

# CONTROL BOARD

***TBD900-24-A***

***PBD-9***

***OPA-T900***

***NEU-T900***

# SPECIFICATION MANUAL

Rev. No. 0.05



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# CHAPTER 1 GENERAL DESCRIPTION

The control board TBD900 is a dedicated circuit board (hereinafter referred to as “board”) to drive the printer mechanism TUP900 series.

It is composed of the mechanism control circuits to control the motors and print head and the interface circuits for signal exchanges between a PC and the printer. The interface conforms to a Centronics Parallel interface or an RS-232C serial interface can be selected. Driving the printer mechanism is possible by the user prepared electrical power source.

## How to Display the Model Name

**TBD900 -24-A**  
└─ 24: 24V DC  
└─ Control Board for the TUP900 Series

## Options

**PBD-9**  
└─ Sub-Board

**OPA-T900**  
└─ Control Panel Board

**NEU-T900**  
└─ Paper Near End Sensor

# CHAPTER 2 BASIC SPECIFICATIONS

## 2-1 General Specifications

Items	Contents	
Model Name and Display Method	TBD900	
Printer	TUP900 Series	
Interface	Conforms to Centronics Parallel interface or RS-232C Serial interface	
Power (*1)	DC +24V±10% (A separate power unit for power supply is required)	
Current Consumption	When Idle	Typ. approximately 0.08A
	At ASCII printing (At print duty 17.5%)	Typ. approximately 1.7A
		Peak approximately 7.0A
	At print duty 100%	Typ. approximately 5.0A
		Peak approximately 13.0A
Ambient Operating Conditions	Temperature	+0°C to +50°C
	Humidity	10% to 80% RH (+40°C, No condensation)
Ambient Storage Conditions	Temperature	-20°C to +70°C
	Humidity	5% to 95% RH (+40°C, No condensation)
External Dimensions	90 mm x 120 mm	
Weight	Approximately 75 g	
Board	CPU	HD6412324
	Gate Array	LC24108B-TSPB
	Clock Frequency	25 MHz
	Flash ROM	8 M bits x 2 pcs. loaded
	RAM	4 M bits loaded

(\*1) Connect a capacitor higher than 3300  $\mu$ F to a 24V system on the power connector side.

## 2-2 Printing Specifications

The following describes the printing specifications when using the TUP900 series.

Items	Contents	
Printing Method	Thermal Line Dot Method	
Dot Configuration	832 dots/line	
Number of Print Dots	832 dots	
Number of Dots	Maximum 320 dots	
Simultaneously Energized		
Print Density	Horizontal Direction	8 dots/mm
	Vertical Direction	8 dots/mm
Printing Speed (See Note 1)	HS Mode	Max. 150 mm/sec
	LQ Mode	Max. 110 mm/sec
	HQ Mode	Max. 60 mm/sec
	2 Color Printing Mode	Max. 60 mm/sec
Printing Width	Maximum 104 mm	
Recording Paper Width (See Note 2)	79.5 ±0.5 mm to 111.5 mm ± 0.5 mm	
Paper Feed	Paper Feed Method	Friction Method
	Paper Feed Pitch	0.125 mm
	Paper Feed Speed	Max. 150mm/sec
Detector Functions (See Note 3)	Head Temperature Detection	Thermistor
	Paper End Detection	Reflective Type Photo-interrupter
	Paper Near-end Detection	Microswitch or Reflective Type Photo-interrupter
	Platen Position Detection	Microswitch
	Cutter Home Position Detection	Microswitch

Note 1: Be aware that printing speed varies according to the processing speed on the controlling side and the print pulse width.

Note 2: Printing quality can deteriorate according to the type and thickness of the recording paper.

Refer to the recording paper specifications, provided on a separate sheet, and use according to the drive conditions of the mechanism.

Note 3: Because a reflective type photo-interrupter is used as the paper out detector, it can also be used to detect black marks.

## 2-3 Loaded Characters and Bar Code Specifications

### 2-3-1 STAR Line Mode

Items	Contents		
Character Type	Standard Specifications	English Characters	95 Characters
		Expanded Graphics	128 Characters
		International Characters	32 Characters
	Chinese Specifications	English Characters	95 Characters
		Chinese Characters (*1)	7189 Characters
Character Configuration	English Characters	12 x 24 dots (W x H)	
	IBM Graphics	12 x 32 dots (W x H)	
	Single Byte Characters	12 x 24 dots (W x H) (Chinese Specifications)	
	Two Byte Chinese Characters	24 x 24 dots (W x H) (Chinese Specifications)	
Character Dimensions	12 x 24 Dot Fonts	1.50 mm x 3.00 mm (W x H)	
	12 x 32 Dot Fonts	1.50 mm x 4.00 mm (W x H)	
	24 x 24 Dot Fonts	3.00 mm x 3.00 mm (W x H)	
Character Code Table	40 Code Pages		
Bar Codes	UPC-A		
	UPC-E		
	JAN/EAN8		
	JAN/EAN13		
	ITF		
	CODE39		
	CODE93		
	CODE128		
	CODABAR (NW-7)		

\*1: Conforms to GB2312



## 2-3-2 STAR Page Mode (supported by ROM version 2.0 later)

Items	Contents			
Character Type	Lowercase Characters		English Characters	220 Characters
			International Characters	32 Characters
	Standard Characters		English Characters	220 Characters
			International Characters	32 Characters
	Chinese	Single Byte	English Characters	158 Characters
		Two Byte	English Characters	95 Characters
			Chinese Characters (*1)	7189 Characters
	Big Characters		English Characters	128 Characters
			International Characters	32 Characters
OCR Characters		English Characters	103 Characters	
Character Configuration	Lowercase Characters		8 x 16 dots (W x H)	
	Standard Characters		16 x 24 dots (W x H)	
	Single Byte Characters		12 x 24 dots (W x H) (Chinese Specifications)	
	Two Byte Chinese Characters		24 x 24 dots (W x H) (Chinese Specifications)	
	Big Characters		24 x 32 dots (W x H)	
	OCR Characters		16 x 24 dots (W x H)	
Character Dimensions	8 x 16 Dot Fonts		1.00 mm x 2.00 mm (W x H)	
	12 x 24 Dot Fonts		1.50 mm x 3.00 mm (W x H)	
	16 x 24 Dot Fonts		2.00 mm x 3.00 mm (W x H)	
	24 x 24 Dot Fonts		3.00 mm x 3.00 mm (W x H)	
	24 x 32 Dot Fonts		3.00 mm x 4.00 mm (W x H)	
Character Code Table	2 Code Pages			
Bar Codes	UPC-A			
	UPC-E			
	JAN/EAN8			
	JAN/EAN13			
	ITF			
	CODE39			
	CODE93			
	CODE128			
	CODABAR (NW-7)			

\*1: Conforms to GB2312

### 2-3-3 ESC/POS Mode (supported by ROM version 3.0 later)

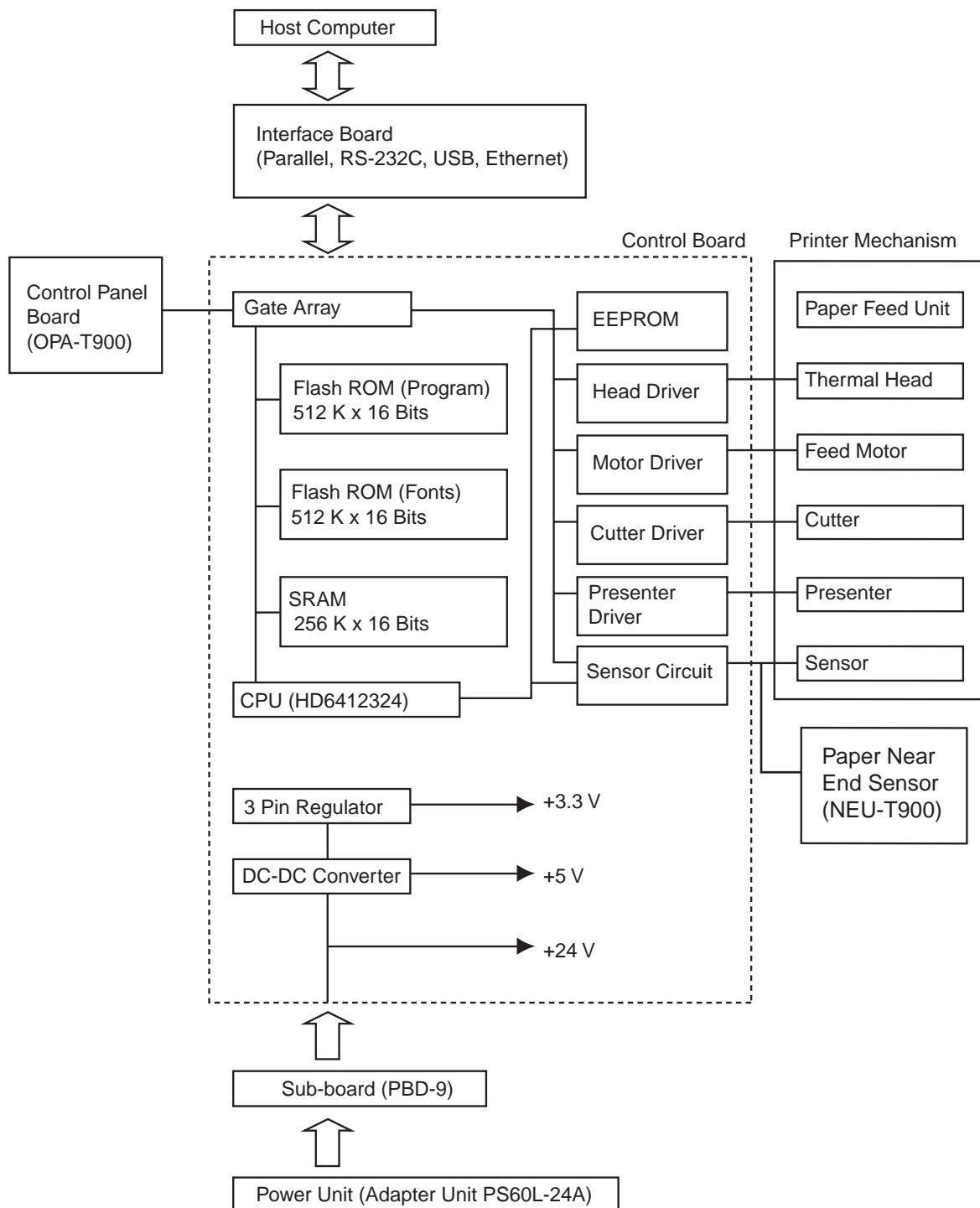
Items	Contents		
Character Type	Standard Specifications	English Characters	95 Characters
		Expanded Graphics	128 Characters
		International Characters	32 Characters
	Chinese Specifications	English Characters	95 Characters
		Chinese Characters (*1)	7189 Characters
Character Configuration	English Characters	12 x 24 dots (W x H)	
	IBM Graphics	12 x 32 dots (W x H)	
	Two Byte Chinese Characters	24 x 24 dots (W x H) (Chinese Specifications)	
Character Dimensions	12 x 24 Dot Fonts	1.50 mm x 3.00 mm (W x H)	
	24 x 24 Dot Fonts	3.00 mm x 3.00 mm (W x H)	
Character Code Table	40 Code Pages		
Bar Codes	UPC-A		
	UPC-E		
	JAN/EAN8		
	JAN/EAN13		
	ITF		
	CODE39		
	CODE93		
	CODE128		
	CODABAR (NW-7)		

\*1: Conforms to GB2312

# CHAPTER 3 CONFIGURATION

## 3-1 Block Diagram

The following block diagram describes the relationships between the control board and interface board and the peripheral devices.



## 3-2 General Description of Each Unit

### 1) CPU

Controls everything according to the program written to the flash ROM. Use Hitachi's HD6412324 for the CPU and operate at a clock speed of 25 MHz.

### 2) Gate Array

Use LC24108B-TSPB for the gate array to mainly send and receive interface signals and to convert mechanism drive control signals into drive signals.

### 3) Flash ROM

Mounted with ROM1 which is written with a program to control this board; and ROM2 which is written with fonts. The CPU performs each of its processes according to the program written in ROM1. Use 8 M (mega) bits for each ROM.

### 4) SRAM

Used in the CPU stack area, work area and data buffer. Use 4 M (mega) bits for the SRAM.

### 5) EEPROM

Used to save a variety of information such as the maintenance counter.

### 6) Drive Circuit

Converts control signals from the CPU and gate array to drive signals to drive the printer mechanism.

### 7) Control Panel Board (option)

Composed of switches and LED on the external operating board, this is used for fixed operations and display of information.

### 8) Interface Card

This communicates the data between the host computer and the printer.

### 9) Sub-board

Comprises a power switch and fuse (3.15 A/250 V rated).

### 10) Power Unit

Prepare a separate power unit because it does not have a power circuit. This board requires supply the supply of power. Supply power: DC +24 V, GND

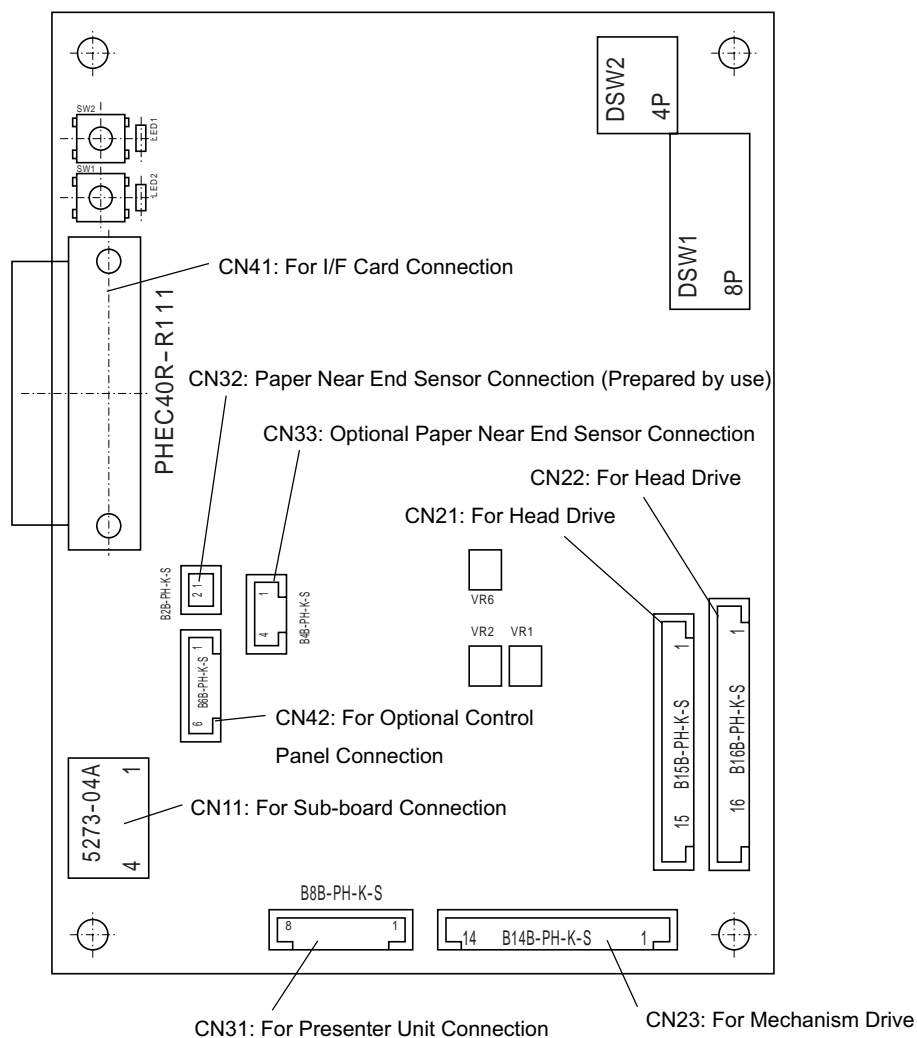
### 11) Printer Mechanism

The printer mechanism is composed of a print head, paper feed motor, paper feed unit, detectors and a presenter.

# CHAPTER 4 CONNECTIONS

## 4-1 Connector Specifications and Signal Names

### 4-1-1 Control Board



**(1) Connector 11**

Use	Connection to Sub-board (Power Input)					
Part ID	CN11					
Pin Count	4 Pins					
Connector Used	5273-04A	Manufacturer		Molex (Corporation)		
Pin Signal Names and Functions	No.	Signal Name	Function (Gen. Desc.)	No.	Signal Name	Function (Gen. Desc.)
	1	M-GND	_____	3	24 V	_____
	2	24 V	_____	4	M-GND	_____
Remarks	Compatible Housing: 5195-0400 (Compatible Terminal: 5194) Compatible Cable Set: Cable U 4 x 60 CC PBD-9					

**(2) Connector 21**

Use	Connection to Print Head					
Part ID	CN21					
Pin Count	15 Pins					
Connector Used	B15B-PH-K-S	Manufacturer		JST Mfg. Co., Ltd.		
Pin Signal Names and Functions	No.	Signal Name	Function (Gen. Desc.)	No.	Signal Name	Function (Gen. Desc.)
	1	VH	24 V	9	TM	Thermistor
	2	VH	24 V	10	TM	Thermistor
	3	VH	24 V	11	S-GND	_____
	4	VH	24 V	12	M-GND	_____
	5	DI	Head Data Output Signal	13	M-GND	_____
	6	STB6	Head Drive Signal	14	M-GND	_____
	7	STB5	Head Drive Signal	15	M-GND	_____
	8	STB4	Head Drive Signal			_____
Remarks	Compatible Cable: 30721710 Cable U (A) TMP9					

**(3) Connector 22**

Use	Connection to Print Head					
Part ID	CN22					
Pin Count	16 Pins					
Connector Used	B16B-PH-K-S	Manufacturer		JST Mfg. Co., Ltd.		
Pin Signal Names and Functions	No.	Signal Name	Function (Gen. Desc.)	No.	Signal Name	Function (Gen. Desc.)
	1	VH	24 V	9	STB1	Head Drive Signal
	2	VH	24 V	10	STB 2	Head Drive Signal
	3	VH	24 V	11	STB3	Head Drive Signal
	4	VH	24 V	12	M-GND	_____
	5	DO	Head Data Input Signal	13	M-GND	_____
	6	LAT	Head Data Latch Signal	14	M-GND	_____
	7	CLK	Head Data Transfer Clock	15	M-GND	_____
	8	5 V		16	N. C.	_____
Remarks	Compatible Cable: 30721720 Cable U (B) TMP9					

#### (4) Connector 23

Use	Connection to Mechanism Unit					
Part ID	CN23					
Pin Count	14 Pins					
Connector Used	B14B-PH-K-S		Manufacturer	JST Mfg. Co., Ltd.		
Pin Signal Names and Functions	No.	Signal Name	Function (Gen. Desc.)	No.	Signal Name	Function (Gen. Desc.)
	1	3.3 V	—————	8	LF#3	LF Motor Drive Signal
	2	PE	PE Detection Signal	9	LF#4	LF Motor Drive Signal
	3	PELED	PE Detection Signal LED	10	MHDUP	Head Up Signal
	4	BM	BM Detection Signal	11	S-GND	—————
	5	BMLED	BM Detection Signal LED	12	CUTSW1	Cutter Switch Signal
	6	LF#1	LF Motor Drive Signal	13	CUTM+	Cutter Motor Drive Signal
	7	LF#2	LF Motor Drive Signal	14	CUTM-	—————
Remarks	Compatible Cable: 30721700 Cable U 14 x 300 CC TMP9					

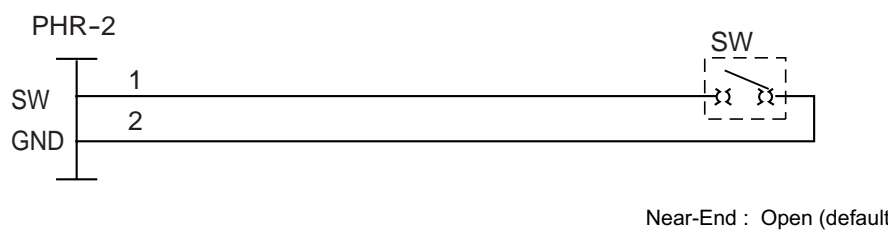
#### (5) Connector 31

Use	Connection with Presenter Unit					
Part ID	CN31					
Pin Count	8 Pins					
Connector Used	B8B-PH-K-S		Manufacturer	JST Mfg. Co., Ltd.		
Pin Signal Names and Functions	No.	Signal Name	Function (Gen. Desc.)	No.	Signal Name	Function (Gen. Desc.)
	1	3.3 V	—————	5	M-	Presenter Motor Drive Signal
	2	SIG1	Sensor 1 Detection Signal	6	M+	—————
	3	S-GND	—————	7	SIG3	Sensor 3 Detection Signal
	4	SIG2	Sensor 2 Detection Signal	8	PRS0	Presenter Detection Signal
Remarks	Compatible Cable: 30721740 Cable U 8 x 350 CC PR9					

#### (6) Connector 32 (Prepared by User)

Use	Connection with Paper Near End Sensor					
Part ID	CN32					
Pin Count	2 Pins					
Connector Used	B2B-PH-K-S		Manufacturer	JST Mfg. Co., Ltd.		
Pin Signal Names and Functions	No.	Signal Name	Function (Gen. Desc.)	No.	Signal Name	Function (Gen. Desc.)
	1	NE	Paper Near End Detection	2	S-GND	—————
Remarks	Compatible Housing: PHR-2 (JST Mfg. Co., Ltd.) Compatible Connector: SPH-002T-P0.5S (JST Mfg. Co.,Ltd.)					

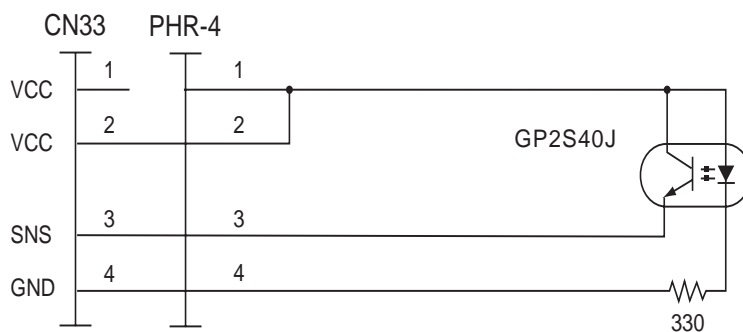
Sample Circuit for Paper Near End Sensor (Mechanical type)



## (7) Connector 33

Use	Connection with Optional Paper Near End Sensor (NEU-T900)					
Part ID	CN33					
Pin Count	4 Pins					
Connector Used	B4B-PH-K-S		Manufacturer		JST Mfg. Co., Ltd.	
Pin Signal Names and Functions	No.	Signal Name	Function (Gen. Desc.)	No.	Signal Name	Function (Gen. Desc.)
	1	VCC (3.3V)	_____	3	SNS	Detection Signal
	2			4	S-GND	_____
Remarks	Compatible Housing: PHR-4 (JST Mfg. Co., Ltd.)					

Sample Circuit for Paper Near End Sensor (Photo-Sensor type)





## (8) Connector 41

Use	Connection with I/F Card					
Part ID	CN41					
Pin Count	40 Pins					
Connector Used	PHEC40R-R111		Manufacturer		FCI	
Pin Signal Names and Functions	No.	Signal Name	Function (Gen. Desc.)	No.	Signal Name	Function (Gen. Desc.)
	A-1	ID0	ID0 Signal	B-1	ID1	ID1
	A-2	ID2	ID2 Signal	B-2	TXD1	TXD Signal
	A-3	S-GND	_____	B-3	RXD1	RXD Signal
	A-4	CD0	CD0 Signal	B-4	CD1	CD1 Signal
	A-5	CD2	CD2 Signal	B-5	CD3	CD3 Signal
	A-6	CD4	CD4 Signal	B-6	CD5	CD5 Signal
	A-7	CD6	CD6 Signal	B-7	CD7	CD7 Signal
	A-8	I/O8	I/O8 Signal	B-8	I/O9	I/O9 Signal
	A-9	5 V	_____	B-9	5 V	_____
	A-10	ERR	ERR Signal	B-10	/INIT	/INIT Signal
	A-11	/SEL	/SEL Signal	B-11	/POUT	/POUT Signal
	A-12	/BUSY	/BUSY Signal	B-12	ACK	ACK Signal
	A-13	STB	STB Signal	B-13	/RD	/RD Signal
	A-14	I/O10	I/O10 Signal	B-14	/CS	/CS Signal
	A-15	/WR	/WR Signal	B-15	S-GND	_____
	A-16	I/O0	I/O0 Signal	B-16	I/O1	I/O1 Signal
	A-17	I/O2	I/O2 Signal	B-17	I/O3	I/O3 Signal
	A-18	I/O4	I/O4 Signal	B-18	I/O5	I/O5 Signal
	A-19	I/O6	I/O6 Signal	B-19	I/O7	I/O7 Signal
A-20	S-GND	_____	B-20	S-GND	_____	
Remarks	Compatible Connector: PHEC40P-R111					



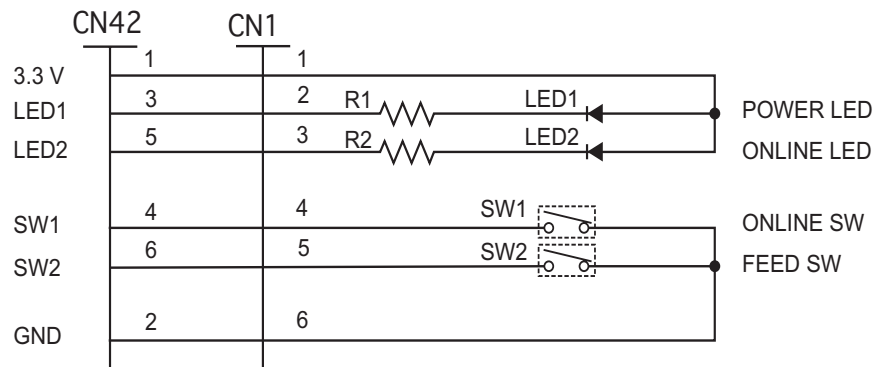
## (9) Connector 42

Use	Connection with the Optional Control Panel PCB (OPA-T900)						
Part ID	CN42						
Pin Count	8 Pins						
Connector Used	B8B-PH-K-S		Manufacturer		JST Mfg. Co., Ltd.		
Pin Signal Names and Functions	No.	Signal Name	Function (Gen. Desc.)		No.	Signal Name	Function (Gen. Desc.)
	1	3.3 V			4	SW1	Switch 1
	2	S-GND			5	LED2	LED2
	3	LED1	LED1		6	SW2	Switch 2
Remarks	Compatible Housing: PHR-6 (JST)						

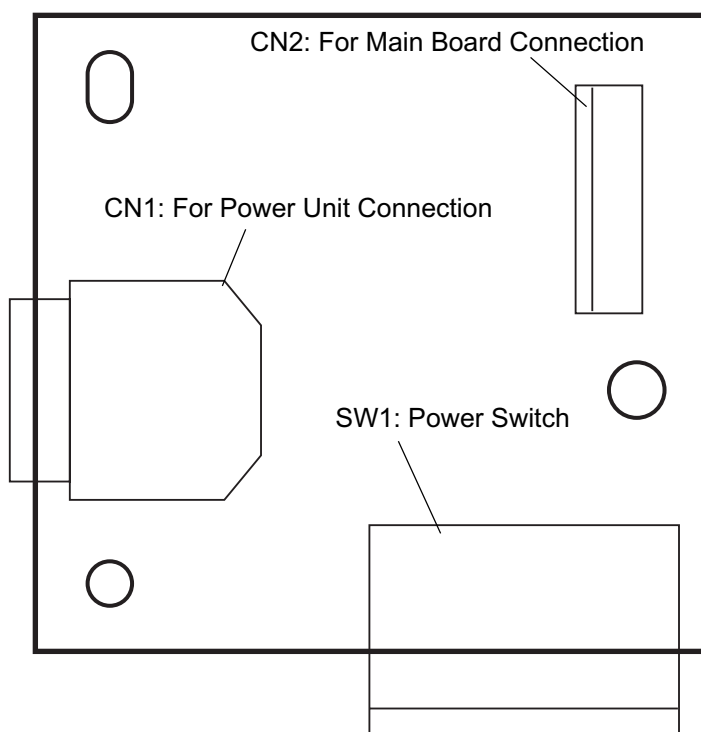
### Example Circuit for the Control Panel PCB

Symbols	Part	Function
R1	330 $\Omega$ (1/10W)	_____
R2	330 $\Omega$ (1/10W)	_____
LED1		POWER LED
LED2		ERROR LED
SW1		ON LINE SW
SW2		FEED SW

### Circuit Diagram for the Control Panel PCB



## 4-1-2 Sub-board (Optional)



### Connector 1

Use	Connection with Power Unit							
Part ID	CN1							
Pin Count	4 Pins							
Connector Used	TCS7960-53-2010		Manufacturer		Triple Industries Taiwan Corp.			
Pin Signal Names and Functions	No.	Signal Name	Function (Gen. Desc.)		No.	Signal Name	Function (Gen. Desc.)	
	1	24 V	_____		3	N. C.	_____	
	2	M-GND	_____		4	F-GND	_____	
Remarks								

### Connector 2

Use	Connection with Main Board							
Part ID	CN2							
Pin Count	4 Pins							
Connector Used	51036-0400		Manufacturer		Nihon Molex (Corporation)			
Pin Signal Names and Functions	No.	Signal Name	Function (Gen. Desc.)		No.	Signal Name	Function (Gen. Desc.)	
	1	M-GND	_____		3	24 V	_____	
	2	24 V	_____		4	M-GND	_____	
Remarks	Compatible Housing: 51036-0400 (Compatible Terminal: 50098)							
	Compatible Cable Set: Cable U 4 x 60 CC PBD-9							

# CHAPTER 5 DIPSW/MEMORY SWITCH SPECIFICATIONS

To change the DIPSW and memory switch settings, turn OFF the power to both the printer and the computer.

## 5-1 DIPSW

### 5-1-1 Main Board DIPSW#1

1) When mounted with a parallel interface

<At Ex-factory: All are turned ON.>

DIPSW1	Function	ON	OFF
DIPSW1-1	Emulation	See table below *2	
DIPSW1-2	Emulation	See table below *2	
DIPSW1-3	(Reserved: Fixed at ON)	-	-
DIPSW1-4	Sensor Adjustment Mode	Enabled	Disabled
DIPSW1-5	Reset by INIT Signal	Enabled	Disabled
DIPSW1-6	BUSY Condition	Reception Buffer Full/OFF-LINE	Reception Buffer Full
DIPSW1-7	(Reserved: Fixed at ON)	-	-
DIPSW1-8	NE Sensor Contact State (*1)	Non-contact	Contact

2) When mounted with a RS-232C interface

<At Ex-factory: All are turned ON.>

DIPSW1	Function	ON	OFF
DIPSW1-1	Emulation	See table below *2	
DIPSW1-2	Emulation	See table below *2	
DIPSW1-3	(Reserved: Fixed at ON)	-	-
DIPSW1-4	Sensor Adjustment Mode	Enabled	Disabled
DIPSW1-5	(Reserved: Fixed at ON)	-	-
DIPSW1-6	BUSY Condition	Reception Buffer Full/OFF-LINE	Reception Buffer Full
DIPSW1-7	(Reserved: Fixed at ON)	-	-
DIPSW1-8	NE Sensor Contact State (*1)	Non-contact	Contact

\* 1: Be aware that operations are not guaranteed if the state set using this bit and the actual NE (Near-End) sensor contact state are different.

\* 2: Emulation

DIPSW1-1	DIPSW1-2	Emulation
ON	ON	STAR Line Mode
OFF	ON	STAR Page Mode (supported by ROM version 2.0 later)
ON	OFF	(Reserved)
OFF	OFF	ESC/POS Mode (supported by ROM version 3.0 later)

## 3) When mounted with a USB interface

&lt;At Ex-factory: All are turned ON.&gt;

DIPSW1	Function	ON	OFF
DIPSW1-1	Emulation	See table below *3	
DIPSW1-2	Emulation	See table below *3	
DIPSW1-3	(Reserved: Fixed at ON)	-	-
DIPSW1-4	Sensor Adjustment Mode	Enabled	Disabled
DIPSW1-5	USB mode (*2)	See table belows	
DIPSW1-6			
DIPSW1-7	(Reserved: Fixed at ON)	-	-
DIPSW1-8	NE Sensor Contact State (*1)	Non-contact	Contact

## 4) When mounted with an Ethernet interface

&lt;At Ex-factory: All are turned ON.&gt;

DIPSW1	Function	ON	OFF
DIPSW1-1	Emulation	See table below *3	
DIPSW1-2	Emulation	See table below *3	
DIPSW1-3	(Reserved: Fixed at ON)	-	-
DIPSW1-4	Sensor Adjustment Mode	Enabled	Disabled
DIPSW1-5	(Reserved: Fixed at ON)	-	-
DIPSW1-6	(Reserved: Fixed at ON)	-	-
DIPSW1-7	(Reserved: Fixed at ON)	-	-
DIPSW1-8	NE Sensor Contact State (*1)	Non-contact	Contact

\* 1: Be aware that operations are not guaranteed if the state set using this bit and the actual NE (Near-End) sensor contact state are different.

\* 2: USB mode (supported by ROM Version 1.2 later)

DIPSW1-5	DIPSW1-6	USB Mode
ON	ON	Mode-0 (Printer Class)
OFF	ON	Mode-2 (Vendor Class New Type)
ON	OFF	Mode-1 (Printer Class New Type)
OFF	OFF	(Reserved)

The Vendor Class Driver is needed for using the Mode 2 (Vendor Class).

\* 3: Emulation

DIPSW1-1	DIPSW1-2	Emulation
ON	ON	STAR Line Mode
OFF	ON	STAR Page Mode (supported by ROM version 2.0 later)
ON	OFF	(Reserved)
OFF	OFF	ESC/POS Mode (supported by ROM version 3.0 later)

## 5-1-2 RS-232C Interface Board DIPSW#1

<At Ex-factory: DIPSW 1 – 7 is OFF, DIPSW 1-8 is OFF, all others are ON.>

DIPSW1	Function	ON	OFF
DIPSW1-1	Baud Rate	(See table below)	
DIPSW1-2			
DIPSW1-3	Data Length	8 bit	7 bit
DIPSW1-4	Parity Check	Disabled	Enabled
DIPSW1-5	Parity Selection	Odd	Even
DIPSW1-6	Handshake	DTR Mode	Xon/Xoff Mode
DIPSW1-7	(Reserved: OFF)	-	-
DIPSW1-8	(Reserved: OFF)	-	-

<Details for Baud Rate Settings>

DIPSW1-1	DIPSW1-2	Baud Rate
ON	ON	9600 bps
OFF	ON	4800 bps
ON	OFF	19200 bps
OFF	OFF	38400 bps

## 5-2 Memory Switch Specifications

The following describes memory switch specifications.

The symbols used in the Emulation cells below mean the following:

- SL: STAR Line Mode
- SP: STAR Page Mode (supported by ROM Version 2.0 later)
- EP: ESC/POS Mode (supported by ROM Version 3.0 later)

### 5-2-1 Memory Switch 0 (MSW0)

bit	Function	OFF/"0"	ON/"1"	Emulation			Note
				SL	SP	EP	
F							
E							
D							
C							
B							
A							
9							
8							
7							
6							
5							
4	Destination Specs.	SBCS (Single Byte Specs.)	DBCS (Double Byte Specs.)	OK	OK	OK	
3							
2							
1							
0							

## 5-2-2 Memory Switch 1 (MSW1)

bit	Function	OFF/"0"	ON/"1"	Emulation			Note
				SL	SP	EP	
F							
E							
D							
C							
B							
A							
9	Top Margin Setting	15mm	3mm (with Back Feed)	OK	OK	OK	*2
8	Black Mark Function	Disabled	Enabled	OK	OK	OK	
7							
6							
5							
4	Zero Style	Normal Zero	Slashed Zero	OK	OK	OK	
3	Intl. Characters	(See table below)		OK	OK	-	*1
2	Intl. Characters	(See table below)		OK	OK	-	*1
1	Intl. Characters	(See table below)		OK	OK	-	*1
0	Intl. Characters	(See table below)		OK	OK	-	*1

### \*1) Details of International Characters

n	MSW1-3	MSW1-2	MSW1-1	MSW1-0	International Characters
"0"	0	0	0	0	USA
"1"	0	0	0	1	France
"2"	0	0	1	0	Germany
"3"	0	0	1	1	UK
"4"	0	1	0	0	Denmark 1
"5"	0	1	0	1	Sweden
"6"	0	1	1	0	Italy
"7"	0	1	1	1	Spain 1
"8"	1	0	0	0	Japan
"9"	1	0	0	1	Norway
"A"	1	0	1	0	Denmark 2
"B"	1	0	1	1	Spain 2
"C"	1	1	0	0	Latin America
"D"	1	1	0	1	Korea
"E"	1	1	1	0	Ireland
"F"	1	1	1	1	Legal

### \*2) Top Margin Settings

The top margin of 3 mm with this function is realized by feeding paper after performing a full cut. Therefore, this function is ignored with making a partial cut.

Also, when the top margin is set to 3 mm using this function, the setting for the paper position when the power is turned ON is the position after executing a reverse paper feed.

### 5-2-3 Memory Switch 3 (MSW3)

bit	Function	OFF/"0"	ON/"1"	Emulation			Note
				SL	SP	EP	
F	Code Page	(See table below)		OK	-	-	*2
E	Code Page	(See table below)		OK	-	-	*2
D	Code Page	(See table below)		OK	-	-	*2
C	Code Page	(See table below)		OK	-	-	*2
B	Code Page	(See table below)		OK	-	-	*2
A	Code Page	(See table below)		OK	-	-	*2
9	Code Page	(See table below)		OK	-	-	*2
8	Code Page	(See table below)		OK	-	-	*2
7							
6							
5	Chinese Character Printing Position Count	(See table below)		OK	-	-	*1
4	Printing Positions	(See table below)		OK	-	-	*1
3							
2							
1	<CR> Code	Ignored	Handled as <LF>	OK	-	OK	
0	Amount of Line Feed	4mm	3mm	OK	-	-	

\*1) Details for Chinese Character Printing Position Count/ANK Printing Position Count

<For SBCS>

MSW3-4	Character Type	Character Size (Font + Right Space)	Printing Region (MSW4-0 to MSW4-2)	Printing Positions
0	ANK	12 (12+0) dots	104mm (832dot)	69 Positions
			80mm (640dot)	53 Positions
			72mm (576dot)	48 Positions
			56mm (448dot)	37 Positions
1	ANK	15 (12+3) dot	104mm (832dot)	55 Positions
			80mm (640dot)	42 Positions
			72mm (576dot)	38 Positions
			56mm (448dot)	29 Positions



<When set for Chinese characters (When carrying Chinese characters and DBCS)>

MSW3-5	Character Type	Character Size (Left Space + Font + Right Space)	Printing Region (MSW4-0 to MSW4-2)	Printing Positions
0	Chinese Character	26 (1+24+1) dot	104mm (832dot)	32 Positions
			80mm (640dot)	24 Positions
			72mm (576dot)	22 Positions
			56mm (448dot)	17 Positions
1	Chinese Character	30 (3+24+3) dot	104mm (832dot)	27 Positions
			80mm (640dot)	21 Positions
			72mm (576dot)	19 Positions
			56mm (448dot)	14 Positions

MSW3-4	Character Type	Character Size (Font + Right Space)	Printing Region (MSW4-0 to MSW4-2)	Printing Positions
0	ANK	13 (12+1) dot	104mm (832dot)	64 Positions
			80mm (640dot)	49 Positions
			72mm (576dot)	44 Positions
			56mm (448dot)	34 Positions
1	ANK	15 (12+3) dot	104mm (832dot)	55 Positions
			80mm (640dot)	42 Positions
			72mm (576dot)	38 Positions
			56mm (448dot)	29 Positions

\*2) Details for the Code Page

n	MSW8-F	MSW3-E	MSW3-D	MSW3-C	MSW3-B	MSW3-A	MSW3-9	MSW3-8	Character Table
"00"	0	0	0	0	0	0	0	0	Normal*
"01"	0	0	0	0	0	0	0	1	CodePage437 (USA,Std. Europe)
"02"	0	0	0	0	0	0	1	0	Katakana
"03"	0	0	0	0	0	0	1	1	CodePage437 (USA,Std. Europe)
"04"	0	0	0	0	0	1	0	0	Codepage 858 (Multilingual)
"05"	0	0	0	0	0	1	0	1	Codepage 852 (Latin-2)
"06"	0	0	0	0	0	1	1	0	Codepage 860 (Portuguese)
"07"	0	0	0	0	0	1	1	1	Codepage 861 (Icelandic)
"08"	0	0	0	0	1	0	0	0	Codepage 863 (Canadian French)
"09"	0	0	0	0	1	0	0	1	Codepage 865 (Nordic)
"0A"	0	0	0	0	1	0	1	0	Codepage 866 (Cyrillic Russian)
"0B"	0	0	0	0	1	0	1	1	Codepage 855 (Cyrillic Bulgarian)
"0C"	0	0	0	0	1	1	0	0	Codepage 857 (Turkey)
"0D"	0	0	0	0	1	1	0	1	Codepage 862 (Israel (Hebrew) )
"0E"	0	0	0	0	1	1	1	0	Codepage 864 (Arabic)
"0F"	0	0	0	0	1	1	1	1	Codepage 737 (Greek)
"10"	0	0	0	1	0	0	0	0	Codepage 851 (Greek)
"11"	0	0	0	1	0	0	0	1	Codepage 869 (Greek)
"12"	0	0	0	1	0	0	1	0	Codepage 928 (Greek)
"13"	0	0	0	1	0	0	1	1	Codepage 772 (Lithuanian)
"14"	0	0	0	1	0	1	0	0	Codepage 774 (Lithuanian)
"15"	0	0	0	1	0	1	0	1	Codepage 874 (Thai)
"20"	0	0	1	0	0	0	0	0	Codepage 1252 (Windows Latin-1)
"21"	0	0	1	0	0	0	0	1	Codepage 1250 (Windows Latin-2)
"22"	0	0	1	0	0	0	1	0	Codepage 1251 (Windows Cyrillic)
"40"	0	1	0	0	0	0	0	0	Codepage 3840 (IBM-Russian)
"41"	0	1	0	0	0	0	0	1	Codepage 3841 (Gost)
"42"	0	1	0	0	0	0	1	0	Codepage 3843 (Polish)
"43"	0	1	0	0	0	0	1	1	Codepage 3844 (CS2)
"44"	0	1	0	0	0	1	0	0	Codepage 3845 (Hungarian)
"45"	0	1	0	0	0	1	0	1	Codepage 3846 (Turkish)
"46"	0	1	0	0	0	1	1	0	Codepage 3847 (Brazil-ABNT)
"47"	0	1	0	0	0	1	1	1	Codepage 3848 (Brazil-ABICOMP)
"48"	0	1	0	0	1	0	0	0	Codepage 1001 (Arabic)
"49"	0	1	0	0	1	0	0	1	Codepage 2001 (Lithuanian-KBL)
"4A"	0	1	0	0	1	0	1	0	Codepage 3001 (Estonian-1)
"4B"	0	1	0	0	1	0	1	1	Codepage 3002 (Estonian-2)
"4C"	0	1	0	0	1	1	0	0	Codepage 3011 (Latvian-1)
"4D"	0	1	0	0	1	1	0	1	Codepage 3012 (Latvian-2)
"4E"	0	1	0	0	1	1	1	0	Codepage 3021 (Bulgarian)
"4F"	0	1	0	0	1	1	1	1	Codepage 3041 (Maltese)
"FF"	1	1	1	1	1	1	1	1	User Setting (Blank Code Page)

This function is valid only when set for SBCS and is invalid when set for DBCS.

- When installed with Chinese characters (DBCS settings): Code Page Normal Fixed

## 5-2-4 Memory Switch 4 (MSW4)

bit	Function	OFF/"0"	ON/"1"	Emulation			Note
				SL	SP	EP	
F							
E							
D							
C							
B							
A							
9							
8	Printing Mode	Mono color printing	Two color printing	-	-	OK	
7							
6							
5							
4							
3							
2	Printing Region	(See table below)		OK	OK	OK	*1
1	Printing Region	(See table below)		OK	OK	OK	*1
0	Printing Region	(See table below)		OK	OK	OK	*1

\*1) Details of printing region

n	MSW4-2	MSW4-1	MSW4-0	Printing Region
"0"	0	0	0	104mm (832dot)
"1"	0	0	1	80mm (640dot)
"2"	0	1	0	72mm (576dot)
"3"	0	1	1	(Reserved)
"4"	1	0	0	(Reserved)
"5"	1	0	1	(Reserved)
"6"	1	1	0	(Reserved)
"7"	1	1	1	(Reserved)

## 5-2-5 Memory Switch 5 (MSW5)

bit	Function	OFF/"0"	ON/"1"	Emulation			Note
				SL	SP	EP	
F							
E							
D							
C							
B							
A							
9							
8							
7	Presenter Paper Auto-recovery Function	(See table below)		OK	OK	OK	*1
6	Same as above	(See table below)		OK	OK	OK	*1
5	Same as above	(See table below)		OK	OK	OK	*1
4	Same as above	(See table below)		OK	OK	OK	*1
3	Same as above	(See table below)		OK	OK	OK	*1
2	Same as above	(See table below)		OK	OK	OK	*1
1	Same as above	(See table below)		OK	OK	OK	*1
0	Same as above	(See table below)		OK	OK	OK	*1

\*1) Details for Presenter Paper Auto-recovery Function

n	MSW5-7 to MSW5-0	Presenter Paper Auto-recovery Function
"00"	00000000	Auto-recovery Invalid
"01"	00000001	Auto-recovery Time: 0.5 sec.
"02"	00000010	Auto-recovery Time 1.0sec
"03"	00000011	Auto-recovery Time 1.5sec
"04"	00000100	Auto-recovery Time: 2.0 sec.
	:	
"08"	00001000	Auto-recovery Time: 5.0 sec.
	:	
"14"	00010100	Auto-recovery Time: 10.0 sec.
	:	
"28"	00101000	Auto-recovery Time: 20.0 sec.
	:	
"3C"	00111100	Auto-recovery Time: 30.0 sec.
	:	
"78"	01111000	Auto-recovery Time: 60.0 sec.
	:	
"B4"	10110100	Auto-recovery Time: 90.0 sec.
	:	
"F0"	11110000	Auto-recovery Time: 120.0 sec.
	:	
"FF"	11111111	Auto-recovery Time: 127.5 sec.

## 5-2-6 Memory Switch 6 (MSW6)

bit	Function	OFF/"0"	ON/"1"	Emulation			Note
				SL	SP	EP	
F							
E							
D							
C							
B							
A							
9							
8							
7							
6							
5							
4	ABS presenter paper position status	Disabled	Enabled	OK	OK	-	*1
3							
2							
1							
0							

ABS: Automatic Status Back

\* 1 ASB presenter paper position status (for ROM Version 1.2 or later)

This function enables/disables the presenter paper position status on the ASB 9th byte.

When disabled, the presenter paper position status on the ASB 9th byte is fixed at 0 and the status does not change.

Also, when the presenter is not connected, the presenter paper position status on the ASB 9th byte is fixed at 0 and the status does not change.

## 5-2-7 Memory Switch 7 (MSW7)

bit	Function	OFF/"0"	ON/"1"	Emulation			Note
				SL	SP	EP	
F							
E							
D							
C	ABS Function	Disabled	Enabled	OK	OK	OK	
B							
A							
9							
8							
7							
6							
5							
4							
3							
2							
1							
0							

ABS: Automatic Status Back

## 5-2-8 Memory Switch 8 (MSW 8)

bit	Function	OFF/"0"	ON/"1"	Emulation			Note
				SL	SP	EP	
F							
E							
D							
C							
B							
A							
9							
8							
7							
6							
5							
4							
3							
2							
1	Format read	See below *1		-	OK	-	*1
0	at power ON	See below *1		-	OK	-	*1

\*1 Format read at power ON

n	NSW 8-1	NSW 8-0	
" 0 "	0	0	Not read
" 1 "	0	1	Format 1
" 2 "	1	0	Format 2
" 3 "	1	1	( Reserved)

## 5-2-9 Memory Switch A (MSW A)

bit	Function	OFF/"0"	ON/"1"	Emulation			Note
				SL	SP	EP	
F							
E							
D							
C							
B							
A	NE Sensor Input	Signal Level High	Low	OK	OK	OK	*1
9	NE Sensor Input	Signal Photo-Sensor Type (CN33: Option)	Mechanical Type (CN32: NE)	OK	OK	OK	*2
8							
7							
6							
5							
4							
3							
2							
1							
0							

\*1

- 1) High: The signal level becomes High when the paper is almost out.  
Low: The signal level becomes Low when the paper is almost out.
- 2) This function is effective when NE Sensor Contact State is contact. See DIP SW1-8.

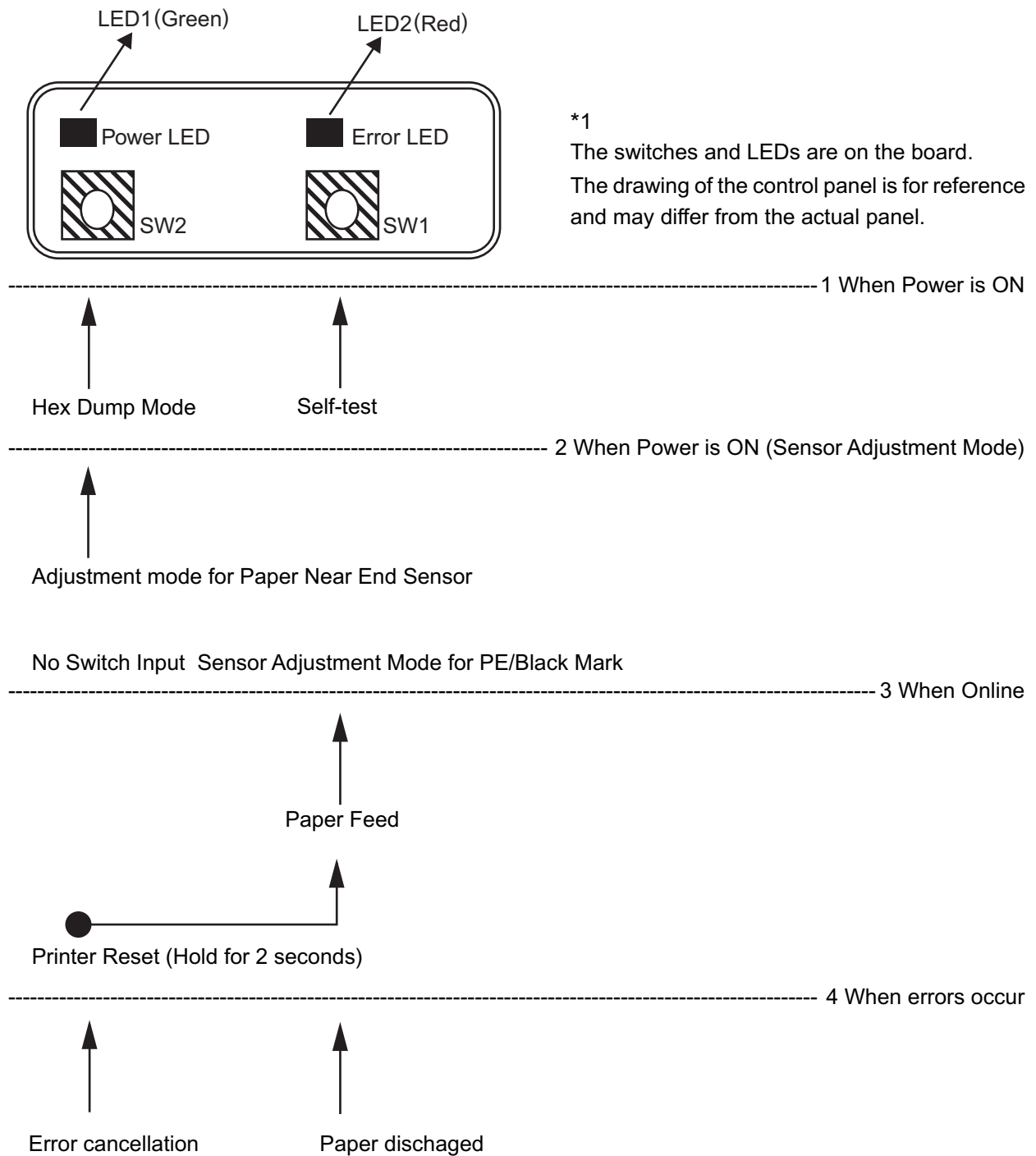
\*2

This function is effective when NE Sensor Contact State is contact. See DIP SW 1-8.



# CHAPTER 6 OPERATION SPECIFICATIONS

## 6-1 Control Panel Specifications



① When Power is ON

SW Input	Operation
SW1	Self-test Print
SW2	Hex Dump Mode

② When in Sensor Adjustment Mode and Power is ON (Sensor Adjustment Mode is selected using by setting the DIPSW1-4 on the main board to OFF.)

SW Input	Operation
No SW Input	Sensor Adjustment Mode for PE/Black Mark
SW2	Adjustment Mode for Paper Near End Sensor (*1)

\*1) Adjustment mode for Paper Near End sensor is used when an optical sensor is employed.

③ When Online

SW Input	Operation
SW1	Paper Feed (*2)
SW1 + SW2 (Hold for 2 sec.)	Printer Software Reset

\*2) Details for Paper Feed Specifications

Presenter Contact Status	Black Mark Function	Paper Feed Specifications
Non-contact	Disabled	Paper feed continues while SW1 is input
	Enabled	Performs TOF operation
Contact	Disabled	Paper Feed + Full Cut + Presenter Paper Discharge Ignores SW input under the following conditions • When LF motor is operation • When paper is being supplied to the presenter
	Enabled	TOF + Full Cut + Presenter Paper Discharge Ignores SW input under the following conditions • When LF motor is operation • When paper is being supplied to the presenter

④ When errors occur

SW Input	Operation
SW1	Paper Discharge (*3) Function executed only under the following conditions • Cover is closed • No Paper
SW2	Error cancel operation (according to MSW1-E settings)

\*3) Paper Discharge

This function cancels the paper wait state of the platen that exists when there is no paper detected when printing by feeding paper. Paper can be easily removed without opening the cover, by using this function. However, caution must be exercise in using this function when there is no paper being waited for at the platen because over use can damage the print head.

## 6-2 LED Specifications

Status		LED Specifications	
		Power LED	Error LED
Normal State		ON	OFF
Auto-recovery Error	Printing stops because of detection of the high temperature of the head	Blink 500msec	OFF
Recoverable Errors	PE Error	ON	Blink 500msec
	NE Error	ON	Blink 2000msec
	Cover Open Error	ON	ON
	Black Mark Error	ON	Blink 500msec
Non-recoverable Errors	Auto-cutter Errors	OFF	Blink 125msec
	Presenter Paper Jam Errors	OFF	Blink 250msec
	FLASH Access Errors	OFF	Blink 500msec
	EEPROM Access Errors	OFF	Blink 750msec
	SRAM Access Errors	OFF	Blink 1000msec
	Thermistor Errors	OFF	Blink 1500msec
	Power Voltage Errors	OFF	Blink 2000msec

## 6-3 Error Specifications

### 6-3-1 Auto-recovery Errors

This error automatically cancels E errors by varying the status internally on the printer.

Error	LED		Cause	How to Recover
	Power	Error		
Printing Stops Because Detection of High Temperature Head	Blink 500msec	OFF	Head Thermistor Temperature Detected (When detected to be over 60°C)	Automatic Recovery when Head Thermistor Temperature Detected to Drop (When detected to be under 55°C)

## 6-3-2 Auto-recovery Errors

This error cancels errors while maintaining the printer's status, by executing a determined error recovery means.

Error	LED		Cause	How to Recover
	Power	Error		
NE Error	ON	Blink 2000msec	Not enough paper	Replace the paper
PE Error	ON	Blink 500msec	Paper Out Detection	1. Open the cover and remove the paper in the presenter and printer. 2. Replace the paper. 3. Manually setting of the paper Set the paper and close the cover. Error cancel SW input Auto-loading of the Paper Close the cover. Insert paper into the printer's paper supply inlet. Auto-loading starts. 4. Cut paper. 5 Paper discharged to front of presenter when presenter is connected.
Cover Open Error	ON	ON	Cover Detected to be open	1. Remove paper in the presenter and in the printer. 2. Manually setting of the paper Set the paper and close the cover. Error cancel SW input Auto-loading of the Paper Close the cover. Insert paper into the printer's paper supply inlet. Auto-loading starts. 3. Cut paper. 4 Paper discharged to front of presenter when presenter is connected.
Black Mark Error	ON	Blink 500msec	White detected over 400 mm long	Black mark paper size error Replace the Black Mark paper Adjust sensitivity in the sensor adjustment mode

### 6-3-3 Non-recoverable Errors

This error requires the printer to be reset after executing a determined error recovery means because a fatal error has occurred.

The printer may need to be repaired if the same error occurs even after resetting the printer.

Error	LED		Cause	How to Recover
	Power	Error		
Auto-cutter Errors	OFF	Blink 125msec	Cutter failure	Check/repair the cutter
Presenter Paper Jam Errors	OFF	Blink 250msec	Paper jam in Presenter	Remove paper from the Presenter
FLASH Access Errors	OFF	Blink 500msec	FLASH ROM Access Errors	Repair
EEPROM Access Errors	OFF	Blink 750msec	EEPROM Access Errors	Repair
SRAM Access Errors	OFF	Blink 1000msec	SRAM Access Errors	Repair
Thermistor Errors	OFF	Blink 1500msec	Head Thermistor Error Value Detected	Repair
Power Voltage Errors	OFF	Blink 2000msec	Power Voltage Error Value Detected	Check/repair the power supply

## 6-4 Sensor Adjustment Mode Specifications

This mode adjusts the sensitivity of the sensor by adjusting the variable resistor on the PCB.

### 6-4-1 Sensor Adjustment Mode for PE/Black Mark

#### <Operating Procedures>

1. Set paper into the PE sensor portion.
2. Turn the printer power ON with the DIPSW1-4 OFF setting.
3. Rotate VR1 to adjust so that both the Power and Error LEDs light.

If you cannot find the position where both the Power and Error LEDs light using the VR1, the sensor adjustment is impossible.

4. Turn the printer power OFF and return the DIPSW1-4 to its original setting of ON.

### 6-4-2 Paper Near End Sensor Adjustment Mode

The Paper Near End sensor uses a mechanical or an optical sensor. Select the sensor to use by the memory switch.

This adjustment mode is used when an optical sensor is employed.

However, because this adjustment mode has a set adjustment point when using the recommended circuits, adjustments made with this adjustment mode will not be guaranteed if the recommended circuit is not being used.

#### <Operating Procedures>

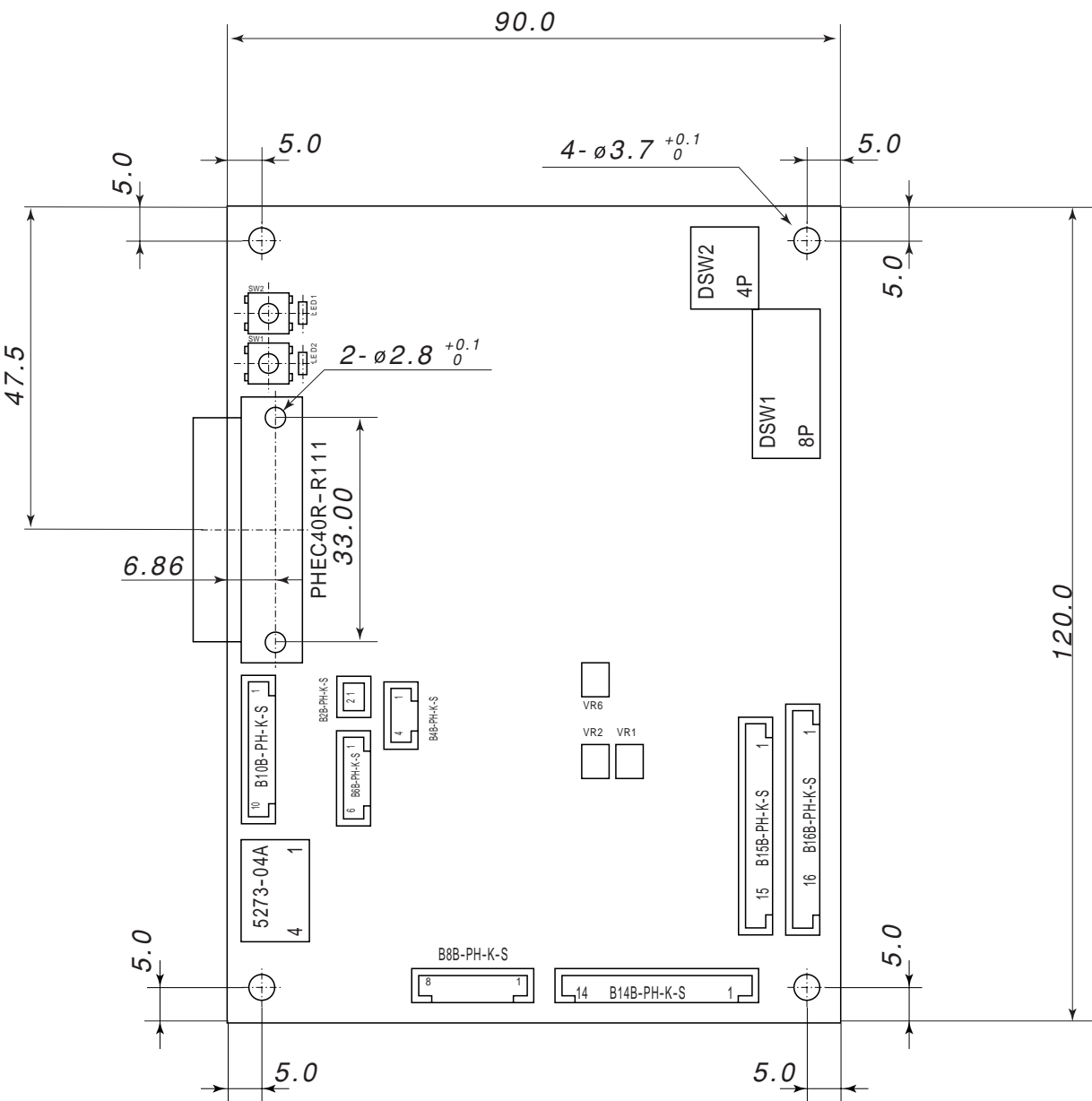
1. Set paper at the Paper Near End sensor portion.
2. Set the DIPSW 1-4 to OFF and turn the printer power ON while holding down the Error switch.
3. Turn the VR6 to adjust to the position where both LEDs for Power/Error light.
4. When the position where both LEDs for Power/Error light cannot be found by adjusting VR6,  
Adjust VR6 to the position where the Power LED extinguishes and the Error LED lights.

If the adjustment positions of 3 and 4 cannot be found using VR6, the sensor cannot be adjusted.

5. Turn the printer power OFF and return the DIPSW 1-4 setting to ON.

# CHAPTER 7 PC BOARD, CIRCUIT DIAGRAM, PARTS LIST

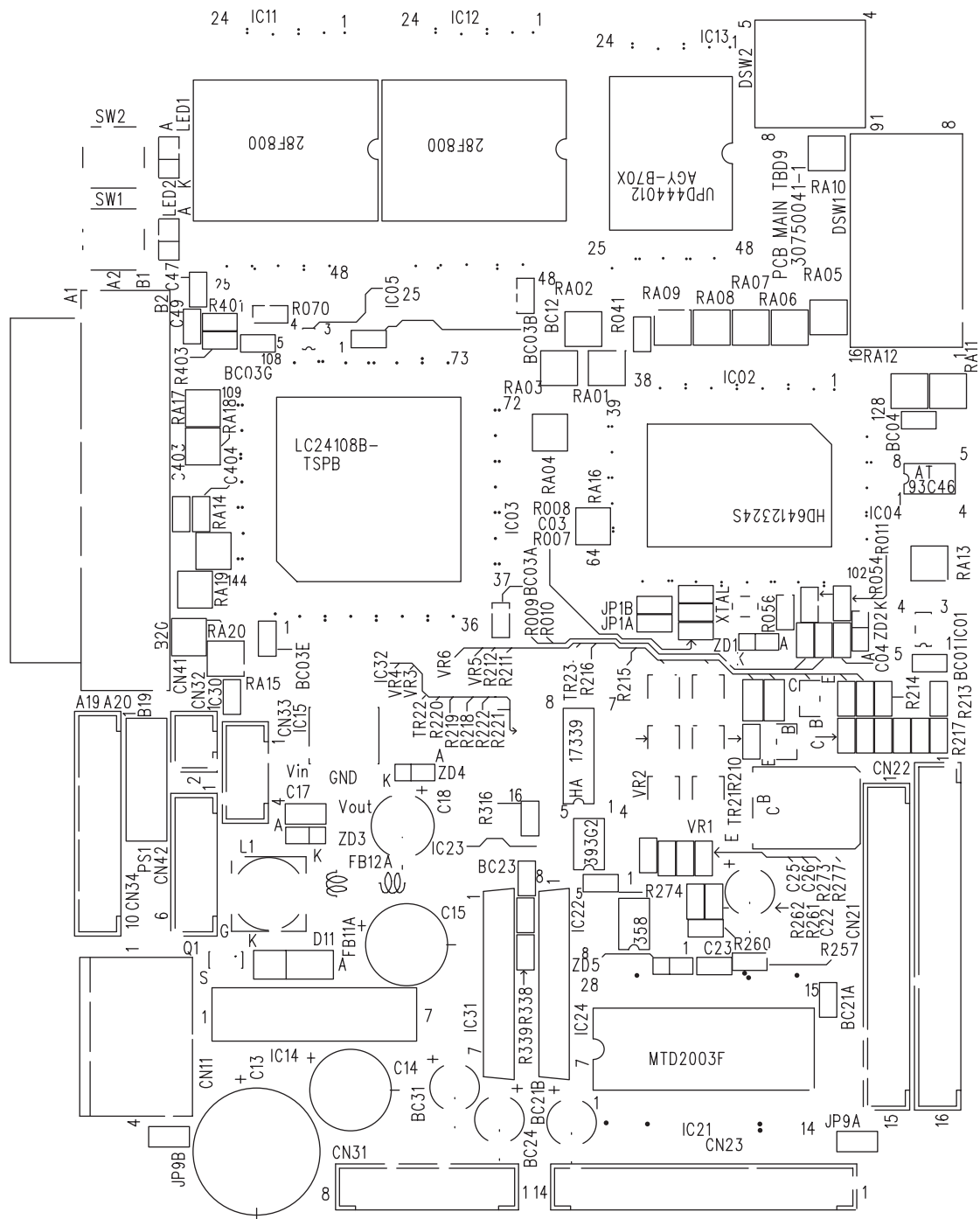
## 7-1 PC Board Dimension Drawing



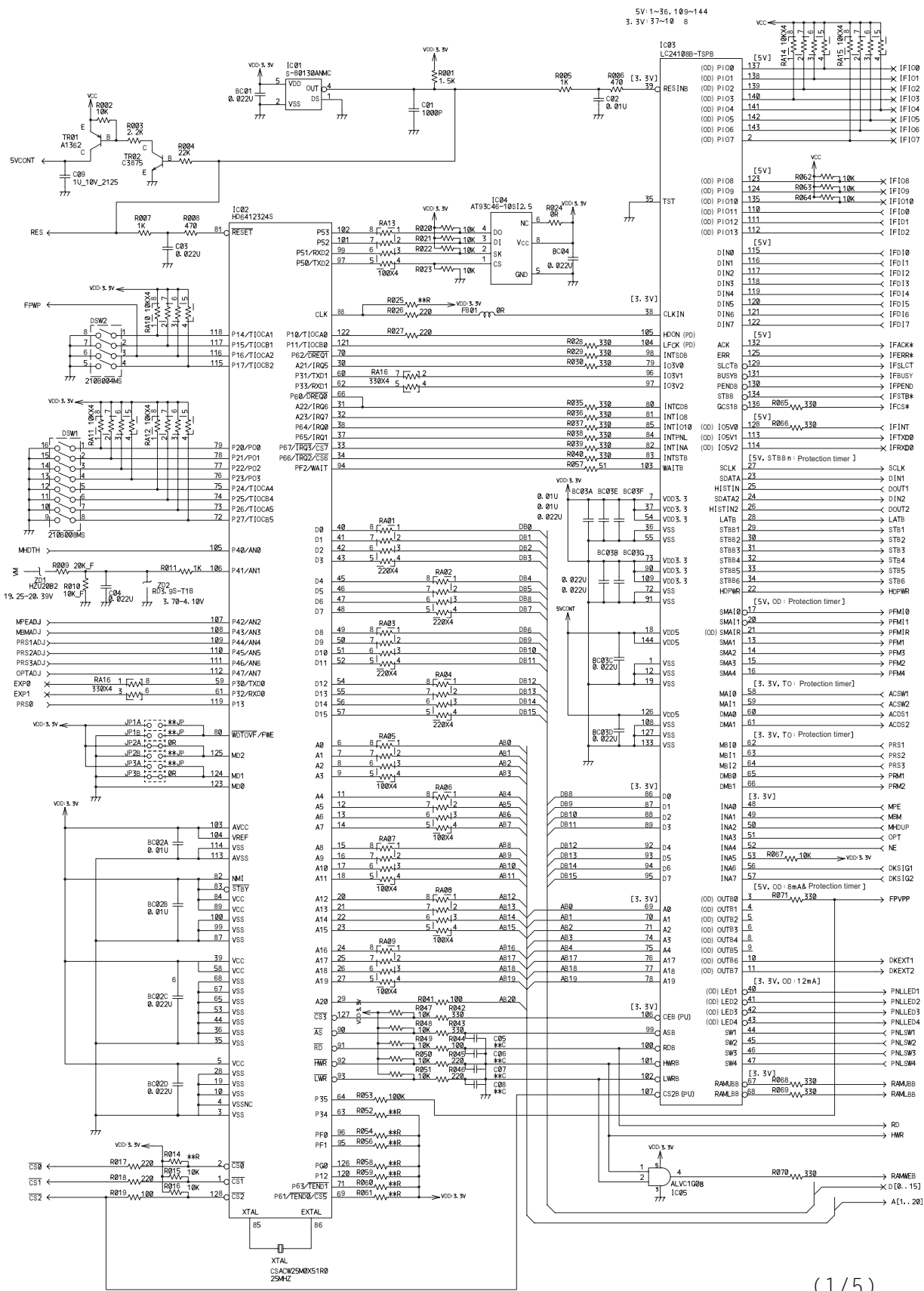
Unit:mm



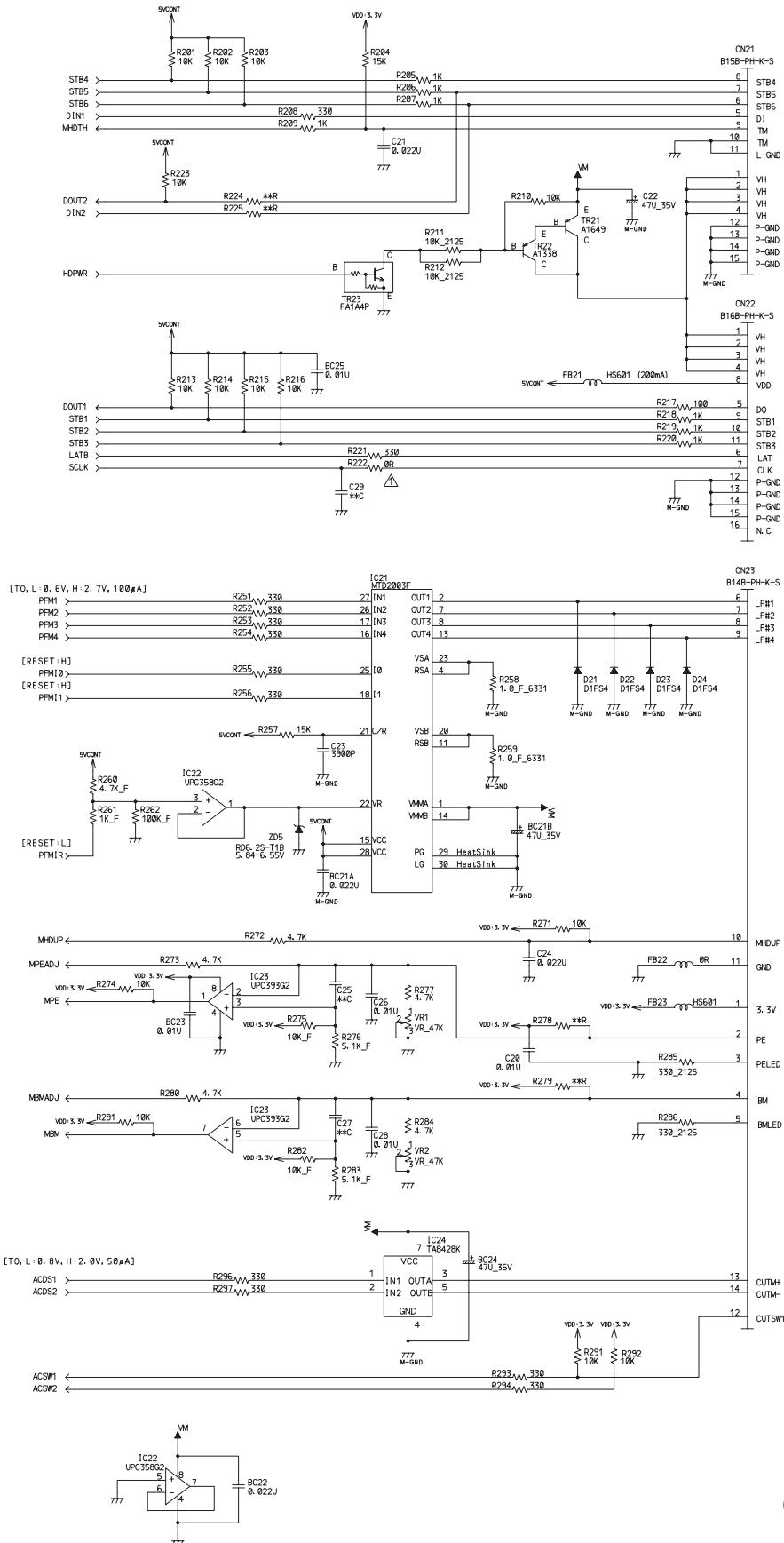
## 7-2 Component Layout



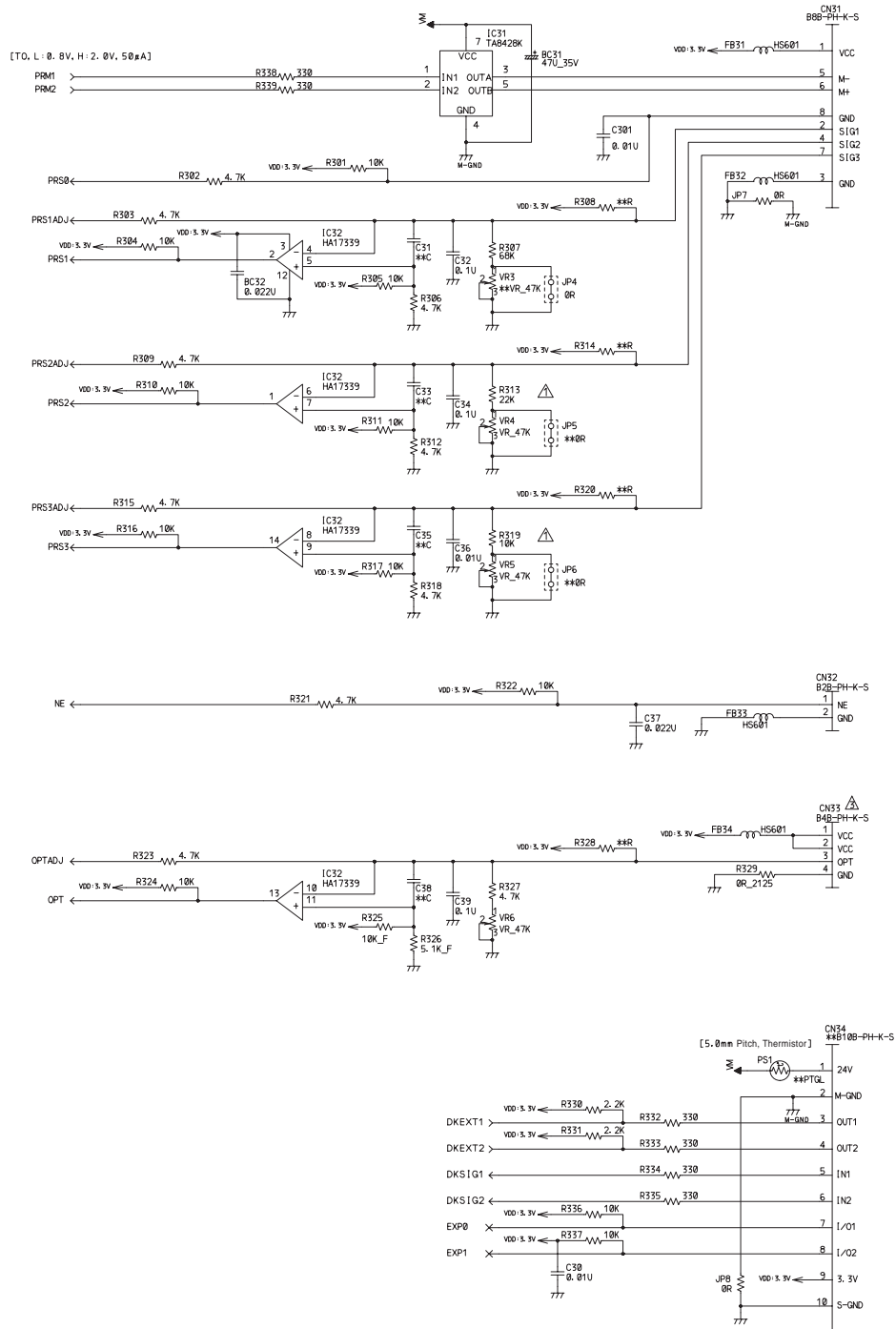
## Circuit Diagram

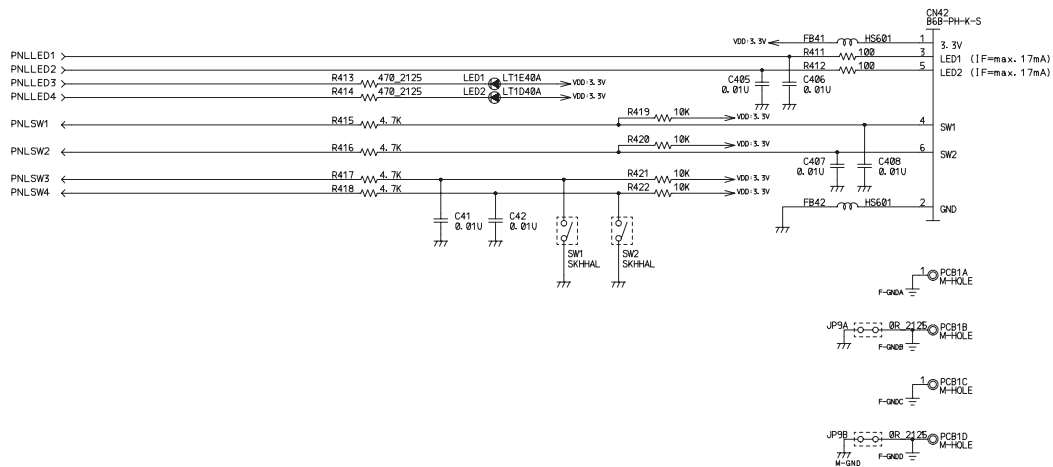
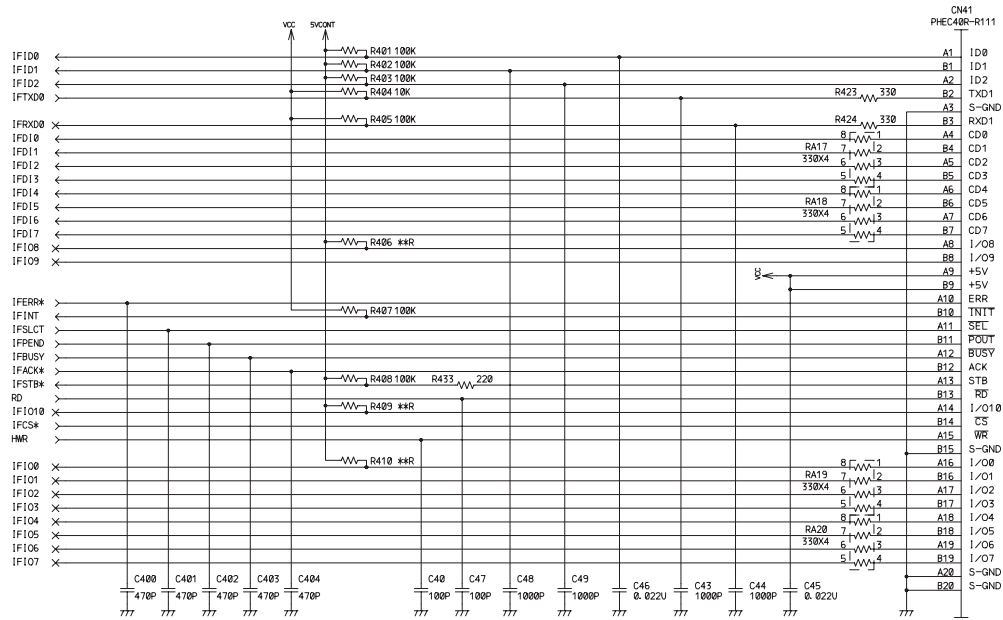






(3/5)





## 7-4 Parts List

DRWG.NO.	PARTS NO.	PARTS NAME	Q'TY	REMARKS
BC01	05752238	CERA.CAPA.CHIP1608 0.022UF 50V	1	
BC02A-2B	05751037	CERA.CAPA.CHIP1608 0.01UF 50V	2	
BC02C-2D	05752238	CERA.CAPA.CHIP1608 0.022UF 50V	2	
BC03A	05751037	CERA.CAPA.CHIP1608 0.01UF 50V	1	
BC03B-3D	05752238	CERA.CAPA.CHIP1608 0.022UF 50V	3	
BC03E	05751037	CERA.CAPA.CHIP1608 0.01UF 50V	1	
BC03F-3G	05752238	CERA.CAPA.CHIP1608 0.022UF 50V	2	
BC04	05752238	CERA.CAPA.CHIP1608 0.022UF 50V	1	
BC11	05751037	CERA.CAPA.CHIP1608 0.01UF 50V	1	
BC12-13	05731045	CERA.CAPA.CHIP1608 0.1UF 25V	2	
BC14	05751044	CERA. CAPA. CHIP 0.1UF 50V	1	
BC21A	05752238	CERA.CAPA.CHIP1608 0.022UF 50V	1	
BC21B	05044766	CHEM. CAPA. 47UF 35V	1	
BC22	05752238	CERA.CAPA.CHIP1608 0.022UF 50V	1	
BC23	05751037	CERA.CAPA.CHIP1608 0.01UF 50V	1	
BC24	05044766	CHEM. CAPA. 47UF 35V	1	
BC25	05751037	CERA.CAPA.CHIP1608 0.01UF 50V	1	
BC31	05044766	CHEM. CAPA. 47UF 35V	1	
BC32	05752238	CERA.CAPA.CHIP1608 0.022UF 50V	1	
C01	05751027	CERA.CAPA.CHIP1608 1000PF 50V	1	
C02	05751037	CERA.CAPA.CHIP1608 0.01UF 50V	1	
C03-04	05752238	CERA.CAPA.CHIP1608 0.022UF 50V	2	
C09	05711051	CERA. CAPA. CHIP 1UF 10V	1	
C12	05731045	CERA.CAPA.CHIP1608 0.1UF 25V	1	
C13	05041081	CHEM. CAPA. 1000UF 35V	1	
C14	05051077	CHEM. CAPA. 100UF 50V	1	
C15	05014776	CHEM. CAPA. 470UF 10V	1	
C16	05731047	CERA.CAPA.CHIP1608 0.1UF 25V	1	
C17	05711051	CERA. CAPA. CHIP 1UF 10V	1	
C18	05012270	CHEM. CAPA. 220UF 10V	1	
C20	05751037	CERA.CAPA.CHIP1608 0.01UF 50V	1	
C21	05752238	CERA.CAPA.CHIP1608 0.022UF 50V	1	
C22	05044766	CHEM. CAPA. 47UF 35V	1	
C23	05753925	CERA.CAPA.CHIP1608 3900PF 50V	1	
C24	05752238	CERA.CAPA.CHIP1608 0.022UF 50V	1	
C26	05751037	CERA.CAPA.CHIP1608 0.01UF 50V	1	
C28	05751037	CERA.CAPA.CHIP1608 0.01UF 50V	1	
C30	05751037	CERA.CAPA.CHIP1608 0.01UF 50V	1	
C301	05751037	CERA.CAPA.CHIP1608 0.01UF 50V	1	
C32	05731045	CERA.CAPA.CHIP1608 0.1UF 25V	1	
C34	05731045	CERA.CAPA.CHIP1608 0.1UF 25V	1	
C36	05751037	CERA.CAPA.CHIP1608 0.01UF 50V	1	
C37	05752238	CERA.CAPA.CHIP1608 0.022UF 50V	1	
C39	05731045	CERA.CAPA.CHIP1608 0.1UF 25V	1	
C40	05751016	CERA. CAPA. CHIP 100PF 50V	1	
C400-404	05754718	CERA.CAPA.CHIP1608 470PF 50V	5	
C405-408	05751037	CERA.CAPA.CHIP1608 0.01UF 50V	4	
C41-42	05751037	CERA.CAPA.CHIP1608 0.01UF 50V	2	
C43-44	05751027	CERA.CAPA.CHIP1608 1000PF 50V	2	
C45-46	05752238	CERA.CAPA.CHIP1608 0.022UF 50V	2	
C47	05751016	CERA. CAPA. CHIP 100PF 50V	1	
C48-49	05751027	CERA.CAPA.CHIP1608 1000PF 50V	2	
CN11	09100614	CONNECTOR 5273-04A	1	
CN21	09100821	CONNECTOR B15B-PH-K-S	1	

DRWG.NO.	PARTS NO.	PARTS NAME	Q'TY	REMARKS
CN22	09100840	CONNECTOR B16B-PH-K-S	1	
CN23	09100820	CONNECTOR B14B-PH-K-S	1	
CN31	09100420	CONNECTOR B8B-PH-K	1	
CN32	09100841	CONNECTOR B2B-PH-K-S	1	
CN33	09100774	CONNECTOR B4B-PH-K-S	1	
CN41	09100610	CONNECTOR PHEC40R-R111	1	
CN42	09100539	CONNECTOR B6B-PH-K-S	1	
D11	08030058	SCHOTTKY DIODE RB160L-40*	1	
D21-24	08030055	SCHOTTKY DIODE CHIP D1FS4*	4	
DSW1	09090068	DIP SWITCH 210B008MS	1	
DSW2	09090069	DIP SWITCH 210B004MS	1	
FB01	06760004	CHIP RESISTOR 0 OHM 1/16W	1	
FB11A-12A	09990736	BEADS INDUCTOR RH035047RT-Y7	2	
FB21	09990754	CHIP BEADS IND. BK1608HS601*	1	
FB22	06760004	CHIP RESISTOR 0 OHM 1/16W	1	
FB23	09990754	CHIP BEADS IND. BK1608HS601*	1	
FB31-34	09990754	CHIP BEADS IND. BK1608HS601*	4	
FB41-42	09990754	CHIP BEADS IND. BK1608HS601*	2	
IC01	08200205	IC-RESET S-80130AN*	1	
IC02	08251021	CPU HD6412324SVF25	1	
IC03	08240097	GATE ARRAY LC24108B-TSPB	1	
IC04	08222121	EEPROM AT93C46-10SI25	1	
IC05	08231089	CMOS 74ALVC1G08*	1	
IC11	08224006	FLASH MEMORY 28F800BJ-70	1	TB9 *.*
IC12	08224006	FLASH MEMORY 28F800BJ-70	1	T9/#CH*.*
IC11-12	09991912	FLASH MEMORY SEAL KEI-801	2	
IC13	08221084	SRAM D444012AGY-B55X	1	
IC14	08202057	IC-REG BP5250-24	1	
IC15	08202051	IC-REG L88M33T*TL	1	
IC21	08200196	IC-MOTOR MTD2003F-4072	1	
IC22	08201034	IC-LIN UPC358G2*T1	1	
IC23	08201013	IC-LIN UPC393G2*T1	1	
IC24	08200176	IC-MOTOR TA8428K	1	
IC31	08200176	IC-MOTOR TA8428K	1	
IC32	08201029	IC-LIN HA17339F*EL	1	
JP2A	06760004	CHIP RESISTOR 0 OHM 1/16W	1	
JP3B	06760004	CHIP RESISTOR 0 OHM 1/16W	1	
JP4	06760004	CHIP RESISTOR 0 OHM 1/16W	1	
JP5-6				NOT MOUNTED
JP7-8	06760004	CHIP RESISTOR 0 OHM 1/16W	2	
JP9A-9B	06750004	CHIP RESISTOR 0 OHM 1/10W	2	
L1	09251080	INDUCTOR CDH74-220L*	1	
LED1	08300187	LED CHIP LT1E40A*	1	
LED2	08300186	LED CHIP LT1D40A*	1	
Q1	08041005	FET CHIP CPH6306*TL	1	
R001	06761521	CHIP RES1608 1.5 KOHM 1/16W 5%	1	
R002	06761034	CHIP RESISTOR 10 K-OHM 1/16W	1	
R003	06762221	CHIP RESISTOR 2.2 K-OHM 1/16W	1	
R004	06762231	CHIP RESISTOR 22 K-OHM 1/16W	1	
R005	06761024	CHIP RESISTOR 1 K-OHM 1/16W	1	
R006	06764711	CHIP RESISTOR 470 OHM 1/16W	1	
R007	06761024	CHIP RESISTOR 1 K-OHM 1/16W	1	
R008	06764711	CHIP RESISTOR 470 OHM 1/16W	1	
R009	06762032	CHIP RESISTOR 20 K-OHM 1/16W	1	



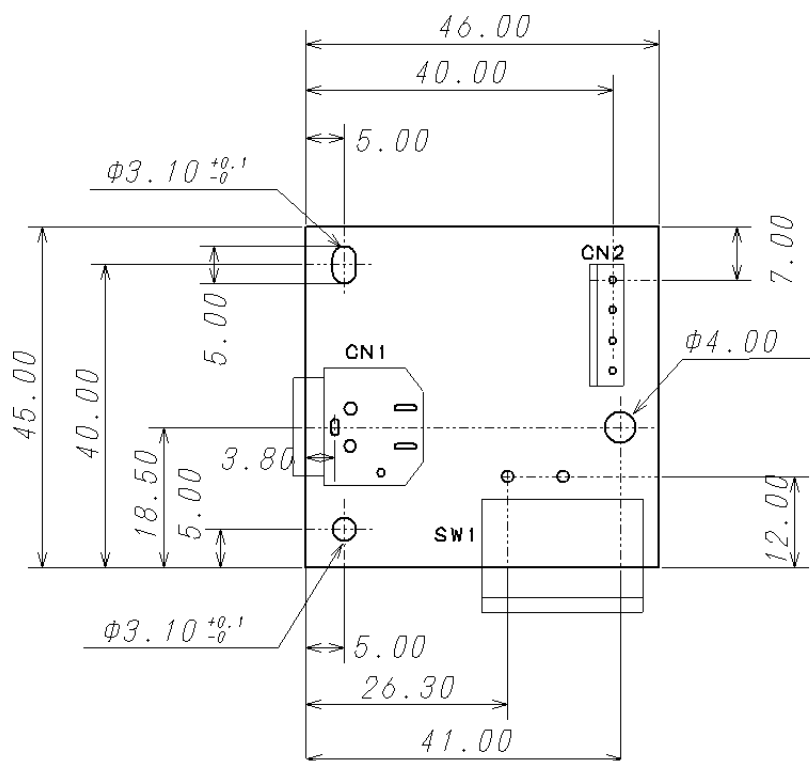
DRWG.NO.	PARTS NO.	PARTS NAME	Q'TY	REMARKS
R010	06761032	CHIP RESISTOR 10 K-OHM 1/16W	1	
R011	06761024	CHIP RESISTOR 1 K-OHM 1/16W	1	
R015-16	06761034	CHIP RESISTOR 10 K-OHM 1/16W	2	
R017-18	06762211	CHIP RES1608 220 OHM 1/16W 5%	2	
R019	06761014	CHIP RESISTOR 100 OHM 1/16W	1	
R020-23	06761034	CHIP RESISTOR 10 K-OHM 1/16W	4	
R024	06760004	CHIP RESISTOR 0 OHM 1/16W	1	
R026-27	06762211	CHIP RES1608 220 OHM 1/16W 5%	2	
R028-30	06763311	CHIP RESISTOR 330 OHM 1/16W	3	
R035-40	06763311	CHIP RESISTOR 330 OHM 1/16W	6	
R041	06761014	CHIP RESISTOR 100 OHM 1/16W	1	
R042-43	06763311	CHIP RESISTOR 330 OHM 1/16W	2	
R044	06761014	CHIP RESISTOR 100 OHM 1/16W	1	
R045-46	06762211	CHIP RES1608 220 OHM 1/16W 5%	2	
R047-51	06761034	CHIP RESISTOR 10 K-OHM 1/16W	5	
R053	06761041	CHIP RESISTOR 100 K-OHM 1/16W	1	
R057	06765104	CHIP RESISTOR 51 OHM 1/16W	1	
R062-64	06761034	CHIP RESISTOR 10 K-OHM 1/16W	3	
R065-66	06763311	CHIP RESISTOR 330 OHM 1/16W	2	
R067	06761034	CHIP RESISTOR 10 K-OHM 1/16W	1	
R068-71	06763311	CHIP RESISTOR 330 OHM 1/16W	4	
R101	06762231	CHIP RESISTOR 22 K-OHM 1/16W	1	
R102	06761531	CHIP RESISTOR 15 K-OHM 1/16W	1	
R103	06761034	CHIP RESISTOR 10 K-OHM 1/16W	1	
R104	06762221	CHIP RESISTOR 2.2 K-OHM 1/16W	1	
R105	06761034	CHIP RESISTOR 10 K-OHM 1/16W	1	
R106	06761531	CHIP RESISTOR 15 K-OHM 1/16W	1	
R107	06740010	CHIP RES3216 0.1 OHM 1/4W 5%	1	
R108	06763032	CHIP RES1608 30 KOHM 1/16W 1%	1	
R109	06761032	CHIP RESISTOR 10 K-OHM 1/16W	1	
R201-203	06761034	CHIP RESISTOR 10 K-OHM 1/16W	3	
R204	06761531	CHIP RESISTOR 15 K-OHM 1/16W	1	
R205-207	06761024	CHIP RESISTOR 1 K-OHM 1/16W	3	
R208	06763311	CHIP RESISTOR 330 OHM 1/16W	1	
R209	06761024	CHIP RESISTOR 1 K-OHM 1/16W	1	
R210	06761034	CHIP RESISTOR 10 K-OHM 1/16W	1	
R211-212	06751031	CHIP RESISTOR 10 K-OHM 1/10W	2	
R213-216	06761034	CHIP RESISTOR 10 K-OHM 1/16W	4	
R217	06761014	CHIP RESISTOR 100 OHM 1/16W	1	
R218-220	06761024	CHIP RESISTOR 1 K-OHM 1/16W	3	
R221	06763311	CHIP RESISTOR 330 OHM 1/16W	1	
R222	06760004	CHIP RESISTOR 0 OHM 1/16W	1	
R223	06761034	CHIP RESISTOR 10 K-OHM 1/16W	1	
R251-256	06763311	CHIP RESISTOR 330 OHM 1/16W	6	
R257	06761531	CHIP RESISTOR 15 K-OHM 1/16W	1	
R258-259	06710100	CHIP RESISTOR 1.0 OHM 1W	2	
R260	06764721	CHIP RESISTOR 4.7 K-OHM 1/16W	1	
R261	06761025	CHIP RES1608 1 KOHM 1/16W 1%	1	
R262	06761042	CHIP RES1608 100 KOHM 1/16W 1%	1	
R271	06761034	CHIP RESISTOR 10 K-OHM 1/16W	1	
R272	06764724	CHIP RESISTOR 4.7 K-OHM 1/16W	1	
R273	06764724	CHIP RESISTOR 4.7 K-OHM 1/16W	1	
R274	06761034	CHIP RESISTOR 10 K-OHM 1/16W	1	
R275	06761032	CHIP RESISTOR 10 K-OHM 1/16W	1	

DRWG.NO.	PARTS NO.	PARTS NAME	Q'TY	REMARKS
R276	06765123	CHIP RES1608 5.1 KOHM 1/16W 1%	1	
R277	06764724	CHIP RESISTOR 4.7 K-OHM 1/16W	1	
R280	06764724	CHIP RESISTOR 4.7 K-OHM 1/16W	1	
R281	06761034	CHIP RESISTOR 10 K-OHM 1/16W	1	
R282	06761032	CHIP RESISTOR 10 K-OHM 1/16W	1	
R283	06765123	CHIP RES1608 5.1 KOHM 1/16W 1%	1	
R284	06764724	CHIP RESISTOR 4.7 K-OHM 1/16W	1	
R285-286	06753314	CHIP RESISTOR 330 OHM 1/10W	2	
R291-292	06761034	CHIP RESISTOR 10 K-OHM 1/16W	2	
R293-294	06763311	CHIP RESISTOR 330 OHM 1/16W	2	
R296-297	06763311	CHIP RESISTOR 330 OHM 1/16W	2	
R301	06761034	CHIP RESISTOR 10 K-OHM 1/16W	1	
R302-303	06764724	CHIP RESISTOR 4.7 K-OHM 1/16W	2	
R304-305	06761034	CHIP RESISTOR 10 K-OHM 1/16W	2	
R306	06764724	CHIP RESISTOR 4.7 K-OHM 1/16W	1	
R307	06766831	CHIP RES1608 68 KOHM 1/16W 5%	1	
R309	06764724	CHIP RESISTOR 4.7 K-OHM 1/16W	1	
R310-311	06761034	CHIP RESISTOR 10 K-OHM 1/16W	2	
R312	06764724	CHIP RESISTOR 4.7 K-OHM 1/16W	1	
R313	06762231	CHIP RESISTOR 22 K-OHM 1/16W	1	
R315	06764724	CHIP RESISTOR 4.7 K-OHM 1/16W	1	
R316-317	06761034	CHIP RESISTOR 10 K-OHM 1/16W	2	
R318	06764724	CHIP RESISTOR 4.7 K-OHM 1/16W	1	
R319	06761034	CHIP RESISTOR 10 K-OHM 1/16W	1	
R321	06764724	CHIP RESISTOR 4.7 K-OHM 1/16W	1	
R322	06761034	CHIP RESISTOR 10 K-OHM 1/16W	1	
R323	06764724	CHIP RESISTOR 4.7 K-OHM 1/16W	1	
R324	06761034	CHIP RESISTOR 10 K-OHM 1/16W	1	
R325	06761032	CHIP RESISTOR 10 K-OHM 1/16W	1	
R326	06765123	CHIP RES1608 5.1 KOHM 1/16W 1%	1	
R327	06764724	CHIP RESISTOR 4.7 K-OHM 1/16W	1	
R329	06750004	CHIP RESISTOR 0 OHM 1/10W	1	
R330-331	06762221	CHIP RESISTOR 2.2 K-OHM 1/16W	2	
R332-335	06763311	CHIP RESISTOR 330 OHM 1/16W	4	
R336-337	06761034	CHIP RESISTOR 10 K-OHM 1/16W	2	
R338-339	06763311	CHIP RESISTOR 330 OHM 1/16W	2	
R401-403	06761041	CHIP RESISTOR 100 K-OHM 1/16W	3	
R404	06761034	CHIP RESISTOR 10 K-OHM 1/16W	1	
R405	06761041	CHIP RESISTOR 100 K-OHM 1/16W	1	
R407-408	06761041	CHIP RESISTOR 100 K-OHM 1/16W	2	
R411-412	06761014	CHIP RESISTOR 100 OHM 1/16W	2	
R413-414	06754711	CHIP RESISTOR 470 OHM 1/10W	2	
R415-418	06764724	CHIP RESISTOR 4.7 K-OHM 1/16W	4	
R419-422	06761034	CHIP RESISTOR 10 K-OHM 1/16W	4	
R423-424	06763311	CHIP RESISTOR 330 OHM 1/16W	2	
R433	06762211	CHIP RES1608 220 OHM 1/16W 5%	1	
RA01-04	06562211	RESIS. ARRAY CHIP MNR14J221*	4	
RA05-09	06561011	RESIS. ARRAY CHIP MNR14J101*	5	
RA10-12	06561031	RESIS. ARRAY CHIP MNR14J103*	3	
RA13	06561011	RESIS. ARRAY CHIP MNR14J101*	1	
RA14-15	06561031	RESIS. ARRAY CHIP MNR14J103*	2	
RA16-20	06563311	RESIS. ARRAY CHIP MNR14J331*	5	
SW1-2	09010041	PUSH SWITCH SKHHAL	2	
TR01	07013622	CHIP TRANSISTOR 2SA1362GR*85L	1	

DRWG.NO.	PARTS NO.	PARTS NAME	Q'TY	REMARKS
TR02	07238754	CHIP TRANSISTOR 2SC3875S-G*AL	1	
TR11	07603017	DIGITAL TRANSISTOR FN1A4P	1	
TR12	07238754	CHIP TRANSISTOR 2SC3875S-G*AL	1	
TR13	07013622	CHIP TRANSISTOR 2SA1362GR*85L	1	
TR14	07603016	DIGITAL TRANSISTOR FA1A4P	1	
TR21	07016493	CHIP TRANSISTOR 2SA1649Z*E1	1	
TR22	07013381	CHIP TRANSISTOR 2SA1338-67*TA	1	
TR23	07603016	DIGITAL TRANSISTOR FA1A4P	1	
VR1-2	06494732	RP CHIP RESISTOR EVM3S-47K	2	
VR4-6	06494732	RP CHIP RESISTOR EVM3S-47K	3	
XTAL	09250082	CERA. OSC CSACW25M0X51*	1	
ZD1	08020126	ZENER DIODE CHIP HZU20B2TRF	1	
ZD2	08020156	ZENER DIODE CHIP RD3.9SB1*	1	
ZD3	08020157	ZENER DIODE CHIP RD6.2SB1*	1	
ZD4	08020156	ZENER DIODE CHIP RD3.9SB1*	1	
ZD5	08020157	ZENER DIODE CHIP RD6.2SB1*	1	
-	09991910	S/N SEAL KEI-802	1	

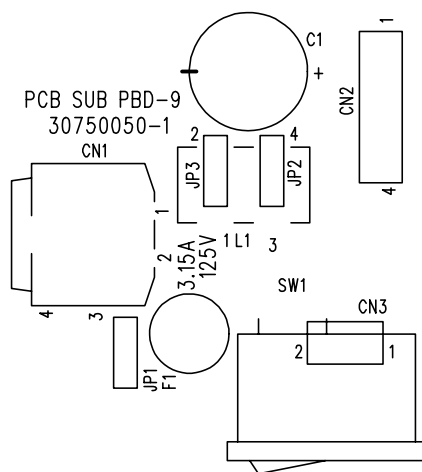
# CHAPTER 8 SAB-BOARD

## 8-1 PC Board Dimension Drawing

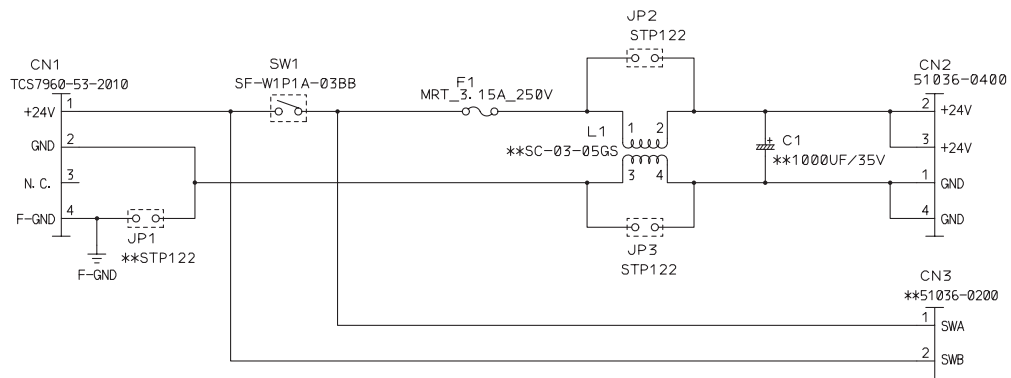


Unit:mm

## 8-2 Component Layout



## 8-3 Circuit Diagram



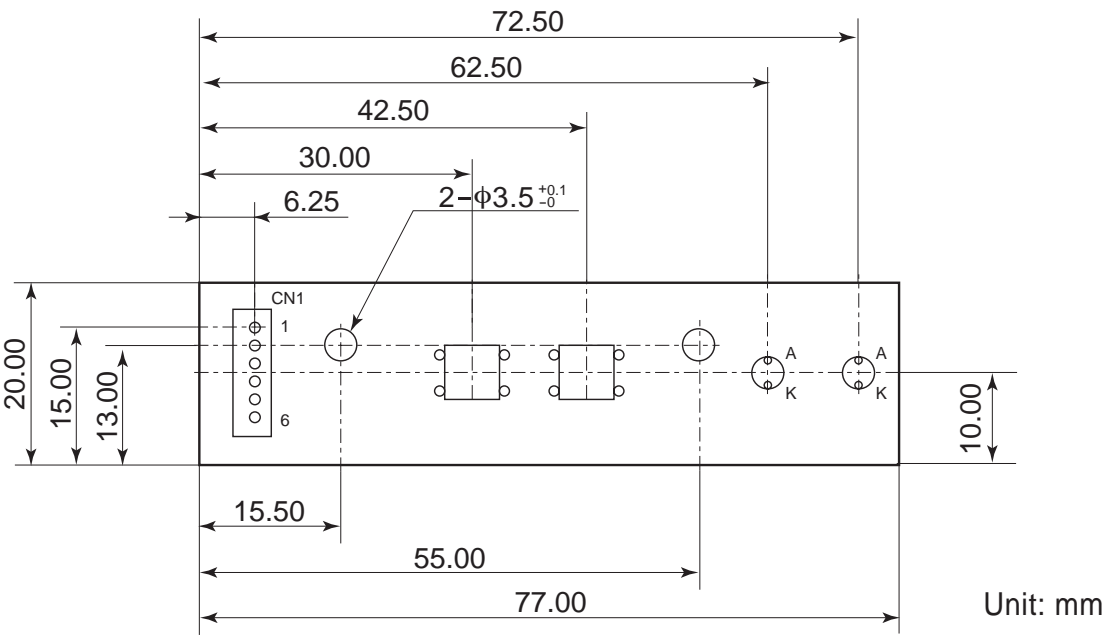
## 8-4 Parts List

Sub-board

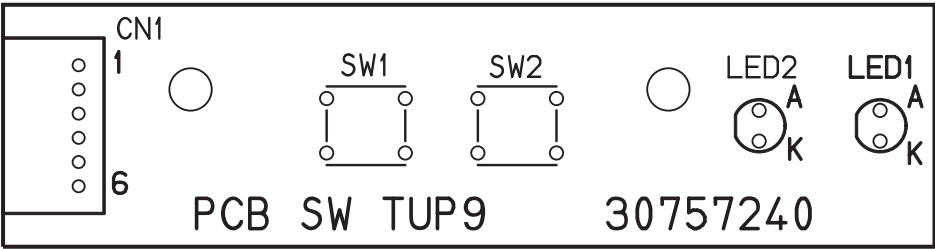
DRWG.NO.	PARTS NO.	PARTS NAME	Q'TY	REMARKS
C1				NOT MOUNTED
CN1	09100636	CONNECTOR TCS7960-53-2010	1	
CN2	30721750	CABLE UNIT 4X60CC PBD-9	1	
	09990762	FERRITE CORE K5BRC16X16X8-M	1	
F1	09991026	FUSE MRT3.15A-250V*	1	
JP1-3	93930006	JUMPER WIRE STP122	3	
SW1	09030036	SEESAW SWITCH SF-W1P1A03BB	1	
-	09990762	FERRITE CORE K5BRC16X16X8-M	1	

# CHAPTER 9 CONTROL PANEL BOARD

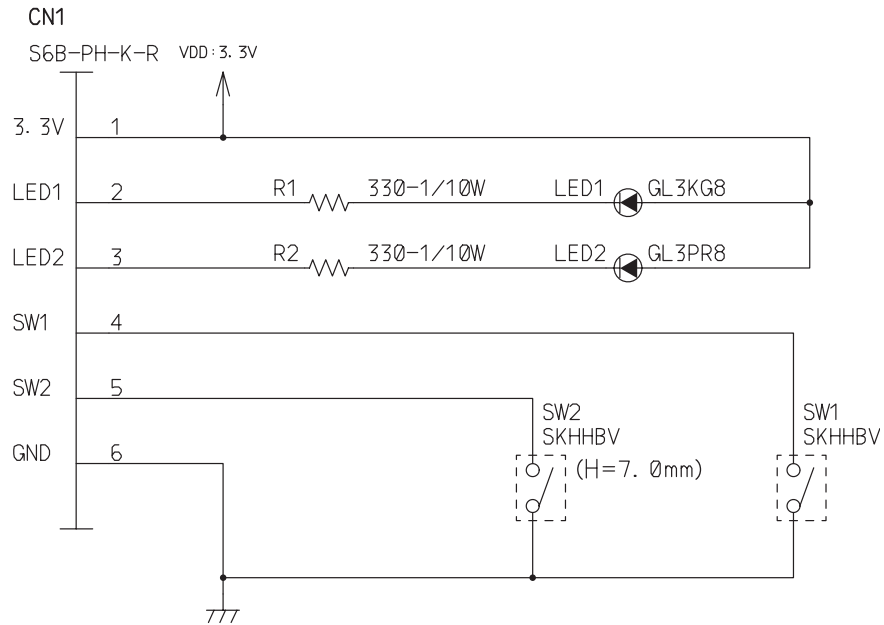
## 9-1 PC Board Dimension Drawing



## 9-2 Component Layout



## 9-3 Circuit Diagram



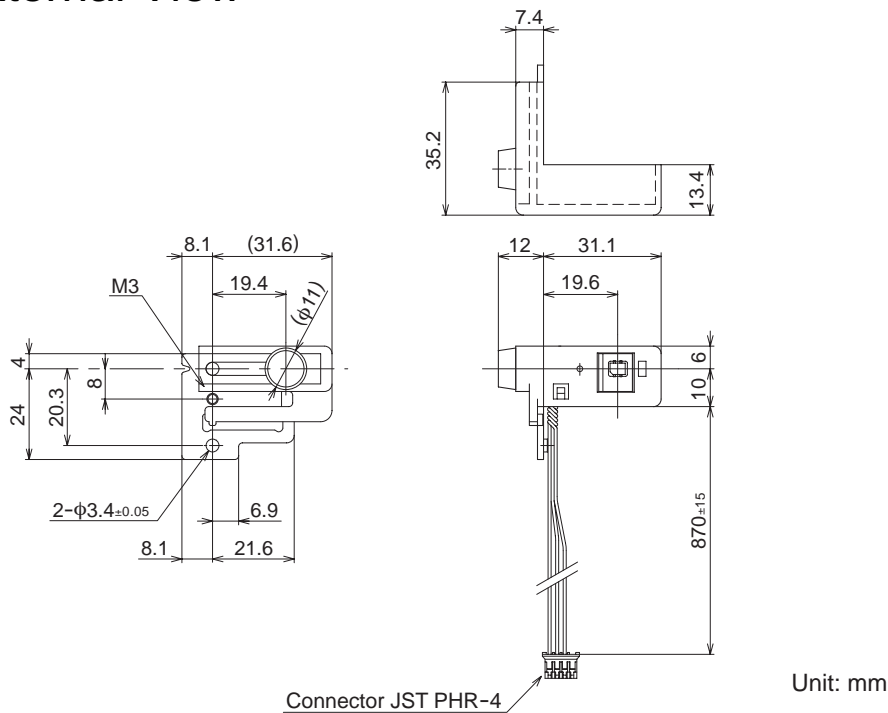
## 9-4 Parts List

Control panel board

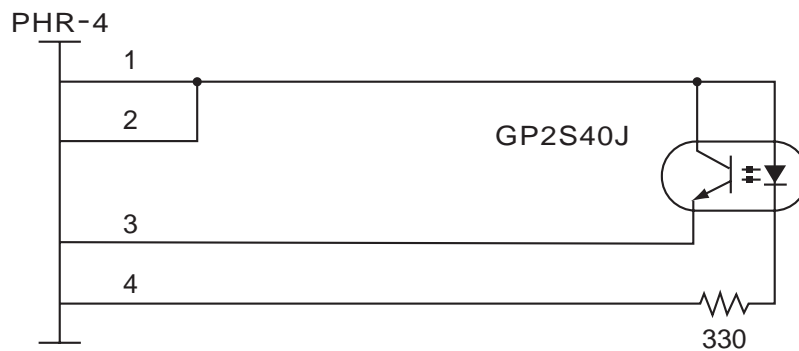
DRWG.NO.	PARTS NO.	PARTS NAME	Q'TY	REMARKS
CN1	09100860	CONNECTOR S6B-PH-K-R	1	
LED1	08300101	LED GL3KG8	1	
LED2	08300069	LED GL3PR8	1	
R1-2	06753314	CHIP RESISTOR 330 OHM 1/10W	2	
SW1-2	09010068	PUSH SWITCH SKHHBV	2	
-	30721760	CABLE UNIT 6X220CC TUP9	1	

# CHAPTER 10 OPTIONAL PAPER NEAR END SENSOR UNIT

## 10-1 External View



## 10-2 Circuit Diagram



## 10-3 Parts List

Optional paper near end sensor unit

DRWG.NO.	PARTS NO.	PARTS NAME	Q'TY	REMARKS
-	06753314	CHIP RESISTOR 330 OHM 1/10W	1	
	08300157	PHOTO-INTERRUPTER GP2S40J	1	
	30721070	CABLE UNIT 3X900C TUP9	1	



# CHAPTER 11 INTERFACE

## 11-1 RS-232C Interface

Refer to the “STAR Line Mode Command Specifications for Line Thermal Printers” manual for details.

Refer to the “STAR Page Mode Command Specifications for Line Thermal Printers” manual for details.

## 11-2 Parallel Interface

Refer to the “STAR Line Mode Command Specifications for Line Thermal Printers” manual for details.

Refer to the “STAR Page Mode Command Specifications for Line Thermal Printers” manual for details.

# CHAPTER 12 COMMAND SPECIFICATIONS

## 12-1 Star Line Mode

Refer to the “STAR Line Mode Command Specifications for Line Thermal Printers” manual for details.

## 12-2 Star Page Mode (supported by ROM version 2.0 later)

Refer to the “STAR Page Mode Command Specifications for Line Thermal Printers” manual for details.

# CHAPTER 13 CHARACTER CODES

## 13-1 Star Line Mode

Refer to the “STAR Line Mode Command Specifications for Line Thermal Printers” manual for details.

## 13-2 Star Page Mode (supported by ROM version 2.0 later)

Refer to the “STAR Page Mode Command Specifications for Line Thermal Printers” manual for details.



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