

# 2MBI75P-140

## IGBT Module P-Series

### 1400V / 75A 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

#### ■ Maximum ratings and characteristics

##### ● Absolute maximum ratings (at $T_c=25^\circ\text{C}$ unless otherwise specified)

Item	Symbol	Conditions	Rating	Unit	
Collector-Emitter voltage	$V_{CES}$		1400	V	
Gate-Emitter voltage	$V_{GES}$		$\pm 20$	V	
Collector current	$I_c$	Continuous	$T_c=25^\circ\text{C}$	100	A
			$T_c=80^\circ\text{C}$	75	
	$I_{cp}$	1ms	$T_c=25^\circ\text{C}$	200	
			$T_c=80^\circ\text{C}$	150	
	$-I_c$			75	
$-I_c$ pulse			150		
Collector Power Dissipation	$P_c$	1 device	600	W	
Junction temperature	$T_j$		+150	$^\circ\text{C}$	
Storage temperature	$T_{stg}$		-40 to +125		
Isolation voltage   between terminal and copper base *1	$V_{iso}$	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 $T_j=25^\circ\text{C}$ unless otherwise specified)

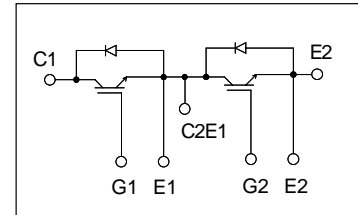
Item	Symbols	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Zero gate voltage collector current	$I_{CES}$	$V_{GE}=0V, V_{CE}=1400V$	-	-	1.0	mA
Gate-Emitter leakage current	$I_{GES}$	$V_{CE}=0V, V_{GE}=\pm 20V$	-	-	200	nA
Gate-Emitter threshold voltage	$V_{GE(th)}$	$V_{CE}=20V, I_c=75mA$	6.0	8.0	9.0	V
Collector-Emitter saturation voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_c=75A, T_j=25^\circ\text{C}$	-	2.7	3.0	V
		$V_{GE}=15V, I_c=75A, T_j=125^\circ\text{C}$	-	3.3	-	
Input capacitance	$C_{ies}$	$V_{CE}=10V$	-	7500	-	pF
Output capacitance	$C_{oes}$	$V_{GE}=0V$	-	1000	-	
Reverse transfer capacitance	$C_{res}$	$f=1MHz$	-	500	-	
Turn-on time	$t_{on}$	$V_{CC}=600V$	-	-	1.20	$\mu\text{s}$
	$t_r$	$I_c=75A$	-	-	0.60	
Turn-off time	$t_{off}$	$V_{GE}=\pm 15V$	-	-	1.00	$\mu\text{s}$
	$t_f$	$R_G=16\ \Omega$	-	-	0.30	
Diode forward on voltage	$V_F$	$I_F=75A, V_{GE}=0V$	-	2.4	3.3	V
Reverse recovery time	$t_{rr}$	$I_F=75A$	-	-	0.35	$\mu\text{s}$

##### ● Thermal resistance characteristics

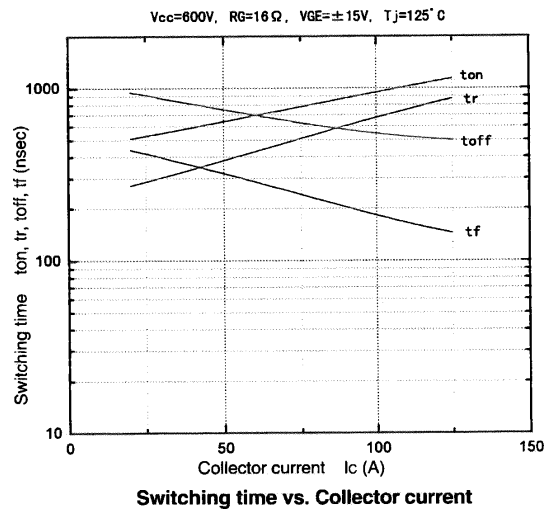
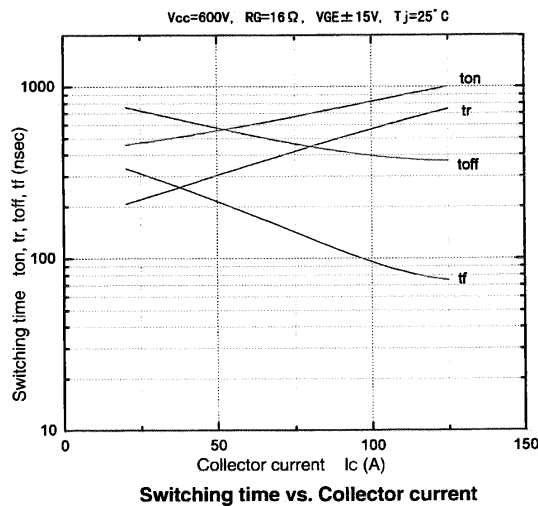
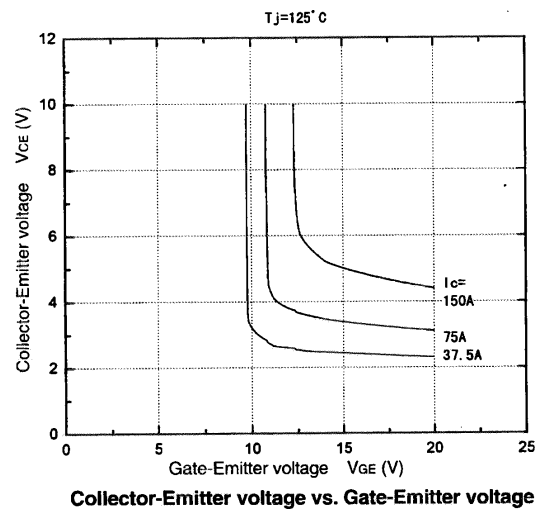
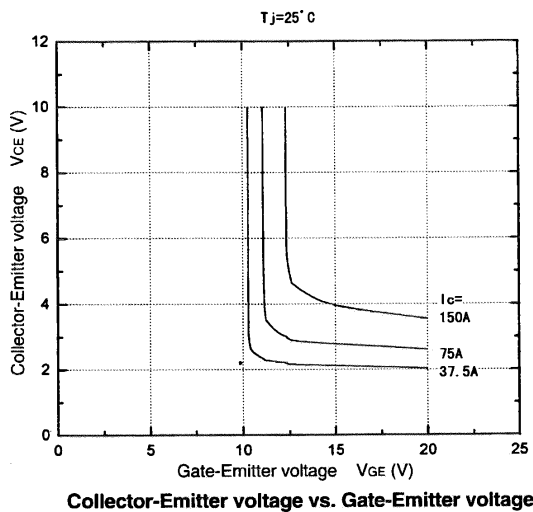
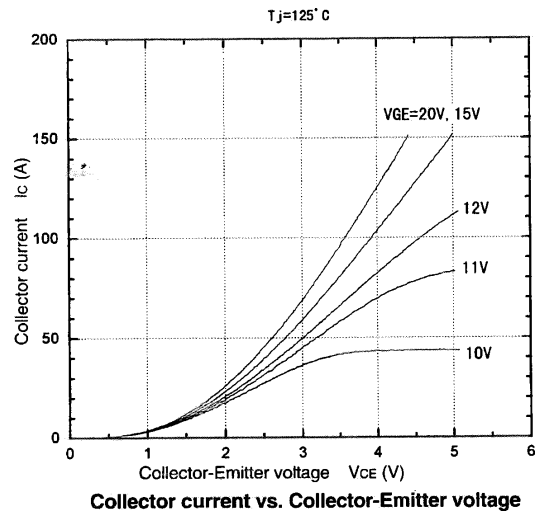
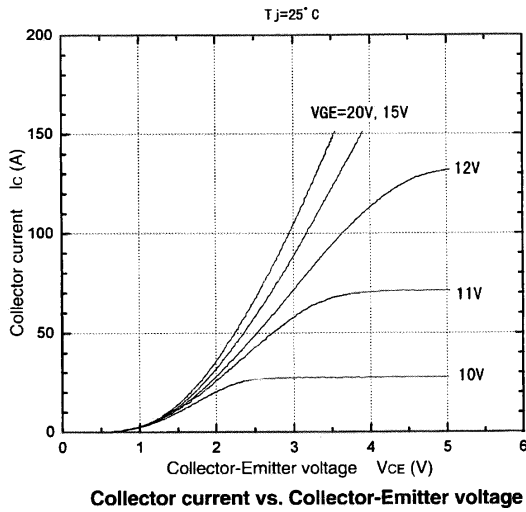
Items	Symbols	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{th(j-c)}$	IGBT	-	-	0.21	$^\circ\text{C/W}$
	$R_{th(j-c)}$	Diode	-	-	0.47	$^\circ\text{C/W}$
Contact Thermal resistance	$R_{th(c-f)}^*4$	the base to cooling fin	-	0.05	-	$^\circ\text{C/W}$

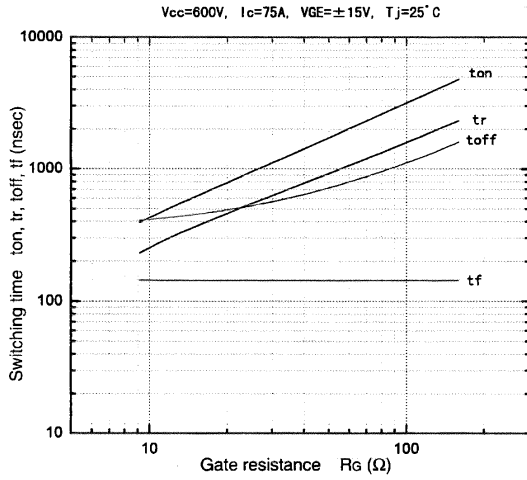
\*4: This is the value which is defined mounting on the additional cooling fin with thermal compound.

#### ■ Equivalent Circuit Schematic

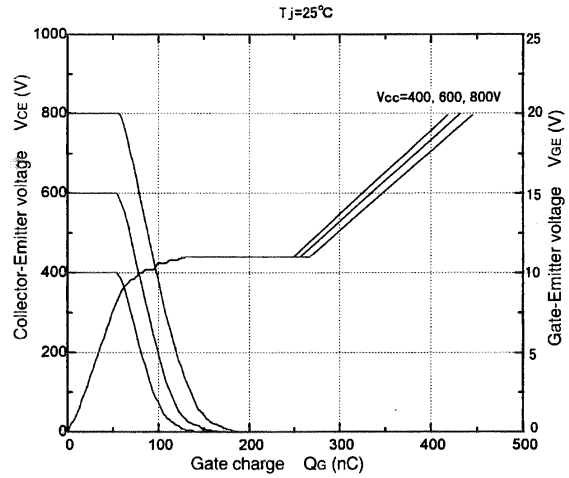


■ Characteristics (Representative)

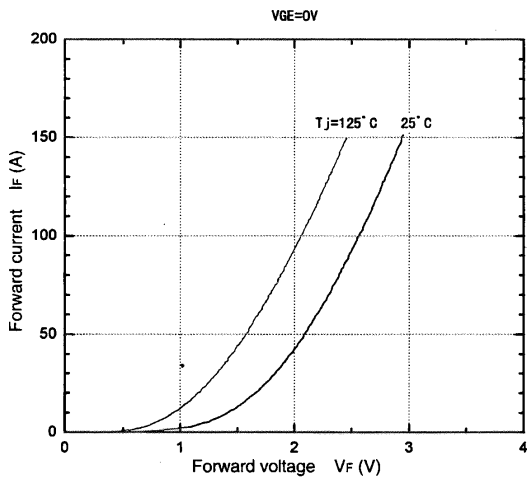




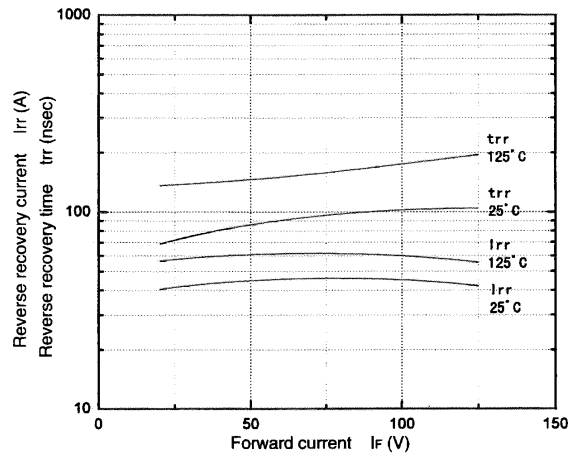
Switching time vs. Gate resistance



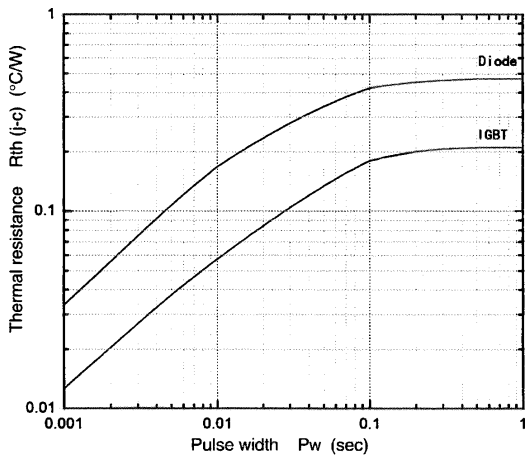
Dynamic input characteristics



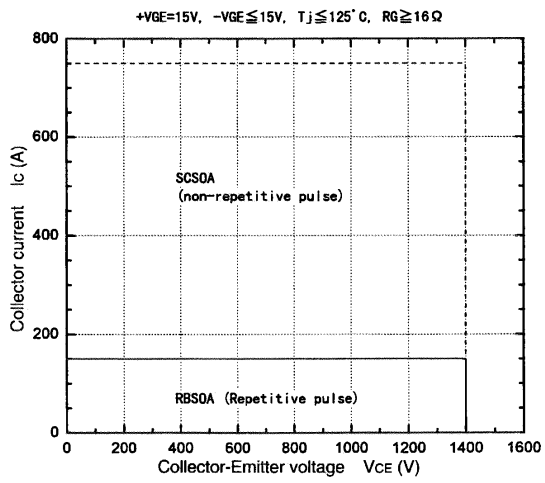
Forward current vs. Forward voltage



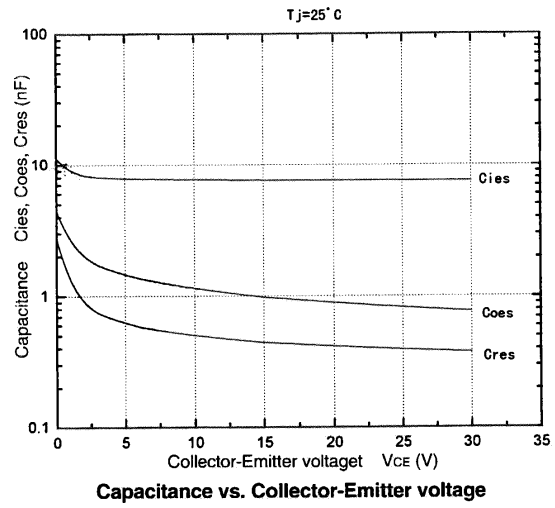
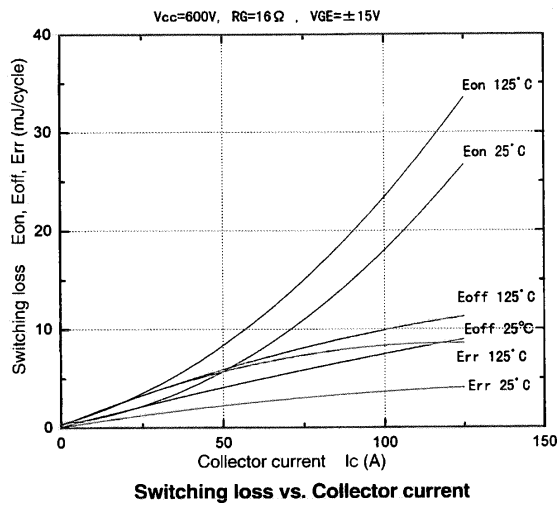
$T_{rr}, I_{rr}$  vs.  $I_F$



Transient thermal resistance

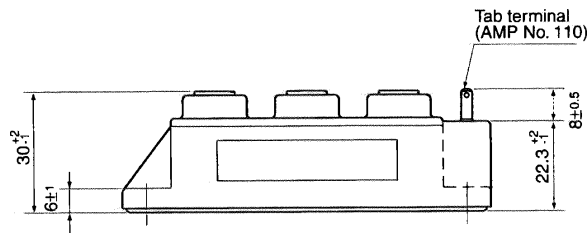
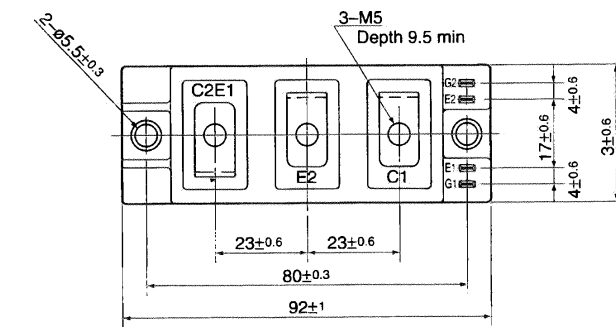


Reverse biased safe operating area



■ Outline Drawings, mm

M232



Mass : 180g