

# 2MBI150PC-140

## IGBT Module P-Series

### 1400V / 150A 2 in one-package



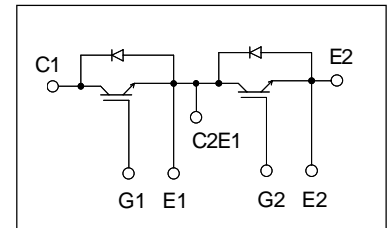
#### ■ Features

- 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 <sub>CES</sub>		1400	V	
Gate-Emitter voltage	V <sub>GES</sub>		±20	V	
Collector current	I <sub>c</sub>	Continuous	T <sub>c</sub> =25°C	200	A
			T <sub>c</sub> =80°C	150	
	I <sub>cp</sub>	1ms	T <sub>c</sub> =25°C	400	
			T <sub>c</sub> =80°C	300	
	-I <sub>c</sub>			150	
-I <sub>c</sub> pulse			300		
Collector Power Dissipation	P <sub>c</sub>	1 device	1100	W	
Junction temperature	T <sub>j</sub>		+150	°C	
Storage temperature	T <sub>stg</sub>		-40 to +125		
Isolation voltage	V <sub>iso</sub>	between terminal and copper base *1 AC:1min.	2500	VAC	
Screw Torque	Mounting *2		3.5	N·m	
	Terminals *2		3.5		

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

\*2: Recommendable value : 2.5 to 3.5 N·m(M5)

##### ● Electrical characteristics (at T<sub>j</sub>=25°C unless otherwise specified)

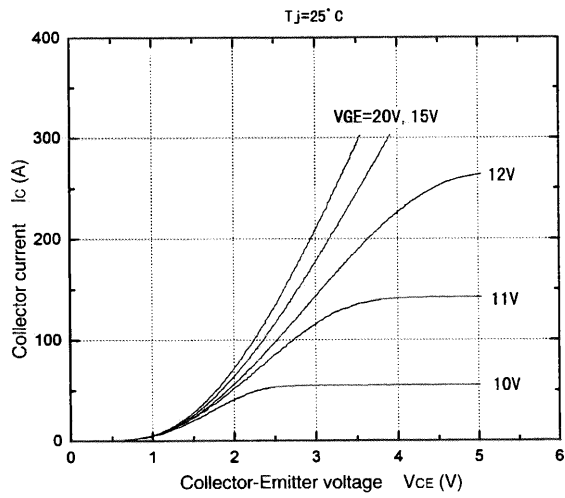
Item	Symbols	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Zero gate voltage collector current	I <sub>CES</sub>	V <sub>GE</sub> =0V, V <sub>CES</sub> =1400V	-	-	2.0	mA
Gate-Emitter leakage current	I <sub>GES</sub>	V <sub>CE</sub> =0V, V <sub>GE</sub> =±20V	-	-	400	nA
Gate-Emitter threshold voltage	V <sub>GE(th)</sub>	V <sub>CE</sub> =20V, I <sub>c</sub> =150mA	6.0	8.0	9.0	V
Collector-Emitter saturation voltage	V <sub>CES(sat)</sub>	V <sub>GE</sub> =15V, I <sub>c</sub> =150A, T <sub>j</sub> =25°C	-	2.7	3.0	V
		V <sub>GE</sub> =15V, I <sub>c</sub> =150A, T <sub>j</sub> =125°C	-	3.3	-	
Input capacitance	C <sub>ies</sub>	V <sub>CE</sub> =10V	-	15000	-	pF
Output capacitance	C <sub>oes</sub>	V <sub>GE</sub> =0V	-	2000	-	
Reverse transfer capacitance	C <sub>res</sub>	f=1MHz	-	1000	-	
Turn-on time	t <sub>on</sub>	V <sub>CC</sub> =600V	-	-	1.20	μs
	t <sub>r</sub>	I <sub>c</sub> =150A	-	-	0.60	
Turn-off time	t <sub>off</sub>	V <sub>GE</sub> =±15V	-	-	1.00	μs
	t <sub>f</sub>	R <sub>G</sub> = 5.6 Ω	-	-	0.30	
Diode forward on voltage	V <sub>F</sub>	I <sub>F</sub> =150A, V <sub>GE</sub> =0V	-	2.4	3.3	V
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =150A	-	-	0.35	μs

##### ● Thermal resistance characteristics

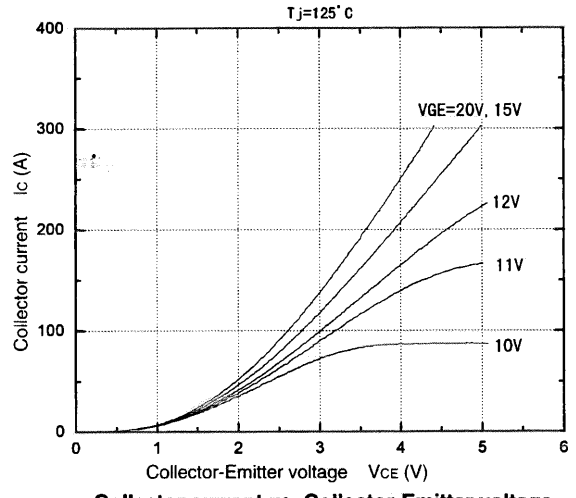
Items	Symbols	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance	R <sub>th(j-c)</sub>	IGBT	-	-	0.11	°C/W
	R <sub>th(j-c)</sub>	Diode	-	-	0.24	
Contact Thermal resistance	R <sub>th(c-f)</sub> *4	the base to cooling fin	-	0.025	-	°C/W

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

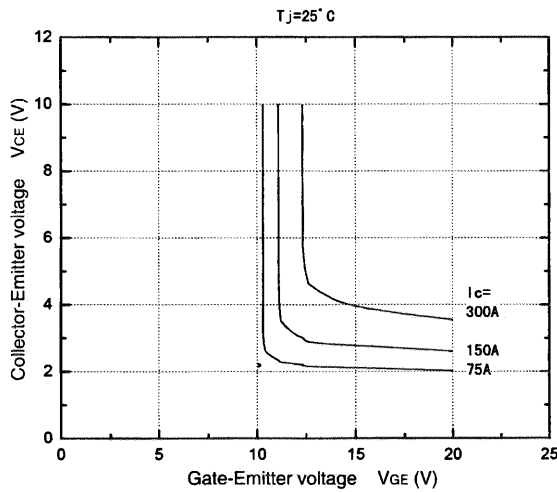
■ Characteristics (Representative)



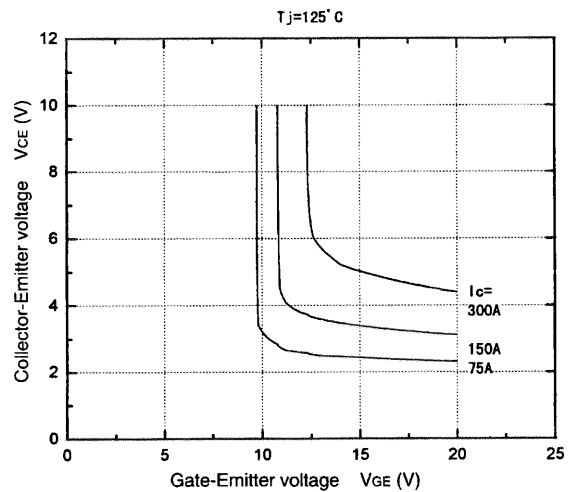
Collector current vs. Collector-Emmitter voltage



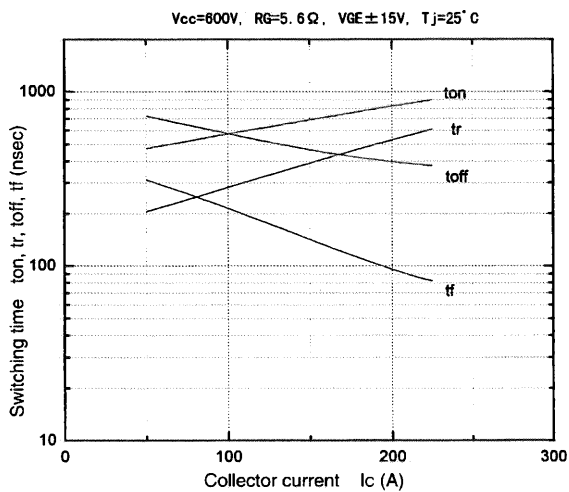
Collector current vs. Collector-Emmitter voltage



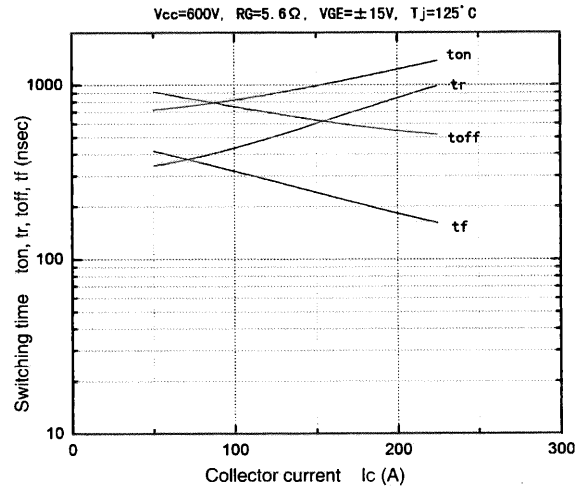
Collector-Emmitter voltage vs. Gate-Emmitter voltage



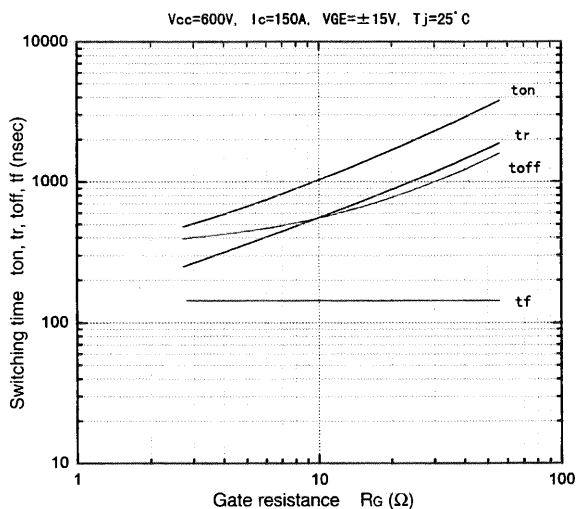
Collector-Emmitter voltage vs. Gate-Emmitter voltage



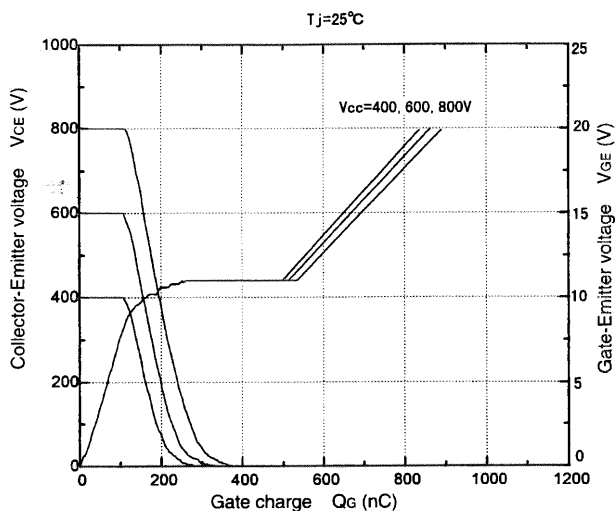
Switching time vs. Collector current



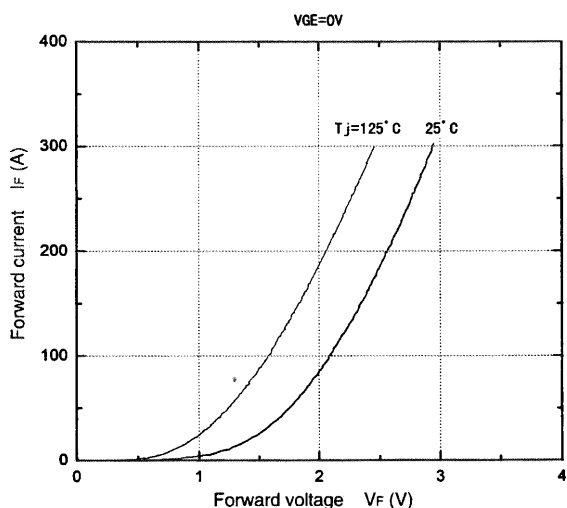
Switching time vs. Collector current



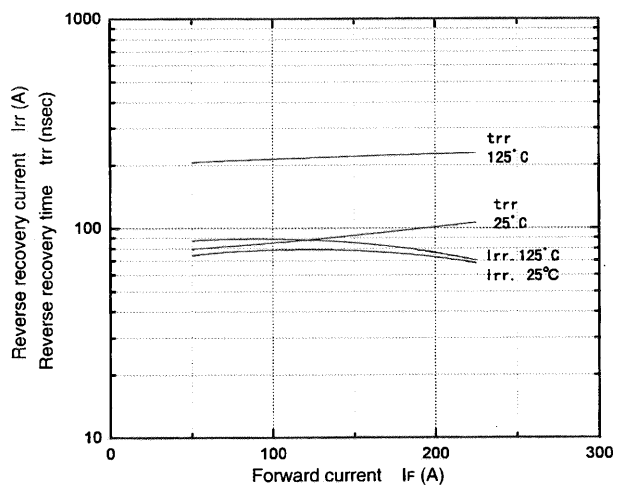
Switching time vs. Gate resistance



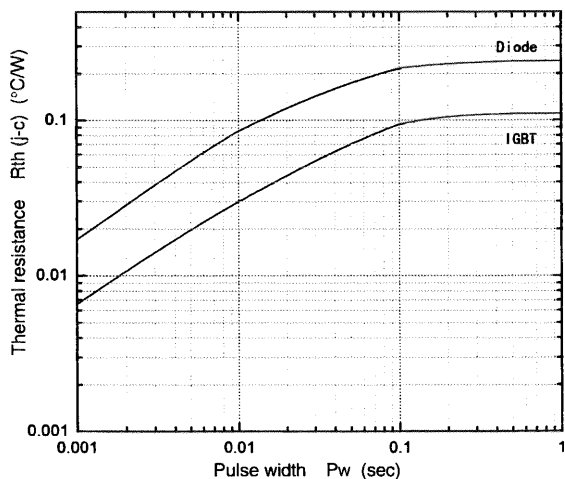
Dynamic input characteristics



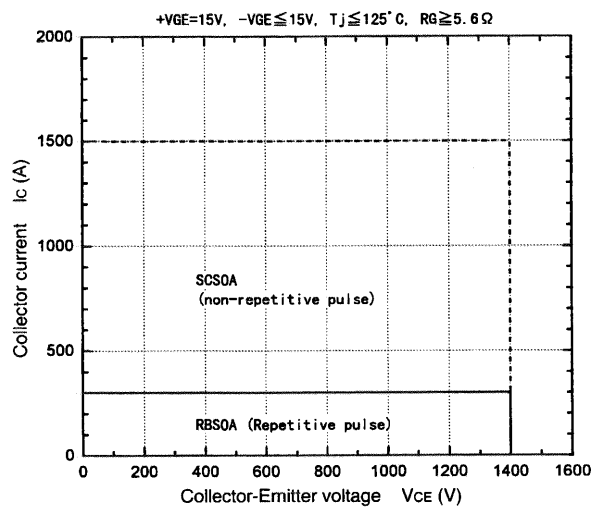
Forward current vs. Forward voltage



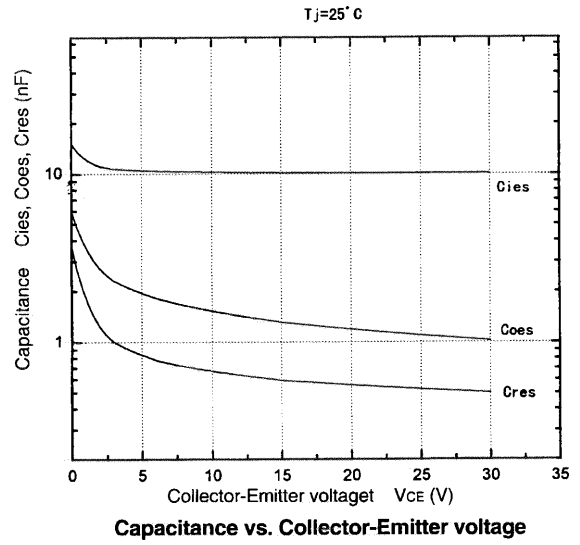
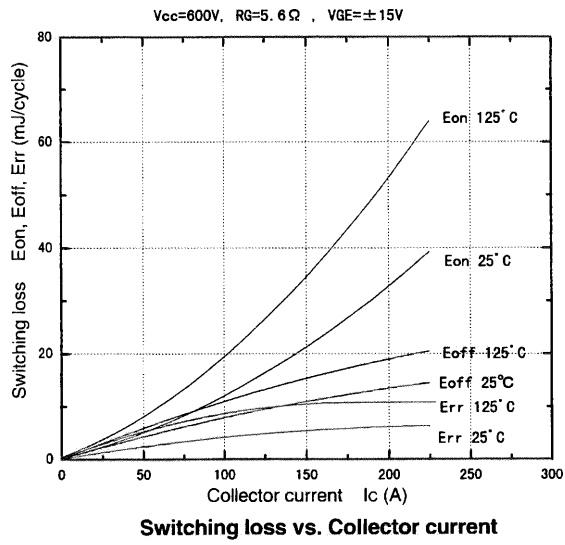
$T_{rr}, I_{rr}$  vs.  $I_F$



Transient thermal resistance

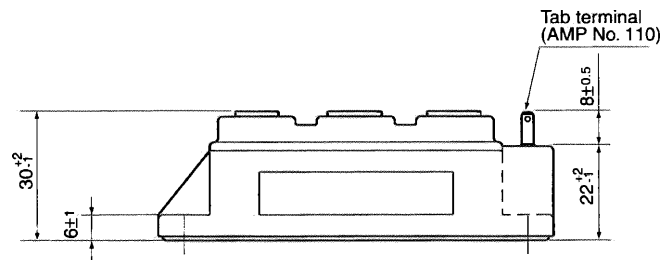
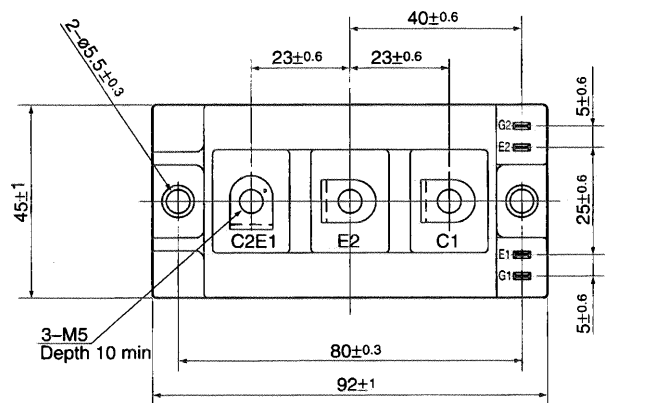


Reverse biased safe operating area



■ Outline Drawings, mm

M233



Mass : 240g