

2MBI300P-140

IGBT Module P-Series

1400V / 300A 2 in one-package



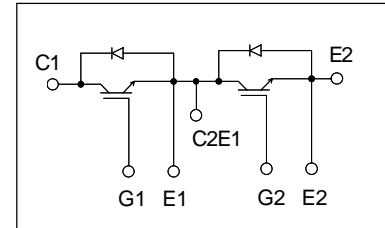
■ Features

- Small temperature dependence of the turn-off switching loss
- Easy to connect in parallel
- Wide RBSOA (square up to 2 time of rated current) and high short-circuit withstand capability
- Low loss and soft-switching (reduction of EMI noise)

■ Applications

- General purpose inverter
- AC and DC Servo drive amplifier
- Uninterruptible power supply

■ Equivalent Circuit Schematic



■ Maximum ratings and characteristics

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

Item	Symbol	Conditions	Rating	Unit	
Collector-Emitter voltage	V _{CES}		1400	V	
Gate-Emitter voltage	V _{GES}		±20	V	
Collector current	I _c	Continuous	T _c =25°C	400	A
			T _c =80°C	300	
	I _{cp}	1ms	T _c =25°C	800	
			T _c =80°C	600	
	-I _c			300	
-I _c pulse			600		
Collector Power Dissipation	P _c	1 device	2500	W	
Junction temperature	T _j		+150	°C	
Storage temperature	T _{stg}		-40 to +125		
Isolation voltage	V _{iso}	between terminal and copper base *1	2500	VAC	
Screw Torque	Mounting *2		3.5	N·m	
	Terminals *3		4.5		

*1: All terminals should be connected together when isolation test will be done.

*2: Recommendable value : 2.5 to 3.5 N·m(M5) *3: Recommendable value : 3.5 to 4.5 N·m(M6)

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

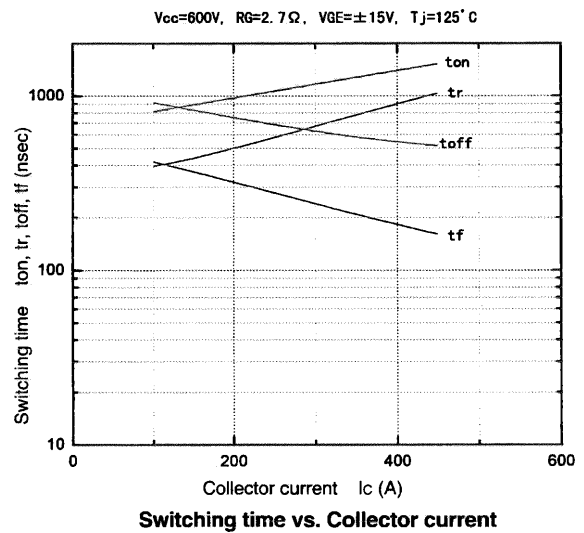
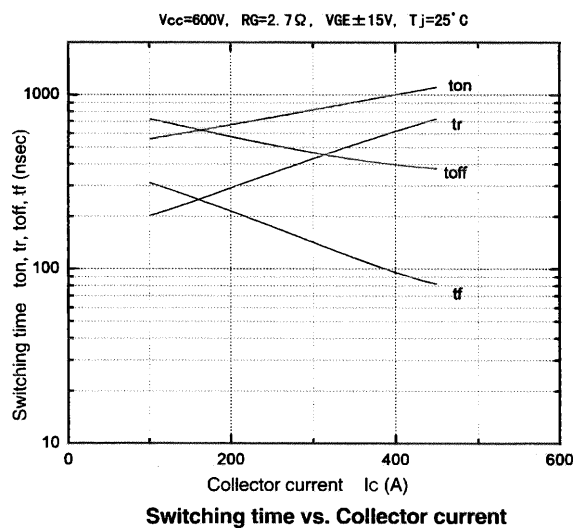
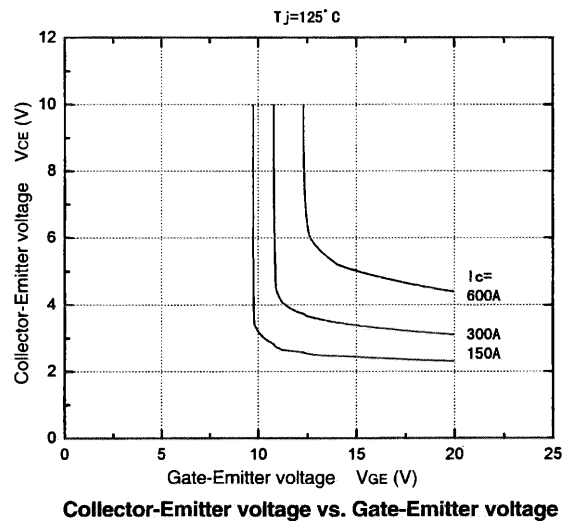
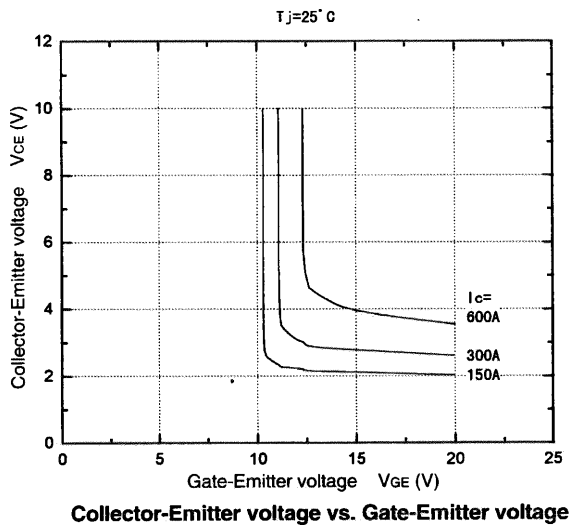
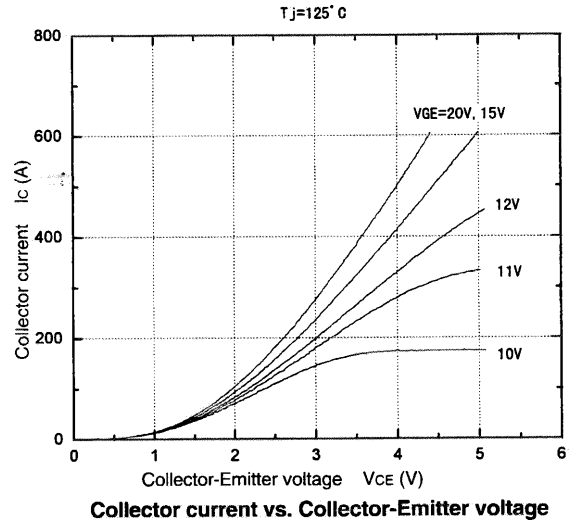
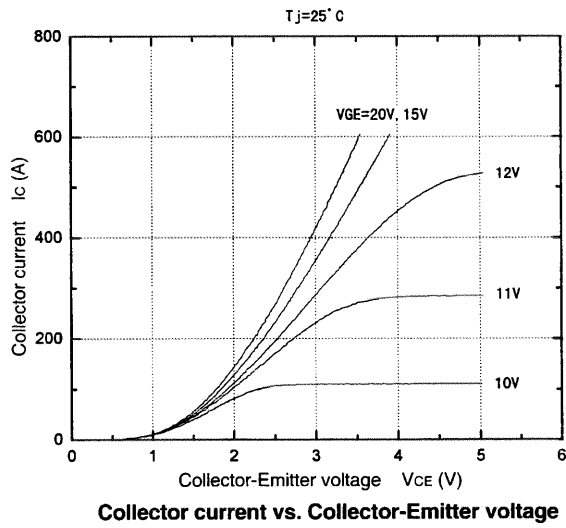
Item	Symbols	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Zero gate voltage collector current	I _{CES}	V _{GE} =0V, V _{CE} =1400V	–	–	3.0	mA
Gate-Emitter leakage current	I _{GES}	V _{CE} =0V, V _{GE} =±20V	–	–	600	nA
Gate-Emitter threshold voltage	V _{GE(th)}	V _{CE} =20V, I _c =300mA	6.0	8.0	9.0	V
Collector-Emitter saturation voltage	V _{CE(sat)}	V _{GE} =15V, I _c =300A, T _j =25°C	–	2.7	3.0	V
		V _{GE} =15V, I _c =300A, T _j =125°C	–	3.3	–	
Input capacitance	C _{ies}	V _{CE} =10V	–	30000	–	pF
Output capacitance	C _{oes}	V _{GE} =0V	–	4500	–	
Reverse transfer capacitance	C _{res}	f=1MHz	–	2000	–	
Turn-on time	t _{on}	V _{CC} =600V	–	–	1.20	μs
	t _r	I _c =300A	–	–	0.60	
Turn-off time	t _{off}	V _{GE} =±15V	–	–	1.00	μs
	t _f	R _G = 2.7 Ω	–	–	0.30	
Diode forward on voltage	V _F	I _F =300A, V _{GE} =0V	–	2.4	3.3	V
Reverse recovery time	t _{rr}	I _F =300A	–	–	0.35	μs

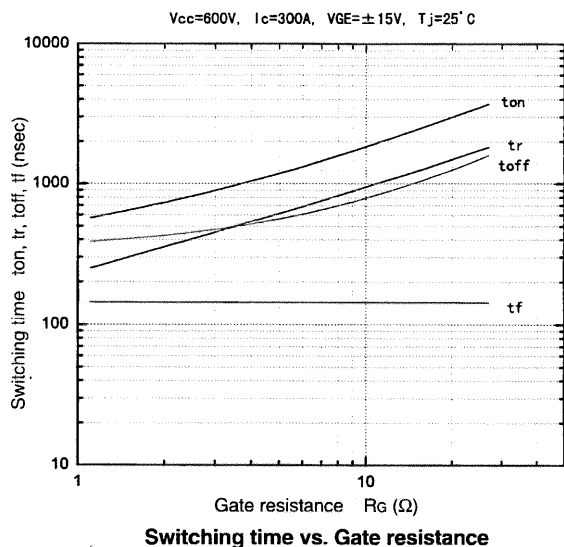
● Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance	R _{th(j-c)}	IGBT	–	–	0.05	°C/W
	R _{th(j-c)}	Diode	–	–	0.10	
Contact Thermal resistance	R _{th(c-f)} *4	the base to cooling fin	–	0.0167	–	°C/W

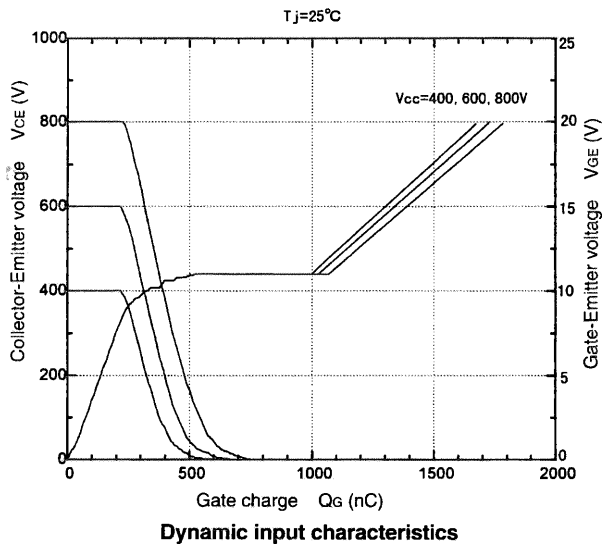
*4: This is the value which is defined mounting on the additional cooling fin with thermal compound.

■ Characteristics (Representative)

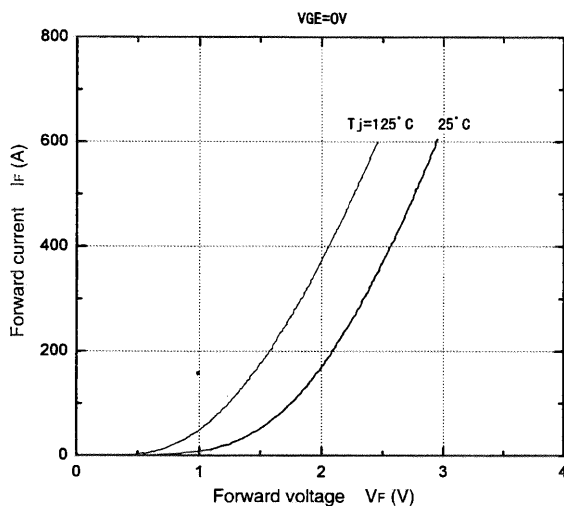




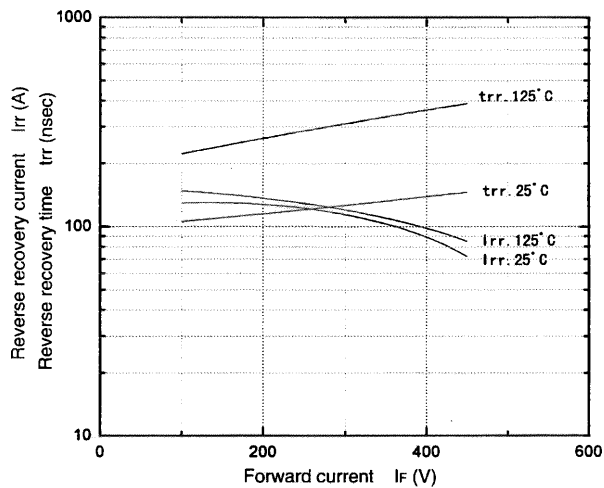
Switching time vs. Gate resistance



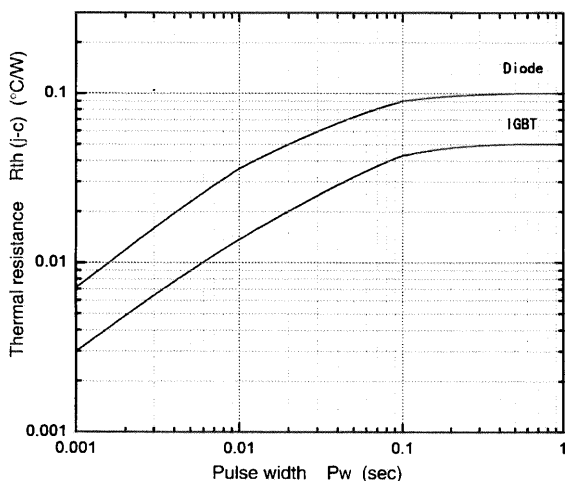
Dynamic input characteristics



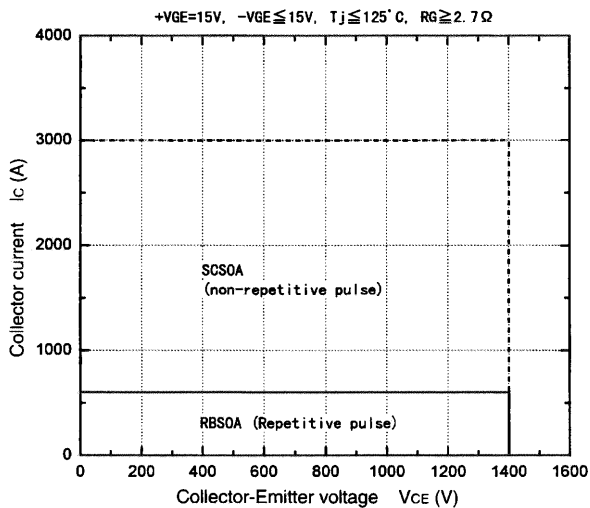
Forward current vs. Forward voltage



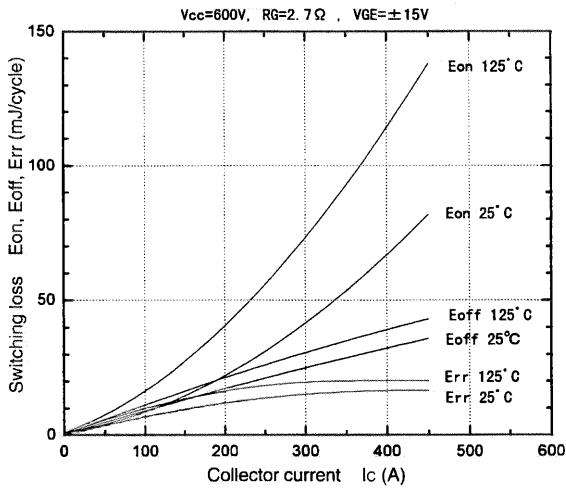
T_{rr}, I_{rr} vs. I_f



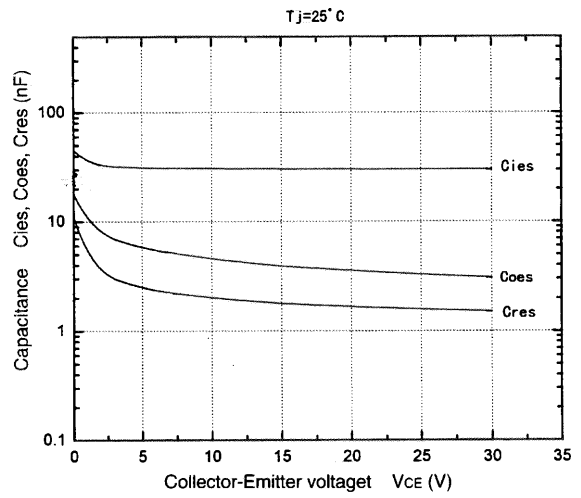
Transient thermal resistance



Reverse biased safe operating area



Switching loss vs. Collector current



Capacitance vs. Collector-Emittet voltage

■ Outline Drawings, mm

M238

