SPECIFICATION

Device Name : IGBT module

Type Name : 2MBI150NT-120-01

Spec. No. : **MS5F3937**

Fuji Electric Co., Ltd.
Matsumoto Factory

	DATE	NAME	APPROVED
DRAWN	Feb.-21-'97	T. Kobayashi	S.K
CHECKED	Feb.-21-'97	S. Miyata	

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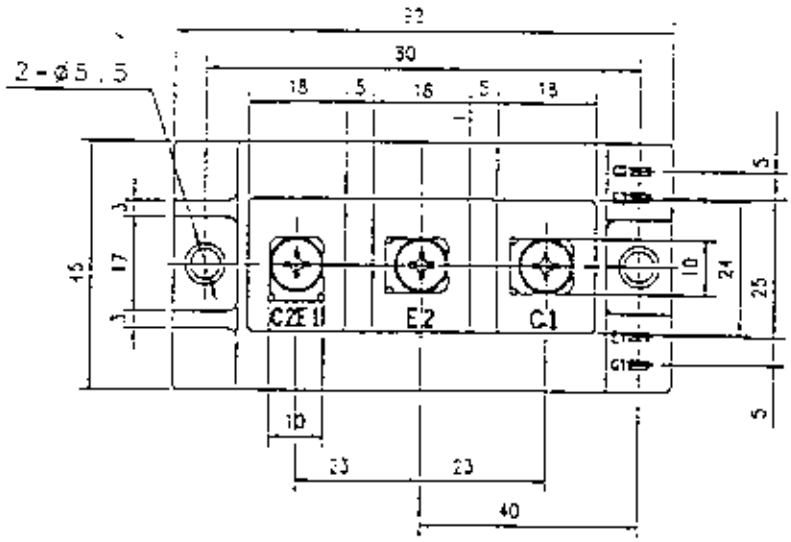
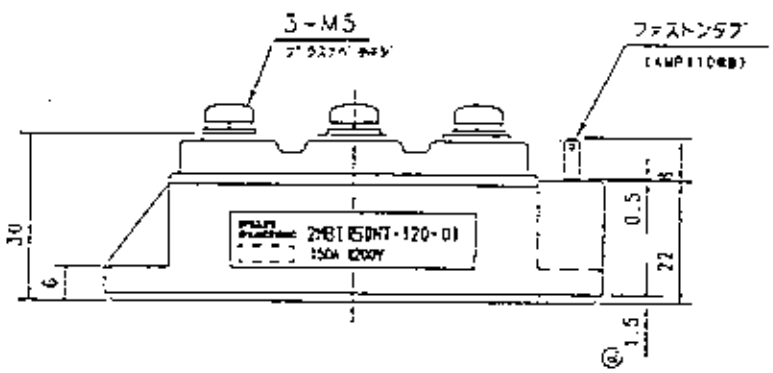
H04-004-07

Revised Records

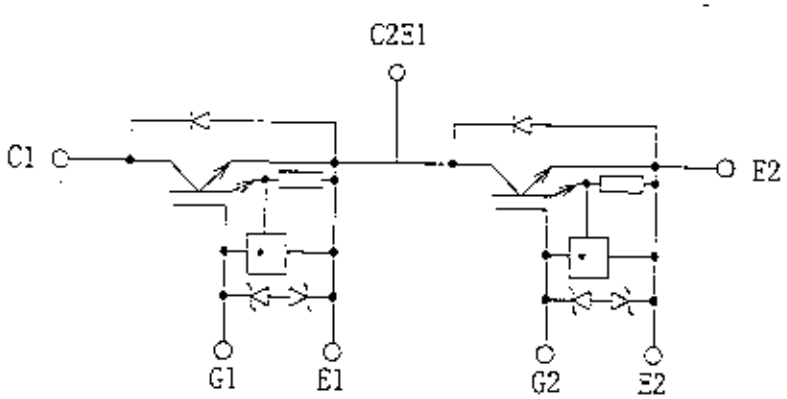
Date	Classi-fication	Ind.	Content	Applied date	Drawn	Checked	Approved
Feb.21.'97	enactment	—	———	Issued date	—	S.Miyashita	S.K
Apr.18.'97	Revision	a	P5/7 Revers gate bias voltage		T.Kobayashi	S.Miyashita	S.K.

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	150	A
	1ms	Ic pulse	300	
		-Ic	150	
	1ms	-Ic pulse	300	
Max. power dissipation		PC	1210	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)

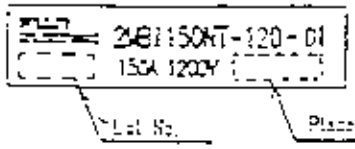
4. Electrical characteristics (at Tj=25℃ unless otherwise specified)

Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Zero gate voltage Collector current	I_{CES}			2.0	V_{GE}=0V, V_{CE}=1200V	mA
Gate-Emitter leakage current	I_{GES}			30	V_{CE}=0V, V_{GE}=±20V	μA
Gate-Emitter threshold voltage	$V_{GE(th)}$	4.5		7.5	V_{CE}=20V, Ic=150mA	V
Collector-Emitter saturation voltage	$V_{CE(sat)}$			3.5	V_{GE}=15V, Ic=150A	V
Input capacitance	Cies		27000		V_{GE}=0V	pF
Output capacitance	Coes		12500		V_{CE}=10V	
Reverse transfer capacitance	Cres		10000		f=1MHz	
Turn-on time	ton		0.65	1.2	Vcc=600V	μs
	tr		0.25	0.6	Ic=150A	
Turn-off time	toff		0.85	1.5	V_{GE}=±15V	
	tf		0.35	0.5	R_G=5.6Ω	
Diode forward on voltage	V_F			3.4	I_F=150A, V_{GE}=0V	V
Reverse recovery time	trr			350	I_F=150A	ns
Short-circuit withstand capability	Pw	10			Vcc=800V, V_{GE}=±15V R_G=2.7Ω	μs

5. Thermal resistance characteristics

Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Thermal resistance	Rth(j-c)			0.10	IGBT	℃/W
	Rth(j-c)			0.30	Diode	
	※ Rth(c-f)		0.025		the base to cooling fin	

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



7. Applicable category (適用範囲)

This specification is applied to IGBT module named 2MBI150NT-120-01.
本納入仕様書は、IGBTモジュール2MBI150NT-120-01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。

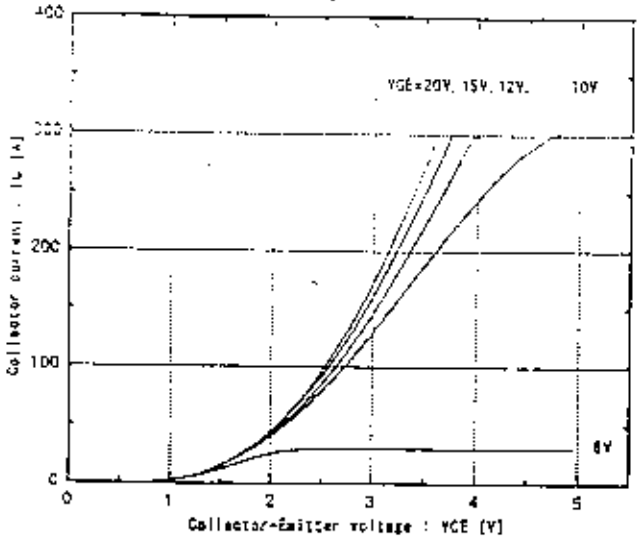
9. Heat sink mounting notes (ヒートシンク取り付け上の注意事項)

- 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使用した場合、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。

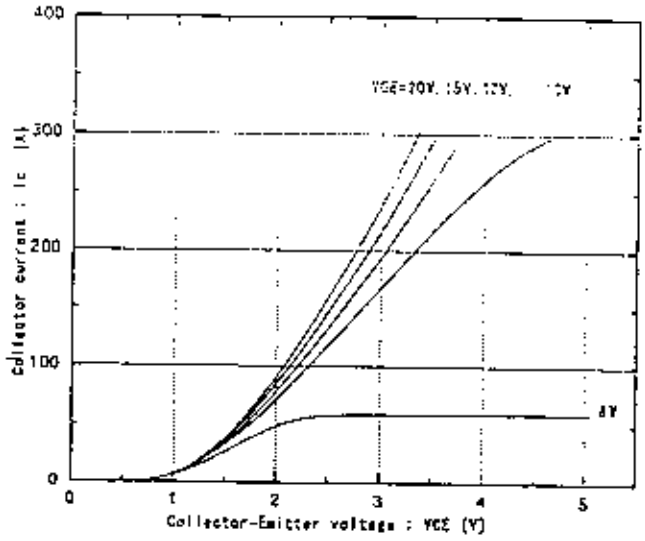
⑩ 10. Revers gate bias voltage (ゲート逆バイアス電圧)

- ⑧ ·Recommendable value of the revers gate bias voltage : -7V(typ.), -5V(min.) RG=5.6Ω
  ゲート逆バイアス電圧の推奨値 : -7V(typ.), -5V(min.) RG=5.6Ω
- ⑩ ·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。

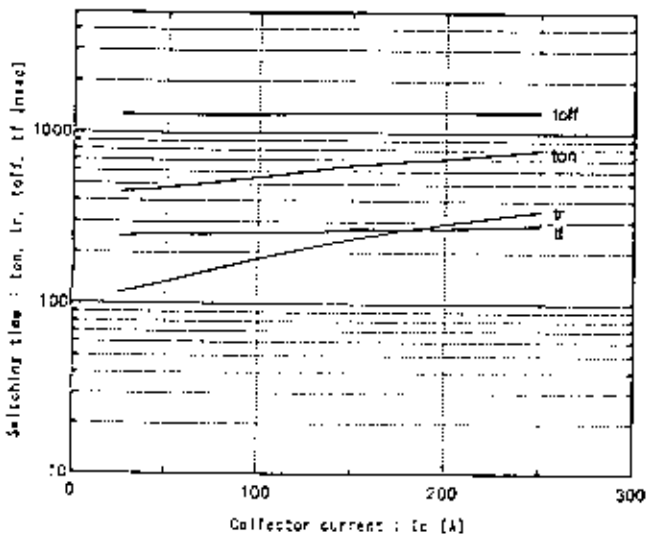
Collector current vs. Collector-Emitter voltage
Tj=25°C



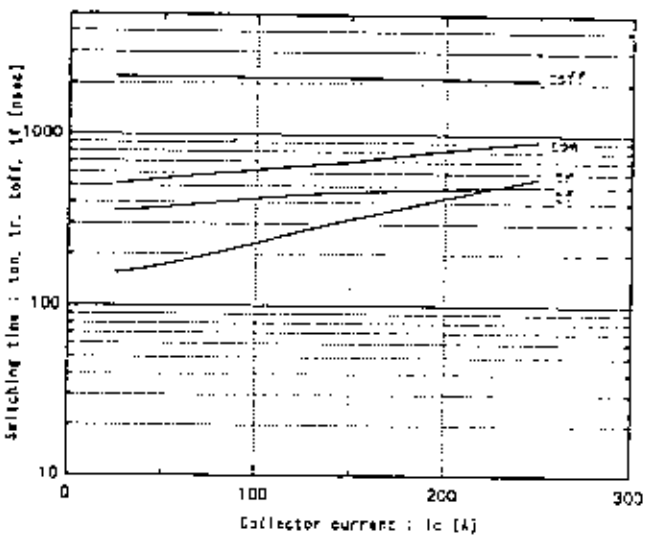
Collector current vs. Collector-Emitter voltage
Tj=125°C



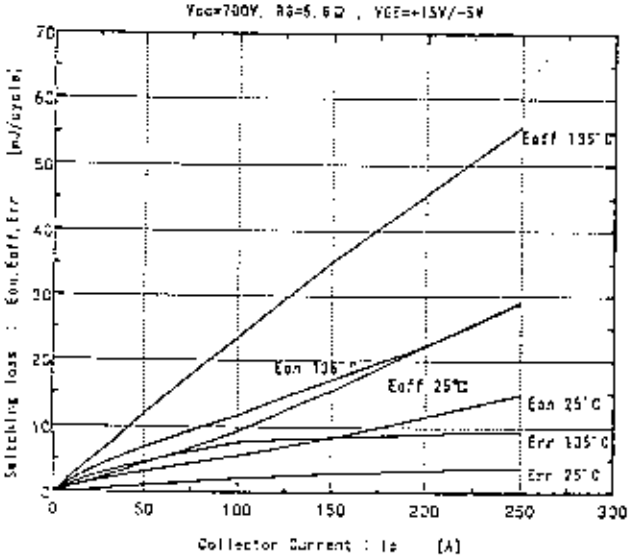
Switching time vs. Collector current
Vcc=700V, RG=5.6Ω, VGE=±15V/-5V, Tj=25°C



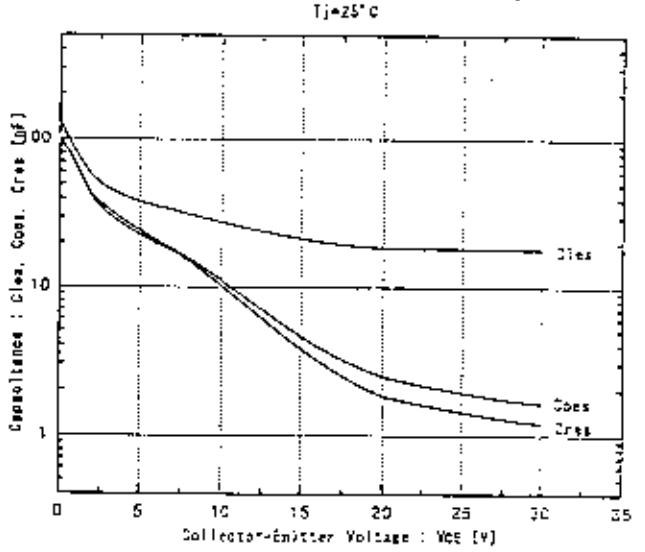
Switching time vs. Collector current
Vcc=700V, RG=5.6Ω, VGE=±15V/-5V, Tj=125°C



Switching loss vs. Collector current
Vcc=700V, RG=5.6Ω , VGE=±15V/-5V



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



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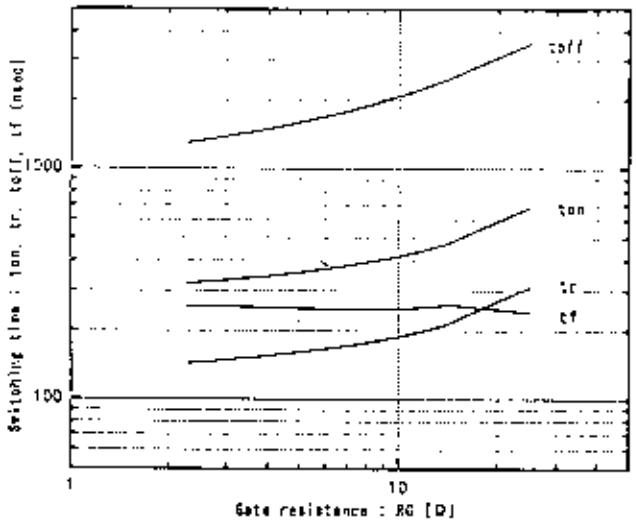
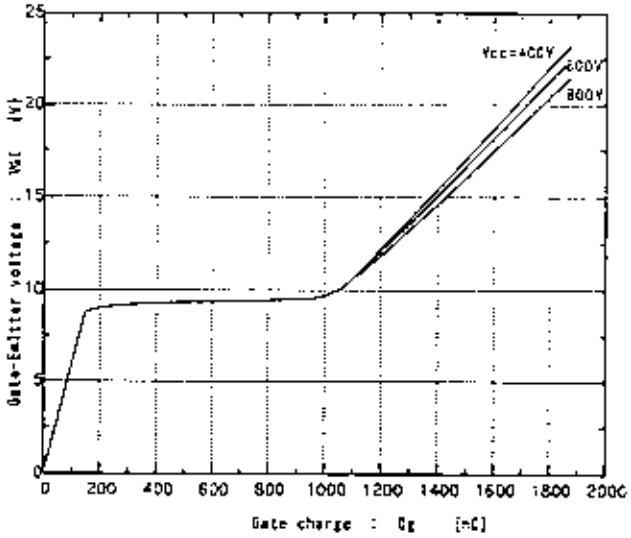
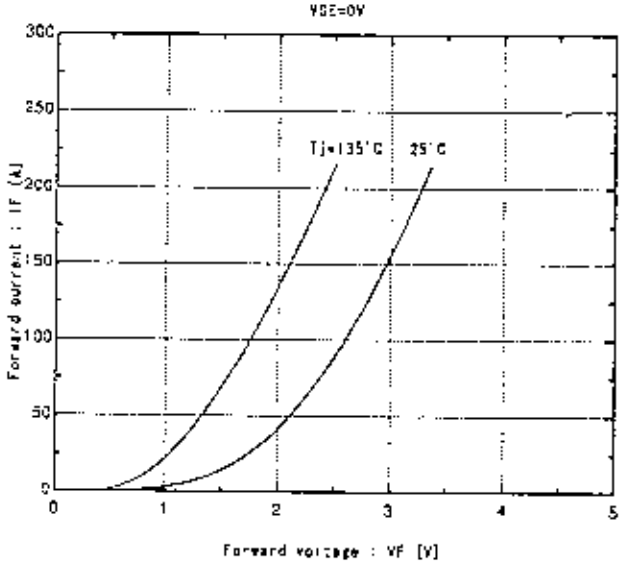
Switching time vs. RG
Vcc=700V, Ic=150A, VGE=+15V/-5V, Tj=25°C



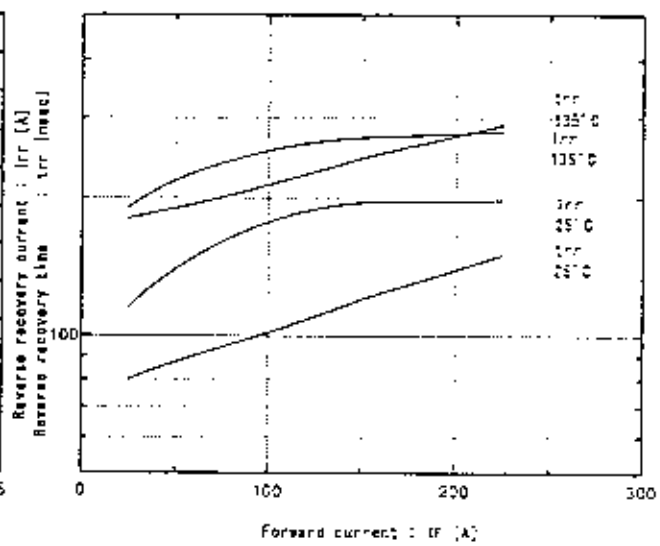
Dynamic input characteristics
Tj=25°C



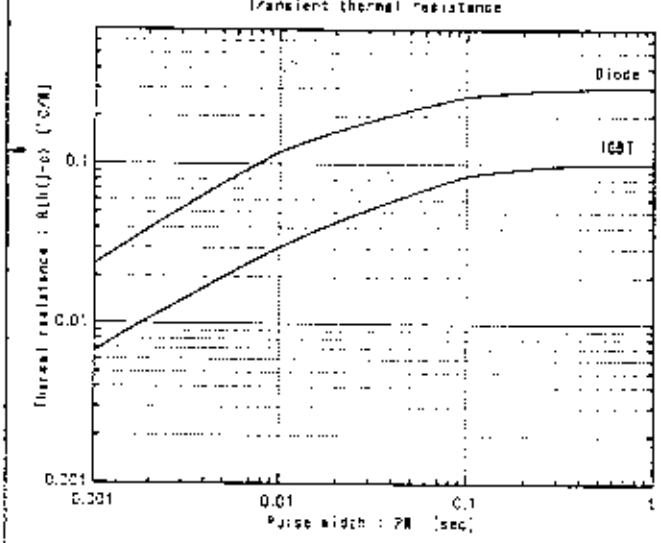
Forward current vs. Forward voltage
VGE=0V



Reverse recovery characteristics
trr, Irr vs. IF



Transient thermal resistance



Reversed biased safe operating area
+VGE=15V, -VGE≦15V, Tj≦135°C