TOSHIBA

TOSHIBA Thermal Printer

B-EX4 T1/T2 SERIES

Product Description

Document No. **SPTM-0152**

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(Revised)

PRINTED IN JAPAN

TOSHIBA TEC CORPORATION

TABLE OF CONTENTS

CAUTION!

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2. *The contents of this manual may be changed without notification.*
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1. OUTLINE

1.1 PRINTER SPECIFICATIONS

1) Various bar codes, characters and graphic data can be printed using both thermal transfer and thermal direct methods. This printer can also print writable characters and logos at designated coordinates by using a graphic command.
2) The USB and LAN interface are available as standard interfaces between the printer and a PC. In addition, optional interfaces such as RS-232C interface, Centronics interface, expansion I/O interface, RTC & USB Host interface and Wireless LAN interface are available.
3) A 32-bit CPU and ASIC equipped with several peripheral LSIs realizes high system performance.
4) With the element positioned at the edge of the print head, print quality is improved because the media passes straight through.
5) The B-EX4 series accommodates a max. printing speed of 14”/sec.
6) High throughput can be obtained with “on-the-fly” formatting.
7) Installation space is minimized because the media is loaded internally.
8) The metal cover and damper provide a heavy-duty enclosure.
9) Various optional devices, including the Strip module including the rewinder, the ribbon saving module which economizes ribbon usage, rotary cutter module, disk cutter module, RFID module, RS-232C interface, Centronics interface, expansion I/O interface, RTC & USB Host interface and Wireless LAN interface are available.

NOTE: *Every size is written in millimeter (mm) in this manual. To obtain the size in inch, divide by 25.4.*

1.2 DESCRIPTION OF MODEL NUMBER

B - E X 4 T 2 - G S 1 2 - QM - R

- Compliance with ROHS
  - R: RoHS compliant model
- Destination Code
  - QM: Global
  - CN: China
  - None: Japan
- Machine Type
  - 2: Oversea Standard Model
  - 5: Japan Model
  - 6: WLAN with CN Model
  - 8: RFID with CN model
- Machine Version
  - 1: Version 1
- Issue mode
  - S: Standard type
  - H: Peel-off type
  - C: Cutter type
- Resolution
  - G: 203dpi
  - T: 305dpi or 300dpi
  - H: 600dpi
- Print head type / Sensor Position
  - 1: Near Edge head / Center
  - 2: Flat head / left side
- Printing method
  - D: Thermal direct
  - T: Thermal transfer and thermal direct
- Printing width
  - 4: 4 inches width
  - 6: 6 inches width

1.3 APPEARANCE AND DIMENSIONS (APPROXIMATE)

1.3.1 Appearance

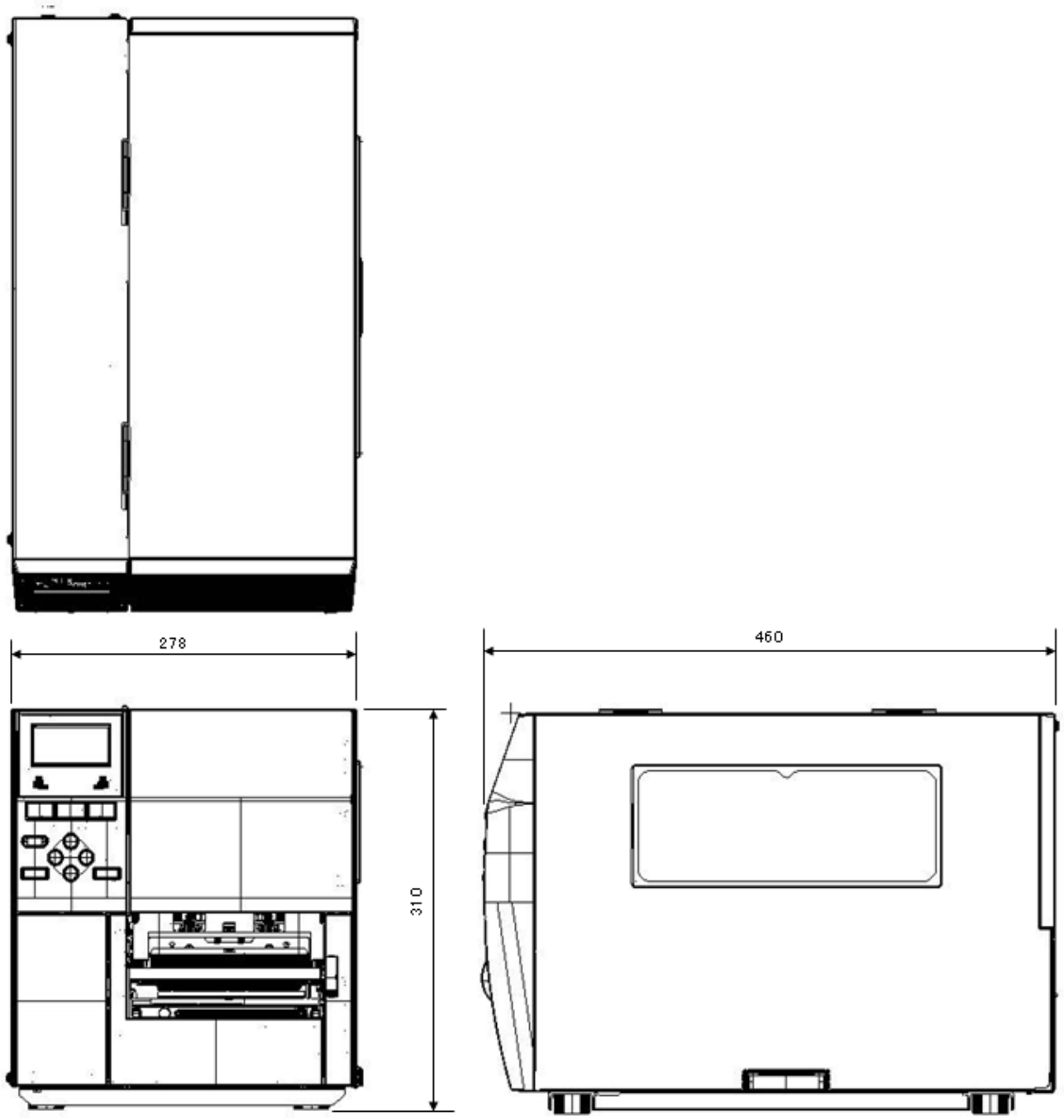
Front drawing

Side drawing

1.3.2 Operation Panel

Key	Function
[FEED]	(1) Feeds one sheet of paper.
	(2) Prints the data in the image buffer on one label according to the system mode setting.
[RESTART]	(1) Resumes printing after a temporary stop of label printing or after an error.
	(2) Places the printer in the usual initial state which is obtained when the power is turned on.
	(3) Switches to user mode.
[PAUSE]	(1) Stops label printing temporarily.
	(2) Programs the threshold values.
[MODE]	(1) Switches to user mode.
[CANCEL]	(1) Clears the job.
[ENTER]	(1) Displays help messages.
[UP]	(1) No function
[DOWN]	(1) No function
[LEFT]	(1) No function
[RIGHT]	(1) Displays help messages.

1.3.3 Dimensions (Approximate)



Color : Metal cover: Cool Black Mold cover: Cool Black
Weight : B-EX4 T2 19.0Kg(acking condition) 17.0Kg(rinter only)
Outside dimension: Width 278mm x Depth 460mm x Hight 310mm

It is based on individual product specifications.

1.4 BASIC SPECIFICATIONS

1) Printing method ..... Thermal direct printing or thermal transfer printing

2) Print head

[GS model]

(1) Total number of dots	832 dots	(3) Effective print width	104.0 mm
(2) Dot density	8 dots/mm	(4) Thermal pitch .....….....	0.125 mm

[TS model]

(1) Total number of dots	1,253 dots	(3) Effective print width	104.0 mm
(2) Dot density	11.8 dots/mm	(4) Thermal pitch .....….....	0.085 mm

[HS model]

3) Print speed

GS model ..... 3”/sec., 6”/sec., 10”/sec. 12”/sec.

TS model..... 3”/sec., 5”/sec, 8”/sec., 10”/sec. 12”/sec.

[HS model]

NOTE: *These print speeds are available when printing ratio is less than 15% of the entire label or tag paper.*

4) Format size (W) x (L)

GS model ..... Max. 104.0 mm x 1500.0 mm

TS model..... Max. 104.0 mm x 1500.0 mm

[HS model]

5) Issue mode ..... Batch
Cut (Option)
Peel-off (Option)

6) Type of bar code/two dimensional code

(1) JAN8, EAN8, JAN13, EAN13, UPC-A, UPC-E
(2) EAN8, EAN13, UPC-A, UPC-E + 2digit
(3) EAN8, EAN13, UPC-A, UPC-E + 5digit
(4) NW-7
(5) CODE39 (STANDARD)
(6) CODE39 (FULL ASCII)
(7) ITF
(8) MSI
(9) CODE93
(10) CODE128
(11) EAN128
(12) Data Matrix
(13) PDF417
(14) QR Code
(15) Industrial 2 of 5
(16) Customer Bar Code
(17) POSTNET
(18) RM4SCC
(Royal Mail 4 State Customer Code)
(19) KIX CODE
(20) Maxi Code
(21) Micro PDF417
(22) CP CODE
(23) GS1 Databer
(The composite is included.)

7) Bar code rotation ..... 0°, 90°, 180°, 270°

8) Type of characters

[GS model]

(1) Times Roman medium (12, 15 point)
(2) Times Roman bold (15, 18, 21 point)
(3) Times Roman Italic (18 point)
(4) Helvetica medium (9, 15, 18 point)
(5) Helvetica bold (18, 21 point)
(6) Helvetica Italic (18 point)
(7) Presentation bold (27 point)
(8) Letter Gothic medium (14.3 point)
(9) Prestige Elite medium (10.5 point)
(10) Prestige Elite bold (15 point)
(11) Courier medium (15 point)
(12) Courier bold (18 point)
(13) OCR-A, B (12 point)
(14) Outline font (Helvetica bold, Helvetica bold proportional, Price Font (1,2,3), Times roman proportional, Pop Proportional, Proportional)
(15) Writable characters (2-byte character is available.)
(16) Gothic 725 black
(17) China font (24x24) for CHINA model only
(18) Mincho font (24x24, 32x32), Gothic font (16x16, 24x24, 32x32, 48x48) for Japan Model

[TS model]

(1) Times Roman medium (8, 10 point)
(2) Times Roman bold (10, 12, 14 point)
(3) Times Roman Italic (12 point)
(4) Helvetica medium (6, 10, 12 point)
(5) Helvetica bold (12, 14 point)
(6) Helvetica Italic (12 point)
(7) Presentation bold (18 point)
(8) Letter Gothic medium (9.5 point)
(9) Prestige Elite medium (7 point)
(10) Prestige Elite bold (10 point)
(11) Courier medium (10 point)
(12) Courier bold (12 point)
(13) OCR-A, B (12 point)
(14) Outline font (Helvetica bold, Helvetica bold proportional, Price Font (1,2,3), Times roman proportional, Pop Proportional, Proportional)
(15) Writable characters (2-byte character is available.)
(16) Gothic 725 black
(17) China font (24x24) for CHINA model only
(18) Mincho font (24x24, 32x32), Gothic font (16x16, 24x24, 32x32, 48x48) for Japan Model

[HS model]

(1) Times Roman medium (8, 10 point)
(2) Times Roman bold (10, 12, 14 point)
(3) Times Roman Italic (12 point)
(4) Helvetica medium (6, 10, 12 point)
(5) Helvetica bold (12, 14 point)
(6) Helvetica Italic (12 point)
(7) Presentation bold (18 point)
(8) Letter Gothic medium (9.5 point)
(9) Prestige Elite medium (7 point)
(10) Prestige Elite bold (10 point)
(11) Courier medium (10 point)
(12) Courier bold (12 point)
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(17) China font (24x24) for CHINA model only
(18) Mincho font (24x24, 32x32), Gothic font (16x16, 24x24, 32x32, 48x48) for Japan Model

9) Character code
(1) PC-850 (2) PC-8 (3) PC-852 (4) PC-857 (5) Arabic (6) LATIN 9 (7) PC-1257 (8) PC-1254 (9) PC-1253 (10) PC-1252 (11) PC-1251 (12) PC-1250 (13) PC-855 (14) PC-851 (15) UTF-8 (16) PC-866

10) Character magnification
(1) Regular font: 0.5 ~ 9.5 times (magnified by 0.5 times in each direction)
(2) Outline font: 2.0 ~ 150.0 mm (magnified 0.1 mm in each direction)

NOTE: *When the outline font size is large, the ribbon may wrinkle according to the quality of the ribbon or print tone.*

11) White or black background all types of characters are available.

12) Character rotation ..... 0°, 90°, 180°, 270°

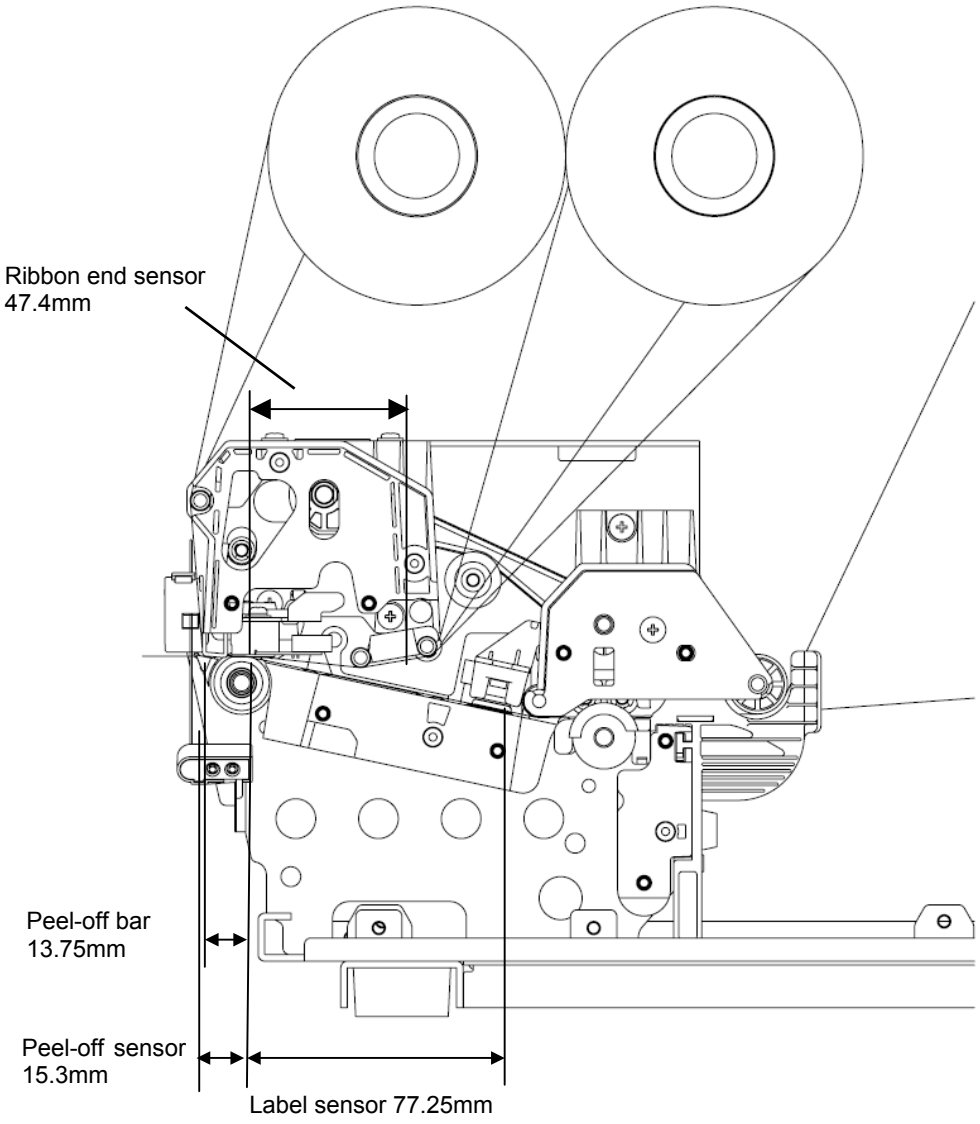
13) Character strings rotation ..... 0°, 90°, 180°, 270°

14) Type of line
(1) Horizontal line (2) Vertical line (3) Slant line (4) Square (5) Rounded Rectangle (6) Circle

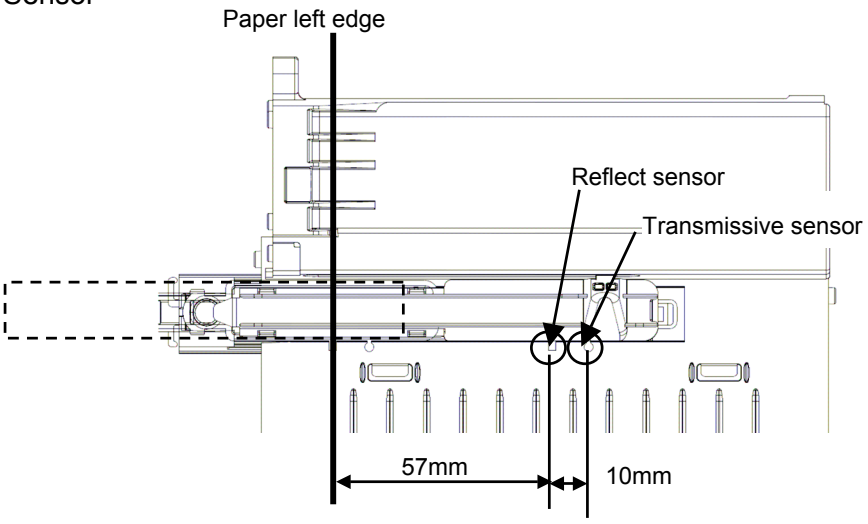
15) Line Width ..... 0.1 to 0.9 mm can be specified (in unit of 0.1 mm)

16) Mechanism

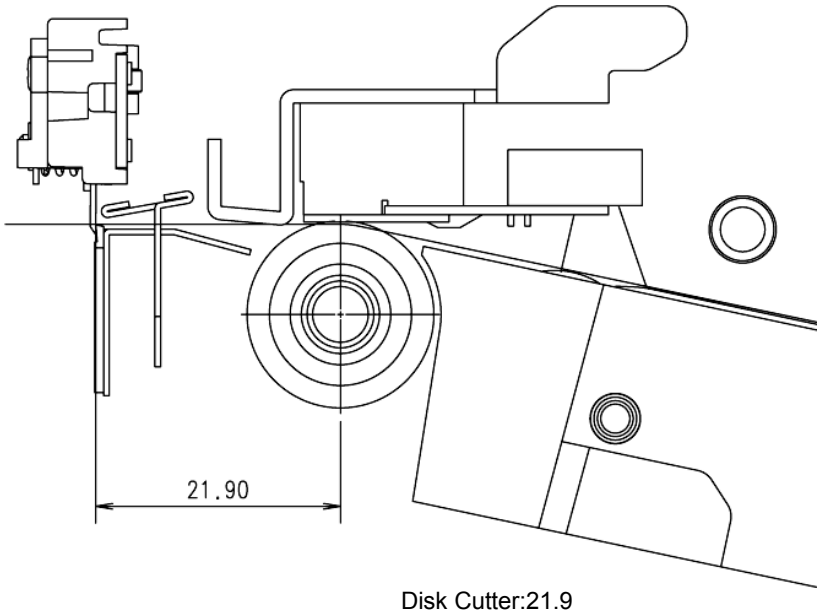
(1) Mechanism



(2) Paper Sensor



(3) Cutter mechanism
When the cutter module is installed, the backing paper of the label stock or tag paper is cut individually.
Disk cutter: Stop and cut



Disk Cutter:21.9

Item			Specification
Cutter type			DISK CUTTER
Possible cut size	Paper width		30.0mm -
	Cut length	Tag	25.4- 500mm (T.B.D)
		Label	38.0 - 1500mm (T.B.D)
	Thickness		80 - 170µm(T.B.D)
Cutter life			1,000,000 cut (160µm tag) (T.B.D)

* Cutter life is confirmed by using same width paper.

17) Power supply
CN model: AC220 - 240 V ±10%, 50Hz
QM model: AC100 - 240 V ±10%, 50/60Hz

			Global(QM)	China(CN)
Input voltage/frequency			AC100V-240V ±10% 50-60Hz	AC100V-240V ±10% 50Hz
AC cord			Not include	Not include
Power supply specification	Rush current		100V: 22A 240V: 71A	240V: 71A
			In order to exceed 10A, explane to users set up exclusive plug socket.	
	Power consumption	Sleep (Factory inital)	5.7W 0.09A	5.7W 0.09A
		Stand-by (Maximum)	Less than 8W (Print ready) Less than 15W (Option full-operating)	
		Operation *1	157.34W 2.0A-0.7A	157.34W 2.0A-0.7A
	Energy star appliance		Yes	

*1 An operation is a power consumption at the time of a 20% slant line.
(It is based on a specification test format.)

18) Current consumption

[B-EX4T2]

	QM-R & CN-R model (100V)	QM-R & CN-R model (240V)
Printing	166.31W,1.6888A	157.34W, 0.7147 A
Sleep mode	4.5W, 0.0893A	5.7W, 0.0861A

NOTES:
Be sure to provide an exclusive AC outlet for this machine. (This is 20% slant line print)
Energy Star Program appliance

19) Rush current

QM model: 100V: 22.1A, 240V: 70.6A

1.5 ELECTRONICS SPECIFICATIONS

1) CPU R8A77211C133BGV

2) Memory
   (1) Program .....2 x 16MB Flash ROM
   (2) Image buffer + Work.....2 x 16MB SDRAM

Model	Hardware			
	Flash ROM	SDRAM	Font ROM	Type Font
B-EX4T2-GS12-QM-R	16MB	32MB	None	
B-EX4T2-TS12-QM-R				
B-EX4T2-HS12-QM-R				
B-EX4T1-GS12-CN-R			8MB	Simplified Chinese
B-EX4T1-TS12-CN-R				
B-EX4T1-HS12-CN-R				

3) Interface
   (1) USB
      1) Standard: USB V2.0
      2) Transfer mode: Control transfer, Bulk transfer
      3) Transfer rate: Full speed (12M bps)
      4) Class Printer class
      5) USB interface Connector: USB-Type B
         Power: Self-power
      6) USB cable Type-A and Type-B cable of USB V2.0

   (2) Wired LAN
      1) Standard: IEEE802.3
      2) Protocol: Physical layer: 10BASE-T, 100BASE-TX
         Auto negotiation 10/100Mbps. Full/Half, Duplex
         Data link layer: CSMA/CD
         Network layer: IP, ICMP, ARP
         Transport layer: TCP, UDP
         Application layer: Server: LPR, SOCKET, HTTP, FTP
         lient: POP3, SMTP, DHCP, WINS
         Agent: SMMP
      3) Network interface: Connector RJ-45

   (3) RS-232C interface (Option)
      1) Communication mode: Full-duplex
      2) Transmission speed: 2400,4800,9600,19200, 38400, 115200 bps (selectable)
      3) Asynchronous communication method
      4) Transmission parameter
         * Parity: None, EVEN, ODD
         * Start bit: 1-bit
         * Stop bit: 1-bit or 2-bit
         * Word length: 7-bit or 8-bit
      5) Error detection
         * Parity check: VRC (Vertical Redundancy Checking)
         * Framing error: This error occurs when no stop bit is found in the frame specified starting with the start bit.
      6) Data entry code: ASCII, 8-bit code for European characters, 8-bit code for graphic
      7) Receiving buffer: B-EX4T: 6MB

8) Protocol

* XON/XOFF (DC1/DC3) protocol
  - When initialized after power on, this printer becomes ready to receive data and sends an XON code (11H). (Transmission or non-transmission of XON code is selectable by means of the parameter setting.)
  - The printer sends an XOFF code (13H) when the free area in the receive buffer becomes 10K Bytes or less.
  - The printer sends an XON code (11H) when the free area in the receive buffer are 512KB or more.
  - When there is no free area in the receive buffer, the printer discards received data which exceeds the receive buffer capacity without storing it in the buffer. (After detecting the XOFF code, the host computer must stop transmission before the printer receive buffer becomes full.)
  - The printer sends an XOFF code (13H) at power off time. (Transmission or non-transmission of XOFF code is selectable with the parameter setting.)
  - The DTR signal is always “High” level (Ready).
  - The RTS signal is always “High” level (Ready).

* READY/BUSY (DTR) protocol
  - When initialized after power on, this printer becomes ready to receive data and converts the DTR signal to "High" level (READY).
  - The printer converts the DTR signal to "Low" level (BUSY) when the free area in the receive buffer amount to 10K bytes or less.
  - The printer converts the DTR signal to "High" level (READY) when the free area in the receive buffer amount to 512KB or more.
  - When there is no free area in the receive buffer, the printer discards received data which exceeds the receive buffer capacity without storing it in the buffer. (After detecting a BUSY signal, the host computer must stop transmission before the printer receive buffer becomes full.)
  - The RTS signal is always “High” level.

* XON/XOFF (DC1/DC3) protocol + READY/BUSY (DTR) protocol
  - When initialized after power on, this printer becomes ready to receive data and converts the DTR signal to "High" level (READY). The printer sends an XON code (11H).
  - When the free area in the receive buffer are 10K bytes or less, the printer converts the DTR signal to "Low" level (BUSY) and sends an XOFF code (13H).
  - When the free area in the receive buffer are 512KB or more, the printer converts the DTR signal to "High" level (READY) and sends an XON code (11H).
  - When there is no free area in the receive buffer, the printer discards received data which exceeds the receive buffer capacity without storing it in the buffer. (After detecting the XOFF code or BUSY signal, the host computer must stop transmission before the printer receive buffer becomes full.)
  - The printer sends an XOFF code (13H) at power off time.
  - The RTS signal is always “High” level.

* READY/BUSY (RTS) Protocol
  - When initialized after power on, this printer becomes ready to receive data and converts the RTS signal to "High" level (READY).
  - The printer converts the RTS signal to “Low” level (BUSY) when the free area in the receive buffer amount to 10K bytes or less.
  - The printer converts the RTS signal to “High” level (READY) when the free area in the receive buffer amount to 512KB or more.
  - When there is no free area in the receive buffer, the printer discards received data which exceed the receive buffer capacity without storing it in the buffer. (After detecting a BUSY signal, the host computer must stop transmission before the printer receive buffer becomes full.)
  - The DTR signal is always “High” level (READY).
  - The host should keep the DSR signal “High” level.

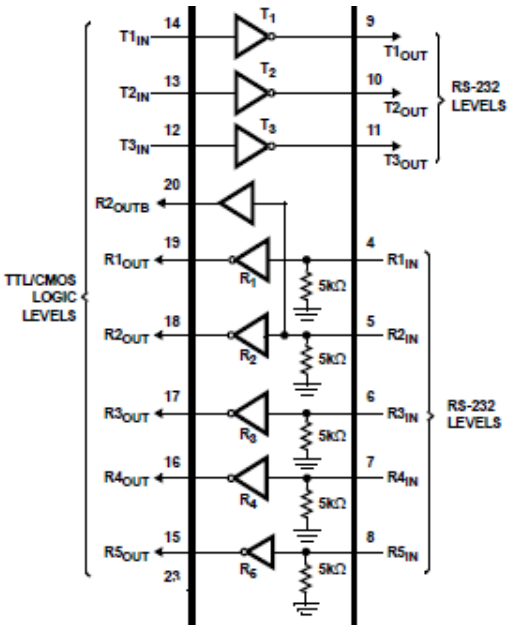
NOTE: *Be sure to select the READY/BUSY (RTS) protocol when controlling the flow between the Windows. Also, be sure to select “Hardware” for the flow control in the Windows communication port setting.*

9) Pin description

Pin No.	Signal	I/O	Description
1	FG (Frame Ground)	---	Ground line for circuit protection.
2	RD (Received Data)	Input	Data line from which the printer receives data from the host (receive data line). Logic “1” is “Low”, and “0” is “High”. It is LOW (MARK) while no data is being sent.
3	TD (Transmit Data)	Output	Data line from which the printer sends data to the host (send data line). Logic “1” is “low”, and “0” is “High”. It is LOW (MARK) while no data is being sent.
4	CTS (Clear to Send)	Input	Input signal from the host. This printer ignores this signal.
5	RTS (Request to Send)	Output	Output signal to the host. When READ/BUSY (RTS) protocol is selected, this signal means READY to receive data. When the receive buffer is nearly full, the signal turns to “Low”, and “High” when nearly empty. In case of other protocol is selected, this signal is always “High” level after the power is turned on.
6	DTR (Data Terminal Ready)	Output	Output signal from the printer. When READY/BUSY (DTR) or XON/XOFF (DC1/DC3)+READY/BUSY (DTR) is selected, this signal means READY to receive data. When the receive buffer is nearly full, the signal turns to “Low”, and “High” when nearly eimpty. In case of XON/XOFF (DC1/DC3) or READY/BUSY (RTS), this signal is always “High” level after the power is turned on.
7	SG (Signal Ground)	---	Ground line for all data and control signals.
20	DSR (Data Set Ready)	Input	Input signal from the host. It must be “High” for the printer to receive data.

10) Interface circuit

* Circuit



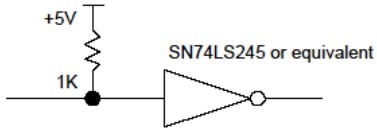
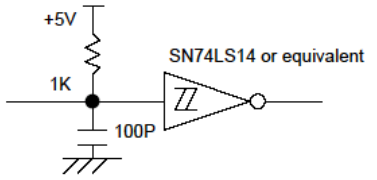
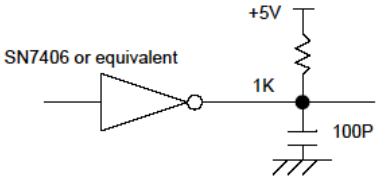
* Signal level

Input voltage: "H" .. +2.4 V to + 25V
"L" ... –25V to 0.6V

Output voltage: "H" = MIN +5.0V, Typ. +5.4V
"L" = MIN -5.0V, Typ. -5.4V

(4) Centronics interface (Option)

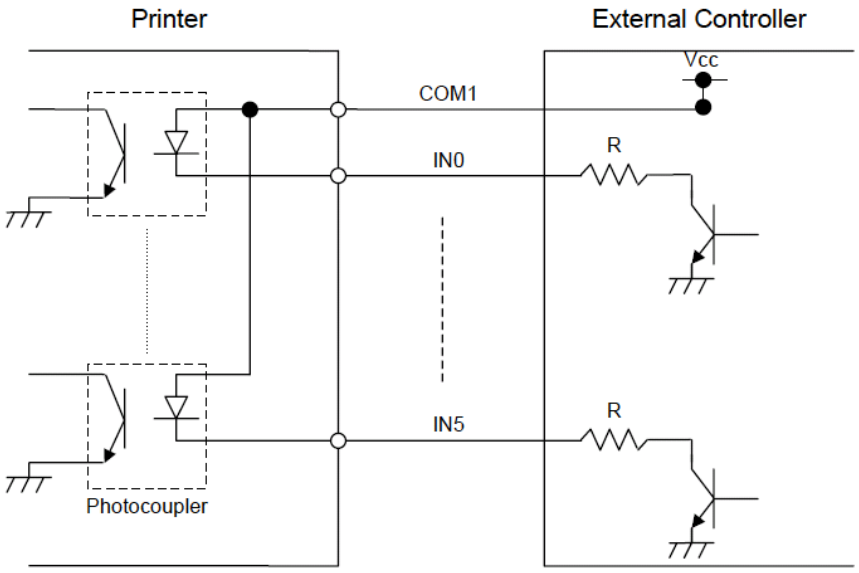
1) Data input method: 8-bit parallel (DATA 1 to 8)
2) Control signals
   SPP mode: nStrobe, nAck, Busy, PError, Select, nAutoFd, nInit, nFault, nSelectIn
   Nibble mode: HostClk, PtrClk, PtrBusy, AckDataReq, Xflag, HostBusy, nInit, nDataAvail, IEEE1284Active
3) Data input code: ASCII, JIS 8-bit code for European characters, 8-bit code for graphic
4) Receiving buffer: 6MB (Max. 65536 lines)
5) Input/Output circuit configuration and Input/Output conditions

	Signal	Configuration	
Input	DATA1 ~ 8		Logic level (Input) "1" = 2 ~ 5 V "0" = 0 ~ 0.4 V
	nStrobe/HostClk/HostClk nInit/nInit/ nReverseRequest nAutoFd/HostBusy/ HostAck nSelectIn/IEEE1284Active/ IEEE1284Active		
Output	Busy/PtrBusy/PeriphAck nFault/nDataAvail/ nPeriphRequest nAck/PtrClk/PeriphClk Select/Xflag/XFlag PError/AckDataReq/ nAckReverse		Logic level (Input) "1" = 2.4 ~ 5 V "0" = 0 ~ 0.4 V

Connector

	Amp. Japan 552742-1 or equivalent
Printer side:	DDK 57RE-40360-73B or equivalent
	Amp. Japan 552470-1 or equivalent
Cable side:	DDK 57E-30360 or equivalent

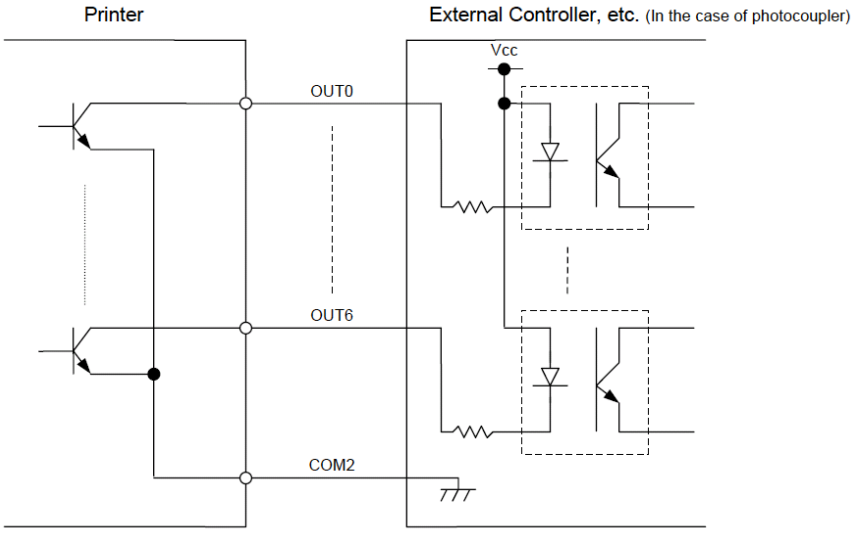
(5) Expansion I/O interface (Option)
Interface circuit
* Input circuit



Photocoupler: TLP521 (TOSHIBA)

There are 6 input circuits, and each input is a current loop using the photo coupler. The anode of the photo coupler of each circuit is connected to the common pin COM 1. The cathodes are independent. The voltage of Vcc is 5 to 24 V, while the diode operating current is 16 mA (average).

* Output circuit



There are 7 output circuits, and each output is an open collector. The voltage of Vcc is 5 to 24 V, while the drive current is 150 mA (max.).
For other details, please refer to the Expansion I/O specifications stored in the enclosed CD-ROM or posted on the web site with the URL, http://barcode.toshibatec.co.jp.

(6) USBH (Option)

1)	Standard:	USB V2.0
2)	Transfer mode:	Control transfer, Bulk transfer
3)	Transfer rate:	Full speed (12M bps)
4)	USB interface	Connector: USB-Type A Power supply specification: 500mA output

(7) Wireless LAN (Option)

1)	Standard:	IEEE802.11b/g
2)	Protocol:	Physical layer: 802.11b/g Date link layer: CSMA/CA Network layer: IP, ICMP, ARP Transport layer: TCP, UDP Application layer: Server: LPR, SOCKET, HTTP, FTP Client: POP3, SMTP, DHCP, WINS Agent: SNMP Security: IEEE802.11i Encryption: WEP (64/128bit), TKIP (WPA), AES (WPA2) Authentication: Shared key (for WEP), PSK, PEAP, TLS, TTLS, MD5, LEAP, EAP-FAST
3)	Communicable distance:	Class1, 100m (When there is no obstacle), 360 deg. (depending on conditions)
4)	Antenna:	Built-in (Not available for external antenna)
5)	Certification:	WiFi, CCX V3, V4

4) Sensor/switch

Transmittive sensor	Transmittive (Movable/Adjustable)
Refrective sensor	Refrective (Movable/Adjustable)
Outer temperature sensor	Detect range: 0 to 70°C
Head temperature sensor	Detect range 0 to 80°C
Head up sensor	Optical slit sensor
Ribbon rotation detect sensor	Optical slit sensor (Ribbon diameter detection for rewinder, back tension block)
Ribbon end sensor	Refrective (Detect silver area of ribbon end tape)

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 and ribbon are described in Supply Manual by model. It is issued by and sent from TOSHIBA TEC H.Q (Sales Division) upon release of new model or manual's revision. When purchasing the supplies locally, be sure to refer to the Supply Manual for details. Use of non-specified media may shorten the print head life and result in problems with bar code readability or print quality. Be sure to read carefully and understand the Supply Manual since it also includes the details about notes, precision of the print start position, limitations on printing, etc. When selling the products to VARs, instruct them to buy media and ribbons that the substances described in the following precautions are not included.

2.1 MEDIA (Paper)

2.1.1 Types of paper

Two types of paper are available, labels and tags, each being further divided into the direct thermal type and thermal transfer type. The approved paper must be used.

Use of any non-approval paper may cause problems.

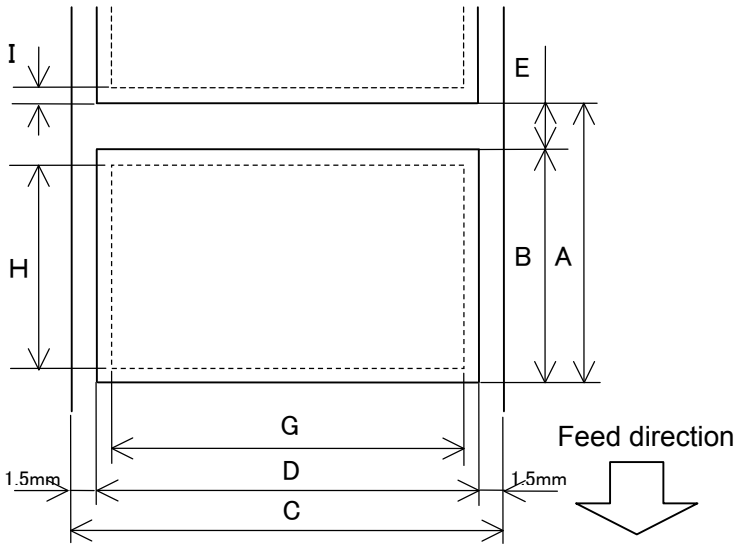
2.1.2 Paper Size and Shape

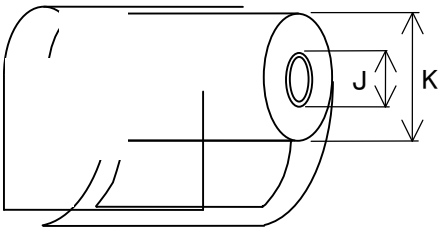
Item				B-EX4T2								
Thermal head density				8dots/mm (203dpi)			11.8dots/mm (300dpi)			23.6dots/mm (600dpi)		
Thermal head width				104.0mm			108.416mm			105.58mm		
Contents		Issue type		Batch	Strip *Note1	Disc Cutter	Batch	Strip *Note1	Disc Cutter	Batch	Strip	Disc Cutter
A:	Paper Pitch	Label	Min.	10.0	25.4	25.4	10.0	25.4	25.4	8.0	25.4	25.4
			Max.	1500.0	256.0	1500.0	1500.0	256.0	1500.0	500.0	256.0	500.0
		Tag	Min.	10.0	—	25.4	10.0	—	25.4	10.0	—	25.4
			Max.	1500.0	—	1500.0	1500.0	—	1500.0	500.0	—	500.0
B:	Paper length	Min.		8.0	23.4	23.4 *Note2	8.0	23.4	23.4 *Note2	6.0	23.4	23.4 *Note2
		Max.		1498.0	254.0	1494.0	1498.0	254.0	1494.0	498.0	254.0	494.0
C:	Tag width Backing paper width	Min.		30.0	50.0	30.0	30.0	50.0	30.0	30.0	50.0	30.0
		Max.		114.0			114.0			114.0		
D:	Label width	Min.		27.0			27.0			27.0		
		Max.		111.0			111.0			111.0		
E:	Label-to-label gap	Min.		2.0		6.0	2.0		6.0	2.0		6.0
		Max.		20.0			20.0			20.0		
F:	Black mark length	Min.		2.0			2.0			2.0		
		Max.		10.0			10.0			10.0		
G:	Max. effective print width	Max.		104.0 +-0.2			104.0 +-0.2			104.0 +-0.2		
H:	Effective print length	Label	Min.	6.0	21.4	21.4	6.0	21.4	21.4	6.0	21.4	21.4
			Max.	1496.0	252.0	1492.0	1496.0	252.0	1492.0	496.0	252.0	492.0
		Tag	Min.	8.0	—	21.4	8.0	—	21.4	8.0	—	21.4
			Max.	1498.0	—	1498.0	1498.0	—	1498.0	498.0	—	498.0
I:	Slow-up and down area (Un-print area)	Slow-up		1.0			1.0			1.0		
		Slow-down		1.0			1.0			1.0		
J:	Paper thickness	Min.		0.13			0.13			0.13		
		Max.		0.17			0.17			0.17		
K:	Max. on-the-fly printing length			749.0			749.0			249.0		
L:	Max. paper roll diameter			φ200 (Using external rewinder φ180)			φ200 (Using external rewinder φ180)			φ200 (Using external rewinder φ180)		
M:	Paper winding direction			Inside the printing side (STD.)			Inside the printing side (STD.)			Inside the printing side (STD.)		
N:	Paper core			Inside diameter φ76.2±0.3			Inside diameter φ76.2±0.3			Inside diameter φ76.2±0.3		

**Note1: When using the peel-off at 12"/sec or more for 203dpi model, issue at 10"/sec.*
When using the peel-off at 10"/sec or more for 300dpi model, issue at 8"/sec.

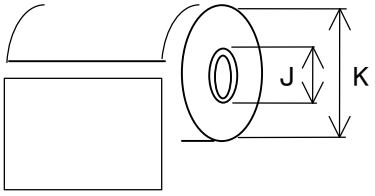
**Note2: When using the disk cutter, the label length must meet the following condition:*
Label length ≧ 18.0mm - (Gap length/2).

<Labels>



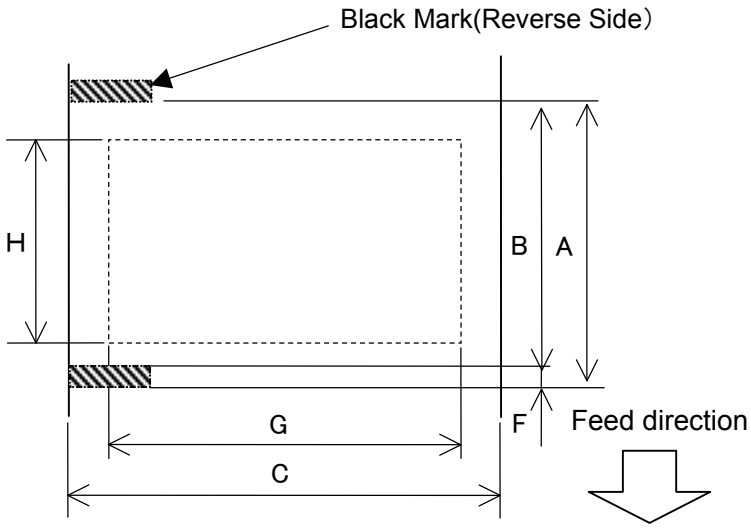


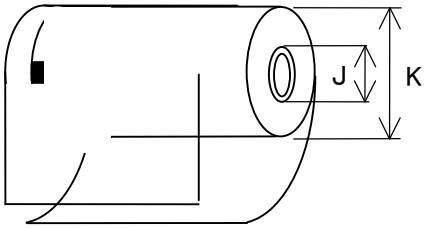
Roll method: Labels facing inside



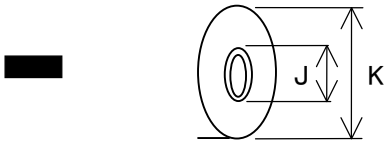
Roll method: Labels facing outside

<Tags>





Roll method: Tag facing inside

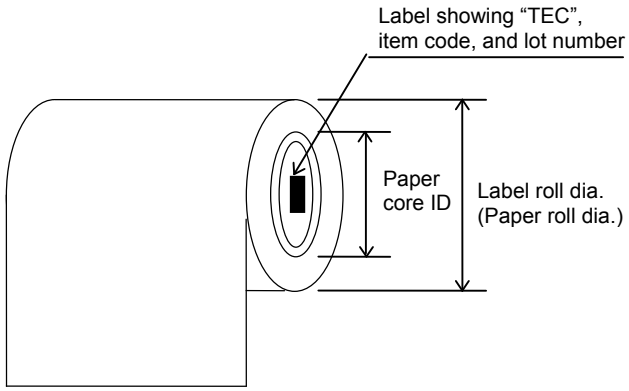


Roll method: Tags facing outside

NOTES:

1. *For label issues, set the head lever to position ①LABEL.*
2. *For tag issues, set the head lever to position ②TAG.*
3. *When using narrow paper, may need to set the head lever to position ②TAG, or need to adjust the right head pressure.*
4. *The ratio of "Label length" to "Gap length" must be 3:1 or more.*
5. *The backing paper is approved together with label.*
6. *The paper width for the label includes its backing paper.*
7. *The backing paper to be used must be glassine paper (white or 7K) or equivalent, and must have a transmission factor of 22% or more.*
8. *A label showing "TEC", item code, and lot number must be attached to the paper core inside.*

For reference;
Relationship between Paper Roll Length and Paper Core Diameter



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

L: Paper length
D: Paper roll diameter
d: Paper core outside diameter
t: Paper thickness

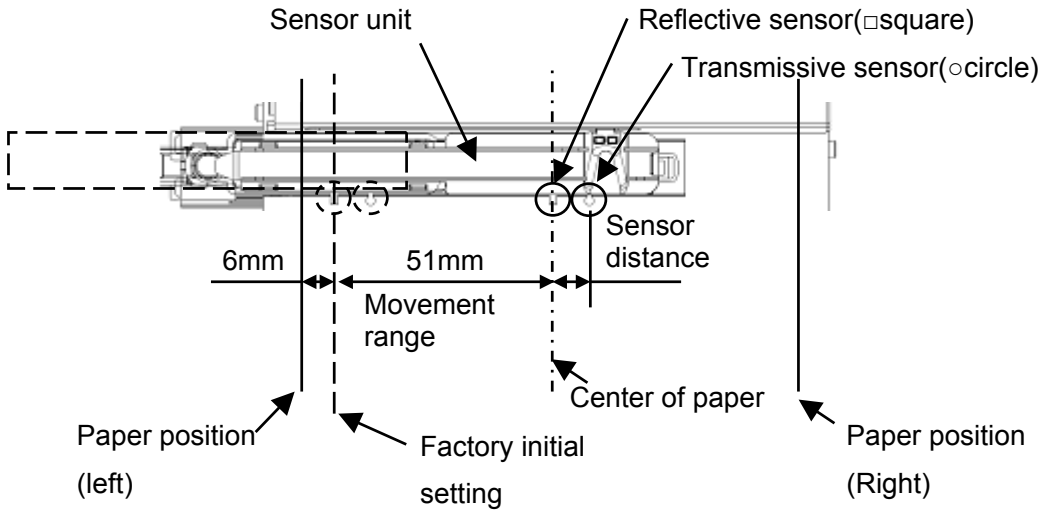
In calculation, the unit of each factor must be the same.

9. *In the cut issue mode, the backing paper of labels (the gap between labels) can be cut. The label itself cannot be cut. When the perforated label is used, it is necessary to test and confirm the cutting performance beforehand.*
10. *In the cut issue mode, the gap length must be 6 mm or more, and the cut position must be adjusted so that the cutter cuts in the center of the gap.*
11. *When the stop position is not proper, the print stop position should be changed by the strip position fine adjustment.*
12. *When the gap between labels is 5 mm or more, the effective print length should be set to the maximum value (Label pitch minus 2 mm), then the print stop position should be changed by the strip position fine adjustment.*
13. *When the rotary cutter is used, a cut and issue should be performed with the head-up operation being activated by using ribbon save unit together.*
14. *If paper is jammed at the platen when cut issue is performed, enable the forward feed function ("FORWARD WAIT") in system mode.*
15. *When the paper thickness is more than 200 µm, the print head installation position may need to be changed.*

2.1.3 Detection Area on Labels and Tags

2.1.3.1 Sensor position

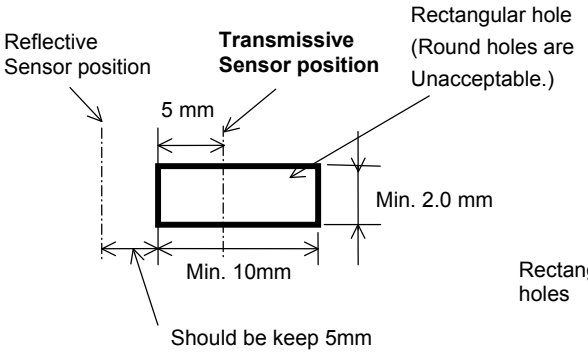
The sensor is movable in the range from the center of the paper to the left end.
Transmissive sensor and Reflective sensor are moving from side to side at same time each sensor unit.



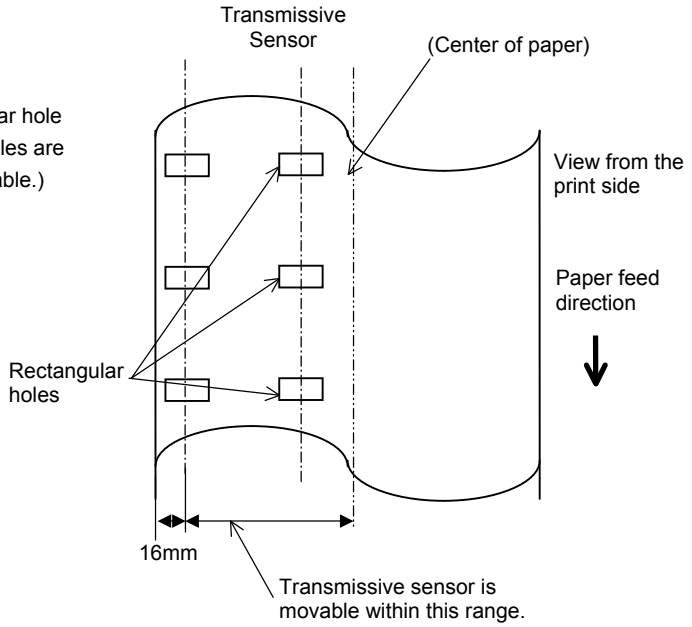
2.1.3.2 Detection Area of Transmissive Sensor

<Tags>

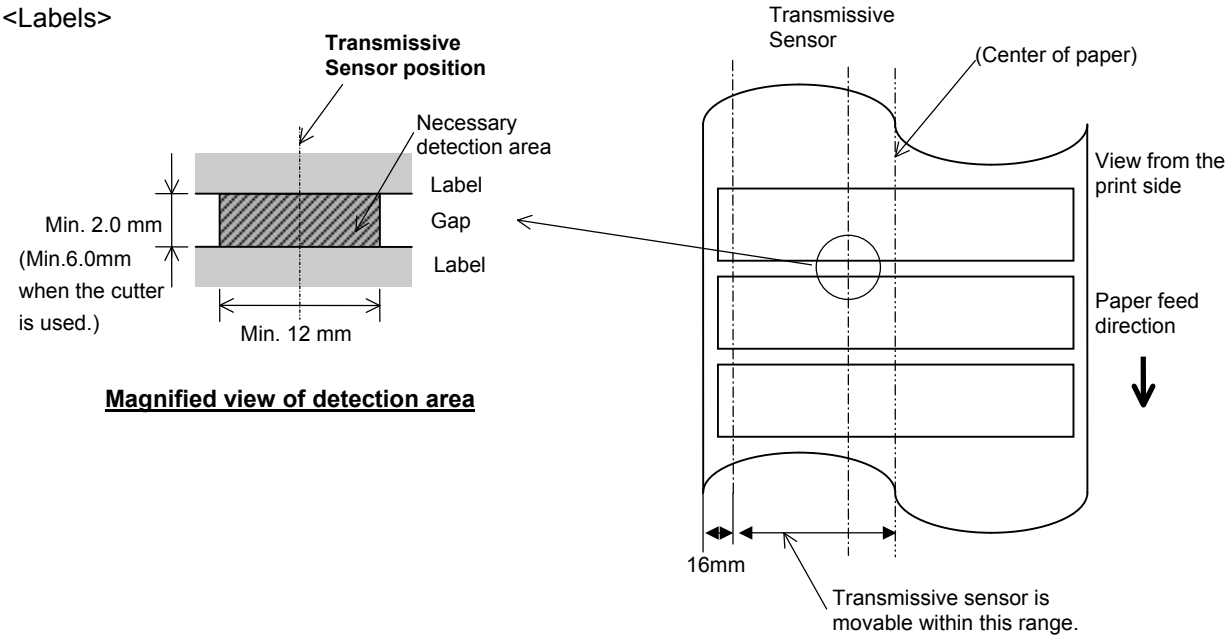
Detection of hole



Magnified view of detection area

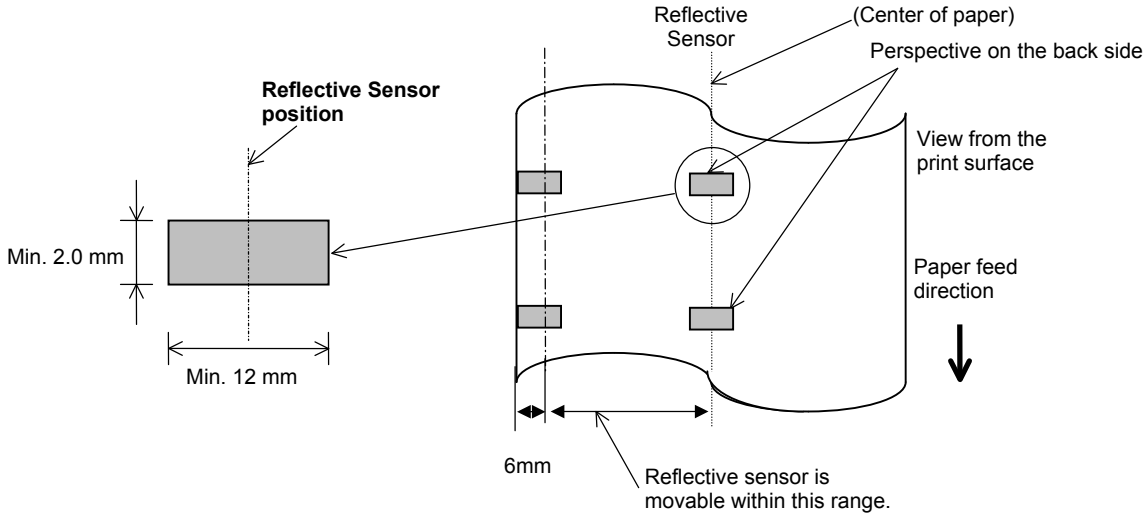


<Labels>



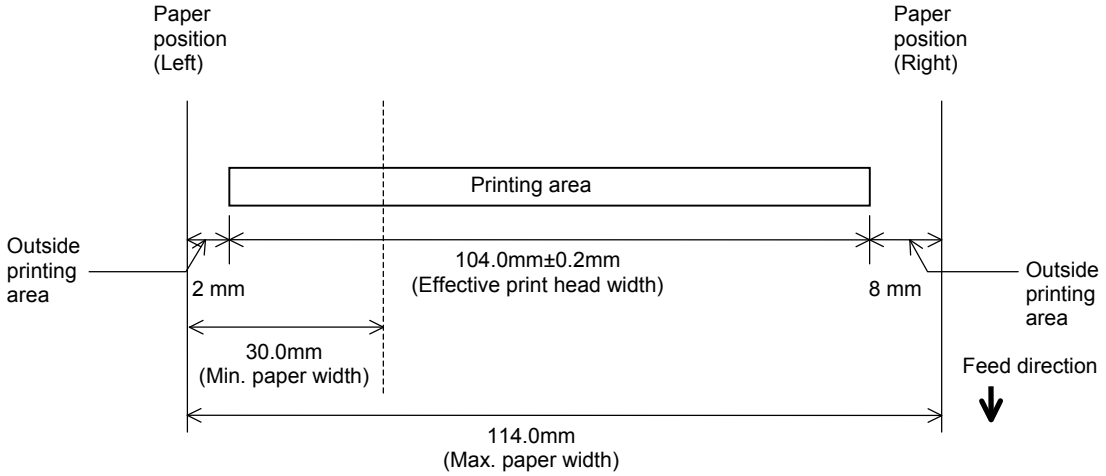
2.1.3.4 Detection Area of Reflective Sensor

1. The sensor is movable in the range from the center of the paper to the left end. (For detail, refer to 2.3.1)
2. The reflectance of the black mark must be 10% or less with a waveform length of 950 nm.
3. The sensor detects at the center of the black mark.
4. The black marks, if necessary, must be printed on the labels in the gap areas. (See (5) in section 2.4.4.)
5. Rectangular holes can substitute the black marks, on the condition that nothing is printed on the back side. Round holes cannot be detected by the reflective sensor.

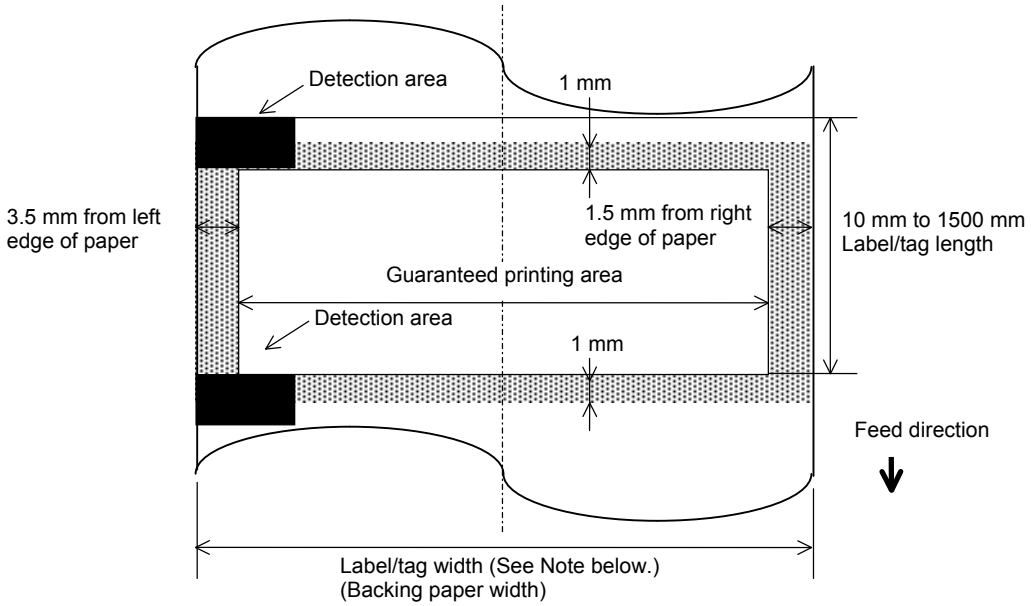


2.1.4 Effective Print Area of Paper

2.1.4.1 Relationship between Print Head Effective Print Width and Paper Width



2.1.4.2 Effective Print Area of Tags and Labels



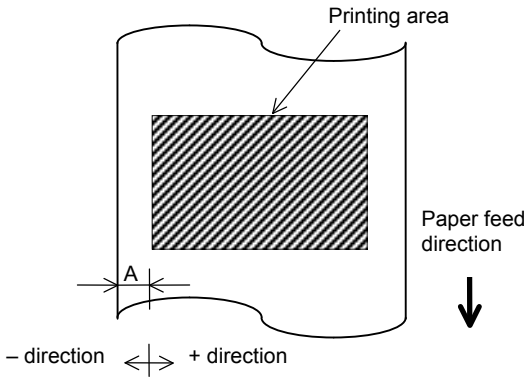
NOTES:

1. *Print quality in the shaded area is not guaranteed. For the label, printing in the 1-mm width area around the label is not guaranteed as well as the shaded area shown above.*
2. *This printer paper set position is left side,*
   The center of the paper (label and tag) is not almost aligned with the center of the print head.
3. *<u>If printing is performed in the shaded area, the ribbon may wrinkle. This may affect the print quality of the guaranteed printing area.</u>*

2.1.4.3 Print Position Misalignment

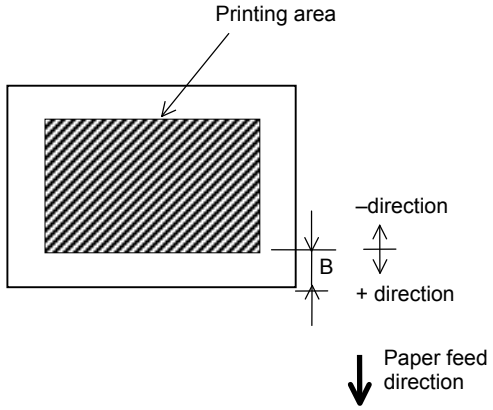
(1) Horizontal(Meandering)
Horizontal misalignment due to repetition:
A = ±1.0 mm

To determine the reference value for A, make a print test 10 times or more using the specified label or tag, and adjust the print position using the average value of the variations to the programmed print position.



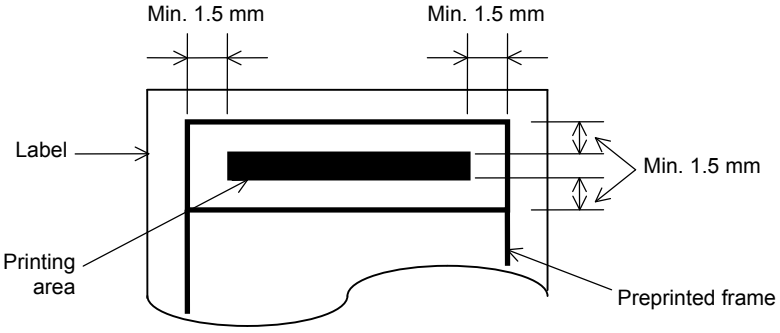
(2) Vertical (Feed Direction)
Vertical misalignment due to repetition: B
B = ±1.0 mm

To determine the reference value for B, make a print test 10 times or more using the specified label or tag, and adjust the print position using the average value of the variations to the programmed print position. B has a ±3% variation to the programmed value.



Precaution for Preprinting
Preprinting should be performed in the area at least 1.5 mm from the printing area, taking the print position variation into consideration.

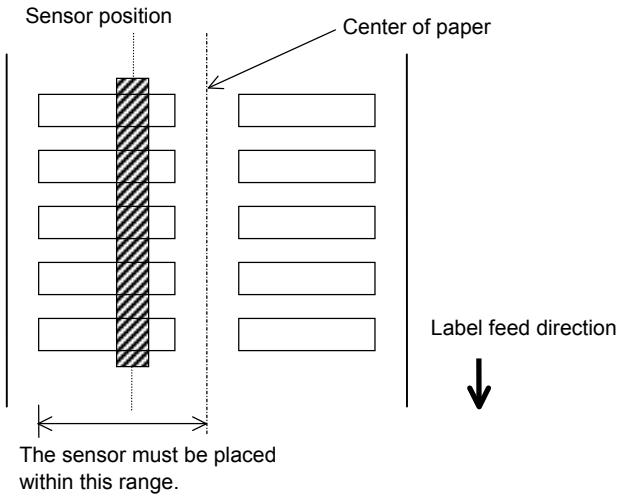
(Example)



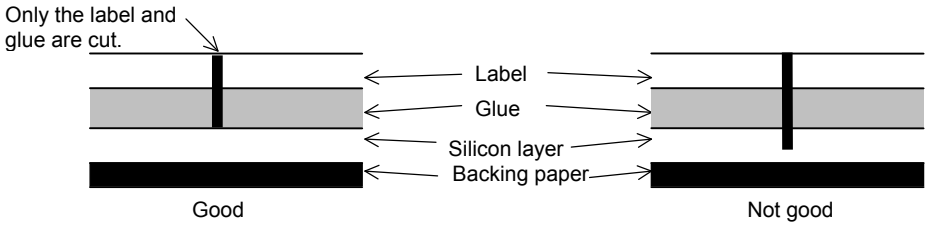
2.1.4.4 Suggestions for Designing Labels

(1) Multiple-piece Labels

To properly detect each label by the transmissive sensor, the necessary detecting area that is specified in section 2.3.1 should be provided. At the same time, the shaded area shown below must be non-transmissive, excluding the necessary detecting area.

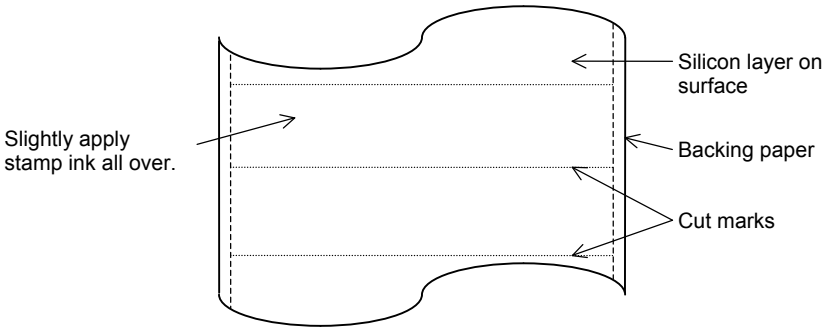


(2) Use a label of which silicon layer at the die-cut part is not damaged.



[Judgment Method]

Remove some labels from the backing paper, slightly apply stamp ink all over the backing paper surface. Judge the cut condition by observing the darkness of the ink.



The stamp ink will enter into the cut marks, and label shapes will emerge.

① If the back of the backing paper is saturated with ink, this means the silicon layer is damaged. The label is unacceptable.

② If the darkness of the cut marks is clearly uneven, the label is unacceptable.

③ If the entire cut marks look light, the label is acceptable.

(3) Perforation

Labels and tags must always be perforated from the printing side.
Note) At present time, Fanfold paper has not been certified.
If using Fanfold paper, paper retainer should be required.

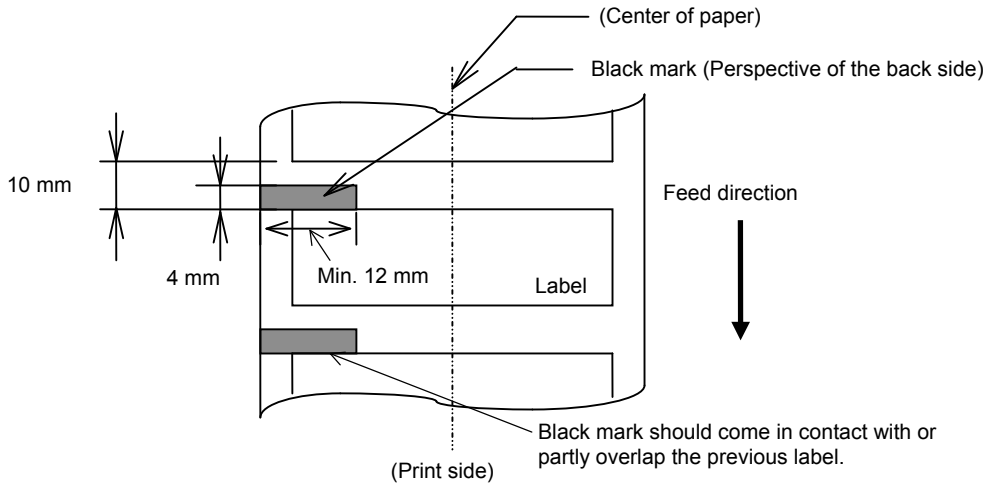
(4) Preprinting

The print head may be abnormally worn depending on the ink to be used. Ink which do not contain materials of high hardness, such as, calcium carbonate and kaolin, should be used for preprinting.

(5) Printing Black Marks on the Label

The black marks should be printed on the back of the gaps.
The black marks should be positioned so that they come in contact with or partly overlap the previous label. (See the figure below.)

(Example) Gap length: 10 mm
Black mark: 4 mm



2.1.5 Approved Paper

Type		Item Code	Manufacturer Type No.	Paper Thickness (µm)	Manufacturer	Remarks
Label	Direct thermal type		150LA-1P	82	RICOH	
	Thermal transfer type		Vellum		Raflatac	(Uncoated)
			Transtherm 1C		Fasson	(Coated, gloss)
			VES-85	85	OSAKA SEALING PRINTING	(Yupo)
		FR1412-50	White PET	50	LINTEC	
		FR1510-50	Silver sand mat	50	LINTEC	
		FR1615-50	Silver chemical mat	50	LINTEC	
Tag	Direct thermal type		130LAB-1-150	150	RICOH	
	Thermal transfer type	IS50	I-BEST S	164	OSAKA SEALING PRINTING	

NOTE:

1. The print head life varies depending on the print pattern (printing ratio).

2.2 RIBBON

2.2.1 Ribbon

The approved ribbon must be used.
Use of any non-approved ribbon may cause problems.

2.2.2 Shape and Size of Ribbon

No.	Item		Specification
1	Ribbon Shape		Spool type
2	Ribbon Width		68(40) ±1 mm to 112 mm
	Ribbon Winding Width		68(40) $^{+2}_{-1}$ mm to 112 mm
3	Max. Ribbon Length		600 m (Ø90 mm or less)
4	Max. Ribbon OD		Ø90 mm
5	Back Treatment		Coated
6	Ribbon Core	Material	Paper
		Shape	See Fig. 1.
7	Leader Tape		Polyester film (silver), 300 ± 5 mm long
8	End Tape		Polyester film (silver), 250 ± 5 mm long
9	Winding Method		The ribbon is wound outside. For the core and ribbon winding positions, see Fig. 2.

NOTES:

1. *The ribbon type number and the lot No. should be marked on the ribbon core end with black indelible ink. (If doing this is impossible, separately specify the location where the type number and the lot number are stamped.)*
2. *It is recommended that the ribbon is wider than the paper width by 5 mm or more.*
   - *When the difference between the ribbon width and the paper width is same or too minimum, the ribbon may wrinkle.*
   - *When the difference between the ribbon width and the paper width is too large, the ribbon may wrinkle.*
   - *Be careful of the upper limit of the ribbon width.*
3. *The ribbon which is narrower than the paper width by 5 mm or more can be used, but the print area becomes narrower.*

Fig. 1: Core Shape

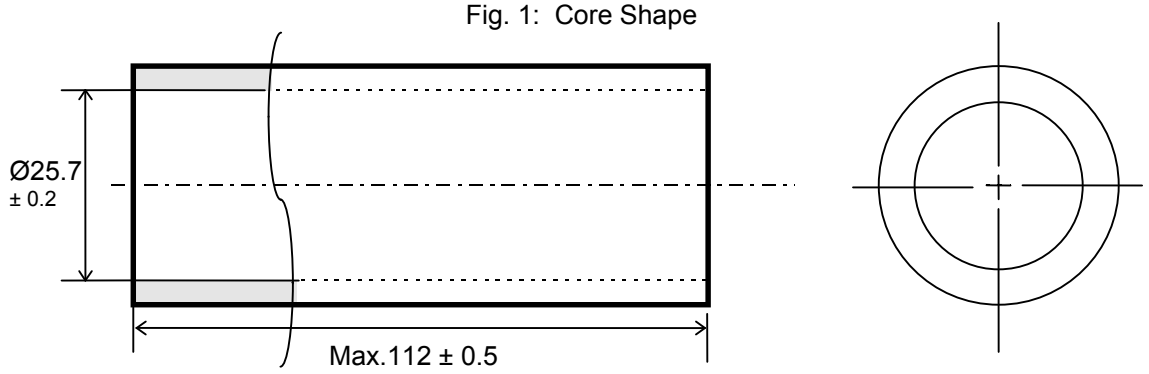
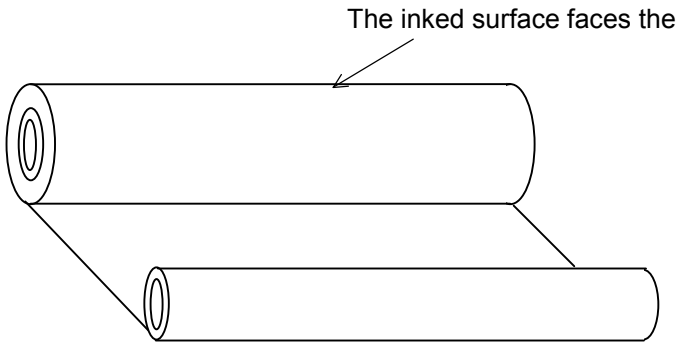
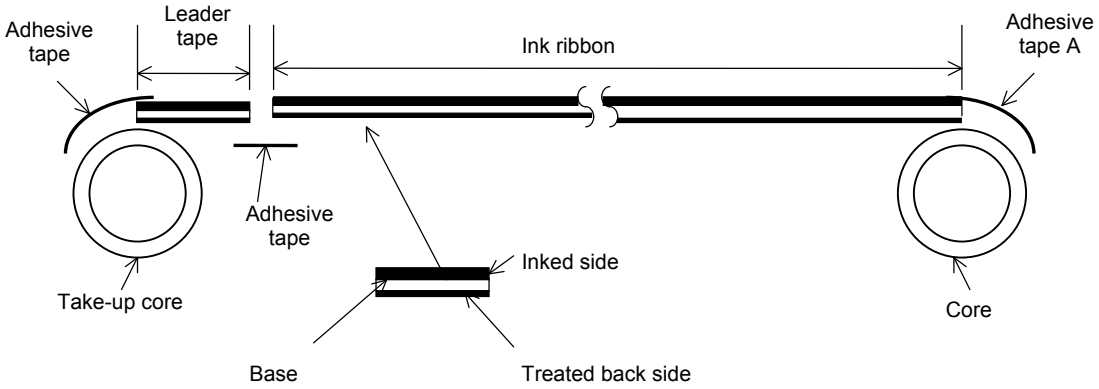


Fig. 2: Positional Relationship between Core and Ribbon



NOTE: *Wind the ink ribbon so that the ribbon center aligns with the core center.*

Fig. 3: Connection between Leader Tape and Ribbon



NOTE: *The ink ribbon must be wound at a right angle to the core.*

2.2.3 NOTES on using ribbon

If the difference between the ribbon width and the paper width is too large, the ribbon may wrinkle. Refer to the table below and choose the paper appropriate to the ribbon width. Even if the ribbon is narrower than paper, printing can be performed. However, it results in the narrower print range.

B-EX4T Type2 series

Ribbon width	41mm	50mm	68mm	84mm	112mm
Appropriate paper width	30 to 36 mm	36 to 45 mm	45 to 63 mm	63 to 79 mm	79 to 114 mm

When use paper width over 108mm, we recommend ribbon width using 112mm or over.

The ribbon tension adjustment may be further required according to the ribbon width. In the case a narrower width of the ribbon is used, if the ribbon tension is strong, the ribbon will wrinkle. According to the print patterns, fine adjustment of the ribbon take-up motor voltage is required. As a guide, regardless of the print speed, it should be set to “-3” (FW) and “-1” (BK) for 68-mm wide ribbon, and “-4” (FW) and “-2” (BK) for 50-mm wide or less ribbon, respectively.

2.2.4 Approved Ribbon

The manufacturer ink names must be handled carefully and must not be revealed.

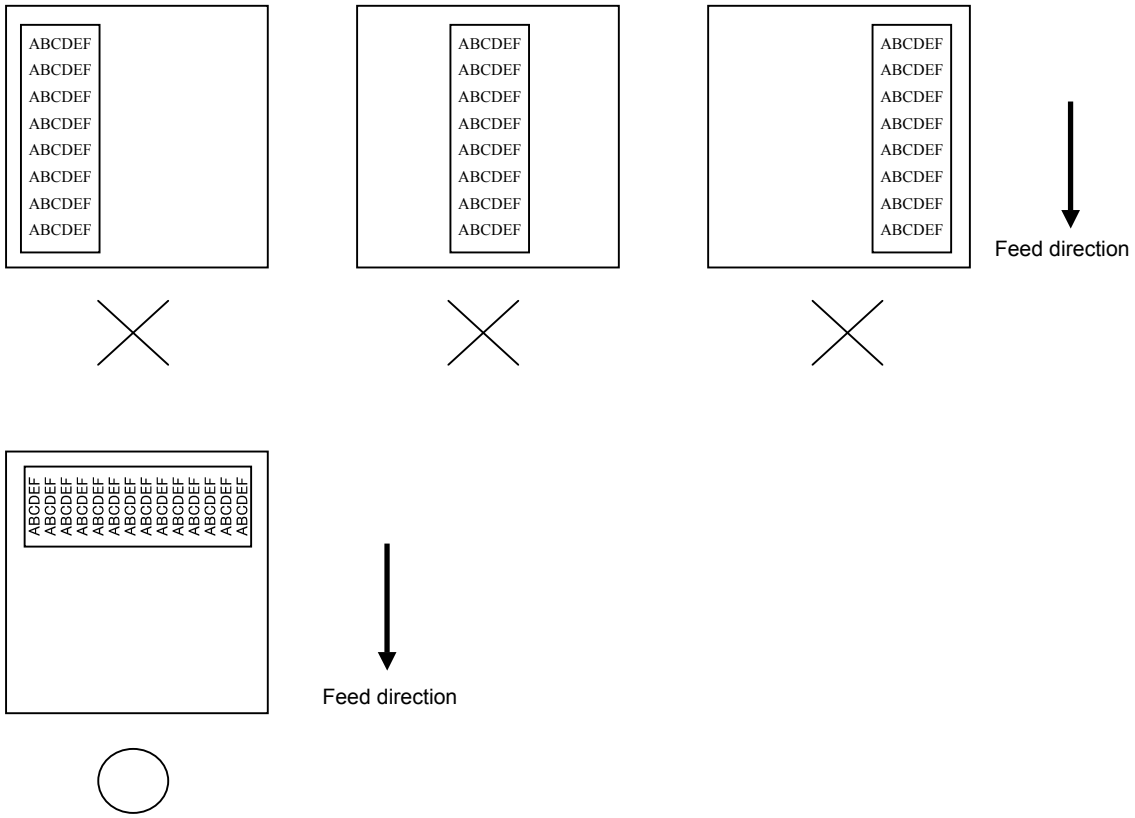
problem.

Type: N: Normal P: Premium S: Super premium

Item Code (Grobal)	Item Code (Japanese)	Manufacturer Ink Name	Ink Thickness (µm)	Base Thickness (µm)	Manufacturer	Type	Remarks
BR-*****AW3	BR-*****W10N	AWR6			ARMOR	N	
BR-*****AW5		AWX-FH			ARMOR	N	
BR-*****AW6F		AWARD			ARMOR	N	
BR-*****AW7F	BR-*****W05	AWR470Solfree			ARMOR	N	
BR-*****AG3		APR6			ARMOR	P	
BR-*****AG4	BR-*****A11N	APX-FH			ARMOR	P	
BR-*****AS1	BR-*****A21	AXR7+			ARMOR	S	
BR-*****AS2		AXR8			ARMOR	S	
BR-*****AS3		AXR9			ARMOR	S	
BR-*****RG2	BR-*****R1	B110A			RICOH	P	
	BR-*****R1S	B110AXS			RICOH	P	Japanese only
BR-*****RS1	BR-*****R2	B110C			RICOH	S	
	BR-*****R2S	B110CR			RICOH	S	Japanese only
BR-*****SW1		TR4085			DNP	N	
BR-*****SG3F		TR5080			DNP	P	
BR-*****SG4F		N280			DNP	P	
BR-*****SS2F		R510HF			DNP	S	

2.2.5 NOTES

2.2.5.1 If printing is performed using only a narrow range of the ribbon as shown below, the ribbon may wrinkle.



2.2.5.2 When a ribbon error occurs, the ribbon tension value for the ribbon feed motor should be adjusted in the negative (–) direction. For details regarding the fine adjustment of the ribbon motor drive voltage, refer to the Key Operation Specification (EAA-03184).

2.3 CARE AND HANDLING OF THE MEDIA AND RIBBON

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

- Do not store the media and ribbon for longer than the manufactures recommended shelf life.
- Store media rolls on the flat end, do not store them on the curved sides as this might flatten that side causing erratic media advance and poor print quality.
- Store the media in plastic bags and always reseal after opening. Unprotected media can get dirty and the extra abrasion from the dust and dirt particles will shorten the print head life.
- Store the media and ribbon 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 and ribbon manufacturer.

2.4 PRINT CONDITIONS

2.4.1 Print Quality of Bar Code

Bar code	Head Resolution	Speed	NB	NS	WB	WS	CS	Criteria
Parallel	203dpi	3”/sec	2	2	5	5	2	Grade B
		6”/sec	2	2	5	5	2	Grade B
		10”/sec	2	2	5	5	2	Grade C
		12”/sec	2	2	5	5	2	Grade C
	300dpi	3”/sec	3	3	8	8	3	Grade B
		5”/sec	3	3	8	8	3	Grade B
		8”/sec	3	3	8	8	3	Grade C
		10”/sec	3	3	8	8	3	Grade C
		12”/sec	3	3	8	8	3	Grade C
	600dpi	2”/sec	6	6	16	16	6	Grade B
		3”/sec	6	6	16	16	6	Grade B
		4”/sec	6	6	16	16	6	Grade B
		5”/sec	6	6	16	16	6	Grade B
		6”/sec	6	6	16	16	6	Grade B
Serial	203dpi	3”/sec	2	2	5	5	2	Grade C
		6”/sec	2	2	5	5	2	Grade C
		10”/sec	2	4	5	7	4	Readable
		12”/sec	2	4	5	7	4	Readable
	300dpi	3”/sec	3	3	8	8	3	Grade C
		5”/sec	3	3	8	8	3	Grade C
		8”/sec	2	5	6	10	5	Readable
		10”/sec	2	5	6	10	5	Readable
		12”/sec	2	5	6	10	5	Readable
	600dpi	2”/sec	6	6	16	16	6	Grade C
		3”/sec	6	6	16	16	6	Grade C
		4”/sec	6	6	16	16	6	Grade C
		5”/sec	6	6	16	16	6	Grade C
		6”/sec	6	6	16	16	6	Grade C

NB: Narrow bar width, NS: Narrow space width, WB: Wide bar width, WS: Wide space width, CS: Space between characters, Bar code type: CODE39

NOTES:

1. *Serial bar codes may not be readable depending on the number of bar code digits, supplies used or print density fine adjustment, even if the above conditions are satisfied. The spaces (NS, WS) should be increased, or the print density should be turned down.*
2. *If print data of high printing ratio, like serial bar codes, continues, spots may be printed where the print head stops due to accumulated heat in the print head. In this case, take the following action:*
   1) *In case of printing labels, set the effective print length to the max. value (label pitch minus 2 mm) so that the print head stops on the gap.*
   2) *In case of printing tags in the cut mode, set the effective print length to the max. value (tag pitch minus 2 mm) so that the tag will be cut at the stop position.*
   3) *In case of printing perforated tags, change the stop position by the fine adjustment so that it is just on the perforations.*
   4) *If the problem cannot be eliminated by the above 1) to 3), lower the print speed, lower the print density using the fine adjustment, or change the print pattern.*

2.4.2 PRINT QUALITY OF QR CODE

Head Resolution	Speed	1 cell	Criteria
203dpi	3”/sec	3 dots or more	Grade D
	6”/sec	4 dots or more	Grade D
	10”/sec	4 dots or more	Readable
	12”/sec	4 dots or more	Readable
300dpi	3”/sec	3 dots or more	Grade D
	5”/sec	4 dots or more	Grade D
	8”/sec	4 dots or more	Readable
	10”/sec	4 dots or more	Readable
	12”/sec	4 dots or more	Readable
600dpi	2”/sec	T.B.D.	T.B.D.
	3”/sec	T.B.D.	T.B.D.
	4”/sec	T.B.D.	T.B.D.
	5”/sec	T.B.D.	T.B.D.
	6”/sec	T.B.D.	T.B.D.

Model: Model 1, Error correction level: Q

Note: JIS X 05109 (2-D code symbol QR code Basic Specification)

1) QR codes may not be readable depending on the print formats, supplies used or print density fine adjustment, even if the above conditions are satisfied. The number of dot per 1cell should be increased, or the print density should be turned down.

- LINE PRINTING

(1) Lines of 3 or more dots are guaranteed. Although 1 or 2 dots can be designated, avoid printing them.
(2) When printing horizontal lines, the combination of paper and ribbon, may cause the printing stick. Accordingly, may cause the printing disconnection, the bleed printing, etc.
When sticking occurred, try the following items.
This horizontal line changes the border thinning.
Thermal head Tone adjustment change to lower.
Change the combination of paper and ribbon

- PRINT TONE

The print density should be adjusted according to print data and supplies used, with reference to ATTACHMENT-3. When the serial bar code is regarded as important, turn down the print density (adjust in the negative (-) direction), and when the horizontal line is regarded as important, turn up the print density (adjust in the positive (+) direction). If voids occur, turn up the print density, and if reverse thermal transfer or ribbon wrinkle occurs, turn down the print density.

- DURABILITY

If the printout is used in an environment where its surface may be rubbed, confirm the durability of the printout before it is used. Basically rubbing the printout surface deteriorates the quality. The supply that is suitable for that particular environment should be used.

- OTHER CAUTIONS

(1) The thermal paper used for direct thermal printing must not have specifications that exceed Na^+ 800 ppm, K^+ 250 ppm and Cl^- 500 ppm.
(2) Use of paper containing SiO_2 talc, which may cause abnormal abrasion of the print head protection layer, should be avoided.
(3) If the paper and ribbon are left under pressure of the print head for a long period of time, the ribbon may stick to the paper, which causes a problem at a start of printing. In addition, there is the case that a pressure welding trace (smudge) of the ribbon occurs at the time of a printing start and the end by a kind of the ribbon.

2.5 SPECIFICATION OF RFID TAG (for B-EX700-RFID-H1-QM-R)

2.5.1 General Description

The RFID supplies are RFID tag (wireless IC tag) inlays designed to be converted into tag and label applications. Printers, which are equipped with an RFID kit, can print data on the surface of RFID tags as well as write data on them.
The B-EX series optional RFID kit, B-EX700-RFID-H1-QM-R, is destined for Europe and operates in the UHF band 13.56MHz.
(RFID module and antenna are locally purchased.)
Although the specified frequency band can be used in the other countries than Europe, the destination is limited to Europe because the certification is obtained only for Europe.

***NOTE**: Regarding the specification of RFID supplies and the ribbon used for printing on them, refer to Section 2.1 MEDIA and Section 2.2 RIBBON.*

2.5.2 Available RFID Tag

- TagSys C210, C220, C240, I-Code, Tag-it, ISO15693

2.5.3 Location of RFID Tag

The location of an RFID tag on a label influences on the accuracy of writing data on the RFID tag.
It is impossible to define the one best location for every RFID tag on labels because the best location depends on the type of RFID tag and RFID tag antenna.
The B-EX RFID Analyze Tool can evaluate the accuracy of writing data on the RFID tag. For the usage of this tool, refer to the B-EX RFID Analyze Tool Operation Specification.

2.5.4 Cautions for using RFID Tags

1) Lift-up of Print Head
   An RFID tag chip or the print head may be damaged when the print head passes over the chip. This can be prevented by using the ribbon saving module (standard feature for the B-EX6T and optional for the B-EX4T). The print head is lifted by the ribbon saving module when it passes over the chip to prevent it from touching the chip.
   The print head is lifted by approximately 1 mm from the platen.

2) Storage of RFID Supplies
   Do not store RFID tags close to printers, or their communication performance may not be as specified when they are used.

3) Roll-type RFID Supplies
   When RFID supplies are to be rolled, roll hardness must be concerned.
   Although it depends on the type of glue, tag, and backing paper, RFID-tag embedded labels tend to stay rolled. Especially, when they are wound outside, a media jam error may occur. Unless otherwise specified, it is recommended that the RFID-tag embedded labels be wound inside.

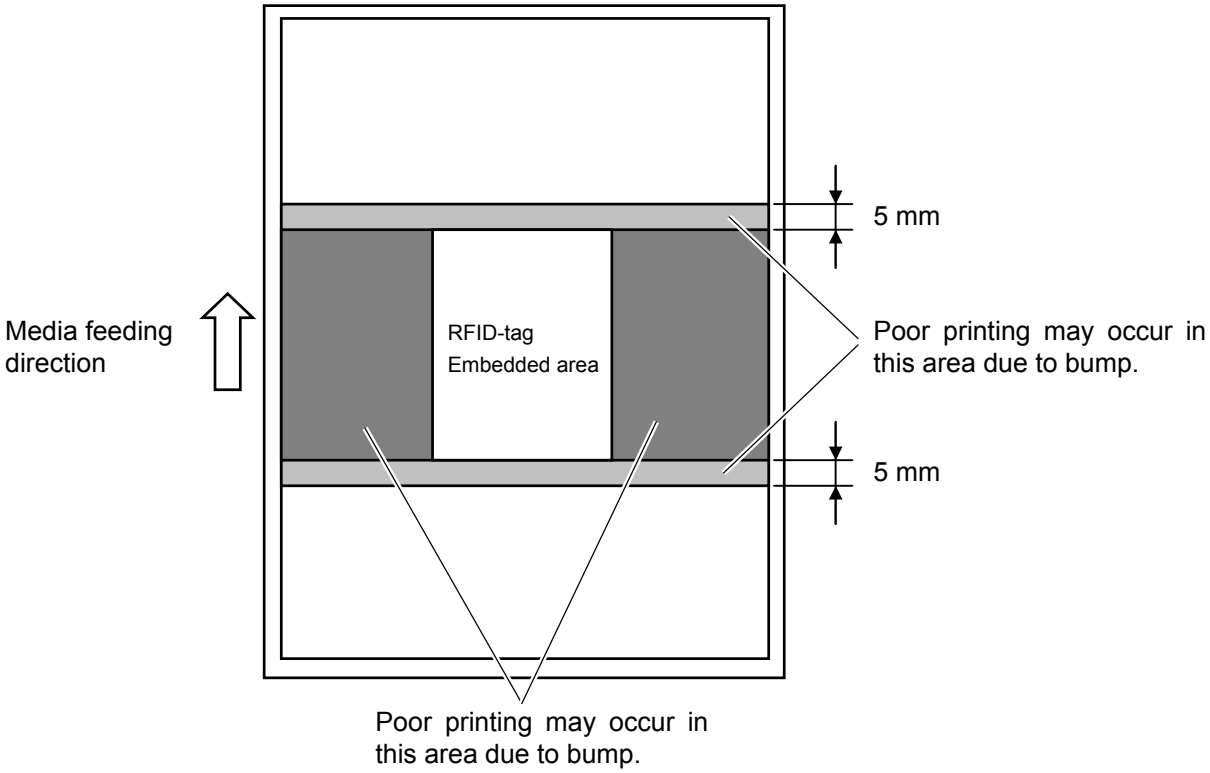
4) Sensor
   When the transmissive sensor or reflective sensor is enabled, transmissivity or reflectivity of a label or tag may vary at an RFID-tag embedded area depending on the pattern of an antenna or other factors. In such cases, a manual threshold setting is required in Online mode. For details, refer to the B-EX Key Operation Specifications.

5) Cutter
When an RFID label or tag is used in cut issue mode, care must be taken not to cut an antenna of the RFID tag or an IC chip in order not to damage the cutter.

6) Static Electricity
When printing is performed in a place where humidity is low or under some specific conditions, writing data on an RFID tag may fail due to static electricity generated by a label or a ribbon.

7) Printing on Bump (Chip/Antenna) Area
Embedding an RFID tag in labels creates bumps in a chip/antenna area in the labels, causing incomplete printing.
Uneven printing or incomplete printing can occur easily, especially within 5 mm back and forth of the RFID tag, and right and left sides of the RFID-tag embedded area, as shown in the figure below.

NOTE: *The degree of poor printing quality differs depending on height of a chip/antenna used.*



8) Ambient Temperature
Low temperature deteriorates wireless performance, under which conditions writing data on an RFID tag may fail.

9) Head-up Back feed
When an RFID label is used, a back feed may be required before an issue depending on the location of an RFID tag in the label.
A printer without the ribbon saving module may not be able to perform a back feed properly because the print head may be caught by an edge of the label. For this reason, the ribbon saving module must be installed in the printer when media, which requires a back feed before an issue, is used.

10) Strip Issue
Stripping performance in strip issue mode depends on the type of glue, tag, and backing paper. For some RFID supplies used, an issue may not be performed properly in strip issue mode.

11) Caution for Minimum Label Pitch Length
When media, of which label pitch length is short, is used, data may be written on an RFID tag next to the target RFID tag.
As the location, where data is to be written, differs among RFID tag types, a check must be performed to make sure that the data is written on the target RFID tags.
The B-EX RFID Analyze Tool can be used for this purpose.

12) Defective RFID Supply
RFID supplies may include defective RFID tags at the time of shipment from the maker. The defect rate differs depending on tag types, method of converting to supplies, etc.
The RFID supply maker should provide a way to distinguish defective tags by printing a mark on them or any other methods.
Or, defective tags should be rejected in the production process.
How to distinguish a defective tag from good one must be notified to end users.

2.5.5 Improvement of Writing Accuracy

As RFID tags use wireless technologies, writing data on the RFID tag may fail depending on environment and characteristics of the RFID tags.
In order to improve the accuracy of writing data on the RFID tags, the following method can be used:

1) Change of the maximum number of RFID write retries
The maximum number of RFID write retries is variable and can be changed by the RFID settings in System mode. Setting the high number can improve the writing accuracy. However, overall printing throughput may become worse because a retry is also performed for tags on which data cannot be written.
For details of settings, refer to the B-EX Key Operation Specification.

2) Enabling of RFID adjustment for retry
The printer has the RFID adjustment for retry feature. If writing data on the RFID tag fails, the printer automatically feeds the RFID tag forward or backward for a specified length in order to retry writing data.
Enabling this feature can improve the writing accuracy. However, overall printing throughput may become worse because a retry is also performed for tags on which data cannot be written.
For details of settings, refer to the B-EX Key Operation Specification.

3) Adjustment of location of antenna
When writing data on tags, especially on short-pitch tags, the antenna may communicate with non-target tags, and this lowers the write rate.
The B-EX4T/EX6T has a feature to pinpoint a target tag by evaluating the output power (AGC) of tags. Setting an AGC threshold for data write enables choosing a tag of which AGC is higher than the threshold, determining this tag to be a target tag positioned just above the antenna, and writing data on it. This feature can prevent writing data to non-target tags (= off the antenna).
For details of settings, refer to the B-EX4T/EX6T Key Operation Specification.

NOTE: *The writing control by AGC is impossible in the H1 series.*

2.6 SPECIFICATION OF RFID TAG (for B-EX700-RFID-U2-EU-R)

2.6.1 General Description

The RFID supplies are RFID tag (wireless IC tag) inlays designed to be converted into tag and label applications. Printers, which are equipped with an RFID kit, can print data on the surface of RFID supplies as well as write data on the embedded RFID tags.
The B-EX700-RFID-U2-EU-R is destined for Europe/India and operates in the UHF band (869.85MHz).

2.6.2 Available RFID Tag

EPC Generation 2, ISO-18000-6C

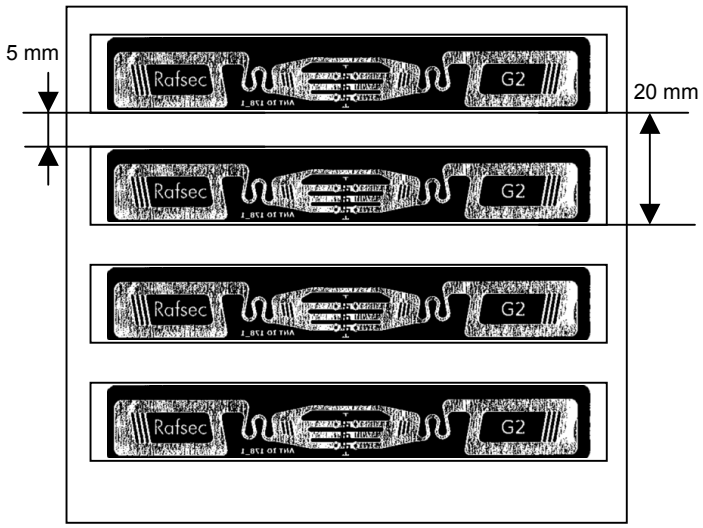
2.6.3 Location of RFID Tag

The location of an RFID tag in a label influences on the accuracy of writing data on the RFID tag. It is impossible to define the one best location for every RFID tag in labels because the best location depends on the type of RFID tag and RFID tag antenna.
The RFID Analyze Tool can evaluate the accuracy of writing data on the RFID tag. For the usage of this tool, refer to the RFID Analyze Tool Operation Specification.

2.6.4 Short-pitch Tag

A short-pitch tag kit is supplied with the B-EX700-RFID-U2-EU-R to enable the RFID kit to encode short-pitch tags properly. When the short-pitch tag kit is attached to the printer, the write field will be narrower.
The RFID kit is designed so that the second label is positioned just above the antenna while the first label is at the print start position, when using the following short-pitch label.

B-EX700-RFID-U2-EU-R



After printing a label, a reverse feed for a distance equivalent to one label pitch is required to write data onto its tag. During this reverse feed, the bottom edge of the printed label may be stuck on the print head edge, causing a feed jam. This is because the labels become thicker due to embedded tags. When several labels are issued in a batch, set the offset printing parameter to 1 (Offset printing is performed without a reverse feed of the first label.) in order to make the printer issue labels without performing a reverse feed. In this case, however, the printer does not print or write data on the first label, so it is wasteful. This mode is not suitable for applications where a small number of labels are issued on an as-needed basis.
For details of the offset printing feature, refer to the B-EX4T/EX6T External Equipment Interface Specification.

2.6.5 Cautions for using RFID Tags

1) Lift-up of Print Head
An RFID tag chip or the thermal head may be damaged when the thermal head passes over the chip. This can be prevented by using the ribbon saving module (standard feature for the B-EX6T and optional for the B-EX4T) by which the thermal head is lifted up preventing it from touching the chip when it passes over the chip.
When the thermal head is lifted up, the distance from the platen roller to the head is approximately 1 mm.

2) Storage of RFID Supplies
Do not store RFID tags close to printers, or their communication performance may not be as specified when they are used.

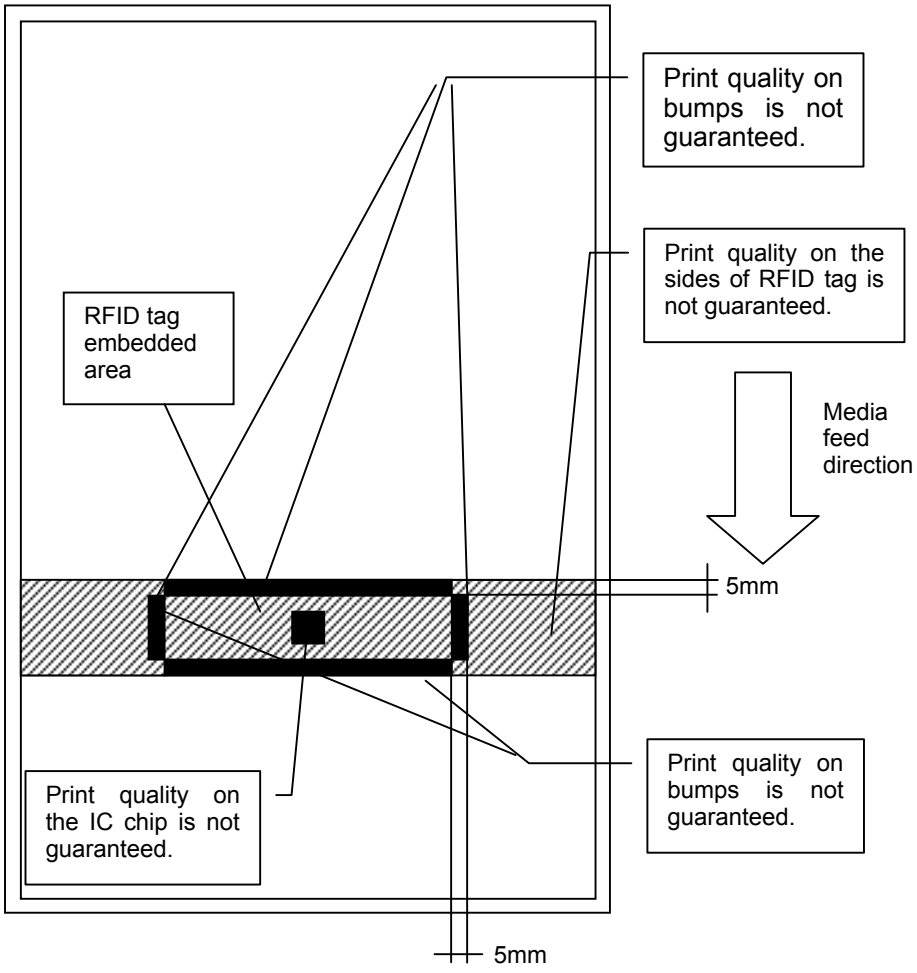
3) Roll-type RFID Supplies
When RFID supplies are to be rolled, roll hardness must be concerned.
Although it depends on the type of glue, tag, and backing paper, RFID-tag embedded labels tend to stay rolled. Especially, when they are wound outside, a media jam error may occur. Unless otherwise specified, it is recommended that the RFID-tag embedded labels be wound inside.

4) Sensor
When the transmissive sensor or reflective sensor is enabled, transmissivity or reflectivity of a label or tag may vary at an RFID-tag embedded area depending on the pattern of an antenna or other factors. In such cases, a manual threshold setting is required in the printer system mode. For details, refer to the B-EX4T/EX6T Key Operation Specifications.

5) Cutter
When an RFID label or tag is used in cut issue mode, care must be taken not to cut the antenna or the IC chip of an RFID tag in order not to damage the cutter.

6) Static Electricity
When printing is performed in a place where humidity is low or under some specific conditions, writing data on an RFID tag may fail due to static electricity generated by a label or a ribbon.

7) Printing on Bump (Chip/Antenna) Area
Embedding RFID tags in labels creates bumps in a chip/antenna area in the labels, causing incomplete printing.
Especially, in the areas 5 mm from and left and right sides of the RFID-tag embedded area shown in the figure below, uneven printing or incomplete printing can occur easily.
* The degree of poor printing quality differs depending on height of a chip/antenna used.



8) Ambient temperature
Low operating temperature deteriorates wireless performance, under which conditions writing data on an RFID tag may fail.

9) Strip issue
Stripping performance in strip issue mode depends on the type of glue, tag, and backing paper. For some RFID supplies used, an issue may not be performed properly in strip issue mode.

10) Caution for minimum label pitch length
When short-pitch media is used, data may be written on a next RFID tag instead of the target RFID tag.
As the location, where data is to be written, differs among RFID tag types, a check must be performed using the labels to be used to make sure that the data is written on the target RFID tags. The RFID Analyze Tool (7FM001113) can be used for this purpose.

11) Defective RFID Tag
Defective tags could be embedded while they are converted into labels, and the error rate differs depending on the tag types or the conversion methods.
Label manufacturers should mark such defective labels with something to indicate the tag is defective, or should prevent defective tags from being used.
Also, how to identify defective tags and good tags should be properly notified to end users.

12) PRINT POSITION ACCURACY
When using RFID tag embedded media, the print position accuracy may exceed the guaranteed tolerance of ±1 mm in all issue modes.
It is required to check the print position accuracy for each media type.

13) PAPER JAM ERROR
Depending on the type of glue or the flexibility of labels, a label may come unstuck in front of the sensor unit, which cause a paper jam. Particularly, the frequency of paper jam could become higher on the condition of low operating temperature or use of short-pitch labels.
It is required to check the media feed using the media to be used under the actual operating environment.

2.6.6 Improvement of Writing Accuracy

As RFID tags use wireless technologies, writing data on the RFID tag may fail depending on environment and characteristics of the RFID tags.
In order to improve the accuracy of writing data on the RFID tags, the following method can be used:

(1) Change of the maximum number of write retries
The maximum number of write retries is variable and can be changed in the system mode. Setting the greater value can improve the writing accuracy. However, overall printing throughput may become worse because a retry is also performed for tags on which data cannot be written.
For details of settings, refer to the B-EX4T/EX6T Key Operation Specification.

(2) Enabling of RFID adjustment for retry
The printer has the RFID adjustment for retry feature. If writing data on the RFID tag fails, the printer automatically feeds the RFID tag forward or backward for a specified length in order to retry a data write.
Enabling this feature can improve the writing accuracy. However, overall printing throughput may become worse because a retry is performed even for defective tags.
For details of settings, refer to the B-EX4T/EX6T Key Operation Specification.

(3) Adjustment of location of antenna
When writing data on tags, especially on short-pitch tags, the antenna may communicate with non-target tags, and this lowers the write rate.
The B-EX4T/EX5T has a feature to pinpoint a target tag by evaluating the output power (AGC) of tags. Setting an AGC threshold for data write enables choosing a tag of which AGC is higher than the threshold, determining this tag to be a target tag positioned just above the antenna, and writing data on it. This feature can prevent writing data to non-target tags (= off the antenna).
For details of settings, refer to the B- EX4T/EX6T Key Operation Specification.

2.7 SPECIFICATION OF RFID TAG (for B-EX700-RFID-U2-US-R)

2.7.1 General Description

The RFID supplies are RFID tag (wireless IC tag) inlays designed to be converted into tag and label applications. Printers, which are equipped with an RFID kit, can print data on the surface of RFID supplies as well as write data on the embedded RFID tags.
The B-EX700-RFID-U2-US-R (Serial Number: 2809Axxxxxx or later) is destined for North America, Australia, Taiwan, South Korea, Brazil, Mexico and operates in the following UHF band.

US setting	902.75 to 927.25MHz (UHF for North America)
AU setting	918.25 to 925.75MHz (UHF for Australia)
TW setting	922.25 to 927.25MHz (UHF for Taiwan)
KR setting	920.4 to 913.6MHz (UHF for South Korea)

2.7.2 Available RFID Tag

EPC Generation 2, ISO-18000-6C

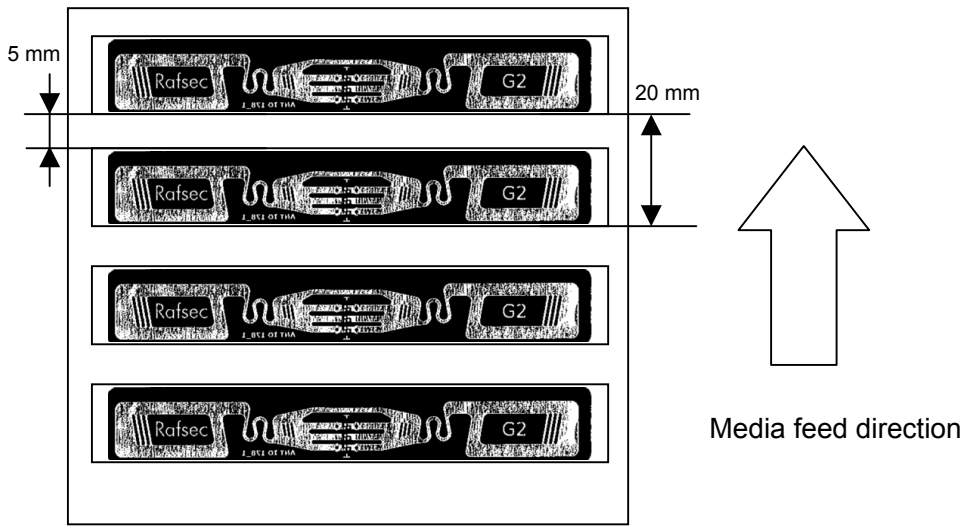
2.7.3 Location of RFID Tag

The location of an RFID tag in a label influences on the accuracy of writing data on the RFID tag. It is impossible to define the one best location for every RFID tag in labels because the best location depends on the type of RFID tag and RFID tag antenna.
The RFID Analyze Tool can evaluate the accuracy of writing data on the RFID tag. For the usage of this tool, refer to the RFID Analyze Tool Operation Specification.

2.7.4 Short-pitch Tag

A short-pitch tag kit is supplied with the B-EX700-RFID-U2-US-R to enable the RFID kit to encode short-pitch tags properly. When the short-pitch tag kit is attached to the printer, the write field will be narrower. The RFID kit is designed so that the second label is positioned just above the antenna while the first label is at the print start position, when using the following short-pitch label.

Rafsec Short Dipole2 Tag



After printing a label, a reverse feed for a distance equivalent to one label pitch is required to write data onto its tag. During this reverse feed, the bottom edge of the printed label may be stuck on the print head edge, causing a feed jam. This is because the labels become thicker due to embedded tags. In most cases, this problem can be avoided by enabling the ribbon saving function of the printer which raises the thermal head during a reverse feed. When using short-pitch tags, enable the ribbon saving function.
When several labels are issued in a batch, set the offset printing parameter to 1 (Offset printing is performed without a reverse feed of the first label.) in order to make the printer issue labels without performing a reverse feed. In this case, however, the printer does not print or write data on the first label, so it is wasteful. This mode is not suitable for applications where a small number of labels are issued on an as-needed basis.
For details of the offset printing feature, refer to the B-EX4T/EX6T External Equipment Interface Specification.

2.7.5 Cautions for using RFID Tags

1) Lift-up of Print Head
   An RFID tag chip or the thermal head may be damaged when the thermal head passes over the chip. This can be prevented by using the ribbon saving module (standard feature for the B-EX5T and optional for the B-EX4T) by which the thermal head is lifted up preventing it from touching the chip when it passes over the chip.
   When the thermal head is lifted up, the distance from the platen roller to the head is approximately 1 mm.

2) Storage of RFID Supplies
   Do not store RFID tags close to printers, or their communication performance may not be as specified when they are used.

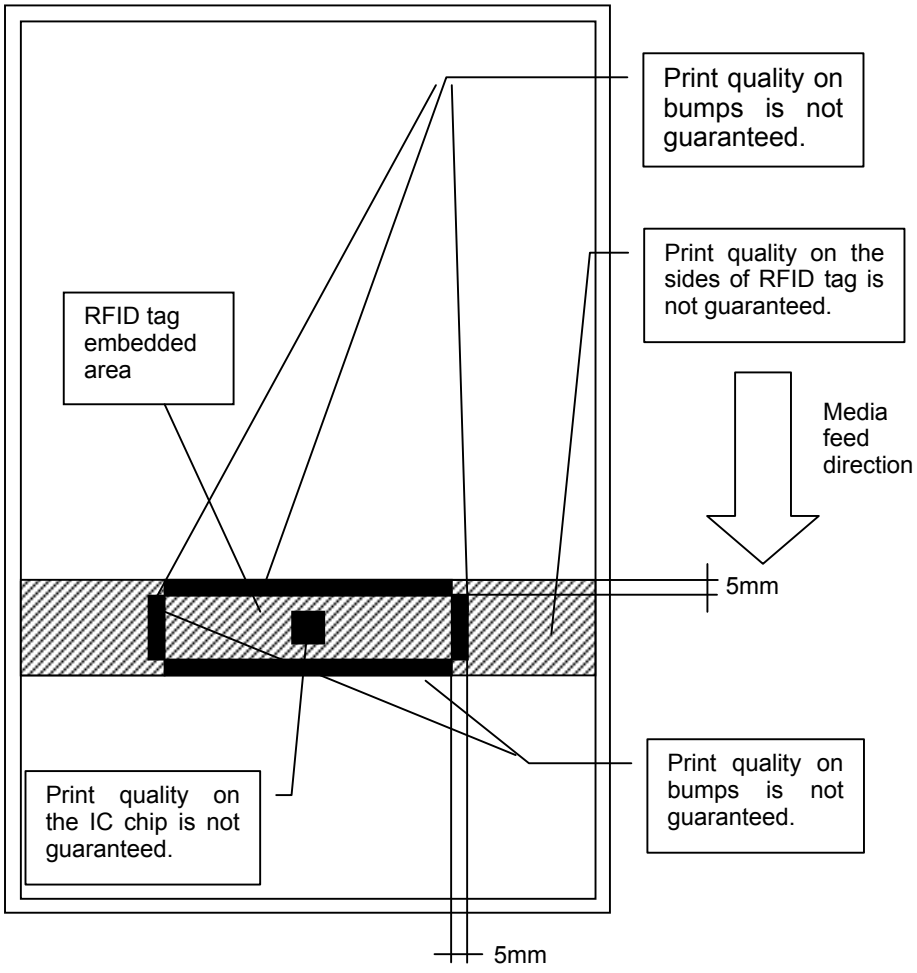
3) Roll-type RFID Supplies
   When RFID supplies are to be rolled, roll hardness must be concerned.
   Although it depends on the type of glue, tag, and backing paper, RFID-tag embedded labels tend to stay rolled. Especially, when they are wound outside, a media jam error may occur. Unless otherwise specified, it is recommended that the RFID-tag embedded labels be wound inside.

4) Sensor
   When the transmissive sensor or reflective sensor is enabled, transmissivity or reflectivity of a label or tag may vary at an RFID-tag embedded area depending on the pattern of an antenna or other factors. In such cases, a manual threshold setting is required in the printer system mode. For details, refer to the B-EX4T/B-E6T Key Operation Specifications.

5) Cutter
   When an RFID label or tag is used in cut issue mode, care must be taken not to cut the antenna or the IC chip of an RFID tag in order not to damage the cutter.

6) Static Electricity
   When printing is performed in a place where humidity is low or under some specific conditions, writing data on an RFID tag may fail due to static electricity generated by a label or a ribbon.

7) Printing on Bump (Chip/Antenna) Area
Embedding RFID tags in labels creates bumps in a chip/antenna area in the labels, causing incomplete printing.
Especially, in the areas 5 mm from and left and right sides of the RFID-tag embedded area shown in the figure below, uneven printing or incomplete printing can occur easily.
* The degree of poor printing quality differs depending on height of a chip/antenna used.



8) Ambient temperature
Low operating temperature deteriorates wireless performance, under which conditions writing data on an RFID tag may fail.

9) Strip issue
Stripping performance in strip issue mode depends on the type of glue, tag, and backing paper. For some RFID supplies used, an issue may not be performed properly in strip issue mode.

10) Caution for minimum label pitch length
When short-pitch media is used, data may be written on a next RFID tag instead of the target RFID tag.
As the location, where data is to be written, differs among RFID tag types, a check must be performed using the labels to be used to make sure that the data is written on the target RFID tags. The RFID Analyze Tool can be used for this purpose.

11) Defective RFID Tag
Defective tags could be embedded while they are converted into labels, and the error rate differs depending on the tag types or the conversion methods.
Label manufacturers should mark such defective labels with something to indicate the tag is defective, or should prevent defective tags from being used.
Also, how to identify defective tags and good tags should be properly notified to end users.

12) PRINT POSITION ACCURACY
When using RFID tag embedded media, the print position accuracy may exceed the guaranteed tolerance of ±1 mm in all issue modes.
It is required to check the print position accuracy for each media type.

13) PAPER JAM ERROR
Depending on the type of glue or the flexibility of labels, a label may come unstuck in front of the sensor unit, which cause a paper jam. Particularly, the frequency of paper jam could become higher on the condition of low operating temperature or use of short-pitch labels.
It is required to check the media feed using the media to be used under the actual operating environment.

2.7.6 Improvement of Writing Accuracy

As RFID tags use wireless technologies, writing data on the RFID tag may fail depending on environment and characteristics of the RFID tags.
In order to improve the accuracy of writing data on the RFID tags, the following method can be used:

(1) Change of the maximum number of write retries
The maximum number of write retries is variable and can be changed in the system mode. Setting the greater value can improve the writing accuracy. However, overall printing throughput may become worse because a retry is also performed for tags on which data cannot be written.
For details of settings, refer to the B-EX4T/EX6T Key Operation Specification.

(2) Enabling of RFID adjustment for retry
The printer has the RFID adjustment for retry feature. If writing data on the RFID tag fails, the printer automatically feeds the RFID tag forward or backward for a specified length in order to retry a data write.
Enabling this feature can improve the writing accuracy. However, overall printing throughput may become worse because a retry is performed even for defective tags.
For details of settings, refer to the B-EX4T/EX6T Key Operation Specification.

(3) Adjustment of location of antenna
When writing data on tags, especially on short-pitch tags, the antenna may communicate with non-target tags, and this lowers the write rate.
The B-EX4T/EX6T has a feature to pinpoint a target tag by evaluating the output power (AGC) of tags. Setting an AGC threshold for data write enables choosing a tag of which AGC is higher than the threshold, determining this tag to be a target tag positioned just above the antenna, and writing data on it. This feature can prevent writing data to non-target tags (= off the antenna).
For details of settings, refer to the B-EX4T/EX6T Key Operation Specification.

2.8 SPECIFICATION OF RFID TAG (for B-EX700-RFID-U2-CN-R)

2.8.1 General Description

The RFID supplies are RFID tag (wireless IC tag) inlays designed to be converted into tag and label applications. Printers, which are equipped with an RFID kit, can print data on the surface of RFID supplies as well as write data on the embedded RFID tags.
The B-EX700-RFID-U2-CN-R is destined for China, Hong Kong, Singapore, Thailand and operates in the UHF band (920.625-924.375 MHz).

2.8.2 Available RFID Tag

EPC UHF Gen2, ISO-18000-6C

2.8.3 Location of RFID Tag

The location of an RFID tag in a label influences on the accuracy of writing data on the RFID tag. It is impossible to define the one best location for every RFID tag in labels because the best location depends on the type of RFID tag and RFID tag antenna.
The RFID Analyze Tool can evaluate the accuracy of writing data on the RFID tag. For the usage of this tool, refer to the RFID Analyze Tool Operation Specification.

2.8.4 Short-pitch Tag

A short-pitch tag kit is supplied with the B-EX700-RFID-U2-CN-R to enable the RFID kit to encode short-pitch tags properly.
However, an adjustment will be necessary for each type of short-pitch tags individually. When short-pitch tags are used, consult TOSHIBA TEC Japan.

2.8.5 Cautions for using RFID Tags

1) Lift-up of Print Head
   An RFID tag chip or the thermal head may be damaged when the thermal head passes over the chip. This can be prevented by using the ribbon saving module (standard feature for B-EXT1-TS15-R and optional for B-EXT1-GS12-QM-R and B-EXT1-GS12-CN-R) by which the thermal head is lifted up preventing it from touching the chip when it passes over the chip.
   When the thermal head is lifted up, the distance from the platen roller to the head is approximately 1 mm.

2) Storage of RFID Supplies
   Do not store RFID tags close to printers, or their communication performance may not be as specified when they are used.

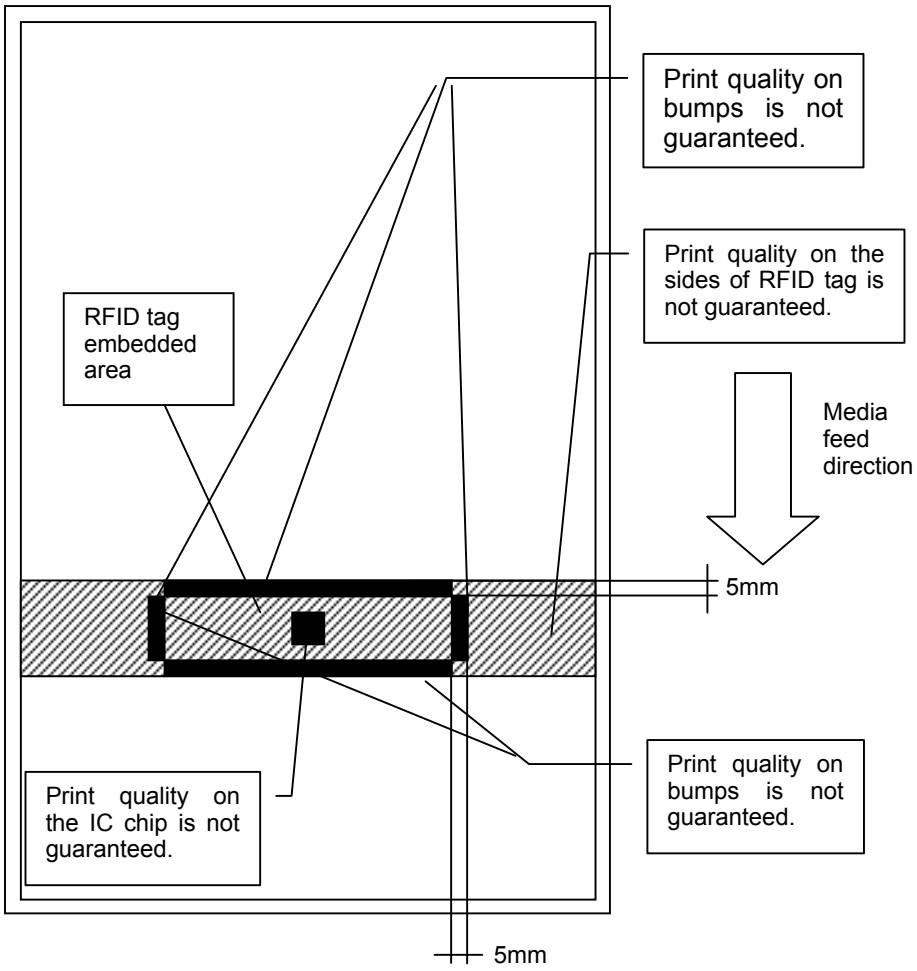
3) Roll-type RFID Supplies
   When RFID supplies are to be rolled, roll hardness must be concerned.
   Although it depends on the type of glue, tag, and backing paper, RFID-tag embedded labels tend to stay rolled. Especially, when they are wound outside, a media jam error may occur. Unless otherwise specified, it is recommended that the RFID-tag embedded labels be wound inside.

4) Sensor
   When the transmissive sensor or reflective sensor is enabled, transmissivity or reflectivity of a label or tag may vary at an RFID-tag embedded area depending on the pattern of an antenna or other factors. In such cases, a manual threshold setting is required in the printer system mode. For details, refer to the B-EX4T/6T Key Operation Specifications.

5) Cutter
When an RFID label or tag is used in cut issue mode, care must be taken not to cut the antenna or the IC chip of an RFID tag in order not to damage the cutter.

6) Static Electricity
When printing is performed in a place where humidity is low or under some specific conditions, writing data on an RFID tag may fail due to static electricity generated by a label or a ribbon.

7) Printing on Bump (Chip/Antenna) Area
Embedding RFID tags in labels creates bumps in a chip/antenna area in the labels, causing incomplete printing.
Especially, in the areas 5 mm from and left and right sides of the RFID-tag embedded area shown in the figure below, uneven printing or incomplete printing can occur easily.
* The degree of poor printing quality differs depending on height of a chip/antenna used.



8) Ambient temperature
Low operating temperature deteriorates wireless performance, under which conditions writing data on an RFID tag may fail.

9) Strip issue
Stripping performance in strip issue mode depends on the type of glue, tag, and backing paper. For some RFID supplies used, an issue may not be performed properly in strip issue mode.

10) Caution for minimum label pitch length
When short-pitch media is used, data may be written on a next RFID tag instead of the target RFID tag.
As the location, where data is to be written, differs among RFID tag types, a check must be performed using the labels to be used to make sure that the data is written on the target RFID tags. The RFID Analyze Tool can be used for this purpose.

11) Defective RFID Tag
Defective tags could be embedded while they are converted into labels, and the error rate differs depending on the tag types or the conversion methods.
Label manufacturers should mark such defective labels with something to indicate the tag is defective, or should prevent defective tags from being used.
Also, how to identify defective tags and good tags should be properly notified to end users.

12) PRINT POSITION ACCURACY
When using RFID tag embedded media, the print position accuracy may exceed the guaranteed tolerance of ±1 mm in all issue modes.
It is required to check the print position accuracy for each media type.

13) PAPER JAM ERROR
Depending on the type of glue or the flexibility of labels, a label may come unstuck in front of the sensor unit, which cause a paper jam. Particularly, the frequency of paper jam could become higher on the condition of low operating temperature or use of short-pitch labels.
It is required to check the media feed using the media to be used under the actual operating environment.

2.8.6 Improvement of Writing Accuracy

As RFID tags use wireless technologies, writing data on the RFID tag may fail depending on environment and characteristics of the RFID tags.
In order to improve the accuracy of writing data on the RFID tags, the following method can be used:

(1) Change of the maximum number of write retries
The maximum number of write retries is variable and can be changed in the system mode. Setting the greater value can improve the writing accuracy. However, overall printing throughput may become worse because a retry is also performed for tags on which data cannot be written.
For details of settings, refer to the B-EX4T/EX6T Key Operation Specification.

(2) Enabling of RFID adjustment for retry
The printer has the RFID adjustment for retry feature. If writing data on the RFID tag fails, the printer automatically feeds the RFID tag forward or backward for a specified length in order to retry a data write.
Enabling this feature can improve the writing accuracy. However, overall printing throughput may become worse because a retry is performed even for defective tags.
For details of settings, refer to the B-EX4T/EX6T Key Operation Specification.

(3) Adjustment of location of antenna
When writing data on tags, especially on short-pitch tags, the antenna may communicate with non-target tags, and this lowers the write rate.
The B-EX4T/EX6T has a feature to pinpoint a target tag by evaluating the output power (AGC) of tags. Setting an AGC threshold for data write enables choosing a tag of which AGC is higher than the threshold, determining this tag to be a target tag positioned just above the antenna, and writing data on it. This feature can prevent writing data to non-target tags (= off the antenna).
For details of settings, refer to the B-EX4T/EX6T Key Operation Specification.

3. OPTIONAL KIT

Option Name	Type	Applicable Model	Use
Disc cutter module	B-EX204-QM-R	B-EX4T1/T2	This cutter module uses a disc or rotary cutter. It cuts backing paper of labels and tag paper automatically in “Stop and cut” mode.
	B-EX206-QM-R	B-EX6T2	
Peel off module (with internal rewinder)	B-EX904-H-QM-R	B-EX4T1/T2	This strip module strips the label from the backing paper with the take-up block and strip block. When the rewinder guide plate is attached, the tag paper and label with backing paper are wound.
	B-EX906-H-QM-R	B-EX6T2	
Expansion I/O card	B-EX700-IO-QM-R	All models	Installing this board allows connection to external devices.
RTC/USB host I/F card	B-EX700-RTC-QM-R	All models	Can be using the USB memory.
RFID module	B-EX700-RFID-H1-QM-R	All models	Installing this module enables read and write of RFID tags.
	B-EX700-RFID-U2-EU-R		
	B-EX700-RFID-U2-US-R		
	B-EX700-RFID-U2-CN-R		
Wireless LAN Module	B-EX700-WLAN-QM-R	All models	Installing this PC board allows a communication by wireless LAN.
Parallel I/F card	B-EX700-CEN-QM-R	All models	
Serial I/F card	B-EX700-RS-QM-R	All models	

***NOTE**: To purchase the optional kits, please contact the TOSHIBA TEC Head Quarters.*

3.1 CUTTER MODULE: B-EX204-QM-R (Disk Cutter)

This compact cutter module uses a built-in disk cutter. The specification is provided below:

1) Disc cutter module:

Paper Specifications

Contents		Specification
Label		
	Paper length	12 to 1500mm
	Cut width	15 to 120mm
	Label width	13 to 117mm
	Gap length	2 to 20mm
Tag		
	Paper length	10 to 1498mm
	Black mark Length	2 to 10mm

Common Specifications

Contents	Specification	
Cut paper thickness	87μm to 170μm	
Cut method	Round trip cutting by Disc cutter	
Cut form	Stop cut(Cut after printing)	
Cut accuracy	±1mm	
Minimum cut length	10mm	
Cutter life	100milion cut	Tag or liner
Interlock SW	Yes	
Sensor	Home Position Sensor (Right and Left side)	
Max print speed	14ips	
Operation temparature	5 to 40 °C Humidity 10~90% (Does not dew)	

3.2 PEEL OFF MODULE: B-EX904-H-QM-R

This strip module consists of the take-up block and the strip block. Installing the strip module enables the printer to not only remove labels from the backing paper, but wind the tag paper or label with backing paper onto the take-up spool by using the rewinder guide plate. The rewind full sensor is provided to detect the overflow if the wound tag paper or label exceeds the specified amount is provided.

Specification:

<table>
<tr><th colspan="3">Contents</th><th colspan="2">Specification</th><th></th></tr>
<tr><td colspan="3">Peel-off method</td><td colspan="2">Rewind paper with DC motor.</td><td></td></tr>
<tr><td rowspan="3">Function</td><td colspan="2">Select SW</td><td colspan="2">Can selectable 2mode of rewind function.
・ Standard Peel-off mode
・ Rewind mode
Note:Using this function should be indication by print command.</td><td></td></tr>
<tr><td colspan="2">Peel-off Sensor</td><td colspan="2">The sensor, which detects the Peel-off label.</td><td></td></tr>
<tr><td colspan="2">Over flow Sensor</td><td colspan="2">The sensor, which detects the over flow of rewind liner.</td><td></td></tr>
<tr><td colspan="3">Operation temparature</td><td colspan="2">5 to 40 °C
Humidity 10 to 90%（Does not dew）</td><td></td></tr>
<tr><td rowspan="4">Print speed</td><td rowspan="2">203dpi</td><td>EXPIO Type1(STD)</td><td>3-10ips</td><td>Print speed set to 10ips over, operate 10ips automatically</td></tr>
<tr><td>EXPIO Type2(In-line)</td><td>Selected print speed Automatic pre-peel-off mode for over 10ips.</td><td>Do not support internal rewinder</td></tr>
<tr><td rowspan="2">300dpi
305dpi</td><td>EXPIO Type1(STD)</td><td>3-8ips</td><td>Print speed set to 8ips over, operate 8ips automatically</td></tr>
<tr><td>EXPIO Type2(In-line)</td><td>Selected print speed Automatic pre-peel-off mode for over 10ips.</td><td>Do not support internal rewinder</td></tr>
</table>

Performance:

Notes: Refer to B-EX supply specifications (RAA-1396) for the conditions of Peel-off issue.

Liner paper width	30 to 120mm
Label width	27 to 117mm
Label length *1	23.4 to 1494.0mm
Max Print speed *2	203dpi: Max 6ips 305(300) dpi: Max 5ips

*1: Label length is 76.2mm or more, The removed label may hang down and it may stick to an Peel-off unit.

3.3 EXPANSION I/O CARD: B-EX700-IO-QM-R

This interface board is used to connect the printer to external devices, such as a labeler. The input/output signals from the connected external devices can control label feeding or printing and indicate the print status.

3.4 RTC/USB host INTERFACE BOARD: B-EX700-RTC-QM-R

Installing this board enables a connection USB memory.

* Conforming to USB 1.1 USB HOST
* Supporting Full-speed (12M bps) transmission

3.5 RFID MODULE: B-EX700-RFID-H1-QM-R

Installing this module enables the printer to write data on an RFID tag as well as to print on the surface of RFID supplies.
The three RFID module types are different from each other in frequency band and applicable countries.

HF RFID kit destined for Europe (RFID module and antenna are locally purchased.)
Although the specified frequency band can be used in the other countries than Europe, the destination is limited to Europe because the certification is obtained only for Europe.

Antenna cover
Ribbon guide
RFID module plate
Antenna frame
Cord bush
Cable clamp
Harness
Screws
Nylon washer
Spacer
Installation Manual

Specification

Contents		Specification
RFID Spec.	RFID Module	TagSys MEDIO S002 (This module does not enclose to the kit)
	Frequency	13.56MHz
	Output	200mW
	RFID Tag	TagSys C210, C220, C240, I-Code, Tag-it, ISO15693
Operation temperature		5~40 °C Humidity 10 to 90% (Does not dew)

RFID module can write in using an evaluation tag sample,
About the write-in performance to a RFID tag, it is not a guarantee diplomatically in market.

3.6 RFID MODULE: B-EX700-RFID-U2-EU/US/CN-R

Installing this module enables the printer to write data on an RFID tag as well as to print on the surface of RFID supplies.

Applicable model:

(1) This optional device is intended for the following models:
B-EXT1-GS12-QM-R and B-EXT1-GS12-CN-R, RFID ready printer.
An RFID Ready printer can be identified by the model name sticker on the front of the printer.
Be careful not to install this product in the B-EXT1-TS15-R RFID Ready printers.

(2) The countries where the use of this device is allowed are as follows:

Model Name	Frequency Band	Applicable Countries
B-EX704-RFID-U2-EU-R	UHF 869.7 to 870.0MHz (Center frequency: 869.85MHz)	EU member states and EFTA member states
B-EX704-RFID-U2-CN-R	UHF 920.625 to 924.375MHz (Center frequency: 922.5MHz)	China
B-EX704-RFID-U2-US-R (Serial Number: 2808Yxxxxxx and earlier)	UHF 902.75 to 927.5MHz (Center frequency: 915.125MHz)	U.S.A., Canada

Destination Code Setting should be performed in the system mode of the printer according to the destination.
The countries where the use of this device is allowed are as follows:

Model Name	Setting	Frequency Band	Applicable Countries
B-SX704-RFID–U2-US-R (Serial Number: 2809Axxxxxx or later)	US	UHF 902.75 to 927.5MHz	U.S.A., Canada
	AU	UHF 918.25 to 925.75 MHz	Australia
	KR	UHF 910.4 to 913.6 MHz	South Korea
	TW	UHF 922.25 to 927.25 MHz	Taiwan

Specification:

The specification of the B-EX700-RFID-U2-EU/ US/CN-R is as follows.

Item	Specification
Module	EU: TOSHIBA TEC TRW-EUM-01 for Europe US (Serial Number 2808Yxxxxxx and earlier): TOSHIBA TEC TRW-USM-01 for U.S.A. and Canada US (Serial Number 2809Axxxxxx or earlier): TOSHIBA TEC TRW-USM-01 for U.S.A., Canada, Australia, South Korea, Taiwan CN: TOSHIBA TEC TRW-CNM-01 for CHina
Applicable standard	EU: ETSI EN 300 220 AU: C-Tick AS.NZS 428(2003); A1 US: FCC Part15 Subpart C TW: NCC (National Communications Commission) LP2002 Low-power Radio-frequency Devices Technical Specifications KR: KCC (Korea Communications Commission) Radio Certification Standard No. 2008-26 Article 98
Frequency range	EU: 869.7 - 870.0MHz AU: 918.25 - 925.75MHz US: 902.75 - 927.5MHz KR: 910.4 - 913.6 MHz TW: 922.25 - 927.25 MHz CN: 920.625 - 924.375MHz
Center frequency	EU: 869.85MHz AU: 922MHz US: 915.125MHz KR: 912MHz TW: 924.75MHz CN: 922.5MHz
Output power (ERP)	EU: Max. 5mW (Power class 7a)
Output power (Conducted)	10 - 100mW
Modulation method (RW to Tag)	DSB-ASK
Modulation method (Tag to RW)	Back scatter ASK
Transmission speed (RW to Tag)	40kbps
Transmission speed (Tag to RW)	40kbps
Encoding (RW to Tag)	PIE
Encoding (Tag to RW)	FM0
Number of channels	EU: 1 AU: 31 (Frequency Hopping) US: 99 (Frequency Hopping) TW: 21 (Frequency Hopping) KR: 17 (Frequency Hopping) CN: 16 (Frequency Hopping)
Duty Cycle	EU: Max. 100% (Class 4)
Carrier sense feature	None
Environmental standard	RoHS directive
Available RFID tags	EPC C1 Gen2, ISO-18000-6C

3.7 WIRELESS LAN BOARD: B-EX700-WLAN-QM-R

Country code:

Be sure to set the country code beforehand because the frequency band differs depending on the country. Please ask end-users to confirm the country code setting. Using the printer with wrong country code may conflict with the radio law of each country, causing a penalty.

Setting the country code not listed below will be processed as that of Japan.

Country code	Country	11b Usable Channel	11g Usable Channel
392	Japan	1-14	1-13
840	USA	1-11	1-11
124	Canada	1-11	1-11
36	Australia	1-13	1-13
554	New Zealand	1-13	1-13
484	Mexico	1-11	1-11
710	South Africa	1-13	1-13
156	China	1-13	1-13
344	Hong Kong	1-13	1-13
158	Taiwan	1-11	1-11
410	Republic of Korea	1-13	1-13
56	Belgium	1-13	1-13
528	Netherlands	1-13	1-13
442	Luxembourg	1-13	1-13
250	France	1-13	1-13
380	Italy	1-13	1-13
276	Germany	1-13	1-13
208	Denmark	1-13	1-13
372	Ireland	1-13	1-13
826	United Kingdom	1-13	1-13
300	Greece	1-13	1-13
724	Spain	1-13	1-13
620	Portugal	1-13	1-13
40	Austria	1-13	1-13
246	Finland	1-13	1-13
752	Sweden	1-13	1-13
203	Czech Republic	1-13	1-13
233	Estonia	1-13	1-13
196	Cyprus	1-13	1-13
428	Latvia	1-13	1-13
440	Lithuania	1-13	1-13
348	Hungary	1-13	1-13
470	Malta	1-13	1-13
616	Poland	1-13	1-13
705	Slovenia	1-13	1-13
703	Slovakia	1-13	1-13
100	Bulgaria	1-13	1-13
642	Romania	1-13	1-13
578	Norway	1-13	1-13
438	Liechtenstein	1-13	1-13
352	Iceland	1-13	1-13
756	Switzerland	1-13	1-13

MAC Address:

MAC address is described on the wireless LAN module and the accessory sticker.
It is required when using the MAC address filtering function of the Access Point (AP). Please describe it in the installation manual, etc. which is managed by end-users.
The MAC address can be confirmed by the maintenance counter print in the system mode.

Specification:

1) Hardware

Item	Description			
Standard	IEEE802.11b/g			
Enabled Device	B-EP2DL/B-EP4DL Series			
Operating Temperature	0°C to +50°C			
Destination	Japan		USA	Europe
Frequency (Center Channel)	2412 to 2484MHz		2412 to 2462MHz	2412 to 2472MHz
Channel	1 to 14ch		1 to 11ch	1 to 13ch
Spacing	5MHz			
Transmission speed/ Modulation	IEEE802. 11b	Transmission method	Conforming to IEEE802.11b DSSS method	
		Channel	Depending on the country	
		Data transmission speed/ Modulation	11/5.5Mbps:CCK 2Mbps:DQPSK 1Mbps:DBPSK	
	IEEE802. 11g	Transmission method	Conforming to IEEE802.11g OFDM method DSSS method	
		Channel	Depending on the country	
		Data transmission speed/ Modulation	54/48Mbps:64QAM 36/24Mbps:16QAM 18/12Mbps:QPSK 9/6Mbps:BPSK	
Antenna	Chip type antenna (Built-in module)			
Aerial power	802.11b	13dBm(19.95mW) Max		
	802.11g	11dBm(12.59mW) Max		

2) Software

Item		Description
Connection mode (Refer to Note 1)		Infrastructure, Adhoc
Default Country Code		JPN
Default IP Address		192.168.xxx.yyy Set the printer ID for xxx,yyy.
Default Subnet Mask		255.255.0.0
Default ESSID		TOSHIBATEC
Security		IEEE802.11i
	Cryptography	WEP (64/128bit), TKIP(WPA), AES(WPA2)
	Authorization	Shared Key (for WEP), PSK, PEAP, TLS, TTLS, MD5, LEAP, EAP-FAST
	Browser	Microsoft IE5.01 and greater
Protocol (Refer to Note 2)		TCP/IP,Socket,LPD（LPR）,DHCP/WINS,HTTPD,（SNMP）
Wireless LAN Parameter Setting and Status monitor (Refer to Note 3)		Parameter Setting: Command （PC Setting Tool） Status monitor: via HTTP

NOTES:

1. *The printer constantly performs communication with cordless handset in Adhoc mode, therefore, the consumption current in standby status increases, causing the time available of the battery pack to be reduced.*
2. *SNMP protocol is only for the download with the network tool.*
3. *Part of the parameter setting can be performed by key operations.*