terminal 1-Terminal 2	$V_{ISO\ T\text{-}T}$		8,400 (AC 1 minute)
Screw Torque	Terminals (M8)	-	N·m	10 (2)
	Mounting (M6)	-		6 (3)

Notes: (1) Terminal temperature shall not exceed the specified temperature in any operation.
(2) Recommended Value 9±1N·m (3) Recommended Value 5.5±0.5N·m



ELECTRICAL CHARECTERISTICS

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Repetitive Reverse Current	I_{RRM}	mA	-	2.0	25	VAK=4,500V, Tj=125℃
Forward Voltage Drop	V_F	V	-	3.4	3.9	IF=1,200A, Tj=125℃
Reverse Recovery Time	trr	μs	-	0.9	1.8	V_{CC}=2,600V, IF=1,200A, Ls=180nH
Reverse Recovery Loss	$E_{rr(10\%)}$	J/P	-	3.4	5.1	Tj=125°C Rg=3.3Ω(4)

Notes:(4) Counter arm; MBN1200H45E2 VGE=+/-15V
Rg value is the test condition's value for evaluation of the switching times, not recommended value.
Please, determine the suitable Rg value after the measurement of switching waveforms
(overshoot voltage, etc.) with appliance mounted.

PACKAGE CHARECTERISTICS

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Terminal Resistance	R_{CE}	mΩ	-	0.3	-	per arm
Terminal Stray Inductance	L_{SCE}	nH	-	42	-	per arm
Thermal Impedance	Rth(j-c)	K/W	-	-	0.017	Junction to case (per arm)
Comparative tracking index	CTI		-	600	-	
Contact Thermal Impedance	Rth(c-f)	K/W	-	0.007	-	Case to fin (λgrease=1W/(m·K), heat-sink flatness ≤50um)

* 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.

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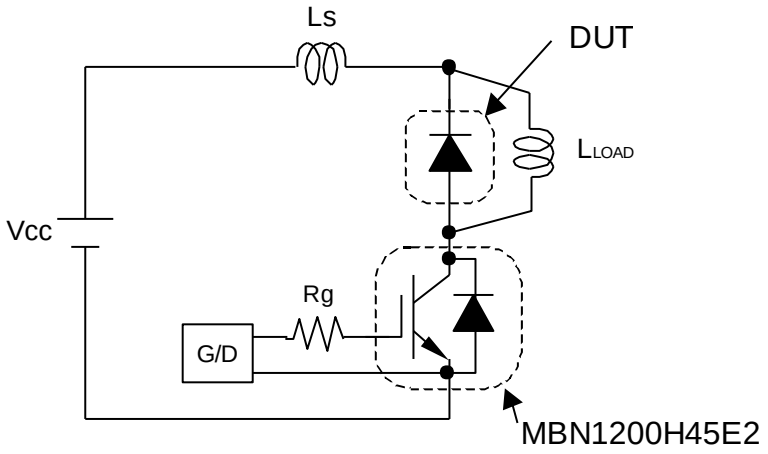
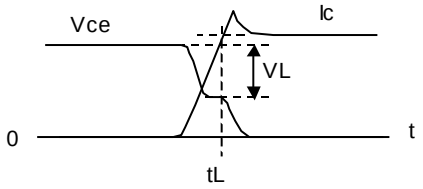
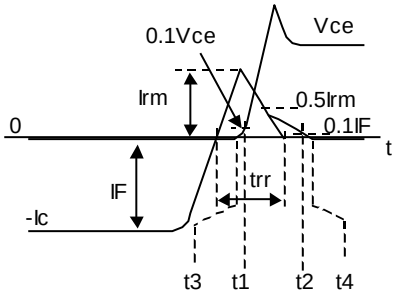


Fig.1 Switching test circuit



$$Ls = \frac{V_L}{\left(\frac{dIc}{dt}\right)_{t=t_L}}$$

Fig.2 Definition of stray inductance



$$Err(10\%) = \int_{t1}^{t2} IF \cdot Vce \, dt$$

$$Err(Full) = \int_{t3}^{t4} IF \cdot Vce \, dt$$

Fig.3 Definition of switching loss

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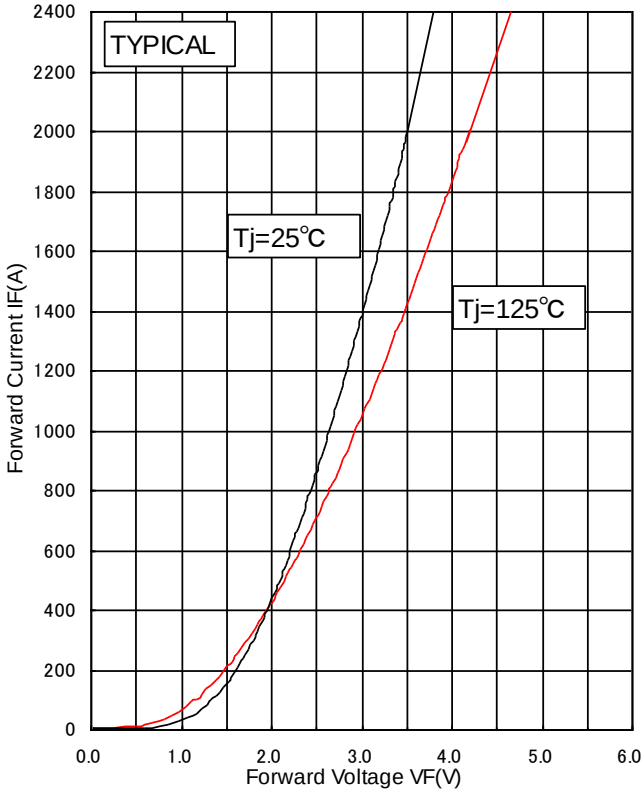
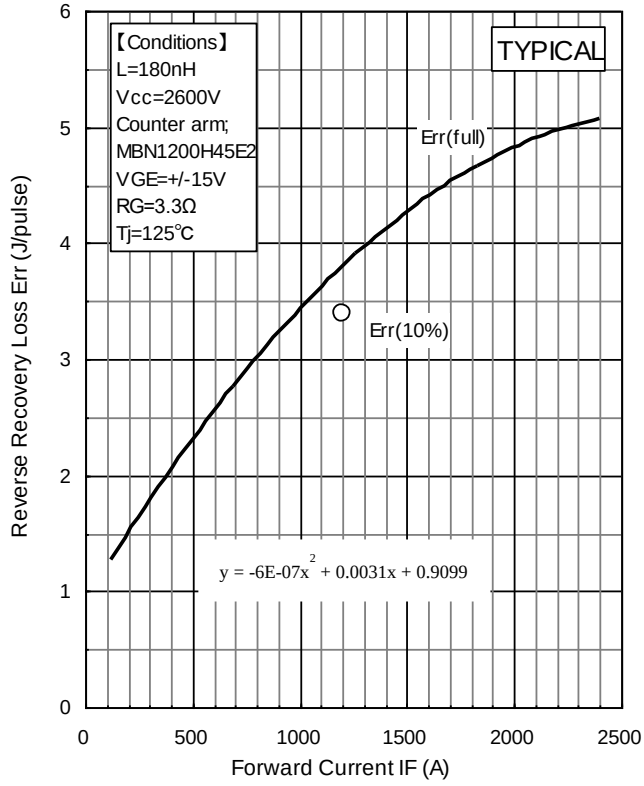
STATIC CHARACTERISTICS

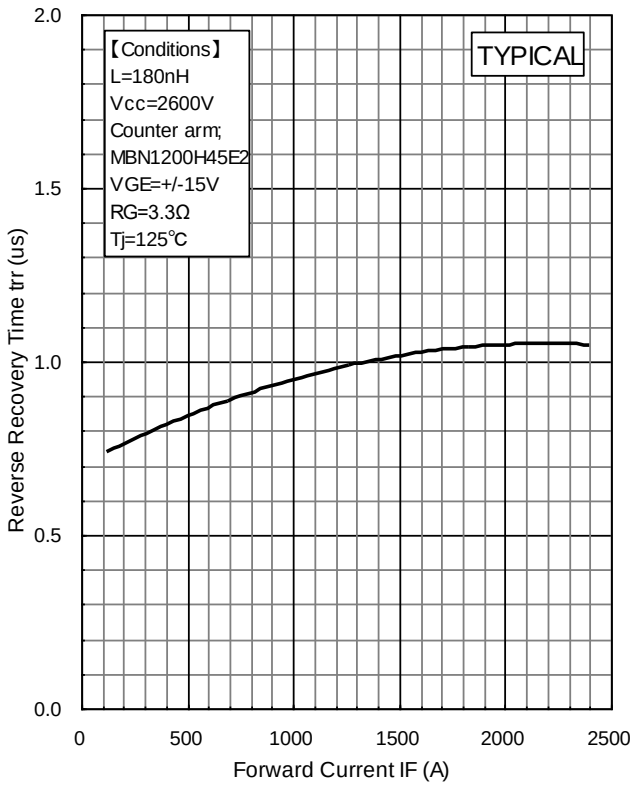


Forward Voltage of diode

DYNAMIC CHARACTERISTICS



Recovery Loss vs. Forward Current



Recovery Time vs. Forward Current

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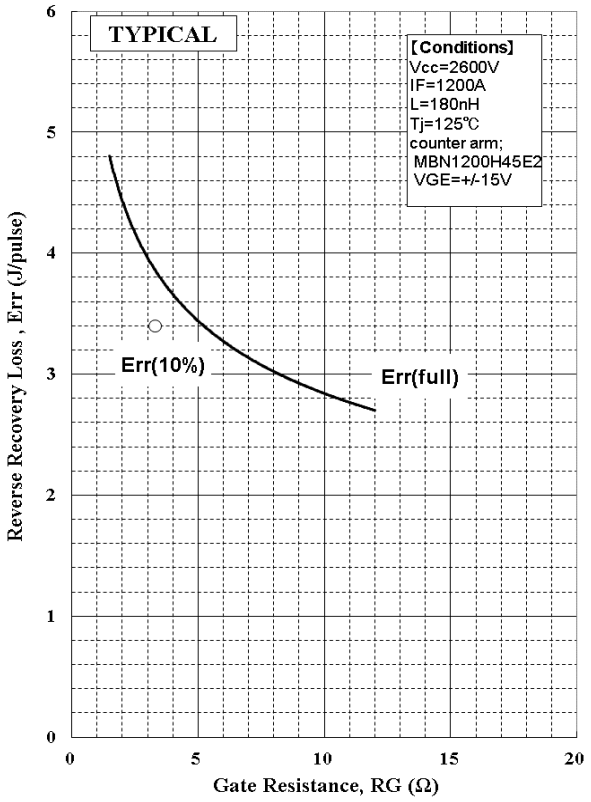
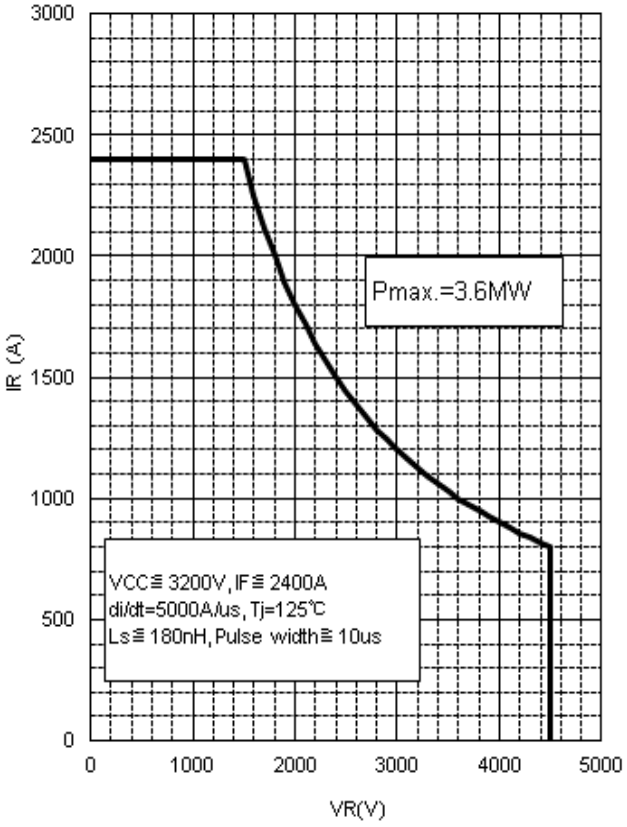


Recovery Loss vs.Gate Resistance



RecSOA

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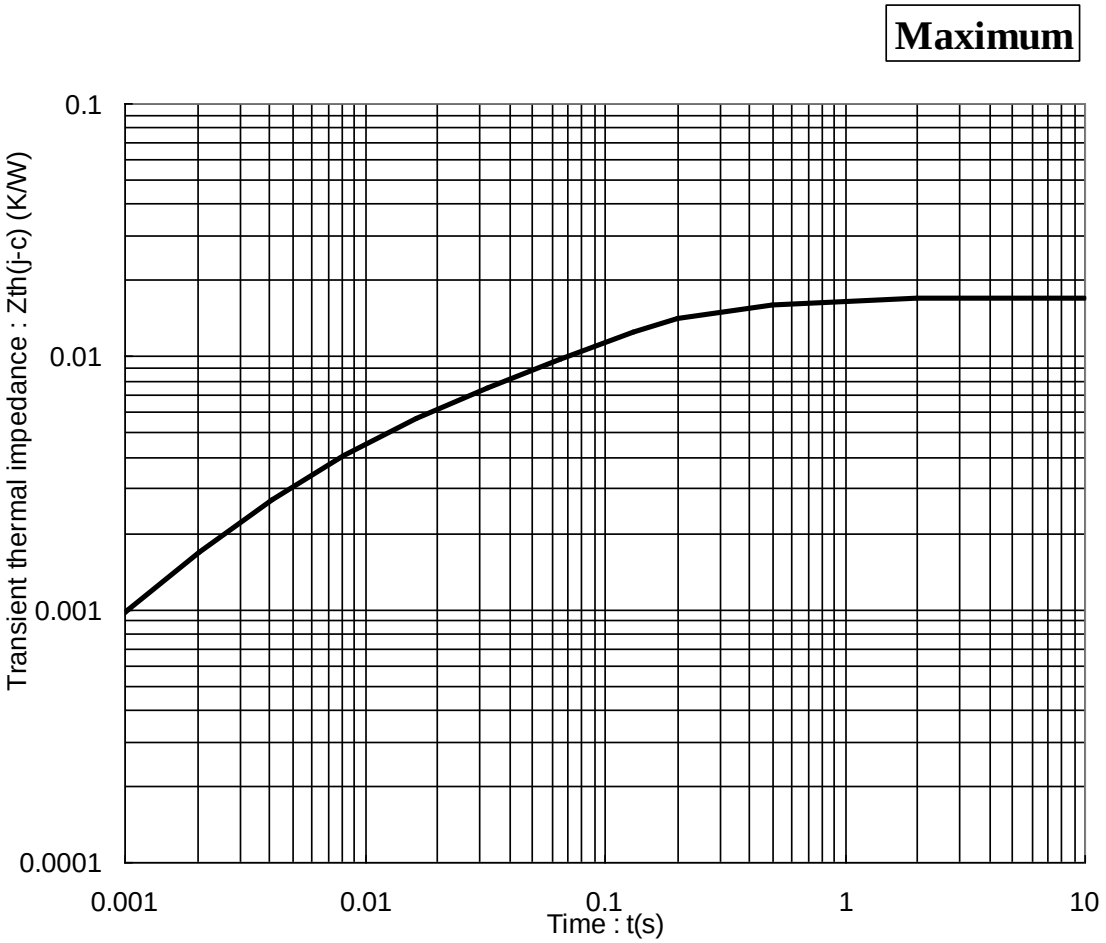
TRANSIENT THERMAL IMPEDANCE



Transient Thermal Impedance Curve

Curve Approximation Model
Σ rth[n]*(1-exp(-t/τth[n]))

n	1	2	3	4	Unit
τ th[n]	3.98E-01	6.81E-02	1.32E-02	3.16E-04	sec
rth[n,IGBT]	1.02E-02	3.35E-03	3.19E-03	2.87E-04	K/W

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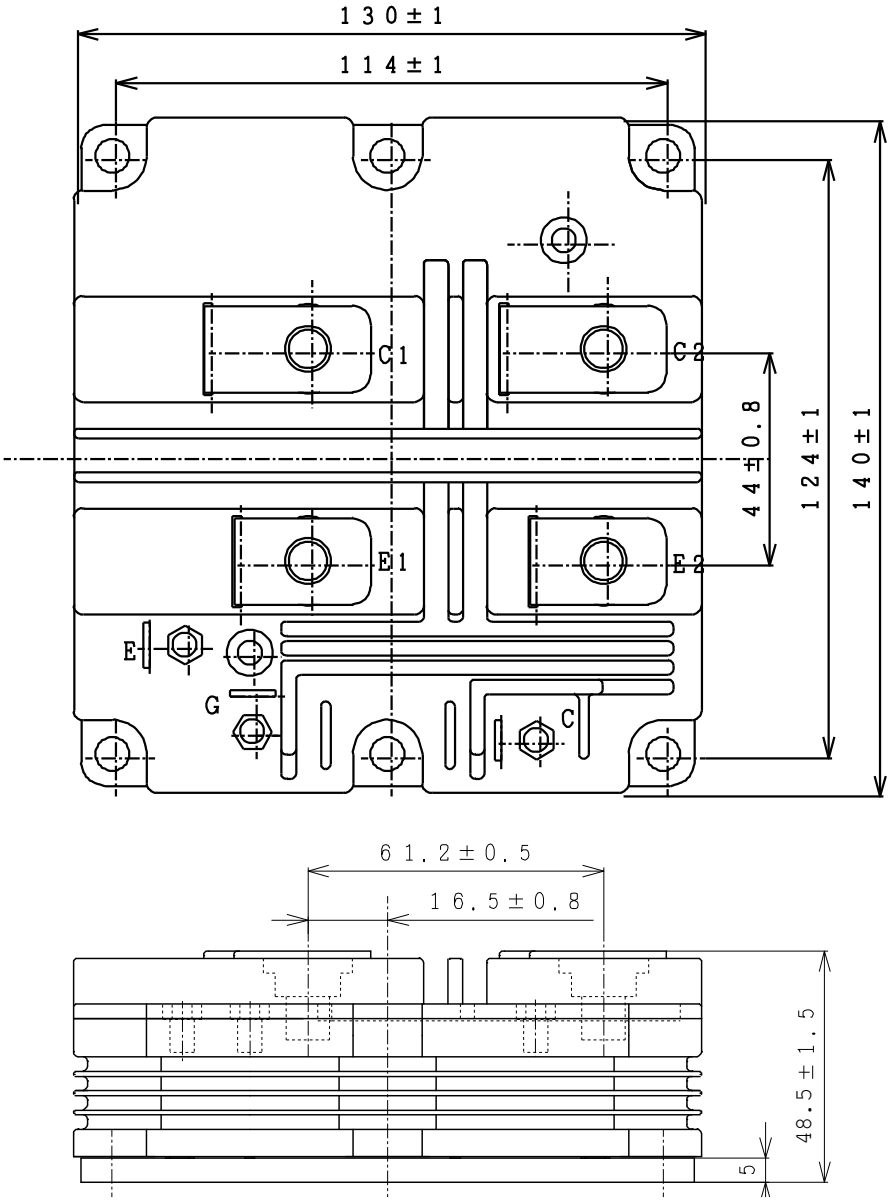
OUTLINE DRAWING

Unit in mm



Weight: 1050(g)

Material declaration

Please note the following materials are contained in the product in order to keep product characteristic and reliability level.

Material	Contained part
Lead (Pb) and its compounds	Solder

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Minebea POWER SEMICONDUCTORS

Notices

1. Since mishandling of semiconductor devices may cause malfunctions, please be sure to read "Precautions for Safe Use and Notices" in the individual brochure before use.
2. When designing an electronic circuit using semiconductor devices, please do not exceed the absolute maximum rating specified for the device under any external fluctuations. And for pulse applications, please also do not exceed the "Safe Operating Area (SOA)".
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6. This specification is a material for component selection, which describes specifications of power semiconductor devices (hereinafter referred to as products), characteristic charts, and external dimension drawings.
7. The information given herein, including the specifications and dimensions, is subject to change without prior notice to improve product characteristics. Before ordering, purchasers are advised to contact with Minebea power semiconductor sales department for the latest version of this data sheets.
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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