

# 6MBI100S-120

IGBT Modules

## IGBT MODULE ( S series) 1200V / 100A 6 in one-package

### ■ Features

- Compact package
- P.C.board mount
- Low  $V_{CE(sat)}$

### ■ Applications

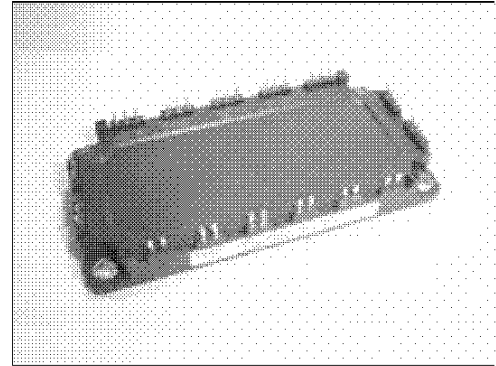
- Inverter for motor drive
- AC and DC servo drive amplifier
- Uninterruptible power supply
- Industrial machines, such as welding machines

### ■ Maximum ratings and characteristics

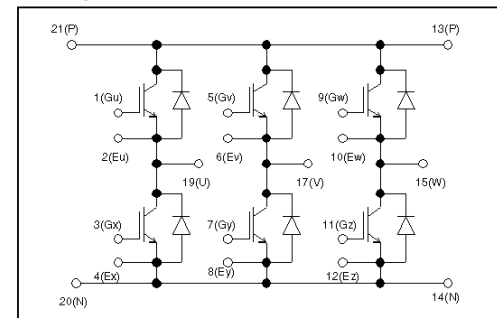
● Absolute maximum ratings ( $T_c=25^\circ\text{C}$  unless otherwise specified)

Item	Symbol	Rating	Unit		
Collector-Emitter voltage	$V_{CES}$	1200	V		
Gate-Emitter voltage	$V_{GES}$	$\pm 20$	V		
Collector current	Continuous	$T_c=25^\circ\text{C}$	$I_C$	150	A
		$T_c=80^\circ\text{C}$		100	
	1ms	$T_c=25^\circ\text{C}$	$I_C$ pulse	300	A
		$T_c=80^\circ\text{C}$		200	
		$-I_C$	100	A	
		$-I_C$ pulse	200	A	
Max. power dissipation (1 device)	$P_C$	700	W		
Operating temperature	$T_j$	+150	$^\circ\text{C}$		
Storage temperature	$T_{stg}$	-40 to +125	$^\circ\text{C}$		
Isolation voltage	$V_{is}$	AC 2500 (1min.)	V		
Screw torque	Mounting *1	3.5	N·m		

\*1 : Recommendable value : 2.5 to 3.5 N·m (M5)



### ■ Equivalent Circuit Schematic



● Electrical characteristics ( $T_j=25^\circ\text{C}$  unless otherwise specified)

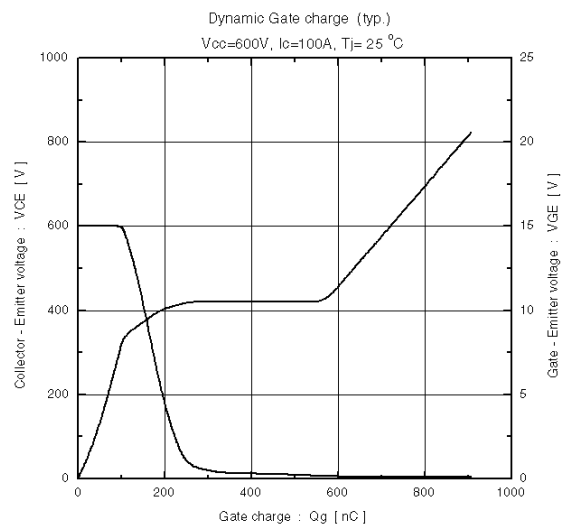
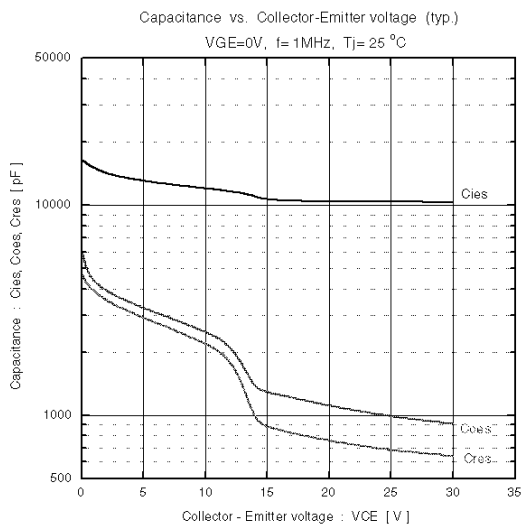
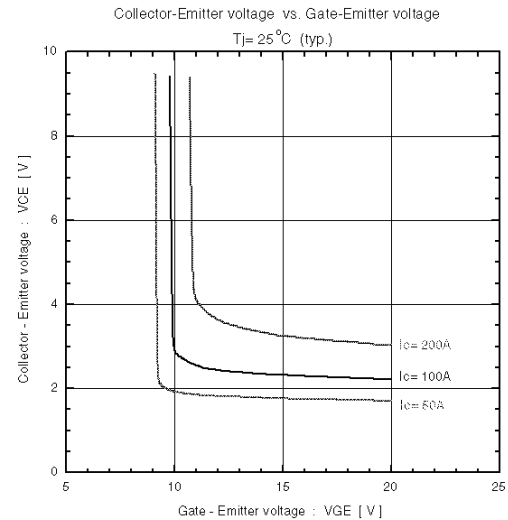
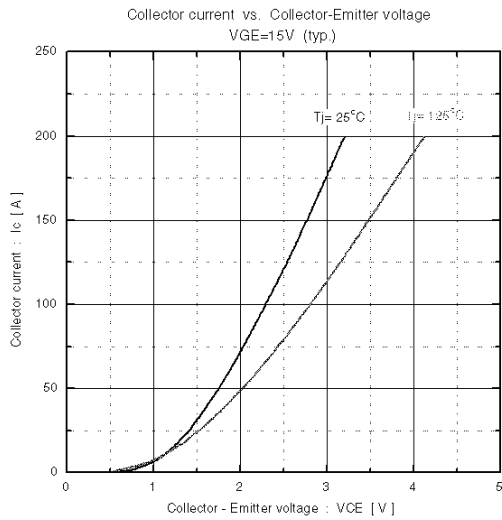
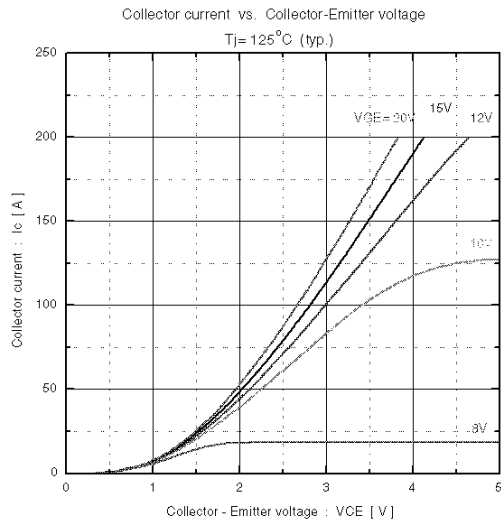
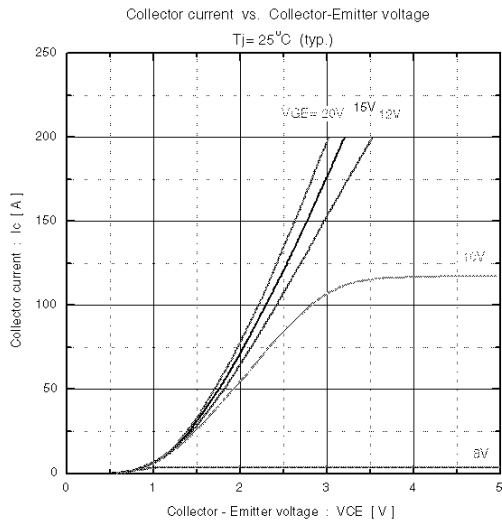
Item	Symbol	Characteristics			Conditions	Unit	
		Min.	Typ.	Max.			
Zero gate voltage collector current	$I_{CES}$	–	–	1.0	$V_{GE}=0\text{V}$ , $V_{CE}=1200\text{V}$	mA	
Gate-Emitter leakage current	$I_{GES}$	–	–	0.2	$V_{CE}=0\text{V}$ , $V_{GE}=\pm 20\text{V}$	$\mu\text{A}$	
Gate-Emitter threshold voltage	$V_{GE(th)}$	5.5	7.2	8.5	$V_{CE}=20\text{V}$ , $I_C=100\text{mA}$	V	
Collector-Emitter saturation voltage	$V_{CE(sat)}$	–	2.3	2.6	$T_j=25^\circ\text{C}$	$V_{GE}=15\text{V}$ , $I_C=100\text{A}$	V
		–	2.8	–	$T_j=125^\circ\text{C}$		
Input capacitance	$C_{ies}$	–	12000	–	$V_{CE}=0\text{V}$	pF	
Output capacitance	$C_{oes}$	–	2500	–	$V_{CE}=10\text{V}$		
Reverse transfer capacitance	$C_{res}$	–	2200	–	$f=1\text{MHz}$		
Turn-on time	$t_{on}$	–	0.35	1.2	$V_{CC}=600\text{V}$ $I_C=100\text{A}$ $V_{GE}=\pm 15\text{V}$ $R_G=12\Omega$	$\mu\text{s}$	
	$t_r$	–	0.25	0.6			
	$t_{r(i)}$	–	0.1	–			
Turn-off time	$t_{off}$	–	0.45	1.0			
	$t_i$	–	0.08	0.3			
Diode forward on voltage	$V_F$	–	2.5	3.3	$T_j=25^\circ\text{C}$	$I_F=100\text{A}$ , $V_{GE}=0\text{V}$	V
		–	2.0	–	$T_j=125^\circ\text{C}$		
Reverse recovery time	$t_{rr}$	–	–	0.35	$I_F=100\text{A}$	$\mu\text{s}$	

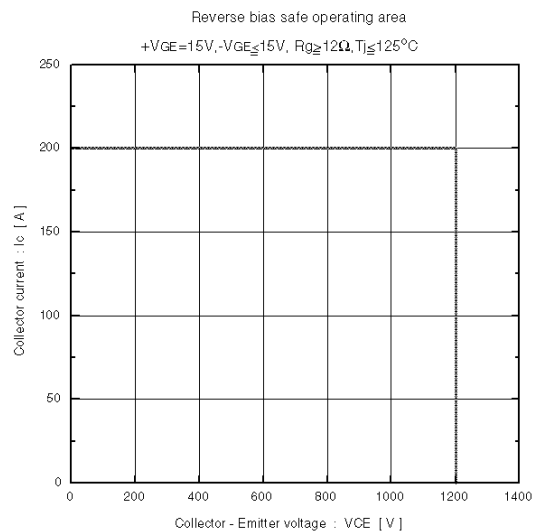
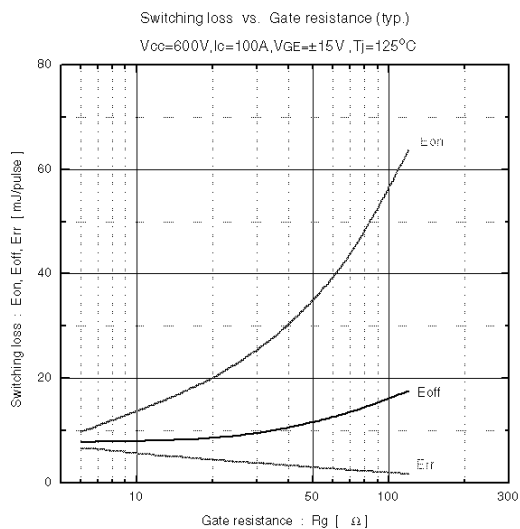
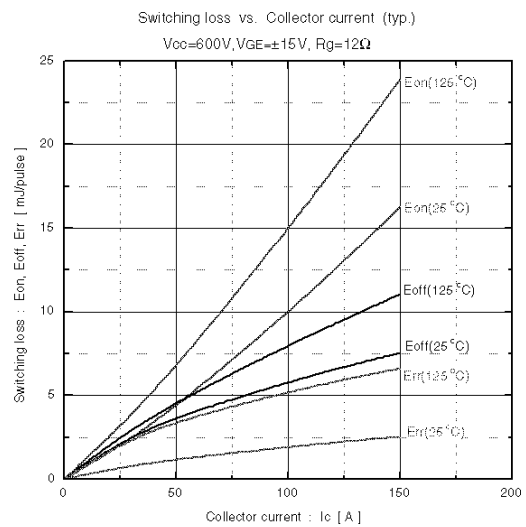
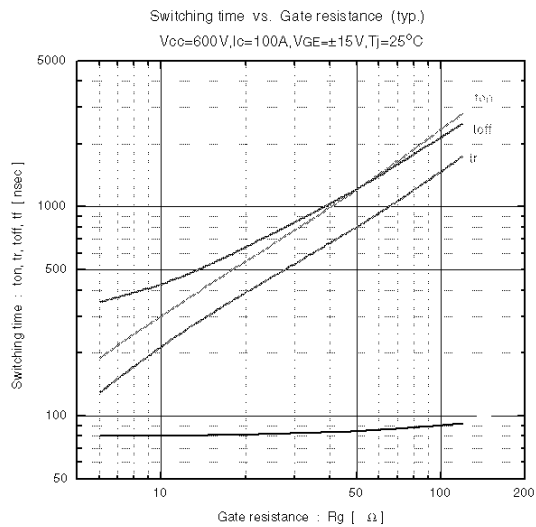
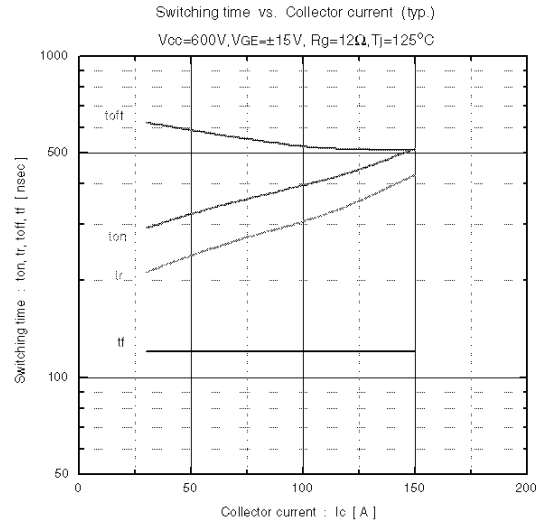
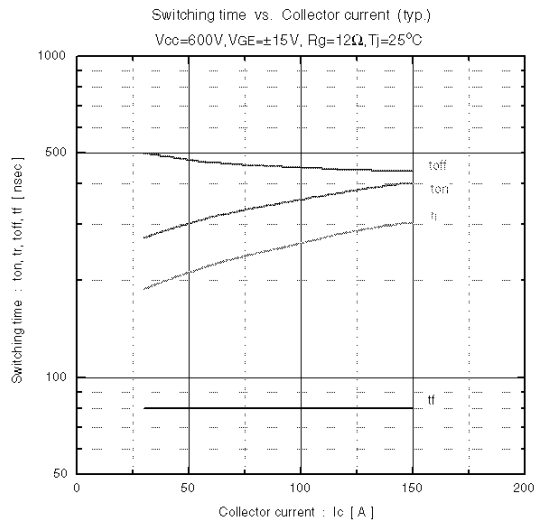
● Thermal resistance characteristics

Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Thermal resistance	$R_{th(j-c)}$	–	–	0.18	IGBT	$^\circ\text{C/W}$
	$R_{th(j-c)}$	–	–	0.36	FWD	$^\circ\text{C/W}$
	$R_{th(c-f)}^* 2$	–	0.05	–	the base to cooling fin	$^\circ\text{C/W}$

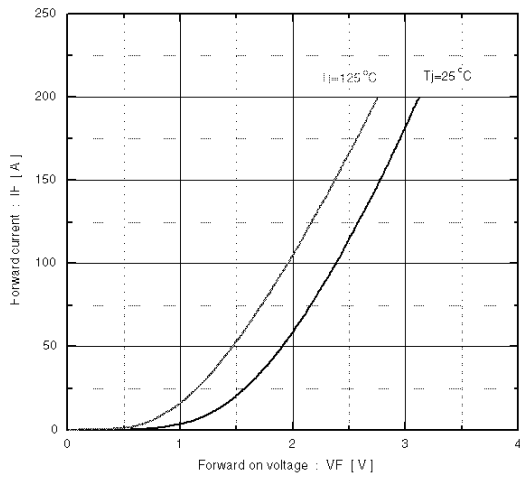
\*2 : This is the value which is defined mounting on the additional cooling fin with thermal compound

Characteristics

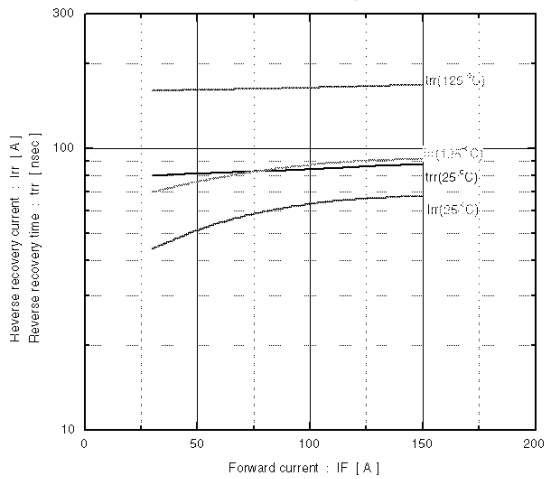




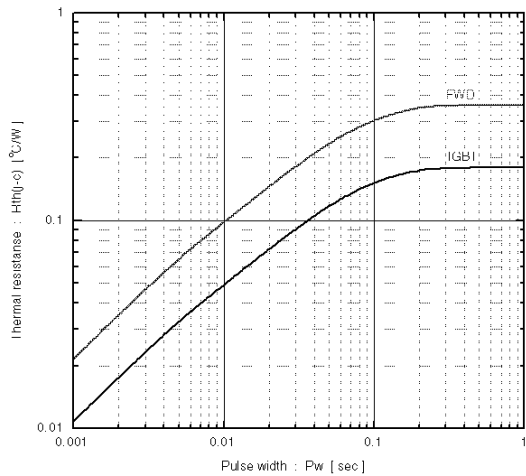
Forward current vs. Forward on voltage (typ.)



Reverse recovery characteristics (typ.)



Transient thermal resistance



■ Outline Drawings, mm

