1MBI200N-120 **IGBT Module**

1200V / 200A 1 in one-package

Features

- High speed switching
- Voltage drive
- Low inductance module structure

Applications

- Inverter for Motor drive
- AC and DC Servo drive amplifier
- Uninterruptible power supply
- Industrial machines, such as Welding machines

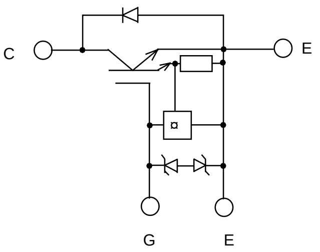
Maximum ratings and characteristics

● Absolute maximum ratings (at Tc=25°C unless otherwise specified)

Item		Symbol	Rating	Unit
Collector-Emitter voltage		V_{CES}	1200	V
Gate-Emitter voltaga		V_{GES}	±20	V
Collector current	Continuous	I_C	200	A
	1ms	I_C pulse	400	A
	Continuous	$-I_C$	200	A
	1ms	$-I_C$ pulse	400	A
Max. power dissipation		P_C	1500	W
Operating temperature		T_j	+150	°C
Storage temperature		T_{stg}	-40 to +125	°C
Isolation voltage		V_{is}	AC 2500 (1min.)	V
Screw torque		Mounting *1	3.5	N·m
		Terminals *2	4.5	N·m
		Terminals *3	1.7	N·m

*1 : Recommendable value : 2.5 to 3.5 N·m(M5) or (M6)
*2 : Recommendable value : 3.5 to 4.5 N·m(M6)
*3 : Recommendable value : 1.3 to 1.7 N·m(M4)

Equivalent Circuit Schematic



¤ Current control circuit

● Electrical characteristics (at Tj=25°C unless otherwise specified)

Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Zero gate voltage collector current	I_{CES}	–	–	4.0	V_{GE}=0V, V_{CE}=1200V	mA
Gate-Emitter leakage current	I_{GES}	–	–	60	V_{CE}=0V, V_{GE}=±20V	µA
Gate-Emitter threshold voltage	$V_{GE(th)}$	4.5	–	7.5	V_{CE}=20V, I_C=200mA	V
Collector-Emitter saturation voltage	$V_{CE(sat)}$	–	–	3.3	V_{GE}=15V, I_C=200A	V
Input capacitance	C_{ies}	–	32000	–	V_{GE}=0V	pF
Output capacitance	C_{oes}	–	11600	–	V_{CE}=10V	
Reverse transfer capacitance	C_{res}	–	10320	–	f=1MHz	
Turn-on time	t_{on}	–	0.65	1.2	V_{CC}=600V	µs
	t_r	–	0.25	0.6	I_C=200A	
Turn-off time	t_{off}	–	0.85	1.5	V_{GE}=±15V	
	t_f	–	0.35	0.5	R_G=4.7 ohm	
Diode forward on voltage	V_F	–	–	3.0	I_F=200A, V_{GE}=0V	V
Reverse recovery time	t_{rr}	–	–	0.35	I_F=200A	µs

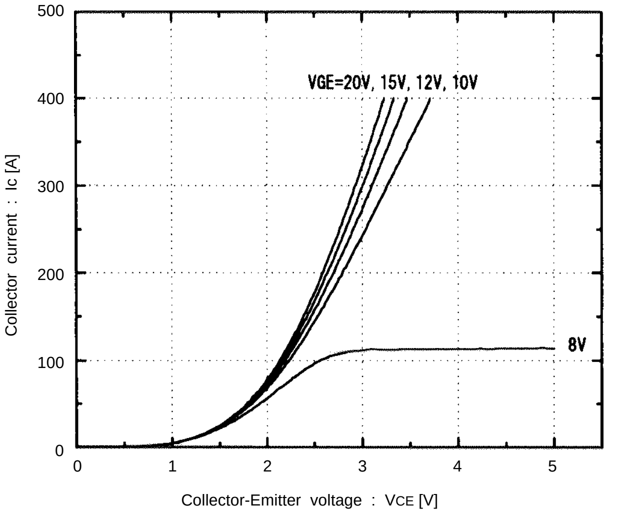
● Thermal resistance characteristics

Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Thermal resistance	Rth(j-c)	–	–	0.085	IGBT	°C/W
	Rth(j-c)	–	–	0.22	Diode	°C/W
	Rth(c-f)*4	–	0.0125	–	the base to cooling fin	°C/W

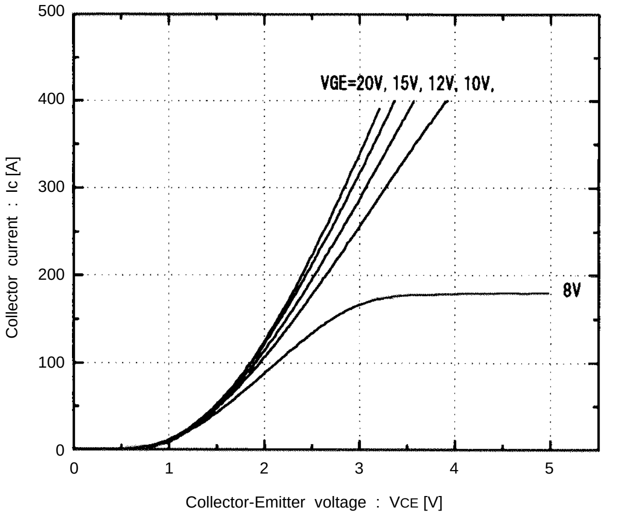
*4 : This is the value which is defined mounting on the additional cooling fin with thermal compound

■ Characteristics (Representative)

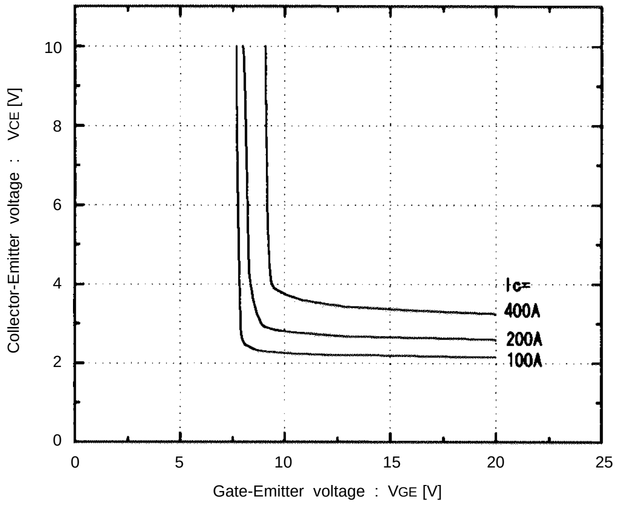
Collector current vs. Collector-Emitter voltage
Tj=25°C



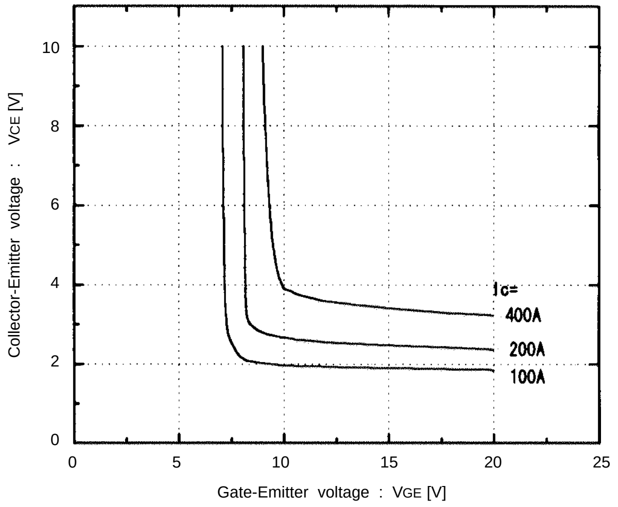
Collector current vs. Collector-Emitter voltage
Tj=125°C



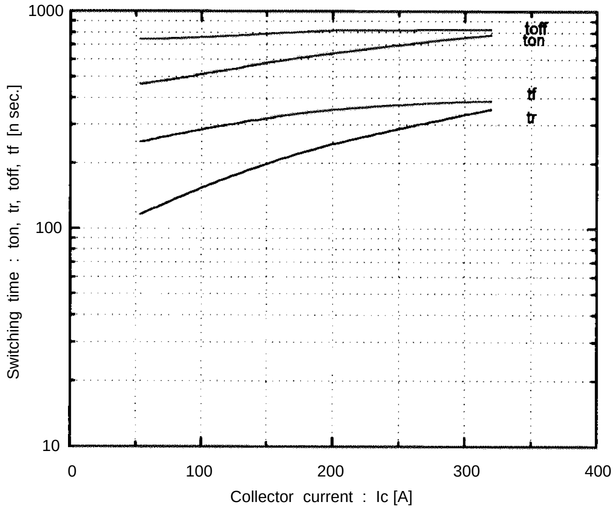
Collector-Emitter vs. Gate-Emitter voltage
Tj=25°C



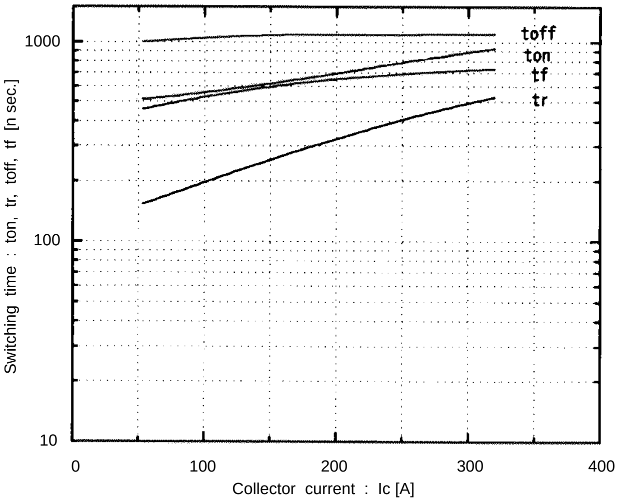
Collector-Emitter vs. Gate-Emitter voltage
Tj=125°C



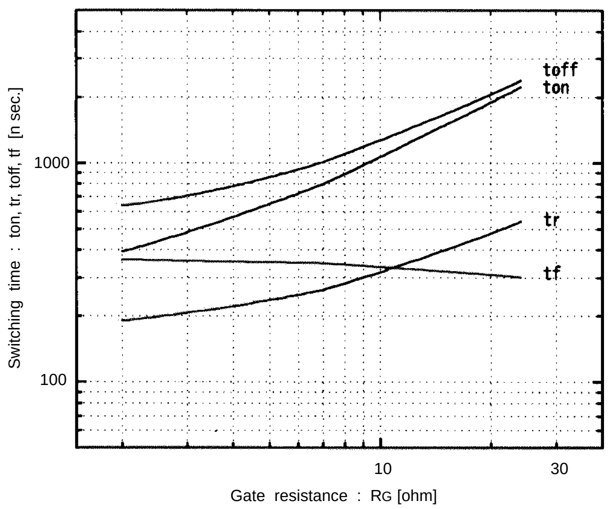
Switching time vs. Collector current
Vcc=600V, RG=4.7 ohm, VGE=±15V, Tj=25°C



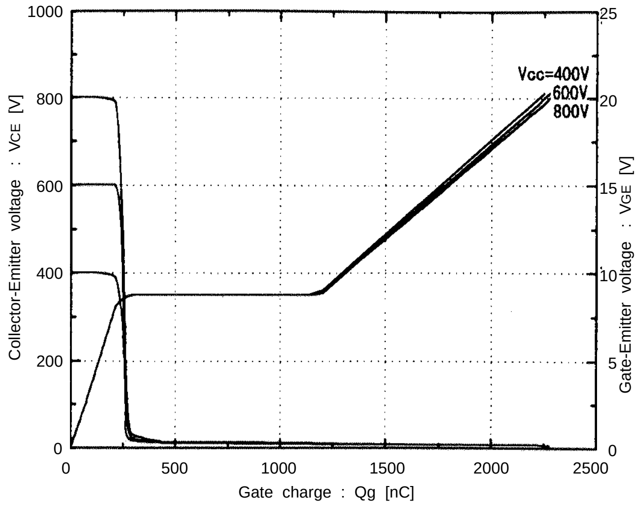
Switching time vs. Collector current
Vcc=600V, RG=4.7 ohm, VGE=±15V, Tj=125°C



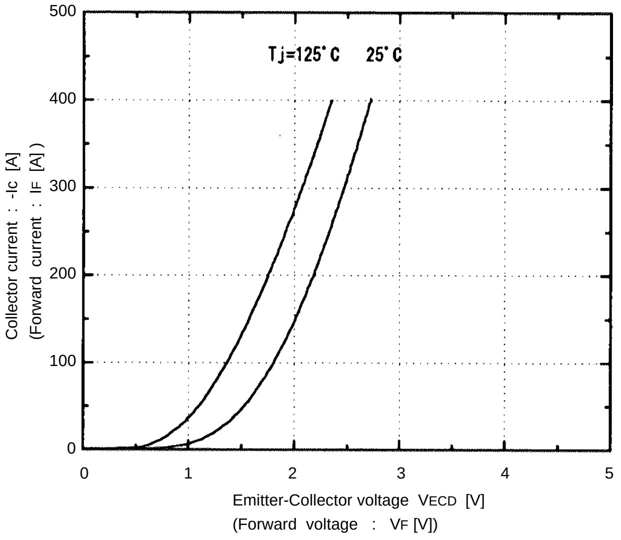
Switching time vs. RG
Vcc=600V, Ic=200A, VGE=±15V, Tj=25°C



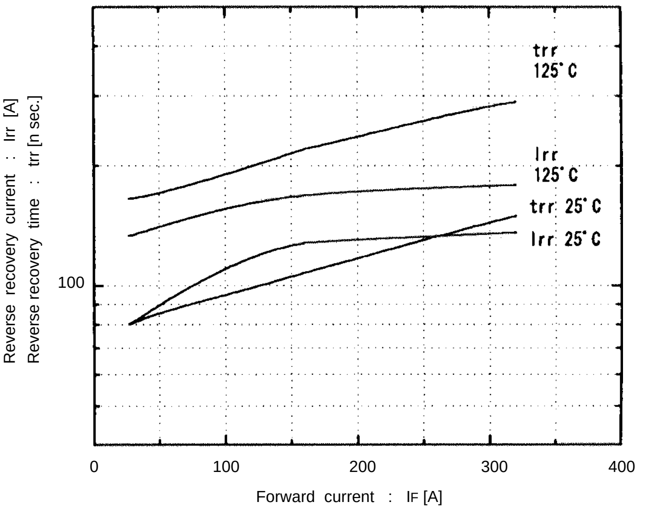
Dynamic input characteristics
Tj=25°C



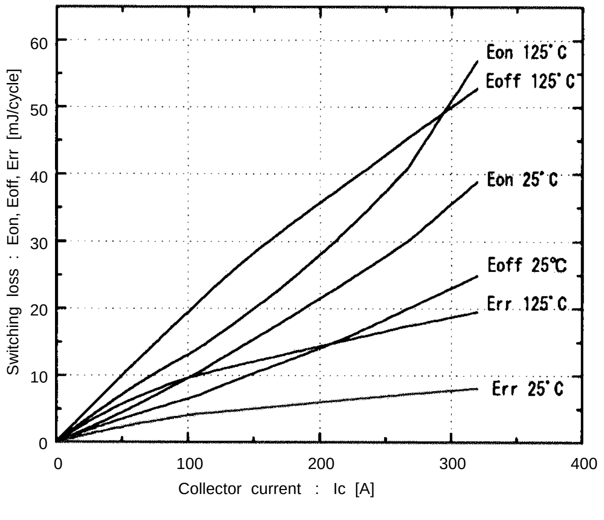
Forward current vs. Forward voltage
VGE=0V



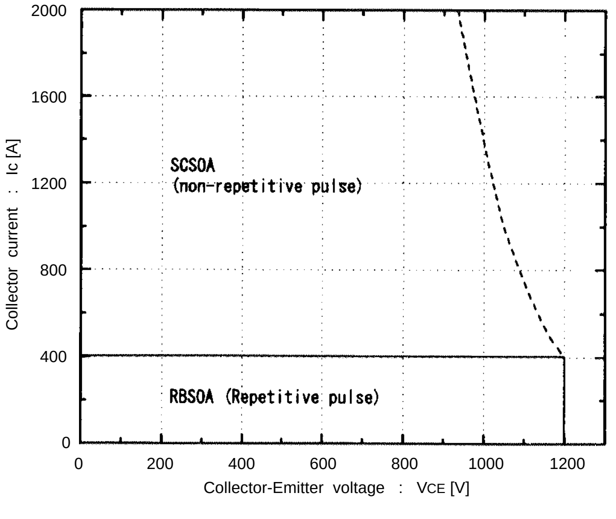
Reverse recovery characteristics
trr, Irr, vs. IF

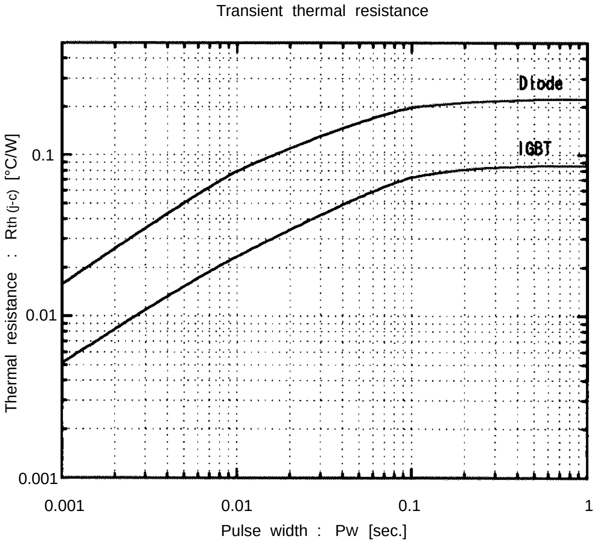


Switching loss vs. Collector current
Vcc=600V, RG=4.7 ohm, VGE=±15V

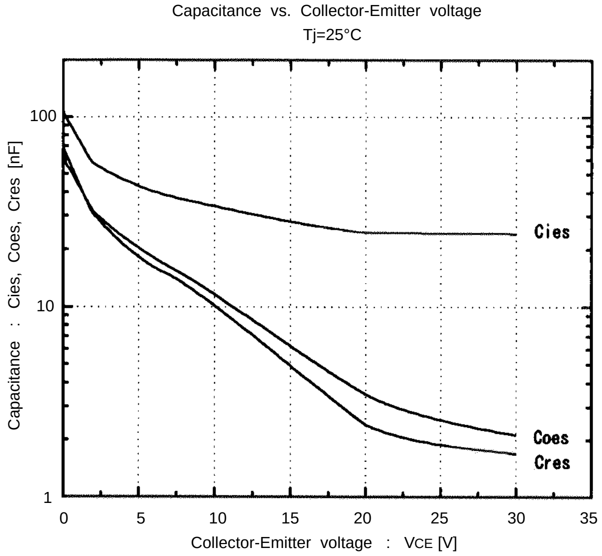


Reversed biased safe operating area
+VGE=15V, -VGE ≦ 15V, Tj ≦ 125°C, RG ≧ 4.7 ohm



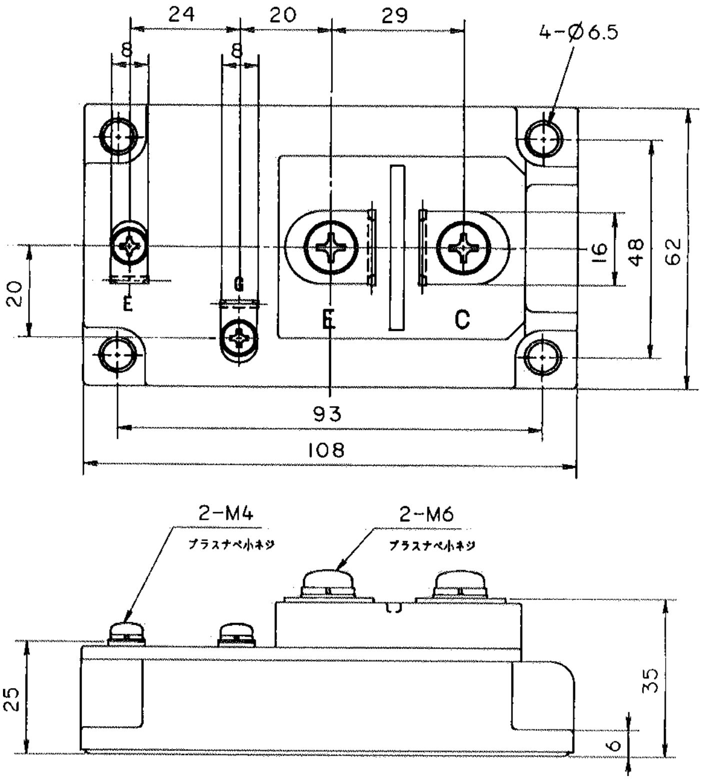


Transient thermal resistance



Capacitance vs. Collector-Emitter voltage
Tj=25°C

■ Outline Drawings, mm



mass : 380g