SPECIFICATION

Device Name : IGBT module

Type Name : 2MBI300NT-120-02

Spec. No. : MS5F3939

Fuji Electric Co., Ltd.
Matsumoto Factory

	DATE	NAME	APPROVED
DRAWN	Feb.-21-'97	J. Kobayashi	
CHECKED	Feb.-21-'97	S. Miyata	
			S.K

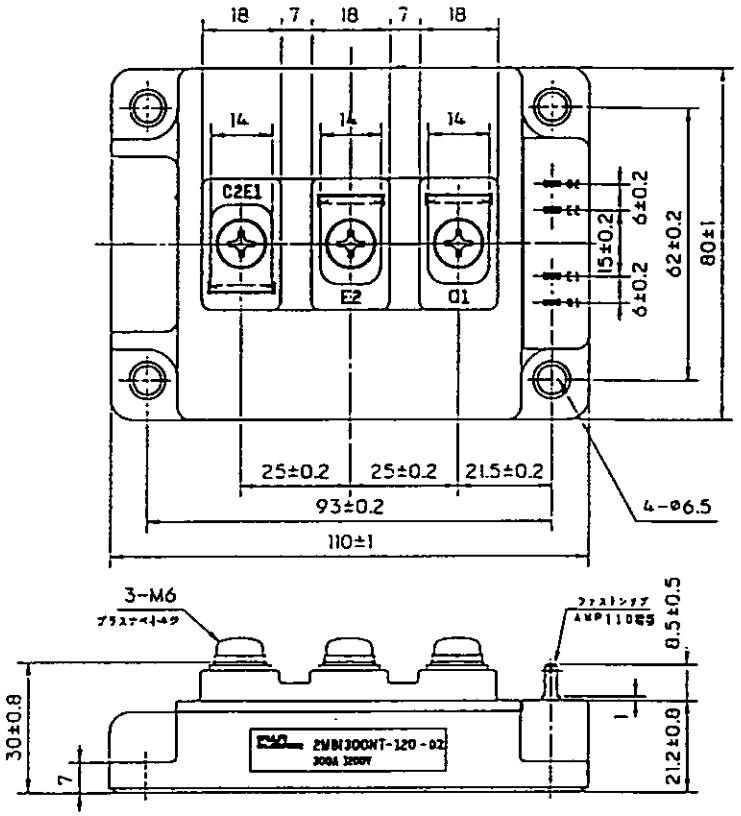
Fuji Electric Co.,Ltd.

DWG.NO. MS5F3939 1/7 a

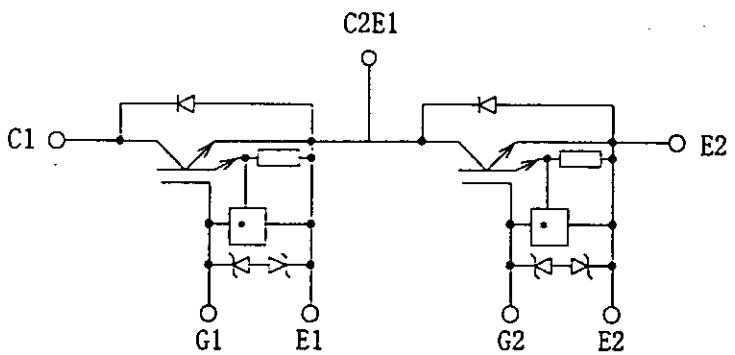
Revised Records

Date	Classi-fication	Ind.	Content	Applied date	Drawn	Checked	Approved
Feb. 21. '97	enactment	—	————	Issued date	—	S. Miyashita	S. K.
Apr. 18. '97	Revision	a	P5/7 Revers gate bias voltage		Y. Kobayashi	S. Miyashita	S. K.

1. Outline Drawing
   Unit : mm



2. Equivalent circuit



* NLU (Over Current Limiting Circuit)

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

Items		Symbols	Ratings	Units
Collector-Emitter voltage		V_{CES}	1200	V
Gate-Emitter voltage		V_{GES}	±20	V
Collector current	Continuous	Ic	300	A
	1ms	Ic pulse	600	
		-Ic	300	
	1ms	-Ic pulse	600	
Max. power dissipation		PC	2310	W
Operating temperature		Tj	+150	℃
Storage temperature		Tstg	-40~+125	℃
Isolation voltage		Vis	AC 2500 (1min.)	V
Screw torque		Mounting *1	3.5	N・m
		Terminals *2	4.5	

Note : *1 Recommendable value : 2.5~3.5 N・m (M5) or (M6)
*2 Recommendable value : 3.5~4.5 N・m (M6)

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

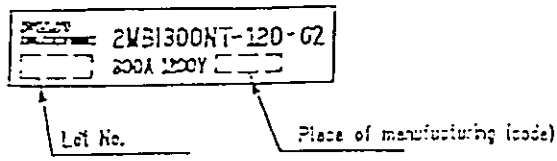
Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Zero gate voltage Collector current	I_{CES}			3.0	V_{GE}=0V, V_{CE}=1200V	mA
Gate-Emitter leakage current	I_{GES}			45	V_{CE}=0V, V_{GE}=±20V	μA
Gate-Emitter threshold voltage	V_{GE}(th)	4.5		7.5	V_{CE}=20V, Ic=300mA	V
Collector-Emitter saturation voltage	V_{CE}(sat)			3.5	V_{GE}=15V, Ic=300A	V
Input capacitance	Cies		52000		V_{GE}=0V V_{CE}=10V f=1MHz	pF
Output capacitance	Coes		21000			
Reverse transfer capacitance	Cres		20500			
Turn-on time	ton			1.2	Vcc=600V Ic=300A V_{GE}=±15V R_G=2.7Ω	μs
	tr		0.25	0.6		
Turn-off time	toff			1.5		
	tf		0.35	0.5		
Diode forward on voltage	V_F			3.4	I_F=300A, V_{GE}=0V	V
Reverse recovery time	trr			350	I_F=300A	ns
Short-circuit withstand capability	Pw	10			Vcc=800V, V_{GE}=+15V R_G=1.2Ω	μs

5. Thermal resistance characteristics

Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Thermal resistance	Rth(j-c)			0.054	IGBT	℃/W
	Rth(j-c)			0.135	Diode	
	※ Rth(c-f)		0.0167		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 2MBI300NT-120-02.
本納入仕様書は、IGBTモジュール2MBI300NT-120-02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。

9. Heat sink mounting notes (ヒートシンク取り付け上の注意事項)

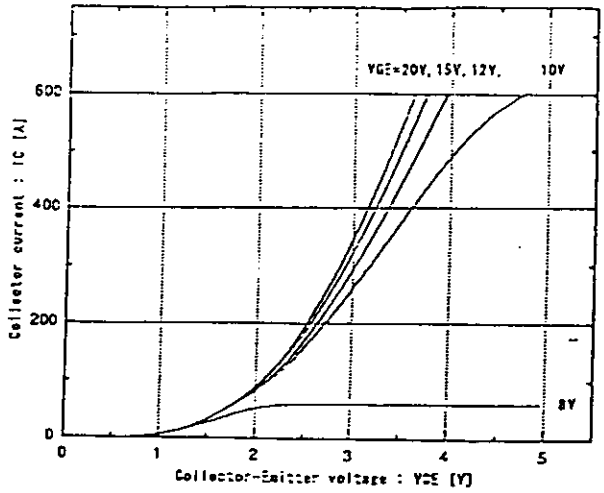
- The mounting surface of the heat sink should be finished to a roughness of 10μm or less and a warp between screw holes of 100μm or less.
  本モジュールを取り付ける冷却体の取付面の仕上げは、粗さ10μm以下、取付ネジ間で平坦度100μm以下とする。
- Each mounting screw should be fastened using a specified torque after pre-fastening using a 1/3 specified torque.
  取付けネジは、規定の1/3のトルクで仮締を行った後、規定のトルクで本締を行って下さい。
- If the above notes are not met, it has a possibility to break the insulation between the IGBT module's chips and metal base.
- 上記注意事項の範囲外で御運用した場合、IGBTモジュールのチップと金属ベース間の絶縁破壊を生ずる可能性があります。

ⓐ 10. Revers gate bias voltage (ゲート逆バイアス電圧)

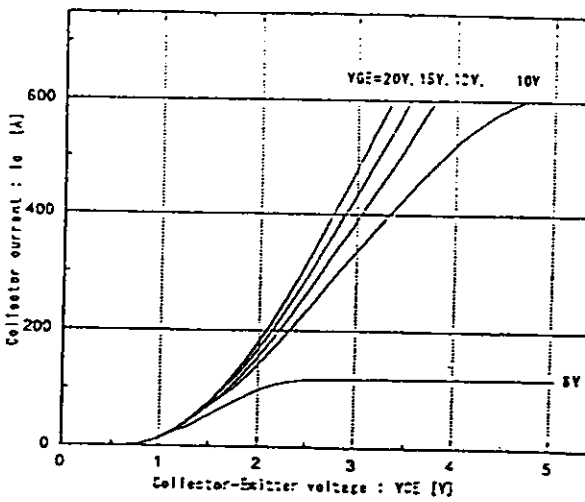
ⓐ・Recommendable value of the revers gate bias voltage : -7V(typ.), -5V(min.) RG=2.7Ω
ゲート逆バイアス電圧の推奨値 : -7V(typ.), -5V(min.) RG=2.7Ω

ⓐ・The revers gate bias voltage means the voltage between the gate terminal and the auxiliary emitter terminal of the modules.
ゲート逆バイアス電圧は、モジュールのゲート端子と補助エミッタ端子間の電圧である。

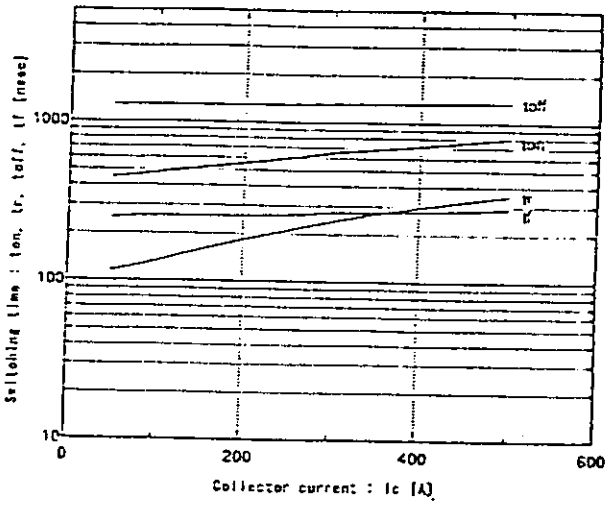
Collector current vs. Collector-Emitter voltage
Tj=25°C



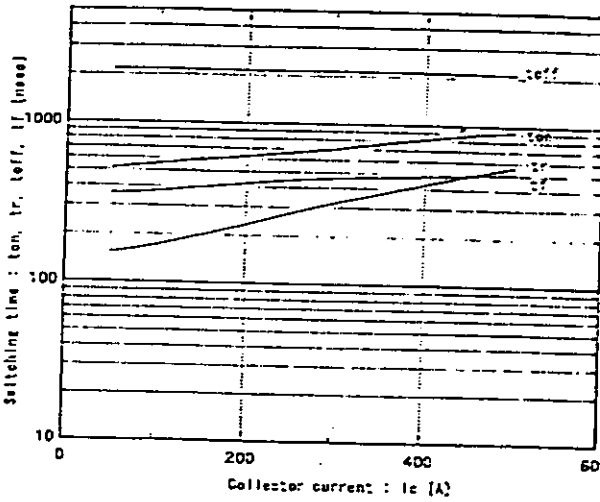
Collector current vs. Collector-Emitter voltage
Tj=125°C



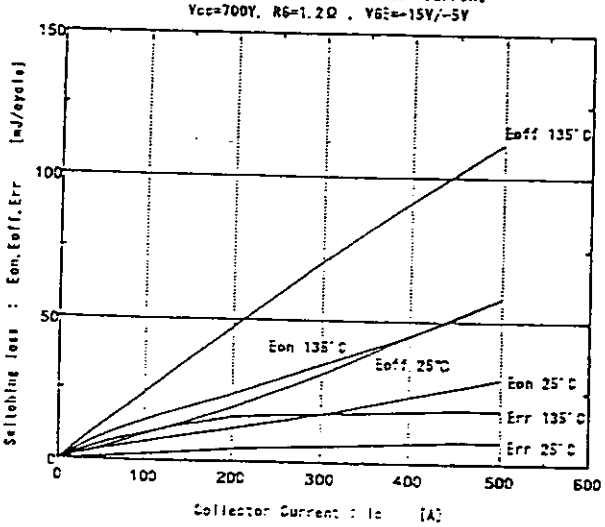
Switching time vs. Collector current
Vcc=700V, RG=1.2Ω, VGE=15V/-5V, Tj=25°C



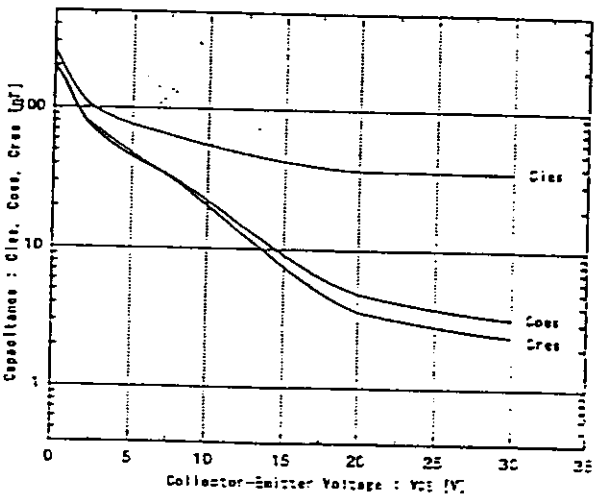
Switching time vs. Collector current
Vcc=700V, RG=1.2Ω, VGE=-15V/-5V, Tj=125°C



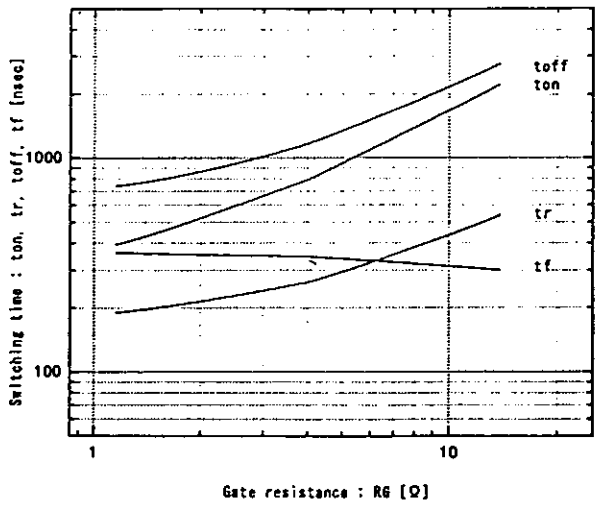
Switching loss vs. Collector current
Vcc=700V, RG=1.2Ω , VGE=-15V/-5V



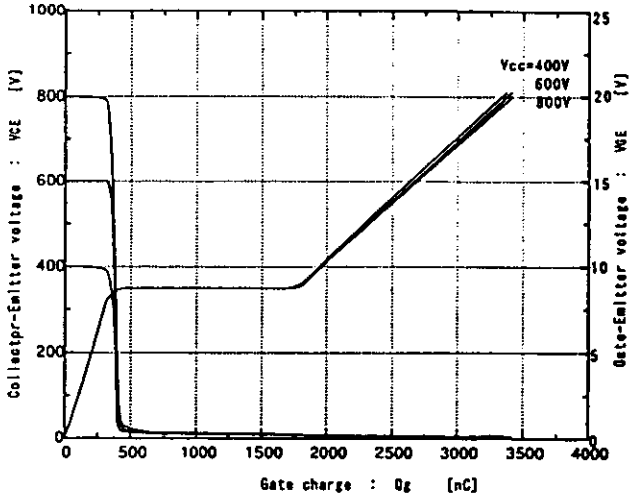
Capacitance vs. Collector-Emitter voltage
Tj=25°C



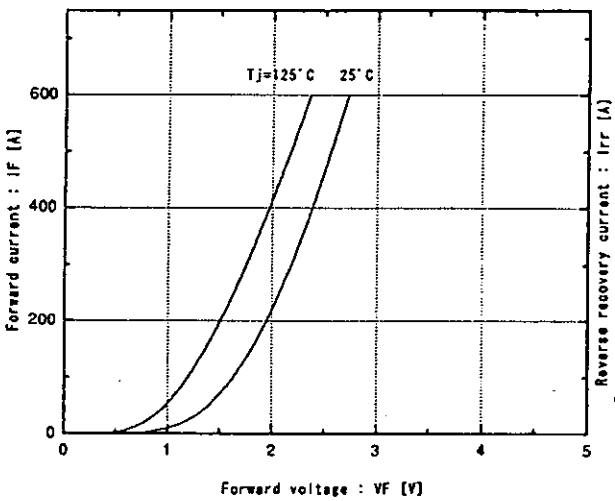
Switching time vs. RG
Vcc=600V, Ic=300A, VGE=±15V, Tj=25°C



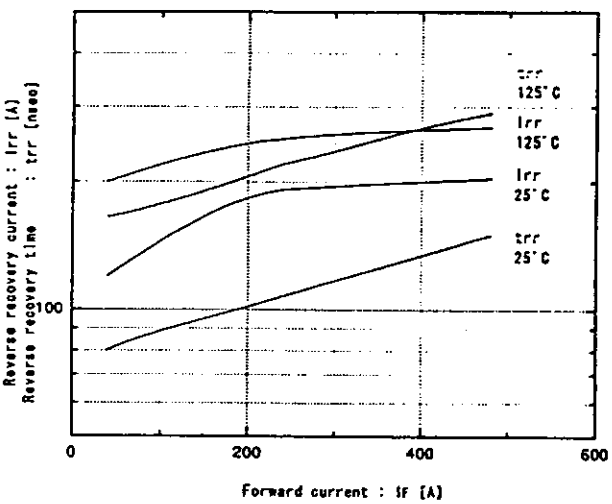
Dynamic input characteristics
Tj=25°C



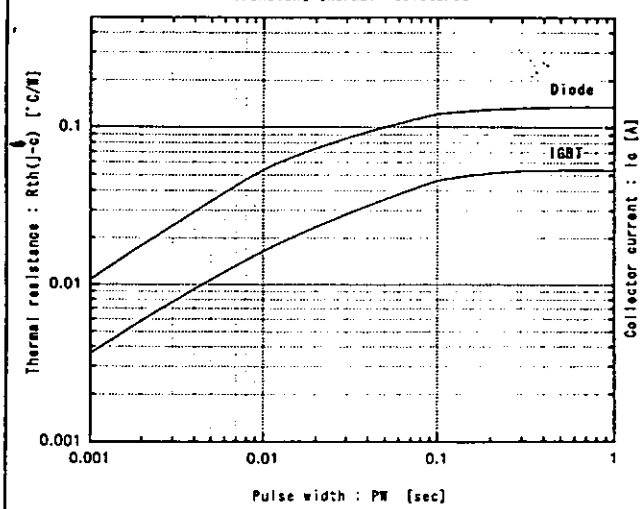
Forward current vs. Forward voltage
VGE=0V



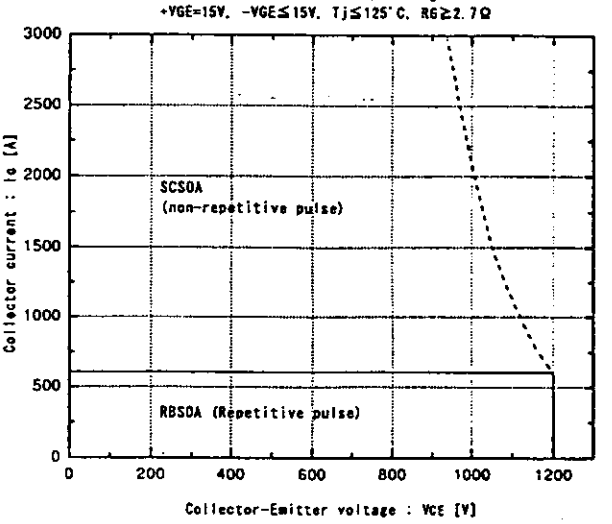
Reverse recovery characteristics
trr, Irr vs. IF



Transient thermal resistance



Reversed biased safe operating area
+VGE=15V, -VGE≤15V, Tj≤125°C, RG≥2.7Ω



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