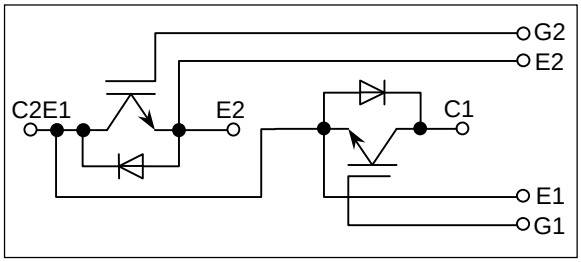
MBM400GR6

[Rated 400A/600V, Dual-pack type]

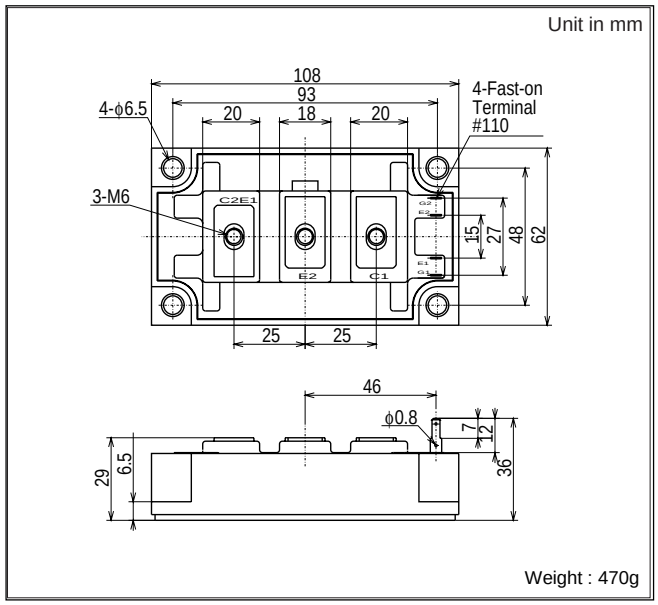
FEATURES

- 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)

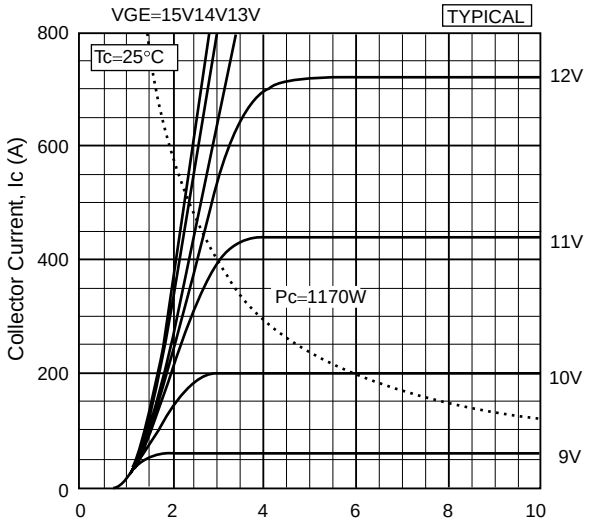
Item		Symbol	Unit	Value
Collector-Emitter Voltage		V_{CES}	V	600
Gate-Emitter Voltage		V_{GES}	V	±20
Collector Current	DC	I_C	A	400
	1ms	I_{CP}		800
Forward Current	DC	I_F	A	400 *1
	1ms	I_{FM}		800
Collector Power Dissipation		P_C	W	1170
Junction Temperature		T_j	°C	-40 ~ +150
Storage Temperature		T_{stg}	°C	-40 ~ +125
Isolation Voltage		V_{iso}	V_{RMS}	2500(AC 1 minute)
Screw Torque	Terminals	–	N·m (kgf·cm)	2.94(30) *2
	Mounting			2.94(30) *3

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

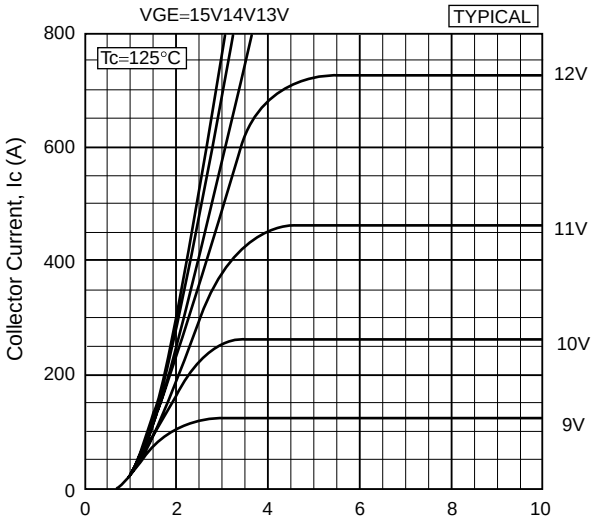
CHARACTERISTICS (T_C=25°C)

Item		Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Collector-Emitter Cut-Off Current		I_{CES}	mA	–	–	1.0	V_{CE}=600V, 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	–	2.1	2.6	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	–	20000	–	V_{CE}=10V, V_{GE}=0V, f=1MHz
Switching Times	Rise Time	t_r	μs	–	0.25	0.5	V_{CC}=300V, R_L=0.75Ω, R_G=6.2Ω *4, V_{GE}=±15V
	Turn-ON Time	t_{on}		–	0.35	0.7	
	Fall Time	t_f		–	0.2	0.32	
	Turn-Off Time	t_{off}		–	0.8	1.1	
Peak Forward Voltage Drop		V_{FM}	V	–	1.6	2.2	I_F=400A, V_{GE}=0V
Reverse Recovery Time		t_{rr}	μs	–	–	0.3	I_F=400A, V_{GE}=-10V,di/dt=400A/μs
Thermal Impedance	IGBT	$R_{th(j-c)}$	°C/W	–	–	0.106	Junction to case
	FWD	$R_{th(j-c)}$				0.22	

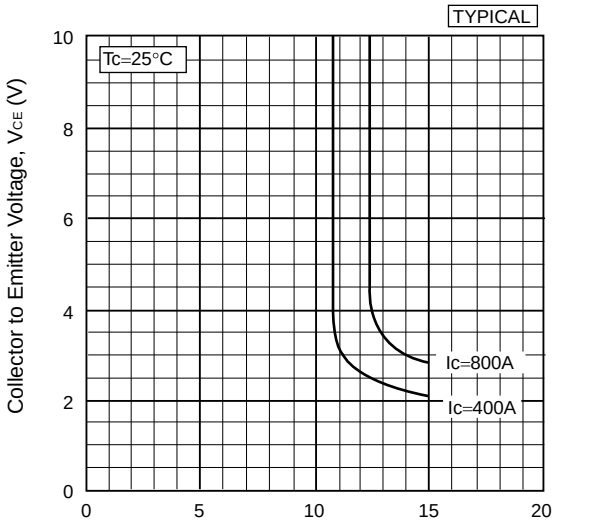
Notes; *4:R_G value is the test condition's value for decision of the switching times, not recommended value, please determine the suitable R_G value after the measurement of switching waveforms (overshoot voltage, etc.) with appliance mounted.
Remark; The specification given herein, is subject to change without prior notice to improve product characteristics.



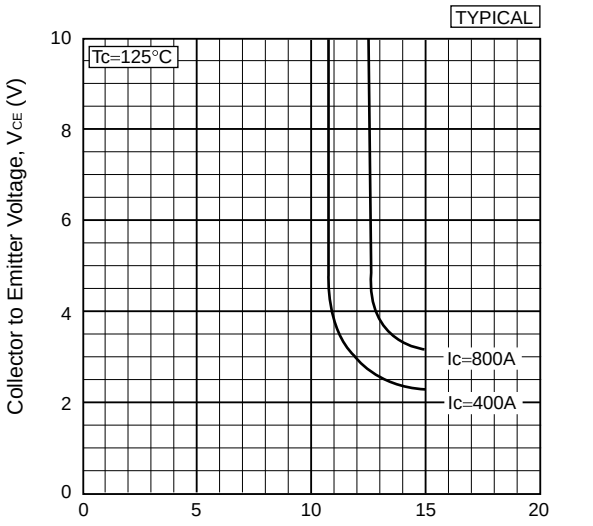
Collector current vs. Collector to Emitter voltage



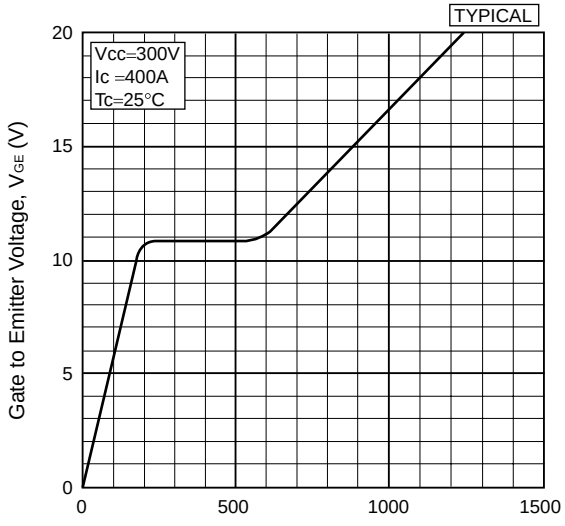
Collector current vs. Collector to Emitter voltage



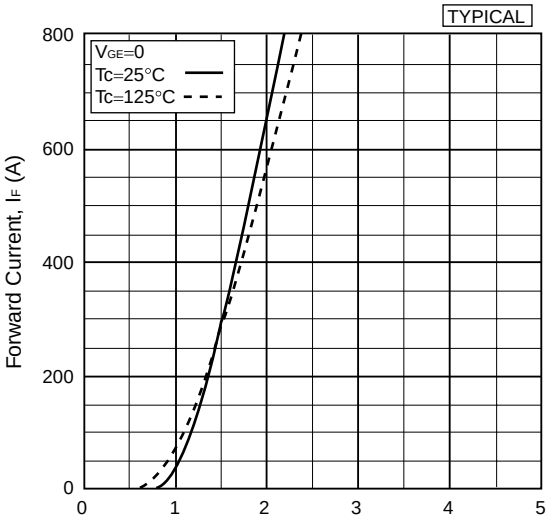
Collector to Emitter voltage vs. Gate to Emitter voltage



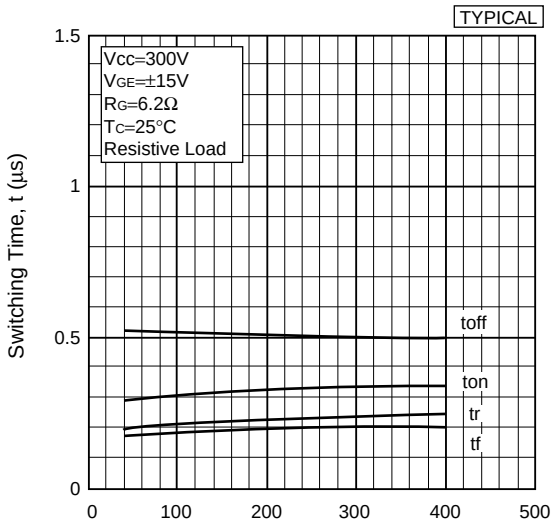
Collector to Emitter voltage vs. Gate to Emitter voltage



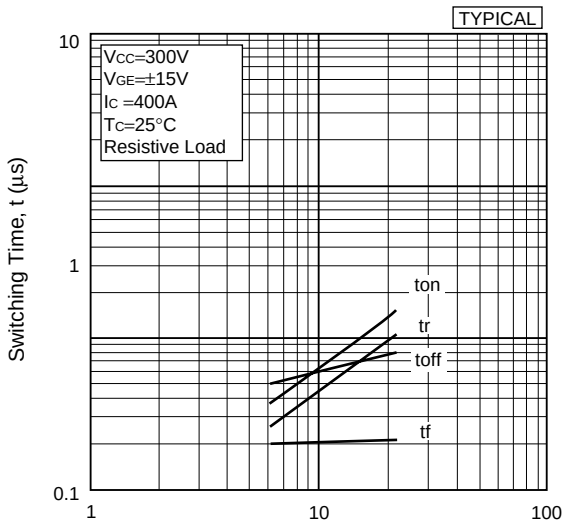
Gate charge characteristics



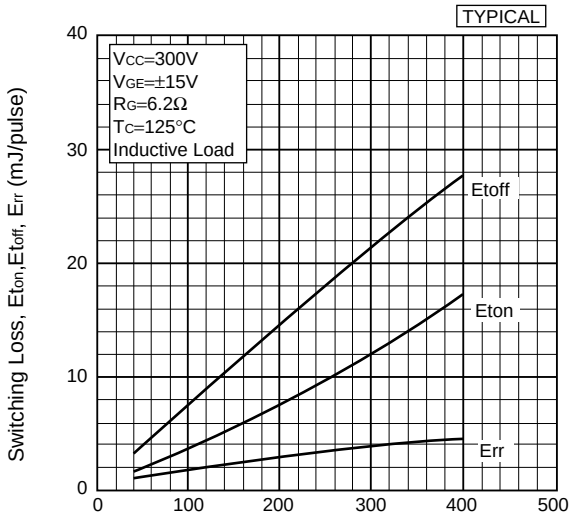
Forward voltage of free-wheeling diode



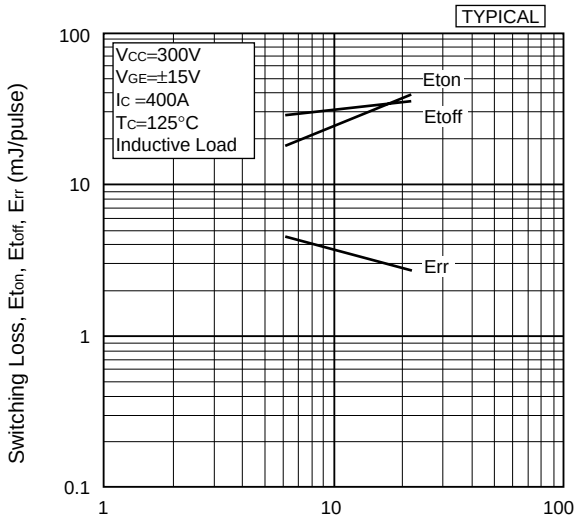
Switching time vs. Collector current



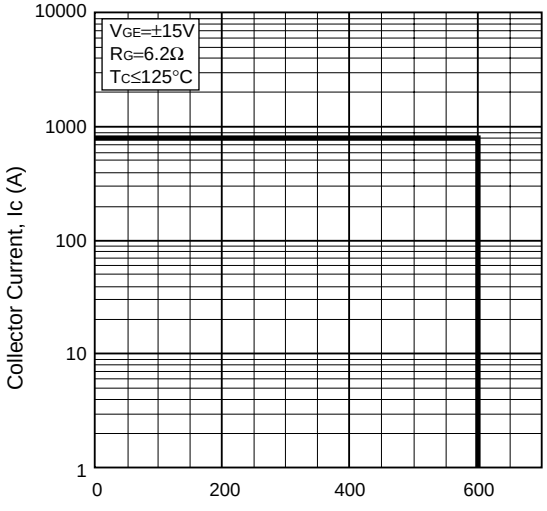
Switching time vs. Gate resistance



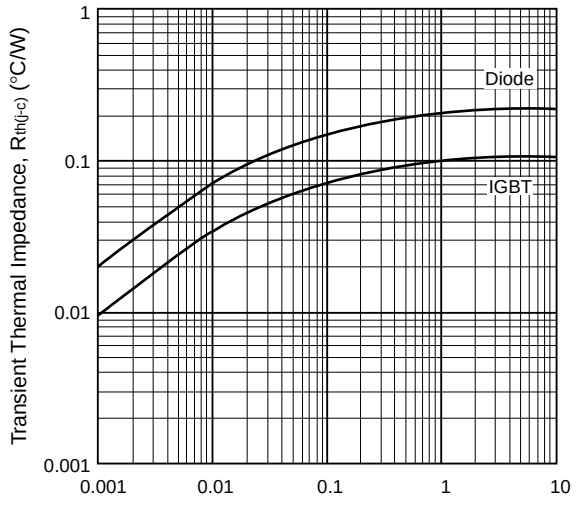
Switching loss vs. Collector current



Switching loss vs. Gate resistance



Reverse biased safe operating area



Transient thermal impedance

HITACHI POWER SEMICONDUCTORS

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