

# SPECIFICATION

Device Name : Power Integrated Module

Type Name : 7MBR100U4B120

Spec. No. : MS6M 0856

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	DATE	NAME	APPROVED	<b>Fuji Electric Device Technology Co., Ltd.</b>		
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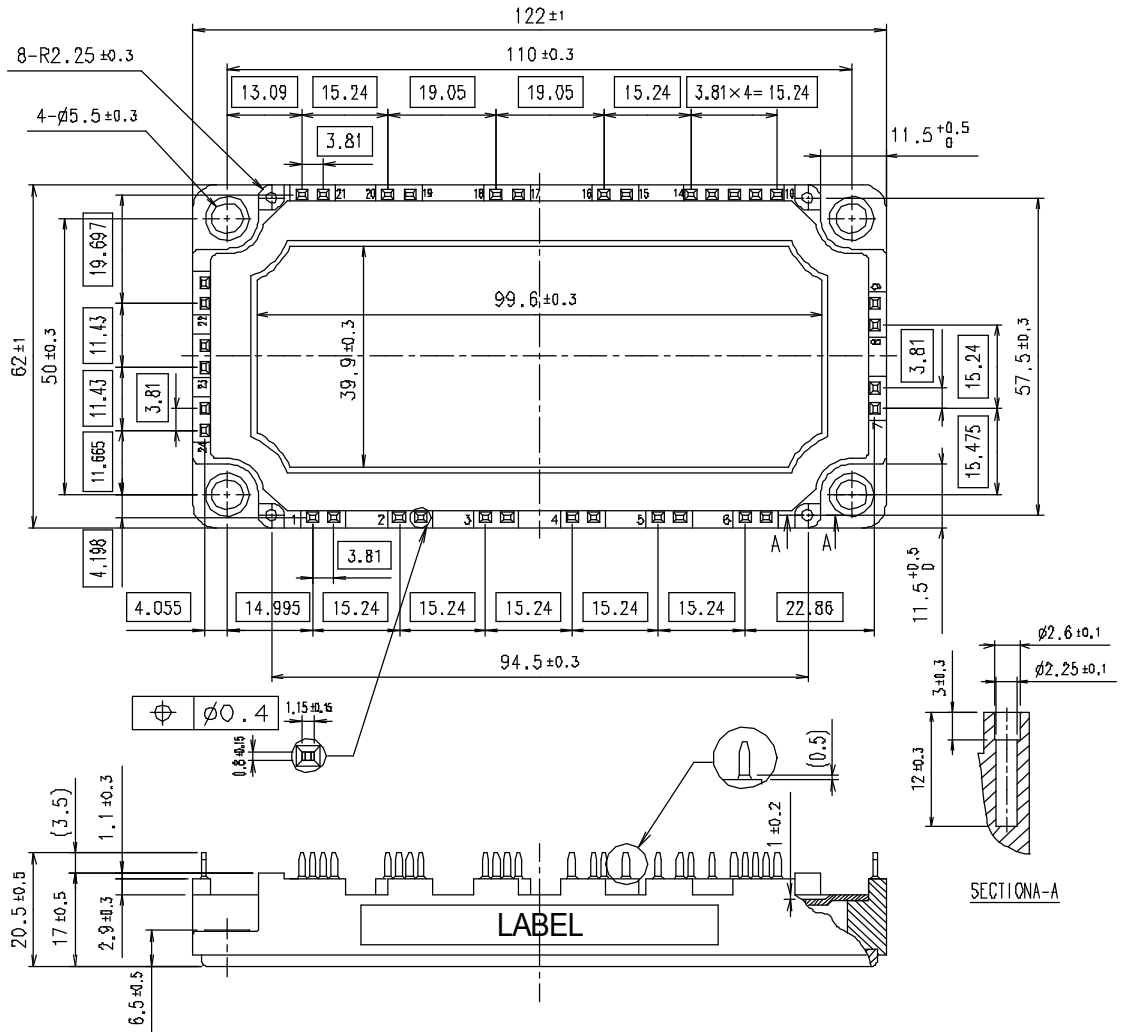
# Revised Records

Date	Classification	Ind.	Content	Applied date	Drawn	Checked	Checked	Approved
Feb.-02-'05	Enactment	—	—————	Issued date	—	M.Watanabe	K.Yamada	Y.Seki

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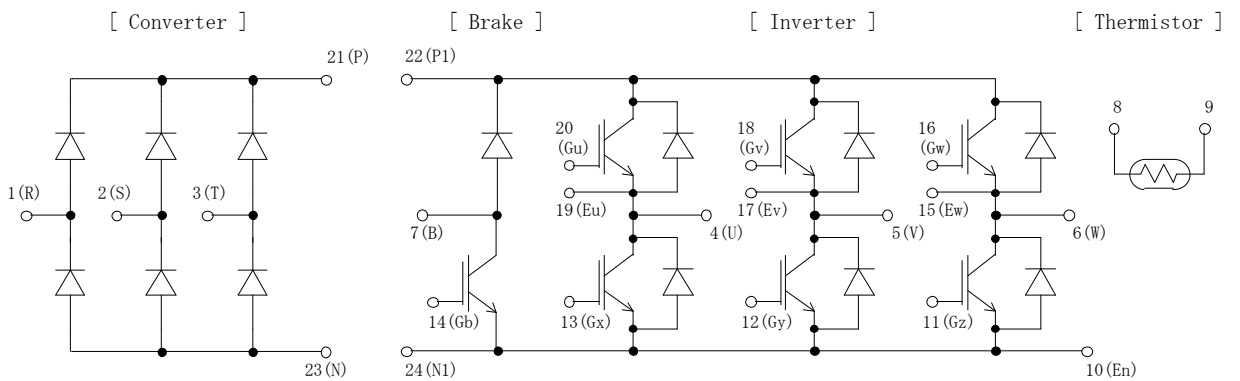

# 7MBR100U4B120

## 1. Outline Drawing ( Unit : mm )



shows theoretical dimension.  
 ( ) shows reference dimension.

## 2. Equivalent circuit



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

Items		Symbols	Conditions	Maximum Ratings	Units	
Inverter	Collector-Emitter voltage	VCES		1200	V	
	Gate-Emitter voltage	VGES		±20	V	
	Collector current	Ic	Continuous	Tc=25°C	100	A
				Tc=80°C	75	
		Icp	1ms	Tc=25°C	200	
				Tc=80°C	150	
		-Ic			100	
-Ic pulse	1ms		200			
Collector Power Dissipation	Pc	1 device		390	W	
Brake	Collector-Emitter voltage	VCES		1200	V	
	Gate-Emitter voltage	VGES		±20	V	
	Collector current	Ic	Continuous	Tc=25°C	50	A
				Tc=80°C	35	
		Icp	1ms	Tc=25°C	100	
				Tc=80°C	70	
Collector Power Dissipation	Pc	1 device		205	W	
Repetitive peak reverse Voltage (Diode)	VRRM			1200	V	
Converter	Repetitive peak reverse Voltage	VRRM		1600	V	
	Average Output Current	Io	50Hz/60Hz sine wave	100	A	
	Surge Current (Non-Repetitive)	IFSM	Tj=150°C, 10ms	520	A	
	I <sup>2</sup> t (Non-Repetitive)	I <sup>2</sup> t	half sine wave	1352	A <sup>2</sup> s	
Junction temperature	Tj			150	°C	
Storage temperature	Tstg			-40 ~ +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	

(\*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 : 2.5~3.5 Nm (M5)

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

Items	Symbols	Conditions	Characteristics			Units		
			min.	typ.	max.			
Inverter	Zero gate voltage Collector current	ICES	VGE = 0V VCE = 1200V	-	-	1.0	mA	
	Gate-Emitter leakage current	IGES	VCE = 0V VGE=±20V	-	-	200	nA	
	Gate-Emitter threshold voltage	VGE(th)	VCE = 20V Ic = 100mA	4.5	6.5	8.5	V	
	Collector-Emitter saturation voltage	VCE(sat) (terminal)	VGE=15V Ic = 100A	Tj= 25°C	-	2.60	2.85	V
				Tj=125°C	-	2.95	-	
		VCE(sat) (chip)	Tj= 25°C	-	2.10	2.35		
			Tj=125°C	-	2.45	-		
	Input capacitance	Cies	VCE=10V,VGE=0V,f=1MHz	-	8	-	nF	
	Turn-on time	ton	Vcc = 600V	-	0.38	1.20	μs	
		tr	Ic = 100A	-	0.13	0.60		
		tr (i)	VGE=±15V	-	0.03	-		
	Turn-off time	toff	Rg = 9.1 Ω	-	0.41	1.00	μs	
		tf		-	0.07	0.30		
Forward on voltage	VF (terminal)	VGE=0V IF = 100A	Tj= 25°C	-	2.60	2.85	V	
			Tj=125°C	-	2.90	-		
	VF (chip)	Tj= 25°C	-	2.10	2.35			
		Tj=125°C	-	2.40	-			
Reverse recovery time	trr	IF = 100A	-	-	0.35	μs		
Brake	Zero gate voltage Collector current	ICES	VGE = 0V VCE = 1200V	-	-	1.0	mA	
	Gate-Emitter leakage current	IGES	VCE = 0V VGE=±20V	-	-	200	nA	
	Collector-Emitter saturation voltage	VCE(sat) (terminal)	VGE=15V Ic = 50A	Tj= 25°C	-	2.25	2.65	V
				Tj=125°C	-	2.60	-	
		VCE(sat) (chip)	Tj= 25°C	-	2.00	2.40		
			Tj=125°C	-	2.35	-		
	Turn-on time	ton	Vcc = 600V	-	0.53	1.20	μs	
		tr	Ic = 50A	-	0.43	0.60		
toff		VGE=±15V	-	0.37	1.00			
Turn-off time	tf	Rg = 33 Ω	-	0.07	0.30	μs		
	Reverse current	IRRM	VR=1200V	-	-	1.0	mA	
Converter	Forward on voltage	VFM	VGE=0V	terminal	-	1.55	1.90	V
			IF = 100A	chip	-	1.40	-	
Reverse current	IRRM	VR=1600V	-	-	1.0	mA		
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	

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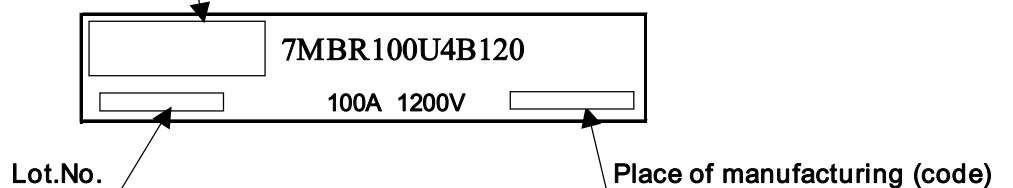
### 5. Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance(1device)	Rth(j-c)	Inverter IGBT	-	-	0.32	°C/W
		Inverter FWD	-	-	0.58	
		Brake IGBT	-	-	0.60	
		Converter Diode	-	-	0.50	
Contact Thermal resistance (1device) (*4)	Rth(c-f)	with Thermal Compound	-	0.05	-	

(\*4) This is the value which is defined mounting on the additional cooling fin with thermal compound.

### 6. Indication on module

#### Logo of production



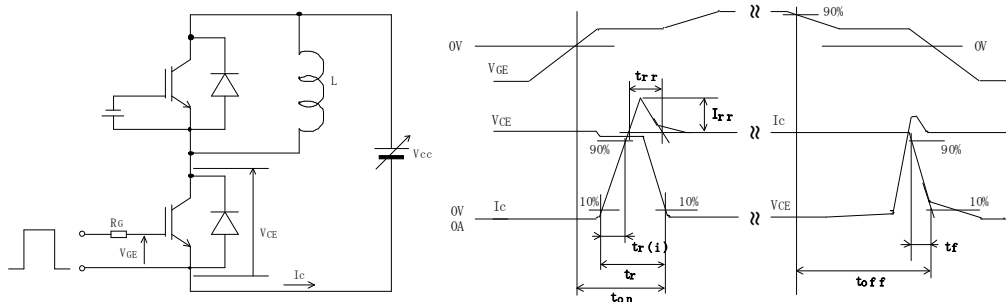
### 7.Applicable category

This specification is applied to Power Integrated Module named 7MBR100U4B120 .

### 8.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.

### 9. Definitions of switching time



### 10. Packing and Labeling

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