

This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

SPECIFICATION

Device Name : IGBT Module

Type Name : 1MBI600PX - 120 - 01

Spec. No. : MS5F4405

Fuji Electric Co., Ltd.
Matsumoto Factory

	DATE	NAME	APPROVED		Fuji Electric Co., Ltd.	
DRAWN	Sep. 9, '98	S. Yoshida			DWG. NO.	MS5F4405
CHECKED	Sep. 9, '98	S. Miyatake				
			T. HOSOKAWA			1/8

Revised Records

[illegible]

This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

Fuji Electric Co., Ltd.

DWG. NO.

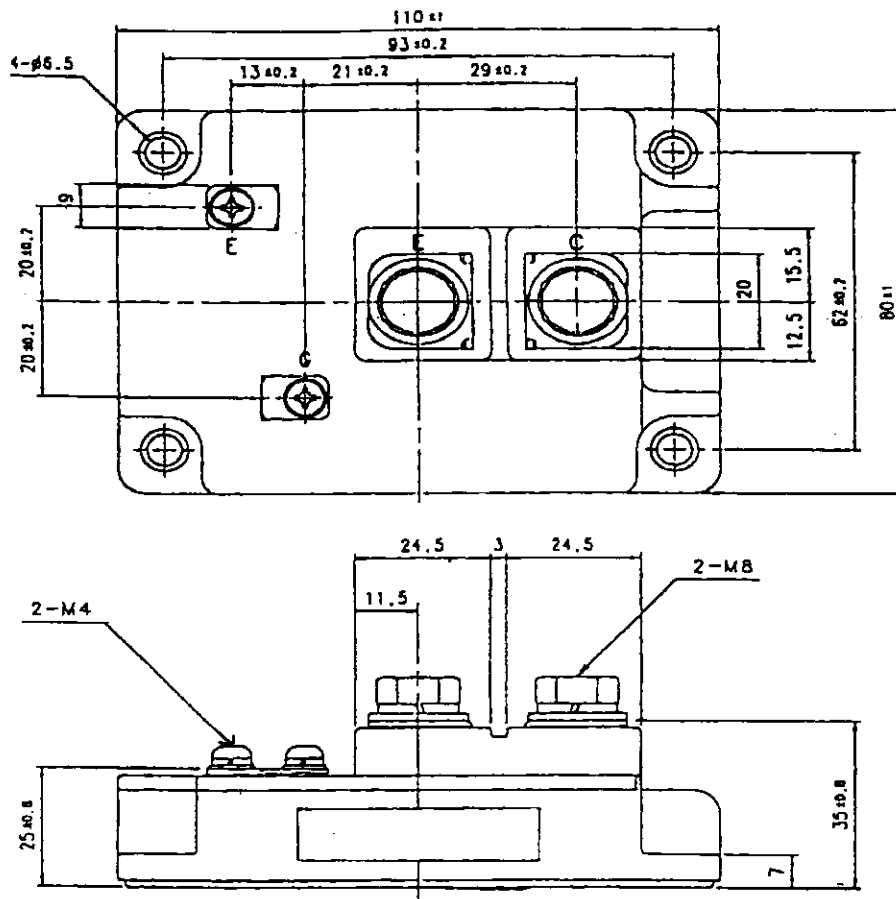
MS 5F4405

 $\frac{7}{8}$

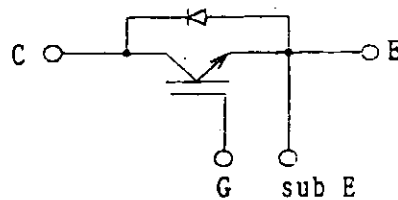
1MBI600PX-120-01

1. Outline Drawing

Unit : mm



2. Equivalent circuit



Fuji Electric Co., Ltd.

DWG. NO.

MS5F4405

3/8

H04-004-03

3. Absolute Maximum Ratings (at $T_c=25^{\circ}\text{C}$ unless otherwise specified)

Items			Symbols	Ratings	Units
Collector-Emitter voltage			V_{CES}	1200	V
Gate-Emitter voltage			V_{GES}	± 20	V
Collector current	Continuous	$T_c=25^{\circ}\text{C}$	I_c	800	A
		$T_c=80^{\circ}\text{C}$		600	
	1ms	$T_c=25^{\circ}\text{C}$	I_c pulse	1600	
		$T_c=80^{\circ}\text{C}$		1200	
			$-I_c$	600	
	1ms		$-I_c$ pulse	1200	
	Max. power dissipation			PC	
Operating temperature			T_j	+150	$^{\circ}\text{C}$
Storage temperature			T_{stg}	$-40\sim+125$	$^{\circ}\text{C}$
Isolation voltage			V_{is}	AC 2500 (1min.)	V
Screw torque			Mounting #1	4.5	N · m
			Terminals #2	11.0	
			Terminals #3	1.7	

Note : #1 Recommendable value : $4.0 \pm 0.5 \text{ N} \cdot \text{m}$ (M6)

Note : #2 Recommendable value : $10.0 \pm 1.0 \text{ N} \cdot \text{m}$ (M8)

Note : #3 Recommendable value : $1.50 \pm 0.2 \text{ N} \cdot \text{m}$ (M4)

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

Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Zero gate voltage Collector current	I_{CES}			2.0	$V_{GE}=0\text{V}, V_{CE}=1200\text{V}$	mA
Gate-Emitter leakage current	I_{GES}			± 0.5	$V_{CE}=0\text{V}, V_{GE}=\pm 20\text{V}$	μA
Gate-Emitter threshold voltage	$V_{GE(th)}$	6.0	8.0	9.0	$V_{CE}=20\text{V}, I_c=600\text{mA}$	V
Collector-Emitter saturation voltage	$V_{CE(sat)}$	2.5	2.85	3.0	$V_{GE}=15\text{V}, I_c=600\text{A}$	V
Input capacitance	C_{ies}		60		$V_{GE}=0\text{V}$	nF
Output capacitance	C_{oes}		9		$V_{CE}=10\text{V}$	
Reverse transfer capacitance	C_{res}		4		$f=1\text{MHz}$	
Turn-on time	t_{on}		750	1200	$V_{cc}=600\text{V}$	ns
	t_r		200	600	$I_c=600\text{A}$	
Turn-off time	t_{off}		650	1000	$V_{GE}=\pm 15\text{V}$	
	t_f		100	300	$R_G=2.0\Omega$	
Diode forward on voltage	V_F	2.0		3.4	$I_F=600\text{A}, V_{CE}=0\text{V}$	V
Reverse recovery time	t_{rr}			350	$I_F=600\text{A}$	ns

5. Thermal resistance characteristics

Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Thermal resistance	$R_{th(j-c)}$			0.03	IGBT	$^{\circ}\text{C/W}$
	$R_{th(j-c)}$			0.06	Diode	
	※		0.0063		the base to cooling fin	
	$R_{th(c-f)}$					

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

Fuji Electric Co., Ltd.

DWG. NO.

MS5F4405

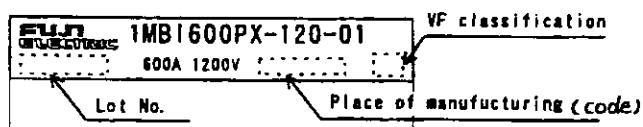
4/8

H04-004-03

6. VF class

class	VF range [V]
A	2.0 ~ 2.3
B	2.2 ~ 2.5
C	2.4 ~ 2.7
D	2.6 ~ 3.0
E	2.9 ~ 3.4

7. Indication module (モジュール表示)



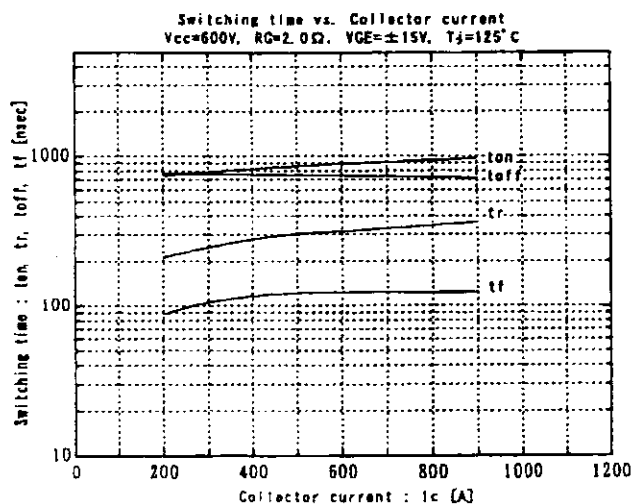
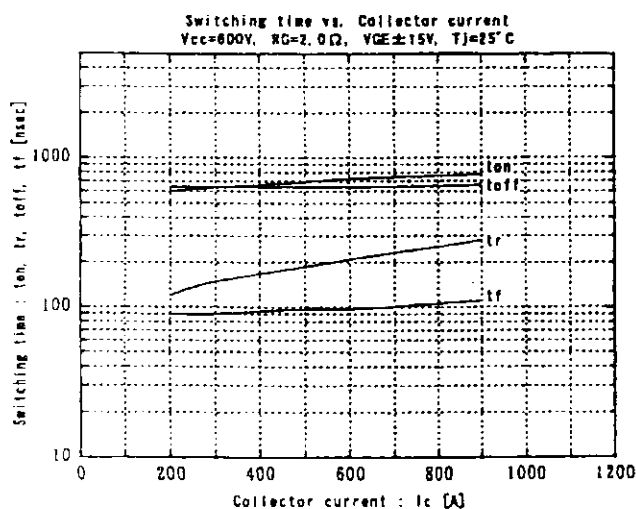
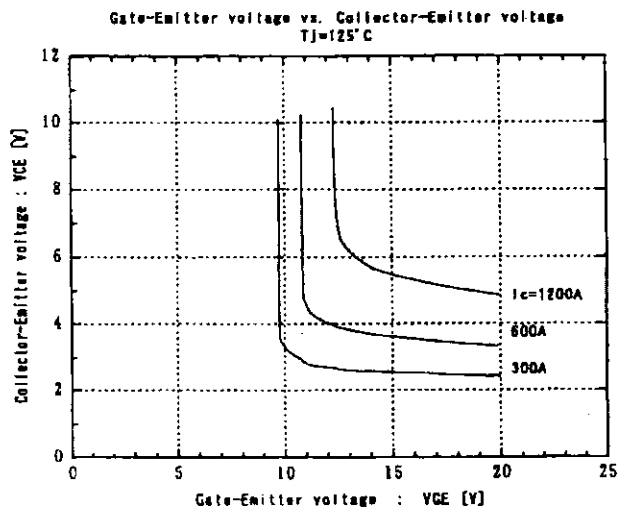
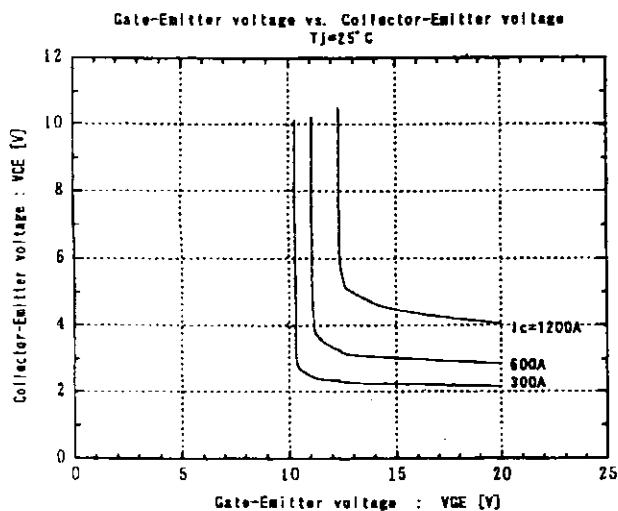
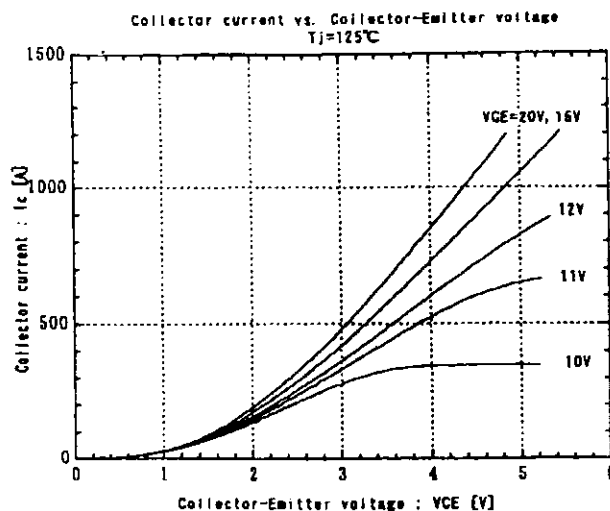
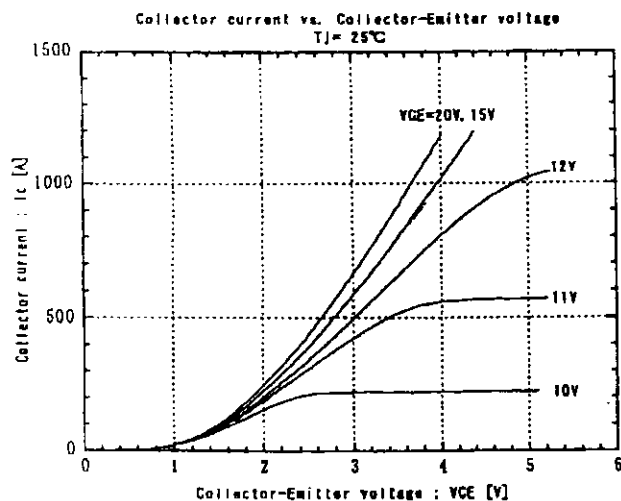
8. Applicable category (適用範囲)

This specification is applied to IGBT module named 1MBI600PX-120-01.
 本納入仕様書は、IGBTモジュール1MBI600PX-120-01に適用する。

9. Storage and transportation notes (保管、運搬上の注意事項)

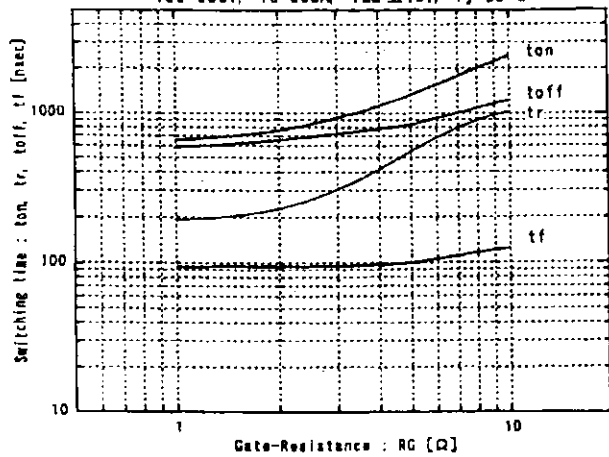
- This IGBT module should be stored at a standard temperature of 5 to 35℃ and humidity of 45% to 75%.
 常温保管が望ましい。
- Store modules in a place with few temperature changes in order to avoid condensation on the module surface.
 急激な温度変化の無きこと。(モジュール表面が結露しないこと)
- Avoid exposure to corrosive gases and dust.
 腐蝕性ガスの発生場所、塵埃の多い場所は避けること。
- Avoid excessive external force on the module.
 製品に荷重がかからないように十分注意すること。
- Store modules with unprocessed terminals.
 モジュールの端子は未加工の状態で保管すること。
- Do not drop or otherwise shock the modules when transporting.
 製品の運搬時に衝撃を与えたり、落下させたりしないこと。

This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party, nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

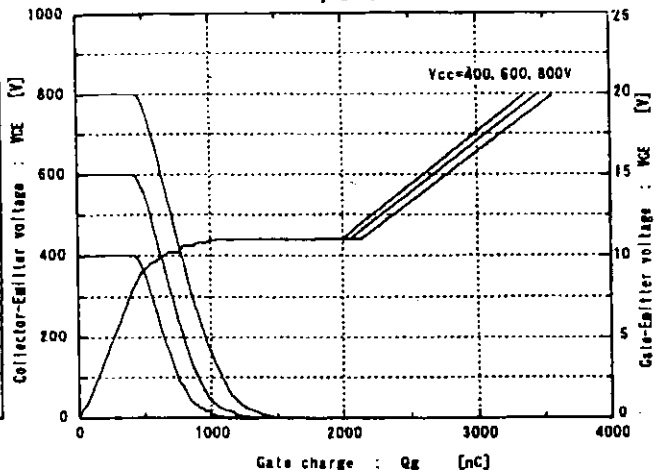


This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party, nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

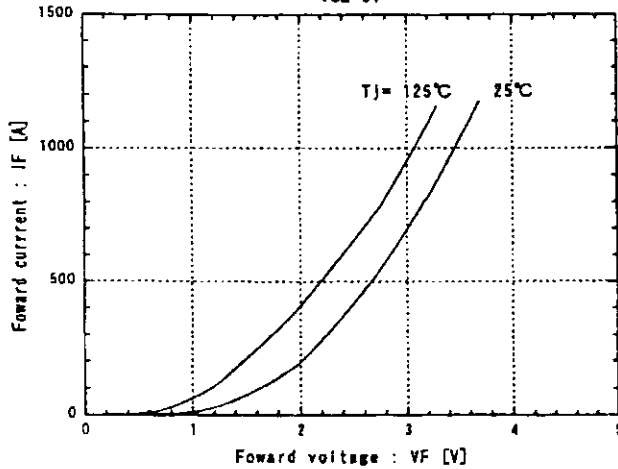
Switching time vs. Gate-Resistance
 $V_{CC}=600V$, $I_C=600A$, $V_{GE} \pm 15V$, $T_J=25^\circ C$



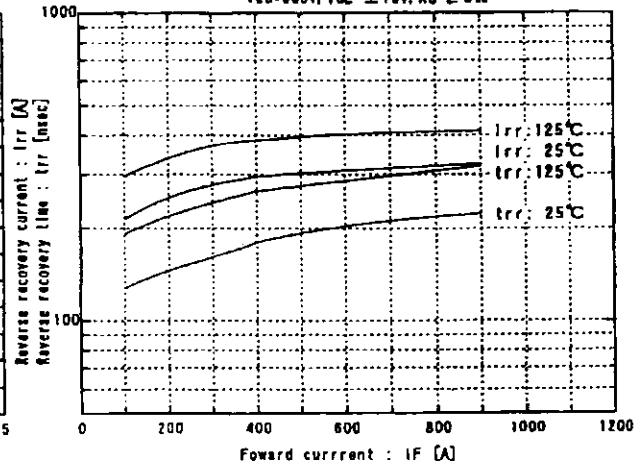
Dynamic input characteristics
 $T_J=25^\circ C$



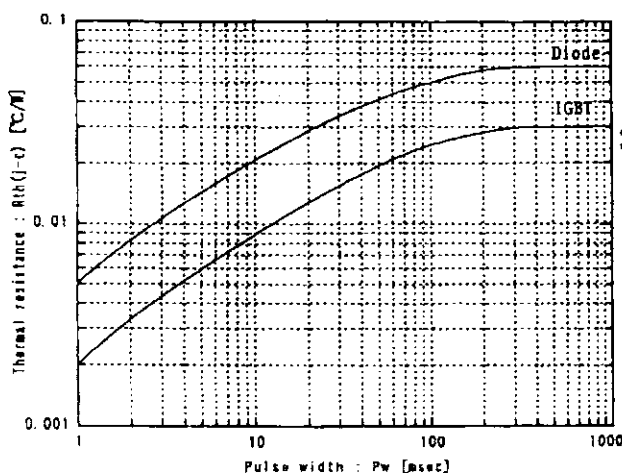
Forward current vs. Forward voltage
 $V_{GE}=0V$



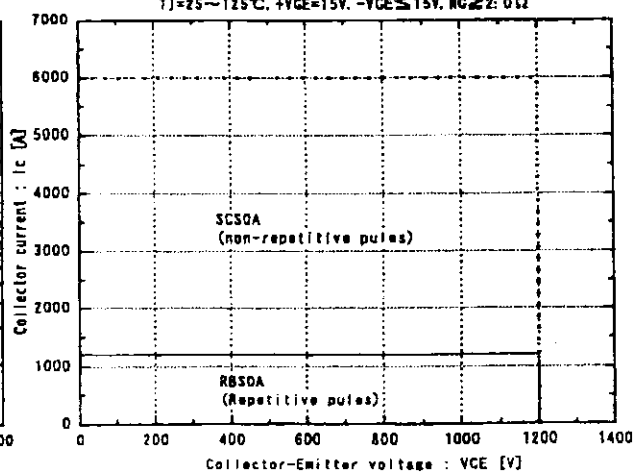
Reverse recovery characteristics (t_{rr} , I_{rr} vs. I_F)
 $V_{CC}=600V$, $V_{GE}=\pm 15V$, $R_G=2.0\Omega$



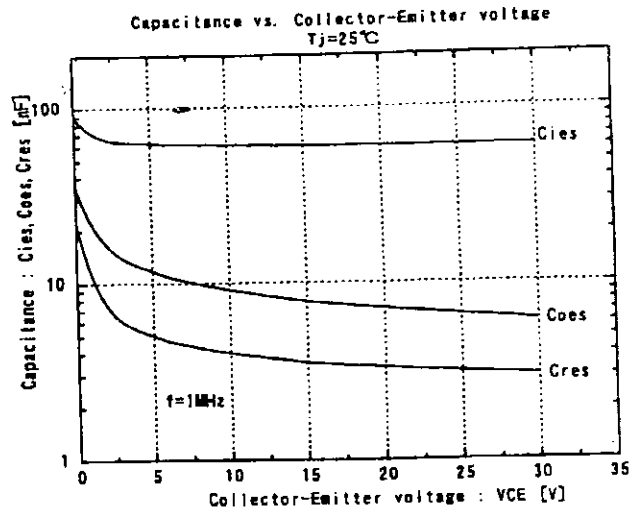
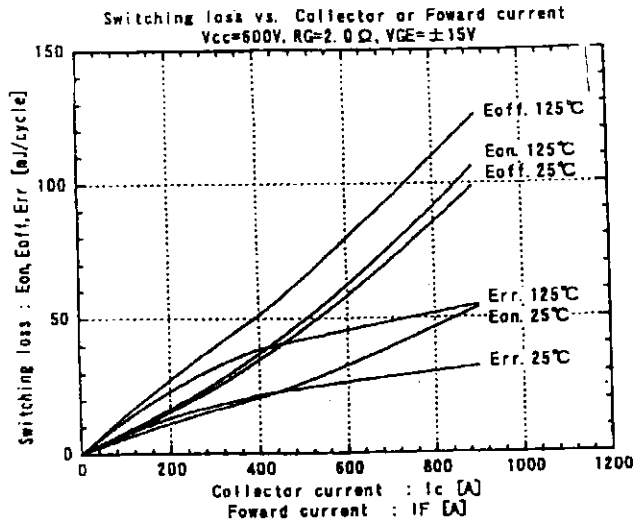
Transient thermal resistance



Reverse biased safely operating area
 $T_J=25\sim 125^\circ C$, $+V_{GE}=15V$, $-V_{GE}\leq 15V$, $R_G\geq 2.0\Omega$



This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party, nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.



Fuji Electric Co., Ltd.

DWG NO.

MS5F4405

8/8

H04-004-03