

2MBI100HB-120-50

IGBT Modules

HIGH SPEED IGBT MODULE

1200V / 100A / 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 _{CE}		1200	V
Gate-Emitter voltage	V _{GE}		±20	V
Collector current	I _c	Continuous	Tc=25°C Tc=80°C	A
			150 100	
	I _c pulse	1ms	Tc=25°C Tc=80°C	
			300 200	
	-I _c		50	
	-I _c pulse	1ms	100	
Collector Power Dissipation	P _c	1 device	1040	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)		3.5	

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)

Note *3: Recommendable Value : Terminals 2.5 to 3.5 Nm (M5)

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

Items	Symbols	Conditions		Characteristics			Units
				min.	typ.	max.	
Zero gate voltage collector current	I _{CE}	V _{GE} = 0V, V _{CE} = 1200V		-	-	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 = 100mA		5.7	6.2	6.7	V
Collector-Emitter saturation voltage	V _{CE} (sat) (terminal)	V _{GE} = 15V	T _j =25°C	-	3.30	3.60	V
	T _j =125°C		-	4.20	-		
	V _{CE} (sat) (chip)	I _c = 100A	T _j =25°C	-	3.10	3.40	
	T _j =125°C		-	4.00	-		
Input capacitance	C _{ies}	V _{CE} = 10V, V _{GE} = 0V, f = 1MHz		-	9	-	nF
Turn-off time	t _{off}	V _{CC} = 600V, I _c = 100A		-	0.30	0.60	μs
	t _f	V _{GE} = ±15V, R _G = 3.1Ω L _s = 20nH			0.05	0.20	
Forward on voltage	V _F (terminal)	V _{GE} = 0V	T _j =25°C	-	1.85	2.30	V
	T _j =125°C		-	2.00	-		
	V _F (chip)	I _F = 50A	T _j =25°C	-	1.70	2.15	
	T _j =125°C		-	1.85	-		
Lead resistance, terminal-chip (*4)	R lead			-	1.55	-	mΩ

Note *4: Biggest internal terminal resistance among arm.

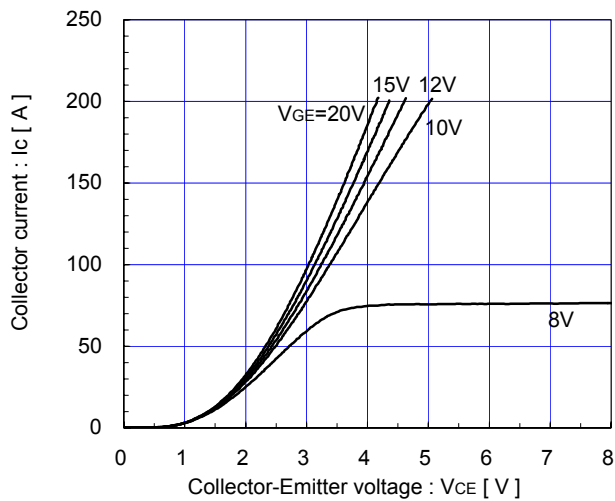
● Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance (1device)	R _{th(j-c)}	IGBT	-	-	0.12	°C/W
		FWD	-	-	0.65	
Contact Thermal resistance (1 device) (*5)	R _{th(c-f)}	with Thermal Compound	-	0.05	-	

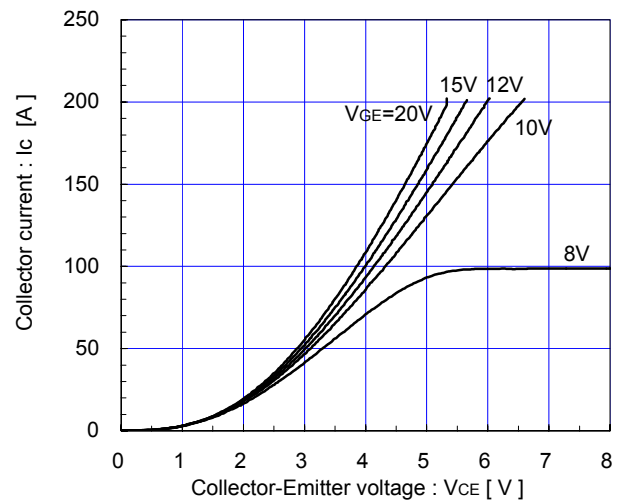
Note *5: This is the value which is defined mounting on the additional cooling fin with thermal compound.

■ Characteristics (Representative)

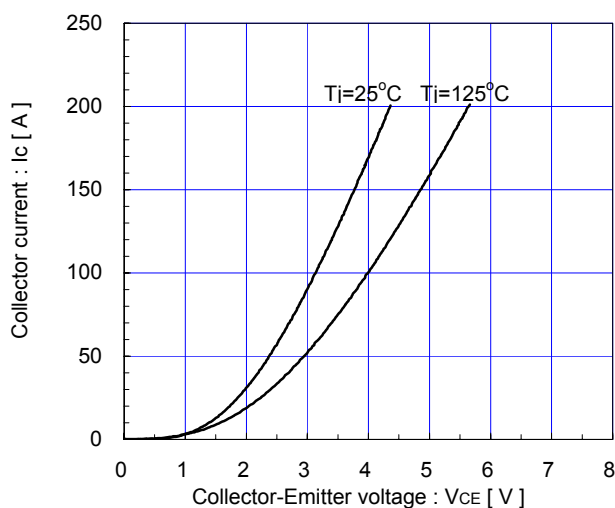
Collector current vs. Collector-Emitter voltage (typ.)
T_j=25°C / chip



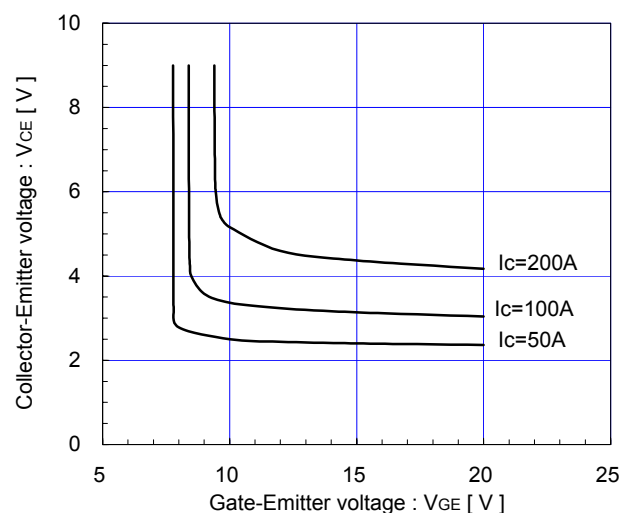
Collector current vs. Collector-Emitter voltage (typ.)
T_j=125°C / chip



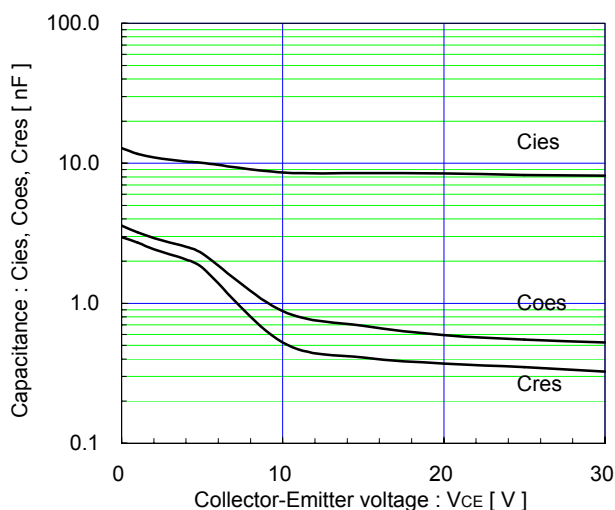
Collector current vs. Collector-Emitter voltage (typ.)
V_{GE}=15V / chip



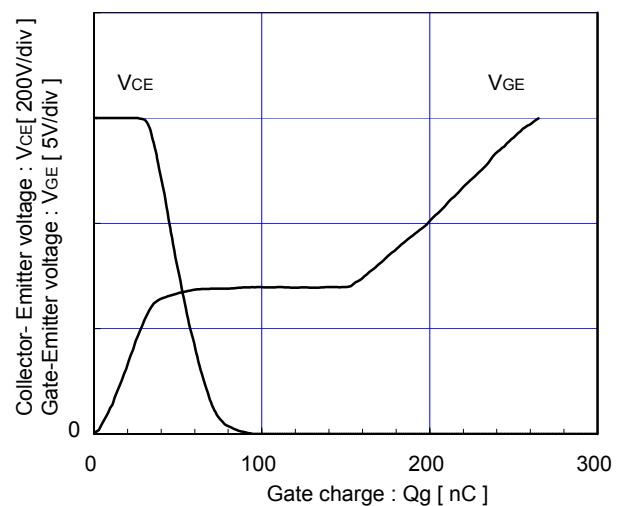
Collector-Emitter voltage vs. Gate-Emitter voltage (typ.)
T_j=25°C / chip



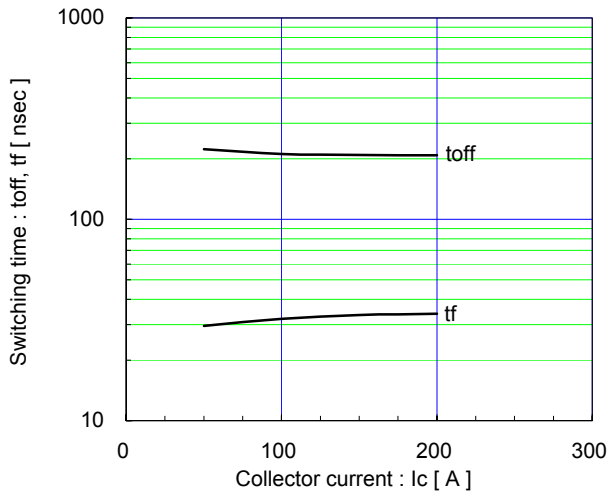
Capacitance vs. Collector-Emitter voltage (typ.)
V_{GE}=0V, f=1MHz, T_j=25°C



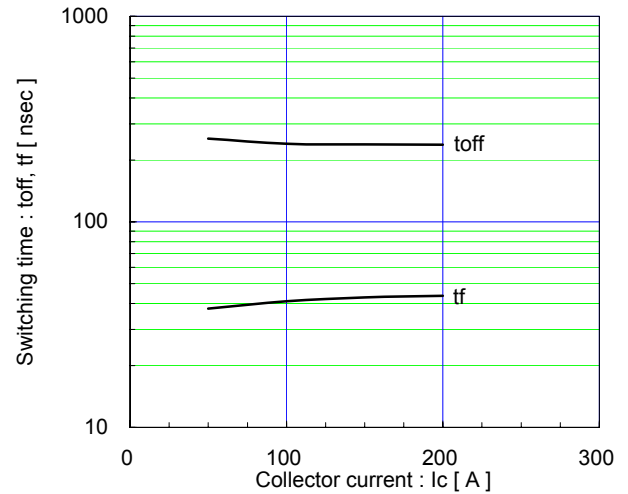
Dynamic Gate charge (typ.)
V_{CC}=600V, I_C=100A, T_j=25°C



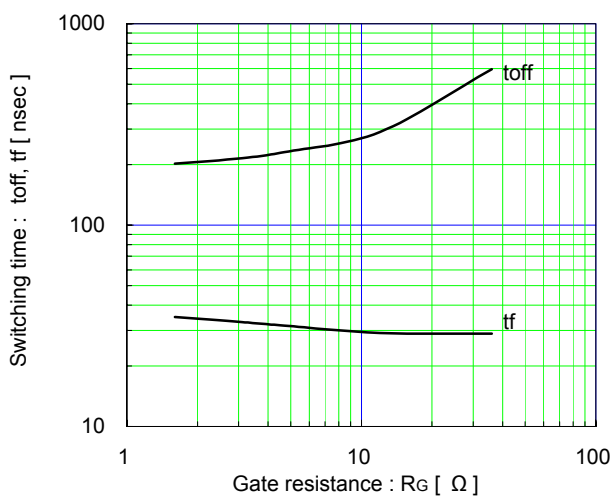
Switching time vs. Collector current (typ.)
 $V_{CC}=600V$, $V_{GE}=\pm 15V$, $R_G=3.1\Omega$, $T_j=25^\circ C$



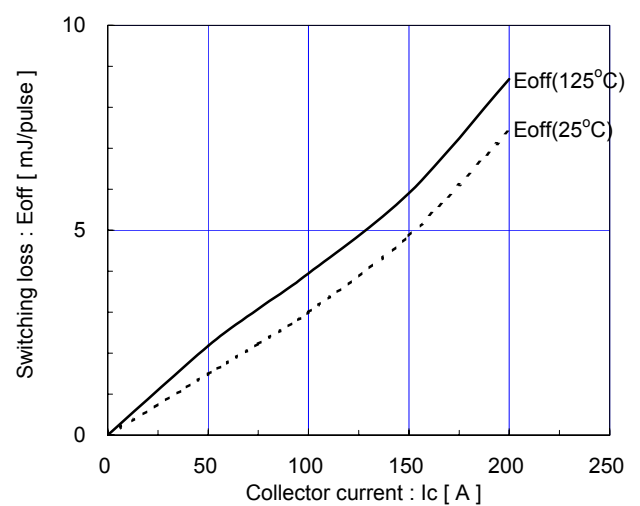
Switching time vs. Collector current (typ.)
 $V_{CC}=600V$, $V_{GE}=\pm 15V$, $R_G=3.1\Omega$, $T_j=125^\circ C$



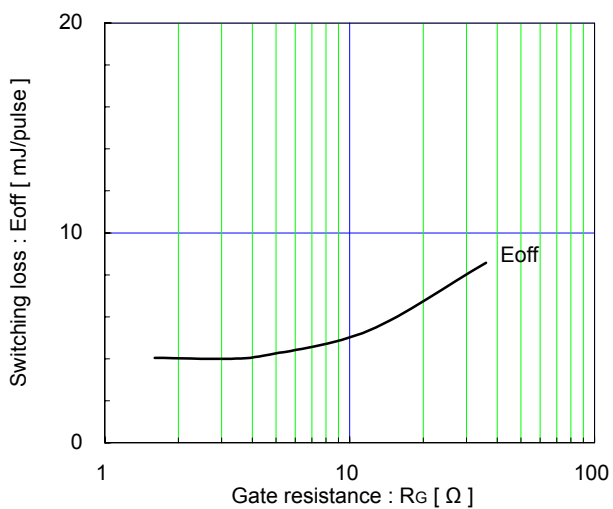
Switching time vs. Gate resistance (typ.)
 $V_{CC}=600V$, $I_C=100A$, $V_{GE}=\pm 15V$, $T_j=25^\circ C$



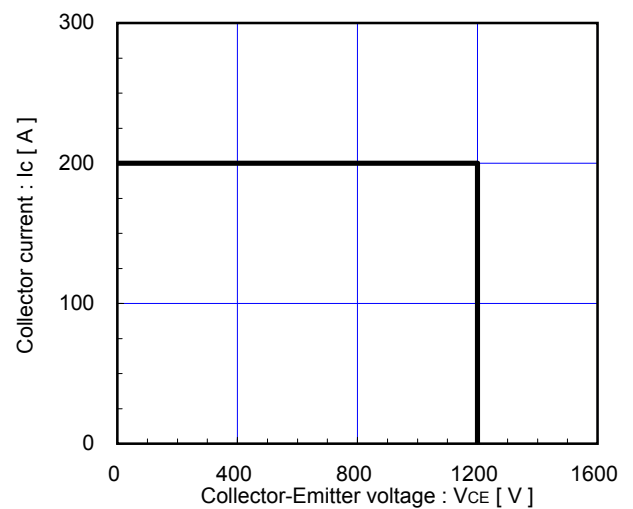
Switching loss vs. Collector current (typ.)
 $V_{CC}=600V$, $V_{GE}=\pm 15V$, $R_G=3.1\Omega$



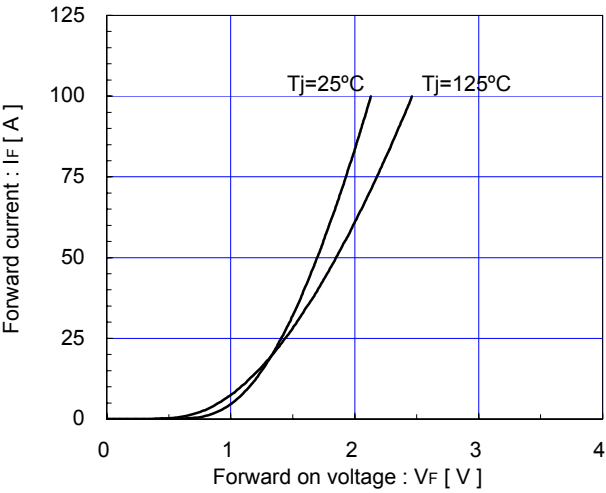
Switching loss vs. Gate resistance (typ.)
 $V_{CC}=600V$, $I_C=100A$, $V_{GE}=\pm 15V$, $T_j=125^\circ C$



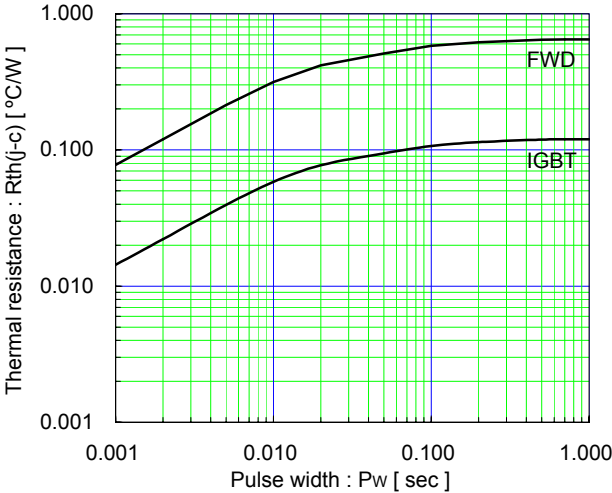
Reverse bias safe operating area (max.)
 $+V_{GE}=15V$, $-V_{GE} \leq 15V$, $R_G \geq 3.1\Omega$, $T_j \leq 125^\circ C$



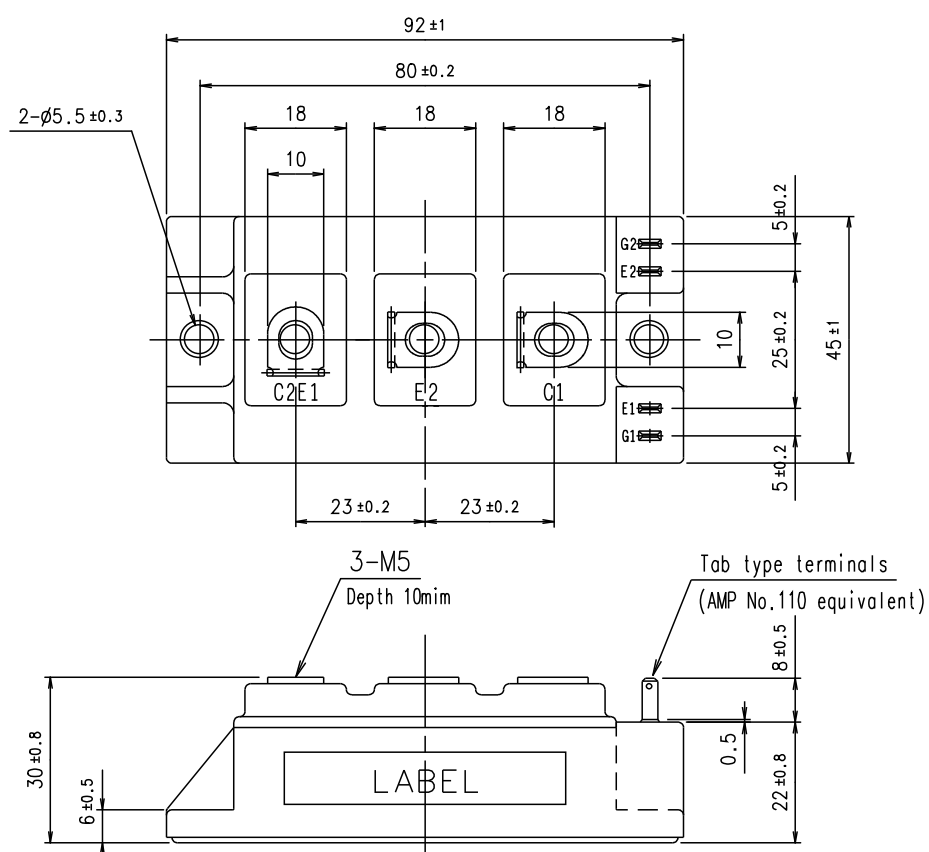
Forward current vs. Forward on voltage (typ.)
chip



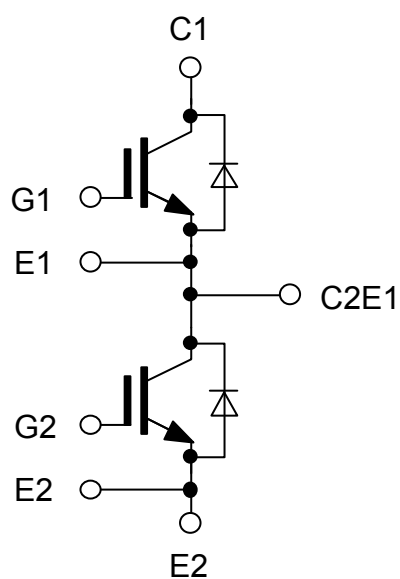
Transient thermal resistance (max.)



■ Outline Drawings, mm



■ Equivalent Circuit Schematic



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