

# 2MBI150HH-120-50

IGBT Modules

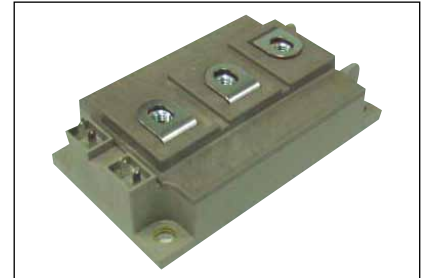
## HIGH SPEED IGBT MODULE 1200V / 150A / 2 in one package

### ■ 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 <sub>CEs</sub>		1200	V
Gate-Emitter voltage	V <sub>GES</sub>		±20	V
Collector current	I <sub>c</sub>	Continuous	Tc=25°C	200
			Tc=80°C	150
	I <sub>c</sub> pulse	1ms	Tc=25°C	400
			Tc=80°C	300
	-I <sub>c</sub>			50
-I <sub>c</sub> pulse	1ms		100	
Collector Power Dissipation	P <sub>c</sub>	1 device	1390	W
Junction temperature	T <sub>j</sub>		+150	°C
Storage temperature	T <sub>stg</sub>		-40 ~ +125	°C
Isolation voltage	V <sub>iso</sub>	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 <sub>CEs</sub>	V <sub>GE</sub> = 0V, V <sub>CE</sub> = 1200V	-	-	2.0	mA	
Gate-Emitter leakage current	I <sub>GES</sub>	V <sub>CE</sub> = 0V, V <sub>GE</sub> = ±20V	-	-	400	nA	
Gate-Emitter threshold voltage	V <sub>GE(th)</sub>	V <sub>CE</sub> = 20V, I <sub>c</sub> = 150mA	5.7	6.2	6.7	V	
Collector-Emitter saturation voltage	V <sub>CE(sat)</sub> (terminal)	V <sub>GE</sub> = 15V I <sub>c</sub> = 150A	Tj=25°C	-	3.40	3.70	V
			Tj=125°C	-	4.20	-	
	V <sub>CE(sat)</sub> (chip)		Tj=25°C	-	3.20	3.50	
	Tj=125°C		-	4.00	-		
Input capacitance	C <sub>ies</sub>	V <sub>CE</sub> = 10V, V <sub>GE</sub> = 0V, f = 1MHz	-	12	-	nF	
Turn-off time	t <sub>off</sub>	V <sub>CC</sub> = 600V, I <sub>c</sub> = 150A V <sub>GE</sub> = ±15V, R <sub>G</sub> = 2.1Ω	-	0.30	0.60	μs	
	t <sub>f</sub>	L <sub>s</sub> = 20nH		0.05	0.20		
Forward on voltage	V <sub>F</sub> (terminal)	V <sub>GE</sub> = 0V I <sub>F</sub> = 50A	Tj=25°C	-	1.85	2.30	V
			Tj=125°C	-	2.00	-	
	V <sub>F</sub> (chip)		Tj=25°C	-	1.70	2.15	
	Tj=125°C		-	1.85	-		
Lead resistance, terminal-chip (*4)	R <sub>lead</sub>		-	1.20	-	mΩ	

Note \*4: Biggest internal terminal resistance among arm.

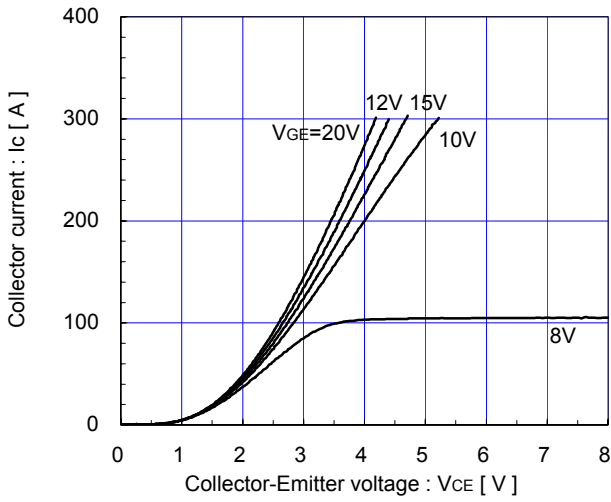
#### ● Thermal resistance characteristics

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

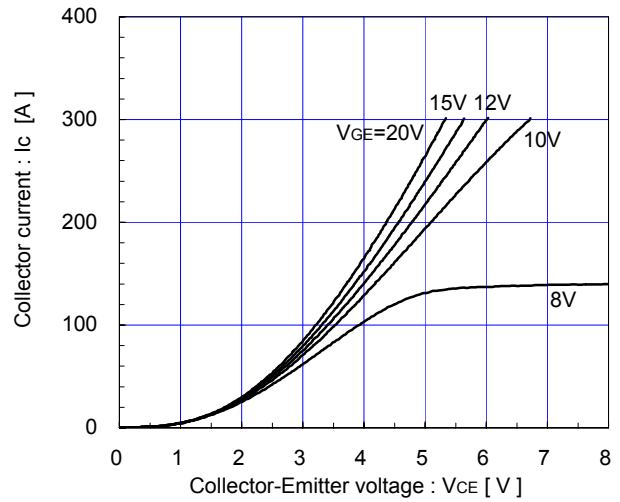
Note \*5: This is the value which is defined mounting on the additional cooling fin with thermal compound.

■ Characteristics (Representative)

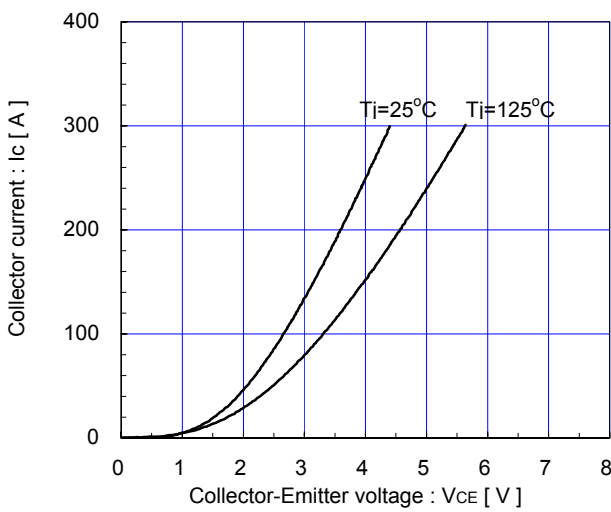
Collector current vs. Collector-Emittor voltage (typ.)  
T<sub>j</sub>=25°C / chip



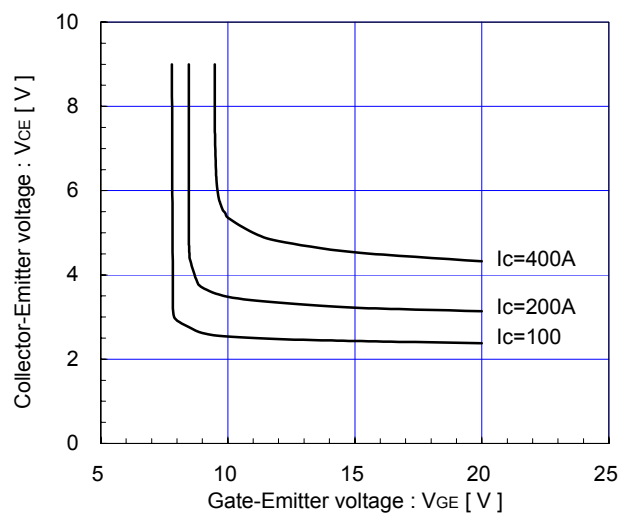
Collector current vs. Collector-Emittor voltage (typ.)  
T<sub>j</sub>=125°C / chip



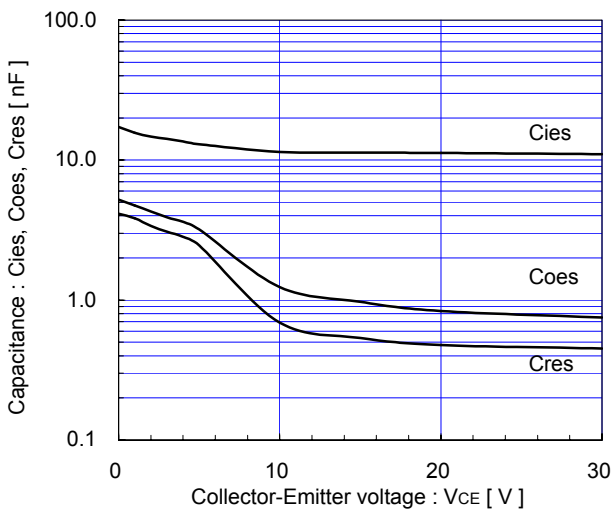
Collector current vs. Collector-Emittor voltage (typ.)  
V<sub>GE</sub>=15V / chip



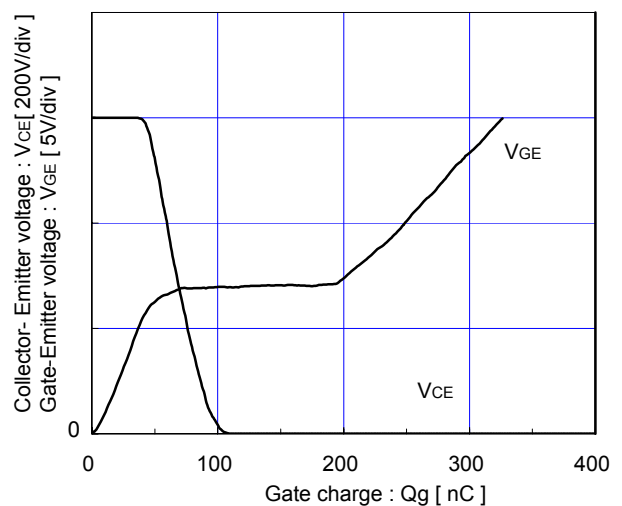
Collector-Emittor voltage vs. Gate-Emittor voltage (typ.)  
T<sub>j</sub>=25°C / chip

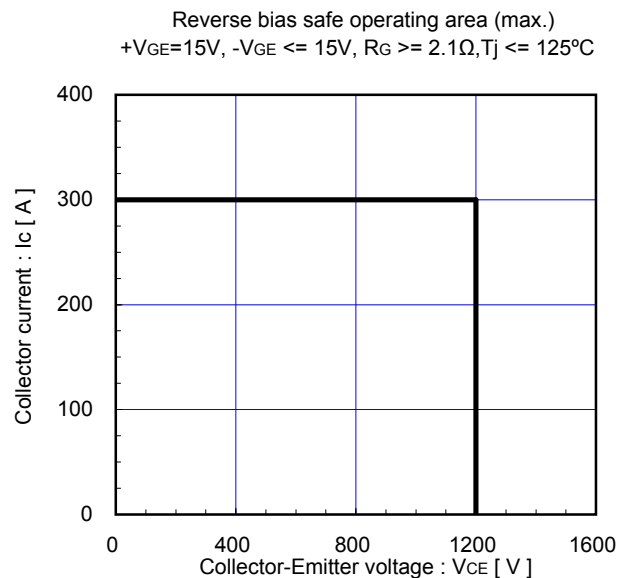
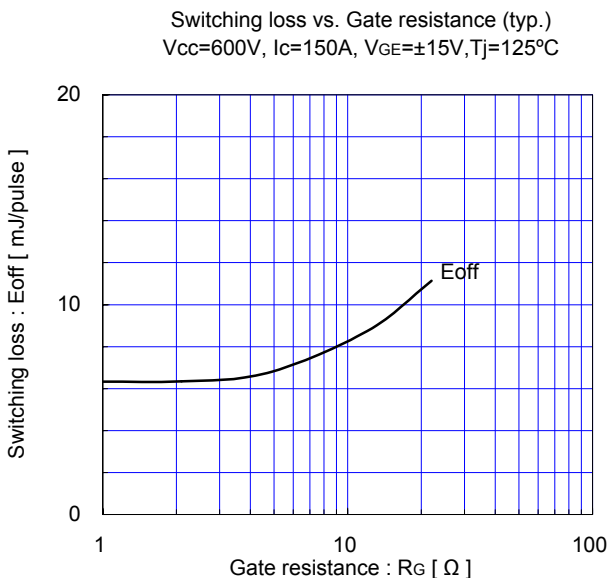
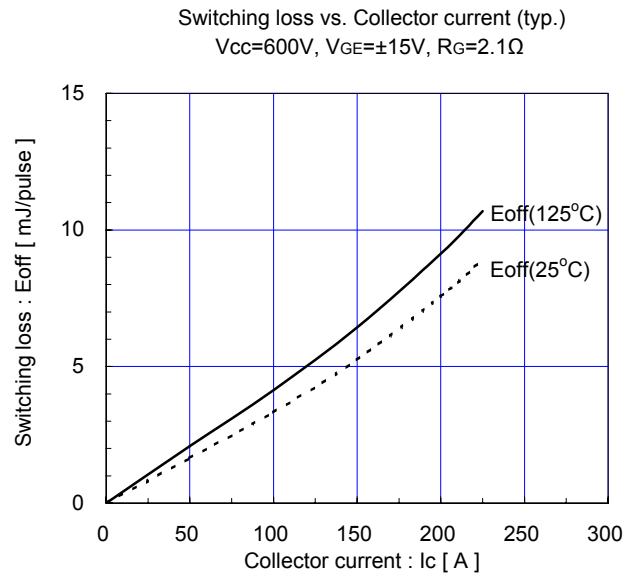
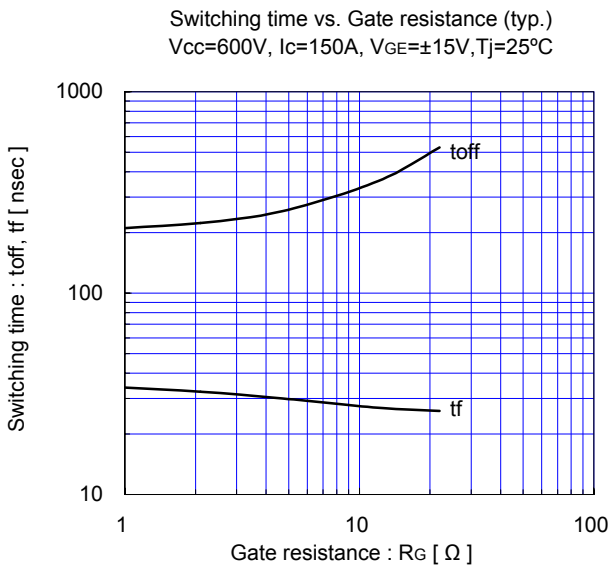
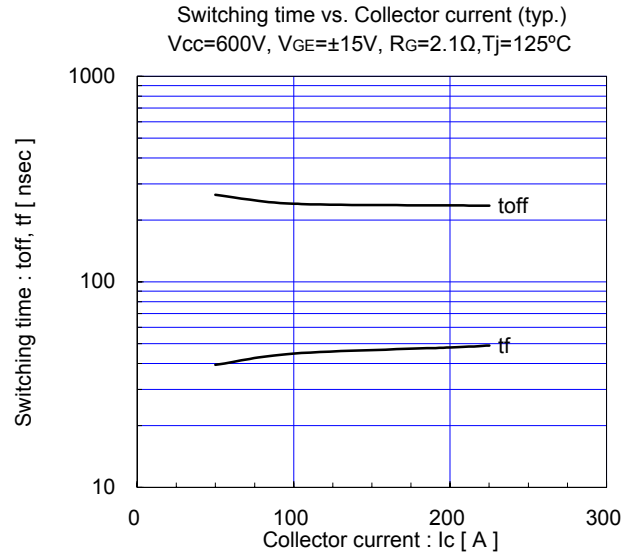
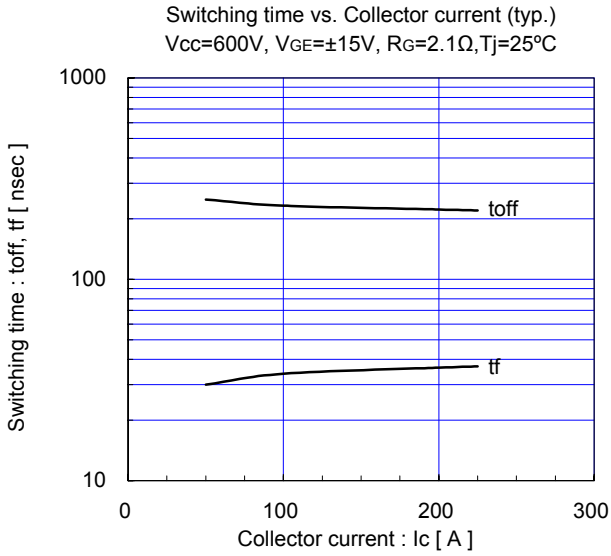


Capacitance vs. Collector-Emittor voltage (typ.)  
V<sub>GE</sub>=0V, f=1MHz, T<sub>j</sub>=25°C

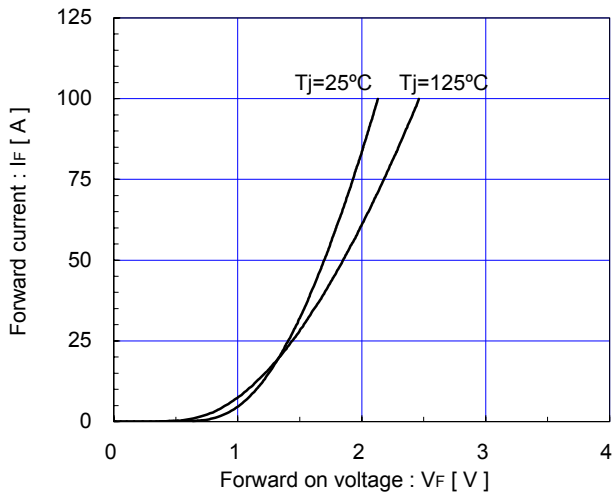


Dynamic Gate charge (typ.)  
V<sub>CC</sub>=600V, I<sub>C</sub>=150A, T<sub>j</sub>=25°C

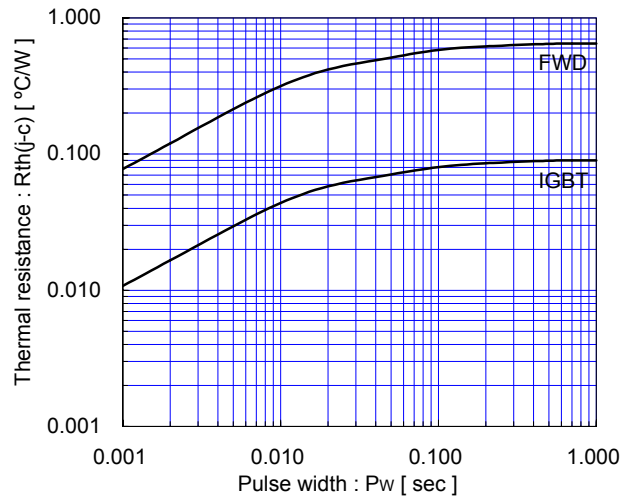




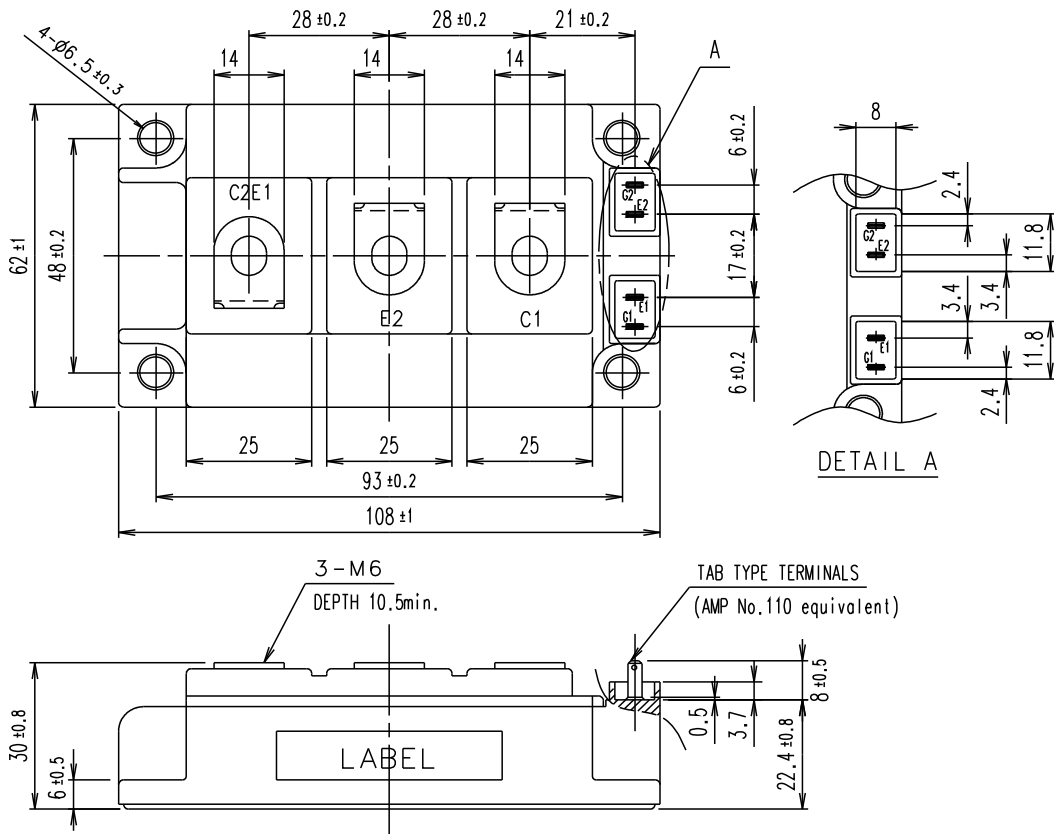
Forward current vs. Forward on voltage (typ.)  
chip



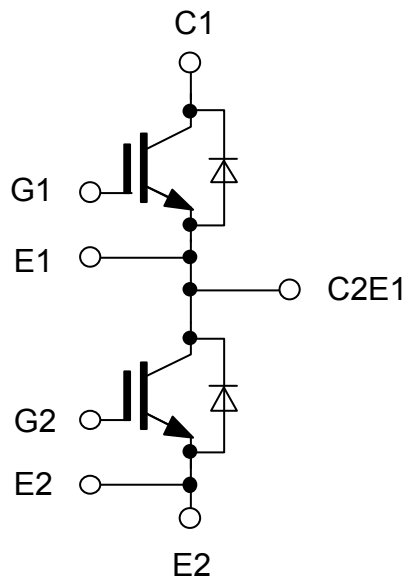
Transient thermal resistance (max.)



■ Outline Drawings, mm



■ Equivalent Circuit Schematic



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