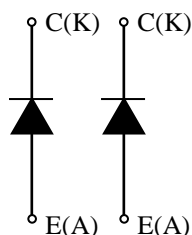


MDM400H45E2

FEATURES

- * 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 (T_c=25°C)

Item	Symbol	Unit	MDM400H45E2
Repetitive Peak Reverse Voltage	V _{RRM}	V	4,500
Forward Current	DC	A	400
	1ms		800
Junction Temperature	T _j	°C	-50 ~ +125
Maximum Junction Temperature	T _{vj max}	°C	150 (1)
Storage Temperature	T _{stg}	°C	-50 ~ +125 (2)
Isolation Test Voltage	Terminals-base	V _{RMS}	10,200 (AC 1 minute)
	Terminal 1-Terminal 2		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	-	0.8	8.0	V _{KA} =4,500V, T _j =125°C
Forward Voltage Drop	V _F	V	-	3.4	3.9	I _F =400A, T _j =125°C
Reverse Recovery Time	trr	μs	-	0.8	1.6	V _{CC} =2,600V, I _F =400A, L _s =190nH
Reverse Recovery Loss	E _{rr(10%)}	J/P	-	1.1	1.7	T _j =125°C R _G =4.7 Ω (5)

PACKAGE CHARACTERISTICS

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	R _{th(j-c)}	K/W	-	-	0.052	Junction to case (par arm)
Comparative tracking index	CTI		-	600	-	
Contact Thermal Impedance	R _{th(c-f)}	K/W	-	0.024	-	Case to fin (λ _{grease} =1W/(m·K), Heat-sink flatness ≤50μm)

Notes:(5) Counter arm; MBN800H45E2 VGE=+/-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.

* 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.

MDM400H45E2

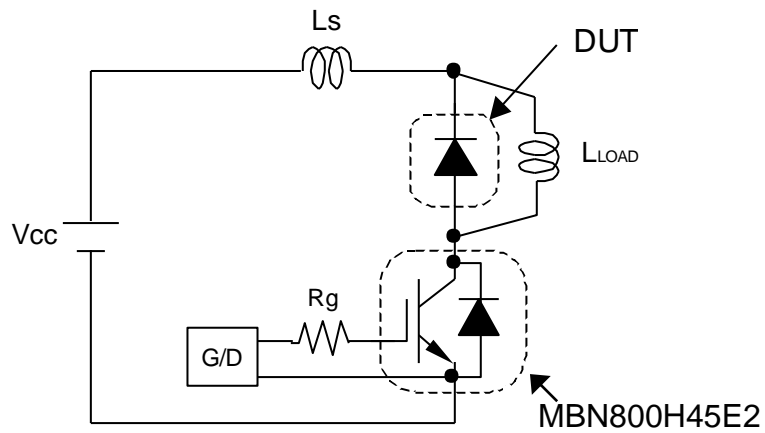


Fig.1 Switching test circuit

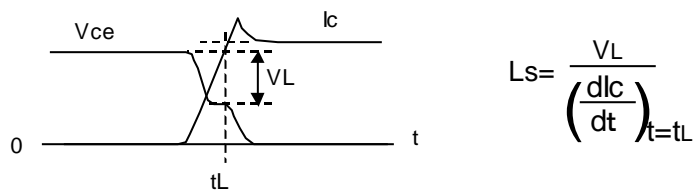
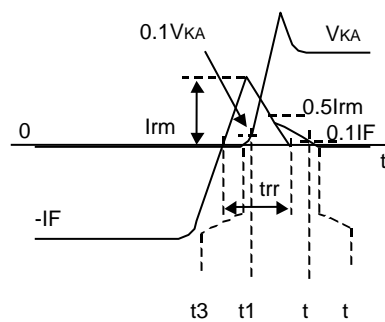


Fig.2 Definition of stray inductance



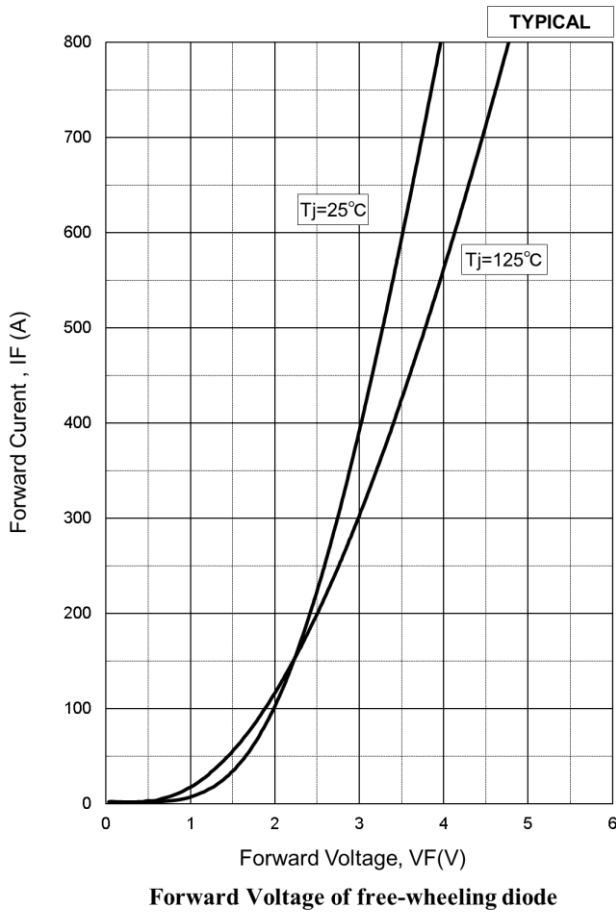
$$Err(10\%) = \int_{t1}^{t2} IF \cdot V_{KA} dt$$

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

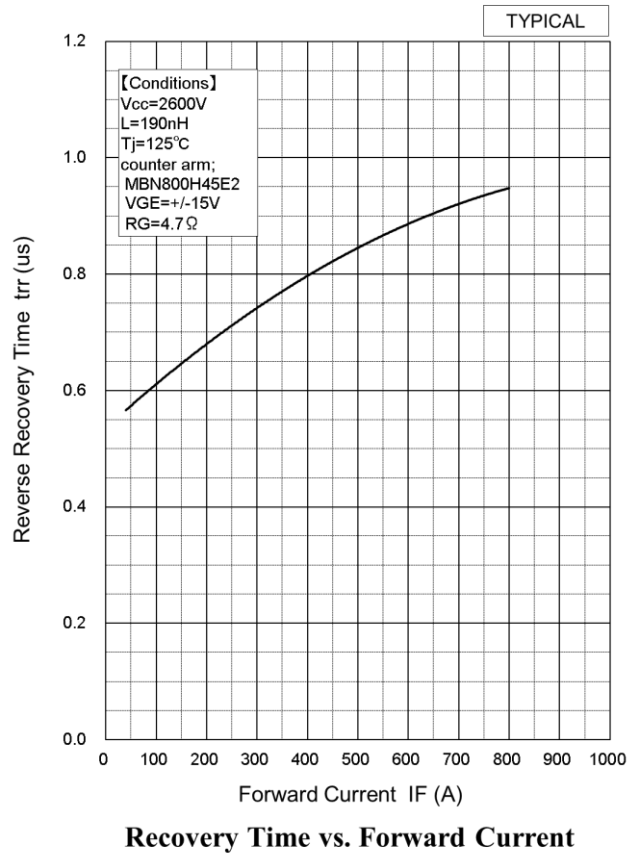
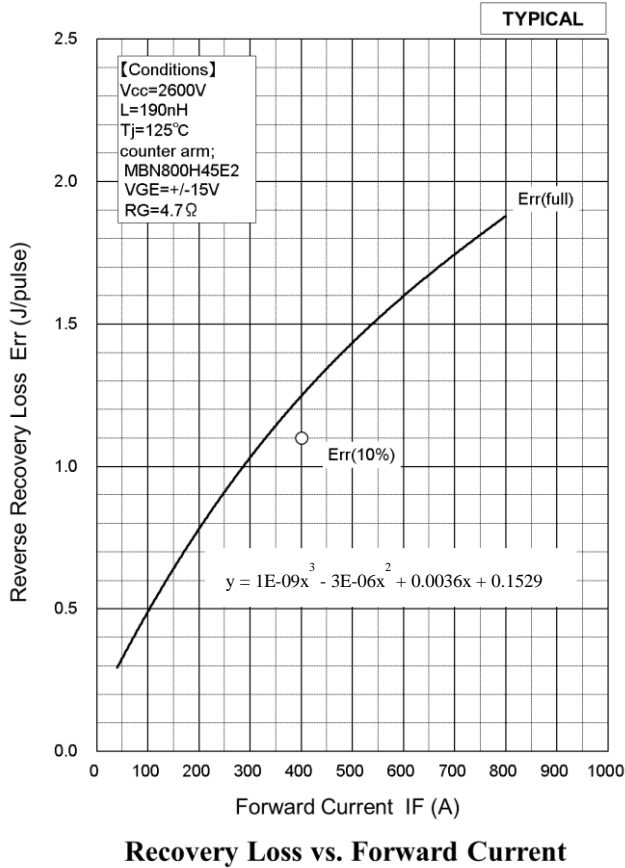
Fig.3 Definition of switching loss

MDM400H45E2

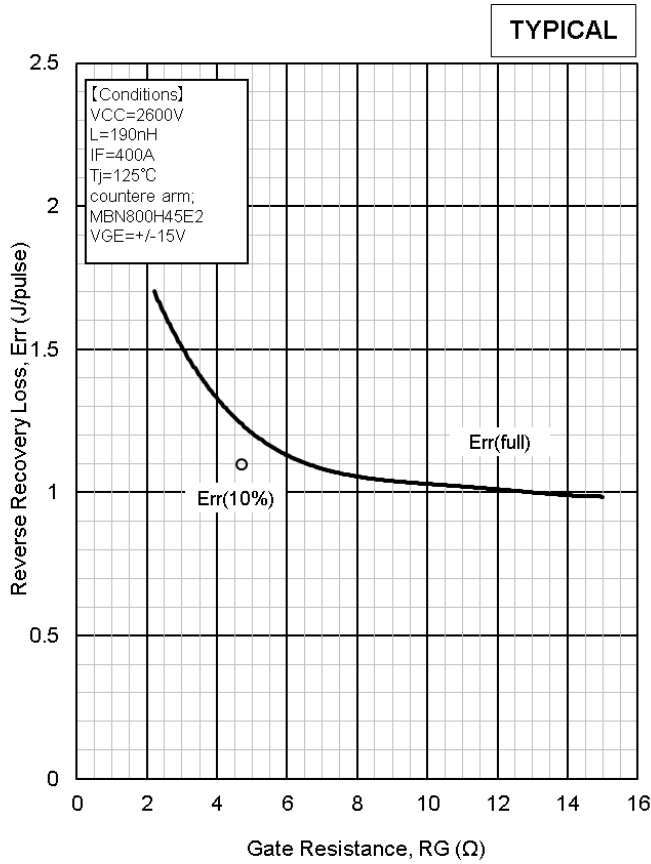
STATIC CHARACTERISTICS



DYNAMIC CHARACTERISTICS



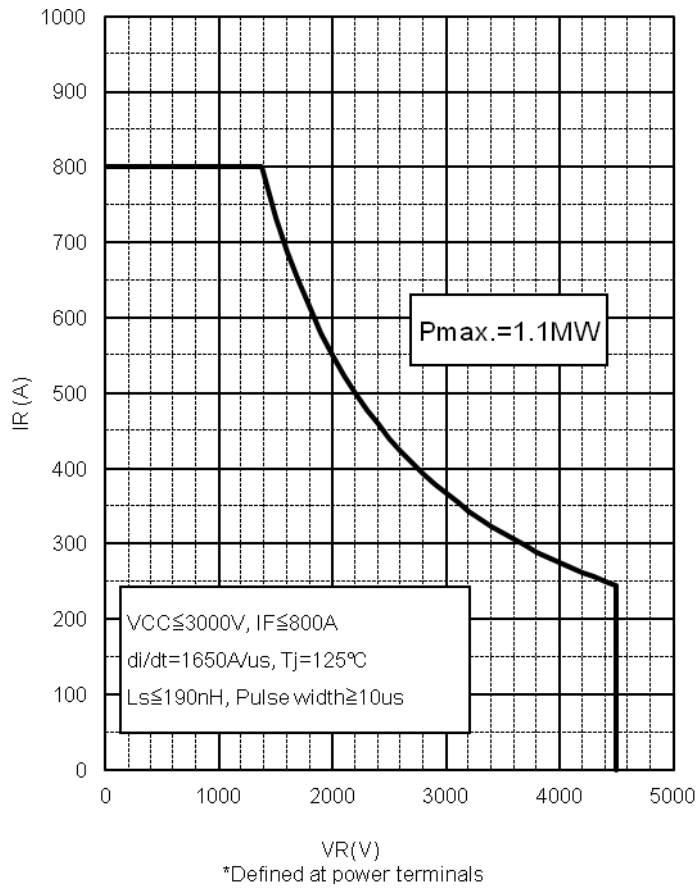
MDM400H45E2



Recovery loss vs. Gate Resistance

MDM400H45E2

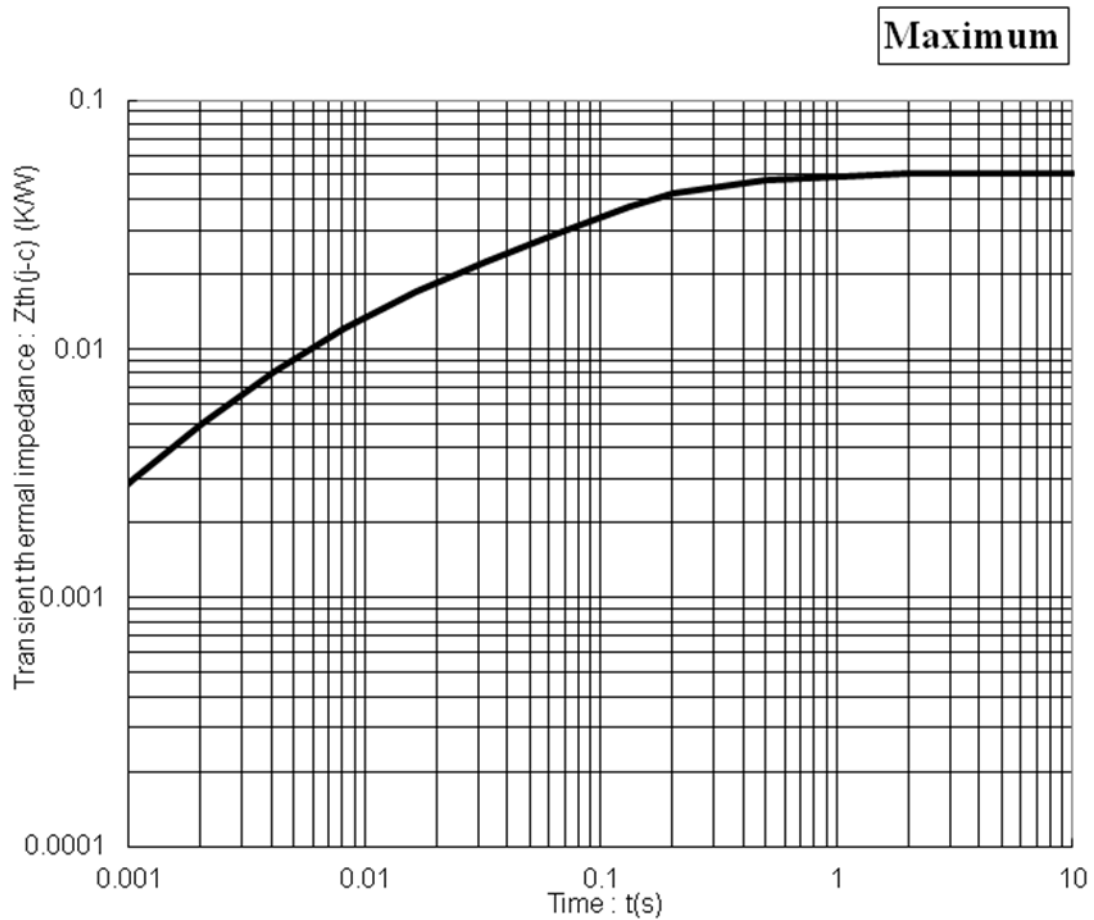
Safe Operating Area



Reverse Recovery Safe Operation Area (RRSOA)

MDM400H45E2

TRANSIENT THERMAL IMPEDANCE



Transient Thermal Impedance Curve

Curve Approximation Model

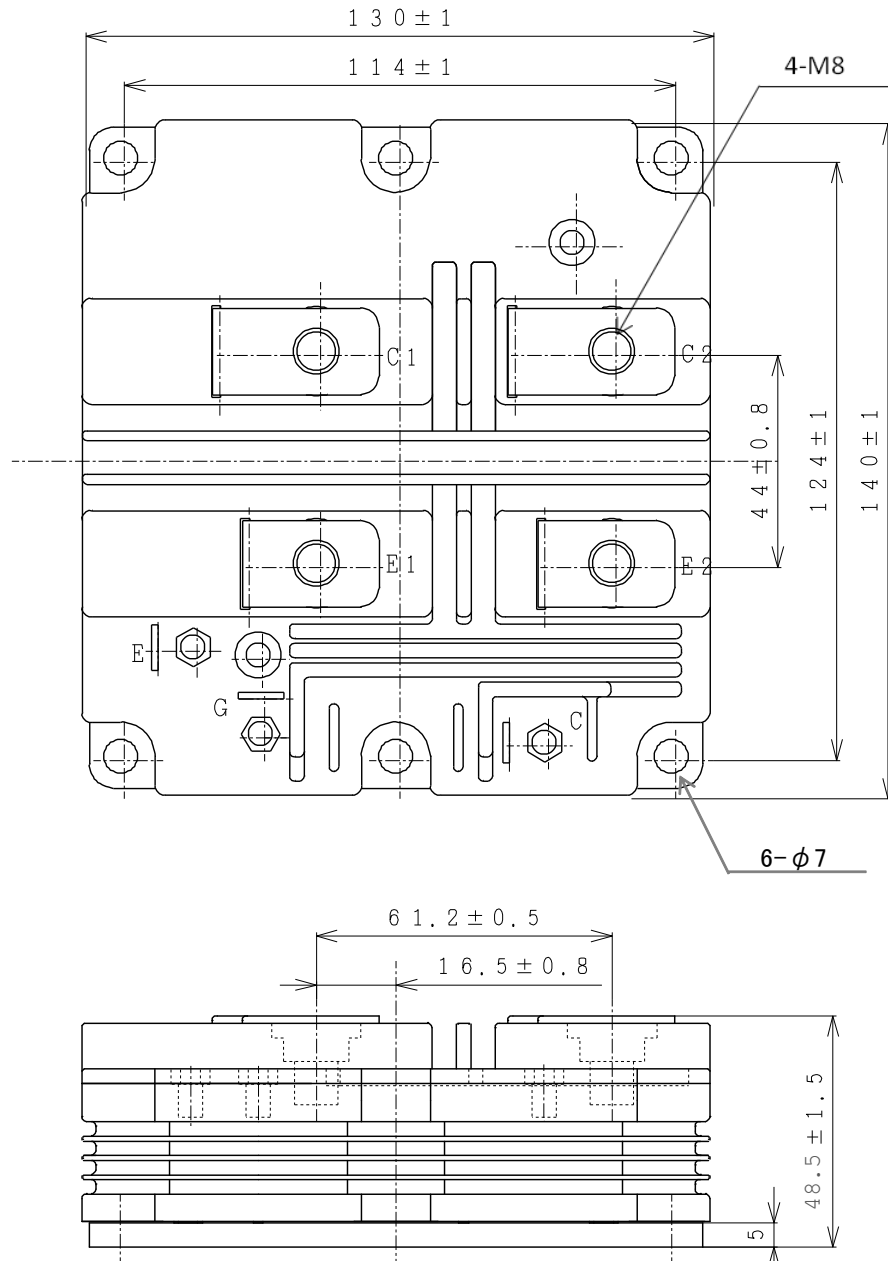
$$\sum r_{th}[n] * (1 - \exp(-t/r_{th}[n]))$$

n	1	2	3	4	Unit
$\tau_{th}[n]$	3.98E-01	9.61E-02	7.65E-03	3.16E-04	sec
$r_{th}[n, Diode]$	8.82E-03	2.89E-02	1.30E-02	1.34E-03	K/W

MDM400H45E2

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

MDM400H45E2

HITACHI POWER SEMICONDUCTORS

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