Messrs. Rockwell Automation

SPECIFICATION

Device Name : IGBT Module

Type Name : 1MBI600PX-140-03

Spec. No. : MS5F4851

Fuji Electric Co.,Ltd.
Matsumoto Factory

	DATE	NAME	APPROVED
DRAWN	May-31-'00	S.Yoshiwara	T.Miyasaka
CHECKED	May-31-'00	S.Myata	

Fuji Electric Co.,Ltd.

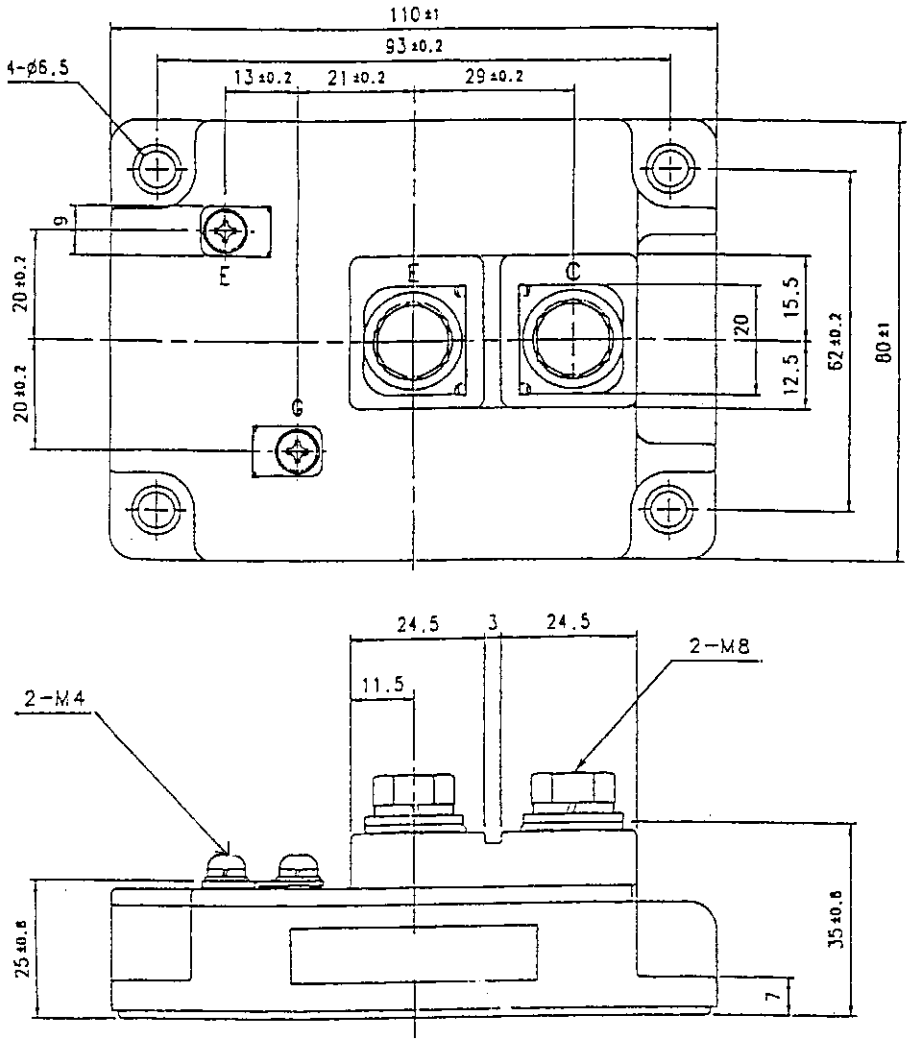
DWG.NO. MS5F4851 1/8

H04-004-

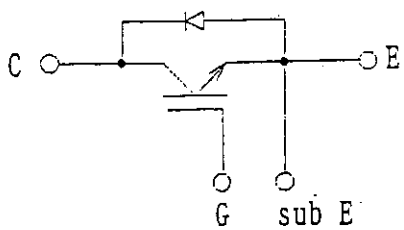
Revised Records

Date	Classi-fication	Ind.	Content	Applied date	Drawn	Checked	Approve
May-31-'00	enactment	—	————	Issued date	—	S.Myata	T.Miyaso

1. Outline Drawing
Unit : mm



2. Equivalent circuit



3. Absolute Maximum Ratings (at Tc=25℃ unless otherwise specified)

Items			Symbols	Ratings	Units
Collector-Emitter voltage			V_{CES}	1400	V
Gate-Emitter voltage			V_{GES}	±20	V
Collector current	Continuous	Tc=25℃	Ic	800	A
		Tc=80℃		600	
	1ms	Tc=25℃	Ic pulse	1600	
		Tc=80℃		1200	
			-Ic	600	
	1ms		-Ic pulse	1200	
Max. power dissipation			PC	4100	W
Operating temperature			Tj	+150	℃
Storage temperature			Tstg	-40～+125	℃
Isolation voltage			Vis	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±0.5 N・m (M6)
Note : *2 Recommendable value : 10.0±1.0 N・m (M8)
Note : *3 Recommendable value : 1.50±0.2 N・m (M4)

4. Electrical characteristics (at Tj=25℃ unless otherwise specified)

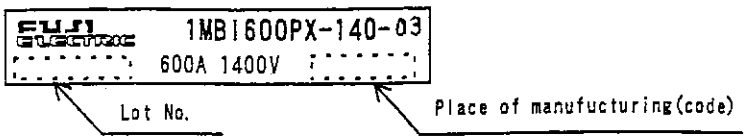
Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Zero gate voltage Collector current	I_{CES}			2.0	V_{GE}=0V, V_{CE}=1400V	mA
Gate-Emitter leakage current	I_{GES}			±0.5	V_{CE}=0V, V_{GE}=±20V	μA
Gate-Emitter threshold voltage	$V_{GE}(th)$	6.0	8.0	9.0	V_{CE}=20V, Ic=600mA	V
Collector-Emitter saturation voltage	$V_{CE}(sat)$		2.85	3.2	V_{GE}=15V, Ic=600A	V
Input capacitance	Cies		60		V_{GE}=0V	nF
Output capacitance	Coes		9		V_{CE}=10V	
Reverse transfer capacitance	Cres		4		f=1MHz	
Turn-on time	ton		750	1200	Vcc=600V	ns
	tr		200	600	Ic=600A	
Turn-off time	toff		650	1000	V_{GE}=±15V	
	tf		100	300	R_G=2.0Ω	
Diode forward on voltage	V_F			3.4	I_F=600A, V_{GE}=0V	V
Reverse recovery time	trr			350	I_F=600A	ns

5. Thermal resistance characteristics

Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Thermal resistance	Rth(j-c)			0.03	IGBT	℃/W
	Rth(j-c)			0.06	Diode	
	※ Rth(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.

6. Indication on module (モジュール表示)



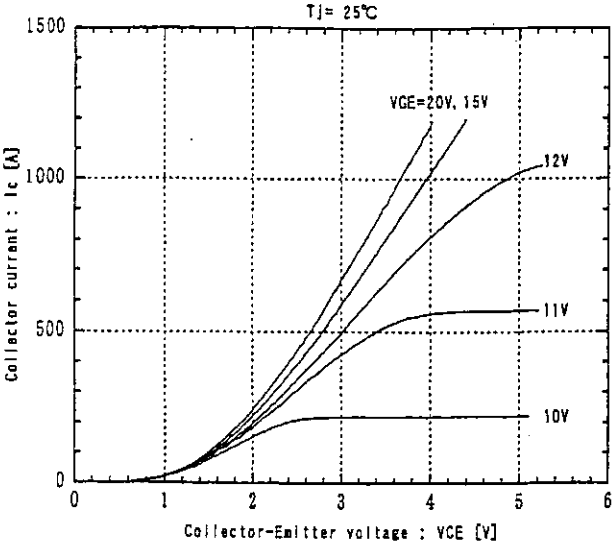
7. Applicable category (適用範囲)

This specification is applied to IGBT module named 1MBI600PX-140-03
本納入仕様書は、IGBTモジュール１ＭＢＩ６００ＰＸ－１４０－０３に適用する。

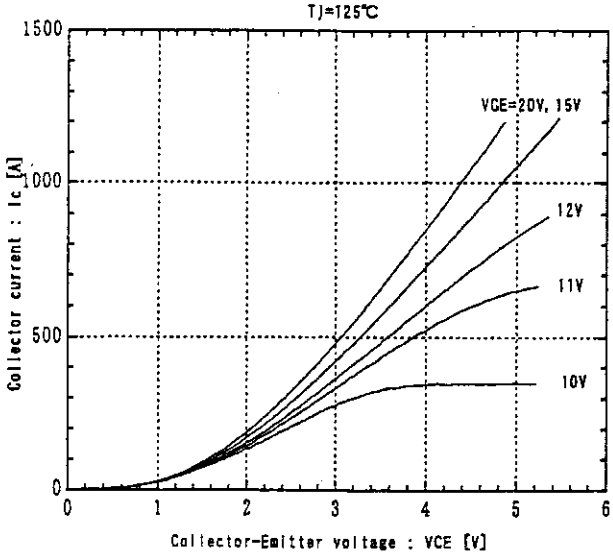
8. Storage and transportation notes (保管、運搬上の注意事項)

- The IGBT module should be stored at a standard temperature of 5 to 35℃ and humidity of 45 to 75%.
  常温保存が望ましい。(5～35℃、45～75%)
- 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。

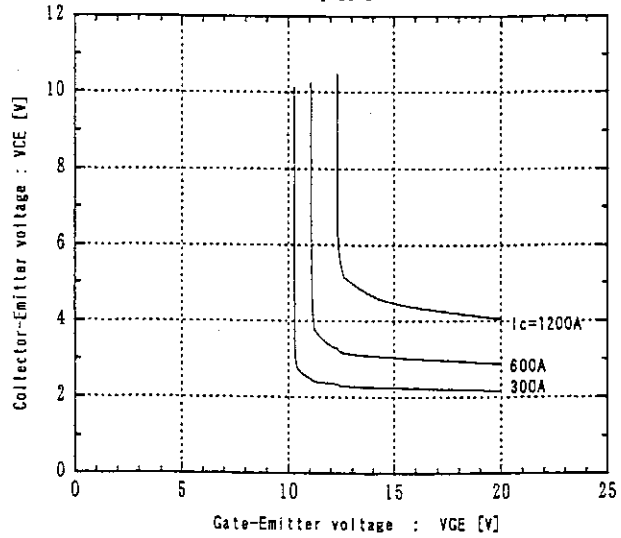
Collector current vs. Collector-Emitter voltage
Tj= 25℃



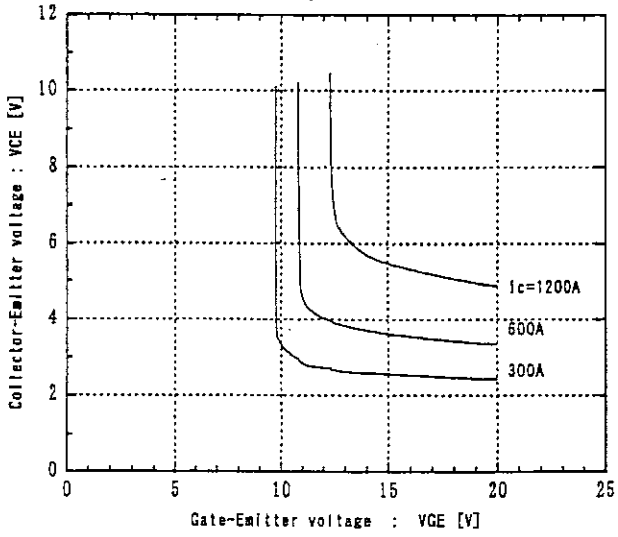
Collector current vs. Collector-Emitter voltage
TJ=125℃



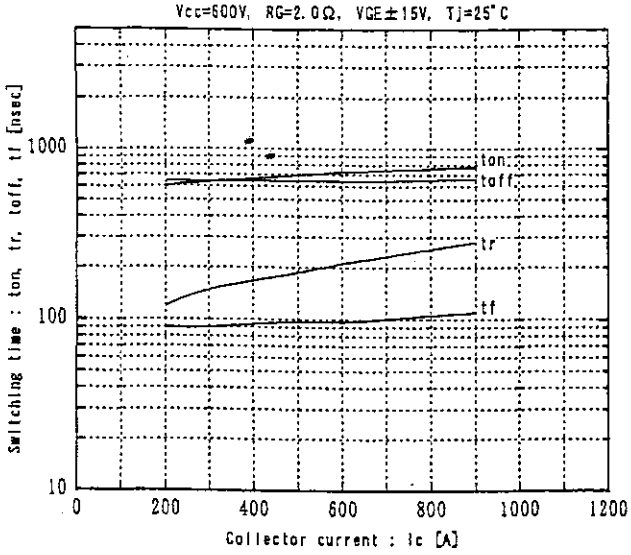
Gate-Emitter voltage vs. Collector-Emitter voltage
Tj=25°C



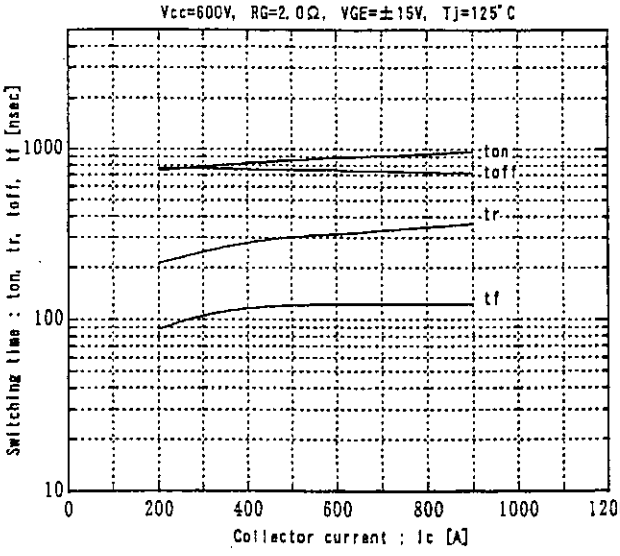
Gate-Emitter voltage vs. Collector-Emitter voltage
Tj=125°C



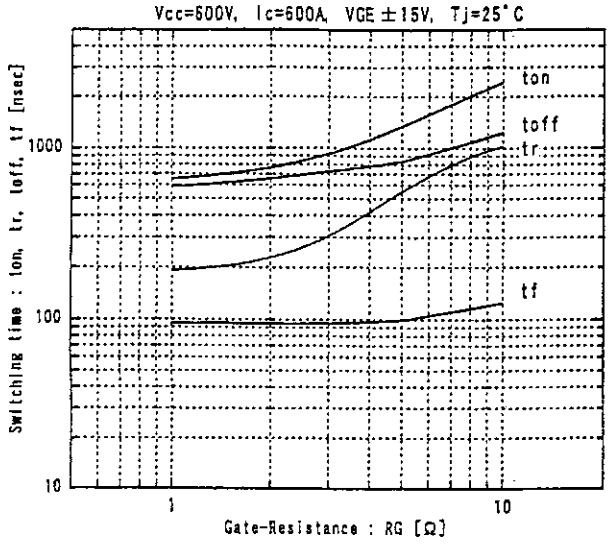
Switching time vs. Collector current
Vcc=600V, RG=2.0Ω, VGE±15V, Tj=25°C



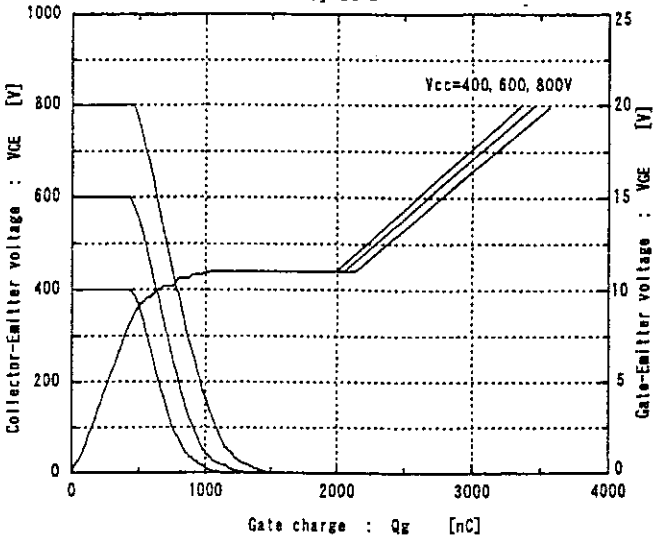
Switching time vs. Collector current
Vcc=600V, RG=2.0Ω, VGE=±15V, Tj=125°C



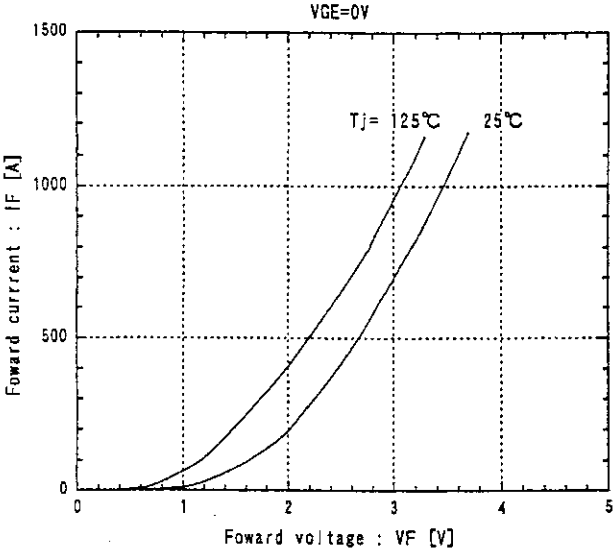
Switching time vs. Gate-Resistance
Vcc=600V, Ic=600A, VGE ±15V, Tj=25°C



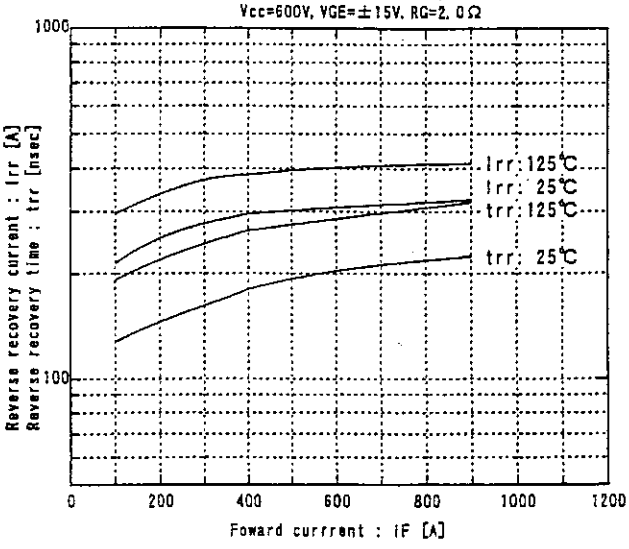
Dynamic input characteristics
Tj=25°C



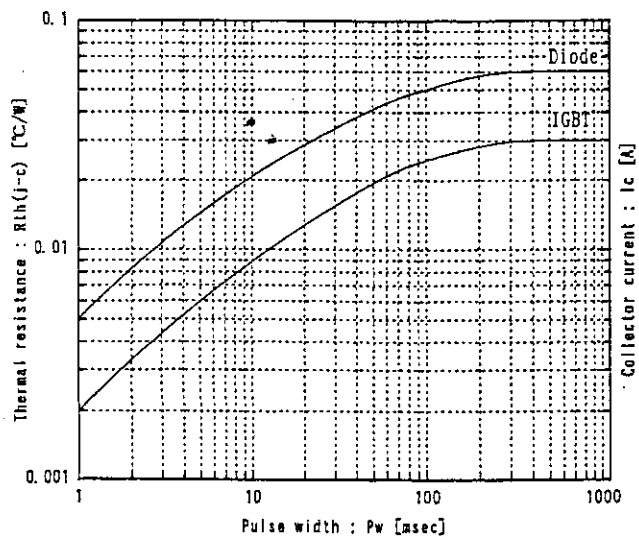
Foward currrent vs. Foward voltage
VGE=0V



Reverse recovery characteristics(trr, Irr vs. IF)
Vcc=600V, VGE=±15V, RG=2.0Ω



Transient thermal resistance



Reverse biased safty operating area
Tj=25~125°C, +VGE=15V, -VGE≦15V, RG≧2.0Ω