

# 1MBI600PX-140

IGBT Modules

## IGBT Modules P series

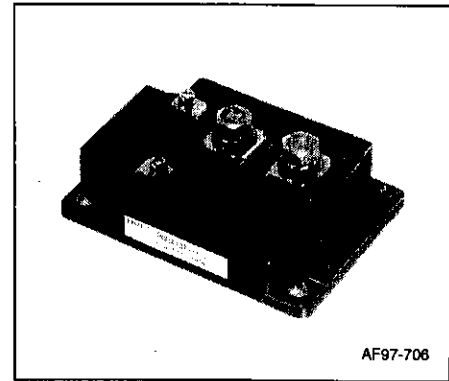
1400V / 600A

### ■ Features

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

### ■ Applications

- General purpose inverters
- AC servo systems (Drive unit)
- UPS (Uninterruptible Power Supply)



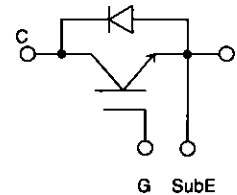
AF97-708

### ■ Maximum ratings and characteristics

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

Item	Symbol	Rating	Unit		
Collector-Emitter voltage	V <sub>CE</sub> S	1400	V		
Gate-Emitter voltage	V <sub>GE</sub> S	±20	V		
Collector current	Continuous	Tc=25°C	I <sub>c</sub>	800	A
		Tc=80°C		600	
	1ms	Tc=25°C	I <sub>c</sub> pulse	1600	
		Tc=80°C		1200	
	Continuous	-I <sub>c</sub>	600		
	1ms	-I <sub>c</sub> pulse	1200		
Max power dissipation	P <sub>c</sub>	4100	W		
Operating temperature	T <sub>J</sub>	+150	°C		
Storage temperature	T <sub>stg</sub>	-40 to +125	°C		
Isolation voltage	Vis	2500 AC (1min.)	V		
Screw torque	Mounting *1	4.5	N·m		
	Terminals *2	11.0			
	*3	1.7			

### ■ Equivalent circuit



Recommendable value

\*1 4.0 ± 0.5 N·m (M6) \*2 10.0 ± 1.0 N·m (M8)

\*3 1.50 ± 0.2 N·m (M4)

#### ● Electrical ratings and characteristics (T<sub>J</sub>=25°C unless otherwise specified)

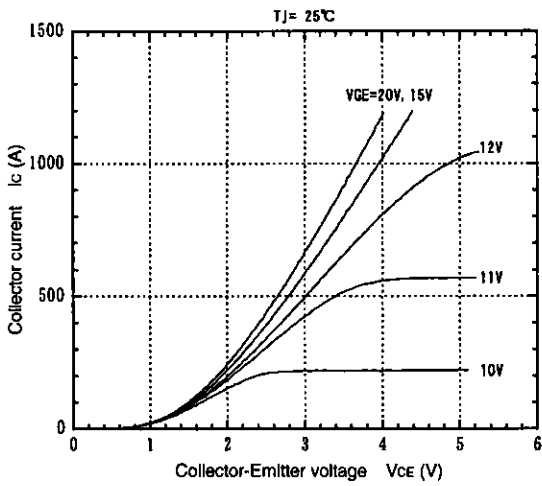
Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Zero gate voltage collector current	I <sub>CES</sub>	-	-	2.0	V <sub>GE</sub> =0V, V <sub>CE</sub> =1400V	mA
Gate-Emitter leakage current	I <sub>GES</sub>	-	-	0.5	V <sub>CE</sub> =0V, V <sub>GE</sub> =±20V	μA
Gate-Emitter threshold voltage	V <sub>GE</sub> (th)	6.0	8.0	9.0	V <sub>CE</sub> =20V, I <sub>c</sub> =600mA	V
Collector-Emitter saturation voltage	V <sub>CE</sub> (sat)	-	2.85	3.2	V <sub>GE</sub> =15V, I <sub>c</sub> =600A	V
Input capacitance	C <sub>ies</sub>	-	60	-	V <sub>GE</sub> =0V	nF
Output capacitance	C <sub>oes</sub>	-	9	-	V <sub>CE</sub> =10V	
Reverse transfer capacitance	C <sub>res</sub>	-	4	-	f=1MHz	
Turn-on time	t <sub>on</sub>	-	0.75	1.20	V <sub>CC</sub> =600V I <sub>c</sub> =600A	μs
	t <sub>r</sub>	-	0.20	0.60		
Turn-off time	t <sub>off</sub>	-	0.65	1.00	V <sub>GE</sub> =±15V R <sub>G</sub> =2.0Ω	
	t <sub>f</sub>	-	0.10	0.30		
Diode forward on voltage	V <sub>F</sub>	-	-	3.4	I <sub>F</sub> =600A, V <sub>GE</sub> =0V	V
Reverse recovery time	t <sub>rr</sub>	-	-	0.35	I <sub>F</sub> =600A	μs

#### ● Thermal resistance characteristics

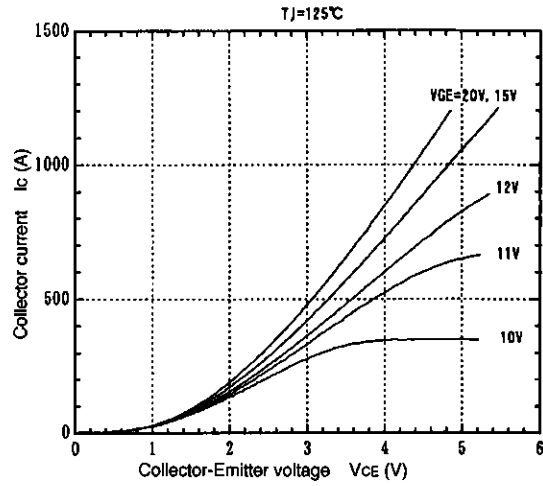
Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Thermal resistance	R <sub>th</sub> (j-c)	-	-	0.03	IGBT	°C/W
	R <sub>th</sub> (j-c)	-	-	0.06	Diode	
	R <sub>th</sub> (c-f)*	-	0.0063	-	the base to cooling fin	

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

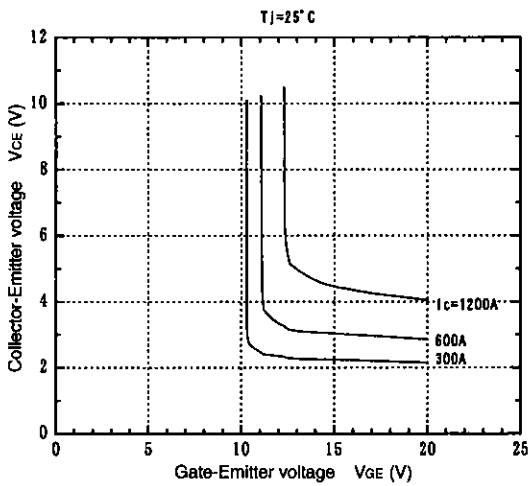
Characteristics



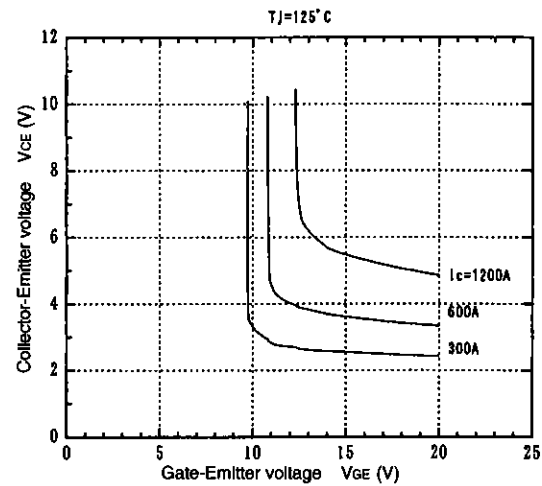
Collector current vs. Collector-Emitter voltage



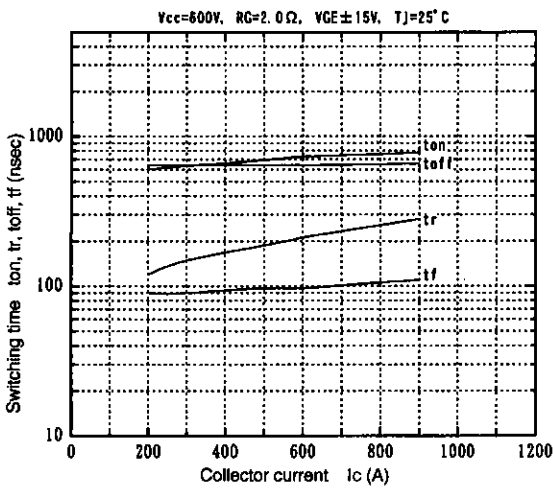
Collector current vs. Collector-Emitter voltage



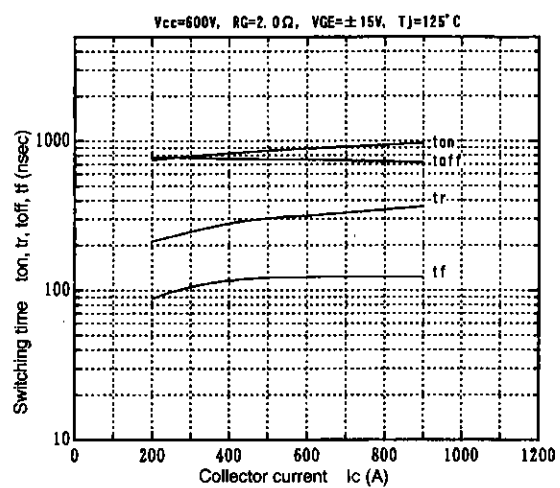
Collector-Emitter voltage vs. Gate-Emitter voltage



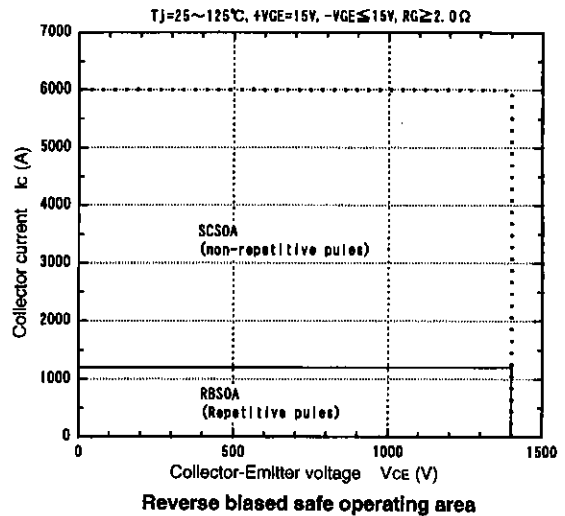
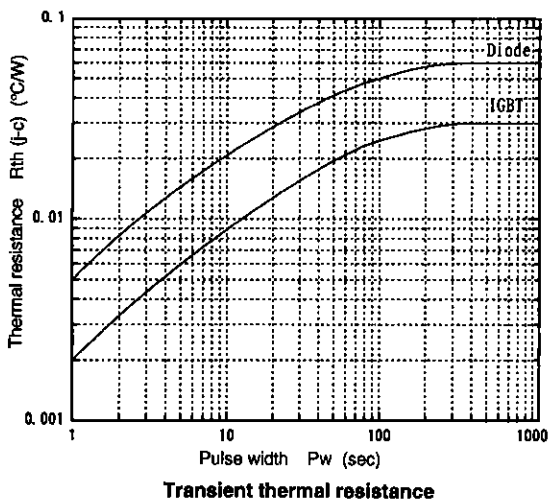
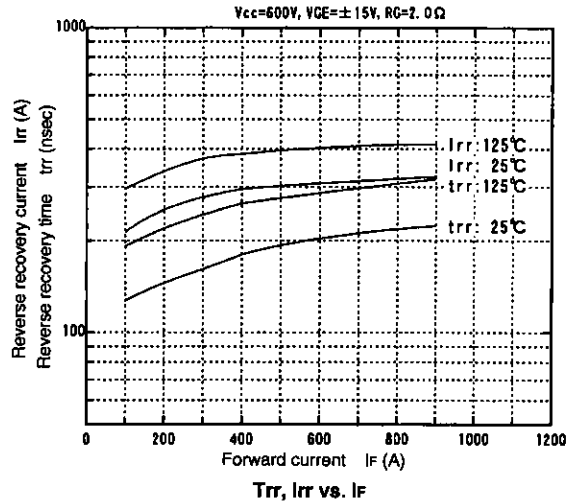
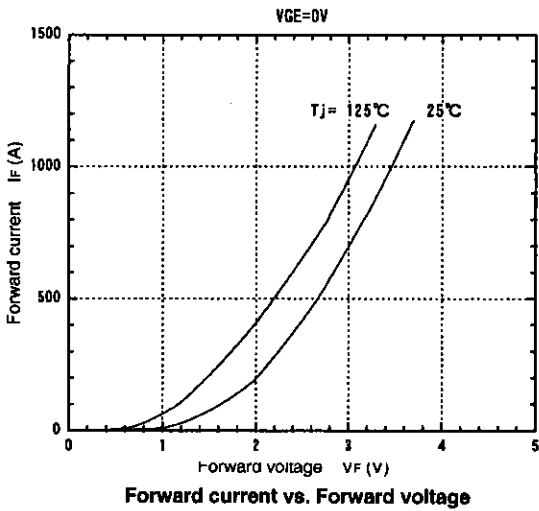
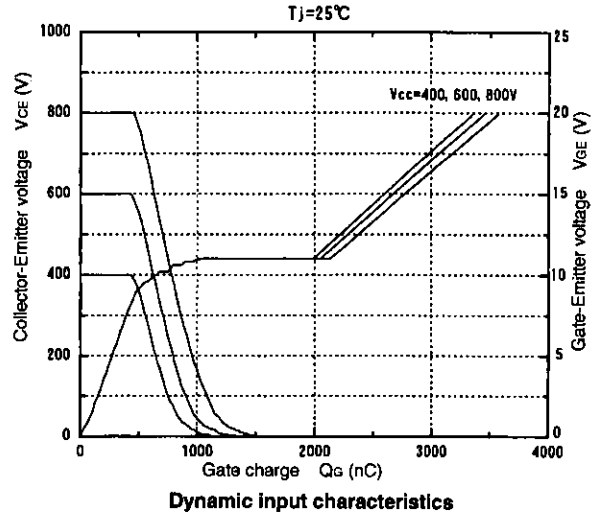
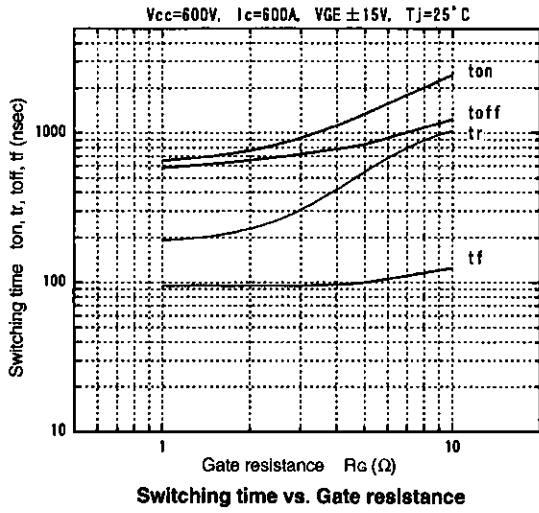
Collector-Emitter voltage vs. Gate-Emitter voltage

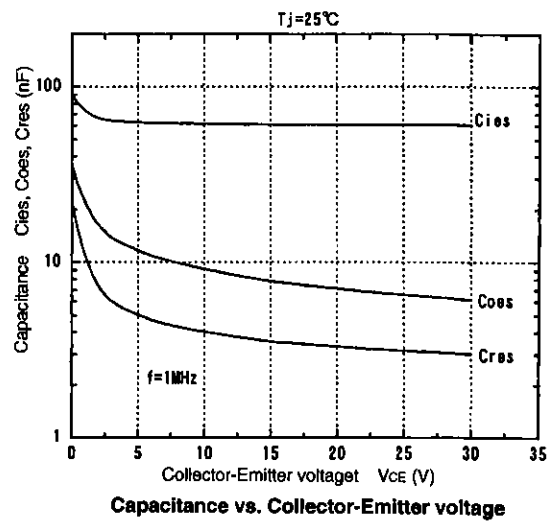
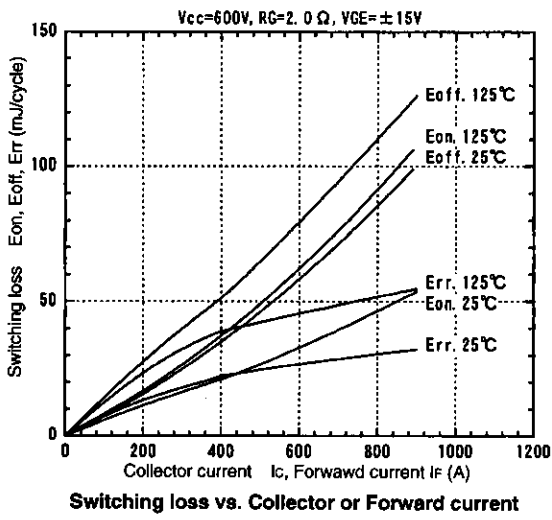


Switching time vs. Collector current



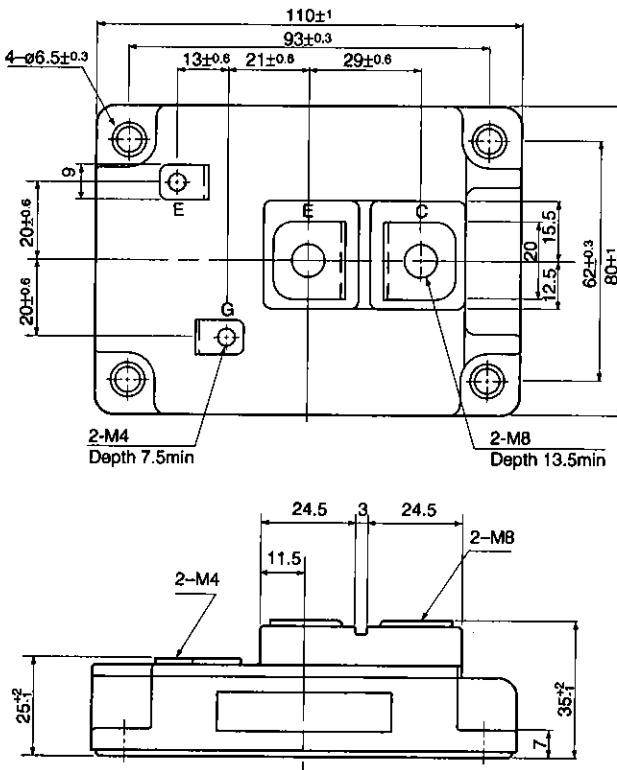
Switching time vs. Collector current





■ Outline drawings, mm

M138



Mass : 530g