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PT-9500PC Command Reference

ESC/P Volume

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Model Name: P-touch 9500pc

Created by: Brother Industries, Ltd., Personal & Home Company, Development Dept.

Introduction

This material provides the necessary information for directly controlling PT-9500PC. This information is provided assuming that the user has full understanding of the operating system being used and basic mastery of RS-232C and USB in a developer's environment.

We accept no responsibility for any problems caused by programs that you develop using the information provided in this material, affecting software, data or hardware, including the PT-9500PC, and any problems resulting directly or indirectly from them. Use this material only if you accept these terms.

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These ESC/P commands have been adapted specifically for this company.

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PT-9500PC function specifications

Printing	Printing method		Raster printing (PTCBP mode) ESC/P printing (ESC/P mode)
	Printing conditions		Auto tape cut (command specification) Auto half cut (command specification) Chain printing (command specification) Mirror printing (command specification) Margins Stamp
	Resolution (dpi)		Height × Width HG cassette (high speed)/TZ cassette 360 × 360 HG cassette (high resolution) 360 × 720
	Buffer		Print image buffer: Approx. 2 Mbits When not compressed: Approx. 30 cm (approx. 12 in.) When compressed: 30 cm or more (differs according to the print contents) With ESC/P: Approx. 25 cm (approx. 10 in.) Note: Halve with high-resolution printing Transmission buffer: 256 bytes
	Text	Font	English: HELSINKI (proportional Gothic-style font) LETTER GOTHIC (fixed pitch Gothic-style font) Japanese: Misugi Gothic (hiragana, katakana, Arabic numerals, and first level kanji) The data uses only bitmapped fonts.
		Size (points)	English: 24, 18, 12, 9, 6, 4.5, Auto Japanese: 18 (four times the size of 9), 9, 4.5, Auto
		Character style	None , Bold, Italics
		Frame	None , Rectangular frame
		Underline	Off , On
		Character width	Half, Normal , Wide
		Horizontal alignment	Left , Center, Right, Justify
		Rotate	Off , On
		Bar code	Protocols	CODE39, ITF, CODABAR, EAN8, EAN13, UPC-A, UPC-E
		Width	Large, Medium, Small
	Bar code ratio	3:1 , 2.5:1, 2:1	
Transmission control	RS	Baud rate (bps)	115.2k , 57.6k, 9600
		Flow control	DTR , Xon/Xoff
		Data length	8 , 7
		Parity	NONE , ODD, EVEN
		Stop bit	1 bit
	USB *1	IC	PDIUSB12 Manufactured by Philips
		Bandwidth	Maximum during bulk transmission: 12 Mbps
Specifications		Complies with Ver. 1.1 Compatible with full-speed devices (12 Mbps) Compatible with Bulk OUT, Bulk IN, and control transmission	
Command	PTCBP	Refer to the Command Reference for the CBP-RASTER Mode (different volume).	
	ESC/P	Refer to the Command Reference for ESC/P mode (this volume).	

Settings that **appear in bold and are underlined** are the default settings.

*1 The ESC/P commands are only valid with a serial connection. They do not function with a USB connection.

Serial interface (RS-232C)

Connector (RS)

MINI DIN 8PIN

DTR: Data Terminal Ready	(output)
TXD: Transmission Data	(output)
GND: Safety ground, signal ground	
RXD: Reception Data	(input)
RTS: Request to Send	(output) P-touch turned on

Connection diagram

	PIN CONNECTION				
SIGNAL NAME	DCD	RXD	TXD	DTR	GND
Windows connector (D-sub)	1	2	3	4	5
SIGNAL NAME		RXD	TXD	DTR	GND
Macintosh connector (Mini-Din)	NC	5	3	1	4
SIGNAL NAME	RTS	TXD	RXD	DSR	GND
PT-9500PC connector (Mini-Din)	8	3	5	2	4

Avoiding cross-connections

If the USB cable is connected and the connected computer is turned on, the USB connection is activated, even if a serial cable is connected.

If a USB cable is not connected, or if a USB cable is connected, but the connected computer is not turned on, the serial connection is activated if a serial cable is connected.

	Case 1	Case 2	Case 3	Case 4
USB	Connected (The computer is turned on.)	Connected (The computer is turned on.)	Connected (The computer is turned off.)	
Serial	Connected		Connected	Connected
Activated Interface	USB	USB	Serial	Serial

* "Connected" indicates that the cable is connected.

In order to print in ESC/P mode, the serial connection must be activated.

List of commands

<Overview>

This machine can use the CBP-RASTER mode (PTCBP mode), which is an original command system, or it can use commands based on ESC/P (ESC/P mode).

When printing from the printer driver on either a Windows or Macintosh computer, normally the commands are received in the CBP-RASTER mode (PTCBP mode).

When used with another host and when printing directly using character codes instead of going through the driver on a Windows or Macintosh computer, printing is possible with the ESC/P mode.

(Note) The ESC/P mode can only be used with a serial (RS-232C) connection. It cannot be used with a USB connection.

This manual contains information on the commands for the ESC/P mode. For details on the commands with the raster mode, refer to the CBP-RASTER Mode (PTCBP Mode) volume of the PT-9500PC Command Reference.

<Initial setting>

The manufacturer's default setting is the CBP-RASTER mode (PTCBP mode).
In order to use the ESC/P mode, the machine must be set to use the ESC/P mode.

<Changing the mode>

The printing method can be switched between the CBP-RASTER mode (PTCBP mode) and the ESC/P mode in either of the following two ways.

1. Switching by using commands

Procedure

- (1) Connect the P-touch to the serial port of the computer.
- (2) Send the "change mode" command to the COM port where the P-touch is connected.

ESC ia	Switch between ESC/P and PTCBP	
	ASCII	ESC I A
	Hexadecimal	1B 69 61
	Parameters	n (0.n.255)

[Description]

- . Selects the command mode.
- . If n=0 (hexadecimal), the ESC/P mode is selected.
If anything other than n=0 (hexadecimal), the PTCBP mode is selected.

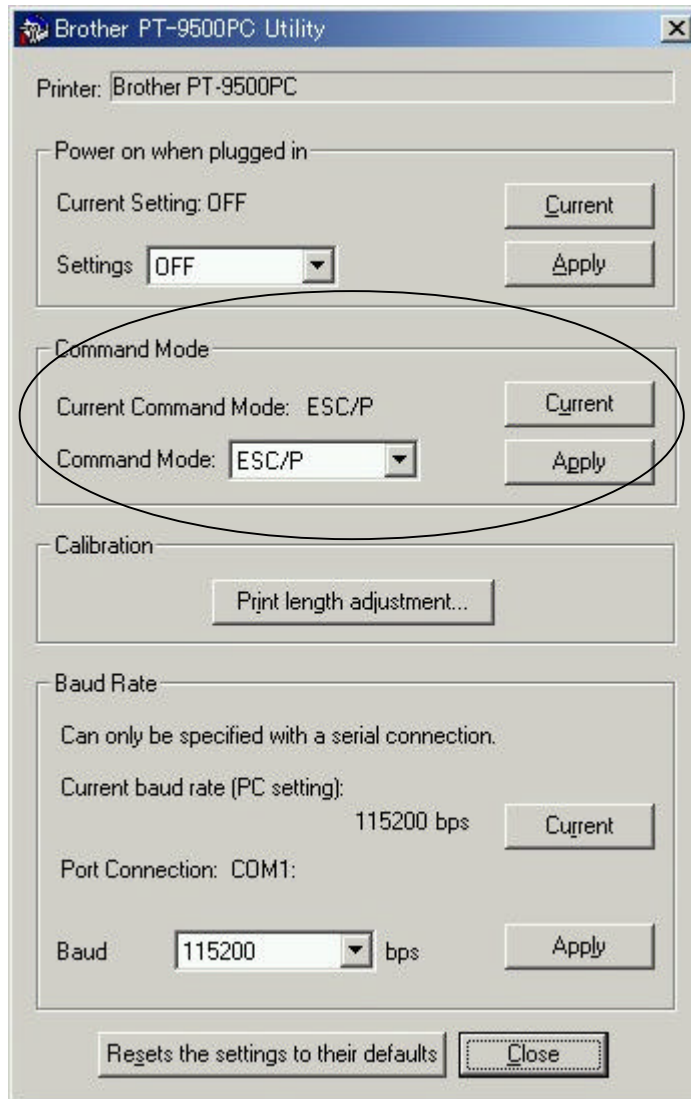
Note: When sending a command directly to the COM port, the input/output settings of the computer and the P-touch must set correctly. The manufacturer's default settings for serial transmission with the P-touch are indicated below in **bold and underlined**.

Baud rate (bps)	<u>115.2k</u> , 57.6k, 9600
Flow control	<u>DTR</u> , Xon/Xoff
Data length	<u>8</u> , 7
Parity	<u>NONE</u> , ODD, EVEN
Stop bit	1 bit

2. Switching by using the utility included with the Windows printer driver

Procedure

- (1) Install the printer driver. (Switching the mode is possible from either a serial or a USB connection.)
- (2) From the Printers folder, display the properties for Brother PT-9500PC.
 - On Windows 9x: Click the [Utility] button on the Advanced tab to start up the Brother PT-9500PC Utility.
 - On Windows NT: Click the [Utility] button on the Device Settings tab, and then click the [Properties] button that appears to start up the Brother PT-9500PC Utility.



The setting is made from the “Command Mode” box on the dialog box that appeared. In order to apply this setting, the P-touch must be turned off, then on again.

Caution

If the printer driver is installed with a serial connection, the printer port is the COM port where the P-touch is connected. To print from the same computer using the ESC/P mode, use the utility to switch modes, and then change the printer port of the PT-9500PC to a different port, such as “FILE:”, so that the COM port where the P-touch is connected is no longer being used.

If the P-touch is set to the CBP-RASTER mode (PTCBP mode), text output cannot be received by ASCII code. However, if the P-touch is set to the ESC/P mode, the printer driver automatically switches to raster mode to output the raster data.

List of commands for ESC/P mode

List of ESC/P mode commands (1: Basic)

	Command Code	Hexadecimal	Function
1- 1	CR (Note)	0D	Line feed or begin printing
1- 2	LF (Note)	0A	Line feed or begin printing
1- 3	FF	0C	Begin printing
1- 4	ESC J *	1B 4A *	Specify and perform line feed of n/180"
1- 5	ESC 0	1B 30	Specify line feed of 1/8"
1- 6	ESC 2	1B 32	Specify line feed of 1/6"
1- 7	ESC 3 *	1B 33 *	Specify line feed of n/180"
1- 8	ESC A *	1B 41 *	Specify line feed of n/60"
1- 9	ESC \$ *	1B 24 *	Specify absolute location
1-10	ESC \ *	1B 62 *	Specify relative location
1-11	ESC 4	1B 34	Apply italics
1-12	ESC 5	1B 35	Remove italics
1-13	ESC E	1B 45	Apply bold style
1-14	ESC F	1B 46	Remove bold style
1-15	ESC G	1B 47	Apply bold style
1-16	ESC H	1B 48	Remove bold style
1-17	ESC - *	1B 2D *	Apply/remove underlining
1-18	ESC ! *	1B 21 *	Global formatting
1-19	ESC K *	1B 4B *	8-dot bit image (standard density)
1-20	ESC L *	1B 4C *	8-dot bit image (double density)
1-21	ESC Y *	1B 59 *	8-dot bit image (double speed, double density)
1-22	ESC Z *	1B 5A *	8-dot bit image (quadruple density)
1-23	ESC **	1B 2A *	Select bit image
1-24	ESC @	1B 40	Initialize
1-25	CAN	18	Clear text
1-26	DEL	7F	Delete one character
1-27	ESC i *	1B 69 *	Bar code control
1-28	ESC CR	1B 0D	Not available
1-29	ESC i a *	1B 69 71 *	Switch between ESC/P and PTCBP

(Note) CR, LF, CR+LF and LF+CR are all "line feed" or "begin printing" commands.

(Note) The print result is the same whether ESC E or ESC G is specified to apply bold.

List of ESC/P mode commands (2: Text operations)

	Command Code	Hexadecimal	Function
2- 1	ESC R *	1B 52 *	Specify international character set
2- 2	ESC t *	1B 74	Select character code table
2- 3	ESC W *	1B 57 *	Select double-width characters
2- 4	SI	0F	Select reduced size (half width)
2- 5	ESC SI	1B 0F	Select reduced size (half width)
2- 6	DC2	12	Cancel reduced size (half width)
2- 7	ESC a *	1B 61 *	Specify alignment (global)

List of ESC/P mode commands (3: Text and font)

	Command Code	Hexadecimal	Function
3- 1	FS &	1C 26	Select Japanese mode
3- 2	FS .	1C 46	Cancel Japanese mode
3- 3	FS SI	1C 0F	Specify half-width text
3- 4	FS DC2	1C 12	Cancel half-width text
3- 5	FS -	1C 2D	Specify Japanese underlining
3- 6	FS k *	1C 6B *	Select font (no setting for vertical writing)

3-7	FS Y *	1C 59 *	Select text size

List of ESC/P mode commands (4: P-touch-specific)

	Command Code	Hexadecimal	Function
4-1	ESC i C *	1B 69 43 *	Select full cut, half cut, or chain printing
4-2	ESC i F *	1B 69 66 *	Apply/remove a frame (global)
4-3	ESC i l *	1B 69 4C *	Specify tape length ("0" indicates "AUTO".)
4-4	ESC i L *	1B 69 6C *	Apply/remove rotated printing
4-5	ESC i m *	1B 69 6D *	Margins

List of ESC/P mode commands (5: RS232C settings)

	Command Code	Hexadecimal	Function
5-1	ESC i U B *	1B 69 55 42 *	Specify baud rate
5-2	ESC i U b *	1B 69 55 62 *	Specify bit length
5-3	ESC i U P *	1B 69 55 50 *	Specify parity
5-4	ESC i U C *	1B 69 55 43 *	Specify busy controls

Details of ESC/P mode commands

1: Basic commands

1-1

CR	Line feed	
	ASCII	CR
	Hexadecimal	0D
	Parameters	None

[Description]

- Performs a line feed of the amount specified by a command that specifies the line feed amount (ESC 0, ESC 2, ESC 3 and ESC A).
- If no line feed amount is specified, it is automatically distributed according to the width of the tape.
- The next print position is the beginning of the following line.

1-2

LF	Line feed	
	ASCII	LF
	Hexadecimal	0A
	Parameters	None

[Description]

- Performs the same line feed operation as CR.

CR LF	Line feed	
	ASCII	CR LF
	Hexadecimal	0D 0A
	Parameters	None

[Description]

- Performs the same line feed operation as CR.

LF CR	Line feed	
	ASCII	LF CR
	Hexadecimal	0A 0D
	Parameters	None

[Description]

- Performs the same line feed operation as CR.

1-3

FF	Begin printing	
	ASCII	FF
	Hexadecimal	0C
	Parameters	None

[Description]

- . Begins printing.
- . Clears the text, image data and bar code data after printing.
- . If the data does not fit within the printable height of the tape, the data is divided and printed onto multiple pages.
- . If the height of the print data exceeds 10 inches, the LED lights up to indicate that an error has occurred.

1-4

ESC J	Line feed of n/180"	
	ASCII	ESC J
	Hexadecimal	1B 4A
	Parameters	n (0.n.255)

[Description]

- . Finishes inputting the current line, and then feeds the vertical print position n/180".
- . If n is less than 24, a line feed of 24/180" (approximately 0.34 cm) is added.

1-5

ESC 0	Specify line feed of 1/8"	
	ASCII	ESC 0
	Hexadecimal	1B 30
	Parameters	None

[Description]

- . Sets the line feed amount to 1/8" (approximately 0.32 cm).

1-6

ESC 2	Specify line feed of 1/6"	
	ASCII	ESC 2
	Hexadecimal	1B 32
	Parameters	None

[Description]

- . Sets the line feed amount to 1/6" (approximately 0.42 cm).

1-7

ESC 3	Specify line feed of n/180"	
	ASCII	ESC 3
	Hexadecimal	1B 33
	Parameters	n (0.n.255)

[Description]

- Sets the line feed amount to n/180" per line.
- If n is less than 24, the line feed amount is set to 24/180" (approximately 0.34 cm).

1-8

ESC A	Specify line feed of n/60"	
	ASCII	ESC A
	Hexadecimal	1B 41
	Parameters	n (0.n.255)

[Description]

- Sets the line feed amount to n/60".
- If n is less than 8, the line feed amount is set to 8/60" (approximately 0.34 cm).

1-9

ESC \$	Specify absolute horizontal location	
	ASCII	ESC \$
	Hexadecimal	1B 24
	Parameters	n1 (0.n1.255) n2 (0.n2.255)

[Description]

- Specifies the absolute location for the print position of the next data in units of 1/60".
- When specifying an absolute location, the horizontal print position is specified from the left margin.
- The next character is printed at a position (n1+256*n2)/60" from the left margin.
- The maximum number of dots that can be specified, depending on n1 and n2, is 1023/60".
 - However, since the printable length is 10", an actual value greater than 600/60" will result in an error during printing.

1-10

ESC \	Specify relative horizontal location	
	ASCII	ESC \
	Hexadecimal	1B 5C
	Parameters	n1 (0.n1.255) n2 (0.n2.255)

[Description]

- Specifies the relative location for the print position of the next data in units of 1/180".
- When specifying a relative location, the horizontal print position is specified based on the current position.
- The next character is printed at a position $(n1+256*n2)/180$ " from the current position.
- A relative position cannot be specified to the left (in the negative direction).
- The maximum number of dots that can be specified, depending on n1 and n2, is $16383/180$ ".
 - However, since the printable length is 10", an actual value greater than $1800/180$ " will result in an error during printing.

1-11

ESC 4	Apply italic style	
	ASCII	ESC 4
	Hexadecimal	1B 34
	Parameters	None

[Description]

- Applies the italic style to the following text.

1-12

ESC 5	Remove italic style	
	ASCII	ESC 5
	Hexadecimal	1B 35
	Parameters	None

[Description]

- Removes the italic style.

1-13

ESC E	Apply bold style	
	ASCII	ESC E
	Hexadecimal	1B 45
	Parameters	None

[Description]

- Prints the following text in bold.

1-14

ESC F	Remove bold style	
	ASCII	ESC F
	Hexadecimal	1B 46
	Parameters	None

[Description]

- Removes the bold style.

1-15

ESC G	Apply bold style	
	ASCII	ESC G
	Hexadecimal	1B 47
	Parameters	None

[Description]

- Prints the following text in bold.**

1-16

ESC H	Remove bold style	
	ASCII	ESC H
	Hexadecimal	1B 48
	Parameters	None

[DESCRIPTION]

- Removes the bold style.

1-17

ESC -	Apply/remove underlining	
	ASCII	ESC -
	Hexadecimal	1B 2D
	Parameters	n (n=0 or n=30h) or (n=1 or n=31h)

[Description]

- Applies or removes underlining.
- If n=1 or 31h ("1"), underlining is applied.
- If n=0 or 30h ("0"), underlining is removed.
- The underlining is a continuous line according to the specified code.
- Areas between characters and spaces are also underlined.

1-18

ESC !	Global formatting	
	ASCII	ESC !
	Hexadecimal	1B 21
	Parameters	n (0.n.255)

[Description]

- Specifies a combination of the various print modes.
- Specifies the mode according to each bit of the value of n.
- This allows multiple print modes to be specified at one time.

Bit	7	6	5	4	3	2	1	0
Set to "1"	Underline	Italics	Not used	Bold	Bold	Not used	Not used	Not used
Set to "0"	Remove	Remove	Not used	Remove	Remove	Not used	Not used	Not used

1-19

ESC K	8-dot bit image (standard density)	
	ASCII	ESC K
	Hexadecimal	1B 4B
	Parameters	n1 (0.n1.255) n2 (0.n2.255) d1.dk (k=n2x256+n1)

[EXPLANATION]

Specifies that an 8-dot bit image (standard density) will be printed with the dot position defined by n1 and n2.

1-20

ESC L	8-dot bit image (double density)	
	ASCII	ESC L
	Hexadecimal	1B 4C
	Parameters	n1 (0.n1.255) n2 (0.n2.255) d1.dk (k=n2x256+n1)

[Description]

- Specifies that an 8-dot bit image (double density) will be printed with the dot position defined by n1 and n2.
- The specification of n1 and n2 is the same as with ESC K.

1-21

ESC Y	8-dot bit image (double speed, double density)	
	ASCII	ESC Y
	Hexadecimal	1B 59
	Parameters	n1 (0.n1.255) n2 (0.n2.255) d1.dk (k=n2.256+n1)

[Description]

- Specifies that an 8-dot bit image (double speed, double density) will be printed with the dot position defined by n1 and n2.
- The specification of n1 and n2 is the same as with ESC K.

1-22

ESC Z	8-dot bit image (quadruple density)	
	ASCII	ESC Z
	Hexadecimal	1B 5A
	Parameters	n1 (0.n1.255) n2 (0.n2.255) d1.dk (K=n2.256+n1)

[Description]

- Specifies that an 8-dot bit image (quadruple density) will be printed with the dot position defined by n1 and n2.
- The specification of n1 and n2 is the same as with ESC K.

ESC *	Select bit image	
	ASCII	ESC *
	Hexadecimal	1B 2A
	Parameters	m (m=0, 1, 2, 3, 4, 6, 32, 33, 38, 39, 40) n1 (0.n1.255) n2 (0.n2.255) d1.dk (If m.6, K=n2×256+n1) (If m.32, K=(n2×256+n1)×3)

[Description]

- The bit image is selected according to the value of m, then printed out.
- n1 and n2 indicate the dot position.

m	Bit Image	Dot Density of Width	Dot Density of Height
0	8-dot, single density	éèèéé	éèèéé
1	8-dot, double density	éèèèéé	éèèéé
2	8-dot, double speed, double density	éèèèéé	éèèéé
3	8-dot, quadruple density	éèèèéé	éèèéé
4	8-dot CRT graphic	éèèéé	éèèéé
6	8-dot CRT graphic 2	éèèéé	éèèéé
32	24-dot, single density	éèèéé	éèèèéé
33	24-dot, double density	éèèèéé	éèèèéé
38	24-dot CRT graphic 2	éèèéé	éèèèéé
39	24-dot, triple density	éèèèéé	éèèèéé
40	24-dot, sextuple density	éèèèéé	éèèèéé

ESC/P Specifications					Zoom Ratio When Printing With PT9500PC (at 360 dpi)		Remarks
m	Bit Image	Dot Density of Width .dpi.	Dot Density of Height .dpi.	Width	Height		
0	8-bit, single density	60	60	X6	X6	Same as ESC K	
1	8-dot, double density	120	60	X3	X6	Same as ESC L	
2	8-dot, double speed, double density	120	60	X3	X6	Same as ESC Y	
3	8-dot, quadruple density	240	60	X2	X6	Same as ESC Z	
4	8-dot CRT graphic	80	60	X4	X6		
6	8-dot CRT graphic II	90	60	X4	X6		

32	24-dot, single density	60	180	X6	X2	
33	24-dot, double density	120	180	X3	X2	
38	24-dot CRT graphic II	90	180	X4	X2	
39	24-dot, triple density	180	180	X2	X2	
40	24-dot, sextuple density	360	180	X1	X2	

1-24

ESC @	Initialize	
	ASCII	ESC @
	Hexadecimal	1B 40
	Parameters	None

[Description]

- Resets all functions to their default settings.

Item	After Initialization
Command mode .ESC/P or PTCBP.	No change
Communication settings (Baud rate, Parity, Bit length and Busy control)	No change
Received text and bar codes	Cleared
Received image data	Cleared
Line feed amount	AUTO
Relative location specification	Cleared
Absolute location specification	Cleared
Font	HELSINKI
Character size	AUTO
Italics	OFF
Bold	OFF
Underline	OFF
Character width	Normal (The Half and Wide styles are removed.)
Character code table	Multilingual
International character set	USA
Kanji mode	Cancelled
Frame	None
Rotate	OFF
Text alignment	Left
Margins	2mm
Tape length	AUTO

Bar code protocol	CODE39
Bar code width	Small
Bar code ratio	3.1
Bar code check digit	OFF
Characters under bar codes	ON
Full cut	ON
Half cut	ON
Chain printing	OFF

1-25

CAN	Clear text	
	ASCII	CAN
	Hexadecimal	18
	Parameters	None

[Description]

- Clears all character, image and bar code data that was received.

1-26

DEL	Delete one character	
	ASCII	DEL
	Hexadecimal	7F
	Parameters	None

[Description]

- With the same operation, one character is deleted from the immediately preceding entered character data.
- If the immediately preceding data is a bar code, the bar code is deleted.
- Image data cannot be deleted.

ESC i	Start bar code mode	
	ASCII	ESC i
	Hexadecimal	1B 69
	Parameters	<p>n</p> <p>(n=54h('T') or n=74h('t') or n=52h('R') or n=72h('r') or n=42h('B') or n=62h('b') or n=73h('s') or n=70h('p') or n=75h('u') or n=78h('x') or n=79h('y') or n=68h('h') or n=77h('w') or n=7Ah('z'))</p>

[Description]

- . Starts bar code mode.
- . The bar code mode is constructed as shown below.

ESC i	[Parameter]	B or b	[Bar code data]	\
	(1)	(2)	(3)	(4)
- . (1) can be omitted; however, (2) through (4) cannot be omitted.
- . (1) can be used to specify multiple parameters.
- . The bar code data of (3) can be as long as 22 characters, unless otherwise specified.

(1) [Parameter]: Bar code parameters (can be omitted; multiple parameters can be specified)

ASCII	Hexadecimal	Function
T or t	54 or 74	Specifies the bar code protocol.

t0	74 30	CODE39
t1	74 31	INTERLEAVED 2 OF 5
t2	74 32	EAN-13
t3	74 33	EAN-8
t4	74 34	UPC-A
t5	74 35	Automatically switches EAN-8 (if the bar code data that was sent is 7 characters long) UPC-A (if the bar code data that was sent is 11 characters long) EAN-13 (if the bar code data that was sent is 12 characters long) *The check digit mark “?” is not included in the number of
t6	74 36	characters.
t9	74 39	UPC-E CODABAR

s	73	Not available (This parameter is ignored.)
p	70	Not available (This parameter is ignored.)

R or r	52 or 72	Specifies whether or not the characters appear below the bar code.
r0	72 30	The characters do not appear below the bar code.
r1	72 31	The characters appear below the bar code.

u	75	Not available (This parameter is ignored.)
x	78	Not available (This parameter is ignored.)
y	79	Not available (This parameter is ignored.)
h	68	Not available (This parameter is ignored.)

w	77	Specifies the bar code width.
w0	77 30	Small
w1	77 31	Medium
w2	77 32	Large

z	7A	Specifies the ratio between thick and thin bars.
z0	7A 30	3.1
z1	7A 31	2.5.1
z2	7A 32	2.1

The numbers in the parameters are 0 through 9, which can be indicated as “0” through “9” or “30h” through “39h”.

(2) B (42h) or b (62h): Indicates the beginning of the bar code data.

(3) [Bar code data]: Sends the bar code data to be printed.

- . The bar code data can be as long as 22 characters, unless otherwise specified.
- . If the check digit parameter is specified, “?” is added at the end of the bar code data.

?(3Fh)	Automatically calculates and adds the check digit.
--------	--

(4) \ or \ (5Ch): Indicates the end of the bar code data.

1-28

ESC CR	Not available	
	ASCII	ESC CR
	Hexadecimal	1B 0D
	Parameters	n (0.n.255)

[Description]

- . None

1-29

ESC i a	Switch between ESC/P and PTCBP	
	ASCII	ESC i a
	Hexadecimal	1B 69 61
	Parameters	n (0.n.255)

[Description]

- . Selects the command mode.
- . If n=0 (hexadecimal), the ESC/P mode is selected.
- . If anything other than n=0 (hexadecimal), the PTCBP mode is selected.

2: Text operations

2-1

ESC R	Specify international character set	
	ASCII	ESC R
	Hexadecimal	1B 52
	Parameters	n (0.n.13, 64)

[DESCRIPTION]

- . Selects the character set of each country.
- . If n=0 United States
- . If n=1 France
- . If n=2 Germany
- . If n=3 Britain
- . If n=4 Denmark
- . If n=5 Sweden
- . If n=6 Italy
- . If n=7 Spain
- . If n=8 Japan
- . If n=9 Norway
- . If n=10 Denmark 2
- . If n=11 Spain 2
- . If n=12 Latin America
- . If n=13 Korea
- . If n=64 Legal
- . When using the multilingual code table, printing is performed according to the international character set setting.
- . When using the Eastern European character table, the international character set setting is ignored.

2-2

ESC t	Select character code table	
	ASCII	ESC t
	Hexadecimal	1B 74
	Parameters	n (0.n.1)

[DESCRIPTION]

- . Selects the character code table.
- . If n=0, the multilingual code table is selected.
- . If n=1, the Eastern European code table is selected.

2-3

ESC W	Select double-width characters	
	ASCII	ESC W
	Hexadecimal	1B 57
	Parameters	n (n=0, 1 or 30h, 31h)

[Description]

- . Selects double-width characters.
- . If n=1 (or 31h), double-width characters are selected.
- . If n=0 (or 30h), double-width characters are not selected.

2-4

SI	Select reduced size	
	ASCII	SI
	Hexadecimal	0F
	Parameters	None

[Description]

- . The following data is printed as half-width characters.

2-5

ESC SI	Select reduced size	
	ASCII	ESC SI
	Hexadecimal	1B 0F
	Parameters	None

[Description]

- . Same as SI

2-6

DC2	Cancel reduced size	
	ASCII	DC2
	Hexadecimal	12
	Parameters	None

[Description]

- . Cancels the reduced size style. (Returns the character size to full width.)

ESC a	Specify alignment	
	ASCII	ESC a
	Hexadecimal	1B 61
	Parameters	n (0.n.3 or 30h.n.33h)

[Description]

- . The text is printed with the alignment described below, depending on the value of n.
 - If N=0 (or 30h), left alignment is specified.
 - If N=1 (or 31h), center alignment is specified.
 - If N=2 (or 32h), right alignment is specified.
 - If N=3 (or 33h), justified text is specified.
- . The default setting is left alignment.
- . The last alignment setting received applies to all of the print data.
- . If an absolute horizontal position or a relative horizontal position is specified, the text must be aligned on the left when it is printed.

3: Text and font

3-1

FS &	Select Japanese mode	
	ASCII	FS &
	Hexadecimal	1C 26
	Parameters	None

[Description]

- . Selects the Japanese mode.
- . In Japanese mode, the characters are expressed in a 2-byte code (JIS code).
- . With this mode, katakana and hiragana text can be printed.
- . Only first level kanji can be printed.

(Example) To express the character string “.. a”

. (JIS code: 242B)

. (JIS code: 244A)

a (ASCII code: 61)

Sequence: FS & .. FS .a

Hexadecimal: 1C 26 24 2B 24 4a 1C 2E 61

3-2

FS .	Cancel Japanese mode	
	ASCII	FS .
	Hexadecimal	1C 2E
	Parameters	None

[Description]

- . Cancels Japanese mode.

3-3

FS SI	Specify half-width text	
	ASCII	FS SI
	Hexadecimal	1C 0F
	Parameters	None

[Description]

- . The following data is printed as half-width characters.

3-4

FS DC2	Cancel half-width text	
	ASCII	FS DC2
	Hexadecimal	1C 12

Parameters	None
------------	------

[Description]

- Cancels the reduced size style. (Returns the character size to full width.)

3-5

FS -	Apply/remove Japanese underlining	
	ASCII	FS -
	Hexadecimal	1C 2D
	Parameters	n (n=0 or n=30h) or (n=1 or n=31h)

[Description]

- Applies or removes underlining.
 - If n=1 or 31h ("1"), underlining is applied.
 - If n=0 or 30h ("0"), underlining is removed.
 - The underlining is a continuous line according to the specified code.
- Areas between characters and spaces are also underlined.

3-6

FS k	Select font	
	ASCII	FS k
	Hexadecimal	1C 6B
	Parameters	n (0.n.1 or 30h.n.31h)

[DESCRIPTION]

- Selects the font for English text.
 - If n=0 (or 30h) HELSINKI (proportional Gothic-style font)
 - If n=1 (or 31h) LETTER GOTHIC (fixed-pitch Gothic-style font)

3-7

FS Y	Select text size	
	ASCII	FS Y
	Hexadecimal	1C 59
	Parameters	n (0.n.6 or 30h.n.36h)

[Description]

- . Specifies the character size.
- . The character size can be set to AUTO or a fixed size (6 sizes).
- . However, there are three character sizes (24 dots, 48 dots, and 48 dots × 2) for Japanese fonts.
 - If n=0 (or 30h), the AUTO size is selected.
 - If n=1 (or 31h), the 4 point size is selected. (English: 21 dots; Japanese: 24 dots)
 - If n=2 (or 32h), the 6 point size is selected. (English: 28 dots; Japanese: 24 dots)
 - If n=3 (or 33h), the 9 point size is selected. (English: 44 dots; Japanese: 48 dots)
 - If n=4 (or 34h), the 12 point size is selected. (English: 56 dots; Japanese: 48 dots)
 - If n=5 (or 35h), the 18 point size is selected. (English: 88 dots; Japanese: 48 dots)
 - If n=6 (or 36h), the 24 point size is selected. (English: 120 dots; Japanese: 48 dots × double width)
- . Japanese with the 6-point, 12-point or 18-point sizes applied are the same as if the 4-point, 9-point or 9-point sizes, respectively, are applied.
- . With the AUTO size, the text is printed with the largest size possible for the width of the installed tape. If there are multiple lines of text, the character size is automatically reduced to fit within the width of the tape.

4: P-touch-specific commands

4-1

ESC i C	Select cut setting	
	ASCII	ESC i C
	Hexadecimal	1B 69 43
	Parameters	n (0.n.255)

[Description]

- Selects full cut, half cut, or chain printing.
- The n parameter (1 byte) specifies all settings in bit units, as shown below.

7	6	5	4	3	2	1	0
---	---	---	---	---	---	---	---

- 0: Full cut
- 1: Half cut
- 2: Chain printing
- 3: Not used
- 4: Not used
- 5: Not used
- 6: Not used
- 7: Not used

- If bit 0 of parameter n is "1", full cut is specified. If it is "0", full cut is cancelled.
- If bit 1 of parameter n is "1", half cut is specified. If it is "0", half cut is cancelled.
- If bit 2 of parameter n is "1", chain printing is specified. If it is "0", chain printing is cancelled.
- With chain printing, after a label is printed, it is not fed out and cut until the next label is printed. In this way, the excess tape that is normally fed out at the beginning of the next printed label can be reduced. This greatly reduces the amount of excess tape if many labels are printed. However, it is necessary to wait until the next label can be printed.

4-2

ESC i f	Apply/remove a frame (global)	
	ASCII	ESC i f
	Hexadecimal	1B 69 66
	Parameters	n (0.n.1 or 30h.n.31h)

[Description]

- Applies a frame around the entire text.
 - If N=0 (or 30h), the frame is removed.
 - If N=1 (or 31h), a rectangular frame is applied.

ESC i l	Specify tape length ("0" indicates "AUTO".)	
	ASCII	ESC i l
	Hexadecimal	1B 69 6C
Parameters	n1 n2 len = n1+n2 x 256 (len =0 or 36.len.1800)	

[DESCRIPTION]

- . The tape length "len" is specified in increments of 1/180". (len=n1 + n2 x 256)
In this 2-byte parameter, n1 represents the lower order byte of len, and n2 represents the upper order byte of len.
- . The range in which the tape length can be set is 0.2 to 10 inches. (36.len.1800)
- . If len=0 is set, AUTO length is selected.
If the tape length is set to AUTO, the length is adjusted according to the data to be printed.

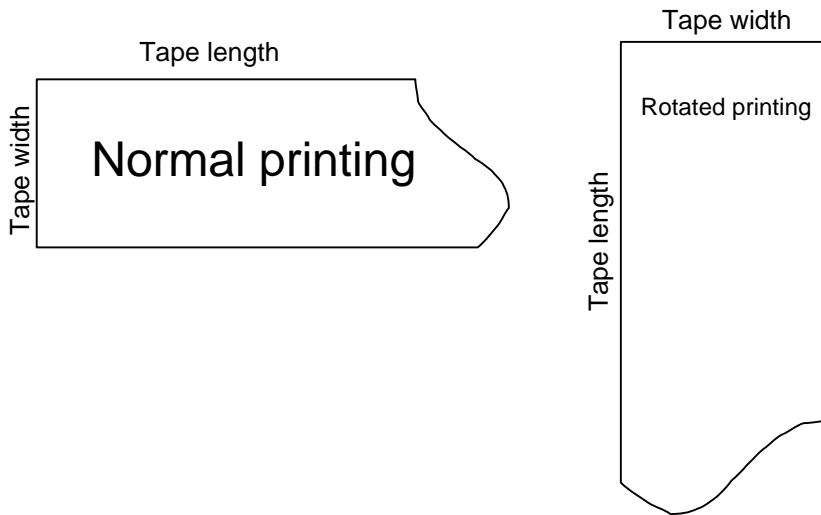
<Calculate n1 and n2 for a label length of 50 mm>

1. Convert 50 mm to inches. (1 inch = approx. 25.4 mm)
 $50/25.4 = 1.968503937007874015748031496063 = \text{approx. } 1.968 \text{ inch}$
2. Calculate the value (len) corresponding to that calculated in step 1 with 1/180" equal to one unit.
 $1.968 \times 180 = 354.24 = 354$
3. Determine the hexadecimal notation for the value calculated in the previous step.
Hexadecimal value of 354: 162h
If this value is written in two bytes, the upper order byte and lower order byte are 01 and 62, respectively.
n1=62
n2=01
4. Command that is sent: ESC i 1 62h 01h
Hexadecimal notation: 1B 69 6C 62 01

ESC i L	Apply/remove rotated printing	
	ASCII	ESC i L
	Hexadecimal	1B 69 4C
	Parameters	n (0.n.1 or 30h.n.31h)

[Description]

- . Applies rotated printing to the text.
 - If n=0 (or 30h), rotated printing is removed.
 - If n=1 (or 31h), rotated printing is applied.
- . Rotated printing rotates the text and prints it horizontally along the length of the tape.



ESC i m	Specify margin width	
	ASCII	ESC i m
	Hexadecimal	1B 69 6D
	Parameters	n1 n2 mgn=n1+n2x256 (7.mgn.720)

[Description]

- . The margin width mgn is set in increments of 1/180". (mgn=n1+n2x256)
 - . The range in which the margin width can be set is 0.04 to 4 inches (1.016 to 101.6 mm). (7.mgn.720)
- For details on calculating values for n1 and n2, refer to the section "Specify tape length" (4-3).

5: RS232C settings

5-1

ESC i U B	Specify baud rate	
	ASCII	ESC i U B
	Hexadecimal	1B 69 55 42
	Parameters	n (0.n.12)

[Description]

- As an RS232C communication setting, the baud rate is set as shown below.
 - If n=0, a baud rate of 115200 bps is selected.
 - If n=1, a baud rate of 600 bps is selected.
 - If n=2, a baud rate of 1200 bps is selected.
 - If n=3, a baud rate of 2400 bps is selected.
 - If n=4, a baud rate of 4800 bps is selected.
 - If n=5, a baud rate of 9600 bps is selected.
 - If n=6, a baud rate of 14400 bps is selected.
 - If n=7, a baud rate of 19200 bps is selected.
 - If n=8, a baud rate of 28800 bps is selected.
 - If n=9, a baud rate of 31250 bps is selected.
 - If n=10, a baud rate of 38400 bps is selected.
 - If n=11, a baud rate of 57600 bps is selected.
 - If n=12, a baud rate of 115200 bps is selected.

(The default setting is 115200 bps.)
- The setting is applied the next time that the P-touch is turned on.
- Printing from the printer driver is possible only at three communication speeds (115200 bps, 57600 bps and 9600 bps).

5-2

ESC i U b	Specify bit length	
	ASCII	ESC i U b
	Hexadecimal	1B 69 55 62
	Parameters	n (0.n.1)

[Description]

- As an RS232C communication setting, the bit length is set as shown below.
 - If n=0, a bit length of 7 bits is selected.
 - If n=1, a bit length of 8 bits is selected.

(The default setting is 8 bits.)
- The setting is applied the next time that the P-touch is turned on.

5-3

ESC i U P	Specify parity	
	ASCII	ESC i U P
	Hexadecimal	1B 69 55 50
	Parameters	n (0.n.2)

[Description]

- As an RS232C communication setting, the parity is set as shown below.

If n=0 None

If n=1 ODD

If n=2 EVEN

(The default setting is None.)

- The setting is applied the next time that the P-touch is turned on.

5-4

ESC i U C	Specify busy controls	
	ASCII	ESC i U C
	Hexadecimal	1B 69 55 43
	Parameters	n (0.n.1)

[Description]

- As an RS232C communication setting, the busy control is set as shown below.

If n=0 Hardware (DTR)

If n=1 X-ON/X-OFF

(The default setting is Hardware (DTR).)

- The setting is applied the next time that the P-touch is turned on.

Appendix

Code table

Character data for ESC/P codes

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	`	p	Ç	É	á	!	+		a	
1			!	1	A	Q	a	q	ü	æ	í	!	-		ß	±
2			“	2	B	R	b	r	é	Æ	ó	!	-			
3			#	3	C	S	c	s	â	ô	ú	!	+			¾
4			\$	4	D	T	d	t	ä	ö	ñ	!	-			
5			%	5	E	U	e	u	à	ò	Ñ		+			§
6			&	6	F	V	f	v	å	û	à				μ	÷
7			'	7	G	W	g	w	ç	ù	°					
8			(	8	H	X	h	x	ê	ÿ	?	©	+			°
9			)	9	I	Y	i	y	ë	Ö	®	!	+	+		.
.			*	:	J	Z	j	z	è	Ü	€	!	-	+	O	
.			+	;	K	[	k	{	ï	¢	½	+	-	✓	d	
.			,	<	L	\	l	!	î	£	¼	+	!	☑		³
.			-	=	M	]	m	}	ì	¥	¡	TEL	-		∅	²
.			.	>	N	^	n	~	Ä	Pts	«	FAX	+			
.			/	?	O	_	o	DEL	Å	f	»	+		□		

“.” indicates that a space is printed.

“.” indicates that the character will change if the international character set is switched.

Code table: Compatible characters in each language when the international character set is switched

n		23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
0	United States	#	\$	@	[	\	\]	^	`	{	|	}	~
1	France	#	\$	à	°	ç	§	^	`	é	ù	è	¨
2	Germany	#	\$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
3	Britain	£	\$	@	[	\	\]	^	`	{	|	}	~
4	Denmark I	#	\$	@	Æ	Ø	Å	^	`	æ	ø	å	~
5	Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6	Italy	#	\$	@	°	\	é	^	ù	à	ò	è	ì
7	Spain I	Pt	\$	@	ı	Ñ	ı	^	`	¨	ñ	}	~
8	Japan	#	\$	@	[	¥	]	^	`	}	|	}	~
9	Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
10	Denmark II	#	\$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
11	Spain II	#	\$	á	ı	Ñ	ı	é	`	í	ñ	ó	ú
12	Latin America	#	\$	á	ı	Ñ	ı	é	ü	í	ñ	ó	ú
13	Korea	#	\$	@	[	₩	]	^	`	{	|	}	~
64	Legal	#	\$	§	°	'	"	¶	`	©	®	.	™

Code table for Eastern European characters

東欧文字用コード表

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	`	p	€	ť		°	Ř	Đ	ř	đ
1			!	1	A	Q	a	q	À	‘	˘	±	Á	Ń	á	ń
2			"	2	B	R	b	r	,	’	˘	˘	Â	Ň	â	ň
3			#	3	C	S	c	s	Ě	“	Ł	ł	Ă	Ó	ă	ó
4			\$	4	D	T	d	t	„	”	¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u	...	•	Ą	μ	Í	Õ	í	õ
6			&	6	F	V	f	v	†	—	|	¶	Ć	Ö	ć	ö
7			’	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷
8			(	8	H	X	h	x	Ĳ		”	˘	Č	Ř	č	ř
9			)	9	I	Y	i	y	‰	™	©	ą	É	Û	é	û
A			*	:	J	Z	j	z	Š	š	Ş	ş	Ę	Ú	ę	ú
B			+	;	K	[	k	{	<	>	«	»	Ë	Ů	ë	ů
C			,	<	L	\	l	!	Ś	ś	¬	Ł	Ě	Ü	ě	ü
D			-	=	M	]	m	}	Ť	ť	-	˘	Í	Ý	í	ý
E			.	>	N	^	n	~	Ž	ž	®	ł	Î	Ţ	î	ţ
F			/	?	O	_	o	DEL	Ž	ž	Ž	ž	Ď	ß	ď	·

“” indicates that a space is printed.

Japanese code table (hiragana and katakana)

	ô _	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63		
ï	u	JIS	40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F	50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F	
01	21	•	_						•e	'	g	•	h	•	i	•	j			•	l	•	m	•	n	•	o	•	p						
02	22																																		
03	23		é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	
04	24	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	
05	25	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	

	ô _	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
ï	u	JIS	20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F	30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
01	21																																	
02	22																																	
03	23																																	
04	24		é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é
05	25	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â

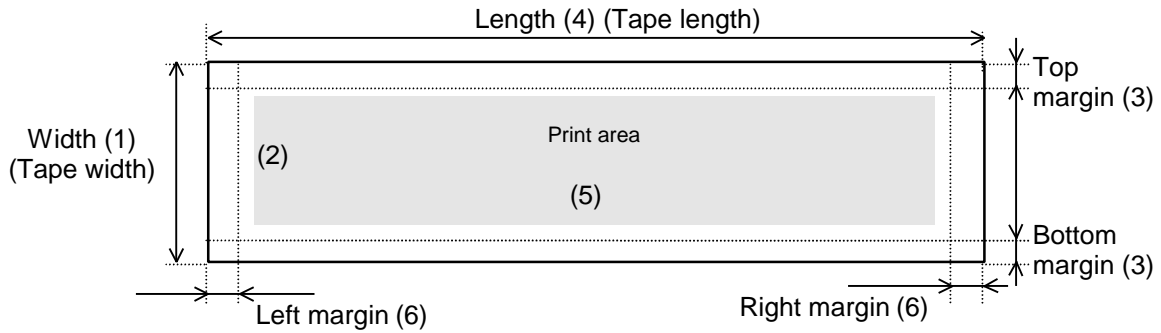
	ô _	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	
ï	u	JIS	60	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F	70	71	72	73	74	75	76	77	78	79	7A	7B	7C	7D	7E	7F
01	21	•	€															•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
02	22																																	
03	23		é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é
04	24	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é
05	25	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â	â

* Only first level kanji can be printed with JIS codes.

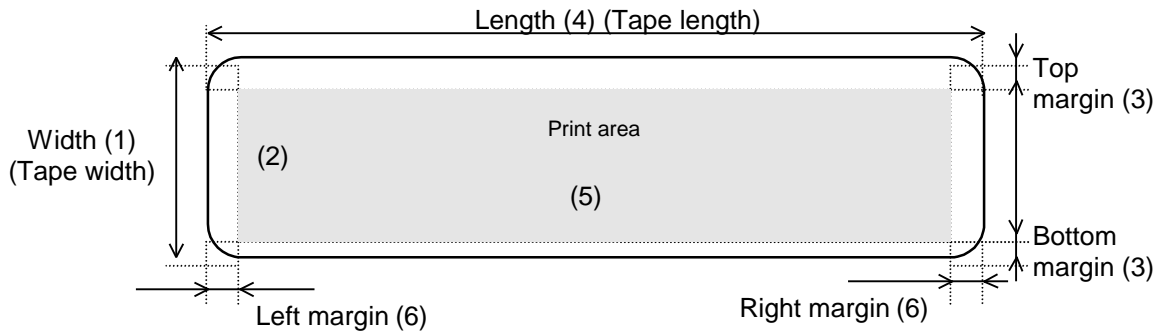
Tape widths and print area

The print area for each tape width is shown below.

TZ tape



AV tape (US/Canada only)



Type	Width mm	Print Area (Vertical) mm/dots	Top/Bottom Margins mm	Length mm	Print Area (Horizontal) mm/dots	Left/Right Margins mm	Dot Position*	Maximum Number of Text Lines
	(1)	(2)	(3)	(4)	(5)	(6)		
36	36	27.1/384	4.5				0 to 383	16
24	24	22.6/320	0.71				32 to 351	13
18	18	16.5/234	0.75				75 to 308	9
12	12	10.6/150	0.71				117 to 266	6
9	9	7.5/106	0.76				139 to 244	4
6	6	4.5/64	0.74				160 to 223	2
AV2067	20.0	16.9/240	1.55	66.6	56.7/804	5.0	72 to 311	4
AV1957	19.2	15.8/224	1.69	57.3	47.1/668	5.1	80 to 303	4
AV1789	16.9	13.5/192	1.69	89.0	78.9/1118	5.1	96 to 287	3

* The dot position is the lowest dot that is specified as 0. (0 through 383)









* AV tape is only available in the United States and Canada.

Print character font

Bitmapped fonts for two English fonts and one Japanese font (hiragana, katakana, Arabic numerals and first level kanji) are available. In addition, a dot image font for the characters under the bar codes is also available.

The maximum printing length (when using ESC/P commands) is approximately 25 cm.

Tape cutting patterns

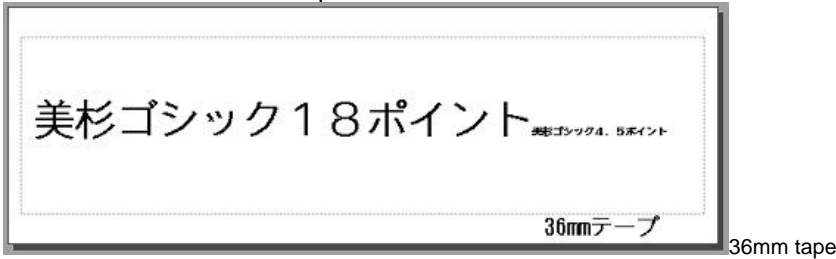
No.	Chain printing	Half cut	Auto cut	Cutting pattern
00	0	0	0	
01	0	0	1	
02	0	1	0	
03	0	1	1	
04	1	0	0	
05	1	0	1	
06	1	1	0	
07	1	1	1	

1: Enabled; 0: Disabled

With chain printing, the last label printed is not cut until the next label is printed. (This reduces the excess tape that is normally fed out at the beginning of the next printed label.)

Font images

The design and maximum and minimum size of the fonts are shown below. There may be some differences with the actual printed text.



Print sample

The following label is a sample printed using ESC/P commands from raster mode. If the machine is already in ESC/P mode, the 6-byte or 4-byte commands at the beginning are unnecessary.



	Select ESC/P mode	Initialize	Print data "12345"	Print bar code data "1234567" with EAN8.	Begin printing
ASCII:	ESC i a 0	ESC @	1 2 3 4 5	ESC i T 3 B 1 2 3 4 5 6 7 ? \	FF
Hexadecimal:	1B 69 61 00	1B 40	31 32 33 34 35	1B 69 54 33 43	31 32 33 34 35 36 37 3F 5C 0C
				Specify bar code	Begin bar code
				Select EAN 8	Bar code data
					Add check digit
					End bar code