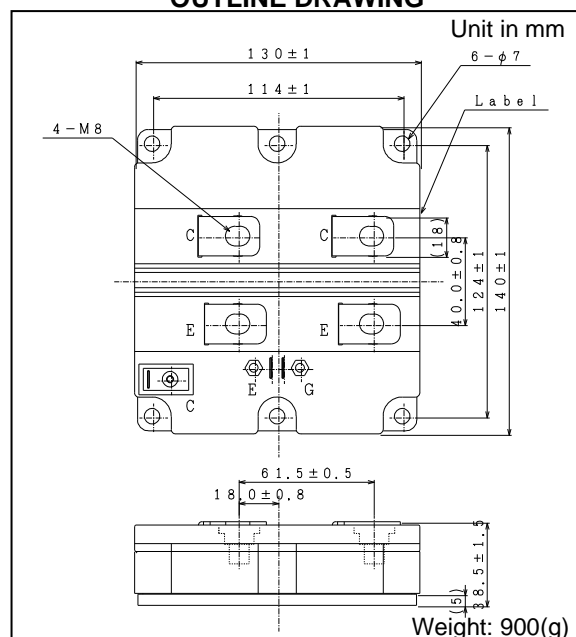


# MDM1000E33E2

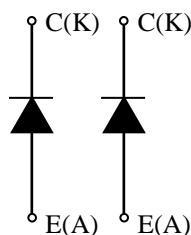
## OUTLINE DRAWING



## FEATURES

- \* Low noise due to ultra soft fast recovery diode.
- \* High reliability, high durability diodes.
- \* Isolated heat sink (terminal to base).

## CIRCUIT DIAGRAM



## ABSOLUTE MAXIMUM RATINGS (T<sub>c</sub>=25°C)

Item	Symbol	Unit	MDM1000E33E2
Repetitive Peak Reverse Voltage	V <sub>RRM</sub>	V	3,300
Forward Current	DC	I <sub>F</sub>	1,000
	1ms	I <sub>FM</sub>	2,000
Junction Temperature	T <sub>j</sub>	°C	-40 ~ +150
Storage Temperature	T <sub>stg</sub>	°C	-40 ~ +125
Isolation Test Voltage	V <sub>ISO</sub>	V <sub>RMS</sub>	6,000 (AC 1 minute)
Screw Torque	Terminals (M8)	-	15 (1)
	Mounting (M6)	-	6 (2)

Notes: (1) Recommended Value 15<sup>+0</sup><sub>-3</sub>N·m (2) Recommended Value 5.5±0.5N·m

## ELECTRICAL CHARACTERISTICS

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Repetitive Reverse Current	I <sub>RRM</sub>	mA	-	2.5	25	VAK=3,300V, T <sub>j</sub> =125°C
Forward Voltage Drop	V <sub>F</sub>	V	-	2.5	3.0	I <sub>F</sub> =1,000A, T <sub>j</sub> =125°C
			-	2.5	-	I <sub>F</sub> =1,000A, T <sub>j</sub> =150°C
Reverse Recovery Time	t <sub>rr</sub>	μs	-	0.7	1.2	T <sub>j</sub> =125°C V <sub>CC</sub> =1,650V, I <sub>F</sub> =1,000A, L <sub>s</sub> =100nH, R <sub>G</sub> =3.3Ω, (3)
Reverse Recovery Loss	E <sub>rr</sub> (10%)	J/P	-	1.6	2.3	
	E <sub>rr</sub> (full)		-	2.0	-	

## PACKAGE CHARACTERISTICS

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Terminal Resistance	R <sub>CE</sub>	mΩ	-	0.2	-	per arm
Terminal Stray Inductance	L <sub>SCE</sub>	nH	-	21	-	per arm
Thermal Impedance	R <sub>th(j-c)</sub>	K/W	-	-	0.017	Junction to case (par arm)
Comparative tracking index	CTI		-	600	-	
Contact Thermal Impedance	R <sub>th(c-f)</sub>	K/W	-	0.008	-	Case to fin (λ <sub>grease</sub> =1W/(m·K), Heat-sink flatness ≤50μm)

Notes:(3) Counter arm; MBN1200E33D VGE=+/-15V

R<sub>G</sub> value is the test condition's value for evaluation of the switching times, not recommended value.

Please, determine the suitable R<sub>G</sub> value after the measurement of switching waveforms (overshoot voltage, etc.) with appliance mounted.

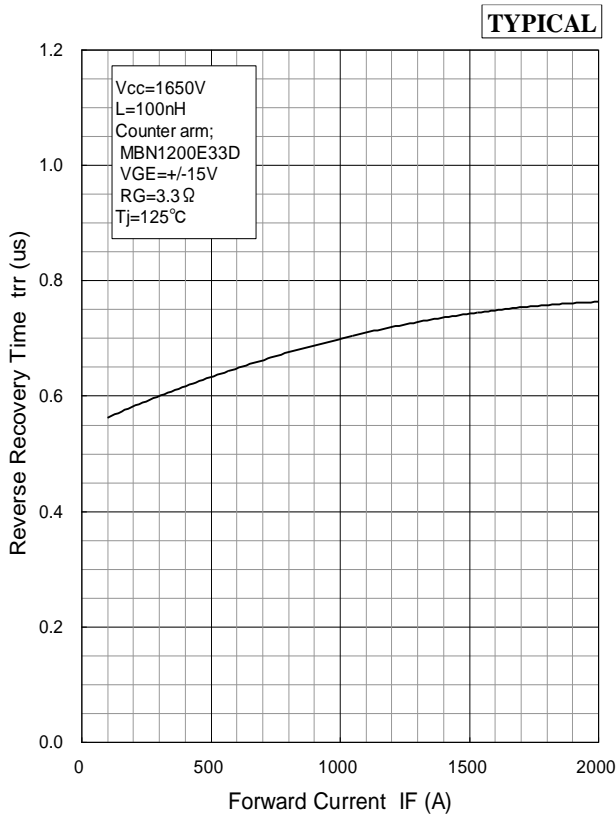
\* Please contact our representatives at order.

\* For improvement, specifications are subject to change without notice.

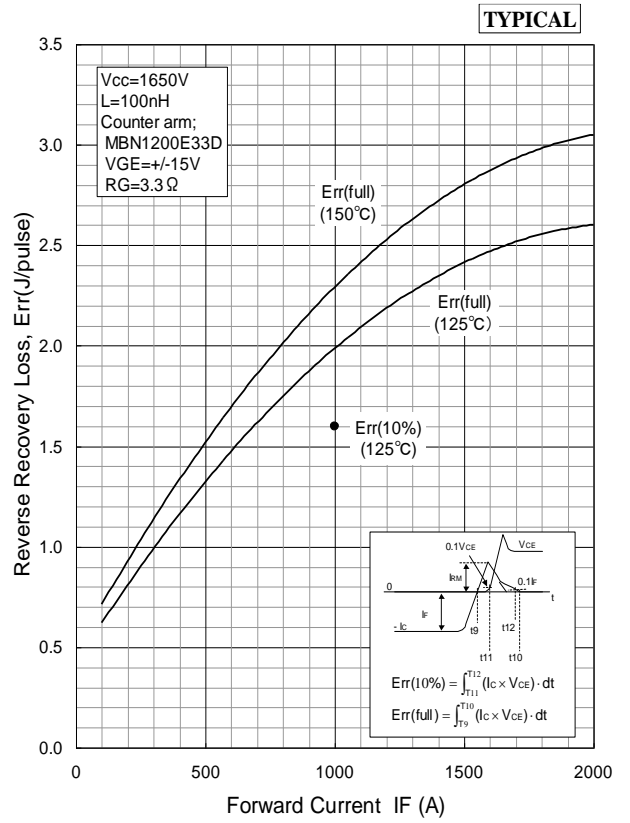
\* For actual application, please confirm this spec sheet is the newest revision.

# MDM1000E33E2

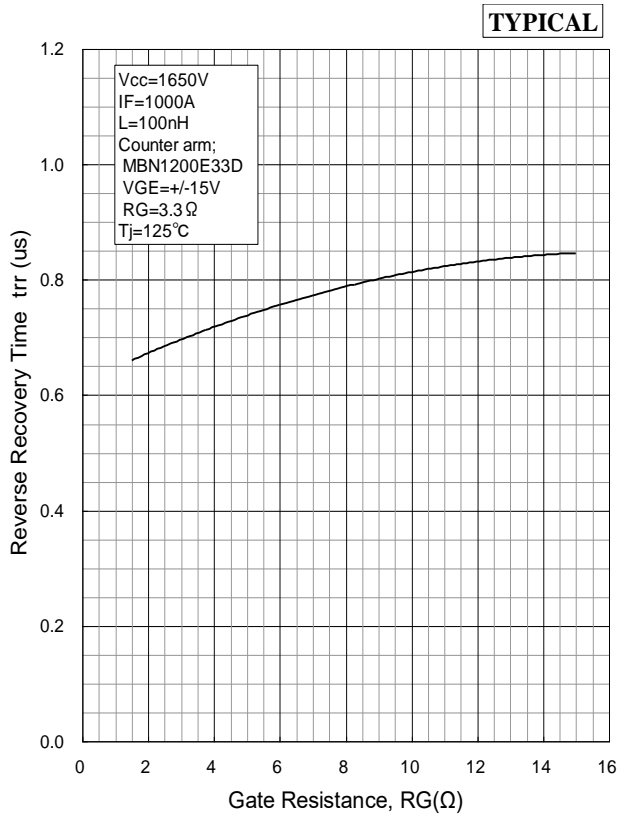
## DYNAMIC CHARACTERISTICS



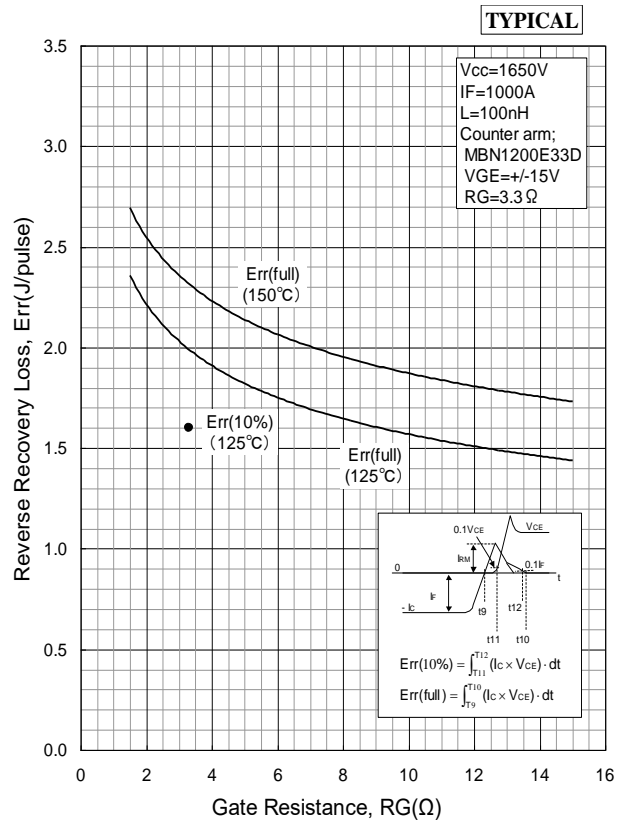
Reverse Recovery Time vs Forward Current



Reverse Recovery Loss vs Forward Current



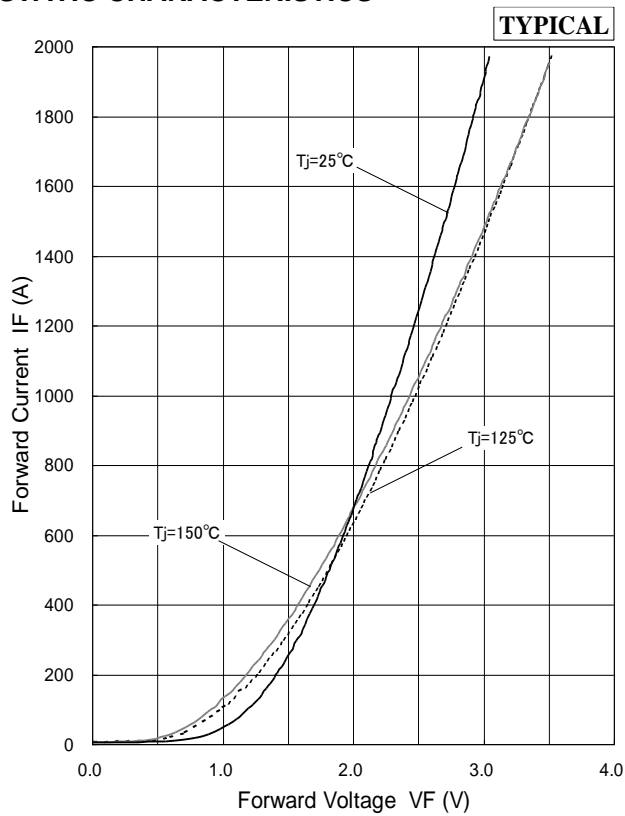
Reverse Recovery Time vs Gate Resistance



Reverse Recovery Loss vs Gate Resistance

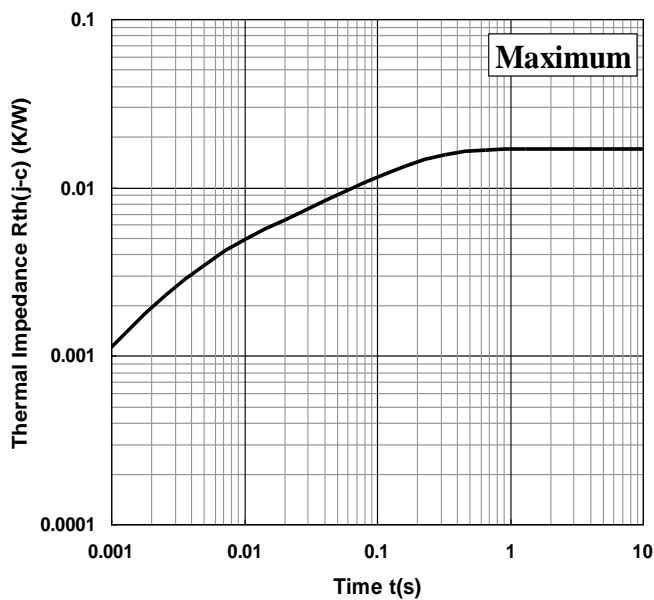
# MDM1000E33E2

## STATIC CHARACTERISTICS



Diode Forward Characteristics

## TRANSIENT THERMAL IMPEDANCE



Transient Thermal Impedance Curve

### Material declaration

Please note that 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

# MDM1000E33E2

## 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)".
3. Semiconductor devices may sometimes break down by accidental or unexpected surge voltage, so please be careful about the safety design such as redundant design and malfunction prevention design which don't cause the damage expand even if they break down.
4. In cases where extremely high reliability is required (such as use in nuclear power control, aerospace and aviation, traffic equipment, life-support-related medical equipment, fuel control equipment and various kinds of safety equipment), safety should be ensured by using semiconductor devices that feature assured safety or by means of users' fail-safe precautions or other arrangement. Or consult with MPSD's sales department staff. (When semiconductor devices fail, as a result the semiconductor devices or wiring, wiring pattern may smoke, ignite, or the semiconductor devices themselves may burst.)
5. A semi-processed article is done now using solder which contains lead inside the semiconductor devices. There is possibility of the regulation substance depend on the applied models, so please check before using.
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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# MDM1000E33E2

## Minebea POWER SEMICONDUCTORS

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