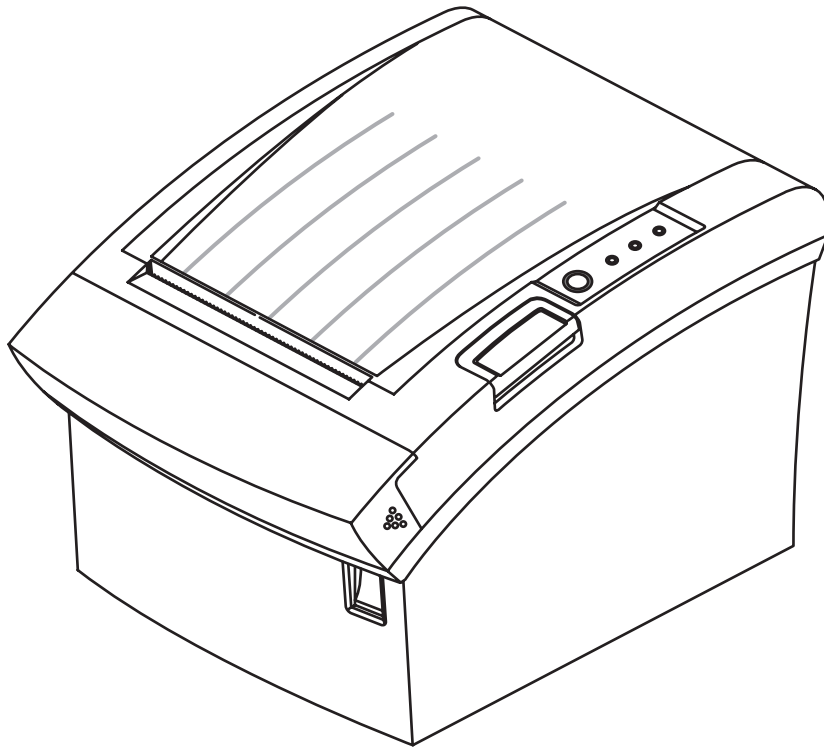


**BIXOLON®**

**Service Manual**  
**SRP-350**

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**Thermal Printer**  
**Rev. 3.02**



<http://www.bixolon.com>

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## ■ About

### About this Manual

This Service Manual describes how to perform hardware service maintenance for the BIXOLON SRP-350 Receipt Printer.

### Notes

Notes may appear anywhere in the manual. They draw your attention to additional information about the item.

### Precaution symbols



Indicates a Safety Precaution that applies to this part component.



Indicates the part or component is an electro-statically sensitive device. Use caution when handling these parts.

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## ■ Overview of this Receipt Printer

This System Receipt Printer is a microprocessor-based system, using a 16 bit-microprocessor.

This Service Manual provides the technical information for many individual component systems, circuits and gives an analysis of the operations performed by the circuits. If you need more technical information, please contact our service branch or R&D center. Schematics and specifications provide the needed information for the accurate troubleshooting.

All information in this manual is subject to change without prior notice. Therefore, you must check the correspondence of your manual with your machine. No part of this manual may be copied or reproduced in any form or by any means, without the prior written consent of BIXOLON Co., Ltd.

# 1. Precaution Segment

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

## 1-1 Safety Precautions

1. Be sure that all of the built-in protective devices are replaced. Restore any missing protective shields.
2. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including nonmetallic control knobs and compartment covers.
3. Make sure that there are no cabinet openings through which people - particularly children - might insert fingers and contact dangerous voltages. Such openings include excessively wide cabinet ventilation slots and improperly fitted covers and drawers.

4. Leakage Current Hot Check:

**WARNING: Do not use an isolation transformer during this test.**

Use a leakage-current tester or a metering system that complies with American National Standards Institute (ANSI C101.1, Leakage Current for Applications), and Underwriters Laboratories (UL Publications UL1410, 59.7).

With the unit completely reassembled, plug the AC line cord directly into a 100VAC or 240VAC outlet of the Adaptor.

With the unit's AC switch first in the ON position and then OFF, measure the current between a known Earth ground (metal water pipe, conduit, etc.) and all exposed metal part, including: metal cabinet, frame, and screw-heads and printer. The current measure should not exceed 0.1 milliamp. Reverse the power-plug prong in the AC outlet and repeat the test.

5. Design Alteration Warning:



Never alter or add to the mechanical or electrical design of the Receipt Printer. Unauthorized alterations might create a safety hazard. Also any design changes or additions will void the manufacture's warranty.

6. Components, parts and wiring that appear to have overhead or that are otherwise damaged should be replaced with parts that meet the original specifications. Always determine the cause of damaged or overheating and correct any potential hazards.

7. Observe the original lead dress, especially near the following areas: sharp edges, and especially the AC and high voltage supplies. Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board. Check the AC power cord for damage. Make sure that leads and components do not touch thermally hot parts.

8. Product Safety Notice:

Some electrical and mechanical parts have special safety-related characteristics, which might not be obvious from visual inspection. These safety features and the protection they give might be lost if the replacement component differs from the original-even if the replacement is rated for higher voltage, wattage, etc.

Components that are critical for safety are indicated in the circuit diagram by shading, () or (). Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

## **1-2 Servicing Precaution**

**WARNING 1:** First read the Safety Precaution section of this manual. If some unforeseen circumstance creates a conflict between the servicing and safety precautions, always follow the safety precaution.

**WARNING 2:** An electrolytic capacitor installed with the wrong polarity might explode.

1. Always unplug the unit's AC power cord from the AC power source or the Power Switch off before attempting to:
  - (a) Remove or reinstall any component or assembly,
  - (b) Disconnect an electrical plug or connector,
  - (c) Connect a test component in parallel with an electrolytic capacitor.
2. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometime used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
3. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.
4. Check the insulation between the blades of the AC plug and accessible conductive parts. (example: metal panels and input terminals).
5. Insulation Checking Procedure:

Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500V) to the blades of the AC plug. The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 mega-ohm.
6. Never defeat any of the B+ voltage interlock. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
7. Always connect an instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

### **1-3 Precaution for Electrostatically Sensitive Devices (ESDs)**

1. Some semiconductor (solid state) devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs); examples include integrated circuits and some field-effect transistors. The following techniques will reduce the occurrence of component damaged caused by static electricity.
2. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. (Be sure to remove it prior to applying power-this is an Electric shock precaution.)
3. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.
4. Do not use freon-propelled chemical. These can generate electrical charges that damage ESDs.
5. Use only a grounded-tip soldering iron when soldering or unsoldering ESDs.
6. Use only an anti-static solder removal device. Many solder removal devices are not rated as anti-static; these can accumulate sufficient electrical charge to damage ESDs.
7. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
8. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the device will be installed.
9. Minimize body motions when handling unpacked replacement ESDs. Motions such as brushing clothes together, or lifting a foot from a carpeted floor can generate enough static electricity to damaged an ESD.

### **1-4 Operational Precautions**

1. The hitting element of the printer mechanism's thermal head and the driver IC are easily damaged. Never allow these components to come into contact with metal or other hard objects.
2. Never touch the printer mechanism's heating element with your hand. Doing so can damage the heating element and affect proper operation.
3. The head and motor areas are very hot during and immediately after printing. Do not touch components in these areas directly with your hand.
4. Do not use any paper other than these specified in this manual otherwise print head reliability and print quality are affected adversely.
5. Thermal paper starts to color at around 70°C. Take care to protect unused and printed thermal paper against the affects of heat, light and characters on the paper to feed.
6. Take the roll paper out of the printer when you will not use the printer for a long time in a high temperature and humidity environment.

## 2. Installation and Operation

### 2-1 Installation

#### 2-1-1 AC Adapter Installation

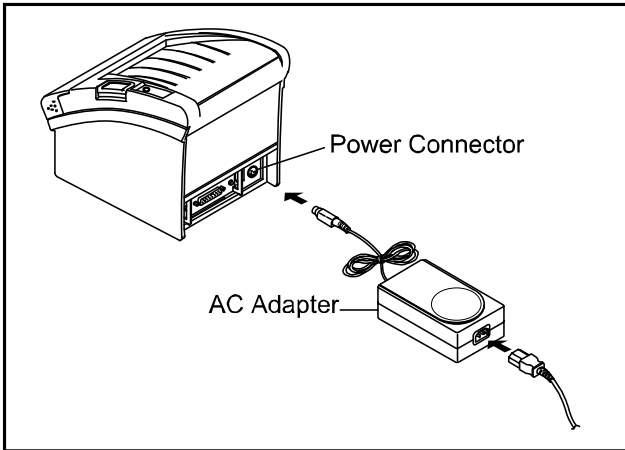


Figure 2-1 AC Adapter Installation

1. Make sure the printer is turned off with the side of the switch.
2. Plug the DC cord connector into the power jack on the printer. (Plug the flat side down)
3. Plug the AC Adapter power cord into the wall outlet.

#### 2-1-2 Interface Cable Installation

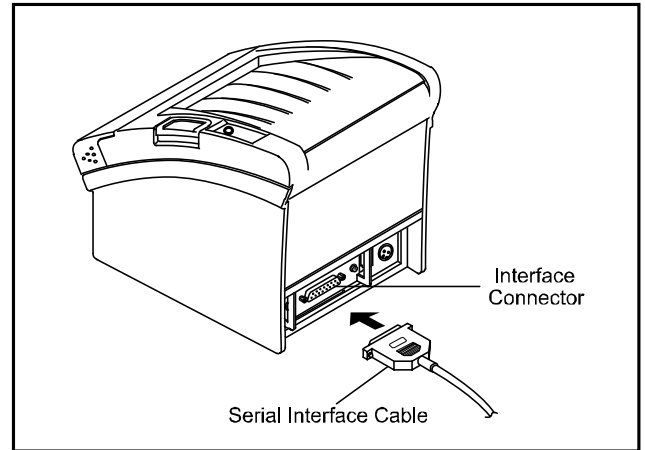


Figure 2-2 I/F Cable Installation

1. Turn off printer, host ECR and Computer.
2. Plug RS-232, RS-485, USB or Parallel Cable connector into the I/F connector on the printer.
3. Tighten the screws on both sides of the connector.
4. Turn on the printer, host ECR and Computer.

#### 2-1-3 Cash Drawer Cable Installation

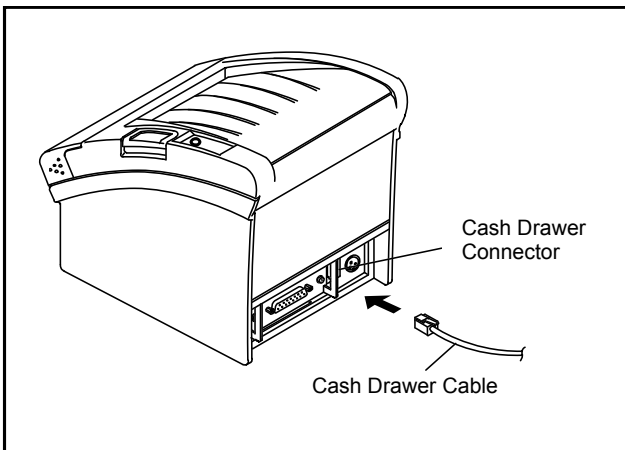


Figure 2-3 Cash Drawer Cable Installation

1. Turn the printer off.
2. Plug the Cash Drawer cable connector into the connector on the printer.  
(To remove the Cash Drawer cable, press the clip on the connector, grasp the connector and pull it out.)

#### 2-1-4 Paper Roll Installation

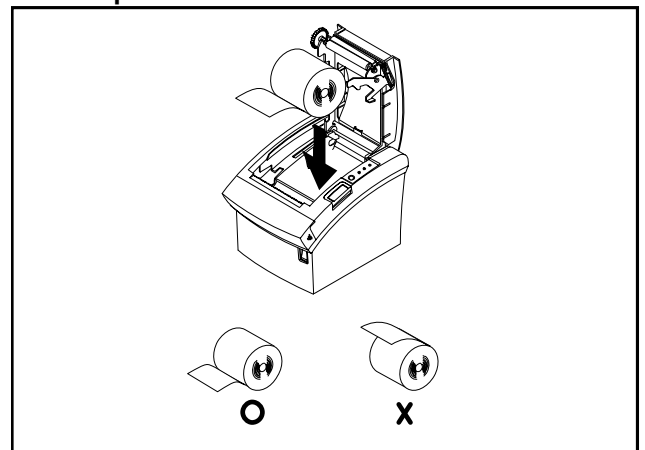


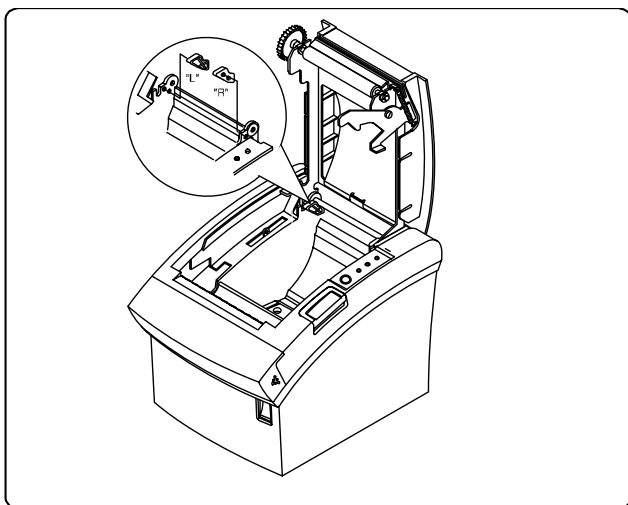
Figure 2-4 Paper Roll Installation

1. Open the cover printer and remove the used paper roll core if there is one.
2. Load the paper roll on the paper holder as shown.
3. Close the cover printer.

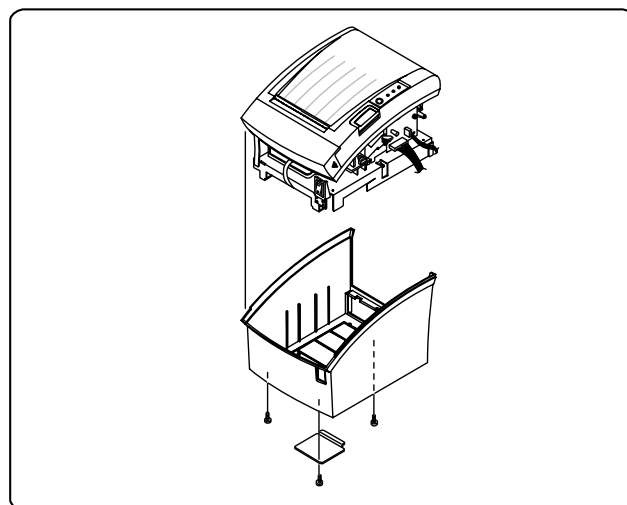


## 2-1-5 Wall Mount Installation

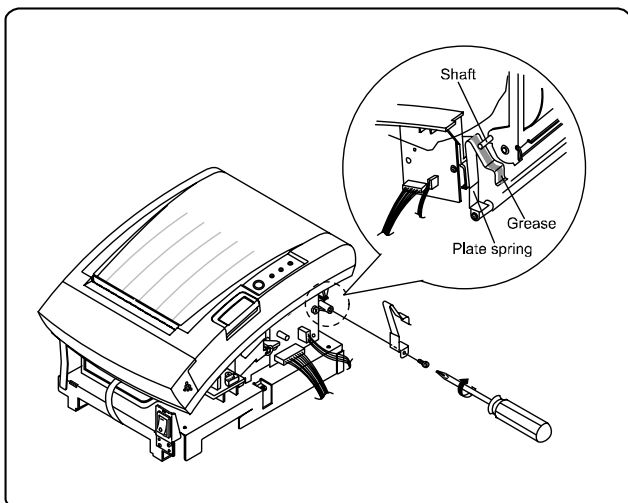
1. Press the Push Button. After opening the cover, insert the Wall-Guide L, R to the Upper-Left Hole and the Upper-Right Hole inside of the printer.



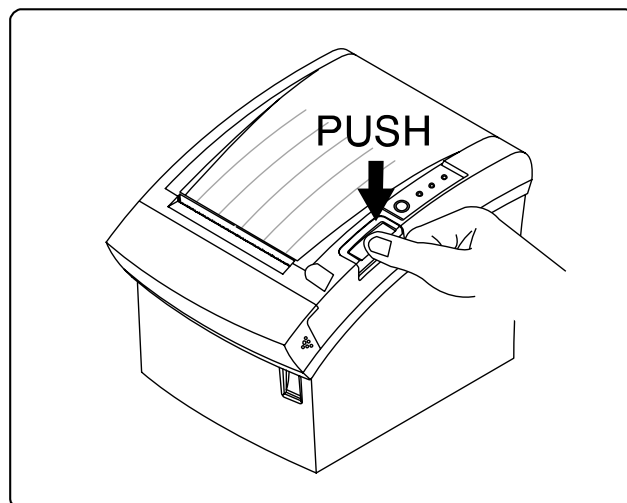
2. Remove the three screws from the bottom of the Case-Lower. Separate the Case-Lower from the Main Body.



3. Attach the Plate-Spring to the right side of Frame-Body and tighten a screw.

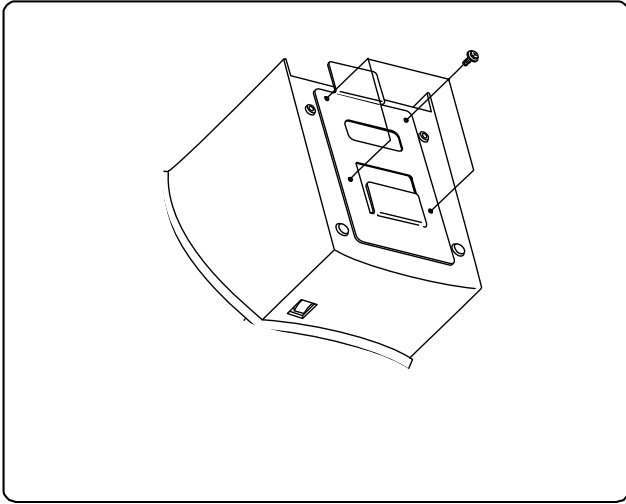


4. Check whether it works properly by pressing the Push Button after tightening the screw.

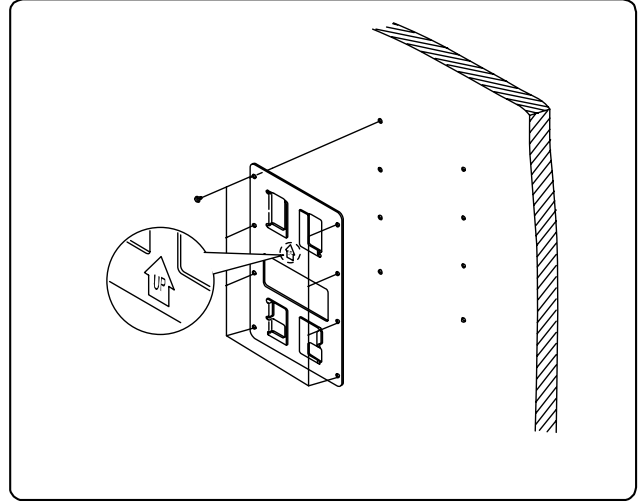


5. After assembling the Plate Spring, the height will be 7~10[mm] when pressing the Push Button. If no problem Re-assemble in the reverse order.

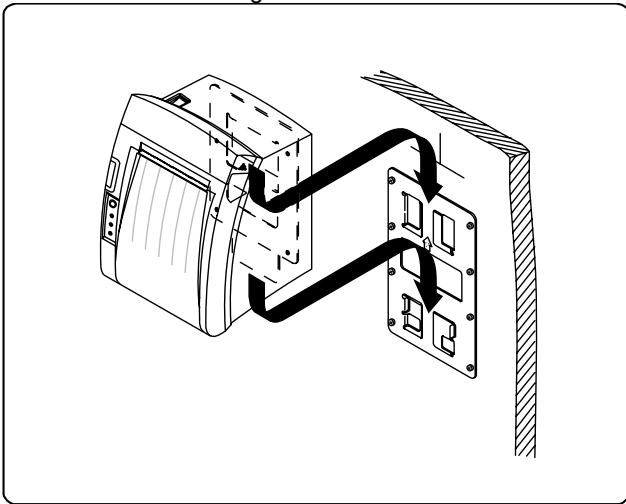
6. After assembling the Case-Lower to Set Body, turn the Set over and attach the BRKT Hanger to the Case Lower then tighten four screws.



7. Attach the BRKT Mount to the wall firmly with the eight screws. Be sure that the BRKT attached properly to match the direction of arrow. And the BRKT Mount should be always fixed vertically.



8. Insert the BRKT Hanger of Set to the BRKT Mount.



## 2-2 Operation

### 2-2-1 Setting the DIP switches

The DIP switches are located on the bottom of the printer. The DIP switches are used to set the printer to perform various functions. Follow these when changing DIP switches setting:

1. Turn the printer power switch off.
2. Remove the screw on the bottom of the printer and open the bracket.
3. Flip the DIP switches using tweezers or another marrow-ended tool. Switches are in when up and off when off down.
4. The new setting takes effect when you turn on the printer.

**※ Note : Always change DIP switch settings only when the printer is turned off. Change made with the power on have no effect and then on again.**

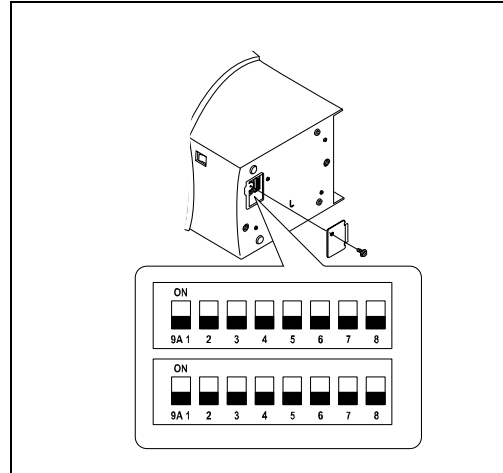


Figure 2-5 Setting the DIP switches

### 2-2-2 Setting the DIP switch (RS-232C Serial Interface)

• DIP Switch 1

SW	Function	ON	OFF	Default
1	Auto Line Feed	Always enabled	Always disabled	OFF
2	Reserved	-	-	OFF
3	Handshaking	XON/OFF	DTR/DSR	OFF
4	Word length	7 bits	8 bits	OFF
5	Parity check	Yes	No	OFF
6	Parity selection	EVEN	ODD	OFF
7	Baud rate selection	Refer to the Following Table 1		ON
8				OFF

• DIP Switch 2

SW	Function	ON	OFF	Default
1	Code Page Selection	Refer to the Following Table 3		OFF
2	Internal bell control	Internal bell disable	Internal bell enable	OFF
3	Auto Cutter Selection	Disable	Enable	OFF
4	Code Page Selection	Refer to the Following Table 3		OFF
5	Select Print Density	Refer to the Following Table 2		OFF
6				OFF
7	Near End Sensor Status	Disable	Enable	OFF
8	Code Page Selection	Refer to the Following Table 3		OFF

**2-2-3 Setting the DIP switch (IEEE1284 Parallel, USB Interface)**

• DIP Switch 1

SW	Function	ON	OFF	Default
1	Auto Line Feed	Always enabled	Always disabled	OFF
2	Reserved	-	-	OFF
3	Reserved	-	-	OFF
4	Reserved	-	-	OFF
5	Reserved	-	-	OFF
6	Reserved	-	-	OFF
7	Reserved	-	-	OFF
8	Reserved	-	-	OFF

• DIP Switch 2

SW	Function	ON	OFF	Default
1	Code Page Selection	Refer to the Following Table 3		OFF
2	Internal bell control	Internal bell disable	Internal bell enable	OFF
3	Auto Cutter Selection	Disable	Enable	OFF
4	Code Page Selection	Refer to the Following Table 3		OFF
5	Select Print Density	Refer to the Following Table 2		OFF
6				OFF
7	Near End Sensor Status	Disable	Enable	OFF
8	Code Page Selection	Refer to the Following Table 3		OFF

• Table 1 – Baud rate (bps) Selection

Transmission speed	SW – 7	SW – 8
9600 baud	ON	OFF
19200 baud	OFF	OFF
38400 baud	ON	ON
57600 baud	OFF	ON

• Table 2 – Print Density Selection

Print Density	SW - 5	SW – 6
1 ( Light )	ON	ON
2	OFF	OFF
3	ON	OFF
4 ( Dark )	OFF	ON

• Table 3 – Code Page Selection

Code Page	SW – 1	SW – 4	SW - 8
PC 437	OFF	OFF	OFF
PC 737	OFF	OFF	ON
PC 852	OFF	ON	OFF
PC 857	OFF	ON	ON
PC 864	ON	OFF	OFF
PC 866	ON	OFF	ON
WPC 1251	ON	ON	OFF
WPC 1254	ON	ON	ON

**2-2-4 Hexadecimal Dumping**

This feature allows experienced users to see exactly what data is coming to the printer. This can be useful in finding software problems. When you turn on the hexadecimal dump function, the printer prints all commands and data in hexadecimal format along with a guide section to help you find specific commands.

To use the hexadecimal dump function, follow these steps :

1. After you make sure that the printer is off. Open the cover.
2. Turn on the printer, while holding down the FEED button.
3. Close the cover, then the printer enters the hexadecimal dump mode.
4. Run any software program that sends data to the printer. The printer will print all the codes it receives in a two-column format. The first column contains the hexadecimal codes and the second column gives the ASCII characters that corresponds to the codes.

```

1B 21 00 1B 26 02 40 40 40 40      . ! . . & . @ @ @ @
02 0D 1B 44 0A 14 1E 28 28 28      . . . D . . . . ( ( (
00 01 0A 41 0D 42 0A 43 43 43      . . . A . B . C C C

```

**Note :** A period(.) is printed for each code that no ASCII equivalent.

**Note :** During the hex dump all commands except DLE EOT and DLE ENQ are disabled.

5. When the printing finishes, turn off the printer.
6. Turn on the printer and then the hexadecimal model is off.

**2-2-5 The self Test Mode**

The self-test checks whether the printer has any problem. If the printer does not function properly, contact your dealer. The self-test checks the following :

1. Make sure paper roll has been installed properly.
2. Turn on the power while holding down the FEED button. The self-test begins.
3. The self-test prints the current printer status, which provides the control ROM version and the DIP switch setting.
4. After printing the current printer status, self-test printing will print the following and pause. (The PAPER LED light blinks).

<p><b>SELF-TEST PRINTING.</b>  <b>PLEASE PRESS THE FEED BUTTON.</b></p>
---

5. Press the FEED button to continue printing. The printer prints a pattern using the built-in character set.
6. The self-test automatically ends and cuts the paper after printing the following.

<p><b>*** COMPLETED ***</b></p>
---------------------------------

The printer is ready to receive data as soon as it completes the self-test.

**(A) Serial Self-Test Sheet**

```

SRP-350 VER 1.00 1999.11.09
=====

Serial (RS-232C) Interface
Baud Rate       : 19200 bps
Data Bits       : 8 bits
Stop Bits       : 1 bits
Habdshaking     : DTR/DSR
Parity Check    : Disable
Receive Error   : Ignore

EPSON EMULATION MODE

Print Density
LIHGT [ 1 2 3 4 ] DARK
    ■

                Self-Test printing.
            Please press the FEED button

I!#$%&'()*+,-./0123456789;:<=>?ABCDEFGHIJ
"#$%&'()*+,-./0123456789;:<=>?ABCDEFGHIJK
#$%&'()*+,-./0123456789;:<=>?ABCDEFGHIJKL
$%&'()*+,-./0123456789;:<=>?ABCDEFGHIJKLM
%'()*+,-./0123456789;:<=>?ABCDEFGHIJKLMN
'()*+,-./0123456789;:<=>?ABCDEFGHIJKLMNO
()*+,-./0123456789;:<=>?ABCDEFGHIJKLMNOP
)*+,-./0123456789;:<=>?ABCDEFGHIJKLMNOPQ
*+,-./0123456789;:<=>?ABCDEFGHIJKLMNOPQR
+,-./0123456789;:<=>?ABCDEFGHIJKLMNOPQRS
,-./0123456789;:<=>?ABCDEFGHIJKLMNOPQRST
-./0123456789;:<=>?ABCDEFGHIJKLMNOPQRSTU
./0123456789;:<=>?ABCDEFGHIJKLMNOPQRSTUV
/0123456789;:<=>?ABCDEFGHIJKLMNOPQRSTUVW
0123456789;:<=>?ABCDEFGHIJKLMNOPQRSTUVWX
123456789;:<=>?ABCDEFGHIJKLMNOPQRSTUVWXY
23456789;:<=>?ABCDEFGHIJKLMNOPQRSTUVWXYZ
3456789;:<=>?ABCDEFGHIJKLMNOPQRST TUVWXYZ[
456789;:<=>?ABCDEFGHIJKLMNOPQRST TUVWXYZ[
56789;:<=>?ABCDEFGHIJKLMNOPQRST TUVWXYZ[\

~

RSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{

*** COMPLETED ***
    
```

**(B) Parallel Self-Test Sheet**

```

SRP-350 VER 1.00 1999.11.09
=====

Parallel (IEEE1284) Interface

EPSON EMULATION MODE

Print Density
LIHGT [ 1 2 3 4 ] DARK
    ■

                Self-Test printing.
            Please press the FEED button

I!#$%&'()*+,-./0123456789;:<=>?ABCDEFGHIJ
"#$%&'()*+,-./0123456789;:<=>?ABCDEFGHIJK
#$%&'()*+,-./0123456789;:<=>?ABCDEFGHIJKL
$%&'()*+,-./0123456789;:<=>?ABCDEFGHIJKLM
%'()*+,-./0123456789;:<=>?ABCDEFGHIJKLMN
'()*+,-./0123456789;:<=>?ABCDEFGHIJKLMNO
()*+,-./0123456789;:<=>?ABCDEFGHIJKLMNOP
)*+,-./0123456789;:<=>?ABCDEFGHIJKLMNOPQ
*+,-./0123456789;:<=>?ABCDEFGHIJKLMNOPQR
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123456789;:<=>?ABCDEFGHIJKLMNOPQRSTUVWXY
23456789;:<=>?ABCDEFGHIJKLMNOPQRSTUVWXYZ
3456789;:<=>?ABCDEFGHIJKLMNOPQRST TUVWXYZ[
456789;:<=>?ABCDEFGHIJKLMNOPQRST TUVWXYZ[
56789;:<=>?ABCDEFGHIJKLMNOPQRST TUVWXYZ[\

~

RSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{

*** COMPLETED ***
    
```

Figure 3-13 The Self-Test Sheet

## 3. Product Specifications

### 3-1 Appearance

#### 3-1-1 Printer Dimensions (mm)

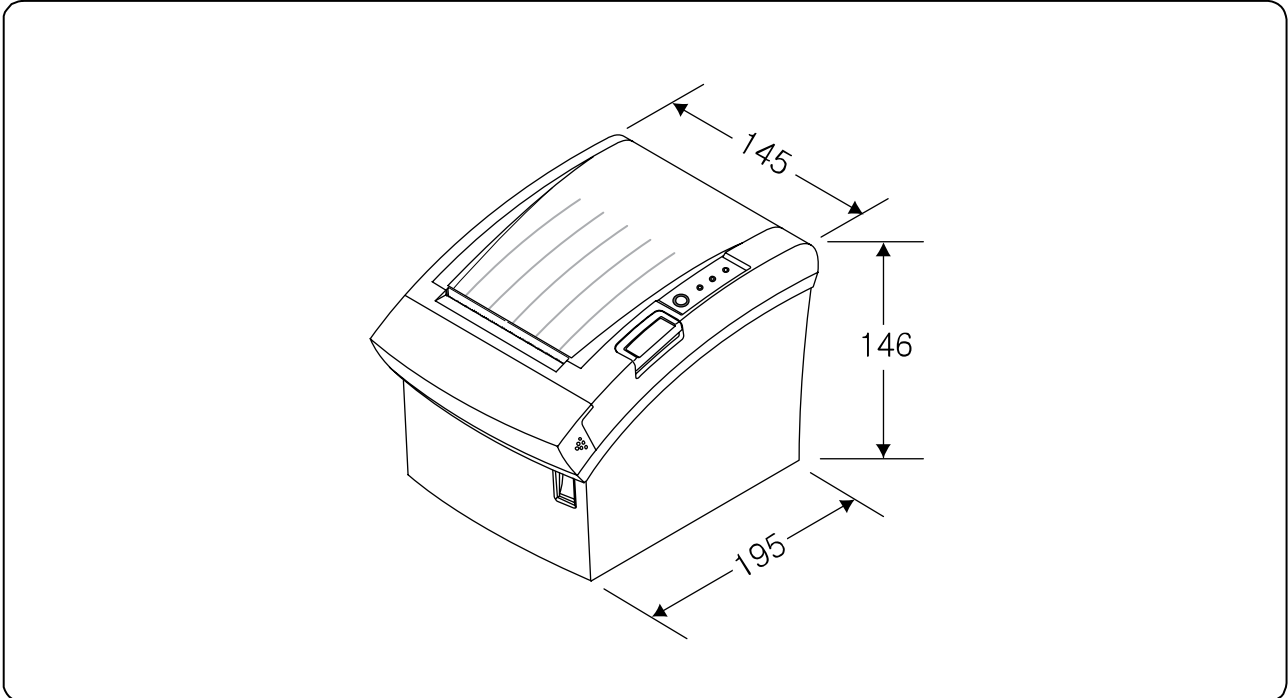


Figure 3-1 Printer Dimension

#### 3-1-2 AC Adapter Dimensions (mm)

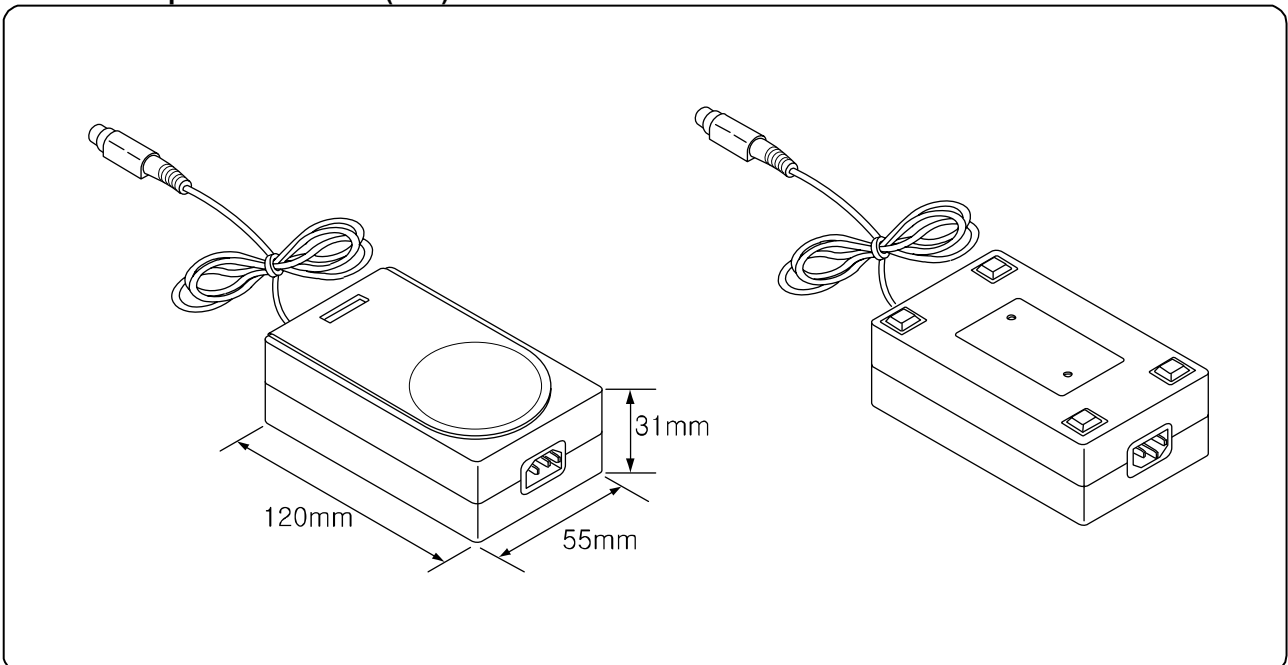


Figure 3-2 Adapter Dimension

**3-1-3 Feature Locations**

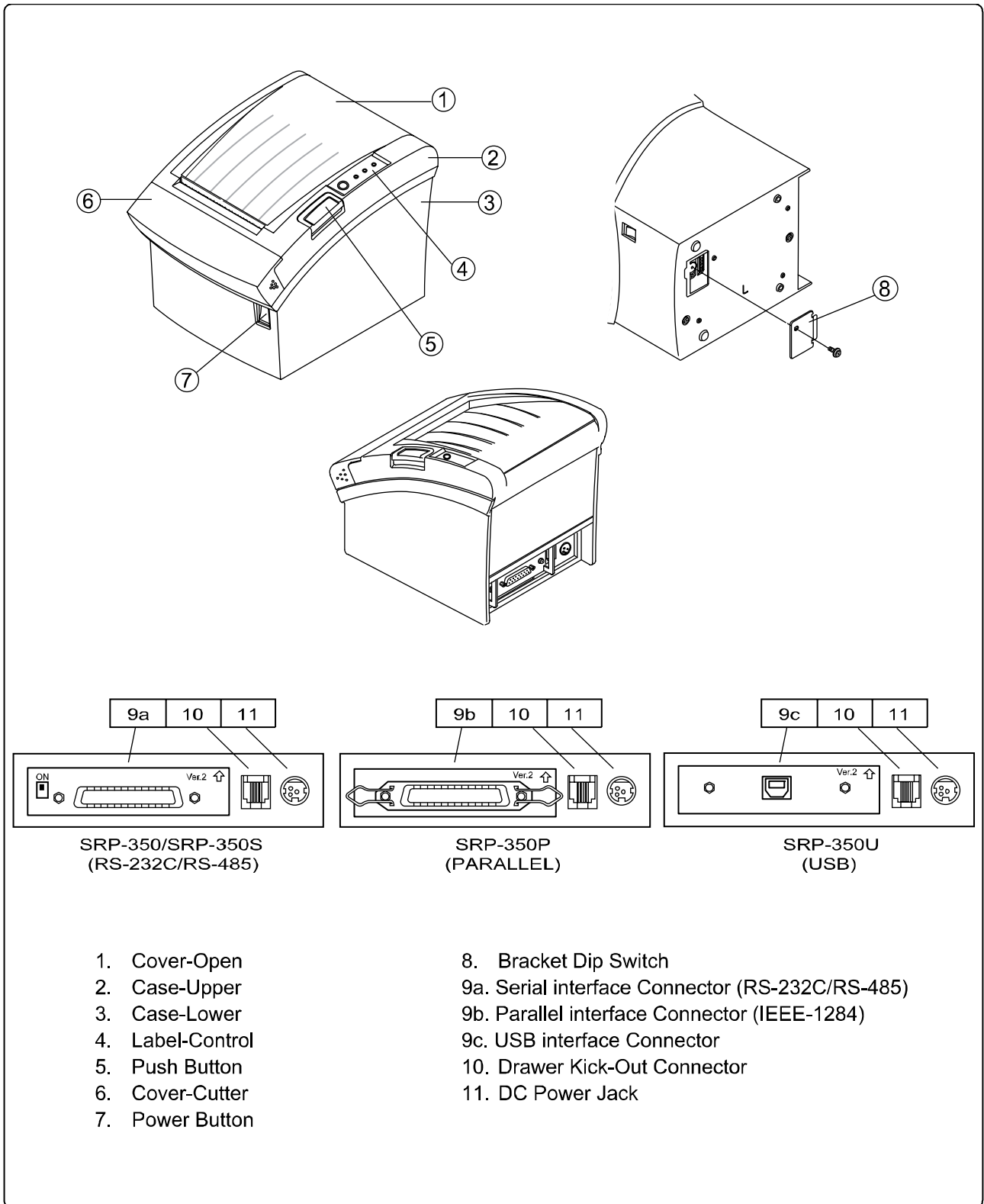


Figure 3-3 Feature Location



### 3-2 General Specifications

Item	Description	Remark
Product	<ul style="list-style-type: none"> <li>• SRP-350 : RS-232 Serial Communication</li> <li>• SRP-350S : RS-485 Serial Communication</li> <li>• SRP-350P : IEEE1284 Parallel Communication</li> <li>• SRP-350U : USB Communication</li> </ul>	
Processor	<ul style="list-style-type: none"> <li>• MITSUBISHI M16C/62 Group M30624FGFP (16 Bit)               <ol style="list-style-type: none"> <li>1) Internal ROM Size : 256K Byte</li> <li>2) Internal RAM Size : 20K Byte</li> </ol> </li> </ul>	Flash ROM Version
Memory	<ul style="list-style-type: none"> <li>• RAM               <ol style="list-style-type: none"> <li>1) SRAM : 1Mbits (KM681000B*1)</li> <li>2) FLASH RAM : 8Mbits (AM29F800B*1)</li> </ol> </li> </ul>	
Interface Serial (RS-232C / RS-485)	<ul style="list-style-type: none"> <li>• Flow Control :               <ol style="list-style-type: none"> <li>1) DTR / DSR (H/W Flow Control)</li> <li>2) XON / XOFF (S/W Flow Control)</li> </ol> </li> <li>• Baud Rate : 9600 / 19200 / 38400 / 57600 Bps</li> <li>• Receive Buffer : 4 Kbytes</li> <li>• Connector : DB25P Female (I/F PBA Side)</li> </ul>	The Flow Control, Baud Rate, Stop Bit and Parity are determined by DIP S/W position.
Interface Parallel	<ul style="list-style-type: none"> <li>• Mode :               <ol style="list-style-type: none"> <li>1) Forward Mode : Compatibility Mode</li> <li>2) Reverse Mode : Nibble / Byte Mode</li> </ol> </li> <li>• Connector : 36 Pin Centronics (Ribbon Type)</li> </ul>	
USB	<ul style="list-style-type: none"> <li>• Transfer Type : BULK</li> <li>• Speed : 12 Mbps (Full-Speed)</li> <li>• Power : Self-Powered</li> </ul>	
Printer	<ul style="list-style-type: none"> <li>• Printing Method : Thermal Line Printing</li> <li>• Printing Speed : 150 mm/Sec, 46.2 Line/Sec (Font A, 1/6" Feed)</li> </ul>	
Auto Cutter	<ul style="list-style-type: none"> <li>• Type : Guillotine</li> <li>• Cutting Method : 1 Point Partial Cutting</li> </ul>	
Power Consumption	<ul style="list-style-type: none"> <li>• Approx. 27W (Peak)</li> </ul>	
AC Adapter	<ul style="list-style-type: none"> <li>• Input : AC 100V ~ 240V, 50Hz/60Hz</li> <li>• Output : DC 24V±5%, 2.5A</li> <li>• Ripple and Noise : ±200mV</li> </ul>	
Environment Condition	<ul style="list-style-type: none"> <li>• Temperature: 0°C ~ 45°C</li> <li>• Humidity : 30% ~ 80% RH</li> </ul>	
Weight	<ul style="list-style-type: none"> <li>• 2.3 Kg (With Packing)</li> </ul>	
Dimensions(mm)	<ul style="list-style-type: none"> <li>• 145(W) x 195(D) x 146(H)</li> </ul>	

Table 3-1 General Specification

### 3-3 Thermal Printer Specifications

#### 3-3-1 Printer Specification

Item	Description	Remark
Model	<ul style="list-style-type: none"> <li>• SRP-350 (TPH : KF1803-GF14B - ROHM)</li> </ul>	
Print Method	<ul style="list-style-type: none"> <li>• Thermal Line Printing</li> </ul>	
Dot Density	<ul style="list-style-type: none"> <li>• 0.141 mm (7.09 Dots/mm)</li> </ul>	
Printing Direction	<ul style="list-style-type: none"> <li>• Unidirection with friction feed</li> </ul>	
Printing Width	<ul style="list-style-type: none"> <li>• 72.192±0.2mm, 512 dot Position</li> </ul>	
Character / Line	<ul style="list-style-type: none"> <li>• 42 (Font A : 12x24)</li> <li>• 56 (Font B : 9x17 )</li> </ul>	
Character Spacing	<ul style="list-style-type: none"> <li>• 0.28mm (0.01") (2 dots) (Font A)</li> <li>• 0.28mm (0.01") (2 dots) (Font B)</li> </ul>	
Printing Speed	<ul style="list-style-type: none"> <li>• Max. 46.2 Lines / Sec (1/6inch feed)</li> <li>• Max. 150mm / Sec (5.9" /Sec)</li> </ul>	
Paper feeding Speed	<ul style="list-style-type: none"> <li>• Approx. 150mm /Sec</li> </ul>	

Table 3-2 Thermal Printer Specification

**3-3-2 Character Specification**

Item	Description	Remark
Number of Character	• Alphanumeric Characters : 95	
	• Extended Characters : 128 x 34 Page (Including one space page)	
	• International Characters : 32	
Character Structure	• 12 x 24 (Font A) (Including 2-dot spacing in horizontal) • 9 x 17 (Font B) (Including 2-dot spacing in horizontal) Font A is selected as the default	

Table 3-3 Thermal Printer Character Specification

**3-3-3 Paper Specification**

Item	Description	Remark
Paper Type	• JUJO AF50KS-E	
Paper Form	• Paper Roll	
Paper Width	• 80mm(+0,-1), 3.14"(+0,-0.039")	
Paper Roll Size	• Max 83mm	
Spool Inside Dia.	• 12mm (0.47")	
Spool Outside Dia.	• 18mm (0.71")	

Table 3-4 Thermal Printer Paper Specification

※ **Note : The Following paper can be used instead of the specified paper above.**

- TF50KS-E : Nippon Paper industries Co., Ltd.
- PD 160R : New Oji Paper Mfg, Co., Ltd.
- F380 : Kansaki Specialty Paper, Inc. (USA)

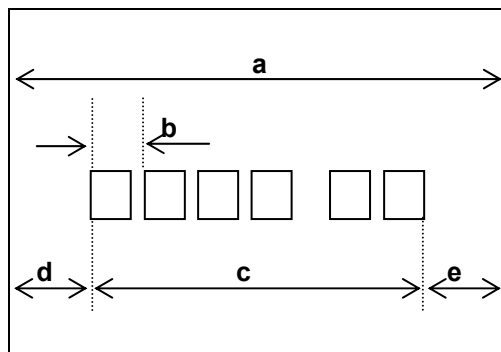
**3-3-4 Reliability and Environment Specification**

Item	Description	Remark
Life	• Mechanism : 15 Million lines • Head : $1 \times 10^8$ Pulses / 100Km • Auto Cutter : 1,500,000 Cut	
MCBF	• 37,000,000Lines	
Environmental Temperature	• Operating : 0°C ~ +45°C • Storage : -10°C ~ +50°C (Except for Paper)	
Humidity	• 30~80% RH (Operating) • 10~90% RH (Storage) ; Except for Paper	

Table 3-5 Thermal Printer Reliability Specification

**3-3-5 Printable Area**

The Printer area of a paper with width of 80-1.0mm(3.13"±0.02") is 72.2±0.2mm(2.84"±0.008")(512dots) and The space on the right and left sides are approximately 2.5mm(0.098").



- a = 80-1.0mm (3.13"±0.02")
- b = 0.141mm±0.05mm (.056"±.008")
- c = 72mm±0.2mm (2.83"±.002")
- d = 2.5mm (0.098") Over
- e = 2.5mm (0.098") Over

[All the numeric values are typical]

Figure 3-4 Printable Area

**3-3-6 TPH (Thermal Printer Head) Specification**

Item	Description	Remark
Heat Element Structure	2 Heaters / Dot	
Number of Heat Element	512 Dots	
Heat Element Pitch	0.141mm/dot, 7.09Dot/mm (180DPI)	
Print Width	72±0.2mm	
Average Resistance	650Ω ± 3%	
Thermistor	1) Resistance R25 : 30kΩ ± 5% (At 25 °C) 2) B Value : 3950K ± 2% 3) Temperature : - 20 °C ~ +80 °C	

Table 3-6 TPH Specification

Item	Maximum	Unit	Conditions
Print Cycle (S.L.T.)	0.94	m/Line	Tsub=25°C
Supply Energy	0.315	mJ/Dot	
Supply Voltage	26.4	V	Vp < 28.0V (Vp : Peak of VH)
Substrate Temperature	65	°C	Thermister Temperature
Number of Dots to be Energized simultaneously	256	Dots	Note 1
Logic Supply Voltage (Vdd)	7	V	Include Peak Voltage of Vdd
Logic input Voltage (Vin)	-0.5 ~ Vdd+0.5	V	

Table 3-7 TPH Maximum Condition (At 25 °C)

**3-3-7 Other Component Specification**

Item	Description	Remark
Auto Cutter	<ul style="list-style-type: none"> <li>• Model : ORC-RUY80 (OHYANE RIKI MFG, Co., Ltd)</li> <li>• Type : Guillotine Type</li> <li>• Motor : DC Brush Motor FK-180SH-12280 (Mabuchi Motor)</li> <li>• Voltage : 24V DC ± 7 %</li> <li>• Current : 800mA (Average), 1.6A(Peak)</li> </ul>	
Paper Feed Motor	<ul style="list-style-type: none"> <li>• Model : PM35L-048 (NMB)</li> <li>• Type : 4-Phase, 48-Polarity (PM Type Bi-Polar Driver)</li> <li>• Voltage : 24V ± 10% DC</li> <li>• Resistance : 20Ω at 25 °C per Phase)</li> </ul>	
Paper End Sensor	• Reflection Type Photo Sensor	
Paper Roll Near End Sensor	• Reflection Type Photo Sensor	

Table 3-8 Other Component Specification

### 3-4 SMPS Specifications

#### 3-4-1 SMPS (Switching Mode Power Supply) Specification

Item	Description	Remark
Input Voltage	<ul style="list-style-type: none"> <li>• Typical : 115V / 230V AC</li> <li>• Min : 90V AC</li> <li>• Max : 264V AC</li> </ul>	
Input Current	<ul style="list-style-type: none"> <li>• Max : 1.5A (When 120V), 0.75A (When 230V)</li> </ul>	
In rush Current	<ul style="list-style-type: none"> <li>• Max : 30A (Peak to Peak) / 115Vac / 25°C</li> </ul>	
Line Regulation	<ul style="list-style-type: none"> <li>• +24V ± 1%</li> </ul>	
Load Regulation	<ul style="list-style-type: none"> <li>• +24V ± 5%</li> </ul>	
Ripple Noise	<ul style="list-style-type: none"> <li>• Peak 200mV</li> </ul>	
O.C.P (Over Current Protect)	<ul style="list-style-type: none"> <li>• 3.0A ~ 6.0A</li> </ul>	
S.C.P (Shot Current Protect)	<ul style="list-style-type: none"> <li>• Fold-Back Method</li> </ul>	

Table 3-12 Power Adapter (SMPS) Specification

#### 3-4-2 SMPS Output Connector

Pin Number	Signal Name
1	+24 VDC
2	GND
3	N.C
Shield	Frame GND

Table 3-13 Power Connector Pin Description

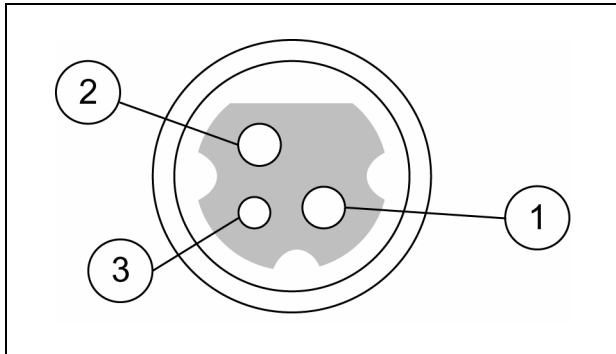


Figure 3-5 Power Connector

### 3-5 Interface Specifications

#### 3-5-1 RS-232C Serial Interface

##### 3-5-1(a) Specification

Item	Description	Remark
Data Transmission	• Serial	
Synchronization	• Asynchronous	
HandShaking (Flow Control)	• H/W : DTR / DSR • S/W : XON / XOFF	XON: ASC Code 11h XOFF: ASC Code 13h
Signal Level	• Logic"1" (MARK) : -3V ~ -15V • Logic"0" (SPACE) : +3V ~ +15V	
Baud Rate	• 9600/19200/38400/57600 Bps	
Data Word Length	• 7 Bit / 8 Bit	
Parity	• None / Even / Odd	
Connector	• DB25P Female (I/F PBA)	

Table 3-14 RS-232C Specification

※ Note : The HandShaking (Flow Control) / Data Word Length / Baud Rate / Parity functions depend on the DIP Switch settings. Refer to the User's Manual.

##### 3-5-1(b) RS-232C I/F Cable

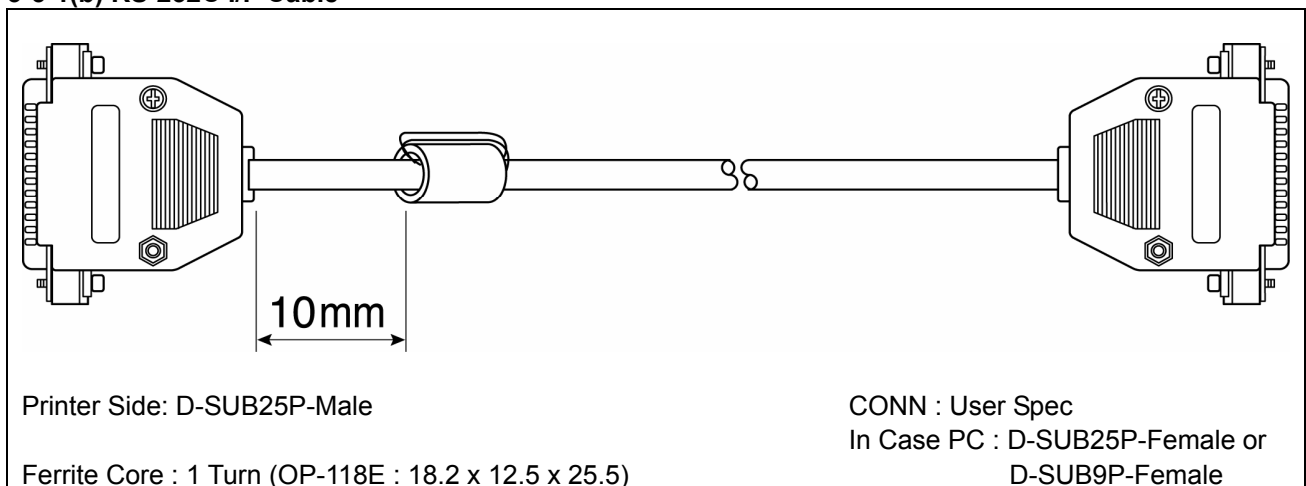


Figure 3-6 RS-232C Cable

**3-5-1(c) Cable Connection**

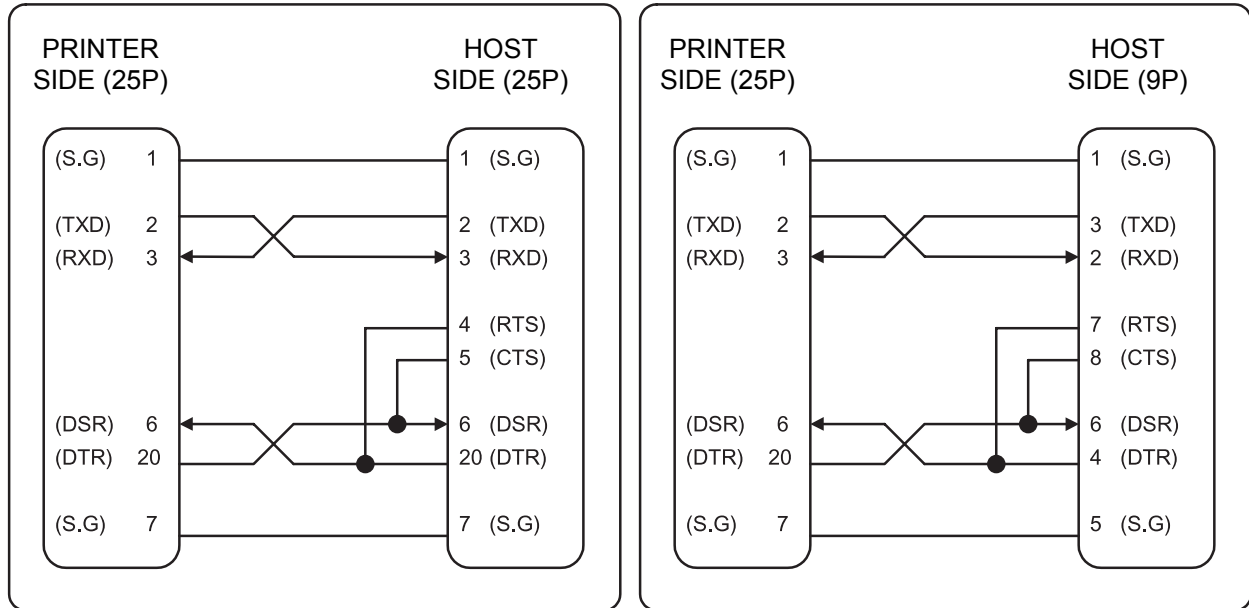


Figure 3-7 RS-232C Cable Connection

**3-5-1(d) Signal Description**

Pin No.	Signal name	Direction	Function
1	FG	-	Frame Ground
2	TxD	Output	Transmit Data
3	RxD	Input	Receive Data
4	RTS	Output	Ready To Send
5	CTS	Input	Clear To Send
6	DSR	Input	This signal indicates whether the host computer can receive data. (H/W flow control) 1) MARK(Logic1) : The host can receive a data. 2) SPACE(Logic0) : The host can not receive a data. 3) The printer transmits a data to the host, after confirming this signal. 4) When XON/XOFF flow control is selected, the printer does not check this signal.
7	SG	-	Signal Ground
20	DTR	Output	This signal indicates whether the printer is busy. (H/W flow control) 1) MARK(Logic1) : The printer is busy. 2) SPACE(Logic0) : The printer is not busy. 3) The host transmits a data to the printer, after confirming this signal. 4) When XON/XOFF flow control is selected, the host does not check this signal.

Table 3-15 RS-232C Pin Description

**3-5-1(e) H/W Flow Control**

When DTR/DSR flow control is select, before transmitting a data, the Printer checks whether the host is BUSY or not. If the host is BUSY, the Printer does not transmit a data to the host. If the host is not BUSY, the Printer transmits a data to the Host. The host is the same. Refer to the Interface Part of Chapter 4-3 Special Circuit Diagrams.

**3-5-1(f) S/W Flow Control**

When XON/XOFF flow control is selected, the printer transmits XON(ASCII 11h) or XOFF(ASCII 13h) signal through the TXD line. If the Printer is BUSY, the Printer transmits XOFF(ASCII 13h) to host through the TXD line. Then the host recognize that the Printer is BUSY. So, the host does not transmit a data to the Printer. If the Printer is released from BUSY, the Printer transmits XON(ASCII 11h) to host through the TXD line. Then the host recognize that the Printer is not BUSY. And the host transmit a data to the Printer.

※ **Note** : Refer to the Operation Manual about XON/XOFF flow control.

**3-5-2 RS-485 Serial Interface**

**3-5-2(a) Specification**

Item	Description	Remark
Data Transmission	• Serial	
Synchronization	• Asynchronous	
HandShaking (Flow Control)	• H/W : DTR / CTS (Same as DSR) • S/W : XON / XOFF	XON: ASC Code 11h XOFF: ASC Code 13h
Signal Level	• Logic"1" : SD1-SD2 ≥ 0.2V, RD1-RD2 ≥ 0.2V • Logic"0" : SD1-SD2 ≤ 0.2V, RD1-RD2 ≤ 0.2V	
Baud Rate	• 9600/19200/38400/57600 Bps	
Data Word Length	• 7 Bit / 8 Bit	
Parity	• None / Even / Odd	
Connector	• DB25P Female (I/F PBA)	

Table 3-16 RS-485 Specification

※ **Note** : The HandShaking (Flow Control) / Data Word Length / Baud Rate / Parity functions depend on the DIP Switch settings. Refer to the User's Manual.

**3-5-2(b) RS-232C I/F Cable**

Same as the appearance of RS-232C Cable

**3-5-2(c) Cable Connection**

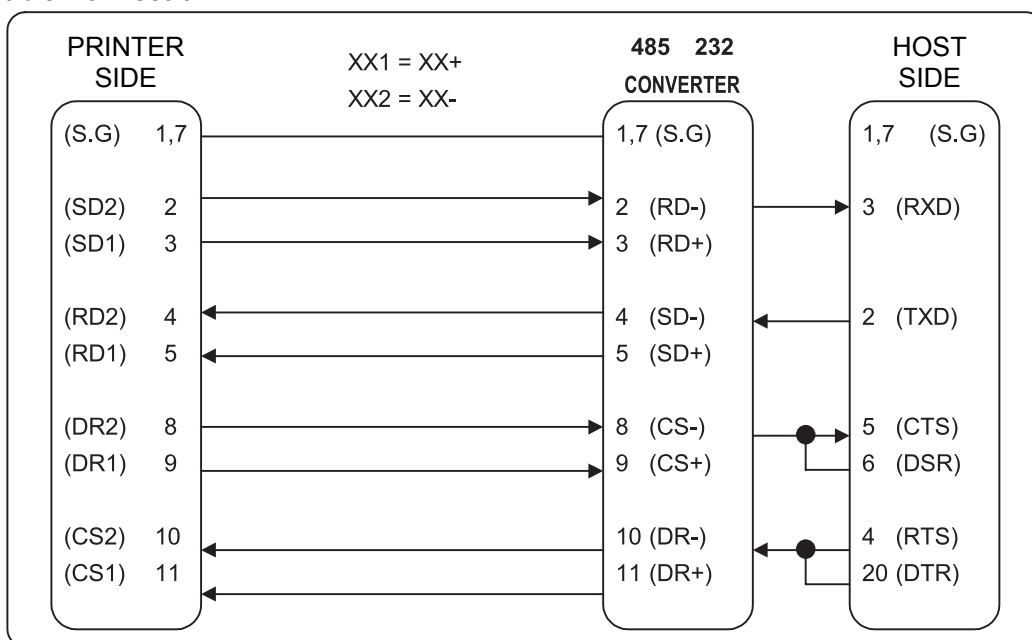


Figure 3-8 RS-485 Cable Connection

**3-5-2(d) Signal Description**

Pin No.	Signal name	Direction	Function
1	Frame GND	-	Frame Ground
2	SD2	Output	Send Data
3	SD1	Output	"H" : SD1 > SD2 , "L" : SD1 < SD2
4	RD2	Input	Receive Data
5	RD1	Input	"H" : RD1 > RD2 (RD1-RD2 ≥ 0.2V) "L" : RD1 < RD2 (RD1-RD2 ≤ 0.2V)
7	SGND	-	Signal Ground
8 9	DR2 DR1	Output	When DTR/DSR is selected, this signal indicates whether the printer is BUSY or READY. (H/W flow control) 1) DR1 > DR2 (H) : The printer is BUSY. 2) DR1 < DR2 (H) : The printer is READY. 3) The host computer transmits a data to the host, after confirming this signal.
10 11	CS2 CS1	Input	When DTR/DSR is selected, this signal indicates whether the host computer is BUSY or READY. (H/W flow control) 1) CS1 > CS2 (H) : The host computer is BUSY. 2) CS1 < CS2 (H) : The host computer is READY. 3) The printer transmits a data to the host, after confirming this signal.

Table 3-17 RS-485 Pin Description

※ **Note** : BUSY condition and other information refer to the User's Manual.

※ **Note** : This format is used when the UART for RS-232C is connected to the RS-485 driver.

**3-5-2(e) H/W Flow Control**

When DR1,2/CR1,2 flow control is select, before transmitting a data, the Printer checks whether the host is BUSY or not. If the host is BUSY, the Printer does not transmit a data to the host. If the host is not BUSY, the Printer transmits a data to the Host. The host is the same. Refer to the Interface Part of Chapter 4-3 Special Circuit Diagrams.

**3-5-2(f) S/W Flow Control**

When XON/XOFF flow control is selected, the printer transmits XON(ASCII 11h) or XOFF(ASCII 13h) signal through the TXD line. If the Printer is BUSY, the Printer transmits XOFF(ASCII 13h) to host through the TXD line. Then the host recognize that the Printer is BUSY. So, the host does not transmit a data to the Printer. If the Printer is released from BUSY, the Printer transmits XON(ASCII 11h) to host through the TXD line. Then the host recognize that the Printer is not BUSY. And the host transmit a data to the Printer.

※ **Note** : Refer to the Operation Manual about XON/XOFF flow control.

**3-5-3 IEEE1284 Parallel Interface**

Bidirectional parallel interface : in accordance with the IEEE1284 Nibble/Byte mode.

**3-5-3(a) Forward Mode Specification (Compatibility mode)**

Data transmission from host computer to printer : Centronics compatible

Item	Description	Remark
Data Transmission	• 8-bit Parallel	
Synchronization	• External supplied nStrobe signals	
HandShaking	• nACK and Busy signals	
Signal Level	• TTL compatible	
Connector	• Centronics 36P	

Table 3-18 IEEE1284 Specification



**3-5-3(b) Reverse Mode Specification (Nibble / Byte mode)**

Data transmission from the printer to the host computer.

The STATUS data transmission from the printer to the host computer is accomplished in the Nibble or Byte mode. This mode allows data transmission from the asynchronous printer under the control of the host computer. Data transmission in the Nibble mode are made via the existing control lines in units of for bits (Nibble). In the Byte mode, data transmission in accomplished by making the 8-bit data lines bidirectional. Neither mode can operate at the same time as the compatibility mode, so switching is always required.

**3-5-3(c) Signal Specification (Compatibility/Nibble/Byte mode)**

Pin No.	Source	Compatibility Mode	Nibble Mode	Byte Mode
1	Host	nStrobe	HostClk	HostClk
2	Host / Printer	Data 0 (LSB)	-	Data 0 (LSB)
3	Host / Printer	Data 1	-	Data 1
4	Host / Printer	Data 2	-	Data 2
5	Host / Printer	Data 3	-	Data 3
6	Host / Printer	Data 4	-	Data 4
7	Host / Printer	Data 5	-	Data 5
8	Host / Printer	Data 6	-	Data 6
9	Host / Printer	Data 7 (MSB)	-	Data 7 (MSB)
10	Printer	nAck	PtrClk	PtrClk
11	Printer	Busy	PtrBusy/Data3,7	PtrBusy
12	Printer	Perror	AckDataReq /Data2,6	AckDataReq
13	Printer	Select	Xflag/Data1,5	Xflag
14	Host	nAutoFeed	HostBusy	HostBusy
15		NC	ND	ND
16		GND	GND	GND
17		FG	FG	FG
18	Printer	Logic-H	Logic-H	Logic-H
19~30		GND	GND	GND
31	Host	nInit	nInit	nInit
32	Printer	nFault	nDataAvail /Data0,4	nDataAvail
33		GND	ND	ND
34	Printer	DK_Status	ND	ND
35	Printer	+5V	ND	ND
36	Host	nSelectIn	1284-Active	1284-Active

Table 3-19 IEEE1284 Pin Description

**3-5-3(c) IEEE1284 I/F Cable**

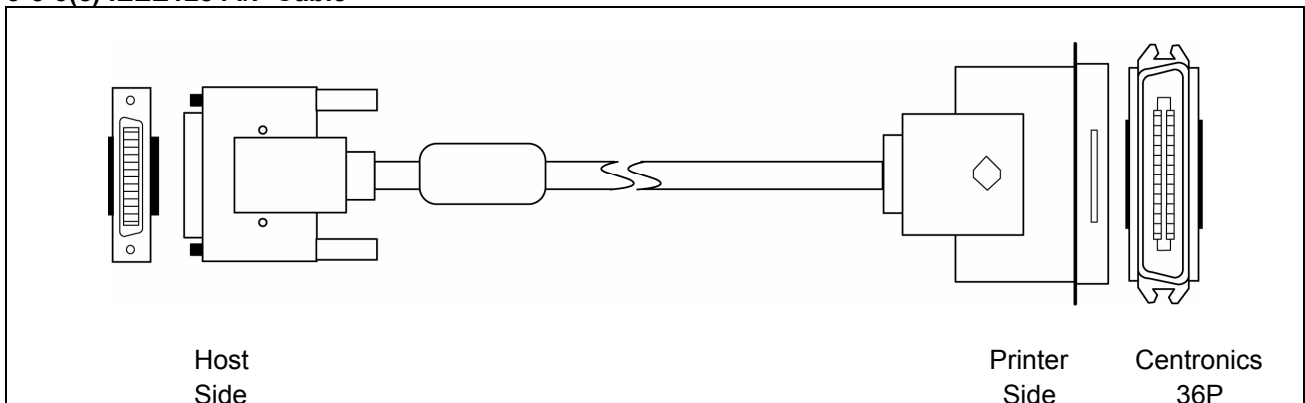


Figure 3-9 IEEE1284 Cable

**3-5-4 USB Interface**

SRP-350 support the USB (Universal Serial Bus) Serial Communication.

**3-5-4(a) Specification**

Item	Description	Remark
Transfer Type	• BULK	
Data Signal	• Bi-direction, Half-Duplex • Differential Signal Pair (D+ / D-)	
Data Format	• NRZI Format • Zero Bit Stuffing after 6 ones	
Transceiver	• Differential Receive Sensitivity : 200[mV] • Differential common Mode Range : 0.8 ~ 2.5[V] • Single-End Receiver Threshold : 0.8 ~ 2.0[V]	
Speed	• 12 Mbps	
Power	• Self-Powered	
Cable & Connector	• Cable : 5m / 2m • Connector : B Type	
Other	• Support USB SPEC V1.1	

Table 3-20 USB Specification

**3-5-4(b) Signal Description**

Pin No.	Signal Name	Assignment(Color)	Function
Shell	Shield	Drain Wire	Frame Ground
1	VBUS	Red	Host Power : DC5[V] / 500[mA]
2	D-	White	Differential Data Line
3	D+	Green	Differential Data Line
4	GND	Black	Signal Ground

Table 3-21 USB Pin Description

**3-5-4(c) USB I/F Cable**

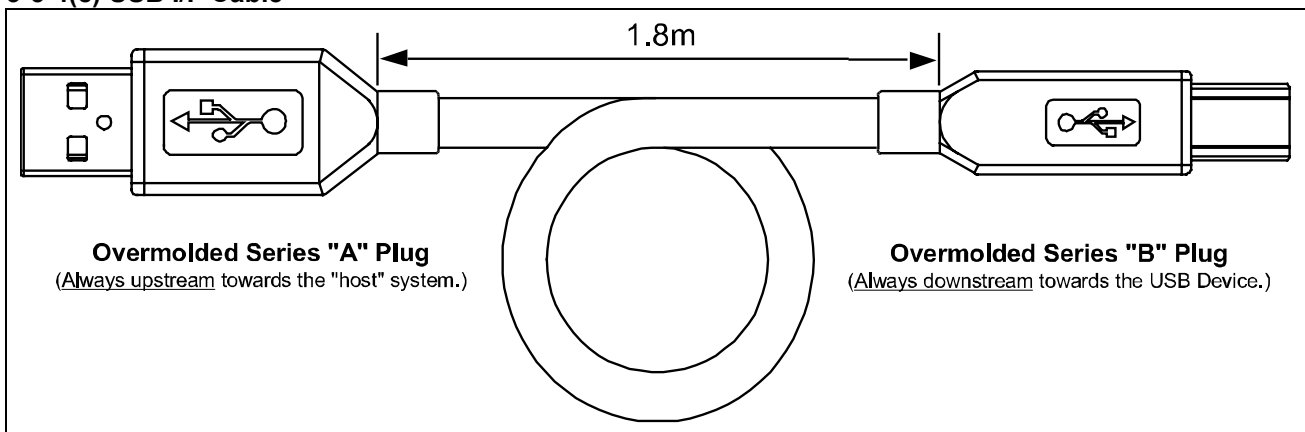
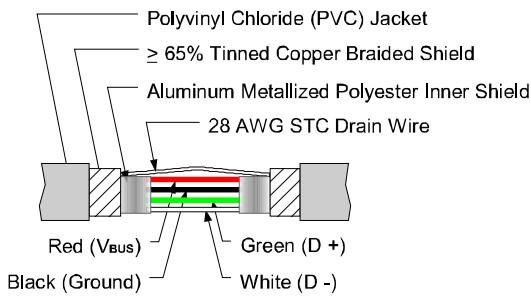


Figure 3-10 USB A-B Type Cable

**(Typical USB Shielded Cable)**

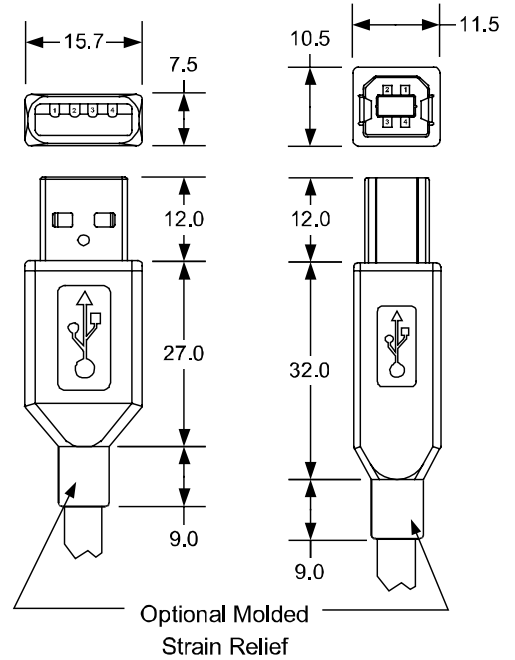


All dimensions are in millimeters (mm) unless otherwise noted.

Dimensions are **TYPICAL** and are for general reference purposes only.

**Detail A - A  
(Series "A" Plug)**

**Detail B - B  
(Series "B" Plug)**



**3-6 Cash Drawer Specifications**

**3-6-1 Cash Drawer Cable**

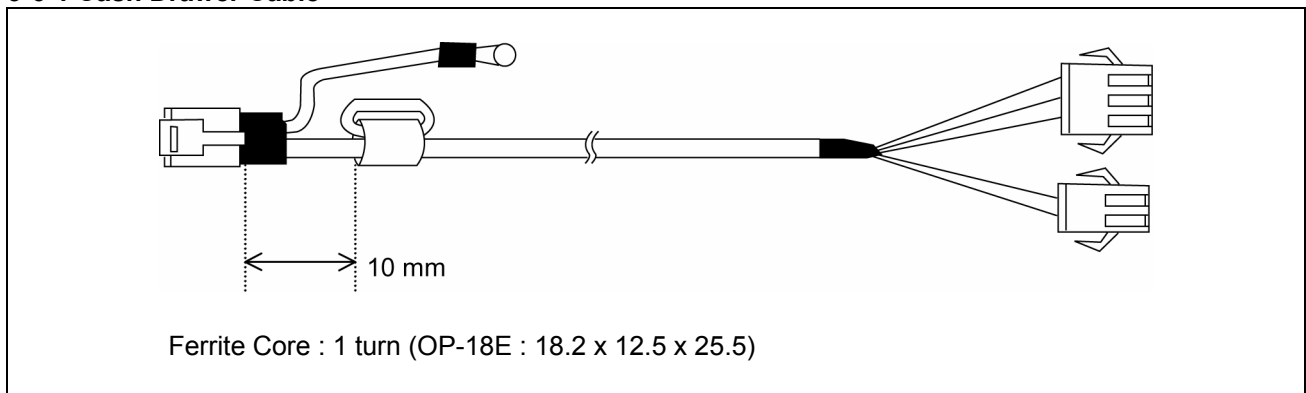


Figure 3-12 Drawer Cable

**3-6-2 Cable Connection**

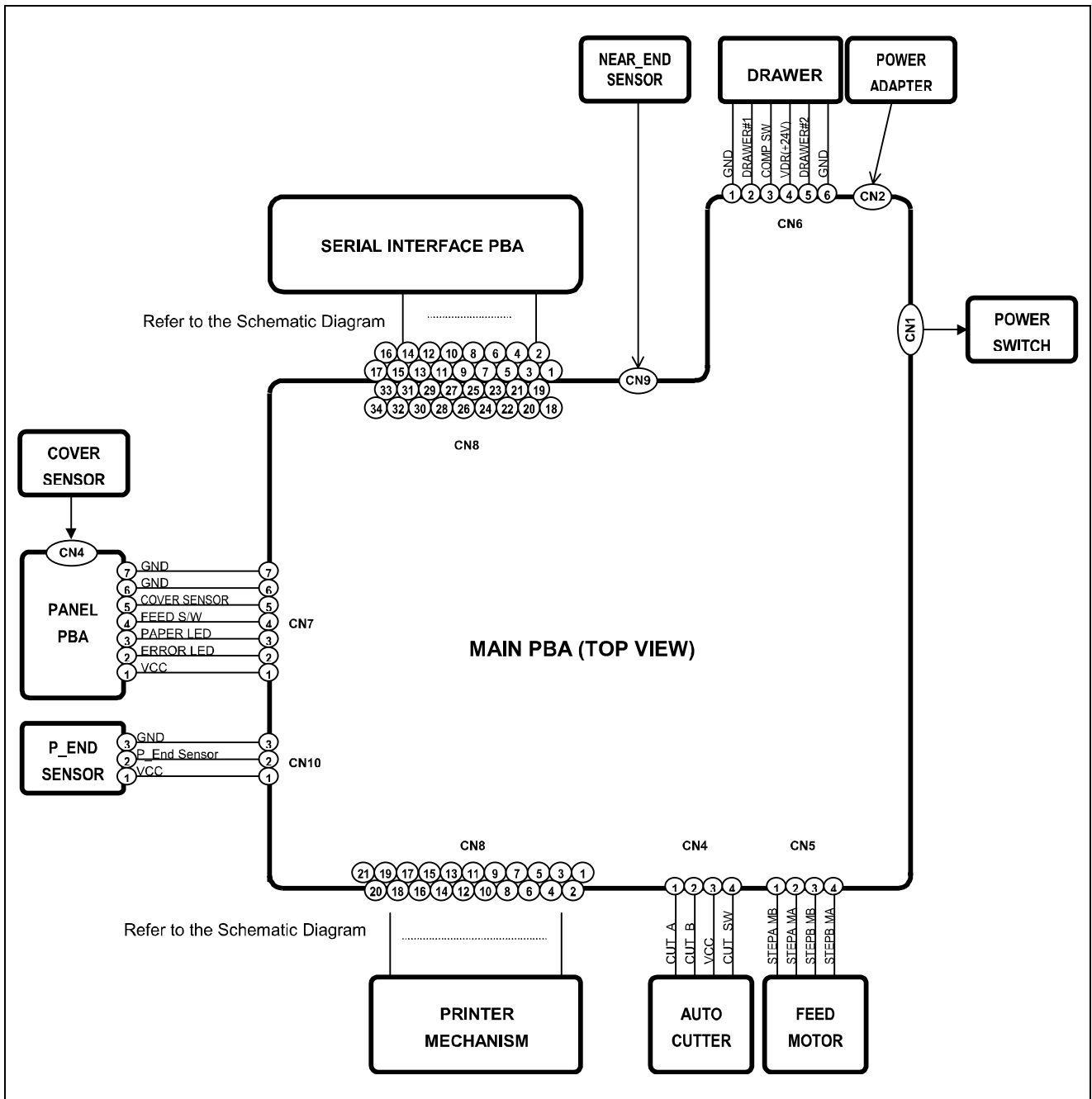
Pin No.	Description	Direction
1	Frame GND	-
2	Cash Drawer Driver Signal #1	Output
3	Drawer Open / Close Signal	Input
4	+24V	-
5	Cash Drawer Driver Signal #2	Output
6	Signal GND	-

Table 3-23 Drawer Cable Connection

※ Note : +24V is always output through pin 4 during power on.

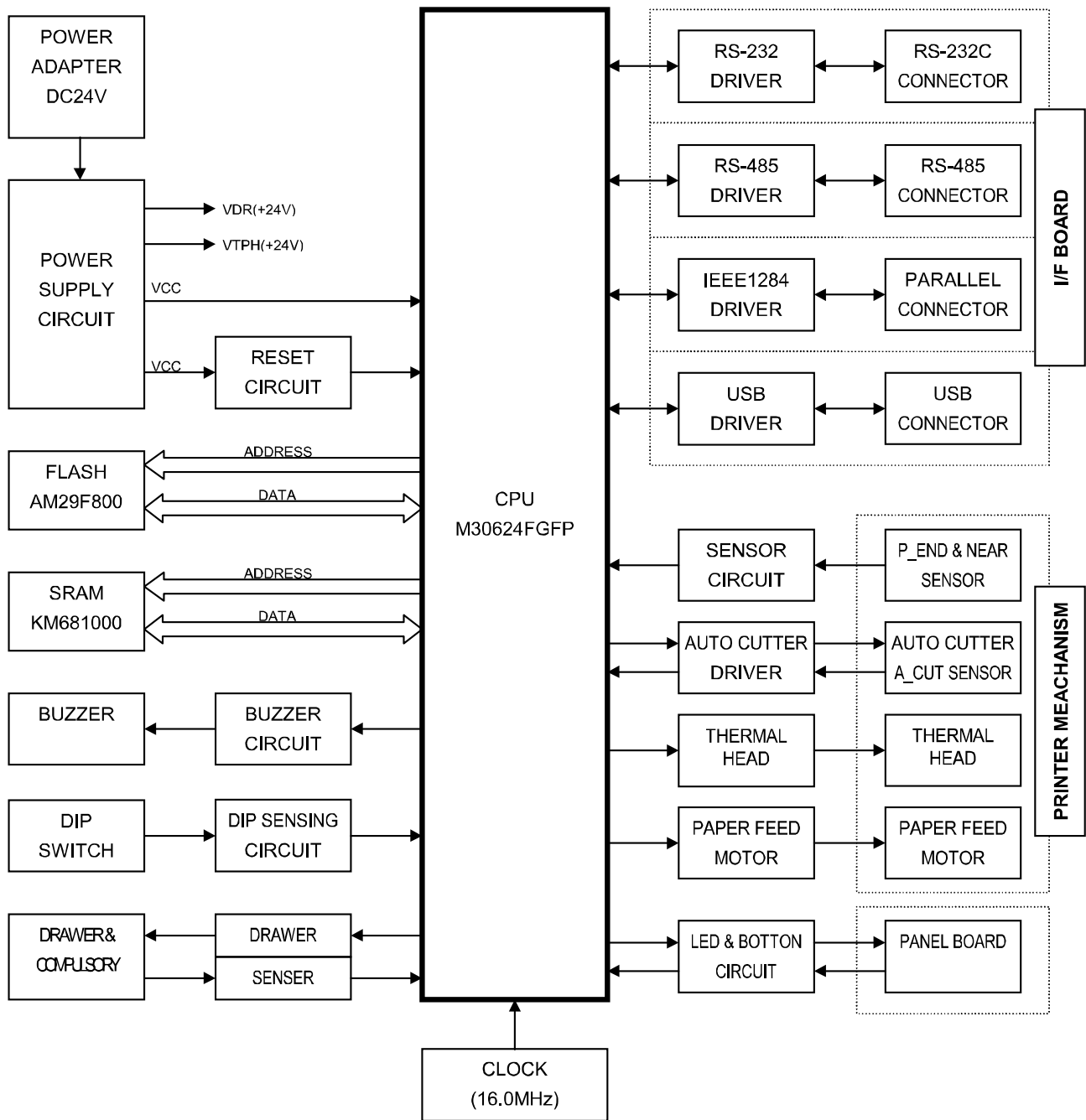
# 4. Hardware

## 4-1 Wiring Diagram



[Figure 4-1 Board Wiring Diagram]

**4-2 Block Diagram**

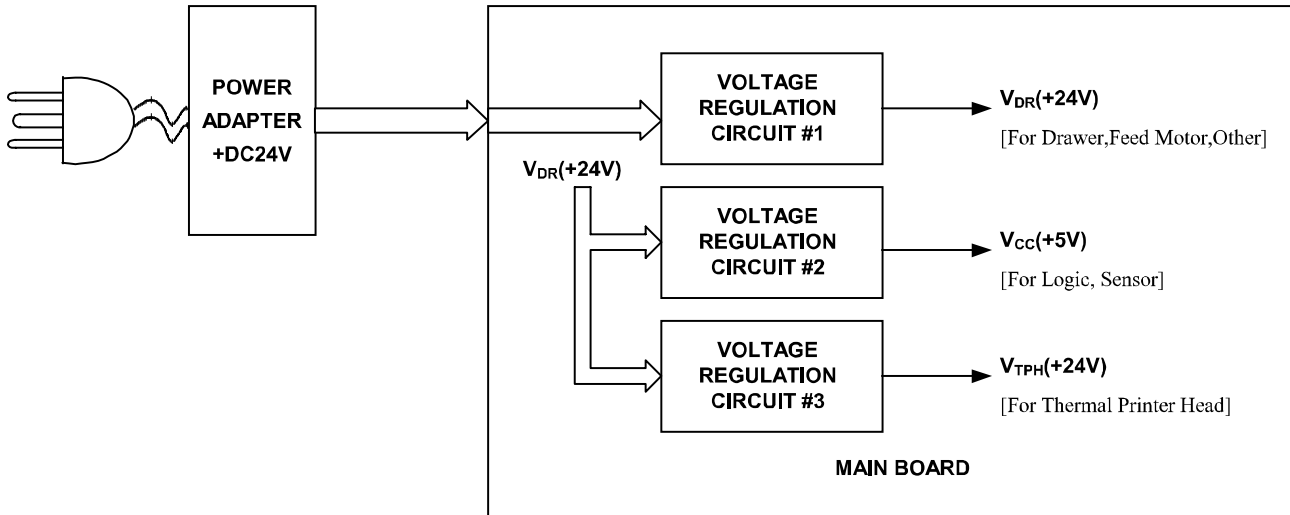


[Figure 4-2 Block Diagram]

## 4-3 Special Circuit Descriptions

### 4-3-1 Power Circuit

This system is operated under 115Vac or 230Vac. The power circuit supplies the three differential DC voltage sources.



[Figure 4-3 Power Block Diagram]

No.	VOLTAGE	DESCRIPTION
1	$V_{DR}(+24VDC)$	Cash Drawer Solenoid Driving / Step Motor Voltage
2	$V_{CC}(+5VDC)$	Logic IC Driving Voltage
3	$V_{TPH}(+24VDC)$	Thermal Printer Head (TPH) Voltage

#### 1) Drawer Driving and Feed, Auto Cutter Motor Voltage, TPH Driving Voltage : +24Vdc

+24VDC is supplied from SMPS. This Voltage is smoothed by capacitors (CL1).

This voltage is used as a Cash Drawer Solenoid Driving voltage, Step motor driving voltage and a source voltage of the other voltage sources.

#### 2) Logic IC Driving Voltage: +5V

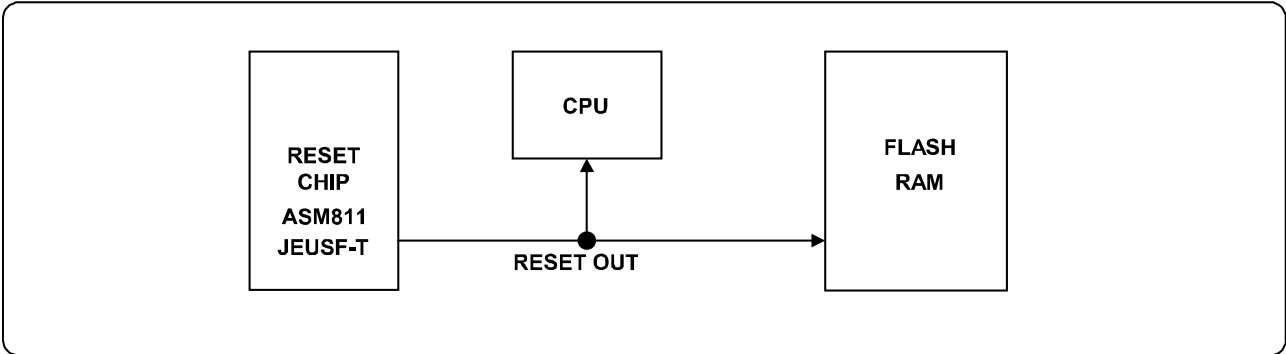
+5Vdc Logic driving voltage is produced by the step-down Switching Regulator U1(LM2576-ADJ). This is, U1 produces rectangular wave. This makes D4(B240) and L1 store energy. The voltage is smoothed by CL2(470uF) and then +5Vdc Logic voltage is produced.

#### 3) TPH Driving Voltage : +24Vdc

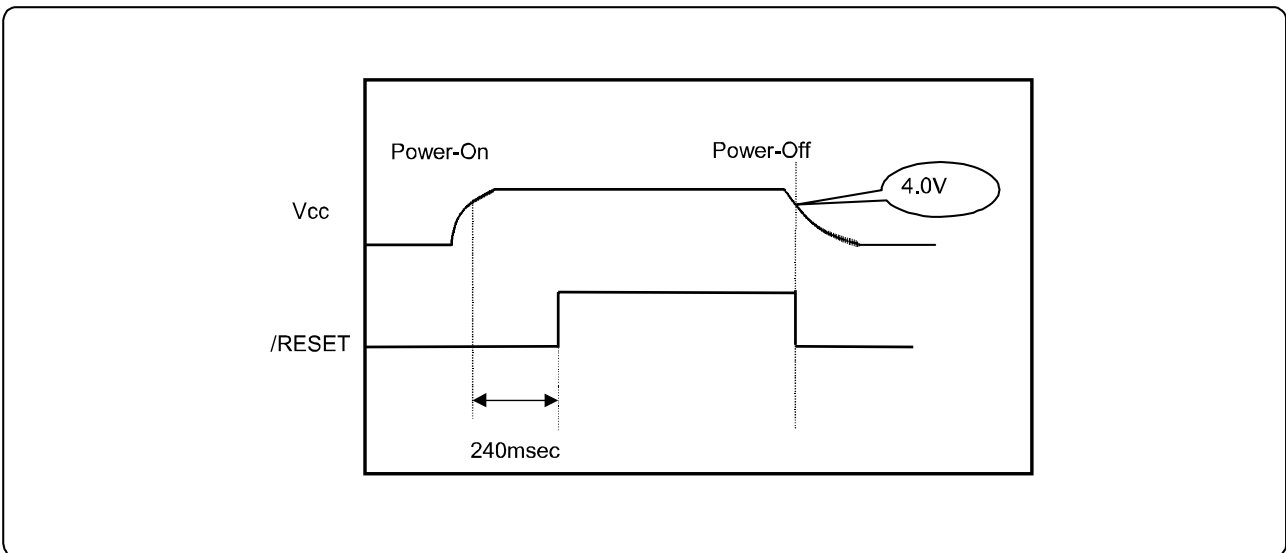
Q2(2222A) is turned on by ON\_OFF (P6.1) signal on CPU.

**4-3-2 RESET Circuit**

Reset signal is signal in order to start-up CPU under Power-on. Reset circuit uses a reset ASM811JEUSF-T(U5). When +5Vdc is fallen under 4.0Vdc by Power-off, reset signal prohibits the system from miss-operating by lowering down to 0V.



[Figure 4-4 Reset Block Diagram]

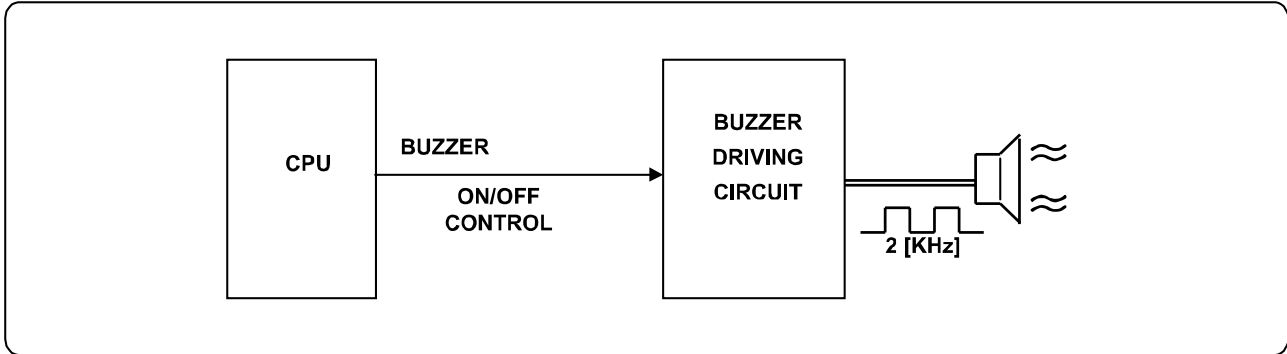


[Figure 4-5 Reset Waveform]

**4-3-3 Buzzer and Cash Drawer Circuits**

**1) Buzzer Driving Circuit**

The Buzzer is used to inform several kinds of states which occur under system operating and gives some information to users by controlling the P7.6 of CPU (M30624FGFP)

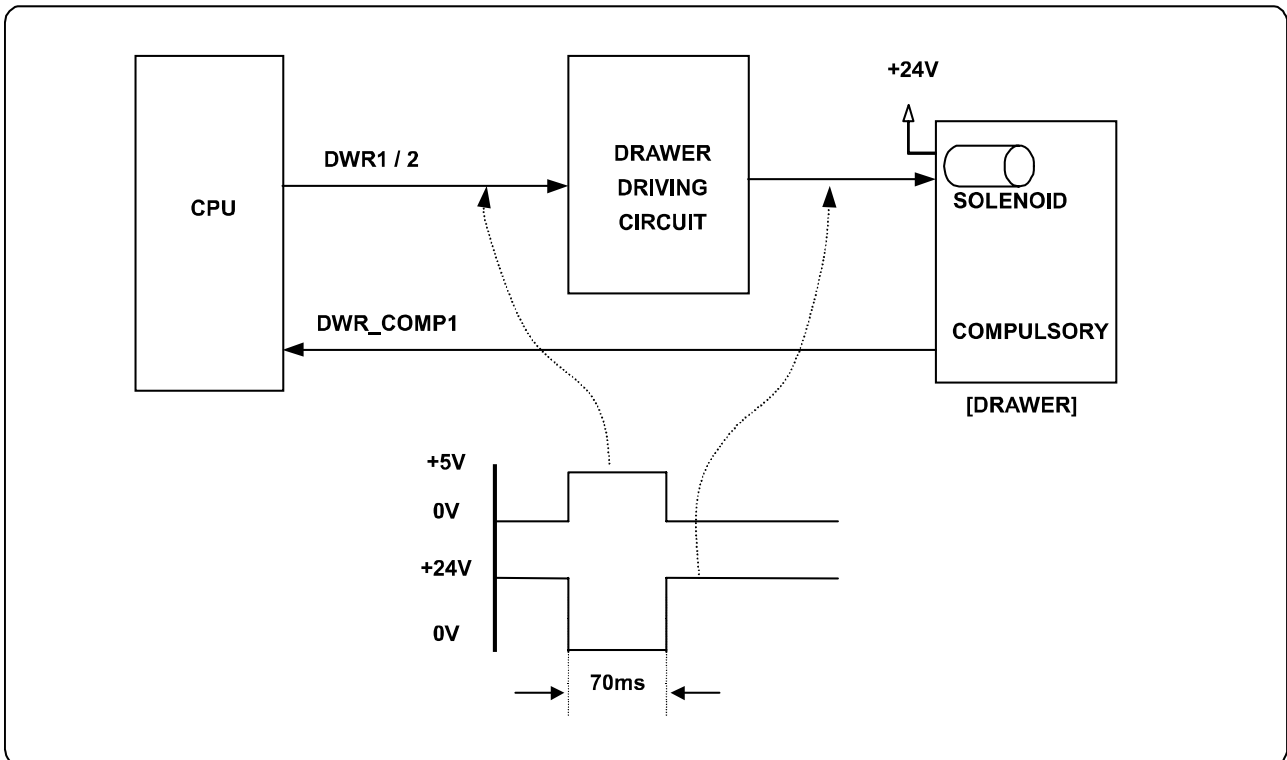


[Figure 4-6 Buzzer Block Diagram]

**2) Cash Drawer Driving Circuit**

The circuit is used for opening cash drawer and driven by the Q4, Q5 (2SD2170). When its state is high level signal, Q4 or Q5 (2SD2170) drive the solenoid to open the cash drawer. As an optional item, we provide sensor switch (we call it a compulsory switch) which checks the drawer whether it is opened or not. This sensor switch turns on for the drawer open condition, and turns off for the other.

**※ Caution : Make sure that the Cash Drawer solenoid resistance is more than 20Ω.**



[Figure 4-7 Cash Drawer Block Diagram]

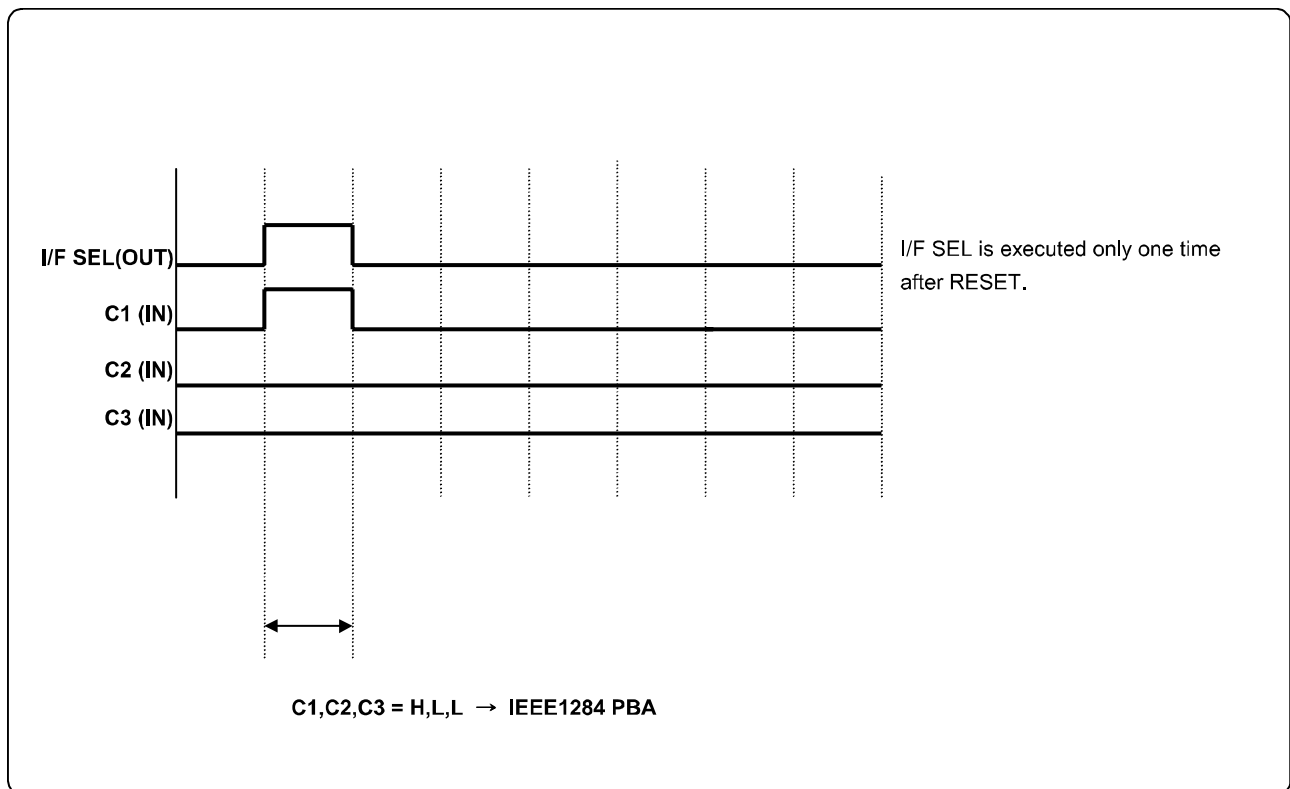


**4-3-4 I/F PBA Detect Block Diagram**

When the printer is ON, the printer checks what kind of the I/F PBA is installed. After detection, the CPU specify the I/O port properly. The following is the method of I/F PBA detection.

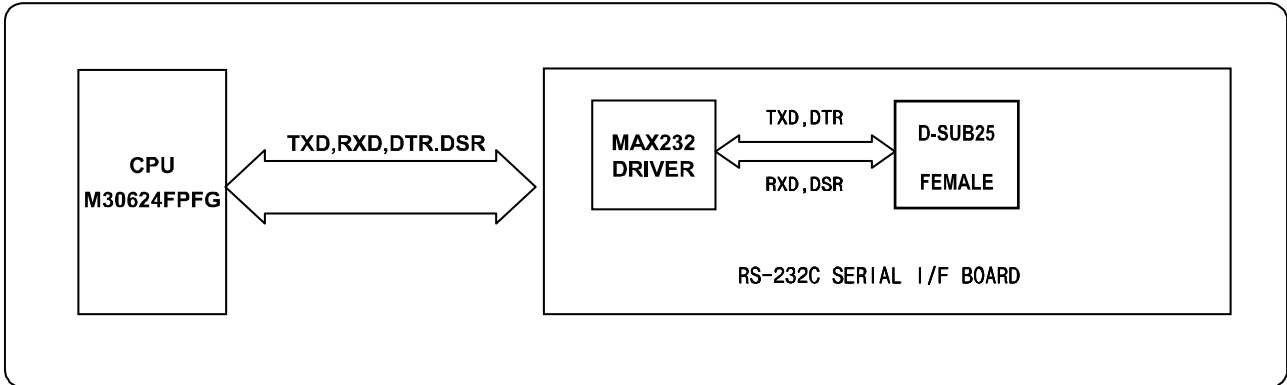
First, the CPU sends a "I/F Sel" signal (P7.0) to I/F PBA. The I/F PBA has the three return Signal (DIP 1~3). The CPU recognize the I/F PBA by the value of the three return signal.

I/F PBA	DIP_C1	DIP_C2	DIP_C3
RS-232C	L	L	H
RS-485	L	H	L
IEEE1284	H	L	L
USB2.0	H	H	L
No Connection	L	L	L

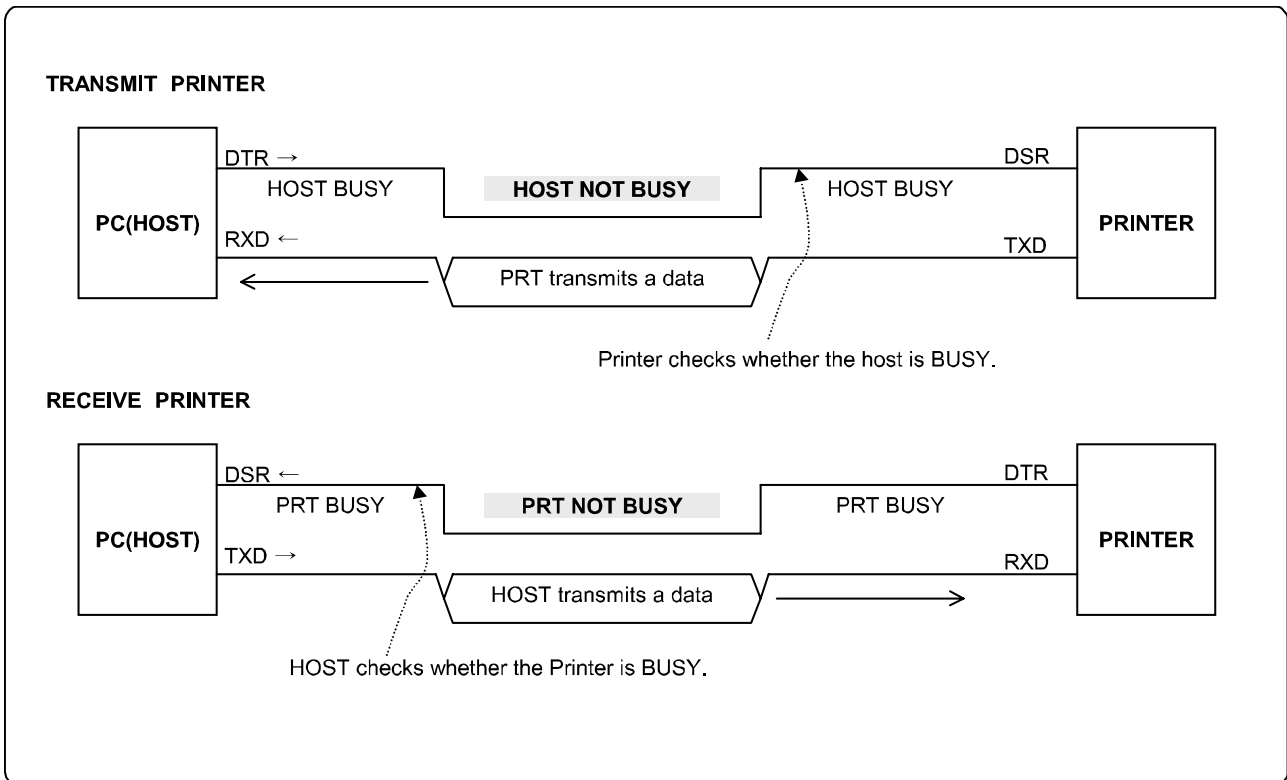


**4-3-5 RS-232C Communication Block Diagram**

The CPU is used for serial communication.  
 And also RS-232C Driver (MAX232), is used to serial communication.  
 Show following block diagram.



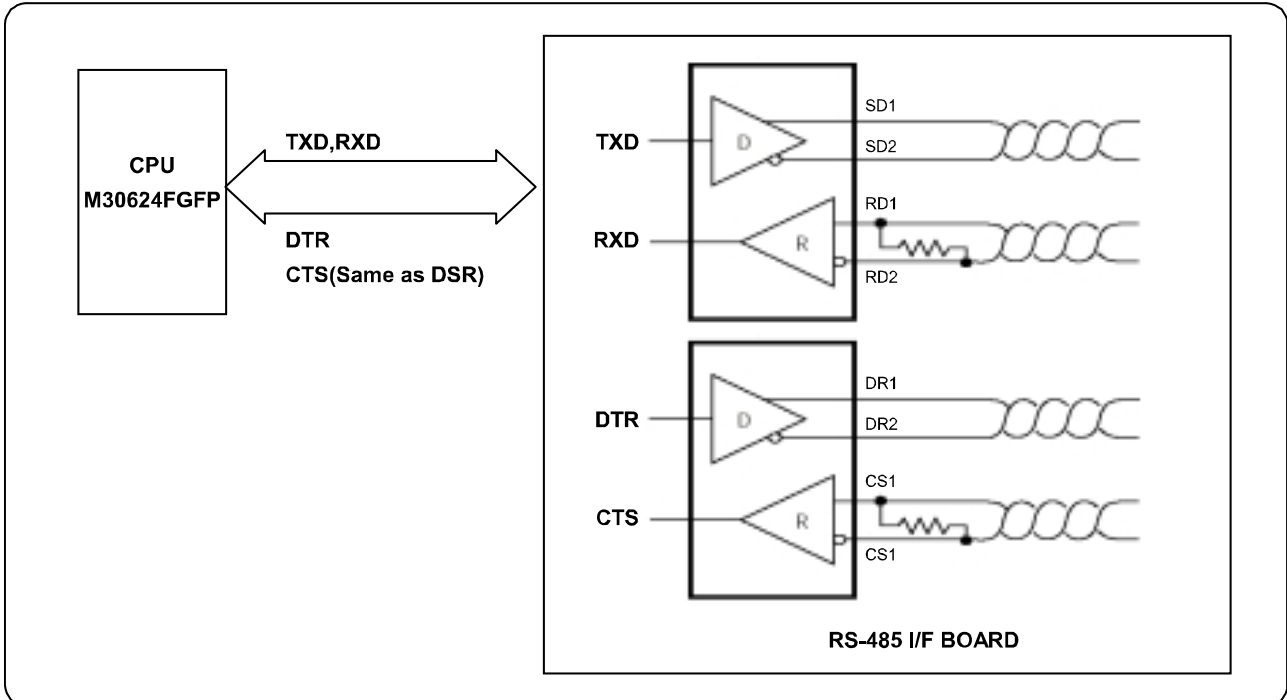
[Figure 4-8 RS-232C Communication Block Diagram]



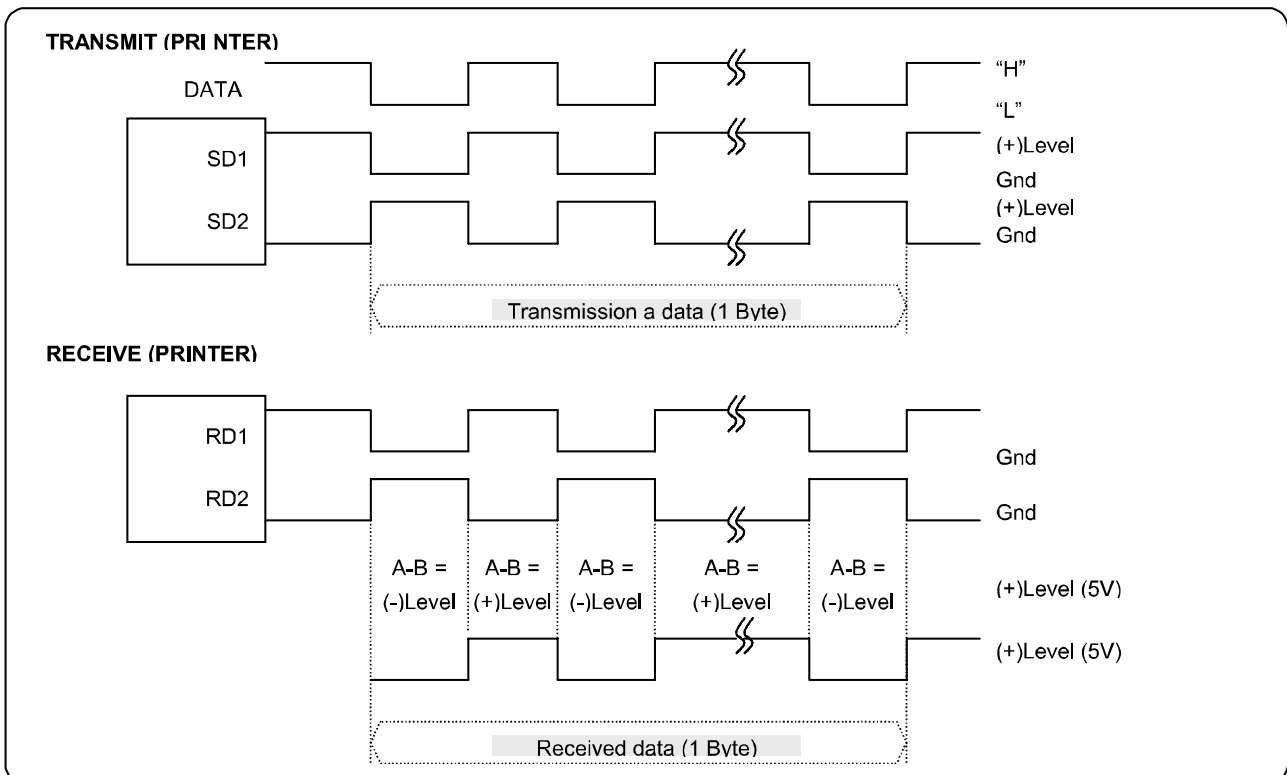
[Figure 4-9 RS-232C Communication Waveform]

**4-3-6 RS-485 Communication Block Diagram**

The CPU is used for serial communication.  
 And also RS-485 Driver (MAX488), is used to serial communication.  
 Show following block diagram.



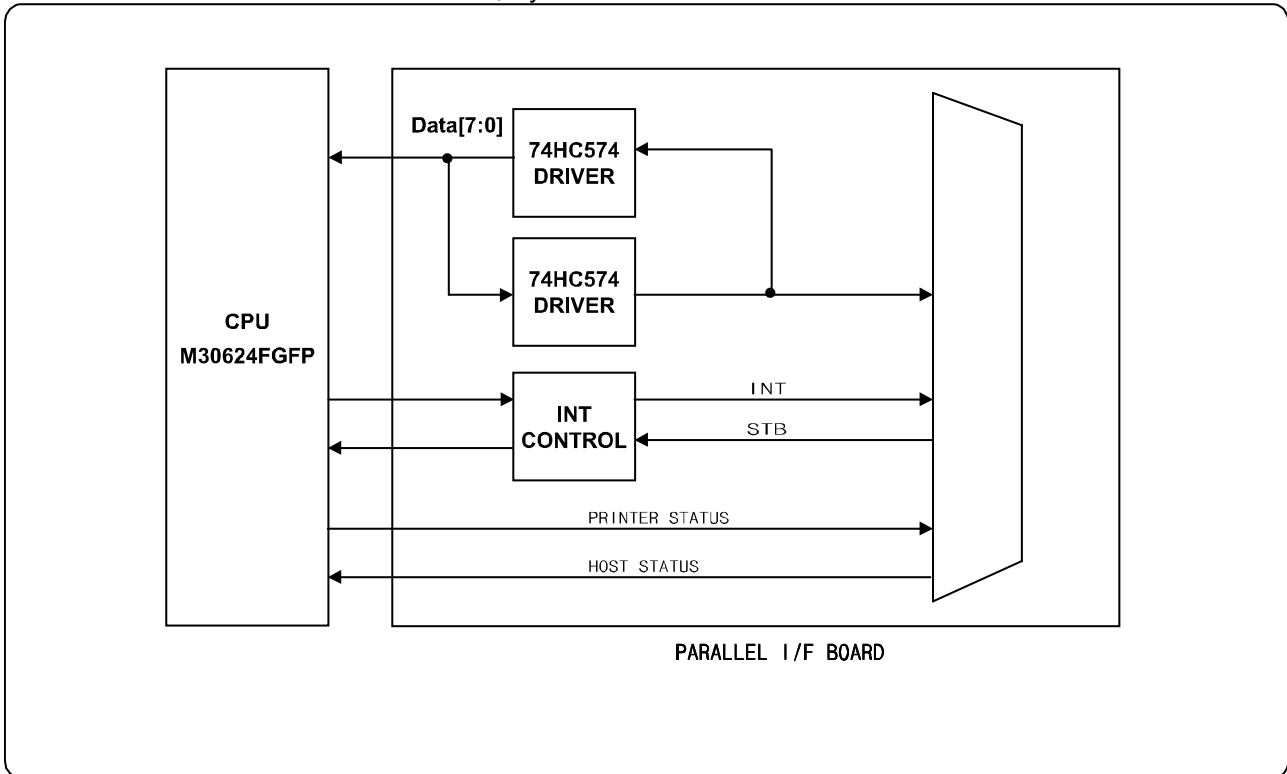
[Figure 4-10 RS-485 Communication Block Diagram]



[Figure 4-11 RS-485 Communication Waveform]

**4-3-7 Parallel Communication Block Diagram**

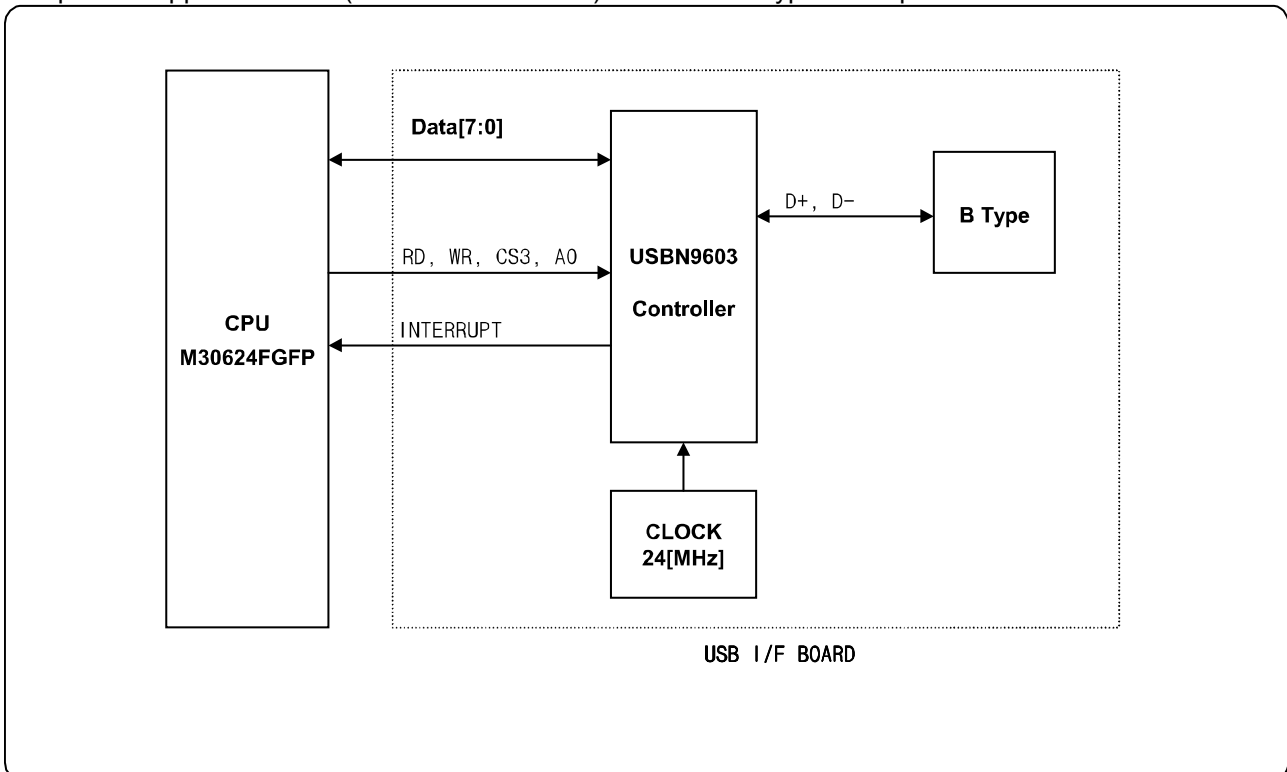
The printer support the bidirectional Parallel Interface with Centronics, Nibble, Byte Mode. The Centronics is Forward and the Nibble, Byte are reverse Mode.



[Figure 4-10 IEEE1284 Communication Block Diagram]

**4-3-8 USB Communication Block Diagram**

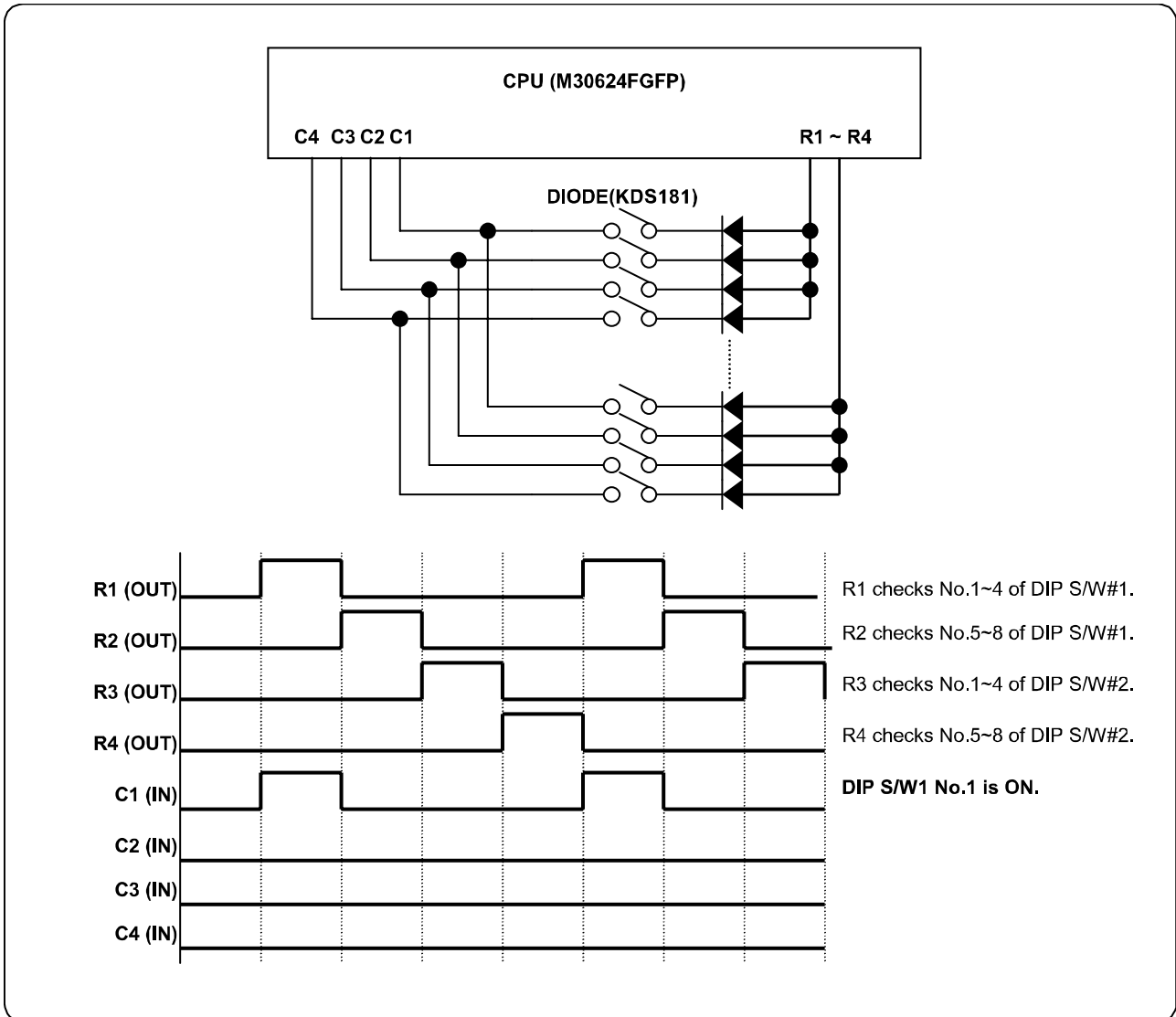
The printer support the USB (Universal Serial Bus). The transfer type of the printer is the BULK.



[Figure 4-11 USB2.0 Communication Block Diagram]

**4-3-9 DIP Switch Circuit**

The key board circuit consist of the scan signal of 4 lines and the return signal of 4-line. The CPU sends repeatedly and continuously the scan data R1~R4 through. The DIP S/W information input in the return signal if the specific DIP S/W is ON status during the given time. The CPU reads the data through C1~C4 and analyzes what DIP S/W is ON and performs the selected function.



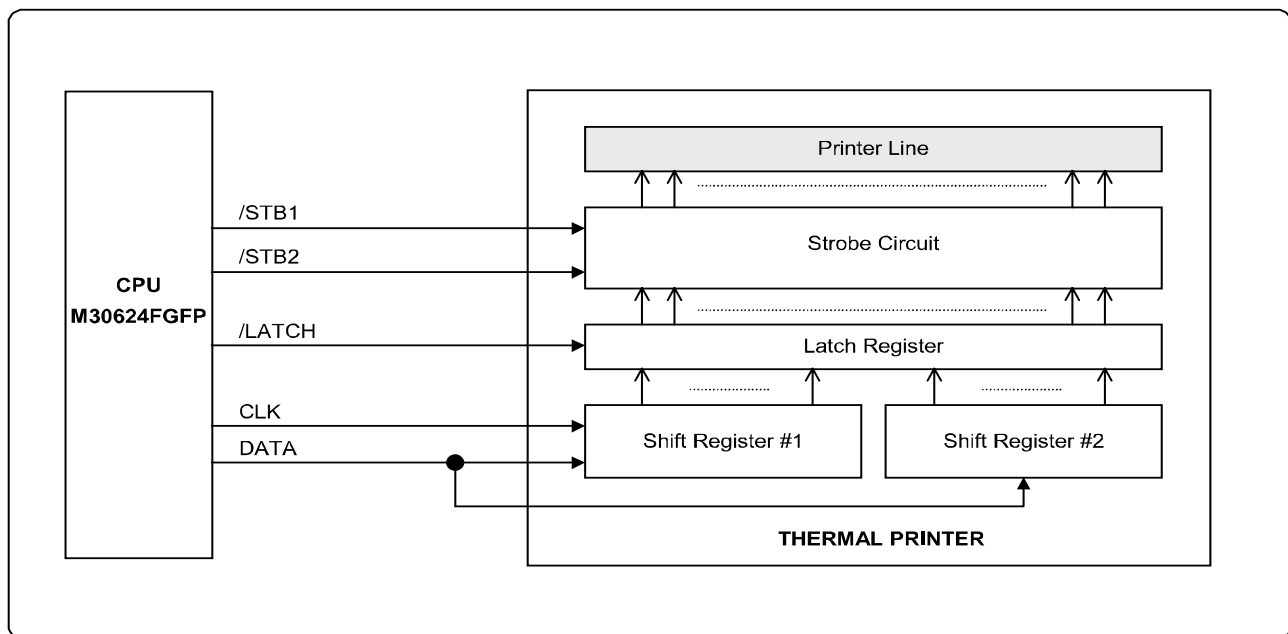
[Figure 4-12 DIP Switch Block Diagram]

**4-3-10 Thermal Printer Head Circuit**

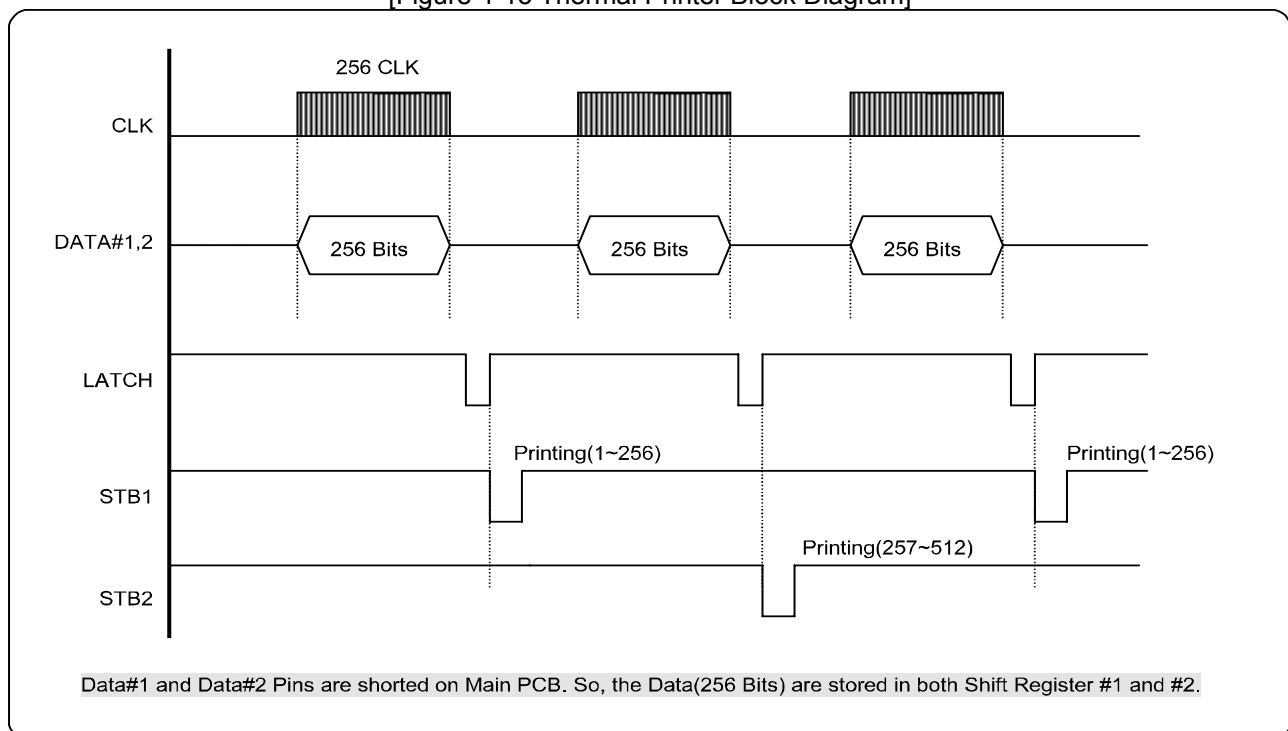
First, the CPU sends a Serial Clock and Serial Data 256Bits(32Bytes) to the Shift Register of the Thermal Printer. The Serial Data are stored to each Shift Register in the Thermal Printer. Because the Data#1 Pin and the Data#2 pin are shorted on Main PCB, the Data(256Bits) are stored in both Shift Register#1 and #2.

Second, the CPU send a Latch Signal to the Thermal Printer. Then, the Data of both Shift Register#1 and #2 (256\*2=512 Bits) are moved to the Latch Register. After that, the CPU sends a Strobe Signal to the Thermal Printer. Then, the Printer outputs the Serial Data. Each Strobe Signal manages the Printer Dot.

STB No.	DOT No.	DOTs/STB	SRP-350 Strobe Processing
STB1	1 ~ 256	256	The content of data is same.
STB2	257 ~ 512	256	



[Figure 4-13 Thermal Printer Block Diagram]

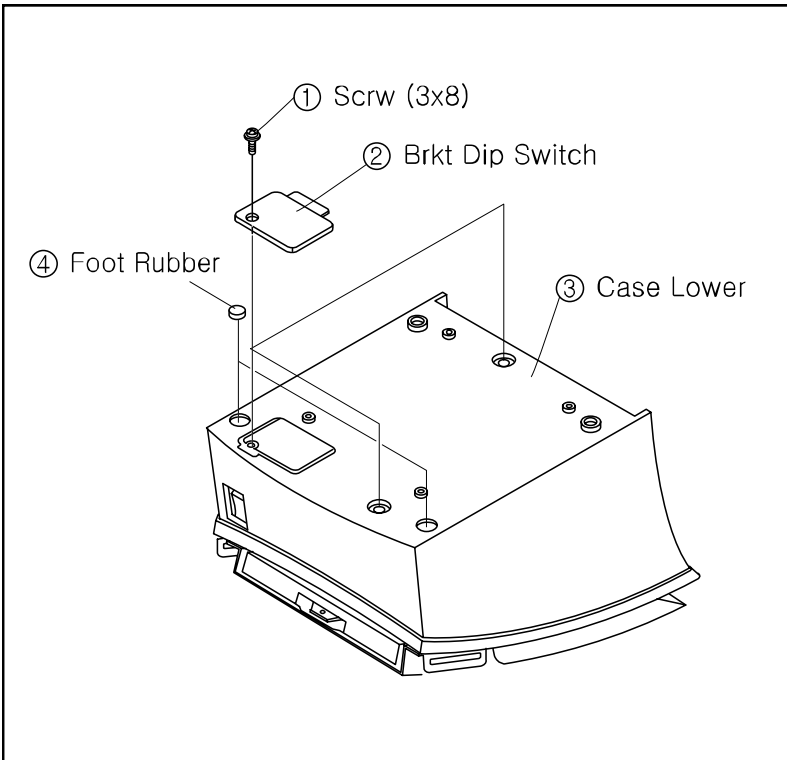


Data#1 and Data#2 Pins are shorted on Main PCB. So, the Data(256 Bits) are stored in both Shift Register #1 and #2.

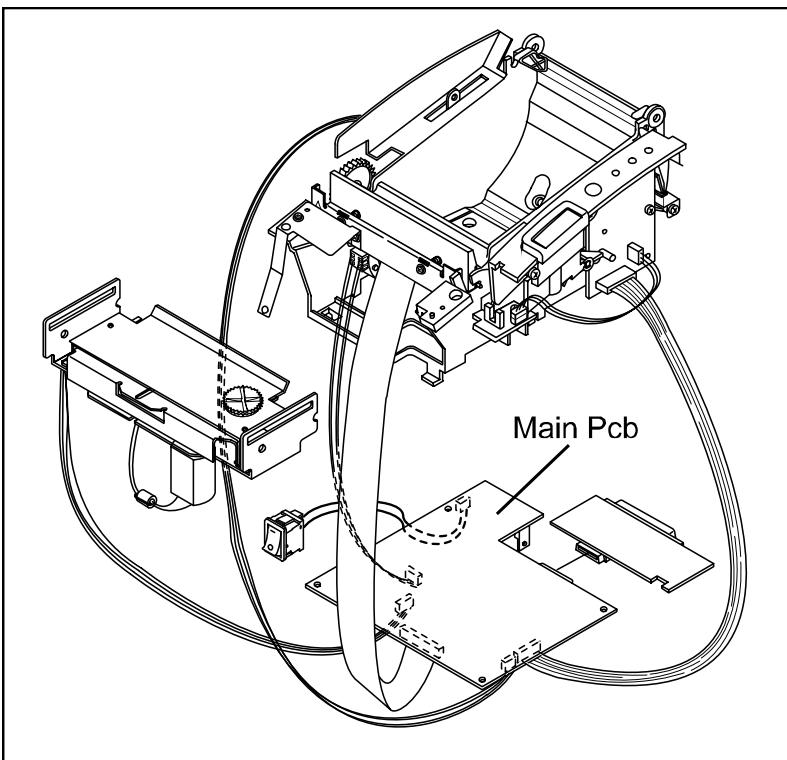
[Figure 4-14 Thermal Printer Timing Waveform]

## 5. Disassembly and Assembly

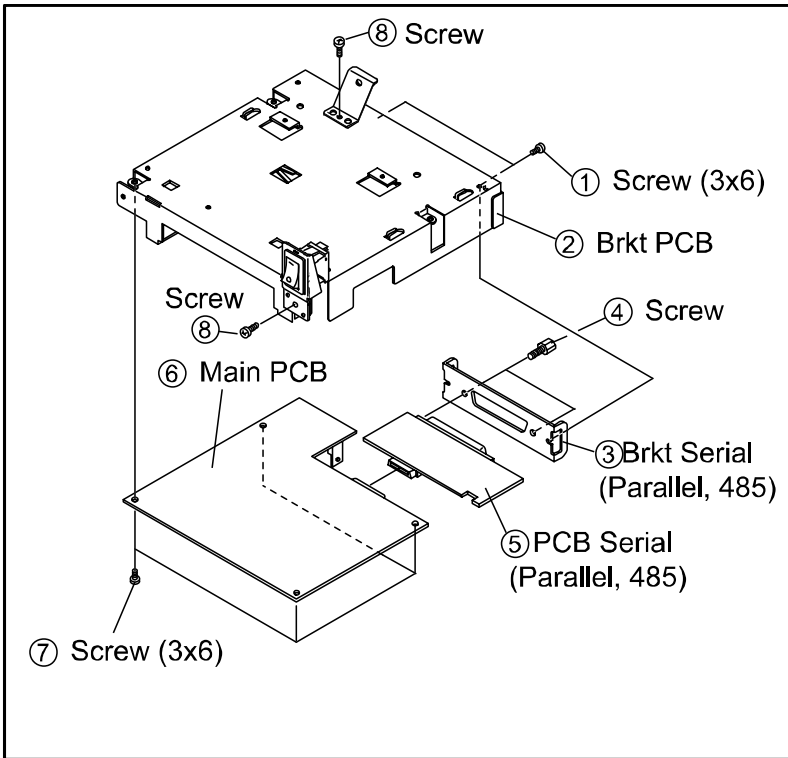
### 5-1 Case-Lower block



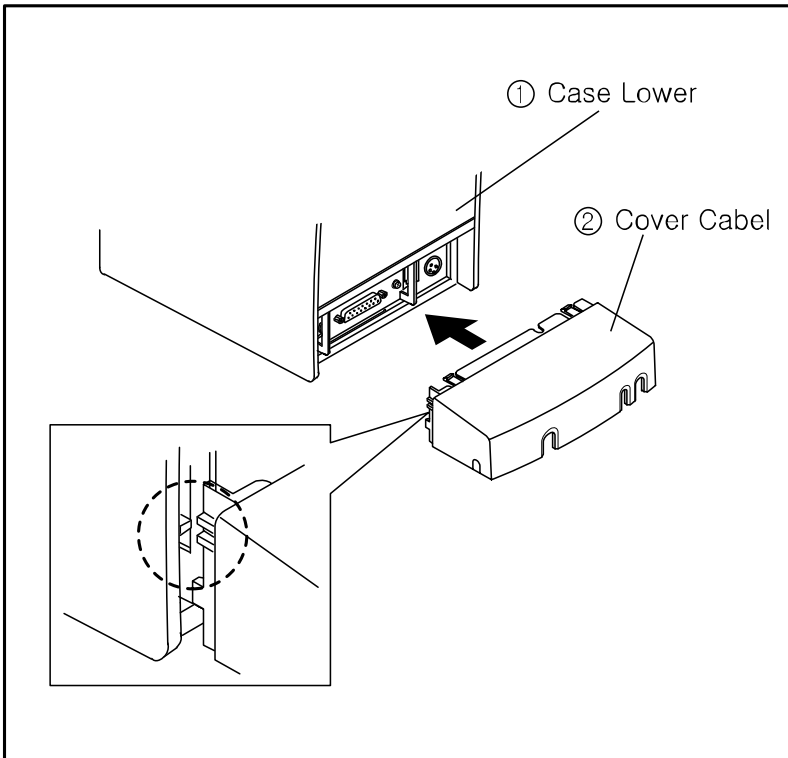
1. Remove the three screws.
2. Separate the Bracket-Dip-switch, Case-Lower, Foot-Rubber from the Printer.



1. Remove the connector wires from main PBA and sub Assembly.



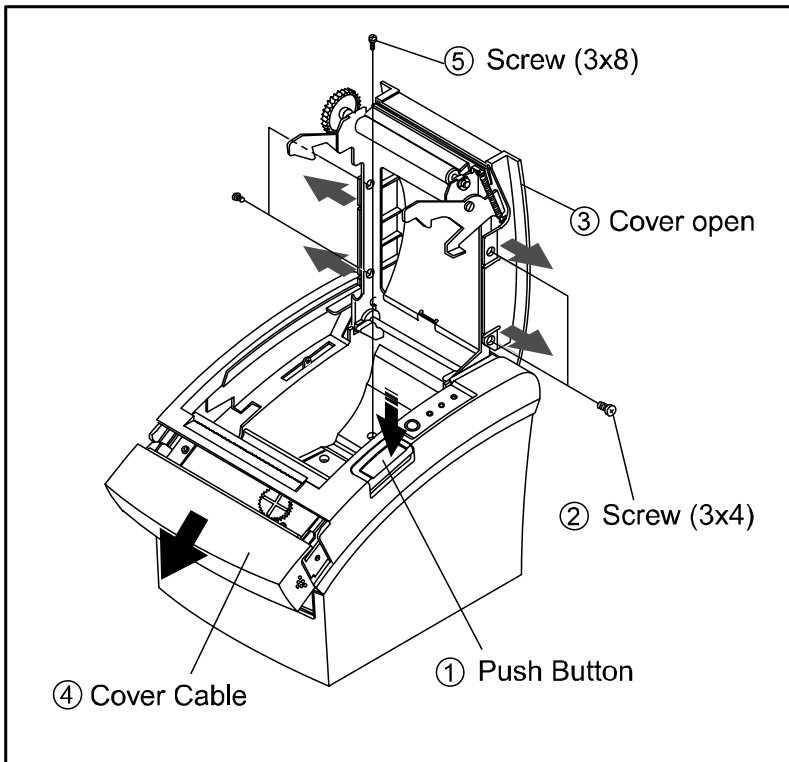
1. Remove the three Screws from the BRKT PBA.
2. Separate the BRKT Interface.
3. Remove the two screws.
4. Separate the BRKT Interface from the I/F PBA Assembly.
5. Separate the I/F PBA from the Main PBA.
6. Remove the four screws.
7. Separate the Main PBA from the BRKT PCB.



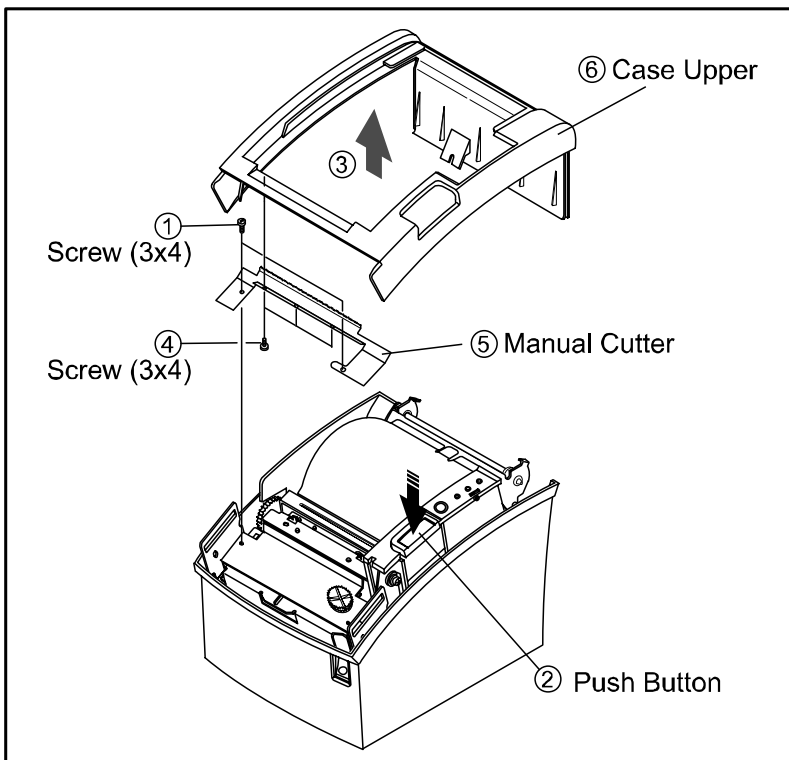
1. Separate the Cover-Cable from Case-Lower.



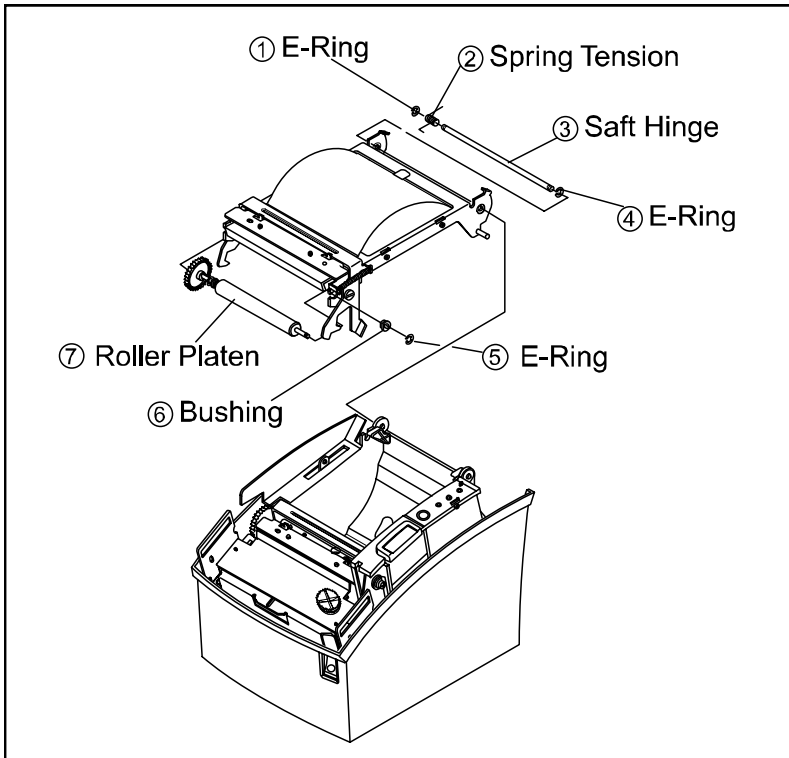
**5-2 Case Upper block**



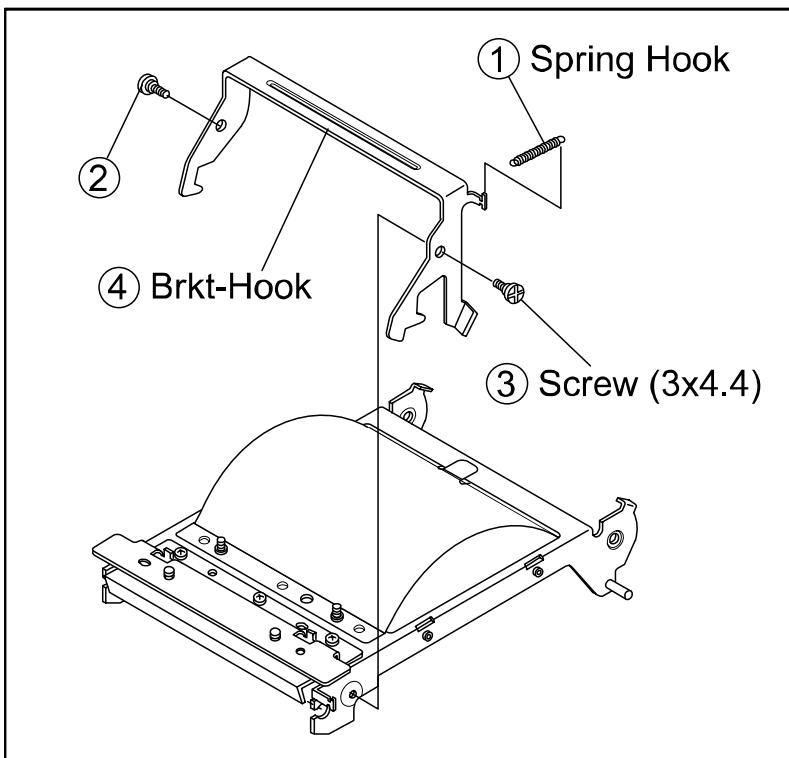
1. Push the Button to open the Cove-Open.
2. Remove the four screws.
3. Separate the Cover-Open.
4. Separate the Cover-Cutter.
5. Remove the screws.



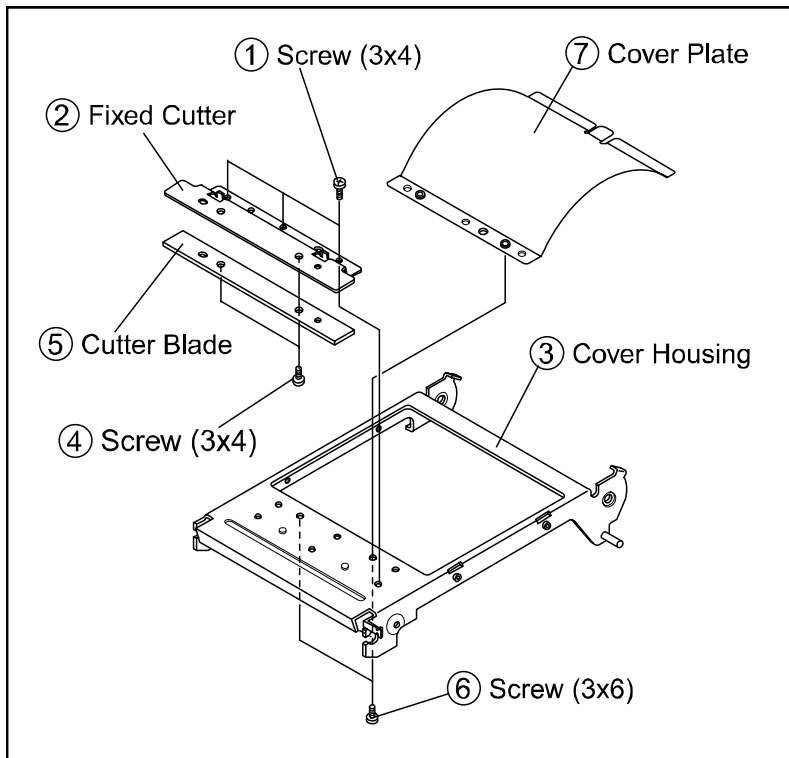
1. Remove the two screws.
2. Lift the Case-Upper in the direction of an arrow during pushing the Push-Button.
3. Remove the three screws.
4. Separate the Manual-Cutter from the Case-Upper.



1. Remove the E-Ring.
2. Separate the Spring Tension, the Shaft Hinge and the E-Ring.
3. Remove the E-Ring.
4. Separate the Bushing and the Roller Platen Assembly.

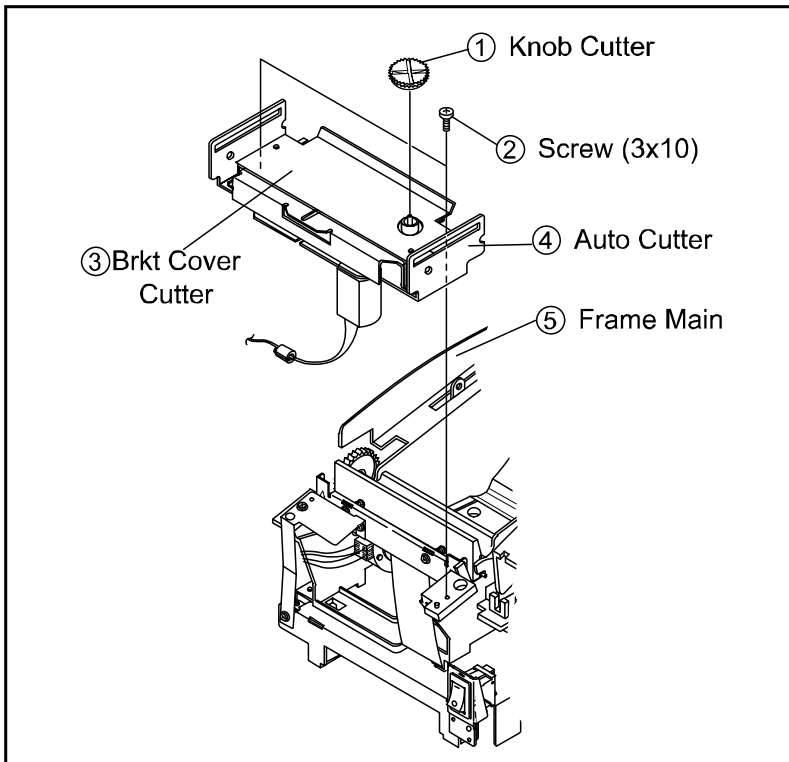


1. Remove the Spring Hook.
2. Remove the two screws.
3. Separate the BRKT Hook.

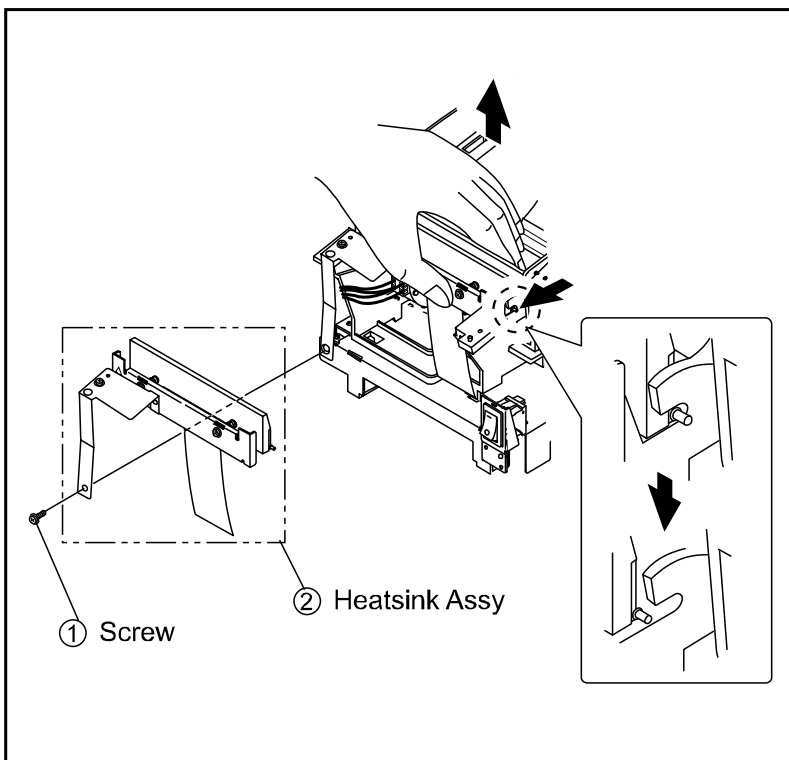


1. Remove the three screws.
2. Separate the Fixed-Cutter from the Cover-Housing.
3. Remove the two screws.
4. Separate the Cutter-Blade from Fixed-Cutter.
5. Remove the two screws.
6. Separate the Cover-Plate from the Cover-Housing.

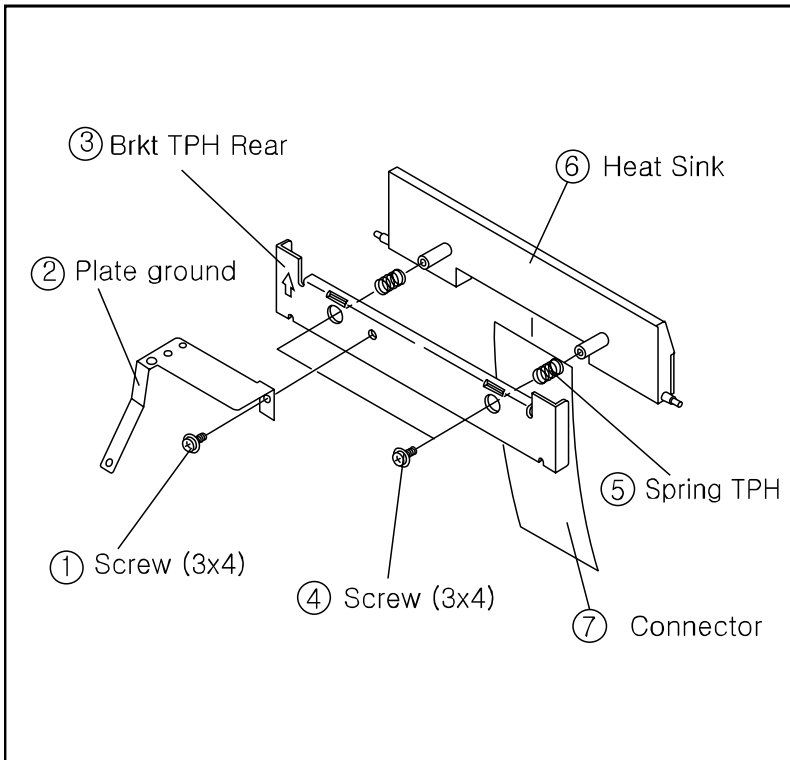
**5-3 Frame block**



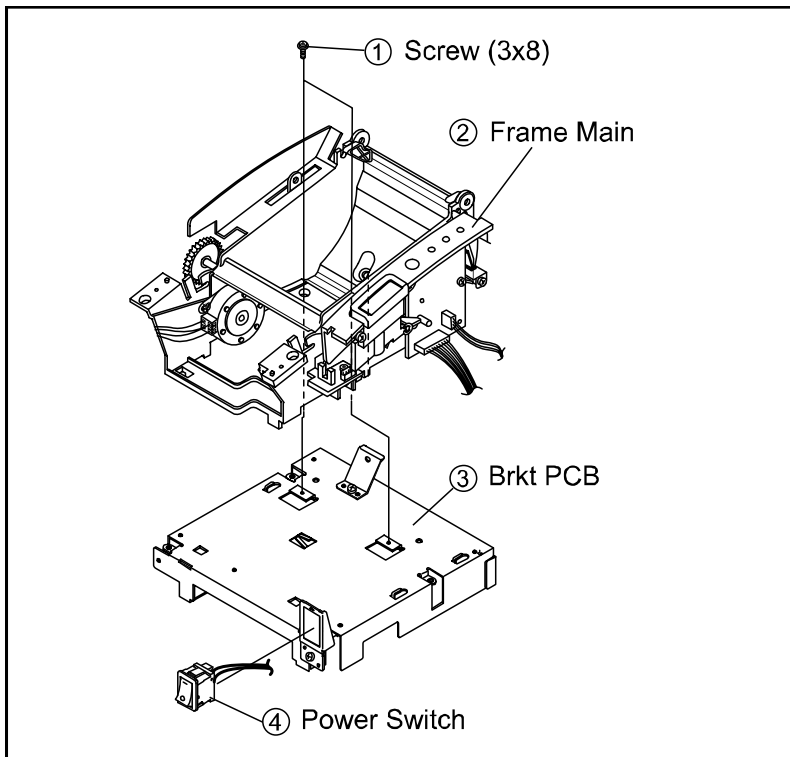
1. Pull out the Knob-Cutter and separate it.
2. Remove the two screws.
3. Separate the BRKT Cover-Cutter and the Auto-Cutter from the Frame Main.



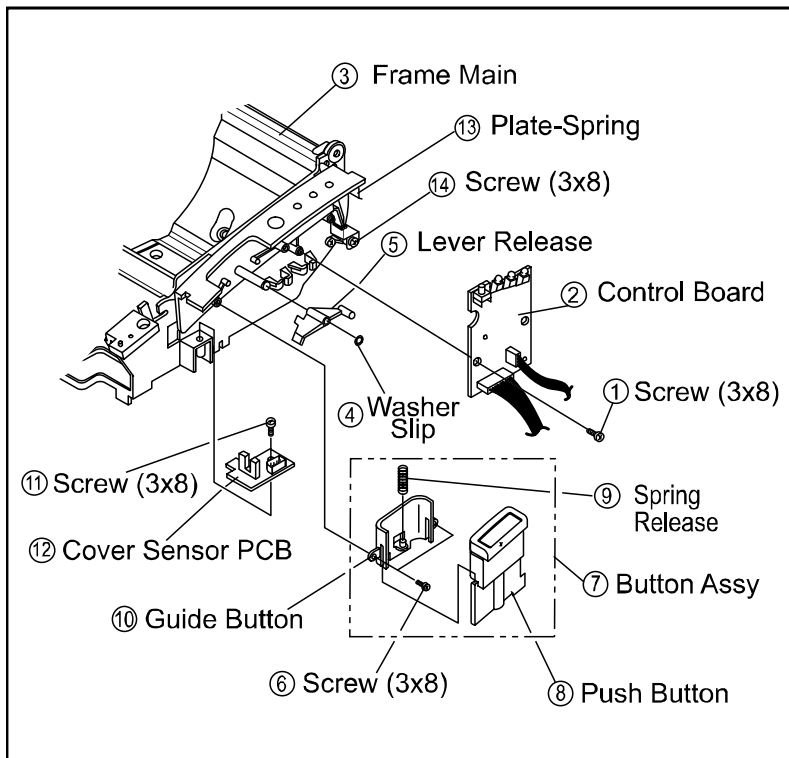
1. Remove the screws.
2. Push the Heat-Sink Assembly in the direction of an arrow and separate it.



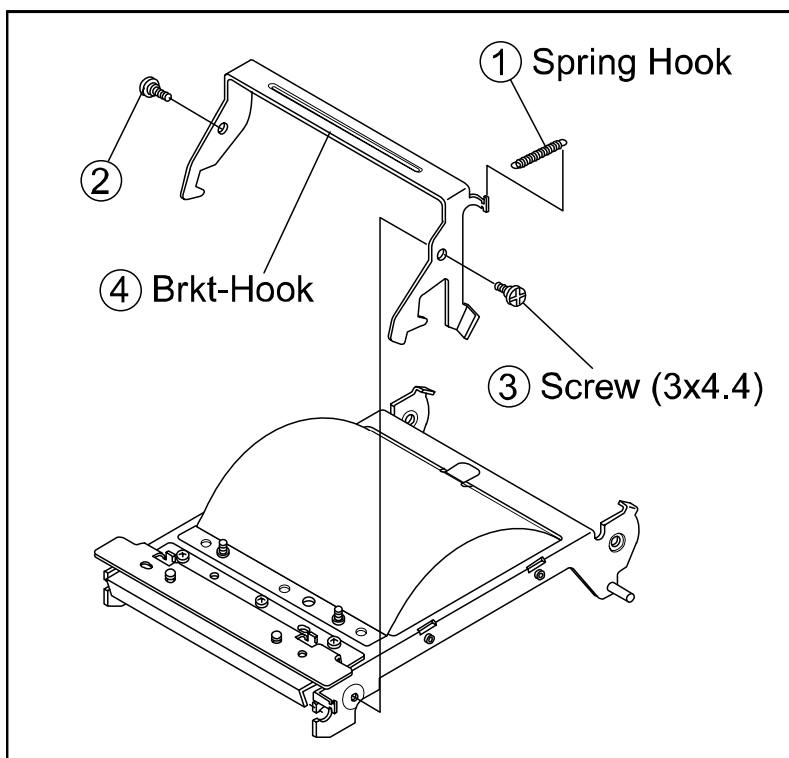
1. Remove the screws.
2. Separate the Plate-ground and BRKT TPH Rear.
3. Remove the two screws.
4. Separate the Heat-Sink and the Spring-TPH.
5. Separate the Connector from the Heat-Sink.



1. Remove the two screws.
2. Separate the Frame-Main from the BRKT PCB.
3. Separate the Power-Switch from the BRKT PCB.



1. Remove the screw. And separate the Control-Board from the Frame-Main.
2. Remove the washer slip.
3. Separate the Lever-Release from the Frame-Main.
4. Remove the two screws.
5. Separate the Button Assembly from the Frame-Main.
6. Push the Button. Then, the Button Assembly is separated. (Internal Spring Release, Guide-Button.)
7. Remove the screw. And separate the Cover-Sense PCB from the Frame-Main.
8. Remove the screw. And separate the Plate-Spring from the Frame-Main.



1. Remove the screw in the Frame-Main (3PCS).
2. Separate the Knob paper End.
3. Separate the Housing paper End (2PCS).
4. Separate the Sub-Board(2PCS).
5. Remove the Washer slip. And Separate the Gear-Idle from the Frame Main.
6. Remove the two Screw. And Separate the Motor STEP from the Frame-Main.

# 6. Adjustments and Maintenance

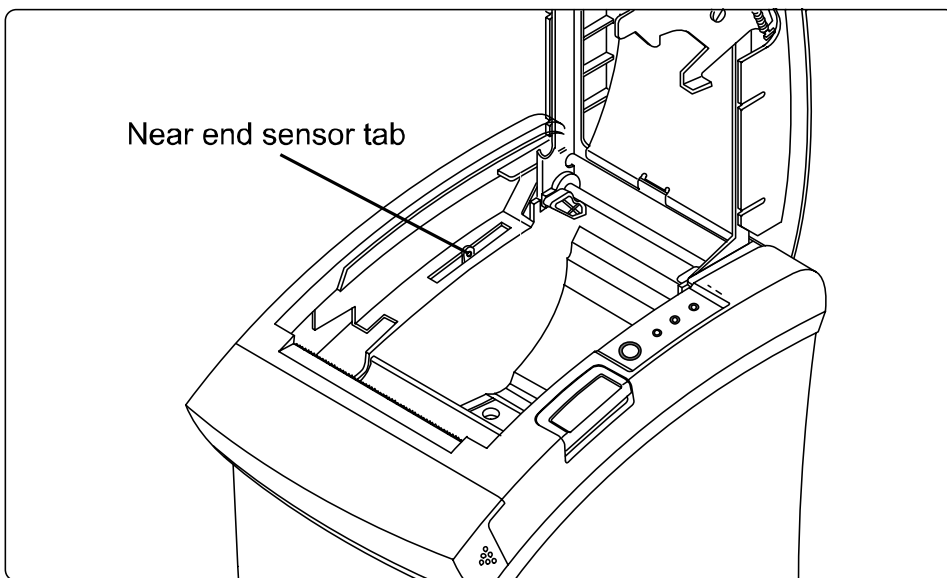
## 6-1 Adjustment

### 6-1-1 Remaining Roll Paper Adjustment

This sensor is set to the step3 position at the factory. If you find that there is not or too enough paper remaining on the roll when the near-end sensor is triggered, you can change the setting to the upper or lower position as described below.

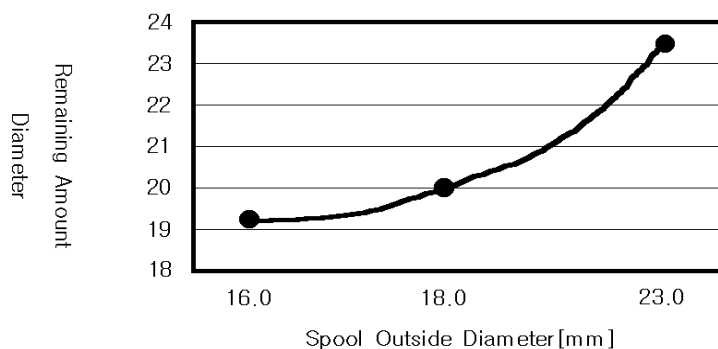
※ **Note** : The factory setting is based on a paper roll core with an outside diameter of 18mm. If you use a paper roll with a core with an outside diameter of more than 18mm, it is better to change to the upper position (Rotate the tab at front side) as described below.

1. Open the paper roll cover.
2. Rotate the tab at front or rear Position.



※ **Note** : For your reference, this shows the diameter at which the near-end sensor is triggered. Note that this figure is a calculated value, and there may be some variations depending on the printer.

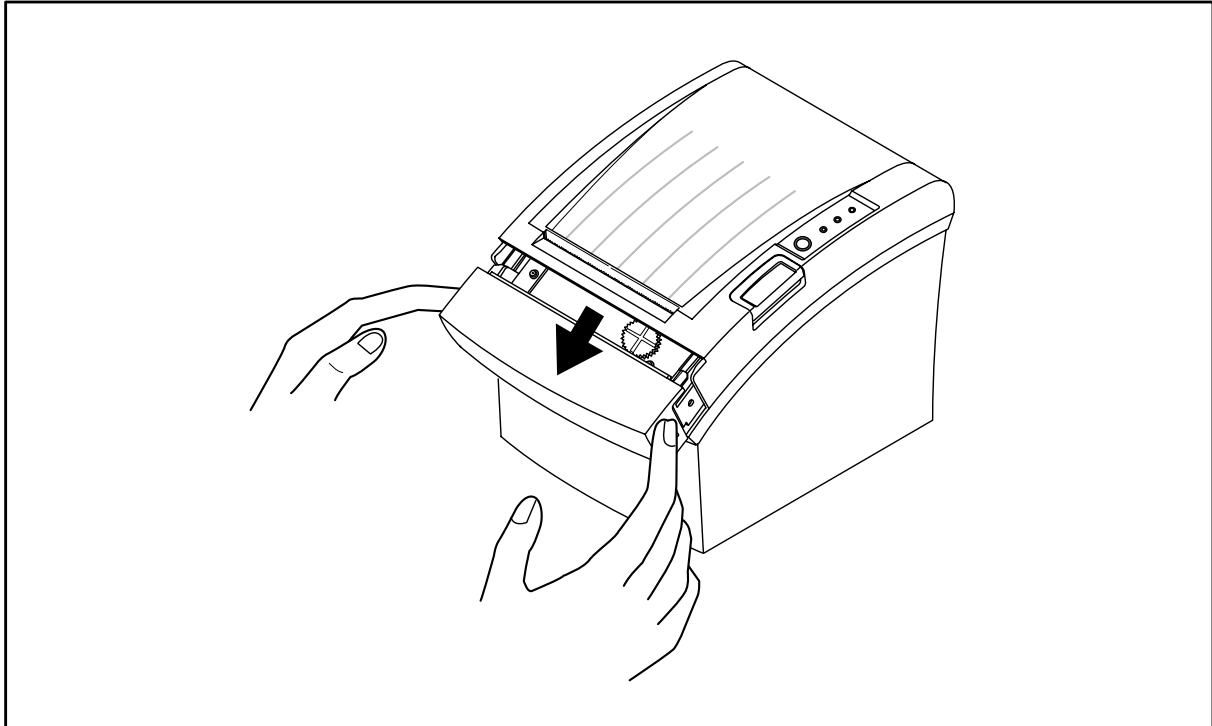
Paper Remaining Amount for Paper Spool Diameter  
(Fixed Position #1)



**6-1-2 Paper Jam**

If the paper jam occur, the buzzer will beep. If the cover-open can be opened, open the cover-open and remove the paper. If the cover-open can not be opened, follow the below.

1. Open the auto cutter cover with power ON.
2. Then turn the knob clockwise with a coin or similar tool until the buzzer beep stops.
3. Close the auto cutter cover.
4. Pull up the roll paper cover by hand.





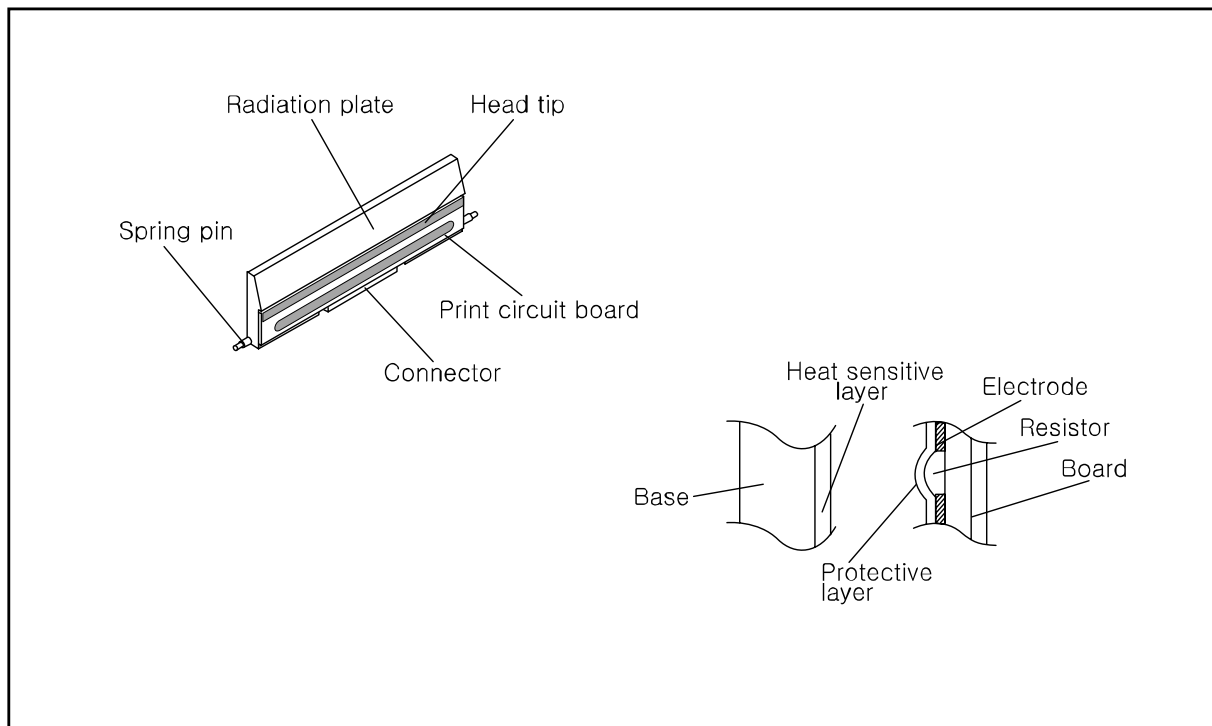
## 6-2 Maintenance

Paper dust on the heating elements may lower the print quality. In this case, clean the print head as follows:

※ **Caution** : Turn off the printer power before cleaning.

※ **Caution** : Note that the thermal head (Thermal Element and Radiation Plate) becomes very hot during normal operation, creating the danger of burn injury. Be sure to wait for about 10 minutes after turning printer power off before beginning the cleaning.

1. Open the cover-open.
2. Clean the thermal element (the area that looks like it is marked a thin black line) of the thermal head with a cotton swab moistened with an alcohol solvent (ethanol, methanol, or IPA).
3. After confirming that the alcohol solvent has been dried up completely, close the cover-open.



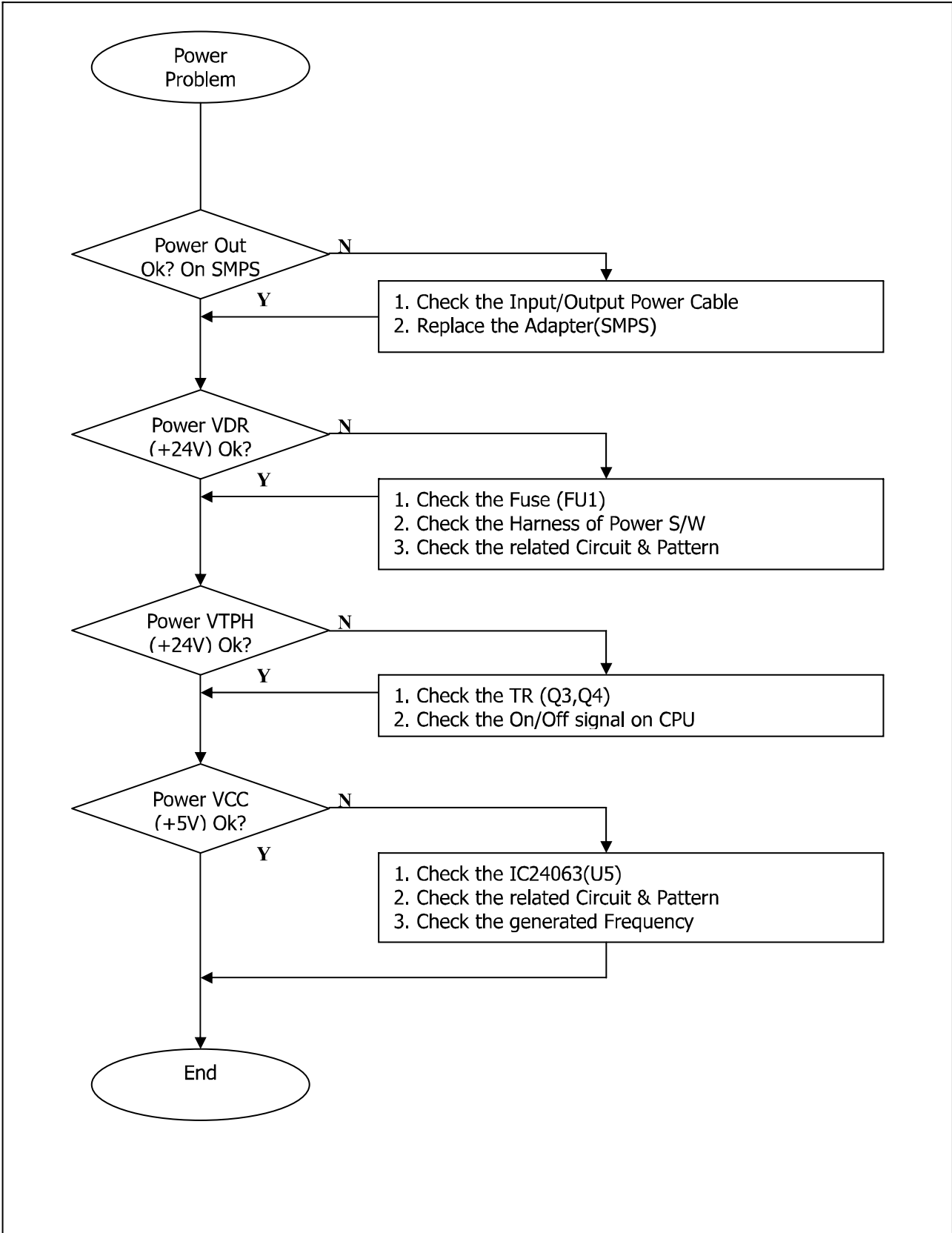
※ **Note** : Never touch the thermal element with your hand. Doing so can damage the thermal element.

※ **Note** : Do not scratch the Printer Head.

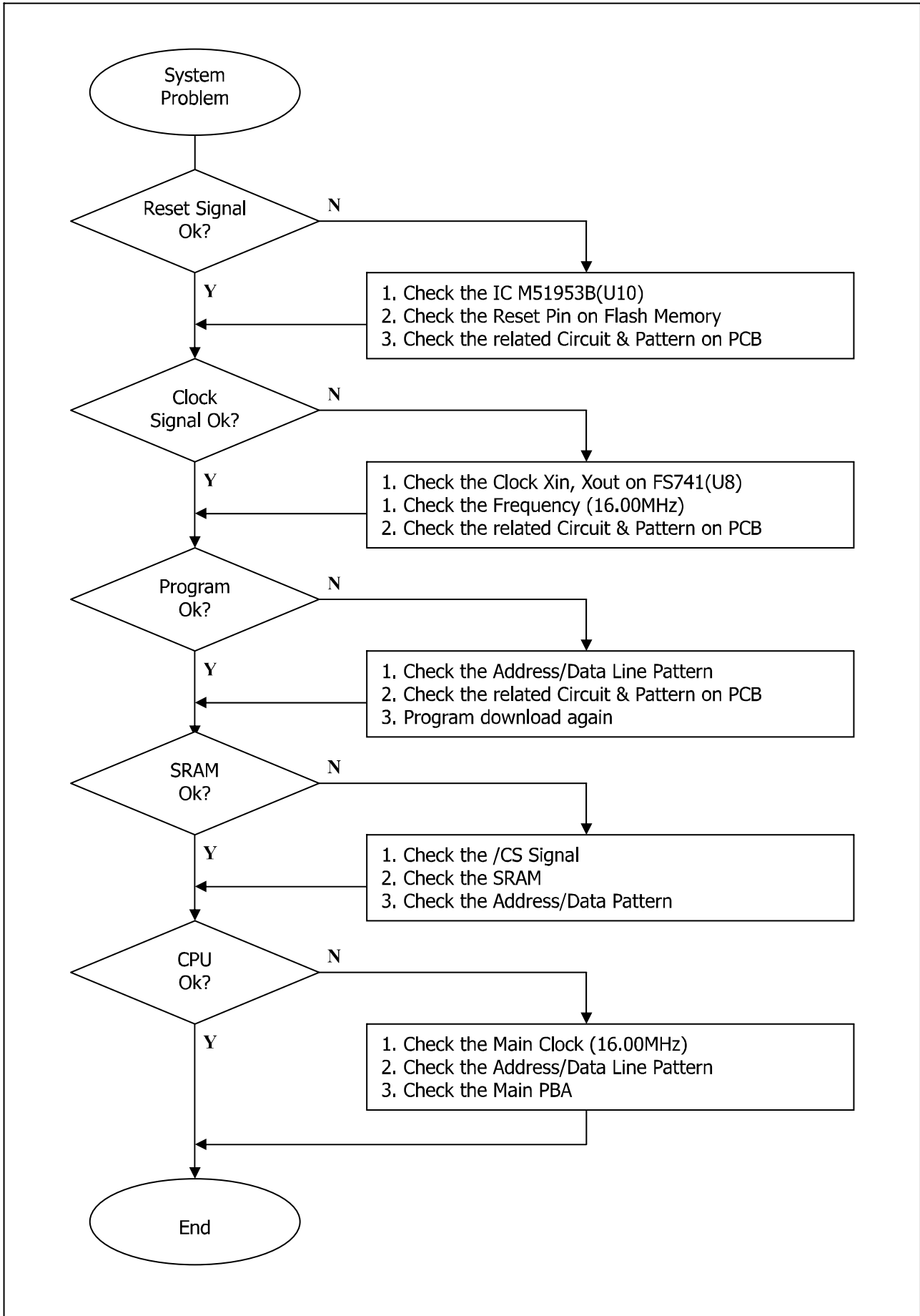
# 7. Troubleshooting

This chapter describes the methods for troubleshooting in this Receipt Printer.

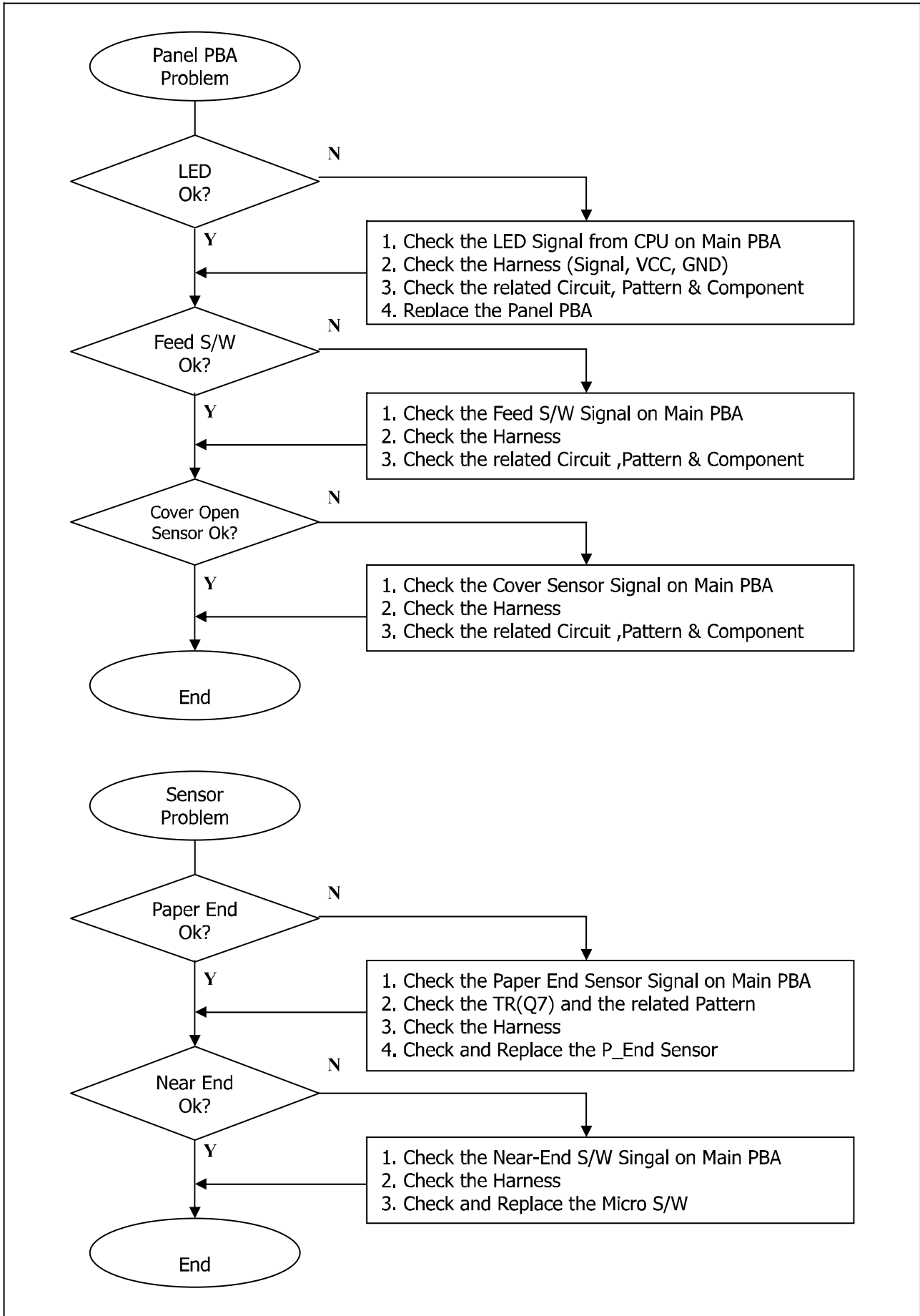
## 7-1 Power Problem



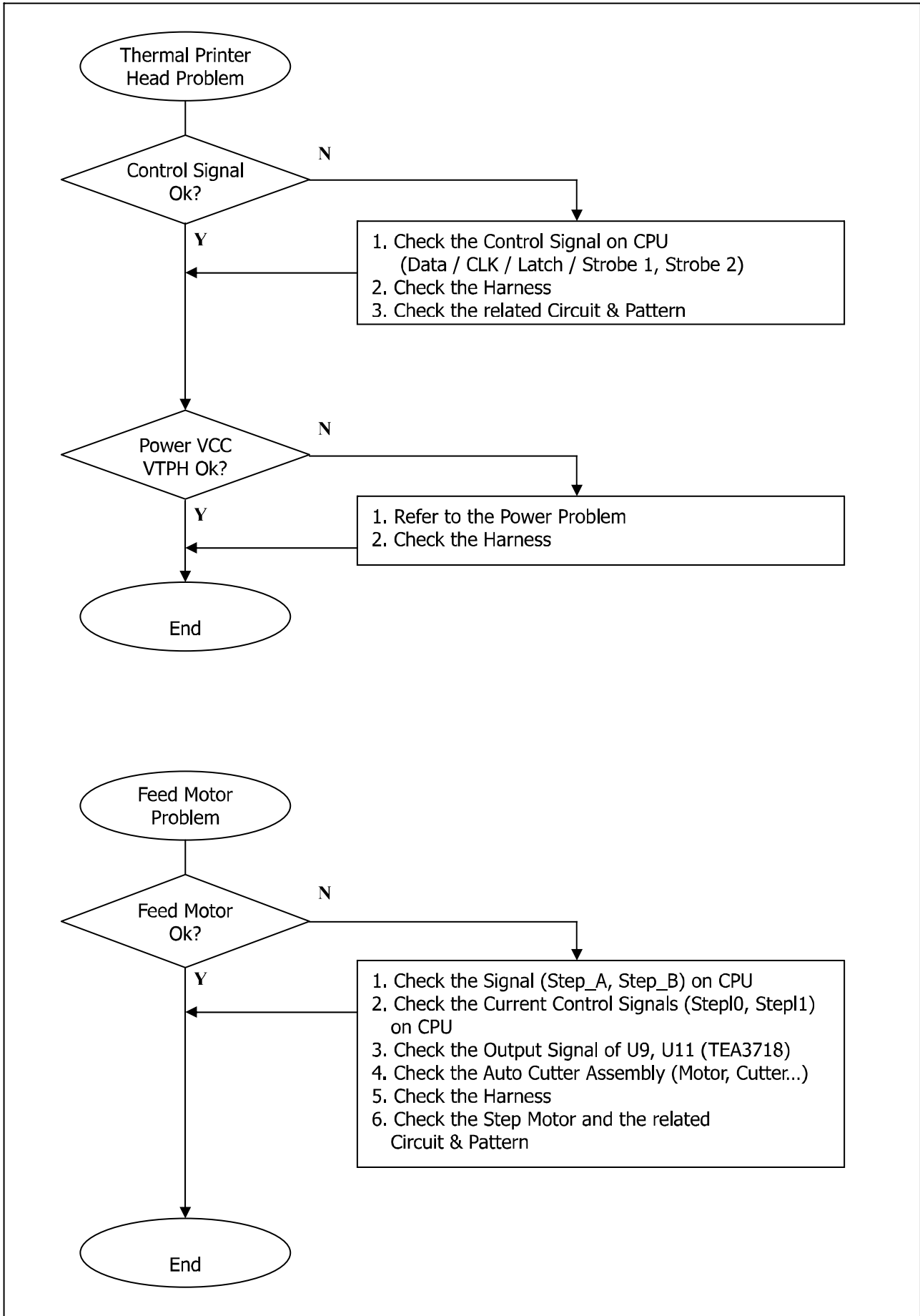
**7-2 System Problem**



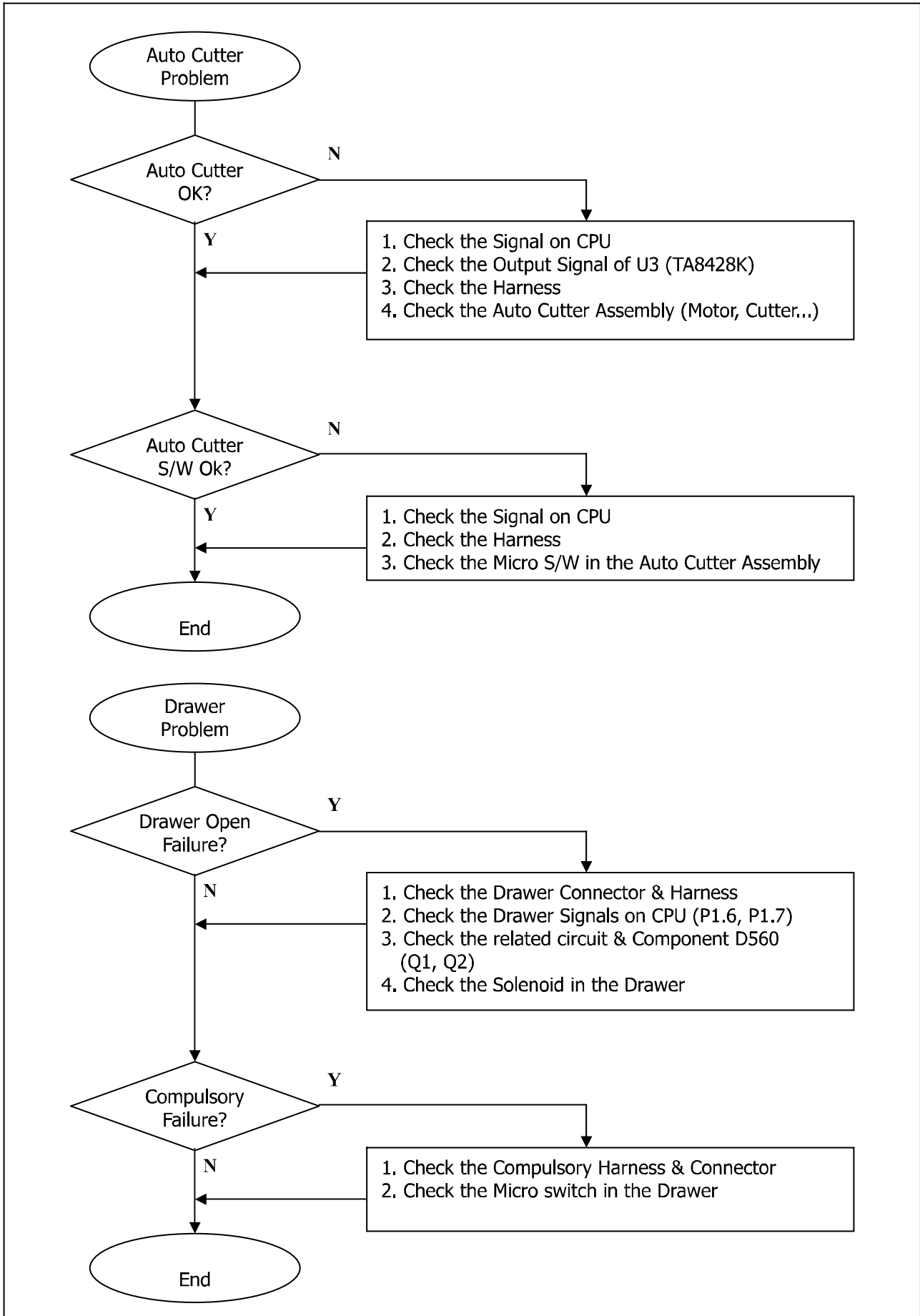
**7-3 Panel PBA and Sensor Problem**



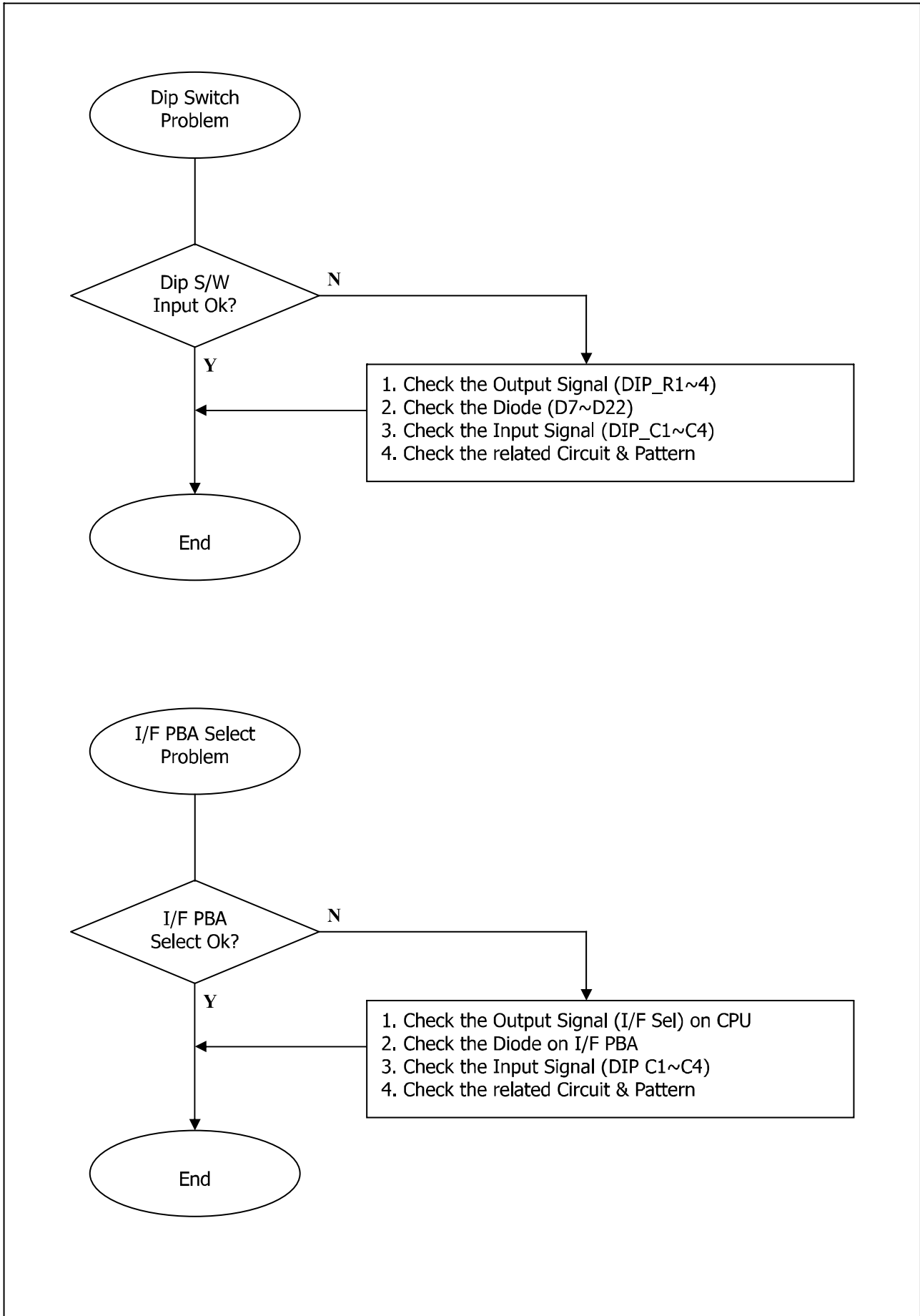
**7-4 Thermal Printer Head and Feed Motor Problem**



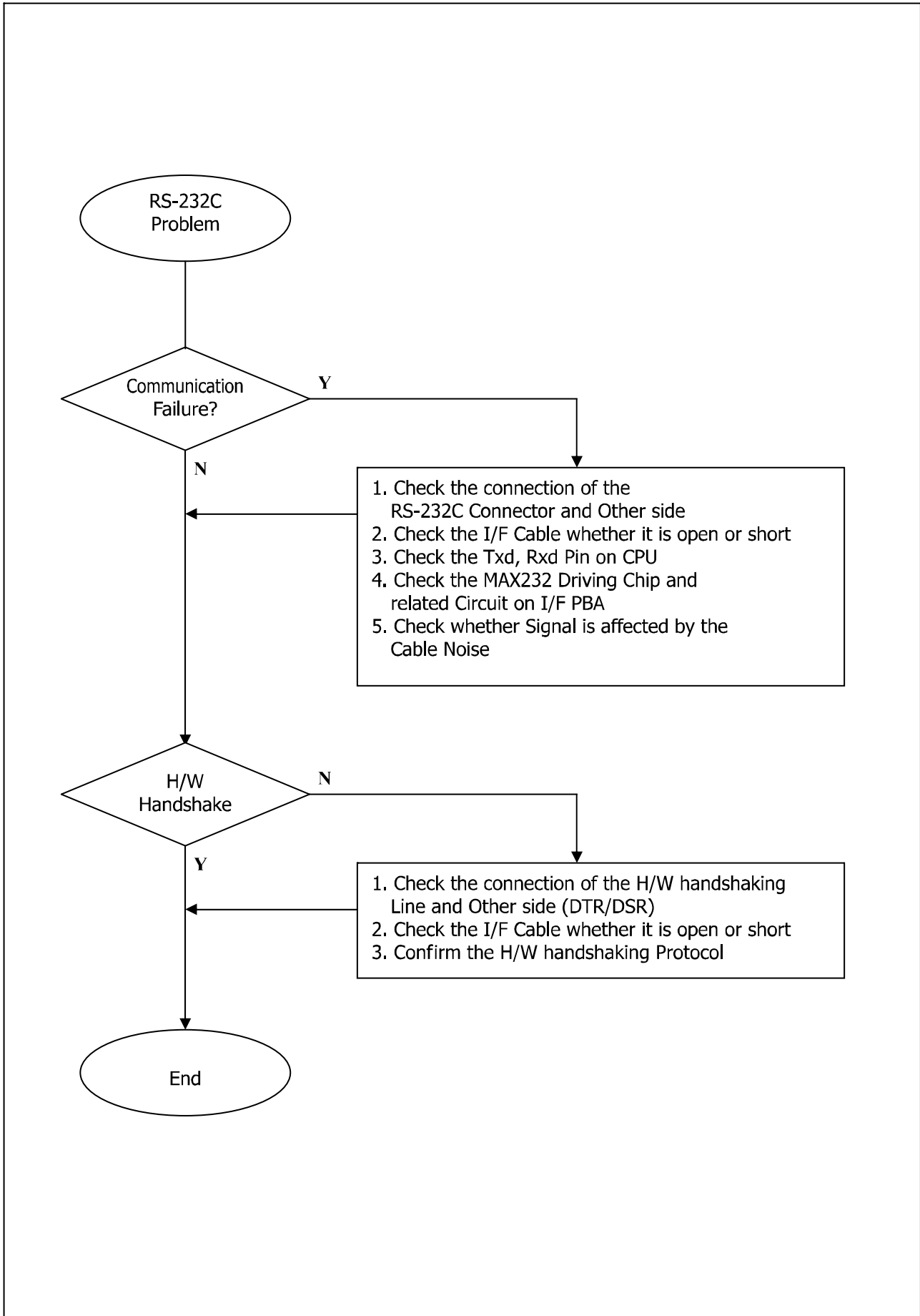
**7-5 Auto Cutter and Drawer Problem**



**7-6 Dip S/W and I/F PBA Select Problem**

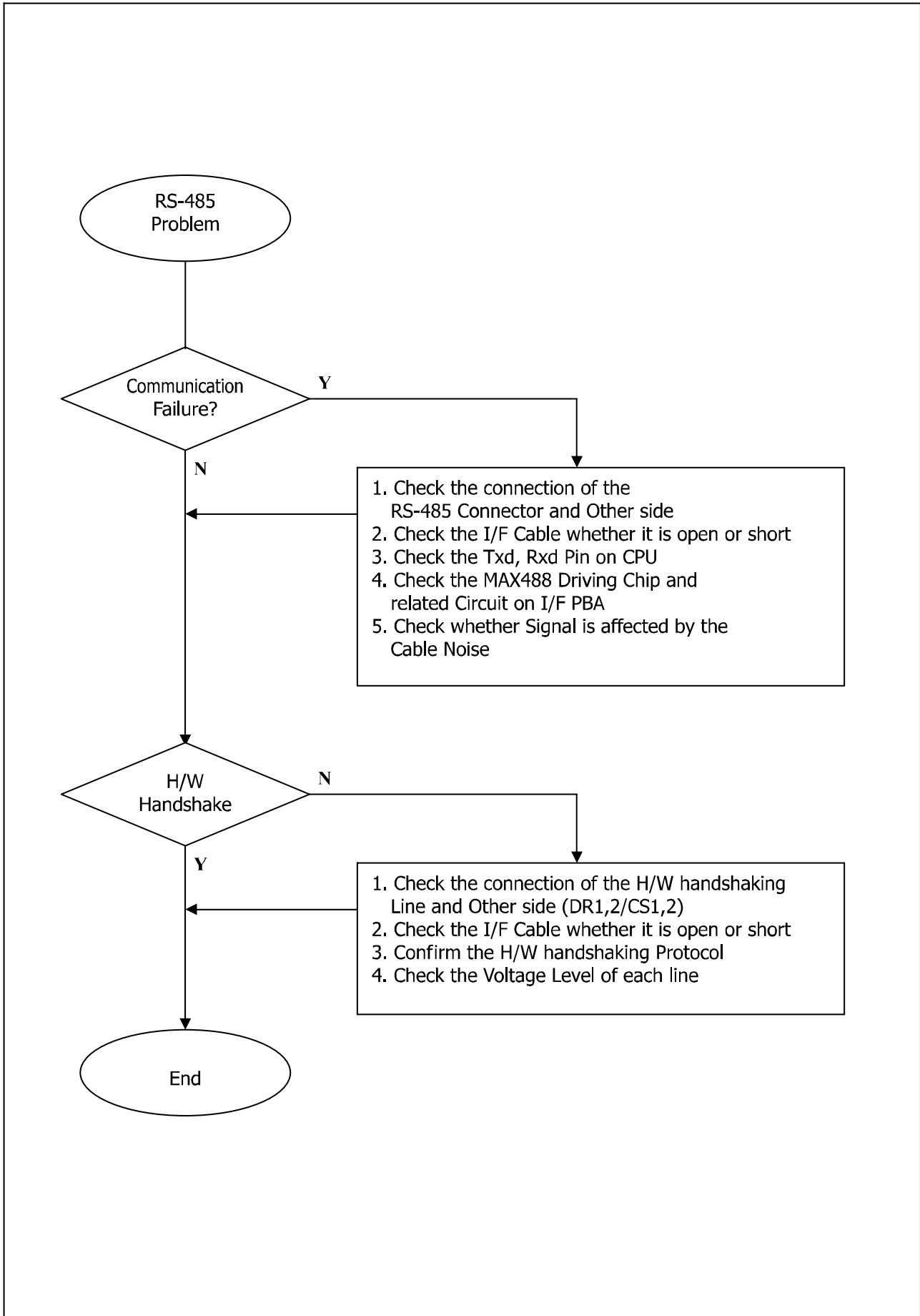


**7-7 RS-232C Serial Communication Problem**

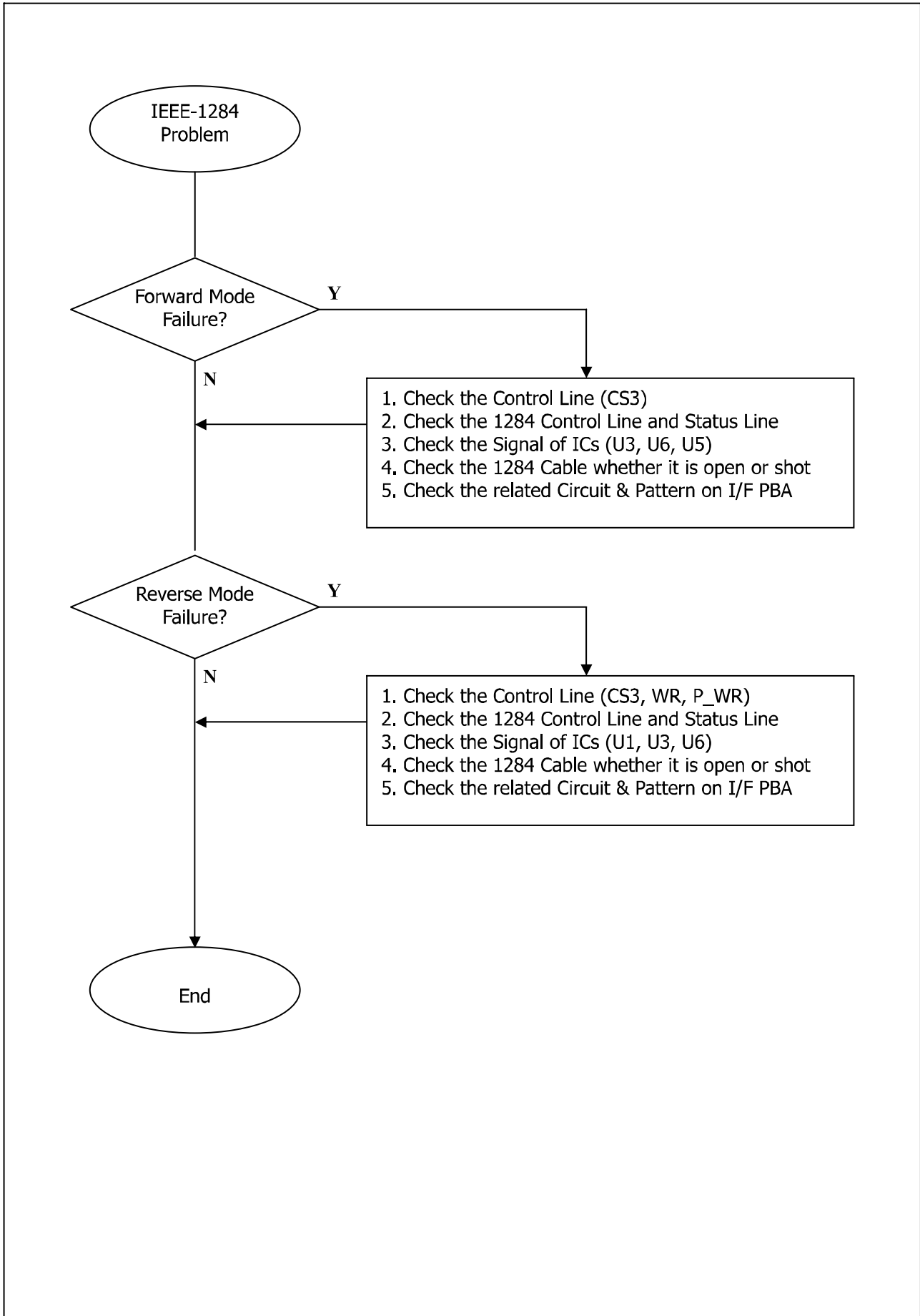




**7-8 RS-485 Serial Communication Problem**



**7-9 IEEE-1284 Parallel Communication Problem**



**7-10 USB Communication Problem**

