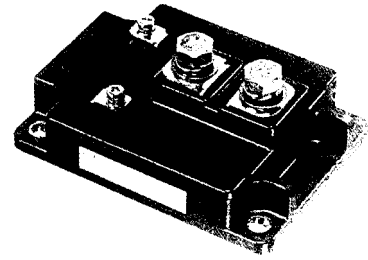


# 1MBI600PX-120

## IGBT Module P-Series

1200V / 600A 1 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 Tc=25°C unless otherwise specified)

Item	Symbol	Conditions	Rating	Unit		
Collector-Emitter voltage	V <sub>CES</sub>		1200	V		
Gate-Emitter voltage	V <sub>GES</sub>		±20	V		
Collector current	I <sub>c</sub>	Continuous	T <sub>c</sub> =25°C	800	A	
			T <sub>c</sub> =80°C	600		
	I <sub>c</sub> pulse	1ms	T <sub>c</sub> =25°C	1600		
			T <sub>c</sub> =80°C	1200		
	-I <sub>c</sub>	Continuous	600			
-I <sub>c</sub> pulse	1ms	1200				
Collector Power Dissipation	P <sub>c</sub>		4100	W		
Junction temperature	T <sub>j</sub>		+150	°C		
Storage temperature	T <sub>stg</sub>		-40 to +125			
Isolation voltage	between terminal and copper base *1		V <sub>iso</sub>	AC:1min.	2500	VAC
Screw Torque	Mounting *2			4.5	N·m	
	Terminals *3			11.0		
	*4			1.7		

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

Recommendable value : \*2 4.0±0.5 N·m(M6), \*3 10.0±1.0 N·m(M8), \*4 1.50±0.2 N·m(M4)

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

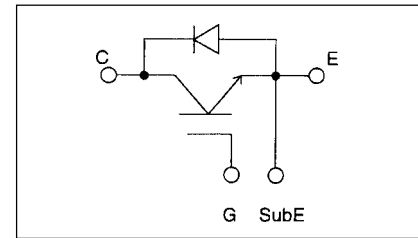
Item	Symbols	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Zero gate voltage collector current	I <sub>CES</sub>	V <sub>GE</sub> =0V, V <sub>CE</sub> =1200V	-	-	2.0	mA
Gate-Emitter leakage current	I <sub>GES</sub>	V <sub>CE</sub> =0V, V <sub>GE</sub> =±20V	-	-	0.5	µA
Gate-Emitter threshold voltage	V <sub>GE(th)</sub>	V <sub>CE</sub> =20V, I <sub>c</sub> =600mA	6.0	8.0	9.0	V
Collector-Emitter saturation voltage	V <sub>CE(sat)</sub>	V <sub>GE</sub> =15V, I <sub>c</sub> =600A, T <sub>j</sub> =25°C	-	2.85	3.2	V
Input capacitance	C <sub>ies</sub>	V <sub>CE</sub> =10V	-	60	-	nF
Output capacitance	C <sub>oes</sub>	V <sub>GE</sub> =0V	-	9	-	
Reverse transfer capacitance	C <sub>res</sub>	f=1MHz	-	4	-	
Turn-on time	t <sub>on</sub>	V <sub>CC</sub> =600V	-	0.75	1.20	µs
	t <sub>r</sub>	I <sub>c</sub> =600A	-	0.2	0.60	
Turn-off time	t <sub>off</sub>	V <sub>GE</sub> =±15V	-	0.65	1.00	
	t <sub>f</sub>	R <sub>G</sub> =2.0 Ω	-	0.10	0.30	
Diode forward on voltage	V <sub>F</sub>	I <sub>F</sub> =600A, V <sub>GE</sub> =0V	-	-	3.4	V
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =600A	-	-	0.35	µs

#### ● Thermal resistance characteristics

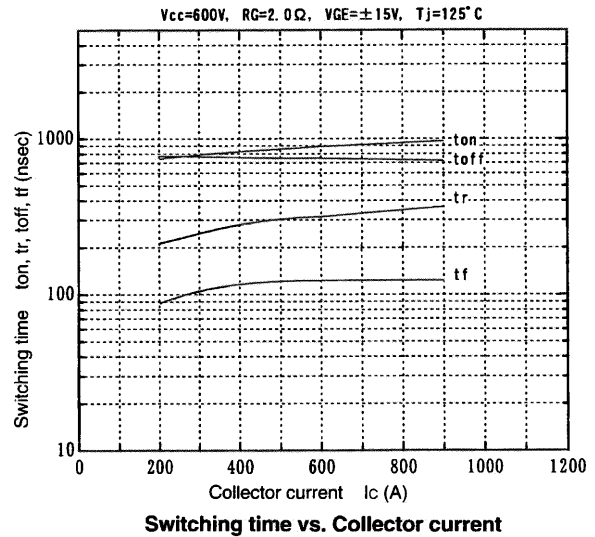
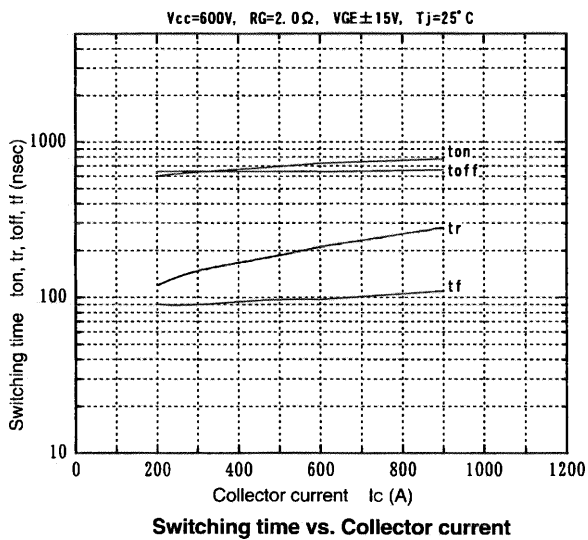
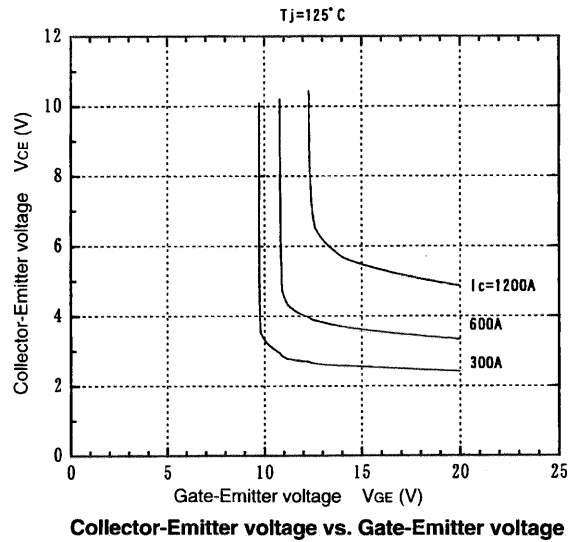
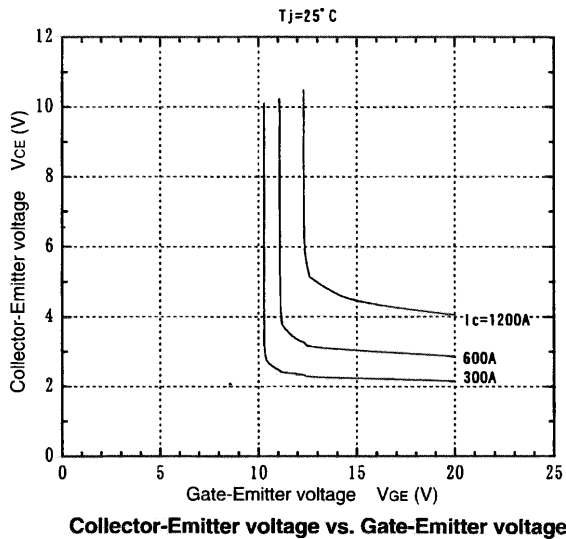
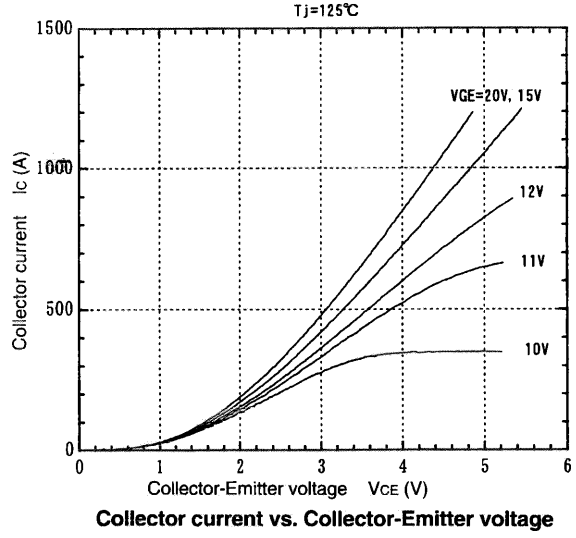
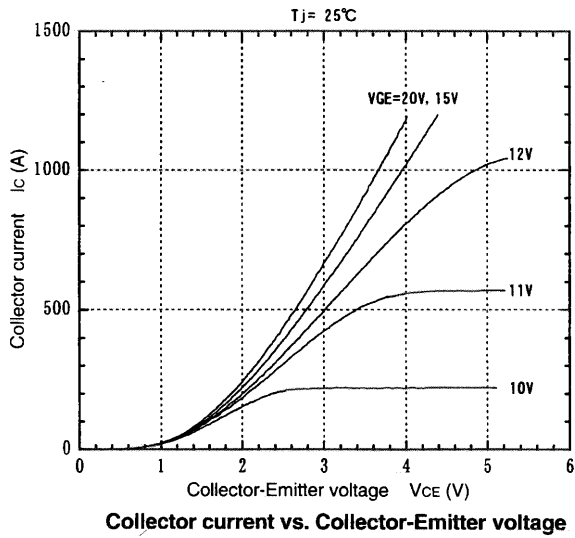
Items	Symbols	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance	R <sub>th(j-c)</sub>	IGBT	-	-	0.03	°C/W
	R <sub>th(j-c)</sub>	Diode	-	-	0.06	
Contact Thermal resistance	R <sub>th(c-f)</sub> *4	the base to cooling fin	-	0.0063	-	°C/W

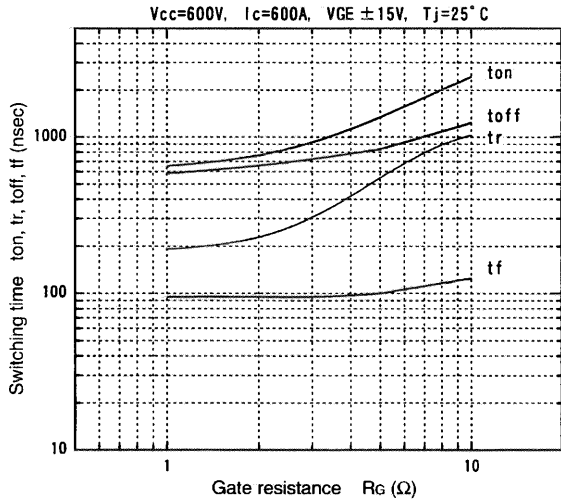
\*4 : This is the value which is defined mounting on the additional cooling fin with thermal compound.

### ■ Equivalent Circuit Schematic

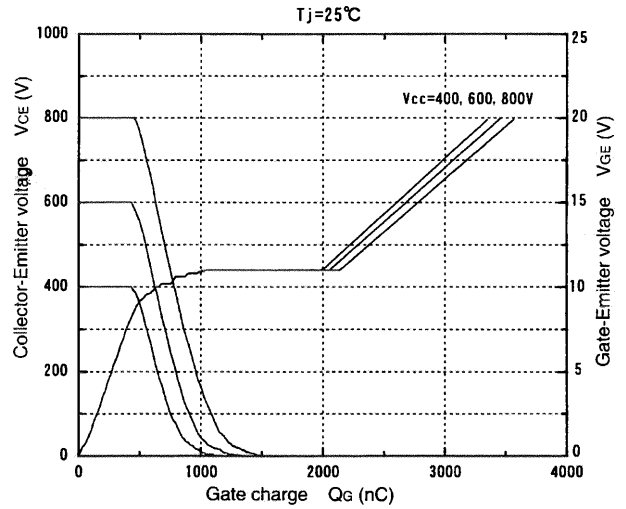


■ Characteristics (Representative)

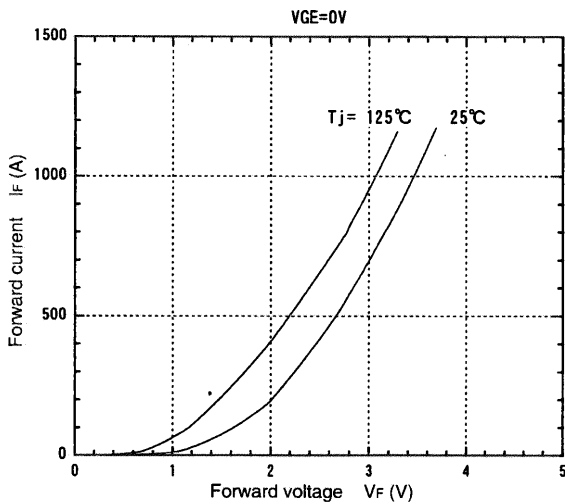




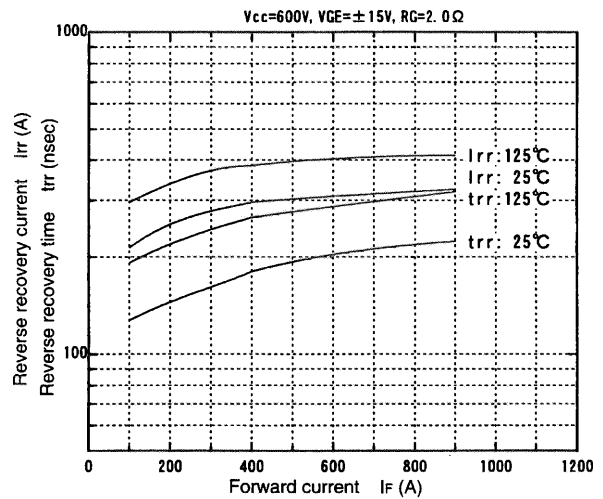
Switching time vs. Gate resistance



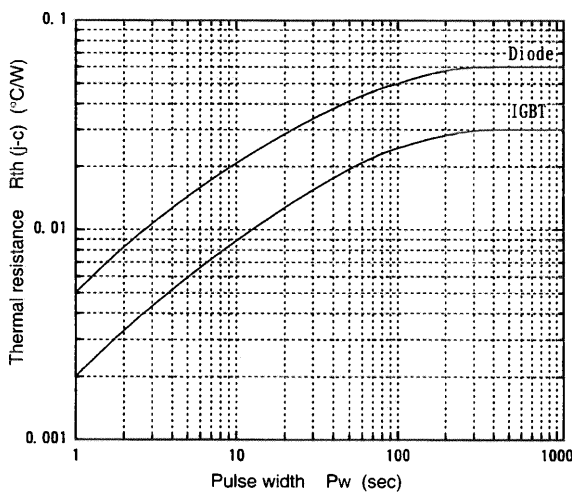
Dynamic input characteristics



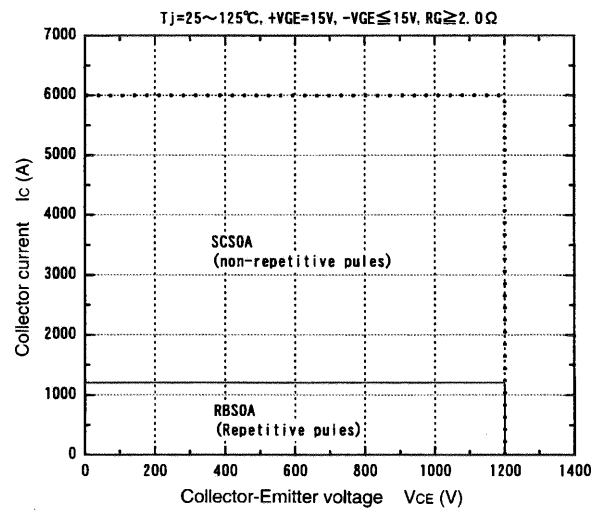
Forward current vs. Forward voltage



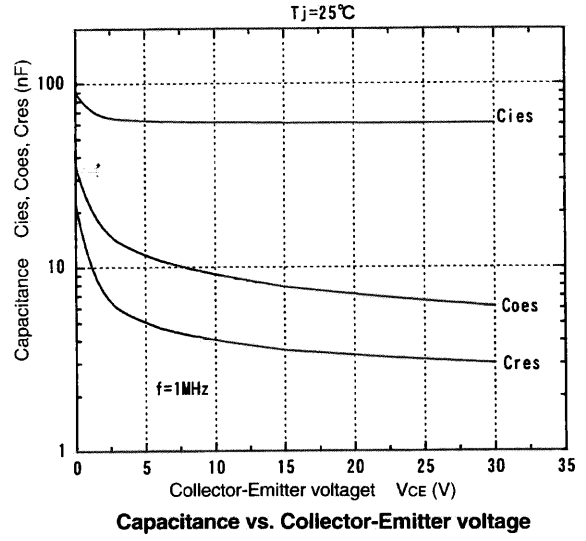
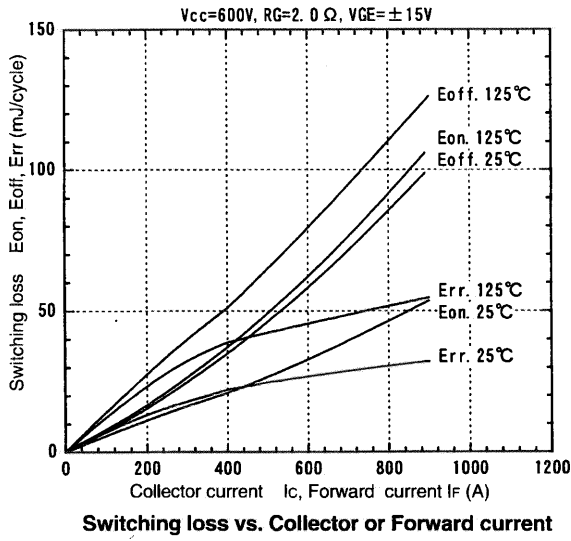
Trr, Irr vs. IF



Transient thermal resistance

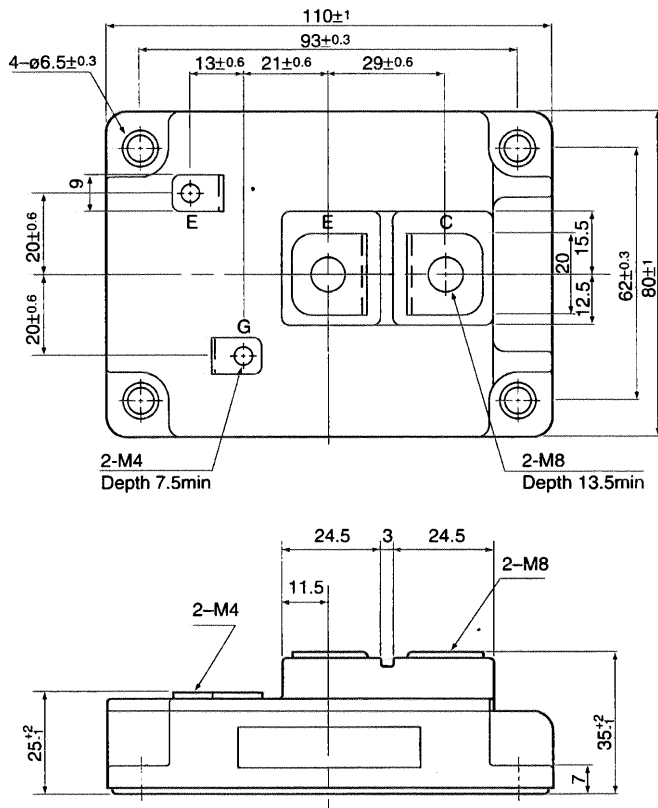


Reverse biased safe operating area



■ Outline Drawings, mm

M138



Mass : 530g