

# 2MBI200SB-120

## IGBT MODULE (S series) 1200V / 200A / 2 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)

Items	Symbols	Conditions	Maximum ratings	Units	
Collector-Emitter voltage	V <sub>CEs</sub>		1200	V	
Gate-Emitter voltage	V <sub>GES</sub>		±20	V	
Collector current	I <sub>c</sub>	Continuous	Tc=25°C	300	A
			Tc=80°C	200	
	I <sub>c</sub> pulse	1ms	Tc=25°C	600	
			Tc=80°C	400	
	-I <sub>c</sub>			200	
-I <sub>c</sub> pulse	1ms		400		
Collector power dissipation	P <sub>c</sub>	1 device	1500	W	
Junction temperature	T <sub>j</sub>		150	°C	
Storage temperature	T <sub>stg</sub>		-40 to +125	°C	
Isolation voltage (*1)	V <sub>iso</sub>	AC : 1min.	2500	V	
Screw torque	Mounting (*2)		3.5	N·m	
	Terminals (*2)		4.5		

Note \*1: All terminals should be connected together when isolation test will be done.

Note \*2: Recommendable value : Mounting : 2.5-3.5 N·m (M5 or M6), Terminals : 3.5-4.5 N·m (M6)

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

Items	Symbols	Conditions	Characteristics			Units	
			min.	typ.	max.		
Zero gate voltage collector current	I <sub>CEs</sub>	V <sub>GE</sub> = 0V, V <sub>CE</sub> = 1200V	-	-	1.0	mA	
Gate-Emitter leakage current	I <sub>GES</sub>	V <sub>CE</sub> = 0V, V <sub>GE</sub> = ±20V	-	-	0.4	µA	
Gate-Emitter threshold voltage	V <sub>GE(th)</sub>	V <sub>CE</sub> = 20V, I <sub>c</sub> = 200mA	5.5	7.2	8.5	V	
Collector-Emitter saturation voltage	V <sub>CE(sat)</sub>	V <sub>GE</sub> = 15V I <sub>c</sub> = 200A	Tj=25°C	-	2.3	2.6	V
			Tj=125°C	-	2.8	-	
Input capacitance	C <sub>ies</sub>	V <sub>GE</sub> = 0V	-	24000	-	pF	
Output capacitance	C <sub>oes</sub>	V <sub>CE</sub> = 10V	-	5000	-		
Reverse transfer capacitance	C <sub>res</sub>	f = 1MHz	-	4400	-		
Turn-on time	ton	V <sub>CC</sub> = 600V I <sub>c</sub> = 200A V <sub>GE</sub> = ±15V R <sub>G</sub> = 4.7Ω	-	0.35	1.2	µs	
	tr		-	0.25	0.6		
	tr (i)		-	0.1	-		
Turn-off time	toff	R <sub>G</sub> = 4.7Ω	-	0.45	1.0	µs	
	tf		-	0.08	0.3		
Forward on voltage	V <sub>F</sub>	I <sub>F</sub> = 200A	Tj=25°C	-	2.3	3.0	V
			Tj=125°C	-	2.0	-	
Reverse recovery time	trr	I <sub>F</sub> = 200A	-	-	0.35	µs	

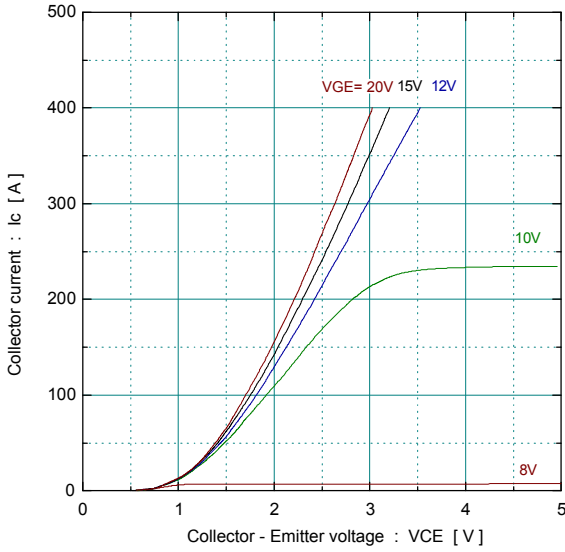
#### ● Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance (1device)	R <sub>th(j-c)</sub>	IGBT	-	-	0.085	°C/W
		FWD	-	-	0.18	
Contact thermal resistance	R <sub>th(c-f)</sub>	with Thermal Compound (*3)	-	0.025	-	

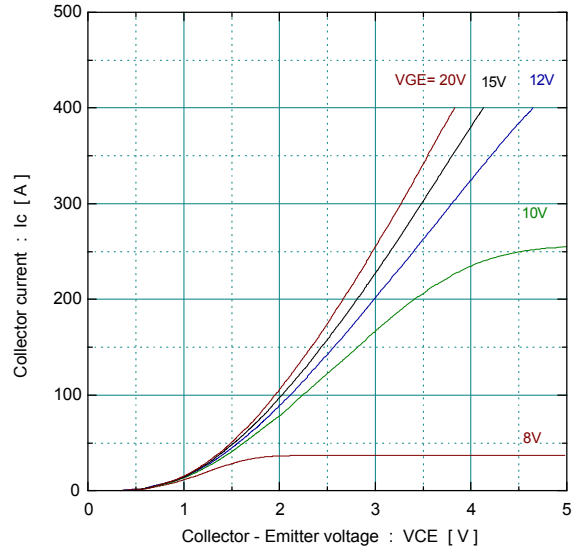
Note \*3: This is the value which is defined mounting on the additional cooling fin with thermal compound.

■ Characteristics (Representative)

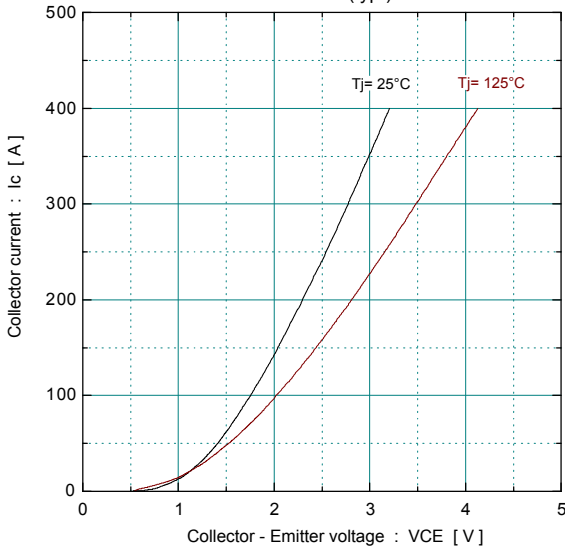
Collector current vs. Collector-Emiiter voltage  
T<sub>J</sub>= 25°C (typ.)



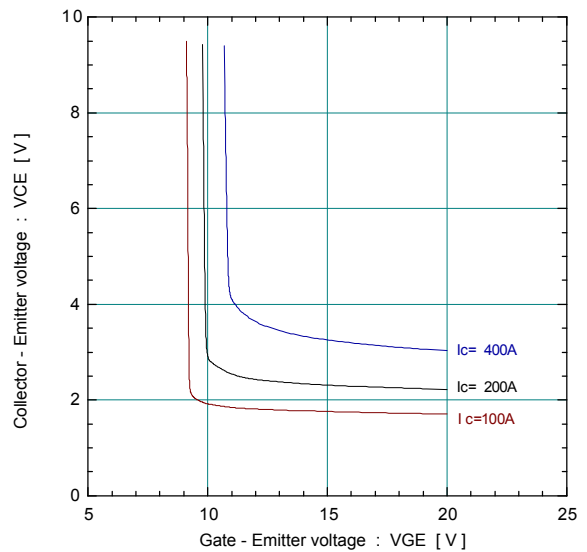
Collector current vs. Collector-Emiiter voltage  
T<sub>J</sub>= 125°C (typ.)



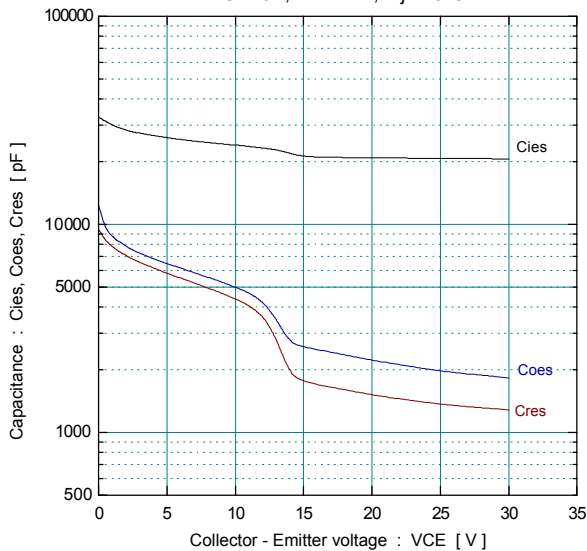
Collector current vs. Collector-Emiiter voltage  
VGE=15V (typ.)



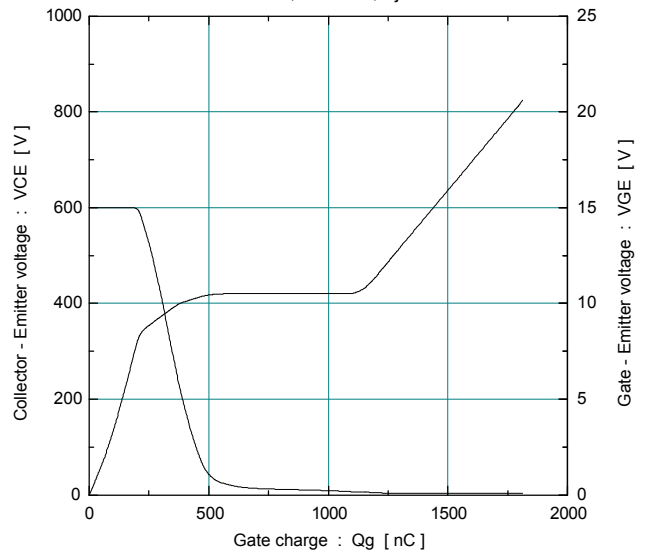
Collector-Emiiter voltage vs. Gate-Emiiter voltage  
T<sub>J</sub>= 25°C (typ.)

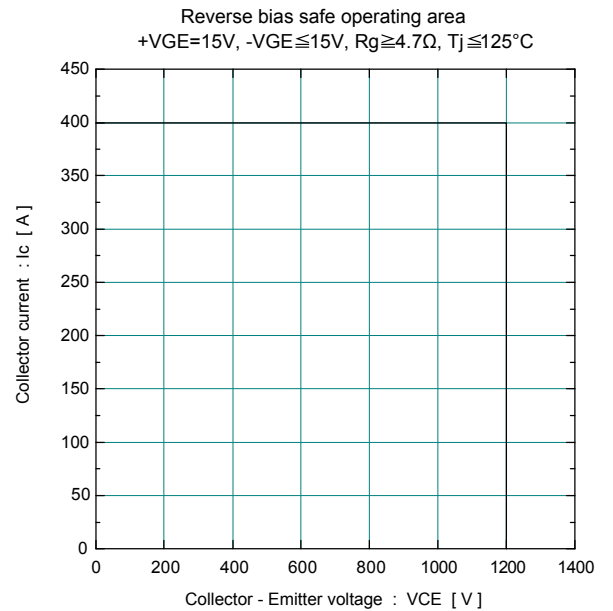
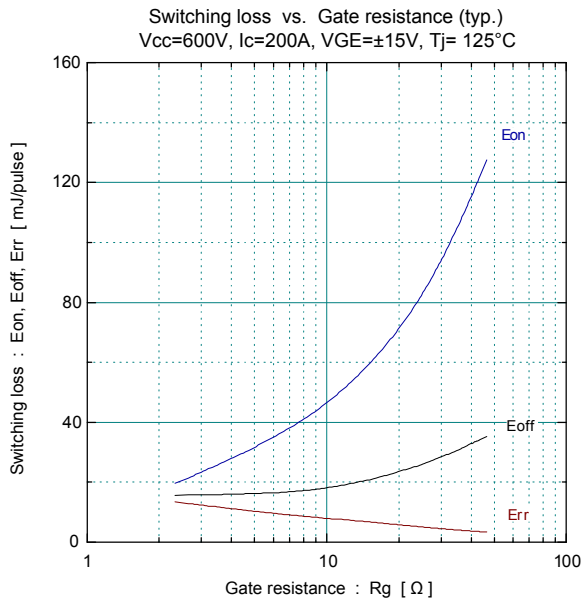
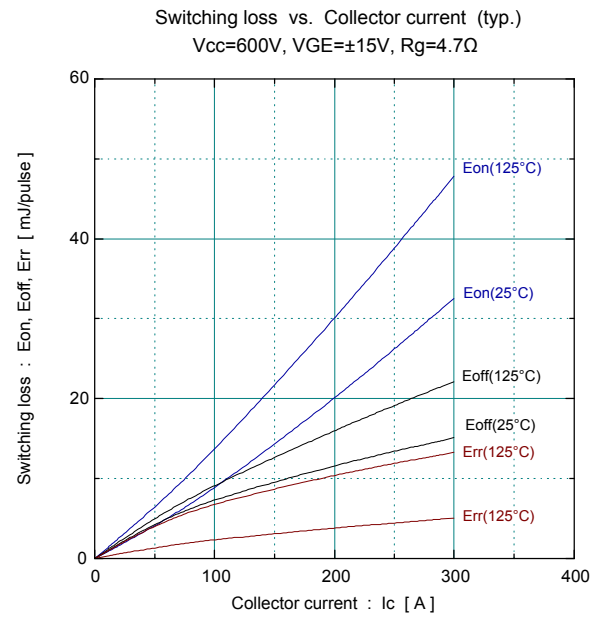
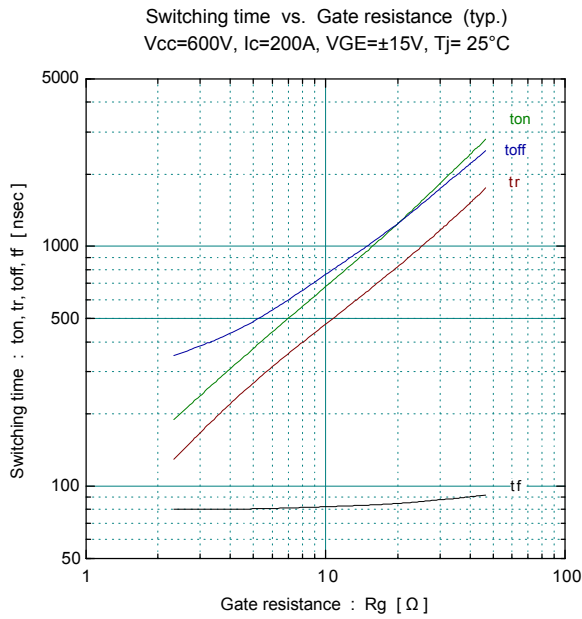
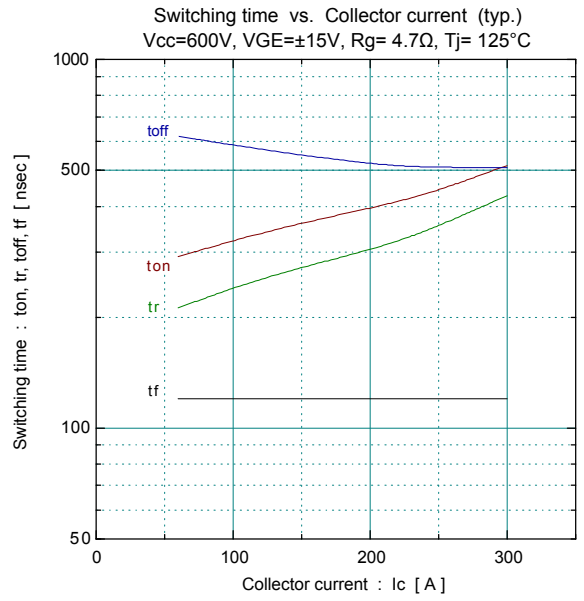
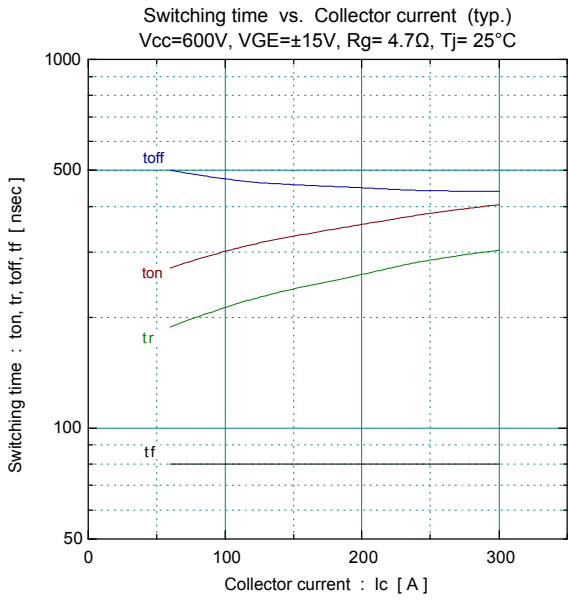


Capacitance vs. Collector-Emiiter voltage (typ.)  
VGE=0V, f= 1MHz, T<sub>J</sub>= 25°C

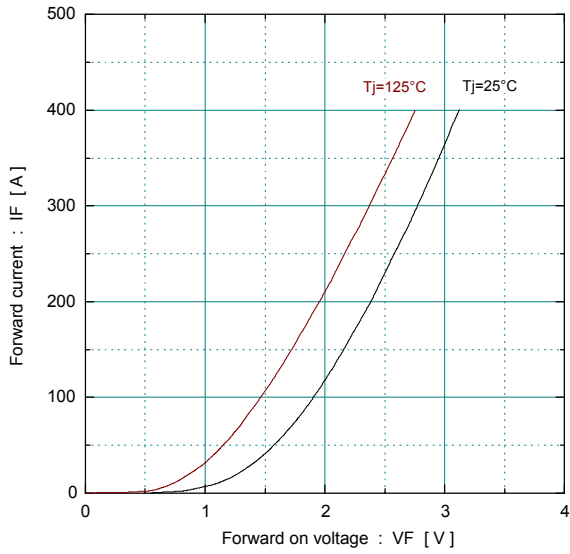


Dynamic Gate charge (typ.)  
Vcc=600V, Ic=200A, T<sub>J</sub>= 25°C

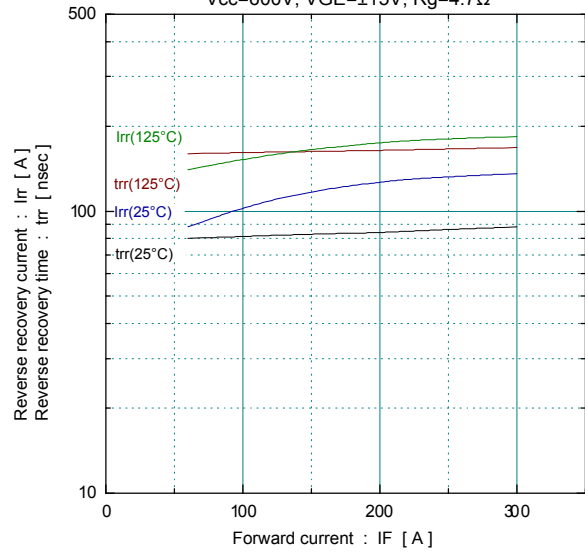




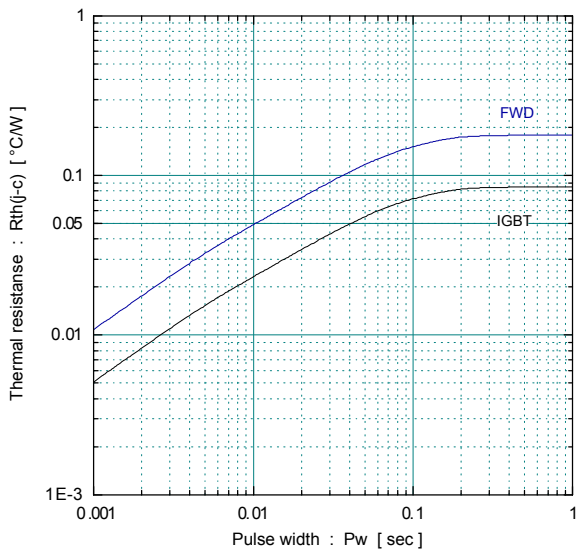
Forward current vs. Forward on voltage (typ.)



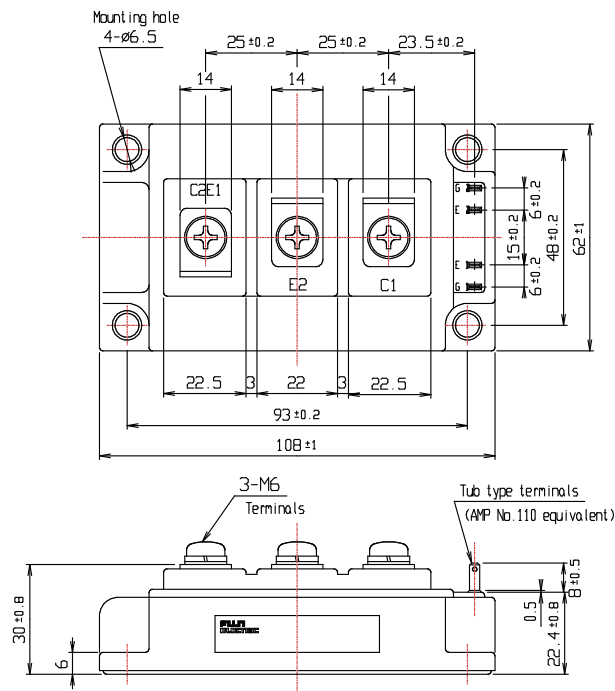
Reverse recovery characteristics (typ.)



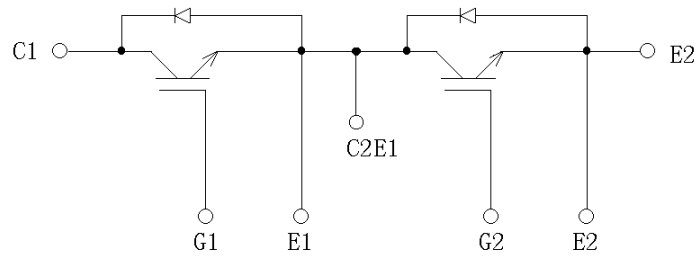
Transient thermal resistance



■ Outline Drawings, mm



■ Equivalent Circuit Schematic



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