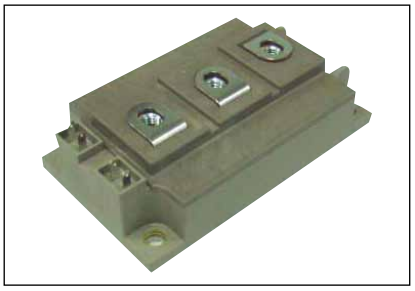
2MBI150HH-120-50

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		Ic	Continuous	Tc=25°C	200	A
				Tc=80°C	150	
		Ic pulse	1ms	Tc=25°C	400	
				Tc=80°C	300	
		-Ic			50	
		-Ic pulse	1ms		100	
Collector Power Dissipation		Pc	1 device		1390	W
Junction temperature		Tj			+150	°C
Storage temperature		Tstg			-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 min.	Characteristics typ.	Characteristics max.	Units
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	Cies	V_{CE} = 10V, V_{GE} = 0V, f = 1MHz		-	12	-	nF
Turn-off time	toff	V_{CC} = 600V, I_C = 150A, V_{GE} = ±15V, R_G = 2.1Ω, Ls = 20nH		-	0.30	0.60	μs
	tf				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.

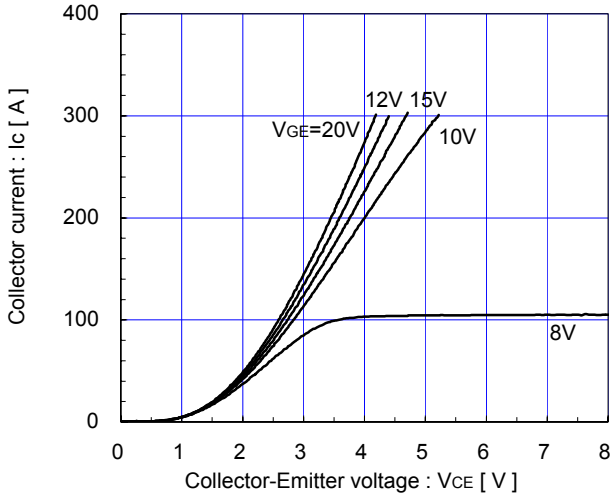
● Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics min.	Characteristics typ.	Characteristics max.	Units
Thermal resistance (1device)	Rth(j-c)	IGBT	-	-	0.09	°C/W
		FWD	-	-	0.65	
Contact Thermal resistance (1 device) (*5)	Rth(c-f)	with Thermal Compound	-	0.025	-	

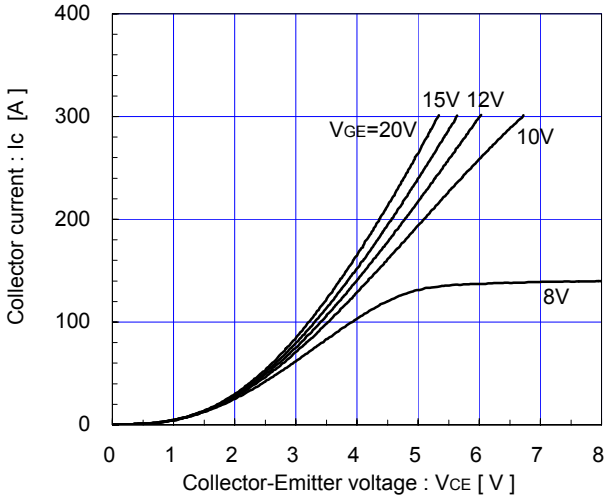
Note *5: This is the value which is defined mounting on the additional cooling fin with thermal compound.

■ Characteristics (Representative)

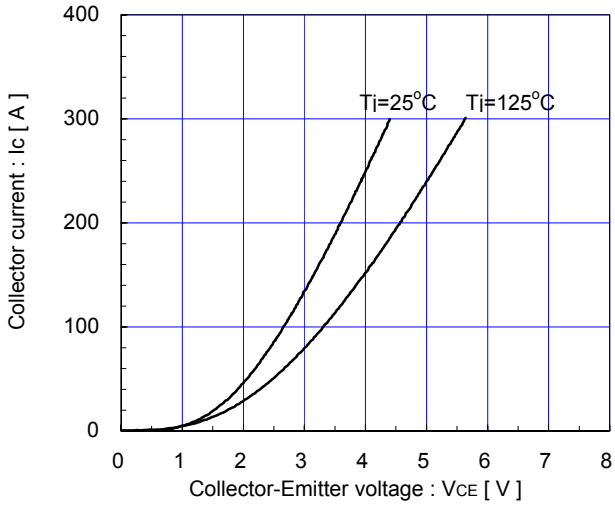
Collector current vs. Collector-Emitter voltage (typ.)
Tj=25°C / chip



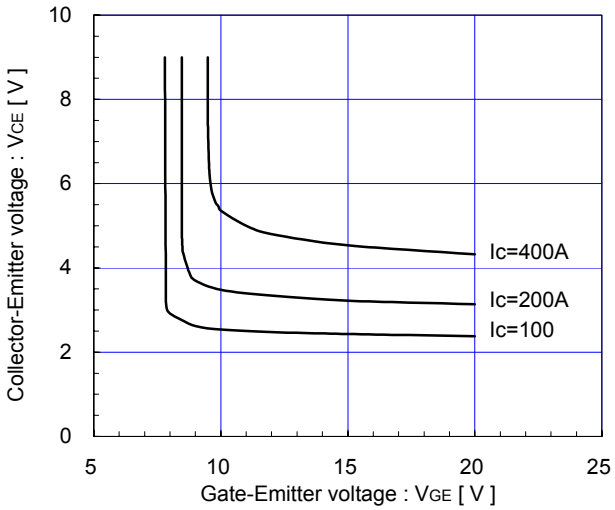
Collector current vs. Collector-Emitter voltage (typ.)
Tj=125°C / chip



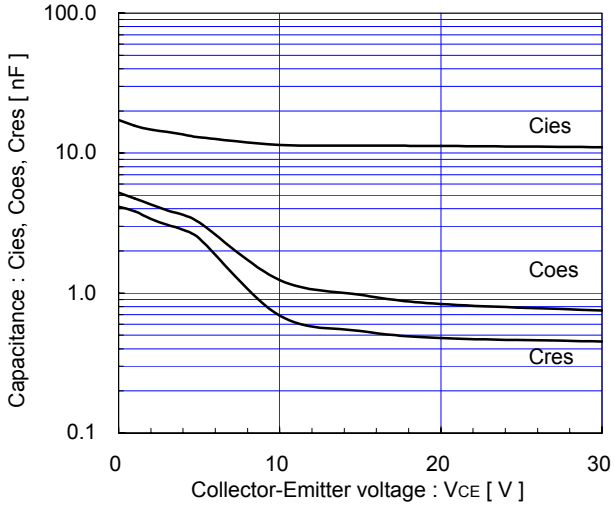
Collector current vs. Collector-Emitter voltage (typ.)
VGE=15V / chip



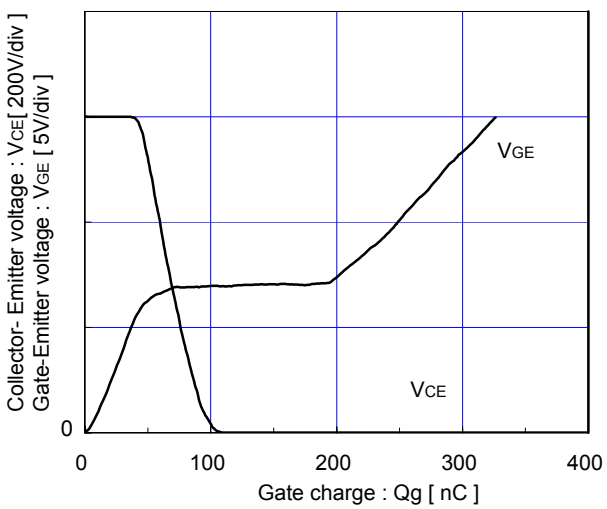
Collector-Emitter voltage vs. Gate-Emitter voltage (typ.)
Tj=25°C / chip



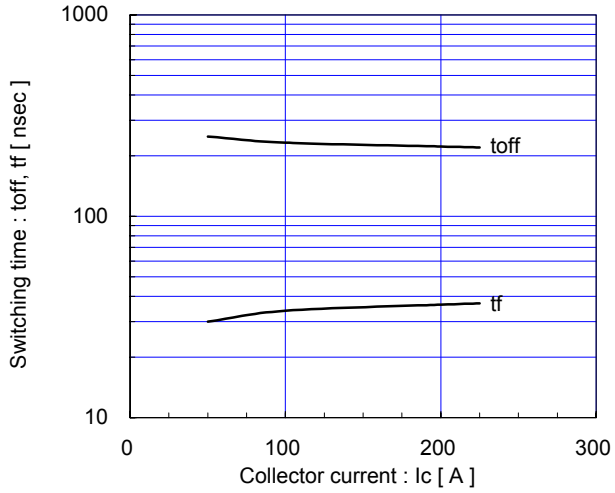
Capacitance vs. Collector-Emitter voltage (typ.)
VGE=0V, f=1MHz, Tj=25ºC



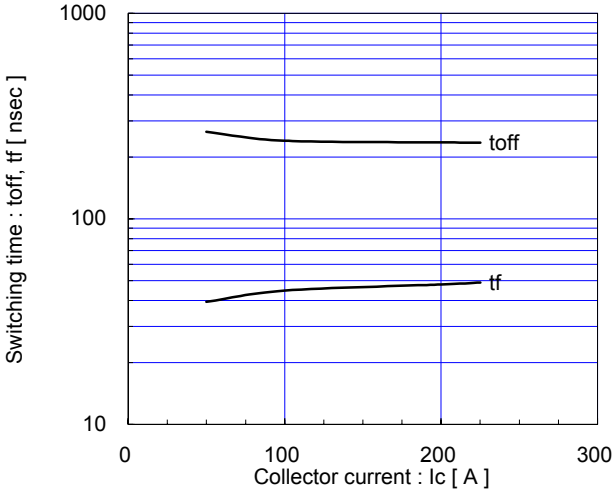
Dynamic Gate charge (typ.)
Vcc=600V, Ic=150A, Tj=25°C



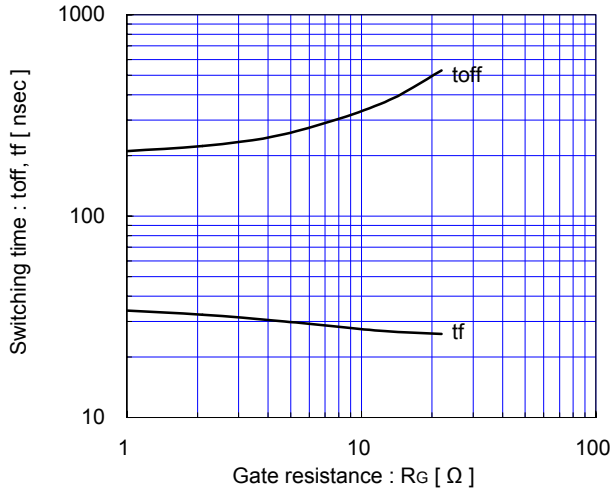
Switching time vs. Collector current (typ.)
Vcc=600V, VGE=±15V, RG=2.1Ω,Tj=25ºC



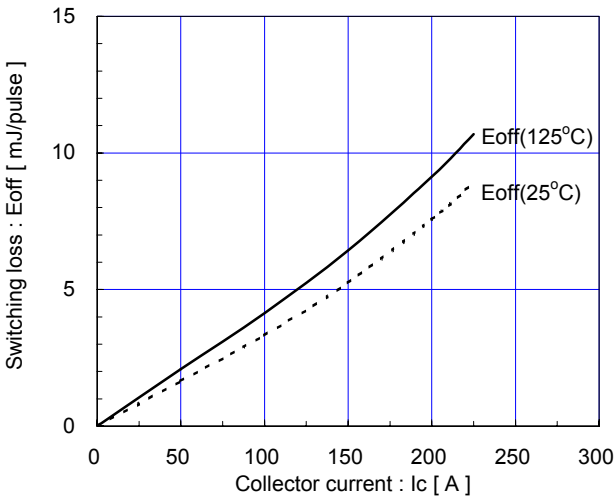
Switching time vs. Collector current (typ.)
Vcc=600V, VGE=±15V, RG=2.1Ω,Tj=125ºC



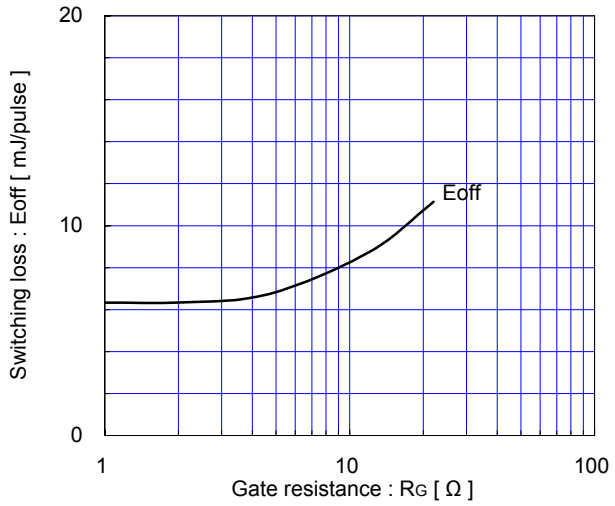
Switching time vs. Gate resistance (typ.)
Vcc=600V, Ic=150A, VGE=±15V,Tj=25ºC



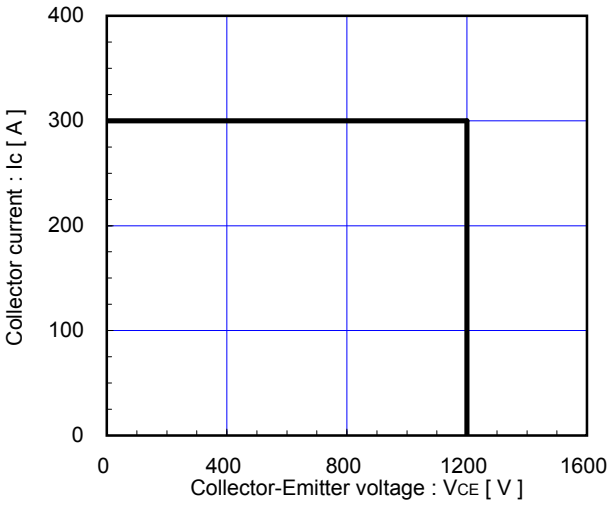
Switching loss vs. Collector current (typ.)
Vcc=600V, VGE=±15V, RG=2.1Ω



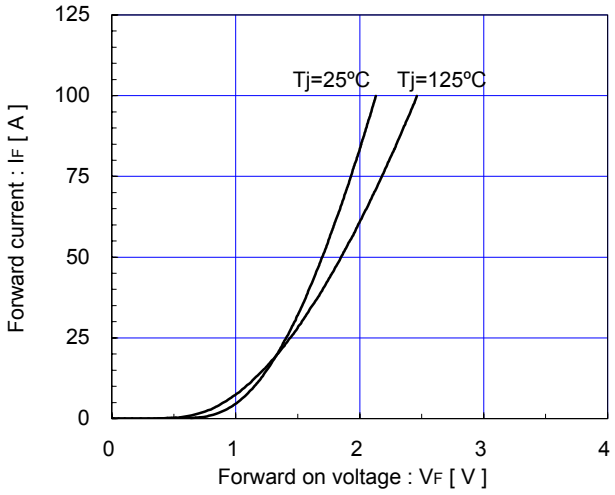
Switching loss vs. Gate resistance (typ.)
Vcc=600V, Ic=150A, VGE=±15V,Tj=125ºC



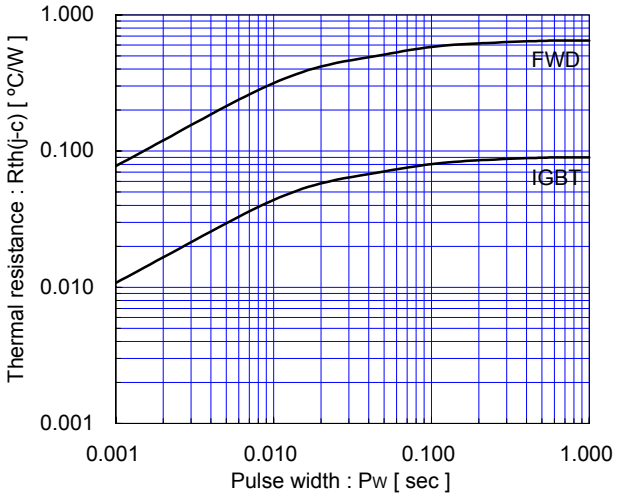
Reverse bias safe operating area (max.)
+VGE=15V, -VGE <= 15V, RG >= 2.1Ω,Tj <= 125ºC



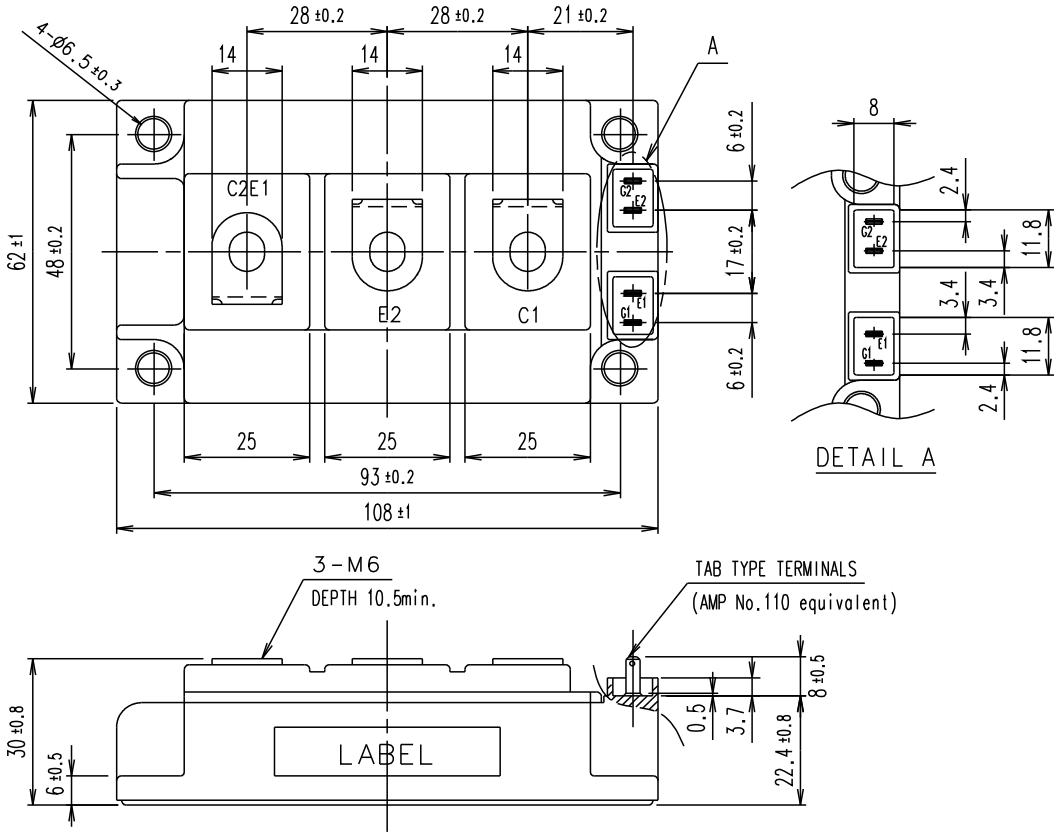
Forward current vs. Forward on voltage (typ.)
chip



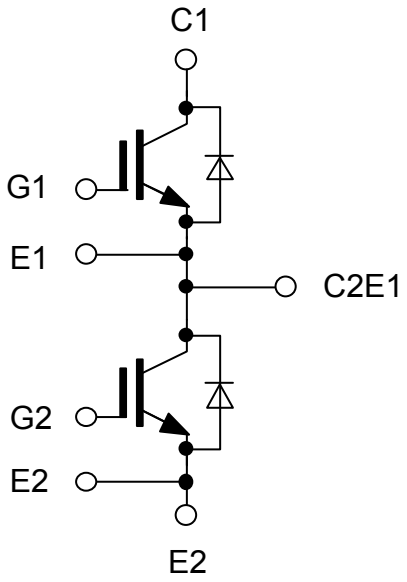
Transient thermal resistance (max.)



■ Outline Drawings, mm



■ Equivalent Circuit Schematic



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- Measurement equipment
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- Personal equipment
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- Safety devices
- Medical equipment

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