

2MBI200UB-120



IGBT Module U-Series 1200V / 200A 2 in one-package

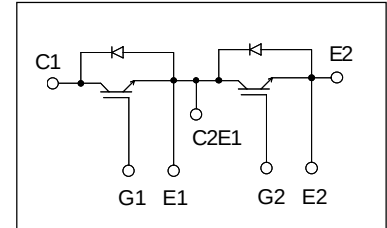
■ Features

- 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

■ Equivalent Circuit Schematic



■ Maximum ratings and characteristics

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

Item		Symbol	Conditions	Rating	Unit	
Collector-Emitter voltage		V _{CES}	1200		V	
Gate-Emitter voltage		V _{GES}	±20		V	
Collector current		I _c	Continuous	T _c =25°C	300	A
				T _c =80°C	200	
		I _{cp}	1ms	T _c =25°C	600	
				T _c =80°C	400	
		-I _c			200	
		-I _c pulse			400	
Collector Power Dissipation		P _c	1 device	1040	W	
Junction temperature		T _j	+150		°C	
Storage temperature		T _{stg}	-40 to +125			
Isolation voltage	between terminal and copper base *1		V _{iso}	AC:1min.	2500	VAC
Screw Torque		Mounting *2			3.5	N·m
		Terminals *2			3.5	

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

*2 : Recommendable value : Mounting 2.5 to 3.5 N·m(M5)

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

Item	Symbols	Conditions		Characteristics			Unit
				Min.	Typ.	Max.	
Zero gate voltage collector current	I _{CES}	V _{GE} =0V, V _{CE} =1200V		—	—	2.0	mA
Gate-Emitter leakage current	I _{GES}	V _{CE} =0V, V _{GE} =±20V		—	—	400	nA
Gate-Emitter threshold voltage	V _{GE(th)}	V _{CE} =20V, I _c =200mA		4.5	6.5	8.5	V
Collector-Emitter saturation voltage	V _{CE(sat)} (terminal)	V _{GE} =15V, I _c =200A	T _J =25°C	—	1.95	2.30	V
			T _J =125°C	—	2.20	—	
	V _{CE(sat)} (chip)		T _J =25°C	—	1.75	2.10	
			T _J =125°C	—	2.00	—	
Input capacitance	C _{ies}	V _{CE} =10V, V _{GE} =0V, f=1MHz		—	22	—	nF
Turn-on time	t _{on}	V _{CC} =600V I _c =200A V _{GE} =±15V		—	0.36	1.20	μs
	t _r			—	0.21	0.60	
	t _{r(i)}			—	0.03	—	
Turn-off time	t _{off}	R _G =3 Ω		—	0.37	1.00	
	t _f			—	0.07	0.30	
Forward on voltage	V _F (terminal)	V _{GE} =0V I _F =200A	T _J =25°C	—	1.80	2.10	V
			T _J =125°C	—	1.90	—	
	V _F (chip)		T _J =25°C	—	1.60	1.90	
			T _J =125°C	—	1.70	—	
Reverse recovery time	t _{rr}	I _F =200A		—	—	0.35	μs
Lead resistance, terminal-chip*3	R lead			—	0.97	—	mΩ

*3:Biggest internal terminal resistance among arm.

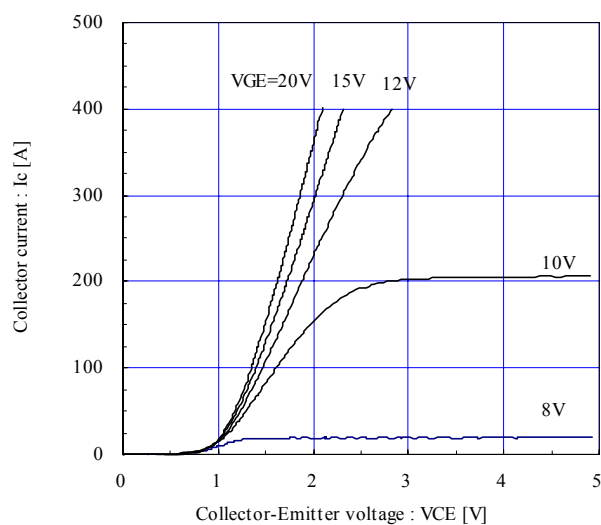
● Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance	R _{th(j-c)}	IGBT	—	—	0.12	°C/W
	R _{th(j-c)}	FWD	—	—	0.20	°C/W
Contact Thermal resistance	R _{th(c-f)*4}	With thermal compound	—	0.025	—	°C/W

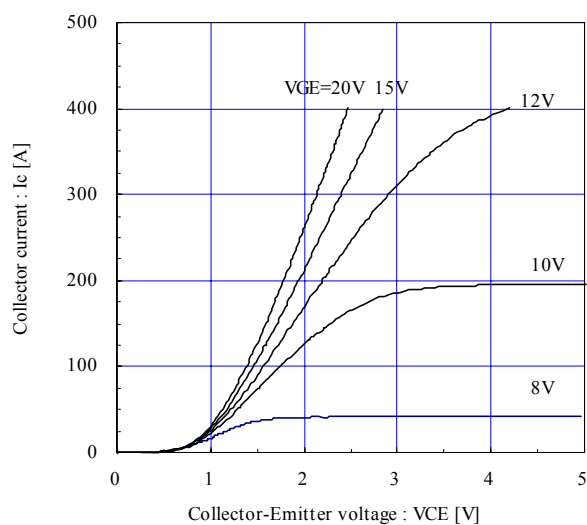
*4 : This is the value which is defined mounting on the additional cooling fin with thermal compound.

■ Characteristics (Representative)

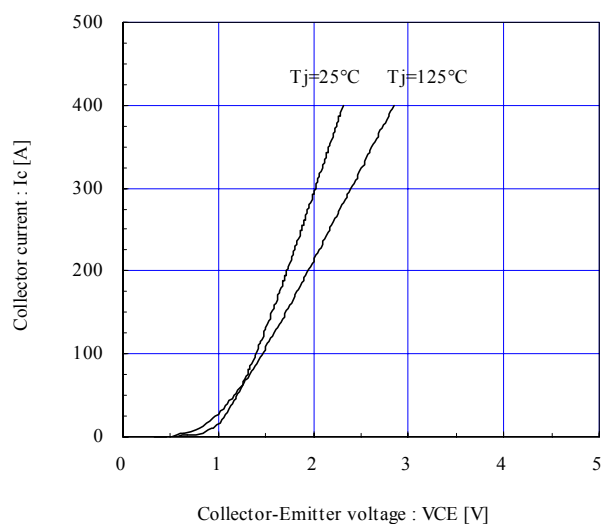
Collector current vs. Collector-Emitter voltage (typ.)

 $T_j = 25^\circ\text{C}$ / chip

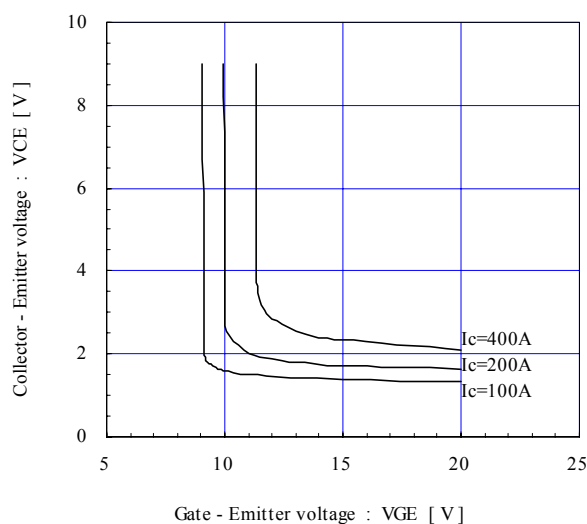
Collector current vs. Collector-Emitter voltage (typ.)

 $T_j = 125^\circ\text{C}$ / chip

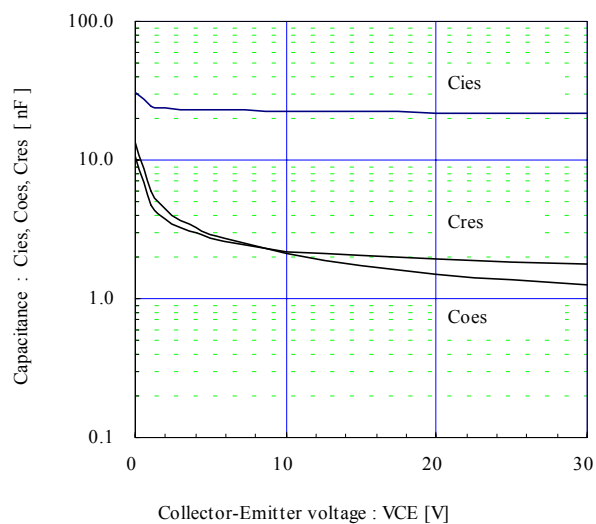
Collector current vs. Collector-Emitter voltage (typ.)

 $V_{GE} = 15\text{V}$ / chip

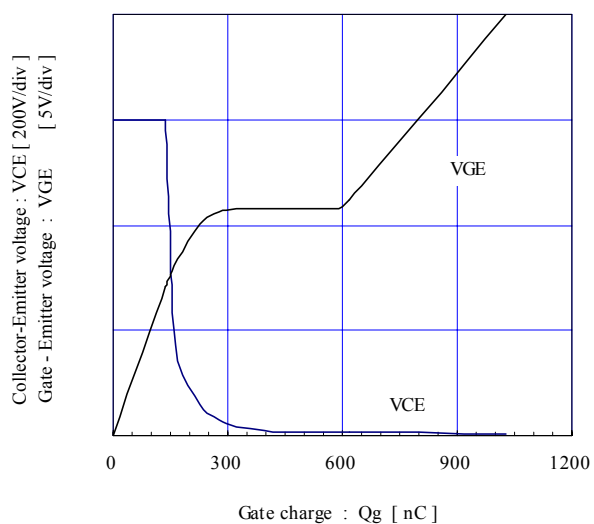
Collector-Emitter voltage vs. Gate-Emitter voltage (typ.)

 $T_j = 25^\circ\text{C}$ / chip

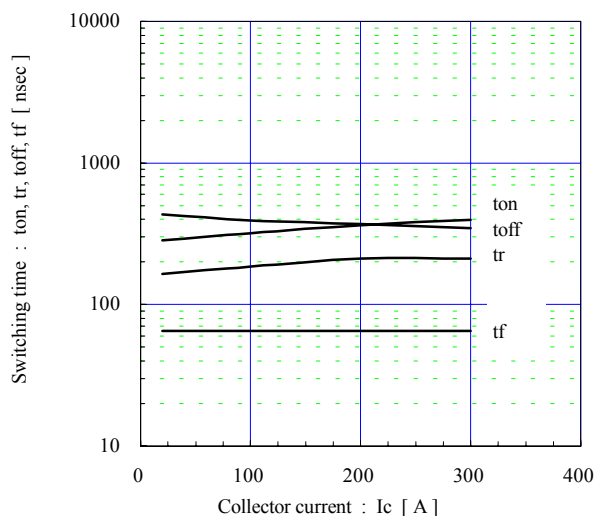
Capacitance vs. Collector-Emitter voltage (typ.)

 $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$, $T_j = 25^\circ\text{C}$ 

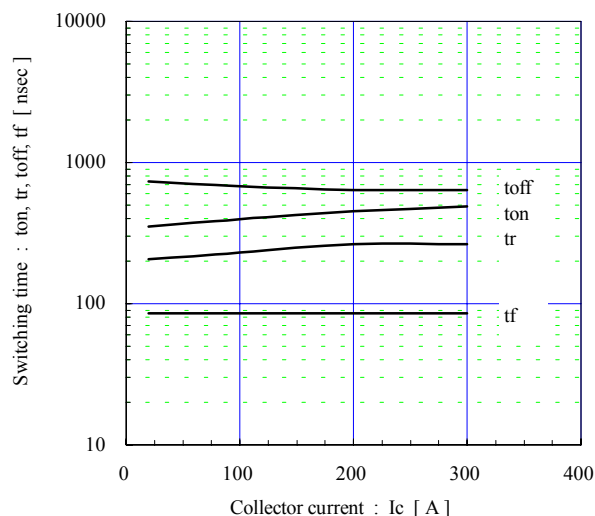
Dynamic Gate charge (typ.)

 $V_{CC} = 600\text{V}$, $I_C = 200\text{A}$, $T_j = 25^\circ\text{C}$ 

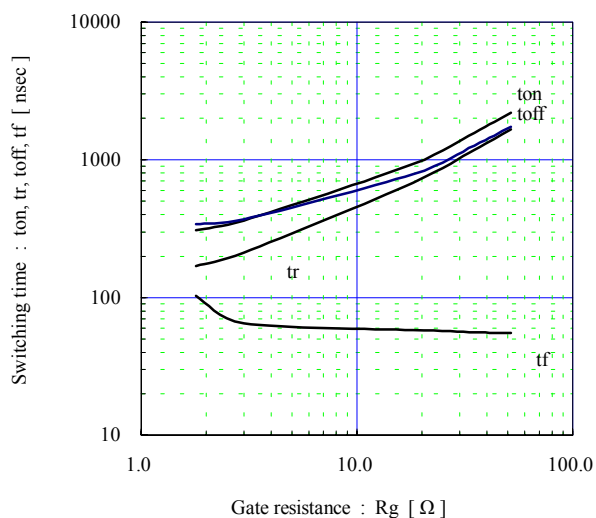
Switching time vs. Collector current (typ.)

 $V_{cc}=600V$, $V_{GE}=\pm 15V$, $R_g=3\Omega$, $T_j=25^\circ C$ 

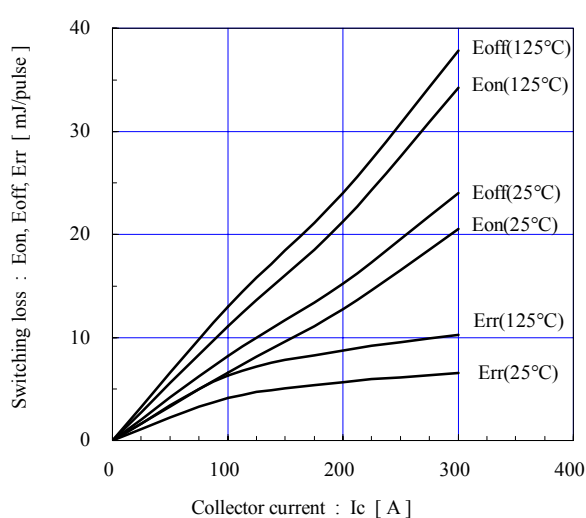
Switching time vs. Collector current (typ.)

 $V_{cc}=600V$, $V_{GE}=\pm 15V$, $R_g=3\Omega$, $T_j=125^\circ C$ 

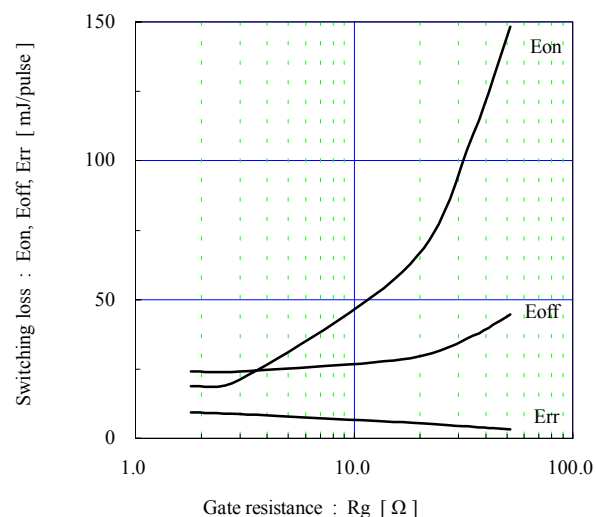
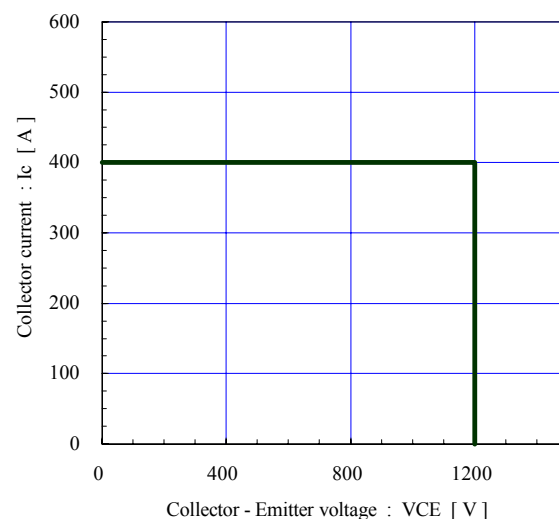
Switching time vs. Gate resistance (typ.)

 $V_{cc}=600V$, $I_c=200A$, $V_{GE}=\pm 15V$, $T_j=25^\circ C$ 

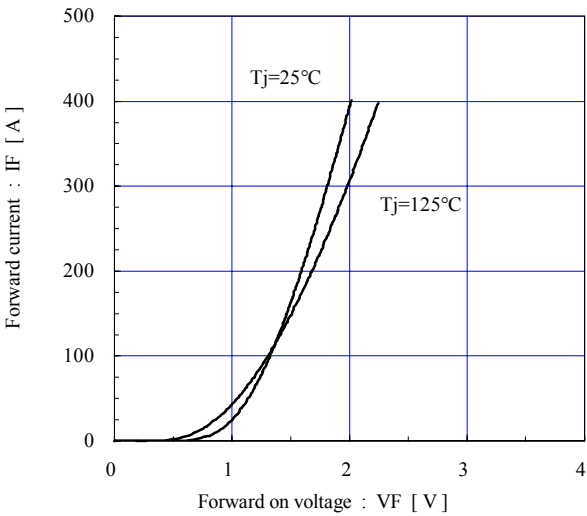
Switching loss vs. Collector current (typ.)

 $V_{cc}=600V$, $V_{GE}=\pm 15V$, $R_g=3\Omega$ 

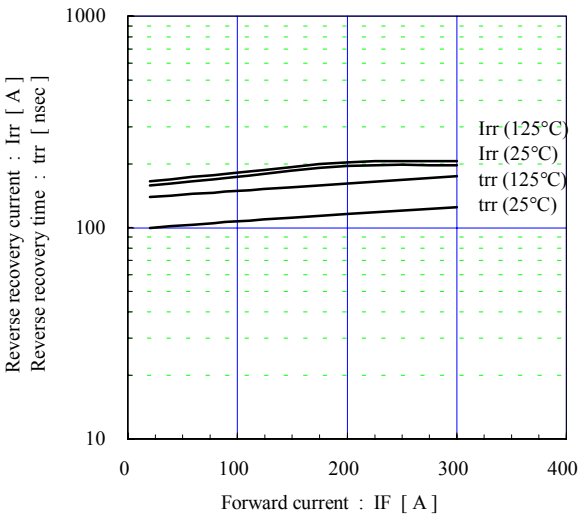
Switching loss vs. Gate resistance (typ.)

 $V_{cc}=600V$, $I_c=200A$, $V_{GE}=\pm 15V$, $T_j=125^\circ C$ Reverse bias safe operating area (max.)
+ $V_{GE}=15V$, - $V_{GE} \leq 15V$, $R_g \geq 3\Omega$, $T_j \leq 125^\circ C$ 

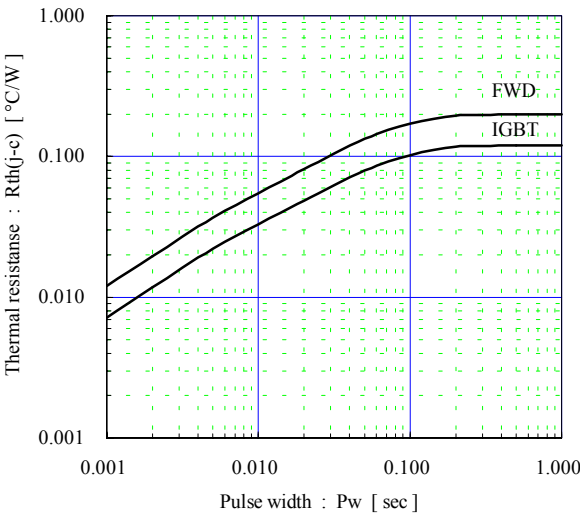
Forward current vs. Forward on voltage (typ.)
chip



Reverse recovery characteristics (typ.)
Vcc=600V, VGE=±15V, Rg=3Ω



Transient thermal resistance (max.)



■ Outline Drawings, mm

M233

