

SPECIFICATION

Device Name : IGBT MODULE

Type Name : 1MBI400U4-120

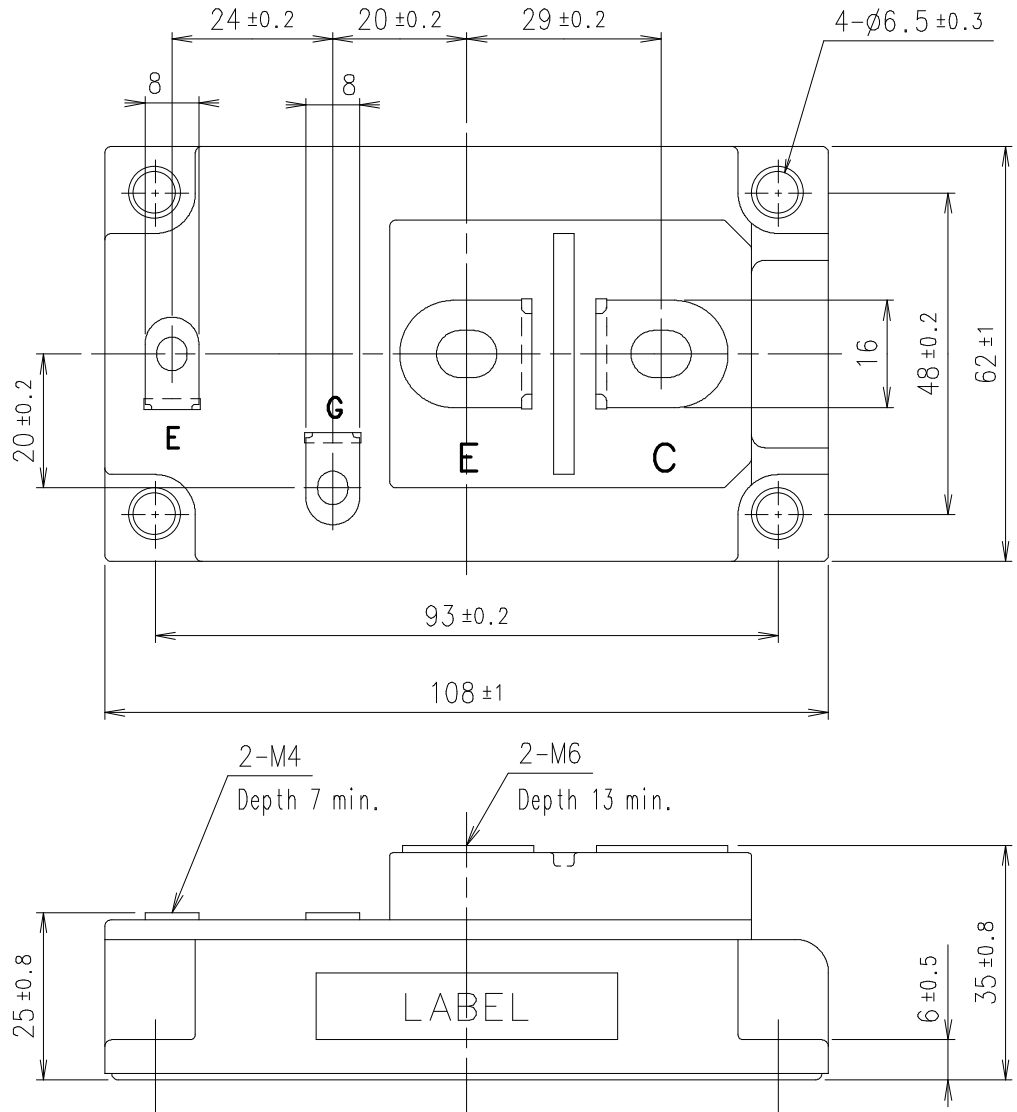
Spec. No. : MS5F 6039

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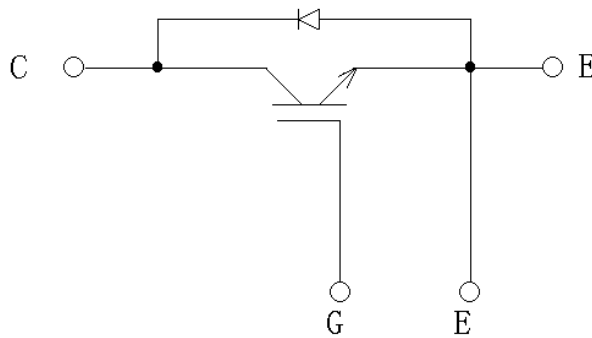
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1MBI400U4-120

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	600	A
			Tc=80°C	400	
	Icp	1ms	Tc=25°C	1200	
			Tc=80°C	800	
	-Ic			400	
-Ic pulse	1ms		800		
Collector Power Dissipation		Pc	1 device	2155	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 (*3)			4.5	
	Terminals (*4)			1.7	

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

(*2) Recommendable Value : Mounting 2.5 to 3.5 Nm (M5 or M6)

(*3) Recommendable Value : Terminals 3.5 to 4.5 Nm (M6)

(*4) Recommendable Value : Terminals 1.3 to 1.7 Nm (M4)

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

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Zero gate voltage collector current	ICES	VCE=1200V VGE=0V	-	-	4.0	mA
Gate-Emitter leakage current	IGES	VCE=0V VGE=±20V	-	-	800	nA
Gate-Emitter threshold voltage	VGE(th)	VCE=20V Ic=400mA	4.5	6.5	8.5	V
Collector-Emitter saturation voltage	VCE(sat) (terminal)	Ic=400A VGE=15V	Tj=25°C	2.10	2.25	V
			Tj=125°C	2.30	-	
	VCE(sat) (chip)		Tj=25°C	1.90	2.05	
			Tj=125°C	2.10	-	
Input capacitance	Cies	VCE=10V, VGE=0V, f=1MHz	-	45	-	nF
Turn-on time	ton	Vcc=600V	-	0.32	1.20	us
	tr	Ic=400A	-	0.10	0.60	
	tr(i)	VGE=±15V	-	0.03	-	
Turn-off time	toff	RG=1.5Ω	-	0.41	1.00	us
	tf		-	0.07	0.30	
Forward on voltage	VF (terminal)	IF=400A VGE=0V	Tj=25°C	1.85	2.00	V
			Tj=125°C	1.95	-	
	VF (chip)		Tj=25°C	1.65	1.80	
			Tj=125°C	1.75	-	
Reverse recovery time	trr	IF=400A	-	-	0.35	us
Lead resistance, terminal-chip (*5)	R lead		-	0.40	-	mΩ

(*5) Biggest internal terminal resistance among arm.

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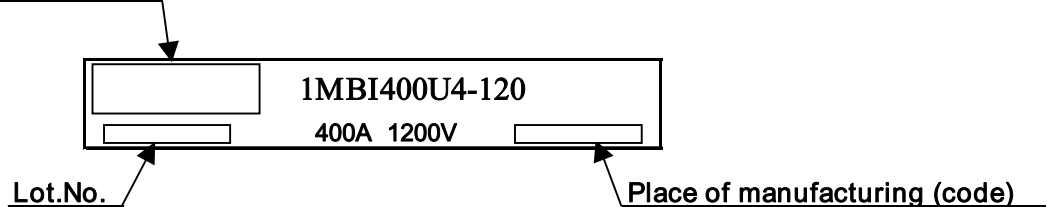
5. Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance(1device)	Rth(j-c)	IGBT	-	-	0.058	°C/W
		FWD	-	-	0.10	
Contact Thermal resistance (1 device) (*6)	Rth(c-f)	with Thermal Compound	-	0.0125	-	

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

6. Indication on module

Logo of production



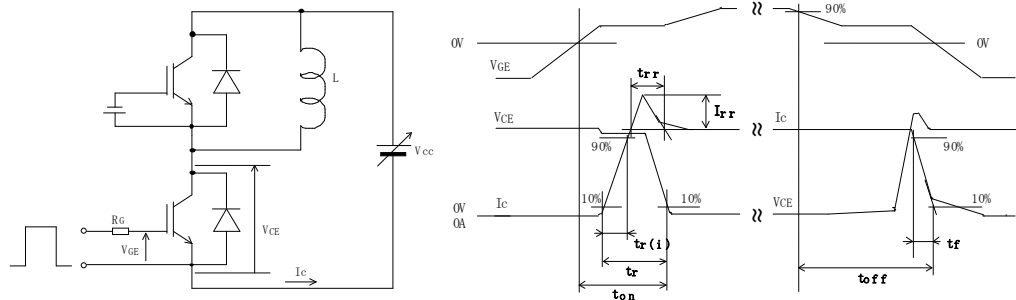
7. Applicable category

This specification is applied to IGBT-Module named 1MBI400U4-120.

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