

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



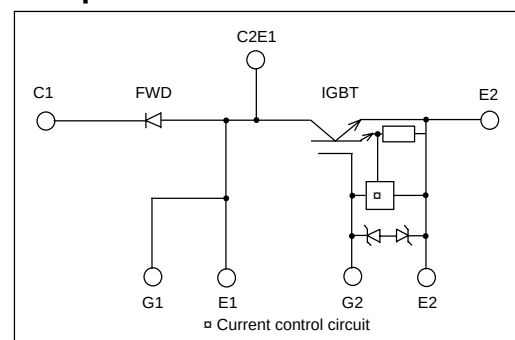
■ Maximum ratings and characteristics

● 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	I _C	150	A
		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
		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

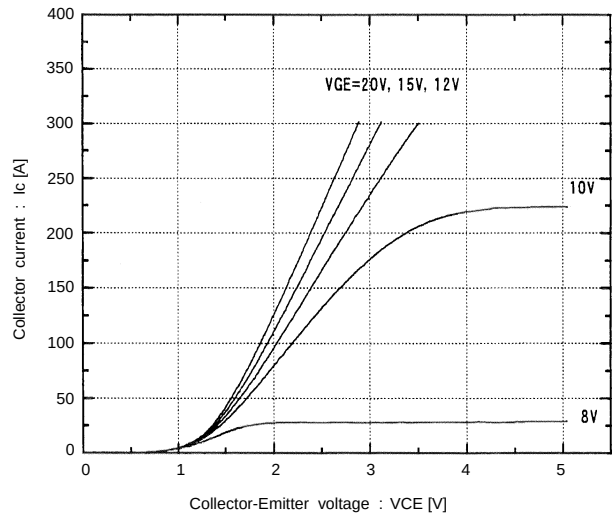
● Thermal resistance characteristics

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

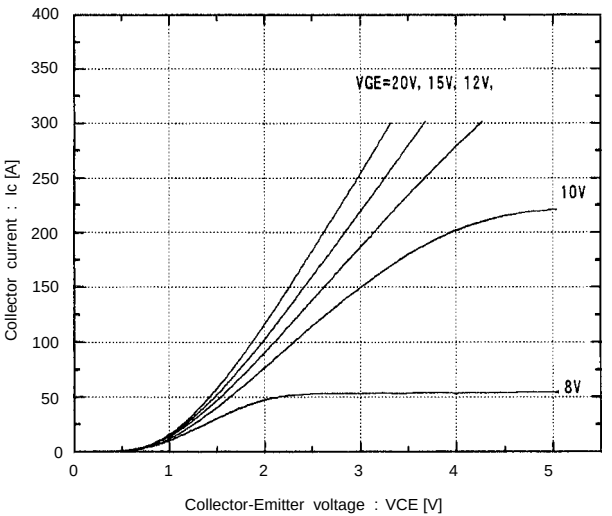
*2 : This is the value which is defined mounting on the additional cooling fin with thermal compound

Characteristics (Representative)

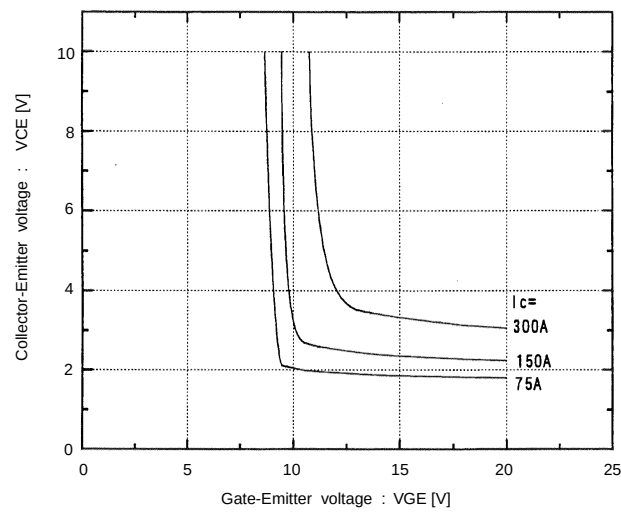
Collector current vs. Collector-Emittter voltage
T_J=25°C



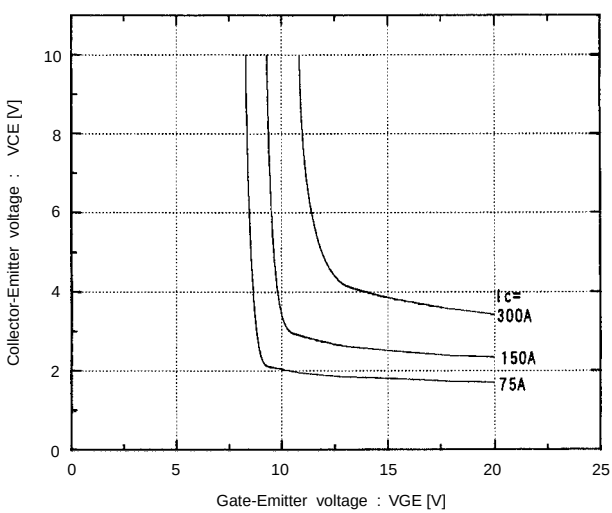
Collector current vs. Collector-Emittter voltage
T_J=125°C



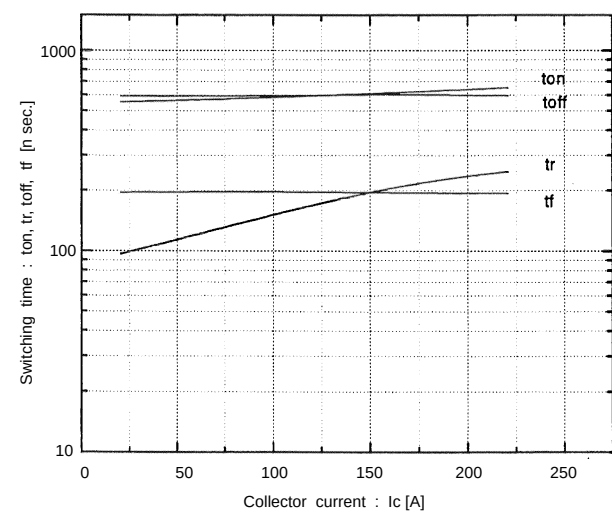
Collector-Emittter vs. Gate-Emittter voltage
T_J=25°C



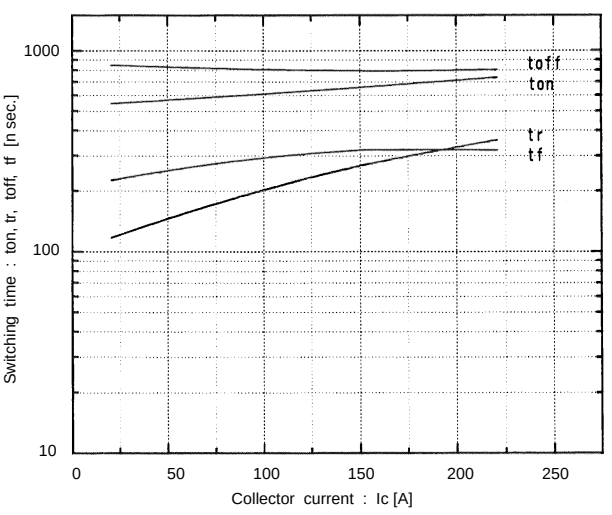
Collector-Emittter vs. Gate-Emittter voltage
T_J=125°C



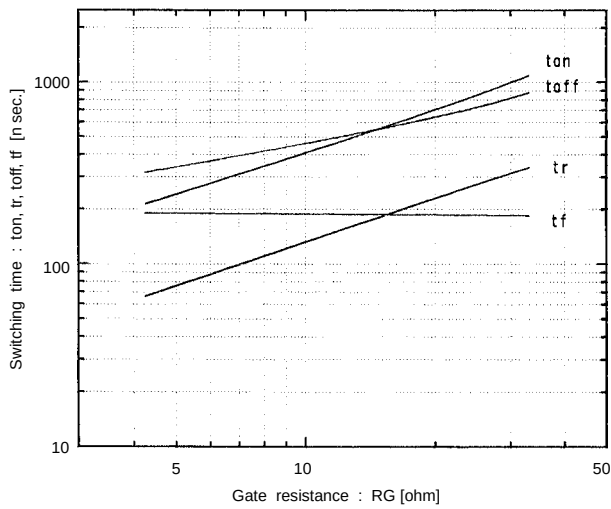
Switching time vs. Collector current
V_{CC}=300V, R_G=16 ohm, V_{GE}=±15V, T_J=25°C



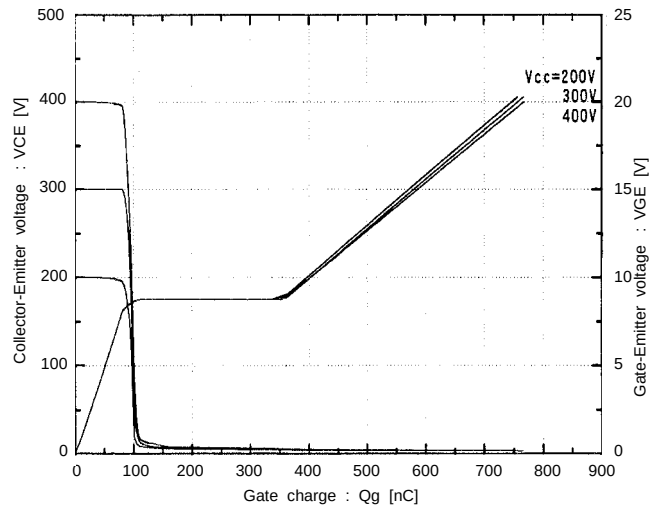
Switching time vs. Collector current
V_{CC}=300V, R_G=16 ohm, V_{GE}=±15V, T_J=125°C



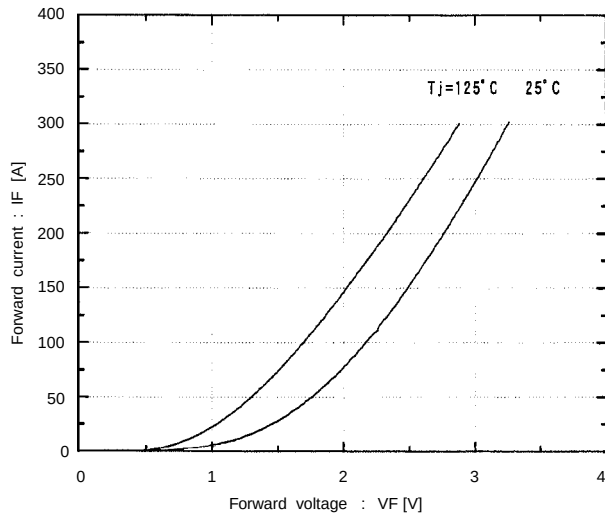
Switching time vs. R_G
 $V_{CC}=300V$, $I_C=150A$, $V_{GE}=\pm 15V$, $T_J=25^\circ C$



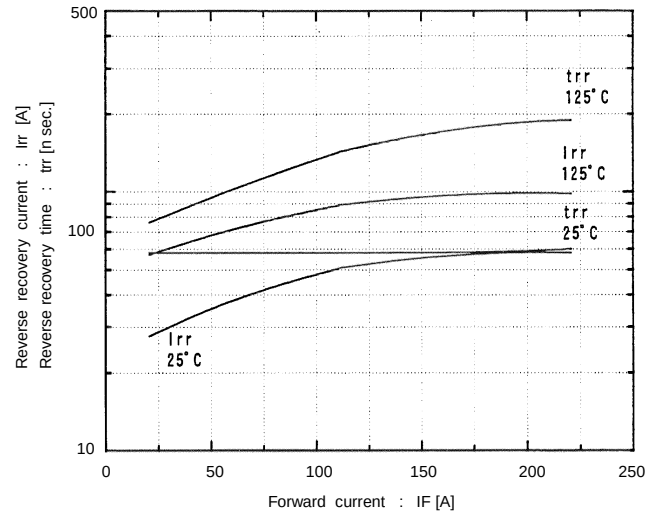
Dynamic input characteristics
 $T_J=25^\circ C$



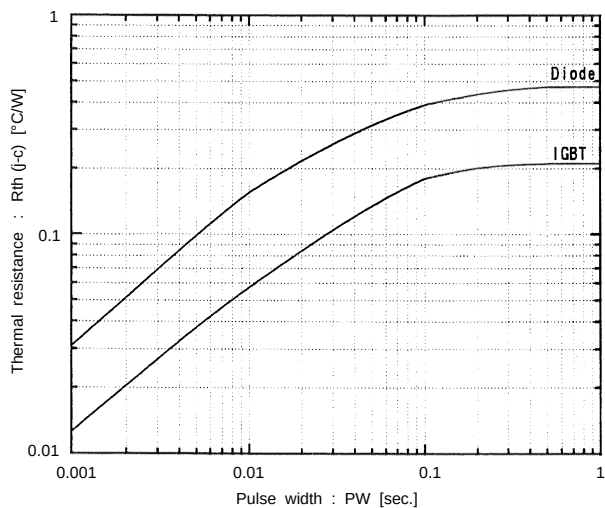
Forward current vs. Forward voltage
 $V_{GE}=0V$



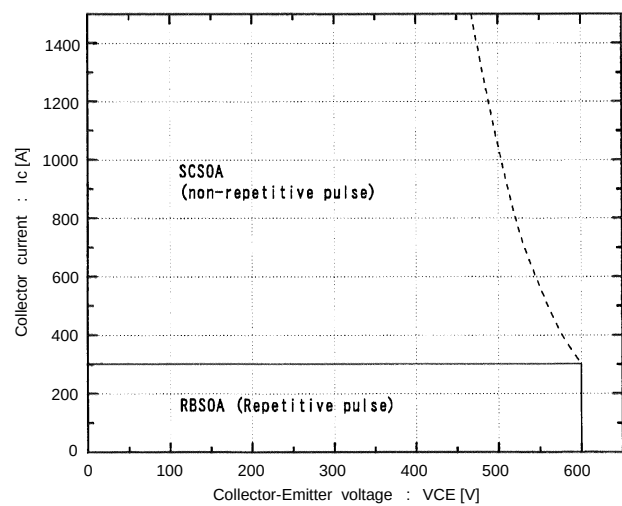
Reverse recovery characteristics
 t_{rr} , I_{rr} vs. I_F

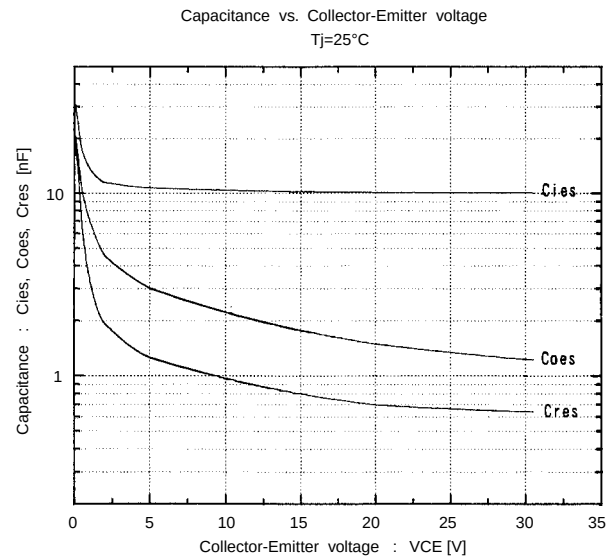
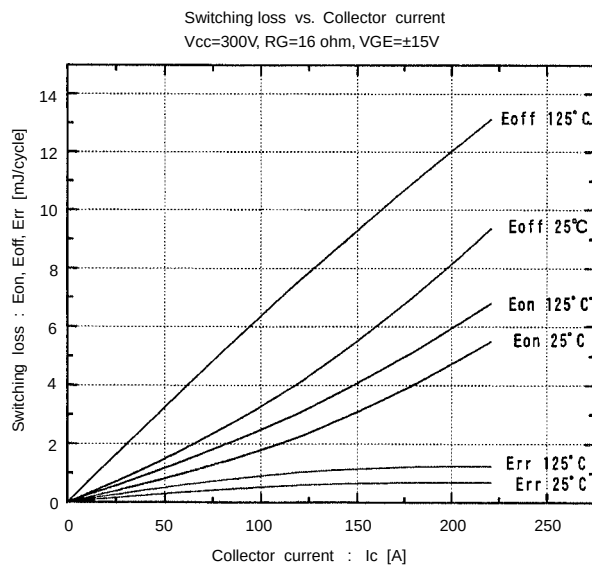


Transient thermal resistance



Reversed biased safe operating area
 $+V_{GE}=15V$, $-V_{GE} \leq 15V$, $T_J \leq 125^\circ C$, $R_G \geq 16 \text{ ohm}$





Outline Drawings, mm

