

SPECIFICATION

Device Name : IGBT MODULE

Type Name : 2MBI150U4A-120

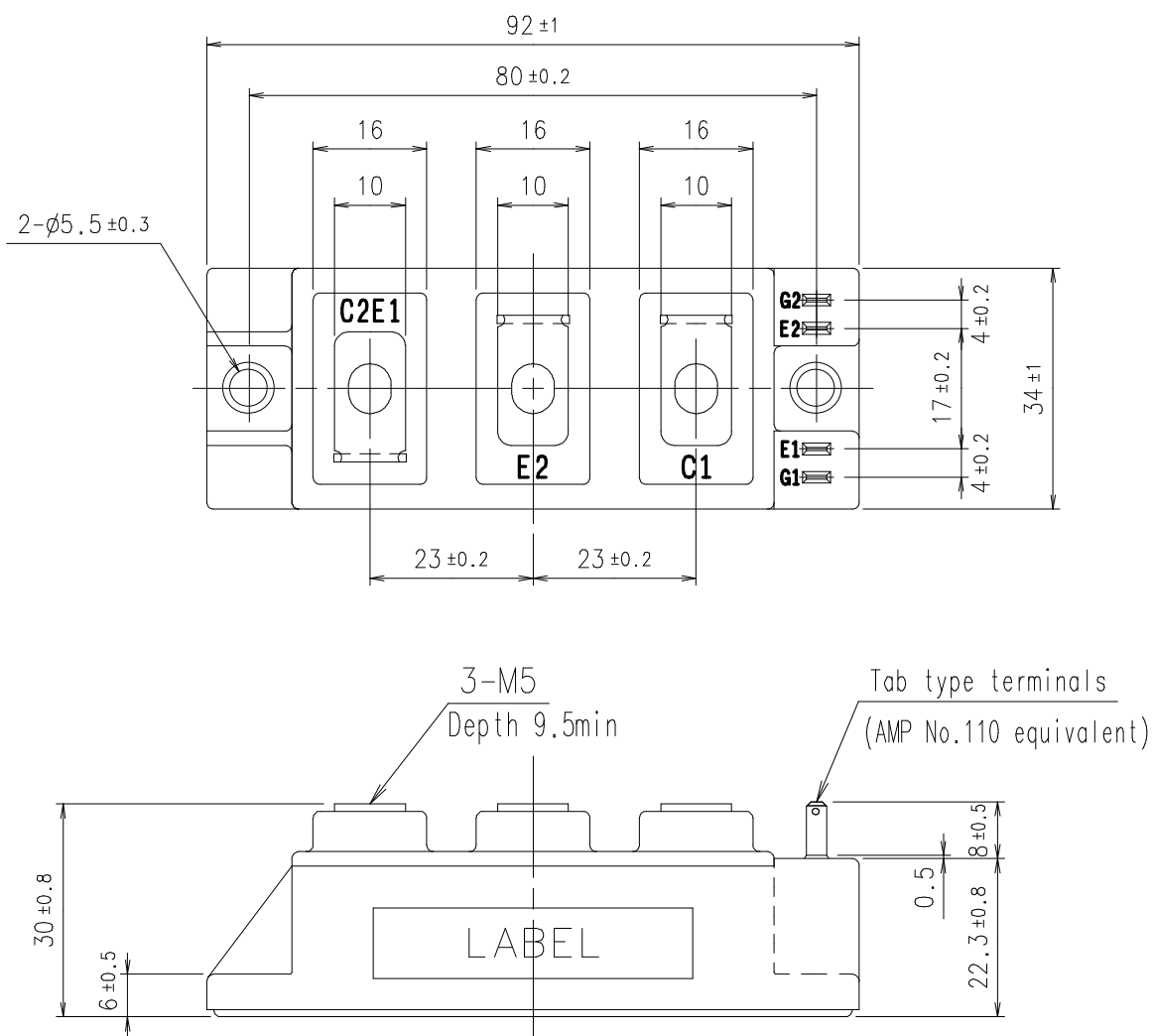
Spec. No. : MS5F 6031

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2MB1150U4A-120

1. Outline Drawing (Unit : mm)



2. Equivalent circuit



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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	200	A
			Tc=80°C	150	
	Icp	1ms	Tc=25°C	400	
			Tc=80°C	300	
	-Ic			150	
-Ic pulse	1ms		300		
Collector Power Dissipation		Pc	1 device	735	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
Screw Torque	Mounting (*2)			3.5	N m
	Terminals (*2)				

(*1) All terminals should be connected together when isolation test will be done.

(*2) Recommendable Value : 2.5 to 3.5 Nm (M5)

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

Items	Symbols	Conditions	Characteristics			Units	
			min.	typ.	max.		
Zero gate voltage collector current	ICES	VCE=1200V VGE=0V	-	-	1.0	mA	
Gate-Emitter leakage current	IGES	VCE=0V VGE=±20V	-	-	200	nA	
Gate-Emitter threshold voltage	VGE(th)	VCE=20V Ic=150mA	4.5	6.5	8.5	V	
Collector-Emitter saturation voltage	VCE(sat) (terminal)	Ic=150A VGE=15V	Tj=25°C	-	2.15	2.30	V
			Tj=125°C	-	2.35	-	
	VCE(sat) (chip)		Tj=25°C	-	1.90	2.05	
			Tj=125°C	-	2.10	-	
Input capacitance	Cies	VCE=10V, VGE=0V, f=1MHz	-	17	-	nF	
Turn-on time	ton	Vcc=600V	-	0.32	1.20	us	
	tr	Ic=150A	-	0.10	0.60		
	tr(i)	VGE=±15V	-	0.03	-		
Turn-off time	toff	RG=2.2Ω	-	0.41	1.00	us	
	tf		-	0.07	0.30		
Forward on voltage	VF (terminal)	IF=150A VGE=0V	Tj=25°C	-	1.90	2.05	V
			Tj=125°C	-	2.00	-	
	VF (chip)		Tj=25°C	-	1.65	1.80	
			Tj=125°C	-	1.75	-	
Reverse recovery time	trr	IF=150A	-	-	0.35	us	
Lead resistance, terminal-chip (*3)	R lead		-	1.39	-	mΩ	

(*3) Biggest internal terminal resistance among arm.

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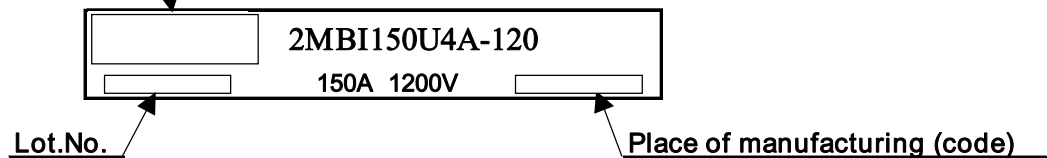
5. Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance(1device)	Rth(j-c)	IGBT	-	-	0.17	°C/W
		FWD	-	-	0.28	
Contact Thermal resistance (1 device) (*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



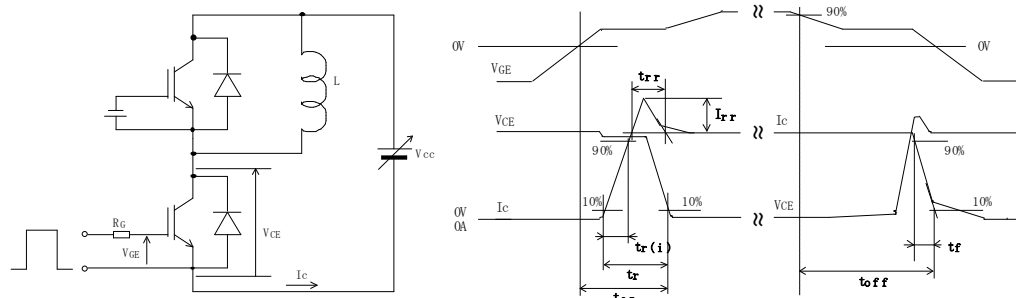
7. Applicable category

This specification is applied to IGBT-Module named 2MBI150U4A-120.

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

11. Reliability test results

Reliability Test Items

Test categories	Test items	Test methods and conditions	Reference norms EIAJ ED-4701 (Aug.-2001 edition)	Number of sample	Acceptance number
Mechanical Tests	1 Terminal Strength (Pull test)	Pull force : 40N Test time : 10±1 sec.	Test Method 401 Method I	5	(0 : 1)
	2 Mounting Strength	Screw torque : 2.5 ~ 3.5 N·m (M5) Test time : 10±1 sec.	Test Method 402 method II	5	(0 : 1)
	3 Vibration	Range of frequency : 10 ~ 500Hz Sweeping time : 15 min. Acceleration : 100m/s ² Sweeping direction : Each X,Y,Z axis Test time : 6 hr. (2hr./direction)	Test Method 403 Reference 1 Condition code B	5	(0 : 1)
	4 Shock	Maximum acceleration : 5000m/s ² Pulse width : 1.0msec. Direction : Each X,Y,Z axis Test time : 3 times/direction	Test Method 404 Condition code B	5	(0 : 1)
Environment Tests	1 High Temperature Storage	Storage temp. : 125±5 °C Test duration : 1000hr.	Test Method 201	5	(0 : 1)
	2 Low Temperature Storage	Storage temp. : -40±5 °C Test duration : 1000hr.	Test Method 202	5	(0 : 1)
	3 Temperature Humidity Storage	Storage temp. : 85±2 °C Relative humidity : 85±5% Test duration : 1000hr.	Test Method 103 Test code C	5	(0 : 1)
	4 Unsaturated Pressurized Vapor	Test temp. : 120±2 °C Test humidity : 85±5% Test duration : 96hr.	Test Method 103 Test code E	5	(0 : 1)
	5 Temperature Cycle	Test temp. : ┌ Low temp. -40±5 °C ├ High temp. 125 ±5 °C └ RT 5 ~ 35 °C Dwell time : High ~ RT ~ Low ~ RT 1hr. 0.5hr. 1hr. 0.5hr. Number of cycles : 100 cycles	Test Method 105	5	(0 : 1)
	6 Thermal Shock	Test temp. : ┌ High temp. 100 ⁺⁰ °C └ Low temp. 0 ⁻⁰ °C Used liquid : Water with ice and boiling water Dipping time : 5 min. par each temp. Transfer time : 10 sec. Number of cycles : 10 cycles	Test Method 307 method I Condition code A	5	(0 : 1)

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