

Applications manual for BRNS/BRFS series

## How to remove BRNS/BRFS series from a PWB



## BRNS/BRFS series

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# For BRNS/BRFS series




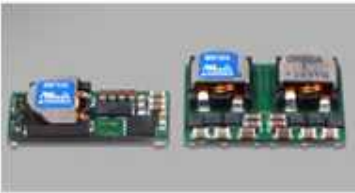
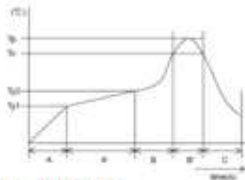


## 1. Overview

### 1.1 Overview

This manual shows how to remove BRNS/BRFS series from user board.

Please choose the suitable method for removing with reference to the following Table.1.  
(According to the equipment which a customer owns.)

Table.1 removal method list

Object of Product	removal method	reference page
 	 +  removal tool + reflow	3-1 3-2 3-3
	 +  removal tool + Hot Air equipment	3-4
 	 +  removal tool + reflow	3-1 3-2 3-3
	 +  removal tool + Hot Air equipment	3-4
	 T character type soldering iron	4-1

## 2. Preparation

Please prepare those listed below before proceeding to remove the power supply.

Removal tool  
Adhesive  
Thermocouple

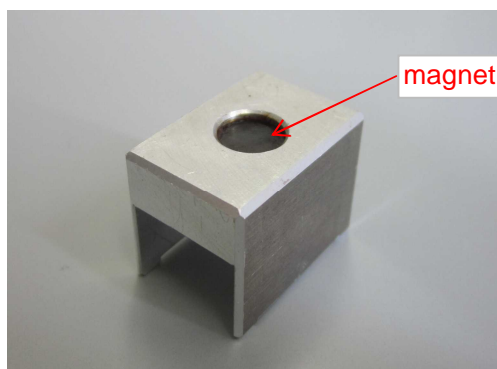
### 2.1 Removal tool

The removal tool as shown in the Fig.2.1.1 is necessary in this removal method. In this tool, there is a purpose to protect the components on the power supply from hot airflow during removal, and to lift the power supply from the user board by magnetic force when the solder becomes molten.

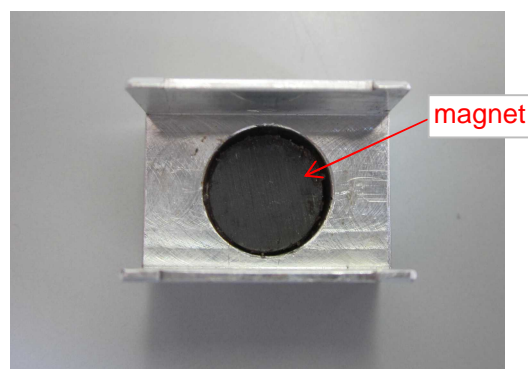
The tool is composed of a magnet and the body of the aluminum. Please select the material of a magnet that magnetic force is less likely to fall off at high temperature. Samarium-cobalt is recommended. When you install a magnet body, please use adhesive that is heat-resistant (such as a thermosetting adhesive).

This tool should be prepared in accordance with the size of each module. Please refer to the dimensions of the tool as described in the remarks on Sec. 6.

Fig. 2.1.1  
The removal tool  
for BRNS20I



isometric view



bottom view

### 2.2 Adhesive

You should be adhered to the module's PWB the inductor with an adhesive to prevent the module's PWB and the inductor being removed during removal. It is recommended to thermosetting adhesive with heat resistance (ADE400D Panasonic etc.)refer Sec.3.

### 2.3 Thermocouple

Please prepare a thermocouple to confirm the removal temperature profile. Please select a thermocouple capable for measuring at high temperatures (approximately 300 degrees).

### 3. The method for removing by removal tool

#### 3.1 Bond a inductor to module's PWB

When removing the product, there is a possibility that the inductor is removed from module's PWB.

Please apply the adhesive to the place shown in the Fig. below.

Allow this adhesive to cure before applying heat to remove the module.

Fig. 3.1.1  
Application point  
(BRNS6,12)

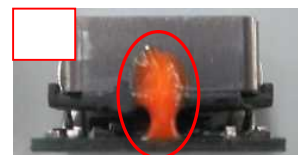
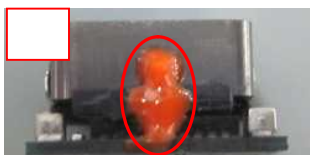
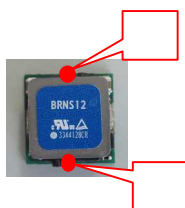


Fig. 3.1.2  
Application point  
(BRNS20)

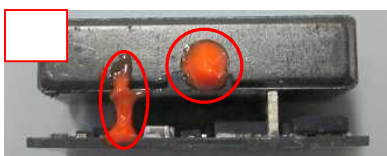


Fig. 3.1.3  
Application point  
(BRFS30)

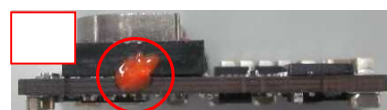
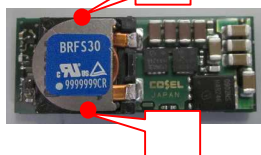
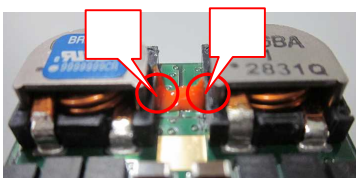
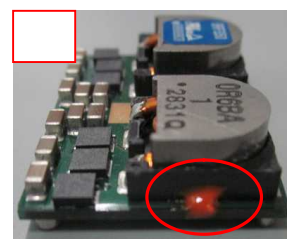
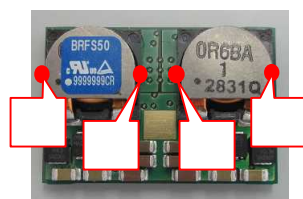


Fig. 3.1.4  
Application point  
(BRFS50)

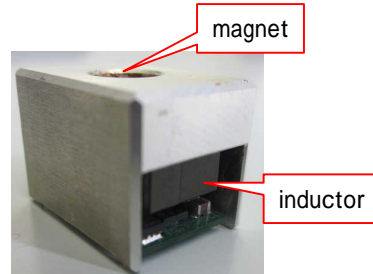


# For BRNS/BRFS series

## 3.2 Removal tool installation

Please adjust the position of the magnet with comes to just above the inductor.

Fig. 3.2.1  
Installation location



## 3.3 Connection of the thermocouple

Please connect the thermocouple near the mounting pad shown in Fig. below.  
Please apply the glue on the thermocouple.

Fig. 3.3.1  
Connecting point  
(bottom view)  
(BRNS6,12)

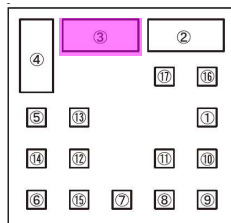


Fig. 3.3.2  
Connecting point  
(bottom view)  
(BRNS20)

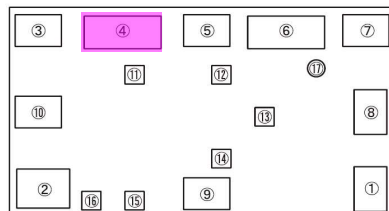


Fig. 3.3.3  
Connecting point  
(bottom view)  
(BRFS30)

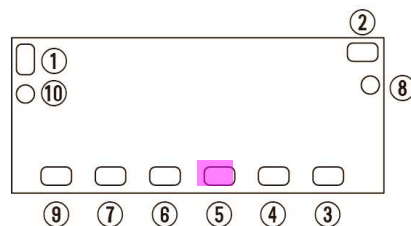


Fig. 3.3.4  
Connecting point  
(bottom view)  
(BRFS50)

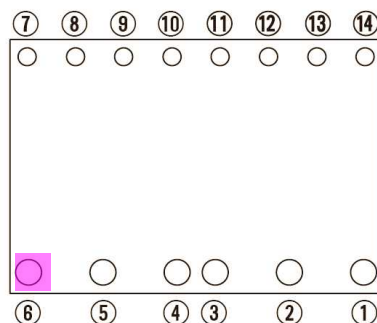
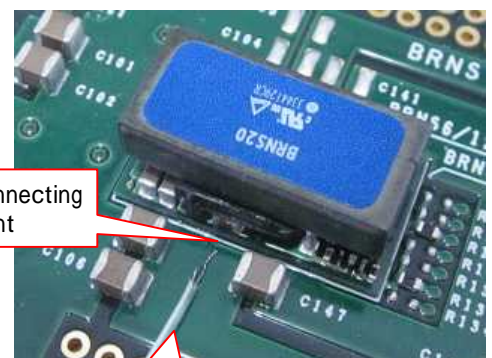


Fig. 3.3.5  
Example  
(BRNS20)



thermocouple





### 3.4 Heating method

#### 3.4.1 Reflow

By using a removal tool, BRNS/BRFS series can be removed from a user board by reflow.

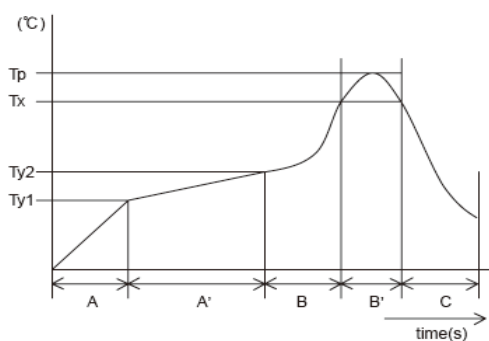
Please set up so that the installation point of a thermocouple becomes below a recommended reflow soldering condition shown in Fig. 3.4.1.1.

(It can be removed at the same temperature as the temperature profile for reflow soldering.)

If the term and temperature of the regulation for reflow soldering are exceeded, the reliability of internal parts may be spoiled.

Moreover, the magnetism of a removal tool deteriorates and it may be unable to take up a power supply.

Fig. 3.4.1.1  
Recommended reflow  
soldering condition



A	1.0 - 5.0°C/ s
A'	Ty1 : 160±10°C Ty2 : 180±10°C Ty1 - Ty2 : 120s max
B	1.0 - 5.0°C/ s
B'	Tp : Max245°C 10s max Tx : 220°C or more : 70s max
C	1.0 - 5.0°C/ s

Please remove a power supply promptly with the removal tool.  
When you remove, be careful since the removal tool gets hot.

Fig. 3.4.1.2  
Removal by  
a removal tool

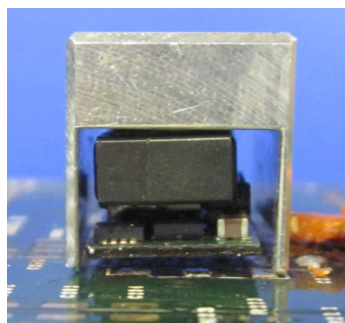
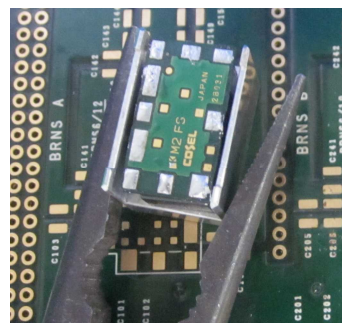


Fig. 3.4.1.3  
After removal



## 3.4.2 Hot Air

BRNS/BRFS series can be removed from a user board with the following procedure using instruments, such as hot air (Fig.3.4.2.5).

- (1) Please preheat from the bottom side of the mounting board to 180 (Fig.3.4.2.1) by using a heater(Fig.3.4.2.2) etc.

\* When temperature is set up out of the range of  $180 \pm 10$ , BRNS/BRFS may be taken up since the magnetism of the removal tool deteriorates at peak temperature.

Fig. 3.4.2.1  
Preheating



Fig. 3.4.2.2  
Preheater  
HAKKO FR-830  
(model name)



- (2) Set a removal tool(Fig.3.4.2.3).

Fig. 3.4.2.3  
The set of  
a removal tool



- (3) Heat to 245 (Fig.3.4.2.4) by using hot air(Fig.3.4.2.5) etc.

\* When the temperature is higher than 245, the magnetism of a removal tool deteriorates. BRNS/BRFS may be unable to be taken up.

Fig. 3.4.2.4  
Heating in a hot air

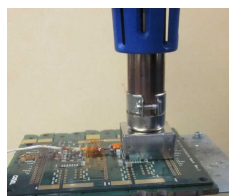
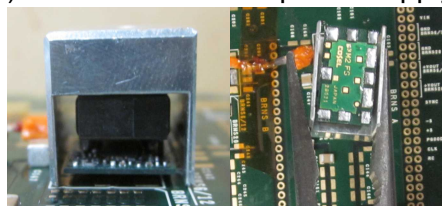


Fig. 3.4.2.5  
Hot Air  
HAKKO FR-802  
(model name)



- (4) Please remove a power supply promptly with the removal tool.

Fig. 3.4.2.6  
After removal

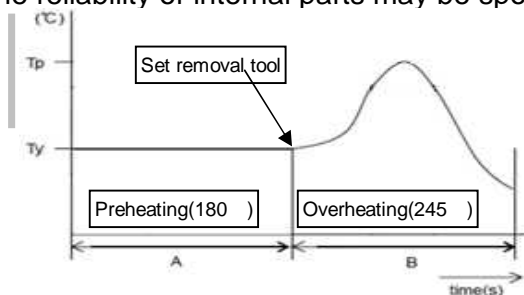


When you remove, be careful since the removal tool gets hot.

The timing is shown in Fig.3.4.2.7.

If the term and temperature of the regulation for reflow soldering are exceeded, the reliability of internal parts may be spoiled.

Fig.3.4.2.7  
Temperature profile



A	Ty : $180 \pm 10^{\circ}\text{C}$
B	Tp : Max $245^{\circ}\text{C}$ 10s max



## 4. The method for removing by soldering iron

### 4.1 Soldering iron (Only BRFS series )

In order to remove BRFS series from a user board, all the terminals on the back are heated simultaneously, to be melted the solder. It is necessary to carry out.

(The back of the product is shown in Fig. 4.1.1)

In order to improve the working efficiency, there are some methods that heating the whole mounting board by the heater which is prepared under the user board or preparing the heating pad on the user board shown in Fig. 4.1.2.

Fig. 4.1.1  
The back terminal of BRFS  
(The left : BRFS50,  
right:BRFS30)

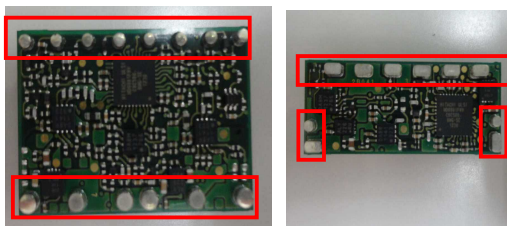
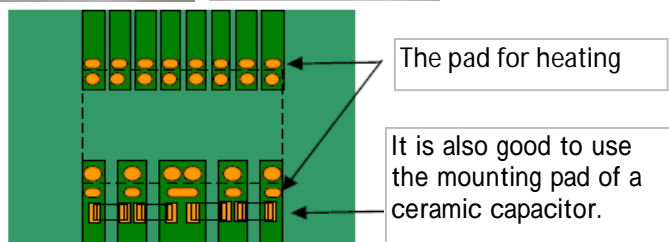


Fig. 4.1.2  
The example of a substrate with  
the pad for heating



Next, near the terminal of the pad for heating or a power supply as shown in Fig. 4.1.2 is directly heated with a soldering iron, melting the soldering portion of a terminal and a power supply is removed from a user board.

In this case, if a T character type soldering iron as shown in Fig. 4.1.3.

Working efficiency can be improved. The example of work is shown in Fig. 4.1.4

Fig. 4.1.3  
T character type soldering iron  
HAKKO iron pen JK4-20L  
(soldering iron point model name)



Fig. 4.1.4  
Example of removal work



Besides the soldering iron shown in Fig. 4.1.3, there are the soldering iron point (T12-1406) of T character for FX-951 manufactured by HAKKO, etc. as a station type.

\* Avoid reuse of removed power supply since the terminal part has a problem for reliability.

## 5. Attachment after removal

### 5.1 Attachment

#### 5.1.1 Removal of solder

After applying flux, the solder on the pad after removing a power supply is desoldering tool etc., removed by residue.

The residue of the solder should be removed carefully since it may cause the problem that the solder paste is less printed or the power supply is mounted at a tilt.

Fig. 5.1.1.1  
The pad after  
power supply  
removal



Fig. 5.1.1.2  
The pad after solder  
removal

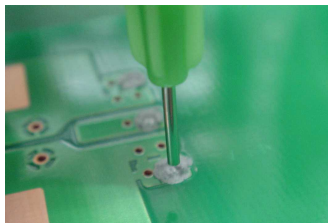


\* When a power supply inclines and is mounted, a terminal may become non-solder in part.

#### 5.1.2 Supply of a soldering paste

An applicator (dispenser) and spatula are used for the terminal pad of a user board

Fig. 5.1.2.1  
The application by a  
dispenser (it applies  
to a user board)



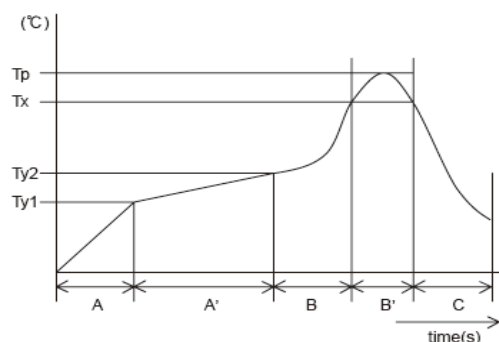
#### 5.1.3 Mounting the power supply (loading, reflow)

Please mount a power supply on a pad and perform reflow.

\* Please do not apply except reflow soldering, since it is difficult to be mounted the power supply flatly, it cause the soldering failure of the terminal.

\* Hot air heating and mounting with a soldering iron may degrade the reliability of power supply internal parts. (Superfluous heating and contact with a soldering iron)

Fig. 5.1.3.1  
Recommended reflow  
soldering condition



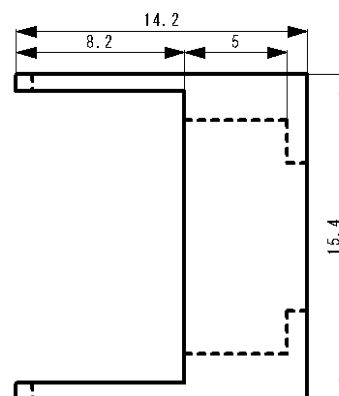
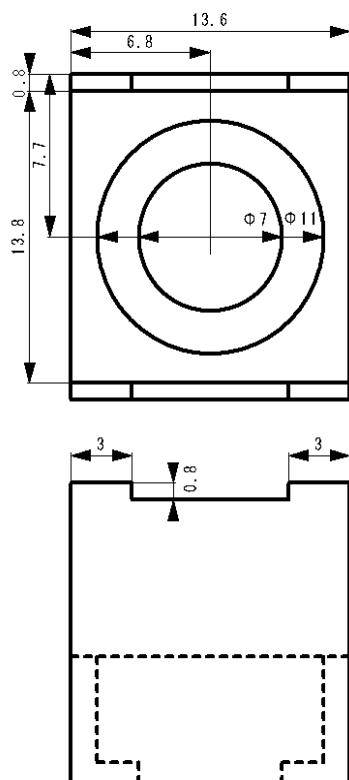
A	1.0 - 5.0°C/ s
A'	Ty1 : 160±10°C Ty2 : 180±10°C Ty1 - Ty2 : 120s max
B	1.0 - 5.0°C/ s
B'	Tp : Max245°C 10s max Tx : 220°C or more : 70s max
C	1.0 - 5.0°C/ s

# For BRNS/BRFS series

## 6. Remarks

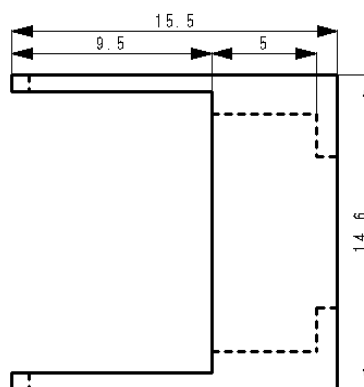
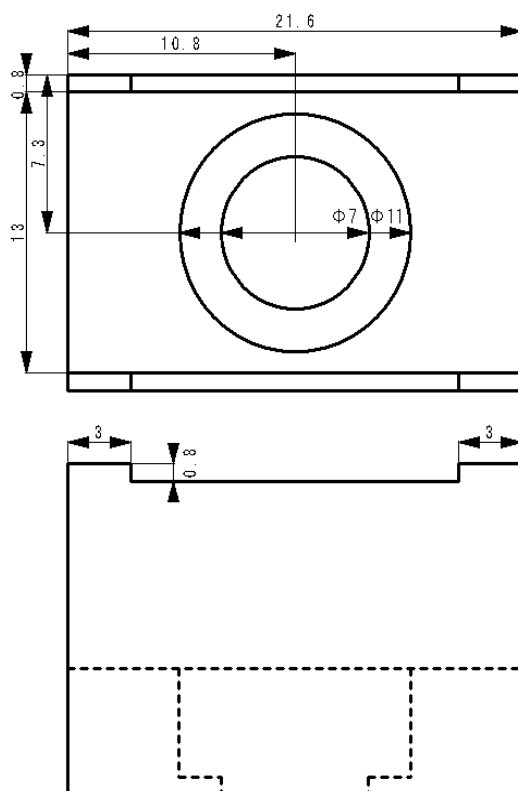
### 6.1 The dimensions of the removal tool

#### ■ BRNS6/12



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 APPLIED MODULE : BRNS6/BRNS12  
 UNIT : mm

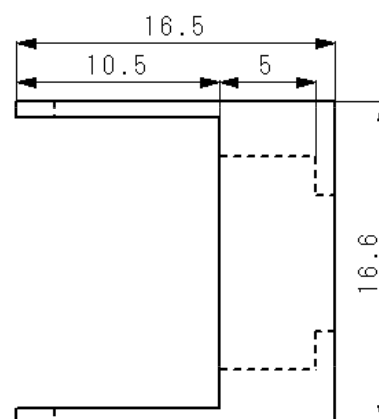
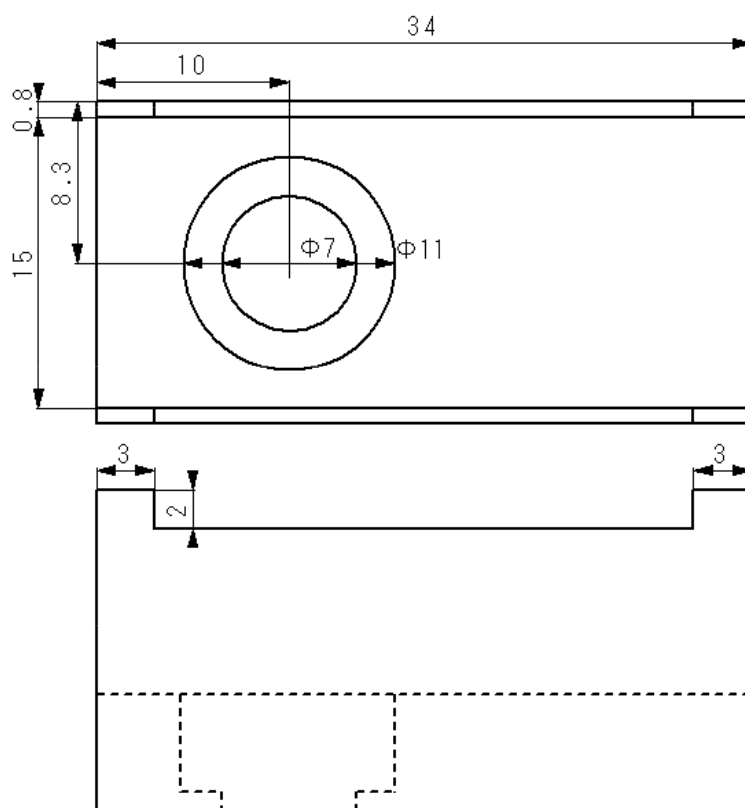
#### ■ BRNS20



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 APPLIED MODULE : BRNS20  
 UNIT : mm

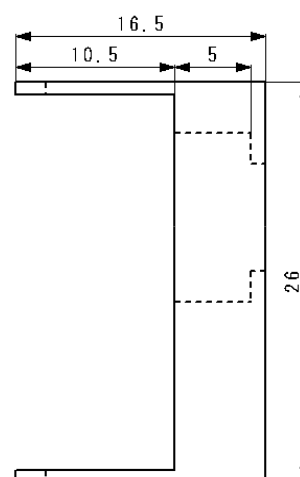
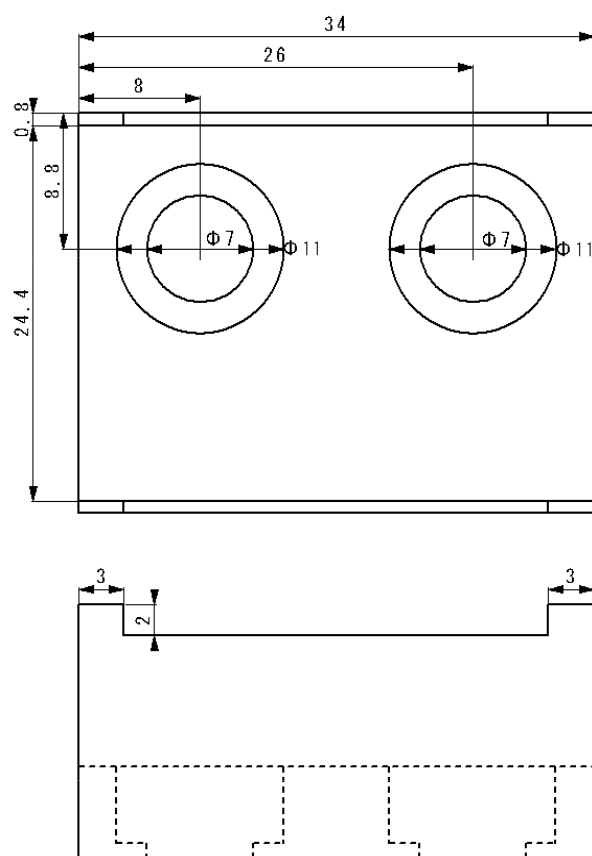
## For BRNS/BRFS series

## ■ BRFS30



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 APPLIED MODULE : BRFS30  
 UNIT : mm

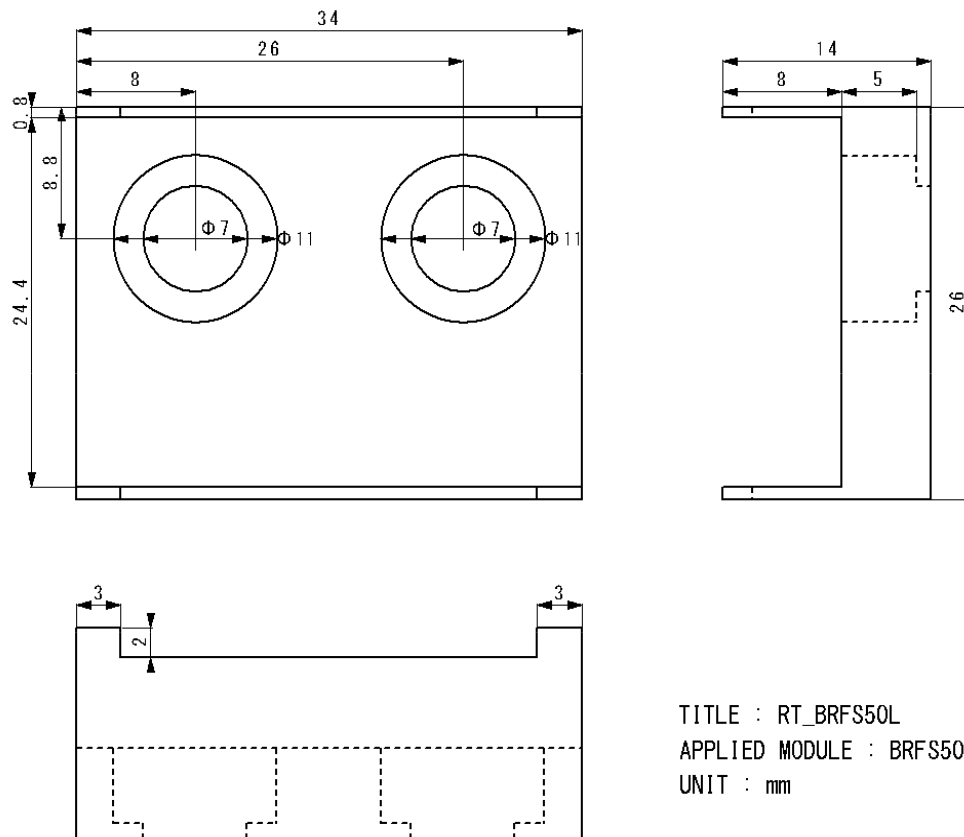
## ■ BRFS50



TITLE : RT\_BRFS50  
 APPLIED MODULE : BRFS50  
 UNIT : mm

# For BRNS/BRFS series

## ■ BRFS50L



## ■ Magnet

