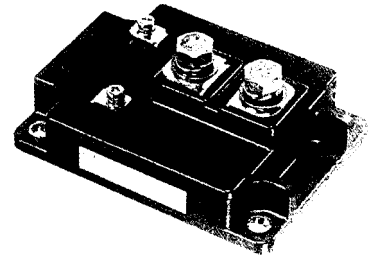


1MBI600PX-120

IGBT Module P-Series

1200V / 600A 1 in one-package



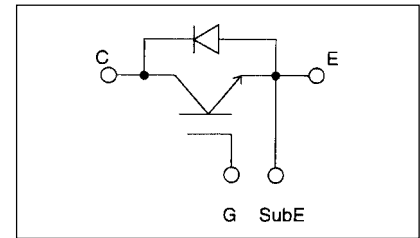
■ Features

- 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

■ 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}		1200	V	
Gate-Emitter voltage	V _{GES}		±20	V	
Collector current	I _c	Continuous	T _c =25°C	800	A
			T _c =80°C	600	
	I _c pulse	1ms	T _c =25°C	1600	
			T _c =80°C	1200	
	-I _c	Continuous	600		
-I _c pulse	1ms	1200			
Collector Power Dissipation	P _c		4100	W	
Junction temperature	T _j		+150	°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		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_j=25°C unless otherwise specified)

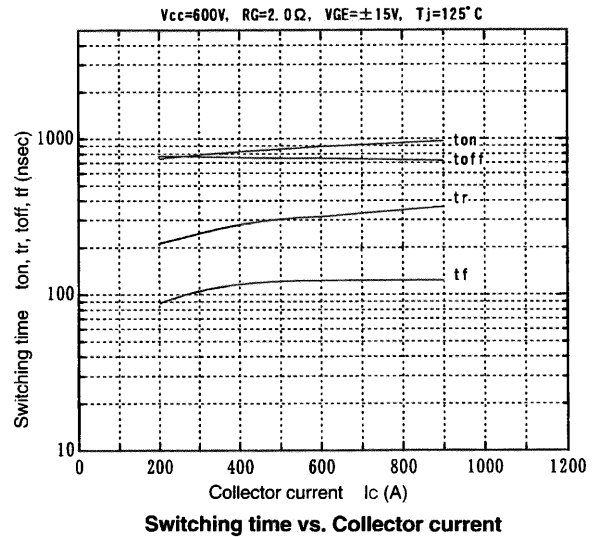
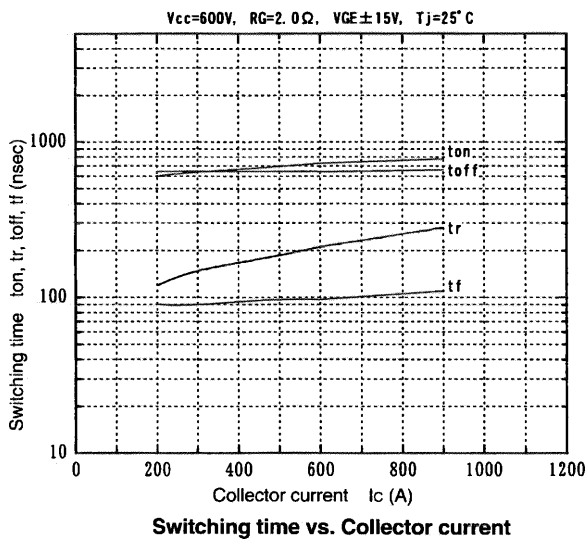
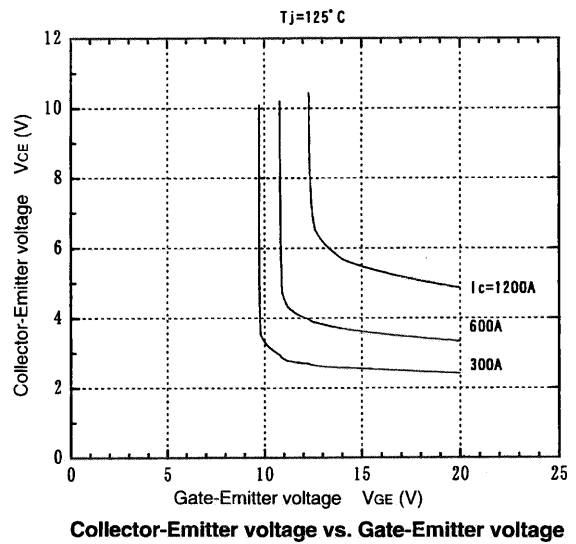
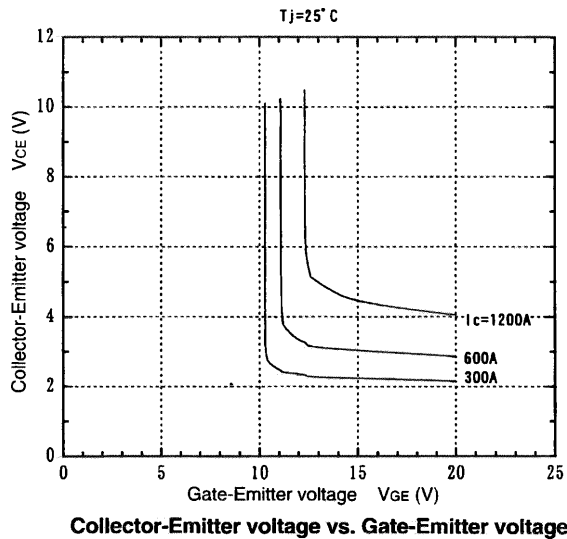
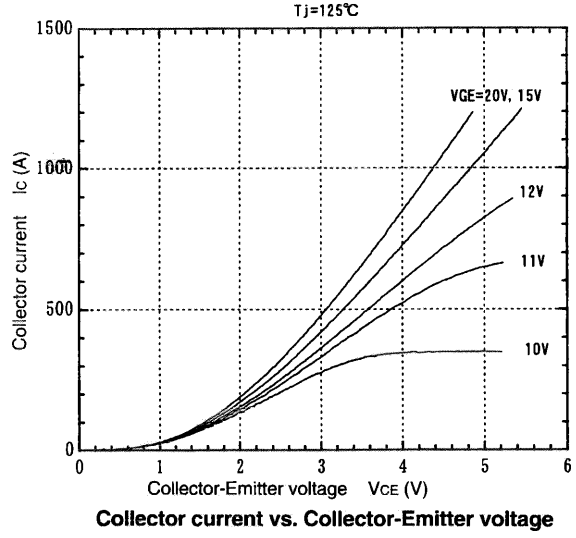
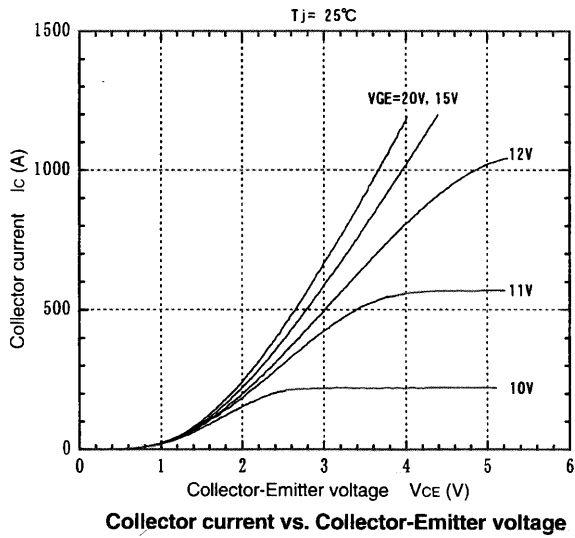
Item	Symbols	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Zero gate voltage collector current	I _{CES}	V _{GE} =0V, V _{CES} =1200V	–	–	2.0	mA
Gate-Emitter leakage current	I _{GES}	V _{CES} =0V, V _{GE} =±20V	–	–	0.5	µA
Gate-Emitter threshold voltage	V _{GE(th)}	V _{CES} =20V, I _c =600mA	6.0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

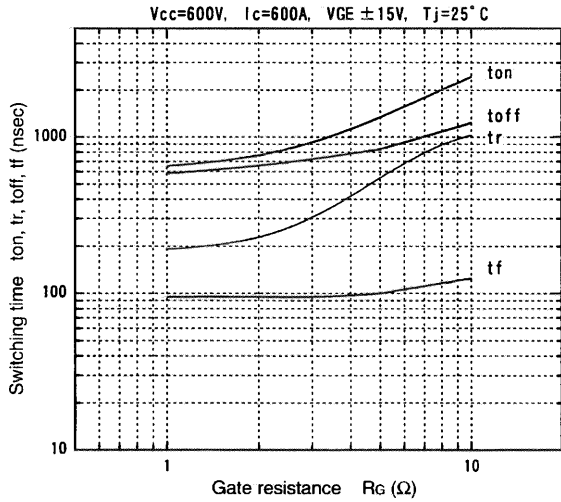
● Thermal resistance characteristics

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

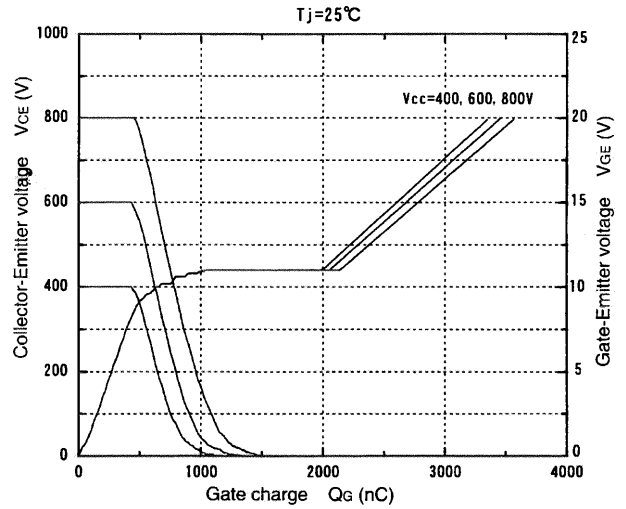
*4 : This is the value which is defined mounting on the additional cooling fin with thermal compound.

■ Characteristics (Representative)

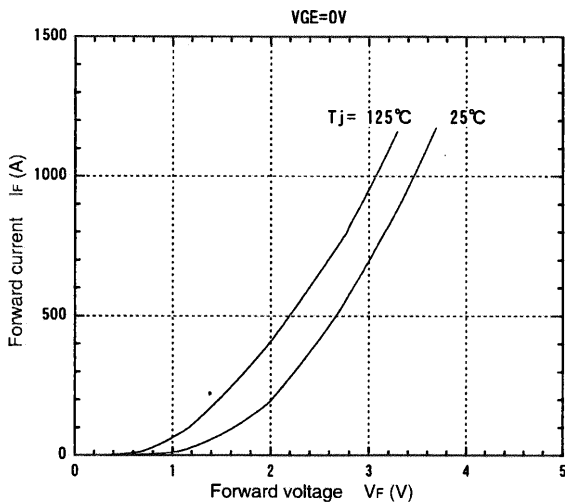




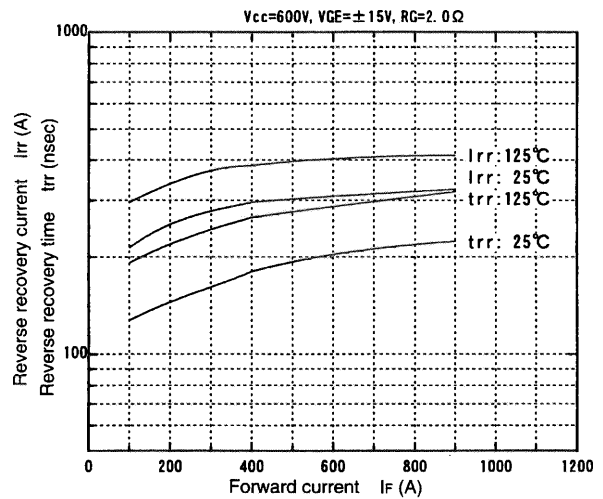
Switching time vs. Gate resistance



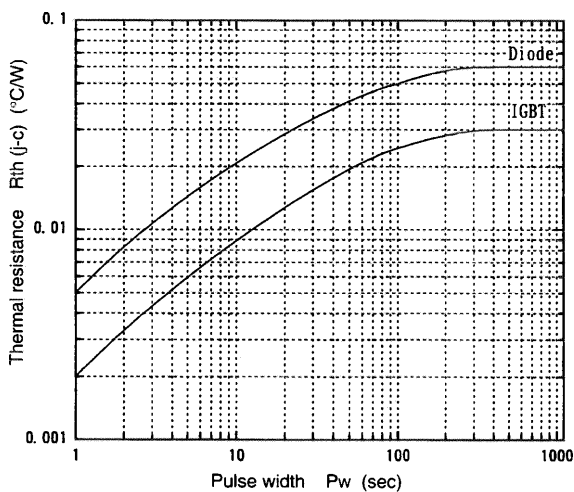
Dynamic input characteristics



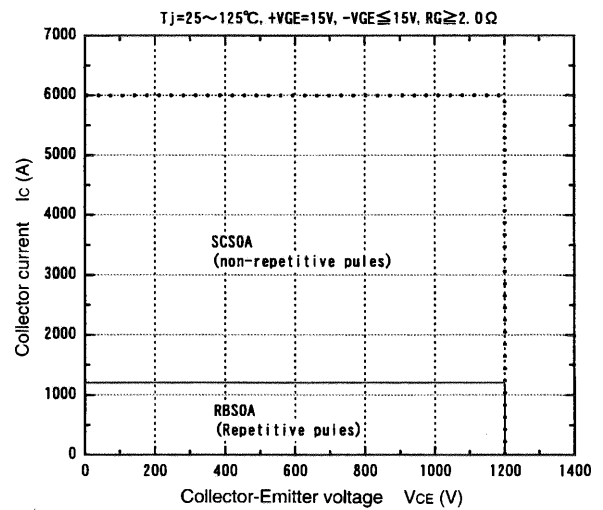
Forward current vs. Forward voltage



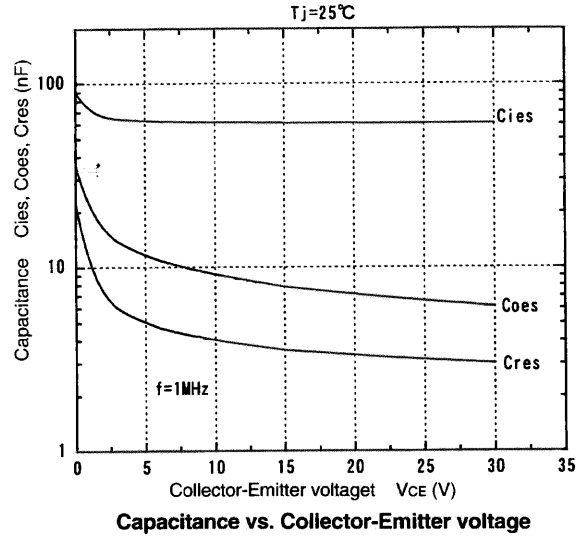
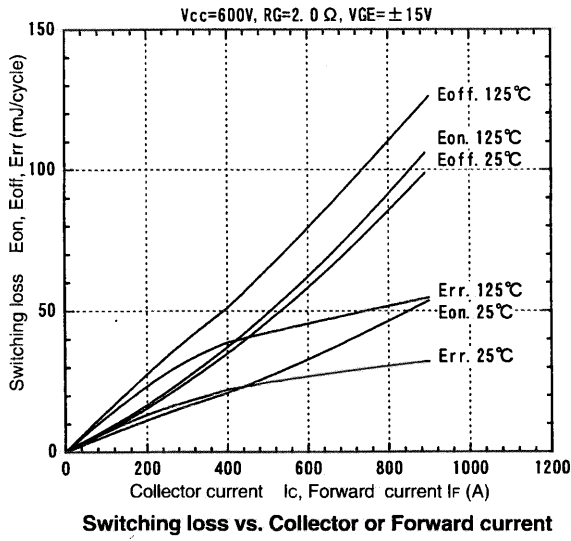
T_{rr}, I_{rr} vs. I_F



Transient thermal resistance

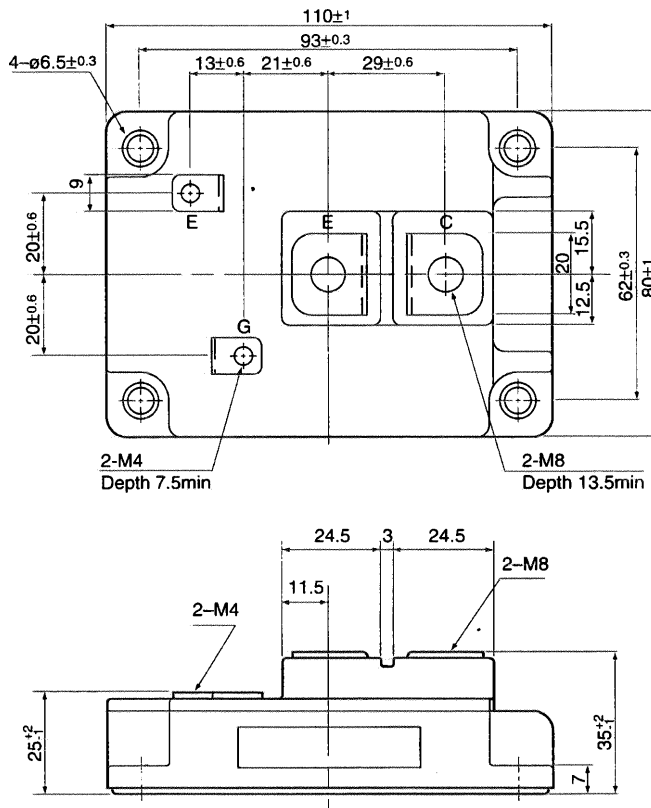


Reverse biased safe operating area



■ Outline Drawings, mm

M138



Mass : 530g