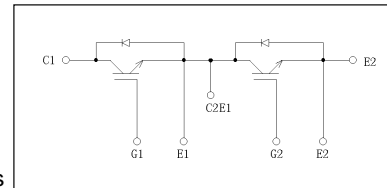


2MBI400U2B-060



IGBT Module U-Series 600V / 400A 2 in one-package

Equivalent Circuit Schematic



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 $T_c=25^\circ\text{C}$ unless otherwise specified)

Item	Symbol	Conditions	Rating	Unit
Collector-Emitter voltage	V _{CEs}		650	V
Gate-Emitter voltage	V _{GES}		±20	V
Collector current	I _c	Continuous	400	A
	I _{cp}	1ms	800	
	-I _c		400	
	-I _c pulse		800	
Collector Power Dissipation	P _c	1 device	1250	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 3.5N·m(M5), Terminal 2.5 to 3.5 N·m(M5)

Electrical characteristics (at $T_j=25^\circ\text{C}$ unless otherwise specified)

Item	Symbols	Conditions	Characteristics			Unit	
			Min.	Typ.	Max.		
Zero gate voltage collector current	I _{CEs}	V _{GE} =0V, V _{CE} =600V	-	-	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 =400mA	6.2	6.7	7.7	V	
Collector-Emitter saturation voltage	V _{CE(sat)} (terminal)	V _{GE} =15V, I _c =400A	T _j =25°C	-	2.25	2.55	V
			T _j =125°C	-	2.50	-	
	V _{CE(sat)} (chip)		T _j =25°C	-	1.85	-	
			T _j =125°C	-	2.10	-	
Input capacitance	C _{ies}	V _{CE} =10V, V _{GE} =0V, f=1MHz	-	29	-	nF	
Turn-on time	t _{on}	V _{CC} =300V	-	0.40	1.20	μs	
	t _r	I _c =400A	-	0.22	0.60		
	t _{r(i)}	V _{GE} =±15V	-	0.16	-		
Turn-off time	t _{off}	R _G = 6.8 Ω	-	0.48	1.20	μs	
	t _f		-	0.07	0.45		
Forward on voltage	V _F (terminal)	V _{GE} =0V I _F =400A	T _j =25°C	-	2.00	2.35	V
			T _j =125°C	-	2.05	-	
	V _F (chip)		T _j =25°C	-	1.60	-	
			T _j =125°C	-	1.65	-	
Reverse recovery time	t _{rr}	I _F =400A	-	-	0.35	μs	
Lead resistance, terminal-chip*3	R lead		-	0.97	-	mΩ	

*3:Biggest internal terminal resistance among arm.

Thermal resistance characteristics

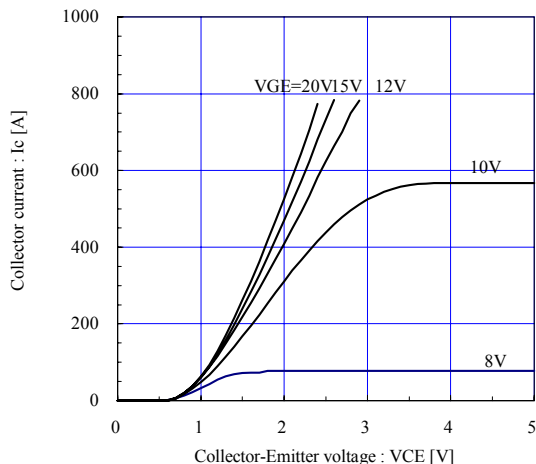
Items	Symbols	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance	R _{th(j-c)}	IGBT	-	-	0.10	°C/W
	R _{th(j-c)}	FWD	-	-	0.16	°C/W
Contact Thermal resistance	R _{th(c-f)} *4	With thermal compound	-	0.025	-	°C/W

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

■ Characteristics (Representative)

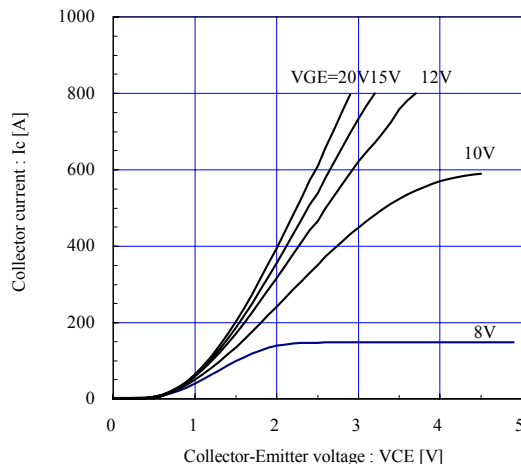
Collector current vs. Collector-Emitter voltage (typ.)

T_j = 25°C / chip



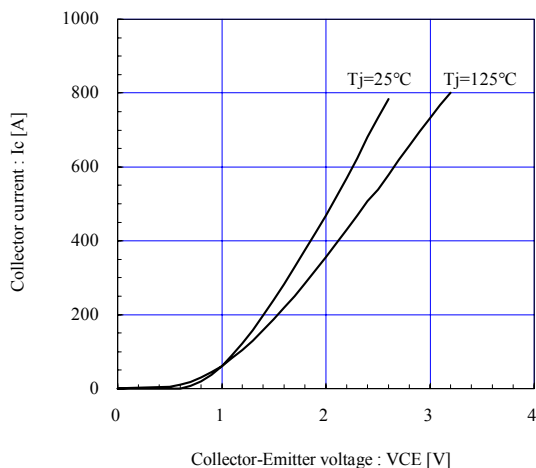
Collector current vs. Collector-Emitter voltage (typ.)

T_j = 125°C / chip



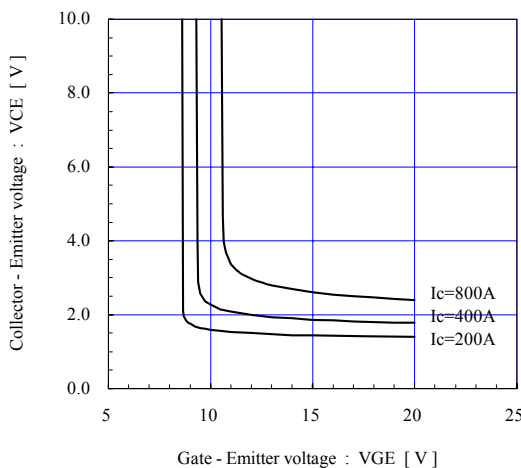
Collector current vs. Collector-Emitter voltage (typ.)

VGE = 15V / chip

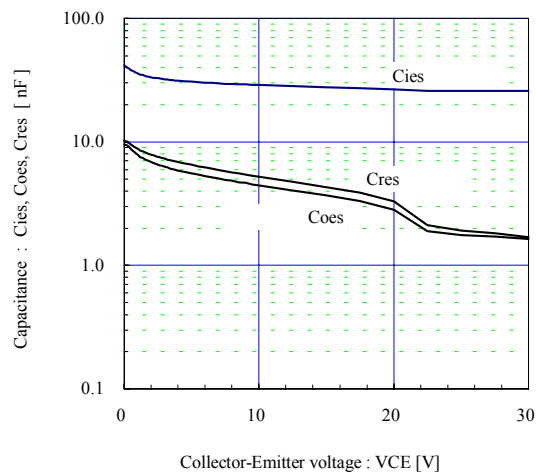


Collector-Emitter voltage vs. Gate-Emitter voltage (typ.)

T_j = 25°C / chip

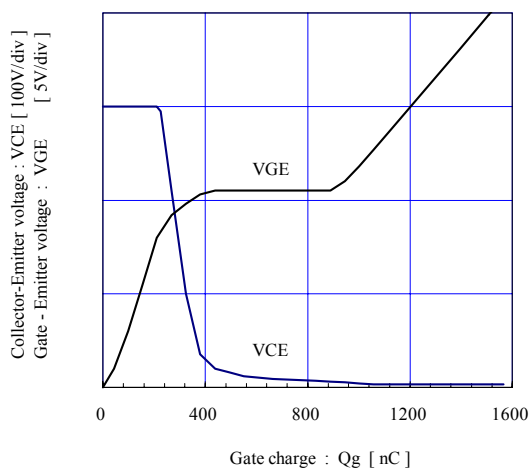


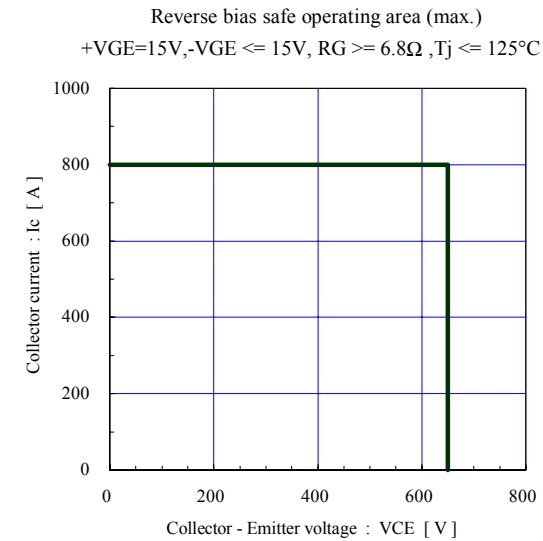
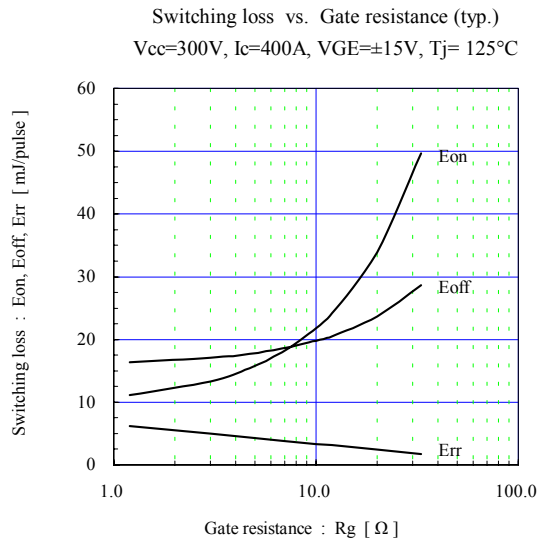
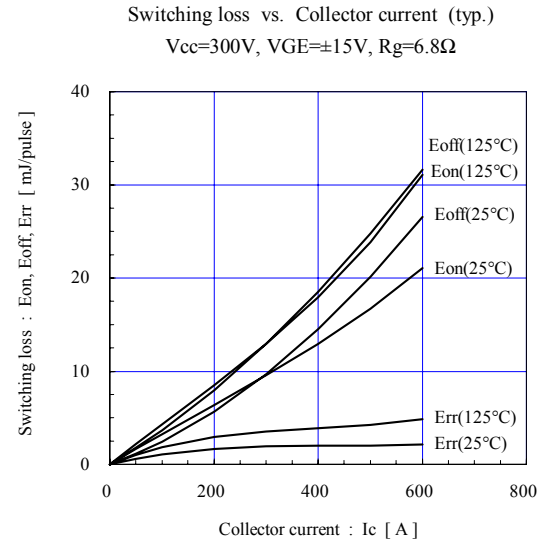
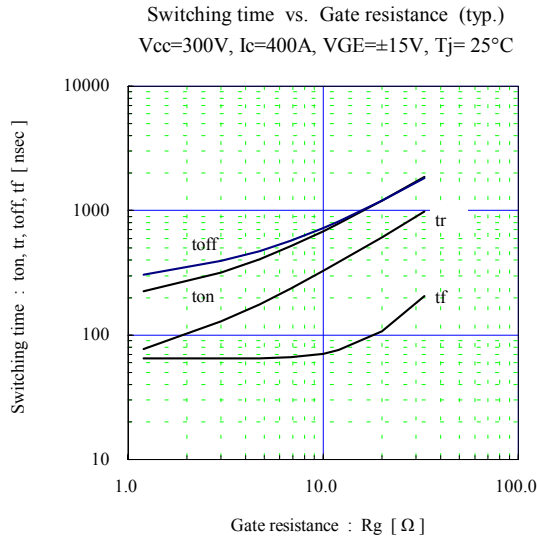
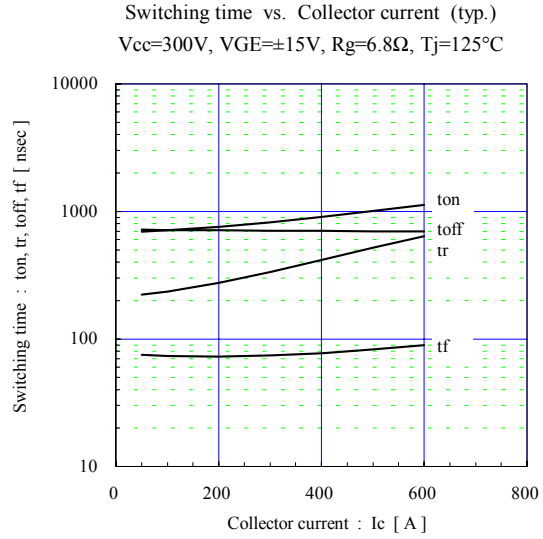
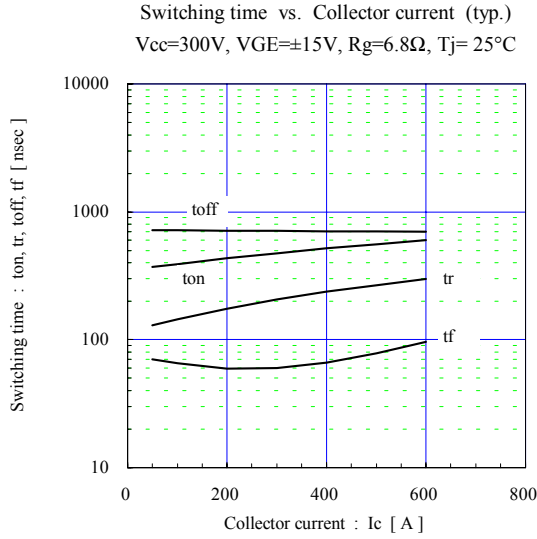
Capacitance vs. Collector-Emitter voltage (typ.)

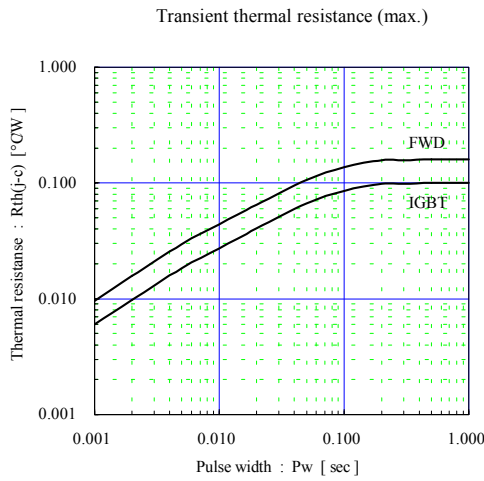
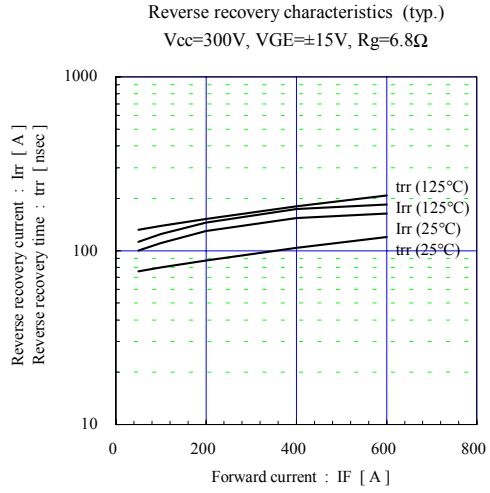
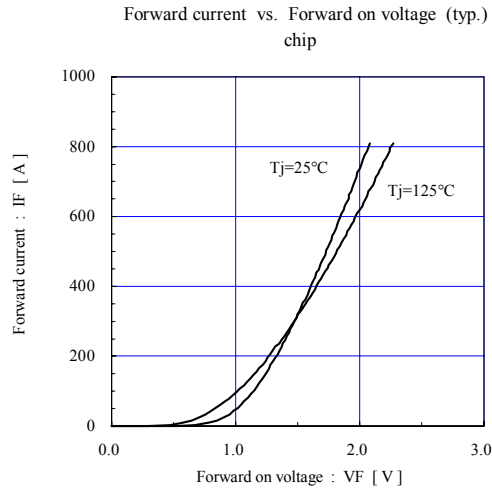


Dynamic Gate charge (typ.)

V_{cc} = 300V, I_c = 400A, T_j = 25°C







■ Outline Drawings, mm

M233

