

2MBI200VH-120-50

IGBT Modules

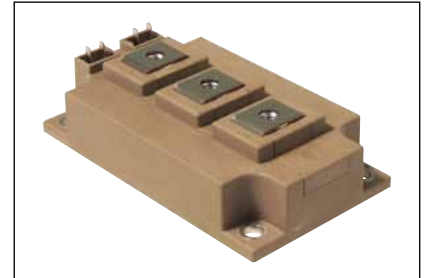
IGBT MODULE (V series) 1200V / 200A / 2 in one package

■ 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)

Items		Symbols	Conditions	Maximum ratings	Units	
Inverter	Collector-Emitter voltage	V _{CE}	1200		V	
	Gate-Emitter voltage	V _{GE}	±20		V	
	Collector current	I _c	Continuous	T _c =100°C	200	A
				T _c =25°C	240	
		I _c pulse	1ms	400		
		-I _c		200		
		-I _c pulse	1ms	400		
	Collector power dissipation	P _c	1 device	1110	W	
Junction temperature		T _j	175	°C		
Operating junction temperature (under switching conditions)		T _{jop}	150			
Case temperature		T _c	125			
Storage temperature		T _{stg}	-40 ~ +125			
Isolation voltage	between terminal and copper base (*1)	V _{iso}	AC : 1min.	2500	VAC	
Screw torque	Mounting (*2)	-		6.0	N m	
	Terminals (*3)	-		5.0		

Note *1: All terminals should be connected together during the test.

Note *2: Recommendable Value : 3.0-6.0 Nm (M5 or M6) (c)

Note *3: Recommendable Value : 2.5-5.0 Nm (M6)

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

Items		Symbols	Conditions		Characteristics			Units
					min.	typ.	max.	
Inverter	Zero gate voltage collector current	I _{CE}	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 = 200mA		6.0	6.5	7.0	V
	Collector-Emitter saturation voltage	V _{CE (sat)} (terminal)	V _{GE} = 15V I _C = 200A	T _J =25°C	-	1.95	2.40	V
				T _J =125°C	-	2.25	-	
				T _J =150°C	-	2.30	-	
		V _{CE (sat)} (chip)		T _J =25°C	-	1.75	2.15	
				T _J =125°C	-	2.05	-	
			T _J =150°C	-	2.10	-		
	Input capacitance	C _{ies}	V _{CE} = 10V, V _{GE} = 0V, f = 1MHz		-	18	-	nF
	Turn-on time	t _{on}	V _{CC} = 600V		-	0.60	-	μs
		t _r	I _C = 200A		-	0.20	-	
	Turn-off time	t _{r (i)}	V _{GE} = ±15V		-	0.05	-	
		t _{off}	R _G = 2.7Ω		-	0.80	-	
t _f		T _J = 150°C		-	0.08	-		
Forward on voltage	V _F (terminal)	V _{GE} = 0V I _F = 200A	T _J =25°C	-	1.85	2.35	V	
			T _J =125°C	-	2.00	-		
			T _J =150°C	-	1.95	-		
	V _F (chip)		T _J =25°C	-	1.70	2.15		
			T _J =125°C	-	1.85	-		
Reverse recovery time	t _{rr}	I _F = 200A		-	0.15	-	us	

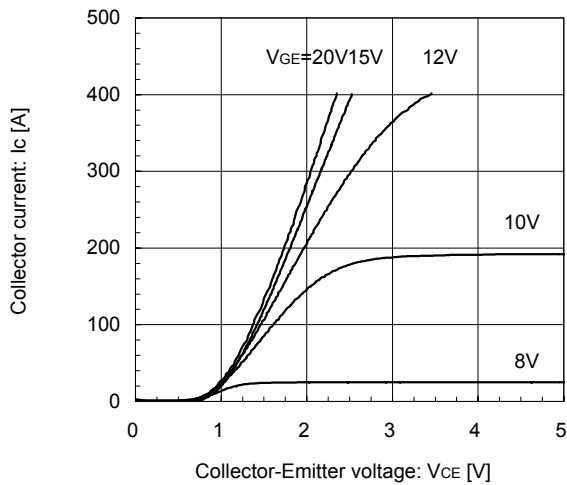
● Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance (1device)	R _{th(j-c)}	IGBT	-	-	0.135	°C/W
		FWD	-	-	0.200	
Contact thermal resistance (1device) (*4)	R _{th(c-f)}	with Thermal Compound	-	0.0250	-	

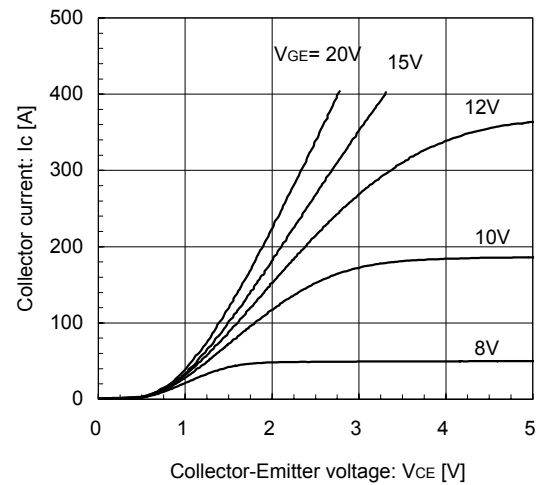
Note *4: This is the value which is defined mounting on the additional cooling fin with thermal compound.

■ Characteristics (Representative)

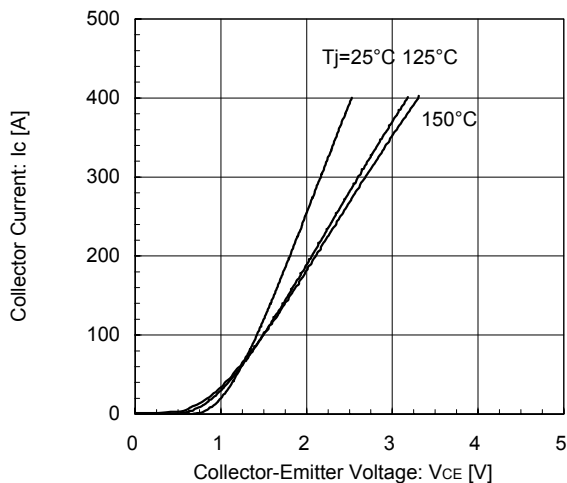
Collector current vs. Collector-Emitter voltage (typ.)
T_j = 25°C / chip



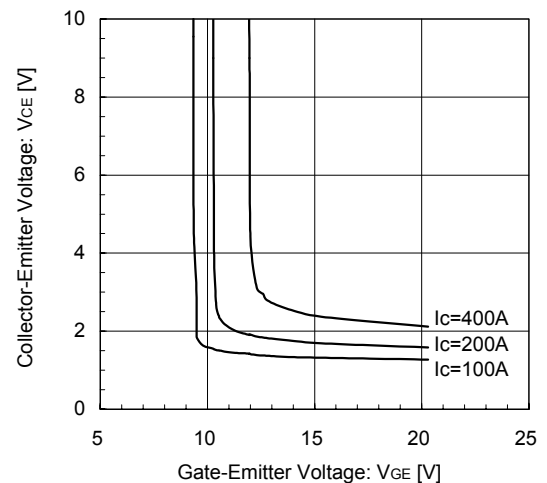
Collector current vs. Collector-Emitter voltage (typ.)
T_j = 150°C / chip



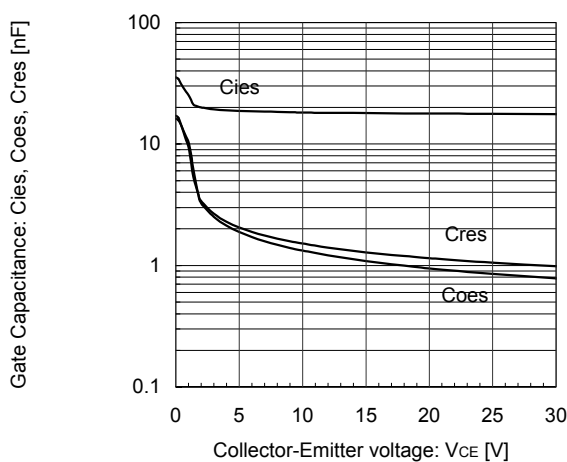
Collector current vs. Collector-Emitter voltage (typ.)
V_{GE} = 15V / chip



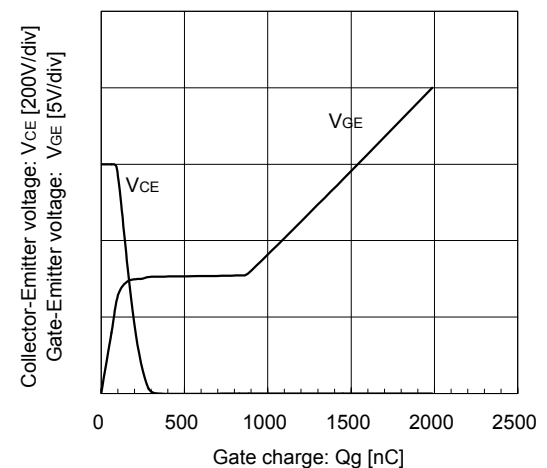
Collector-Emitter voltage vs. Gate-Emitter voltage (typ.)
T_j = 25°C / chip



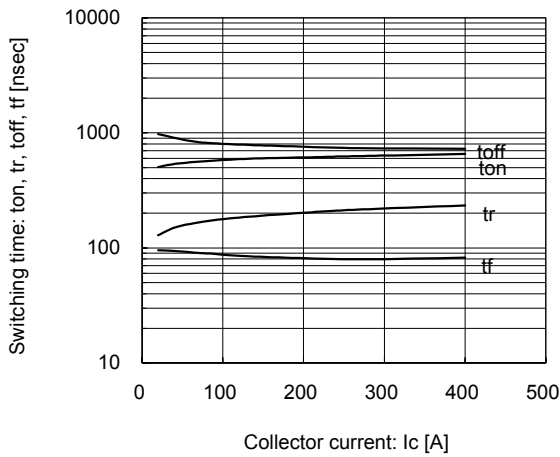
Gate Capacitance vs. Collector-Emitter Voltage (typ.)
V_{GE} = 0V, f = 1MHz, T_j = 25°C



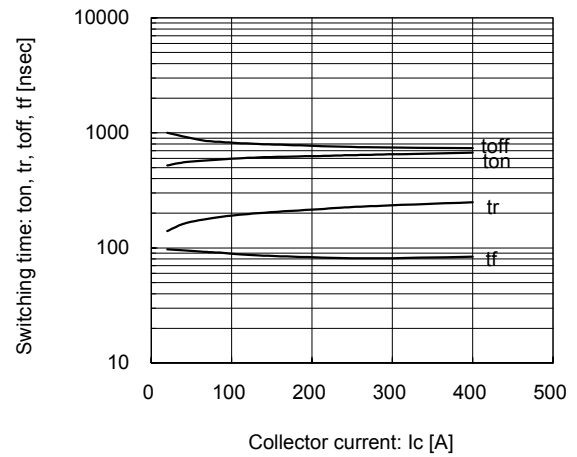
Dynamic Gate Charge (typ.)
V_{CC} = 600V, I_C = 200A, T_j = 25°C



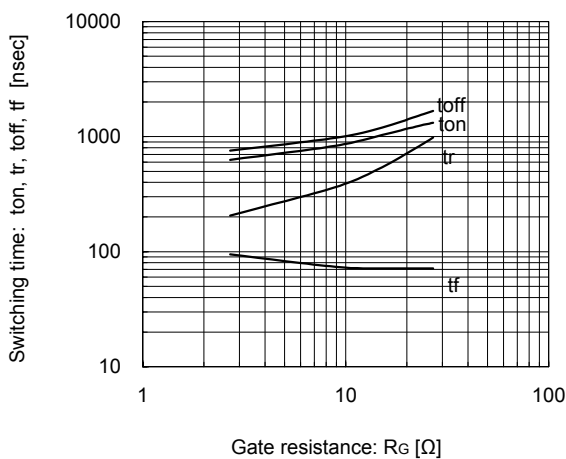
Switching time vs. Collector current (typ.)
 $V_{CC}=600V$, $V_{GE}=\pm 15V$, $R_G=2.7\Omega$, $T_J=125^\circ C$



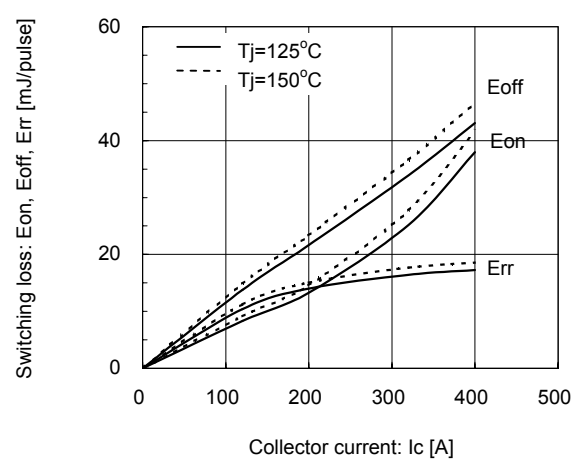
Switching time vs. Collector current (typ.)
 $V_{CC}=600V$, $V_{GE}=\pm 15V$, $R_G=2.7\Omega$, $T_J=150^\circ C$



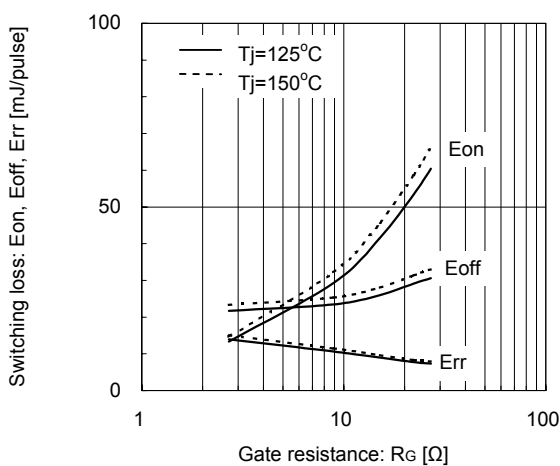
Switching time vs. Gate resistance (typ.)
 $V_{CC}=600V$, $I_C=200A$, $V_{GE}=\pm 15V$, $T_J=125^\circ C$



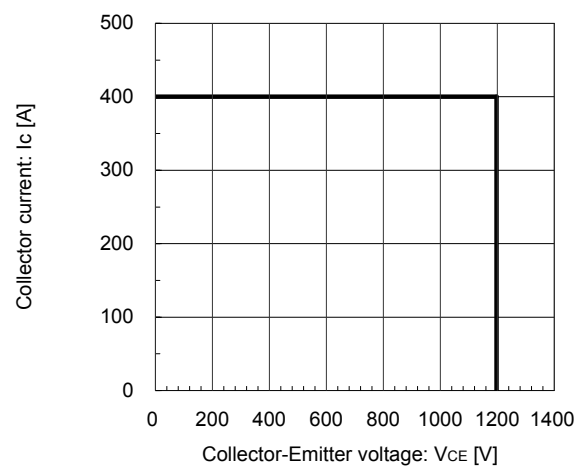
Switching loss vs. Collector current (typ.)
 $V_{CC}=600V$, $V_{GE}=\pm 15V$, $R_G=2.7\Omega$, $T_J=125^\circ C$, $150^\circ C$



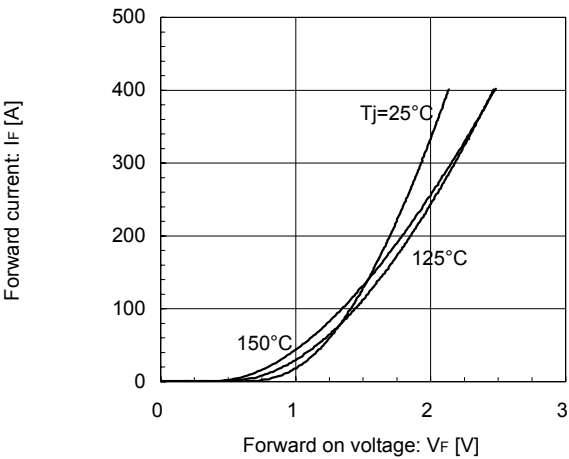
Switching loss vs. Gate resistance (typ.)
 $V_{CC}=600V$, $I_C=200A$, $V_{GE}=\pm 15V$, $T_J=125^\circ C$, $150^\circ C$



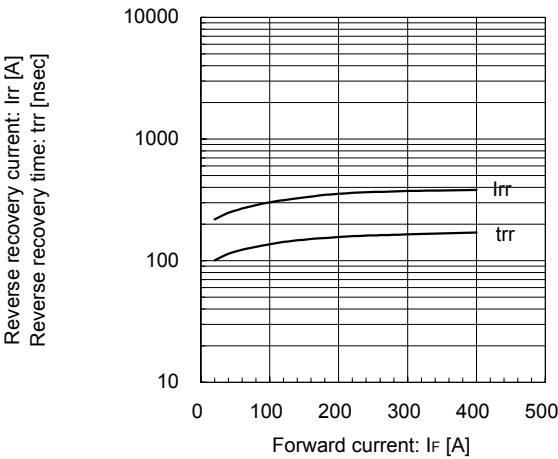
Reverse bias safe operating area (max.)
 $+V_{GE}=15V$, $-V_{GE}=15V$, $R_G=2.7\Omega$, $T_J=150^\circ C$



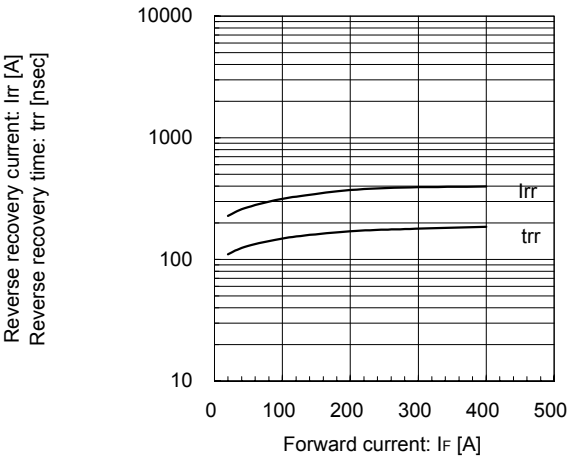
Forward Current vs. Forward Voltage (typ.)
chip



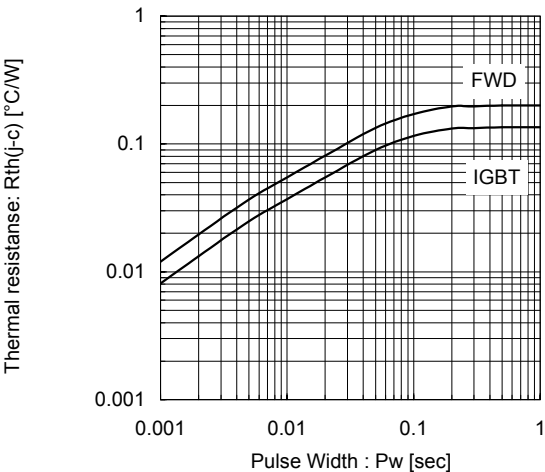
Reverse Recovery Characteristics (typ.)
 $V_{CC}=600\text{V}$, $V_{GE}=\pm 15\text{V}$, $R_G=2.7\Omega$, $T_J=125^\circ\text{C}$



Reverse Recovery Characteristics (typ.)
 $V_{CC}=600\text{V}$, $V_{GE}=\pm 15\text{V}$, $R_G=2.7\Omega$, $T_J=150^\circ\text{C}$



Transient Thermal Resistance (max.)



[illegible]

The diagram shows two common-emitter amplifier stages. The first stage has input terminals G1 and E1, and output terminal C1. Its collector is connected to the base of the second stage. The second stage has input terminals G2 and E2, and output terminal C2E1. Both stages include a base resistor and a collector load resistor with a bypass capacitor.

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