

SPECIFICATION

Device Name : IGBT MODULE

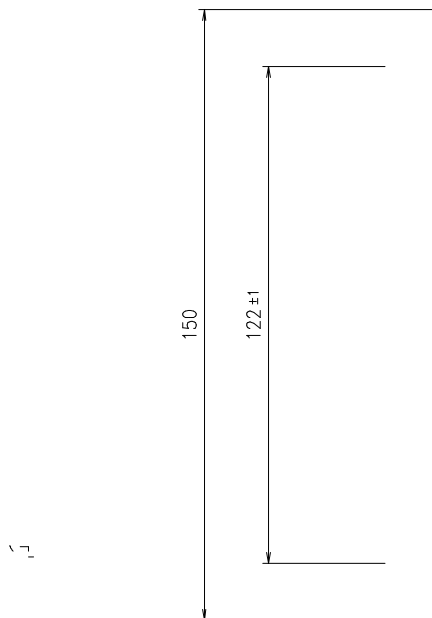
Type Name : 6MBI450U4-170

Spec. No. : MS5F 6097

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	DATE	NAME	APPROVED	Fuji Electric Device Technology Co., Ltd.		
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CHECKED	Apr.- 15 - '05	T.Miyasaka				a
CHECKED	- -	K.Yamada				

1. Outline Drawing (Unit : mm)



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2. Equivalent circuit

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

Maximum Ratings Units

Tc=25°C
Tc=80°C
Tc=25°C
Tc=80°C

Screw Mounting (*3)
Torque Te 2 M

- (*1) All terminals should be connected together when isolation test will be done. b
- (*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 : Mounting 2.5~3.5 Nm (M5) 2
- (*4) Recommendable Value : Terminals 3.5~4.5 Nm (M6) M

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

	Symbols	Conditions ●				
w M w M	ICES	VGE = 0V	-	-	3.0	mA
		VCE = 1700V			M	
2	IGES	VCE = 0V	-	-	8	nA
		VGE=±20V			600	
M w	VGE(th)	2w	6.5	2	8.5	V
			-	2.80	2.95	
			-	3.20	-	V
			-	2.25	2.40	
			-	2.65	-	
	o	2	-	42	-	nF
			-	0.62		
M		VGE=±15V	-	0.05		
			-	0.55		
Forward on voltage	VF (terminal) VF (chip)	Tj= 25°C	-			
		Tj=125°C	-			
		Tj= 25°C				
Lead resistance, terminal-chip(*5)	R lead		-	1.00		mΩ
Thermistor Resistance		T = 25°C				Ω
		T =100°C	465	495	520	
Thermistor B Value	w M	T = 25/50°C	3305	3375	3450	KM

(*5) Biggest internal arm.

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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 (1device) (*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

Logo of production

Lot.No.

6MBI450U4-170
450A 1700V

Place of manufacturing (code)

8.Applicable category

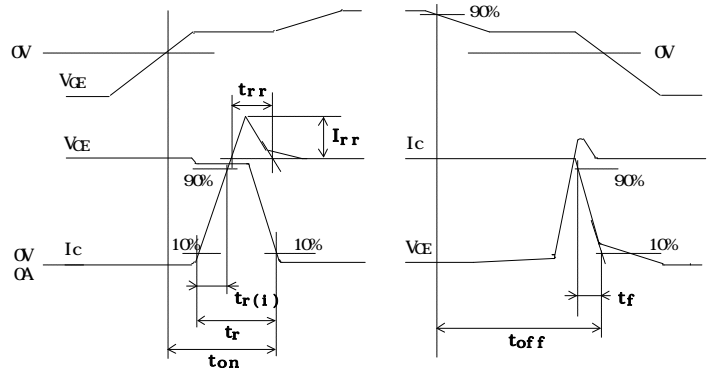
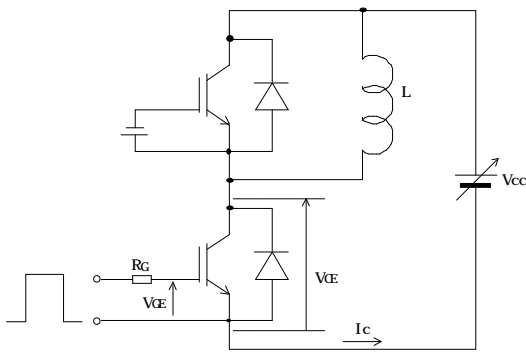
This specification is applied to IGBT Module named 6MBI450U4-170 .

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.

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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

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12. Relia

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Reliability Test Items

Test categories	Test items	Test methods and conditions	Reference norms EIAJ ED-4701 (Aug.-2001 edition)	Number of sample	Acceptance number	
1	High temperature Reverse Bias	Test temp.	Test Method 101	5	(0 : 1)	
						: $T_a = 125 \pm 5$ ($T_j = 150 \pm 5$)
		Bias Voltage				: $V_C = 0.8 \times V_{CES}$
		Bias Method				: Applied DC voltage to C-E $V_{GE} = 0V$
	Test duration	: 1000hr.				
2	High temperature Bias (for gate)	Test temp.	Test Method 101	5	(0 : 1)	
						: T_a

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Reliability Test Results

Test
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Tj= 25°C / chip

VGE=15V / chip

Tj=25°C / chip

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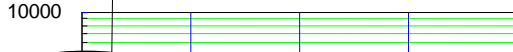
Capacitance vs. Collector-Emitter voltage (typ.)

VGE=0V, °f= 1MHz, Tj= 25°C

Dynamic Gate charge (typ.)

Vc

Switching time vs. Collector current (typ.)
V_{cc}=900V, V_{GE}=±15V, R_g=1.1Ω, T_j= 25°C



Switching time vs. Collector current (typ.)
V_{cc}=900V, V_{GE}=±15V, R_g=1.1Ω, T_j=125°C

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Switching
V_{cc}=900V,

Switching loss vs. Gate resistance (typ.)
V_{cc}=900V, I_c=450A, V_{GE}=±15V, T_j= 125°C

Reverse bias safe operating area (max.)
+V_{GE}=15V, -V_{GE} ≤ 15V, R_G ≥ 1.1Ω, T_j ≤ 125°C
Stray inductance ≤ 100nH

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