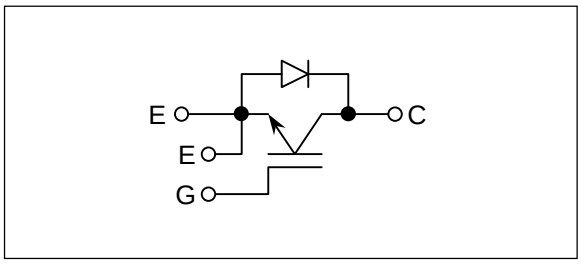
MBN400GR12

[Rated 400A/1200V, Single-pack type]

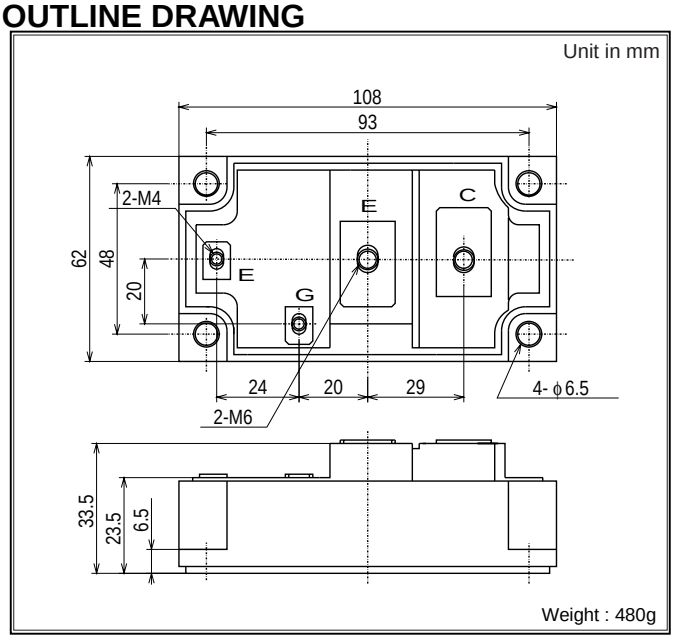
FEATURES

- Low saturation voltage and high speed.
- Low turn-OFF switching loss.
- Low noise due to build-in free-wheeling diode. (Ultra Soft and Fast recovery Diode (USFD))
- High reliability structure.
- Isolated heat sink (terminals to base).

CIRCUIT DIAGRAM



OUTLINE DRAWING



ABSOLUTE MAXIMUM RATINGS(T_C=25°C)

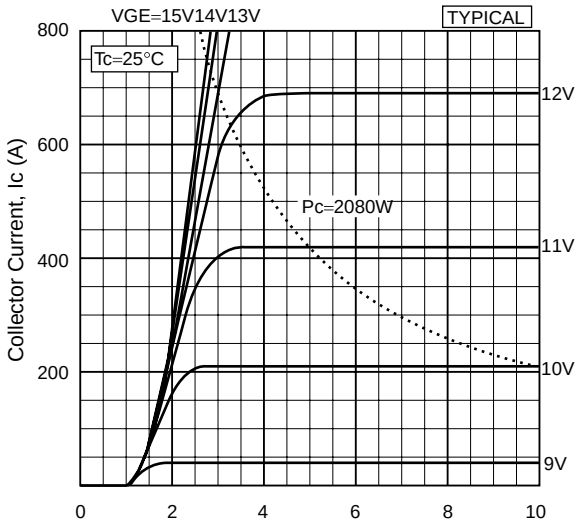
Item		Symbol	Unit	Value
Collector-Emitter Voltage		V_{CES}	V	1200
Gate-Emitter Voltage		V_{GES}	V	±20
Collector Current	DC	I_C	A	400
	1ms	I_{CP}		800
Forward Current	DC	I_F	A	400 *1
	1ms	I_{FM}		800
Collector Power Dissipation		P_C	W	2080
Junction Temperature		T_j	°C	-40 ~ +150
Storage Temperature		T_{stg}	°C	-40 ~ +125
Isolation Voltage		V_{iso}	V_{RMS}	2500(AC 1 minute)
Screw Torque	Terminals (M4/M6)	–	N·m (kgf·cm)	1.37(14) / 2.94(30) *2
	Mounting			2.94(30) *3

Notes; *1: RMS current of Diode ≤ 120 Arms
*2: Recommended value 1.18 / 2.45 N·m (12 / 25 kgf·cm)
*3: Recommended value 2.45 N·m (25 kgf·cm)

CHARACTERISTICS (T_C=25°C)

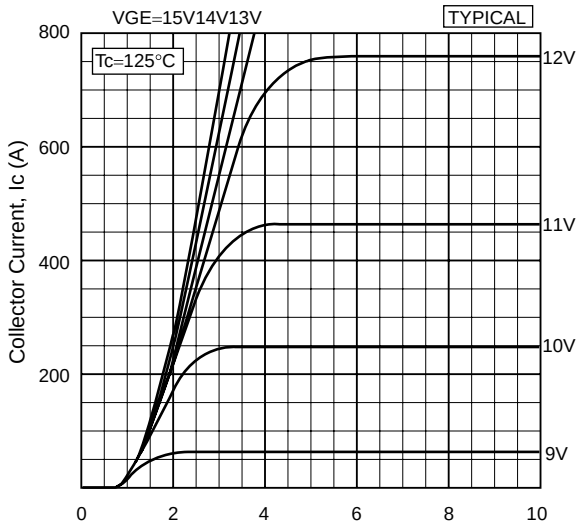
Item		Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Collector-Emitter Cut-Off Current		I_{CES}	mA	–	–	1.0	V_{CE}=1200V, V_{GE}=0V
Gate-Emitter Leakage Current		I_{GES}	nA	–	–	±500	V_{GE}=±20V, V_{CE}=0V
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	V	–	2.2	2.8	I_C=400A, V_{GE}=15V
Gate-Emitter Threshold Voltage		$V_{GE(TO)}$	V	–	–	10	V_{CE}=5V, I_C=400mA
Input Capacitance		C_{ies}	pF	–	37000	–	V_{CE}=10V, V_{GE}=0V, f=1MHz
Switching Times	Rise Time	t_r	μs	–	0.25	0.7	V_{CC}=600V, R_L=1.5Ω, R_G=2.7Ω *4, V_{GE}=±15V
	Turn-ON Time	t_{on}		–	0.4	0.9	
	Fall Time	t_f		–	0.2	0.35	
	Turn-Off Time	t_{off}		–	0.7	1.1	
Peak Forward Voltage Drop		V_{FM}	V	–	2.5	3.5	I_F=400A, V_{GE}=0V
Reverse Recovery Time		t_{rr}	μs	–	–	0.4	I_F=400A, V_{GE}=-10V, di/dt=400A/μs
Thermal Impedance	IGBT	$R_{th(j-c)}$	°C/W	–	–	0.06	Junction to case
	FWD	$R_{th(j-c)}$				0.10	

Notes; *4:R_G value is the test condition's value for decision 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.
Remark; The specification given herein, is subject to change without prior notice to improve product characteristics.



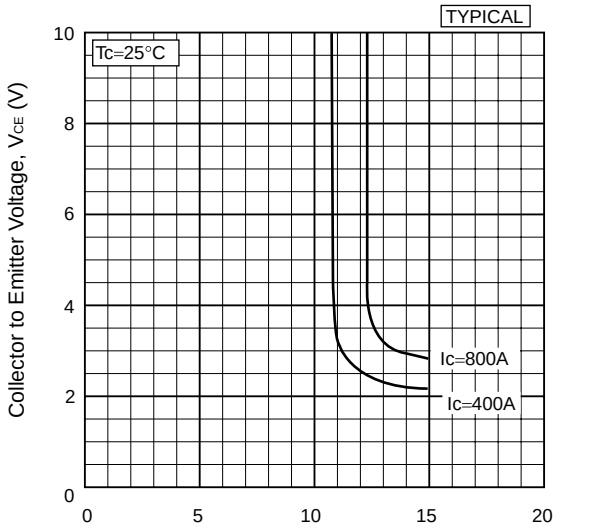
Collector to Emitter Voltage, V_{CE} (V)

Collector current vs. Collector to Emitter voltage



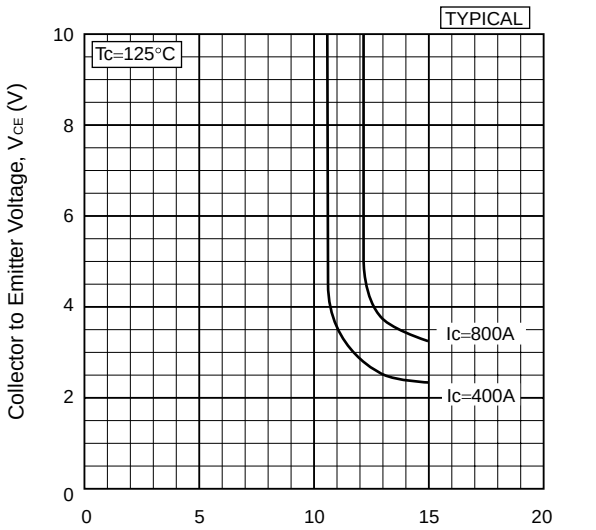
Collector to Emitter Voltage, V_{CE} (V)

Collector current vs. Collector to Emitter voltage



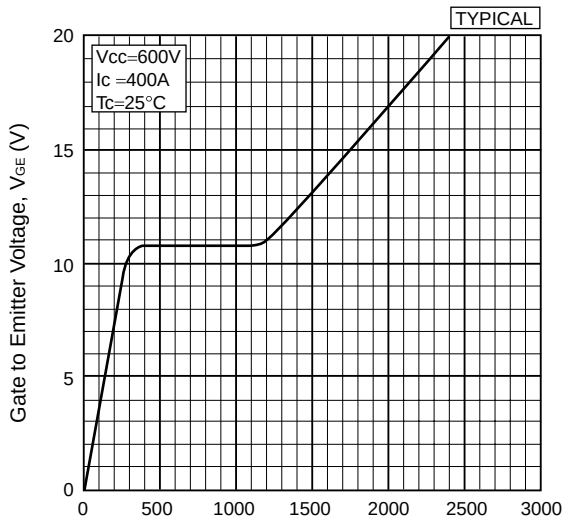
Gate to Emitter Voltage, V_{GE} (V)

Collector to Emitter voltage vs. Gate to Emitter voltage



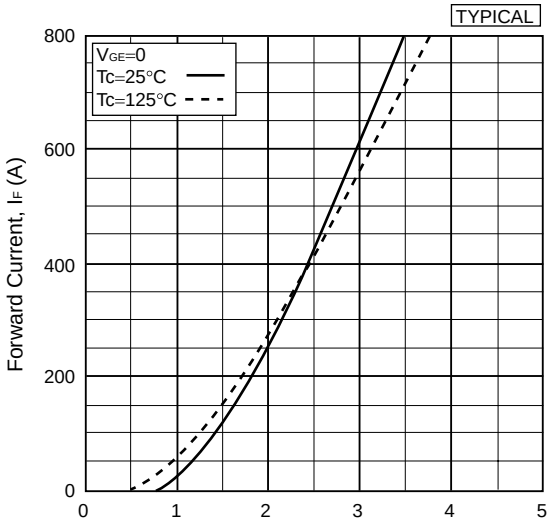
Gate to Emitter Voltage, V_{GE} (V)

Collector to Emitter voltage vs. Gate to Emitter voltage



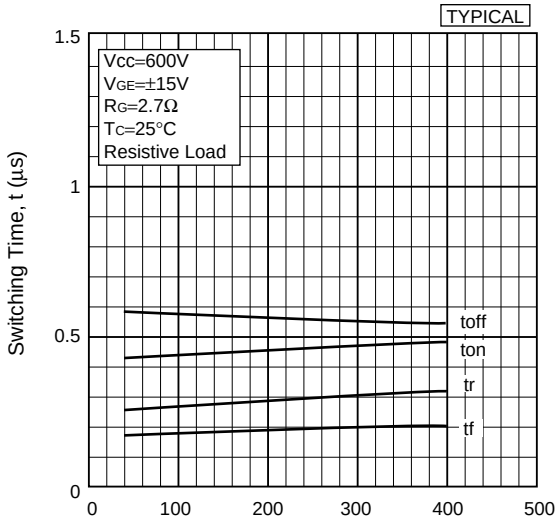
Gate Charge, Q_G (nC)

Gate charge characteristics

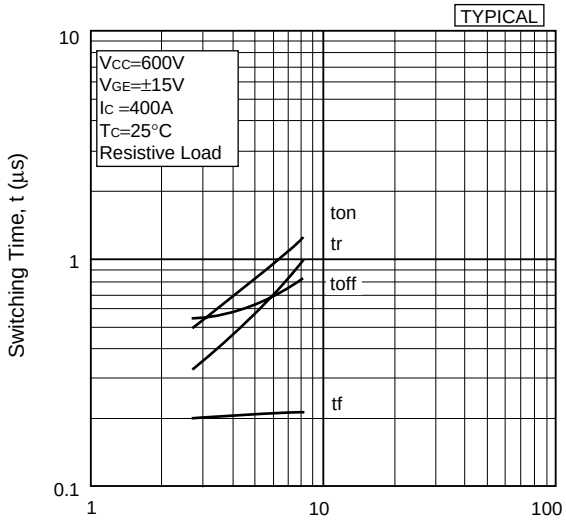


Forward Voltage, V_F (V)

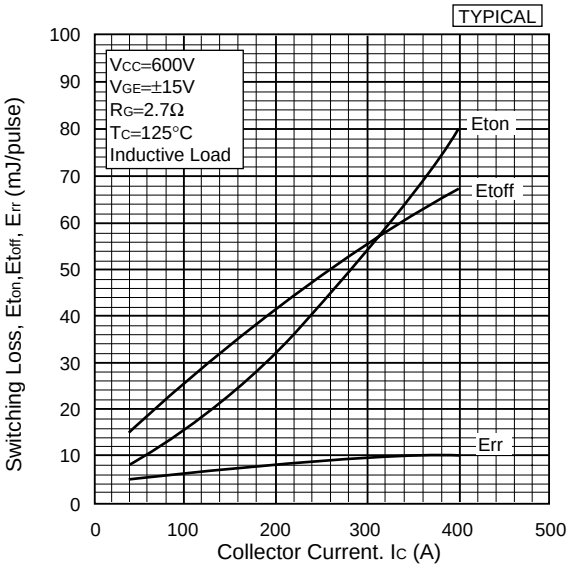
Forward voltage of free-wheeling diode



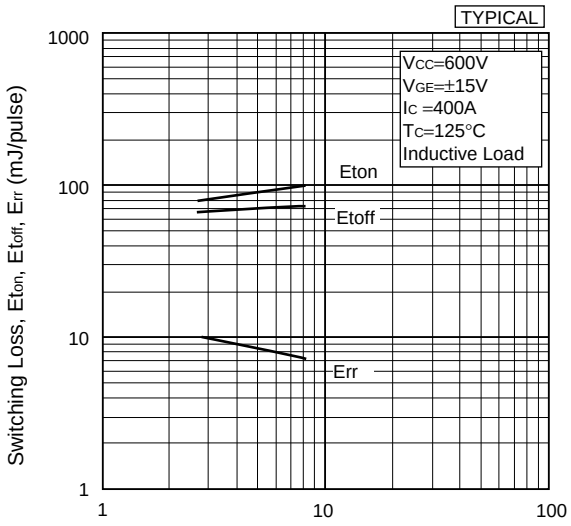
Switching time vs. Collector current



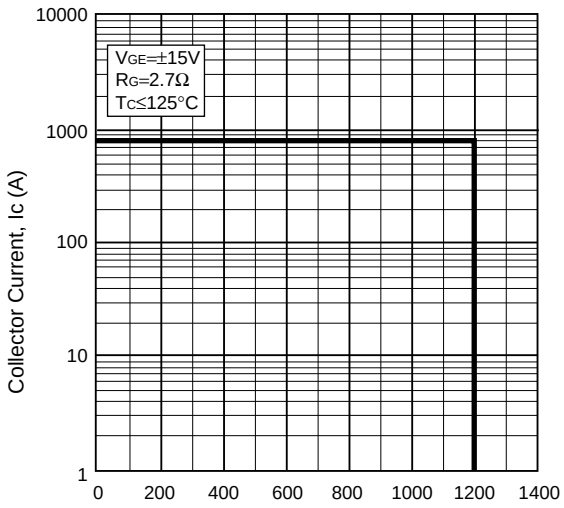
Switching time vs. Gate resistance



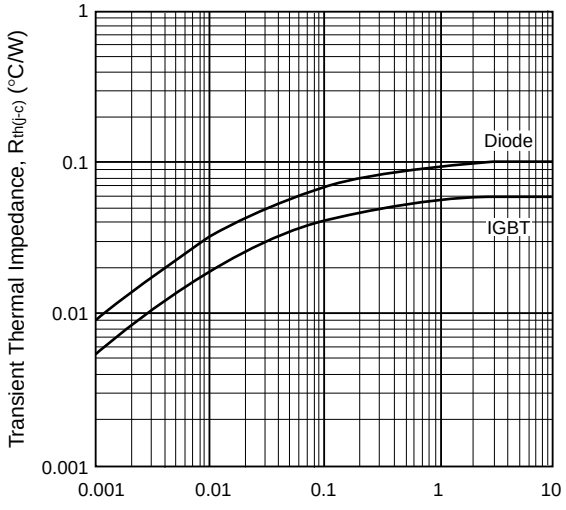
Switching loss vs. Collector current



Switching loss vs. Gate resistance



Reverse biased safe operating area



Transient thermal impedance

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HITACHI POWER SEMICONDUCTORS

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