SPECIFICATION

Device Name : IGBT MODULE

Type Name : 6MBI450U4-120

Spec. No. : MS5F 6020

	DATE	NAME	APPROVED
DRAWN	Jan.- 20 -'05	S.Miyashita	Y.Seki
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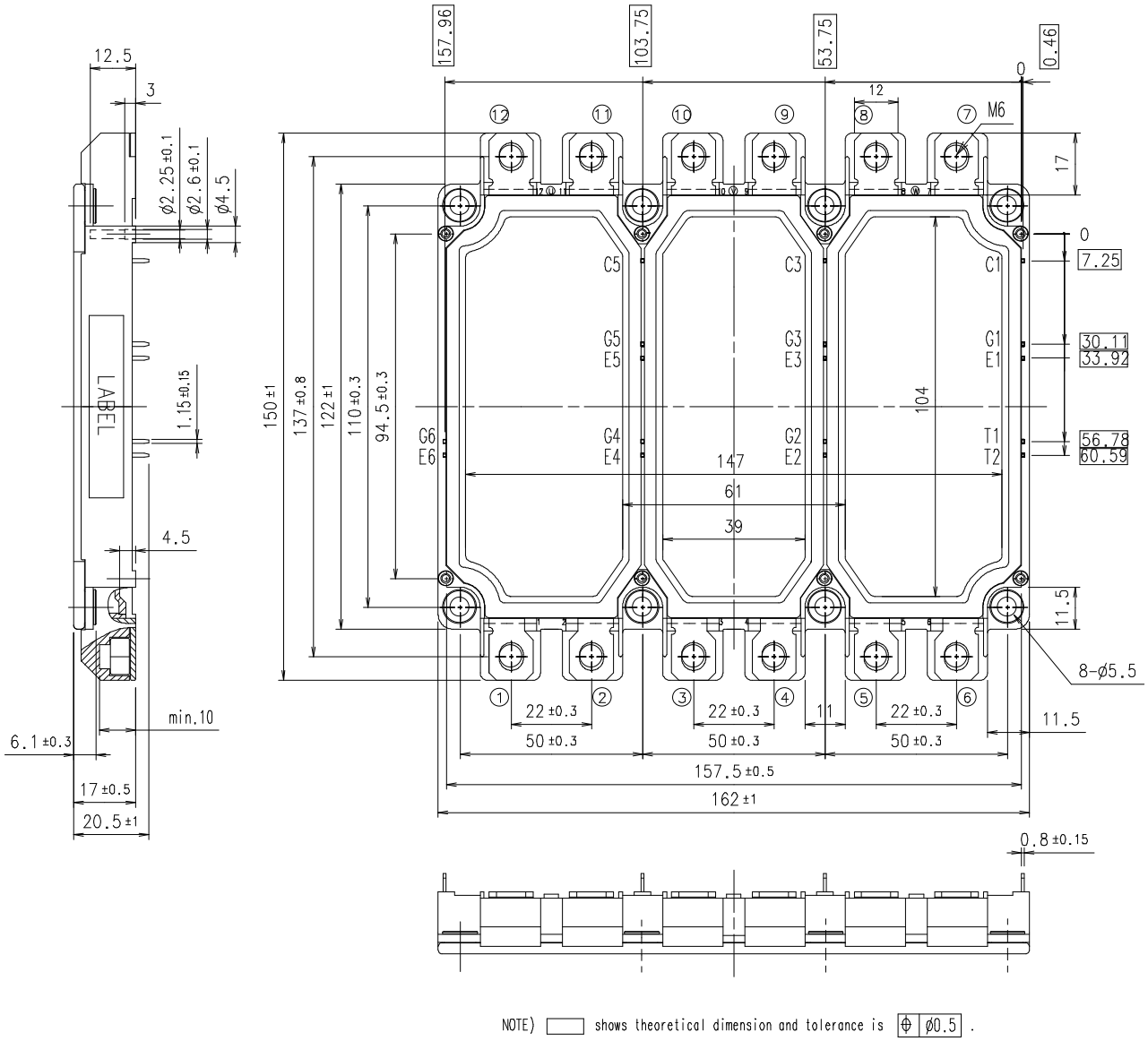
CHECKED	- -	K.Yamada	

Fuji Electric Device Technology Co.,Ltd.

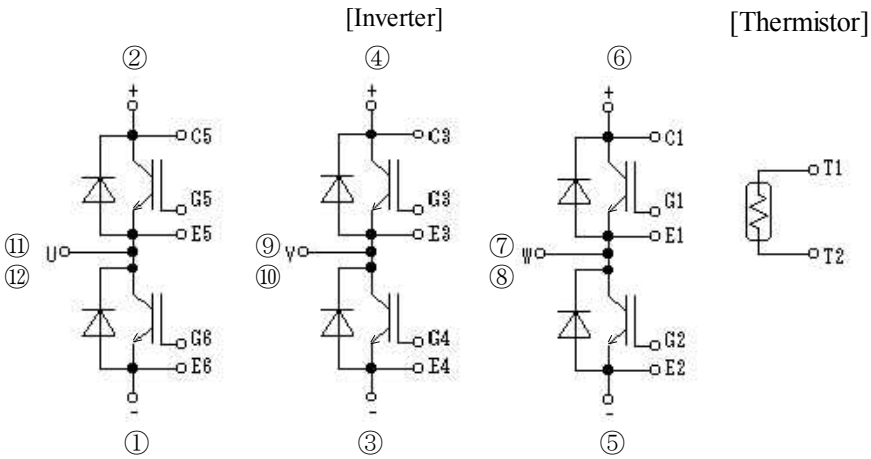
DWG.NO. MS5F6020 1/14 a

1. Outline Drawing (Unit : mm)



NOTE) ☐ shows theoretical dimension and tolerance is ⌖ | ϕ0.5 .

2. Equivalent circuit



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

Items		Symbols	Conditions		Maximum Ratings	Units
Collector-Emitter voltage		VCES			1200	V
Gate-Emitter voltage		VGES			±20	V
Collector current		Ic	Continuous	Tc=25°C	600	A
				Tc=80°C	450	
		Icp	1ms	Tc=25°C	1200	
				Tc=80°C	900	
		-Ic			450	
		-Ic pulse	1ms		900	
Collector Power Dissipation		Pc	1 device		2080	W
Junction temperature		Tj			+150	°C
Storage temperature		Tstg			-40 to +125	
Isolation voltage	between terminal and copper base (*1)	Viso	AC : 1min.		2500	VAC
	between thermistor and others (*2)					
Screw Torque	Mounting (*3)	-			3.5	N m
	Terminals (*4)				4.5	

(*1) All terminals should be connected together when isolation test will be done.
(*2) Two thermistor terminals should be connected together, each other terminals should be connected together and shorted to base plate when isolation test will be done.
(*3) Recommendable Value : 2.5 to 3.5 Nm (M5)
(*4) Recommendable Value : 3.5 to 4.5 Nm (M6)

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

Items		Symbols	Conditions		Characteristics min.	Characteristics typ.	Characteristics max.	Units
Inverter	Zero gate voltage collector current	ICES	VCE=1200V VGE=0V		-	-	3.0	mA
	Gate-Emitter leakage current	IGES	VCE=0V VGE=±20V		-	-	600	nA
	Gate-Emitter threshold voltage	VGE(th)	VCE=20V Ic=450mA		4.5	6.5	8.5	V
	Collector-Emitter saturation voltage	VCE(sat) (terminal)	Ic=450A VGE=15V	Tj=25°C	-	ⓐ 2.40	ⓐ 2.55	V
				Tj=125°C	-	ⓐ 2.60	-	
		VCE(sat) (chip)		Tj=25°C	-	1.90	2.05	
				Tj=125°C	-	2.10	-	
	Input capacitance	Cies	VCE=10V,VGE=0V,f=1MHz		-	50	-	nF
	Turn-on time	ton	Vcc=600V Ic=450A VGE=±15V RG=1.1Ω		-	0.32	1.20	us
		tr			-	0.10	0.60	
		tr(i)			-	0.03	-	
	Turn-off time	toff			-	0.41	1.00	
		tf			-	0.07	0.30	
	Forward on voltage	VF (terminal)	IF=450A VGE=0V	Tj=25°C	-	2.10	2.25	V
				Tj=125°C	-	2.20	-	
		VF (chip)		Tj=25°C	-	1.65	1.80	
				Tj=125°C	-	1.75	-	
	Reverse recovery time	trr	IF=450A		-	-	0.35	us
	Lead resistance, terminal-chip (*5)	R lead			-	1.00	-	mΩ
Thermistor	Resistance	R	T=25°C		-	5000	-	Ω
			T=100°C		465	495	520	
	B value	B	T=25/50°C		3305	3375	3450	K

(*5) Biggest internal terminal resistance among arm.

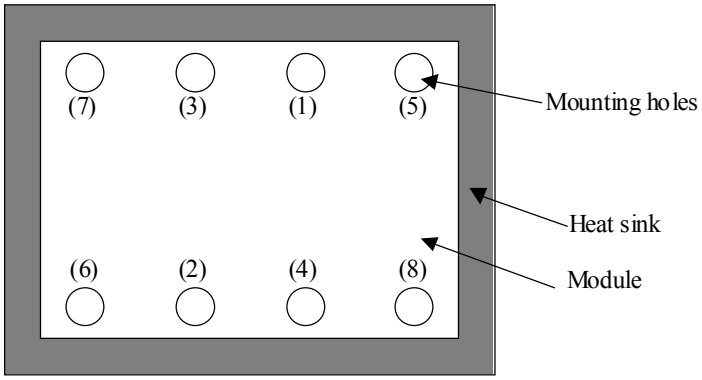
5. Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance(1device)	Rth(j-c)	IGBT	-	-	0.06	°C/W
		FWD	-	-	0.10	
Contact Thermal resistance (1 device) (*6)	Rth(c-f)	with Thermal Compound	-	0.0167	-	

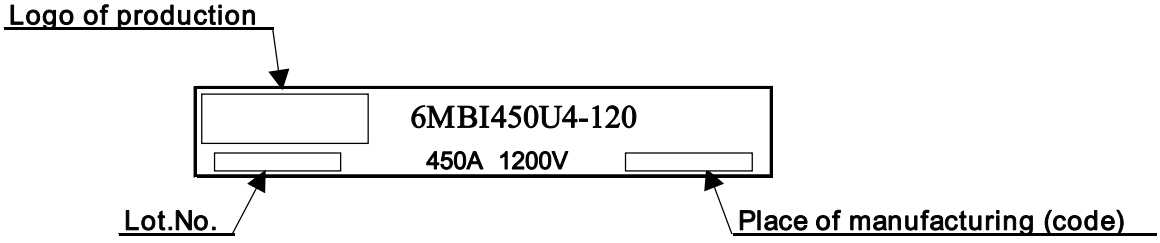
(*6) This is the value which is defined mounting on the additional cooling fin with thermal compound.

6.Recommend way of module mounting to Heat sink Clamping

(1) Initial : 1/3 specified torque, sequence (1)→(2)→(3)→(4)→(5)→(6)→(7)→(8)
(2) Final :Full specified torque (3.5 Nm),sequence(4)→(3)→(2)→(1)→(8)→(7)→(6)→(5)



7. Indication on module



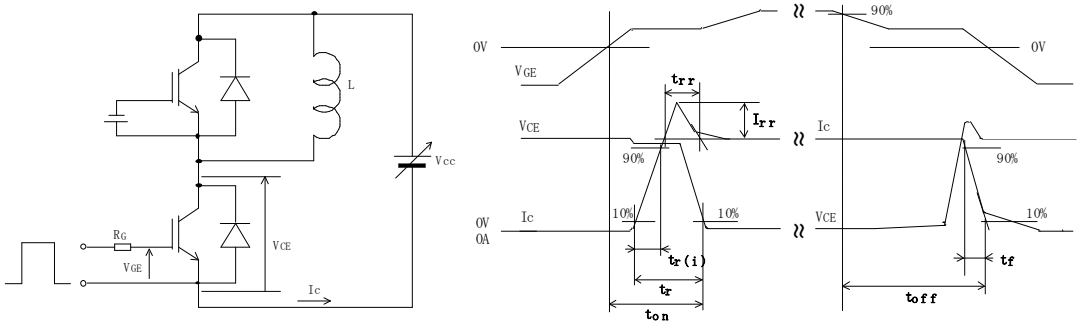
8. Applicable category

This specification is applied to IGBT-Module named 6MBI450U4-120.

9. Storage and transportation notes

- The module should be stored at a standard temperature of 5 to 35°C and humidity of 45 to 75% .
- Store modules in a place with few temperature changes in order to avoid condensation on the module surface.
- Avoid exposure to corrosive gases and dust.
- Avoid excessive external force on the module.
- Store modules with unprocessed terminals.
- Do not drop or otherwise shock the modules when transporting.

10. Definitions of switching time



11. Packing and Labeling

Display on the packing box

- Logo of production
- Type name
- Lot No
- Products quantity in a packing box