

FUJI IGBT Modeules U Series

Mounting Instructions 2MBI400U(4)H-120

CONTENTS	Page
1. Mounting.....	1
2. Main terminal connection.....	3
3. Dimensions.....	3

This manual describes the recommended method to install and use 2MBI400U(4)H-120 safely.

1 Mounting

1.1 Mounting on heat sink

Since thermal resistance varies according to the position of the mounted modules, pay attention to the following points:

- a. When mounting only one module, position it in the center of the heat sink in order to minimize the thermal resistance.
- b. When mounting several modules, determine the individual positions on the heat sink according to the amount of heat that each module generates. Leave more space for modules that generate more heat.

1.2 Heat sink surface finishing (module mounting area)

The mounting surface of the heat sink should be finished to the roughness of 10µm or less and a warp based on a length of 100mm should be 50µm or less.

If the surface of the heat sink is not flat enough, there will be a sharp increase in the contact thermal resistance (Rth(c-f)). If the flatness of the heat sink does not meet the above requirements, the mounted module will experience extreme stress on the DBC substrate possibly destroying its insulating barrier.

Roughness: 10µm max.

Flatness of the heat sink: 50µm max. (based on a length of 100mm)

1.3 Thermal compound application

To reduce the contact thermal resistance, we recommend applying thermal compound with screen printing, rollers or spatulas between the heat sink and the base plate of the module. Recommended thickness of the compound is approx.100µm.

Recommended thermal compound for your reference

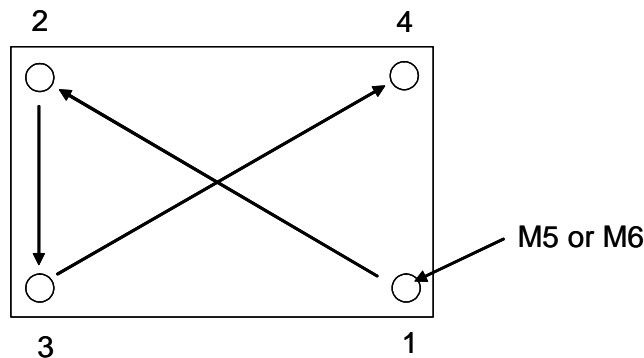
Penetration (typ.)	338 min.
Thermal conductivity	0.92 W/m·k min.
Thickness of the compound	100µm±30µm

Note:

- 1) The contact thermal resistance is dependent on the compound's efficiency and thickness.
The thickness of the compound could be lessened if the warp of the heat sink could be reduced.
Use the above table as a reference to decide the thickness of the compound being used.
- 2) Confirm the expansion of the compound when the module is installed with high viscosity compound. On the other hand, note that low viscosity compound may flow out due to the temperature cycle.

1.4 Mounting procedure

- 1) Recommended tightening torques: 2.5 to 3.5 N•m (M5 or M6)
- 2) Initial: Torque 0.5 to 1.0 (N•m), sequence (1)-(2)-(3)-(4)
- 3) Final: Full specified torque (3.5 N•m), sequence (1)-(2)-(3)-(4)



1.5 ESD

If excessive static electricity is applied to the control terminals, the devices could be broken. Some countermeasures against static electricity is necessary. Refer to the Chapter 3-2 of the Application Manual (REH984).

2 Main terminal connection

2.1 Bus bar connection

- 1) Screw: M6
- 2) Screw length: Bus bar thickness + (7.5mm to 9.5mm)
- 3) Tightening torque: 3.5 to 4.5 [N•m]
- 4) Allowable terminal temperature: 100°C max.
- 5) Allowable terminal pull force: 40N max.

Note:

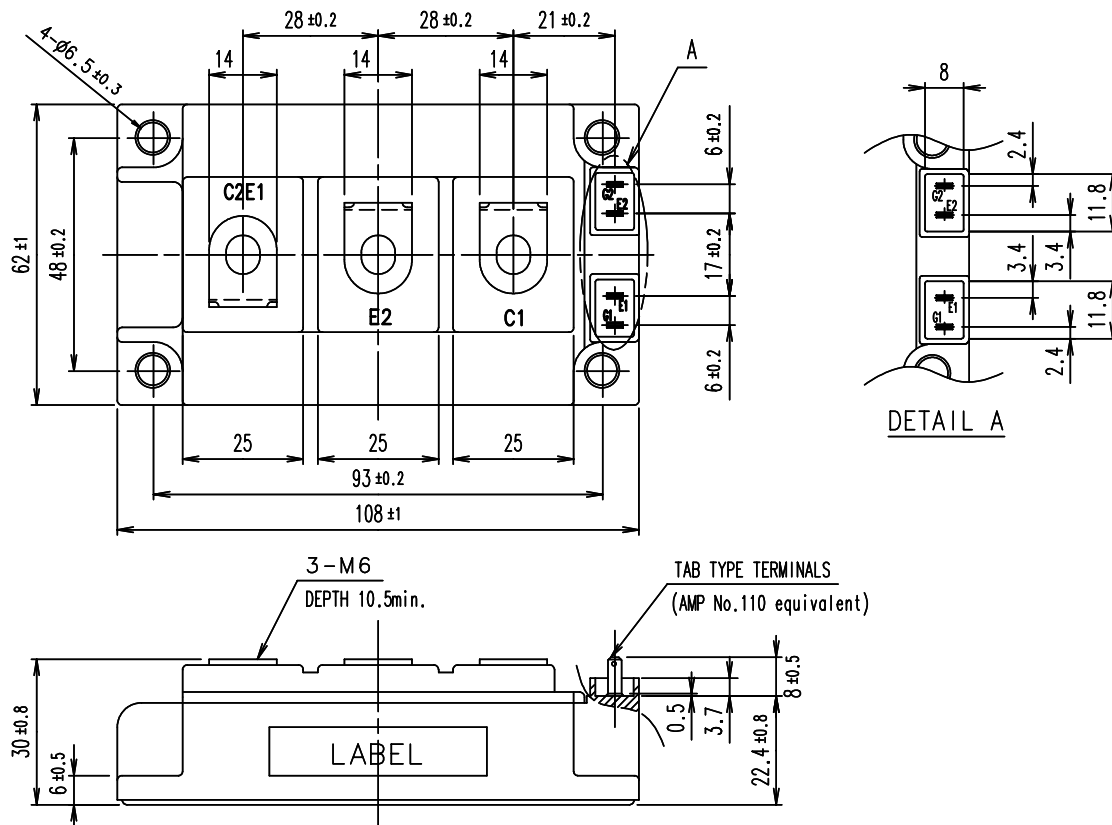
In case of connecting a bus bar to the main terminal, avoid excessive force to a terminal part.

Especially, the applied force at the opposite end of the copper bar will act as much bigger to the terminal part, because the moment force is proportional to the copper bar length.

Moreover, if a screw will be tightened when there is position gap between a terminal and a copper bar, stress will be generated continuously in the terminal part, and becomes the cause of damage.

Fasten the screw so that position gap does not occur.

3 Dimensions



WARNING

1. This Catalog contains the product specifications, characteristics, data, materials, and structures as of May 2011.
The contents are subject to change without notice for specification changes or other reasons. When using a product listed in this Catalog, be sure to obtain the latest specifications.
2. All applications described in this Catalog exemplify the use of Fuji's products for your reference only. No right or license, either express or implied, under any patent, copyright, trade secret or other intellectual property right owned by Fuji Electric Co., Ltd. is (or shall be deemed) granted. Fuji Electric Co., Ltd. makes no representation or warranty, whether express or implied, relating to the infringement or alleged infringement of other's intellectual property rights which may arise from the use of the applications described herein.
3. Although Fuji Electric Co., Ltd. is enhancing product quality and reliability, a small percentage of semiconductor products may become faulty. When using Fuji Electric semiconductor products in your equipment, you are requested to take adequate safety measures to prevent the equipment from causing a physical injury, fire, or other problem if any of the products become faulty. It is recommended to make your design failsafe, flame retardant, and free of malfunction.
4. The products introduced in this Catalog are intended for use in the following electronic and electrical equipment which has normal reliability requirements.
 - Computers
 - OA equipment
 - Communications equipment (terminal devices)
 - Measurement equipment
 - Machine tools
 - Audiovisual equipment
 - Electrical home appliances
 - Personal equipment
 - Industrial robots etc.
5. If you need to use a product in this Catalog for equipment requiring higher reliability than normal, such as for the equipment listed below, it is imperative to contact Fuji Electric Co., Ltd. to obtain prior approval. When using these products for such equipment, take adequate measures such as a backup system to prevent the equipment from malfunctioning even if a Fuji's product incorporated in the equipment becomes faulty.
 - Transportation equipment (mounted on cars and ships)
 - Trunk communications equipment
 - Traffic-signal control equipment
 - Gas leakage detectors with an auto-shut-off feature
 - Emergency equipment for responding to disasters and anti-burglary devices
 - Safety devices
 - Medical equipment
6. Do not use products in this Catalog for the equipment requiring strict reliability such as the following and equivalents to strategic equipment (without limitation).
 - Space equipment
 - Aeronautic equipment
 - Nuclear control equipment
 - Submarine repeater equipment
7. Copyright ©1996-2011 by Fuji Electric Co., Ltd. All rights reserved.
No part of this Catalog may be reproduced in any form or by any means without the express permission of Fuji Electric Co., Ltd.
8. If you have any question about any portion in this Catalog, ask Fuji Electric Co., Ltd. or its sales agents before using the product. Neither Fuji Electric Co., Ltd. nor its agents shall be liable for any injury caused by any use of the products not in accordance with instructions set forth herein.