

SPECIFICATION

Device Name : IGBT module

Type Name : 2MBI150NT-120A

Spec. No. : **MS5F4143**

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Fuji Electric Co., Ltd.
Matsumoto Factory

	DATE	NAME	APPROVED	Fuji Electric Co., Ltd.		
DRAWN	Sep. -19-'97	T. Kobayashi		DWG. NO	MS5F4143	a
CHECKED	Sep. -19-'97	S. Ozawa	T. HOSEN			1/8

H04-004-07

Revised Records

Date	Classification	Ind.	Content	Applied date	Drawn	Checked	Approved
Sep. 19. '97	enactment	—	—	Issued date	—	S. Ozawa	T. HOSEN
Sep. 24. '97	Revision	a	Paragraph 10. RG (P5/8)		Y. Kobayashi	S. Ozawa	T. HOSEN
Sep. 21. '98	Revision	b	erase tentative		J. Takahawa	S. Ozawa	T. HOSEN

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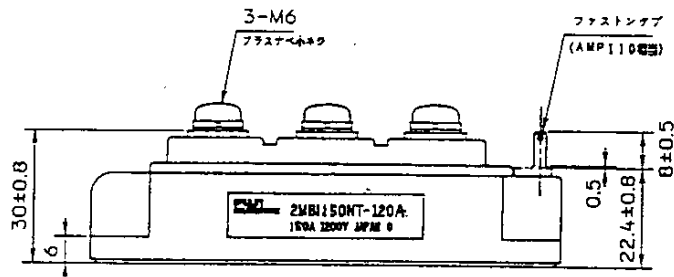
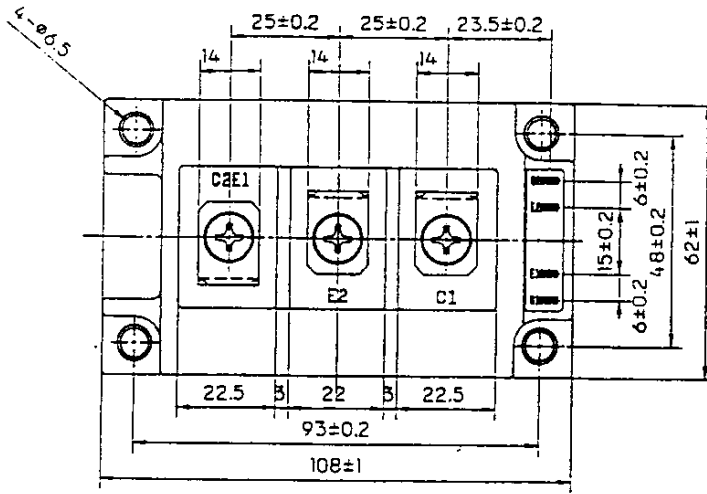
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2MBI150NT-120A

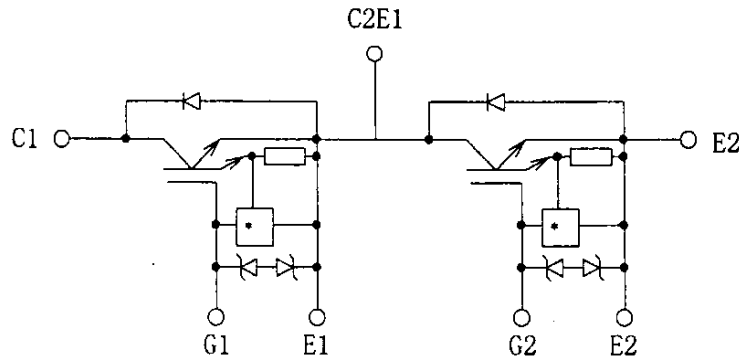
1. Outline Drawing

Unit : mm



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2. Equivalent circuit



* NLU (Over Current Limiting Circuit)

3. Absolute Maximum Ratings (at Tc=25°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	I _c	150	A
	1ms	I _c pulse	300	
		-I _c	150	
	1ms	-I _c pulse	300	
Max. power dissipation		PC	1210	W
Operating temperature		T _j	+150	°C
Storage temperature		T _{stg}	-40~+125	°C
Isolation voltage		V _{is}	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 T_j=25°C 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, I _c =150mA	V
Collector-Emitter saturation voltage	V _{CE(sat)}			3.5	V _{GE} =15V, I _c =150A	V
Input capacitance	C _{ies}		27000		V _{GE} =0V	pF
Output capacitance	C _{oes}		12500		V _{CE} =10V	
Reverse transfer capacitance	C _{res}		10000		f=1MHz	
Turn-on time	t _{on}		0.65	1.2	V _{CC} =600V	μs
	t _r		0.25	0.6	I _c =150A	
Turn-off time	t _{off}		0.85	1.5	V _{GE} =±15V	μs
	t _f		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	t _{rr}			350	I _F =150A	ns
Short-circuit withstand capability	P _w	10			V _{CC} =800V, V _{GE} =+15V R _G =2.7Ω	μs

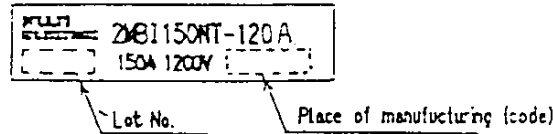
5. Thermal resistance characteristics

Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Thermal resistance	R _{th(j-c)}			0.10	IGBT	°C/W
	R _{th(j-c)}			0.24	Diode	
	※ R _{th(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.

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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 2MB1150NT-120A.
本納入仕様書は、IGBTモジュール 2MB1150NT-120A 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°C and humidity of 45 to 75%.
常温保存が望ましい。(5~35°C、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の保管すること。
- 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適用した場合、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。

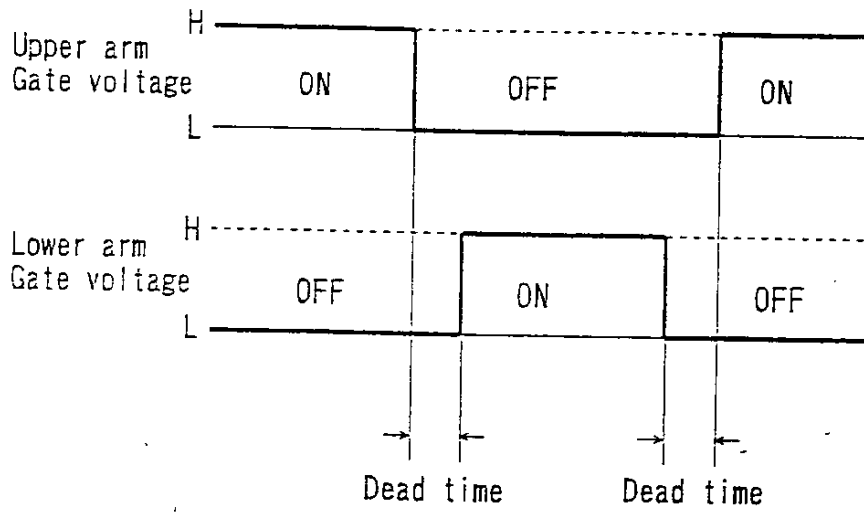
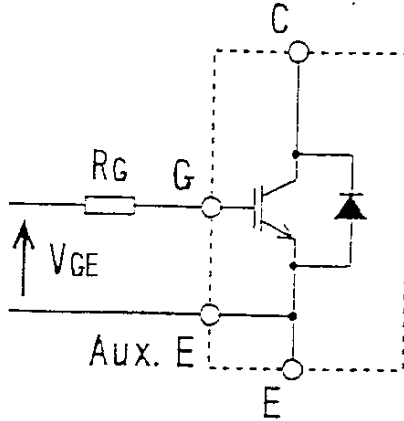
10. Reverse gate bias voltage (ゲート逆バイアス)

- Recommendable value of the reverse gate bias voltage : -7V(typ.), -5V(min.), $RG=9.1\Omega$.
ゲート逆バイアスの推奨値 : -7V(typ.), -5V(min.), $RG=5.6\Omega$
- The reverse gate bias voltage means the voltage between the gate terminal and the auxiliary emitter terminal of the module.
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。

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11. Setting dead-time (デッドタイムの設定)

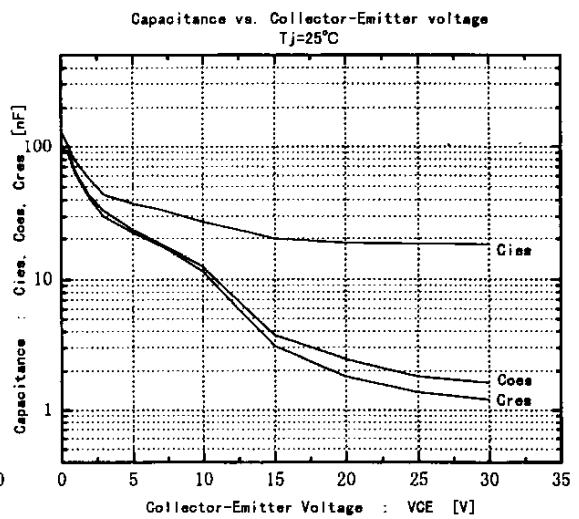
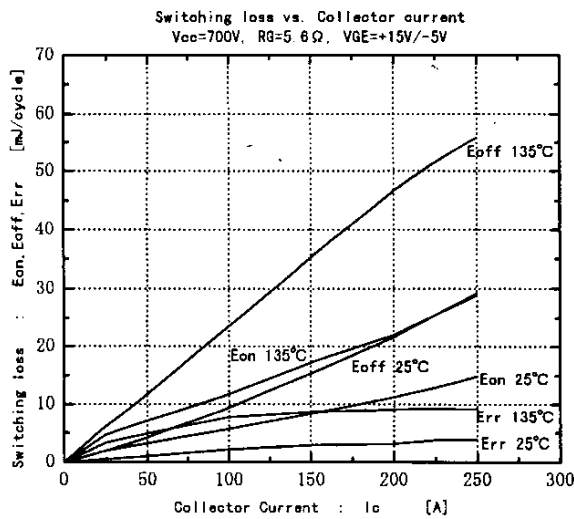
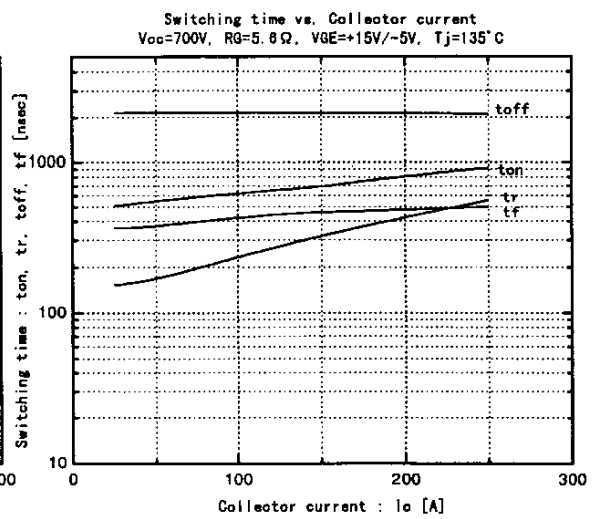
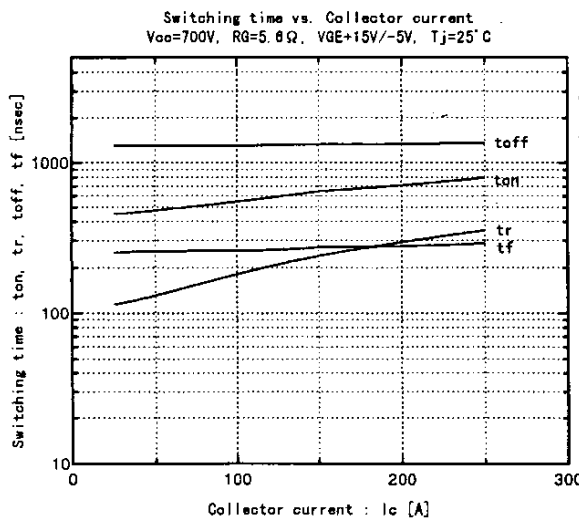
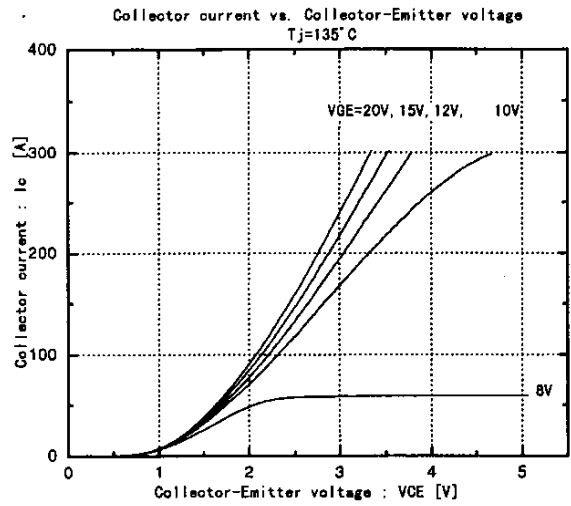
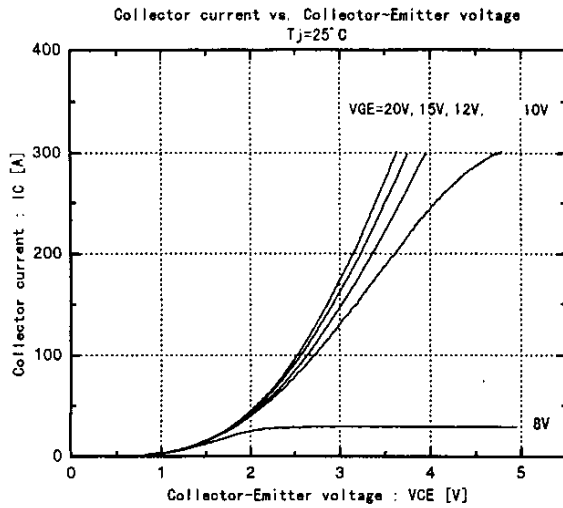
- Recommendable value of the dead-time : $3\mu\text{s}$ (min)
- デッドタイムの推奨値 : $3\mu\text{s}$ (min)



Dead time timing chart

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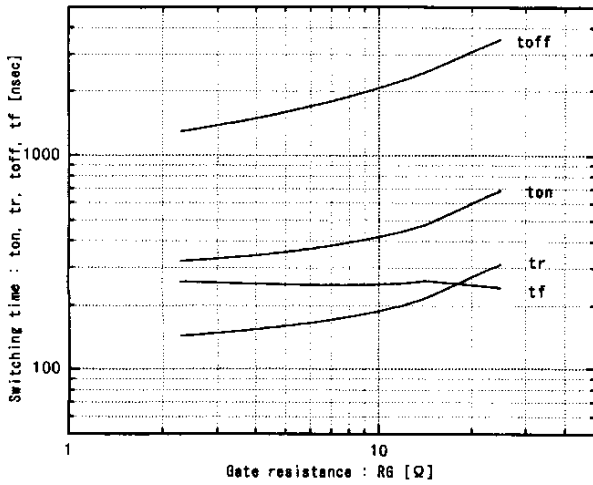
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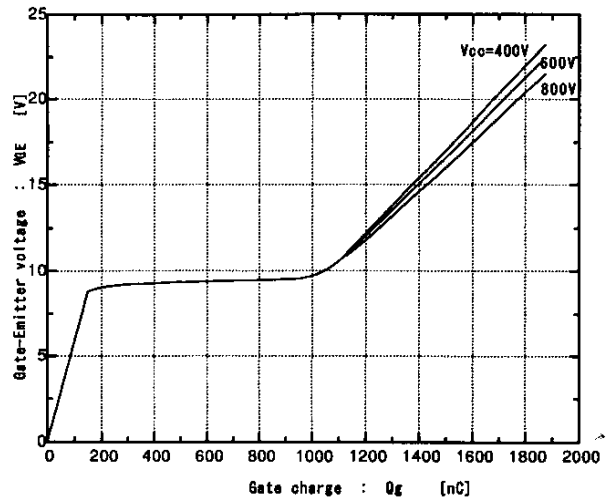
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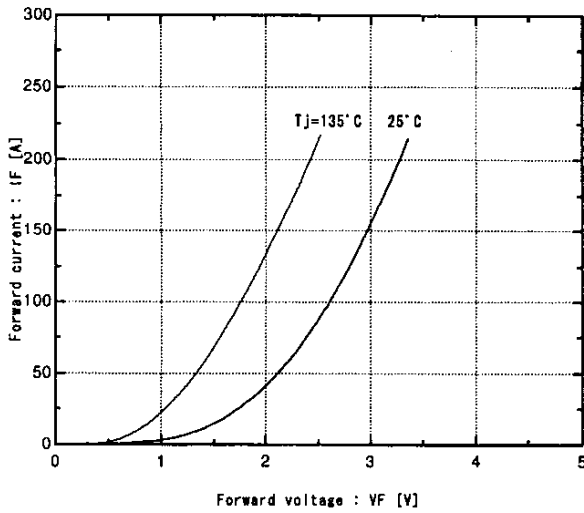
Switching time vs. R_G
 $V_{CC}=700V, I_C=150A, V_{GE}=+15V/-5V, T_J=25^\circ C$



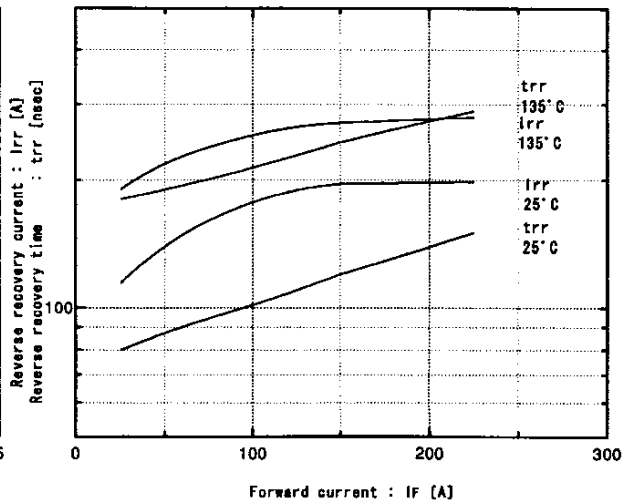
Dynamic input characteristics
 $T_J=25^\circ C$



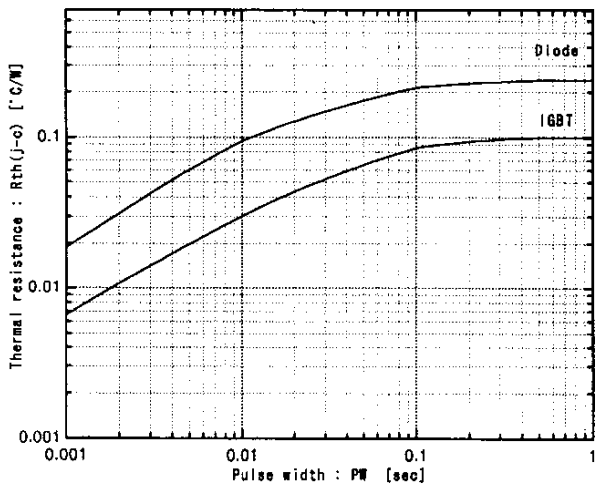
Forward current vs. Forward voltage
 $V_{GE}=0V$



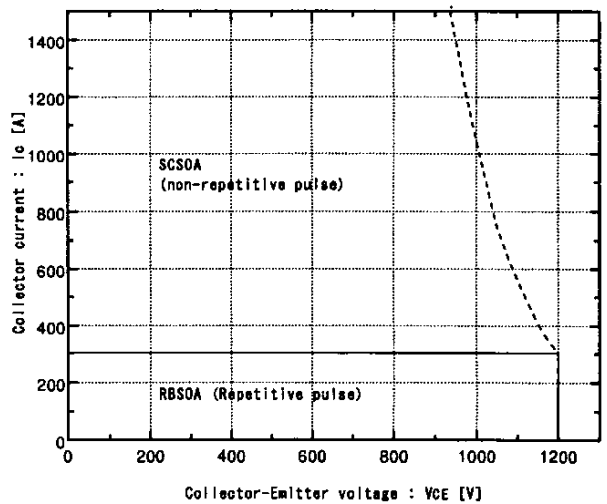
Reverse recovery characteristics
 t_{rr}, I_{rr} vs. I_F



Transient thermal resistance



Reversed biased safe operating area
 $+V_{GE}=15V, -V_{GE}\leq 15V, T_J\leq 135^\circ C$



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