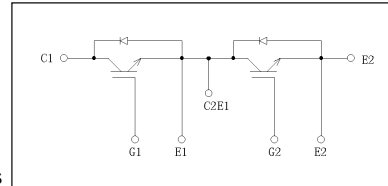


2MBI150U2A-060



IGBT Module U-Series 600V / 150A 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 Tc=25°C unless otherwise specified)

Item	Symbol	Conditions	Rating	Unit
Collector-Emitter voltage	V _{CEs}		600	V
Gate-Emitter voltage	V _{GES}		±20	V
Collector current	I _c	Continuous	150	A
	I _{cp}	1ms	300	
	-I _c		150	
	-I _c pulse		300	
Collector Power Dissipation	P _c	1 device	500	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 or M5), Terminal 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} =600V	-	-	1.0	mA	
Gate-Emitter leakage current	I _{GES}	V _{CE} =0V, V _{GE} =±20V	-	-	200	nA	
Gate-Emitter threshold voltage	V _{GE(th)}	V _{CE} =20V, I _c =150mA	6.2	6.7	7.7	V	
Collector-Emitter saturation voltage	V _{CE(sat)} (terminal)	V _{GE} =15V, I _c =150A	T _j =25°C	-	2.05	2.35	V
			T _j =125°C	-	2.30	-	
	V _{CE(sat)} (chip)		T _j =25°C	-	1.80	-	
			T _j =125°C	-	2.05	-	
Input capacitance	C _{ies}	V _{CE} =10V, V _{GE} =0V, f=1MHz	-	12	-	nF	
Turn-on time	t _{on}	V _{CC} =300V	-	0.40	1.20	μs	
	t _r	I _c =150A	-	0.22	0.60		
	t _{r(i)}	V _{GE} =±15V	-	0.16	-		
Turn-off time	t _{off}	R _G = 24 Ω	-	0.48	1.20	μs	
	t _f		-	0.07	0.45		
Forward on voltage	V _F (terminal)	V _{GE} =0V I _F =150A	T _j =25°C	-	1.80	2.20	V
			T _j =125°C	-	1.85	-	
	V _F (chip)		T _j =25°C	-	1.60	-	
			T _j =125°C	-	1.65	-	
Reverse recovery time	t _{rr}	I _F =150A	-	-	0.35	μs	
Lead resistance, terminal-chip*3	R lead		-	1.39	-	mΩ	

*3:Biggest internal terminal resistance among arm.

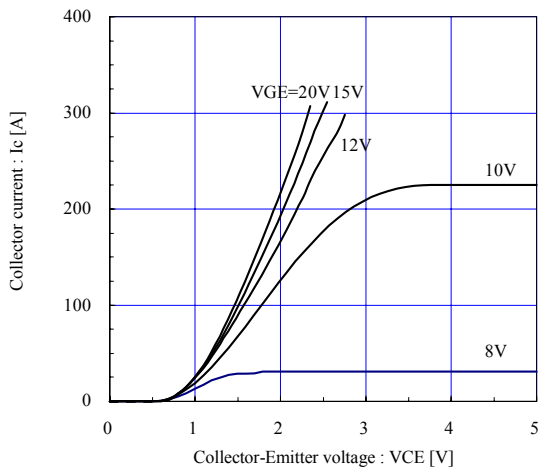
Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance	R _{th(j-c)}	IGBT	-	-	0.25	°C/W
	R _{th(j-c)}	FWD	-	-	0.46	°C/W
Contact Thermal resistance	R _{th(c-f)} *4	With thermal compound	-	0.05	-	°C/W

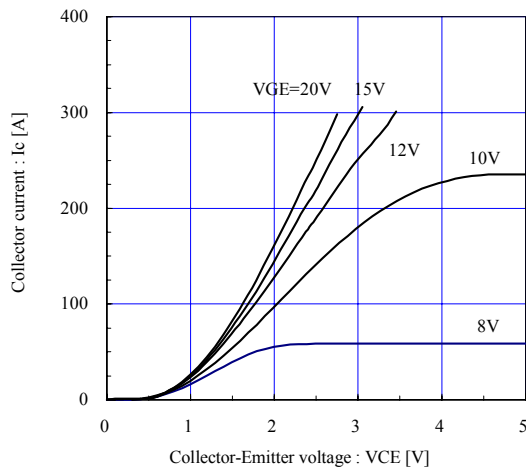
*4 : This is the value which is defined mounting on the additional cooling fin with thermal compound.

Characteristics (Representative)

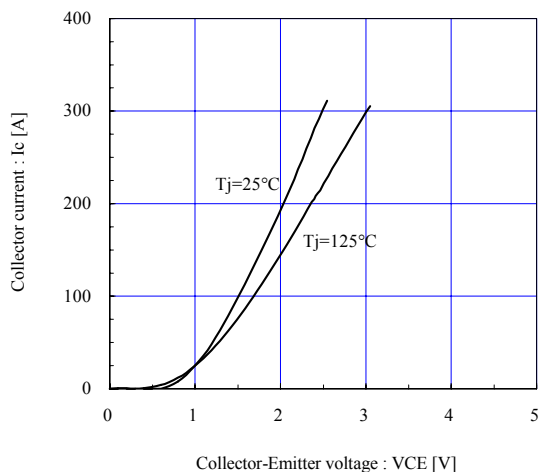
Collector current vs. Collector-Emitter voltage (typ.)
Tj= 25°C / chip



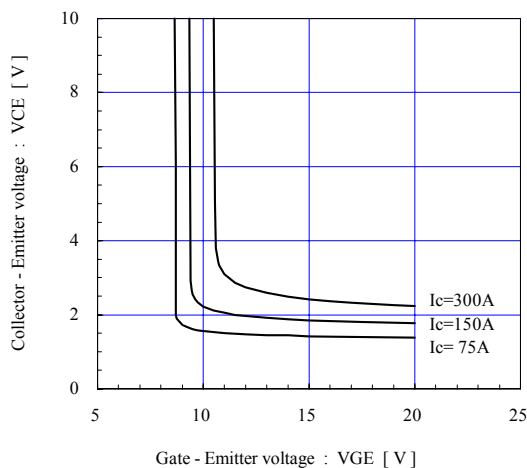
Collector current vs. Collector-Emitter voltage (typ.)
Tj= 125°C / chip



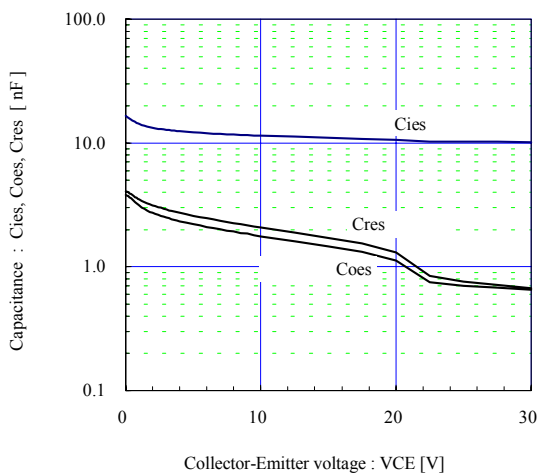
Collector current vs. Collector-Emitter voltage (typ.)
VGE=15V / chip



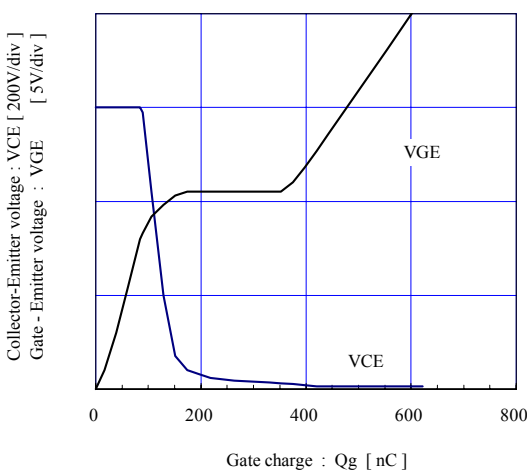
Collector-Emitter voltage vs. Gate-Emitter voltage (typ.)
Tj=25°C / chip



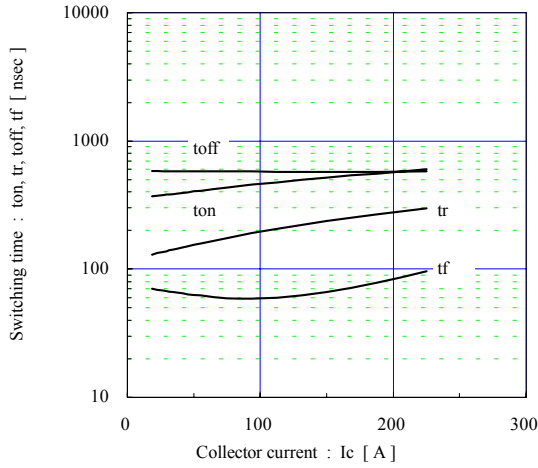
Capacitance vs. Collector-Emitter voltage (typ.)



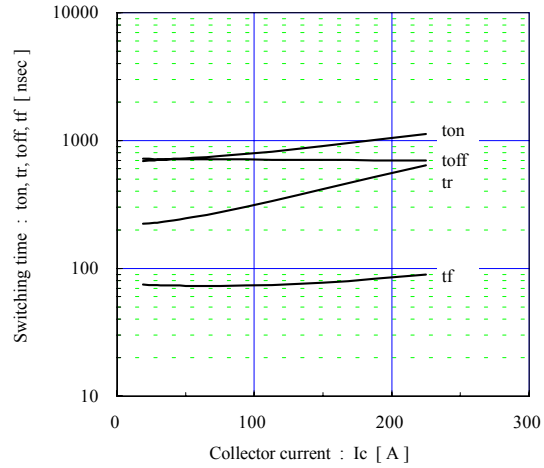
Dynamic Gate charge (typ.)
Vcc=300V, Ic=150A, Tj= 25°C



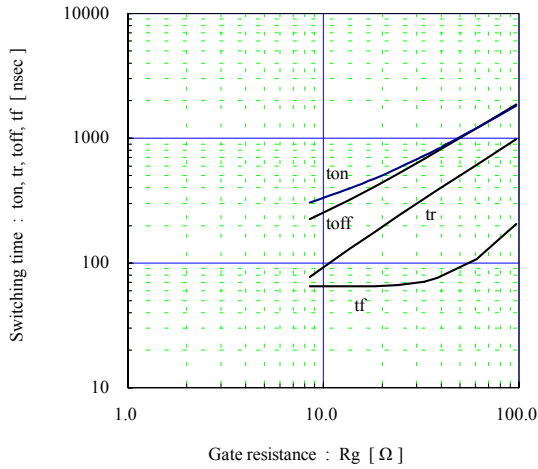
Switching time vs. Collector current (typ.)
 $V_{cc}=300V, V_{GE}=\pm 15V, R_g=24\Omega, T_j=25^\circ C$



Switching time vs. Collector current (typ.)
 $V_{cc}=300V, V_{GE}=\pm 15V, R_g=24\Omega, T_j=125^\circ C$



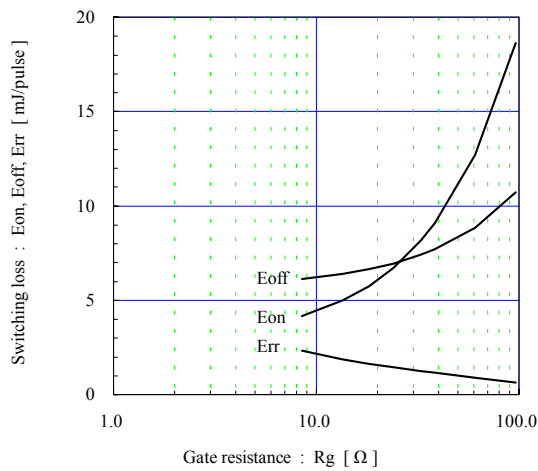
Switching time vs. Gate resistance (typ.)
 $V_{cc}=300V, I_c=150A, V_{GE}=\pm 15V, T_j=25^\circ C$



Switching loss vs. Collector current (typ.)
 $V_{cc}=300V, V_{GE}=\pm 15V, R_g=24\Omega$



Switching loss vs. Gate resistance (typ.)
 $V_{cc}=300V, I_c=150A, V_{GE}=\pm 15V, T_j=125^\circ C$



Reverse bias safe operating area (max.)
 $+V_{GE}=15V, -V_{GE} \le 15V, R_g \ge 24\Omega, T_j \le 125^\circ C$

