

TEC Portable Printer

# **B-SP2D SERIES**

## **Product Description**

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(Revised )

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### **CAUTION:**

- 1. This manual may not be copied in whole or in part without prior written permission of TOSHIBA TEC.*
- 2. The contents of this manual may be changed without notification.*
- 3. Please refer to your local Authorized Service representative with regard to any queries you may have in this manual.*

# 1. OUTLINE

## 1.1 FEATURES

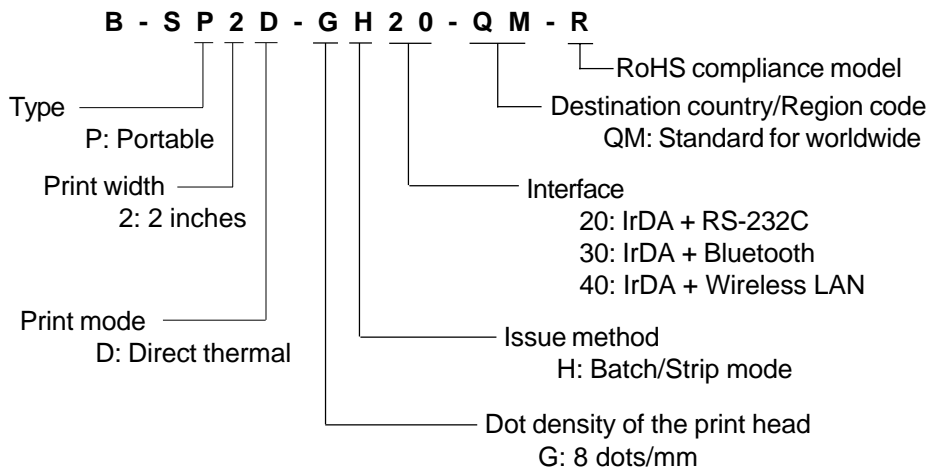
- 1) Various bar codes, characters and graphic data can be printed using the thermal direct method.  
 This printer can also print writable characters and logos at designated coordinates by using a graphic command.
- 2) The Bluetooth™ interface and IrDA are available as standard interfaces between the printer and the host (Handy Terminal, etc.). (The GH30 model only)  
 The IrDA interface and RS-232C ports are available as standard interfaces between the printer and the host. (The GH20 model only)  
 The IrDA interface and wireless LAN are available as standard interfaces between the printer and the host. (The GH40 model only)
- 3) A 32-bit CPU equipped with several peripheral LSIs realizes high system performance.
- 4) This printer accepts a max. format size of 48 mm wide by 500 mm long and provides a max. print speed of 80 mm/sec.
- 5) Owing to a low power consumption design and use of a chargeable lithium-ion battery as a power source, this printer can issue max. 300 pieces of labels with a fully-charged battery. (When printing 48 mm (W) x 40 mm (H) labels at printing ratio of 30% and ambient temperature of 25°C.)
- 6) An automatic power off function allows obtaining the battery driving time to the maximum. There are four choices of the setting time: 1 minute, 5 minutes, 30 minutes and 120 minutes.
- 7) Loading a label roll is very simple; just put a label roll into the printer and close the media cover. A belt holder provided on the rear of the printer enables the printer to be held hands-free at your waist for improved productivity.

\* The Bluetooth is a trademark owned by Bluetooth SIG, Inc. and used by TOSHIBA TEC Corporation under license.

\* IrDA Protocol Stack「Deep Core」© Link Evolution Corp. All right Reserved.

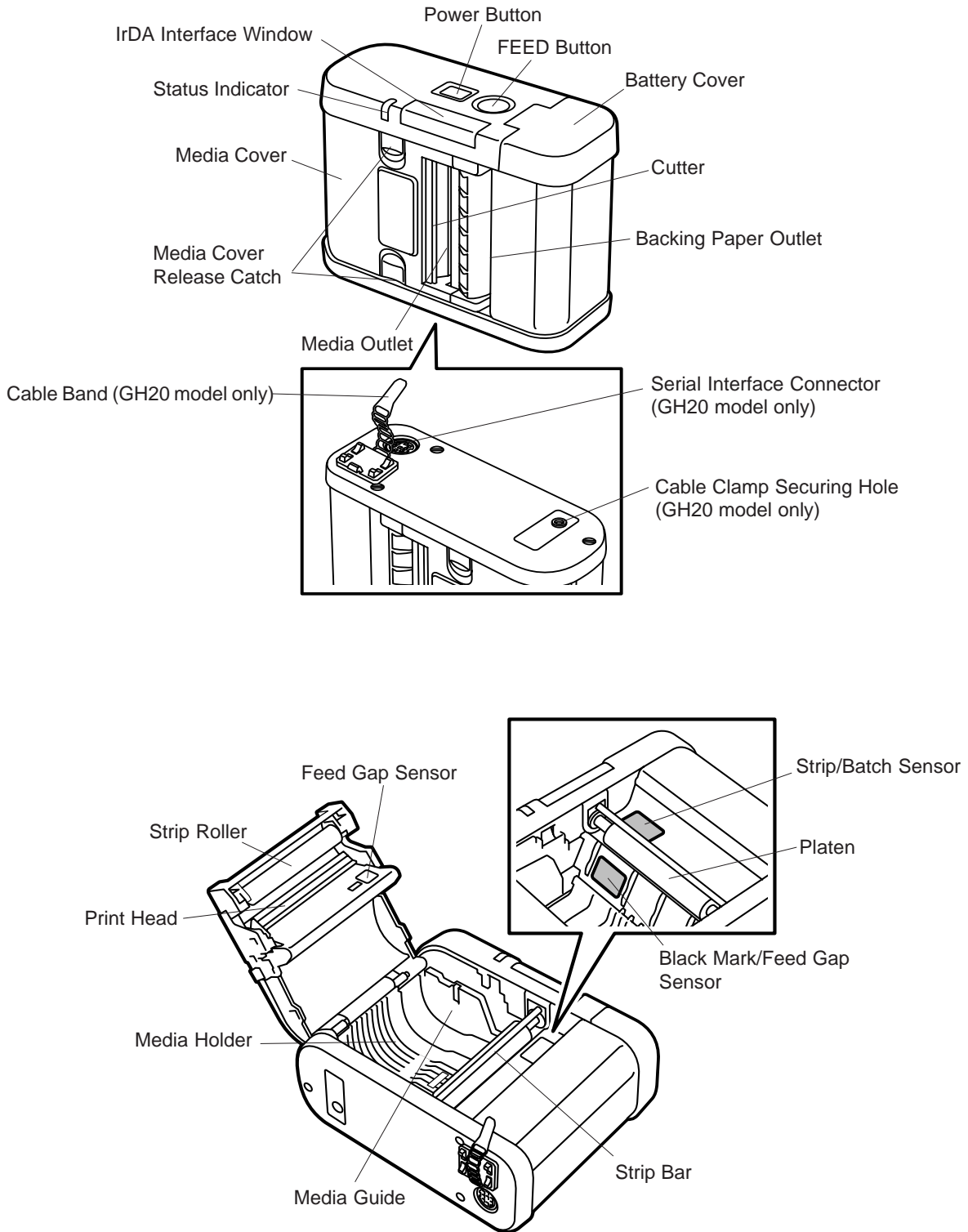
**NOTE:** All sizes are written in millimeters (mm) in this manual. To obtain the size in inches, divide by 25.4.

## 1.2 DESCRIPTION OF MODEL NUMBER



## 1.3 APPEARANCE

### 1.3.1 Front View and Interior



### 1.3.2 Operation Panel

#### FEED Button

When this button is pressed, the printer issues the same label as the one issued last. The function of this button differs depending on the print modes.

Description of the print modes in case of the Batch issue.

- LABEL mode: The number of labels specified by the host are printed continuously with the format specified by the host. After the all labels are printed, the last label can be issued again by pressing the **[FEED]** button.
- TPCL-LE mode: The number of labels specified by the host are printed continuously with the format specified by the host. Re-issue function is not available in this mode.
- RECEIPT mode: Print data is printed line by line with the format specified by the host. After the all data are printed, the label can be fed for 20 mm by pressing the **[FEED]** button.

**NOTE:** In the Batch issue mode, the printer will perform a back feed before starting to print. However, when firmware version is V1.3 or greater, back feed will not be performed if there is no print data within 2.1 mm from the top edge of the media.

Description of the print modes in case of the Strip issue.

- LABEL mode: The number of labels specified by the host are printed one by one with the format specified by the host. After the all labels are printed, the last label can be issued again by pressing the **[FEED]** button.
- TPCL-LE mode: The number of labels specified by the host are printed one by one with the format specified by the host. Re-issue function is not available in this mode.

**NOTE:** In the Strip issue mode, the printer will not perform a back feed.

#### STATUS Indicator (Red/Orange/Green)

The status indicator indicates the printer status; for example, lights when the power is turned on or blinks when an error has occurred.

Status Indicator	Printer Status
Blinks in red for a few seconds. ↓ Blinks in green (orange). ↓ Lights in green (orange).	Power on time
Lights in green (orange).	Idle (normal) Cover is opened. Power saving mode
Blinks in green.	Communicating with the host
Blinks in red at 0.1 sec. interval. (Refer to the NOTE 2.)	Command syntax error Feed jam Media end Cover open error Print head broken dot error Print head overheat Flash ROM write error Flash ROM erase error Communication error Normal issue + media end Flash ROM's area full
Lights in red.	Low battery
Blinks in red twice.	Forced download mode (at the power on time)

The status indicator goes off on the following conditions:

- When the power is automatically turned off by the auto power off function. (The same state as power off.)
- The status indicator indicating an error will go off after 5 minutes if the auto power off time is set to other than 1 minute. (The same state as power off.)

**NOTES:**

1. The status indicator indicating the low battery will keep on lighting until the power is turned off. If the printer status changes before the power is turned off, however, the new status will be effective.

2. Detailed explanation of the printer status

The conditions that cause each of the following errors are described below.

1) Command Syntax Error

- A command length error, command transmission sequence error, command format error, or parameter setting error is detected during command analysis.
- In the LABEL mode, the form designated by the data print command has not been stored. Or, in the TPCL-LE mode, the number that has not been registered for PC saving was called.
- The block numbers are not ascending sequential numbers starting from 0.

2) Feed Jam

- When a gap or black mark is not detected even when the printer feeds the media for the length equivalent to 1.5 times of the label pitch specified by the label size setting command. (only in the LABEL issue mode, or TPCL-LE issue mode with the transmissive/reflective sensor specified.)

3) Media End

In case of LABEL mode, RECEIPT mode (mode = 1, 3), or TPCL-LE mode

- Issuing or feeding media is attempted when there is no media.
- Backing paper level is continuously detected for 14 mm.
- Label end level is continuously detected for 1 mm.

In case of RECEIPT 1 mode (mode = 2)

- Issuing or feeding media is attempted when there is no media.
- 1.5 mm of no print area is detected as label end level.
- Label end level is continuously detected for 14 mm.

4) Cover Open Error

- While issuing or feeding the media, the cover open state is detected for 5 mm or more.
- Issuing or feeding media is attempted while the cover is open.

5) Print Head Broken Dot Error

- Broken dot is detected during the automatic broken dot check that is performed when the power is turned on or cover is closed.
- An error occurs in the thermal head driver.

6) Print Head Overheat

- The thermistor of the thermal head detects high temperature.

7) Flash ROM Write Error

- An error occurs while data is written onto the flash ROM.

8) Flash ROM Erase Error

- An error occurs while the flash ROM is initialized.

9) Normal Issue + Media End

In case of LABEL mode or TPCL-LE mode

- A label end is detected after the printer has printed the data equivalent to the effective print length.

In case of RECEIPT mode

- A media end is detected after the printer has printed the data equivalent to the effective print length.

10) Flash ROM's Area Full

- The storage area of the flash ROM has become full.

11) Others

- When the battery is almost dead and printing cannot be continued, the LED will blink in red.
- When an undefined command error occurs, the printer will be automatically reset.

**Power Button**

A push power switch

To turn on the power, press this switch once. To turn off the power, press and hold this switch for about 2 seconds. The power will automatically turn off when the specified idle time\* (selectable from 1, 5, 30, and 120 minutes) has passed. To turn on the power again, press this button. The time can be selected on the host.

\* Period of time when no operation is performed or no data is sent from the host.

**1.3.3 Dimensions**

114 mm (W) x 44 mm (D) x 91 mm (H)\* (\*: The height of the GH40 model is 101 mm.)

**1.3.4 Weight**

Approximately 380 g\* (including a battery) (\*: The weight of the GH40 model is 410g.)

**1.4 BASIC SPECIFICATIONS**

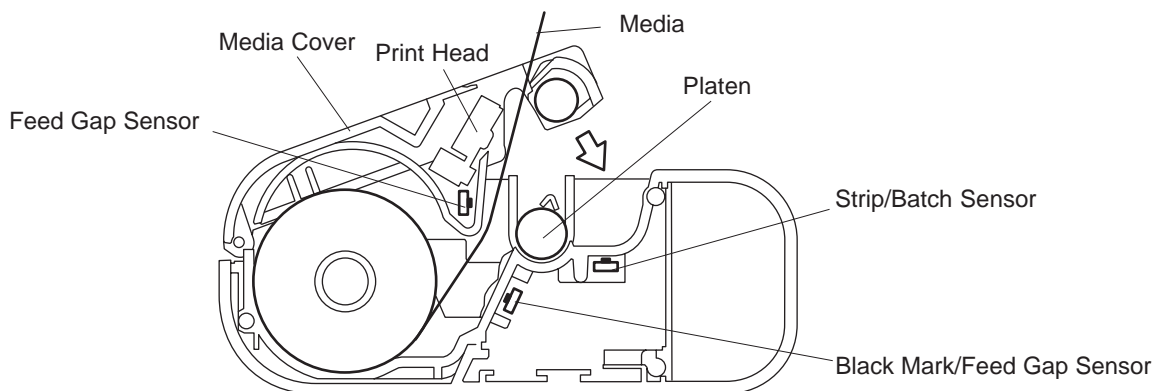
- 1) Print Method ..... Direct Thermal Printing only.
- 2) Print Head
  - (1) Total number of dots ..... 384 dots
  - (2) Dot density ..... 8 dots/mm (203 dpi)
  - (3) Effective print width ..... 48.0 mm
  - (4) Thermal element size ..... 0.110 x 0.132 mm<sup>2</sup>
  - (5) Thermal pitch ..... 0.125 mm
- 3) Print Speed ..... Approximately 12.5 mm/sec. ~ 80.0 mm/sec.  
(It automatically varies depending on the print head temperature and the battery voltage.)
- 4) Format Size (W) x (H) ..... 48.0 x 500.0 mm max.
- 5) Issue Mode ..... Batch or strip
- 6) Type of Bar Code ..... NW7, EAN 8, EAN 13, JAN 8, JAN 13, UPC-A, UPC-E, CODE 39, Interleaved 2 of 5, EAN128, CODE128, MSI, Customer Bar Code, RSS  
**NOTE:** Available bar codes depend on the print mode.
- 7) Two-dimensional Code ..... QR Code, PDF417, Data Matrix, Maxicode, Micro PDF417  
**NOTE:** Available codes depend on the print mode.
- 8) Bar Code Rotation ..... 0°, 90°, 180°, 270°
- 9) Character Types (Bit Map Font)  
Standard characters and characters under bar codes (12x24 dots), Bold characters (48x96 dots), Writable characters (16x16 dots, 24x24 dots), Price Font1 (16x40 dots), Price Font2 (32x48 dots), Letter Gothic Medium (14.3 point), Presentation (27 point), Helvetica Medium (9, 15, 18 point), Helvetica bold (18, 21 point), Helvetica Italic (18 point), Times New Roman Medium (12, 15 point), Times New Roman Bold (15, 18, 21 point), Times New Roman Italic (18 point), Prestige Elite Medium (10.5 point), Prestige Elite Bold (15 point), Courier Medium (15 point), Courier Bold (18 point), OCR-A (12 point), OCR-B (12 point), GOTHIC725 Black (6 point)  
**NOTE:** Available fonts depend on the print mode.
- 10) Character Types (Outline Font)
  - (1) TEC Font 1
  - (2) TEC Font 1 (Proportional)
  - (3) Price Font 2
- 11) Format
  - (1) LABEL Mode ..... Max. 20 types (Storage area size: 128 KB)
  - (2) TPCL-LE Mode ..... Max. 99 types (Storage area size: 192 KB)

- 12) Graphics ..... Max. 2 graphics can be registered. (LABEL mode)  
 (Storage area size: 64 KB)
- 13) Writable Characters (Storage area size: 64 KB)
  - (1) LABEL Mode ..... 24 x 24 dots, 50 characters
  - (2) TPCL-LE Mode ..... Free size 224 characters
    - 16 x 16 dots 188 characters
    - 24 x 24 dots 188 characters

14) Mechanism

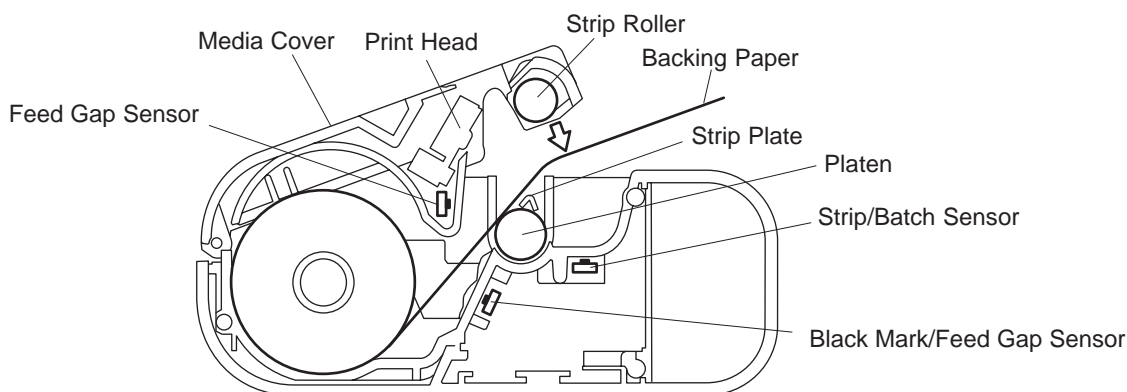
(1) Batch print mechanism

When a media roll is loaded as shown below, the strip/batch sensor does not detect the media, which makes the printer recognize the batch mode. Receiving print data along with the designation of format and the number of copies from the host, the printer prints the data continuously within each media's effective print area. The detection of the print start position is performed by the media sensor (black mark/feed gap sensor) detecting inter-label gaps or black marks printed on the reverse side of the receipt. When the **[FEED]** button is pressed after the all number of labels have been printed, the printer will re-print the label issued last in LABEL mode or will feed the media for 20 mm in RECEIPT mode. These **[FEED]** button functions are not provided in TPCL-LE mode.



(2) Strip print mechanism

When a label roll is loaded as shown below, the strip/batch sensor detects the backing paper, which makes the printer recognize the strip mode. The printer prints labels one by one in the format specified by the host. The media sensor (black mark/feed gap sensor) detects inter-label gaps, enabling the printer to print labels properly within the effective print area. Labels are separated from the backing paper by the strip plate and the strip roller. When the **[FEED]** button is pressed after the all number of labels have been printed, the printer will re-print the label issued last in LABEL mode. This **[FEED]** button function is not provided in TPCL-LE mode.





## 15) Power Supply

- (1) Battery: Lithium ion battery 7.4V, 1400mAh (nominal)
- (2) Charge method: Battery charger
- (3) Battery capacity: A fully charged battery allows the printer to print about 300 labels on the following conditions:
- 48 mm (W) x 40 mm (H) labels
  - Printing ratio: 30%
  - Ambient temperature: 25°C
- (4) Current consumption: 3.0A (when printing bar codes)
- (5) Charge and discharge cycle: 300 cycles

**1.5 ELECTRONICS SPECIFICATIONS**1) CPU ..... RISC chip NEC V850E/MA1 ( $\mu$ PD703103A)

## 2) Memory

- (1) ROM: Flash ROM 4M bytes (2M x 16 bits)
- (2) RAM: S-RAM 8M bytes (1M x 16 x 4 banks)

## 3) Interface

## (1) Bluetooth interface (GH30 model only)

- Type ..... Bluetooth V1.1 (RoHS compliance model: V1.2)
- Support profile ..... Serial Port Profile
- Communication method ..... IEEE802.11b (RoHS compliance model: IEEE802.11b/g)
- Radio class ..... Class 2
- Transmission speed ..... 115,200 bps
- Communication method ..... Bi-directional (Half-duplex)
- Communicating distance ..... 3 m (360 degrees angle)
- Data code ..... JIS 8 code, Shift JIS code
- Transmission control ..... Credit Based Flow Control
- Operating mode ..... Slave mode
- Receiving buffer: ..... 2k bytes
- PIN code ..... Not used.
- Service name ..... ZV-AT
- Device nickname ..... TOSHIBA TEC BT
- Link time out ..... 20 seconds
- Inquiry control ..... No response to the inquiry after 1 minute from the power on.
- SR mode in page/inquiry scanning
  - R1 scan interval ..... 1.28 sec.
  - Scan window ..... 11.25m sec.

## (2) RS-232C interface (GH20 model only)

- Communication mode: Start-stop synchronization
- Transmission method: Bi-directional (Full-duplex)
- Transmission speed: 9600/19200/38400/115200 bps <sup>(NOTE 1)</sup>
- Start bit: 1 bit
- Stop bit: 1 bit
- Data length: 8 bits
- Parity: Even, None
- Error detection: Parity error, Overrun error, Framing error <sup>(NOTE 2)</sup>
- Data code: JIS 8 code and Shift JIS code
- Receiving buffer: 64 KB

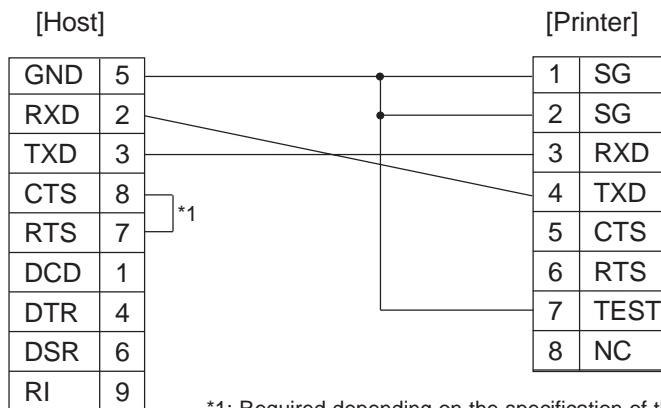
**NOTES:** 1. Transmission speed depends on the communication protocol setting.  
2. Error detection is available only in the Receipt mode.

- Protocol
  - XON/XOFF method
    - The printer sends an XOFF code (13H) when the receiving buffer has 800 bytes or less of free space and an XON code (11H) when there are 2k bytes or more of free space.
    - If the receiving buffer is full, the printer will discard any more data. (The host must detect an XOFF code and stop sending data before the receive buffer becomes full.)

• Pin description

Pin No.	Signal	I/O	Description
1, 2	SG (Signal Ground)	----	A ground line for all data transmission and control signals. (without a noise filter)
3	RXD (Receive Data)	I	A line for data transmission from the host to the printer. Logic 1 is Low and 0 is High. While no data is sent, the status is Low.
4	TXD (Transmit Data)	O	A line for data transmission from the printer to the host. Logic 1 is Low and 0 is High. While no data is sent, the status is Low. In the power save mode, the printer is in the high impedance.
5	CTS (Cancel to Send)	----	The printer does not receive this signal.
6	RTS (Request to Send)	O	The printer does not control this signal.
7	TEST	----	This line must be connected to the SG.
8	P5V	----	A +5V line for supplying power to an external equipment. (Max. 100mA)

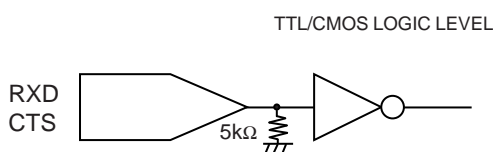
• Pin connection



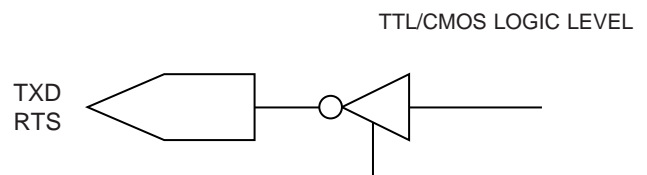
\*1: Required depending on the specification of the host side connector.

• Interface circuit

■ Input circuit



■ Output circuit



■ Signal level

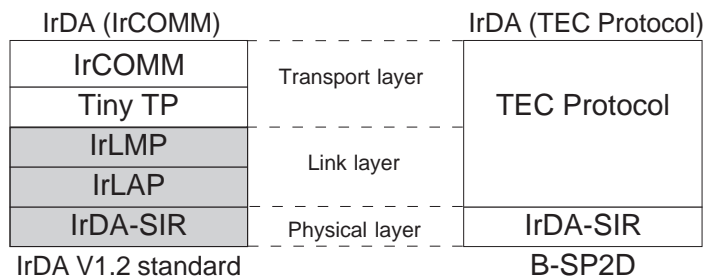
Input voltage "H": +2.4V ~ +25V  
"L": -25V ~ +0.6V

Output voltage "H": Min. +5.0V Typ +5.4V  
"L": Min. -5.0V Typ -5.4V

- Connector
  - Printer side                      Maker: Hoshiden  
                                   Type: TCP8580
  - Host side                         Maker: DDK  
                                   Type: 17LE-13090-02-D8C

(3) IrDA interface

- This printer has the following two types of IrDA protocol.



: Shadowed layers are required as IrDA V1.2 standard.

- Physical Layer
  - Type:                                      Physical layer conforming to IrDA-SIR V1.2 (Low power)
  - Transmission speed:                      9600/19200/38400/115200 bps <sup>(NOTE 1)</sup>
  - Communicable distance:                    0.1 m max. <sup>(NOTE 2)</sup>
  - Peak wavelength of the infrared ray:   850 to 900 nm
  - Communicable angle:                       ±15 degrees max.
  - Ambient light immunity:                   1,000 lx max. (under a fluorescent lamp or incandescent lamp)
  - Intensity of emission:                     Min. 3.6mW/Sr (θh, θv ≤ ±15°)
  - Receivable infrared ray:                   Min. 9μW/cm<sup>2</sup> (θh, θv ≤ ±15°)

**NOTES:** 1. It depends on the communication protocol settings.  
 2. The distance may be shortened depending on the performance of the host.

- Input/Output Signal
  - RD (Host to Printer)
    - Data signal the printer receives from the host.
    - The logic 1 is Low and 0 is High.
    - While this signal is not sent, the status is Low.
  - SD (Printer to Host)
    - Data signal the printer sends to the host.
    - The logic 1 is Low and 0 is High.
    - While this signal is not sent, the status is Low.

(4) Wireless LAN 802.11b (GH40 model only)

- Communication method ..... IEEE802.11b
  - Supporting print protocol ..... Socket/LPR
  - Communicable distance ..... 100 m (When there is no obstacle.)
  - Client protocol ..... DHCP, WINS
  - Security protocol ..... WEP (40 bits/104 bits), MD5/EAP/LEAP
- NOTE:** LEAP is selectable only when the wireless LAN module version is V1xx. The version of the wireless LAN module can be checked by printing the wireless LAN parameter settings. (Refer to the Maintenance Manual Section 7.2.1.)
- Flow control ..... TCP/IP
  - Antenna ..... Built-in
  - Parameter setting ..... Via HTTP, via IrDA

**NOTE:** The printer interface is automatically switched between IrDA and RS-232C/Bluetooth/wireless LAN on the following conditions:

- **IrDA+RS-232C model (GH20 model)**

When the RS-232C cable is connected to the printer, the printer interface will be switched to the RS-232C interface. When the RS-232C cable is disconnected, the interface will be switched to IrDA.

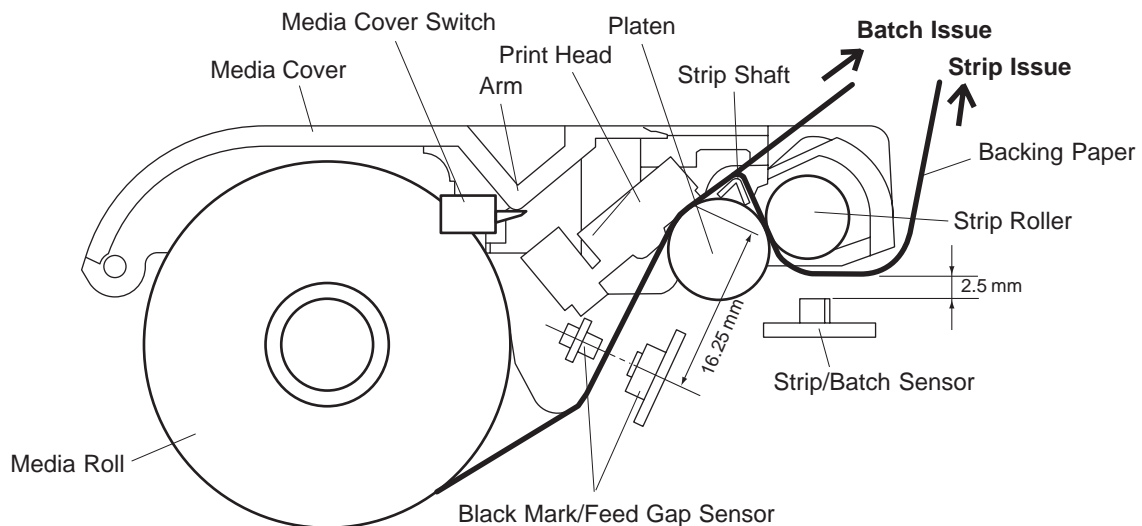
- **IrDA+Bluetooth model or IrDA+Wireless LAN model (GH30 or GH40 model)**

Usually, IrDA interface is standing by for a communication. When data is sent from Bluetooth interface or wireless LAN interface, the printer interface is automatically switched to the appropriate interface.

When over 5 seconds have passed since the termination of the communication by Bluetooth or wireless LAN interface, the printer interface will return to IrDA. Therefore, communication by IrDA cannot be made during or within 5 seconds after the communication by Bluetooth or wireless LAN interface.

If data is sent to the printer by Bluetooth or wireless LAN interface during the communication by IrDA, the printer interface will be automatically switched to Bluetooth or wireless LAN, and consequently the communication by IrDA cannot be made successfully.

## 5) Sensor/Switch



### (1) Media sensor

This sensor is comprised of a black mark sensor and a feed gap sensor. It is positioned 16.25 mm from the print head element.

- **Black mark sensor (Reflective sensor)**

This sensor detects the difference of potential between the black mark and the receipt paper to find the print position of the receipt paper.

- **Feed gap sensor (Transmissive sensor)**

This sensor detects the difference in potential between the backing paper and the label to find the print position of the label.

### (2) Strip/Batch sensor

This sensor detects the presence or lack of the backing paper, which allows the printer to recognize the strip mode.

### (3) Media cover switch

This switch is a micro switch, attached to two positions inside the printer, which is turned ON/OFF by the arms on the media cover when closed. Both switches are turned ON when the media cover is closed completely, causing the printer to be ready.

## 2. SUPPLY SPECIFICATIONS

Information regarding the supply specifications contained in Product Description is essential to service engineers. Detail specifications and other information on the media are described in each model's Supply Manual. It is issued by and sent from TEC H.Q. (Sales Division) upon release of a new model or a manual's revision. When purchasing the supplies locally, be sure to refer to the Supply Manual for details to avoid any problems.

Be sure to read carefully and understand the Supply Manual since it includes further details about notes, precision of the print start position, limitations on printing, etc.

### 2.1 MEDIA

(Unit: mm)

Item	Media		Label		Tag/Receipt	Receipt
	Batch mode	Strip mode	With black mark	No black mark		
Ⓐ Label/Receipt pitch	10.0 – 167.0	13.0 – 67.0	10.0 – 507.0			Variable
Ⓑ Label/Receipt length	7.0 – 160.0	10.0 – 60.0	7.0 – 500.0			Variable
Ⓒ Backing paper width	28, 31, 34, 37, 40, 43, 46, 49, 52, 55, 58±0.5 <sup>(NOTE 2)</sup>		—			
Ⓓ Media width	25.0 – 55.0 <sup>(NOTE 3)</sup>		28, 31, 34, 37, 40, 43, 46, 49, 52, 55, 58±0.5 <sup>(NOTE 2)</sup>			
Ⓔ Gap/black mark length	3.0 – 7.0		3.0 – 7.0			—
Ⓕ Distance between the label edge and the backing paper edge	1.5 – 7.0		—			
Ⓖ Effective print width	48.0					
Ⓗ Effective print length	7.0 – 160.0	7.0 – 60.0	7.0 - 500.0			Variable
Ⓘ Margin	1.0 (gap = 7 mm) – 5.0 (gap=3 mm)					—
Outer roll diameter	∅36 (max.)					
Roll direction	Either is acceptable					

#### NOTES:

1. Do not use the media other than the above to ensure print quality and print head life.
2. 28 mm and 31 mm are not applicable to the media rolled outside.
3. This specification is applicable only to the media rolled inside. For the media rolled outside, the specification is 31.0 mm - 55.0 mm.
4. The thermal paper used for direct thermal printing must not have specifications which exceed Ca<sup>++</sup> 800 ppm, Na<sup>+</sup> 800 ppm, K<sup>+</sup> 800 ppm and Cl<sup>-</sup> 600 ppm.
5. Some ink used on pre-printed labels may contain ingredients which shorten the print head's product life. Do not use labels pre-printed with ink which contain hard substances such as carbonic calcium (CaCO<sub>3</sub>) and kaolin (Al<sub>2</sub>O<sub>3</sub>, 2SiO<sub>2</sub>, 2H<sub>2</sub>O).
6. Avoid using media containing SiO<sub>2</sub> or talc, as it will wear the print head protection layer.
7. Relations between media roll length and core diameter.

$$L = \frac{(D^2 - d^2) \times \pi}{4t}$$

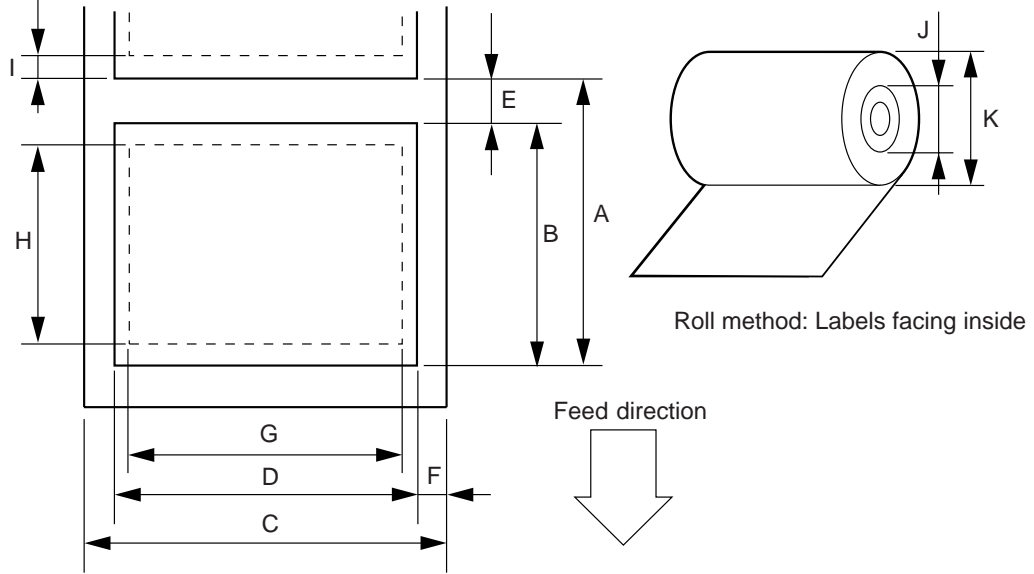
L: Media length

d: Media core outside diameter

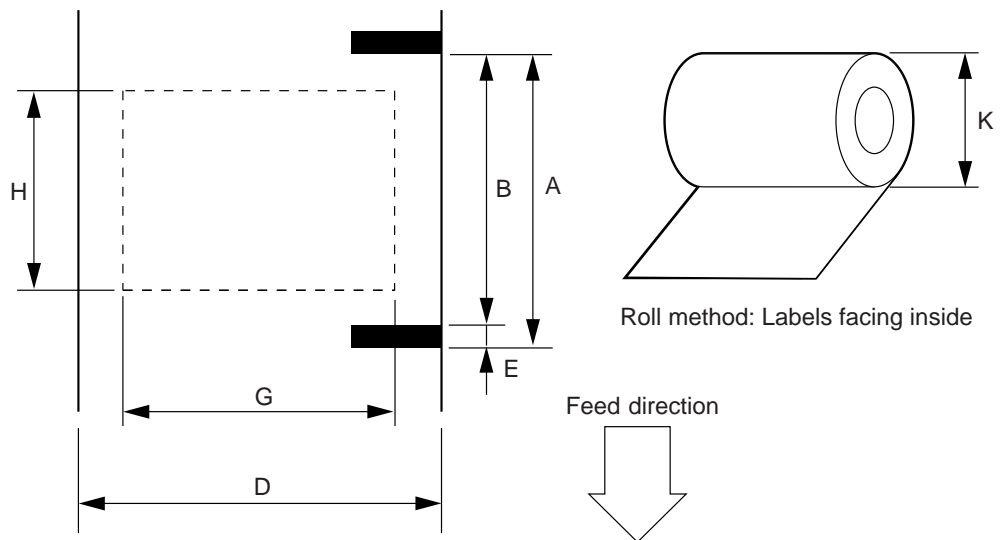
D: Max. roll diameter

t: Media thickness

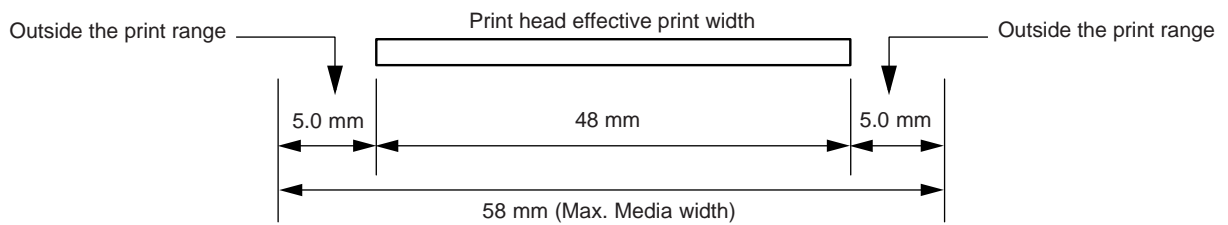
1) Label



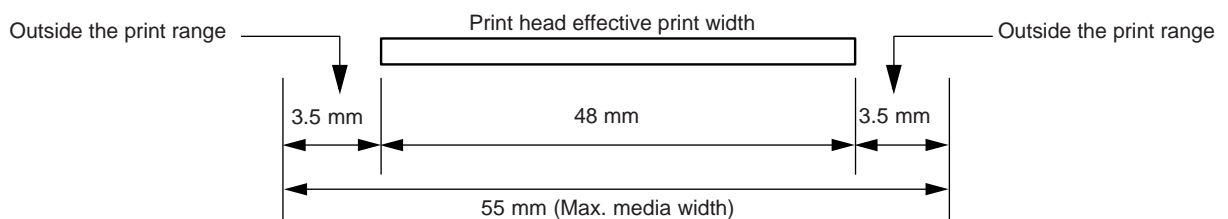
2) Receipt with black marks



3) Relationship between the print head effective print width and paper



(When the two media guides are fitted.)



## 2.2 CARE AND HANDLING OF THE MEDIA

**CAUTION:**

*Be sure to read carefully and understand the Supply Manual. Use only media which meet specified requirements. Use of non-specified media may shorten the print head life and result in problems with bar code readability or print quality. All media should be handled with care to avoid any damage to the media or printer. Read the following guidelines carefully.*

- Do not store the media for longer than the manufacturer's recommended shelf life.
- Store media rolls on the flat end, do not store them on their sides as this might flatten them, causing erratic media advance and poor print quality.
- Store the media in plastic bags and always reseal after opening. If the unprotected media becomes dirty, abrasion from the dust and dirt particles will shorten the print head life.
- Store the media in a cool, dry place. Avoid areas where they would be exposed to direct sunlight, high temperature, high humidity, dust or gas.

For further information please contact your local distributor or your media manufacturer.

### 3. OPTIONAL KIT

Option Name	Type	Use
Battery Charger	B-SP2D-CHG-QM	The battery charger exclusively for the B-SP2D-BT battery pack for the B-SP2D series printer.
5-slot Battery Charger	B-SP2D-CHG5-QM	This battery charger can charge the maximum of 5 battery packs at the same time.
Battery Pack	B-SP2D-BT	Lithium ion battery pack exclusively for the B-SP2D series printer.

#### 3.1 BATTERY CHARGER: B-SP2D-CHG-QM

The specification of this battery charger is as follows:

- (1) Power requirements: 100 to 240V AC, 50/60Hz
- (2) Output voltage: Battery charge terminal:  
8.4V, 0.9A in charge mode, 1 slot
- (3) Application: B-SP2D-BT TEC battery pack
- (4) Operating temperature: 0°C to 40°C (32°F to 104°F)
- (5) Storage temperature: -20°C to 65°C (-4°F to 149°F)
- (6) Dimensions: Approx. 70 mm (W) x 41 mm (H) x 120 mm (D)  
(2.8 x 1.6 x 4.7 inches)including projecting parts
- (7) Weight: Approx. 140g

#### 3.2 LITHIUM ION BATTERY PACK: B-SP2D-BT

The specification of this battery pack is as follows:

- (1) Type: Lithium ion battery
- (2) Voltage: DC7.4V
- (3) Capacity: 1400mAh
- (4) Current consumption: 3A (when the print rate is 30%.)
- (5) Charge/discharge cycle: 300 cycles
- (6) Protection circuit: Overcharge protection (Enclosed cell 4.35±0.05V/cell)  
Over discharge protection (Enclosed cell 2.30±0.15V/cell)  
Short-circuit (over current protection)
- (7) Number of printable labels: 650 pieces/charge (Condition: 25°C, 40-mm long label, 30%-print rate)  
300 pieces/charge (Condition: 8-hour use, 25°C, 40-mm long label, 30%-print rate)



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### 3.3 5-SLOT BATTERY CHARGER: B-SP2D-CHG5-QM

The specification of this 5-slot battery charger is as follows:

#### 3.3.1 Charger

- (1) Power requirements: DC 15V, 3.5A
- (2) Output voltage: Battery charge terminal:  
8.4V, 0.9A in charge mode/1 slot
- (3) Application: B-SP2D-BT TEC battery pack
- (4) Operating temperature: 0°C to 40°C (32°F to 104°F)
- (5) Operating humidity: 25% to 85% (no condensation)
- (6) Dimensions: 310 mm (W) x 41 mm (H) x 110 mm (D)  
(12.2 x 1.6 x 4.3 inches)including projecting parts
- (7) Weight: Approx. 420g (14.8 oz)

#### 3.3.2 AC Adapter

- (1) Power requirements: 100 to 240V AC, 50/60Hz  
183VA or lower (when 4A is output.)
- (2) Output voltage: DC 15V, 4A
- (3) Operating temperature: 0°C to 40°C (32°F to 104°F)
- (4) Operating humidity: 25% to 85% (no condensation)
- (5) Dimensions: 108 mm (W) x 30 mm (H) x 52 mm (D)  
(4.3 x 1.2 x 2.0 inches)
- (6) Weight: Approx. 280g (9.9 oz)