

2MBI150HH-120-50

IGBT Modules

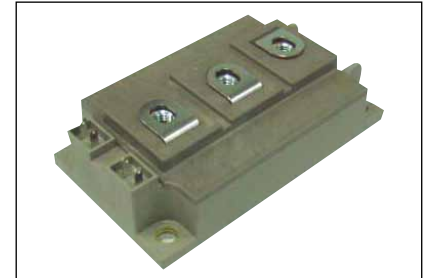
HIGH SPEED IGBT MODULE 1200V / 150A / 2 in one package

■ Features

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

■ Applications

- Soft-switching Application
- 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 _{CEs}		1200	V	
Gate-Emitter voltage	V _{GES}		±20	V	
Collector current	I _c	Continuous	Tc=25°C	200	A
			Tc=80°C	150	
	I _c pulse	1ms	Tc=25°C	400	
			Tc=80°C	300	
	-I _c			50	
-I _c pulse	1ms		100		
Collector Power Dissipation	P _c	1 device	1390	W	
Junction temperature	T _j		+150	°C	
Storage temperature	T _{stg}		-40 ~ +125		
Isolation voltage	Between terminal and copper base (*1) V _{iso}	AC : 1min.	2500	VAC	
Screw torque	Mounting (*2)		3.5	N m	
	Terminals (*3)		4.5		

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

Note *2: Recommendable Value : Mounting 2.5 to 3.5 Nm (M5 or M6)

Note *3: Recommendable Value : Terminals 3.5 to 4.5 Nm (M6)

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

Items	Symbols	Conditions	Characteristics			Units	
			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 = 150mA	5.7	6.2	6.7	V	
Collector-Emitter saturation voltage	V _{CE(sat)} (terminal)	V _{GE} = 15V I _c = 150A	Tj=25°C	-	3.40	3.70	V
			Tj=125°C	-	4.20	-	
	V _{CE(sat)} (chip)		Tj=25°C	-	3.20	3.50	
			Tj=125°C	-	4.00	-	
Input capacitance	C _{ies}	V _{CE} = 10V, V _{GE} = 0V, f = 1MHz	-	12	-	nF	
Turn-off time	t _{off}	V _{CC} = 600V, I _c = 150A V _{GE} = ±15V, R _G = 2.1Ω	-	0.30	0.60	μs	
	t _f	L _s = 20nH		0.05	0.20		
Forward on voltage	V _F (terminal)	V _{GE} = 0V I _F = 50A	Tj=25°C	-	1.85	2.30	V
			Tj=125°C	-	2.00	-	
	V _F (chip)		Tj=25°C	-	1.70	2.15	
			Tj=125°C	-	1.85	-	
Lead resistance, terminal-chip (*4)	R _{lead}		-	1.20	-	mΩ	

Note *4: Biggest internal terminal resistance among arm.

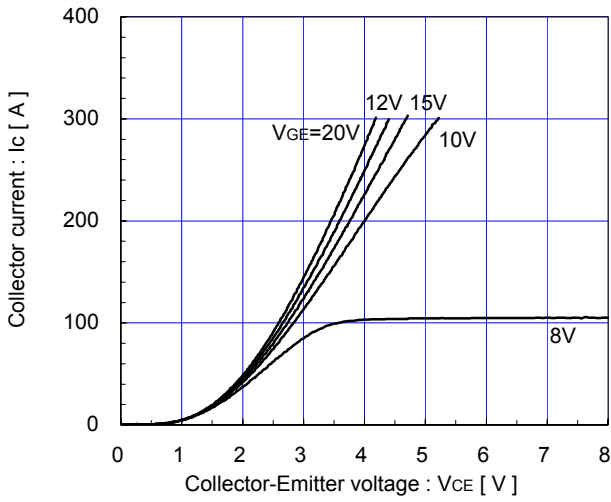
● Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance (1device)	R _{th(j-c)}	IGBT FWD	-	-	0.09	°C/W
Contact Thermal resistance (1 device) (*5)	R _{th(c-f)}	with Thermal Compound	-	0.025	-	

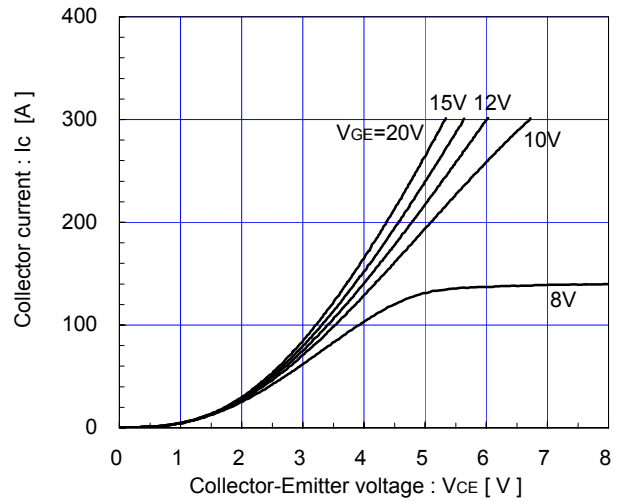
Note *5: This is the value which is defined mounting on the additional cooling fin with thermal compound.

■ Characteristics (Representative)

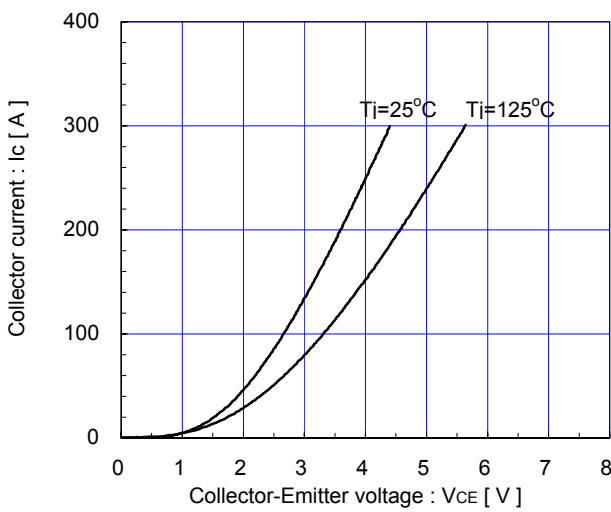
Collector current vs. Collector-Emittor voltage (typ.)
T_j=25°C / chip



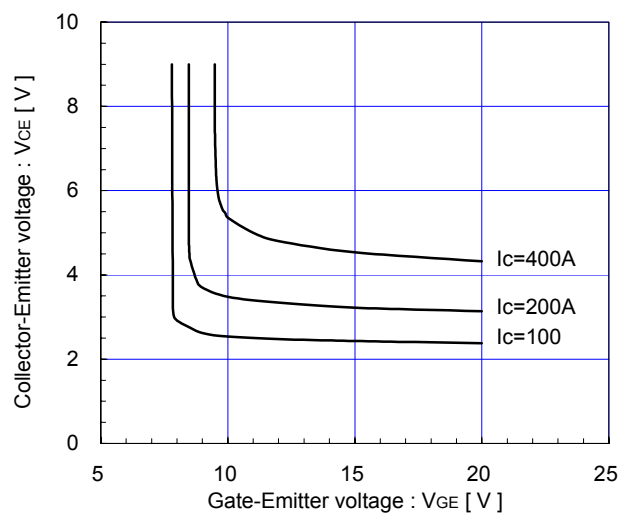
Collector current vs. Collector-Emittor voltage (typ.)
T_j=125°C / chip



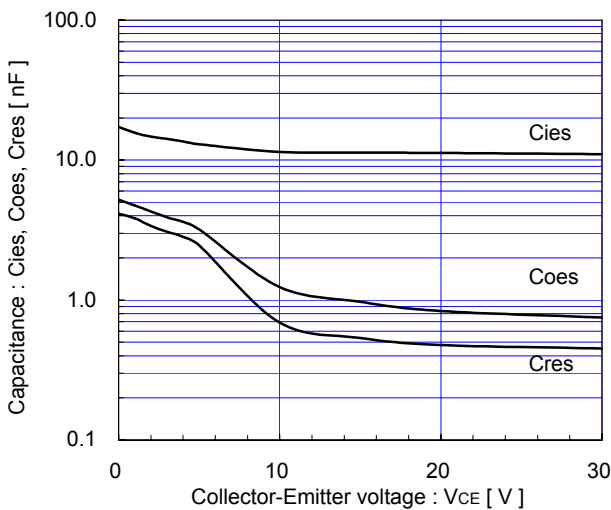
Collector current vs. Collector-Emittor voltage (typ.)
V_{GE}=15V / chip



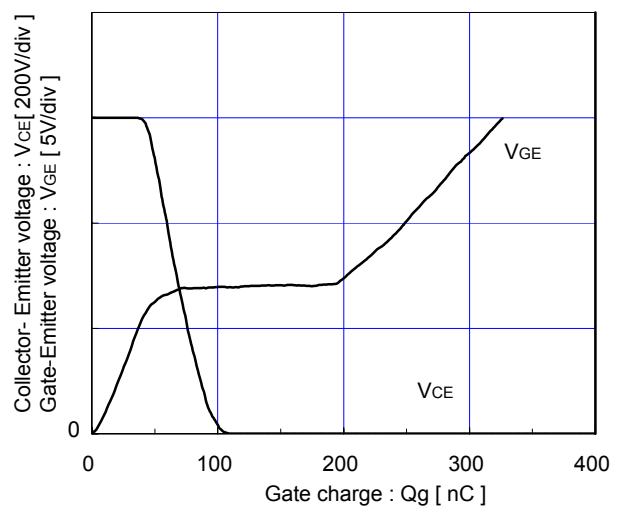
Collector-Emittor voltage vs. Gate-Emittor voltage (typ.)
T_j=25°C / chip



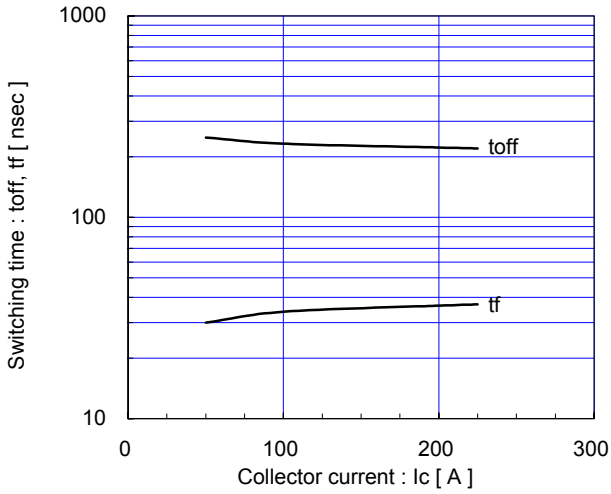
Capacitance vs. Collector-Emittor voltage (typ.)
V_{GE}=0V, f=1MHz, T_j=25°C



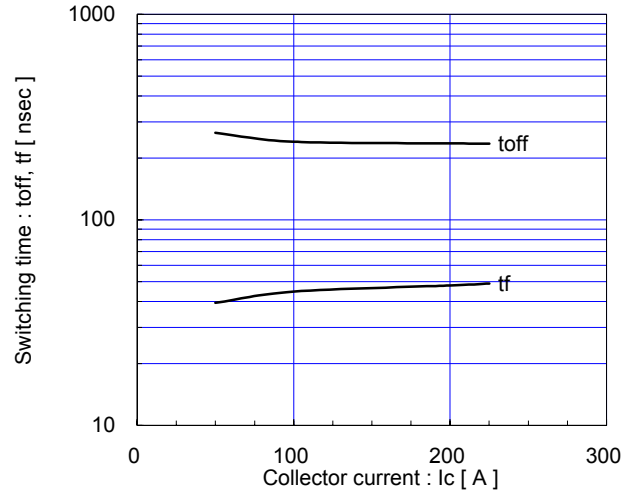
Dynamic Gate charge (typ.)
V_{CC}=600V, I_C=150A, T_j=25°C



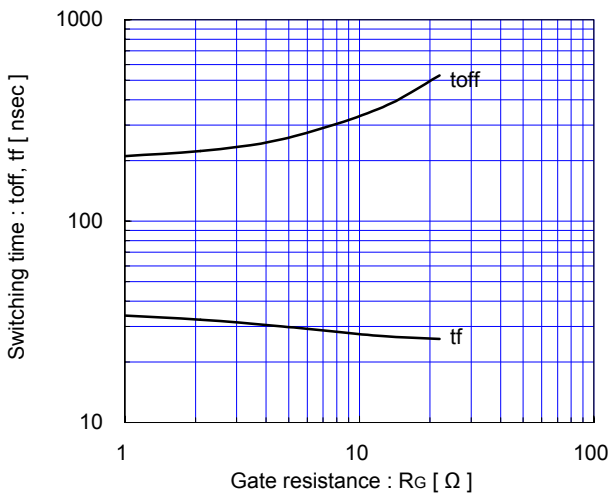
Switching time vs. Collector current (typ.)
 $V_{CC}=600V, V_{GE}=\pm 15V, R_G=2.1\Omega, T_J=25^\circ C$



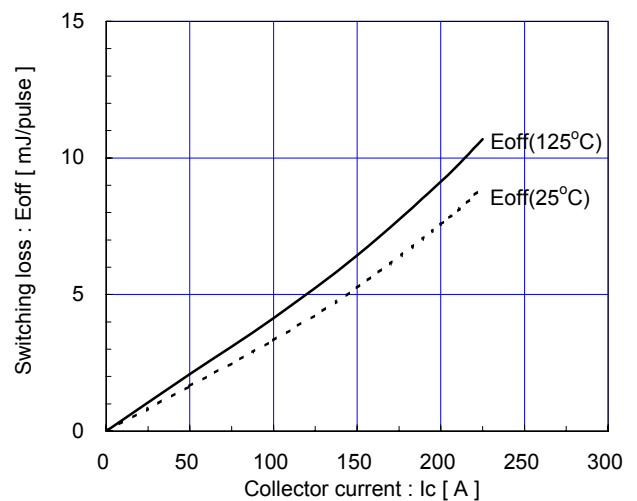
Switching time vs. Collector current (typ.)
 $V_{CC}=600V, V_{GE}=\pm 15V, R_G=2.1\Omega, T_J=125^\circ C$



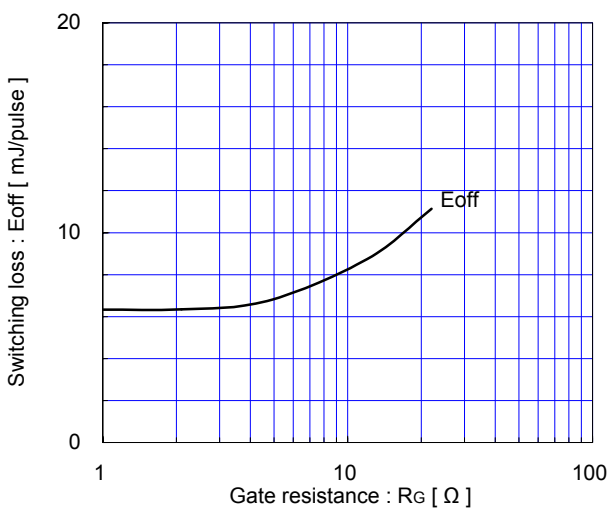
Switching time vs. Gate resistance (typ.)
 $V_{CC}=600V, I_C=150A, V_{GE}=\pm 15V, T_J=25^\circ C$



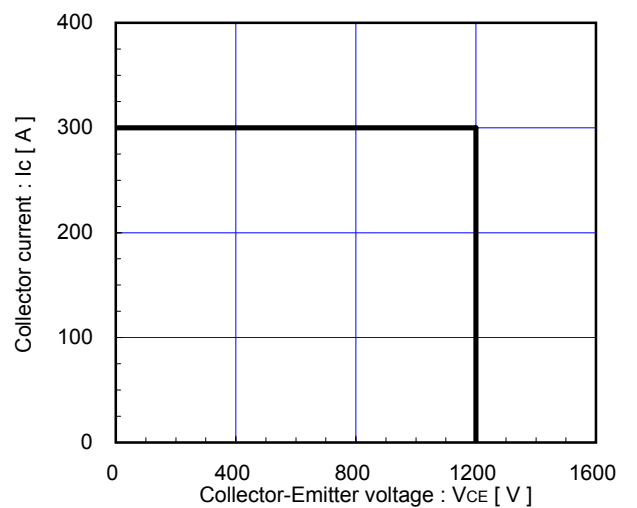
Switching loss vs. Collector current (typ.)
 $V_{CC}=600V, V_{GE}=\pm 15V, R_G=2.1\Omega$



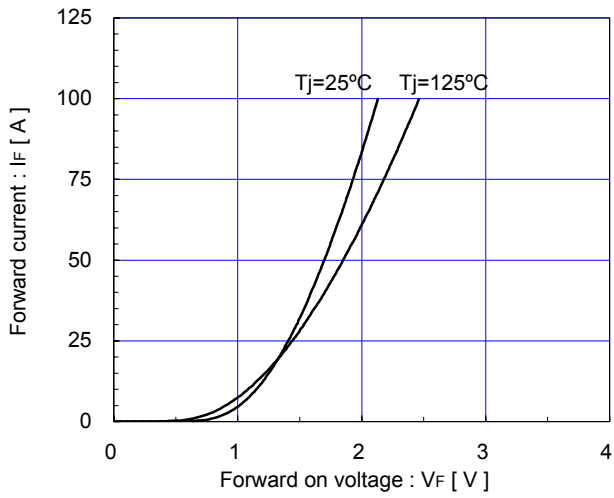
Switching loss vs. Gate resistance (typ.)
 $V_{CC}=600V, I_C=150A, V_{GE}=\pm 15V, T_J=125^\circ C$



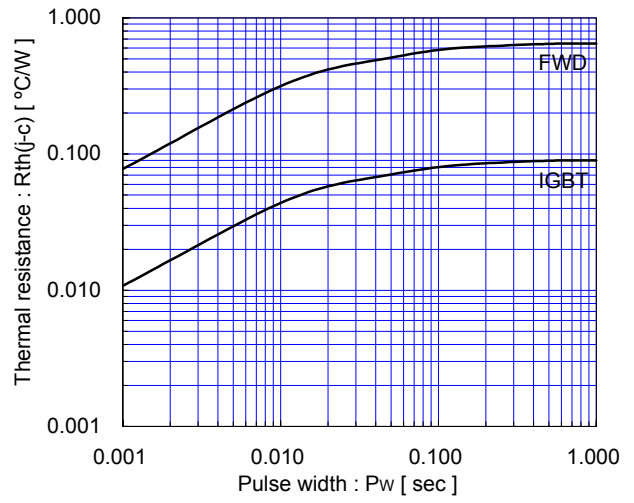
Reverse bias safe operating area (max.)
 $+V_{GE}=15V, -V_{GE} \le 15V, R_G \ge 2.1\Omega, T_J \le 125^\circ C$



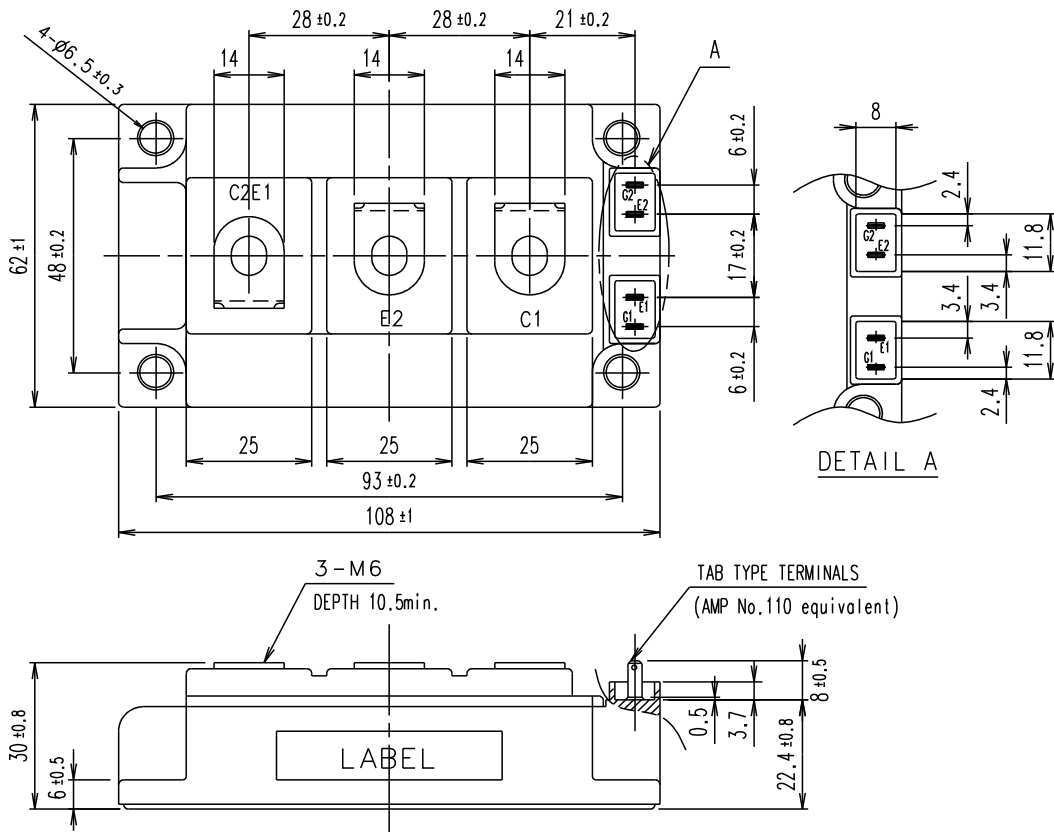
Forward current vs. Forward on voltage (typ.)
chip



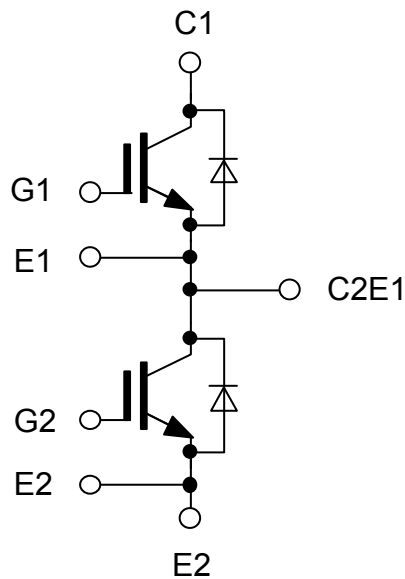
Transient thermal resistance (max.)



■ Outline Drawings, mm



■ Equivalent Circuit Schematic



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