1MBI150NH-060

IGBT Module

600V / 150A Chopper Module

■ Features

· High speed switching
· Low inductance module structure
· Suitable for Chopper and Dynamic brake circuit

■ Applications

· Uninterruptible power supply
· Inverter for Motor drive

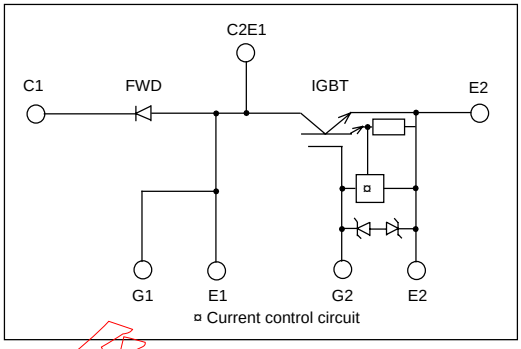
■ Maximum ratings and characteristics

● Absolute maximum ratings (at Tc=25°C unless otherwise specified)

	Item		Symbol	Rating	Unit
IGBT	Collector-Emitter voltage		V_{CES}	600	V
	Gate-Emitter voltage		V_{GES}	±20	V
	Collector current	Continuous	I_C	150	A
		1ms	$I_{C\ pulse}$	300	A
	Max. power dissipation		P_C	600	W
FWD	Repetitive peak dissipation		V_{RRM}	600	V
	Forward current		I_F	150	A
		1ms	$I_{F\ pulse}$	300	A
	Operating temperature		T_j	+150	°C
	Storage temperature		T_{stg}	-40 to +125	°C
	Isolation voltage		V_{is}	AC 2500 (1min.)	V
	Screw torque		Mounting *1	3.5	N·m
			Terminals *1	3.5	N·m

*1 : Recommendable value : 2.5 to 3.5 N·m (M5)

■ Equivalent Circuit Schematic



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

	Item	Symbol	Characteristics			Conditions	Unit
			Min.	Typ.	Max.		
IGBT	Zero gate voltage collector current	I_{CES}	–	–	1.0	V_{GE}=0V, V_{CE}=600V	mA
	Gate-Emitter leakage current	I_{GES}	–	–	15	V_{CE}=0V, V_{GE}=±20V	µA
	Gate-Emitter threshold voltage	$V_{GE(th)}$	4.5	–	7.5	V_{CE}=20V, I_C=150mA	V
	Collector-Emitter saturation voltage	$V_{CE(sat)}$	–	–	2.8	V_{GE}=15V, I_C=150A	V
	Input capacitance	C_{ies}	–	9900	–	V_{GE}=0V	pF
	Output capacitance	C_{oes}	–	2200	–	V_{CE}=10V	
	Reverse transfer capacitance	C_{res}	–	1000	–	f=1MHz	
	Turn-on time	t_{on}	–	0.6	1.2	V_{CC}=300V	µs
		t_r	–	0.2	0.6	I_C=150A	
	Turn-off time	t_{off}	–	0.6	1.0	V_{GE}=±15V	
		t_f	–	0.2	0.35	R_G=16ohm	
FWD	Diode forward on voltage	V_F	–	–	3.0	I_F=150A, V_{GE}=0V	V
	Reverse recovery time	t_{rr}	–	–	0.3	I_F=150A	µs
	Reverse current	I_{RRM}	–	–	1.0	V_R=600V	mA

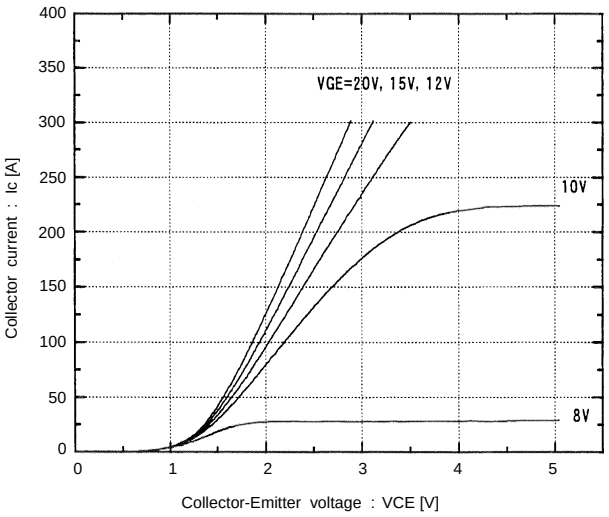
● Thermal resistance characteristics

Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Thermal resistance	Rth(j-c)	–	–	0.21	IGBT	°C/W
	Rth(j-c)	–	–	0.47	FWD	°C/W
	Rth(c-f)*2	–	0.05	–	the base to cooling fin	°C/W

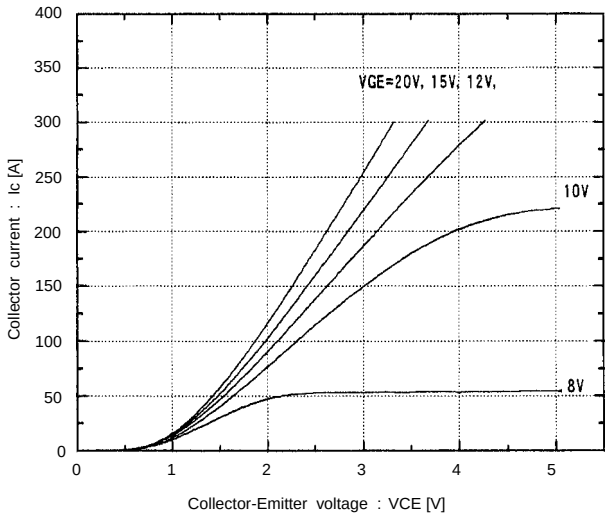
*2 : This is the value which is defined mounting on the additional cooling fin with thermal compound

■ Characteristics (Representative)

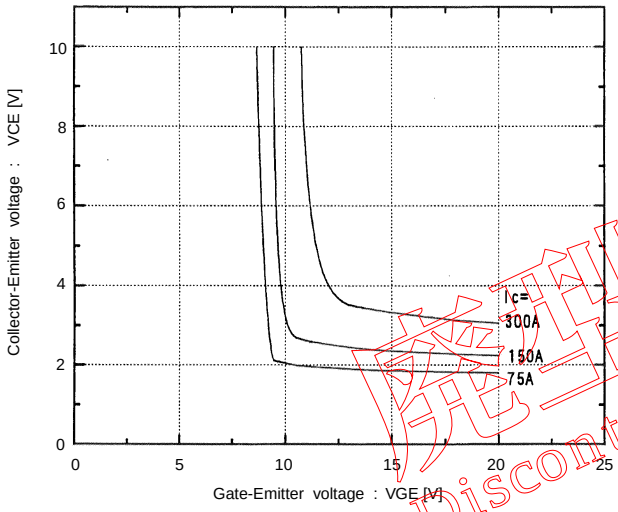
Collector current vs. Collector-Emitter voltage
Tj=25°C



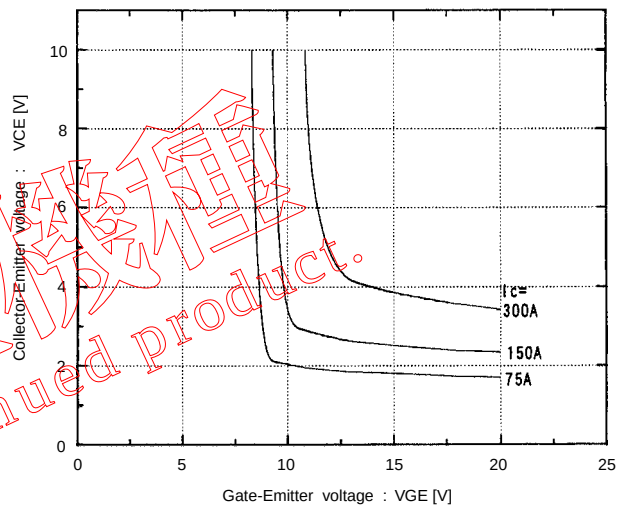
Collector current vs. Collector-Emitter voltage
Tj=125°C



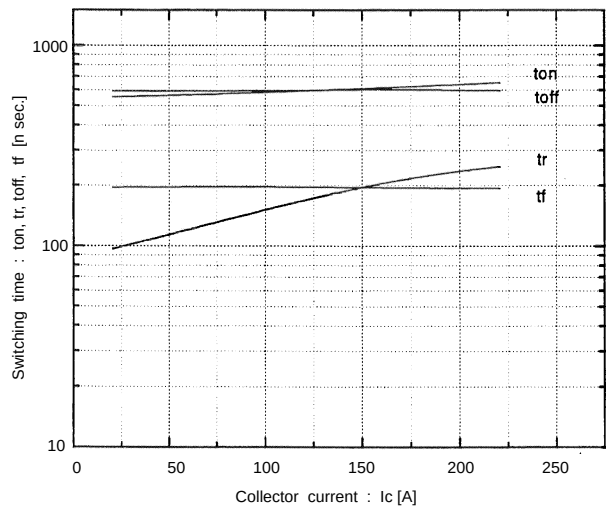
Collector-Emitter vs. Gate-Emitter voltage
Tj=25°C



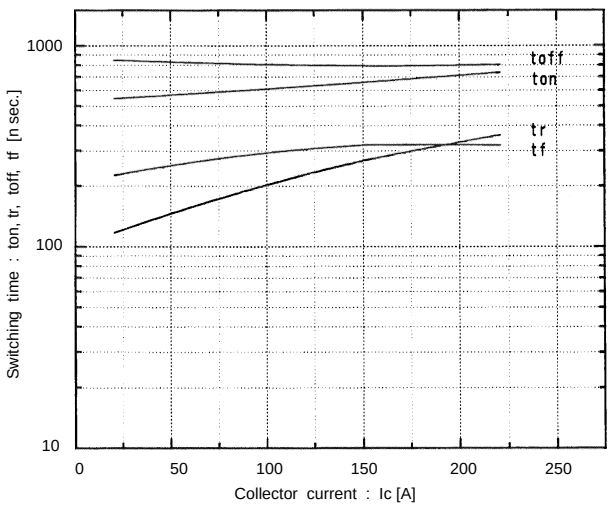
Collector-Emitter vs. Gate-Emitter voltage
Tj=125°C



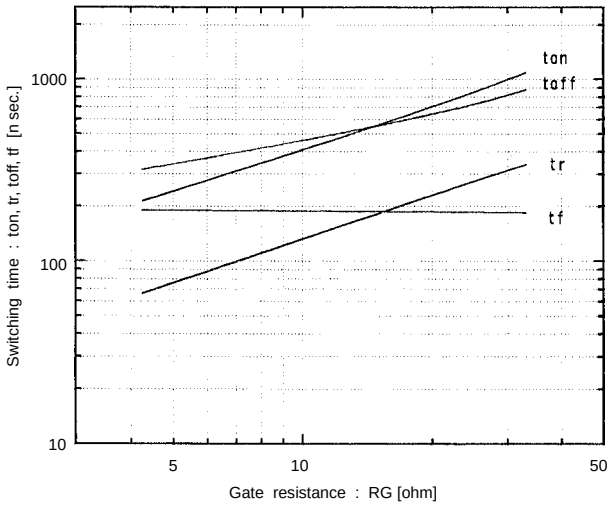
Switching time vs. Collector current
Vcc=300V, RG=16 ohm, VGE=±15V, Tj=25°C



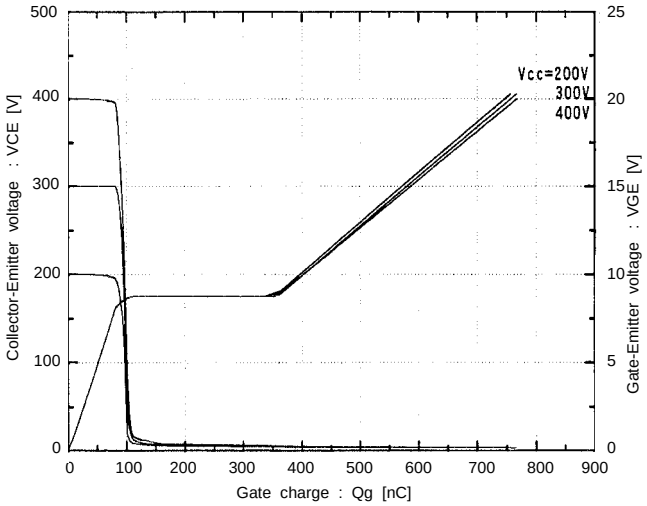
Switching time vs. Collector current
Vcc=300V, RG=16 ohm, VGE=±15V, Tj=125°C



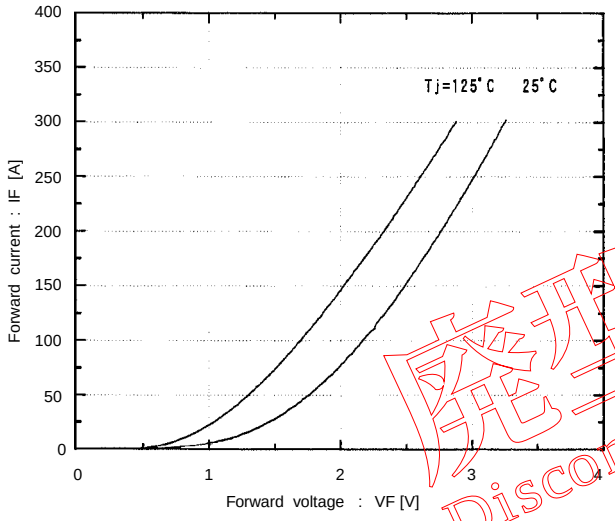
Switching time vs. RG
Vcc=300V, Ic=150A, VGE=±15V, Tj=25°C



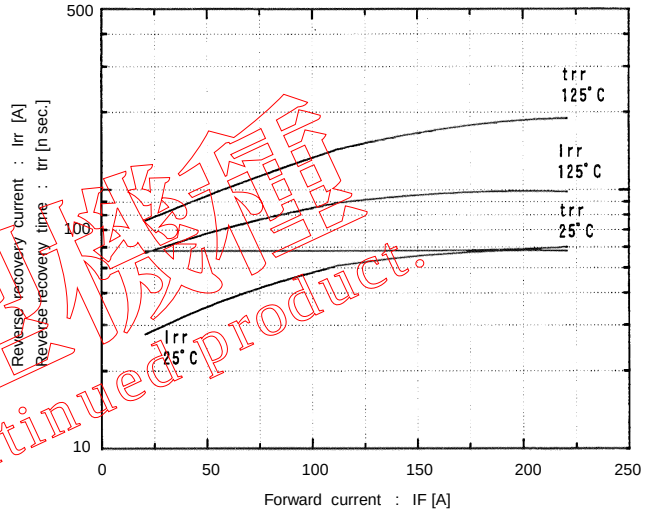
Dynamic input characteristics
Tj=25°C



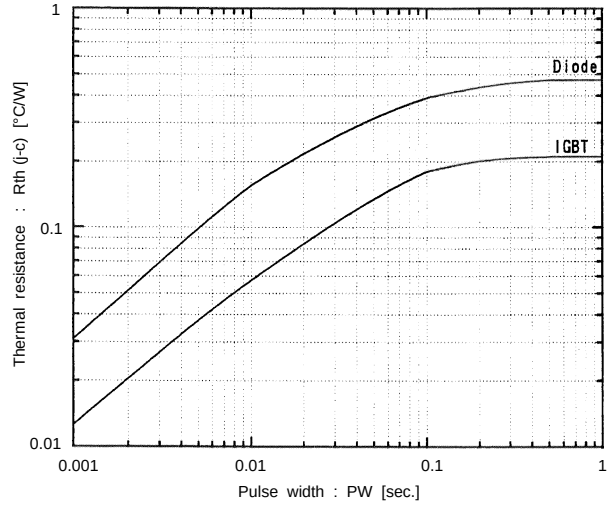
Forward current vs. Forward voltage
VGE=0V



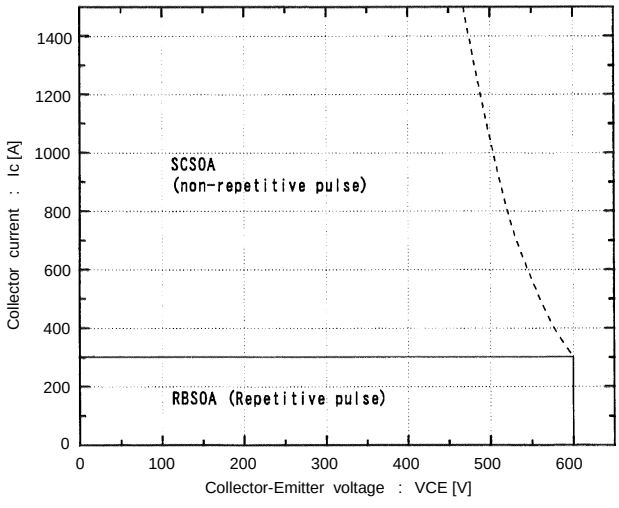
Reverse recovery characteristics
trr, Irr, vs. IF



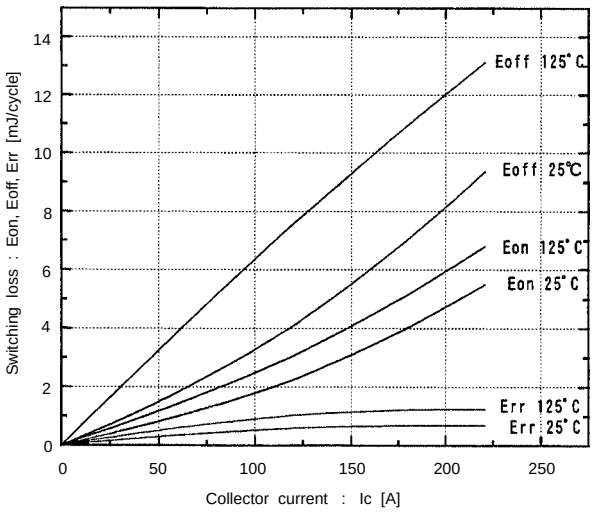
Transient thermal resistance



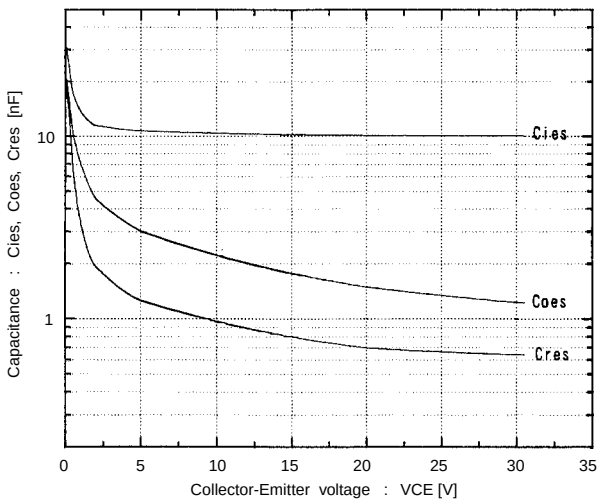
Reversed biased safe operating area
+VGE=15V, -VGE ≦ 15V, Tj ≦ 125°C, RG ≧ 16 ohm



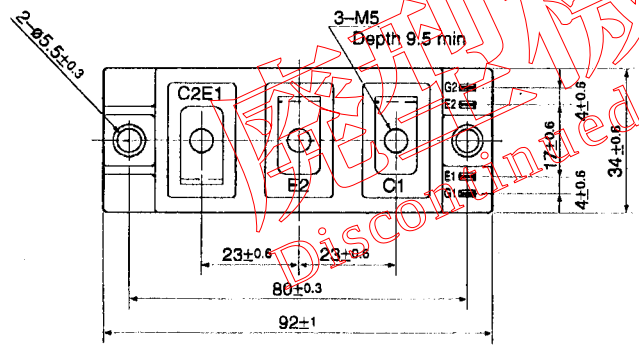
Switching loss vs. Collector current
Vcc=300V, RG=16 ohm, VGE=±15V

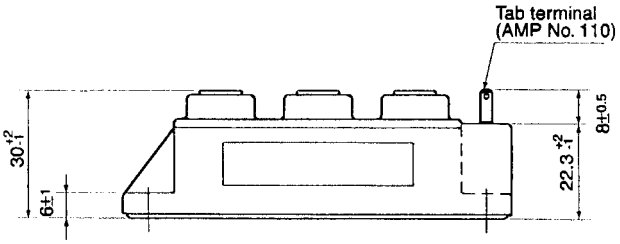


Capacitance vs. Collector-Emitter voltage
Tj=25°C



■ Outline Drawings, mm





Mass : 180g