

User's Manual  
TR3-C202-A0-8

**TAKAYA**

Manual No.TDR-MNL-C202-A0-8-EN-101

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# Introduction

Thank you for purchasing a TR3-C202-A0-8 RFID READER/WRITER.

Be sure to read this manual before using the product.

After reading it, store the manual in a convenient place for future reference.

# Regulations and Standards

| <b>FCC</b>  |                       |          |              |             |                   |      |                       |            |                    |          |               |
|---|-----------------------|----------|--------------|-------------|-------------------|------|-----------------------|------------|--------------------|----------|---------------|
| <p>This product is conform to the FCC standards.<br/>         FCC Rules (Federal Communications Commission)<br/>         This product complies with Part 15 Subpart C of the FCC Rules.<br/>         FCC ID : MK4TR3-C202-A0-8</p> <p>This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.<br/>         This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by tuning the equipment off an on, the user is encouraged to try to correct the interference by one or more of the following measures:</p> <ul style="list-style-type: none"> <li>- Reorient or relocate the receiving antenna.</li> <li>- Increase the separation between the equipment and receiver.</li> <li>- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.</li> <li>- Consult the dealer or an experienced radio/TV technician for help.</li> </ul> <p><b>FCC NOTICE</b><br/>         This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:<br/>         (1) This device may not cause harmful interference.<br/>         (2) This device must accept any interference received, including interference that may cause undesired operation.</p> <p><b>FCC WARNING</b><br/>         Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.</p> <p>The following sentence has to be displayed on the outside of the device in which the transmitter module is installed : "Contains FCC ID: MK4TR3-C202-A0-8"</p> |                       |          |              |             |                   |      |                       |            |                    |          |               |
| <b>Japan Radio Law</b>  |                       |          |              |             |                   |      |                       |            |                    |          |               |
| <p>Equipment using high frequencies: Inductive Reading/Writing Communications Equipment<br/>         Conforming standards: Inductive Reading/Writing Communications Equipment;<br/>         Standard: ARIB STD-T82</p>  |                       |          |              |             |                   |      |                       |            |                    |          |               |
| <b>Tags</b>   |                       |          |              |             |                   |      |                       |            |                    |          |               |
| <p>This product can communicate the standard tags of ISO/IEC15693 and ISO/IEC18000-3(Mode1).</p> <table border="1"> <thead> <tr> <th>Supports</th> <th>Manufacturer</th> </tr> </thead> <tbody> <tr> <td>Tag-it HF-I</td> <td>Texas Instruments</td> </tr> <tr> <td>my-d</td> <td>Infineon Technologies</td> </tr> <tr> <td>I·CODE SLI</td> <td>NXP Semiconductors</td> </tr> <tr> <td>MB89R118</td> <td>FUJITSU Japan</td> </tr> </tbody> </table>   |                       | Supports | Manufacturer | Tag-it HF-I | Texas Instruments | my-d | Infineon Technologies | I·CODE SLI | NXP Semiconductors | MB89R118 | FUJITSU Japan |
| Supports  | Manufacturer          |          |              |             |                   |      |                       |            |                    |          |               |
| Tag-it HF-I   | Texas Instruments     |          |              |             |                   |      |                       |            |                    |          |               |
| my-d  | Infineon Technologies |          |              |             |                   |      |                       |            |                    |          |               |
| I·CODE SLI  | NXP Semiconductors    |          |              |             |                   |      |                       |            |                    |          |               |
| MB89R118  | FUJITSU Japan         |          |              |             |                   |      |                       |            |                    |          |               |
| <b>RoHS is support</b>  |                       |          |              |             |                   |      |                       |            |                    |          |               |
| Restriction of Hazardous Substances   |                       |          |              |             |                   |      |                       |            |                    |          |               |
| <b>Waste</b>  |                       |          |              |             |                   |      |                       |            |                    |          |               |
| Dispose of the Products as industrial waste.  |                       |          |              |             |                   |      |                       |            |                    |          |               |



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# Safety Precautions

The following symbols are used in this manual to indicate precautions that must be observed to ensure safe use of this product. The precautions provided here contain important safety information. Be sure to observe these precautions.

The following signal words are used in this manual.

|  |  |
|--|--|
|  <b>WARNING</b> | Failure to comply with a <b>WARNING</b> may result in serious injury or death.                                 |
|  <b>CAUTION</b> | Failure to comply with a <b>CAUTION</b> may result in injury to the operator, or damage to the items involved. |

## **WARNING**

### **Be sure to observe the following precautions to ensure safe use of the Products.**

Decomposition of this product and cable, repair, remodeling, please strictly prohibited. There is the possibility of fire or electric shock injuries.

This product is using the RFID reader writer radio equipment. Therefore, depending on where the applications you use may affect medical equipment. To minimize the impact of medical equipment for use, please observe the following countermeasure. The Japan Automatic Identification Systems Association (JAISA) guidelines are as follows: RFID antennas from implanted cardiac pacemakers or other medical devices please 22cm apart. We recommend that you paste "RFID sticker" at equipment.



← RFID Sticker

## **CAUTION**

### **Be sure to observe the following precautions to ensure safe use of the Products.**

#### Installation and storage environment

1. Do not use the Products in sunlight.
2. Do not use the Products in environment of spray of water, oil or chemicals.
3. Do not use the Products in environments with flammable, explosive, or corrosive gasses.
4. Do not use the Products in environment of hot humid.
5. Do not use the Products in environment of vibration or shock.
6. Do not use the Products in environment of condensation.
7. Do not use the Products in environment of around the metal is covered.
8. Do not use the Products in environment of high temperature.
9. Do not use the Products in environment that has a device that generates magnetic field and shock voltage.
10. Do not use the Products in unstable place.
11. If there is failure, discontinue use immediately, please contact us or the distributor.

#### Installation

1. Turn off the power before installation or removing.
2. The following effects may not work correctly.
  - Near 13.56MHz radio device
  - Near speakers, Inverter, motor and Plasma Display
3. The communication range may vary due to environment and conditions.

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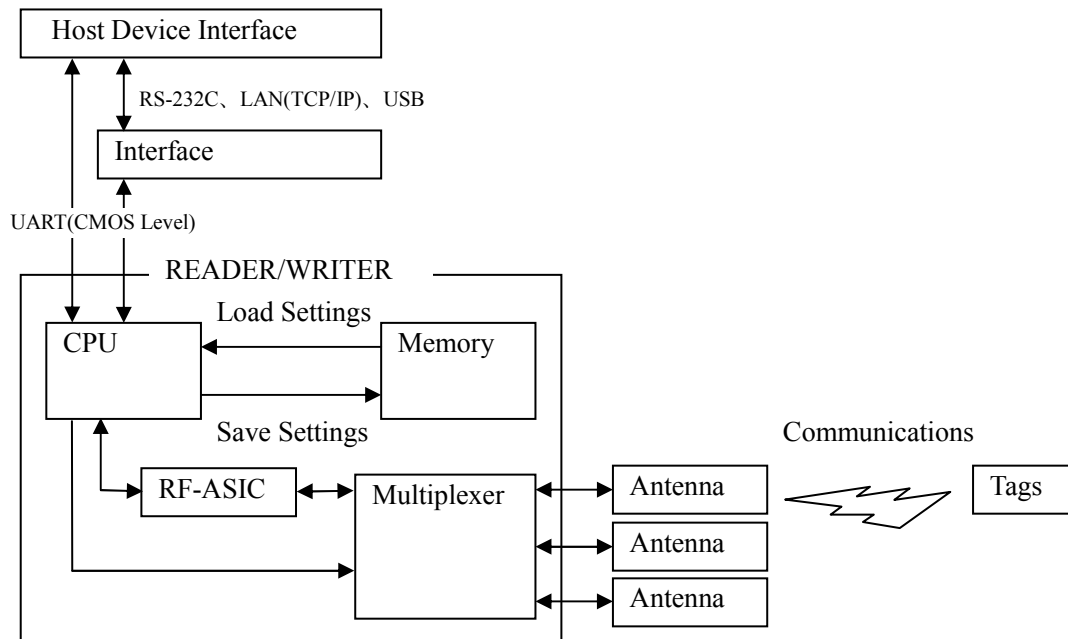
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# 1 Product Overview

## 1.1 Features

This product uses the 13.56MHz frequency. This product is the electromagnetic induction type non-contact IC can read and write RFID tag data.

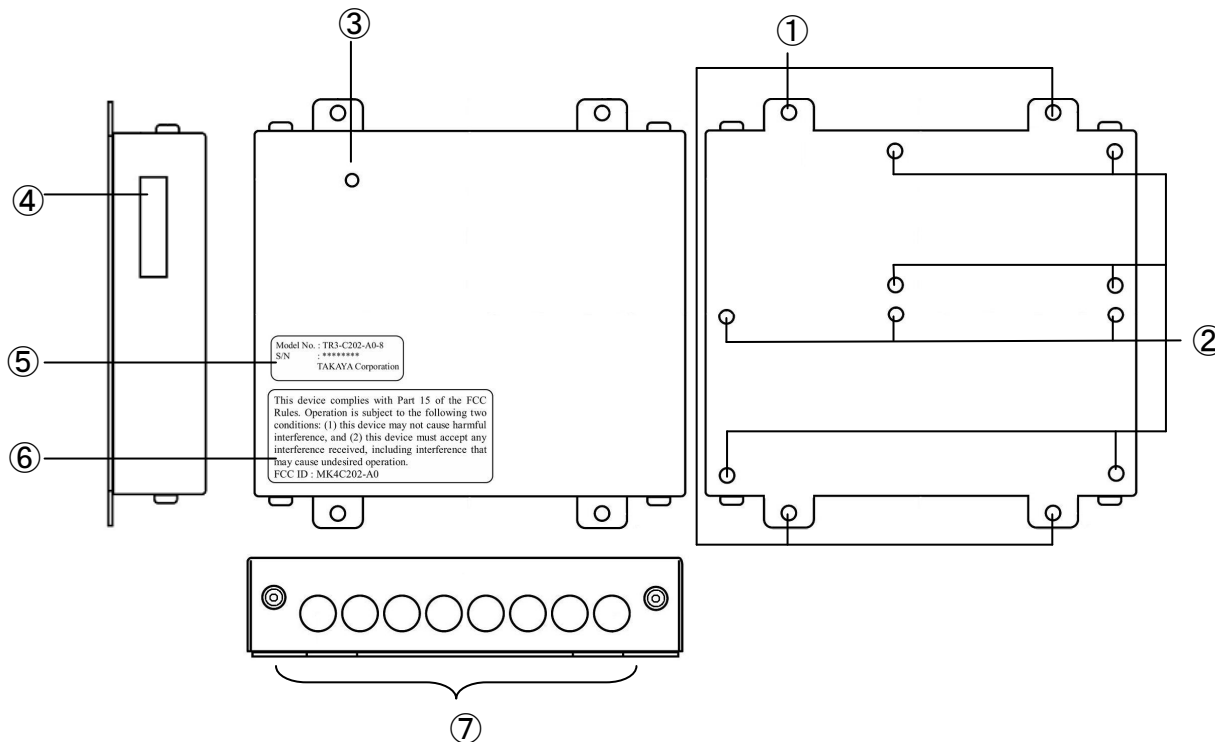
This Product is designed to be embedded and integrated within OEM devices and finished products such as label printers, cashless payment terminals or any other device that can benefit from integrated RFID capabilities.



- Conform to international standards  
ISO/IEC15693 and ISO/IEC18000-3(Mode1) is supports.
- Rich Products
  - Various interface RS-232C, USB, TCP/IP.
  - Antennas of various sizes
- Software
  - TR3-series common communication protocol
  - Software Development Kit
- Multiplexer  
Select the RF output.
- Useful
  - Continuous inventory mode  
UID of the tag automatically sends Host Device.
  - RDLoop mode  
UID or User Data of the tag automatically sends Host Device.
 For more information please refer to the TR3-PROTOCOL manual.
- Environmentally  
EU RoHS(2002/95/EC) Support

## 2 Names of Parts and Functions

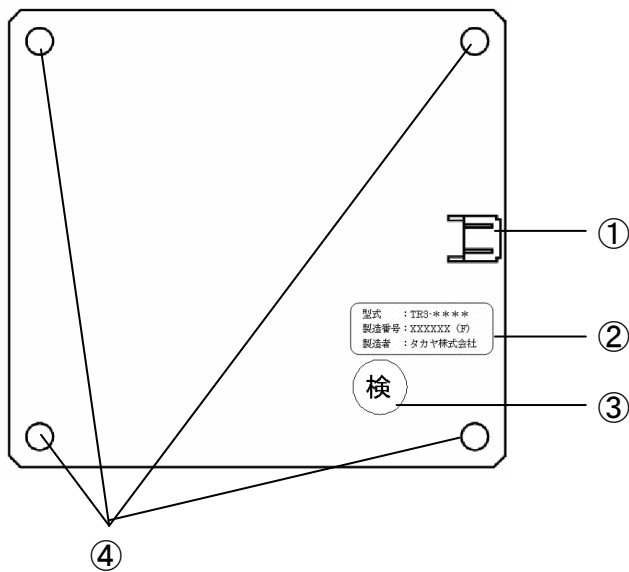
### 2.1 TR3-C202-A0-8



| No | Name            | Description  |
|----|-----------------|--|
| ①  | Screw holes     | M3 holes   |
| ②  | STUD NUTS       | Internally, substrate is fixed at stud nuts.<br>M3 Screw hole depth : 3mm  |
| ③  | LED1            | Displays the status of this product.   |
| ④  | CN1             | This connector is for connection to the host.  |
| ⑤  | Nameplate       | Production numbers, will be 8-digit serial number.<br><br><div style="border: 1px solid black; padding: 5px; width: fit-content;">                     Model No. : TR3-C202-A0-8      Model Name<br/>                     S/N : *****                      Serial number : ***** (F)<br/>                     TAKAYA Coporation                 </div> |
| ⑥  | FCC ID stickers |  |
| ⑦  | CH1 to CH8      | Connect the antenna cable.<br>Please connect form CH1.   |

## 2.2 Antenna

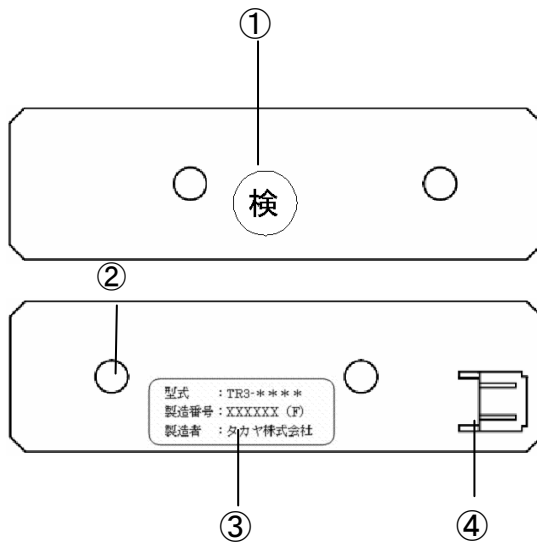
### 2.2.1 TR3-A202



| No                | Name                      | Description  |                |            |                   |                           |               |  |
|-------------------|---------------------------|--|----------------|------------|-------------------|---------------------------|---------------|--|
| ①                 | CN1                       | Connect the antenna cable.   |                |            |                   |                           |               |  |
| ②                 | Nameplate                 | Production numbers, will be 8-digit serial number.<br><div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">型式 : TR3-*****</td> <td style="width: 40%;">Model Name</td> </tr> <tr> <td>製造番号 : XXXXXX (F)</td> <td>Serial number : ***** (F)</td> </tr> <tr> <td>製造者 : タカヤ株式会社</td> <td></td> </tr> </table> </div> | 型式 : TR3-***** | Model Name | 製造番号 : XXXXXX (F) | Serial number : ***** (F) | 製造者 : タカヤ株式会社 |  |
| 型式 : TR3-*****    | Model Name                |  |                |            |                   |                           |               |  |
| 製造番号 : XXXXXX (F) | Serial number : ***** (F) |  |                |            |                   |                           |               |  |
| 製造者 : タカヤ株式会社     |                           |  |                |            |                   |                           |               |  |
| ③                 | Inspection mark           |  |                |            |                   |                           |               |  |
| ④                 | Screw holes               | M3 holes   |                |            |                   |                           |               |  |

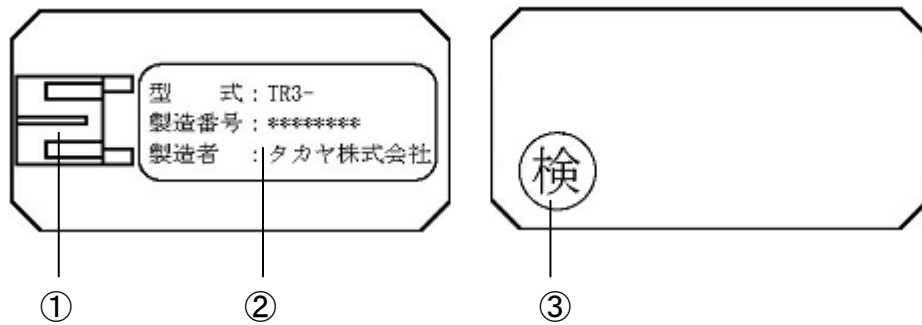


2.2.2 TR3-A302



| No | Name            | Description   |
|----|-----------------|---|
| ①  | Inspection mark |   |
| ②  | Screw holes     | M3 holes  |
| ③  | Nameplate       | Production numbers, will be 8-digit serial number.<br><div style="border: 1px solid black; padding: 5px; margin: 5px;">                     型式 : TR3-****      Model Name<br/>                     製造番号 : XXXXXX (F)      Serial number : * * * * * * * (F)<br/>                     製造者 : タカヤ株式会社                 </div> |
| ④  | CN1             | Connect the antenna cable.  |

2.2.3 TR3-A401

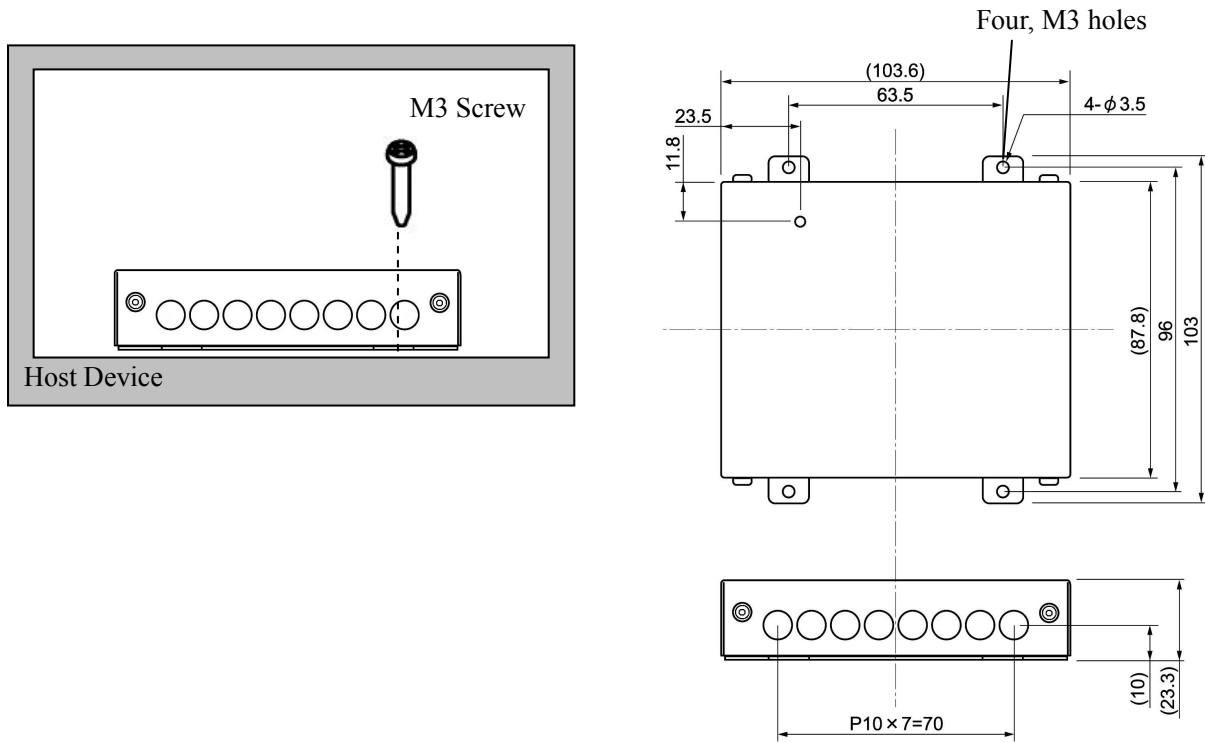


| No | Name            | Description   |
|----|-----------------|---|
| ①  | CN1             | Connect the antenna cable.  |
| ②  | Nameplate       | Production numbers, will be 8-digit serial number.<br><div style="border: 1px solid black; padding: 5px; margin: 5px;">                     型式 : TR3-****      Model Name<br/>                     製造番号 : XXXXXX (F)      Serial number : * * * * * * * (F)<br/>                     製造者 : タカヤ株式会社                 </div> |
| ③  | Inspection mark |   |

## 3 Installation and connection

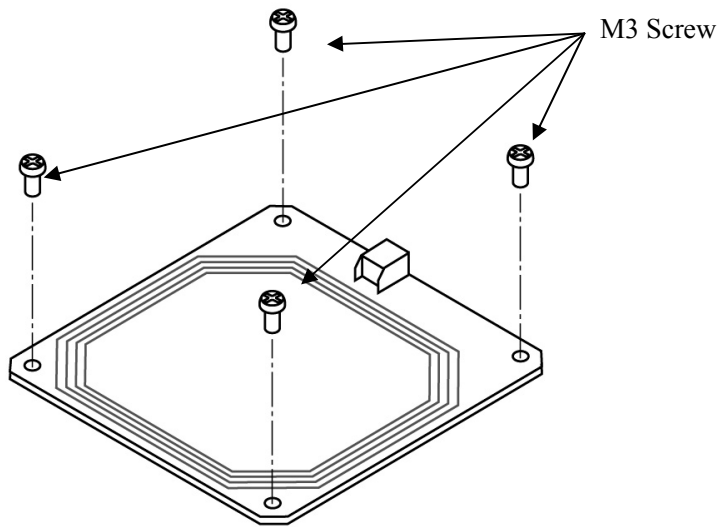
### 3.1 Installation into a host device

#### 3.1.1 Installation from the Front



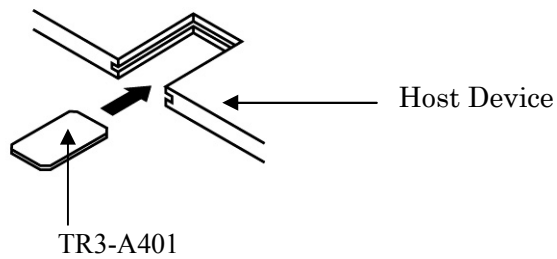
## 3.2 Antenna installation into a host device

### 3.2.1 Screw holes



### 3.2.2 Guide

TR3-A401 is recommended that you set up a guide on fixed-like the figure below.

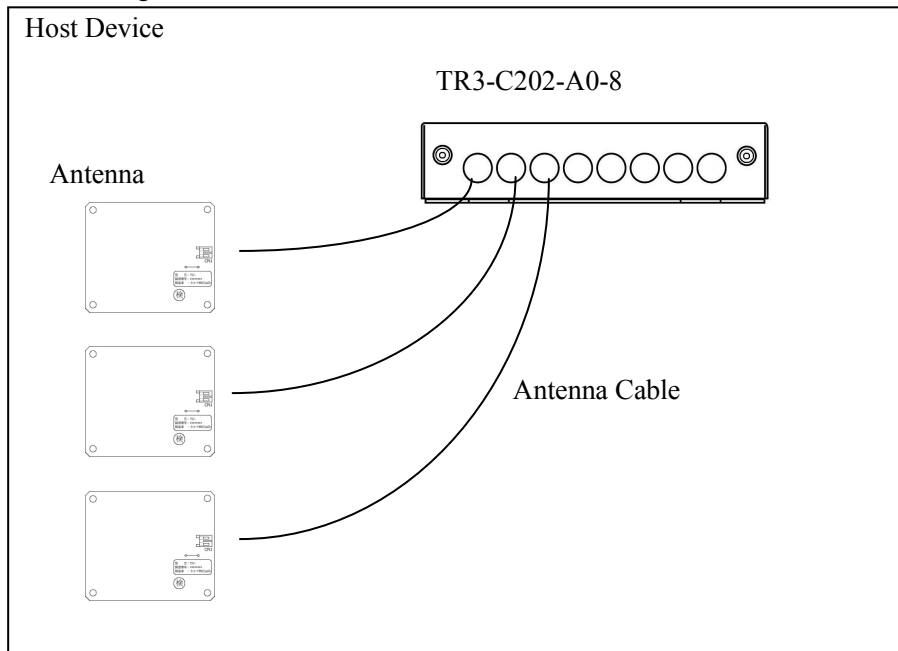


### 3.3 Connection

This product will connect with the antenna and antenna cables.

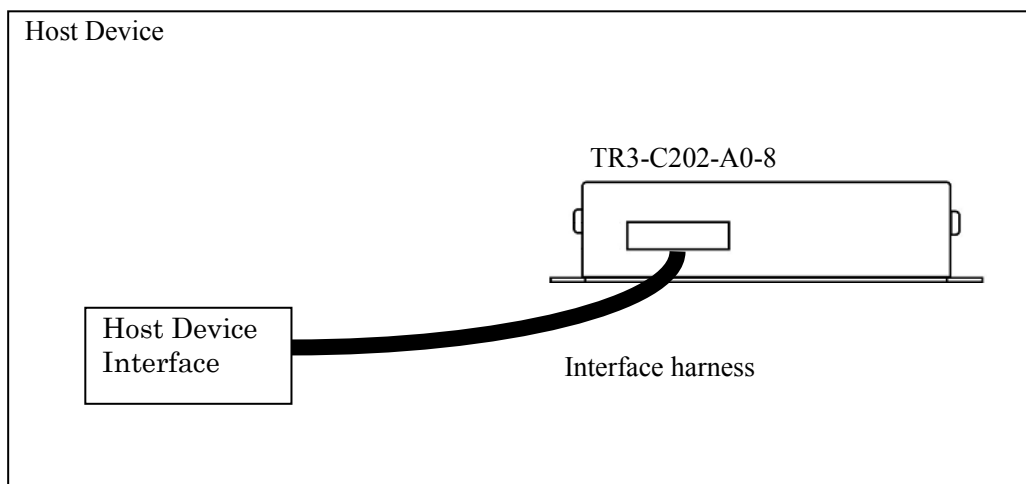
This product connects with Host Device that direct connection or connect using our interface.

#### 3.3.1 Attaching the Cable and Antenna

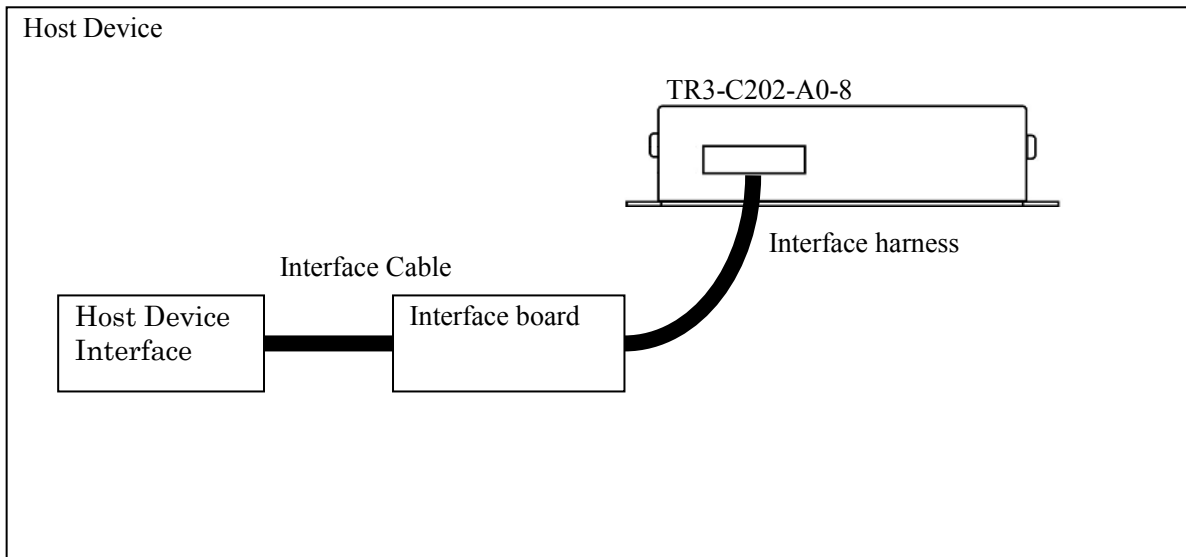


#### 3.3.2 Direct connection to the Host Device Interface

Please prepare to the interface harness.



3.3.3 Using the interface board to connect to the Host Device Interface  
Interface board, please contact us.



## 4 Specifications

### 4.1 TR3-C202-A0-8

■ Specifications

| Specifications       | Item  | Parameter   |           |                   |                        |                   |          |           |       |          |                   |           |  |
|----------------------|---|---|-----------|-------------------|------------------------|-------------------|----------|-----------|-------|----------|-------------------|-----------|--|
| Applicable Standards | Japan Radio Law   | ARIB STD-T82  |           |                   |                        |                   |          |           |       |          |                   |           |  |
|                      | FCC   | FCC Part 15 Subpart C<br>FCC ID : MK4TR3-C202-A0-8  |           |                   |                        |                   |          |           |       |          |                   |           |  |
|                      | RoHS  | EU RoHS(2002/95/EC) Supports  |           |                   |                        |                   |          |           |       |          |                   |           |  |
| Radio Frequency      | Carrier frequency   | 13.56MHz ±50ppm(Ta=25°C) or less  |           |                   |                        |                   |          |           |       |          |                   |           |  |
|                      | Transmit power or power range   | 10 to 100mW ± 20%<br>(Transmit power range varies with input voltage.)  |           |                   |                        |                   |          |           |       |          |                   |           |  |
|                      | Standards   | ISO/IEC 15693、ISO/IEC18000-3(Model1)  |           |                   |                        |                   |          |           |       |          |                   |           |  |
|                      | Tags  | Tag-it HF-I, my-d, I·CODE SLI, MB89R118(※1)   |           |                   |                        |                   |          |           |       |          |                   |           |  |
|                      | Data rate   | <table border="1"> <thead> <tr> <th></th> <th>Speed</th> <th>Data rate</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Reader/Writer⇒Tag</td> <td>1/4</td> <td>26.48kbps</td> </tr> <tr> <td>1/256</td> <td>1.65kbps</td> </tr> <tr> <td>Tag⇒Reader/Writer</td> <td colspan="2">26.69kbps</td> </tr> </tbody> </table> |           | Speed             | Data rate              | Reader/Writer⇒Tag | 1/4      | 26.48kbps | 1/256 | 1.65kbps | Tag⇒Reader/Writer | 26.69kbps |  |
|                      |   | Speed   | Data rate |                   |                        |                   |          |           |       |          |                   |           |  |
|                      | Reader/Writer⇒Tag   | 1/4   | 26.48kbps |                   |                        |                   |          |           |       |          |                   |           |  |
| 1/256                |   | 1.65kbps  |           |                   |                        |                   |          |           |       |          |                   |           |  |
| Tag⇒Reader/Writer    | 26.69kbps   |   |           |                   |                        |                   |          |           |       |          |                   |           |  |
| Modulation           | <table border="1"> <thead> <tr> <th></th> <th>Parameter</th> </tr> </thead> <tbody> <tr> <td>Reader/Writer⇒Tag</td> <td>ASK 10%(※2) / ASK 100%</td> </tr> <tr> <td>Tag⇒Reader/Writer</td> <td>ASK, FSK</td> </tr> </tbody> </table> |   | Parameter | Reader/Writer⇒Tag | ASK 10%(※2) / ASK 100% | Tag⇒Reader/Writer | ASK, FSK |           |       |          |                   |           |  |
|                      | Parameter   |   |           |                   |                        |                   |          |           |       |          |                   |           |  |
| Reader/Writer⇒Tag    | ASK 10%(※2) / ASK 100%  |   |           |                   |                        |                   |          |           |       |          |                   |           |  |
| Tag⇒Reader/Writer    | ASK, FSK  |   |           |                   |                        |                   |          |           |       |          |                   |           |  |
| Anti-collision       | Support   |   |           |                   |                        |                   |          |           |       |          |                   |           |  |

※1 : Tag-it HF-I is a registered trademark of Texas Instruments Incorporated.  
my-d is a registered trademark of Infineon Technologies AG.  
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MB89R118 is a registered trademark of FUJITSU Japan.

※2 : initialization

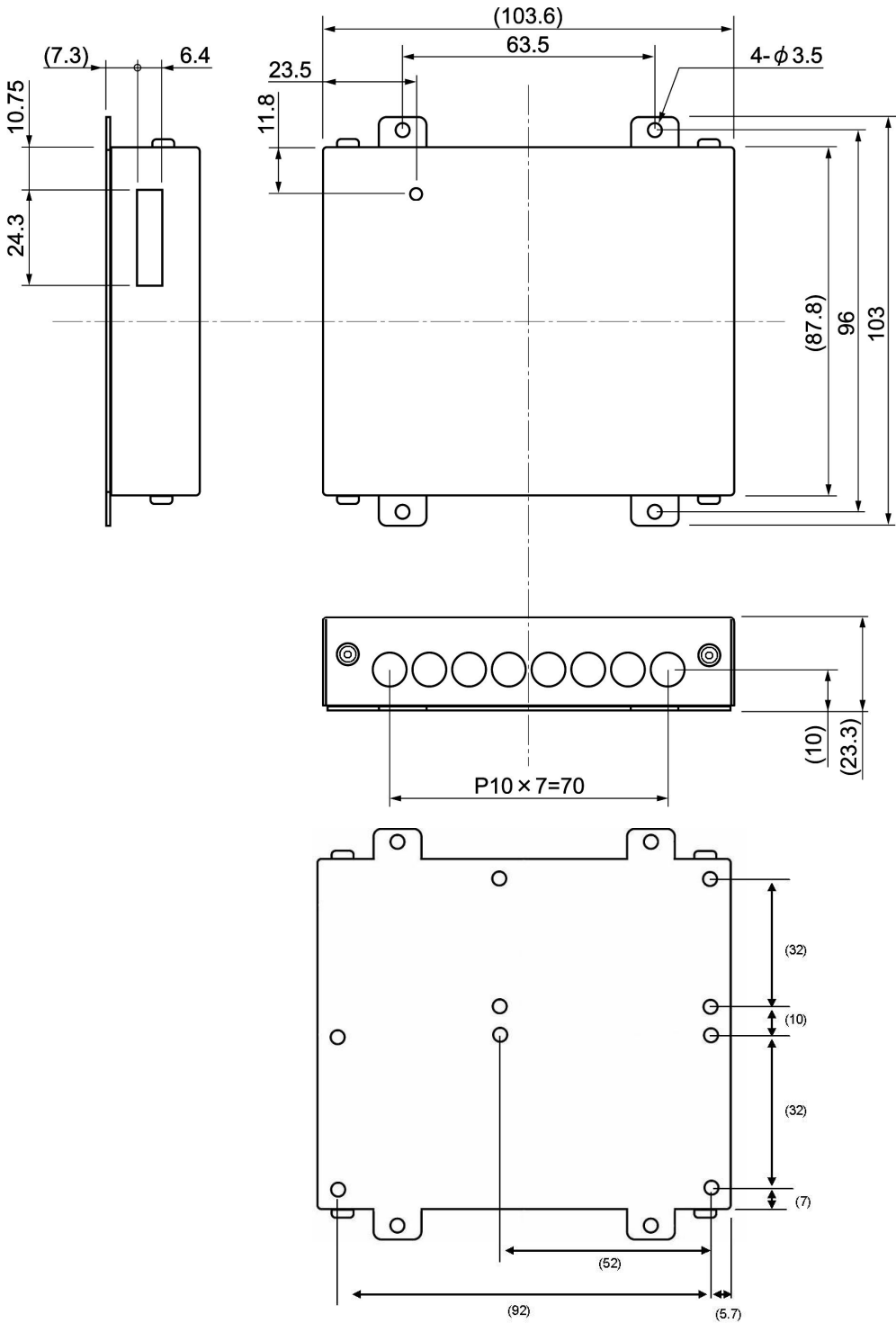
| Specifications | Item                                | Parameter   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
|----------------|-------------------------------------|---|----------|-----------|----------|-------------------------------------|-----------|---------------|--------|------|----------|---|--------------|------|---|-----|-----|---|----|----------------------|---|----|-------------------------|---|------|--------------|---|-----|--|---|-----|---|----|-----|--------------|
| Controll       | Command                             | Please refer to the TR3-C202 Protocol-Manual.   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
|                | Host Interface                      | UART(CMOS)<br><table border="1"> <thead> <tr> <th>Item</th> <th>Parameter</th> </tr> </thead> <tbody> <tr> <td>Speed</td> <td>9600bps<br/>19200bps(※2)<br/>38400bps</td> </tr> <tr> <td>Data bits</td> <td>8</td> </tr> <tr> <td>Parity</td> <td>None</td> </tr> <tr> <td>Stop bit</td> <td>1</td> </tr> <tr> <td>Flow control</td> <td>None</td> </tr> </tbody> </table>   | Item     | Parameter | Speed    | 9600bps<br>19200bps(※2)<br>38400bps | Data bits | 8             | Parity | None | Stop bit | 1 | Flow control | None |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
|                | Item                                | Parameter   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| Speed          | 9600bps<br>19200bps(※2)<br>38400bps |   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| Data bits      | 8                                   |   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| Parity         | None                                |   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| Stop bit       | 1                                   |   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| Flow control   | None                                |   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| LED1           | 1pc (3 colors, red/green/orange)    |   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| Connector      | CN1                                 | Connector : JST S10B-PH-SM4-TB(LF)(SN)<br>Housing : JST PHR-10<br>Contact : JST SPH-002T-P0.5S<br><br>Pin assignment<br><table border="1"> <thead> <tr> <th>Pin No.</th> <th>Symbol</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>VCC</td> <td>Power</td> </tr> <tr> <td>2</td> <td>VCC</td> <td>Power</td> </tr> <tr> <td>3</td> <td>GND</td> <td>GND</td> </tr> <tr> <td>4</td> <td>GND</td> <td>GND</td> </tr> <tr> <td>5</td> <td>Rx</td> <td>Received data signal</td> </tr> <tr> <td>6</td> <td>Tx</td> <td>Transmitted data signal</td> </tr> <tr> <td>7</td> <td>VCC2</td> <td>Power output</td> </tr> <tr> <td>8</td> <td>IO1</td> <td>Input/Output or Detection signal<br/>output H : Detection</td> </tr> <tr> <td>9</td> <td>IO2</td> <td>Input/Output or Trigger input<br/>L : Trigger ON</td> </tr> <tr> <td>10</td> <td>IO3</td> <td>Input/Output</td> </tr> </tbody> </table> | Pin No.  | Symbol    | Function | 1                                   | VCC       | Power         | 2      | VCC  | Power    | 3 | GND          | GND  | 4 | GND | GND | 5 | Rx | Received data signal | 6 | Tx | Transmitted data signal | 7 | VCC2 | Power output | 8 | IO1 | Input/Output or Detection signal<br>output H : Detection | 9 | IO2 | Input/Output or Trigger input<br>L : Trigger ON | 10 | IO3 | Input/Output |
|                | Pin No.                             | Symbol  | Function |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| 1              | VCC                                 | Power   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| 2              | VCC                                 | Power   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| 3              | GND                                 | GND   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| 4              | GND                                 | GND   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| 5              | Rx                                  | Received data signal  |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| 6              | Tx                                  | Transmitted data signal   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| 7              | VCC2                                | Power output  |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| 8              | IO1                                 | Input/Output or Detection signal<br>output H : Detection  |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| 9              | IO2                                 | Input/Output or Trigger input<br>L : Trigger ON   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| 10             | IO3                                 | Input/Output  |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
|                | CH1 to CH8                          | Connector : JST S2B-PH-SM4-TB(LF)(SN)<br>Housing : JST PHR-2<br>Contact : JST SPH-002T-P0.5S<br><br>Pin assignment<br><table border="1"> <thead> <tr> <th>Pin No.</th> <th>Symbol</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>RF</td> <td>Analog signal</td> </tr> <tr> <td>2</td> <td>GND</td> <td>GND</td> </tr> </tbody> </table>  | Pin No.  | Symbol    | Function | 1                                   | RF        | Analog signal | 2      | GND  | GND      |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| Pin No.        | Symbol                              | Function  |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| 1              | RF                                  | Analog signal   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |
| 2              | GND                                 | GND   |          |           |          |                                     |           |               |        |      |          |   |              |      |   |     |     |   |    |                      |   |    |                         |   |      |              |   |     |  |   |     |   |    |     |              |

※2 : initialization

| Specifications     | Item                        | Parameter                                     |
|--------------------|-----------------------------|---|
| Mechanical data    | Dimensions (W x D x H)      | 103.6 x 103 x 23.3mm                          |
|                    | Wight                       | approx. 240g                                  |
|                    | Installation                | M3 Screw<br>Screw is not included.            |
| Electrical data    | Power                       | Supply Voltage : +3.3± 10%, +5V ± 10%         |
|                    |                             | Current consumption : approx. 160mA(VDD=5.0V) |
|                    |                             | Carrier off : approx. 60mA(VDD=5.0V)          |
|                    |                             | Power down mode : approx. 50mA(VDD=5.0V)      |
|                    |                             | Consumption : max 1.0W(VDD=5.0V)              |
| Ambient Conditions | Temperature Operating range | 0 to 55 degree                                |
|                    | Humidity Operating range    | 30 to 80%RH                                   |
|                    | Temperature Storage range   | 0 to 55 degree                                |
|                    | Humidity Storage range      | 30 to 80%RH                                   |
| Other              | Accessories                 | None  |



■ Dimensions



Unit : mm  
Tolerance : ±1mm  
( ) is Recommended Dimension

■ Connections

| Names           | Model         | Notes  |
|-----------------|---------------|--|
| Antenna         | TR3-A202      |  |
|                 | TR3-A302      |  |
|                 | TR3-A401      |  |
| Cable           | TR3-AC-2A-*** | *** puts the cable length.<br>0.5m ~ 3m cable are available. |
| Interface board | TR3-IF-1C     | RS232C interface   |
|                 | TR3-IF-N1     | TCP/IP interface   |
|                 | TR3-IF-U1     | USB interface  |

■ Electrical Characteristics(CN1、CN3)

➤ VDD=5.0V

| Item             | Condition      | MIN  | TYP  | MAX   | Unit |
|------------------|----------------|------|------|-------|------|
| H input voltage  |                | 2.5  |      | 5.0   | V    |
| L input voltage  |                | 0    |      | 1.0   | V    |
| H output voltage | IOH=-5mA,-20mA | 3.0  |      |       | V    |
| L output voltage | IOL=5mA,20mA   |      |      | 2.0   | V    |
| Pull-up resistor |                | 25.0 | 50.0 | 100.0 | kΩ   |

➤ VDD=3.3V

| Item             | Condition      | MIN   | TYP  | MAX   | Unit |
|------------------|----------------|-------|------|-------|------|
| H input voltage  |                | 1.815 |      | 3.3   | V    |
| L input voltage  |                | 0     |      | 0.66  | V    |
| H output voltage | IOH=-5mA,-20mA | 3.0   |      |       | V    |
| L output voltage | IOL=5mA,20mA   |       |      | 2.0   | V    |
| Pull-up resistor |                | 25.0  | 50.0 | 100.0 | kΩ   |

- TX, RX, IO1, IO2 and IO3 is, Pull-up resistor has been connected.
- TX, RX, IO1, IO2 and IO3 is, 100 ohm resistor has been connected.  
Output port, LED is not driven. If the LED drive, please use the digital transistors.

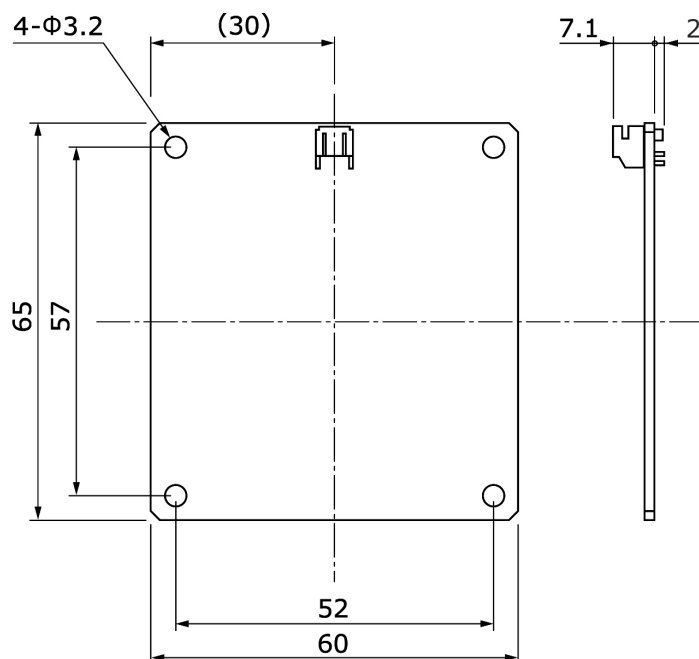
## 4.2 Antenna

### 4.2.1 TR3-A202

#### ■ Specifications

| Specifications       | Item                        | Parameter   |         |        |          |   |    |               |   |
|----------------------|-----------------------------|---|---------|--------|----------|---|----|---------------|---|
| Applicable Standards | RoHS                        | EU RoHS(2002/95/EC) Support   |         |        |          |   |    |               |   |
| Antenna              | Resonant frequency          | 13.56MHz $\pm$ 40kHz(Ta=25°C)   |         |        |          |   |    |               |   |
|                      | Communication distance      | Max 10cm<br>(Communication distance depends on the environment.)  |         |        |          |   |    |               |   |
| Connector            | CN1                         | Connector : JST S2B-PH-SM4-TB(LF)(SN)<br>Housing : JST PHR-2<br>Contact : JST SPH-002T-P0.5S  |         |        |          |   |    |               |   |
|                      |                             | Pin assignment <table border="1"> <thead> <tr> <th>Pin No.</th> <th>Symbol</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>RF</td> <td>Analog signal</td> </tr> <tr> <td>2</td> <td>GND</td> <td>GND</td> </tr> </tbody> </table> | Pin No. | Symbol | Function | 1 | RF | Analog signal | 2 |
| Pin No.              | Symbol                      | Function  |         |        |          |   |    |               |   |
| 1                    | RF                          | Analog signal   |         |        |          |   |    |               |   |
| 2                    | GND                         | GND   |         |        |          |   |    |               |   |
| Mechanical data      | Dimensions (W x D x H)      | 60 x 65 x 9.1 mm  |         |        |          |   |    |               |   |
|                      | Wight                       | approx. 11g   |         |        |          |   |    |               |   |
|                      | Installation                | M3 Screw<br>Screw is not included.  |         |        |          |   |    |               |   |
| Ambient Conditions   | Temperature Operating range | 0 to 55 degree  |         |        |          |   |    |               |   |
|                      | Humidity Operating range    | 30 to 80%RH   |         |        |          |   |    |               |   |
|                      | Temperature Storage range   | 0 to 55 degree  |         |        |          |   |    |               |   |
|                      | Humidity Storage range      | 30 to 80%RH   |         |        |          |   |    |               |   |
| Other                | Accessories                 | RFID Sticker 1 sheet<br>Model Name : SEL41400L  |         |        |          |   |    |               |   |

#### ■ Dimensions



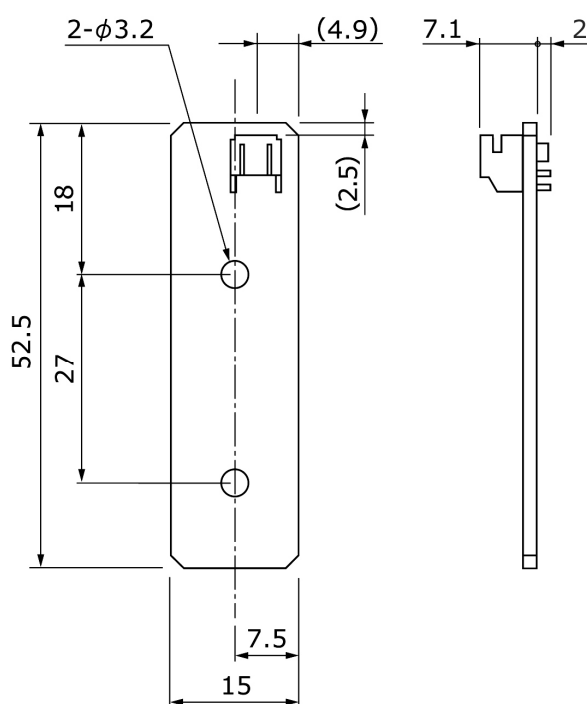
Unit : mm  
Tolerance :  $\pm$ 1mm  
Substrate thickness : 1.6mm

## 4.2.2 TR3-A302

## ■ Specifications

| Specifications       | Item                        | Parameter   |         |        |          |   |    |               |   |
|----------------------|-----------------------------|---|---------|--------|----------|---|----|---------------|---|
| Applicable Standards | RoHS                        | EU RoHS(2002/95/EC) Support   |         |        |          |   |    |               |   |
| Antenna              | Resonant frequency          | 13.56MHz $\pm$ 40kHz(Ta=25°C)   |         |        |          |   |    |               |   |
|                      | Communication distance      | Max 7cm<br>(Communication distance depends on the environment.)   |         |        |          |   |    |               |   |
| Connector            | CN1                         | Connector : JST S2B-PH-SM4-TB(LF)(SN)<br>Housing : JST PHR-2<br>Contact : JST SPH-002T-P0.5S  |         |        |          |   |    |               |   |
|                      |                             | Pin assignment <table border="1"> <thead> <tr> <th>Pin No.</th> <th>Symbol</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>RF</td> <td>Analog signal</td> </tr> <tr> <td>2</td> <td>GND</td> <td>GND</td> </tr> </tbody> </table> | Pin No. | Symbol | Function | 1 | RF | Analog signal | 2 |
| Pin No.              | Symbol                      | Function  |         |        |          |   |    |               |   |
| 1                    | RF                          | Analog signal   |         |        |          |   |    |               |   |
| 2                    | GND                         | GND   |         |        |          |   |    |               |   |
| Mechanical data      | Dimensions (W x D x H)      | 15 x 52.5 x 9.1 mm  |         |        |          |   |    |               |   |
|                      | Wight                       | approx. 3g  |         |        |          |   |    |               |   |
|                      | Installation                | M3 Screw<br>Screw is not included.  |         |        |          |   |    |               |   |
| Ambient Conditions   | Temperature Operating range | 0 to 55 degree  |         |        |          |   |    |               |   |
|                      | Humidity Operating range    | 30 to 80%RH   |         |        |          |   |    |               |   |
|                      | Temperature Storage range   | 0 to 55 degree  |         |        |          |   |    |               |   |
|                      | Humidity Storage range      | 30 to 80%RH   |         |        |          |   |    |               |   |
| Other                | Accessories                 | RFID Sticker 1 sheet<br>Model Name : SEL41400L  |         |        |          |   |    |               |   |

## ■ Dimensions



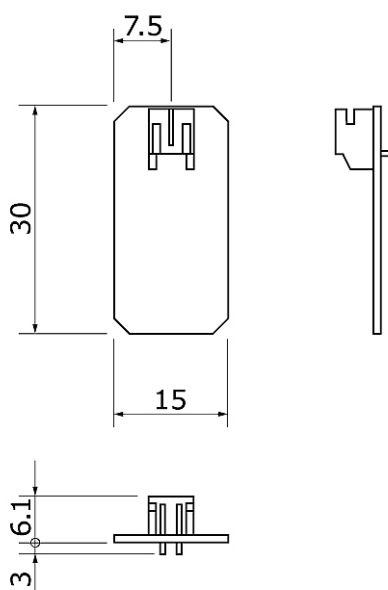
Unit : mm  
Tolerance :  $\pm$ 1mm  
Substrate thickness : 1.6mm

## 4.2.3 TR3-A401

## ■ Specifications

| Specifications       | Item                        | Parameter   |         |        |          |   |    |               |   |
|----------------------|-----------------------------|---|---------|--------|----------|---|----|---------------|---|
| Applicable Standards | RoHS                        | EU RoHS(2002/95/EC) Support   |         |        |          |   |    |               |   |
| Antenna              | Resonant frequency          | 13.56MHz $\pm$ 40kHz(Ta=25°C)   |         |        |          |   |    |               |   |
|                      | Communication distance      | Max 5cm<br>(Communication distance depends on the environment.)   |         |        |          |   |    |               |   |
| Connector            | CN1                         | Connector : JST S2B-PH-K-S(LF)(SN)<br>Housing : JST PHR-2<br>Contact : JST SPH-002T-P0.5S   |         |        |          |   |    |               |   |
|                      |                             | Pin assignment <table border="1"> <thead> <tr> <th>Pin No.</th> <th>Symbol</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>RF</td> <td>Analog signal</td> </tr> <tr> <td>2</td> <td>GND</td> <td>GND</td> </tr> </tbody> </table> | Pin No. | Symbol | Function | 1 | RF | Analog signal | 2 |
| Pin No.              | Symbol                      | Function  |         |        |          |   |    |               |   |
| 1                    | RF                          | Analog signal   |         |        |          |   |    |               |   |
| 2                    | GND                         | GND   |         |        |          |   |    |               |   |
| Mechanical data      | Dimensions (W x D x H)      | 15 x 30 x 9.1 mm  |         |        |          |   |    |               |   |
|                      | Wight                       | approx. 2g  |         |        |          |   |    |               |   |
|                      | Installation                | M3 Screw<br>Screw is not included.  |         |        |          |   |    |               |   |
| Ambient Conditions   | Temperature Operating range | 0 to 55 degree  |         |        |          |   |    |               |   |
|                      | Humidity Operating range    | 30 to 80%RH   |         |        |          |   |    |               |   |
|                      | Temperature Storage range   | 0 to 55 degree  |         |        |          |   |    |               |   |
|                      | Humidity Storage range      | 30 to 80%RH   |         |        |          |   |    |               |   |
| Other                | Accessories                 | RFID Sticker 1 sheet<br>Model Name : SEL41400L  |         |        |          |   |    |               |   |

## ■ Dimensions



Unit : mm  
Tolerance :  $\pm$ 1mm  
Substrate thickness : 1.0mm

## 4.3 Cable

### ■ Model Name

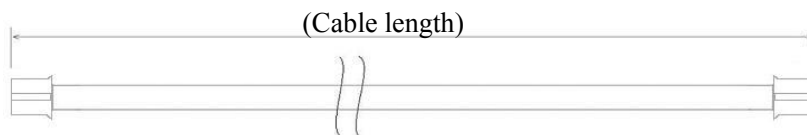
TR3-AC-2A-\*\*\*

└─ Enter the cable length(Unit:m)  
0.5M~3M

### ■ Specifications

| Item       | Parameter                                      |
|------------|--|
| RoHS       | EU RoHS(2002/95/EC) Support                    |
| Linetype   | Coaxial cable 1.5D-2V                          |
| Connector  | PH-PH  |
| Cable loss | 0.5M : approx. 0.043dB<br>3M : approx. 0.255dB |

### ■ Dimensions



( ) is Recommended Dimension

# 5 Maintenance

This product is mainly used in electronic components and semiconductors. Therefore, the long-term stable operation, the environment and conditions are expected to defect, as shown below.

- Device degradation due to overvoltage and overcurrent.
- Device degradation due to high temperature and long-term stress.
- Poor contact of the connector and cause deterioration of insulation by moisture or dust.
- Connector corrosion by corrosive gases.

In order to use this product at its best, please conduct routine or periodic inspections.

| Item               |                     | Maintenance                   | Criteria                                    |
|--------------------|---------------------|-------------------------------|---|
| Ambient conditions | Temperature         | Temperature Operating range   | 0 to 55 degree                              |
|                    | Humidity            | Humidity Operating range      | 30 to 80%RH                                 |
|                    | Enclosure rating    | Check the dusty               | None  |
|                    | Corrosive           | Check the corrosion           | None  |
| Power              | Input               | Check the voltage             | Input Voltage :<br>DC +3.3 ± 10%, +5V ± 10% |
|                    | Voltage fluctuation | Check the Voltage fluctuation |   |
| Attachment         | Product             | Check the Screw               | Checking and verifying                      |
|                    |                     | Check the Connector           |   |
|                    | Cable               | Check the Cable break         | None  |
| Performance        |                     | Check the Performance         | Work  |

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# Revision History

| Revision code | Date       | Revised contents   |
|---------------|------------|--|
| 1.00          | 2010/4/16  | Original production  |
| 1.01          | 2011/03/03 | 3.1.2 Installation from the Front deleted.<br>4.1 TR3-C202-A0-8 Add to 3.3V input voltage. |
|               |            |  |
|               |            |  |
|               |            |  |
|               |            |  |
|               |            |  |
|               |            |  |
|               |            |  |
|               |            |  |



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