MDM1200E33D

FEATURES

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

ABSOLUTE MAXIMUM RATINGS (T_C=25°C)

Item		Symbol	Unit	MDM1200E33D
Repetitive Peak Reverse Voltage		V_{RRM}	V	3,300
Forward Current	DC	I_F	A	1,200
	1ms	I_{FM}		2,400
Junction Temperature		$T_{vj\ op}$	°C	-40 ~ +125
Storage Temperature		T_{stg}	°C	-40 ~ +125
Isolation Test Voltage	Terminals-base	V_{ISO}	V_{RMS}	6,000(AC 1 minute)
	Terminal 1-Terminal 2	$V_{ISO\ T\text{-}T}$		6,000(AC 1 minute)
Screw Torque	Terminals (M8)	-	N·m	15 (1)
	Mounting (M6)	-		6 (2)

Notes: (1) Recommended Value 15^{+0}_{-3}N·m (2) Recommended Value 5.5±0.5N·m

ELECTRICAL CHARACTERISTICS

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Repetitive Reverse Current	I_{RRM}	mA	-	3.0	30.0	VAK=3,300V, T_{vj}=125°C
Forward Voltage Drop	V_F	V	2.3	2.8	3.3	I_F=1,200A, T_{vj}=125°C
Reverse Recovery Time	t_{rr}	μs	-	0.6	1.1	V_{CC}=1,650V, I_F=1,200A, Ls=100nH
Reverse Recovery Loss	$E_{rr(10\%)}$	J/P	-	1.2	1.9	R_G=3.3Ω, T_{vj}=125°C (3)

Notes: (3) Counter arm: MBN1200E33D VGE= ±15V
R_G are the test condition's value to define the switching characteristics 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	RCE	mΩ	-	0.4	-	Tc=25°C, per arm
Stray inductance module	L_{SCE}	nH	-	35	-	per arm
Thermal Impedance	$R_{th(j\text{-}c)}$	K/W	-	-	0.017	Junction to case (par arm)
Comparative tracking index	CTI		-	600	-	
Contact Thermal Impedance	$R_{th(c\text{-}f)}$	K/W	-	0.008	-	Case to fin (par module)

* 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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DEFINITION OF TEST CIRCUIT

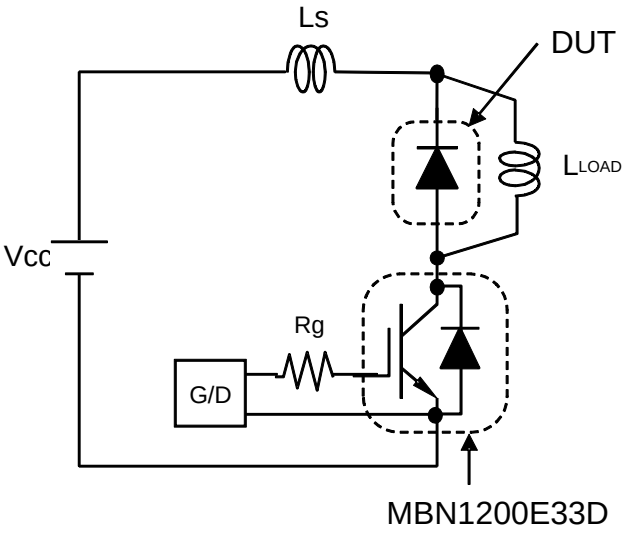
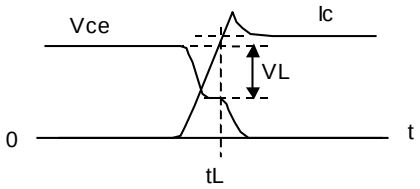
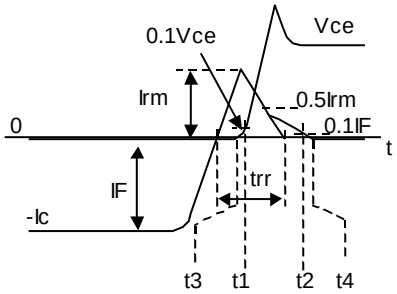


Fig.1 Switching test circuit



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

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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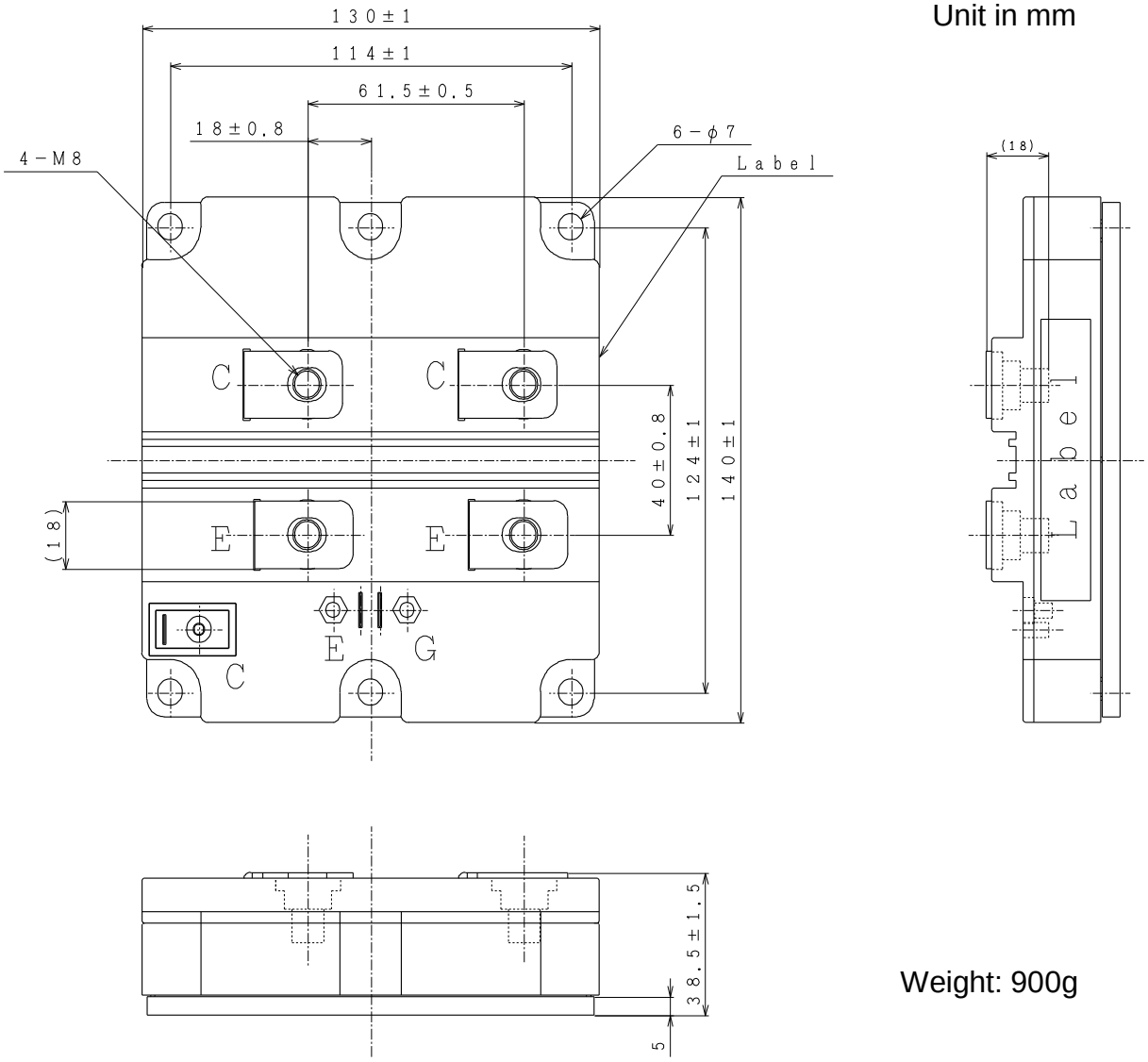
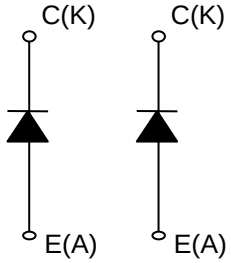
OUTLINE DRAWING

Unit in mm



Weight: 900g

CIRCUIT DIAGRAM



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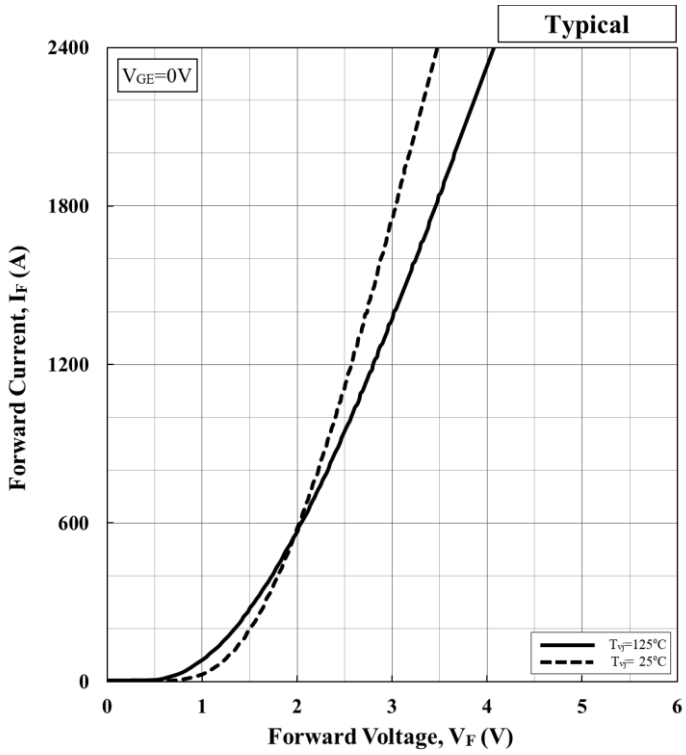
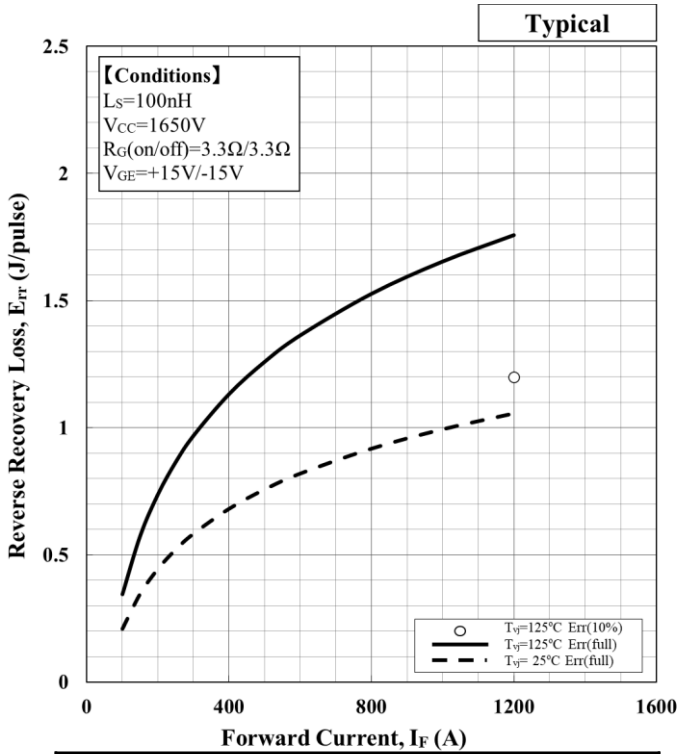


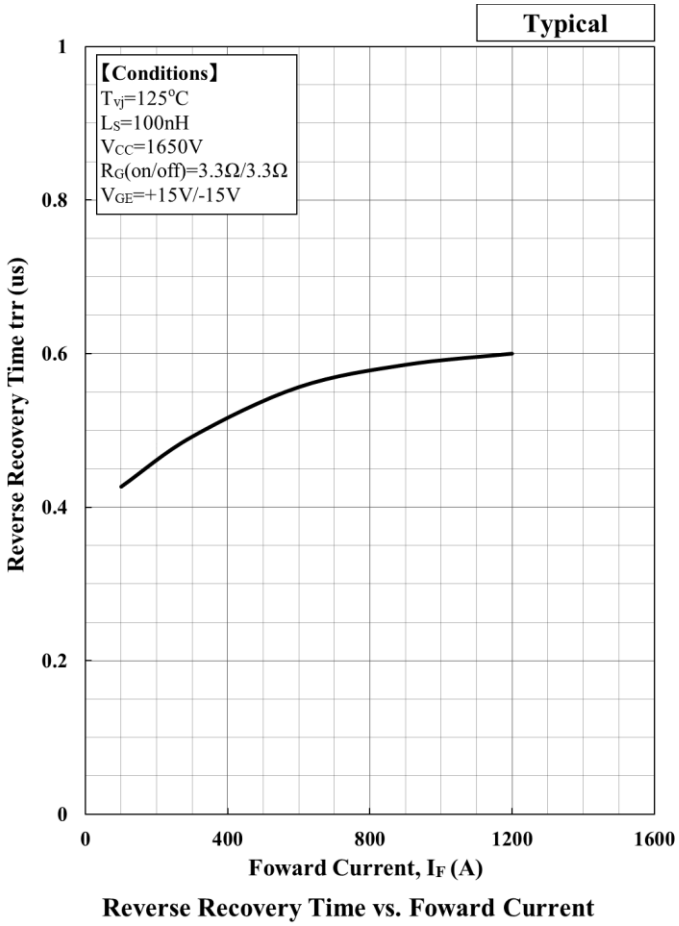
$V_F[V] = a_3 \cdot \lvert I_F \rvert^3 + a_2 \cdot \lvert I_F \rvert^2 + a_1 \cdot \lvert I_F \rvert + a_0$				
Temp.[°C]	a_3	a_2	a_1	a_0
25	1.13E-10	-5.60E-07	1.65E-03	1.20E+00
125	1.37E-10	-6.92E-07	2.20E-03	9.39E-01

Forward Voltage of diode



$E\ [J] = a_3 \cdot \lvert I_F \rvert^3 + a_2 \cdot \lvert I_F \rvert^2 + a_1 \cdot \lvert I_F \rvert + a_0$				
Temp.[°C]	a_3	a_2	a_1	a_0
25	9.98E-10	-2.63E-06	2.61E-03	1.07E-03
125	1.66E-09	-4.38E-06	4.34E-03	1.78E-03

Recovery loss vs. Forward current



Reverse Recovery Time vs. Foward Current

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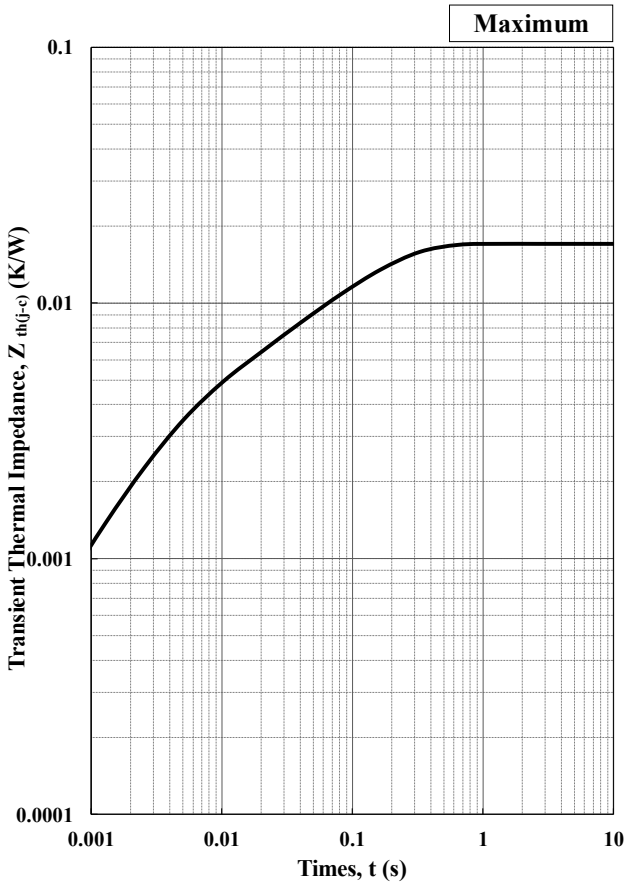

Transient Thermal Impedance Curve

Foster model lumped circuit constant

n	1	2	3	4
R th, Diode [n]	1.04E-02	3.19E-03	3.08E-03	2.99E-04
C th, Diode [n]	1.45E+01	7.81E+00	1.25E+00	2.21E+00

Cauer model lumped circuit constant

n	1	2	3	4
R th, Diode [n]	2.34E-03	2.88E-03	5.68E-03	6.10E-03
C th, Diode [n]	6.91E-01	7.19E-01	5.21E+00	1.59E+01

Material declaration

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

Material	Contained part
Lead (Pb) and its compounds	Solder

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Minebea POWER SEMICONDUCTORS

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Minebea POWER SEMICONDUCTORS

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